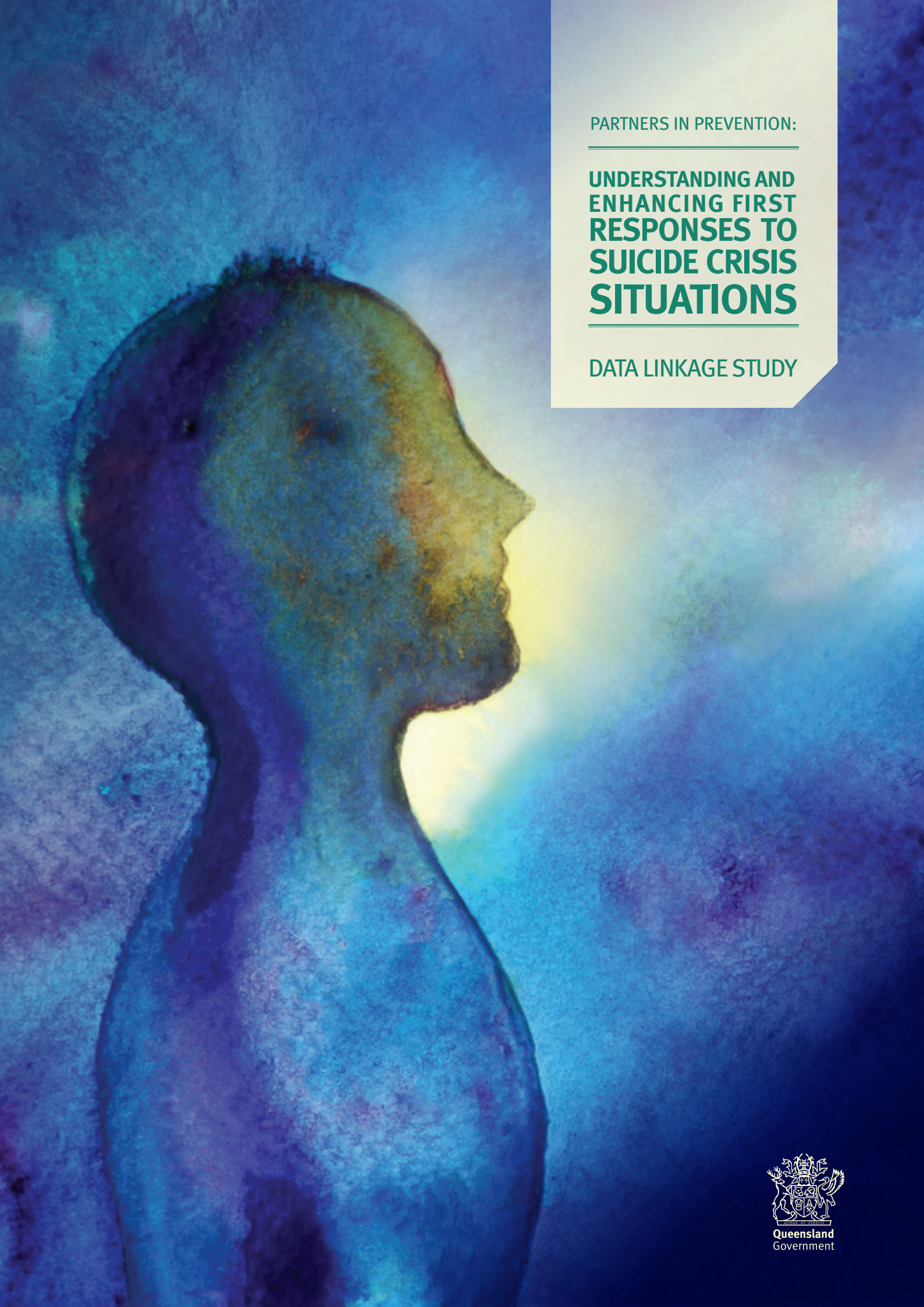

PARTNERS IN PREVENTION:

UNDERSTANDING AND ENHANCING FIRST RESPONSES TO SUICIDE CRISIS SITUATIONS

DATA LINKAGE STUDY

Queensland Government

ACKNOWLEDGEMENTS

We would like to acknowledge the Traditional Custodians of the land on which our services are located. We pay our respects to the Elders both past and present and acknowledge Aboriginal and Torres Strait Islander peoples across the State. We continue to recognise that to Close the Gap we need to work together with Aboriginal and Torres Strait Islander people, communities, staff and stakeholders to ensure that we are meeting the needs of the community.

We acknowledge those who experience suicidality and those lost to suicide, and their families, friends, loved ones, and others who are affected by suicide.

Disclaimers

Queensland Government

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Queensland Police Service

The authors wish to acknowledge the support and assistance from the Queensland Police Service in undertaking this research. The views expressed in this publication are not necessarily those of the Queensland Police Service and any errors of omission or commission are the responsibility of the authors.

Roses in the Ocean

The views expressed by people with a lived experience of suicide engaged in consultation throughout this project and publication are their own specific perspectives and do not endeavour to represent all lived experience perspectives. We acknowledge that all lived experience insights are valuable and important.

Queensland Alliance for Mental Health (QAMH)

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OVERVIEW

Individuals who experience a suicide crisis often come into contact with police or paramedics. Those who have experienced a suicide crisis report deficiencies with the existing system, and police and paramedics report that responding to these events is one of the most challenging aspects of their role. However, little is known about the nature, extent, precipitating factors, pathways and outcomes of a suicide related call-out, and what responses will most effectively and compassionately meet the needs of those in crisis. *Partners in Prevention: Understanding and Enhancing First Responses to Suicide Crisis Situations*, funded by the Queensland Health Suicide Prevention Health Taskforce, was established in 2017 to address these knowledge gaps and inform systems enhancements.

Project overview

The Partners in Prevention project encompassed five major initiatives:

DATA LINKAGE
A linked data study about individuals who came into contact with Queensland Police Service or Queensland Ambulance Service between 2014 and 2017, and their health services use and outcomes between 2013 and 2018.

SERVICE MAPPING
An integrated service mapping of collaborative services involving police, ambulance and mental health services up to January, 2018.

PERSPECTIVES FROM LIVED EXPERIENCE
A workshop to gather lived experience perspectives on optimal first responses to suicide crisis situations, and situations involving a recent bereavement due to suicide.

LITERATURE REVIEWS
Reviews of literature on: optimal care pathways following a suicide-related call to emergency services; evaluation frameworks for collaborative suicide crisis interventions; and data linkage studies in suicidology.

KNOWLEDGE, SKILLS, ATTITUDES AND CONFIDENCE OF POLICE
A mixed methods study of knowledge, skills, attitudes and confidence of police in responding to suicide crisis situations.

Our partners

QUEENSLAND CENTRE FOR MENTAL HEALTH RESEARCH

QUEENSLAND AMBULANCE SERVICE

QUEENSLAND HEALTH

QUEENSLAND POLICE SERVICE

ROSES IN THE OCEAN

BRISBANE NORTH PHN

QUEENSLAND ALLIANCE FOR MENTAL HEALTH

QUEENSLAND MENTAL HEALTH COMMISSION

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SUMMARY

Why we did this

The Partners in Prevention data linkage project was established in order to better understand the service demand associated with suicide crises, the characteristics of individuals who are the subject of a suicide related call to police or ambulance services, their care pathways before and after a suicide crisis, the types of responses that could best serve their needs, the capacity of the services to deliver the responses, and how to improve continuity of care following a crisis.

What we did

We built a dataset around a cohort of individuals who were the subject of a suicide related call to Queensland Ambulance Service and/or Queensland Police Service over the three-year period between 2014 and 2017. Data for this cohort were linked to a range of state-wide health datasets for the five-year period between 2013 and 2018, ensuring that 12 months pre- and post- data were collected for all individuals.

The dataset that was built contains approximately 220,000 calls for 70,000 individuals, linked to over 7,000,000 health records.

What we found

Demand

We estimated that police and paramedics in Queensland received 228,550 suicide related calls over the three-year period 1 February, 2014 to 31 January, 2017. This is an average of 209 suicide related calls per day across the state. Suicide related calls rose between 23% (Queensland Ambulance Service) and 28% (Queensland Police Service) over this period.

Demographic characteristics

Of the individuals who were identified as being the subject of a suicide related call to Queensland Police Service or Queensland Ambulance Service, we estimated that:

- 52% were female, and 48% were male;
- 13% were Aboriginal and/or Torres Strait Islander;
- 84% were born in Australia;
- 11% were under the age of 18 at the time of their index contact with police or paramedics;
- 8% were 65 years of age or older at the time of their index contact with police or paramedics;
- 5% were expectant mothers or had recently given birth around the time of their index contact with police or paramedics;
- 3.5% had died, due to any cause, within 12 months of their index contact with police or paramedics; and
- 1.5% had died with the cause of death identified as due to intentional self-harm within 12 months of their index contact with police or paramedics.

Health characteristics

- 19% of individuals in the Partners in Prevention cohort had a confirmed primary mental health diagnosis, based on data available in the Queensland Health public mental health services database.
- 46% of individuals in the Partners in Prevention cohort had a record, either in an emergency department or mental health services database, that documented suicide or self-harm thoughts or behaviours.

Health services utilisation

- Almost all (96%) individuals in the Partners in Prevention cohort presented to an emergency department, at least once, over the five-year period between 2013 and 2018.
- 69% of individuals in the Partners in Prevention cohort presented to an emergency department on the same day as their index contact with police or paramedics.
- 84% of individuals in the Partners in Prevention cohort had a public mental health services record.
- Health services activity relating to this cohort increased across all health services in the twelve months following an index contact with police or paramedics, compared with the twelve months prior.
- Use of Emergency Examination Orders increased in the twelve months following an index contact with police or paramedics, compared with the twelve months prior.
- 21% of individuals had re-presented to police or paramedics within twelve months of their index contact.

Health pathways

- The most common dispatch type that was used by police or paramedics for individuals in this cohort was an immediate, road speed, response.
- The most common triage category assigned to individuals who presented to an emergency department was 'urgent', meaning that the individual should be seen within 30 minutes.
- The most common 'end status' for individuals subject to a police or paramedic dispatch and triaged as 'urgent', was to have the episode completed and be discharged.
- Pathways through the emergency department were similar for individuals who were the subject of an immediate, road speed, response, regardless of whether they were subject to a police or paramedic dispatch.
- Pathways through the emergency department were distinct for individuals who were the subject of an emergency, 'lights and sirens', response by police or paramedics, with those subject to a paramedic dispatch identified as having greater acuity than those subject to a police dispatch.

Deaths

- In total, 5% of individuals in the Partners in Prevention cohort had died of any cause, over the four-year period between 2014 and 2018. Two percent had a cause of death identified as intentional self-harm over this period.
- Individuals within the Partners in Prevention cohort who died due to intentional self-harm over the three-year period between 2014 and 2017 accounted for an estimated 56% of suicide deaths in Queensland that occurred during this period.
- 36% of individuals in the Partners in Prevention cohort who died by suicide were alive in the calendar month after their index contact with police or paramedics.
- While 46% of individuals in the Partners in Prevention cohort had at least one record noting the presence of suicidal or self-harming thoughts or behaviour, the rate was lower (33%) among those who had a cause of death due to intentional self-harm.

Conclusions

The data linkage study has uncovered the substantial and growing number of suicide related calls that police and paramedics receive. Demographic analysis highlighted the diversity of people who experience suicide crises, across gender, age, and cultural background. Analysis of the health characteristics of this group identified that the minority of individuals who are the subject of a suicide related call had a confirmed mental health diagnosis. Health services activity increased overall, following an index contact with police or paramedics. Health services activity and pathways warrant further attention, especially given the observed heavy reliance on emergency departments. The data on deaths highlighted that police or paramedics will have contact with many individuals whose cause of death is identified as due to intentional self-harm in Queensland. In at least one-third of cases, the individual who died was alive in the calendar month following contact. However, the fact that individuals whose cause of death is identified as due to intentional self-harm appear to be less likely to have had suicidality noted in a prior presentation, than those who did not die, warrants close attention.

INTRODUCTION

Emergency service agencies including police, ambulance and mental health are frequently required to be frontline responders to mental health crises in the community, where people may have significant mental health, emotional, or substance misuse problems and may be suicidal. Because of this, first responders are widely acknowledged to have a unique and important role to play in community-based suicide prevention (World Health Organization, 2009). Yet, currently little is known about the demand that suicide related call-outs place on police and paramedics, the characteristics of individuals who are the subject of these call-outs, and whether existing responses effectively meet the needs of persons experiencing suicide crises. Data linkage, using routinely collected administrative data, can address these knowledge gaps. In particular, this approach can be used to examine complex processes, contexts and multi-agency pathways that individuals traverse.

A literature review undertaken by the project team, of published literature available up until 4 April, 2018, identified the need for the Partners in Prevention data linkage project. From a corpus of 2,408 articles that were found using searches to identify data linkage studies on suicide, 592 data linkage studies were identified as including analysis on the topic of suicide behaviours. On the basis of title and abstract review, eleven of these studies (<2% of the 592 reviewed) were found that met the criteria of: 1) reporting linkage to police or ambulance records; and 2) presenting findings or analysis on police or ambulance records for a reason other than to ascertain the cause of death (i.e., to determine that the cause of death was suicide). These studies are summarised in Table 1. Only two of these studies focussed on an analysis of suicide or self-harm 'events' or crises, broadly defined. These studies were: 1) an Australian study from 2017 by Borschmann and colleagues that examined ambulance attendances due to self-harm in adults following release from prison, including factors predicting attendances (Borschmann et al., 2017); and 2) a Dutch study from 2012 by van den Brink and colleagues based on cross-matching of police records and psychiatric case register data. This study examined individuals in mental health crisis situations who were the subject of a police call out, the extent of disconnection from mental health services, and whether police response results in re-establishing contact (van den Brink et al., 2012). No study was identified that involved linkage to both police and ambulance records, an important oversight to address given the extent of overlap, and need for collaboration, between these agencies when responding to triple zero calls.

The Partners in Prevention data linkage project was established in order to fill knowledge gaps about individuals who experience a suicide crisis that brings them into contact with police or ambulance responders, to better understand the demand, the characteristics of individuals who are the subject of a suicide related call to police or ambulance services, their care pathways before and after a suicide crisis that results in a call to police or ambulance services, the types of responses that could best serve their needs, the capacity of the services to deliver the responses, and how to improve continuity of care following a suicide crisis.

Research questions

Overall, the Partners in Prevention data linkage study sought to find answers to service relevant questions, such as:

- What demand do suicide related calls place on Queensland Police Service and Queensland Ambulance Service?
- What are the demographic and health characteristics of individuals who are the subject of a suicide related call to Queensland Police Service or Queensland Ambulance Service?
- What is the nature of health services contact before and after a call to Queensland Police Service or Queensland Ambulance Service?
- What are outcomes for individuals who are the subject of a suicide related call to Queensland Police Service or Queensland Ambulance Service?

Table 1 Summary of data linkage studies identified that examined suicide behaviours and included linkage to police or ambulance records

Author	Year	Population	Cohort	Linked data	Study aims
Borschmann, Young, Moran et al.	2017	N=1309 adults released from prison 2008-2010; Australia	Adults released from prison	State-wide correctional, ambulance, emergency department, hospital and death records in Queensland, Australia.	Estimates the number of ambulance attendances due to self-harm in adults following release from prison, and identifies factors predictive of such attendances.
Martiniuk, Ivers, Glozier et al.	2009	N=18,871 newly licenced drivers, aged 17-24; Australia	Newly licenced drivers	Linkage of survey data with licensing attempts and police-reported motor vehicle crashes during the follow up period.	Assesses the risk that intentional self-harm poses for motor vehicle crashes among young drivers.
Lyons, Fowler, Jack et al.	2016	N=18,765 fatal incidents; N=19,251 deaths in 2013; North America	Individuals who died violent deaths	Violent Death Reporting System (VDRS) collects data from participating states regarding violent deaths obtained from death certificates, coroner/medical examiner reports, law enforcement reports, and secondary sources (e.g., child fatality review team data, supplemental homicide reports, hospital data, and crime laboratory data).	Reports routine data by sex, age group, race/ethnicity, marital status, location of injury, method of injury, circumstances of injury, and other selected characteristics.
Parks, Johnson, McDaniel et al.	2014	N=15,871 fatal incidents; N=16,186 deaths in 2010; North America	Individuals who died violent deaths	VDRS collects data from participating states regarding violent deaths obtained from death certificates, coroner/medical examiner reports, law enforcement reports, and secondary sources (e.g., child fatality review team data, supplemental homicide reports, hospital data, and crime laboratory data).	Reports routine data by sex, age group, race/ethnicity, marital status, location of injury, method of injury, circumstances of injury, and other selected characteristics.
Fowler, Jack, Lyons et al.	2018	N=22,098 fatal incidents; N=22,618 deaths in 2014; North America	Individuals who died violent deaths	VDRS collects data from participating states regarding violent deaths obtained from death certificates, coroner/medical examiner reports, law enforcement reports, and secondary sources (e.g., child fatality review team data, supplemental homicide reports, hospital data, and crime laboratory data).	Reports routine data by sex, age group, race/ethnicity, marital status, location of injury, method of injury, circumstances of injury, and other selected characteristics.
Kellerman, Rivara, Lee et al.	1996	N=1,915 firearm injuries; North America	Individuals injured by firearms, requiring emergency medical treatment.	Records of the police, medical examiners, ambulance crews, and hospital emergency departments and hospital admissions.	A population-based study of fatal and nonfatal gunshot wounds. Describes the incidence and outcome of injuries due to firearms, includes cause of injury/death.
Warren, Mullen, Thomas et al.	2008	N=613 individuals; Australia	Individuals convicted of threats to kill and who had had prior contact with a public mental health service	Linkage between police and mental health records.	Examines serious violence following making threats to kill and the potential role of mental disorder. (Suicide reported)
van den Brink, Broer, Tholen et al.	2012	N=492 situations; N=336 individuals; Netherlands	Individuals in mental health crisis situations and who are the subject of police call out.	Linkage between police records and psychiatric case register data.	Examines the extent of disconnection from mental health services, and whether police response results in re-establishing contact.
Logan, Hill, Black et al.	2008	N=408 homicide-suicide incidents; North America	Homicide-suicide incidents.	VDRS study.	Examines perpetrator characteristics and how they compare with other homicide suspects and those who have died by suicide.
Fjelsted, Teasdale, Jensen and Erlangsen	2017	N=7,115 individuals who died by suicide between 2000-2010 and N=142,300 matched controls who were alive at the time of matched death; Denmark	Individuals who died by suicide and matched controls who were alive.	Linkage between Danish civil registration system, cause of death register, national hospital register, and national crime register.	Examines whether persons who died by suicide had more frequently been exposed to stressful life events than those who did not die by suicide.
Papalia, Luebbers, Ogloff et al.	2017	N=2,759 cases of child sexual abuse between 1964 and 1995, and N=2,677 matched controls; Australia	Individuals who were identified as having experienced childhood sexual abuse, and a matched sample with no recorded experience of childhood sexual abuse.	Linkage between public mental health database, Victoria Police and Coronial service.	Determines rate, co-occurrence of mental health morbidity, criminal justice system contact, and fatal self-harm among victims of child sexual abuse, and to identify variables associated with adverse experiences.

METHODS

Study design

The Partners in Prevention linked dataset was built around a cohort of individuals who were the subject of a suicide related call to police or paramedics.

What is data linkage?

Data linkage is the process of combining data from different sources into a unified repository for analysis. Its purpose is to harness the power of routinely collected data to inform questions regarding complex processes. A key advantage of research that draws on naturally occurring data is that it provides a snapshot of the phenomena of interest that is unencumbered by 'researcher effects' that include, but are not limited to, social desirability bias and recall bias.

Ethics

This study received ethical clearance from the Royal Brisbane and Women's Hospital Health Research Ethics Committee (HREC/17/QRBW/666), approval from the Queensland Police Service research committee (DOC17/1772716), and *Public Health Act* approval (RD007804). This study has adhered strictly to the separation principle.

Separation principle

The separation principle is the ethical cornerstone of data linkage studies. In essence, the separation principle protects the privacy of individuals whose data are linked by ensuring that identifiable information about a person (e.g., name, address, and date of birth) is separated from the content data that is of interest to researchers (e.g., contacts with health services).

Data sources

Call and cohort identification

Suicide related calls, and individuals who were the subject of suicide related calls, were identified via the following Queensland Police Service and Queensland Ambulance Service databases:

- Queensland Police Service, Queensland Computer Aided Dispatch (QCAD) and Queensland Police Records Information Management Exchange (QPRIME); and
- Queensland Ambulance Service, Computer Aided Dispatch (CAD) and electronic Ambulance Report Form (eARF).

Cohort information

Details on individuals who were the subject of these calls were provided to The Queensland Health Statistical Services Branch to facilitate linkage to a range of Queensland Health datasets, as identified below and in Figure 1:

- Consumer Integrated Mental Health Application (CIMHA)
- Alcohol, Tobacco and Other Drugs Services – Information System (ATODS-IS)
- Queensland Hospital Admitted Patient Data Collection (QHAPDC)
- Emergency Data Collection (EDC)
- Queensland Death Register (QDR)
- Perinatal Data Collection (PDC)

Although it falls outside of the scope of the current report, provisional ethical clearance has been provided to link data to the following health datasets held by the Australian Institute of Health and Welfare:

- Medical Benefits Schedule (MBS)
- Pharmaceutical Benefits Scheme (PBS)
- National Death Index (NDI)

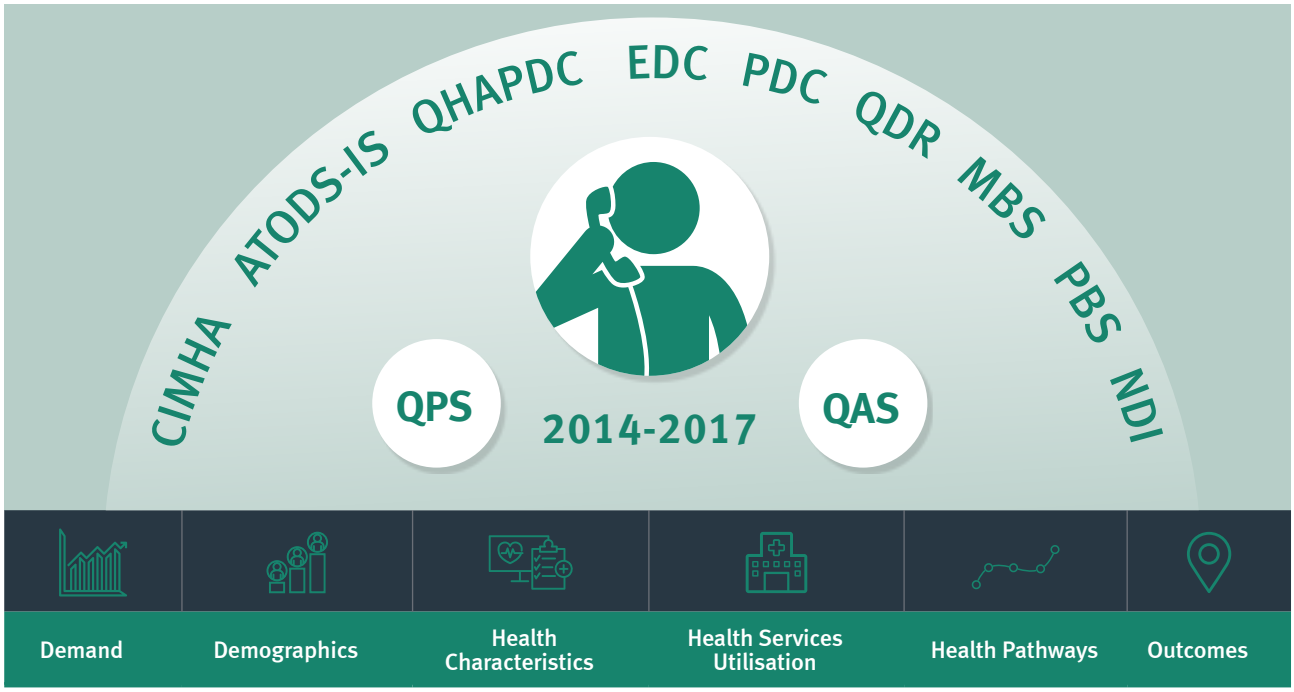

Figure 1 Schematic of the Partners in Prevention data linkage study. CIMHA: Consumer Integrated Mental Health Application; ATODS-IS: Alcohol, Tobacco and Other Drugs Service – Information System; QHAPDC: Queensland Hospital Admitted Patient Data Collection; EDC: Emergency Data Collection; PDC: Perinatal Data Collection; QDR: Queensland Death Register; MBS: Medicare Benefits Schedule; PBS: Pharmaceutical Benefits Scheme; NDI: National Death Index.

Call and cohort identification

The cohort comprises individuals who were the subject of a suicide related call to police or ambulance services between 1 February, 2014 and 31 January, 2017. For the purpose of this report, a suicide related call was defined as a documented instance or account referring to suicidal ideation, threatened suicide, threatened or intentional self-harm, suicide behaviours or suicide attempts, or suicide death. QPRIME records relating to suspected suicide deaths were excluded from the cohort for the purposes of this report, if they were not linked to a Queensland Ambulance Service or Queensland Police Service QCAD record.

Suicide related calls were identified first, and then the individuals who were the subject of the calls were identified from this pool of calls. Calls were selected if they met one of two criteria:

1. they had been assigned a suicide related dispatch code, or
2. the written notes relating to the dispatch included suicide related keywords or phrases, specifically use of the word suicide or self-harm, phrases indicating an intent to harm oneself or take one's life, or phrases indicating the means by which a person intended to take their life.

Queensland Police Service

The process of cohort identification from Queensland Police Service records followed a two-step process: step 1. call identification; and step 2. case (individual) identification.

Call identification

Dispatch code identification

Queensland Police Service calls were predominately extracted via calls for service. All calls with an initial or revised QCAD code of 502 (suicide) or 503 (attempting/threatening suicide) were included in the call set. Subsequently, a range of additional dispatch codes were investigated for subsequent keyword searching (see Appendix A). These dispatch codes were selected through review of previous evaluations and the Queensland Police Service Operational Procedures Manual (Queensland Police Service, 2018), and inductively, through iterative engagement with records in order to identify keywords. New incident types were included if they appeared in relation to at least 1000 records over the three-year search period. Through this process, the following QCAD codes were included for keyword searching:

- 312 (Domestic Violence);
- 313 (Disturbances/Disputes);
- 504 (Mentally Ill Person);
- 513 (QAS);
- 610 (Community Assistance); and
- 619 (Welfare Check).

Keyword selection

There is a growing body of literature, particularly utilising machine learning, that focusses on predictive assessment of suicide risk based on written texts; these include analyses of medical records, suicide notes and social media content (Burnap, Colombo, & Scourfield, 2015; Poulin et al., 2014). Thus, terms lists were sought via literature searches as a way of seeding the terms list for this study. However, suicide language is highly context specific and varies according to type or phase of distress (e.g., suicidal ideation versus attempt), point of view (e.g., first versus third person perspective) and external constraints (e.g., word or character limits or whether the narrative record is static versus dynamic). Early investigations by the research team showed that the utility of keywords and phrases varied according to dispatch code. For example, terms and phrases including the term 'jump', when used in the context of a 504 (Mentally Ill Person), predominately indicated intentional self-harm and/or suicide risk (e.g., 'going to jump off a bridge', 'threatening to jump in front of cars'). However, terms and phrases including 'jump', in the context of a 619 (Welfare Check), included calls from concerned people regarding children or adults jumping in unsafe ways. Jump terms in the contexts of 312 (Domestic Violence) and 313 (Disturbances/Disputes) often referred to threats to evade police (e.g., to jump over a fence or through a window to escape). As such, a bespoke dictionary was developed for this project.

The process of developing the keywords list for this study occurred manually among a subset of the investigator team, as follows:

1. explicit terms of interest were identified (e.g., suicide, self-harm), including common misspellings and grammatical variations (e.g., sucid, self harm); and
2. additional terms and phrases that identified the incident as suicide related were identified through ad-hoc review of a sample of text descriptions regarding 502 and 503 codes and then applied to other dispatches; and
3. terms and phrases were identified through a review of a sample of police narratives pertaining to suicide crisis situations; and
4. terms lists were iteratively reviewed and refined through examination of random samples of incident code and keyword combinations. This fourth step was repeated five times.

Where common misspellings, grammatical errors or abbreviations were identified, these were applied consistently across all similar keywords and phrases. Possible variations in tense, as well as variations in use of personal and gender pronouns, were also applied consistently across all term and phrase types identified. For example, identification of the phrase "kill himself" resulted in the set of phrases {kill himself, kill myself, kill herself, kill themself, kill themselves} and the phrase "take his life" resulted in a list of the following set of phrases {take life, take his life, take her life, take there life, take their life}. Suicide keywords and phrases were sorted into categories:

1. explicit suicide or self-harm terms;
2. statements of intent to die;
3. statements regarding suicide means; and
4. statements regarding the process of self-harm.

The full list of search terms is provided in Appendix B. The final search was hierarchical, undertaken in the order identified above, and conducted without replacement i.e., if a call was selected from batch one keywords, this call was removed from the search of batches two through four.

Validation

In order to reduce false positives, random samples of ten records matching each keyword × incident code combination were reviewed. Any keyword × incident code combination that correctly identified fewer than 80% of calls was excluded. Explanatory notes were recorded for each mis-identification (Appendix C).

Extraction of identifiers

Identifiers were extracted in three ways. First, QCAD incident numbers were searched for within the Queensland Police Service QPRIME database. QPRIME contains identifying details (name, date of birth, and address) for a subset of QCAD incidents. Second, names, ages and date of birth data were extracted from free text ('details') fields within QCAD records, using a bespoke algorithm using regular expressions in Python 3.6.5. A subset of the data consisting of 100 rows was initially investigated by sight to identify patterns which could be used to extract the information of interest. On this basis, an algorithm was written to extract identifiers based on identifiable patterns in the free text fields. For example, the name of the person of interest was frequently followed by the abbreviation "dob" and a date of birth; ages were often abbreviated as, for example, 20yo. Dates of birth varied in their format but the general pattern was of three sets of digits separated by a dot, dash or slash, making it possible to extract nearly all dates of birth. Once identifiers were extracted, they were standardised in preparation for data linkage. Finally, all QPRIME occurrences 1252 (Suspected Sudden Death Suicide) were extracted. Figure 2 shows the records screened and selected to comprise the Queensland Police Service call set.

Queensland Ambulance Service

Call identification

Queensland Ambulance Service 'calls' were selected via a combination of calls for service, and finalised case records. All records classified as MPDS 25 (Psychiatric, Abnormal Behaviour/Suicide Attempt) were included for data linkage. Additional cases were identified from a pre-selected set of record items that were searched for suicide related keywords. Table 2 shows the record items and associated selection criteria that constructed the pool of records that was subsequently keyword searched.

Table 2 Record selection items

Record item	Selection criteria
Case Nature	Overdose; Mental health / behavioural; Emotional problem; Psychiatric problem; Social situation / problem; Hanging; Stabbing
Complaint	Depression; Self harm; Suicidal; Suicide attempt
Secondary Survey	Behaviour: threatening; Ligature marks; Mood: depressed; Thought: depressive; Thought: suicidal
Initial / Final Assessment	Depression; Drug intoxication; Emotional distress; Psychiatric episode
Case Description	"psych" "mental" "suicide" "self harm" "ETOH" "depress" "QPS" "EEO" "psych" "police" "EEA" "emergency examination"

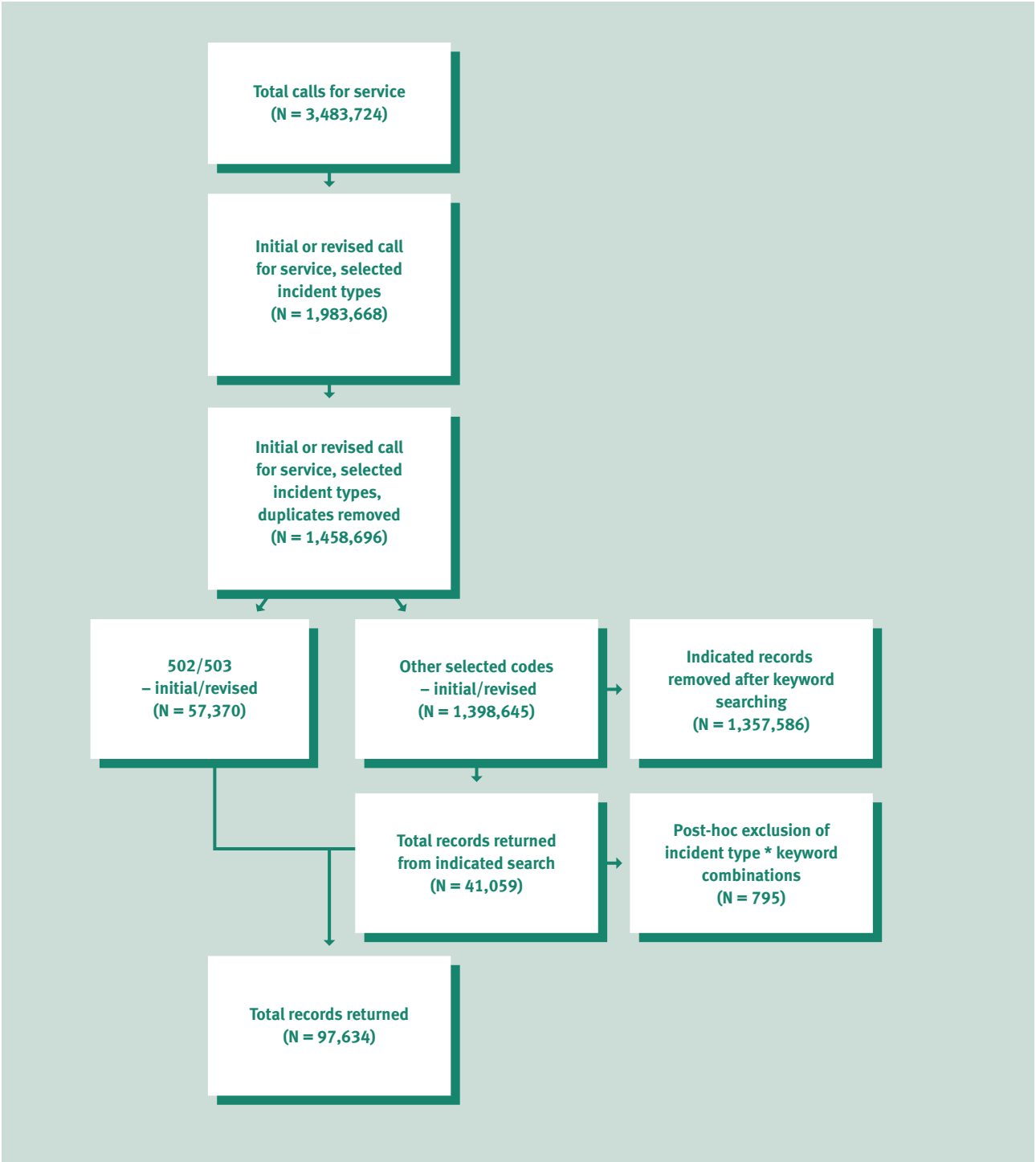

Figure 2 Flowchart showing selection of calls from QPS records.

Keyword selection

Record items were searched for the keywords and stems, including “Suicid”, “Ideation”, “Self Harm”, “End his life”, “End her life”, and “Intent”.

Extraction of identifiers

Identifiers were extracted for all records identified. Figure 3 shows the records screened and selected to comprise the Queensland Ambulance Service call set.

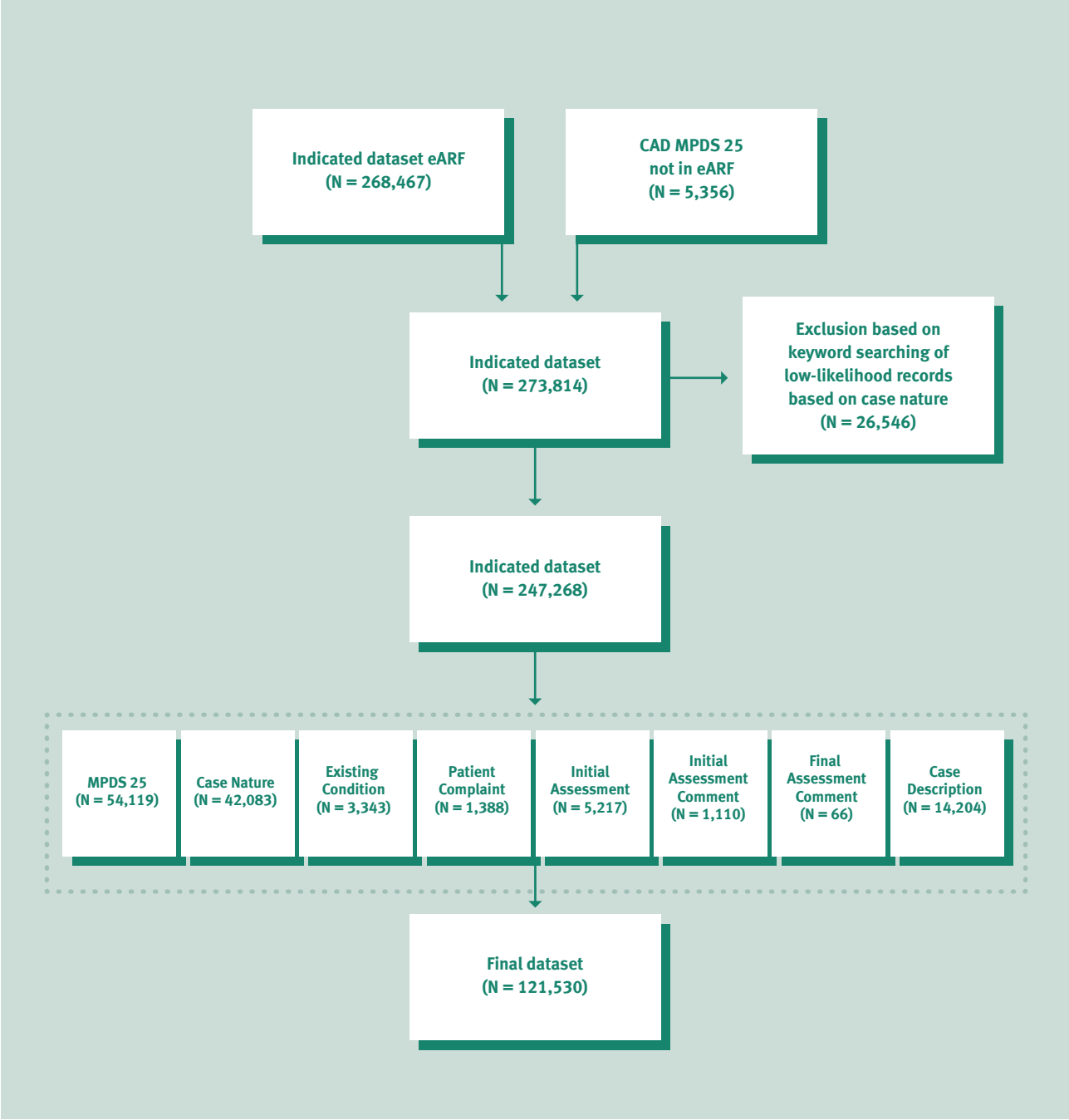

Figure 3 Flowchart showing selection of calls from QAS records.

Linkage

Identifiers were transferred from Queensland Ambulance Service and Queensland Police Service to the data linkage unit within Queensland Health for linkage. Queensland Health created a reference dataset of identifying data from the Queensland datasets to be linked to. Data were linked using a combination of deterministic and probabilistic linkage, and manual review. Queensland Ambulance Service records and the Queensland Police Service QPRIME extract of sudden death suicides were matched on first name, surname and date of birth, deterministically and probabilistically using LinkageWiz software (http://www.linkagewiz.net/index.htm). The remainder of Queensland Police Service QPRIME identified records and Queensland Police Service QCAD records were matched deterministically on first name, surname and date of birth.

Variables

Following identification, data were linked to the state-wide datasets identified earlier. A full list of variables supplied are listed in Appendix D. Data were linked for the period 1 February, 2013 – 31 January, 2018 in order to ensure that data were available 12 months pre - and post - an index contact with police or ambulance services. For each individual, an index contact was defined as the first recorded contact with either police or ambulance over the period 1 February, 2014 – 31 January, 2017.

Data were linked and variables used to ascertain information on:

- Demand
- Demographics
- Health characteristics
- Health services utilisation
- Health pathways
- Outcomes (including re-presentations and death)

Analysis

Data were analysed descriptively.

Demand

Call centres in Queensland Police Service districts Capricornia, Ipswich, Mackay and North West were not upgraded to the Queensland Police Service QCAD system for part of the study period, leading to an underreporting of incoming calls. Thus, the number of Queensland Police Service calls was adjusted to account for missing data, based on population estimates of those districts.

Demographic data

Demographic data were measured per individual as follows:

- Gender was measured based on the most commonly identified gender across all gender values (Male, Female);
- Indigenous status was assigned if there was at least one record for an individual that identified them as Aboriginal and/or Torres Strait Islander;
- Age was measured based on an individual's age at their index suicide related contact with Queensland Police or Ambulance Service. Where two or more ages were provided for the same year, the lowest age was chosen;
- Country of birth was identified based on the most commonly identified country of birth across all country of birth values; and
- A new or expectant mother was defined as someone who had delivered a baby in the same calendar year, or the calendar year before or after their first contact with police or ambulance services.

Descriptive statistics have been calculated out of the number of known values, with unknown values dropped.

Suicide deaths

Comparator data regarding the number of suicide deaths in Queensland during the period of the study were accessed from the Australian Bureau of Statistics (www.abs.gov.au, data cube: 3303.0 - Causes of Death, Australia, 2017).

RESULTS

Calls

After adjustment, it was estimated that there were 107,020 Queensland Police Service calls over the three-year period 1 February, 2014-31 January, 2017. Table 3 shows the percentage of records identified through QCAD dispatch terms or different groups of keywords as identified in Appendix B.

Table 3 Percentage breakdowns of records identification in QPS records by dispatch or keyword combinations.

Dispatch/Keyword	Percentage of records identified
QCAD dispatch 502/503	58%
Explicit terms	34%
End life terms	5%
Means terms	2%
Self-harm terms	1%

There were 121,530 calls to Queensland Ambulance Service over the period 1 February, 2014 – 31 January, 2017. Sixty-four percent of all cases contained a keyword or stem suicid, ideation, self harm, end his life, end her life, intent, kill self. Table 4 shows the percentage of records identified via different elements of Queensland Ambulance Service case records.

Table 4 Percentage breakdowns of records identification in QAS records, by: (i) dispatch records, and (ii) keyword searches of notes fields of other fields.

Dispatch/Keyword	Percentage of records identified
MPDS 25	45%
Case Nature	35%
Case Description	12%
Initial Assessment	4%
Existing Condition	3%
Patient Complaint	1%
Initial Assessment Comment	1%
Final Assessment Comment	‹1%

Demand

In total, after adjustment, it was estimated that there were 228,550 calls over the three-year period, 1 February, 2014 – 31 January, 2017. This was an average of 209 calls per day, comprising 111 calls per day to Queensland Ambulance Service and 98 calls per day to Queensland Police Service (Figure 4).

Figure 4 Estimated average number of suicide related calls per day to QAS or QPS

Figure 5 shows the number of calls identified between 2014 and 2017, separately for Queensland Ambulance Service (left) and Queensland Police Service (right). There was an increase in suicide related calls of 28% of calls to police and an increase of 23% to ambulance services over the three-year period 2014-2017.

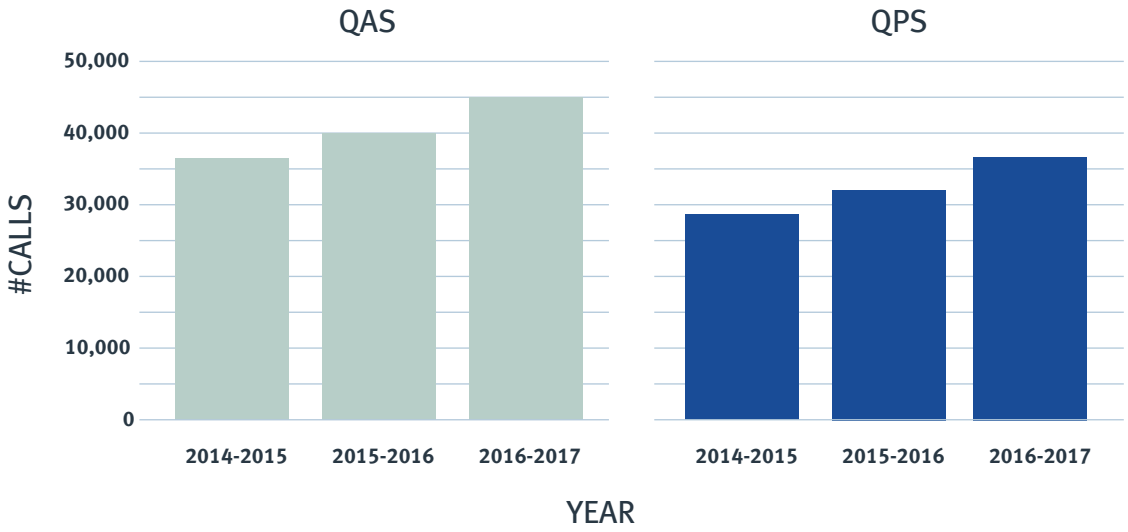

Figure 5 Suicide related calls to QAS and QPS per year for the years 2014-2015, 2015-2016, and 2016-2017. Note that the 12-month period runs from 1 February–31 January of the following year.

Figure 6 highlights the monthly fluctuation of calls to Queensland Police Service and Queensland Ambulance Service, averaged across the study period. It appears that calls peaked between October and January, followed by a noticeable drop in February. The least number of calls were registered in June and July.

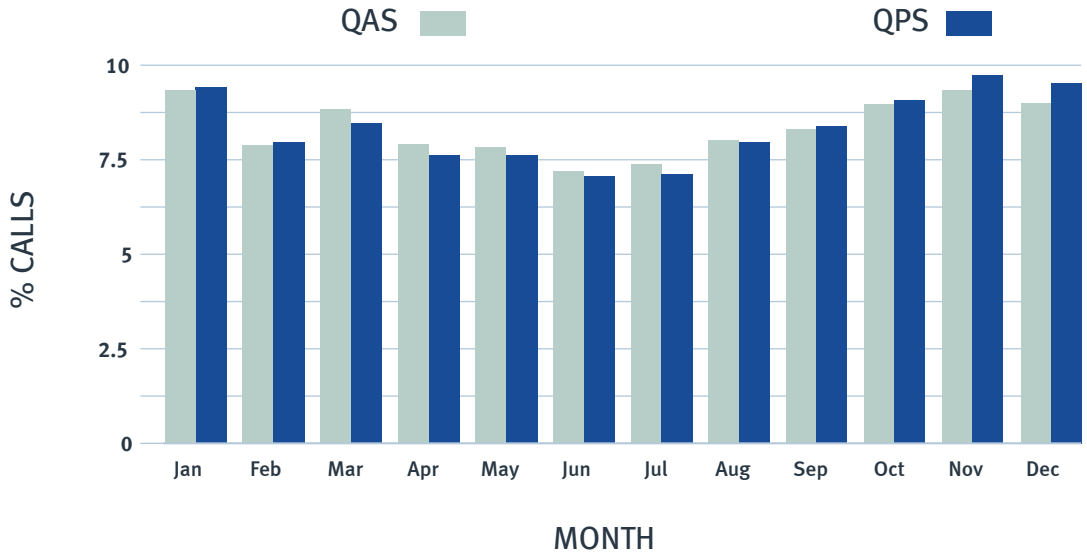

Figure 6 Variation in suicide related calls in Queensland 2014-2017, by month

Figure 7 highlights the fluctuation in calls across the week. A subtle bowl shape is evident with a peak on Sunday and Monday, and a trough between Wednesday and Friday.

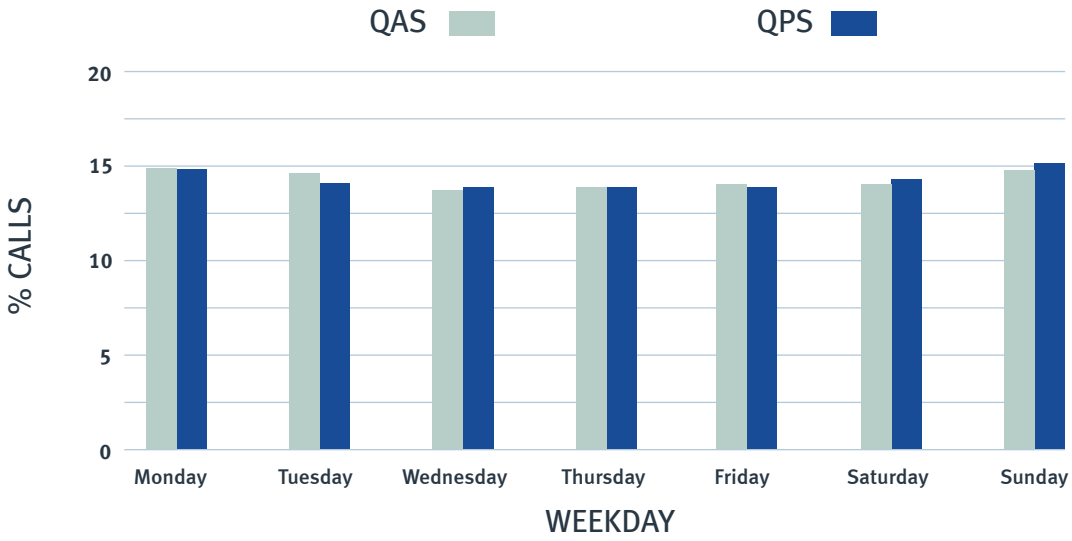

Figure 7 Suicide related calls to QAS and QPS over the years 2014-2017, by day of week.

Figure 8 shows the pattern of calls during the day. Peak demand for both Queensland Ambulance Service and Queensland Police Service occurred around 7.00 pm. However, relative demand on Queensland Ambulance Service exceeded that of Queensland Police Service during the morning hours (approximately 2.00 am to 2.00 pm),
while relative demand on Queensland Police Service exceeded that of Queensland Ambulance Service from approximately 2.00 pm to 2.00 am.

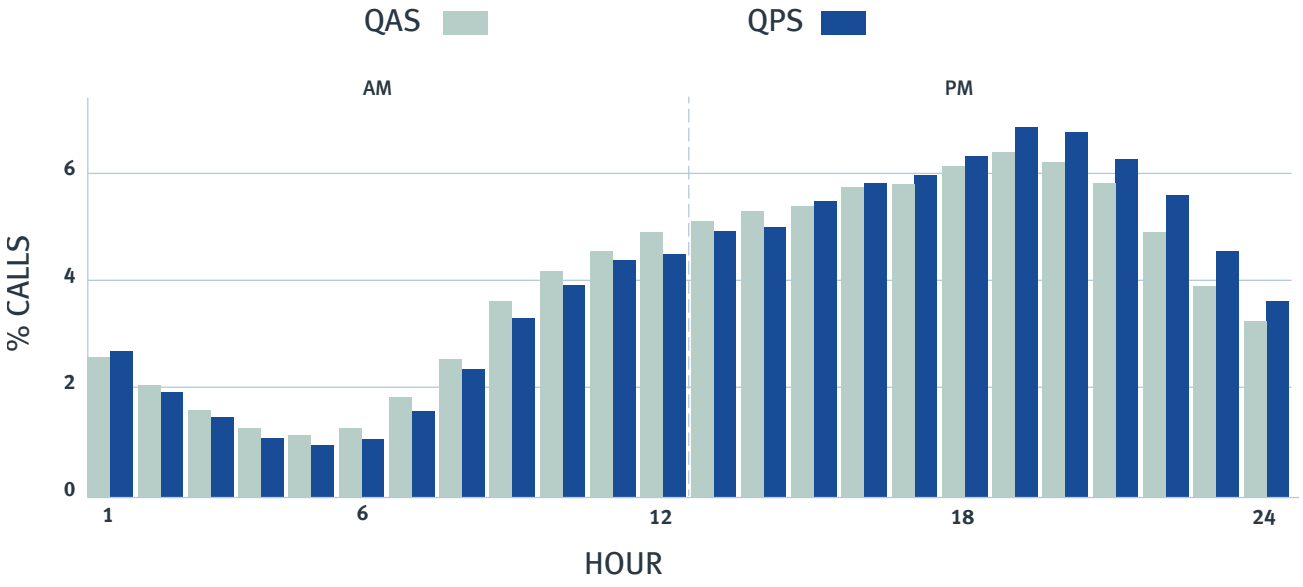

Figure 8 Distribution of suicide related calls to QAS and QPS over the years 2014-2017, by hour of the day.

Figure 9 shows the distribution of suicide related calls, by Hospital and Health Service district. The major metropolitan districts in South East Queensland (Metro South, Metro North and Gold Coast) fielded the bulk of calls, with a combined total of 128,783 records.

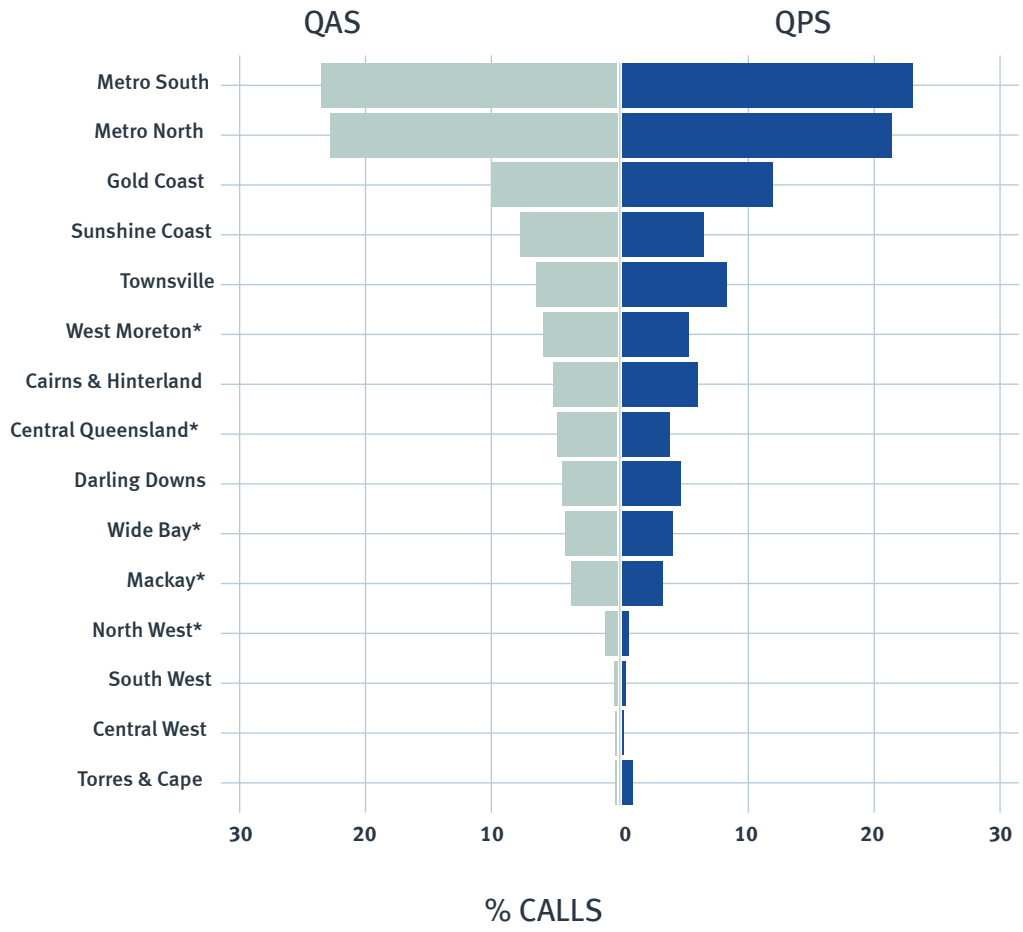

Figure 9 Distribution of suicide related calls to QAS and QPS, disaggregated by Hospital and Health Service district. Asterisks (*) denote adjusted QPS demand estimates within the respective regions due to changes in the CAD system during the study period.

Individuals

The cohort of individuals that comprise the Partners in Prevention dataset were identified from the Queensland Police Service and Queensland Ambulance Service call sets (Table 5). Identifying details were supplied to Queensland Health Statistical Services Branch, for linkage to Queensland Health records. Individuals were included in the cohort if they could be identified in any one of the state-based datasets held by the department.

Differences in how identifying details (names and ages) are inputted into police and ambulance records resulted in variations in ascertainment of records. Identification of records was more complete for ambulance records, because patient name and age are entered into distinctive fields and because there is a Master Linkage File that links ambulance files with other health data files. However, in most instances, identifying data about an individual who is the subject of a police dispatch, if identified, is inputted into an open text box. Consequently, it was only possible to ascertain a subset of individuals who were the subject of a police call via police records. While not without errors, the number of individuals identified via ambulance records can be taken as a current best approximation of number of individuals who were the subject of a suicide related call to Queensland Ambulance Service. Conversely, due to limitations in identification inherent in the structure of police databases, the number of individuals identified via police records is likely to be a substantial undercount of those who were the subject of a suicide related call to Queensland Police Service and should not be interpreted as a prevalence estimate.

Table 5 Individuals identified that comprise the Partners in Prevention cohort

	N
Individuals identified in QPS records	15,353
QPS – suspected sudden death suicide, not elsewhere identified*	1,442
Individuals identified in QAS records	61,595
Individuals identified in both QAS and QPS records	7,510
Total individuals	70,893
PiP cohort*	69,451

*QPS investigate all suspected sudden death suicides. Records for individuals who police were called to investigate, as suspected sudden death suicides, but who were not identified in a QAS or QPS-QCAD record (N=1,442) were excluded from the Partners in Prevention cohort for the purposes of this report.

Demographics

Gender

The overall gender breakdown of individuals was 48% male and 52% female. As Figure 10 shows, gender breakdown varied between ambulance and police. Less than half of individuals (46%) who came into contact with Queensland Ambulance Service were male, while more than half of individuals (58%) who came into contact with Queensland Police Service were male.

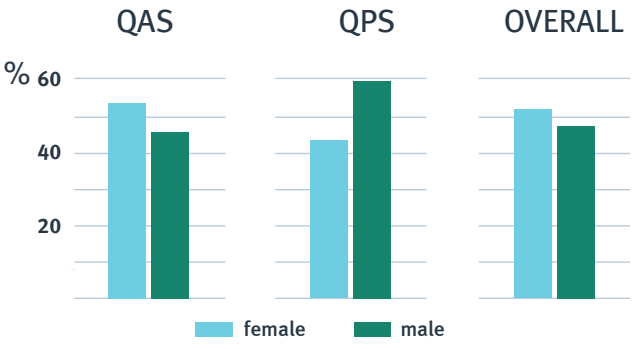

Figure 10 Gender of individuals that comprise the Partners in Prevention cohort, by agency.

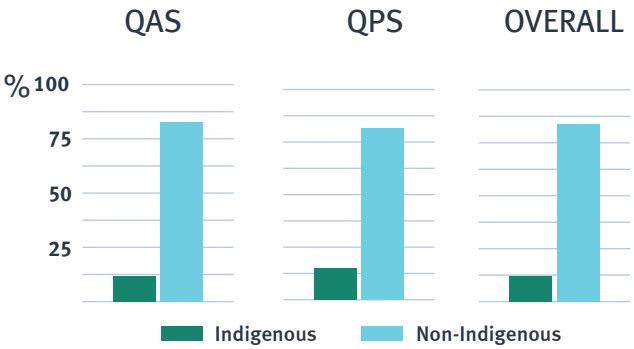

Figure 11 Indigenous status of individuals that comprise the Partners in Prevention cohort, by agency.

Indigenous status

Thirteen percent of the sample were identified as being Indigenous (Aboriginal and/or Torres Strait Islander) (Figure 11). The rate was higher among individuals who had come into contact with Queensland Police Service than for Queensland Ambulance Service (15% in contact with QPS compared to 12% who had come into contact with QAS).

Age

The median age of the cohort, at the time of their first contact with Queensland Police Service or Queensland Ambulance Service was 33 years old (Figure 12). Individuals who came into contact with Queensland Police Service were younger overall (median age 32 years), at the time of their index contact, than those who came in contact with Queensland Ambulance Service (median age 33 years).

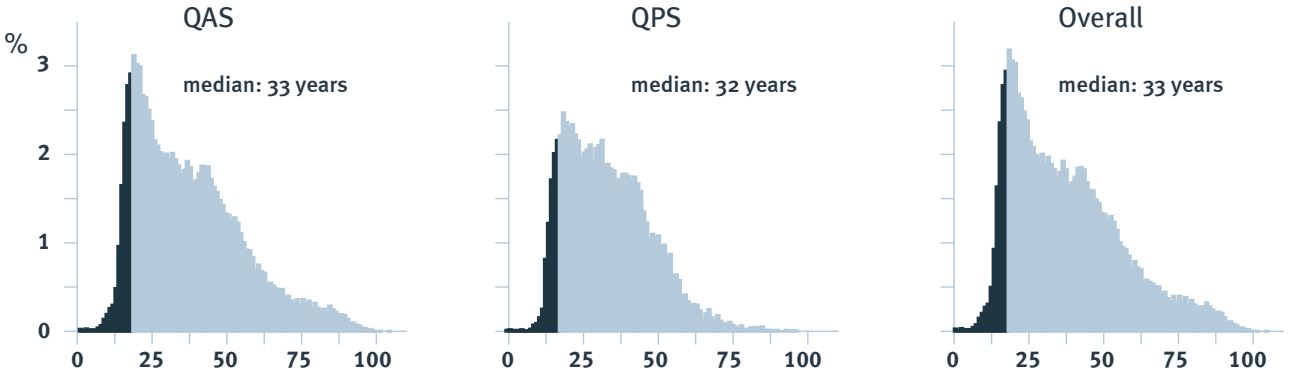

Figure 12 Age distribution of individuals that comprise the Partners in Prevention cohort, by agency. Dark blue areas highlight the proportion of individuals under the age of 18 years.

Eleven percent of the sample were identified as being under the age of 18 at the time of their first suicide related contact with Queensland Police Service or Queensland Ambulance Service. Rates were higher among those who had contact with Queensland Ambulance Service than Queensland Police Service (12% QAS versus 9% QPS). Overall, 8% of the cohort were 65 years of age or older at the time of their index suicide related contact with Queensland Police or Ambulance Services. Rates were higher among those who had contact with Queensland Ambulance Service than Queensland Police Service (9% QAS versus 2% QPS).

Country of birth

Table 6 shows the country of birth of the Partners in Prevention cohort. Overall, 84% of the cohort were identified as being born in Australia. New Zealand and The United Kingdom were the next most commonly identified countries of birth (7% combined), while 9% of the sample came from a range of other countries. There was a slight variation between the Queensland Police Service and Queensland Ambulance Service cohorts, with Queensland Ambulance Service responding to a higher proportion of individuals from countries other than Australia, New Zealand or The United Kingdom (9%), than Queensland Police Service (6%).

Table 6 Distribution of country of birth that comprise the Partners in Prevention cohort

	QAS	QPS	Overall
Australia	84%	87%	84%
New Zealand	4%	5%	4%
The United Kingdom	3%	2%	3%
Other	9%	6%	9%

Health characteristics

Nineteen percent of the Partners in Prevention cohort had a confirmed mental health diagnosis recorded in CIMHA, this was 23% of individuals who had a CIMHA record. Nearly one-half (46%) of individuals had at least one record, either in the Emergency Data Collection or CIMHA, indicating that suicidal or self-harming behaviours had been identified. This was measured based on noting of the ICD-10 codes X64-X84, or as presenting problem suicide threat, suicide attempt, suicidal ideation, self-harm/self-mutilation, or any other suicidal issue.

Health services utilisation

Health service activity

Figure 13 summarises health services utilisation among the Partners in Prevention cohort. Almost all individuals identified in the Partners in Prevention cohort (96%) had at least one contact with an emergency department over the five-year period between 2013 and 2018. Eighty-four percent of individuals had at least one public mental health services record and the same percentage (84%) had at least one hospital admission. Eighteen percent of the sample had a record with a public alcohol or other drugs service, and 7% were identified in the Perinatal Data Collection as having given birth over the period between 2013 and 2018.

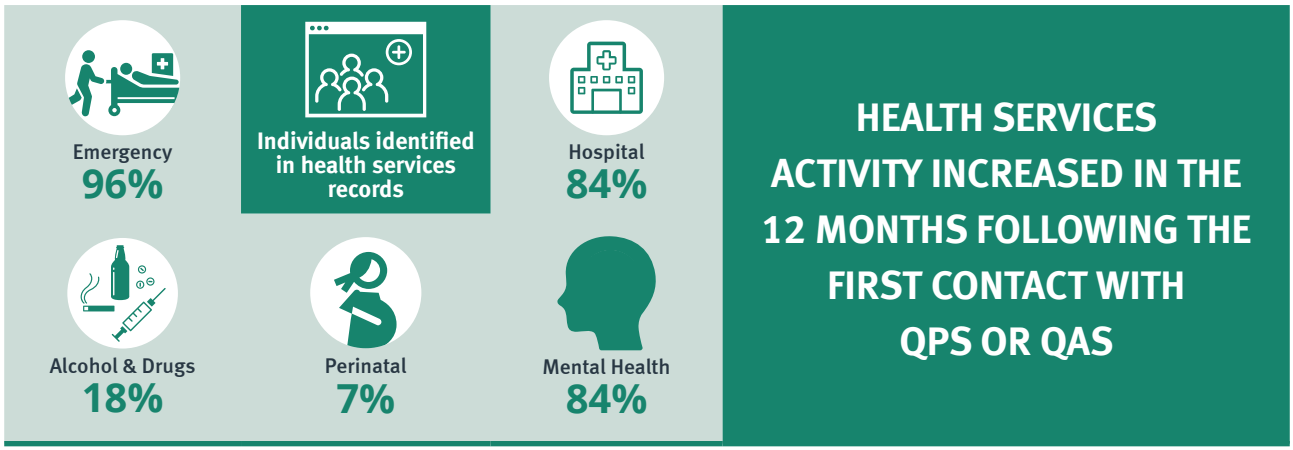

Figure 13 Schematic summary of health services utilisation, and activity among the Partners in Prevention cohort

As shown in Table 7, health services activity increased in the 12-month period following the index contact with police or ambulance services, in comparison to the 12-month period prior to contact with police or ambulance services, across all health services that were examined.

Police and ambulance service activity and use of Emergency Examination Orders

Twenty-one percent of individuals were identified as re-presenting to Queensland Police Service or Queensland Ambulance Service within twelve months of their initial contact. As shown in Table 7, most individuals who received an Emergency Examination Order received one at some point in the year following their index contact with Queensland Police Service or Queensland Ambulance Service. It is likely that Emergency Examination Orders identified prior to the index police or ambulance contact indicate a previous police or ambulance contact.

Health pathways

Suicide related police or ambulance service dispatches often result in emergency department presentations. Figure 14 shows the distribution of dispatch classifications by Queensland Police Service or Queensland Ambulance Service to a suicide related call for the Partners in Prevention cohort, as well as the distribution of triage category assigned in an emergency department for linked emergency department records.

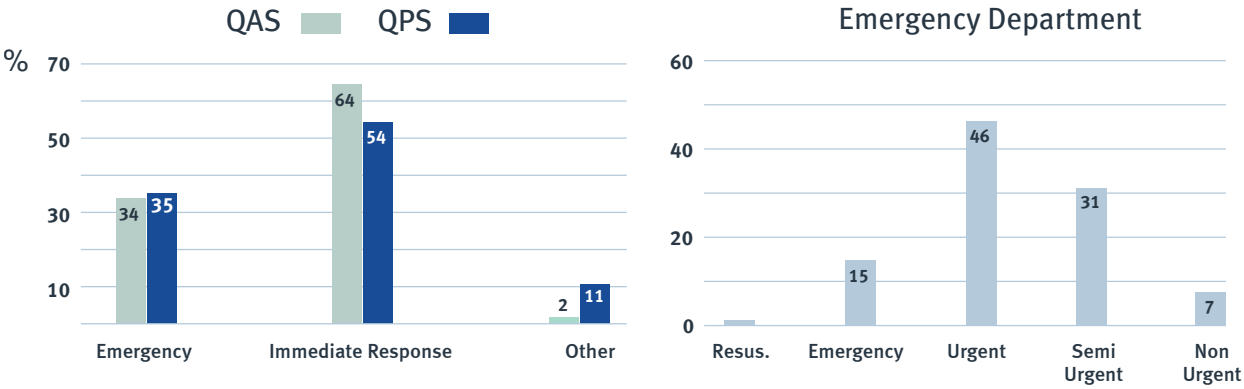

Figure 14 Distribution of police and ambulance dispatches (left) and distribution of emergency department triage status (right) for individuals in the Partners in Prevention cohort who presented to an emergency department. Numbers provided are percentages. Resus: Resuscitation.

Overall, the most common dispatch type for both Queensland Police Service and Queensland Ambulance Service was an immediate response. Immediate responses occur at road speed, obeying road rules. These responses comprised 64% of Queensland Ambulance Service responses and 54% of Queensland Police Service responses. The second most common dispatch type, for both Queensland Police Service and Queensland Ambulance Service, was an emergency response. Emergency responses are immediate responses with lights and sirens, where responders endeavour to arrive at the scene as quickly as possible. Emergency responses comprised 34% of ambulance responses and 35% of police responses.

Table 7 Health services utilisation and other activity over the study period. *Figure calculated based on activity for 8-14 days before/after event. To ascertain 14 days cumulative total add 7 days before/after value. **Value calculated based on births within same calendar year as index event. ***Value calculated based on births in the calendar year before/after the calendar year of the index contact. ****Value calculated based on deaths within same calendar month as index event. EEO: Emergency Examination Order.

		Total	365 days before	14 days before*	7 days before	on same day	7 days after	14 days after*	365 days after
QHAPDC	records	461,071	88,084	2,618	3,042	21,276	14,562	3,724	126,286
	persons	58,394 (84%)	27,862	2,218	2,575	19,900	12,277	3,078	36,003
EDIS/ EDC	records	624,816	120,339	4,083	6,266	49,832	12,747	5,100	157,270
	persons	66,473 (96%)	36,952	5,034	3,414	48,079	10,408	4,047	42,061
CIMHA	records	6,037,787	413,113	14,205	18,240	26,782	118,344	55,239	957,568
	persons	58,006 (84%)	22,462	6,275	8,128	26,782	40,958	22,684	48,400
ATODS	records	26,472	5,157	200	222	236	1,079	495	8,120
	persons	12,484 (18%)	3,783	193	217	234	1,029	482	5,748
PDC	records	6,457	1,170***	—	—	1,022**	—	—	1,357***
	persons	5,028 (7%)	1,168***	—	—	1,020**	—	—	1,355***
QPS	records	19,797	—	—	—	811	582	231	4,624
	persons	15,353 (22%)	—	—	—	738	518	208	3,315
QAS	records	106,913	—	—	—	813	2,587	1,290	27,449
	persons	61,596 (88%)	—	—	—	801	2,330	1,167	13,554
EEO	records	19,336	2,611	121	159	2,752	2,122	301	6,736
	persons	12,051 (17%)	2,129	118	159	2,748	2,063	291	5,411
Deaths		3,780 (5%)	—	—	—	1,082****	—	—	1,327
Primary cause intentional self-harm		1,329 (2%)	—	—	—	847****	—	—	262

Emergency department presentations following an immediate response at road speed

To examine the trajectory for individuals who were the subject of a Queensland Police Service or Queensland Ambulance Service dispatch, we linked individual dispatches to emergency department presentations on the same day. Figure 15 and Figure 16 show pathways from Queensland Police Service and Queensland Ambulance Service through emergency departments for dispatches classified as an 'immediate response'.

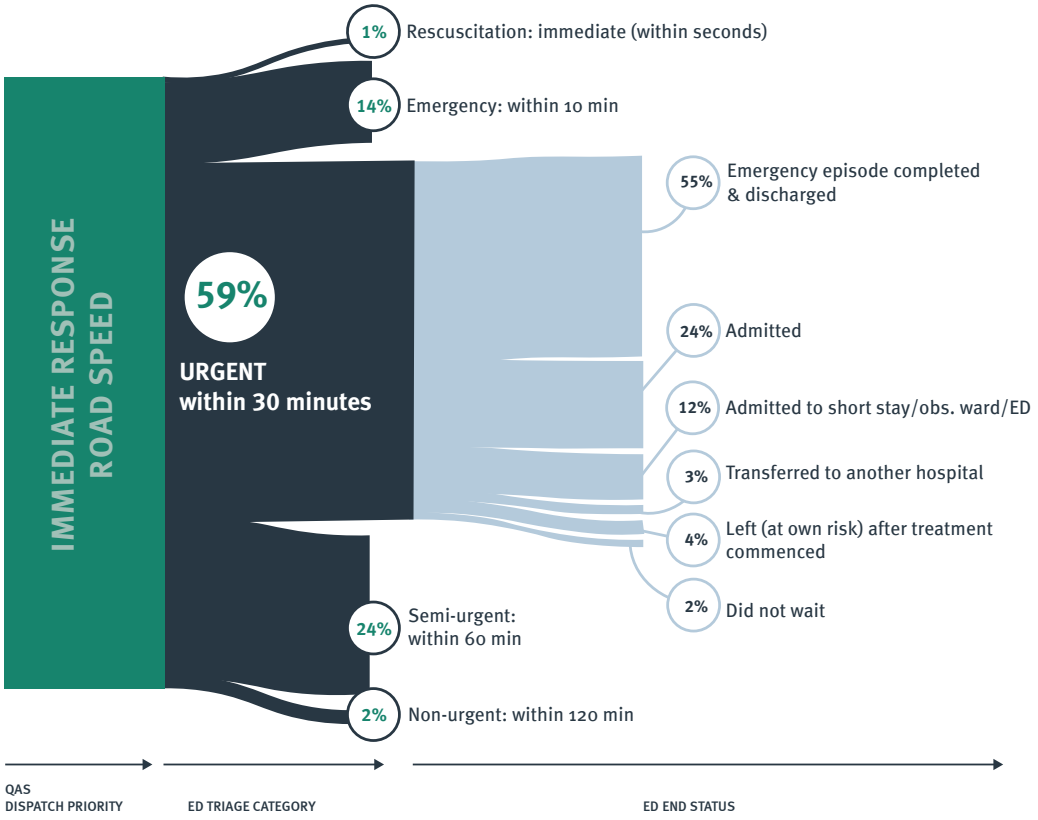

Figure 15 Emergency department triage category and end status for a QAS immediate response, at road speed

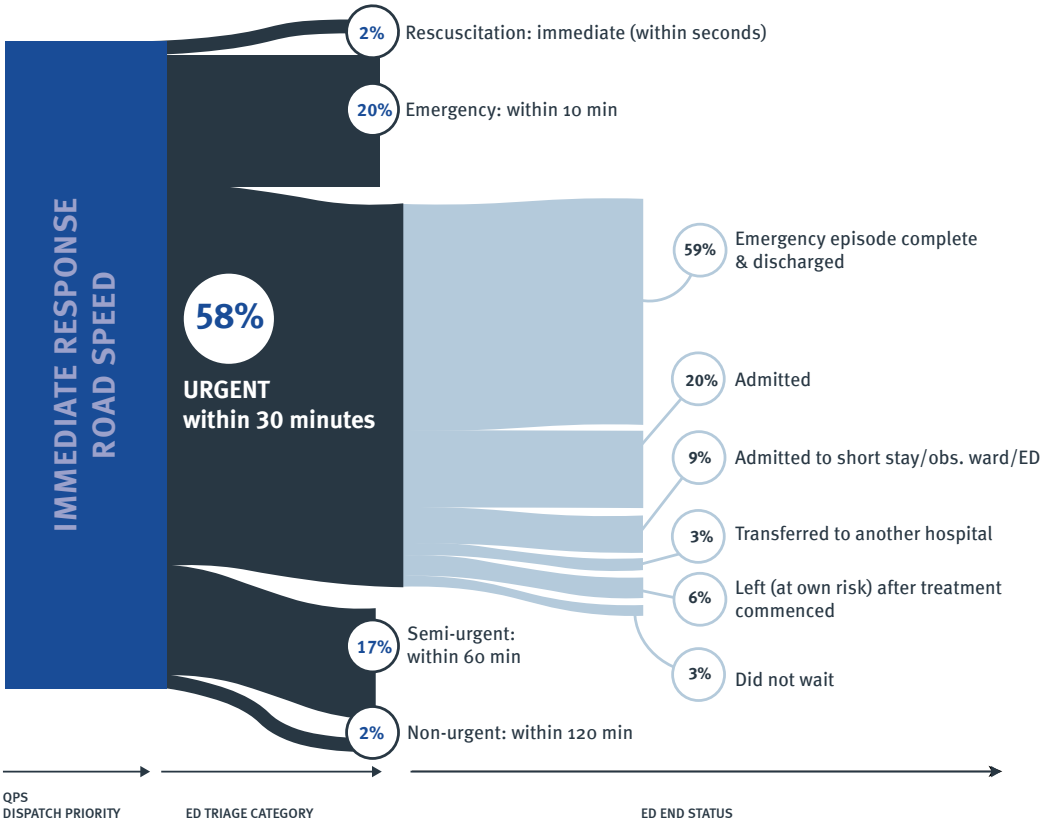

Figure 16 Emergency department triage category and end status for a QPS immediate response, at road speed

The predominant pathway was similar for Queensland Ambulance Service and Queensland Police Service, with a similar number of individuals triaged as 'urgent' (59% QAS and 58% QPS). Overall, the most common end status for those triaged as urgent was 'emergency episode completed and discharged' (55% QAS and 59% QPS).

While the overall pattern looked similar, proportionally more Queensland Ambulance Service arrivals than Queensland Police Service arrivals that were triaged as 'urgent' resulted in a hospital admission (36% QAS versus 29% QPS). Further, fewer Queensland Ambulance Service arrivals triaged as 'urgent' elected not to wait or left at their own risk after treatment commenced, compared with Queensland Police Service arrivals (6% QAS versus 9% QPS).

There was a slight discrepancy in the percentage of dispatches resulting in emergency department presentations triaged as 'emergency' or 'resuscitation' between Queensland Ambulance and Queensland Police Services dispatches (15% QAS versus 22% QPS). Consequently, fewer Queensland Police Service arrivals than Queensland Ambulance Service were triaged as semi-urgent or non-urgent (19% QPS versus 26% QAS).

Emergency department presentations following an emergency response with lights and sirens

Figure 17 and Figure 18 show pathways from Queensland Ambulance Service and Queensland Police Service through emergency departments for dispatches classified as an 'emergency response'.

While the predominant triaging was still 'urgent – within 30 minutes', the pathways of individuals who were subject to an emergency dispatch was more different between Queensland Ambulance Service and Queensland Police Service than for the immediate responses. That is, fewer Queensland Ambulance Service dispatches were triaged as 'urgent' in the emergency department compared with Queensland Police Service (50% QAS versus 58% QPS). Of those, fewer Queensland Ambulance Service arrivals had an emergency episode completed and discharged (50% QAS versus 62% QPS). Yet, more Queensland Ambulance Service arrivals than Queensland Police Service arrivals were admitted (42% QAS versus 30% QPS). There was no difference in the proportion of individuals who did not wait or left at their own risk after treatment commenced (6% for QAS and QPS).

With regards to the remaining emergency department triage categories, proportionally more Queensland Ambulance Service dispatches were classified as emergency or resuscitation, compared with Queensland Police Service (31% QAS versus 26% QPS), and more Queensland Ambulance Service dispatches were classified as semi-urgent or non-urgent than Queensland Police Service dispatches (18% QAS versus 15% QPS).

Comparing patterns of care in emergency departments between Queensland Ambulance Service and Queensland Police Service immediate and emergency response categories

Queensland Ambulance Service dispatches that were classified as emergency versus immediate had distinct pathways through emergency departments. There was a more pronounced skew towards more serious cases for emergency dispatches in comparison to immediate dispatches. That is, 81% of emergency dispatches were classified as urgent, emergency or resuscitation, and 42% of urgent triages were admitted. In comparison, 74% of immediate responses were classified in the emergency department as urgent, emergency or resuscitation, and 36% of cases triaged as urgent were admitted.

In contrast to Queensland Ambulance Service, the pattern of triaging and end status appeared similar across emergency and immediate response dispatch priorities by Queensland Police Service. There was a slight skew towards more serious cases for emergency dispatches in comparison to immediate dispatches. Eighty-four per cent of emergency dispatches were classified as urgent, emergency or resuscitation, and 30% of urgent triages were admitted, compared to 80% of immediate responses being classified as urgent, emergency or resuscitation, and 29% of urgent triages being admitted.

Based on triaging and end status information, it appears that individuals who were subject to an emergency (lights and sirens) dispatch by Queensland Ambulance Service may have required more urgent care than those who were responded to by Queensland Police Service under an emergency dispatch. The individual trajectories following an immediate response dispatch were reasonably similar across Queensland Ambulance and Police Services.

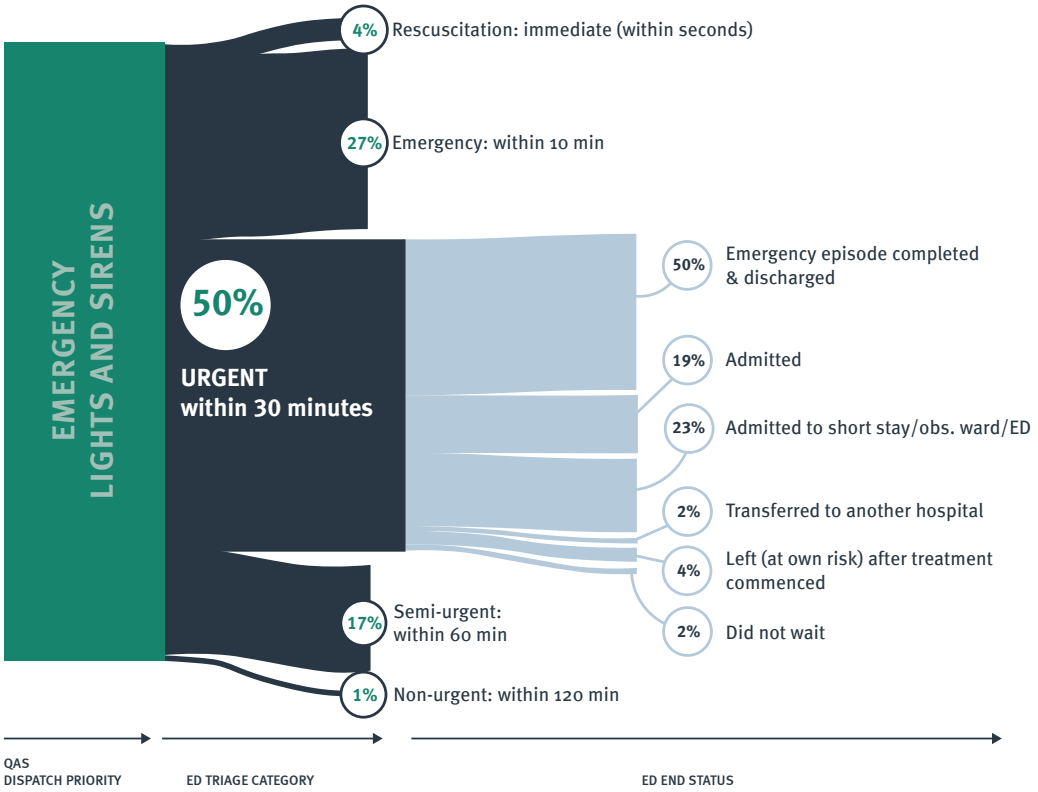

Figure 17 Emergency department triage category and end status for QAS emergency response, lights and sirens

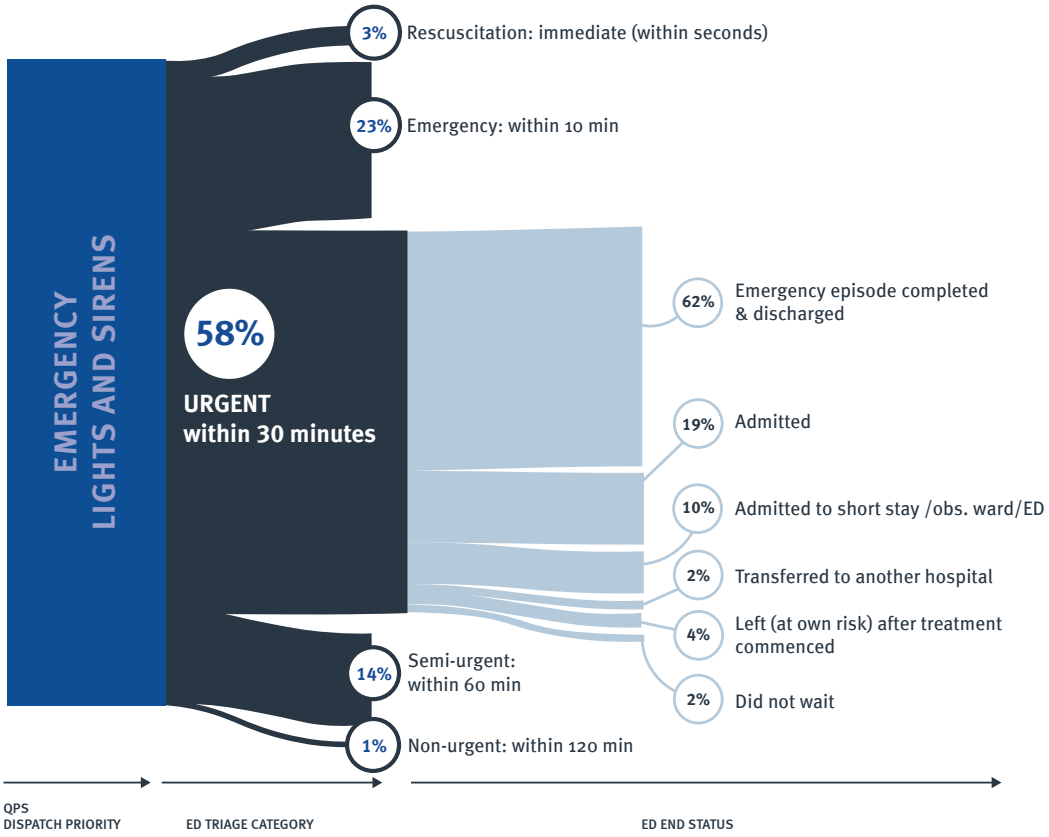

Figure 18 Emergency department triage category and end status for QPS emergency response, lights and sirens

Deaths

Table 7 shows the number of individuals within the Partners in Prevention cohort who died over the four-year period 1 February, 2014 to 31 January, 2018. In total, 5% of the cohort had died due to any cause, and 2% had the primary cause of death identified as intentional self-harm.

In the twelve months following an index police or ambulance contact, 3.5% of the Partners in Prevention cohort had died due to any cause and for 1.5% the primary cause of death was identified as intentional self-harm.

Among the 1,329 individuals who died due to intentional self-harm, 36% were alive in the calendar month following their index suicide related contact with police or paramedics. Individuals in the Partners in Prevention cohort who died due to intentional self-harm account for an estimated 56% of the suicide deaths that occurred in Queensland between 1 January, 2014 and 31 December, 2016.

Overall, as indicated previously, 46% of individuals in the Partners in Prevention cohort had had suicidal or self-harming thoughts or behaviours documented in an emergency department or CIMHA record. However, this percentage was lower among individuals who died. Specifically, only 33% of individuals who had died due to intentional self-harm had a record that indicated that they were experiencing suicidal or self-harming thoughts or behaviours, and 27% of those who had died of any cause had a documented instance of suicide or self-harming thoughts or behaviours.

CONCLUSION

The analysis presented here provides a broad profile of individuals who came into contact with Queensland Police Service or Queensland Ambulance Service over the three-year period between 2014 and 2017, and highlights substantial diversity among individuals who police or paramedics will come into contact with.

Overall, there was a clear and substantial increase in health services activity and low rates of recurrent contact with Queensland Police Service or Queensland Ambulance Service in the twelve months following an index encounter. It is difficult to draw conclusions regarding what this means. While increased health services contact and limited recurrent contact with police or paramedics may indicate a positive health service response, it is important not to equate quantity of care with quality of care. Limitations with respect to identification of individuals who will have contact with Queensland Police Service need to be taken into consideration.

Nearly one-half of those identified in the Partners in Prevention cohort had a health record that documented suicidal or self-harming thoughts or behaviours. However, only about one in five had a confirmed mental health diagnosis. Those who had died due to intentional self-harm were less likely to have a documented history of suicide or self-harming thoughts or behaviours than those who were alive over the study period.

The deaths that occurred among this cohort accounted for an estimated 56% of suicide deaths that occurred in Queensland over the three-year period that defines the cohort. With more than one-third of these individuals alive in the calendar month following the index suicide related encounter with Queensland Police Service or Queensland Ambulance Service, there are clear opportunities to save lives.

Future directions

Data presented here provide critical baseline information from which to evaluate future systems enhancements. The fact that Partners in Prevention data can be disaggregated by health or police district means that it has the potential to be used to evaluate both local and state level innovations in the future.

There is a pressing need to further examine the characteristics and pathways of demographic sub-groups. Health pathways analysis could be enhanced by combining it with clinician interviews to identify current strengths and gaps, to better describe what ‘success’ might look like, and to optimise first responses as a result.

There is potential to develop the Partners in Prevention linked data study into a real-time surveillance and monitoring system, so that Queensland Police Service and Queensland Ambulance Service can access more fulsome information about the health characteristics or cultural background of those that they encounter.

It is important to note that the number of individuals identified in Queensland Police Service records likely represents an undercount of the number of individuals in a suicide crisis who police come into contact with. This is due to the way that identifying data (e.g., names and date of birth) about the person who is the subject of an emergency call are stored in the QCAD system. Making mental health and suicide crises 'reportable incidents' within the QPRIME database would ameliorate this limitation and thus be beneficial from a research and evaluation perspective.

There are vast possibilities available to update, improve and expand the Partners in Prevention dataset. As it stands, the Partners in Prevention dataset includes an immense amount of health information. Further linkage to community services and other non-health sector data would be beneficial to better understanding the social determinants of suicide crisis. With over 7,000,000 health records so far, this dataset provides an excellent resource for trialling machine learning techniques with a view to seeing whether risk prediction algorithms can be developed.

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APPENDIX A

List of QCAD dispatch codes searched

312 (Domestic Violence)

313 (Disturbances/Disputes)

504 (Mentally Ill Person)

513 (QAS)

610 (Community Assistance)

619 (Welfare Check)

818 (Incid. Occ. – Persons Involved Interven. - NFP)

819 (Incid. Occ. – Persons Involved Not Located)

820 (Unable to Locate Incident or Informant)

821 (No Offence Detected)

830 (Police Application)

831 (Breach)

833 (Referral)

836 (E.E.O. and T/Port by Police due to Risk)

837 (E.E.O. by Police and Transported by QAS)

838 (E.E.O. and Transport by QAS)

840 (Queensland Health Referred)

842 (Voluntary Referral by Person to Health)

APPENDIX B

List of keywords used in QPS database searching

Table 8 gives the finalised terms list used for keyword searching.

Table 8 Keyword lists for call identification

Keyword type	Keywords
Explicit	SUICIDE|SUICID|SUCID|SELF HARM|SELF-HARM|SELFHARM||SELF INFLICT|SELF-INFLICT
Killing Self	KILL HIMSELF|KILL HERSELF|KILL THEMSEL|KILL MYSELF|KILLING HIMSELF|KILLING HERSELF|KILLING THEMSEL|KILLING MYSELF|KILLED HIMSELF|KILLED HERSELF|KILLED THEMSEL|TOP HIMSELF|TOP HERSELF|TOP THEMSEL|TOP MYSELF
End Life	WANT TO DIE|WANTING TO DIE|WANTS TO DIE|WANTED TO DIE|ENOUGH OF LIFE|SAID GOODBYE|SAID GOOD BYE|END HER LIFE|END HIS LIFE|END THEIR LIFE|TAKE LIFE|TAKE HIS LIFE|TAKE HER LIFE|TAKE THERE LIFE|TAKE THEIR LIFE|END IT ALL|TAKE MY LIFE|END MY LIFE
Means Jump[1]	WISHED TO JUMP|WISHING TO JUMP|WISHES TO JUMP|WISHS TO JUMP|WISH TO JUMP|GOING TO JUMP|THREAT TO JUMP|THREATEN TO JUMP|THREATENING TO JUMP|THREATENED TO JUMP|THREATED TO JUMP|WOULD JUMP|CLOSE TO JUMP|WILL JUMP|MIGHT JUMP|COULD JUMP|WANT TO JUMP|WANTS TO JUMP|WANTING TO JUMP|WANTED TO JUMP|INTEND TO JUMP|INTENDS TO JUMP|INTENDING TO JUMP|INTENDED TO JUMP|PLAN TO JUMP|PLANS TO JUMP|PLANNING TO JUMP|PLANNED TO JUMP|TRY TO JUMP|TRIES TO JUMP|TRYING TO JUMP|TRIED TO JUMP
Means Hang	HANG HIMSELF|HANG HERSELF|HANG THEMSEL|HANG MYSELF|HANGING HIMSELF|HANGING HERSELF|HANGING MYSELF|HANGING THEMSEL|HANGED HIMSELF|HANGED HERSELF|HANGED THEMSEL
Means Shoot	SHOOT ME|SHOOT HIMSELF|SHOOT HERSELF|SHOOT THEMSEL|SHOOT MYSELF|SHOT ME|SHOT HIMSELF|SHOT HERSELF|SHOT THEMSEL| SHOOTING HIMSELF|SHOOTING HERSELF|SHOOTING THEMSEL|SHOOTING MYSELF
Self-harm Stabbing	STAB HIMSELF|STAB HERSELF|STAB THEMSEL|STAB MYSELF|STABBED HIMSELF|STABBED HERSELF|STABBED THEMSEL|STABBED MYSELF|STABBING HIMSELF|STABBING HERSELF|STABBING THEMSEL|STABBING MYSELF
Self-harm Poisoning	POISON HIMSELF|POISON HERSELF|POISON THEMSEL|POISON MYSELF|POISONING HIMSELF|POISONING HERSELF|POISONING THEMSEL|POISONING MYSELF|POISONED HIMSELF|POISONED HERSELF|POISONED THEMSEL|POISONED MYSELF
Self-harm Cutting[1]	CUTTING HIMSELF|CUTTING HERSELF|CUTTING THEMSEL|CUTTING MYSELF|CUT THERE WRIST|CUT THEIR WRIST|SLASH THEMSEL|SLASH UP|SLASH THEIR WRIST|SLASH THERE WRIST|SLASH HIS WRIST|SLASH HER WRIST|SLASHED UP|SLASHED THEIR WRIST|SLASHED HIS WRIST|SLASHED HER WRIST|SLASHED THERE WRIST| CUT HIMSELF|CUT HERSELF|CUT THEMSEL|CUT MYSELF
Self-harm Hurting	HURT HIMSELF|HURT HERSELF|HURT THEMSEL|HURT MYSELF

[1]Due to character restrictions in SAS, keyword batches for Means Jump and Self-harm Cutting were split into two subsets for the purposes of searching.

NB: The last letter of each phrase (preceding |) functions as a wild card, thus -s and -ed etc., suffixes were included in the search.

APPENDIX C

Keyword × incident code validation

Table 9 provides the level of correct identification of each keyword × incident code combination, based on a random sample of ten records. Out of 60 combinations, twelve were removed for not reaching the 80% threshold. These were "312 – Domestic Violence", keyword combinations "End Life", "Means Jump" and "Self Harm Poisoning"; "313 – Disturbances/Disputes", keyword combinations "Means Jump" and "Self Harm Poisoning"; "513 – QAS", keyword combinations "Means Shoot", "Self harm poisoning", "Self harm hurting"; "610 – Community Assistance", keyword combinations "Means Jump", "Self harm poisoning" and "Self harm hurting"; and 619 – "Welfare check"; keyword combination "Self harm hurting". An explanation of mis-identifications are provided in Table 10.

Table 9 Validation of initial incident code × keyword combinations

Incident type (Initial)	312	313	504	513	610	619	Totals
Explicit	2,253	4,405	2,226	4,796	2,398	12,825	**28,903**
	100%[1]	100%	100%	100%	100%	100%	
Killing Self	509 80%	689 90%	263 100%	160 100%	238 90%	1,516 100%	**3,375**
End Life	62 40%	59 90%	73 90%	34 100%	62 80%	467 100%	**757**
Means Jump	67 30%	292 40%	61 90%	61 80%	112 70%	259 100%	**852**
Means Hang	103 100%	179 100%	69 100%	103 100%	44 90%	297 100%	**795**
Means Shoot	19 90%	50 100%	11 90%	7 60%[2]	10 80%[2]	70 90%	**167**
Self-harm Stabbing	51 100%	108 100%	25 100%	122 90%	19 80%	64 100%	**389**
Self-harm Poisoning	0 records NA	0 records NA	1 100%[2]	2 50%[2]	0 records NA	1 100%[2]	**4**
Self-harm Cutting	16 90%	57 100%	32 100%	119 100%	10 90%	66 100%	**300**
Self-harm Hurting	52 100%	144 80%	52 80%	140 70%	28 40%	85 70%	**501**
Totals	**3,132**	**5,983**	**2,813**	**5,544**	**2,921**	**15,650**	**36,043**

[1]Accuracy (out of 10 records reviewed at final stage)

[2] N≤10. All records reviewed.

Table 10 Incident type (initial) - explanation for mis-identification

Incident type (Initial)	312	313	504	513	610	619
Explicit	—	—	—	—	—	—
Killing Self	Person inciting other(s) to suicide	Person inciting other(s) to suicide	—	—	Person inciting other(s) to suicide	—
End Life	Said goodbye not a metaphor for suicide Phrase describes threat of harm to others	End Life relates to terminal health issuesß	Said goodbye not a metaphor for suicide	—	Said goodbye not a metaphor for suicide	—
Means Jump	Jump a means to evade or escape Refers to jump starting a car Jump is a means to cause damage/act of violence	Jump is a means to cause damage/act of violence Intent unclear	Intent unclear	Intent unclear Refers to jumping a fence	Jump is a means to cause damage/act of violence Refers to jumping a fence Other	—
Means Hang	—	—	—	—	Hypothetical	—
Means Shoot	Describes threat of harm to others	—	Intent unclear	Accidental	Describes threat of harm to others	Describes threat of harm to others
Self-harm stabbing	—	—	—	Intent unclear	Intent unclear	—
Self-harm poisoning	—	—	—	Intent unclear	—	—
Self-harm cutting	Damaging property	—	—	—	Intent unclear	—
Self-harm hurting	—	Injury/accident without intent Intent unclear	Intent unclear	Intent unclear	Intent unclear	Intent unclear

APPENDIX D

Partners in Prevention Variables List

Dataset	Description
QCAD	**Queensland Police Service, Computer Aided Dispatch System**

Call/case identification:

Activity code: Primary Reported Activity [503 – Attempted/Threatening Suicide], Primary Reported Activity [502 – Suicide], Primary Reported Activity [504 – Mentally Ill Person], Welfare Check [619], Domestic Violence[312], Disturbance/Dispute [313], QAS [513], Community Assistance [610] (free text search of 'Incident details' for suicide related search terms*).

free text search terms include %suicid% %self harm% %take h life% %take m* life% %take th* life% %take life%

Variables for linkage:

Name
Address
DOB/Age
Sex
SPI
CAD number (includes event date)

Variables for analysis:

For period: 1 February 2013 – 31 January 2018
For calls and cases identified:
Incident_Code
Activity
RevisedIncident_Code
RevisedIncident
IncidentDate
Priority
CallTime
CallTakerOperator
CallSource
ReturnTime
ClosedTime
HHS
District
Mesh_Block
SA1_Code
SA2_Code
SA3_Code
SA4_Code
KeyWord
ActivityType
Negation
NegationSuicideSelfharm
PresentImminentFuture
ImminentPast
Past
History of Harm
FlagsChecked
DOB
Sex

QPRIME	**Queensland Police Records and Information Management Exchange**

Call/case identification:

For period: 1 February 2014 – 31 January 2017
Person: Involvement Classification: Suicidal; Mental Health
Occurrence Type: [1252] Sudden Death – Suicide
Cases will be identified via cross matching with QCAD to extract identifiers

Variables for linkage:

Variables for linkage will primarily be derived from QPRIME
Person: Name, Sex, DOB, Age, Single Person Identifier, QCAD number, event date

Variables for analysis (for [1252] Sudden-Death – Suicide):

For period: 1 February 2014 – 31 January 2018

Reported
Start Date
Start Time
Call Source
DOB
Age
Sex
Region
District
Mesh Block
SA1_Code
SA2_Code
SA3_Code
SA4_Code
HHS
Incident Code
Activity
RevisedIncident Code
Revised Incident

CAD and eARF — **Queensland Ambulance Service, Computer-aided Dispatch and Electronic Ambulance Report Form**

Call/case identification:

The cohort will be defined on the basis of suicide related calls and cases identified in the period: 1 February 2014 – 31 January 2017
CAD/eARF: Suicide-related cases as identified by MPDS and eARF documentation

Variables for linkage:

Variables requested for linkage will span the period 1 February 2013 – 31 January 2018 to allow for the identification of engagement of the study cohort with ambulance services in the 12 months pre engagement in 2014 and 12 months post engagement in 2017.
Patient Surname
Patient Middle Name
Patient First Name
Patient Sex
Patient date of birth or estimated age (if DoB unknown)
CAD, Incident Date
CAD, Incident Time
Destination (hospital name)

Variables for analysis:

For the cohort who were the subject of a suicide related call-out by QAS, between 1 February 2014 – 31 January 2017, variables are requested for the period 1 February 2013-31 January 2018, as follows:

Study ID
Record ID
Case ID
Patient Sex
Patient date of birth or estimated age (if DoB unknown)
Indigenous Status
Destination Facility
Call received dd/mm/yyyy hh:mm
At destination dd/mmm/yyyy hh:mm
Initial MPDS determinant (for each event)
Dispatch criticality
Scene location, postcode
QAS LASN
Final assessment
Destination
Flag EEO/EEA (EEO/EEA=1, None=0, text search)
Flag combined QAS/QPS response (QPS attendance=1, None=0, text search)

QHAPDC	Queensland Hospital Admitted Patient Data Collection

For period 1 February 2013-31 January 2018

Variables for linkage

Study ID/Unique person identifier (through linkage)
Record ID (dataset specific record identifier)
Patient Surname
Patient Middle Name
Patient First Name
Patient Sex
Patient date of birth
Patient Address
Patient Postcode

Variables for analysis

Flag for episode start time in date range (Y/N). If No, return no records for QHAPDC
Sex
Indigenous status (Indigenous/non-Indigenous flag)
Country of birth (broad country of birth categories)
Age at admission (single years)
Patient Postcode of usual residence
Language code (available for public hospitals only, broad categories)
HHS of usual residence
Public Facility name/or 'Private'
Facility ID (public facilities only or 'private')
HHS of facility
Episode type/ Care type
Source of referral/transfer
Episode start date/time (day-month-year/hour:min)
Episode end date/time (day-month-year/hour:min)
Patient days (capped at 30+ days)
Psych days (capped at 30+ days)
Primary diagnosis
Other diagnosis
Mental health legal status
Standard unit code (on admission)
Account class codes (flag for DVA or DOD, Y/N)

QDR	Queensland Death Register

For period 1 February 2014-31 January 2018

Variables for linkage

Study ID/Unique person identifier (through linkage)
Record ID (dataset specific record identifier)
Patient Surname
Patient Middle Name
Patient First Name
Patient Sex
Patient date of birth
Patient Address
Patient Postcode

Variables for analysis

Date of death (month-year)
Cause of death (coded or text, depending on availability)

PDC	Perinatal Data Collection

For period 1 February 2013-31 January 2018

Variables for linkage

Study ID/Unique person identifier (through linkage)
Record ID (dataset specific record identifier)
Patient Surname
Patient Middle Name
Patient First Name
Patient Sex
Patient date of birth
Patient Address
Patient Postcode

Variables for analysis

Flag for antenatal screening OR baby date of birth (Y/N). If None, return no records PDC.
Baby year of birth
Mother age in single years
Mother's Postcode of usual residence
Mother's Indigenous status (Indigenous/non-Indigenous flag)
Mother's Country of birth (broad country of birth codes)
Present pregnancy - antenatal screening items

Domestic violence
Alcohol use
Illicit drug use
Edinburgh depression score

EDC **Emergency Data Collection**

For period 1 February 2013-31 January 2018

Variables for linkage

Study ID/Unique person identifier (through linkage)
Record ID (dataset specific record identifier)
Patient Surname
Patient Middle Name
Patient First Name
Patient Sex
Patient date of birth
Patient Address
Patient Postcode

Variables for analysis

For records between February 1-2013 – January 31 2018

Flag for service commencement datetime in date range (Y/N). If No, return no records for EDIS
Patient Sex
Patient date of birth (month and year only)
Patient Postcode
Indigenous Status (Indigenous/non-Indigenous flag)
Country of birth (broad country of birth codes)
Please insert flag for DVA file number (Y/N)
Please insert flag for Payment class = (Department of Defence OR Department of Veterans Affairs) (Y/N)
Facility name (public facilities only or 'private')
Facility ID (public facilities only or 'private')
HHS of facility
Arrival transport mode
Triage category
Visit type
Service commencement datetime
Principal diagnosis
Additional diagnosis 1
Additional diagnosis 2
Episode end status
Episode end datetime

CIMHA **Consumer Integrated Mental Health Application**

Variables for linkage

For records between February 1-2013 – January 31 2018
Study ID/Unique person identifier (through linkage)
Record ID (dataset specific person identifier)
Patient Surname
Patient Middle Name

Patient First Name
Patient Sex
Patient date of birth
Patient Address
Patient Postcode

Variables for analysis

Scope Where the QAS/QPS cohort links to the CIMHA data, MHAODB to provide the following data items to the researcher:

Demographic information (all available data, for period specified)

Study ID
Patient Sex
Patient month/year of birth
Indigenous status
Country of birth
Mental health-accommodation type
Accommodation type
Postcode of usual residence
SA2
Education level
Income source
Marital status

Mental health diagnosis

Study ID
Referral ID (when associated with a referral)
Service Episode ID (when associated with a service episode)
Diagnosis Collection Occasion ID
Diagnosis Collection Occasion Date
Diagnosis Collection Occasion Status
Diagnosis Type (Primary or Secondary)
ICD-10-AM Diagnosis Code

Please return count of number of unique mental health diagnoses (both primary and secondary) for the individual, total for date range specified (i.e., please provide both raw data on diagnoses and aggregate count of number of each diagnoses)

Please return count of number of mental health diagnoses (primary and secondary, separately) for the individual, total for date range specified (i.e., how many diagnoses recorded for an individual, irrespective of uniqueness of diagnosis)

Engagement with mental health services

Provision of Service (all POS within the date range)

Study ID
POS ID
Referral ID (when associated with a referral)
Service Episode ID (when associated with a service episode)
Consumers Treating Unit at datetime of POS
Team of treating clinician (if multiple clinicians there will be multiple teams against each POS/intervention combination)
POS datetime
Consumer Participation Status
POS Location (where available)
Intervention Type (there can be one or more interventions per POS)
Third Party Participant Role (there can be zero or more third party participant roles per POS)

Referral (all referrals open within the date range)

Study ID
Referral ID
Presenting problem (there can be one or more presenting problems per referral)
Referral source type
Referral status, with datetime (all statuses for all referrals open within the date range
Referred to further care

Episode (all service episodes open within the date range)

Study ID
Service Episode ID
Service type (episode),
Start datetime
End datetime

Mental Health Act (all orders, authorities etc open within the date range)

Study ID
Mental Health Act Status and Stream

Start datetime
End datetime
Authorised Mental Health Service

Clinical Outcomes (all outcomes within the date range)

Study ID
Collection Occasion ID
Collection Occasion Date
HoNoS Items (individual scores)
HoNoS65+ Items (individual scores)
HoNoSCA items (individual scores)

ATODS-IS **Alcohol, Tobacco and Other Drugs - Information System**

Variables for linkage

For records between February 1-2013 – January 31 2018
Study ID/Unique person identifier (through linkage)
Record ID (dataset specific person identifier)
Patient Surname
Patient Middle Name
Patient First Name
Patient Sex
Patient date of birth
Patient Address
Patient Postcode

Variables for analysis

Study ID/Unique person identifier (through linkage)
Patient Date of Birth (Month/Year)
Patient Postcode
Indigenous Status
Drug of Principal Concern
Episode start date/time
Episode end date/time

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NEED HELP?

Suicide can be a difficult topic for many people. If you would like to talk with someone, find support, or locate more information, you can contact:

Lifeline 13 11 14
www.lifeline.org.au/gethelp

Suicide Call Back Service
1300 659 467
www.suicidecallbackservice.org.au

MensLine Australia
1300 789 978
www.mensline.org.au

Beyond Blue Support Service
1300 224 636
www.beyondblue.org.au

SANE Australia Helpline
1800 187 263
www.sane.org

QLife (LGBTI)
1800 184 5270
www.qlife.org.au

Kids Helpline
1800 551 800
www.kidshelpline.com.au

Defence Family Helpline
1800 624 608
www.defence.gov.au/dco/defence-helpline.asp

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