



Railway suicide in Australia: an overview of incidents using data from a nationally representative coronial database

Report submitted to the TrackSAFE Foundation

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Summary

TrackSAFE commissioned The University of Melbourne to conduct an in-depth review of Australian railway suicide coronial data to develop the evidence base for prevention interventions. We extracted data about railway suicides that occurred over the period 2015-2019 from the National Coronial Information System (NCIS) and systematically coded the detailed circumstances of incidents, focusing particularly on the events of the period proximal to the suicide. While the NCIS contains coded and non-coded data, we mainly used the NCIS non-coded data for this project – that is the information contained in the police summaries and coroners' findings. For each case, we read any available finding, police summary, toxicology and autopsy form and coded all information into our bespoke data collection form. The numbers presented throughout this report are likely to be underestimates as we cannot assume that specific information we were interested in would necessarily be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information.

Study findings:

- Overall, there were 377 railway suicides included in our study, this comprised 268 male suicides (71%) and 109 female suicides (29%).
- Half of all railway suicides occurred in Victoria, more than one-quarter in New South Wales, approximately 10% in each of Queensland and Western Australia, and 5% in South Australia. Railway suicide rates were highest in Victoria (0.6 per 100,000 residents).
- The median age of people who died by railway suicide was 33 years and the age pattern was generally similar for males and females, with the peak age group for both being 20-29 years before generally declining with age. More than a quarter of people who died by railway suicide were aged 20-29 years (28%) and a further 20% were aged 30-39 years.
- Twenty-two percent of Australians who died by railway suicide were born overseas which is slightly lower than the proportion of Australia's general population who are born overseas.
- Almost four percent of Australians who died by railway suicide were Aboriginal and/or Torres Strait Islander (3.7%), which is very similar to 3.3% of the Australian population that was Aboriginal and/or Torres Strait Islander as at 30 June 2016.
- There was evidence in the coronial record that at least 24% of those who died by railway suicide had children. The most common living arrangement was with family members (43% of all railway suicides and 72% of cases with a known living arrangement).
- We recorded whether there was any evidence that individuals had a diagnosed or suspected mental health condition at any time across their life, and specifically within the 12 months prior to

suicide. There was evidence that at least 66% of individuals who died by railway suicide had either a diagnosed or suspected mental health condition (or conditions) at some time across their life and for 26% there was evidence that at least one mental health condition was “active” within 12 months of their suicide. There was a significant association between sex and evidence of 12-month diagnosed mental health condition ($\chi^2 = 5.00$, $df = 1$, $p = 0.025$), where a higher proportion of females had 12-month diagnosed mental health condition (30%) compared to males (18%).

- There was evidence that at least 55% of individuals who died by railway suicide had experienced at least one significant life event within the 12 months prior to suicide. The most common specific events were worsening or onset of mental health issues (32%), relationship breakdown or difficulties (18%), problems relating to school or work (11%) and financial difficulties (8%). There was evidence that at least 18% of individuals who died by railway suicide had experienced at least one significant life event within the 48 hours prior to suicide, again the most common specific events were worsening or onset of mental health issues (9%) and relationship breakdown or difficulties (6%).
- We identified a small proportion of individuals who had 12-month physical health conditions noted (8% of all cases).
- Twenty-four percent of individuals who died by railway suicide were recorded as having made at least one previous suicide attempt. In 45% of instances where the individual was known to have made a previous attempt, there was evidence of them having made multiple previous suicide attempts.
- Almost one-quarter of individuals were recorded as having verbalised their intent to die by suicide at some point prior to their suicide (24%). Of these, approximately one-third specifically stated they had the intention to die by railway suicide (34%).
- We recorded any evidence that the person who died had communicated suicide ideation or intent shortly before the fatal incident. We conceptualised communications of ideation or intent to suicide into two categories – (1) immediate communications of intent or (2) delayed communication of intent, although people could be coded as having communicated in both ways. We identified more instances of delayed ($n=57$) communication of intent when compared to immediate ($n=23$) communications of intent. Immediate communications of intent were most commonly made via text message and sometimes via social media posts.
- If there was information in the coronial record about where the individual was immediately prior to making their way to the railway, we coded the type of location they had been at ($n=173$). By far the most recorded location prior to the fatal incident was a private home (30% of all cases, 65% of cases where a prior location was recorded in the coronial record).

- We identified 96 instances where we had information about the individual's interactions with people prior to setting out to the incident location. For each incident we noted the detail of the interaction that the individual had with others, and we noted whether it appeared that this interaction was (or was likely to have been) perceived as "normal" by family, friends etc. In contrast, we also noted when there was some indication that people interacting with the individuals thought the individual was distressed or behaved in a way that meant people in their life thought there might be a problem. For almost half of the incidents (n=45, 47%), we coded the individual's interactions/behaviour as "normal". In the other incidents (n=51, 53%), there was some indication that the individual was distressed or behaved in a way that meant people in their life thought there might be a problem.
- There was specific evidence that at least 11 individuals (3% of the total sample) contacted someone when they were on the way to the location where they died by railway suicide or when they were at the location.
- In at least 4% of all railway suicides there was evidence of planning to use the railway as the method of suicide. Examples of planning included individuals having made a previous suicide attempt by rail, individuals visiting locations to watch trains, or having a note with train times found on their person. Other examples included individuals using the internet to search for information about different methods of suicide (including railway suicide) or to look up train times.
- Of those with a known means of travel to the incident location, 42% travelled by foot, 39% travelled by private car and 12% travelled by train.
- The open track was the most common location of incidents (45%), followed by stations (34%), level crossings (9%) and pedestrian crossings (6%).
- We were able to determine how individuals accessed the fatal location in 80% of cases (n=301). In 31% of incidents individuals accessed the location by jumping or climbing onto the tracks from a platform, and in 28% the individual accessed via open track. Access to fatal locations was also provided by level or pedestrian crossings (10% and 7%, respectively).
- We were able to estimate how long an individual had spent at the location before the fatal incident for 18% of all incidents using information in the police reports or coroners' findings. The length of time varied from 2 minutes to 6 hours.
- In almost one in five incidents there was specific evidence that suggested someone saw the incident happen (i.e., other people were present) (19%). Some examples of this were simply witnesses observing the individual's behaviour prior to the fatal incident. Whereas, in other incidents, the individual who died interacted with a person immediately prior to the fatal incident.

- We could determine that the individual was stationary on the track immediately prior to the impact with the train in more than one-third of incidents (36%). Other common actions were jumping (25%) or wandering/running (15%).
- Overall, the most commonly recorded behaviours were removing belongings (10% of all cases, 35% of cases with at least one behaviour), hiding (10% of all cases, 33% of cases with at least one behaviour) and pacing (4% of all cases, 14% of cases with at least one behaviour).
- In the vast majority of cases (90%), we could determine that the individual died at the scene, and in at least one third of incidents there was evidence that the individual died instantly (33%).

Implication for prevention:

- Given that almost one-quarter of individuals who died by railway suicide were recorded as having verbalised their intent to die by suicide at any time prior to their suicide and of these, approximately one-third specifically stated they had the intention to die by railway suicide, upstream interventions such as media campaigns should be considered.
- Given that in almost one in five incidents (19%) in our study there was specific evidence that suggested someone saw the incident happen (i.e., other people were present), it is likely that bystander interventions could be effective railway suicide prevention interventions.
- Our findings about the specific types of locations where railway suicides most commonly occurred, and about how these locations were accessed by those who died by railway suicide, also provide insights for prevention. In our study, almost 300 people who died by railway suicide accessed the tracks via a means that theoretically could be restricted. Although ideally all stations would have platform screen doors and the whole railway network would be fenced, the expense associated would be prohibitive, so some prioritisation needs to occur. We suggest that (1) the design of all future stations incorporate some type of platform screen doors, (2) there should continue to be investment in trackside fencing, particularly in Victoria given the over-representation of railway suicides in that state and (3) the removal of level crossings should continue to be prioritised (especially at level crossing sites where suicides have occurred).
- Our study also provides evidence that increasing visibility across the railway network is likely to be another effective way that railway suicides could be prevented. We found that individuals commonly hid somewhere on the network prior to impact with a train. Therefore, removal of vegetation next to tracks and restricting access to (or removing) other infrastructure that people can hide behind should be prioritised. In addition, authorities should consider strategically placed lighting and mirrors to improve the train operator's views of the track.

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Background and rationale for the project

Railway suicide is a significant public health concern

Approximately 75 people die by suicide or suspected suicide each year on the Australian railway network ¹. While all suicides are concerning and warrant prevention efforts, railway suicides are of particular concern because they occur at public sites and are therefore often witnessed by people who are working at or using the rail network, or those who are simply near to the railway when an incident occurs. Train drivers frequently experience severe psychological consequences (e.g., acute stress reactions and PTSD) after being involved in a railway suicide ²⁻⁴. Preventing suicide attempts in the rail environment is also a high priority as these attempts typically result in serious injury ⁵, have a high case-fatality rate ⁶, and have substantial financial implications including through having major effects on the normal operation of the railway system ^{7,8}. The public nature of railway suicides contributes to their dire consequences, though it also provides unique opportunities for prevention. There are several avenues for intervention in public places that are not possible in private places such as the home.

Interventions to prevent railway suicide

Many different measures have been implemented in an effort to prevent railway suicide, including those that restrict access to means (e.g., physical barriers such as platform screen doors^{7,9-11}), those that encourage help seeking (e.g., signs indicating sources of help¹²), those that increase the likelihood of intervention by a third party (e.g., training of railway staff or bystanders^{13,14}) and those that encourage responsible media reporting of railway suicides (e.g., media guidelines¹⁵).

Rationale and study aims

TrackSAFE commissioned The University of Melbourne to conduct an in-depth review of Australian railway suicide coronial data to develop the evidence base for railway suicide prevention interventions and to identify opportunities for new potential interventions. We extracted data about railway suicides from the National Coronial Information System (NCIS) and systematically coded the detailed circumstances of incidents, focusing particularly on the events of the period proximal to the suicide. While we also collected data about history of mental health conditions, past suicide attempts and recent life events, we placed emphasis on examining the period immediately leading up to the suicide: essentially from when the person physically sets out with the intent to die by suicide, through to when the suicide occurs at the final location. The rationale for this in-depth review was that this information is essential for practical intervention in incidents of suicide attempts on the railway. Our study focuses on actions, because railway suicide is by definition a public incident and requires certain actions to be completed: setting out to the railway line, arriving at the railway line, moving to the location of

intended fatal incident, waiting for the train, moving in front of the train. These actions are observable and therefore in theory can be acted upon and can therefore inform the development of interventions to prevent railway suicide.

Methods

Data source

We extracted data about railway suicides from the National Coronial Information System (NCIS). The NCIS is a national internet-based data storage and retrieval system of Australian and New Zealand coronial records. Each record typically has a full text police summary of circumstances, autopsy report, toxicology report, coroner's findings report (where procedures have been performed and are available), as well as coded demographic information (e.g., marital and employment status at the time of death). The NCIS is the best source of data for national studies about railway suicide, though data quality varies across jurisdictions. We chose the period 2015-2019 as current operational statistics on the NCIS website (released January 2023) show that more than 90% of cases for that period are closed.

Data extraction

We included all deaths that occurred over the period 2015-2019 that met the following criteria:

- were closed on the NCIS as of the 16th of October 2023* (our final search date), and
- were classified as **intentional self-harm** at completion of the coronial process, and
- where **mechanism of injury** was coded as "blunt force" (level 1) & "transport injury event" (level 2) and **vehicle details counterpart 1** was coded as "rail vehicle".

** We re-ran our NCIS search on the 16th of October to capture any recently closed cases, so the final dataset used for this preliminary report contains all closed cases for the period 2015-2019 as of the 16th of October 2023.*

Data coding

While the NCIS contains coded and non-coded data, we mainly used the NCIS non-coded data for this project – that is the information contained in the police summaries and coroners' findings. For each case, we read any available coroner's finding, police summary, toxicology and autopsy form and coded all information into our bespoke data collection form. This data collection form consisted of many flag variables. If there was evidence of the given factor in any of the NCIS documents, we coded "yes" into our form. For example, if the police summary stated "handwritten suicide note found at individual's home" we would code "yes" in our "suicide note" variable and "yes" in our "handwritten" variable. Similarly, if the coroner's finding document stated "X had made a previous railway suicide attempt on the 24th May 2015" we would code "yes" to our "suicide attempt ever" variable, and to our "railway suicide attempt ever" variable, as well as coding "24/5/2015" in our "date of most recent suicide attempt" variable. Three coders worked on data collection and coding.

Data analysis

We prepared descriptive results using SPSS v27, StataSE 16 and Excel. We used chi-square as a test of statistical association. Where we have presented short descriptions of events sourced from NCIS text-based documents, we have altered the descriptions to main confidentiality (e.g., we removed references to specific train lines or locations or to the individual's sex/gender or age).

Ethical approval

The study was reviewed and approved by the University of Melbourne's Human Research Ethics Committee (Reference Number: 2023-26370-38635-3), the Department of Justice and Community Safety's Justice Human Research Ethics Committee of Victoria (reference number: CF/23/8021) and the Western Australian Coronial Ethics Committee (NCIS reference number: M0511).

Results

Demographic profile of people who died by railway suicide

Note: For most of this section we used coded data from the NCIS. However, it should be noted that for some data presented here (i.e., information about whether individuals had children and their specific living arrangements) we used information available in the coronial documents including the coronial finding and police summary. These numbers are likely to be underestimates as we cannot assume that specific information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information.

Overall, there were 377 railway suicides included in our study (closed NCIS cases for the period 2015-2019), this comprised 268 male suicides (71.1%) and 109 female suicides (28.9%).

Half of all railway suicides occurred in Victoria, more than one-quarter in New South Wales, approximately 10% in each of Queensland and Western Australia, and 5% in South Australia (Table 1).

Table 1 Australian railway suicides: number of suicides per year by state of occurrence (n=377)

	2015	2016	2017	2018	2019	All	% railway suicides
Victoria	46	39	33	37	33	188	49.9
New South Wales	20	23	24	15	18	100	26.5
Queensland	8	7	13	3	6	37	9.8
Western Australia	*	*	*	*	8	34	9.0
South Australia	*	*	*	*	6	18	4.8
All	83	75	81	67	71	377	100.0

** Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.*

(1) Closed cases only so numbers are likely to be underestimates of the true numbers of railway suicides per year.

Railway suicide rates per 100,000 population were highest in Victoria (0.60 per 100,000 residents) (Table 2).

Table 2 Australian railway suicides: suicide rates per 100,000 population by state of occurrence (n=377)

	Average annual rate per 100,000 residents
Victoria	0.60
New South Wales	0.26
Queensland	0.15
Western Australia	0.19
South Australia	0.21
All	0.31

Age and sex patterns in railway suicide

Understanding how railway suicide manifests across age groups and sex is important for helping to target railway suicide intervention and prevention activities.

The median age of people who died by railway suicide was 33 years (34 years for females and 32 years for males). Figures 1 and 2 show the age pattern for all those who died by railway suicide, and for males and females separately (Figure 1 shows the counts for males and females and Figure 2 shows the proportion for males and females separately and for all persons). The age pattern was generally similar for males and females, with the peak age group for both being 20-29 years before generally declining with age (Figure 1). More than a quarter of people who died by railway suicide were aged 20-29 years (27.6%) and a further 19.9% were aged 30-39 years (Figure 2).

Figure 1 Australian railway suicides: age group and sex of people who died by railway suicide (n=377)

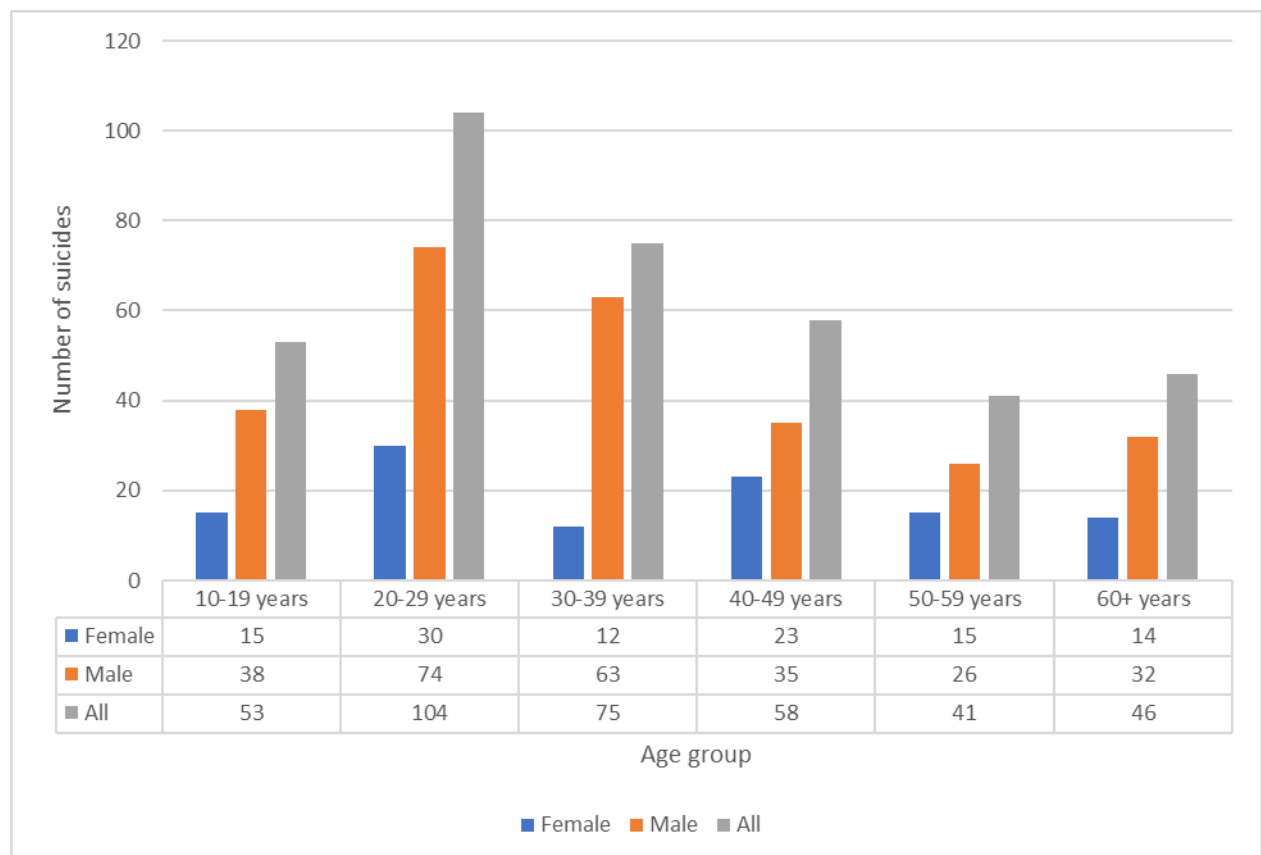
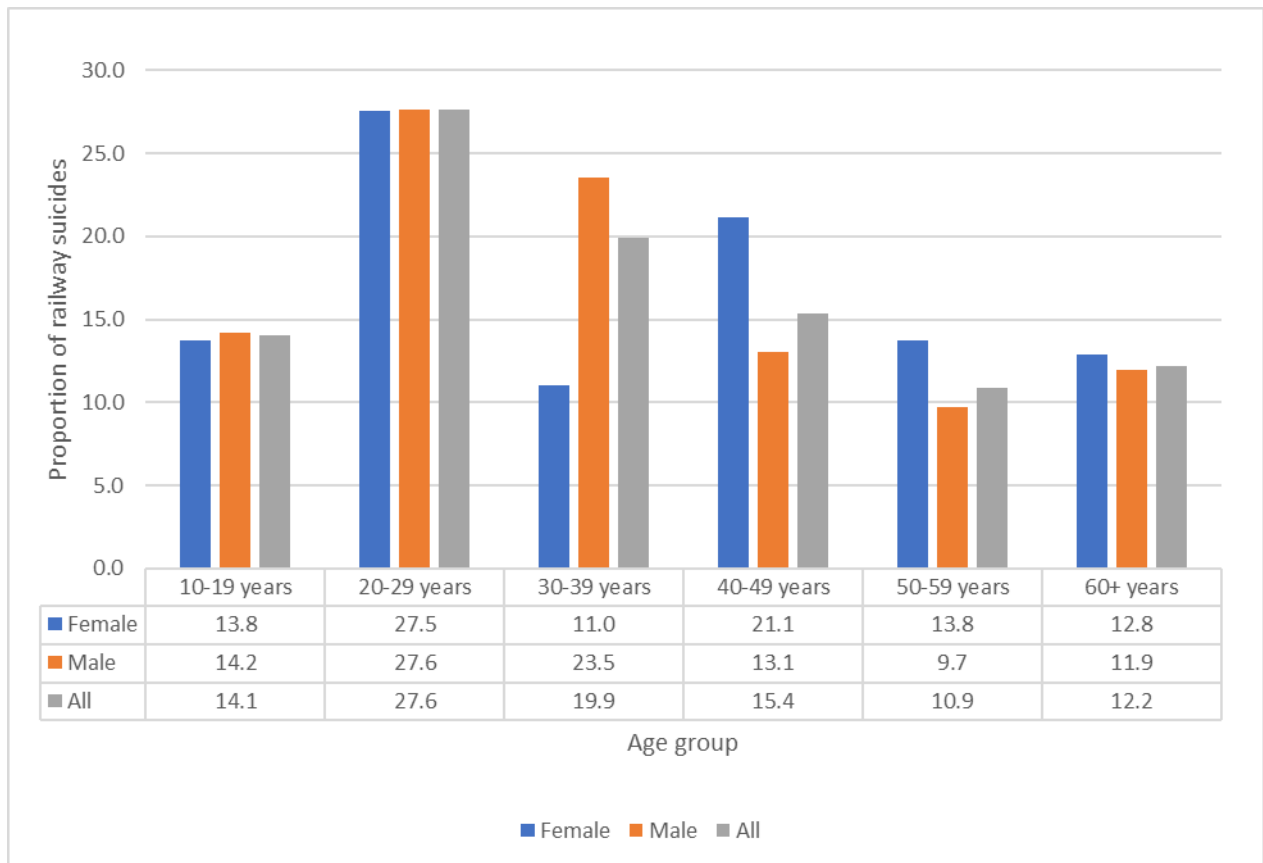


Figure 2 Australian railway suicides: age group and sex of people who died by railway suicide % (n=377)



The median age and the sex distribution of railway suicides is shown in Table 3 by the state of occurrence. Regression analyses showed there was no association between state of occurrence and either age or sex.

Table 3 Australian railway suicides: median age and sex distribution by state of occurrence (n=377)

	Median age (years)	% male
Victoria	34	71.3
New South Wales	32.5	72.0
Queensland	31	64.9
Western Australia	31.5	70.6
South Australia	30	77.8
All	33	71.1

Country of birth

Twenty-two percent of Australians who died by railway suicide were born overseas (n=84, 22.3%) which is slightly lower than the proportion of Australia's general population who are born overseas - reported as being 30% in 2020 ¹⁶.

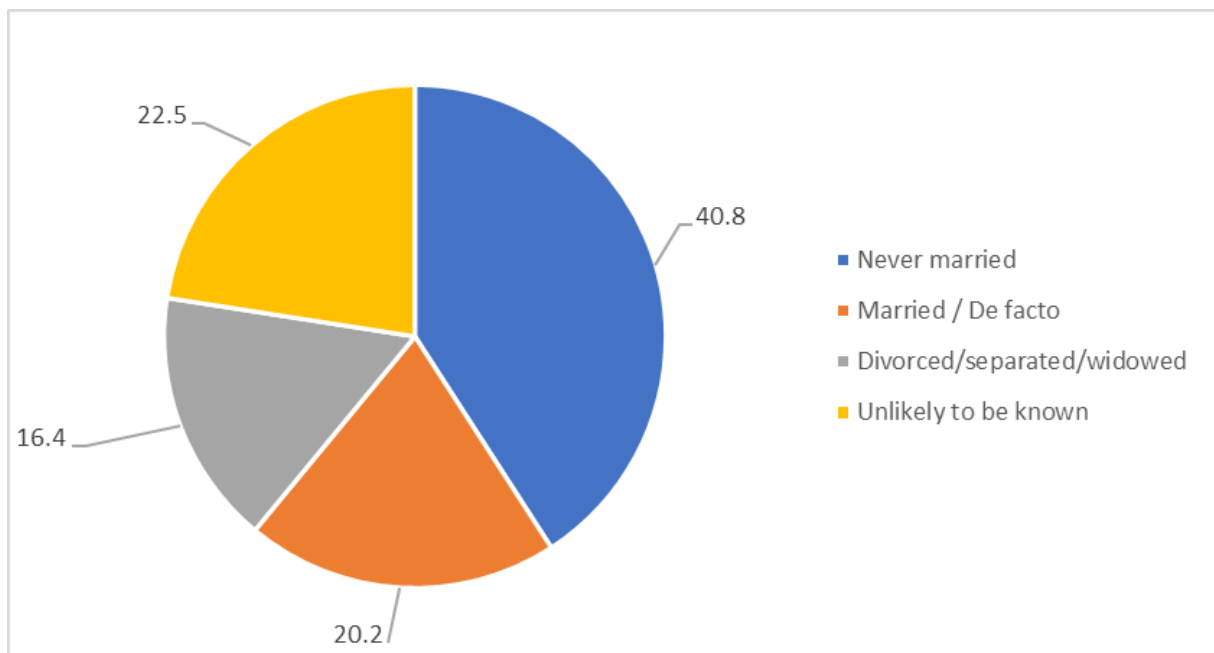
Indigenous status

Almost four percent of Australians who died by railway suicide were Aboriginal and/or Torres Strait Islander (n=14, 3.7%), which is very similar to 3.3% of the Australian population that was Aboriginal and/or Torres Strait Islander as at 30 June 2016 ¹⁷.

Marital status

Approximately 40% of Australians who died by railway suicide had never been married (40.8%, n=154), 20% were either married or in a de facto relationship at the time of their death (n=76), 16% were either divorced, separated or widowed at the time of their death (n=62), and in 23% of cases the individual's marital status was unlikely to be known (n=85) (Figure 3).

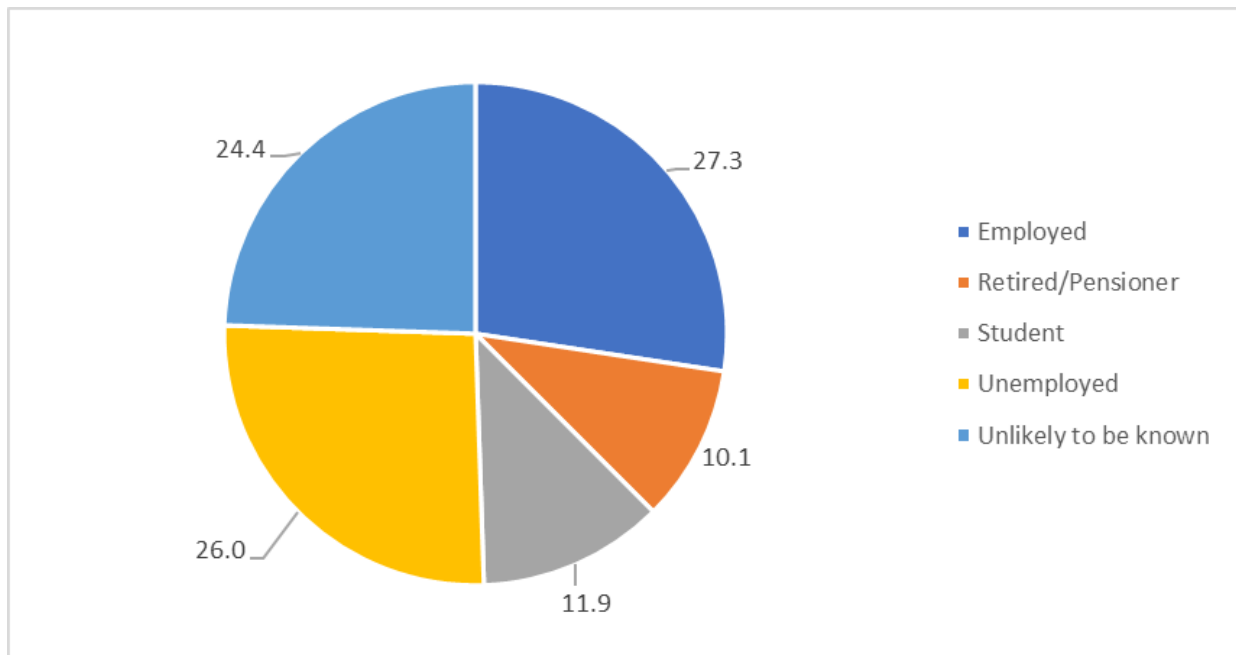
Figure 3 Australian railway suicides: marital status of people who died by railway suicide % (n=377)



Employment status

Slightly more than a quarter of people who died by railway suicide were employed at the time of their death (27.3%, n=103), a similar proportion were unemployed (26.0%, n=98), 11.9% were students, 10.1% were retired or pensioners and the employment status was unlikely to be known for 24.4% (Figure 4).

Figure 4 Australian railway suicides: employment status of people who died by railway suicide % (n=377)



Children

There was evidence in the coronial record that at least 24.1% of those who died by railway suicide had children (n=91).

Specific living arrangements

We were able to determine the specific living arrangements from the coronial file for 59.9% (n=226) of individuals who died by railway suicide (Table 4). The most common living arrangement was with family members (43.0% of all railway suicides and 71.7% of cases with a known living arrangement). Specifically, at least one quarter of individuals who died by railway suicide lived with family other than their partner or their children (n=95).

Table 4 Australian railway suicides: living arrangement at the time of suicide (n=377)

	Number	Percent of all railway suicides	% of cases with specified living arrangement (n=226)
Living with family (partner or other family members)	162	43.0	71.7
<i>Living with partner only</i>	33	8.8	14.6
<i>Living with partner and children</i>	29	7.7	12.8
<i>Living with children only</i>	5	1.3	2.2
<i>Living with family (other than partner or children)</i>	95	25.2	42.0
Living with friends or shared accommodation	15	4.0	6.6
Living in an institution/hospital/care home	7	1.9	3.1
Living alone	20	5.3	8.8
No fixed abode	14	3.7	6.2
Other specified	8	2.1	3.5
Unspecified	151	40.1	
All	377	100.0	

Individual-related factors among people who died by railway suicide

Note: It should be noted that the numbers and proportions we report in this (and the following) section are likely to be underestimates. We cannot assume that the specific information we were interested in would always have been known about or that the information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information.

Mental health conditions

We recorded whether there was any evidence that individuals had a diagnosed or suspected mental health condition at any time across their life, and specifically within the 12 months prior to suicide (Table 5). We specifically coded (and focused on) the 12-month category because we wanted to place the main focus on conditions that were likely to be “active” within 12 months of the railway suicide.

There was evidence that at least 66.3% of individuals who died by railway suicide had either a diagnosed or suspected mental health condition (or conditions) at some time across their life (n=250) and for 26.3% there was evidence that at least one mental health condition was “active” within 12 months of their suicide (n=99) (Table 5).

Table 5 Australian railway suicides: mental health conditions (n=250)

	Number of individuals	Percent of all railway suicides
Mental health condition - ever		
Mental health condition – diagnosed	214	56.8
Mental health condition – suspected (not diagnosed)	36	9.6
Mental health – total	250	66.3
Mental health condition – 12 months		
Mental health condition – diagnosed	81	21.5
Mental health condition – suspected (not diagnosed)	18	4.8
Mental health – total	99	26.3

12-month diagnosed mental health conditions

Of the 81 individuals with a 12-month diagnosed mental health condition, 49 were males (60.5%) and 32 were females (39.5%). There was a significant association between sex and evidence of 12-month diagnosed mental health condition ($\chi^2 = 5.00$, $df = 1$, $p = 0.025$), where a higher proportion of females had 12-month diagnosed mental health condition (29.6%) compared to males (18.3%). There was no association between age group and evidence of 12-month diagnosed mental health condition.

We coded these 12-month diagnosed mental health conditions mentioned in the coronial records (for 81 individuals) to the International Classification of Diseases 10th Revision (ICD-10) categories shown

in Table 6. Categories are not mutually exclusive as individuals could have multiple conditions that cross multiple ICD-10 categories.

Overall, at least 15% of individuals who died by railway suicide had a diagnosed mood disorder in the 12-months prior to suicide (69.1% of individuals with a 12-month diagnosed mental health condition), and approximately 5-6% of individuals had the following: neurotic, stress-related, and somatoform disorders (5.8%), mental and behavioural disorders due to psychoactive substance use (5.6%) and/or schizophrenia, schizotypal, and delusional disorders (4.8%) (Table 6).

Table 6 Australian railway suicides: specific 12 month diagnosed mental health conditions (n=81)

	Number	% of all cases (n=377)	% of people with 12-month diagnosed mental health condition (n=81)
Mood [affective] disorders	56	14.9	69.1
Neurotic, stress-related, and somatoform disorders	22	5.8	27.2
Mental & behavioural disorders due to psychoactive substance use	21	5.6	25.9
Schizophrenia, schizotypal, and delusional disorders	18	4.8	22.2
Disorders of adult personality and behaviour	12	3.2	14.8
Behavioural and emotional disorders (onset usually occurring in childhood and adolescence)	*	*	*
Behavioural syndromes (associated with physiological disturbances and physical factors)	*	*	*
Disorders of psychological development	*	*	*
Unspecified mental disorder	7	1.9	8.6
Any 12-month diagnosed mental health condition	81	21.5	100.0
All railway suicide	377	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Recent life events

We recorded whether there was any evidence that individuals had experienced a significant life event specifically within the 12 months prior to suicide (Table 7). We also coded events that happened within 48-hours of suicide (Table 8).

Life events with 12 months of suicide

There was evidence that at least 54.9% of individuals who died by railway suicide had experienced at least one significant life event within the 12 months prior to suicide (n=207) (Table 7). The most common specific events were worsening or onset of mental health issues (32.1%), relationship breakdown or difficulties (17.5%), problems relating to school or work (10.6%) and financial difficulties (8.2%).

Of the 207 individuals with at least one 12-month life event, 137 were males (71.1%) and 70 were females (28.9%). There was a significant association between sex and evidence of 12-month recent life event ($\chi^2 = 4.86$, $df = 1$, $p = 0.028$), where a higher proportion of females had 12-month recent life event (64.2%) compared to males (51.1%). There was no association between age group and evidence of 12-month recent life event.

Table 7 Australian railway suicides: recent life events (within 12 months of suicide) (n=207)

	Number	% of all cases (n=377)	% of people with life event within 12 months of suicide (n=207)
Worsening or onset of mental health issues	121	32.1	58.5
Relationship breakdown or difficulties	66	17.5	31.9
Problems relating to school or work	40	10.6	19.3
Financial difficulties	31	8.2	15.0
Moved house or country or left hospital	18	4.8	8.7
Worsening or onset of physical illness or injury or pain	17	4.5	8.2
Victim of crime, bullying or abuse	16	4.2	7.7
Bereavement or loss event (e.g. anniversary of death)	16	4.2	7.7
Criminal event (perpetrator)	14	3.7	6.8
Homelessness or threat of losing home	10	2.7	4.8
Legal difficulties	8	2.1	3.9
Any recent life event (within 12 months of suicide)	207	54.9	
All railway suicide	377	100.0	

Life events with 48 hours of suicide

There was evidence that at least 18.0% of individuals who died by railway suicide had experienced at least one significant life event within the 48 hours prior to suicide (n=68) (Table 8). The most common specific events were worsening or onset of mental health issues (9.3%) and relationship breakdown or difficulties (6.1%).

Of the 68 individuals with at least one life event in the 48 hours prior to suicide, 51 were males (75.0%) and 17 were females (25.0%). There was no significant association between sex and evidence of a life event within 48 hours of suicide. Similarly, there was no association between age group and evidence of a life event within 48 hours of suicide.

Table 8 Australian railway suicides: recent life events (within 48 hours of suicide) (n=68)

	Number	% of all cases (n=377)	% of people with recent life event within 48 hours of suicide (n=68)
Worsening or onset of mental health issues	35	9.3	51.5
Relationship breakdown or difficulties	23	6.1	33.8
Problems relating to school or work	9	2.4	13.2
Financial difficulties	9	2.4	13.2
Moved house or country or left hospital	*	*	*
Victim of crime, bullying or abuse	*	*	*
Worsening or onset of physical illness or injury or pain	*	*	*
Bereavement or loss event (e.g. anniversary of death)	*	*	*
Criminal event (perpetrator)	*	*	*
Legal difficulties	0	0.0	0.0
Homelessness or threat of losing home	6	1.6	8.8
Any recent life event (within 48 hours of suicide)	68	18.0	100.0
All railway suicide	377	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Physical health

We recorded whether there was any evidence that individuals had a physical health condition in the 12 months prior to their suicide (Table 9). The condition did not have to have arisen during the 12 months prior to suicide, it just had to likely be having an impact in that period (for example chronic pain as a result of an injury received five-years ago). We identified a small proportion of individuals who had 12-month physical health conditions noted (8.0% of all cases). The most common types of physical health conditions were physical illness (4.0% of all cases, 50.0% of cases with at least one physical health condition) and pain (1.3% of all cases, 16.7% of cases with at least one physical health condition).

Table 9 Australian railway suicides: presence and type of physical health conditions (within 12 months of suicide) (n=377)

	Number	% of all cases (n=377)	% of people with 12-month physical health condition (n=30)
Physical illness	15	4.0	50.0
Physical pain	5	1.3	16.7
Physical injury	*	*	*
Physical disability	*	*	*
Physical – other not listed above	5	1.3	16.7
Any 12-month physical health condition	30	8.0	100.0
All railway suicide	377	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Of the 30 individuals with at least one physical health condition, 20 were males (66.7%) and 10 were females (33.3%). There was no association between sex and evidence of a 12-month physical health condition. The age group of the individuals who experienced physical health conditions in the 12 months prior to suicide is shown in Table 10. Approximately 15% of individuals aged 50-59 years or 60-69 years experienced physical health conditions in the 12 months prior to suicide and there was an association between age group and evidence of 12-month physical health condition ($\chi^2 = 11.76$, $df = 5$, $p = 0.039$), whereby the youngest individuals were less likely to experience physical health conditions prior to suicide.

Table 10 Australian railway suicides: physical health conditions by age group (within 12 months of suicide) (n=30)

	Number	% of age group with evidence of any physical condition
10-19 years	*	*
20-29 years	7	6.7
30-39 years	*	*
40-49 years	6	10.3
50-59 years	6	14.6
60+ years	7	15.2
All ages	30	8.0

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Previous attempts

Ninety-one individuals were recorded as having made at least one previous suicide attempt, which represents 24.1% of all those who died by railway suicide. It should be noted, that as with much of the data presented throughout this report, the proportion of individuals we have reported as having at least one previous suicide attempt is likely to be an underestimate.

In 45.1% of instances where the individual was known to have made a previous attempt, there was evidence of them having made multiple previous suicide attempts (n=41) and 17 individuals had made a previous railway suicide attempt.

Timing of last suicide attempt

For records with specific information about the timing of the previous attempt (n=63), the median time to suicide following the most recent recorded attempt was 48 days. The period of time between the known most recent previous attempt and suicide (n=63) is shown in Table 11. Eight percent of the most recent previous attempts occurred the day of the suicide, 19% within one week, one-third within a fortnight, 44.4% within one month and three-quarters within one year.

Table 11 Australian railway suicides: timing of previous suicide attempt, number and cumulative number (n=63)

Period of time between previous attempt and suicide	Number	Percent of those with previous attempt	Period of time between previous attempt and suicide	Cumulative number	Cumulative percent of those with previous attempt
Same day	5	7.9	Same day	5	7.9
> 1 day < 1 week	7	11.1	Within 1 week	12	19.0
> 1 week < 2 weeks	10	15.9	Within two weeks	22	33.3
> 2 weeks < 1 month	6	9.5	Within one month	28	44.4
> 1 month < 1 year	19	30.2	Within one year	47	74.6
> 1 year	16	25.4		63	100.0
All	63	100.0			

Exposure to suicide

At least 19 individuals who died by railway suicide had a close relationship at some time over their life with someone else who had died by suicide. In four instances it was noted that the person knew multiple people who had died by suicide. Most commonly the person who had died was a parent (n=9), other relationships mentioned were partners, close friends and grandparents. In a few instances it was noted that the person known to the individual had died specifically by railway suicide.

Communications about ideation or intent

Verbalising suicidal intent – any time

Almost one-quarter of individuals were recorded as having verbalised their intent to die by suicide at some point prior to their suicide (24.4%, n=92). Of these, approximately one-third specifically stated they had the intention to die by railway suicide (33.7%, n=31).

Indicators of suicide ideation or intent - proximal to the incident

We recorded any evidence that the person who died had communicated suicide ideation or intent shortly before the fatal incident. We conceptualised communications of ideation or intent to suicide into two categories – (1) immediate communications of intent or (2) delayed communication of intent, although people could be coded as having communicated in both ways (Table 12). An example of an immediate communication of intent would be if an individual phones or texts someone and says, “I am going to suicide today”. In contrast, suicide notes left for people to find after an incident were considered to be delayed communications of intent.

We identified more instances of delayed (n=57) communication of intent when compared to immediate (n=23) communications of intent. Immediate communications of intent were most commonly made via text message and sometimes via social media posts.

Table 12 Australian railway suicides: communications of suicide ideation or intent proximal to the railway suicide (n=377)

	Number	% of all cases (n=377)	% of cases with known communications (n=82)
Yes – communication of suicide ideation or intent	82	21.8	100.0
Delayed	57	15.1	69.5
Immediate	23	6.1	28.0
Unspecified	5	1.3	6.1
Unknown whether communication of suicide ideation or intent	295	78.2	
All	377	100.0	

Suicide notes

One specific way individuals can communicate their intent to suicide is via suicide notes, these are mostly delayed communications of intent but can sometimes be more immediate (for example if sent as a text message). In 53 cases (14.1% of all railway suicides) there was specific evidence that the individual left a suicide note and the location and format of these notes is shown in (Table 13). Most suicide notes were found at private homes (84.9%) and most were handwritten or typed notes (86.8%).

Table 13 Australian railway suicides: suicide notes – location and format of note (n=53)

	Number	% of cases with suicide notes (n=53)
Location (not mutually exclusive)		
At individual's home	45	84.9
On body	7	13.2
At the fatal location (not on body)	12	22.6
Received as electronic message	6	11.3
Other	5	9.4
Unspecified	5	9.4
Mode (not mutually exclusive)		
Hand written or typed note	46	86.8
Text message	13	24.5
Email	*	*
Social media post	*	*
Voice message	*	*
Other	11	20.8

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Incident information

Note: As per the previous section, it should be noted that the numbers and proportions we report in section are likely to be underestimates. We cannot assume that the specific information we were interested in would always have been known about or that the information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of incidents for which we did not have information.

Type of location prior

If there was information in the coronial record about where the individual was immediately prior to making their way to the railway (n=173), we coded the type of location they had been at (Table 14). By far the most commonly recorded location prior to the fatal incident was a private home (30.0% of all cases, 65.3% of cases where a prior location was recorded in the coronial record).

Table 14 Australian railway suicides: type of location immediately prior to the incident (n=377)

	Number	% of all cases (n=377)	% of cases with known location (n=173)
Private home	113	30.0	65.3
Hospital	13	3.4	7.5
Mental health facility	10	2.7	5.8
Own workplace	7	1.9	4.0
School	*	*	*
Pub/bar/nightclub etc	*	*	*
Hotel/apartment	*	*	*
Shopping centre	*	*	*
Other	20	5.3	11.6
Unspecified	204	54.1	
All	377	100	

** Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.*

Interactions with others immediately prior to setting out to the incident location

We identified 96 instances where we had information about the individual's interactions with people prior to setting out to the incident location. We did not include interactions that happened immediately prior to the railway suicide occurring, such as with rail staff or bystanders as these are covered in the section titled "Other people present at incident location".

For each incident we noted the detail of the interaction that the individual had with others, and we noted whether it appeared that this interaction was (or was likely to have been) perceived as "normal" by family, friends etc. In contrast, we also noted when there was some indication that people interacting with the individuals thought the individual was distressed or behaved in a way that meant people in their life thought there might be a problem.

For almost half of the incidents (n=45, 46.9%), we coded the individual's interactions/behaviour as "normal". Some examples of these types of interactions were:

"Individual told spouse they were going for a walk before coming home. Spouse stated that this was not unusual and was not concerned."

"Individual was leaving to do some work, told partner the finish time of shift and what time they would return home. Partner said that there was nothing unusual in behaviour."

"Parent drove individual to an appointment, parent thought individual seemed well."

"Friends from party said individual appeared happy."

In the other incidents (n=51), there was some indication that the individual was distressed or behaved in a way that meant people in their life thought there might be a problem. Some examples of these types of interactions were:

"Parent spoke to individual about their relationship troubles with girlfriend, individual stated that they were not coping well at all."

"Individual told parents they were having 'bad thoughts' but did not elaborate."

"Individual woke up late and told spouse that they had a terrible night and that they couldn't take it anymore. Spouse asked if they should stay home, however, individual said that there was nothing that they could do and encouraged them to leave."

"Individual spoke with partner who described them as being agitated and unwell, discussed about their relationship and both were upset."

"At pub with friend, drinking quickly and behaving fairly normally. Mood changed. Left alone without telling friend."

"Partner reported individual was very calm but talking strangely/monotone. Individual said they were leaving to visit their mother."

In some of these instances, individuals talked to others directly about suicide. Some examples of these interactions were:

"Individual was talking to others and mentioned that they were unhappy with life and had tried to take their life previously, said they were thinking of suicide and that they may jump in front of train."

"Individual told mother that they will either go homeless or suicide."

“Individual told housemate that they will throw themselves in front of a train. Housemate was not concerned because individual often said that.”

“Individual told family they were going to kill themselves and left.”

Communications when on route to, or at, the incident location

There was specific evidence that at least 11 individuals (2.9% of the total sample) contacted someone when they were on the way to the location where they died by railway suicide or when they were at the location.

In terms of the mode of contact, five instances were private messages, and other modes were phone calls or cases where individuals used multiple modes of contact. Individuals mostly contacted members of their family (parents, siblings, children or partners), while others contacted friends. In terms of the content of the contacts, some were what could be referred to as generic goodbye messages mostly to family members. In other instances, individuals specifically referred to their intent to die by suicide and even the method they were going to use.

Evidence of planning to use the railway as the method of suicide

In at least 16 cases (4.2% of all railway suicides) there was evidence of planning to use the railway as the method of suicide. Examples of planning included individuals having made a previous suicide attempt by rail, individuals visiting locations to watch trains, or having a note with train times found on their person. Other examples included individuals using the internet to search for information about different methods of suicide (including railway suicide) or to look up train times.

Means of travel to the incident location

The means of travel to the incident location was available for 137 individuals (36.3% of cases) and is shown in Table 15. Of those with a known means of travel, 42.3% travelled by foot (n=58), 38.7% travelled by private car (n=53) and 12.4% travelled by train (n=17).

Table 15 Australian railway suicides: means of travel to the incident location (n=377)

	Number	% of all cases (n=377)	% of cases with known location (n=137)
On foot	58	15.4	42.3
Private car	53	14.1	38.7
Train	17	4.5	12.4
Other Public Transport	*	*	*
Other	*	*	*
Unspecified	240	63.7	
All	377	100	

** Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.*

Type of location of fatal incident

The specific type of location of incidents is shown in Table 16. The open track was the most common location of incidents (45.4%), followed by stations (34.0%), level crossings (9.0%) and pedestrian crossings (6.4%).

Table 16 Australian railway suicides: specific type of location of fatal incidents (n=377)

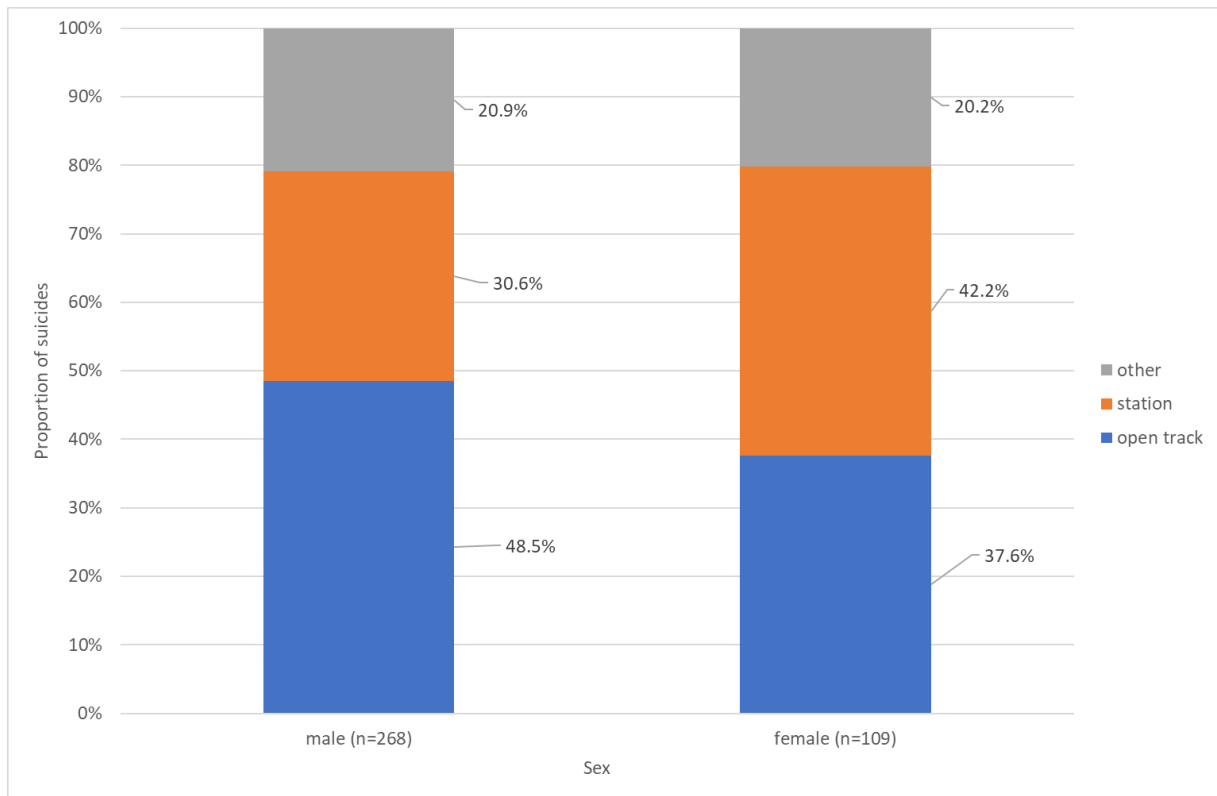
	Number	% of all cases (n=377)	% of cases with known location (n=137)
open track (i.e., between stations or between station and crossing)	171	45.4	47.1
at station	128	34.0	35.3
level crossing	34	9.0	9.4
pedestrian crossing	24	6.4	6.6
level & pedestrian crossing	*	*	*
overpass	*	*	*
other specified location	*	*	*
unspecified	14	3.7	
All	377	100	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

The location of fatal incident is shown separately for males and females in Figure 5 and for individuals of different age groups in Figure 6. There was no significant association between sex and the type of location, although for males, the highest proportion of incidents occurred on open track (48.5%), followed by at stations (30.6%), whereas for women the highest proportion of incidents occurred at stations (42.2%), followed by open track (37.6%). There was a significant association between age group and the type of location ($\chi^2 = 25.63$, $df = 10$, $p = 0.004$). The group with the highest proportion of incidents occurring on open track was the youngest group (64.2%) and the group with the highest proportion of incidents occurring at stations was the oldest group (43.5%).

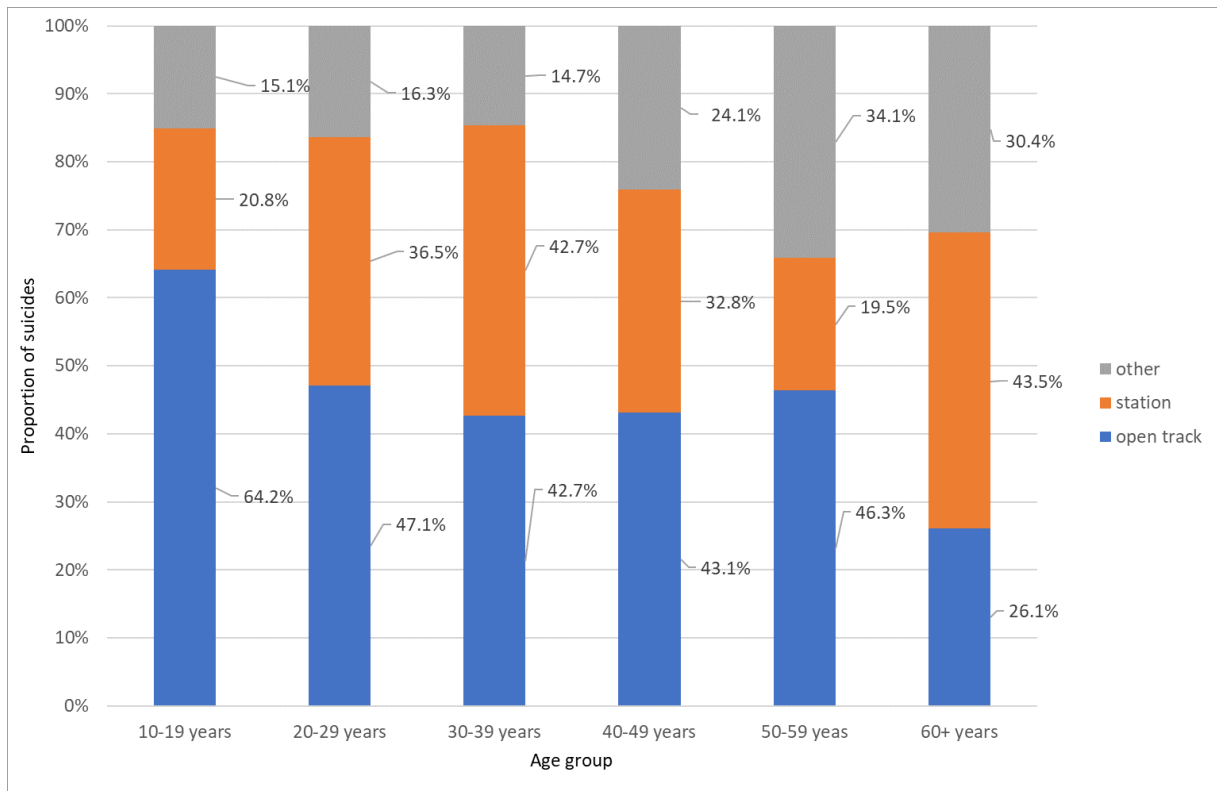
The location of fatal incident by state of occurrence is shown in Figure 7. There was also a significant association between state and the type of location ($\chi^2 = 94.73$, $df = 8$, $p < 0.001$), whereby New South Wales had the highest proportion of incidents occurring at stations (68.0%), and Victoria and Western Australia had the highest proportion occurring on open tracks (58.0% and 58.8%, respectively).

Figure 5 Australian railway suicides: location of fatal incident by sex % (n=377)



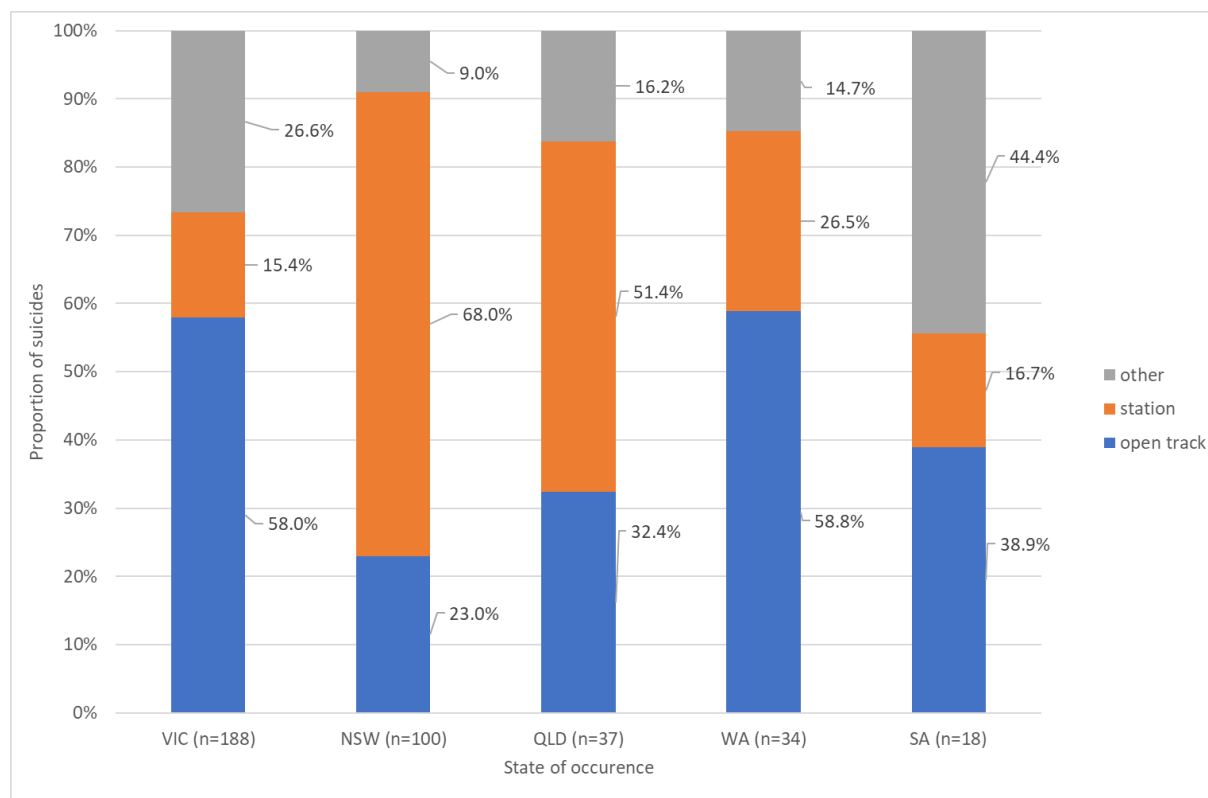
Note: other includes level crossing, pedestrian crossing, overpass and "other specified location".

Figure 6 Australian railway suicides: location of fatal incident by age group % (n=377)



Note: other includes level crossing, pedestrian crossing, overpass and "other specified location".

Figure 7 Australian railway suicides: location of fatal incident by state of occurrence % (n=377)



Note: other includes level crossing, pedestrian crossing, overpass and "other specified location".

Access to the fatal location

We were able to determine how individuals accessed the fatal location in 80% of cases (n=301) (Table 17). In approximately one-third of incidents, individuals accessed the location by jumping or climbing onto the tracks from a platform (n=118 31.3%) and in a similar proportion of cases the individual accessed via open track (n=105, 28.1%). Access to fatal locations was also provided by level or pedestrian crossings (10.3% and 6.9%, respectively).

Table 17 Australian railway suicides: how the fatal location was accessed (n=377)

	Number	% of all cases (n=377)	% of cases where access to the fatal location could be coded (n=301)
jumped or climbed onto track from platform	118	31.3	39.2
open track	106	28.1	35.2
walked onto track from level crossing	39	10.3	13.0
walked onto track from pedestrian crossing	26	6.9	8.6
through a fence	*	*	*
other	*	*	*
unspecified	76	20.2	
All	377	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Train speed

In 157 cases (41.6% of cases) there was information about the speed of the train recorded in the NCIS documents. The mean speed was 73.6kph, the median was 70kph (range 28-155kph).

Alcohol use at the time of the incident

In 301 cases (80% of all cases) information was available about whether the individual had consumed alcohol at the time of the incident. In 22.3% of all incidents (n=84) there was evidence of alcohol use; however, more commonly there was no evidence of alcohol use (57.6% of cases, n=217). There was no significant association between alcohol use at the time of the incident and either age group or sex.

Time spent at the location

We were able to estimate how long an individual had spent at the location before the fatal incident for 67 cases (17.8% of all cases) using information in the police reports or coroners' findings (Table 18). One quarter of individuals with a known time spent at the fatal location (n=17), spent 6-15 minutes and a further quarter spent 16-30 minutes (n=17).

The length of time varied from 2 minutes to 6 hours, averaging 50 minutes (SD = 80). The median time (of 20 minutes) is a better reflection of actual time that most people were at locations, given that there were a few outliers who stayed for very long amounts of time.

Table 18 Australian railway suicides: time spent at location prior to incident occurring (n=67)

	Number	Percent of cases where a time could be estimated (n=67)	Cumulative number	Cumulative percent of cases where a time could be estimated (n=67)
5 minutes or less	12	17.9	12	17.9
6-15 minutes	17	25.4	29	43.3
16-30 minutes	17	25.4	46	68.7
31-45 minutes	*	*	*	*
46 minutes to 1 hour	*	*	*	*
1 hour to 6 hours	12	17.9	67	100.0
All	67	100.0		

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Other people present at incident location

In almost one in five incidents there was specific evidence that suggested someone saw the incident happen (i.e., other people were present) (n=73, 19.4%).

Some examples of this were simply witnesses observing the individual's behaviour prior to the fatal incident:

“Individual was observed by the witness to be standing at the northern end of platform. The witness stated that the individual was sobbing, with their hands covering their face. The individual was standing on the blue line of the platform, which is just prior to the yellow “do not cross” line, leaning forwards towards the train tracks.”

“The witness was sitting about 40 metres away on the same platform near the ticket machine. Witness saw the individual pace on the southern end of the platform.”

“Witness... noticed the individual on platform 1 straight away. Witness noted that individual was continually walking back and forth along the yellow line on platform 1 for about 10 minutes. Witness said that the individual had sitting on the ground where they were pacing. Witness noticed that the individual had no expression on their face but thought this might have been their normal expression.”

In other incidents, the individual who died interacted with a person immediately prior to the fatal incident:

“The individual and a stranger were together sitting on seat at train station speaking with one another. The train approached the station and the individual got up from the seat.”

“The individual is then observed kneeling on the ground on the platform. The witness approached the individual while they were kneeling on the ground and asked if there were Ok.”

In at least one instance, the individual was prevented from making an attempt by a bystander only to then make a fatal attempt:

“Individual was standing on train station platform 1 and attempted to jump from the platform into oncoming train, before bystander has intervened. Approx one minute later individual realised train on platform two was approaching. Individual then jumped from platform two into oncoming train.”

Action directly preceding the incident

We coded the action immediately preceding the fatal incident if this information was available in the coronial record (Table 19). We could determine that the individual was stationary on the track immediately prior to the impact with the train in more than one-third of incidents (n=137, 36.3%). Other common actions were jumping (n=93, 24.7%) or wandering/running (n=55, 14.6%).

Table 19 Australian railway suicides: actions directly preceding impact with train (n=377)

	Number	% of all cases (n=377)	% of cases where actions could be coded (n=320)
Stationary on track (e.g., lying, sitting, standing)	137	36.3	42.8
Jumping	93	24.7	29.1
Wandering, running	55	14.6	17.2
Other specified	35	9.3	10.9
Unspecified	57	15.1	
All	377	100.0	

Behaviours at the incident location

We coded any evidence of individuals' behaviours at the incident locations (Table 18). We haven't included here behaviours directly preceding the incident (such as running, jumping, lying on track etc) as these have been presented above, although we have included behaviours such as "hiding" which often directly preceded the actions presented in Table 17. An individual could be coded for multiple behaviours.

Overall, the most commonly recorded behaviours were removing belongings (10.1% of all cases, 35.2% of cases with at least one behaviour), hiding (9.5% of all cases, 33.3% of cases with at least one behaviour) and pacing (4.0% of all cases, 13.9% of cases with at least one behaviour). Removing belongings mostly involved individuals leaving their belongings such as keys, phones and wallets near to the incident location. In other instances, individuals removed their clothing such as jackets or shoes. There were also instances of handbags or shopping bags being found nearby to incident locations. With regards to hiding, individuals hid in many and varied ways. It was common that individuals hid in, or behind, vegetation near to the track and then ran out into the path of the train. Others hid behind parts of the railway infrastructure to ensure they could not be seen (e.g., "battery box", "station box") and in other instances individuals hid under certain parts of the platform. Examples of individuals "pacing" included instances where they walked up and down a particular platform, or they walked in and out of a station (including walking to and from cars parked at stations). There were also examples where people were seen to walk up and down locations near to level or pedestrian crossings.

Table 20 Australian railway suicides: behaviours at the incident location (n=377)

	Number	% of all cases (n=377)	% of cases with at least one behaviour coded (n=108)
Removing belongings	38	10.1	35.2
Hiding	36	9.5	33.3
Pacing	15	4.0	13.9
Talked with someone in person	6	1.6	5.6
Platform switching	5	1.3	4.6
Drinking/likely substance affected	5	1.3	4.6
Talked with someone on the phone	*	*	*
Loitering	*	*	*
Distressed (sobbing, head in hands, rocking back and forth etc)	*	*	*
Other	9	2.4	8.3
All	377	100	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Information about where and when the person died

In the vast majority of cases (89.9%), we could determine that the individual died at the scene (n=339), in 4.0% there was specific evidence that they did not die at the scene (n=15) and for the remaining 6.1% of cases this information was unknown (n=23).

In at least one third of incidents there was evidence that the individual died instantly (n=125, 33.2%), in 5.3% there was specific evidence that they did not die instantly (n=20). However, in the majority of cases whether or not the deceased died instantly was unknown (n=232, 61.5%).

Summary of findings and implications for prevention

To further develop the evidence base about railway suicide in Australia, we examined the detailed circumstances of 377 railway suicides that occurred across the five-year period 2015-2019. We focused particularly on the events of the period most proximal to the fatal incidents, but also coded information related to the broader lives of individuals such as the presence of mental and physical health conditions and also exposure to recent life events. This information about people's lives can be used in concert with the detailed information about the hours prior to suicide, in the development of potential railway suicide interventions.

Although strengths of our study include that we used a nationally representative database and had almost 400 incidents to analyse, our study is not without limitations. Firstly, all individuals included in the study – by definition – died by railway suicide and therefore it is unknown whether the factors we noted as common in these incidents of railways suicide are actually indicative of railway suicide risk or are simply common factors present among all railway users or all incidents that occur on railways. Secondly, it should be noted that many of the numbers and proportions we report in this study are likely to be underestimates. We cannot assume that the specific information we were interested in would always have been known about or that the information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information.

Selected findings

Individual related factors

Understanding how railway suicide manifests across age, sex and other demographic factors is important for helping to target railway suicide intervention and prevention activities. Males accounted for the majority of railway suicides in our study (71%) – relatively consistent with the pattern for all suicides in Australia over the same time period where males accounted for three-quarters of suicides¹⁸. The railway suicide rate was highest in Victoria – almost twice the Australian rate (0.60 per 100,000 compared with 0.31 per 100,000). This differs from the pattern in overall suicide rates over the same period whereby rates were generally highest in the Northern Territory, Queensland, Tasmania and Western Australia¹⁸. The median age of people who died by railway suicide was 33 years which is lower than the median age for all suicides in 2017 (the mid-point of our study) which was 45 years¹⁹.

We recorded whether there was any evidence that individuals had a mental health condition at any time across their life, and specifically within the 12 months prior to suicide. We coded, and focused on, the 12 months prior to suicide because mental health conditions can and do develop over time,

can be cyclic, and can go through several iterations and treatments or have a precipitous onset ²⁰. Approximately two-thirds of individuals had either a diagnosed or suspected mental health condition (or conditions) at some time across their life (66%) and for more than a quarter at least one mental health condition was present within 12 months of their suicide (26%). By way of comparison to the prevalence of mental health conditions in the general population, the two most recent versions of the National Study of Mental Health and Wellbeing—the most robust measure of the prevalence of mental health conditions in Australia—found approximately 45% of Australians experienced a mental health condition at some time in their life and one in five experienced a mental health condition in the previous 12 months ^{21,22}. This suggests that the prevalence of mental health conditions (at least in the 12 months prior to suicide) might not be significantly overrepresented in Australians who die by railway suicide. It should be noted however that the prevalence we found in our study is likely to be an underestimate due to data quality issues which have been mentioned throughout this report.

We found evidence that more than half of individuals who died by railway suicide had experienced a significant life event specifically within the 12 months prior to suicide (55%) and that the most common specific events were worsening or onset of mental health issues (32%) and relationship breakdown or difficulties (18%). There was evidence that at least 18% of individuals who died by railway suicide had experienced a significant life event specifically within the 48 hours prior to suicide and again, the most common specific events were worsening or onset of mental health issues (9%) and relationship breakdown or difficulties (6%). These types of life events have been observed as being common in the lives of people who died by suicide in other Australian ^{23,24} and international studies ²⁵⁻²⁸.

Previous suicide attempt is one of the strongest predictors of subsequent suicide risk ²⁹. We found evidence that almost one-quarter of Australians who died by railway suicide had made at least one previous suicide attempt. It is difficult to find comparable research that examined the presence of previous suicide attempts for all methods of suicide and that covers the whole of Australia. However, our finding of almost a quarter of those who died by railway suicide having made a previous suicide attempt is higher than an Australian study which used the Victorian Suicide Register and examined all Victorian suicides (i.e., not restricted to railway suicide) which showed 15% of those who died by suicide had a recorded previous suicide attempt ³⁰. In contrast our estimate is lower than published data from Queensland (using the Queensland Suicide Register) which found that around one in three have made a previous attempt.

Almost one-quarter of individuals were recorded as having verbalised their intent to die by suicide at any time prior to their suicide (24% of all railway suicides) and of these, approximately one-third specifically stated they had the intention to die by railway suicide (34%). We also recorded any

evidence that the individual had communicated suicide ideation or intent shortly before the fatal incident.

Incident related information

The following dot points summarise selected findings related to the incident. It is important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information on the various factors of interest. However, the information is still useful to indicate patterns prior to incidents that could be indicative of increased risk for railway suicide.

- Overall, the most commonly recorded behaviours prior to incidents were removing belongings and hiding (each were present in around one third of cases with at least one behaviour identified). Removing belongings mostly involved individuals leaving their belongings such as keys, phones and wallets near to the incident location. It was common that individuals hid in, or behind, vegetation near to the track and then ran out into the path of the train. Others hid behind parts of the railway infrastructure to ensure they could not be seen (e.g., hid behind a “battery box” or a “station box”) and in other instances individuals hid under certain parts of the platform out of the view of rail staff and train drivers. Examples of individuals “pacing” included instances where they walked up and down a particular platform, or they repeatedly walked in and out of a station.
- In almost one in five incidents (19%) there was specific evidence that suggested someone saw the incident happen (i.e., other people were present). Some examples of this were simply witnesses who saw the individual’s behaviour prior to the fatal incident although in other incidents the individuals who died interacted with a person immediately prior to the fatal incident.
- In terms of the specific types of location where incidents occurred, the open track was the most common location (45%), followed by stations (34%), level crossings (9%) and pedestrian crossings (6%).
- In approximately one-third of incidents, individuals accessed the incident location by jumping or climbing onto the tracks from a platform and in a similar proportion of cases the individual accessed the location via open track.
- We could determine that the individual was stationary on the track immediately prior to the impact with the train in more than one-third of incidents (36%) and other common actions were jumping (25%) or wandering/running (15%).

Some implications for prevention

We suggest that the following might be useful for authorities to consider for prevention purposes given our study findings (and previous research). These opportunities for prevention include those that are more specifically related to railway locations, such as restriction of access to the tracks, but also those that are targeted further ‘upstream’ in the pathways that lead to suicide, such as media campaigns.

Potential Interventions

Given that almost one-quarter of individuals were recorded as having verbalised their intent to die by suicide at any time prior to their suicide and of these, approximately one-third specifically stated they had the intention to die by railway suicide, upstream interventions such as media campaigns should be considered given they are a low-cost intervention with recognised benefits in shifting public attitudes, confidence and intentions related to suicide prevention³¹. In general, those who died by railway suicide tended to be younger and therefore this information should be taken into account when designing media or education campaigns that are aimed specifically at preventing railway suicide.

Given that in almost one in five incidents (19%) in our study there was specific evidence that suggested someone saw the incident happen (i.e., other people were present), it is likely that bystander interventions could be effective railway suicide prevention interventions. It should be noted that the specific examples of interactions included in our study are, by definition, indications of interactions that are not likely to be helpful for prevention, given all people in our study died by railway suicide. What is more likely to be useful in informing bystander education and training is the information we gathered about common behaviours of individuals prior to railway suicide. However, importantly, these examples of behaviours are only useful for prevention purposes if we know that the behaviours are overrepresented in people who die by railway suicide as compared to other train users who do not die by railway suicide. In this way, the most recorded behaviours in our study (i.e., removing belongings and hiding) might be good indicators of suicide risk because it is unlikely that these behaviours are common among the general population of train users who are not contemplating suicide. With this in mind, other behaviours identified in our study that could be useful indicators of suicide risk include pacing and platform switching.

Perhaps the best insights for prevention from our study, come from our findings about the specific types of locations where railway suicides most commonly occurred (e.g., stations, open tracks, level crossings etc), and about how these locations were accessed by those who died by railway suicide. We know from past research in public places generally^{32,33}, and the railway environment specifically^{7,9-11,34,35} that restricting access to means is an effective suicide prevention intervention. Multiple studies

have shown that the installation of platform screen doors is an effective railway suicide prevention intervention^{7,9-11} and recent studies from Victoria have demonstrated that removal of level crossings³⁵ and installing trackside fencing (if longer than 100 metres)³⁴ can reduce railway suicides. In our study, almost 300 people who died by railway suicide accessed the tracks via a means that theoretically could be restricted (for example, if all platforms had screen doors, all the railway track was fenced and access via crossings was restricted). Although ideally all stations would have platform screen doors and the whole railway network would be fenced, the expense associated would be prohibitive so some prioritisation needs to occur (although for underground stations these costs could be partially offset by savings from reduced electricity use due to heating, cooling, etc). Therefore, we suggest that (1) the design of all future stations incorporate some type of platform screen doors, (2) there should continue to be investment in trackside fencing, particularly in Victoria given the over-representation of railway suicides in that state and (3) the removal of level crossings should continue to be prioritised (especially at level crossing sites where suicides have occurred). Importantly, there were a few documented instances in our study of people accessing the track at locations where fencing was present, so care should be taken to ensure fencing is maintained and to ensure that it is unable to be climbed over or through.

Our study also provides evidence that increasing visibility across the railway network is likely to be another effective way that railway suicides could be prevented. We found that individuals commonly hid somewhere on the network prior to impact with a train (i.e., hiding was a behaviour identified in around one third of cases where behaviours could be determined). It was common that individuals hid in, or behind, vegetation near to the track and then ran out into the path of the train. Individuals also hid behind, or between, other parts of the railway infrastructure to ensure they could not be seen. Therefore, removal of vegetation next to tracks and restricting access to (or removing) other infrastructure such as railway pylons, station boxes etc, that people can hide behind should be prioritised. In addition, authorities should consider strategically placed lighting and mirrors to improve the train operator's views of the track.

Future research

Future research using coronial data could include more focused analyses of certain groups of people or incidents (for example, younger people, or incidents from Victoria given the overrepresentation of both in our study). In addition, more years of data could be included thereby increasing the statistical power available to do different types of analysis such as cluster analysis to identify typologies of people or incidents that are common among railways suicides in Australia.

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Appendix 1 Railway suicide in Victoria: a preliminary overview of incidents

Demographic profile of people who died by railway suicide in Victoria

Note: For most of this section we used coded data from the NCIS. However, it should be noted that for some data presented here (i.e., information about whether individuals had children and their specific living arrangements) we used information available in the coronial documents including the coronial finding and police summary. These numbers are likely to be underestimates as we cannot assume that specific information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information.

Overall, there were 188 railway suicides in Victoria (closed NCIS cases for the period 2015-2019), this comprised 134 male suicides (71.3%) and 54 female suicides (28.7%). The Victorian railway suicide rate was 0.60 per 100,000 population and the railway suicide rate was higher in males than females (0.86 v 0.34 per 100,000 residents) (Table 2).

Table 21 Victorian railway suicides: number of suicides per year and rate per 100,000 residents (n=188)

	Number	% of railway suicides	Rate per 100,000 residents
Male	134	71.3	0.86
Female	54	28.7	0.34
All	188	100.0	0.60

(1) Closed cases only so numbers are likely to be underestimates of the true numbers of railway suicides per year.

Age and sex patterns in railway suicide

Understanding how railway suicide manifests across age groups and sex is important for helping to target railway suicide intervention and prevention activities.

The median age of people who died by railway suicide in Victoria was 34 years (35 years for females and 34 years for males). Figures 1 and 2 show the age pattern for all those who died by railway suicide in Victoria, and for males and females separately (Figure 1 shows the counts for males and females and Figure 2 shows the proportion for males and females separately and for all persons). The age pattern was generally similar for males and females, with the peak age group for both being 20-29 years before generally declining with age (Figure 1). More than a quarter of people who died by railway suicide in Victoria were aged 20-29 years (27.1%) and a further 17.0% were aged 30-39 years (Figure 2).

Figure 8 Victorian railway suicides: age group and sex of people who died by railway suicide (n=188)

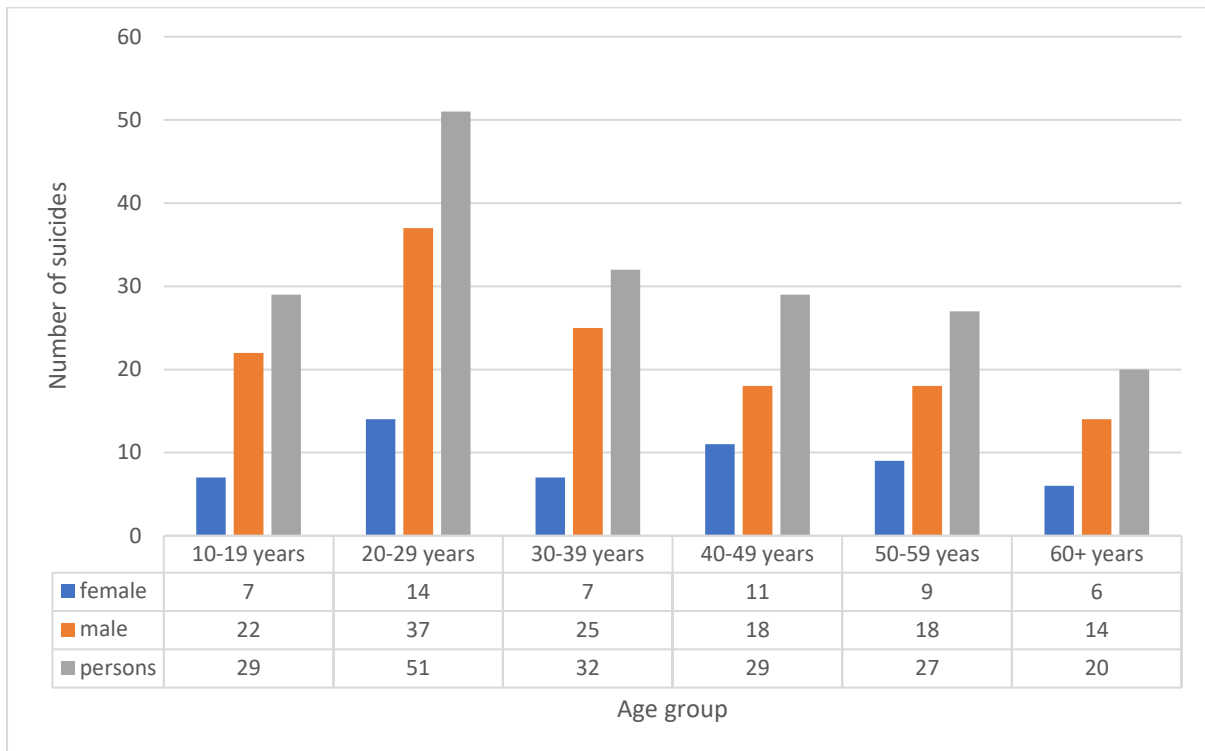
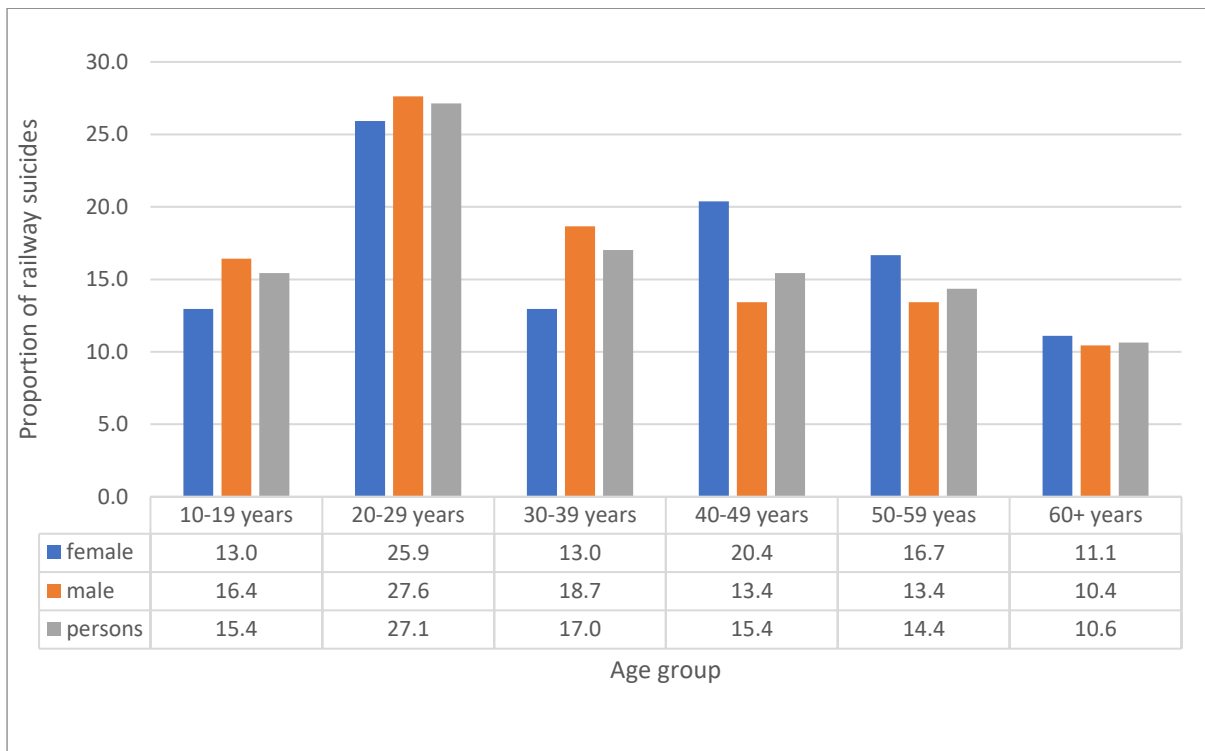


Figure 9 Victorian railway suicides: age group and sex of people who died by railway suicide % (n=188)



Country of birth

Twenty-two percent people who died by railway suicide in Victoria were born overseas (n=41, 21.8%) which is slightly lower than the proportion of Victoria's general population who are born overseas - reported as being 30% in 2020 ¹⁶.

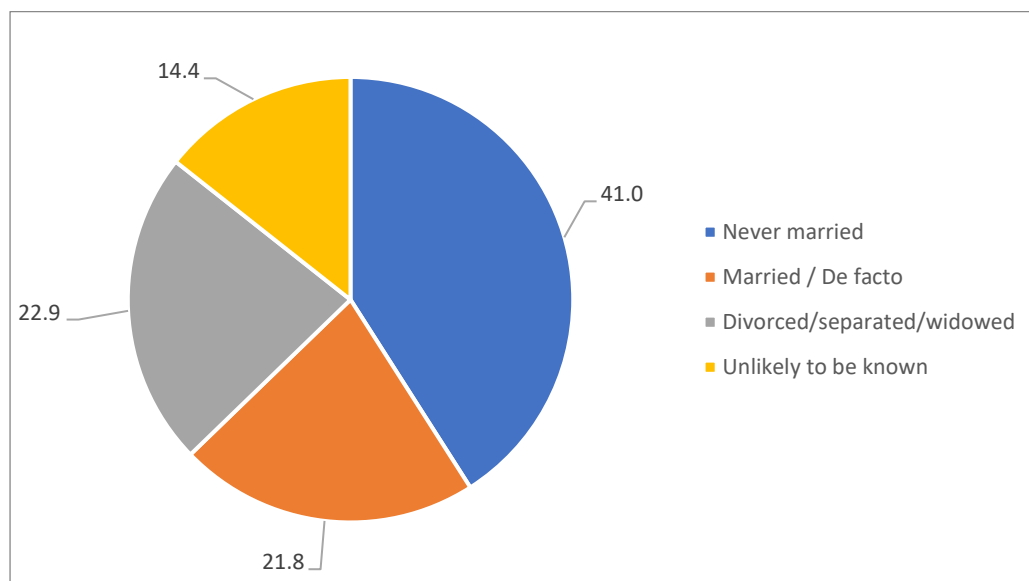
Indigenous status

One percent of people who died by railway suicide in Victoria were Aboriginal and/or Torres Strait Islander (n<5, 1.1%), the same as the proportion (1%) of the Victorian population that was Aboriginal and/or Torres Strait Islander as at 30 June 2016 ¹⁷.

Marital status

Forty-one percent of people who died by railway suicide in Victoria had never been married (n=77), 22.9% were either divorced, separated or widowed at the time of their death (n=43), 21.8% were either married or in a de facto relationship at the time of their death (n=41), and in 14.4% of cases the individual's marital status was unlikely to be known (n=27) (Figure 3).

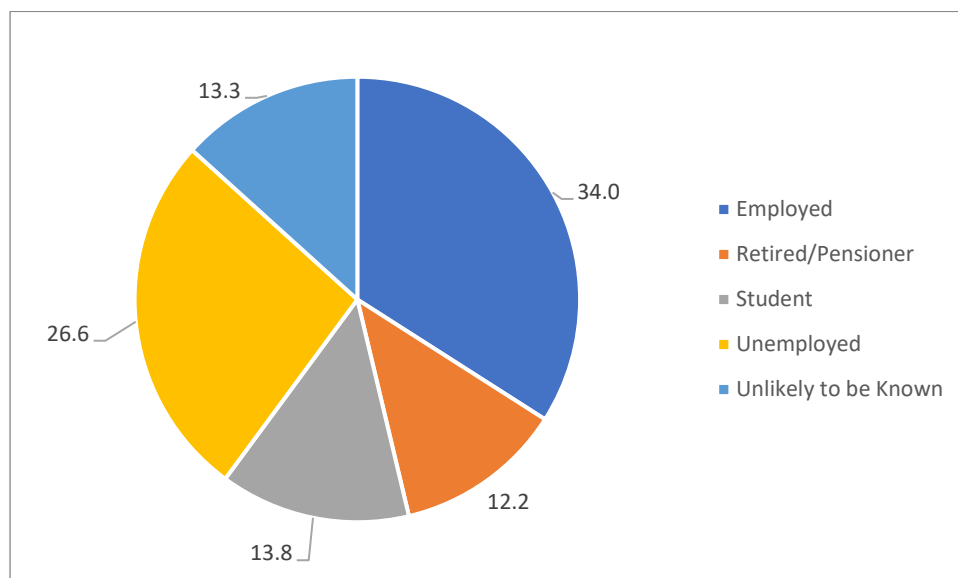
Figure 10 Victorian railway suicides: marital status of people who died by railway suicide % (n=188)



Employment status

Slightly more than one third of people who died by railway suicide in Victoria were employed at the time of their death (34.0%, n=64), around one quarter were unemployed (26.6%, n=50), 13.8% were students (n=26), 12.2% were retired or pensioners (n=23) and the employment status was unlikely to be known for 13.3% (n=25) (Figure 4).

Figure 11 Victorian railway suicides: employment status of people who died by railway suicide % (n=188)



Children

There was evidence in the coronial record that at least one-third of people who died by railway suicide in Victoria had children (n=62).

Specific living arrangements

We were able to determine the specific living arrangements from the coronial file for 76.2% (n=149) of individuals who died by railway suicide in Victoria (Table 4). The most common living arrangement was with family members (59.6% of all Victorian railway suicides and 75.2% of cases with a known living arrangement). Specifically, at least one quarter of individuals who died by railway suicide in Victoria lived with their parents (with or without siblings) (n=63).

Table 22 Victorian railway suicides: living arrangement at the time of suicide (n=188)

	Number	Percent of all railway suicides	% of cases with specified living arrangement (n=149)
Living with family (parents, partner or other family)	112	59.6	75.2
<i>Living with partner (without children)</i>	23	12.2	15.4
<i>Living with partner and children</i>	15	8.0	10.1
<i>Living with parents (with or without siblings)</i>	63	33.5	42.3
<i>Living with other family</i>	11	5.9	7.4
Living with friends or shared accommodation	6	3.2	4.0
Living in an institution/hospital/care home	5	2.7	3.4
Living alone	11	5.9	7.4
No fixed abode	10	5.3	6.7
Other specified	5	2.7	3.4
Unspecified	39	20.7	26.2
All	188	100	

Individual-related factors among people who died by railway suicide

Note: It should be noted that the numbers and proportions we report in this (and the following) section are likely to be underestimates. We cannot assume that the specific information we were interested in would always have been known about or that the information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of individuals for whom we did not have information.

Mental health conditions

We recorded whether there was any evidence that individuals had a diagnosed or suspected mental health condition at any time across their life, and specifically within the 12 months prior to suicide (Table 5). We specifically coded (and focused on) the 12-month category because we wanted to place the main focus on conditions that were likely to be “active” within 12 months of the railway suicide.

There was evidence that at least 76.6% of individuals who died by railway suicide in Victoria had either a diagnosed or suspected mental health condition (or conditions) at some time across their life (n=144) and for 33.5% there was evidence that at least one mental health condition was “active” within 12 months of their suicide (n=63) (Table 5).

Table 23 Victorian railway suicides: mental health conditions (n=144)

	Number of individuals	Percent of all railway suicides
Mental health condition - ever		
Mental health condition – diagnosed	129	68.6
Mental health condition – suspected (not diagnosed)	15	8.0
Mental health – total	144	76.6
Mental health condition – 12 months		
Mental health condition – diagnosed	55	29.3
Mental health condition – suspected (not diagnosed)	8	4.3
Mental health – total	63	33.5

12-month diagnosed mental health conditions

Of the 55 individuals with a 12-month diagnosed mental health condition, 37 were males (67.3%) and 18 were females (32.7%). There was no significant association between sex and evidence of 12-month diagnosed mental health condition or between age group and evidence of 12-month diagnosed mental health condition.

We coded these 12-month diagnosed mental health conditions mentioned in the coronial records (for 81 individuals) to the International Classification of Diseases 10th Revision (ICD-10) categories shown in Table 6. Categories are not mutually exclusive as individuals could have multiple conditions that cross multiple ICD-10 categories.

Overall, at least 21.3% of individuals who died by railway suicide in Victoria had a diagnosed mood disorder in the 12-months prior to suicide (72.7% of individuals with a 12-month diagnosed mental health condition), and approximately 5-8% of individuals had the following: neurotic, stress-related, and somatoform disorders (8.5%), mental and behavioural disorders due to psychoactive substance use (8.0%), schizophrenia, schizotypal, and delusional disorders (6.4%) or disorders of adult personality and behaviour (5.3%) (Table 6).

Table 24 Victorian railway suicides: specific 12 month diagnosed mental health conditions (n=55)

	Number	% of all cases (n=188)	% of people with 12-month diagnosed mental health condition (n=55)
Mood [affective] disorders	40	21.3	72.7
Neurotic, stress-related, and somatoform disorders	16	8.5	29.1
Mental & behavioural disorders due to psychoactive substance use	15	8.0	27.3
Schizophrenia, schizotypal, and delusional disorders	12	6.4	21.8
Disorders of adult personality and behaviour	10	5.3	18.2
Behavioural and emotional disorders (onset usually occurring in childhood and adolescence)	*		
Behavioural syndromes (associated with physiological disturbances and physical factors)	*		
Disorders of psychological development	*		
Unspecified mental disorder	7	3.7	12.7
Any 12-month diagnosed mental health condition	55	29.3	100.0
All railway suicide	188	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Recent life events

We recorded whether there was any evidence that individuals had experienced a significant life event specifically within the 12 months prior to suicide (Table 7). We also coded events that happened within 48-hours of suicide (Table 6).

Life events with 12 months of suicide

There was evidence that at least 72.9% of individuals who died by railway suicide in Victoria had experienced at least one significant life event within the 12 months prior to suicide (n=137) (Table 5). The most common specific events were worsening or onset of mental health issues (47.3%), relationship breakdown or difficulties (24.5%), problems relating to school or work (14.4%) and financial difficulties (12.2%).

Of the 137 individuals with at least one 12-month life event, 94 were males (68.6%) and 43 were females (31.4%). There was no significant association between sex and evidence of 12-month recent life event or between age group and evidence of 12-month recent life event.

Table 25 Victoria railway suicides: recent life events (within 12 months of suicide) (n=137)

	Number	% of all cases (n=188)	% of people with life event within 12 months of suicide (n=137)
Worsening or onset of mental health issues	89	47.3	65.0
Relationship breakdown or difficulties	46	24.5	33.6
Problems relating to school or work	27	14.4	19.7
Financial difficulties	23	12.2	16.8
Moved house or country or left hospital	16	8.5	11.7
Worsening or onset of physical illness or injury or pain	12	6.4	8.8
Victim of crime, bullying or abuse	13	6.9	9.5
Bereavement or loss event (e.g. anniversary of death)	8	4.3	5.8
Criminal event (perpetrator)	6	3.2	4.4
Homelessness or threat of losing home	5	2.7	3.6
Legal difficulties	7	3.7	5.1
Any recent life event (within 12 months of suicide)	137	72.9	100.0
All railway suicide	188	100	

Life events with 48 hours of suicide

There was evidence that at least 27.1% of individuals who died by railway suicide in Victoria had experienced at least one significant life event within the 48 hours prior to suicide (n=51) (Table 6). The most common specific events were worsening or onset of mental health issues (13.8%) and relationship breakdown or difficulties (10.6%).

Of the 51 individuals with at least one life event in the 48 hours prior to suicide, 39 were males (76.5%) and 12 were females (23.5%). There was no significant association between sex and evidence of a life event within 48 hours of suicide. Similarly, there was no association between age group and evidence of a life event within 48 hours of suicide.

Table 26 Victorian railway suicides: recent life events (within 48 hours of suicide) (n=51)

	Number	% of all cases (n=188)	% of people with recent life event within 48 hours of suicide (n=51)
Worsening or onset of mental health issues	26	13.8	51.0
Relationship breakdown or difficulties	20	10.6	39.2
Problems relating to school or work	8	4.3	15.7
Financial difficulties	7	3.7	13.7
Moved house or country or left hospital	*	*	*
Victim of crime, bullying or abuse	*	*	*
Worsening or onset of physical illness or injury or pain	*	*	*
Bereavement or loss event (e.g. anniversary of death)	*	*	*
Criminal event (perpetrator)	*	*	*
Legal difficulties	0	0.0	0.0
Homelessness or threat of losing home	*	*	*
Any recent life event (within 48 hours of suicide)	51	27.1	100.0
All railway suicide	188	100	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Physical health

We recorded whether there was any evidence that individuals had a physical health condition in the 12 months prior to their suicide (Table 9). The condition did not have to have arisen during the 12 months prior to suicide, it just had to likely be having an impact in that period (for example chronic pain as a result of an injury received five-years ago). We identified 10.6% of individuals had 12-month physical health conditions noted (n=20). A physical illness was the most common specified type of physical health condition (4.3% of all cases, 40.0% of cases with at least one physical health condition).

Table 27 Victorian railway suicides: presence and type of physical health conditions (within 12 months of suicide) (n=188)

	Number	% of all cases (n=188)	% of people with 12-month physical health condition (n=20)
Physical illness	8	4.3	40.0
Physical pain	*	*	*
Physical injury	*	*	*
Physical disability	*	*	*
Physical – other not listed above	5	2.7	25.0
Any 12-month physical health condition	20	10.6	100.0
All railway suicide	188	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Of the 20 individuals with at least one physical health condition, 13 were males (65.0%) and 7 were females (35.0%). There was no association between sex and evidence of a 12-month physical health condition. There was also no association between age group and evidence of a 12-month physical health condition.

Previous attempts

Fifty-five individuals were recorded as having made at least one previous suicide attempt, which represents 24.1% of all those who died by railway suicide in Victoria. It should be noted, that as with much of the data presented throughout this report, the proportion of individuals we have reported as having at least one previous suicide attempt is likely to be an underestimate.

In 43.6% of instances where the individual was known to have made a previous attempt, there was evidence of them having made multiple previous suicide attempts (n=24). There was evidence that 11 individuals had made a previous railway suicide attempt (6% of all those who died by railway suicide in Victoria and 20% of those for which there was evidence of a previous attempt).

Timing of last suicide attempt

For records with specific information about the timing of the previous attempt (n=40), the median time to suicide following the most recent recorded attempt was 37 days. The period of time between the known most recent previous attempt and suicide (n=40) is shown in Table 11. Eighteen percent occurred within one week of the railway suicide, 45% within one month and 80% within one year.

Table 28 Victorian railway suicides: timing of previous suicide attempt, number and cumulative number (n=40)

Period of time between previous attempt and suicide	Number	Percent of those with previous attempt	Period of time between previous attempt and suicide	Cumulative number	Cumulative percent of those with previous attempt
> 1 day < 1 week	7	17.5	Within 1 week	7	17.5
> 1 week < 1 month	11	27.5	Within one month	18	45.0
> 1 month < 1 year	14	35.0	Within one year	32	80.0
> 1 year	8	20.0			
All	40	100.0	All	40	100.0

Exposure to suicide

At least 11 individuals who died by railway suicide in Victoria had a close relationship at some time over their life with someone else who had died by suicide. Examples of the people known included parent, close friend, partner and grandparent. In a few instances it was noted that the person known to the individual had died specifically by railway suicide.

Communications about ideation or intent

Verbalising suicidal intent – any time

More than 30% of individuals were recorded as having verbalised their intent to die by suicide at some point prior to their suicide (30.9%, n=58). Of these, approximately 40% specifically stated they had the intention to die by railway suicide (39.7%, n=23).

Indicators of suicide ideation or intent - proximal to the incident

We recorded any evidence that the person who died had communicated suicide ideation or intent shortly before the fatal incident. We conceptualised communications of ideation or intent to suicide into two categories – (1) immediate communications of intent or (2) delayed communication of intent, although people could be coded as having communicated in both ways (Table 12). An example of an immediate communication of intent would be if an individual phones or texts someone and says, “I am going to suicide today”. In contrast, suicide notes left for people to find after an incident were considered to be delayed communications of intent.

We identified more instances of delayed (n=26) communication of intent when compared to immediate (n=19) communications of intent. Immediate communications of intent were most commonly made via text message and sometimes via social media posts.

Table 29 Victorian railway suicides: communications of suicide ideation or intent proximal to the railway suicide (n=188)

	Number	% of all cases (n=188)	% of cases with known communications (n=47)
Yes – communication of suicide ideation or intent	47	25.0	
Delayed	26	13.8	55.3
Immediate	19	10.1	40.4
Unknown whether communication of suicide ideation or intent	141	75.0	
All	188	100.0	

Suicide notes

One specific way individuals can communicate their intent to suicide is via suicide notes, these are mostly delayed communications of intent but can sometimes be more immediate (for example if sent as a text message). In 26 cases (13.8% of all Victorian railway suicides) there was specific evidence that the individual left a suicide note and the location and format of these notes is shown in (Table 13). Most commonly suicide notes were found at private homes (26.9%) or at the fatal location (23.1%), and most were handwritten or typed notes (84.6%).

Table 30 Victorian railway suicides: suicide notes – location and format of note (n=26)

	Number	% of cases with suicide notes (n=26)
Location (not mutually exclusive)		
At individual's home	7	26.9
On body	*	*
At the fatal location (not on body)	6	23.1
Received as electronic message	*	*
Other	*	*
Unspecified	*	*
Mode (not mutually exclusive)		
Hand written or typed note	22	84.6
Text message	12	46.2

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Incident information

Note: As per the previous section, it should be noted that the numbers and proportions we report in section are likely to be underestimates. We cannot assume that the specific information we were interested in would always have been known about or that the information would be reported in the coronial documents. It is therefore important to remember that these findings should be interpreted with caution because of the high number of incidents for which we did not have information.

Type of location prior

If there was information in the coronial record about where the individual was immediately prior to making their way to the railway (n=111), we coded the type of location they had been at (Table 14). By far the most commonly recorded location prior to the fatal incident was a private home (39.9% of all cases, 67.6% of cases where a prior location was recorded in the coronial record).

Table 31 Victorian railway suicides: type of location immediately prior to the incident (n=188)

	Number	% of all cases (n=188)	% of cases with known location (n=111)
Private home	75	39.9	67.6
Hospital	*	*	*
Mental health facility	7	3.7	6.3
Own workplace	*	*	*
School	*	*	*
Pub/bar/nightclub etc	*	*	*
Hotel/apartment	*	*	*
Shopping centre	*	*	*
Other	13	6.9	11.7
Unspecified	77	41.0	
All	188	100	

** Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.*

Interactions with others immediately prior to setting out to the incident location

We identified 76 instances where we had information about the individual's interactions with people prior to setting out to the incident location. We did not include interactions that happened immediately prior to the railway suicide occurring, such as with rail staff or bystanders as these are covered in the section titled "Other people present at incident location".

For each incident we noted the detail of the interaction that the individual had with others, and we noted whether it appeared that this interaction was (or was likely to have been) perceived as "normal" by family, friends etc. In contrast, we also noted when there was some indication that people interacting with the individuals thought the individual was distressed or behaved in a way that meant people in their life thought there might be a problem.

For almost half of the incidents (n=35, 46.1%), we coded the individual’s interactions/behaviour as “normal”. In the other incidents (n=41, 53.9%), there was some indication that the individual was distressed or behaved in a way that meant people in their life thought there might be a problem. In some of these instances, individuals talked to others directly about suicide.

Communications when on route to, or at, the incident location

There was specific evidence that at least 9 individuals (5.1% of the total sample) contacted someone when they were on the way to the Victorian location where they died by railway suicide or when they were at the location.

Evidence of planning to use the railway as the method of suicide

In at least 10 cases (5.3% of all Victorian railway suicides) there was evidence of planning to use the railway as the method of suicide. Examples of planning included individuals using the internet to search for information about different methods of suicide (including railway suicide) or to look up train times.

Means of travel to the incident location

The means of travel to the incident location was available for 88 individuals (46.8% of cases) and is shown in Table 15. Of those with a known means of travel, 53.2% travelled by foot (n=38), 39.8% travelled by private car (n=35) and 10.2% travelled by train (n=9).

Table 32 Victorian railway suicides: means of travel to the incident location (n=188)

	Number	% of all cases (n=188)	% of cases with known location (n=88)
On foot	38	20.2	43.2
Private car	35	18.6	39.8
Train	9	4.8	10.2
Other Public Transport	*	*	*
Other	*	*	*
Unspecified	100	53.2	
All	188	100	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Type of location of fatal incident

The specific type of location of incidents is shown in Table 16. The open track was the most common location of incidents (58.0%), followed by stations (15.4%), level crossings (13.3%) and pedestrian crossings (10.6%).

Table 33 Victorian railway suicides: specific type of location of fatal incidents (n=188)

	Number	% of all cases (n=188)
open track (i.e., between stations or between station and crossing)	109	58.0
at station	29	15.4
level crossing	25	13.3
pedestrian crossing	20	10.6
level & pedestrian crossing	*	*
overpass	*	*
other specified location	*	*
unspecified	*	*
All	188	100

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

The location of fatal incident is shown separately for males and females in Figure 5 and for individuals of different age groups in Figure 6. There was no significant association between sex and the type of location. There was a significant association between age group and the type of location ($\chi^2 = 30.30$, $df = 15$, $p = 0.004$). The group with the highest proportion of incidents occurring on open track was the youngest group (86.2%) and the group with the highest portion of incidents occurring at stations was the oldest group (30.0%).

Figure 12 Victorian railway suicides: location of fatal incident by sex % (n=188)

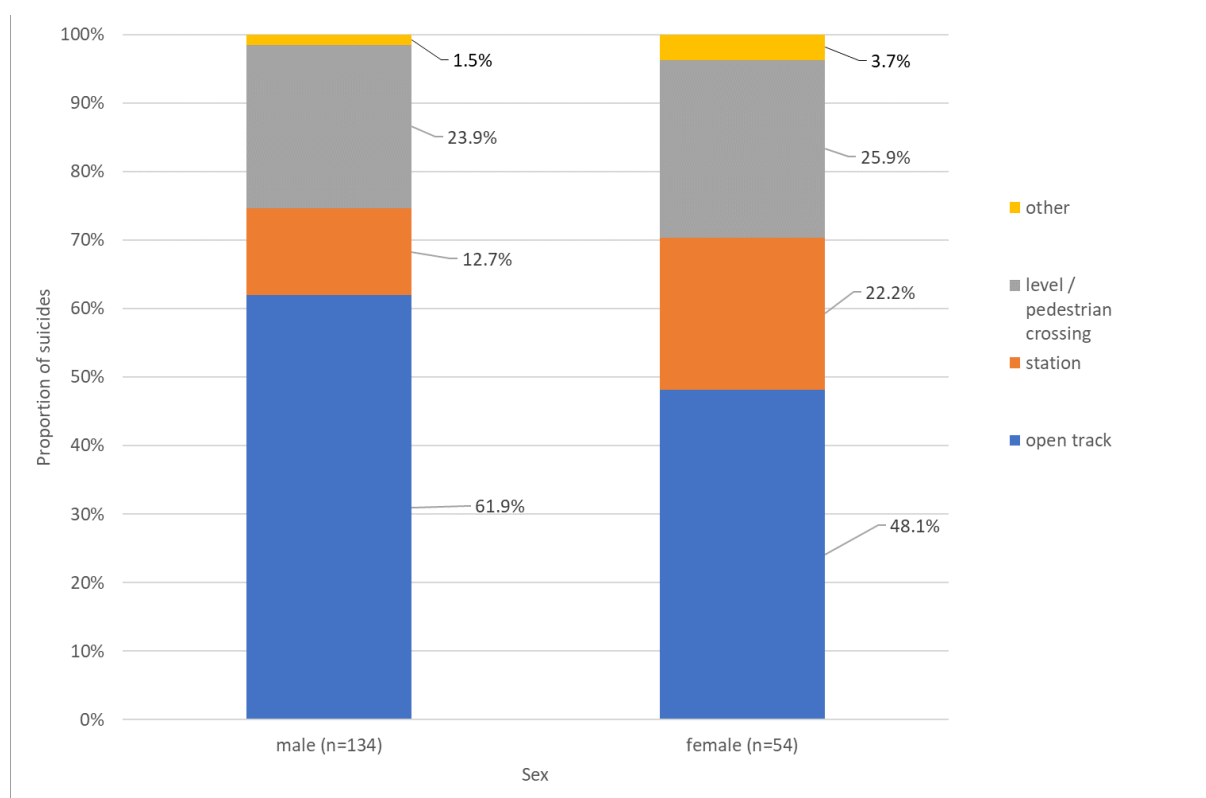
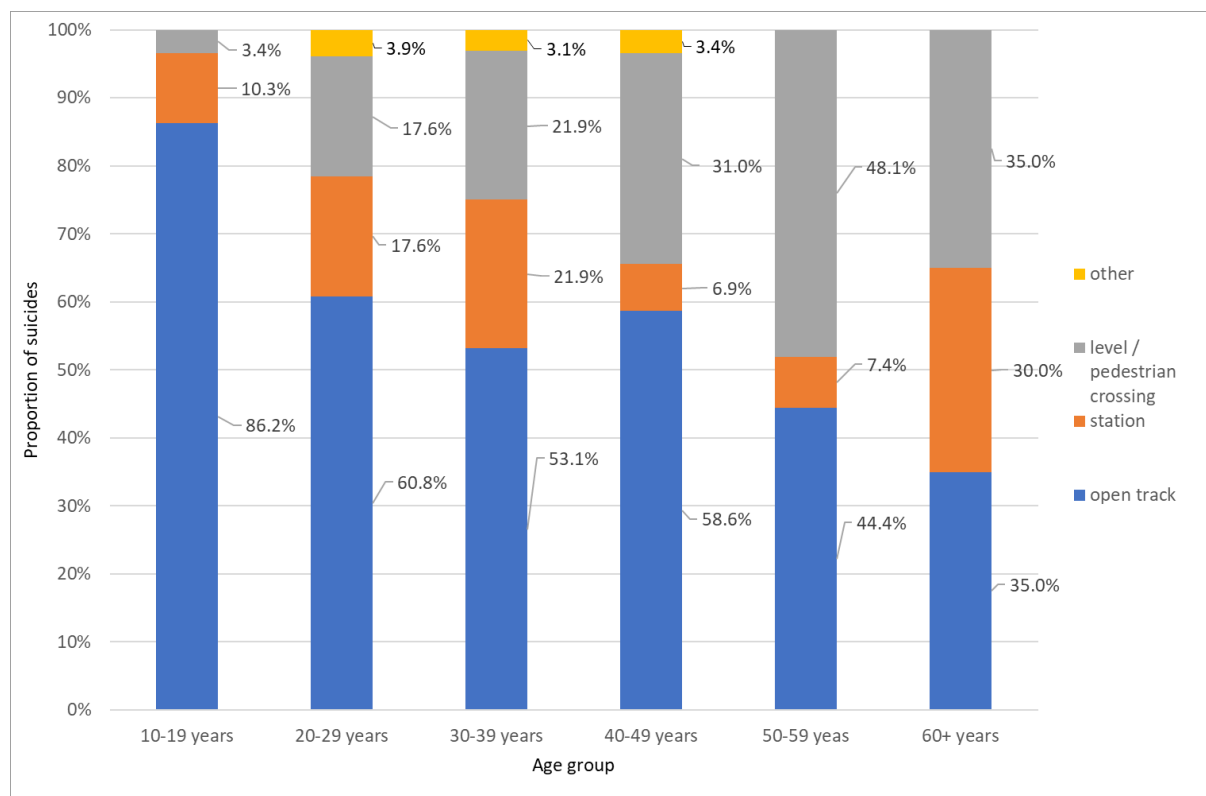


Figure 13 Victorian railway suicides: location of fatal incident by age group % (n=188)



Access to the fatal location

We were able to determine how individuals accessed the fatal location in almost 80% of cases (n=147) (Table 17). In more than one-third of incidents, individuals accessed the location via open track (n=70, 37.2%). In smaller proportions of cases individuals accessed the track by jumping or climbing onto the tracks from a platform (n=26, 13.8%), and via by level or pedestrian crossings (14.4% and 10.1%, respectively).

Table 34 Victorian railway suicides: how the fatal location was accessed (n=188)

	Number	% of all cases (n=188)	% of cases where access to the fatal location could be coded (n=147)
open track	70	37.2	47.6
jumped or climbed onto track from platform	26	13.8	17.7
walked onto track from level crossing	27	14.4	18.4
walked onto track from pedestrian crossing	19	10.1	12.9
through a fence	*	*	*
other	*	*	*
unspecified	41	21.8	27.9
All	188	100	127.9

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Train speed

In 93 cases (49.4% of cases) there was information about the speed of the train recorded in the NCIS documents. The mean speed was 74.8kph, the median was 70kph (range 28-127kph).

Alcohol use at the time of the incident

In 184 cases (98% of all cases) information was available about whether the individual had consumed alcohol at the time of the incident. In 21.8% of all incidents (n=41) there was evidence of alcohol use; however, more commonly there was no evidence of alcohol use (76.1% of cases, n=143). There was no significant association between alcohol use at the time of the incident and either age group or sex.

Time spent at the location

We were able to estimate how long an individual had spent at the location before the fatal incident for 30 cases (16.0% of all cases) using information in the police reports or coroners' findings. The length of time varied from 5 minutes to 355 minutes, averaging 59 minutes (SD = 97). The median time (of 20 minutes) is a better reflection of actual time that most people were at locations, given that there were a few outliers who stayed for very long amounts of time.

Other people present at incident location

In approximately one in five incidents there was specific evidence that suggested someone saw the incident happen (i.e., other people were present) (n=41, 21.8%).

Action directly preceding the incident

We coded the action immediately preceding the fatal incident if this information was available in the coronial record (Table 15). We could determine that the individual was stationary on the track immediately prior to the impact with the train in more than one-third of incidents (n=74, 39.4%). Other common actions were jumping (n=34, 18.1%) or wandering/running (n=37, 19.7%).

Table 35 Victorian railway suicides: actions directly preceding impact with train (n=188)

	Number	% of all cases (n=188)	% of cases where actions could be coded (n=167)
Stationary on track (e.g., lying, sitting, standing)	74	39.4	44.3
Jumping	34	18.1	20.4
Wandering, running	37	19.7	22.2
Other specified	22	11.7	13.2
Unspecified	21	11.2	
All	188	100	

Behaviours at the incident location

We coded any evidence of individuals' behaviours at the incident locations (Table 16). We haven't included here behaviours directly preceding the incident (such as running, jumping, lying on track etc) as these have been presented above, although we have included behaviours such as "hiding" which often directly preceded the actions presented in Table 15. An individual could be coded for multiple behaviours.

Overall, the most commonly recorded behaviours were hiding (13.3% of all cases, 41.0% of cases with at least one behaviour), removing belongings (11.7% of all cases, 36.1% of cases with at least one behaviour), and pacing (2.7% of all cases, 8.2% of cases with at least one behaviour). With regards to hiding, individuals hid in many and varied ways. It was common that individuals hid in, or behind, vegetation near to the track and then ran out into the path of the train. Others hid behind parts of the railway infrastructure to ensure they could not be seen (e.g., "battery box", "station box") and in other instances individuals hid under certain parts of the platform. Removing belongings mostly involved individuals leaving their belongings such as keys, phones and wallets near to the incident location. In other instances, individuals removed their clothing such as jackets or shoes. There were also instances of handbags or shopping bags being found nearby to incident locations. Examples of individuals "pacing" included instances where they walked up and down a particular platform, or they walked in and out of a station (including walking to and from cars parked at stations). There were also examples where people were seen to walk up and down locations near to level or pedestrian crossings.

Table 36 Victorian railway suicides: behaviours at the incident location (n=188)

	Number	% of all cases (n=188)	% of cases with at least one behaviour coded (n=61)
Hiding	25	13.3	41.0
Removing belongings	22	11.7	36.1
Pacing	5	2.7	8.2
Talked with someone in person	*	*	*
Drinking/likely substance affected	*	*	*
Talked with someone on the phone	*	*	*
Platform switching	*	*	*
Loitering	*	*	*
Other	*	*	*
All	188	100.0	

* Cells counts of 1-4 have been suppressed for confidentiality. Some adjacent cells may have also been suppressed to maintain confidentiality.

Information about where and when the person died

In the vast majority of cases (88.8%), we could determine that the individual died at the scene (n=167), in 5.9% there was specific evidence that they did not die at the scene (n=11) and for the remaining 5.3% of cases this information was unknown (n=10).

In more than one quarter of incidents there was evidence that the individual died instantly (n=50, 26.6%), in 7.4% there was specific evidence that they did not die instantly (n=14). However, in the majority of cases whether or not the deceased died instantly was unknown (n=124, 66.0%).