UPLOADS
Understanding and Preventing Led
Outdoor Accidents Data System

The UPLOADS National Incident Dataset

Annual Report: 1st June 2015 to 31st May 2016

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EXECUTIVE SUMMARY

The aim of this report is to present the findings from the UPLOADS National Incident Dataset for the period between the 1st of June 2015 and the 31st May 2016. Nineteen (19) organisations from across Australia contributed incident and participation data using the UPLOADS Software Tool and UPLOADS Lite during this period. The qualitative sections of the incident reports, describing the contributing factors involved in incidents, were coded using the UPLOADS Accident Analysis Method by the research team.

In total, 485 incidents were reported over the 12-month period including: 351 injury-related incidents; 74 illness-related incidents; 34 near miss incidents; 13 incidents involving social or psychological outcomes; and 13 reports of equipment damage. This report presents the findings from analyses of the injury, illness, and near miss incidents.

Injury-related incidents

Incidence rate

The mean injury incidence rate for all activities was 2.1 per 1000 participants. This means that approximately two injury-related incidents were reported for every thousand people who participated in led outdoor activities. This injury-incidence rate has remained consistent since the first annual UPLOADS report (1st of June 2014 and the 31st May 2015). While this incidence rate may underestimate the actual incidence of injuries due to potential underreporting and the small sample of organisations that participated in the trial, the low rate of injury-related reports suggests that the risks associated with led outdoor activities are reasonably well managed in the sample of organisations that contributed data.

Activities

Wheel sport activities had the highest injury incidence rate (8.8 incidents per 1000 participants) followed by trampolining (7.1 incidents per 1000 participants) and walking/running in the outdoors (5.7 incidents per 1000 participants). In comparison with the first annual report, walking/running in the outdoors, campcraft, and snow sports had the highest injury incidence rates (8.2, 5.7, and 5.3 incidents per 1000 participants, respectively). As with the first annual report, over half (55%) of all activities had an injury incidence rate of less than 1 per 1000 participants. This suggests that the risks associated with these particular activities are reasonably well managed in the sample of organisations that contributed data.

People injured

Approximately equal numbers of males and females were injured (male = 46%; female = 41%; missing data = 13%). The majority (86%) of injured people were activity participants (50% male) with a median age of 15 years (range: 7-18; 56% missing data). These demographics are similar to those reported in the first annual report, which also identified activity participants as the most frequently injured actors. However, a larger percentage of males were reported as injured in this dataset (46%) compared to the first report (34%).

There was substantial demographic data missing from the injury data reported during this period; only 44% of injury reports included complete demographic information. As such, caution is urged when interpreting the demographic data.

Contributing factors

Almost all of the reports associated with injuries (96%) had sufficient detail to support further analysis with the UPLOADS Accident Analysis Method. A median of two (2) contributing factor was identified per injury-related incident report (range: 1-7). The most frequently identified contributing factors were 'Infrastructure and Terrain' and 'Activity Participant Experience and Competence' (identified in 35% and 26% of injury incidents, respectively). There was noteworthy absence of detail regarding the relationships between factors in the injury-related incident reports, especially between the categories at the levels of Local Area Government and Higher Level Management, and Supervision and Management Decisions. Contributing factors were identified at the following levels of the UPLOADS Accident Analysis Framework: 'Equipment, Environment and Meteorological Conditions'; 'Decisions and Actions of Leaders', 'Participants and other Actors at the Scene'; 'Supervisory and Management Decisions and Actions'; and 'Local Area Government, Schools, Parents & Carers, Higher Level Management'.

These findings are consistent with the first annual report. There are two key implications of this finding: firstly, it again provides evidence that led outdoor activity injuries represent a systemic issue; and secondly, the UPLOADS accident analysis method allows reporters to identify specific contributing factors within the led outdoor system.

Illness-related incidents

Incidence rate

The mean illness incidence rate across all activities was 0.4 reported incidents per 1000 participants. This means that less than 1 incident associated with an illness was reported for every thousand participants involved in a led outdoor activity. This rate is lower compared to the first annual UPLOADS report (0.6 per 1000 participants).

Activities

Camping in tents had the highest illness-related incidence rate (2.7 incidents per 1000 participants), followed by free time outdoors (1.6 incidents per 1000 participants) and walking/running in the outdoors (1.5 incidents per 1000 participants). In addition, the majority of activities (55%) were not associated with any illness-related incidents. Overall, these findings are consistent with the first annual report.

People reported as ill

The majority (89%) of people reporting illnesses were Activity Participants, 53% of which were female and 39% were male (8% were missing data). The median age of ill activity participants was 15 years old (range: 10 to 16 years), which is slightly younger than the median age of 16 years that was reported in the first annual report.

Contributing factors

Almost all of the reports associated with illnesses (92%) had sufficient detail to support further analysis with the UPLOADS Accident Analysis Method. A median of one (1) contributing factor was identified per illness incident report (range: 1-4). The most frequently identified factors were: 'Activity Participant Mental and Physical Condition' and 'Food and Drink' (identified in 77% and 32% of illness related incidents, respectively). Factors at the following three levels of the UPLOADS Accident Analysis Framework were identified: 'Equipment, Environment and Meteorological Conditions'; 'Decisions and Actions of Leaders, Participants and other Actors at the Scene'; 'Supervisory and Management Decisions and Actions'.

These findings are consistent with the first annual report. This once again illustrates that illnesses during outdoor activities are a systemic issue. In addition, it indicates that the issues that the sector faces are relatively stable across times.

Near miss incidents

Incidence rate

The mean near miss incidence rate for all activities was 0.2 incidents per 1000 participants. This is consistent with the first annual report.

Overall, 65% of near miss incidents were reported to have a potential severity rating of 3 or above, which are incidents with potentially serious to fatal consequences. This suggests that there is underreporting of near miss incidents associated with less severe outcomes, which may provide valuable information about potential hazards. The focus on potentially high severity near misses has

increased since the first report, where only 51% of near miss incidents had a potential severity rating of 3 or above.

Activities

Wheel sports had the highest near miss incidence rate (0.7 incidents per 1000 participants), followed by campcraft (i.e., cooking, campfires; 0.6 incidents per 1000 participants) and river activities (0.4 incidents per 1000 participants). Campcraft was also noted as an activity with a relatively high near miss incidence rate in the first annual report, with a recorded incidence rate of 0.8 near miss incidents per 1000 participants. However, It should be noted that these rates all represent less than 1 reported near miss per 1000 participants.

Contributing factors

Almost all of the near miss reports (97%) had sufficient detail to support further analysis with the UPLOADS Accident Analysis Method. A median of two (2) contributing factors were identified per near miss report (range: 1-7). The most frequently identified factors were 'Activity Participant Communication and Following Instructions' (36%), 'Activity Participant Situation Awareness' (27%), and 'Activity Participant Judgement and Decision-making' (21%). Factors were identified at the following levels of the framework: 'Equipment, Environment and Meteorological Conditions'; 'Decisions and Actions of Leaders', 'Participants and other Actors at the Scene'; and 'Supervisory and Management Decisions and Actions'; and 'Government departments'. These findings indicate that near miss reports provide important information about the factors at the higher levels of the led outdoor activity system that contribute to incidents, that are not necessarily captured in the more frequent reports of injuries or illnesses.

Conclusions

This report presents the findings from the UPLOADS National Incident Dataset in the period between the 1st of June 2015 and the 31st May 2016. There are a number of important conclusions from this analysis for the Australian led outdoor activity sector, pertaining to incidents and incident causation in led outdoor activities, and also to incident reporting within the sector.

First, the analysis shows that there are a range of issues across the led outdoor activity (LOA) system in Australia that are contributing to injury, illness, and near miss incidents. Therefore, incident prevention strategies should focus on addressing the broader network of contributing factors driving adverse events, as opposed to focusing on the issues associated with instructors, participants, equipment and the activity environment in isolation.

Second, compared to other sport and active recreation pursuits, the injury-incidence rate associated with led outdoor activities in Australia appears to be low (2.1 per 1000 participants). While it is acknowledged that this rate may underestimate the actual incidence of injuries due to potential underreporting and the small sample of organisations that participated in the trial, it is consistent with the first annual UPLOADS report. This suggests that the rate is reasonably stable, despite changes in the sample, and therefore reasonably representative of the sector as a whole. Therefore, based on the two years of data from the UPLOADS National Incident Dataset, it is concluded that the rate of injuries during led outdoor activities is considerably lower than in other organised sports.

Third, the low percentage of near miss incident reports is a significant issue that may be limiting the sector's opportunities to prevent future incidents. The near miss reports contained important information about factors at the higher levels of the led outdoor activity sector that are contributing to incidents. Further education around the importance of reporting near miss incidents is therefore recommended.

As a final note, we would like to acknowledge the sector's critical role in producing the UPLOADS National Incident Dataset. This dataset represents a huge contribution of time and effort from the organisations involved, both in terms of data collection and maintaining the quality of the reports. We would like to thank those organisations and our funding partners. We would also like to urge others to contribute data in future. A larger sample size would allow for more firm conclusions to be drawn regarding the management of risk within the sector and the selection of appropriate targets for prevention strategies.

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Introduction

For the past 7-years, the authors have been engaged in a major program of research to tackle issues around incident reporting and injury causation in the led outdoor activity (LOA) sector in Australia. In partnership with a range of stakeholders, the project has resulted in the development an incident reporting system, known as UPLOADS, that allows LOA providers in Australia to contribute incident data to a National Incident Dataset. The project has involved the following stages:

1) Development of an accident analysis method for analysing led outdoor activity incidents;

2) Development, trialling and evaluation of a prototype incident reporting tool;

3) Development of two incident reporting tools to meet the diverse needs of the sector (UPLOADS and UPLOADS Lite); and

4) Implementation of UPLOADS and UPLOADS Lite in a National Trial, start the 1st June 2014.

The accident analysis method was developed to ensure that contributing factors, and the relationships between them, can be reliably identified from the qualitative data collected. The method is underpinned by a systems-theory model of accident causation (Rasmussen, 1997), and consists of taxonomy for coding the qualitative descriptions of incidents and a framework for representing the system of factors identified (see Figure 1). This approach ensures that all epidemiological data reporting the rate and type of incidents is accompanied by detailed analyses of the contributing factors involved.

It is important to note that although the reports are analysed by the research team, all the contributing factors and relationships that are identified must be explicitly stated the incident reports. During the analysis, the UPLOADS team do not draw any further conclusions regarding the factors that may have contributed to the incidents. The analysis process simply involves assigning codes (see Figure 1) to contributing factors and relationships that are reported, so that they can be summarised across all reports. Therefore, the analyses of contributing factors presented in this report represent the issues that are considered important by those who report incidents.

Results from the first 12-month analysis of the data (1st June 2014 – 31st May 2015) illustrated the utility of UPLOADS and highlighted the benefits of collecting and analysing sector-wide incident data ([view report](#)). Specifically, the report highlighted that, as in most complex sociotechnical systems, adverse events and near miss incidents in led outdoor activities have multiple contributing factors from across the overall system. In addition, the report also presented incidence rates for activities in the sector; prior to this report these statistics were not available. The first report concluded that the injury-related incidence rate (2.1 per 1000 participants) associated with led outdoor activities in Australia appears to be low compared to other organised sports.

The aim of this report is to present a detailed overview of the data collected during the second 12 months of data collection for the National Incident Dataset (1st June 2015 – 31st May 2016). This will contribute to a further understanding of the incidents that occur during led outdoor activities in Australia, in order to support the development of appropriate, targeted, prevention strategies.

Method

Design

Self-nominated personnel from participating organisations used the UPLOADS Software tool and UPLOADS Lite to collect data for 12-months (1st June 2015 to 31st May 2016). The University of the Sunshine Coast Human Ethics Committee approved the study.

Recruitment

Organisations who provide led outdoor activities within Australia were invited to participate via peak body and professional association newsletters. Interested organisations were asked to invite a senior staff member in a safety-related role to administer the software tool. This person (the 'system administrator') was responsible for undertaking training in the system (described below), collecting and entering all data, and providing training to other staff within their organisations on reporting incidents. Forty-two (42) organisations signed up to participate for the 1st June 2015 –31st May 2016 period, of which 19 (45.2%) contributed data.

Data collection

The mandatory information captured by the UPLOADS Software tool and UPLOADS Lite is the same.

The UPLOADS Software Tool allows organisations to: 1) systematically track their incident and participation data; 2) analyse their own incidents using a systems analysis framework; 3) generate automatic reports on the data they collect; and 4) contribute de-identified data (i.e., names removed) to the National Incident Dataset. The software tool is installed on a computer within the organisation and the data is not directly accessible by the research team.

UPLOADS Lite was designed for organisations who only want to contribute data to the National Incident Dataset. An online survey tool allows organisations to contribute anonymous incident reports. Organisations are also able to save the data they enter for their own records. Participation data is submitted at 3-monthly intervals using a spreadsheet.

Incident data

Organisations were instructed to record both near misses and incidents associated with adverse outcomes. The UPLOADS definitions of incident, adverse outcomes, and near miss are presented in **Error! Reference source not found.**.

Table 1: Definitions provided for incident, adverse outcome, and near miss

Term	Definition within UPLOADS
Incident	Any event that results in an adverse outcome or a near miss.
Adverse outcome	Any event resulting in a negative impact, including: missing/overdue people; equipment or environmental damage; injury; illness; fatality; or social or psychological impacts.
Near miss	Any serious mishap that has the potential to cause an adverse event but fails to do so because of chance or because it is intercepted. For example, during a rock climbing activity an instructor notices that a participant's carabineer was not locked. If the student had fallen, this may have led to a serious injury.

Incidents are rated in terms of their actual severity (i.e., the actual outcome of the event) and potential severity (i.e., the worst possible outcome, given the scenario), using the incident severity scale as shown in Table 2. To ensure that the data contained in the National Incident Dataset is not biased towards more serious events, organisations were instructed to report any:

- Adverse Outcome with an Actual Severity of 1 or greater; and
- Near Miss with a Potential Severity of 2 or greater.

Table 2: Incident Severity Scale

	Severity Rating	Definition for Actual Severity Ratings	Definition for Potential Severity Ratings
0	No impact	Requires no treatment.	An incident where the potential outcome has a negligible consequence.
1	Minor	Requires localised care (non-evacuation) with short term effects.	An incident where the potential outcome has a low consequence.
2	Moderate	Requires ongoing care (localised or external; i.e., evacuation or not) with short to medium term effects.	An incident where the potential outcome can involve moderate injuries or illnesses.
3	Serious	Requires timely external care (evacuation) with medium to long term effects.	An incident where the potential outcome can involve major irreversible damage or threaten life.
4	Severe	Requires urgent emergency assistance with long term effects.	An incident where the potential outcome is certain death.
5	Critical	Requires urgent emergency assistance with serious ongoing long term effects.	NA
6	Unsurvivable	Fatality.	NA

The incident report captures the information described in Table 3.

Table 3: Information captured concerning incidents by the UPLOADS Software Tool and UPLOADS Lite

1. Incident characteristics
Was the reporter present at the incident?
Date/Time
State/Territory
Type of incident (adverse outcome/near miss)
Actual severity rating
Potential severity rating
Activity associated with the incident
Number of people involved in activity (participants, activity leaders, supervisors, volunteers)
Did the activity leader have relevant qualifications?
2. Adverse outcomes (if applicable)
2.1. Outcomes involving injuries, illnesses or social/psychological damage
Person affected
Experience in activity associated with the incident
Was the incident fatal?
Injury type
Injury location
Illness
Social/psychological impacts
Treatment at the scene of the incident
Evacuation method
Were emergency services called?
2.2 Outcomes involving missing or overdue people
Were clients or staff missing or overdue?
Were Emergency Services contacted/engaged in search?

Table 3 *cont.*: Information captured concerning incidents by UPLOADS

2.3 Outcomes involving equipment loss/damage
Was equipment lost/damaged?
2.4 Outcomes involving environmental damage
Was there environmental damage?
3. Description
Describe the incident in detail, include: who was involved, what happened, when it happened, where it happened and any equipment involved.
Describe any relevant events leading up to incident.
4. Contributing factors and relationships
Reporter: explain in detail what you think caused the incident, including any relationships between causes, include suggestions, comments and recommendations.
Manager: explain in detail what you think caused the incident, including any relationships between causes, include suggestions, comments and recommendations.

Participation data

The total number of participants for each activity conducted during a calendar month was recorded by the participating organisation. In this report, the total number of participants was summed for each activity to provide a denominator for incidence rate calculations (i.e., rate per 1000 participants).

Data analysis

The de-identified data from all organisations was merged into a central database. The actual severity scores for all adverse outcomes were verified against the incident description, and re-coded as required. Descriptive analyses were performed using SPSS (version 21) to calculate frequencies for all quantitative variables.

The first and second authors used the UPLOADS Accident Analysis Method (see Figure 1) to code the qualitative data provided in each report. This involved coding the contributing factors and the relationships that were identified by each organisation's reporters, and using the taxonomy in Figure 1 to classify them. To ensure the accuracy of the coding, a second researcher reviewed all coded responses against the accident analysis taxonomy and identified discrepancies in the coding. Discrepancies were then discussed with reference to the taxonomy until consensus was reached. Frequencies of the number of incidents associated with each contributing factor and relationship were then calculated. The contributing factors and relationships were then represented on the framework for injuries, illnesses, and near miss incident reports.

The participation data included details on 76 different activities. Activities were grouped into 20 categories. For example, the category "walking/running outdoors" included bushwalking, orienteering and adventure races. The category "river activities" included canoeing, rafting and kayaking (see Appendix A for a full list of activities). Activities were clustered using higher order classifications (see Appendix A), which were informed by industry professionals. Incidence rates and severity ratings were calculated for each incident type by activity. Incidence rates were calculated per 1000 participants ((number of incidents/number of participants) x 1000)) for each activity. The rate was then averaged across all activities to provide an estimate of the overall incidence rate. Locations of physical injuries were mapped using data from the incident reports in Visio to inform the anatomical diagram presented in this report.

Government departments	**State and Federal Government** • Communication • Funding and budgets • Infrastructure and land management • Policies and legislation • Other		
Regulatory bodies and associations	**Regulatory bodies and Associations** • Accreditation/licensing • Auditing • Communication • Curriculum of outdoor education/recreation qualifications • Funding and budgets • Interactions with government • Standards and code of practice • Other		

Figure 1: UPLOADS Accident Analysis Method, which was used to code the qualitative data provided in each incident report.

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How to read the results section

The results are split into three main sections: injury-related incidents, illness-related incidents, and near miss incidents. Each section starts with an overview of the data collected and a summary of the characteristics of the incidents. This is followed by an analysis of the contributing factors involved in the incidents, which includes AcciMap diagrams and summary tables with specific examples.

Reading the AcciMaps and summary tables

The AcciMaps represent the network of contributing factors, and relationships between them, that were identified in the incident reports. Each box in the AcciMap denotes the contributing factors identified in the incident reports as well as the number of times each factor was identified. Factors identified in more than 10% of incidents reports are shaded in light grey and those identified in more than 25% of reports are shaded in dark grey.

The relationships between the contributing factors, which were identified by the reporting practitioner, are illustrated by the lines linking the factor boxes. The lines also present the number of times a relationship was identified, and are bolded when a relationship was identified in more than one incident. The relationships describe how contributing factors are influenced by other contributing factors. For example, a relationship between 'Higher Level Management: Financial Constraints' and 'Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment' may indicate an incident in which old and inadequate equipment was not replaced due to financial constraints.

In order to further interpret the AcciMaps, the summary tables provide specific examples of contributing factors and relationships from the incidents reported. The tables detail the contributing factors and relationships from top to bottom of the accident analysis framework (i.e., from the higher levels of the AcciMap to the lower levels). The number of reports that identified this issue is indicated by 'n' in each table. Reading the AcciMaps and the tables together will provide an overview of all the factors that are contributing to incidents during led outdoor activities, as well as the specific issues underpinning them.

Results

Sample of organisations contributing data

Nineteen (19) organisations from across Australia contributed data. These organisations were operating in the following states: NSW (n = 2); QLD (n = 3); VIC (n = 8); SA (n = 4); and WA (n = 2). Eight (8) organisations identified as camps, five (5) identified as commercial enterprises, four (4) identified as schools, and two (2) were registered training organisations (e.g., TAFE, University).

Overview of data collected

In total, 485 incidents were reported over the 12-month period from 1st June 2015 to 31st May 2016. Of these reports, 351 reported injuries, 74 reported illnesses, and 13 reported social or psychological outcomes. In addition, there were 34 reports of near miss incidents and 13 incidents of equipment damage.

The number of reports associated with each outcome is presented in Figure 2. In accordance to our research ethics responsibilities, incidents that were associated with social or psychological outcomes (n = 13) and equipment damage (n = 13) were excluded from further analysis due to the low number of reports.
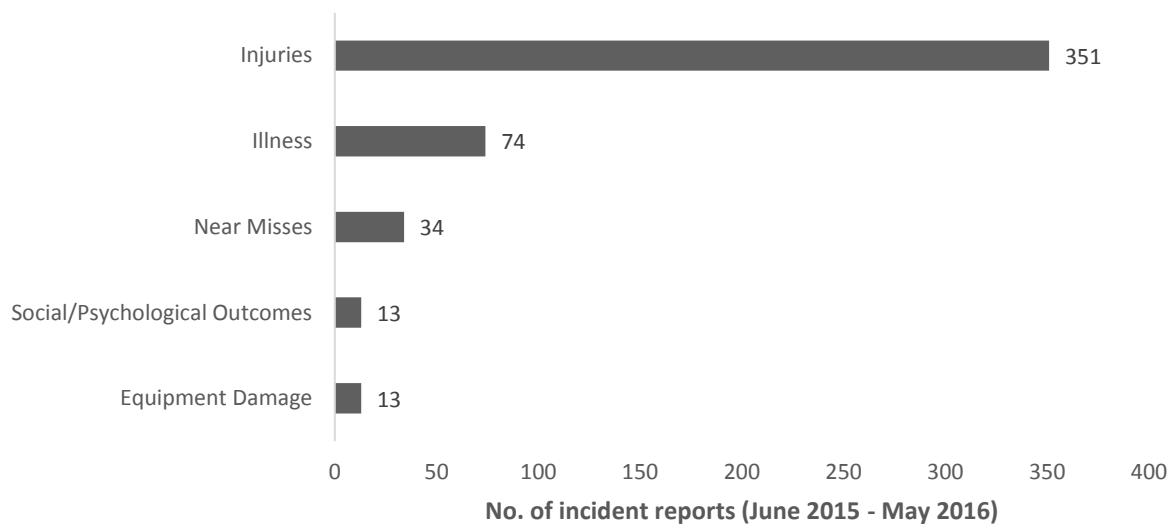
Figure 2: Total number of reports associated with each outcome.

Injury-related incidents

Injury incidence rate

In total, 351 injury-related incidents were reported. Across all activities, the average reported injury incidence rate was 2.1 per 1000 participants. This means that approximately two injury-related incidents were reported for every thousand participants involved in a led outdoor activity.

Activities associated with injury-related incidents

Error! Reference source not found. presents a summary of the injury-related incidence rate by activity type (see Appendix A for a full list of activities). Injury-related incidents not related to an activity or program are not represented on this figure (n = 21). Wheel sports had the highest injury-related incidence rate (8.8 incidents per 1000 participants), followed by trampolining (7.1 incidents per 1000 participants), and walking/running in the outdoors (5.7 incidents per 1000 participants). Notably, over half (55%) of all activities had an injury-related incidence rate of less than 1 per 1000 participants (see Figure 3).

These incidence rates identify the types of activities which may require further risk management. Namely activities such as wheel sports (8.8 incidents per 1000 participants), walking/running outdoors (5.7 incidents per 1000 participants), camping tents (4.8 incidents per 1000 participants), and free time outdoors (4.0 incidents per 1000 participants). Although trampolining had one of the highest injury incidence rates, it was only associated with 3 incidents and a relatively low number of participants, therefore the rate is not likely representative of the true injury rate for this activity across the sector.
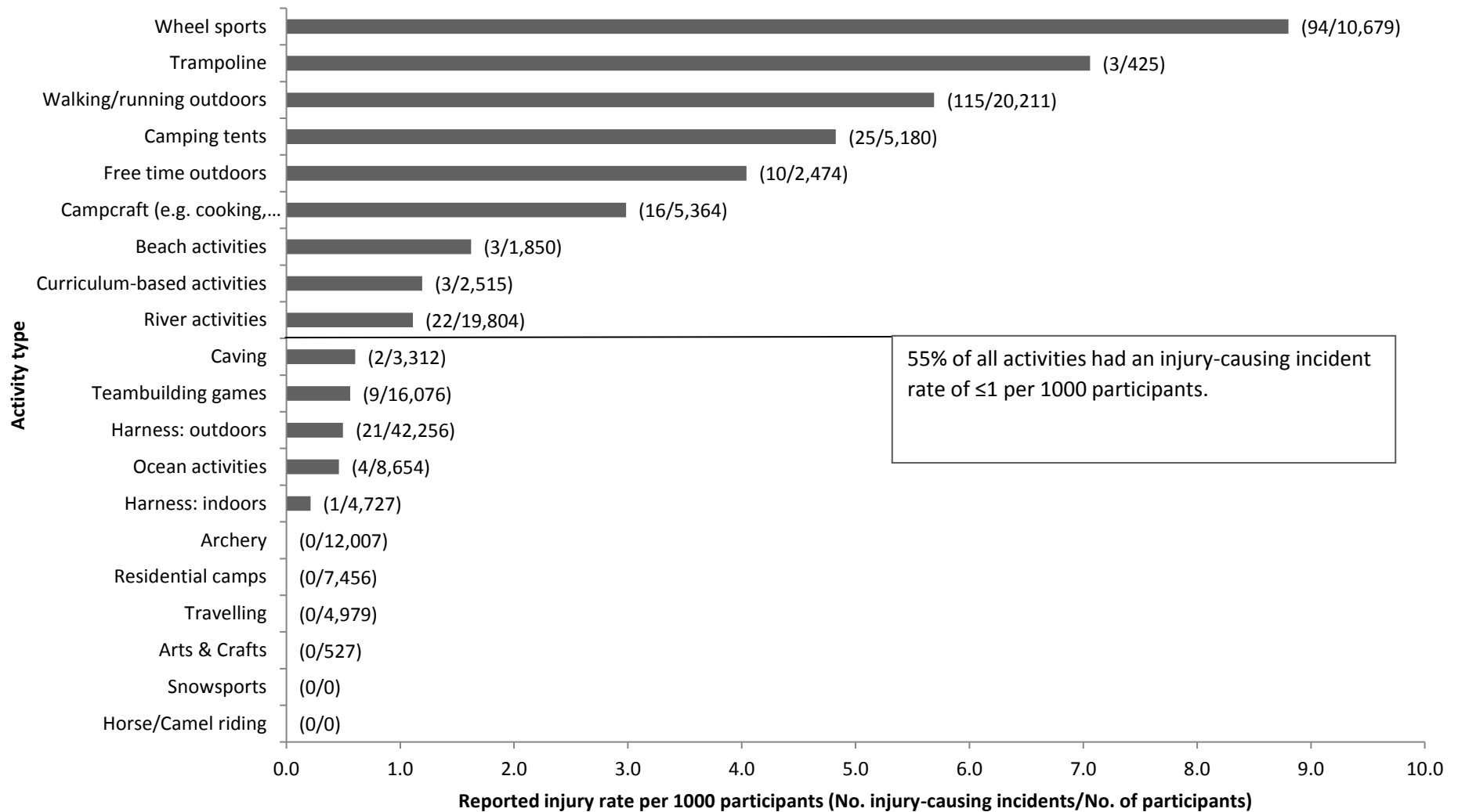
Figure 3: Injury incidence rate per 1000 participants by activity type (June 2015 – May 2016). Numbers in brackets represent the number of reported injury-related incidents and the number of reported participants associated with the activity, respectively. For example, wheel sports had 94 reported injury-related incidents and 10,679 participants throughout the reporting period.

Actual severity ratings for injury-related incidents

Figure 4 presents a histogram of the actual severity scores for injury-related incidents. The median severity was 1 (range: 1 to 4) indicating that the majority of injuries required only localised care and had short term effects.
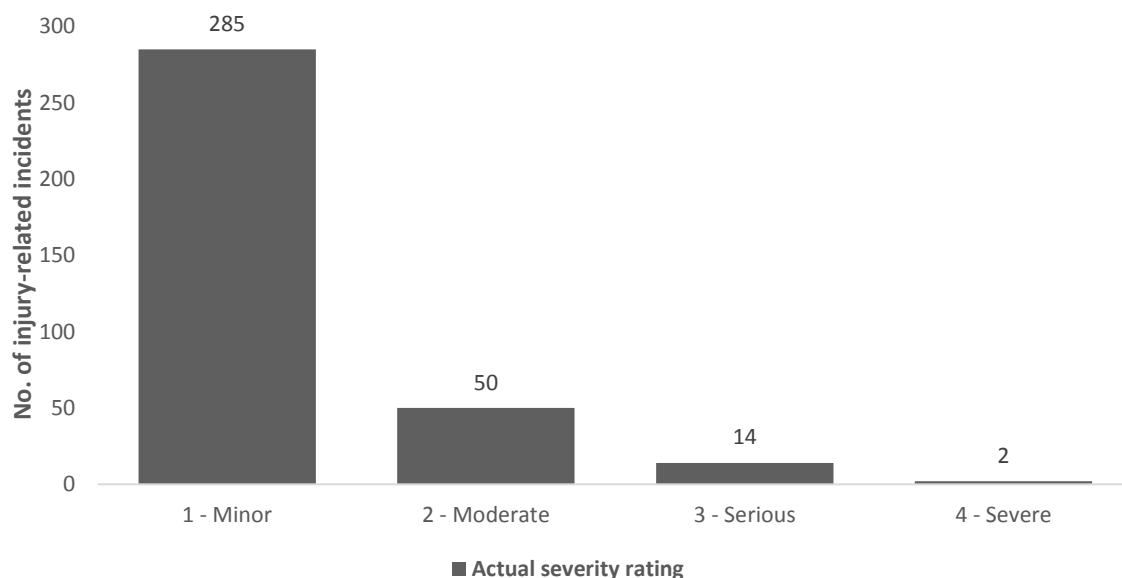
Figure 4: Actual severity ratings for injury-related incidents (total number of injuries = 351).

Of the injury-related incidents, 19% required evacuation (n = 67, median severity = 2, range: 2-4), 26.9% walked out (n = 18, median severity = 2, range: 2-4), 43.9% were evacuated by vehicle (n = 29, median severity = 2, range: 2-3), and 1 injured person was evacuated by stretcher (severity rating = 4). Only 4.6% of injury-related incidents required hospitalisation (n = 16) and 1.4% required emergency services (n = 5).

Injury type and location

Figure 5 shows the type and frequency of injuries sustained according to body location. Highlighted in red are the body locations associated with the most injury causing incidents. In addition to those shown on the diagram, 31 injury-related incidents involved injuries to multiple body regions, and 24 injury-related incidents involved injuries to unspecified body regions. **Error! Reference source not found.** presents the actual severity ratings and frequency of injuries sustained according to body location.

Head 8.0% (n = 28)
- Superficial injury (e.g., abrasion, blister, insect bite) (12)
- Other and unspecified effects of external causes (7)
- Crushing injury (3)
- Open wound (3)
- Effects of foreign body entering through natural orifice (2)
- Injury to muscle, fascia and tendon (1)

Neck <1% (n = 3)
- Other and unspecified effects of external causes (2)
- Superficial injury (e.g., abrasion, blister, insect bite) (1)

Shoulder and upper arm 3.7% (n = 13)
- Dislocation, sprain and strain (6)
- Injury to muscle, fascia and tendon (3)
- Superficial injury (e.g., abrasion, blister, insect bite) (3)
- Other and unspecified effects of external causes (1)

Abdomen, lower back, lumbar spine and pelvis 3.1% (n = 11)
- Superficial injury (e.g., abrasion, blister, insect bite) (3)
- Injury to muscle, fascia and tendon (3)
- Other and unspecified effects of external causes (2)
- Crushing injury (1)
- Dislocation, sprain and strain (1)
- Injury to nerves or spinal cord (1)

Wrist and hand 13.9% (n = 49)
- Superficial injury (e.g., abrasion, blister, insect bite) (22)
- Dislocation, sprain and strain (7)
- Open wound (5)
- Burns and corrosions (5)
- Crushing injury (3)
- Other and unspecified effects of external causes (3)
- Fracture (2)
- Effects of foreign body entering through natural orifice (1)
- Injury to muscle, fascia and tendon (1)

Elbow and forearm 5.1% (n = 18)
- Superficial injury (e.g., abrasion, blister, insect bite) (8)
- Fracture (3)
- Injury to muscle, fascia and tendon (2)
- Dislocation, sprain and strain (2)
- Other and unspecified effects of external causes (2)
- Burns and corrosions (1)

Chest/Thorax <1% (n = 2)
- Superficial injury (e.g., abrasion, blister, insect bite) (1)
- Other and unspecified effects of external causes (1)

Hip and thigh 2.9% (n = 10)
- Superficial injury (e.g., abrasion, blister, insect bite) (6)
- Dislocation, sprain and strain (2)
- Injury to muscle, fascia and tendon (1)
- Other and unspecified effects of external causes (1)

Knee and lower leg 23.4% (n = 82)
- Superficial injury (e.g., abrasion, blister, insect bite) (36)
- Dislocation, sprain and strain (18)
- Open wound (14)
- Other and unspecified effects of external causes (7)
- Injury to muscle, fascia and tendon (5)
- Burns and corrosions (1)
- Crushing injury (1)

Ankle and foot 22.8% (n = 80)
- Dislocation, sprain and strain (45)
- Superficial injury (e.g., abrasion, blister, insect bite) (21)
- Other and unspecified effects of external causes (8)
- Open wound (3)
- Crushing injury (1)
- Fracture (1)
- Injury to muscle, fascia and tendon (1)

Figure 5: Type and frequency of injuries sustained according to body location. The most frequently injured locations are highlighted by a red circle.

Table 4. Actual Severity Rating and frequency of injuries sustained according to injury location

Injury location	1 Minor, no evacuation (n = 285)	2 Moderate, external care or evacuation (n = 50)	3+ Serious+, timely evacuation/ emergency services (n = 16)
Knee/Lower leg (n = 82)	24% (n = 69)	22% (n = 11)	13% (n = 2)
Ankle/Foot (n = 80)	22% (n = 63)	26% (n = 13)	25% (n = 4)
Wrist/Hand (n = 49)	15% (n = 42)	4% (n = 2)	31% (n = 5)
Multiple body regions (n = 31)	9% (n = 26)	8% (n = 4)	6% (n = 1)
Head/Face (n = 28)	7% (n = 21)	10% (n = 5)	13% (n = 2)
Elbow/Forearm (n = 18)	5% (n = 14)	6% (n = 3)	6% (n = 1)
Shoulder/Upper arm (n = 13)	3% (n = 9)	6% (n = 3)	6% (n = 1)
Abdomen/Lower back/Lumbar spine/Pelvis (n = 11)	3% (n = 9)	4% (n = 2)	0% (n = 0)
Hip/Thigh (n = 10)	3% (n = 9)	2% (n = 1)	0% (n = 0)
Neck (n = 3)	1% (n = 3)	0% (n = 0)	0% (n = 0)
Chest/Thorax (n = 2)	1% (n = 2)	0% (n = 0)	0% (n = 0)
Unspecified (n = 24)	6% (n = 17)	12% (n = 6)	6% (n = 1)
Overall	100% (n = 285)	100% (n = 50)	100% (n = 16)

NB. Boxes shaded in grey indicate most commonly injured body location in each severity rating category

Demographic information for injured people

Figure 6 shows the number of people injured by role and gender. Overall there were slightly more injured males (46.4%; n = 163) than females (40.5%; n = 142); 13.1% (n = 46) of reports were missing this data.

Activity participants

The majority of the people injured were Activity Participants (86%, n = 302; 6.3% missing data), with a median age of 15 years (range: 7 to 18 years). There were approximately equal numbers of injured male and female activity participants (male = 50.0%; n = 151; female = 40.4%, n = 122; and missing data = 9.6%, n = 29).

Other injured people

Of the injured Activity Leaders (4.8%, n = 17), Teachers (1.1%, n = 4), and Others (e.g., administration and interns; 1.7%, n = 6), there were more females than males (n = 17 and 8,

respectively). The median age for injured Activity Leaders was 23 years old (range: 16 to 48); the median age for injured Teachers and people with 'Other' roles was 35 years old (range: 19 to 54).
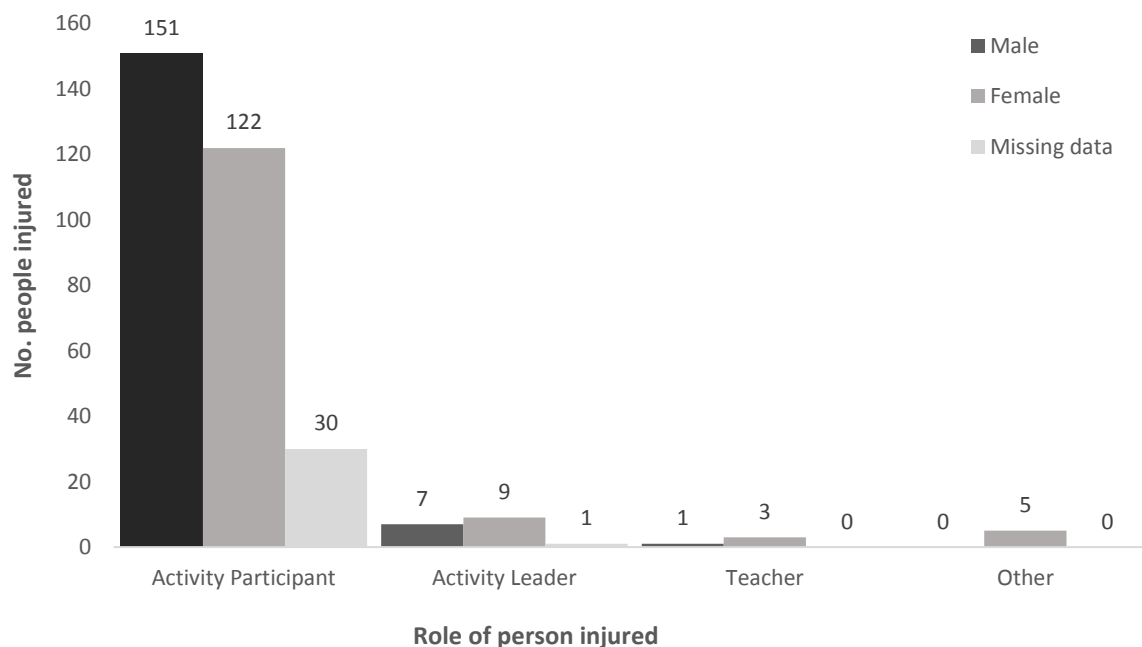
Figure 6: Number of people injured by role and gender.

Profile of activity group for injury-related incidents

The median number of participants involved in activities associated with injury-related incidents was 13 (range: 1 to 142). Activity Leaders were present in 327 of the reported incidents, and the median number of Activity Leaders was 1 (range: 1 to 14). There was a ratio of 1 Activity Leader for every 13 participants in activities associated with injury-related incidents. The median number of Supervisors (e.g., teachers) was 1 (range: 1 to 12; present in 203 incidents) and Volunteers (e.g., parents) was 2 (range: 1 to 4; present in 6 incidents).

In 90% of incidents (n = 315), the Activity Leader was reported to have relevant qualifications. In 9% of incidents (n = 32) qualifications were reported to be "not applicable" and 1% were missing classification (n = 4). Figure 7 shows the number of injury-related incidents by actual severity ratings (ranging from 1 to 3), partitioned according to leader qualifications. The incidents where leader qualifications were reported to be "not applicable" are a potential cause for concern, as these accounted for 43.8% (n = 16) of incidents rated as a severity rating of more than 3 (i.e., serious to critical). The injury-related incidents where leader qualifications were reported to be "not applicable" involved: campcraft (e.g., cooking, campfires; n = 7), free time outdoors (n = 5), and walking/running outdoors (n = 5).
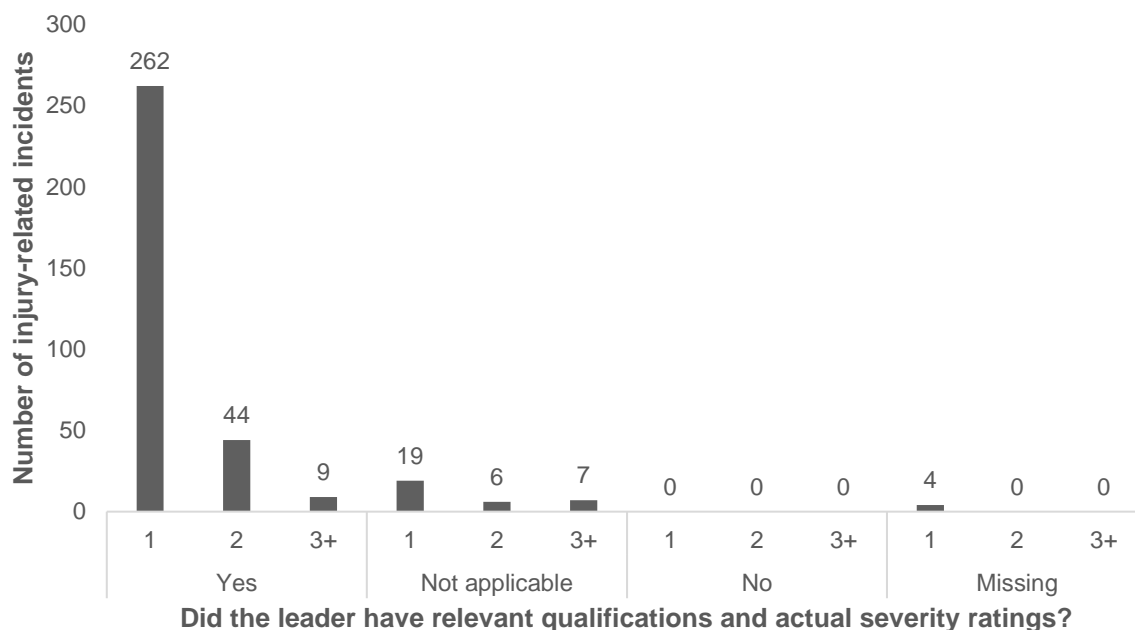
Figure 7: The number of injury-related incidents by actual severity rating, partitioned according to responses to the question "Did the leader have relevant qualifications?"

Contributing factors for injury-related incidents

In total, 337 (96.0%) injury-related incident reports had sufficient detail to be analysed using the UPLOADS Accident Analysis Method (see Figure 1). A median of two (2) contributing factors were identified per injury-related incident report (range: 1-7). Factors were identified at the lower four levels of the UPLOADS Accident Analysis Framework: 'Equipment, Environment and Meteorological Conditions'; 'Decisions and Actions of Leaders, Participants and other Actors at the Scene'; 'Supervisory and Management Decisions and Actions'; and 'Local Area Government, Schools, Parents & Carers, Higher Level Management'. No factors were identified at the government or regulatory body levels of the framework. A summary of the factors and relationships identified is presented in **Error! Reference source not found.**.

Government Department Decisions and Actions

Regulatory Bodies and Associations

Local Area Government, Schools, Parents & Carers, and Higher Level Management

Supervisory and Management Decisions and Actions

Decisions and Actions of Leaders, Participants and other Actors at the Scene of the Incident

Equipment, Environment and Meteorological Conditions

■ Factors identified in ≥10% of reports
■ Factors identified in ≥25% of reports

Parents & Carers: Judgement and Decision-making (1) 0.3%

Parents & Carers: Communication (4) 1.2%

Supervisor/Field Manager: Activity or Program Design (10) 3.0%

Supervisor/Field Manager: Planning and Preparation for Activity or Trip (1) 0.3%

Activity Group Factors: Group Dynamics (5) 1.5%

Other People in Activity Group: Judgement and Decision-making (1) 0.3%

Activity Group Factors: Team Work (1) 0.3%

Activity Group Factors: Communication within Group (3) 0.9%

Other People in Activity Group: Mental And Physical Condition (2) 0.6%

Other People in Activity Group: Situation Awareness (3) 0.9%

Other People in Activity Group: Experience, Qualifications and Competence (2) 0.6%

Other People in Activity Group: Supervision of Activity (4) 1.2%

Activity Leader: Mental and Physical Condition (2) 0.6%

Activity Leader: Supervision and Leadership of Activity (6) 1.8%

Activity Leader: Planning and Preparation for Activity or Trip (1) 0.3%

Activity Leader: Communication, Instruction and Demonstration (3) 0.9%

Activity Leader: Experience, Qualifications and Competence (2) 0.6%

Activity Leader: Judgement and Decision-making (10) 3.0%

Activity Leader: Situation Awareness (3) 0.9%

Activity Leader: Other (1) 0.3%

Activity Leader: Compliance with Procedures, Violations and Unsafe Acts (4) 1.2%

Activity Participant: Judgement and Decision-making (40) 11.9%

Activity Participant: Experience and Competence (87) 25.9%

Activity Participant: Compliance with Procedures, Violations and Unsafe Acts (11) 3.3%

Activity Participant: Communication and Following Instructions (34) 10.1%

Activity Participant: Situation Awareness (54) 16.0%

Activity Participant: Mental and Physical Condition (74) 22.0%

Activity Participant: Planning and Preparation for Activity or Trip (2) 0.6%

Activity Participant: Other (31) 9.2%

Activity Environment: Other (1) 0.3%

Activity Environment: Infrastructure and Terrain (118) 35.0%

Activity Equipment & Resources: Food and Drink (1) 0.3%

Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment (77) 22.8%

Activity Environment: Water Conditions (9) 2.7%

Activity Environment: Weather Conditions (10) 3.0%

Activity Environment: Animal and Insect Hazards (32) 9.5%

Activity Equipment & Resources: Documentation (5) 1.5%

Activity Environment: Trees and Vegetation (10) 3.0%

(1) 0.3% (4) 1.2% (1) 0.3% (1) 0.3% (1) 0.3% (7) 2.1% (5) 1.5% (4) 1.2% (2) 0.6% (12) 3.6% (11) 3.3% (6) 1.8% (3) 0.9% (2) 0.6% (1) 0.3% (5) 1.5% (9) 0.9%

Figure 8: Factors and relationships identified as contributors to injury-related incidents (n = 337). Factors identified in more than 10% of incidents reports are shaded in light grey and those mentioned in more than 25% of reports are shaded in dark grey. Relationships between the factors are illustrated by the connecting lines; these are bolded for relationships that were mentioned more than once.

Government Department Decisions and Actions

No reports identified contributing factors at this level of the framework.

Regulatory Bodies Department Decisions and Actions

No reports identified contributing factors at this level of the framework.

Local Area Government, Schools, Parents & Carers, and Higher Level Management

Five (5) reports identified factors that contributed to injury-related incidents at this level of the framework. **Error! Reference source not found.** shows some examples of factors within the 'Parents & Carers' category. No contributing factors were reported involving 'Local Area Government' or 'Higher Level Management' factors.

Table 5: Examples of contributing factors identified at the "Local Area Government, Schools, Parents & Carers, and Higher Level Management" level

Category	n
Parents & Carers: Communication	
Information not listed on medical or dietary form	4
Parents & Carers: Judgement and Decision-making	
Carers' decision to let their child participate with a pre-existing injury	1

Two (2) relationships were identified between factors related to 'Parents & Carers' and lower level factors. Some examples of these relationships are shown in **Error! Reference source not found.**.

Table 6: Examples of the relationships between 'Parents & Carers' and other factors

Factor 1	Factor 2	Examples	n
Parents & Carers: Communication	***Activity Equipment & Resources:*** Documentation	*Student's pre-existing injury not mentioned on the medical form*	4
Parents & Carers: Judgement & Decision-making	***Activity participant:*** Mental and Physical Condition	*Carers should not have let their child participate due to pre-existing injury*	1

Supervisory and Management Decisions and Actions

Eleven (11) reports identified factors that contributed to injury-related incidents at this level of the framework. **Error! Reference source not found.** shows some examples of the factors identified at this level.

Table 7: Examples of contributing factors identified at the 'Supervisory and Management Decisions and Actions' level

Category and contributing factors	n
Supervisors/Field Manager: Activity or Program Design	
Participant and activity mismatch (e.g., age, pre-existing condition, ability)	7
Inherent risk of activity	7
Timing of activity (e.g., time of day, first session, low light conditions)	4
Time constraints	2
Supervisors/Field Manager: Planning and Preparation for Activity	
No personal protective equipment (PPE) available at the venue	1

Two (2) relationships were identified between 'Supervisory and Management Decisions' and lower level factors, as shown in **Error! Reference source not found.**.

Table 8: Examples of the relationships between 'Supervisory and Management Decisions' and other factors

Factor 1	Factor 2	Examples	n
Supervisor/Field Manager: Planning and Preparation	***Activity Leader:*** Compliance with procedures, Violations and Unsafe Acts	*Activity leader did not wear the prescribed PPE as it was not available at the venue*	1
Supervisor/Field Manager: Activity or Program Design	***Activity Participant:*** Mental and Physical Condition	*The activity design did not allow the required resting time for the participant to successfully manage their pre-existing injury*	1

Decisions and Actions of Leaders, Participants, and other Actors at the Scene of the Incident

Two hundred and forty-two (242) reports identified factors at this level of the framework.

The role of Activity Leaders

Table 9 shows some examples of the contributing factors identified within the 'Activity Leader' category.

Table 9: Examples of contributing factors identified within the 'Activity Leader' categories

Category and contributing factors	n
Activity Leader: Communication, Instruction and Demonstration	
Insufficient instruction or briefing required for activity	1
Dangers of activity not communicated	1
Insufficient demonstration or practice time	1
Activity Leader: Compliance with Procedures, Violations and Unsafe Acts	
Did not check the environment for hazards	2
Not wearing any PPE	1
Did not safely store equipment	1
Activity Leader: Experience, Qualifications and Competence	
Inexperience with activity	1
Poor technique in relation to lifting and moving equipment	1
Activity Leader: Judgement and Decision-making	
Judgement error when handling equipment	4
Decision to change activity goals/environment	2
Decision not to check environment for hazards	2
Putting pressure on student to "give it a go" even though they didn't want to	1
Participant's skills were not properly assessed	1
Activity Leader: Mental and Physical Condition	
Pre-existing injury	1
Fatigue	1
Activity Leader: Planning and Preparation	
Activity leader should have used tape to close off the trail that was under construction	1
Activity Leader: Situation Awareness	
Activity leader was unaware of hazards	2
Activity leader didn't realise another leader was underneath him in the water	1
Activity Leader: Supervision and Leadership of Activity	
Insufficient supervision of activity (general)	3
Incident not witnessed	2
Insufficient participant behaviour management	1
Activity Leader: Other	
Carelessness	1

Four (4) relationships were identified between factors relating to 'Activity Leader' factors, and other factors. Examples are presented in

Table **10**.

Table 10: The relationships between 'Activity Leader' and other factors

Factor 1	Factor 2	Examples	n
Activity Leader: Judgement and Decision-making	*Activity Equipment & Resources:* Equipment, Clothing and Personal Protective Equipment	*Activity leader made the decision not to wear PPE*	2
Activity Leader: Judgement and Decision-making	*Activity Environment:* Water Conditions	*The leader decided not to check the water for hazards*	2
Activity Leader: Communication, Instruction and Demonstration	*Activity Environment:* Infrastructure and Terrain	*Leader did not advise participants to be aware of holes in the ground during a night-time activity*	1
Activity Leader: Supervision and Leadership of Activity	*Activity Participant:* Judgement and Decision-making	*Insufficient supervision meant that the participant decided to go up a slope that he should not have*	1

The role of Activity Participants

Table 11 shows some examples of contributing factors identified within the 'Activity Participant' categories.

Table 11: Contributing factors identified within the 'Activity Participant' categories

Category and contributing factors	n
Activity Participant: Communication and Following Instructions	
Did not follow instructions and/or directions	24
Incorrect use of equipment	6
Did not immediately communicate injury	5
Participant did not listen to the briefing	1
Participant did not communicate their intentions to others (e.g., changing direction, stopping)	1
Activity Participant: Compliance with Procedures, Violations and Unsafe Acts	
Participant did not comply with safely rules provided	6
Participant was physically violent	3
Student refused to use and wear PPE	2
Student left the instructed trail and entered unfamiliar/dangerous terrain	1
Activity Participant: Experience and Competence	
Lack of experience or exceeded ability in activity	53
Poor technique	27
Lack of experience with terrain	10
Lack of experience with equipment (e.g., trangia)	5
Participant was trying to learn a new skill	4
Lack of experience in managing pre-existing condition	1

Table 11 *(cont.)*: Contributing factors identified within the 'Activity Participant' categories

Category and contributing factors	n
Activity Participant: Judgement and Decision-making	
Participant was going too fast	12
Poor judgment and decision making (general)	12
Poor judgement using brakes	9
Poor judgement of terrain	6
Participant made a bad decision in communicating or managing a pre-existing injury	3
Poor judgement regarding own ability level	2
Poor choice of clothing	2
Activity Participant: Mental and Physical Condition	
Pre-existing injury (e.g., ankle, knee, hip, wrist, back, neck or shoulder injury)	41
Lack of fitness	19
Pre-existing medical condition (e.g., allergies)	6
Tiredness or fatigue	5
Poor mental state (general; e.g., anxiety)	5
Poor coordination	3
Poor hygiene	2
Poor physical condition (general; e.g., temperature related discomfort)	2
Activity Participant: Planning and Preparation for Activity or Trip	
Prior preparation (e.g., strapping existing injuries; breaking in new equipment)	2
Activity Participant: Situation Awareness	
Not detecting hazard in activity environment (e.g., sharp coral, rock drop, pothole, submerged log, hot trangia, ant nest)	12
Terrain awareness (e.g., rocks, steepness of hill, slippery terrain, sticks)	11
Not paying attention to other participants during dynamic activity	8
Activity Participant: Situation Awareness	
Unaware of surroundings and changes in surroundings	9
Equipment inattention	6
Distraction of loss of focus	5
Not aware of the danger of the situation	5
Insufficient spacing between participants during activity	4
Activity Participant: Other	
Carelessness	31

Twenty-three (23) relationships were identified between 'Activity Participant' factors and other factors. Some examples are presented in Table 12.

Table 12: The relationships between 'Activity Participant' factors and other factors

Factor 1	Factor 2	Examples	n
Activity Participant: Experience and Competence	*Activity Environment:* Infrastructure and Terrain	*The terrain was too challenging for the participant's ability level*	12
Activity Participant: Experience and Competence	*Activity Equipment & Resources:* Equipment, Clothing and Personal Protective Equipment	*Incorrect use of equipment due to lack of experience*	11
Activity Participant: Experience and Competence	*Activity Participant:* Situation Awareness	*The lack of experience meant that the participant was not paying attention to the proximity of other racers*	7
Activity Participant: Experience and Competence	*Activity Participant:* Judgement and Decision-making	*The participant's lack of experience contributed to making a bad decision*	6
Activity Participant: Mental and Physical Condition	*Activity Environment:* Infrastructure and Terrain	*The terrain was too challenging for the participant's physical condition*	6
Activity Participant: Experience and Competence	*Activity Participant:* Mental and Physical Condition	*The participant lacked experience in managing a pre-existing injury during this type of activity*	5
Activity Participant: Mental and Physical Condition	*Activity Equipment & Resources:* Equipment, Clothing and Personal Protective Equipment	*The backpack was too heavy for the participant's physical condition*	5
Activity Participant: Judgement and Decision-making	*Activity Participant:* Situation Awareness	*Participant lost focus on the track, got worried and slammed the brakes*	4
Activity Participant: Judgement and Decision-making	*Activity Environment:* Infrastructure and Terrain	*The participant made a poor decision by going too fast over an obstacle*	2
Activity Participant: Situation Awareness	*Activity Environment:* Infrastructure and Terrain	*Participant's lack of awareness regarding the loose gravel*	2
Activity Participant: Mental and Physical Condition	*Activity Equipment & Resources:* Documentation	*The pre-existing injury was not mentioned on the medical form*	1
Activity Participant: Mental and Physical Condition	*Activity Environment:* Water Conditions	*The cold water made the participants more irrational and excited*	1

Table 12 *(cont.)*: The relationships between 'Activity Participant' factors and other factors

Factor 1	Factor 2	Examples	n
Activity Participant: Mental and Physical Condition	***Activity Participant:*** Planning and Preparation for Activity or Trip	*Participant did not strap up ankle before going on a long hike*	1
Activity Participant: Mental and Physical Condition	***Activity Participant:*** Situation Awareness	*Exhaustion contributed to participants inattention*	1
Activity Participant: Situation Awareness	***Activity Equipment & Resources:*** Equipment, Clothing and Personal Protective Equipment	*Participant's lack of awareness in terms of proximity to hot equipment*	1
Activity Participant: Situation Awareness	***Activity Environment:*** Animal and Insect Hazard	*Participant accidentally stood on an ants' nest*	1
Activity Participant: Situation Awareness	***Activity Participant:*** Other	*Student's carelessness contributed to poor situation awareness*	1
Activity Participant: Planning and Preparation for Activity or Trip	***Activity Equipment & Resources:*** Equipment, Clothing and Personal Protective Equipment	*Student did not wear in own hiking boots*	1

The role of Activity Group Factors and Other People in Activity Group

Table 13 shows some examples of contributing factors identified within the 'Activity Group Factors' and 'Other People in Activity Group' categories.

Table 13: Examples of contributing factors identified within the 'Activity Group Factors' and 'Other People in the Activity Group' categories

Category and contributing factors	n
Activity Group Factors: Communication within Group	
Other group members did not remind participant of the instructions	1
Insufficient communication during dynamic activity	2
Activity Group Factors: Group Dynamics	
Group dynamics (general)	2
Participant trying to show off	1
Peer pressure	1
Rough play	1
Activity Group Factors: Teamwork	
Not working together as a team	1
Other People in Activity Group: Experience, Qualifications, Competence	
Teacher had insufficient activity skills or experience	2

Table 13 (cont.): Contributing factors identified within the 'Activity Group Factors' and 'Other People in the Activity Group' categories

Category and contributing factors	n
Other People in Activity Group: Mental and physical condition	
Others in activity group were physically too small to support participant as required	1
Teacher's fitness/ability was insufficient for activity	1
Other People in Activity Group: Situation Awareness	
Teacher's situation awareness (general)	1
Teacher failed to detect hazard in activity environment	1
Other people in activity group not being aware of participants behind them	1
Equipment inattention	1
Other People in Activity Group: Supervision of activity	
Other people in the group weren't spotting correctly	2
Teacher did not properly supervise the participants who were spotting	1
Teacher did not see the student dangerously playing with a rope	1

Five (5) relationships were identified between 'Activity Group Factors', 'Other People in Activity Group' and other factors. Examples are presented in Table 14.

Table 14: Examples of the relationships between 'Activity Group Factors' and other factors

Factor 1	Factor 2	Examples	n
Activity Group Factors: Group Dynamics	*Activity Participant*: Judgement and Decision-making	*Group dynamics contributed to the participant deciding to go down the slope*	1
Activity Group Factors: Group Dynamics	*Activity Environment:* Infrastructure and Terrain	*The rough play during the activity caused the slippery terrain to become a factor*	1
Other People in Activity Group: Judgement and Decision-making	*Other People in Activity Group:* Situation Awareness	*Teacher's decision was influenced by a lack of situation awareness*	1
Other People in Activity Group: Situation Awareness	*Activity Environment:* Infrastructure and Terrain	*Teacher had a lack of awareness in relation to the terrain*	1
Other People in Activity Group: Supervision of Activity	*Activity Participant:* Communication and Following Instructions	*Students continued to ignore instructions, because teacher was not supervising students*	1

Equipment, Environment and Meteorological Conditions

Two hundred and twenty-four (224) reports identified factors at this level. Table 15 shows some examples of contributing factors identified within the 'Activity Environment' categories and

Table *16* shows those within the 'Activity Equipment' categories.

Table 15: Contributing factors identified within the 'Activity Environment' categories

Category and contributing factors	n
Activity Environment: Animal and Insect Hazards	
Insect bite (known)	15
Insect bite (unknown)	10
Tick on participant	3
Leech on participant	2
Stinger on participant	1
Aggressive horse	1
Activity Environment: Infrastructure and Terrain	
Slippery terrain (e.g., loose gravel, slippery rocks or wet terrain)	75
Rough or rocky terrain	17
Uneven/steep terrain	17
Trail or terrain (general)	13
Rough wooden fence or handrail	2
Activity Environment: Trees and Vegetation	
Scratches, cuts, or splinters from vegetation	6
Injuries caused by sticks or branches	5
Activity Environment: Water Conditions	
Submerged hazard (e.g., coral, logs/sticks)	3
Murky or muddy water	2
Waves	2
Cold water	1
Algae in water	1
Activity Environment: Weather Conditions	
Hot or humid weather/sun exposure	5
Rain	3
Poor visibility	3
Windy conditions	1
Activity Environment: Other	
Exposure to campfire	1

Table 16: Contributing factors identified within the 'Activity Equipment' categories

Category and contributing factors	n
Activity Equipment and Resources: Documentation	
Pre-existing injury not mentioned on medical from	5
Equipment, Clothing, and Personal Protective Equipment	
Inadequate footwear or clothing	18
Incorrect use of equipment	16
Burns related to cooking oil or equipment (e.g., trangia, knives)	11
People colliding with equipment	9
Equipment failure	8
Heavy equipment (e.g., hiking pack, fully loaded kayak)	6
Poor state of equipment (e.g., sharp edges, splinters, slippery)	6
Lack of PPE	5
Inadequate or poorly fitted equipment	4
Food & drink	
Food or cooking oil causing burns	1

One (1) relationship was identified between 'Activity Equipment & Resources' and 'Activity Environment', as shown in Table 17.

Table 17: The relationships between 'Activity Equipment & Resources' and 'Activity Environment' impacting the conduct of activities

Factor 1	Factor 2	Examples	n
Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment	*Activity Environment:* Infrastructure and Terrain	*Incorrect use of equipment considering the loose gravel*	3

Illness-related incidents

Illness-related incidence rate

In total, 74 illness-related incidents were reported. Across all activities, the average reported illness rate was 0.4 incidents per 1000 participants. This means that, on average, less than 1 illness-related incident was reported for every thousand participants involved in a led outdoor activity.

Activities associated with illness-related incidents

Camping in tents had the highest illness-related incidence rate (2.7 incidents per 1000 participants), followed by free time outdoors (1.6 incidents per 1000 participants) and walking/running in the outdoors (1.5 incidents per 1000 participants). Figure 9 presents a summary of the illness rate per 1000 participants by activity type (see Appendix A for a full list of activities). Incidents associated with illnesses not related to an activity or program (n = 9) are not represented on this figure. Notably, over half (55%) of all activities were not associated with any illness-related incidents.

Activity type	Reported illness rate per 1000 participants
Camping tents	(14/5,180)
Free time outdoors	(4/2,474)
Walking/running outdoors	(30/17,884)
Residential camps	(3/7,456)
Campcraft (e.g. cooking, campfires)	(2/5,364)
River activities	(7/19,804)
Caving	(1/3,312)
Wheel sports	(2/10,679)
Harness: outdoors	(1/42,256)
Teambuilding games	(0/16,076)
Archery	(0/12,007)
Ocean activities	(0/8,654)
Travelling	(0/4,979)
Harness: indoors	(0/4,727)
Curriculum-based activities	(0/2,515)
Beach activities	(0/1,850)
Arts & Crafts	(0/527)
Trampoline	(0/425)
Snowsports	(0/0)
Horse/Camel riding	(0/0)

55% of all activities were not associated with any illnesses.

Reported illness rate per 1000 participants (No. illness incidents/No. of participants)

Figure 9: Illness rate per 1000 participants by activity type (June 2015 – May 2016). Numbers in brackets represent the number of reported incidents associated with illnesses and the number of reported participants associated with the activity, respectively.

40

Actual severity ratings for incidents associated with illnesses

Figure 10 shows a histogram of severity scores for illness-related incidents. The median severity was 1 (range: 0 to 4) indicating that the majority of illnesses only required localised care and had short term effects.
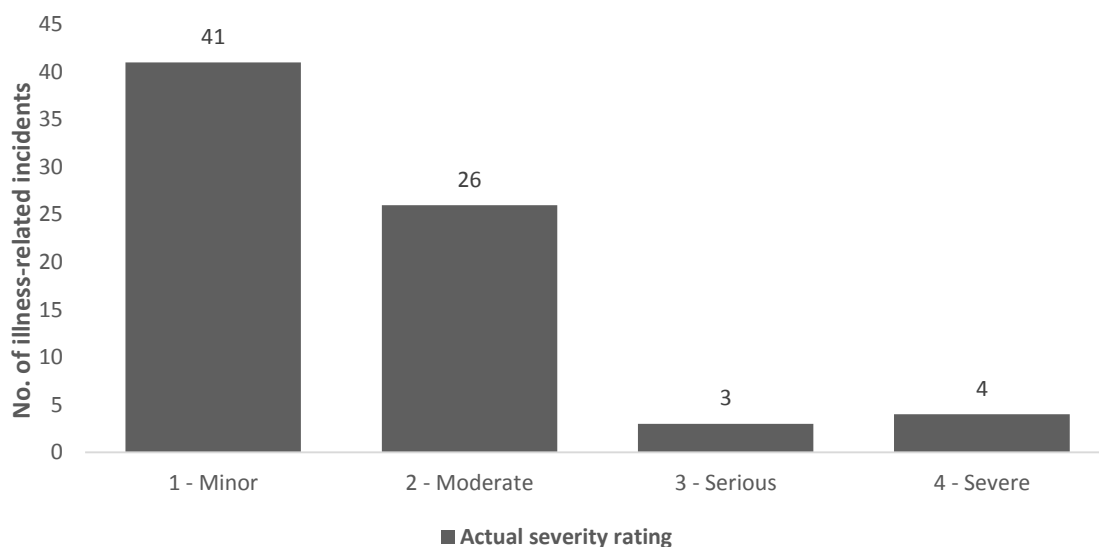
Figure 10: Severity ratings for illness-related incidents.

Less than half (44.6%, n = 33) of the reported illness-related incidents required evacuation, of these 36.4% walked out (n = 12, median severity = 2, range: 2-4) and 27.3% were evacuated by vehicle (n = 9, median severity = 2, range: 1-4). Only 3 (0.04%) illness-related incidents required hospitalisation and emergency services (all with a severity rating of 4, denoting incidents which required urgent emergency assistance).

Illness type

Of the 74 illness-related incidents, only 32% (n = 24) detailed the specific illness type; a further 28% (n = 21) listed the illness type as 'Unknown'. The following illness types were reported: abdominal problem (33.3%; n = 8); respiratory/chest pain (20.8%; n = 5); allergic reaction (16.7%; n = 4); asthma (16.7%; n = 4); non-specific fever (8.3%; n = 2); and diarrhoea (4.2%; n = 1).

Demographic information for ill people

The majority (89%) of ill people were identified as Activity Participants, 53% of whom were female and were 39% male (8% were missing data). The median age of ill activity participants was 15

years (range: 10 to 16 years; 56% missing data). Figure 11 shows the number of people with an illness by role and gender.
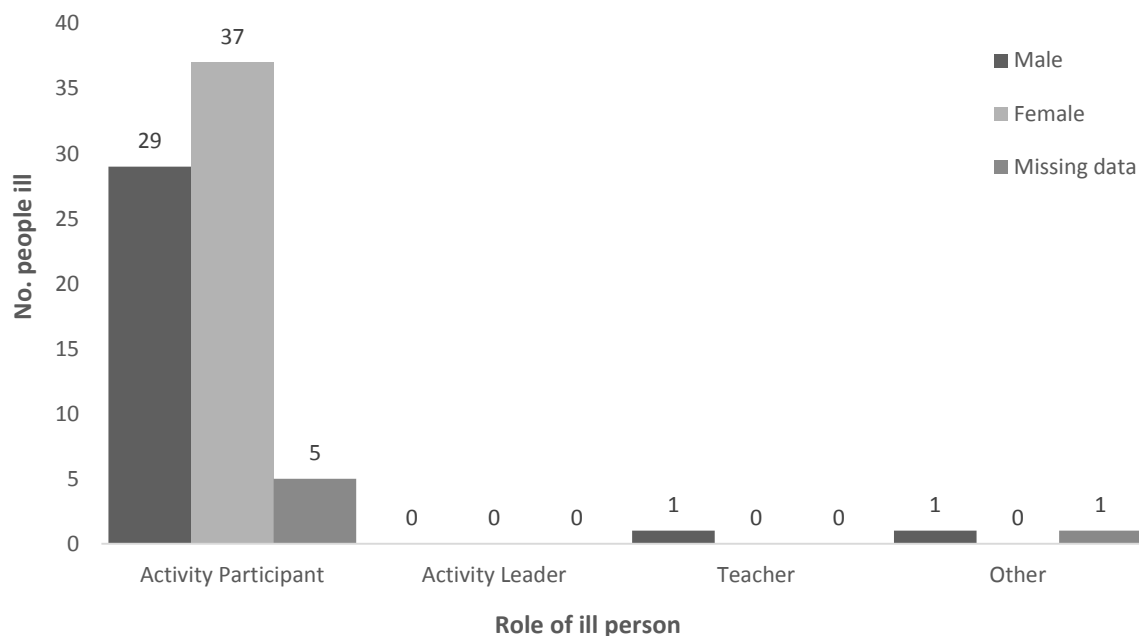
Figure 11: Number of people with an illness by role and gender.

Profile of activity group for illness-related incidents

The median number of participants involved in activities associated with illnesses was 13 (range: 0 to 85). The median number of Activity Leaders was 1 (range: 0 to 4; reported as present in 73 incidents) and Supervisors (e.g., teachers) was <1 (range: 0 to 6; reported as present in 34 incidents). No Volunteers (e.g., parents) were involved in activity groups for illness-related incidents. There was a ratio of 1 Activity Leader for every 13 participants in these activities.

In 81% of incidents (n = 60), the Activity Leader was reported to have relevant qualifications; in the remaining 19% of incidents (n = 14) qualifications were reported to be "not applicable". Figure 12 shows the number of illness-related incidents by actual severity ratings, partitioned according to leader qualifications. The incidents where leader qualifications were reported to be "not applicable" are a potential cause for concern, as this accounted for 57% of the seven incidents with a severity rating of more than 3 (i.e., serious to critical). The illness related incidents where leader qualifications were reported to be "not applicable" involved: camping in tents (n = 3), free time outdoors (n = 3), and walking/running outdoors (n = 4).
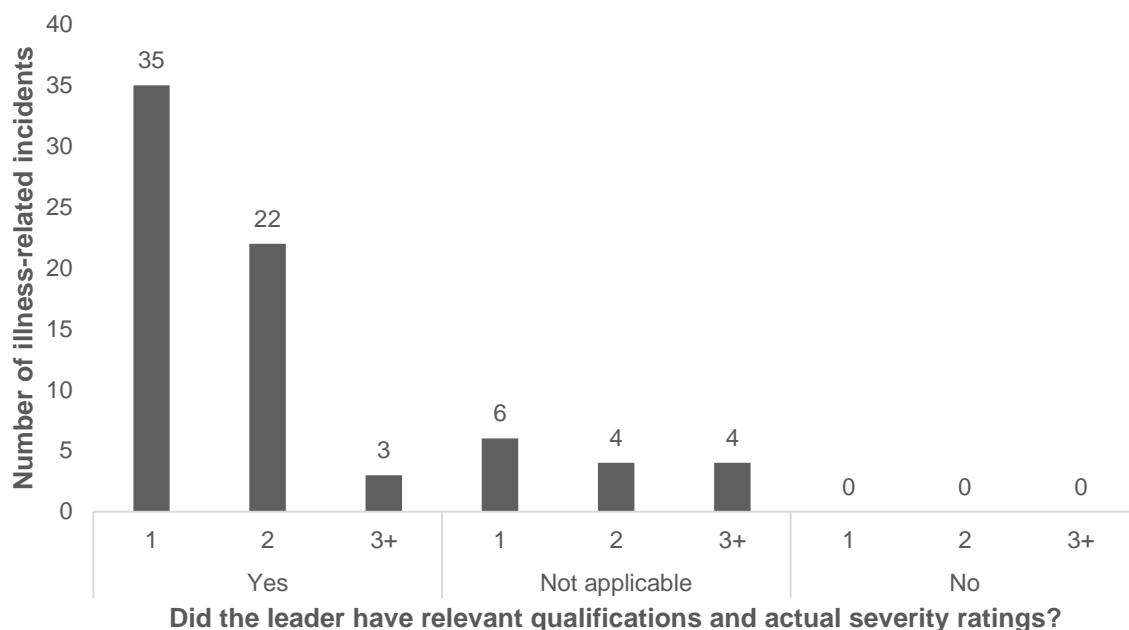
Figure 12: The number of incidents associated with illnesses by actual severity rating, partitioned according to responses to the question "Did the leader have relevant qualifications?"

Contributing factors for illness-related incidents

In total, 92% (n = 68) of the illness-related incident reports had enough detail to be analysed using the UPLOADS Accident Analysis Method (see Figure 1). A median of one (1) contributing factor was identified per report (range: 1-4). Factors at the following three (3) levels of the UPLOADS Accident Analysis Framework were identified: 'Equipment, Environment and Meteorological Conditions'; 'Decisions and Actions of Leaders, Participants and other Actors at the Scene'; and 'Supervisory and Management Decisions and Actions'. A summary of the factors and relationships identified are presented in Figure 13.
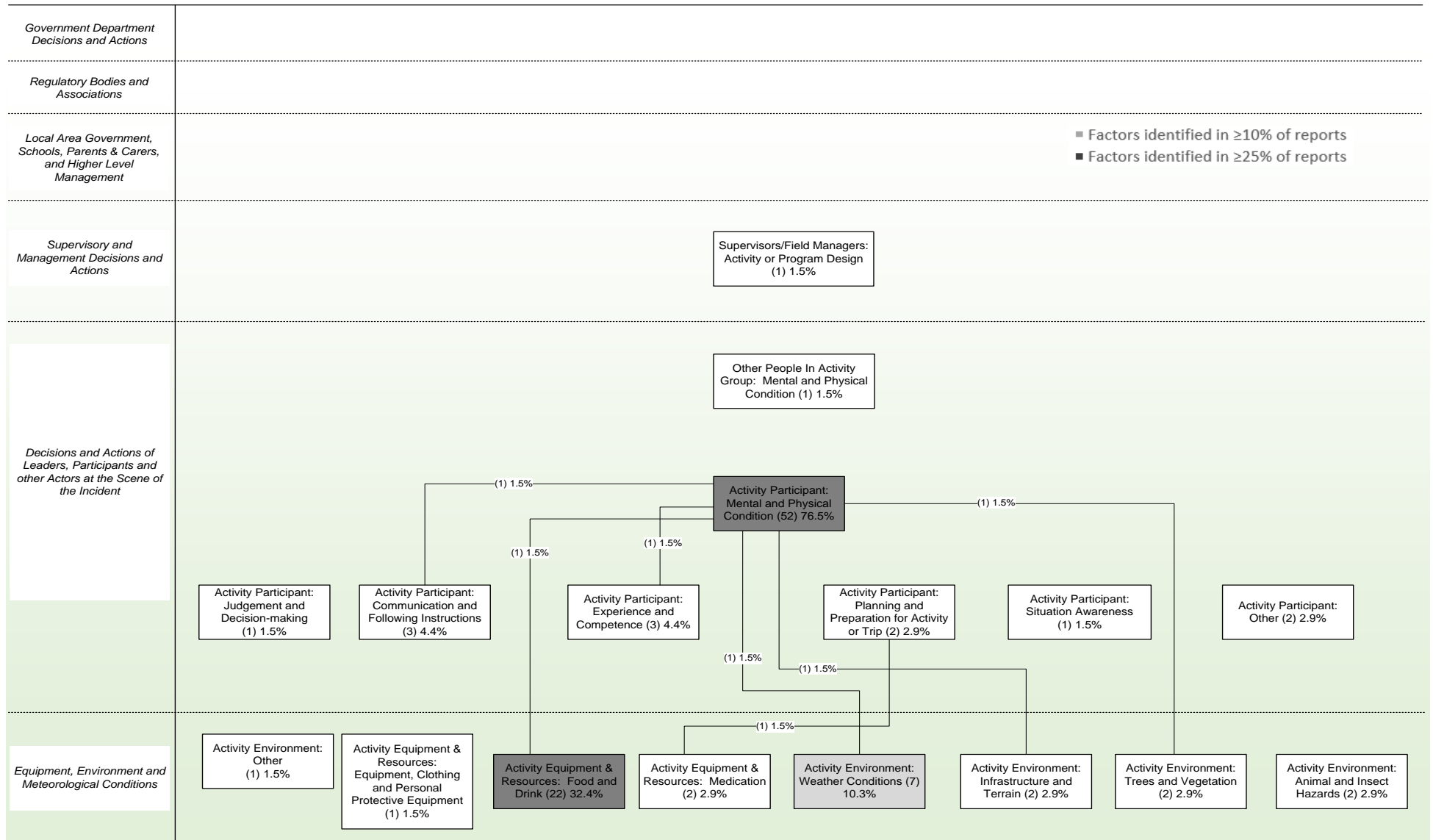
Figure 13: Factors and relationships identified as contributors to illness-related incidents (n = 68). Factors identified in more than 10% of incidents reports are shaded in light grey and those mentioned in more than 25% of reports are shaded in dark grey. Relationships between the factors are illustrated by the connecting lines; these are bolded for relationships that were mentioned more than once.

Government Department Decisions and Actions

No reports identified factors at this level of the framework.

Regulatory Bodies and Associations Decisions and Actions

No reports identified factors at this level of the framework.

Local Area Government, Schools, Parents & Carers, and Higher Level Management

No reports identified factors at this level of the framework.

Supervisory and Management Decisions and Actions

One (1) report identified factors at this level of the framework. This is shown in Table 18.

**Table 18: Contributing factors identified at the level of 'Supervisory and Management Decisions and Actions'**

Category and contributing factors	n
Supervisor/Field Manager: Activity or Program Design	
Activity not suited to participant's condition (e.g., age, pre-existing condition, ability)	3

Decisions and Actions of Leaders, Participants, and other Actors at the Scene of the Incident

Fifty-five (55) reports identified factors at this level of the framework, specifically relating to 'Activity Participants' and 'Other People in Activity Group' (see Figure 13). Table 19 shows some examples of the contributing factors identified within these categories.

Table 19: Contributing factors identified within the 'Activity Participant' and 'Other People in Activity Group' categories

Category and contributing factors	n
Other People in Activity Group: Mental and Physical Condition	
Pre-existing illness/medical condition (e.g., cold/flu, chest infection or stomach ache)	2
Activity Participant: Judgement and Decision-making	
Decided to not report illness in a timely manner (e.g., prior to going to bed)	2
Activity Participant: Mental and Physical Condition	
Pre-existing illness/medical condition (e.g., eczema, asthma, epilepsy, diabetes or heart condition, cold/flu, chest infection)	33
Tiredness or fatigue	14
Pre-existing psychological/behavioural issues	7
Lack of fitness	7
Allergic reaction	7
Poor hygiene	2
Activity Participant: Communication and Following Instructions	
Not reporting illness in a timely manner	3

Table 19 *cont.*: Contributing factors identified within the 'Activity Participant' and 'Other People in Activity Group' categories

Category and contributing factors	n
Activity Participant: Experience and Competence	
Exceeded ability (general)	2
Participant not familiar with activity	1
Activity Participant: Planning and Preparation for Activity or Trip	
Lack of medication for trip	2
Activity Participant: Other	
Carelessness	1
Failed to act	1

Six (6) relationships were identified between 'Activity Participant' and lower level factors. Some examples are shown in

Table **20**.

Table 20: Examples of the relationships between 'Activity Participant' factors and lower level factors

Factor 1	Factor 2	Examples	n
Activity Participant: Mental and Physical Condition	*Activity Environment:* Infrastructure and Terrain	*Terrain was too challenging for participant's physical condition*	1
Activity Participant: Mental and Physical Condition	*Activity Equipment & Resources*: Food & Drink	*The participant felt unwell, which contributed to insufficient water consumption*	1
Activity Participant: Mental and Physical Condition	*Activity Participant:* Experience and Competence	*Lack of camping experience triggered anxiety, which exacerbated the pre-existing condition*	1
Activity Participant: Mental and Physical Condition	*Activity Environment:* Weather Conditions	*Hot weather conditions exacerbated the student's fatigue*	1
Activity Participant: Mental and Physical Condition	*Activity Participant:* Communication and Following Instructions	*Participant did not communicate feeling unwell before going to bed, which exacerbated pre-existing condition*	1
Activity Participant: Planning and Preparation for Activity or Trip	*Activity Equipment & Resources:* Medication	*Participants had forgotten to bring Ventolin*	1

Equipment, Environment and Meteorological Conditions

Thirty-four (34) reports identified factors at this level. Some examples of the contributing factors identified within the 'Activity Equipment & Resources' and the 'Activity Environment' categories are shown in Tables 21 and 22, respectively.

Table 21: Contributing factors identified within the 'Activity Equipment & Resources' categories

Contributing factors	n
Activity Equipment & Resources: Food and Drink	
Insufficient water consumption (i.e., dehydration)	18
Insufficient food consumption	2
Consumption of foods with allergy	1
Food poisoning	1
Activity Equipment & Resources: Medication (for those involved in the activity)	
Failed to bring/ran out of medication	3

Table 22: Contributing factors identified within the 'Activity Environment' categories

Category and contributing factors	n
Activity Environment: Weather conditions	
Cold weather conditions	3
Hot weather conditions	3
Activity Environment: Infrastructure and Terrain	
Steep/rocky terrain	3
Activity Environment: Trees and vegetation	
Allergens from flora	2
Activity Environment: Animal and Insect Hazards	
Allergic reaction to horses	1
Activity Environment: Water Conditions	
Allergic reaction to salty water	1
Activity Environment: Other	
Exposure to fire smoke	1

Near miss incidents

Near miss incidence rate

In total, 34 near miss incidents were reported. Across all activities, the average reported near miss rate was 0.2 incidents per 1000 participants. This means that less than 1 near miss was reported for every thousand participants involved in a led outdoor activity.

Activities associated with near miss incidents

Figure 14 presents a summary of the near miss rate by activity type (see Appendix A for a full list of activities). Wheel sports had the highest near miss incidence rate (0.7 incidents per 1000 participants), followed by campcraft (i.e., cooking, campfires; 0.6 incidents per 1000 participants), and river activities (0.4 incidents per 1000 participants). Four (4) near miss incidents not related to an activity or program are not represented on the figure. Notably, 65% of the activity types were not associated with any near miss incidents.
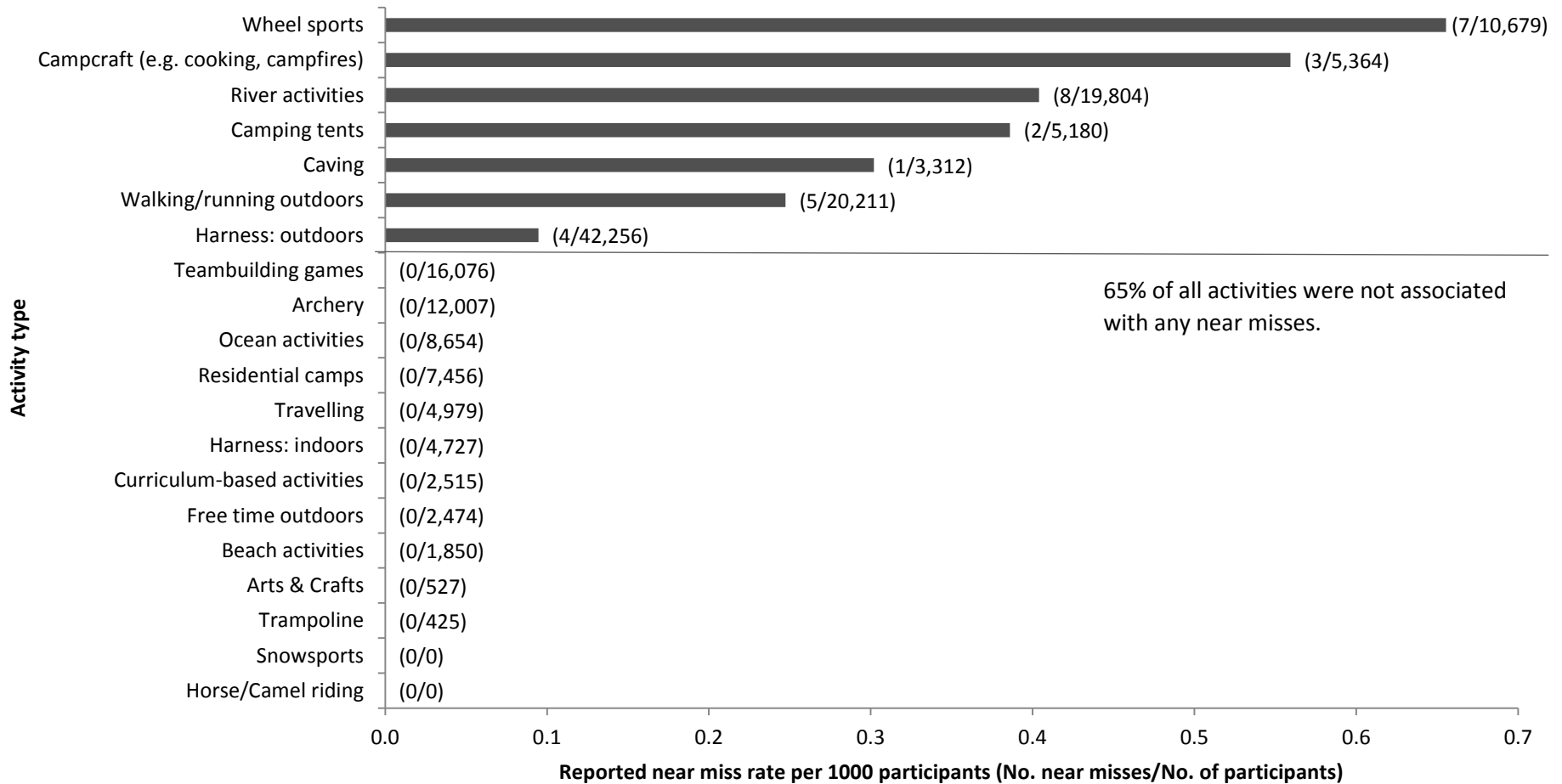
Figure 14: Near miss incidence rate per 1000 participants by activity type (June 2015 – May 2016). Numbers in brackets represent the number of reported incidents associated with near misses and the number of reported participants associated with the activity, respectively.

Demographic information for near miss incidents

The majority of people involved in near miss incidents were identified as Activity Participants (85%, n = 29); the remaining near miss incidents involved Activity Leaders (15%, n = 5). Activity Participants involved in near miss incidents were 52% male (n = 15) and 24% female (n = 7); this detail was missing in the remaining reports (n = 7). Insufficient data was reported for the calculation of median age.

Potential severity ratings for near miss incidents

Near miss incidents were rated in terms of potential severity. Figure 15 shows a histogram of potential severity scores for near miss incidents. The median potential severity rating was 3 (range: 1 to 4). Over half (65%) of near miss incidents had a potential severity rating of 3 or above, which indicates serious to unsurvivable incidents (i.e., incidents where the potential outcome can involve major irreversible damage, threatened life, or fatality).
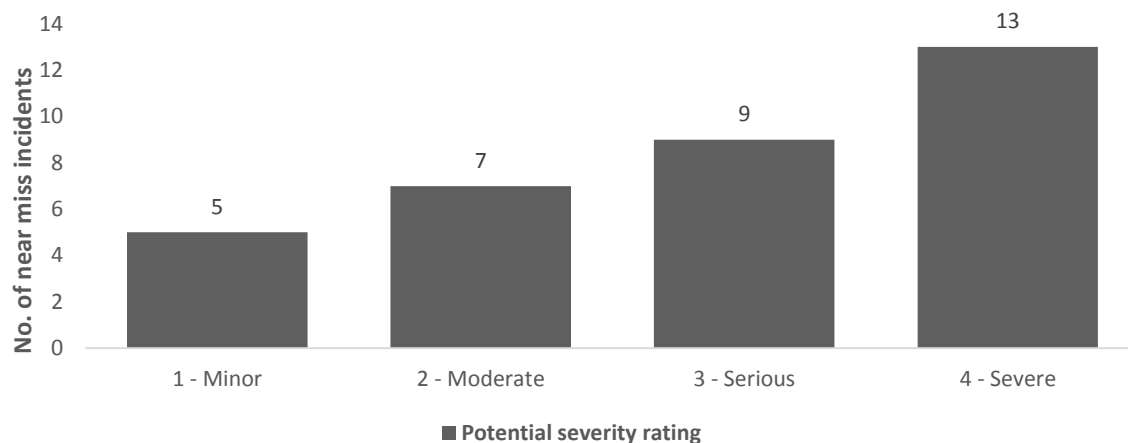
Figure 15: Potential severity ratings for near miss incidents.

Profile of activity group for near miss incidents

The median number of participants involved in activities associated with near misses was 13 (range: 2 to 82; n = 34 incidents). Respectively, the median number of Activity Leaders and Supervisors was 2 (range: 0 to 4) and 1 (range: 0 to 2). There were no Volunteers present during near miss incidents. There was an activity ratio of 1 Activity Leader for every 13 Participants in these activities. In majority of the near miss incidents (94%), the Activity Leader was reported to have relevant qualifications (n = 32). In two (2) incidents leader qualifications were reported as "not applicable". Figure 16 shows the number of near miss incidents by potential severity ratings, partitioned according to leader qualifications.
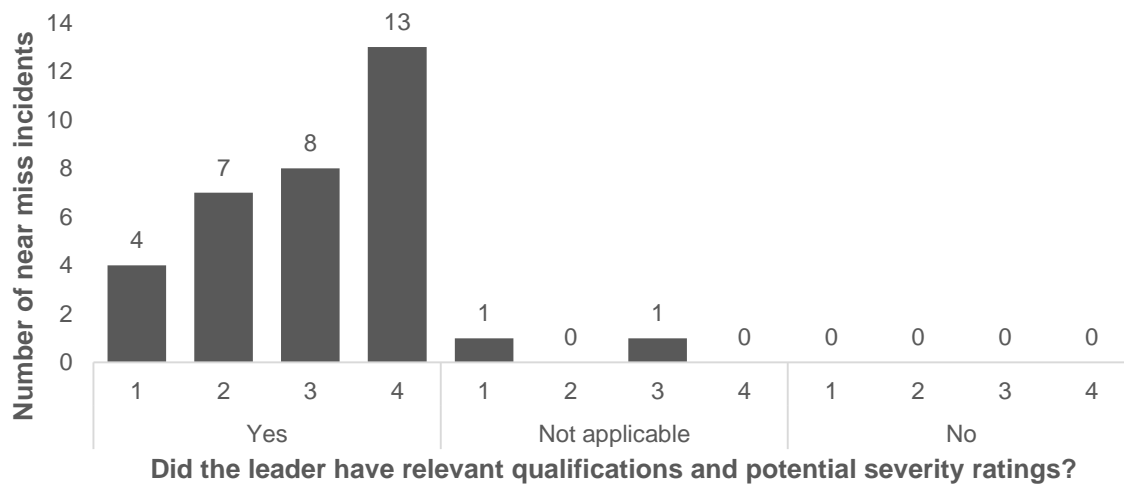
Figure 16: The number of near miss incidents by potential severity rating, partitioned according to responses to the question "Did the leader have relevant qualifications?"

Contributing factors for near miss incidents

In total, 33 near miss incident reports (97%) had enough detail to be coded using the UPLOADS Accident Analysis Method (see Figure 1). A median of two (2) contributing factors were identified per near miss report (range: 1-7). Factors contributing to near miss incidents were identified at all levels of the framework, except for 'Regulatory Bodies and Associations'. A summary of the factors and relationships identified is presented in Figure 17.
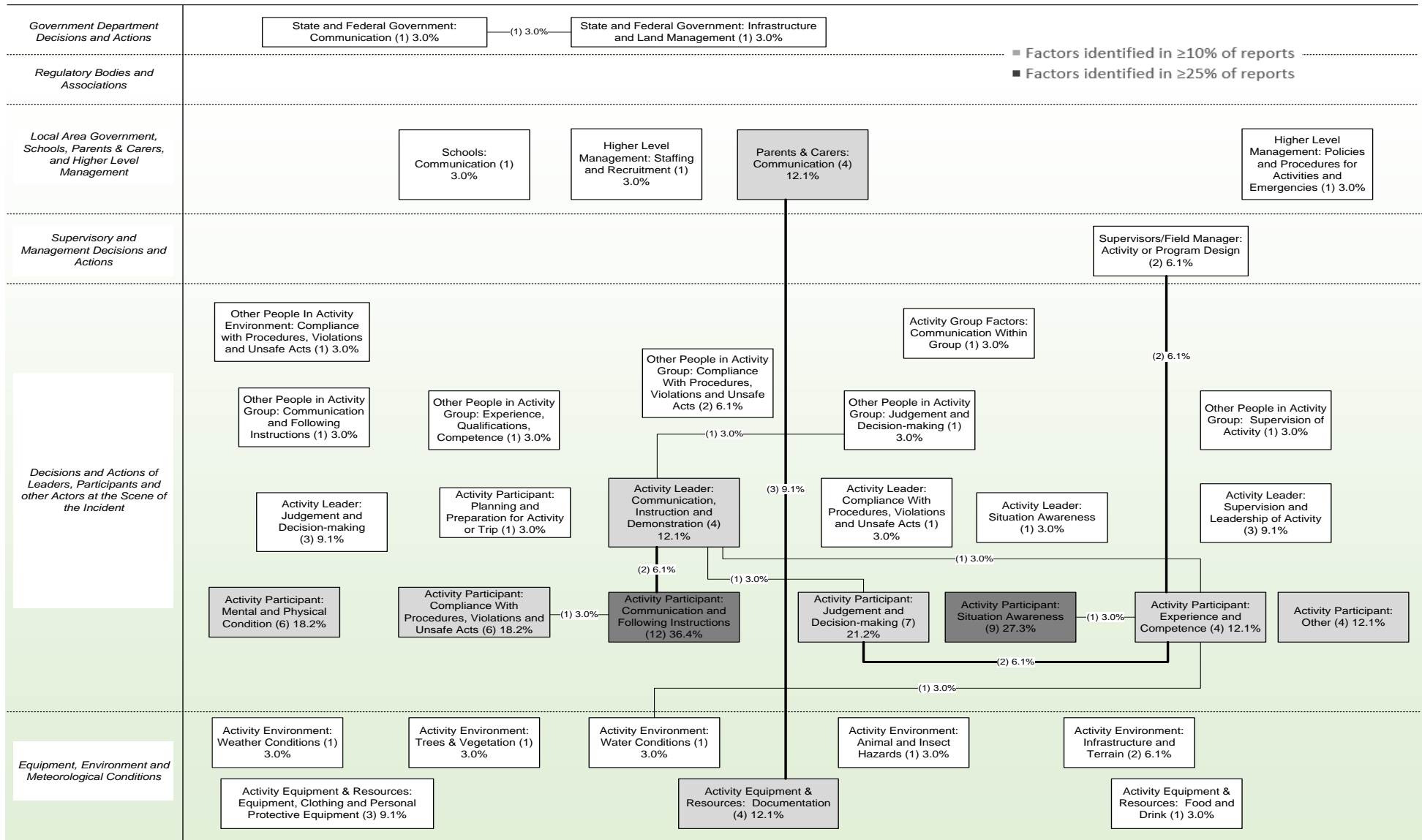
Figure 17: Factors and relationships identified as contributors to near miss incidents (n = 33). Factors identified in more than 10% of incidents reports are shaded in light grey and those mentioned in more than 25% of reports are shaded in dark grey. Relationships between the factors are illustrated by the connecting lines; these are bolded for relationships that were mentioned more than once.

Government Department Decisions and Actions

One (1) report identified factors at this level. Table 23 shows the contributing factors identified at each of the levels of the AcciMap (see Figure 17).

Table 23: Contributing factors identified within each category represented on the AcciMap at the 'Government Department Decisions and Actions' level

Category and contributing factors	n
State and Federal Government: Infrastructure and Land Management	
State department of land planning conducted a planned burn without notification	1
State and Federal Government: Communication	
State department of land planning did not communicate planned burns	1

One (1) relationship was identified between factors at this level. This is shown in Table 24.

Table 24: Relationship influencing the conduct of activities at the 'Government Department Decisions and Actions' level

Factor 1	Factor 2	Examples	n
State and Federal Government: Infrastructure and Land Management	*State and Federal Government:* Communication	*The state department of land planning conducted a burn without communicating this directly or via website*	1

Regulatory Bodies and Associations

No reports identified factors at this level.

Local Area Government, Schools, Parents & Carers, Higher Level Management

Five (5) reports identified factors at this level.

Table *25* shows some examples of contributing factors at this level.

Table 25: Contributing factors identified at each category represented on the AcciMap at the 'Local Area Government, Schools, Parents & Carers, Higher Level Management' level

Category and contributing factors	n
Higher Level Management: Policies and Procedures for Activities and Emergencies	
No detailed operating procedures for the activity	1
Procedures should specify harnesses need to be checked again prior to active participation	1
School: Communication	
Poor communication of pre-existing condition	1
Parents and Carers: Communication	
Information not listed on medical or dietary form	4

One (1) relationship was identified between 'Parents & Carers: Communication' and 'Activity Equipment & Resources: Documentation'. This is shown in Table 26.

Table 26: Relationship influencing the conduct of activities between 'Local Area Government, Schools, Parents & Carers, Higher Level Management' and 'Activity Equipment & Resources'

Factor 1	Factor 2	Examples	n
Parents & Carers: Communication	*Activity Equipment & Resources:* Documentation	*Staff were not aware of pre-existing condition as this was not listed on the medical or dietary form*	3

Supervisory and Management Decisions and Actions

Two (2) reports identified factors at this level. Table 27 shows some examples of the contributing factors identified at this level.

Table 27: Contributing factors identified within each category represented on the AcciMap at the 'Supervisory and Management Decisions and Actions' level

Category and contributing factors	n
Supervisor/Field Manager: Activity or Program Design	
Lack of flexibility to adjust to weather conditions	1
Activity not suited to participant's condition (e.g., age, pre-existing condition, ability)	1

One (1) relationship was identified between the categories 'Supervisor/Field Manager: Activity or Program Design' and 'Activity Participant: Experience and Competence'. This is shown in

Table *28*.

Table 28: Relationships contributing to a near miss incident between 'Supervisory and Management Decisions and Actions' and lower level factors

Factor 1	Factor 2	Examples	n
Supervisor/Field Manager: Activity or Program Design	*Activity Participant:* Experience and Competence	*Activity design did not match the participant's skill level*	2

Decisions and Actions of Leaders, Participants and other Actors at the Scene of the Incident

Thirty (30) reports identified factors at this level. Table 29 shows the contributing factors identified at the 'Activity Group Factors', 'Other People in Activity Group' and 'Other People in Activity Environment' categories.

Table 29: Contributing factors identified within the 'Activity Group Factors', 'Other People in Activity Group' and 'Other People in Activity Environment' categories

Category and contributing factors	n
Activity Group Factors: Communication within Group	
Participants getting lost due to poor communication within the group	1
Other People in Activity Group: Communication and Following Instructions	
Poor communication around checking of harnesses	1
Other People in Activity Group: Compliance with Procedures, Violations and Unsafe acts	
Teacher violated safety procedure	2
Other People in Activity Group: Experience, Qualifications, Competence	
Teacher lacked skills to properly check harnesses	1
Other People in Activity Group: Judgement and Decision-making	
Teacher decided to leave injured student unattended with a stranger	1
Other People in Activity Group: Supervision of Activity	
Teacher left injured students unsupervised and with a stranger	1
Other People in Activity Environment (not in activity group): Compliance with Procedures, Violations and Unsafe Acts	
Severe misbehaviour by other campground users	1

One (1) relationship was identified between 'Other People in Activity Group: Judgement and Decision-making' and 'Activity Leader: Communication, Instruction and Demonstration'. This is presented in Table 30.

Table 30: Relationships associated with a near miss incident between the levels of 'Other People in Activity Group' and 'Activity Leader'

Factor 1	Factor 2	Examples	n
Other People in Activity Group: Judgement and Decision-making	*Activity Leader:* Communication, Instruction and Demonstration	*The teacher was unable to make contact with the group leader and therefore made a poor decision*	1

The role of Activity Leaders

Table 31 shows the contributing factors identified within the 'Activity leader' categories.

Table 31: Contributing factors identified within the 'Activity leader' categories

Category and contributing factors	n
Activity Leader: Judgement and Decision-making	
Poor judgement to leave participants unsupervised	1
Did not send student to other staff member for more basic skills development	1
Staff member decided to continue activity rather than going back	1
Activity Leader: Communication, Instruction and Demonstration	
More instruction or briefing required for activity	3
Adaption of instructions according to group composition skill level	2
Insufficient directions	1
Instructors could not be reached by teacher	1
Activity Leader: Compliance with Procedures, Violations and Unsafe Acts	
Staff failed to implement thorough harness checks	1
Activity Leader: Situation Awareness	
Staff member got lost	1
Activity Leader: Supervision and Leadership of Activity	
Insufficient participant behaviour management	2
Temporarily loss of student	1

Three (3) relationships between 'Activity Leader' factors and other lower level factors were identified. These are shown in

Table **32**.

Table 32: Relationships between Activity Leaders and lower level factors

Factor 1	Factor 2	Examples	n
Activity Leader: Communication, Instruction and Demonstration	*Activity Participant:* Communication and Following Instructions	*Leader's lack of communication skills resulted in participants not listening to instructions*	2
Activity Leader: Communication, Instruction and Demonstration	*Activity Participant:* Experience and Competence	*If the brief was delivered at a slower pace, the students would have been better prepared for the trail ahead*	1

| *Activity Leader:* Communication, Instruction and Demonstration | *Activity Participant*: Judgement and Decision-making | *A guided walk through of the trail would have allowed the student to make a better decision* | 1 |

The role of Activity Participants

Table 33 shows the contributing factors identified within the 'Activity Participant' categories.

Table 33: Contributing factors identified within the 'Activity Participant' categories

Category and contributing factors	n
Activity Participant: Mental and Physical Condition	
Pre-existing psychological/behavioural issues (e.g., eating disorder, suicidal tendencies)	3
Tiredness or fatigue	2
Allergic reaction	1
Activity Participant: Compliance with Procedures, Violations and Unsafe Acts	
Participant did not comply with safely rules or procedures	3
Participant was physically violent towards self or others	2
Participant was verbally violent	1
Activity Participant: Communication and Following Instructions	
Participant failed to follow activity instructions	8
Participant did not follow directions	2
Participant did not follow daily routine instructions	2
Participant did not communicate ill-fitting equipment	1
Activity Participant: Judgement and Decision-making	
Student refused to eat	3
General poor judgement of activity (e.g., terrain, ability level)	3
Participant decided to be defiant/non-compliant	2
Activity Participant: Planning & preparation for activity, trip	
Participant did not bring proper shoes/clothing	1
Activity Participant: Situation Awareness	
Went in the wrong direction due to inattention	5
Not detecting environmental hazard (e.g., sharp coral, submerged log, hot trangia)	4
Activity Participant: Experience and Competence	
Lack of experience/technique or exceeded ability in activity	4
Activity Participant: Other	
Carelessness	4

Four (4) relationships were identified between 'Activity Participant' factors and factors at an equal or lower level, which influenced the conduct of activities. These are shown in Table 34.

Table 34: Relationships contributing to near miss incidents identified between 'Activity Participant' and other factors

Factor 1	Factor 2	Examples	n
Activity Participant: Experience and Competence	**Activity Participant:** Judgement and Decision-making	*Participant's lack of experience in mountain biking led to poor judgement of the terrain*	2
Activity Participant: Experience and Competence	**Activity Participant:** Situation Awareness	*Participant's lack of experience resulted in a lack of attention to surroundings*	1
Activity Participant: Experience and Competence	**Activity Environment:** Water Conditions	*The participants had insufficient skills to safely navigate a rapid*	1
Activity Participant: Communication and Following Instructions	**Activity Participant:** Compliance with Procedures, Violations and Unsafe Acts	*Participant did not follow instructions which resulted in a very unsafe act and violating safety procedures*	1

Equipment, Environment and Meteorological Conditions

Thirteen (13) reports identified factors at this level. Table 35 and 36 shows some examples of contributing factors at this level.

Table 35: Contributing factors identified within the 'Activity Equipment & Resources' categories

Category and contributing factors	n
Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment	
Communication equipment failed (e.g., poor reception)	2
Inadequate footwear	1
Activity Equipment & Resources: Documentation	
Dietary requirements not mentioned on dietary form	3
Behavioural or psychological issues were not mentioned on medical form	2
Activity Equipment & Resources: Food and Drink	
Consumption of foods containing allergen	1

Table 36: Contributing factors identified within the 'Activity Environment' and 'Activity Equipment' categories

Category and contributing factors	n
Activity Environment: Weather Conditions	
Windy conditions	1
Hot weather conditions	1
Activity Environment: Trees and Vegetation	
Tree or tree limbs falling	1
Activity Environment: Water Conditions	
Rapid	1
Activity Environment: Animal and Insect Hazards	
Snake sighted on track	1
Activity Environment: Infrastructure and Terrain	
Obstacle on activity course	1
Dislodged rock falling on or near others	1

Discussion

The aim of this report was to present the findings from the UPLOADS National Incident Dataset in the period between the 1st of June 2015 and 31st May 2016. The following discussion reflects on the key findings from this report and outlines their main implications for the sector. As this report is the second annual report for the UPLOADS project (view 2014-2015 annual report), the results of both reports are compared.

Incidence rates

The findings indicate that the injury incidence rate for led outdoor activities in Australia is low (2.1 per 1000 participants), with approximately two injury-related incidents reported for every thousand participants involved in a led outdoor activity. This injury incidence rate is the same as that found in the first 12 months of data. Taken together, these analyses suggest that the injury incidence rate for led outdoor activities in Australia is low and relatively stable.

It is useful to compare this injury-incidence rate to other similar rates in Australian organised sports. For example, in an Australian study of sports and active recreation injury in the Latrobe Valley, cricket had the highest rate of 242 injuries per 1000 participants, followed by horse-riding (122 injuries per 1000 participants), soccer (107 injuries per 1000 participants) and netball (51 injuries per 1,000 participants; Finch, Cassell, & Stathakis, 1999). Whilst it is acknowledged that this study is dated, this provides an indication that the led outdoor activities provided by participating organisations may be safer than some forms of organised sport in Australia. Unfortunately the UPLOADS injury incidence data cannot be compared with more recent datasets or incidence rates in other contexts such as attending schools or being at home, due to a lack of incidence data within these locations or due to a reporting format incompatible with the UPLOADS format (e.g., per 1000 participation days). Nevertheless, additional support is provided for this finding by a large study conducted in America in university-aged students. Compared to organised outdoor education activities, participants were found to be at least five times more likely to be injured while participating in low contact college sports and up to nine time more likely in high-contact sports (e.g., football, hockey, wrestling; Gaudio, Greenwald, & Holton, 2010).

While these findings are encouraging, caution is urged when interpreting them, as the incidence rate may underestimate the actual incidence of injuries as underreporting is suspected. Further, the sample of organisations contributing data through UPLOADS is relatively small and these organisations may place a particular emphasis on safety. A key requirement for the research program moving forward is therefore to recruit a wider sample of organisations.

Activities

As with the first annual report, over half of all activities had an injury and illness incidence rate of less than 1 per 1000 participants, suggesting that the strategies used to manage the risks associated with these activities are effective. There were no substantial differences in activity participation distribution (percentage of total participants per activity) between the current and previous reports. This figure also illustrates that there is no clear interaction between participation distribution and injury-incidence rate. Despite the sample similarities, some changes were identified in the injury incidence rates across activities. In the current report, wheel sports were found to have the highest injury-incidence rate (8.8 incidents per 1000 participants), followed by trampolining (7.1 incidents per 1000 participants), walking/running in the outdoors (5.7 incidents per 1000 participants), camping tents (4.8 incidents per 1000 participants), and free time outdoors (4.0 incidents per 1000 participants). Free time outdoors and walking/running in the outdoors have recorded a relatively high injury incidence rate over the two reports. As organisations continue to contribute data to the UPLOADS National Incident Dataset, activity-specific incident trends may be able to be identified; however it is too early to do this at present.

The findings from both reports highlight that there is cause for regarding the incidents where leader qualifications were reported to be "not applicable". Although these represent only 10-20% of incidents, these cases account for 29% of injury-related incidents in the first annual report and 44% in the present report. The injury-related activities where leader qualifications were reported to be "not applicable" involved activities such as campcraft (i.e., cooking, campfires), free time outdoors, and walking/running outdoors in both reports. This is of particular concern as walking/running in the outdoors had one of the highest injury-incidence rates in both the current dataset and the previous annual report (8.2 and 5.7 incidents per 1000 participants, respectively). As these types of activities are usually less structured, it could be suggested that organisations do not typically perceive that they require management or supervision. The findings highlight that these activities pose a particular risk to participants, and organisations may need to review their policies regarding supervision during these activities.

Incident outcomes

In addition to the relatively low injury and illness incidence rates, the vast majority of incidents were rated as having only a minor short-term impact on participation (severity rating 1 = 81% of all incidents). This is consistent with the first annual report (severity rating 1 = 85% of all incidents).

Injury type and location remained unchanged from the previous year, with wrist and hands, ankles and feet, and knees and lower legs again being the most frequently injured body parts by

'dislocation, sprain or strain', or 'superficial injury (e.g., abrasion, blister, insect bite)'. Less than 5% of the injuries were reported to require hospitalisation, and only 19% required evacuation.

Contributing factors for injury-related incidents

Contributing factors were identified across the lower four levels of the UPLOADS Accident Analysis Framework, these were: 'Equipment, Environment and Meteorological Conditions'; 'Decisions and Actions of Leaders, Participants, and other Actors at the Scene of the Incident'; 'Supervisory and Management Decisions and Actions'; and 'Local Area Government, Schools, Parents & Carers, Higher Level Management'. This finding is consistent with the first UPLOADS report and provides further evidence that led outdoor activity injuries represent a systemic issue (Salmon et al., 2014). A key implication is that the prevention strategies developed by organisations and the sector should focus on factors across the sector as a whole, rather than only on instructors, equipment, and the environment. A second important implication is that actors across all levels of the sector share the responsibility for safety. It is important then that discussions around system reform for injury prevention involve actors from all levels of the system.

The contributing factors and their interrelations provide some important conclusions regarding accident causation and prevention. Examining the network of contributing factors identified in the injury incident dataset reveals the following prominent contributing factors from across the LOA system:

- Communications between parents and carers and activity providers (e.g., a failure to provide participant dietary or pre-existing injury information);

- Multiple factors associated with activity participants, including their judgement and decision making; experience and competence; compliance with procedures, violations and unsafe acts; communications and following instructions; situation awareness, and mental and physical condition;

- Factors within the activity environment (e.g., infrastructure, weather, vegetation, animal and insect hazards); and

- The activity equipment and resources, such as activity equipment and personal protective equipment.

Reducing the frequency of these factors could represent appropriate goals for injury prevention activities; however a network of prevention strategies would be required to achieve them. It is proposed that this network should include interventions targeting at least at the four lower levels of the LOA system. For example, although activity participant factors are prominent in this dataset, targeted interventions will require modifications to other parts of the system, such as activity leader

procedures and program design. That said, it appears that some simple interventions could prove beneficial for the contributing factors identified in the present dataset. These are presented in Table 37.

Table 37. **Potential prevention strategies for injury incidents based on the contributing factors identified by practitioners using the UPLOADS system**

Contributing factors	Potential intervention	Actors involved
Communications between parents and carers and activity providers	- Improve design and clarity of participant forms (e.g., what information is required to support participation), including an explicit section for pre-existing injury information - Conduct pre-activity checks of participant information forms and request missing information - Communicate importance of providing medical and dietary information on participant forms - Introduce an electronic system to collect medical information, which automatically sends reminders to participants and alerts to providers prior to the activity	Parents, activity providers, schools
Activity/Program Design	- Offer different levels of challenge to account for participants with different capabilities - Build in rest periods to account for the weakest person within the group - Ensure appropriate strategies are in place to allow participants to rest or have breaks from the group if the program becomes too overwhelming	Activity providers
Activity participant factors		
Judgement and decision making	- Introduce team-based training in activities to encourage activity participants to more comprehensively consider hazards and provide opportunities for collaborative decision making	Program design
Experience and competence	- Include skill-based levels of participation (e.g., beginner, novice, experienced) within the program design - Assess/collect documentation of activity participants' previous experience and skill level - Introduce graded levels of the activity to which introduce the basic techniques required - Provide training for general camping activities (e.g., cooking) through the school curriculum - Treat campcraft and free time activities as a skill-based activity, and provide close supervision and instruction	Program design, schools, parents/guardians, activity leaders
Communications and following instructions	- Include the communication of instructions to participants using multiple modes (e.g., written, verbal, visual) in the program design and in communications with schools/parents/guardians - Deliver instructions as needed, so participants are not overwhelmed with too much information	Activity providers, schools, activity leaders
Situation awareness	- Include basic situation awareness training into the design of the activity. For example, encouraging activity participants to narrate their actions when they are learning a new skill or playing 'Eye-Spy' to avoid complacency while performing repetitive tasks (e.g., hiking)	Activity providers, activity leaders
Mental and physical condition	- Ensure sufficient 'check-points' for activity participants to communicate pre-existing injuries and illnesses (e.g., in consent documentation, at school prior to camp, at camp orientation, and during the activity) - Provide activity participants with examples of pre-existing conditions and why it is important to communicate them - Include contingency plans into the program design for activity participants who may have a pre-existing condition; communicate these to the participants at each 'check-point'	Activity providers, parents, schools, activity leaders,

Table 38 *cont*. **Potential interventions for injury incidents based on the contributing factors identified by practitioners using the UPLOADS system**

Activity environment factors	Potential intervention	Actors involved
Infrastructure and terrain	- Communicate with local government to discuss the condition of the infrastructure/terrain - Inspect the infrastructure/terrain before booking an activity with the school/parents/guardians - Train activity leaders to be able to conduct dynamic risk assessments on arrival at a venue or location - Include contingency plans for activities to avoid dangerous/unstable terrain due to changes in weather conditions - Teach activity participants to conduct dynamic risk assessments as part of the activity	Local area government, activity providers, schools, parents/guardians, activity leaders, activity participants
Weather	- Ensure program design incorporates alternative activities in the event of adverse weather - Ensure appropriate measures are taken to cater for adverse weather conditions (e.g., water, suitable clothing)	Activity providers, activity leaders
Trees and vegetation; Animal and insect hazards	- Educate activity participants about the local flora and fauna, including potential hazards, prevention/detection strategies, and first aid.	Schools, activity providers
Clothing and personal protective equipment	- Provide activity participants with pre-outdoor training for using camping and outdoor equipment (e.g., trangias, tents, heavy hiking packs) through the school curriculum and on arrival at venue - Ensure adequate demonstration/familiarisation in the program design to ensure activity participants know how to use the equipment required for the activity (e.g., how to fit a hiking pack)	Activity providers, schools, activity leaders

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Contribution of data and reporting quality

There was a substantial decrease in the number of organisations contributing data. Of the 35 organisations signed up to use UPLOADS, just over half (54%) contributed data, compared to the 72% response rate recorded in the previous annual report. The future of UPLOADS is dependent upon the provision of data from participating organisations across Australia. Key tasks for the sector moving forward include not only increasing the number of participating organisations but also to ensure that participating organisations are providing detailed data regularly. Anecdotally there is a strong desire from many practitioners to adopt UPLOADS; however, in practice it is apparent that there is insufficient time to devote to its proper use. Whilst we acknowledge that practitioners are working under significant pressures and time constraints, we urge the sector to continue contributing data. Without data, it is not possible to generate meaningful analyses or for the UPLOADS National Incident Dataset to survive. The UPLOADS team are currently exploring options to reduce the administrative burden of contributing data. However, we have a shared task in revising the safety culture in the led outdoor sector to ensure consistent, meaningful incident reporting.

Another issue that needs to be addressed is the tendency to focus on individual decision making and behaviour (i.e., activity participant and leader) in incident reports. For example, many reports attribute injuries to "poor decision-making" on behalf of the leader or participant, with minimal consideration of the conditions that contributed to these outcomes. Such reports only highlight the symptoms of a poorly designed system, and do not provide sufficient information to develop appropriate prevention strategies. This may be a result of various contributing factors, including the low severity of the incidents reported, a lack of exposure of reporters to systems thinking and a lack of awareness of how these higher level factors impact the conduct of led outdoor activities. Furthermore, reporters are much more likely to highlight and comment on factors that are within their perceived sphere of influence, and tend to ignore factors that they feel are beyond their level of control. Again, it is important to emphasise that there is further work to do in educating all actors within the sector, to encourage a systems thinking approach to accident causation. This should be achieved through practitioner workshops, practitioner articles (e.g., Dallat, 2016), and other dissemination activities.

There is also work to do with the sector regarding the importance of reporting near miss incidents. The analysis of near miss incidents provides important learning opportunities and is acknowledged to be an integral component of safety management in other safety critical domains (e.g., Le Coze, 2013; Lindberg, Hansson, & Rollenhagen, 2010). The importance of reporting and analysing near miss incidents is further emphasised by the fact that 65% of near miss incidents in the

current dataset were reported to have a potential severity rating of 3 or above (which indicate potentially serious to fatal incidents). This has increased since the previous annual report in which only 51% of near miss incidents reported the same rating. This suggests an increased bias to reporting serious near miss incidents. Further effort is required to build a stronger reporting culture around near misses within the led outdoor activity sector.

On a positive note, it is clear that there has been some improvement in the quality of the data reported. In the first annual dataset, just over half (54%) of the injury-related incidents contained sufficient information to enable further analysis and subsequent identification of contributing factors. In the present dataset, almost all (96%) of the injury-related incidents included sufficient information to enable further analysis. This was similar across illness and near miss reports.

Limitations

As always, it is worth noting some of the limitations associated with UPLOADS and the present dataset. First, generalisability is potentially limited due to the short period of data collection and limited number of organisations contributing data. This will improve as more organisations begin to use UPLOADS and a larger dataset is acquired over time. Second, the reported incidence rates may underestimate the actual rates for various reasons, such as underreporting of injuries that do not require treatment or organisations choosing not to report more serious injuries. However, the large number of minor reports indicates that the organisations involved in the study readily report this type of incident.

Conclusion

This report presents the findings from the analysis of the second 12-months of collecting data for the UPLOADS National Incident Dataset. The analysis has highlighted a number of important issues relating to incidents and incident causation in led outdoor activities, and incident reporting within the sector. The authors hope that this information helps the led outdoor activity sector to better understand the risks they face while also providing an evidence base for taking appropriate action.

Appendix A: Categorisation of Activities

Activity category	Activity coded in participation data
Archery	Archery
Arts & crafts	Arts & crafts
	Bush art
Beach activities	Beach sports/activities
	Fishing
	Sandboarding
Campcraft (e.g. cooking, campfires)	Camping: Campcraft (i.e. cooking and campfires)
Camping tents	Camping: Pioneering
	Camping: Soft top (i.e. tent type accommodation)
Caving	Caving
	Caving (artificial)
Curriculum-based activities	Curriculum-based activities (e.g. environmental, conservation, science studies)
	Earth Education
	Environmental Rehabilitation Rolls
Free time outdoors	Free time Unstructured: outdoor accidents during free time
Harness: Indoors	Harness: Climbing artificial surfaces
Harness: Outdoors	Aerial Runway
	Bouldering
	Combo abseil and climb
	Giant Swing
	Harness: Abseiling
	Harness: Canyoning
	Harness: Crate climb
	Harness: Dangle Duo
	Harness: Flying fox/zip line
	Harness: Giant swing
	Harness: High/low ropes courses
	Harness: Leap of faith
	Harness: Outdoor rock climbing
	Harness: Prussiking
	Multi-pitch abseil
	Pamper Pole
Horse/Camel riding	Camel riding
Ocean activities	Aquatic: Sailing
	Aquatic: Sea kayaking
	Aquatic: Snorkelling
	Aquatic: Surf Education
	Aquatic: Surfing
	Aquatic: Swimming
	Standup Paddle Boarding
Residential camps	Camping: Hard top (i.e. indoor accommodation)
	Expedition Preparation

Appendix A *(cont.)*: Categorisation of Activities

Activity category	Activity coded in participation data
River activities	Aquatic: Canoeing
	Aquatic: Dragon Boating
	Aquatic: Kayaking (flatwater)
	Aquatic: Rafting (flatwater)
	Aquatic: Rafting (whitewater)
	Raft Making
	Rock Pooling / Creek Dipping
Snowsports	Snow: Skiing (Cross-country/Nordic)
	Snow: Skiing (Downhill)
	Snow: Snowboarding
Teambuilding games	Animal Games
	Initiatives/Team games
	Night Time Activities
Trampoline	Trampoline
Travelling - by bus	Travelling - by bus
Walking/running outdoors	Adventure Course
	Adventure Racing
	Bird watching
	Bushwalking
	Farm Days
	Geocaching
	Guided Tour
	Kite-flying
	Laser Skirmish
	Orienteering/Rogaining
	Running activities
	Solo Day/Environmental Interpretation
Wheel sports	Wheel sports: Billy Carts
	Wheel sports: Cycling (bmx)
	Wheel sports: Mountain biking
	Wheel sports: Quad biking
	Wheel sports: Skating - inline and skateboarding

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