



UPLOADS Key Issue Report: CAMPCRAFT

UPLOADS Twelve Months Campcraft Dataset: 1st June 2014
to 31st May 2015

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Funders and Partner Organisations

This project was supported by funding from the Australia Research Council (ARC) in partnership with Australian Camps Association, Outdoor Educators' Association of South Australia, Outdoors South Australia, United Church Camping, Outdoors Victoria, Outdoor Council of Australia, Recreation South Australia, Outdoor Recreation Industry Council, Outdoors WA, YMCA Victoria, The Outdoor Education Group, Girl Guides Australia, Wilderness Escape Outdoor Adventures, Venture Corporate Recharge, Queensland Outdoor Recreation Federation, Christian Venues Association, Parks Victoria, Victorian Department of Planning and Community Development, Outdoor Education Australia and the Department of National Parks, Recreation, Sport and Racing Australia (LP110100037). Caroline Finch was supported by a NHMRC Principal Research Fellowship (ID: 565900). The Australian Centre for Research into Injury in Sport and its Prevention (ACRISP) is one of the International Research Centres for Prevention of Injury and Protection of Athlete Health supported by the International Olympic Committee (IOC). Paul Salmon's contribution was funded through his current Australian Research Council Future Fellowship (FT140100681).



Australian Government
Australian Research Council



Outdoors
Victoria



Department of Planning
and Community Development

Queensland Government
Department of National Parks, Recreation, Sport and Racing

Executive Summary

Aim

Campcraft-related injuries, near misses and illnesses emerged within the UPLOADS dataset as frequently occurring incidents with potentially severe outcomes. The aims of this report are: to present a detailed overview of all the campcraft (e.g. cooking and campfires) data contributed to the UPLOADS National Incident Dataset during its first 12 months; to provide a holistic and in-depth understanding of these campcraft-related incidents that occurred within led outdoor activities in Australia; and to promote discussion within the sector regarding potential prevention strategies and countermeasures.

Method

Organisations collected incident and participation data using the UPLOADS Software Tool and UPLOADS Lite for 12 months (1st June 2014 to 31st May 2015). De-identified data were submitted to the research team on a three monthly basis. The data was merged and the qualitative data, describing the contributory factors involved in the incidents from each report, was coded using the UPLOADS Accident Analysis Method (see **Figure 1**).

Organisations involved

Thirty-one (31) organisations from across Australia contributed data. These organisations were operating in the following states and territories (note some organisations operate in multiple states and territories): ACT (n = 1); NT (n = 1); NSW (n = 8); QLD (n = 6); VIC (n = 12); SA (n = 6); TAS (n = 2); and WA (n = 3).

Data collected

Of the 1020 incidents reported over the 12-month period, 117 were related to campcraft activities. Thirty-six of these incident reports had sufficient detail to be code further using the UPLOADS accident analysis method (see Figure 1). Of the 36 incidents, 67% (n = 24) involved an injury, 17% (n = 6) involved an illness and another 17% (n = 6) involved a near miss. Injuries and illnesses noticed during campcraft, but not related to campcraft activities (e.g. dehydration, severe muscle soreness), were not included in this report.

Results

Incident rate

In the overall UPLOADS dataset, campcraft had the second highest injury-causing incidence rate (5.6 incidents per 1000 participants) with walking/running in the outdoors as the highest injury-causing incidence rate (7.9 incidents per 1000 participants). The average reported injury rate for all led outdoor activities was 2.1 per 1000 participants. This means that there was approximately 3.5 more injury-causing incidents reported for every thousand participants involved in campcraft activities, compared to all led outdoor activities overall.

Occurring at an incidence rate of 3.0 incidents per 1000 participants, campcraft had the second highest illness incidence rate in all outdoor led activities (camping in tents had the highest illness rate with 6.3 incidents per 1000 participants reported). Across all activities, the mean reported illness rate was .57 incidents per 1000 participants. This means that, on average, there were 2.4 more incidents of illness reported for every thousand participants involved in campcraft alone, compared to all led outdoor activities combined.

In total, 8 campcraft-related near miss incidents were reported over the 12-month period, occurring at an incidence rate of .77 incidents per 1000 participants. In comparison, across all activities the mean reported illness rate was .23 incidents per 1000 participants. This means that, on

average, there were .54 more near miss incidents reported for every thousand participants involved in campcraft alone, compared to all led outdoor activities combined.

Contributory factors

Just over one third (n = 36) of the reported incidents associated with campcraft had sufficient detailed information to support further analysis with the UPLOADS Accident Analysis Method. Contributory factors were found at the four lower levels of the UPLOADS Accident Analysis Framework (1. Equipment, environment and meteorological conditions; 2. Decisions and actions of leaders, participants and other actors at the scene; 3. Supervisory and management decisions and actions; and 4. Local area government, schools, parents & carers and higher level management). The most frequently identified factors at each level were: Equipment, Clothing and Personal Protective Equipment (identified in 58% of incidents analysed); Activity Participant Experience and Competence (identified in 33% of incidents analysed); Supervisors/Field Managers Activity or Program Design (identified in 8% of incidents analysed); Parents & Carers: Communication (identified in 6% of incidents analysed).

Conclusion

There are a number of important conclusions that can be drawn from these analyses presented. Firstly, based on analysis of the first 12 months of incident data reported through UPLOADS, campcraft activities represent an important area of focus for incident prevention efforts in the Australian led outdoor activity sector. Secondly, campcraft-related incidents have various contributory factors related to the activity environment and equipment (e.g. cooking equipment, boiling water, fire), the activity leader (e.g. instructions provided), activity participants (e.g. experience and competence), supervisors/field managers (e.g. program design), and parents/carers (e.g. the communication of important dietary information). Thirdly, these findings suggest that campcraft incident prevention interventions should focus on the equipment being used during campcraft

activities (e.g. cooking equipment), the ability of participants to safely undertake campcraft activities (e.g. ability to handle cooking equipment, utensils), briefing and supervisory activities related to campcraft activities, and the information requirements surrounding campcraft activities, such as dietary needs, existing illnesses, and allergies. Finally, preventing future campcraft-related incidents through targeted countermeasures that address the whole system is a complex endeavour. It is therefore recommended that a network of countermeasures be used to tackle campcraft-related incidents. This network should include interventions targeted at least at the four lower levels of the led outdoor sector system (see Figure 1).

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Introduction

For the past six years, the authors have been engaged in a major program of research that aims to tackle issues around injury causation and incident reporting and analysis in the led outdoor activity (LOA) sector in Australia. Known as UPLOADS, one of the major goals is to develop an incident reporting system that allows LOA providers in Australia to contribute incident data to a National Incident Dataset. An important component of this involves reporting trends or key issues to the sector as and when they emerge in the data. Analysis of the UPLOADS National Incident Dataset for the period between the 1st of June 2014 and 31st of May 2015 (see van Mulken et al, 2016) showed that campcraft (e.g. cooking and campfires) represented the second highest category of injury-causing incidents, with an incidence rate of 5.6 incidents per 1000 participants. The average overall injury-causing incidence rate across the dataset was 2.1 incidents per 1000 participants. This means that there were approximately 3.5 more injury-causing incidents reported for every thousand participants involved in campcraft activities, compared to all led outdoor activities overall.

Accordingly, it was decided to further examine the campcraft-related incident data to produce a detailed report. This report provides the key findings and themes around the injuries, illnesses and near miss incidents related to campcraft. The aims of this report are: to present the findings from an analysis of the campcraft incident data contributed in the period between the 1st of June 2014 and 31st May 2015; to provide a holistic and in-depth understanding of these campcraft-related incidents that occurred within led outdoor activities in Australia; and to promote discussion within the sector regarding potential prevention strategies.

Method

Design

Self-nominated personnel from participating organisations used the incident reporting system to collect data for 12 months (1st June 2015 to 31st May 2015). The University of the Sunshine Coast Human Ethics Committee approved the study.

Recruitment

Organisations were invited to participate via peak body and professional membership association newsletters. Interested organisations were asked to invite a senior staff member who held a safety-related role to participate in the study. This person, thereafter referred to as 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-three (43) organisations signed up to participate for the 1st June 2014 –31st May 2015 period.

Data collection

Two incident reporting and learning systems were developed to meet the needs of the diverse Australian outdoor education and recreation sector: the UPLOADS Software tool and UPLOADS Lite. The mandatory information captured by both systems 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 completely anonymous incident reports. Organisations are also able to save the data they enter for their own records. Participation data is submitted at three monthly intervals using an Excel spreadsheet.

Incident data

Organisations were instructed to record incidents associated with adverse outcomes and near miss incidents. Definitions of incident, adverse outcomes, and near miss are presented in Table 1.

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 (e.g. the actual outcome of the event) and potential severity (e.g. the worst possible outcome, given the scenario), using the incident severity scale as shown in Table 2. So 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 to risks 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 to risks can cause moderate injuries or illnesses.
3 Serious	Requires timely external care (evacuation) with medium to long term effects.	An incident where the potential outcome to risks encountered is such that it may cause major irreversible damage or threaten life.
4 Severe	Requires urgent emergency assistance with long term effects.	An incident where the potential outcome to risks encountered is certain death.
5 Critical	Requires urgent emergency assistance with serious ongoing long term effects.	NA
6 Unsurvivable	Fatality.	NA

The UPLOADS software tool captures the incident-related information described in Table 3.

Table 3: Information captured concerning incidents by UPLOADS

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)
<i>2.1. Outcomes involving injuries, illnesses or social/psychological damage</i>
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
Was emergency services called?
<i>2.2 Outcomes involving missing or overdue people</i>
Were clients or staff missing or overdue?
Were Emergency Services contacted/engaged in search?
<i>2.3 Outcomes involving equipment loss/damage</i>
Was equipment lost/damaged?
<i>2.4 Outcomes involving environmental damage</i>
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

Organisations recorded the total number of participants and participation days for each activity conducted during a calendar month. A participation day was defined as a day on which a participant was exposed to the activity (Dickson, 2012). 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). Participation days were not included in the analysis, as the initial check of the data revealed that some values were outside the range of possible values (i.e. indicating that data had been entered incorrectly).

Data analysis

Demographic statistics were calculated in SPSS statistics (version 21) using the participation data supplied by each organisation. This included participant age and gender; size of group; number of supervisors present; and the qualifications of group leaders. The de-identified incident 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 to calculate frequencies for each variable.

Two researchers from the University of the Sunshine Coast used the UPLOADS accident analysis method (see Figure 1) to code the qualitative data provided in each report. This involved identifying contributing factors and relationships from each report, and using the taxonomy in Figure 1 to classify them. Each researcher checked the other's coding and the few disagreements were resolved through discussion. Frequency counts of the number of incidents associated with each factor and relationship were then calculated. The factors and relationships were then represented on the framework for injuries, illnesses and near misses incident reports.

Participation data was merged into a single Excel file. For campcraft, incidence rates and severity ratings were calculated for each incident type. Incidence rates were calculated per 1000 participants $((\text{number of incidents}/\text{number of participants}) \times 1000)$ for each activity. Locations of physical injuries were mapped using data from the incident reports to inform anatomical diagrams constructed in Visio. Frequencies of confounding factors such as weather conditions and activity goals were also calculated for all incident types.

<p><i>Government departments</i></p>	<div style="border: 1px solid black; padding: 5px;"> <p>State and Federal Government</p> <ul style="list-style-type: none"> • Communication • Funding and budgets • Infrastructure and land management • Policies and legislation • Other </div>				
<p><i>Regulatory bodies and associations</i></p>	<div style="border: 1px solid black; padding: 5px;"> <p>Regulatory bodies and Associations</p> <ul style="list-style-type: none"> • Accreditation/licensing • Auditing • Communication • Curriculum of outdoor education/recreation qualifications • Funding and budgets • Interactions with government • Standards and code of practice • Other </div>				
<p><i>Activity centre management planning and budgeting, local area government, parents and schools</i></p>	<div style="border: 1px solid black; padding: 5px;"> <p>Higher-level Management</p> <ul style="list-style-type: none"> • Communication • Financial constraints • Judgement and decision-making • Organisational culture • Policies and procedures for activities and emergencies • Risk assessment and management • Staffing and recruitment • Supervision of staff (e.g. Activity Leaders, Field Managers) • Supervision/oversight of activities and programs • Training and evaluation of staff (e.g. Activity Leaders, Field Managers) • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Local Area Government</p> <ul style="list-style-type: none"> • Auditing • Communication • Funding and budgets • Legal responsibility for safety within the council area • Policies and procedures • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Schools</p> <ul style="list-style-type: none"> • Communication • Dropping off/picking up participants • Judgement and decision-making • Legal responsibility for safety of staff and students • Planning and preparation for activity/trip • Policies and procedures • Teacher/student ratio • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Parents/carers</p> <ul style="list-style-type: none"> • Communication • Dropping off/picking up participants • Judgement and decision-making • Legal responsibility for safety of child • Planning and preparation for activity/trip • Other </div>	
<p><i>Supervisory and management decisions and actions</i></p>	<div style="border: 1px solid black; padding: 5px;"> <p>Supervisors/Field Manager</p> <ul style="list-style-type: none"> • Activity or Program design • Communication • Compliance with procedures, violations & unsafe acts • Experience, qualifications, competence • Judgement and decision-making • Mental and physical condition • Planning & preparation for activity • Supervision of activity leaders and other staff • Supervision/oversight of programs/activities • Other </div>				
<p><i>Decisions and actions of leaders, participants and other actors at the scene of the incident</i></p>	<div style="border: 1px solid black; padding: 5px;"> <p>Activity Leader</p> <ul style="list-style-type: none"> • Communication, instruction & demonstration • Compliance with procedures, violations & unsafe acts • Experience, qualifications, competence • Judgement and decision-making • Mental and physical condition • Planning & preparation for activity/trip • Situation awareness • Supervision/leadership of activity • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Activity Participant</p> <ul style="list-style-type: none"> • Communication & following instructions • Compliance with procedures, violations & unsafe acts • Experience & competence • Judgement and decision-making • Mental and physical condition • Planning & preparation for activity/trip • Situation awareness • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Other People in Activity Group (not actively participating)</p> <ul style="list-style-type: none"> • Communication & following instructions • Compliance with procedures, violations & unsafe acts • Experience, qualifications, competence • Judgement and decision-making • Mental and physical condition • Planning & preparation for activity/trip • Situation awareness • Supervision of activity • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Activity Group Factors</p> <ul style="list-style-type: none"> • Communication within group • Group composition • Group dynamics • Group size • Late arrival of group • Teamwork • Time pressure • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Other People in Activity Environment (not in Activity Group)</p> <ul style="list-style-type: none"> • Communication • Compliance with procedures, violations & unsafe acts • Experience, qualifications, competence • Judgement and decision-making • Mental and physical condition • Planning & preparation • Situation awareness • Other </div>
<p><i>Equipment, environment and meteorological conditions</i></p>	<div style="border: 1px solid black; padding: 5px;"> <p>Activity Equipment and Resources</p> <ul style="list-style-type: none"> • Documentation • Equipment, clothing and Personal Protective Equipment • Food & drink • Medication (for those involved in the activity) • Other </div>	<div style="border: 1px solid black; padding: 5px;"> <p>Activity Environment</p> <ul style="list-style-type: none"> • Animal & insect hazards • Infrastructure & terrain • Trees and vegetation • Water conditions • Weather conditions • Other </div>			

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

How to read this report

The report begins by presenting an overview of the organisations that contributed data and the data collected. The report then provides an overview of the data collected and a summary of the characteristics of the campcraft-related incidents involved. This is followed by an analysis of the contributing factors involved in the campcraft-related incidents. The analysis of the contributing factors includes a diagram of the contributing factors and relationships between them (referred to as an Accimap), and tables which provide specific examples of the contributing factors and relationships that are represented in the diagram.

Reading the Accimaps and Tables

The Accimaps represent a summary of the network of contributing factors and relationships that were identified in the incidents. The boxes include information detailing the number of times each category of contributing factor was identified across all of the incidents reported. The boxes shaded in grey represent categories of contributory factors that were identified in more than one incident. The lines linking the boxes represent relationships between the contributing factors as identified by the activity providers. These relationships describe how contributing factors are influenced by other contributing factors. For example, a line between “Activity Equipment & Resources: Equipment, clothing and Personal Protective Equipment” and “Higher Level Management: Financial Constraints” could indicate (the corresponding Tables provide a more detailed description of each relationship) that old equipment was not replaced by new equipment due to financial constraints. The lines also show the number of times a relationship was identified across all of the incidents, and are bold when a relationship was identified in more than one incident.

To better understand the Accimaps, it is recommended that you look at the corresponding Tables which provide specific examples of contributing factors and relationships derived from the incidents reported. This information describes the specific problems that were identified by the activity providers as causing the incidents. The Tables discuss the contributing factors and

relationships from top (i.e. higher levels in Accimap) to bottom (i.e. lower levels in Accimap) and (generally) from left to right. This means that if you, for example, wish to find more information around the relationship between “Supervisor/Field Manager: Activity Design” and “Activity Participant: Mental and Physical Condition”, then you would have to look in the relationships Table related to “Supervisor/Field Manager: Activity Design”. By reading the Accimaps and Tables together, you can get an overview of all the factors that are contributing to incidents during led outdoor activities, and the specific issues underpinning them.

Results

Sample of organisations contributing data

Thirty-one organisations from across Australia contributed data. These organisations were operating in the following states and territories (note that some organisations operate in multiple states and territories): ACT (n = 1); NT (n = 1); NSW (n = 8); QLD (n = 6); VIC (n = 12); SA (n = 6); TAS (n = 2); and WA (n = 3). Five organisations identified as schools, and eight organisations identified as registered training organisations (e.g. TAFE, University). Eleven organisations identified as not-for-profits, 13 identified as commercial enterprises, and four as government agency or public sector organisations.

System administrator demographics

The majority (71%) of system administrators were male (22 male, 9 female), with a median of 16.9 years’ experience in the outdoor sector (range: 4 to 28 years). Thirty held a management role within their organisation, and 24 led activities as part of their current role.

Overview of data collected

In total, 117 incidents relating to campcraft activities were recorded over the reporting period. The number of reports associated with each type of incident outcome (e.g. near miss, injury, illness etc.) is presented in Figure 2.

Incidents associated with social or psychological outcomes (n = 3), equipment damage (n = 0), and environmental damage (n = 0) were excluded from further analysis due to the low number of reports.

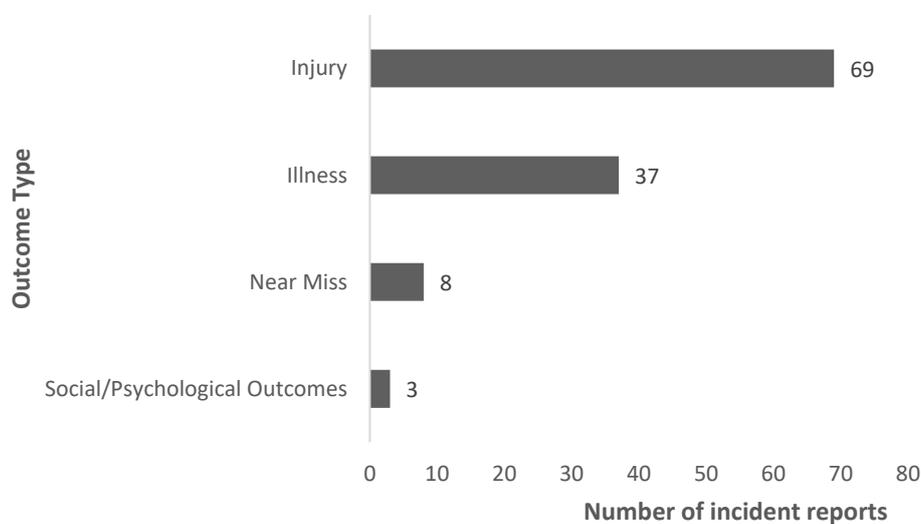


Figure 2: Number of campcraft-related incident reports associated with each type of incident outcome.

Incidents by reporting quarter

Figure 3 shows the number of incidents reported in each quarter. The majority of the incidents occurred during the third quarter (i.e., July through September; n = 60), followed by the second (April through June) and fourth (October through December) quarter (n = 34 and 14, respectively). The lowest number of incidents were reported in the first quarter (January through March; n = 9).

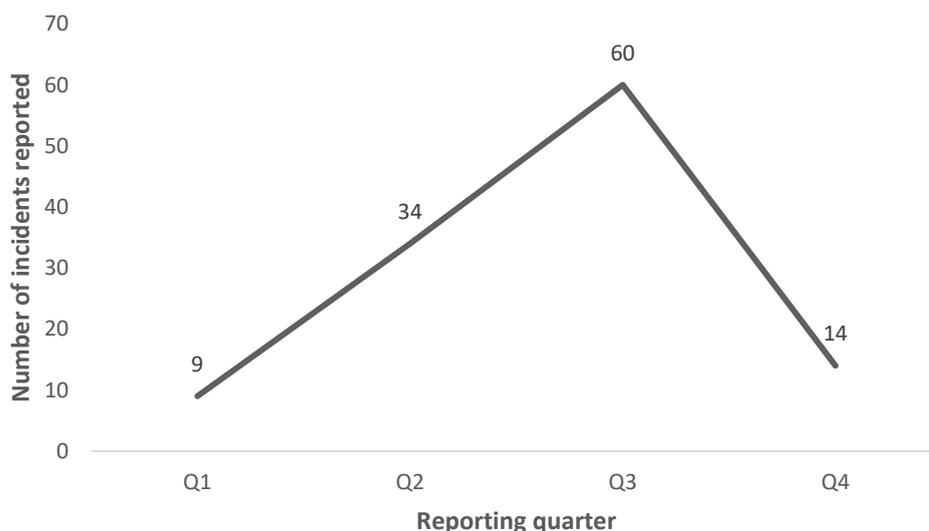


Figure 3: Number of reports associated with campcraft-related incidents over the four reporting quarters.

Overview of incidents associated with campcraft-related injuries

Of the 69 campcraft-related injuries reported, 56 were recorded within the 12-month reporting period (the additional 13 were incidents which occurred prior to 1st June 2014 and were not included in the incidence rate calculations). Campcraft had the second highest injury-causing incidence rate (5.6 incidents per 1000 participants) after walking/running in the outdoors which had an incidence rate of 7.9 incidents per 1000 participants. The average reported injury rate for all led outdoor activities was 2.1 per 1000 participants. This means that there was approximately 3.5 more injury-causing incidents reported for every thousand participants involved in campcraft activities, compared to all led outdoor activities overall. Figure 4 presents a summary of the injury-causing incidence rate per 1000 participants by activity type for the past 12-month reporting period. Injury-causing incidents not related to an activity or program are excluded from the figure below (n = 27). Notably, just over half (55%) of all activities recorded had an injury-causing incidence rate of ≤ 1 per 1000 participants.

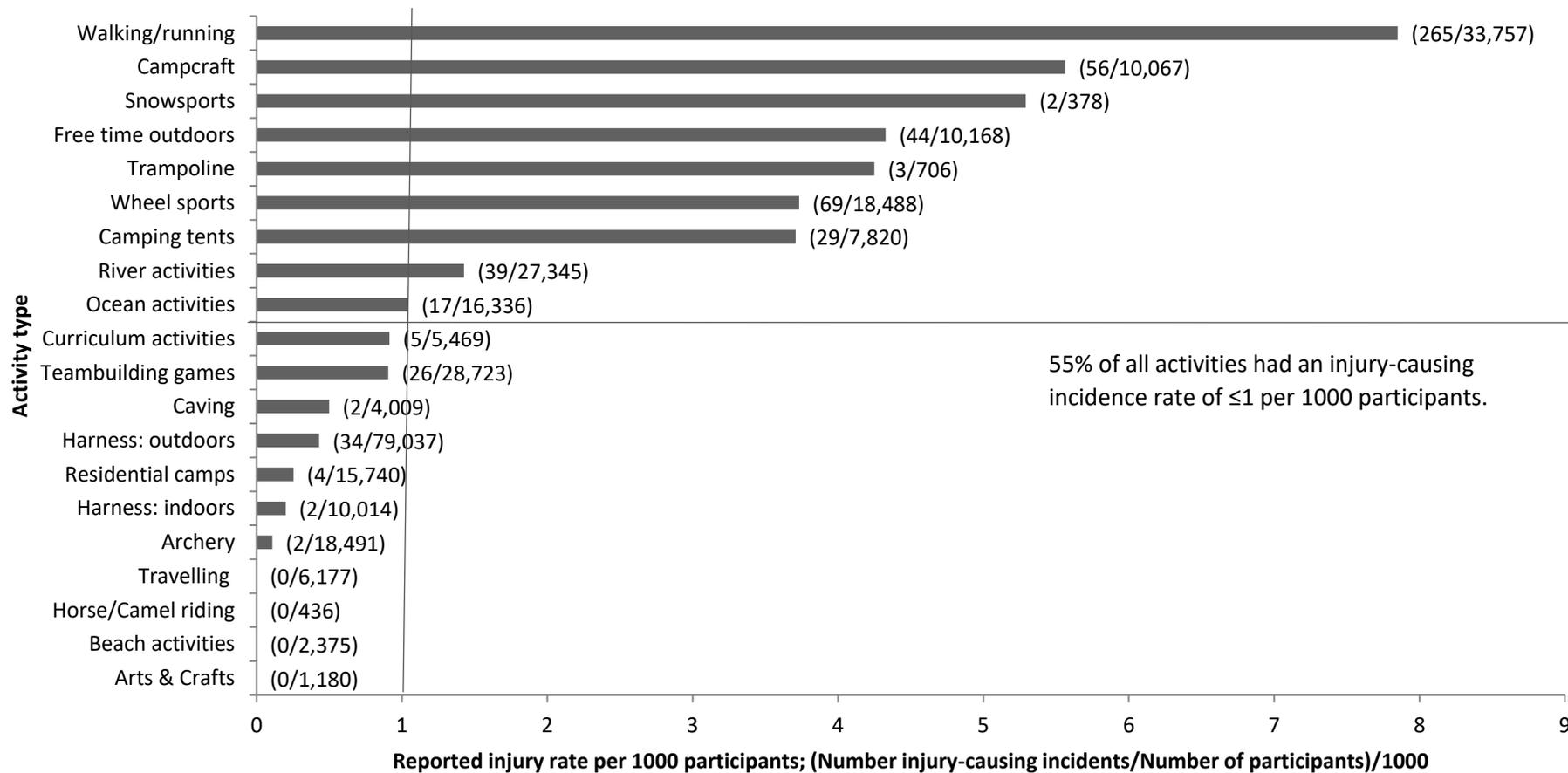


Figure 4: Injury-causing incidence rates per 1000 participants by activity type (June 2014 – May 2015). Numbers in brackets represent the number of reported injury-causing incidents and the number of reported participants associated with the activity, respectively.

Actual severity ratings for injury-causing incidents

Figure 5 shows a histogram of actual severity scores for all of the reported campcraft-related injuries (n = 69). The median severity was 1 (range: 1 to 3) indicating that the majority of injuries required only localised care with short term effects.

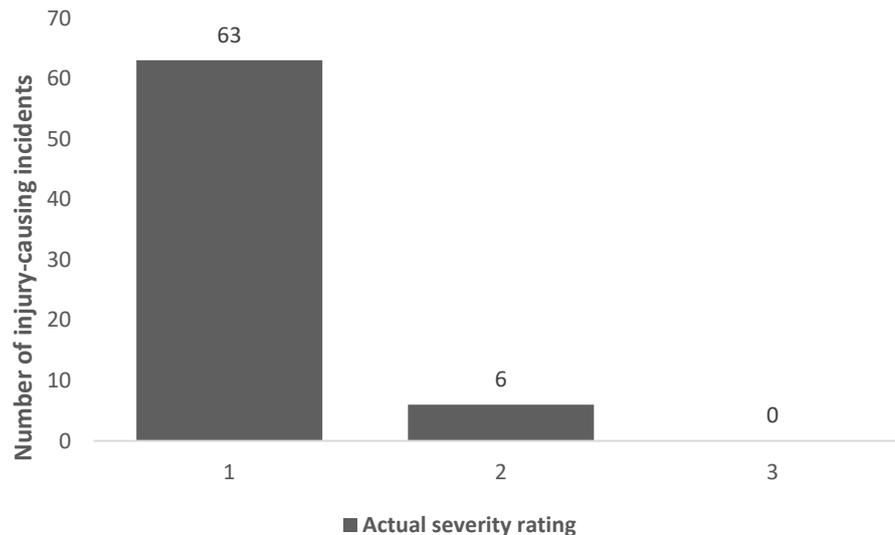


Figure 5: Actual severity ratings for campcraft-related injuries.

These ratings are supported by the findings regarding evacuation, hospitalisation and emergency services. Six (9%) injury-causing incidents were reported as requiring evacuation (Vehicle = 4; Walked out = 1; Boat = 1). Of which, only 4 required hospitalisation and none required Emergency Services.

Injury type and location of campcraft-related injuries

Figure 6 shows the type of campcraft-related injuries sustained according to body location and number of people injured. Highlighted in red are the body locations associated with the most injury causing incidents. In addition to those shown on the diagram, 6% of the sample sustained injuries to unspecified body regions (n = 4).

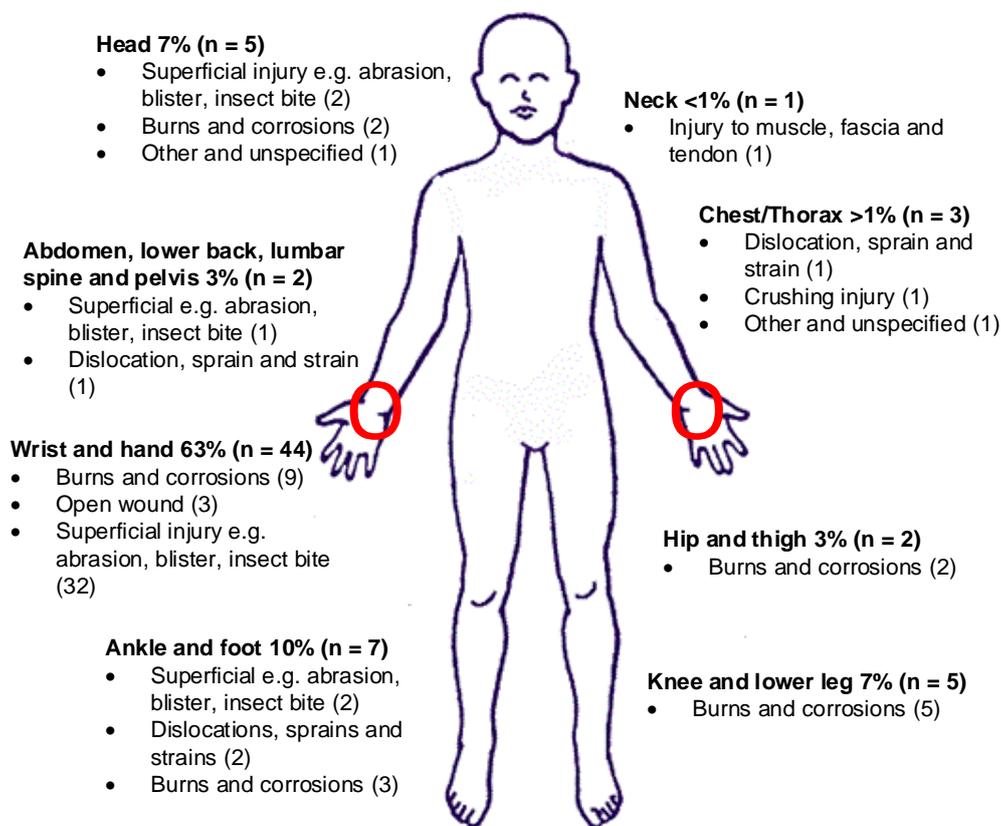


Figure 6: Type of campcraft-related injuries sustained according to body location. Most frequently injured location/s are highlighted by a red circle.

Demographic information for people injured during campcraft activities

The reports included details on 47 injured people (22 of the reports had missing details on the person injured); Figure 7 shows the number of people injured by role, partitioned by gender. The majority of the injured Activity Participants were female (29 female, 11 male), with a median age of 16 years (range: 12 to 45 years). The other roles (e.g., Activity Leaders, Staff) were evenly split in terms of gender (female = 3, male = 4) with a median age of 23 (range: 15 to 58 years).

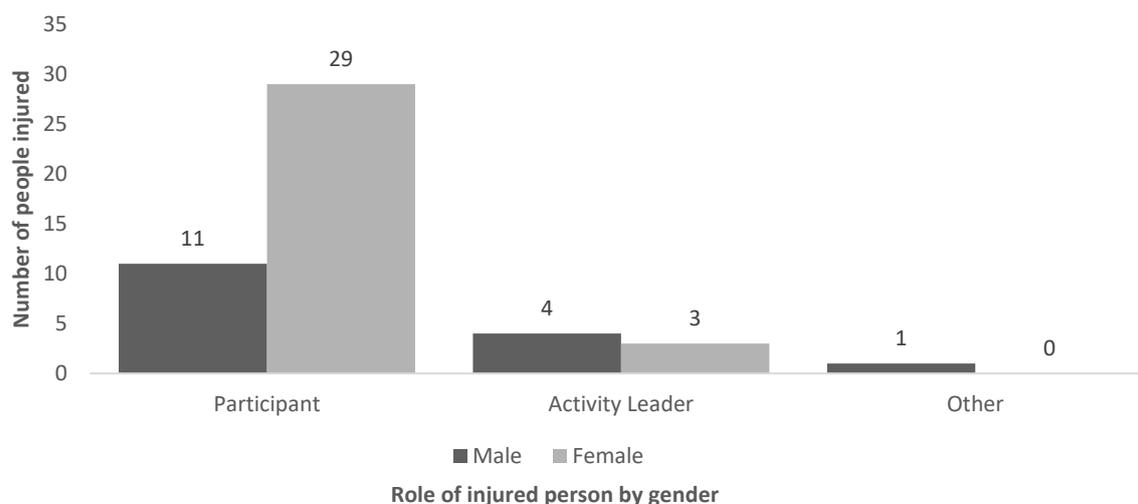


Figure 7: Number of people with a campcraft-related injury by role, partitioned by gender.

Weather for injury-causing incidents related to campcraft

Weather at the time of the incident was rated on a 4-point scale across three dimensions (Rain, Temperature, and Wind). The majority of injury-causing incidents occurred when there was an absence of rain (66%); a moderate temperature (66%), and no or minimal wind (59%).

Goals for injury-causing incidents related to campcraft

Eighteen incident reports provided sufficient details regarding activity objectives and were within the goals of the activity (e.g., cooking, preparing meals). In the remaining 52 reports, data around activity goals were missing. No further analysis was undertaken.

Profile of activity group for injury-causing incidents related to campcraft

The mean number of participants involved in campcraft activities associated with injury-causing incidents was 20.6 (range: 1 to 145, n = 70 incidents), the mean number of activity leaders was 1.7 (range: 1 to 3, n = 60 incidents), supervisors (e.g. teachers) was .9 (range: 1 to 4, n = 56

incidents) and there were 4 volunteers (e.g. parents). There was a ratio of 1 activity leader for every 9 participants in campcraft-related injuries.

In 86% of incidents (n = 59), the Activity Leader was reported to have relevant qualifications. In the remaining 14% of incidents (n = 10) qualifications were reported to be “not applicable”. It is unclear why campcraft was deemed to not require a leader with appropriate qualifications.

Overview of incidents associated with campcraft-related illnesses

Of the 37 reported campcraft-related incidents associated with illness, 31 were recorded within the 12-month reporting period. Occurring at an incidence rate of 3.0 incidents per 1000 participants, this was the second highest illness incidence rate in all outdoor led activities, after camping in tents (6.3 incidents per 1000 participants). Across all activities, the mean reported illness rate was .57 incidents per 1000 participants. This means that, on average, there are 2.4 more incidents of illness reported for every thousand participants involved in campcraft alone, compared to led outdoor activities combined.

Figure 8 presents a summary of the illness rate per 1000 participants by activity type. Incidents associated with illnesses not related to an activity or program (n = 30) are excluded from the figure below. Notably, just under half (40%) of all activities recorded were not associated with any illnesses.

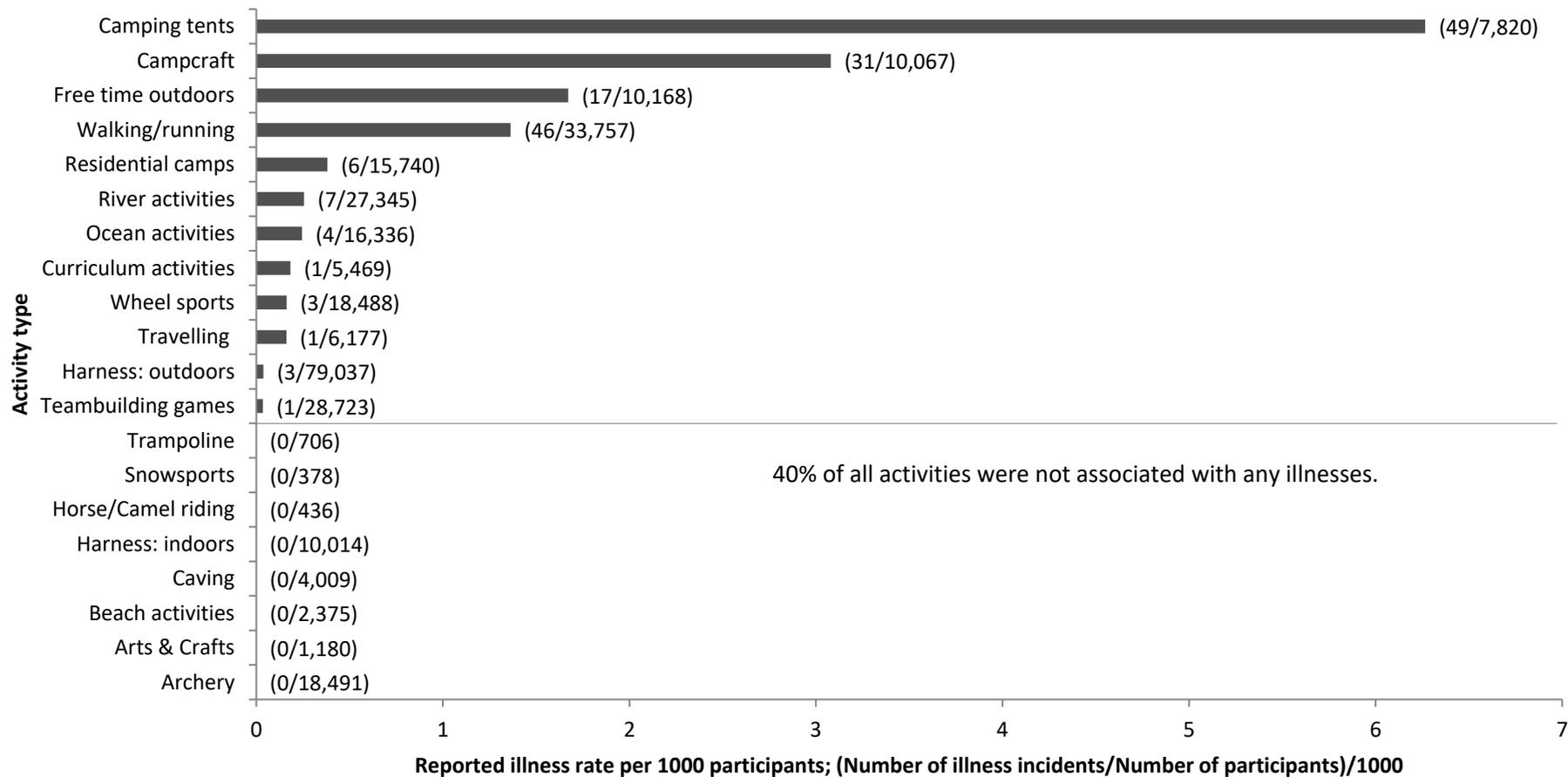


Figure 8: Illness rates per 1000 participants by activity type (June 2014 – May 2015). Numbers in brackets represent the number of reported incident associated with illnesses and the number of reported participants associated with the activity, respectively.

Actual severity ratings for incidents associated with campcraft-related illnesses

Almost all (n = 35) campcraft-related incidents had an actual severity rating of 1 (range: 0 to 3), indicating that the majority of illnesses required only localised care with short term effects. The remaining two incidents had a severity rating of 2 (see Figure 9). These ratings are supported by the findings regarding evacuation, hospitalisation and emergency services as none of the campcraft-related illness incidents required these services.

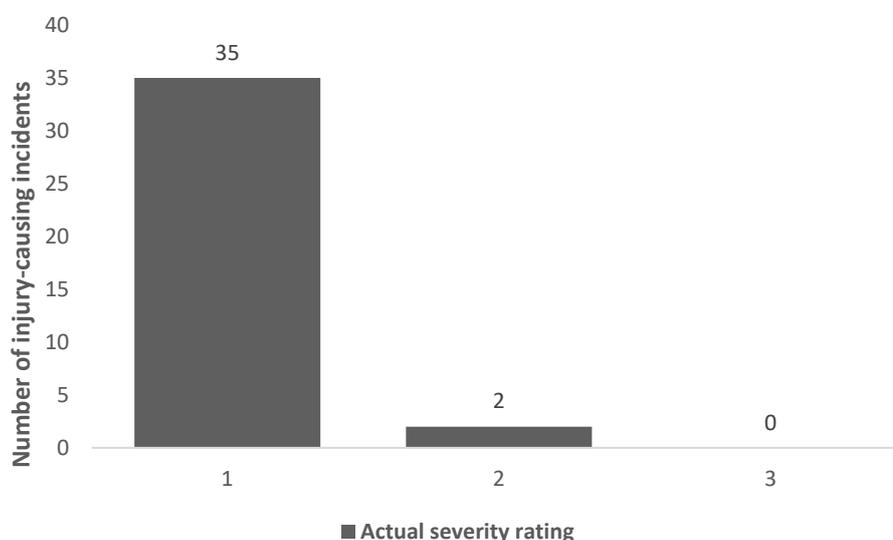


Figure 9: Actual severity ratings for campcraft-related illnesses.

Illness type

Of the 37 incidents associated with illnesses, 14 reported illness type (21 incidents were reported as “unknown”; 2 had missing data). The following illness types were reported: abdominal problem (n = 4); allergic reaction (n = 4); menstrual (n = 4); respiratory/chest pain (n = 1); and non-specific fever (n = 1).

Demographic information for ill people

The reports included details on 27 ill people (see Figure 10). In terms of their roles, 19 ill people were classified as Participants, 6 were Activity Leaders, and there was one Teacher and one Casual

Staff Member. All ill Participants were female, with a median age of 16 years (range: 13 to 18). Gender was evenly split in all other roles (4 female, 4 male). The median age of people within these roles was 27 (range: 15 to 44 years).

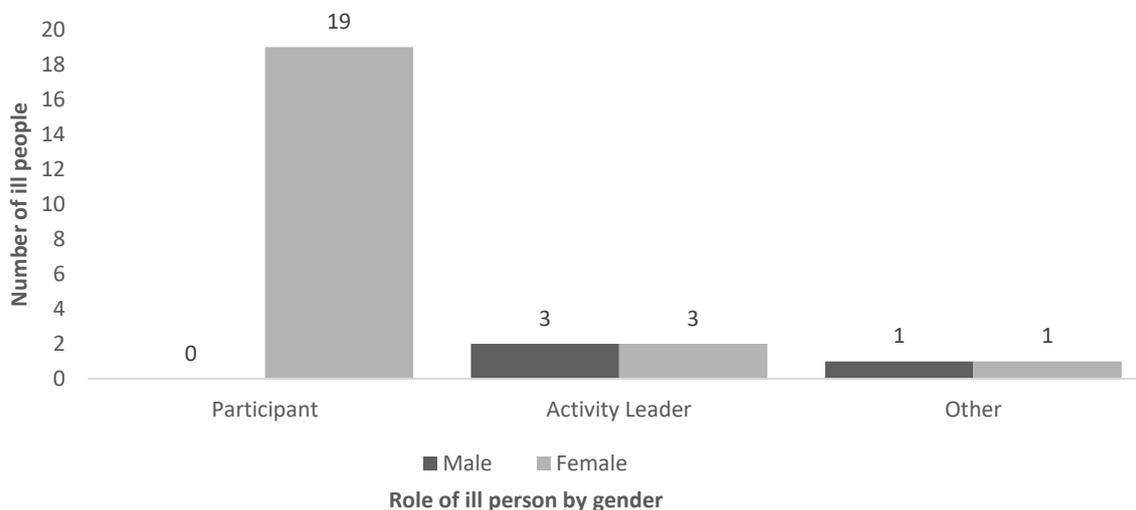


Figure 10: Number of people with a campcraft-related illness by role, partitioned by gender.

Weather for incidents associated with campcraft-related illnesses

Weather at the time of the incident was rated on a 4-point scale across three dimensions (Rain, Temperature, and Wind). The majority of illnesses occurred when there was an absence of rain (71%); a moderate temperature (84%), and no or minimal wind (68%).

Goals for incidents associated with campcraft-related illnesses

The majority of incidents associated with illnesses were missing details regarding the goals associated with the activity (n = 34 missing classification). Of the goals that were listed, goals were related to mealtimes (i.e., having breakfast, lunch, or dinner; n = 3). No further analysis was undertaken.

Profile of activity group for incidents associated with campcraft-related illnesses

The mean number of participants involved in activities associated with illnesses was 17 (range: 9 to 23), the mean number of Activity Leaders was 1.8 (range: 0 to 2), Supervisors (e.g. teachers) was .8 (range: 0 to 2). There were no volunteers (e.g. parents) involved with campcraft-related incidents associated with illnesses. There was a ratio of 1 Activity Leader for every 8 participants in campcraft-related illness incidents. In almost all incidents (n = 35), the Activity Leader was reported to have relevant qualifications, in the remaining two incidents qualifications were reported to be “not applicable”. It is unclear why campcraft is deemed to not require a leader with appropriate qualifications.

Overview of campcraft-related near miss incidents

In total, eight campcraft-related near misses were reported over the 12-month period, occurring at an incidence rate of .77 incidents per 1000 participants. In comparison, across all activities the mean reported near miss incidence rate was .20 incidents per 1000 participants. This means that, on average, there are .57 more near miss incidents reported for every thousand participants involved in campcraft alone, compared to led outdoor activities combined.

Figure 11 presents a summary of the near miss incidence rate per 1000 participants by activity type. Five near miss incidents were not related to an activity or program, so were excluded from the figure. Notably, 35% of the activity types were not associated with any near miss incidents.

CAMPCRAFT: UPLOADS DATA 1st June 2014 – 31st May 2015

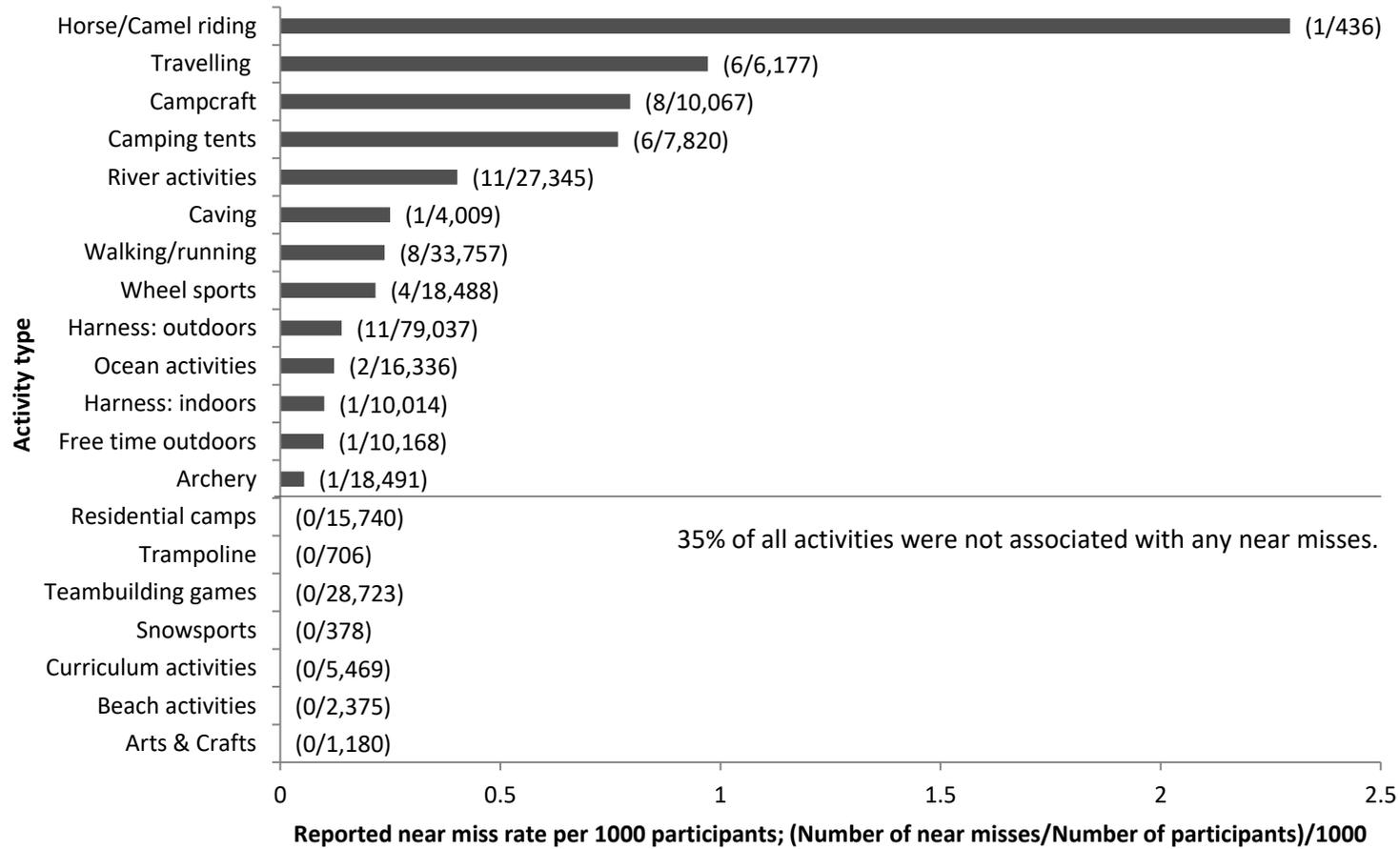


Figure 11: Near miss incidence rates per 1000 participants by activity type (June 2014 – May 2015). Numbers in brackets represent the number of reported incidents associated with near misses and the number of reported participants associated with the activity, respectively.

Potential severity of campcraft-related near miss incidents

Near misses were rated in terms of potential severity (i.e. the worst possible outcome, given the scenario). Figure 12 shows a histogram of potential severity scores for near miss incidents. The median severity was 3 (range: 0 to 6). A severity rating of 3 indicates an incident where the potential outcome to risks encountered is such that it may cause major irreversible damage or threaten life.

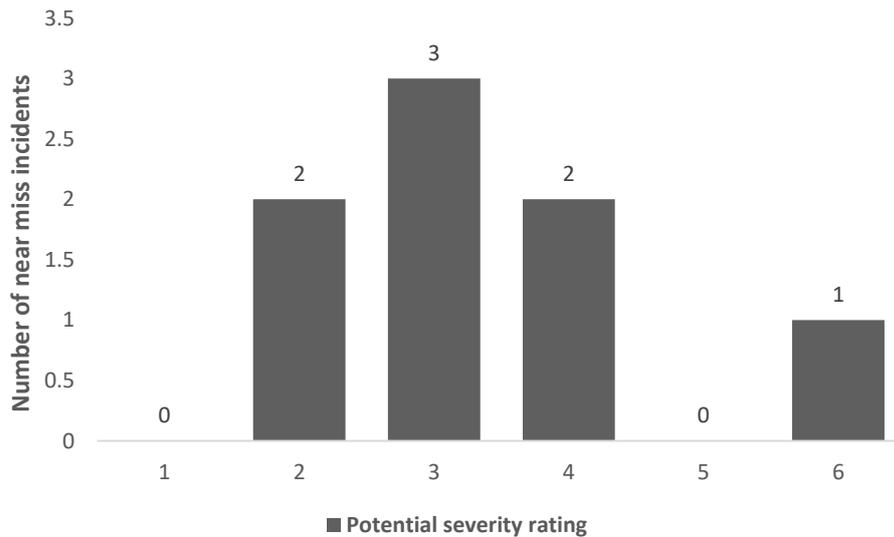


Figure 12: Potential severity ratings for campcraft-related near miss incidents.

Demographic information for campcraft-related near miss incidents

The reports included details on 6 people involved in near miss incidents. In terms of their roles, 2 identified as participants; 2 were activity leaders; one was a field/program manager; and one was a first year intern. Both participants were male, with a mean age of 12.5 years (range: 12-24 years). Both the intern and the field manager were male; and gender was evenly split in the activity leader role (see Figure 13).

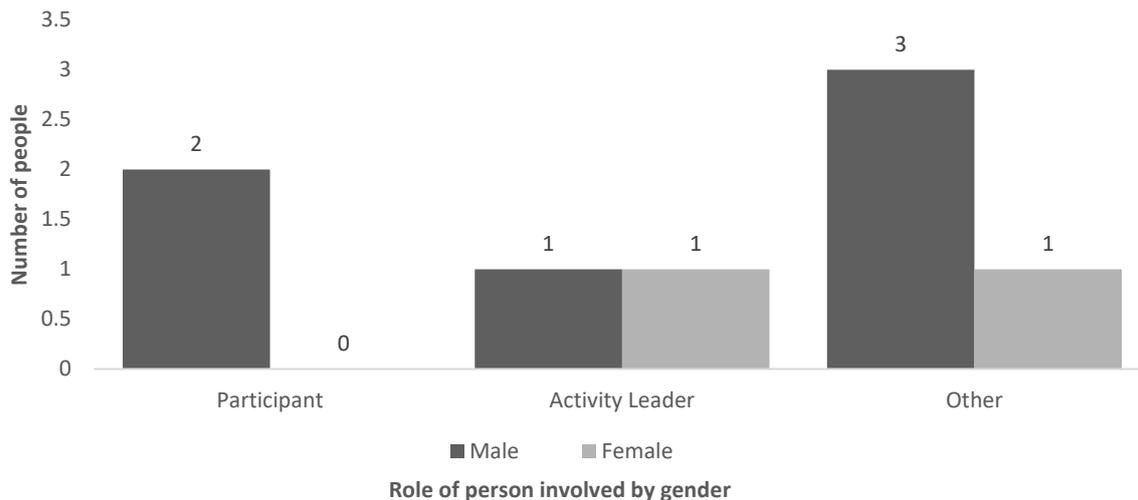


Figure 13: Number of people involved in campcraft-related near miss incidents by role, partitioned by gender.

Weather at the time of the campcraft-related incidents

Weather at the time of the incident was rated on a 4-point scale across three dimensions (Rain, Temperature and Wind). The majority of near misses occurred when there was an absence of or minimal rain (50%; “1” = 3, “2” = 1, “3” = 2, “4” = 0, missing = 2); a moderate temperature (50%; “1” = 0, “2” = 3, “3” = 1, “4” = 0, missing = 4), and no or minimal wind (50%; “1” = 4, missing = 4).

Goals for campcraft-related near miss incidents

The majority of incidents associated with near miss incidents were missing details regarding the goals associated with the activity (n = 6 missing classification). No further analysis was undertaken.

Profile of activity group for campcraft-related near miss incidents

The mean number of participants involved in activities associated with near misses was 12.8 (range: 0 to 23, n = 8 incidents) and the mean number of Activity Leaders was .9 (range: 0 to 2, n = 5 incidents). There were no Supervisors (e.g. teachers) or volunteers (e.g. parents) involved campcraft-

related incidents associated with near misses. There was a ratio of 1 Activity Leader for every 12 participants in campcraft-related near miss incidents.

In almost all campcraft-related near miss incidents (n = 7), qualifications were reported to be “not applicable” for the Activity Leader (only one incident reported that the Activity Leader had relevant qualifications). This is potentially a cause for concern, as it is unclear why campcraft was deemed to not require a leader with appropriate qualifications.

Contributing factors of campcraft-related incidents

One-hundred-seventeen campcraft (e.g. camping and cooking) incidents related to injury, illness or near miss occurred in the period from the 1st of June 2014 through to the 31st of May 2015. Of these incidents, only 31% (n = 36) of the incident reports included sufficient detail to be coded further using the UPLOADS accident analysis method (See Figure 1). Of these 36 incidents, 67% (n= 24) involved an injury, 17% (n = 6) involved an illness and another 17% (n = 6) involved a near miss. A summary of the contributory factors and relationships identified is presented in Figure 14.

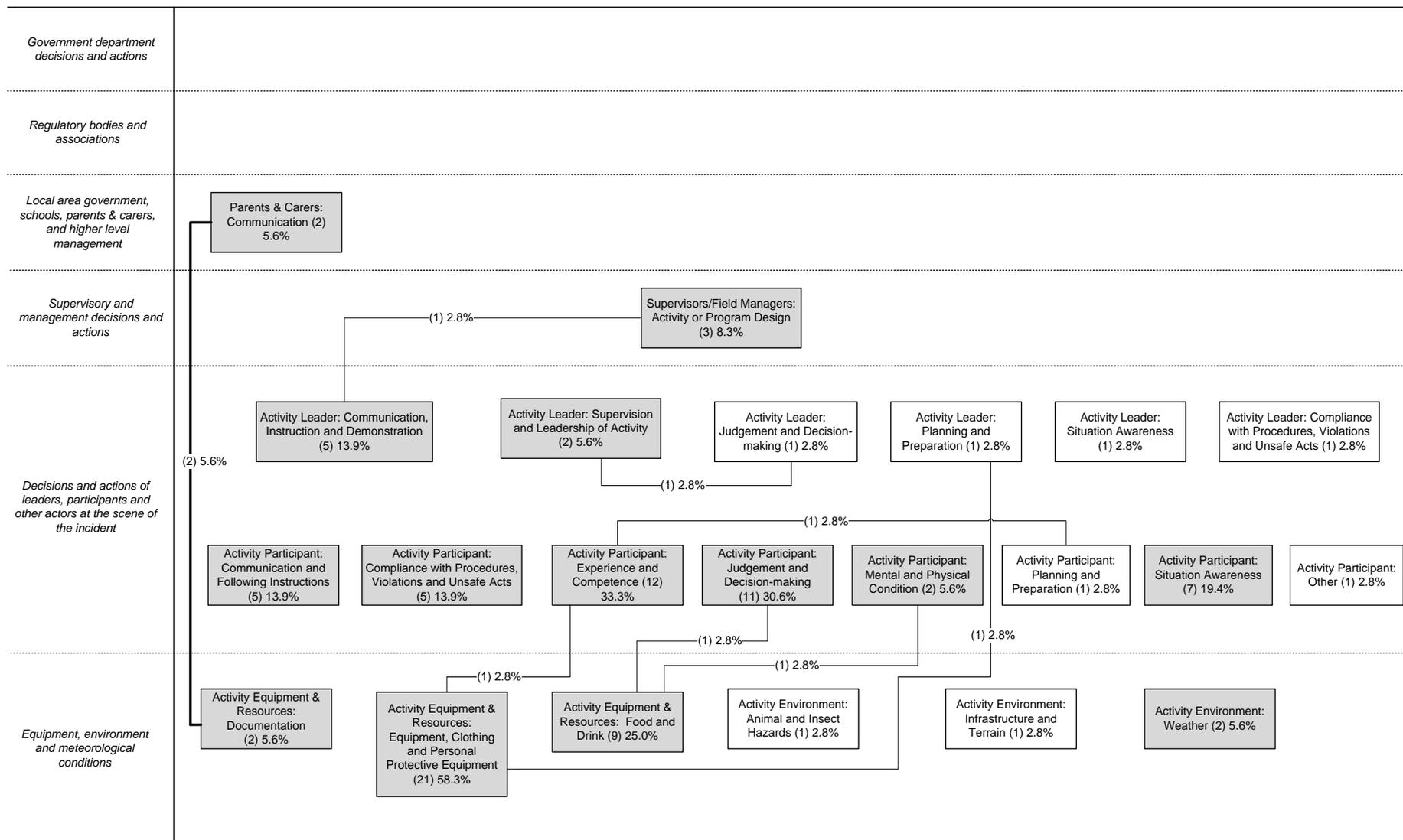


Figure 14: Factors and relationships identified which contributed to incidents (n=36). Factors identified in more than one report are shaded in grey, and relationships identified in more than one report are bolded.

Government Department Decisions and Actions, and Regulatory Bodies and Associations

No reports identified factors at the Government Department or Regulatory Body levels that contributed to an injury.

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

Two reports identified a factor at the ‘Local Area Government, Schools, Parents & Carers, Higher Level Management’ level, which contributed to an illness. Both reports stated that the parents had not listed certain information on the medical form, which had contributed to the participants’ illness.

One relationship was identified between ‘Parents & Carers: Communication’, and ‘Activity Equipment & Resources: Documentation’, which influenced the conduct of activities. This is shown in Table 4.

Table 4: The relationships between “Parents & Carers: Communication” and “Activity Equipment & Resources: Documentation”, influencing the conduct of activities

Factor 1	Factor 2	Examples	n
<i>Parents & Carers: Communication</i>	<i>Activity Equipment & Resources: Documentation</i>	<i>Parents did not notify this on the student’s medical or dietary form</i>	2

Supervisory and Management Decisions and Actions

Four reports identified factors at the ‘Supervisory and Management Decisions and Actions’ level which contributed to an injury. Table 5 shows the contributing factors underpinning each category at this level of the Accimap.

Table 5: Contributing factors related to each category represented on the Accimap at the “Supervisory and management decisions and actions” level

Category and contributing factors	n
<i>Supervisor/Field Manager: Activity or Program Design</i>	
Students were too inexperienced for program and no education or training was provided	2
Inherent risk of activity	2

One relationships was identified between ‘Supervisor/Field Manager: Activity or Program Design’ and a lower level factor in the system, which impacted the conduct of the activity and led to an injury. This is presented in Table 6.

Table 6: The relationships between ‘Supervisor/Field Manager: Activity or Program Design’ and factors at lower levels, influencing the conduct of activities

Factor 1	Factor 2	Examples	n
Supervisor/Field Manager: Activity or Program Design	Activity Leader: Communication, Instruction and Demonstration	<i>Prior to activity, it was not identified whether students had previous experience with food preparation, so the design did not include training on safe cutting techniques</i>	1

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

Thirty-one reports identified factors at the ‘Activity Leader, Participant and other Actors at the Scene’ level, which contributed to an incident (20 injuries, 6 illnesses and 5 near miss incidents).

The role of Activity Leaders

Table 7 shows examples of the contributing factors related to the Activity Leader categories.

Table 7: Contributing factors related to the “Activity Leader” categories

Category and contributing factors	n
Activity Leader: Communication, Instruction and Demonstration	
More instruction or briefing required for activity	4
Unclear instructions provided by Activity Leader	1
Dangers of activity were not communicated	1
Activity Leader: Supervision and Leadership of Activity	
Inadequate supervision or leadership (general)	2
Activity Leader: Judgement and Decision-making	
Decision to provide a known allergen food source to a participant	1
Activity Leader: Planning and Preparation	
Gas lead to BBQ was connected correctly	1
Activity Leader: Situation Awareness	
Insufficient awareness around hot water	1
Activity Leader: Compliance with Procedures, Violations and Unsafe Acts	
Failed to check whether cooking equipment was assembled correctly prior to use	1

Two relationships were identified between Activity Leader factors and a factor at an equal or lower levels in the system, which impacted the conduct of activities. These are presented in Table 8, including the type of incident involved.

Table 8: The relationships between Activity Leader factors and factors at lower levels, influencing the conduct of activities

Factor 1	Factor 2	Examples	n
Activity Leader: Supervision and Leadership of Activity	Activity Leader: Judgement and Decision-making	<i>Due to incorrect supervision, participant was not removed from the group earlier (injury)</i>	1
Activity Leader: Planning and Preparation	Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment	<i>Gas lead to BBQ was not connected correctly (near miss)</i>	1

The role of Activity Participants

Table 9 shows examples of the contributing factors related to the Activity Participant categories.

Table 9: Contributing factors related to the Activity Participant categories

Category and contributing factors	n
Activity Participant: Communication and Following Instructions	
Not following instructions (general)	3
Not attentive to activity briefing	1
Did not follow direction for correct sitting position	1
Activity Participant: Compliance with Procedures, Violations and Unsafe Acts	
Not using PPE gloves	2
Not complying with activity procedures	1
Not engaging with equipment safely	1
Accidentally hitting other participant with equipment	1
Activity Participant: Experience and Competence	
Lack of experience (general)	7
Inexperience with a Trangia	2
Inexperience with a can opener	1
Inexperience with lighting matches	1
Lack of experience with using a knife	1

Table 9 (cont.): Contributing factors related to the Activity Participant categories

Activity Participant: Judgement and Decision-making	
Actions and decisions around heat and fires involving food preparation	7
Judgement and decision-making (general)	3
Decision to remove hot marshmallow from stick	2
Activity Participant: Mental and Physical Condition	
Anxiety during campcraft activities	1
Food allergy	1
Activity Participant: Planning and Preparation	
Student was not sufficiently prepared for cooking on fires	1
Activity Participant: Situation Awareness	
Not paying attention to surroundings	4
Equipment inattention	2
Distraction	1
Activity Participant: Other	
Carelessness	1

Five relationships were identified between Activity Participant factors and factor at lower levels in the system, which impacted the conduct of activities. These are presented in Table 10.

Table 10: The relationships between Activity Leader factors and factors at lower levels, influencing the conduct of activities

Factor 1	Factor 2	Examples	n
Activity Participant: Experience and Competence	Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment	<i>Inexperience with this type of can opener was certainly a contributing factor (injury)</i>	1
Activity Participant: Experience and Competence	Activity Participant: Planning and Preparation	<i>Insufficient time spent in the camp and therefore insufficient readiness for cooking on fire (injury)</i>	1
Activity Participant: Judgement and Decision-making	Activity Equipment & Resources: Food and Drink	<i>Participant's haste to try our food combined with a lack of judgement on heat and hazard of fires (injury)</i>	1
Activity Participant: Mental and Physical Condition	Activity Equipment & Resources: Food and Drink	<i>Participant reported he had vomited in the past after eating creamy or cheesy food (illness)</i>	1

Equipment, Environment and Meteorological Conditions

Thirty-two reports identified factors at the ‘Equipment, Environment and Meteorological Conditions’ level which contributed to an incident (20 injuries, 6 illnesses and 6 near-miss incidents). The factors associated with Activity Equipment & Resources are presented in Table 11. The factors associated with Activity Environment are presented in Table 12.

Table 11: Contributing factors related to “Activity Equipment & Resources” categories

Category and contributing factors	n
<i>Activity Equipment & Resources: Documentation</i>	
Not enough detail on medical or dietary form	2
<i>Activity Equipment & Resources: Equipment, Clothing and Personal Protective Equipment</i>	
Burns related to cooking equipment (e.g. Trangia or hot pan)	13
Cuts or lacerations related to sharp equipment (e.g. knife, saw)	5
Lack of appropriate equipment	2
Faulty equipment	1
Slippery equipment	1
<i>Activity Equipment & Resources: Food and Drink</i>	
Hot food or water causing burns	6
Consumption of foods with allergy	2
Anxiety related to new or different food	1

Table 12: Contributing factors related to “Activity Environment” categories

Category and contributing factors	n
<i>Activity Environment: Animal and Insect hazards</i>	
Insect (unknown) bite during cooking	1
<i>Activity Environment: Infrastructure and Terrain</i>	
Tripped due to uneven terrain with exposed rocks	1
<i>Activity Environment: Weather</i>	
Rain necessitated the use of Trangia stoves	2

Four relationships were identified between factors at this level and higher levels in the system as shown in Table 8 and Table 10. No relationships were identified between ‘Activity Equipment & Resources’ and ‘Activity Environment’.

Discussion

Campcraft activities were found to have the second highest incidence rate in the UPLOADS 12-month National Trial (van Mulken et al, 2016). The aims of this report are to: present a detailed overview of all the campcraft (e.g. cooking and campfires) data identified in the UPLOADS National Incident Dataset during its first 12 months; to provide a holistic and in-depth understanding of these campcraft-related incidents that occurred within led outdoor activities in Australia; and to promote discussion within the sector regarding potential prevention strategies and countermeasures. To further promote this discussion, the following sections reflect on the key findings and themes and outline some of the key implications for the sector that can serve as guidance for future countermeasure development.

Incidence rates, contributing factors and solutions

Compared to the average incidence rates of 2.1 injuries per 1000 participants for all led outdoor activities combined, campcraft-related activities had an incidence rate of 5.6 injuries per 1000 participants. This means that, during the 12 month reporting period, there was approximately 3.5 more injury-causing incidents reported for every thousand participants involved in campcraft activities, compared to all led outdoor activities overall.

An analysis of the contributing factors underpinning campcraft injury, illness and near miss incidents identified contributing factors across the lower four levels of the UPLOADS accident analysis framework (see Figure 14). This means that the known contributing factors that interact to create campcraft-related incidents involve many actors including the activity environment, equipment, activity leaders, activity participants, supervisors/field managers, and parents/carers. It can therefore be concluded that the network of events preceding campcraft-related incidents involve the decisions and actions of many actors from across the overall system, rather than simply the outcome of participant or instructor actions. A key implication of this finding is that interventions developed by organisations and the sector need to focus on factors across the whole sector, rather than only on

instructors, equipment, and the environment. An example of this from the present analysis is the need for parents or carers to provide sufficient information requiring the dietary needs of activity participants.

Although a range of contributing factors were identified, it is worth examining those that were most frequently involved in the incidents analysed. The most frequently identified contributing factors at each level were: Level 1: Equipment, Clothing and Personal Protective Equipment (identified in 58% of incidents analysed); Level 2: Activity Participant Experience and Competence (identified in 33% of incidents analysed); Level 3: Supervisors/Field Managers Activity or Program Design (identified in 8% of incidents analysed); Level 4: Parents & Carers: Communication (identified in 6% of incidents analysed). These findings suggest that campcraft incident prevention interventions should focus on: the equipment being used during campcraft activities (e.g. cooking equipment); the ability of participants to safely undertake campcraft activities (e.g. ability to handle cooking equipment, utensils); briefing and supervisory activities related to campcraft activities; and the information requirements surrounding campcraft activities, such as dietary needs, existing illnesses, and allergies. Potential countermeasures are discussed in the following section.

What now?

Implications for intervention design

Understanding campcraft-related incidents is a complex endeavour and the same is true for developing countermeasures that target the overall system. While the most frequently identified contributory factors (outlined above) provide an indication of the key areas for targeted countermeasures, it is recommended that a network of countermeasures be used to tackle campcraft-related incidents. It is proposed that this network should include interventions targeted at least at the four lower levels of the LOA system (see Figure 1).

That said, it appears that some simple interventions could prove beneficial. For example, the majority of the factors associated with equipment, food and drink relate to the fact that cooking

equipment is either hot or dangerous (e.g. heat source, sharp knife) or that the food or drink is hot (e.g. boiling water), which cannot be removed via interventions as cooking always requires these features. Targeted interventions should therefore focus on ensuring that participants are better able to operate cooking equipment and handle hot/dangerous utensils and food. Additionally, supervision of campcraft activities could be improved as well as field staff's awareness and understanding of the risks associated with campcraft activities.

In addition to these simple targeted interventions, the following system-wide countermeasures provide a more sustainable and therefore more effective approach to campcraft incident prevention. First, programs could incorporate a campcraft educational component whereby a dedicated portion of the activity or camp is used to demonstrate and teach participants how to cook outdoors (e.g. with fires) and operate cooking equipment such as Trangias, can openers, and sharp knives. Fire safe behaviours and safe handling of hot water, hot food and hot utensils should also be included. In this sense, campcraft activities including campfires and cooking should be treated as led outdoor activities rather than free-time and should have briefings similar to other formal or structured activities. From a risk management perspective, there is no reason why abseiling down the side of a mountain should be treated differently to cooking dinner for the group (Dallat, 2016).

Second, care should be taken to ensure that the instructions or briefings given before campcraft activities are: a) comprehensive, and b) fully attended to by participants. It may be worthwhile using measures such as incorporating demonstrations by participants to ensure that they have understood what is required of them during the campcraft activity. This should cover the entire activity; for example, in the case of cooking, this would include all activities from the setup of cooking equipment and food preparation, to cooking, serving and cleaning up. Again, it is recommended that the instructions and briefings are treated in the same manner as the instructions and briefings given for other structured outdoor activities such as kayaking, high ropes courses, and abseiling.

Third, it appears that supervision around campcraft activities could also be improved (Dallat, 2016). This could be driven through changes to policy and program design. For example, policies

around campcraft activities could be modified to ensure minimum supervision levels are adhered to. Designing programs so that campcraft activities are included as a structured activity rather than free time would also be beneficial, and in turn would ensure that supervision does not wane during campcraft-related activities. It is important to note here that activity leader qualifications and training may also need to be addressed. Of the 117 campcraft-related incidents reported in the 12-month dataset, qualifications were reported to be “not applicable” for the activity leader in 16% (n = 19) of the reported incidents. Although this was reported in a relatively small percentages of the reports, it is potentially a cause for concern, as it is unclear why campcraft was considered to not require an appropriately qualified leader.

In response to the campcraft-related incidents reported in the UPLOADS 12 month National Trial report, Dallat (2016) provided an experience-based account of campcraft-related incidents in relation to these findings. In doing so, a series of key issues were outlined as significant contributing factors in campcraft-related incidents, for example:

- cooking is treated not like an activity and thus is afforded a more relaxed approach both in participant briefing and supervision;
- activity supervisory practices may not be maintained during cooking activities;
- cooking, heat, and food preparation is a foreign activity to many activity participants;
- there is a lack of policy around stove positions and seating positions in front of stoves; and
- risk assessments do not sufficiently cover cooking hazards.

When applying Dallat’s (2016) conclusions to the countermeasure suggested in this report, it would appear that avenues such as improving campcraft activity risk assessments, providing better instructions and demonstrations to participants, and ensuring appropriate levels of supervision would all be beneficial in preventing campcraft-related incidents. The overriding conclusion of both the UPLOADS campcraft analyses and Dallat’s (2016) discussion is that the management of campcraft

activities as a structured led outdoor activity (as opposed to a free time-related activity) will enhance safe practice and remove some of the key risks identified.

Limitations

It should be acknowledged that UPLOADS is a relatively new initiative and that there remain opportunities for improvement. Accordingly, there are several limitations worthy of mention in relation the analyses presented. First, generalisability to the wider LOA sector is potentially limited due to the short period of data collection and limited number of organisations who contributed data. This will improve as more organisations begin to use UPLOADS and a larger dataset is developed over time.

Second, the reported incidence rates may underestimate the actual incidence of injuries, illnesses, and near misses for various reasons, such as underreporting of incidents that do not require treatment or organisations choosing not to report more serious incidents. However, the large number of minor incidents that were reported indicates that the organisations involved in the study do report this type of incident.

Third, the low number of reported near miss incidents (relative to injury and illness reports) suggests that this area warrants further attention within organisations and from the UPLOADS research team. It may indicate that there is not a strong culture of reporting near miss incidents within the sector.

Fourth, the overall participation data does not include gender specific information. The organisations that contribute data only provide a total number of people who were involved in the incident. Caution is therefore urged when reviewing the demographic information for campcraft-related injuries, illnesses and near miss incidents presented in this report.

Finally, less than a third (31%) of all reported campcraft-related incidents contained sufficient associated information to support further analysis with the UPLOADS Accident Analysis Method. Consequently, critical information regarding incident causation could not be gleaned from

approximately a third of injury incident reports. Further work with the LOA sector is required to increase the quality of the incident descriptions. Despite these limitations, the analysis presented represents the most comprehensive incident data available for led outdoor activities in Australia to date.

Conclusion

There are a number of important conclusions that can be drawn from the analysis presented. First, based on analysis of the first 12 months of incident data reported through UPLOADS (see van Mulken et al, 2016), campcraft-related activities represent an important area of focus for injury prevention efforts in the Australian LOA sector. Second, campcraft-related incidents have various contributory factors related to the activity environment and equipment (e.g. cooking equipment, boiling water, fire), the activity leader (e.g. instructions provided), activity participants (e.g. experience and competence), supervisors/field managers (e.g. program design), and parents/carers (e.g. the communication of important dietary information). Third, whilst there are a series of targeted interventions that may provide a short term benefit, in the long term a network of countermeasures designed to enhance campcraft practice is required. These countermeasures should focus on all levels of the Australian LOA system.

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