

NATIONAL INCIDENT DATABASE REPORT 2007-2008

→ outdoor education and recreation

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Abstract

This report summarises two years of data collected on the National Incident Database over 2007 and 2008. It presents summary figures and interpretations from a range of database results, and includes a number of brief case-study examples of feature findings and material. Extensive narratives describing incidents and causal factors are included in Appendices according to incident severity, activity type and near-miss status. Recommendations are provided on key needs for growing use of the NID, and for making it more useful.

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1. Background

1.1 Description of the NID

The National Incident Database (NID) is a national record of outdoor recreation incident data and is designed for use by those involved in outdoor activities. That is, people and organisations involved in self propelled outdoor pursuit/outdoor adventure activities such as; kayaking, rafting, biking, tramping, trail running, caving, skiing, climbing, sailing, paragliding, diving, etc. As well as motorised adventure activities such as quad biking and jet skiing. These people/organisations could be commercial, educational, not for profit, or informal groups and individuals recreating in the outdoors or any combination of the above. Any of these may register to use the NID for entering data on any incidents they encounter or for generating summary reports from the wider database of incident records.

In this database '*incident*' is an umbrella term to describe outcomes of fatality, injury, illness, damage to equipment/property, near miss, psychological issue or a combination of these¹. An *incident event* represents the specific occurrence of a situation where any one of these outcomes occurs, and *incident cases* represent these outcomes for each individual person directly affected. At any particular incident event there may be multiple incident cases. Each incident event is labelled with a specific ID number, and any multiple incident cases associated with the event are recorded under that same number. The 41 variables included in each database entry include information on the type of incident, its location and prevailing environmental conditions, the actual and potential severity, the number and description of affected people, the activity type, the group leaders and other people present, a description narrative and some indicative causal factors. The full list of variables included in the NID is presented in Appendix 1. Greater explanation of each variable, its response categories and data-entry requirements is provided in a comprehensive guidelines document that is available in hard copy and online².

In summary the NID provides for:

- free registration
- easy standardised data entry for incident reporting online that meets health and safety legislation requirements
- printable versions of incident report forms for use in the field
- easy online generation of standardised reports
- access to summary information on incident trends and causes
- the possibility for selection of subsets for examining incidents in relation to particular activity types, group characteristics, recreation sectors, locations, environmental conditions and time periods

¹ Wherever the term '*incident*' is used in this report the term is inclusive of these wider types.

² Refer to http://www.incidentreport.org.nz/resources/OER_NID_Guide.pdf

1.2 The Need for a NID

There are many reasons why a resource such as the NID is important to the outdoor recreation community. Some of these reasons are evident from the comments listed below:

“The National Incident Database gets organisations asking ‘what are the factors in our current operations that could lead to such an incident happening here’, and ‘can we make changes to safeguard against the same thing happening to us?’

- Rex Moir, Dept of Labour Senior Advisor

“Anything that better informs people of pitfalls to be aware of, or better ways of organising EOTC events, has to be hugely beneficial to the safety and care of students and adults.”

- Lorraine Kerr, NZ School Trustees Association President

“Risk managers understand the need to track close calls and accidents in their programs. Only by identifying what is actually occurring in the field can managers respond to situations and improve program protocols, staff training etc.”

- Rick Curtis, International Incident Database Project.

“Effective incident reporting and review procedures are crucial to transfer the learning from incidents into effective safety management in an outdoor programme. Valued lessons can be gleaned from incidents to inform organisational policies, improve the programme, assist in staff training, and contribute to a better understanding and management of the risks involved. Incident reports can provide organisations with valuable historic lessons which, if accessibly stored, can help to retain organisational knowledge despite staff and culture changes over time. Incident review findings can also inform relevant government policy and outdoor sector activity guidelines”

- Cathye Haddock, Ministry of Education

Overall, scarce resources mean that better justification is required for any allocation of resources, costs or priorities to develop or improve a recreation program or opportunity. In the absence of good information about relative risk, benefit and participation level, decisions will be made on the basis of perceptions and it is not uncommon that outdoor recreation activities are seen as relatively high risk and relatively low value compared with other types of recreation and sport. It is also difficult to authoritatively identify, implement improve better safety practices and programmes without evidence to show the effect of these over time. To improve the provision of safer and more rewarding recreation services and opportunities, more accurate data is required to compare between different activities, programs and initiatives. And improved data on incidents from different activities and programmes must be accompanied by improved data on the corresponding participation levels, without which true relativities cannot be assessed. Overall it is in the interests of all involved in the outdoor recreation sector to have a comprehensive and standardised database of incidents and corresponding participation levels.

This is not a need confined to New Zealand³, and in describing the background for a proposed international incident database, Rick Curtis of OutdoorEd.Com and OutdoorSafety.org (USA) described for outdoor education what is a familiar situation to anyone trying to develop coordinated information systems in outdoor recreation - *The current state of our industry is incredibly fragmented in this regard. Some programs keep no incident records, others keep records on paper, some in spreadsheets, others in databases. The lack of consistency across data collection means that it is currently impossible to compare types and rates of incidents in any meaningful way.* The initiation of the NID programme has been New Zealand's response to addressing this challenge and developing a coordinated and consistent approach for the outdoor recreation sector. This innovation programme is an ongoing 'work-in-progress' which is refined and revised as opportunity allows. It is in the early stages of the innovation cycle with a mixed uptake by a variety of *early adopters*, and the ski industry is most advanced in its engagement. It is part of a wider information resource available to inform outdoor recreation safety management, based around the two key components of incident and participation data.

1.3 Incident and Participation data

Research on outdoor recreation incidents is highly dependent on the extent to which the data sources are representative of the types of activities being carried out, and of the numbers of participants engaged in them. Accurate reference data on participation levels and characteristics is critical to accurately assessing the relativities between different incident types and different activity types. A range of indicative data on incidents and corresponding participation levels are already collected from a variety of other sources, although the respective limitations of these for sport and recreation purposes need to be recognised. The clear conclusion from reviewing a range of studies related to identifying and assessing outdoor recreation incidents and related participation levels is that no single or simple data sources are available.

Currently any attempts to assess incident characteristics and participation levels rely on extrapolations from indirect database sources such as hospital admissions; emergency department presentations; injury claim records such as those collected by the Accident Compensation Commission (ACC) in New Zealand; or from large scale sample surveys of incident occurrence and activity participation rates. Such high level databases and studies have concentrated mainly on sports, with outdoor recreation-related disciplines often hidden within generic activity classifications. Specific outdoor recreation cases often have to be identified indirectly through means such as content analysis of one line narratives in the case of ACC data (Davidson, undated; Bentley et al 2006). Such high level databases also tend to focus only on injury and fatality, leaving out some of the other incident types affecting outdoor recreation activities (e.g. illness, psychological, equipment, missing and near miss incidents). Whatever the tool being used, there is a dual requirement for good incident data and good participation data, and both are considered briefly here in turn.

³ The NID also matches US attempts to develop a similar resource by the Wilderness Risk Manager's Committee and Association for Experiential Education. This early initiative has recently concluded (http://www.nols.edu/nolspro/pdf/idrp_project_conclusion.pdf) but a new development towards an international standardised database has recently been announced (www.incidentdatabase.org).

1.3.1 Incident data

Collection of injury data related to hospital admissions is common both worldwide and in New Zealand (e.g. NOHSAC, 2005) and some studies have used such data to estimate the extent and characteristics of sport and recreation-related injuries (e.g. Northey, 2003; Gabbe, et. al. 2005; Flood & Harrison, 2006; Smart & Chalmers 2009). However such data is limited to hospital admissions, and those injury cases not requiring hospitalisation are not included. Other studies have used data from emergency department presentations, which do not necessarily involve a hospital admission (e.g. Finch et. al, 1998; Flores et al, 2008). This allows a wider range of coverage, but in turn does not allow for injuries in which treatment may only be required from a GP or other medical provider (e.g. Nicholls et. al. 1995; Cassell et. al. 2003). Occasional studies (e.g. Gabbe et. al. 2005) do go further to combine database sources that span such information hierarchies, but the majority of studies are confined to a narrow range of source material. Nor do any of these it allow for the majority of injury cases where no medical treatment is sought at all. Surveys do provide a means by which non-reported injuries can be assessed (e.g. Nicholl et. al. 1995; Stevenson et. al. 2000; Stevenson et. al. 2003), and these show that non-reported injuries greatly exceed the number of injuries where some treatment is sought. As shown in the UK by Nicholl et. al. (1995), treatment was sought for only about 25% of all injuries reported, with only 7% involving a hospital visit.

Overall these high level medical sector databases do capture many of the more serious injury and illness issues, as does the incident claim data collected in New Zealand by ACC. But they do not capture the far larger number of incidents not connected to their systems through admissions, attendances or claims. While these excluded cases may not be such immediately acute incidents many may have been potentially very serious *near misses* or *close calls*. These require attention as much as do any ultimate injuries as they have significant instructive value to outdoor recreation providers and managers (refer section 2.4). It is clear that the generic frameworks for the recording of injury and incident data do not provide the level of detail required by the outdoor recreation sector.

At the other end of the spectrum are incident records collected on a case-by-case basis for specific organisations, centres or activity groups. As noted in Section 1.2 by Curtis this is '*incredibly fragmented*'. Schools are encouraged by Ministry of Education guidelines to document accidents or incidents in *Education Outside the Classroom* (EOTC) activities, and are provided with a standardised form to do so⁴. Related to this, most outdoor education and experience providers also have their own systems for recording incidents, as indicated by the 12 organisations providing data for the study by Davidson (2002, 2006). Outside of the outdoor education sector any incident recording in the wider outdoor recreation sector appears to be highly variable on the rare occasions it occurs. Progress towards integrating some of these existing resources and processes into the NID is slow, and it part of the ongoing work-in-progress on this innovation.

Particular outdoor sector segments are addressed in some New Zealand research streams with researchers looking at incident issues in outdoor education (e.g. Davidson 2002, 2006, undated; Haddock, 1999, 2008); general adventure tourism and sports (e.g. Bentley et al 2006, 2007; Monasterio, 2006) mountaineering (e.g. Malcolm, 2001; Monasterio, 2005); skiing (Donald et. al. 2005) and equestrian (Northey 2003). It is also

⁴ Refer to www.tki.org.nz/e/community/eotc/

useful to note that extensive research has been done using similar methodologies in the sport sector such as netball (Smart & Chalmers 2009), and in the outdoor recreation sectors overseas (e.g. Stephen et al 2005). However the outdoor recreation sectors in New Zealand beyond the skiing industry are highly fragmented with little centralised capacity to run their own sector incident or participation information systems.

One notable cross-sector incident data recording system for outdoor recreation has been operational in the US since the early 1990s. It was established by the Wilderness Risk Manager's Committee (WRMC) in association with the Association for Experiential Education (AEE) and the National Outdoors Leadership School (NOLS). Results from its data were summarised in Leemon & Merrill (2002) and Leemon (2009), and in its early stages it was an influential example behind advocacy for the NID. It was based most on data from organisations providing outdoor education experiences, with 32 of the 43 organisations which submitted data being AEE accredited. While long established, this initiative has recently concluded (March 2009) due to the technology and staff needs required for necessary database modernisation, and due to changing priorities in the Wilderness Risk Management Committee⁵. However, options are being investigated for continuation, including connection with a proposed international incident database⁶. Such cross-sector options are rare but attempts have been made, and in New Zealand the Ministry of Education has developed a common data entry form for EOTC incidents⁷ that is accessible on the internet. However like the US example above its use is only voluntary to date and it is confined to school use. Other reporting formats are used in other situations such as the mountaineering accident reports done in the US for almost 60 years (American Alpine Club 2006) using data and narratives. Similar summaries are published periodically in New Zealand's Federated Mountain Club (FMC) bulletins. And individual organisations in the professional outdoor education/experience sector (e.g. Outdoor Pursuits Centre, Outward Bound etc) do collect detailed incident and participant data as part of their business management systems.

In all these studies and programmes the key data required has been the presence of a good incident record, combined with applicable reference data on corresponding participation and participants. Where these complementary data are not available, then meaningful quantitative conclusions beyond the immediate study group are largely unachievable. Where good complementary qualitative information is also available some 'working' inferences can be made, but these will eventually require testing if they are considered to be the possible basis for any significant decision-making.

1.3.2 Participation data

The importance of participation data in outdoor recreation applies at a hierarchy of levels. It can relate to managing particular sites or facility uses; particular activity types; particular time periods; individual organisations; whole sectors and issues affecting the national population. National data on sport and recreation participation in New Zealand is collected by the Active New Zealand Survey. Figure 1 summarises some of the key totals for outdoor recreation.

⁵ Refer to http://www.nols.edu/nolspro/pdf/idrp_project_conclusion.pdf

⁶ Refer to www.incidentdatabase.org

⁷ Refer to <http://www.tki.org.nz/r/eotc/resources/pdf/form-19.pdf>

It surveys a representative sample (n=4443) of the population and provides data on participation in different activity types through a national report (SPARC 2008) and a selection of regional and activity-specific summaries (e.g. SPARC 2009 a & b). Of the typical outdoor recreation activities, fishing (marine) is the most prevalent, followed by tramping, canoeing/kayaking and mountain biking. It is important to understand that these totals only represent activities that people have engaged in over the previous 12 months. This is a typical measure in such national level participation studies in New Zealand and overseas (e.g. SPARC 2008; Australian Sports Commission 2008; Outdoor Foundation 2008). What these results cannot do is indicate the *participation intensity or effort* (e.g. participation days or hours), which is the typical participation measure against which incident rates are calculated. Other complementary research would be required to extrapolate these participation levels more widely as representing actual activity-levels.

Figure 1: Overall outdoor recreation activity levels (in last 12 months)

Activity Type	%	Population number
Fishing - marine	16.6	539,446
Tramping	9.4	306,342
Canoeing/Kayaking	6.4	209,648
Mountain Biking	6.1	202,237
Fishing - freshwater	5.7	184,784
Diving/scuba	3.8	121,625
Skiing	3.7	123,536
Equestrian	3.0	99,283
Snowboarding	2.7	87,649
Sailing	2.4	78,209
Mountaineering	1.1	37,868
Orienteering, Hunting (deer, pigs), and Rock climbing	<1.0	No totals given below 1%

There is a distinction between overall participation survey data and the actual levels of activity that people engage in. To calculate meaningful incident rates such activity-level measures are preferred. Ideally more key reference information is required on the number or participants involved in specific activities, times and places. Where the number and time characteristics of use are more readily identified such as in organised sport or at managed sites such as ski fields the participation side of the incident-rate equation is much easier to determine. Ski-fields are typically able to identify very accurate incident rates in New Zealand due to known participation levels and comprehensive incident reporting. However in most parts of the outdoor recreation sector beyond skiing the capability to collect comprehensive participation data is highly limited. This is in part a reflection of the more flexible time-use in many informal outdoor recreation activities, and the highly fragmented nature of organisational structures for many activities in the outdoor recreation sector.

In very specific instances outdoor recreation participation data can be collected through targeted surveys of particular activity groups or site uses, or by concentrating on monitoring numbers at very specific locations. While in other countries it is possible to use park visitation records to provide participation level data (e.g. Stephens et al, 2005), in New Zealand parks entry is not controlled in most locations. The Department of Conservation has good visitor counting devices which can count precise visitor

numbers at particular locations. If researchers were investigating incident issues in very specific outdoor locations, DOC visitor counters could be good sources of participation data. Beyond this there is no real systematic collection of participation data, and anyone engaged in an outdoor safety investigation wanting such data may have to include a specific participation study in their investigation. The NID has provision for the entry of detailed activity-specific participation data in the form of *participation day rates*, representing the participation totals from combining participant numbers with activity/programme durations. It is on this basis that representative incident rates can be calculated.

In the case of the outdoor education/experience sector there is greater potential to collect good participation data and to enter specific *participation day rate* data into the NID. Many individual organisations in the sector do collect participation data about the use of their facilities or services, as well as information about incidents. As noted previously Davidson (2002, 2006) used such data from 12 of 25 major outdoor experience providers. As noted above the Ministry of Education in New Zealand already has a voluntary incident data-entry form and database, and expanding this to include participation data from schools should be relatively simple in principle. However few have taken the opportunity to enter *participation day rate* data into the NID⁸, and in fact the combined use of such incident and participation information across the wider sector is not common, with little data sharing or coordination apparent. As noted in the US by Leemon and Merrill (2002:8) *the collection of incident data for the adventure programming profession has stuttered along in fits and starts. Many organisations have been hesitant to collect data or, if they collect it, they have been reluctant to share their findings with others. The reasons stated are often based on legal philosophies and a fear of admitting mistakes.* In this climate it is difficult to create collaborative common resources.

The purpose of the NID is to provide a mechanism fulfil all these needs across the whole outdoor recreation sector in a one-stop shop, and such a tool has been widely called for by researchers and information managers in New Zealand (e.g. Bentley et al, 2006, 2007; Davidson 2002, 2006, undated; Haddock 1999, 2008) and overseas (e.g. Leemon & Merrill 2002). The NID also goes further by including provision for entry of activity participation levels and detailed narratives, raising the opportunity for the identification of meaningful incident rates and interpretations across a wider arrange of evaluation needs.

1.4 Development and Current Status of the NID

The NID development project was initiated by New Zealand Mountain Safety Council after discussions arising from the Risk 2002 Conference⁹. It went online in May 2004 by June 2007 there were around 120 organisations registered to use it. By June 2008 this had increased to around 250 and at September 2009 the total number of registered organisations was standing at 313. The overall categories of organisations included are:

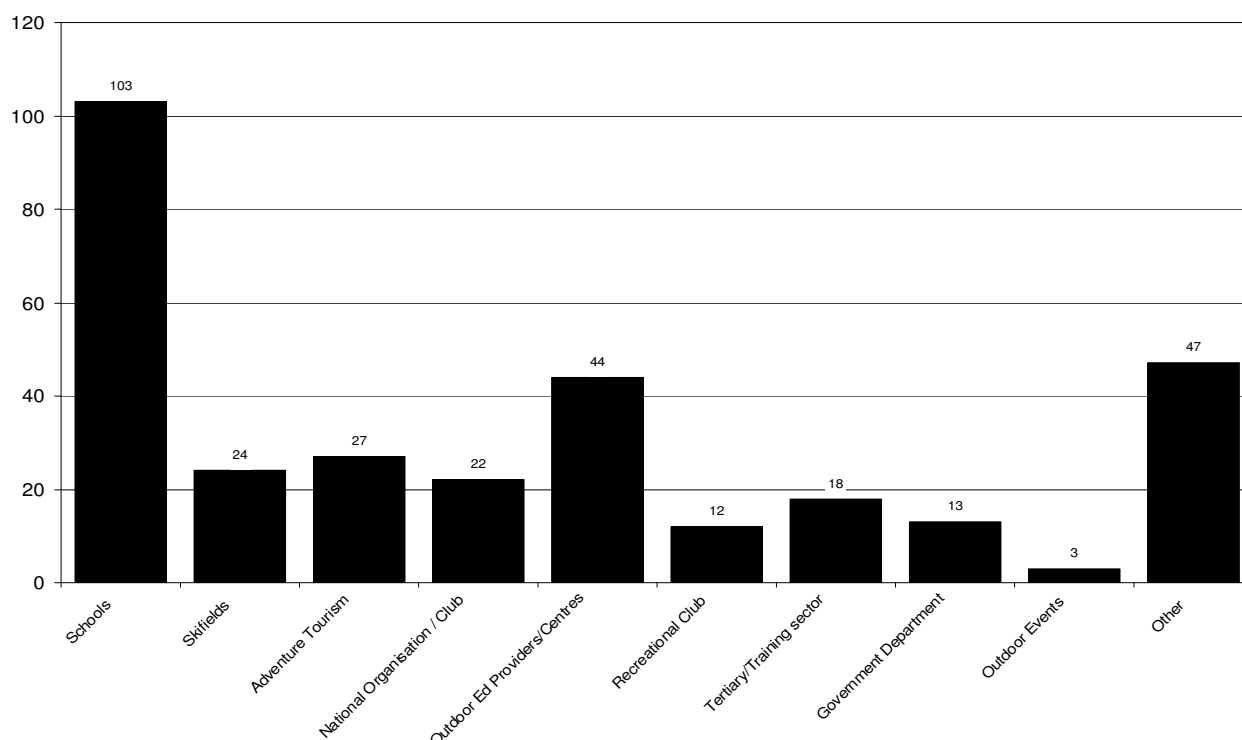
- Schools - primary and secondary schools

⁸ As a result no analyses of results in relation to participation day rates was considered feasible or worthwhile.

⁹ Refer <http://www.safeoutside.org/risk/Data/intro.html> for details of this conference

- Skifields - club and commercial fields¹⁰
- Adventure Tourism - commercial opportunity providers
- National Organisation/Club - national associations and clubs
- Outdoor Education Providers/Centres - site-based or general providers
- Recreational Clubs - local area rather than national member ship
- Tertiary/Training sector - courses and training in outdoors
- Government Departments - for outdoor recreation and safety management
- Outdoor Events - events including competitive outdoors sport
- Other - individuals and groups not otherwise classified

Figure 1: Number of registered organisations (September 2009).



While schools and outdoor education providers comprise around half the total registered organisations (n=147), by far the most significant contributor to the database to date have been the ski-fields. As at September 2009 there were approximately 24,800 entries recorded¹¹. Of these around 24,450 (98%) were from ski fields. The engagement and use of the database by the ski industry is extensive and provides a good example of its potential utility and value. The extent of the ski-field data, made possible by this high level of engagement by most organisations in the ski sector provides strong evidence for judging injury-related issues, trends and needs.

The remaining 363 entries represent incidents entered for a range of outdoor recreation and outdoor education related activities. Here it is important to note that these 363 entries were individual *event cases*, spread over 295 *Incident events*¹². An *incident event* is the incident situation which results in any number of individual incident cases

¹⁰ Incident data from ski fields is reported separately

¹¹ Note that this does not include an additional 400 incidents entered from an overseas source in Malaysia. These are stored in the database but excluded from any analyses here.

¹² In those cases each individual incident case is recorded under the single incident number for the common incident event. This results in some repetition of incident reports under the same *Incident ID* number. Here there were 11 incident events involving more than 1 individual case in each.

arising. An *incident-case* is an individual person's specific 'injury', 'illness', 'psychological', 'equipment', 'missing', 'fatality' or 'near miss' outcome from the event. There may be multiple incident cases from any incident event.

These 363 outdoor recreation incident entries have been entered over a 5 year period as shown in Figure 2, with the comparative numbers of ski field entries also shown. Each recording year used here runs from May 1st, based on the start date of the NID in May 2004. This time fits in the shoulder season between the summer peaks of outdoor recreation activity and the winter peaks of ski field activity.

Figure 2: Annual Incident entries (year to 1 May)

Year	Outdoor Recreation	Ski-field
2004-05	55	16
2005-06	32	4841
2006-07	50	5734
2007-08	157	5018
2008-09	66	5177
2009 (-Sept 1st)	3	3666

The difference in reporting scale is obvious, with vastly more entries from ski field incidents. The low level of database entries from ski fields in 2004-05 reflects the NID going online at the start of the ski season. Ski-field engagement with the NID was not fully achieved until the following season (2005-06). Database entries from outdoor recreation activities do not appear to have increased notably over the period the database has been active, although the 2007-08 year is a clear peak. This may reflect a period of stronger advocacy of the NID to user groups at that time.

Overall it appears that beyond the ski sector, the engagement of the outdoor recreation and education sector with the NID has not been great, with limited engagement, erratic incident reporting, and rare specification of participation data (e.g. participation day rates). For example, Davidson (2002, 2006) gives an indication of the unmet potential in this sector. He approached larger outdoor education organisations (>3 employees) to assess their incidents from 1996-2000. A list of 25 organisations that fitted the criteria was provided by Outdoors New Zealand and each was approached with a request to provide their accident data. Of these 25 only 12 contributed their data. Of the other 13 organisations 7 did not respond to the request or a follow up, 2 did not keep incident records, 2 considered their records didn't have any incidents of interest, 1 did not consider they met the criteria and another simply did not want to contribute data. Yet even with the selective inclusion criteria and limited engagement by requested participants, Davidson was still able to identify over 1900 incidents in the 5 year period. Despite having a much wider scope of potential contributing outdoor recreation sources the NID was only able to get 363 non-ski entries over a similar 5 year period. The scale of non-reporting to the NID by the non-ski outdoors sector is very clear, yet it is also clear that valid data is collected internally and extensively by many qualifying organisations.

What were the factors that led to this better response to Davidson's specific approach (2002, 2006) and from the ski field sector in general? One point is that Dr Davidson is an insider, being director of one of the main outdoor education/experience providers in New Zealand and with very good professional networks. In addition by engaging in a specific research investigation he would most probably have had more opportunity to

dedicate time to specifically soliciting the information and following up on requests. Limited staff and resources have perhaps constrained the Mountain Safety Council from advocating and seeking engagement to the same extent. The reasons for such high engagement by ski fields compared to the remainder of the outdoors sectors are not clear. While they are a shared commercial sector, they are competitors in some respects and issues of commercial sensitivity arise. Despite this the use of the NID by the ski industry is extensive. There has been no evaluation of this to date, and such an evaluation may be a necessary step in order to identify success factors and demonstrate case study examples to advocate the benefits of similar engagement by others.

Noting these omissions, the purpose of this report is to summarise progress and results in the last two years. Past reporting from the database has been based on the calendar year - and this convention of followed here. Consequently the period covered by this report is from January 1st 2007 to December 31st 2008. During this period there were 184 specific *incident events* reported involving 219 individual *incident cases*. Figure 3 summarises the numbers of incident event and incident cases, with some summary notes to illustrate how multiple cases may arise from any single event. The results presentation starts overleaf.

Figure 3: Breakdown of incident cases and events

Cases per event (n= 212)	Incident events (n=184)	Notes
1	169	Most events involved only one incident-case where an individual got injured, ill, had a near miss, equipment issue etc. These more often involved individual circumstances of injury accident, specific illness or lapses in individual judgement.
2	9	In some events multiple individuals were affected. These more often involved adverse environmental conditions of cold and wind, water conditions, challenging terrain or water, wasps etc – things that might affect more than one person if encountered.
3	2	One incident involved an operation to assist an injured tramper where communication deficiencies resulted in some of the helpers missing the recovery party and spending more time out than required. The other involved a canoeing group who went out in extremely adverse conditions resulting in a fatality and two near misses.
5	1	Tramping party disturbed a wasp nest and a number were stung, including one who had previous allergic reactions to stings. All were treated appropriately on-site and external contact was maintained by Mountain Radio.
6	1	Tramping party took a wrong turn and were delayed at an expected rendezvous
7	1	Gorging party caught by quickly rising river resulting in multiple fatalities.
8	1	Half of a school caving group were trapped for several hours by rising water levels and some suffered hypothermia. A major SAR operation was required to rescue them involving an underwater swim of several metres.

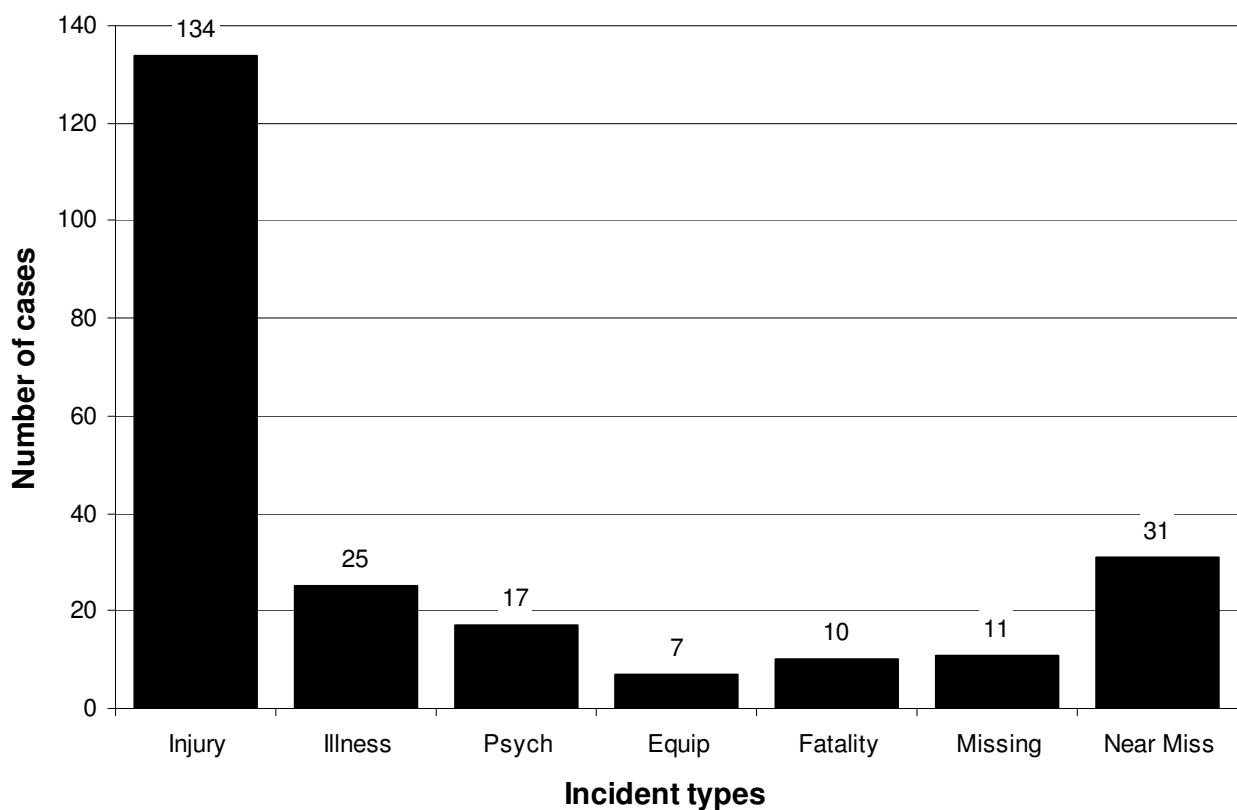
2. Overall Incident Summary

These results represent all 184 incidents reported (incident events), affecting 219 individuals directly (incident cases). The period covered is the two year period from January 1st 2007 to December 31st 2008. The results represent only the subset of incidents reported, and the absence of comprehensive participation and participant data limits the validity of any generalisations beyond that subset to indicative hypothesis only. In other words any notable results seen here might be indicative of a wider pattern, but any confirmation would require specific testing of a corresponding hypothesis with better reference data. In addition some problems with question wording and respondent interpretations were apparent from viewing the database contents, and these are noted where required. These should be considered as options for improvement in any future refinements made to the database and its base questions.

2.1 What types of incidents?

The breakdown of different incident types is presented in Figure 4. The majority of incident reports included only one incident type, although some included more (e.g. *Illness and Psychological, Injury and Equipment*).

Figure 4: Incident types reported (n=219 cases)



The main incident type was *Injury* (134 cases), followed by *Near Miss* (31) and *Illness* (25). These are described briefly below. Further details are provided in Appendix 2, 3

and 4 which includes all the approved¹³ descriptive narratives that were given for the respective incidents, arranged under activity type headings. Note that not all incident reports included a narrative description.

The *injury* cases were predominantly strains & sprains (45); fractures & dislocations (23); lacerations & cuts (18); bruising (10); burns (9); stings (6); and one each of snapped achilles, ruptured spleen; blister and nose bleed. Short narratives from the NID records describing the events leading to these injuries incidents are provided to a limited extent in **Appendix 2**.

The *near miss* cases were highly diverse and depended on a variety of case specific circumstances across a variety of activities. Only 31 near misses were reported, although it seems that where an actual injury, illness or other incident type was recorded then it was not usually considered a near miss as well. However in a different part of each incident record are variables recording *actual* and *potential* severity ratings. This is discussed further in Section 2.4, but it is worth noting here that 74 incidents were recorded as having high potential severity (refer Appendix 5), which could be considered indicative of a near miss situation. Appendix 3 presents short narratives to a limited extent from the NID records describing some of the 31 near miss incidents that were specifically recorded.

The *illness* cases were predominantly hypothermia (9) and allergic reaction (3). Single cases were reported for abdominal pain, asthma, chest pain, dehydration, food poisoning, hypoglycaemic reaction and skin infection. Overall there were 25 cases reported of which 19 specified an illness type. Appendix 4 presents some of the 19 short narratives describing the events leading to these illness incidents.

The *psychological* cases were a variety of personal reactions to stressful or hazardous situations they or people they were with encountered. Some suffered temporary stress and trauma while for others the effects were more long lasting. Appendix 4 presents some of the 15 short narratives describing the events leading to these psychological incidents.

The *equipment* cases were related to problems or damage related to equipment use, or equipment failure in adverse conditions. There were only 7 such cases, related to vehicle use and serious injury/fatality in activities involving equipment. In those cases narratives suggest the equipment did not fail, but was associated with poor user judgement. The related narratives could not be summarised in Appendix 4 due to limited narrative approvals.

The *missing* cases were related to a range of situations from temporary delays due to some party members taking a wrong turn through to fatalities where victims were missing for a time. There were 11 missing cases. As noted previously, some individual cases were attributed with a number of incident types, so are reported here under each heading type that applied to them. The related narratives could not be summarised in Appendix 4 due to limited narrative approvals.

The *fatality* cases were related to one large gorging incident involving 7 fatalities and 3 other separate incidents related use of kayaks. In the case of the kayaking incidents

¹³ Note that not all narrative content could be published here due to lack of approvals from most of the organisations/agencies/individuals entering them. However they do provide useful examples of potential future analysis opportunities

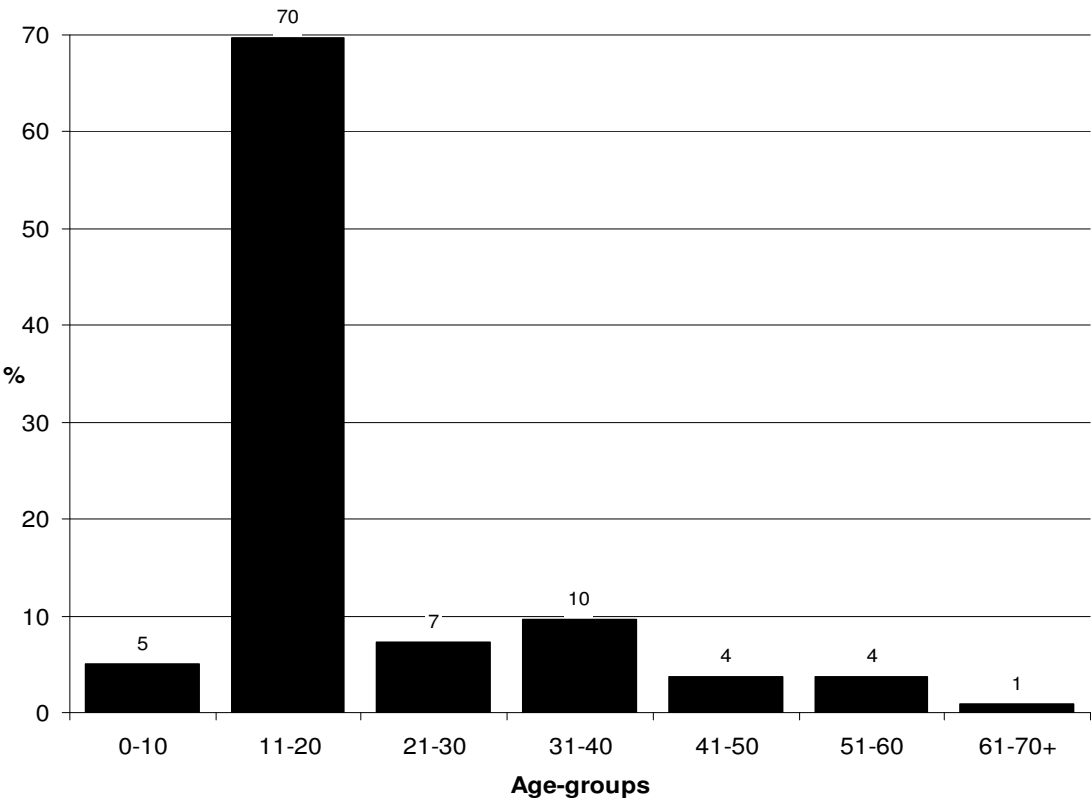
the narratives provide descriptions of what happened. The other 7 fatality cases were still subject to high level review to determine causality when the entries were made to the NID, and the entries had not been updated fully in time for this report. The related narratives could not be summarised in Appendix 4 due to limited narrative approvals.

Overall there were a high variety of incidents of different types and significance. Given the lack of reference data such as participation levels the focus for analysis here should be based on exploring the narratives and identifying priority hypotheses for testing.

2.2 Who suffered incidents?

Incidents could be associated with different ages, ethnicities and gender. Most of the 219 incident cases reported were young New Zealanders. Figure 5 shows 70% were in the 11-20 year age group, reflecting the high proportion of reported incidents made from the outdoor education sector (see Section 2.2).

Figure 5: Age groups of individual incident cases (n=219 cases)

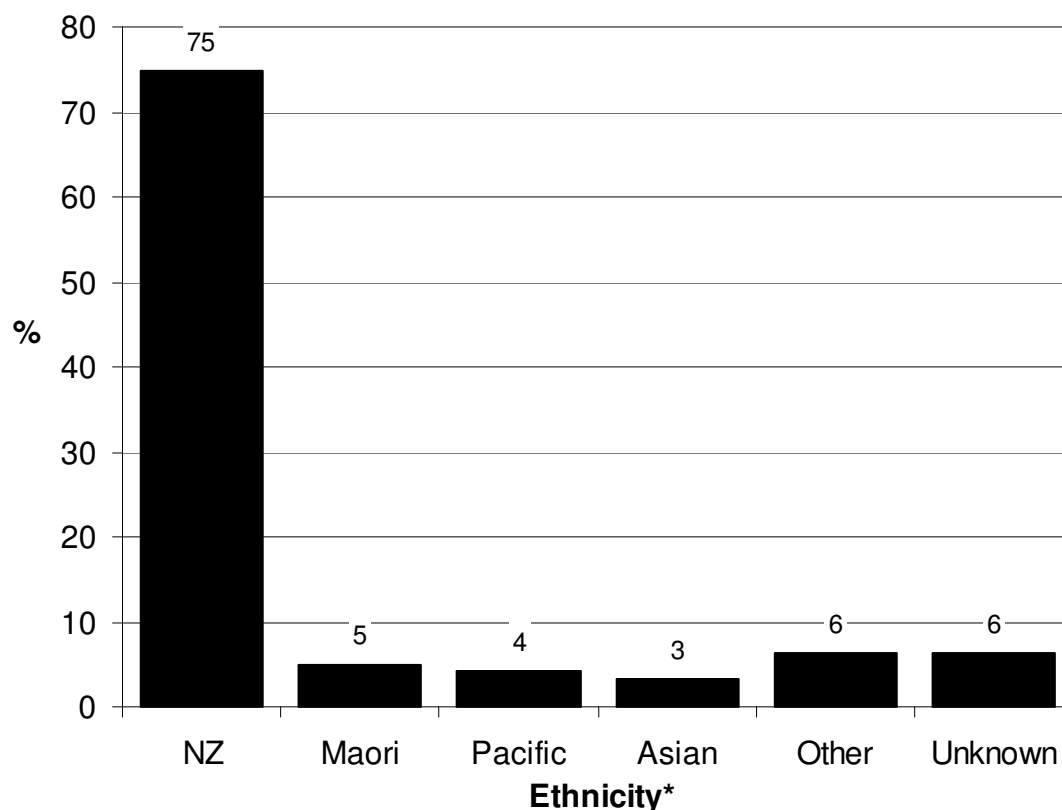


It is unknown if this age-group distribution also reflects the overall pattern of corresponding activity participation, as relevant participation reference data is not available. A bias towards more reports of incidents affecting younger participants is suggested here when comparing these results with those in Bentley et. al. (2006), whose data analysis identified a more even age-group spread in ACC claims from people doing adventure tourism and adventure sport. However survey studies of general population have shown highest rates of sport and recreation injury do seem to occur among children and young adults up to 25 years (Coggan et al 2002; Conn et. al. 2003). While this suggests higher incidence, lack of participation reference data limits any generalisation here.

Figure 6 (overleaf) shows 75% gave 'NZ' as their ethnicity, while the other ethnic groups were all at very low levels. However caution is required with responses to the ethnicity question as it is not well worded in the data entry forms, and there is also a notable respondent resistance to 'ethnicity' questions in general which often results in an inflated 'NZ' response in surveys. Definition of distinct 'ethnicity' and 'nationality' questions combined with careful wording is required in the future.

The gender of individuals reported in incidents was 50:50, with 109 females and 109 males. However any possible hypothesis that women experience more incidents than men would require specific testing with better reference data. In the absence of corresponding participation data no conclusion can be drawn about the representativeness of this result, although most outdoor recreation activities typically involve a higher proportion of males. Males were found by Bentley et al (2006) to make more outdoor recreation based claims to ACC than were females (60:40), but probable differences in the levels of injuries reported as incidents to the NID, and those resulting in eventual claims to ACC mean that direct comparisons cannot be made. Again, better reference data is required to allow any generalisations from these demographic data at this stage.

Figure 6: Ethnicity of individual incident cases (n=218 cases)



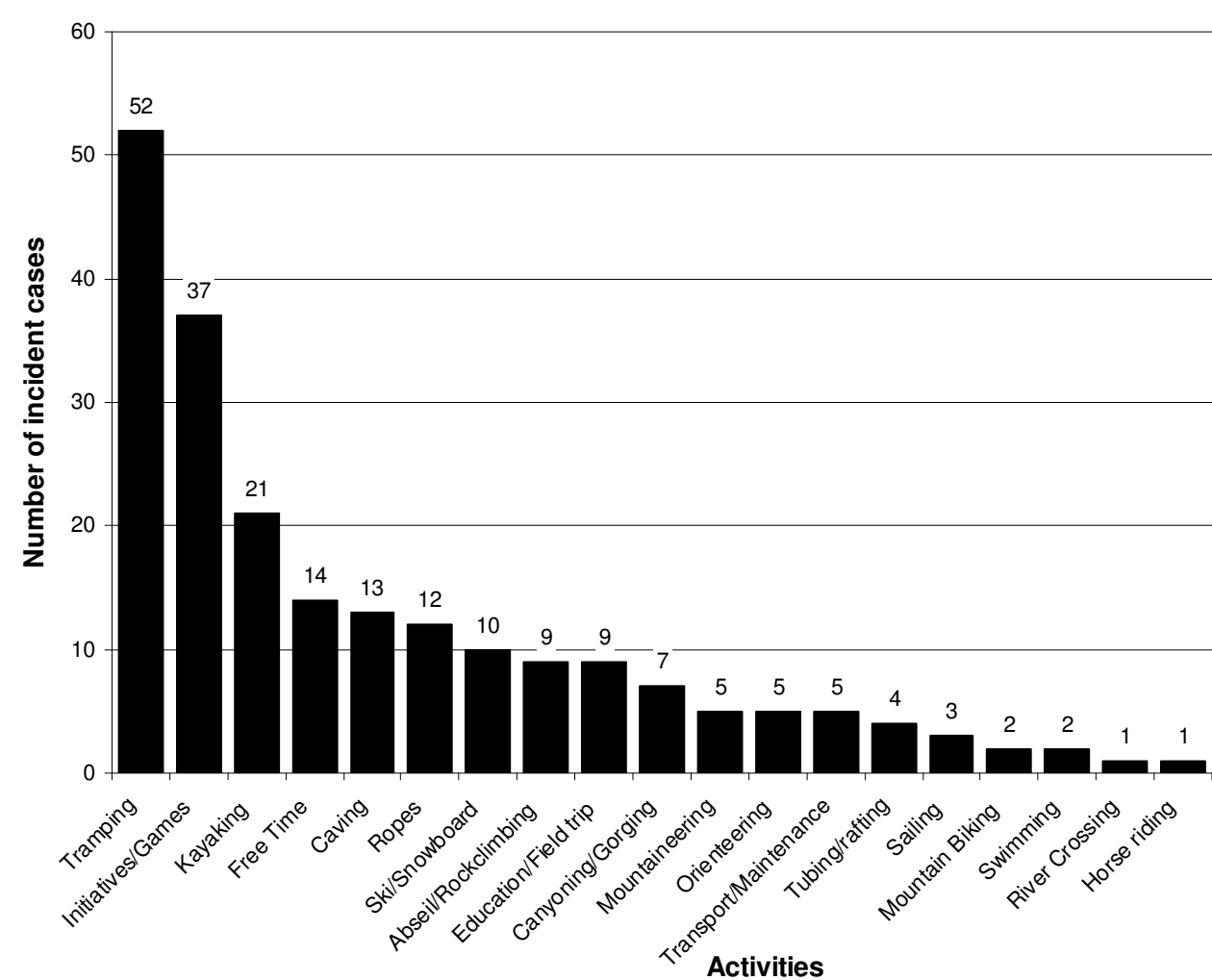
2.3 Where did reported incidents occur?

Incidents can be linked to different activities, times, places and weather conditions, and some distinctive results were apparent. A majority of the reported incidents (57%) were experienced while participants were engaged in activities associated with 'Education Outside the Classroom' (EOTC). These are clearly overrepresented in the NID relative

to overall participation rates in various outdoor recreation activities, although the extent of this cannot be determined without better participation data for EOTC activities. However this does provide some explanation for the very high proportion of 11-20 year olds among incident sufferers shown in Figure 5.

A prominent EOTC context was also apparent in the types of activities where incidents took place. When reported incidents are viewed by specific activity in Figure 7 (overleaf), it is clear that most took place while tramping (52) or on outdoor education initiatives/games (36). These represented 25% and 18% of reported incidents overall. Of the 52 taking place in tramping, 30 were on EOTC trips. Such results are not surprising given the preponderance of incident reports from EOTC activities. However in the absence of reference data this cannot be seen as representative of wider outdoor activity levels or incident patterns, and can be seen as reflecting those incidents reported on the NID.

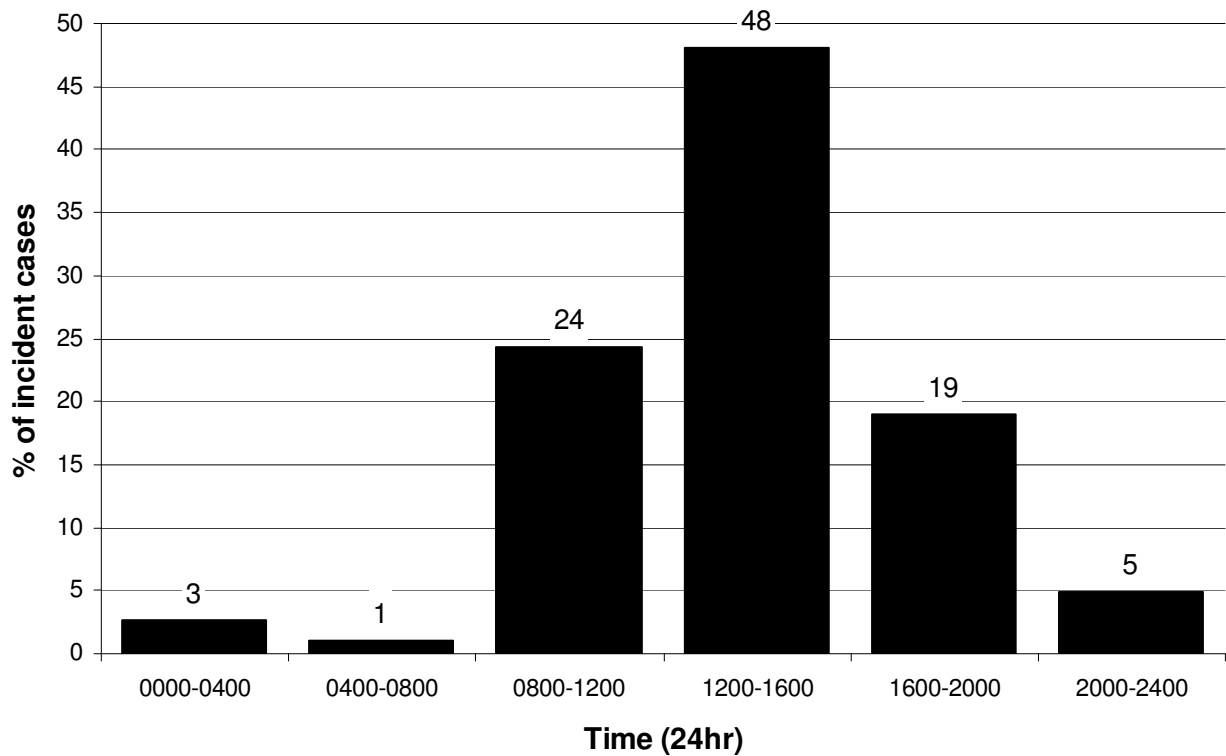
Figure 7: Activities in which Incident cases reported (n=206 cases)



Another interesting point is the presence of incidents reported from people’s free time (13) and in relation to activity transport and maintenance (5). Some of these related to incidents while cooking, at camp or while travelling to or from the activity location. These remind us that safety concerns require attention for the whole of any trip or activity.

The timing of incidents also reflected the need for safety concerns to span the entire trip or activity. Figure 8 shows that while over half the incidents occurred in the early afternoon, some did occur in the later evening and overnight.

Figure 8: Incident timing (n=185 events)



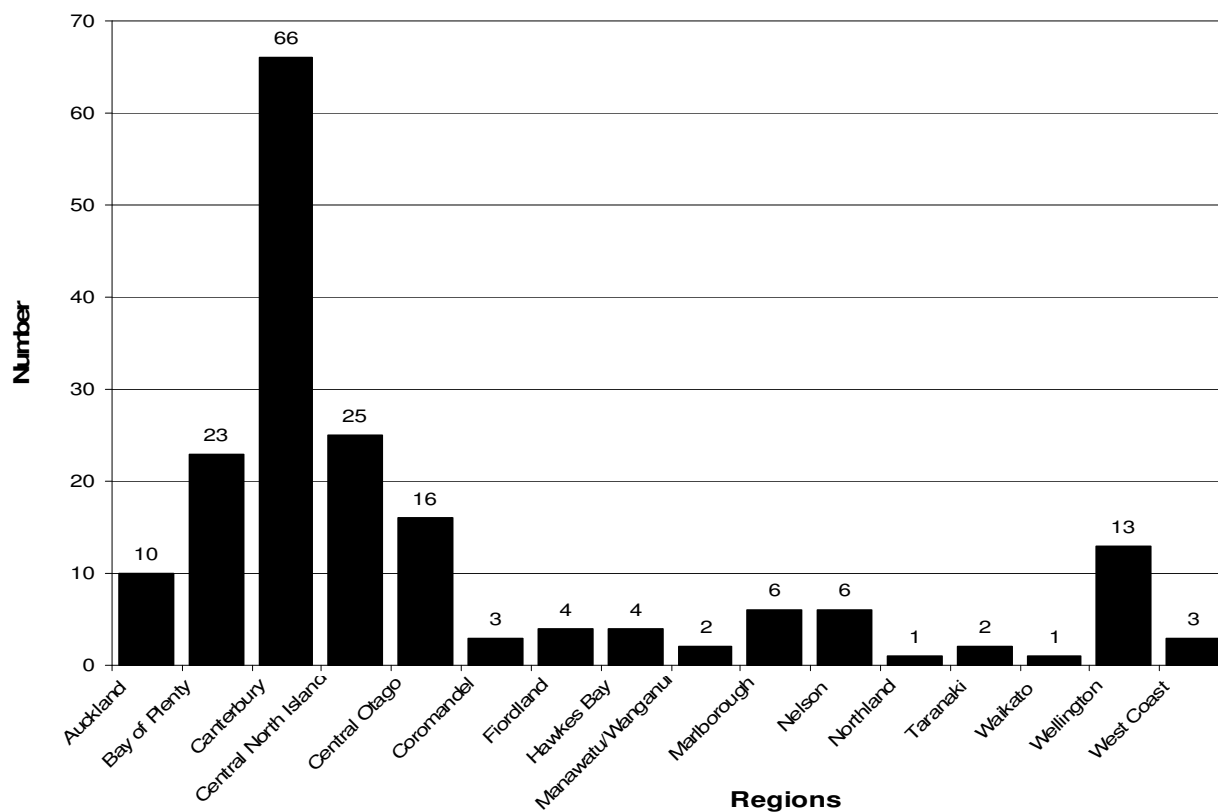
Late evening and overnight incidents were often related to free time activities around cooking and campsites. The pattern shown in Figure 8 was consistent when the timing of injuries in particular (n=134) was investigated separately from other incident types. The preponderance of injury incidents in the early afternoon has also been noted in previous NID summary reports and in the analysis by Bentley (2002; 2004; 2006), although no explanation for this can be offered here. Readers may have insights from their experience which may raise interesting hypotheses in relation to activity intensity, activity scheduling, participant tiredness or other possible factors.

An uneven response pattern was also apparent from the regions where reported incidents took place (Figure 9). The notable feature is the much higher number of cases reported from Canterbury. It is highly unlikely that this result represents higher outdoor recreation participation levels in Canterbury than elsewhere. Results from the Active New Zealand Survey for the Canterbury Region (SPARC 2009b)¹⁴ do not indicate it has any higher outdoor recreation activity levels or club membership than other regions. What this result most probably shows is that some of the organisations that run activities based in Canterbury have been particularly active in reporting incidents. This is clearly not the case for many organisations running activities in other regions. But this cannot be fully explained here as there is no corresponding participation data relative to the reported incident levels, nor is there any data in the NID that specifically identifies who made particular incident reports. In the absence of

¹⁴ Refer to <http://www.activenzsurvey.org.nz/Results/2007-08-Active-NZ-Survey/Regional-Profiles/Canterbury/>

any such key reference data a finding of higher incident rates in Canterbury cannot be made from this result.

Figure 9: Locations of incidents (n=185 events)



2.4 How serious were these incidents?

The seriousness of each incident was indicated by applying a subjective severity score. This was done by the individuals when entering their incident record, guided by reference to a standardised Incident Severity Scale, which is presented Appendix 5. Such an approach had been proposed by Davidson (2002, 2006), in response to inconsistencies he revealed in the severity levels of incidents reported by different groups. A standardised rating approach was subsequently recommended and adopted for the NID.

In addition, Davidson proposed use of both an *actual* severity score representing the reality of the specific incident, and a *potential* severity score representing what could have easily happened in a worse-case scenario. This was consistent with Haddock (1999) who undertook an extensive review outlining the significance of investigating the *high potential for harm* (HIPO) incidents as well as actual instances of serious harm. This does not mean investigating all incidents equally no matter how minor, but it means focussing on those that have the most power to highlight key issues, learning's and directions. Embedding this *actual-potential* distinction supported by application of a standardised severity scale was done to assist the identification from the NID of the relatively few priority *actual* or *near-miss* incidents requiring more in-depth review and investigation, while the larger numbers of relatively minor incidents could be simply recorded as required.

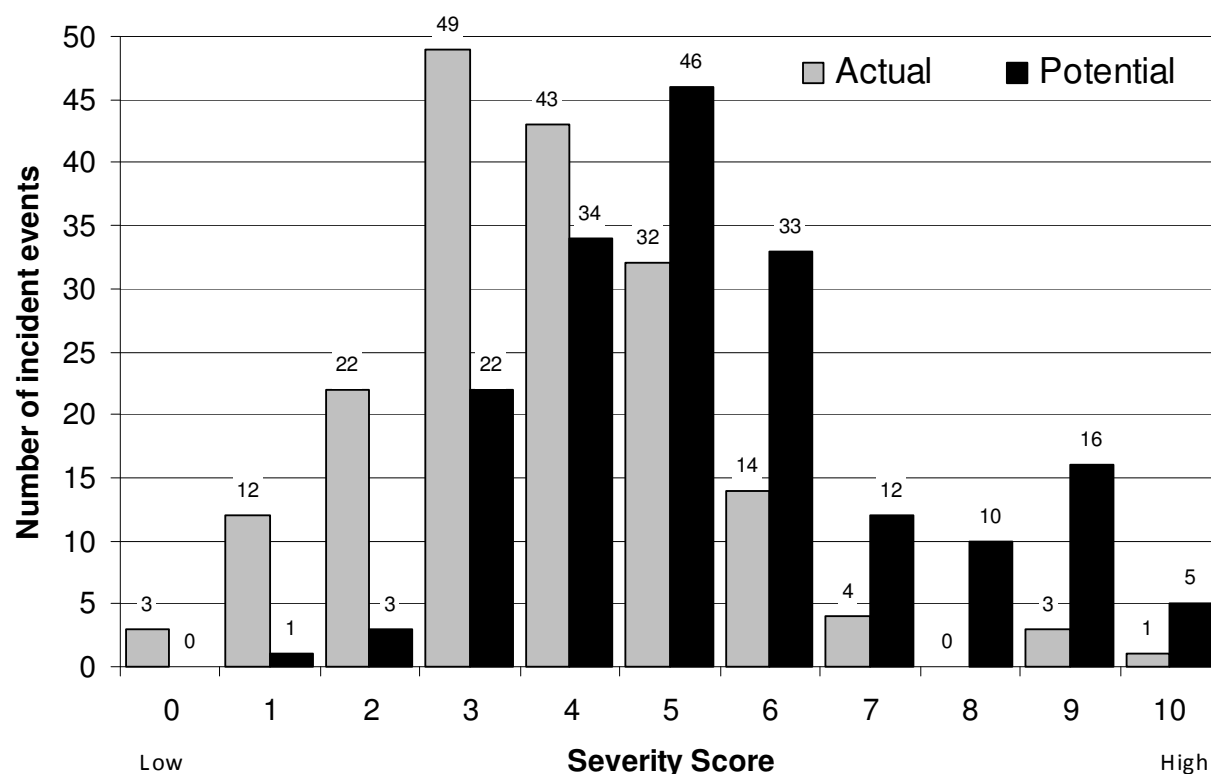
The actual and potential severity of incidents recorded in the NID for this report

reflected those found by Davidson (2002, 2006). The potential severity reported for any single incident event was almost always higher than the corresponding actual severity, indicating a latent hazard component was implicit in almost all incidents. Figures 10 and 11 summarise the actual and potential severity ratings from these incidents and as found by Davidson (2002; 2006), most reported incidents were judged as being minor rather than major. Only 12% of incident events were reported as having a major actual severity, closely matching the corresponding 6% identified in Davidson's original analysis (Davidson (2002, 2006). However the presence of considerable latent hazard in many incidents was apparent from the 41% of incidents judged as being major near misses. These were also closely matching the corresponding 49% identified by Davidson.

Figure 10: Actual & Potential Severity Scores for respective incident (n=183 events)

Severity Scale	Actual Ratings	Potential Ratings	Severity Grouping	Actual freq.	Actual %	Potential freq.	Potential %
0	3	0	Minor injury or near miss	161	88	106	59
1	12	1					
2	22	3					
3	49	22					
4	43	34					
5	32	46					
6	14	33	Major injury or near miss	22	12	76	41
7	4	12					
8	0	10					
9	3	16					
10	1	5					

Figure 11: Chart of Actual and Potential Severity Scores (n=182 events)



Here is useful to note that incidents could be recorded specifically as an incident type of 'near-miss', along with injury, illness, psychological etc. However these near-miss designations tended to apply to those close-call situations where no actual injury occurred. Where injury occurred it was usually only designated as an injury incident. In this respect reliance on the 'near-miss' designation of incident-type can under-estimate the real extent of potential hazard. Of the 76 incidents reported from the NID as having of major potential severity (scoring 6 or over), only 20 had also been recorded as near-miss incidents. This near-miss incident category only picked up 27% of those incidents where those entering the data considered a very serious negative outcome could have occurred.

The use of potential severity rating does provide a useful additional approach by which potential hazard can be included in the incident records. Such an approach allows attention to be focussed on the very serious situations that did occur, or those situations where it was a near miss that could easily have been very much more serious. As emphasised strongly by Davidson (2002, 2006), Haddock (1999) and Leemon & Merrill (2002), both these areas are seen as priorities for strategic learning and informing the development of preventative actions or processes. Based on this approach, selected 'approved' descriptive narrative data from the NID were extracted for inclusion this report (Appendix 6). These were selected on the basis of having a severity score above 6, which has been used here as an arbitrary break between minor and major severity definition (Figure 10).

It was not possible to undertake a qualitative analysis of these narratives for this summary report, but readers can view these narratives and apply their own knowledge and experience to making their interpretations. This in some respects represents a simple form of incident review here, which was the recommended outcome from those advocating a prioritised incident analysis approach that incorporated major potential as well as actual incidents (e.g. Davidson, 2002,2006; Haddock 1999; Leemon & Merrill 2002).

2.5 What causal factors may have contributed to incidents?

A number of classifying variables and a dedicated narrative space have been included in the NID to assist interpretation of possible causal factors related to any combination of environment, people or equipment issues. Reflecting this, the different classifying variables included in the NID are related to weather conditions; the presence, qualifications and experience of leaders; possible causal factors of the leaders, participants, equipment and environment; the number of people and the experience composition of the group. All of these require that those entering data choose from listed options. However the last data entry required in any incident report is a narrative where the person making the incident report can write a specific causal narrative explaining what they think happened. Those approved causal narratives relating to incidents with a severity score of 6 or more are summarised to a limited extent in Appendix 7 along with corresponding descriptive narratives. These illustrate the added interpretive value provided by complementary narrative responses.

Time and space does not allow a full analysis of all classifying variables in this report (refer Appendix 1 for variable list), and both the limitations in the representativeness of the data and the relatively small number of incident records makes such analyses of limited utility at this time. In addition there is a high level of complexity in determining the relative significance of different potential causal factors in the occurrence of any

incident. This is highlighted in an analysis of high potential by Haddock (1998), who goes on to say in Haddock (2008: p18) that

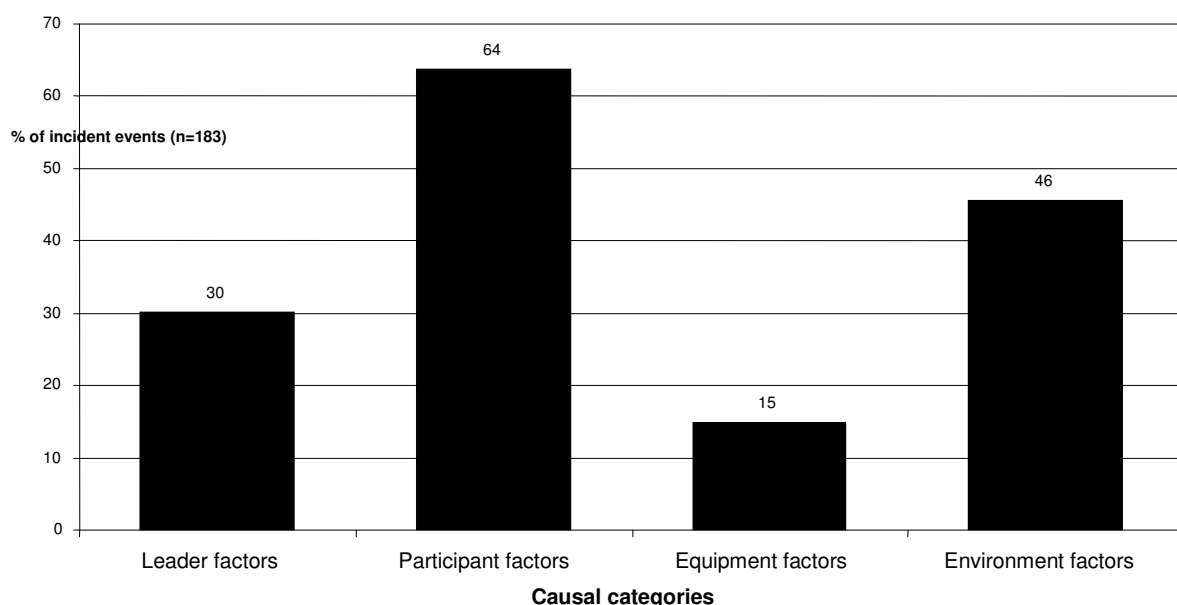
Incidents don't just happen. They usually have multiple causes that combine under just the right circumstances to result in an incident. Some factors can be described as immediate causes such as an unsafe act or equipment failure immediately prior to the event. Other factors can be described as the basic or root causes of an incident, such as inadequate policies and standard operating procedures or an informal culture of saving money by employing unqualified people.; and

It is important to identify both immediate and root causes of incidents. These can form a complex web of interacting factors, with different weightings. In the case of the caving incident 15 immediate and 10 root causes were identified. In the case of the rock climbing incident, 11 immediate and 7 root causes were identified. Organisations need to address the underlying root causes rather than focus purely on preventing unsafe acts (immediate causes).

These quotes are included to emphasise the inherent complexity of causal analysis, and it is beyond the scope of this summary report to undertake such level of analysis. However some useful indicative insights about the potential value of the NID can be gained here from briefly exploring some of these variables and the related narratives (summarised to a limited extent in Appendix 7). A good place to begin is with the causal factors indicated for each incident from the lists of tick box options available. These included specific causal factors listed under main headings of *leader*, *participant*, *equipment* and *environment* headings.

Multiple causal factors were indicated in only 64% of incidents. This would seem an underestimate given the generally accepted levels of complexity in such causal factors. However it may reflect a limitation in the question style used to enter the data, and greater understanding is apparent in the descriptive and causal narratives (summarised to a limited extent in Appendices 2-8). Based on the boxes ticked by entry-makers Figure 12 summarises the number of times in which each category of causal factor was cited overall (e.g. *Leader*, *Participant*, *Equipment* and *Environment* categories).

Figure 12: Percentage of incidents in which causal categories were cited



Looking at each of these categories, a number of different specific factors stood out among their respective sub-categories:

- *Participant-related factors* were cited in 64% of incidents (116 times) including 32 cases specified as *judgement error*; 19 as *bad technique*; 17 as *unsafe acts*; 15 as failure to listen or follow instructions; 14 as *inadequate physical or mental condition*; and 9 as *inadequate practice or preparation*.
- *Environment-related factors* were cited in 46% of incidents (83 times) including 43 cases specified as *terrain*, 18 as *adverse weather*, 7 as *water* and 5 as *animal/insect*.
- *Leader-related factors* were cited in 30% of incidents (55 times) including 27 cases specified as *judgement error*, 9 as *inadequate supervision*, 8 as *inadequate training/experience*; and 5 as *failure to follow procedures*.
- *Equipment-related factors* were cited in 15% of incidents (27 times) including 8 cases specified as *faulty equipment*; 6 as *inadequate design*; 5 as *wrong equipment*; and a number of 'other' comments related to inexperienced or inappropriate use.

While the numbers of responses in individual response sub-categories are sometimes low and arbitrary categories are used to collect the data, valuable guidance is given on the entry-makers interpretation of causal factors and the main areas they consider are important. When combined with access to the explanatory causal narratives entered in relation to their categorised causal responses, deeper insights can be gained. Appendix 7 presents limited examples of these causal narratives, and illustrates a wide range of detail in what people say.

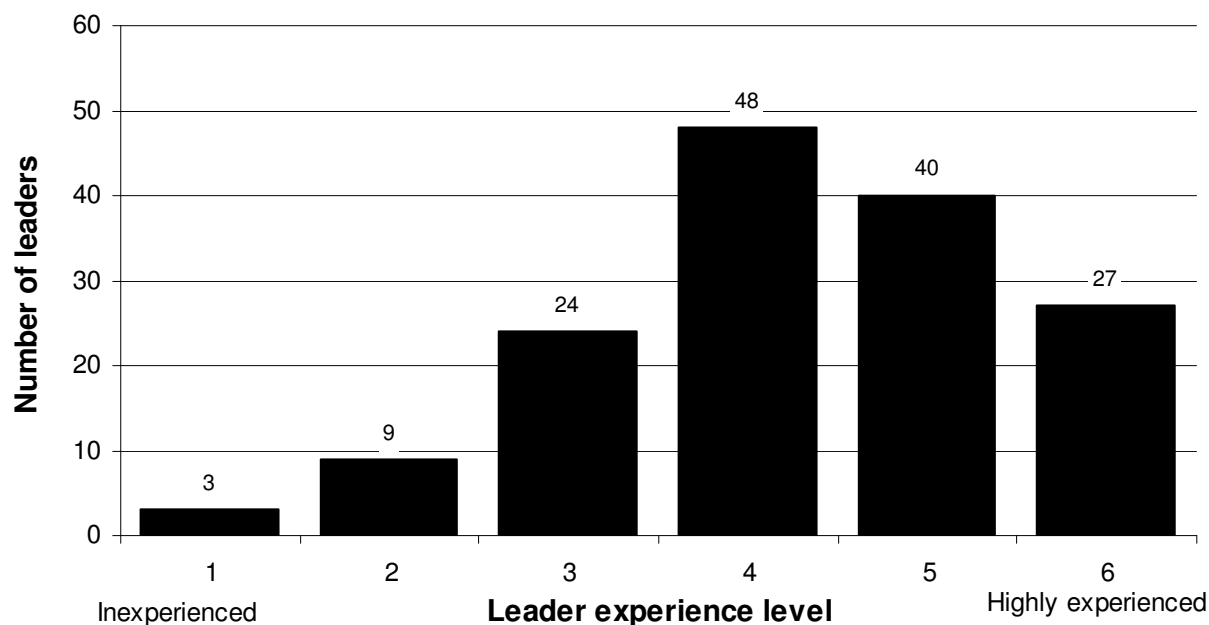
Additional understanding of causal factors can also be gained from using the other data in the NID. Appendix 8 presents a limited summary of two small case studies where general descriptive narratives were selected for incidents of hypothermia, and for incidents of prevailing bad weather conditions. This provides an opportunity for more in-depth causal analysis, identifying interesting points such as the hypothermia not always being associated with the worst weather conditions. Both these examples illustrate how prevailing weather conditions can be key causal factors in some incidents, contribute to the incidents in combination with other factors, or have little to do with the incidents at all. Clarifying such distinctions tests assumptions and broaden people's understanding of the complex interplays of causal factors that are more characteristic of most incidents than are simple cause-effect reactions.

These examples also illustrate how the classifying variables can be used creatively to achieve new perspectives on the data. For example in Appendix 8 the basic classifying variables entered on weather conditions (e.g. precipitation, temperature, wind) were complemented by the through creation of a new *weather index* summary variable to more simply identify target 'bad weather' incidents.

In another example of the potential for deeper causal analysis from NID data the role of leader experience in relation to incident severity can be considered. Leaders of the

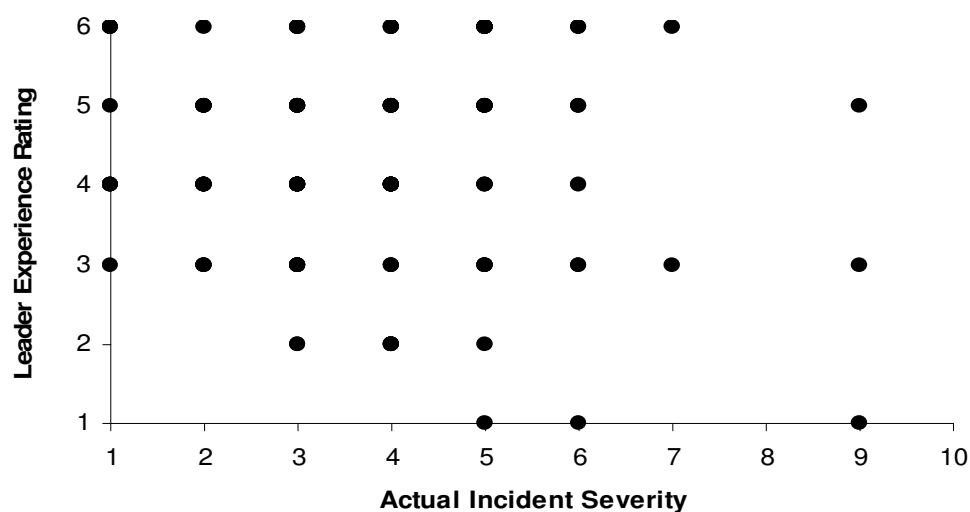
groups reporting incidents were rated as having a range of experience levels (Figure 13). These scores were based on subjective ratings and give no indication of experience criteria such as years of leading, activity qualifications or incident history. However in another classifying variable recorded in the incident entries 84% of leaders were considered to have a relevant activity qualification.

Figure 13: Rated experience levels for group leaders.



While detail of specific leader experience was not available here, the span of responses in Figure 13 does suggest a range of low to high leader experience levels are present in relation to incidents. Given that range, could an example of a useful hypothetical question be to ask if the actual severity of incidents be higher in groups led by less experienced leaders? On deeper investigation reference to current data available in the NID suggests that leader qualifications and experience might not have much relationship with the occurrence and severity of incidents. Figure 14 represents a simple scatter plot distribution of leader experience against actual incident severity.

Figure 14: Scatter-plot of Leader experience score by Incident severity score



The major feature of this figure is that there appears to be no apparent relationship between higher levels of leader experience and lower levels of incident severity – as might be expected if lack of leader experience was a determining causal factor¹⁵. Similarly, when comparing the mean severity ratings for incidents between leaders with low to moderate experience ratings (1-3) and those with highly experienced ratings (6), the respective mean severity scores were barely distinguishable (4.1 and 3.8).

However these example analyses are very simplistic and to draw any conclusive findings on this would require more detailed analyses based on more specifically defined experience criteria. What these indicative results suggest here is that there is unlikely to be a simple relationship between leader experience and the occurrence and severity of incidents. Clearly leadership will play a key role in reducing incident potential and in the ways incident situations are dealt with, but this will not be in isolation from many other factors. Reference to causal narratives would provide valuable interpretive insight to exploring such a question.

Overall, the interaction of the summary classifying variables for incidents type, severity and causal factors with both the descriptive and causal narratives provides a comprehensive basis for exploring incident causes. The classifying variables include comprehensive lists of incident types and causal factors which can allow selection of specific factors for investigation. The utility of this can only improve with the progressive inclusion of more incident data over time. In this respect the more incidents that can be added to the NID the better. Another area where improvements can take place is in the consistency of data entry and category choices by entry-makers. The NID guidelines do provide a good descriptive basis for this especially in relation to incident severity (e.g. the severity scale in Appendix 5), but more guidance on criteria for causal category choice does need to be developed and made more readily available and understood. The process of incident data entry will always have a degree of subjective variation, but the more this can be reduced the more valuable will be the NID data. In addition more comprehensive and specific narratives describing incident occurrences and probable causal factors will add further value. The current notes guiding the causal narratives ask entry-makers to *“Explain in detail what you think caused the incident. Include any suggestions, observations or recommendations regarding this incident”*. The content of Appendix 8 illustrates how variable the quality of narratives sometimes are, but the better this can be done in all respects the better will be the results gained from the NID and its applications. And at some stage in the future connection of the NID database with statistical packages and qualitative text analysis tools will also add considerable value to any general or causal-factor analysis. However considerable value is already available by systematically sorting the narratives around target topics of interest as done here to a limited extent in Appendices 2-7 as examples. These examples are not analysed here in detail as it is beyond the scope of this summary report, but they are included to assist others explore topics of interest, and to provide good examples of what else might be possible.¹⁶

¹⁵ Each point may represent a number of responses and have different weightings, but even taking this in to account using a simple visual EXCEL chart trendline, no apparent relationship was found between severity rating and experience level. Such a relationship could exist but these data do not indicate this.

¹⁶ It is important to note that those narratives presented in the Appendices only represent a small subset of those analysed, due to current limitations in the number of organisations/agencies/individuals able to give approval to use narratives they enter (in suitably ‘anonymised’ form) in the limited time available.

3. Summary and recommendations

In summarising the NID data for 2 years this report has shown both the potential utility of the NID and some areas for its improvement. The NID has been developed on the basis of considerable previous research and database exploration, and it shows the potential to be a significant learning and advocacy resource for the outdoor sector. Its use of actual and potential severity scores, incident prioritising on that basis, a focus on including near misses and use of narratives are all key elements. It offers a single collective store of incident information for New Zealand's outdoor recreation sector, alongside which is the potential to have links to a new initiative that is attempting to develop an international incident database. Both these objectives are worthwhile as both offer the potential to significantly enhance the interpretive power and authoritative status of incident databases and their applications.

As noted early in this report, without access to robust and respected data, the judgements made about outdoor recreation and its relative worth and risks will continue to be more subject to general opinions externally rather than documented fact from inside. In addition, organisations that do not learn or are not seen to learn from past situations or mistakes will come under increasing scrutiny in the future. While individual outdoor sector organisations may have internal needs for good incident data, these should not be seen in isolation from the needs of the wider sector. The outdoor recreation sector is a well known for being fragmented, and few opportunities to pool effort around common needs have been taken. There is good reason behind the old sayings '*divide and conquer*' and '*safety in numbers*'. Most outdoor recreation organisations have very good reasons to have good information systems around incidents and safety, but the information systems used are highly variable where they exist at all.

The NID offers the opportunity for a robust and easy-to-use system that can meet the needs of most organisations. Engaging with this not only provides a useful tool for any individual outdoor sector organisation, many of which lack the capacity to run strong systems on their own, but it also offers a higher level of rigour, robustness and informed collective perspective that adds significant value in risk and safety management, decision-making and justification. The main questions to consider are '*Why wouldn't you?*' and '*How hard can it be?*' - especially if your organisation is already running its own systems. Data matching and transfer systems may be all that is required in some cases.

3.1 Engagement and uptake of the NID

The current NID data on incident region and activity type suggests a very uneven engagement with it to date. It is clear that a considerable number of organisations have registered to use the NID, but the current level of reporting when compared to that apparent in incident studies such as Davidson (2002, 2006) suggests the level of reporting is also low and erratic. As with any innovation there is a common pattern of persistent initiators and early adopters leading the way over an extended period, before a body of evidence and example begins to build and the more general uptake develops (assuming that evidence is compelling). This would appear to be the situation for the NID at present, and more attention would seem to be required on identifying case study examples that illustrate what the NID can offer and how the information can be used. This would appear to be the most constructive direction for new work in relation to

developing the NID, beyond the ongoing technical refinement that should occur as a matter of course. Some of the larger outdoor recreation sector organisations that are already collecting incident information should consider how they might contribute positively here. This does not necessarily involve commitment of any substantial finance or resources, as with a strong collective case other funding opportunities can be explored. But it does involve a willingness to share data and cooperate on database structure. This has been demonstrated in the engagement with and use made of the NID by the ski sector.

Based on level of organisation and shared need, the logical place to look at next in this regard would be the outdoor education component of the outdoor recreation sector. In this area both the outdoor education/experience providers and the schools have requirements for robust risk and safety systems and related incident reporting requirements (both compulsory and voluntary). Many already have their own internal reporting systems and databases, and some are attempting to use common systems already. If this sector could engage with the NID to the extent to which the ski sector does, the NID and its value to all would be considerably enhanced. This would also make the New Zealand outdoor recreation sector world-leading in incident data information and management.

Here the recommendation is that the outdoor education sector progressively moves to adopt the NID as its collective incident database for outdoor recreation and EOTC needs. This can parallel internal systems where they already exist. To facilitate this direction the establishment of a working group of key representatives in incident management and data applications would be a good first step. Opportunities to develop ongoing data matching, sharing and transfer systems from existing database resources should be a priority topic of discussion.

3.2 *Improvement of participation data*

Another general need is improved specification of participation data. There is capacity in the NID for specific participation data to be entered for specific activities, but to date this has been completed by very few registered organisations. Again, basic participation data, including both numbers and basic profile characteristics is something most professional organisations would or should already collect for their own requirements. However it is also clear that this is rarely done outside of the ski industry, and most probably the outdoor education/experience providers. It is recommended here that case studies be sought which demonstrate the value of having such key reference data in combination with good incident records. This could be another theme considered by the working group of key representatives suggested above.

In the case of non-professional/non-commercial organisations it is understood that such data may not be available to different individuals or groups, and that other means may be required to source it when undertaking any incident analysis. However, if specific activity sectors (e.g. mountain biking, equestrian, canoeing etc) can develop their own participation data estimation as best they can then that will be a considerable advantage when engaged in any incident rate or trend investigation (or in meeting any other participant need).

It should be noted here that meeting the risk and safety needs of the outdoor recreation sector are not the not the only reasons for having good participation data. Any initiatives to improve participation data identification and collection could be developed

as part of a wider identified need in the outdoor recreation sector. This has obvious implications for wider resource and funding potential. The NID could just as usefully aim to make itself part of a national participation database as well as being the national incident database. A recommendation here is that the NID stakeholder group investigate possibilities to engage in a wider study of outdoor recreation participation data, along with new partners sharing that need.

3.3 Other recommendations

Leaving aside the need for wider engagement with the NID on incident reporting and participation data, there are a number of areas where it can be improved, or where information from it can be usefully applied. While this must be subject to resource and staff availability, it is useful to briefly note some of the particular points observed while engaged in this report (in no particular order):

- Overall there were a high variety of incidents of different types and significance. Given the lack of reference data such as participation levels the focus for analysis at this time should be on exploring the narratives and identifying priority hypotheses for testing.
- There is clear need for more opportunity to analyse narratives (in a suitably 'anonymised' form). In the limited time available only a few data-contributing organisations/agencies/individuals were able to give approval for this to occur in relation to any narratives they entered, so only a small subset were able to be used at this time. This is clear from viewing the gaps identified in the Appendices. Such approvals should be strongly encouraged in the future, with suitable provisions embedded to provide clear anonymity of data source.
- Case studies of the applications made of the NID data by the ski-industry should be carried out. These would provide examples to demonstrate the benefits of engagement to the non-ski sector. Such evidential material would be required to convince relevant decision-makers to support the time and resources that may be required for their engagement with the NID.
- Consistency in data entry should be improved over time. The guidelines on data entry should if possible be made more widely and easily available so that over time the consistency of data entry is enhanced. This could include some form of link to explanation-assistance for respective questions which is accessible as the individual is entering the record.
- A review of the database variables should be considered, to identify how each variable works in data analysis and whether any changes or additions could improve utility. This would be consistent with the NID project being a development programme, and a current 'work-in-progress'. Any reassessment could also include consideration of data needs from particular sectors. It is noted that the ski-sector has a degree of customisation in its data entry fields, and this could be worthwhile considering in relation to any other large common sectors (e.g. the outdoor education/experiences sector). Should some customisation be the price of achieving greater engagement by a significant sub-set in wider outdoor recreation sector, such flexibility should be considered.

- It is also noted that as part of development of a proposed new international incident database, an extensive analysis has taken place of data needs and the variable types required (i.e. refer www.incidentdatabase.org). Collaboration potential may be possible here.
- Related to the above, a filter variable is required in the database identify different components of the outdoor recreation sector. At the moment it requires a long manual process to distinguish between ski and non-ski records. Should it ever be required to identify an outdoor education sub-sample for example, the process required would be time intensive and subjective, based on data analyst deductions from viewing other data in the records. This would be an easy fix, with some sort of tick box question being all that is required.
- Some specific data entry fields lack criteria to control entry errors. One example is the date field, which was seen to have data entered in dd/mm/yyyy format in some cases; mm/dd/yyyy in others; and text entries. This complicated attempts to search for cases over any set time period. Similarly, some users have entered data in the wrong fields, involving additional data cleaning being required by database managers. Some data entry packages have the capacity to allow specification of valid and non-valid entry types. This could assist here, although it is acknowledged that there are some resource implications. However, if the NID is to be practically easy enough to use to encourage larger scale engagement then such issues must be considered.
- The ethnicity question has some design problems that results in unreliable data. Redesign to distinguish nationality from ethnicity is recommended if this question is to be retained. It is understood that ethnicity data is an important component of subject profiles in any public service provision. Related to this, given popular interest in tourism incident costs, consideration of a simplified nationality question should be given to identify the distinction between New Zealand and overseas subjects.
- Because multiple incident cases can be entered from any specific incident event, some means of better distinguishing the event from the number of cases in each should be considered. Without this, the database reporting will have bias toward incidents involving larger numbers of individuals. This may involve creating a specific variable of unique 'Incident event', as well as the current *IncidentID* number attached to each case. Both are required. In their absence the separation must be done manually. While this is feasible given the non-ski outdoor recreation component of the NID is currently not large, it will become increasingly problematic as it grows.
- Consideration is required for connecting NID data to statistical analysis packages and qualitative information analysis packages. The variables in the database provide a variety of analytical opportunities, which are often not simple or possible to address in EXCEL. The capacity to sort, summarise and analyse data is limited, and considerable manual processing was required to provide many of the data findings and figures charts in this report. In addition, as the narrative record builds, means to more quickly sort through these to identify common qualitative themes will be important.

To conclude using slightly edited content from NID advocacy material, to make the national Incident database work we need:

1. *Active participation from the whole outdoor sector* - Outdoor centres/providers, national organisations, recreational clubs, schools, tertiary education organisations, outdoor event organisers, adventure tourism and ski field operators.
2. *Financial, in-kind and advocacy partners* – contributors so far include the Ministry of Education, NZ Mountain Safety Council, Education Outdoors NZ, Outdoors NZ and ACC. Also note there are also potential international partners developing.
3. *A culture of real collaboration* – including openness, identification of common purpose and a willingness to share incidents without judgement.
4. *To spread the word* – please tell others about the National Incident Database and about any successes you have had using it.

To join go to: www.incidentreport.org.nz

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4. Appendices¹⁷

1. NID base variables
2. 'Injury' Incident Narratives
3. 'Near Miss' Incident narratives
4. 'Other' Incident narratives
5. Incident Severity Scale
6. High Severity Incident Narratives
7. Examples of Causal Narratives
8. Causal Case Study Examples: Hypothermia and Bad Weather)

¹⁷ Note that Appendices 2-8 present only summaries of wider narrative analyses. Full narrative content could not be presented due to only a limited number of 'narrative-use' approvals from contributing organisations being possible to get in the time available.

APPENDIX 1 - NID base variables

This lists the NID variables. They are not listed 'data entry' order, but as they appear in the database. Refer to NID Guidelines for full variable descriptions and metadata.

http://www.incidentreport.org.nz/resources/OER_NID_Guide.pdf

- IncidentID – number for each incident event
- Actual Severity - code
- Potential Severity –code
- Region – open text entry
- Address – specific location - open text entry
- Grid Ref – open text entry
- Date – open text entry
- Time – open text entry
- Incident type - codes, multiple entries possible
- Descriptive narrative – open narrative
- Weather –code
- Temperature - code
- Wind–code
- Communications – open text entry
- Lost Days – YES/NO plus number of days
- Number Persons - number (may be more than 1 incident case per event)
 - age - number
 - sex – male/female
 - ethnicity - code
 - injury – detail of injury type (coded)
 - Illness – detail of illness type (coded)
 - near miss – post-coded by database administrator)
 - missing – post-coded by database administrator)
 - fatality - post-coded by database administrator)
 - evacuation method - code
- Activity Type - code
- Curriculum area – code (schools only)
- Duration hrs - number
- No. Qualified Instructors - number
- No. Volunteer Helpers - number
- No. Supervisors - number
- No. Participants - number
- EOTC
- Leader age - number
- Leader Gender – male/female
- Leader Relevant Qualifications – yes/no
- Leader Experience - coded
- Casual Factors Leader - coded
- Casual Factors Participants - coded
- Casual Factors Equipment - coded
- Causal Factors Environment – coded
- Causal Factors - Narratives

APPENDIX 2 - 'Injury' Incident Narratives

The data presented below for each injury incident comprise the actual severity score, potential severity score and the narrative about what happened. The narratives are edited to remove specific individual and place names so that no specific individual, organisation or location could be identified (e.g. 'anonymised'). Other data is available from the database if required, subject to privacy constraints.

Overall there were 143 useable '**injury incident**' narratives identified and anonymised. However only 35 of these could be presented here, as only few of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Despite this major limitation the 'approved' narratives are presented here to illustrate the potential of narratives as a key information resource. It is important to acknowledge that only a small portion of the otherwise available narratives could be presented this way. With more approval to use narratives the content and value of this information resource will increase.

Injuries during 'Free-Time'

These were received in times outside of the main recreation activity (e.g. tramping, sailing etc) or programmed activity (e.g. games, initiatives etc). Such times were early in the morning, later in the evenings and overnight when people were cooking, sleeping or engaging in casual activities. At these times participants are least likely to be under any leadership direction or supervision, or to be sharing the same activity with others who could be watching and/or assisting them.

There were 17 descriptive narratives identified from the NID data for '***Injuries during Free-Time***' during the 2007-08 years. Only 3 of these could be presented here as few of the organisations were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
5	5	XXX woke in the am with back pain. Had pain in legs night before but unreported. Sharp and stabbing back pain on left lower side. More painful sitting. Most comfortable on back legs bent. History of back pain but nothing indicated on medical records. Panadol for pain relief. 2 hours later pain still not reduced. Evacuated to XXX and evacuated further to YYY
5	6	The group was cooking tea and asked a teacher to refill the meths container for their Trangia cooker. A flame shot up from the container burning the student on the arm and face.
4	4	Y7 students cooking their dinner under the supervision of their Y13 leader over gas cookers in a designated area. Student walked too close to cooker and billy of near boiling water fell and poured water over another student's ankle and foot and into her shoe sustaining a painful burn.

Injuries during 'Initiatives'

These were received doing organised activities associated with outdoor education and adventure based learning. This includes wide games, confidence courses, ropes etc. These would normally be directed activities under supervision and shared with other participants who could be watching and/or assisting them.

There were 30 descriptive narratives identified from the NID data for '***Injuries during Initiatives***' during the 2007-08 years. Only 8 of these could be presented here as few of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
4	4	Two group members jumped up and climbed up onto the top of the wall. I jumped and grabbed the top of the wall and was pulling myself up when I lost my grip slipped and fell back down the wall. My trailing hand hit a knot hole or a crack in the wall and lacerated my left hand in between 4th and 5th digits. Was taken to the doctor where it was 'numbed' and 5 stitches inserted. Not allowed to work play any sport etc for the next week until stitches are taken out and cut healed sufficiently.
3	5	While completing a team activity another student slipped on the log and hit XXX under the chin with his knee.
3	7	Group on XXX pushing teacher along reasonably hard caused her to collide with the belay rope and give her a fright.
3	3	Student tripped and twisted ankle while playing bush basketball
5	5	XXX was dropping students off on the solo loop and slipped off the track. Her ankle was treated with RICE and afterwards was x-rayed and a fracture diagnosed.
3	6	Student slipped coming down steps from the high poles course
3	6	Group were walking back from nightline - student slipped got stuck and her shoulder 'went back' . She moved and felt her shoulder click back into place it was numb and tingly but by the next morning had improved.
4	4	XXX fell off the swing platform as more people got on. Landed on her wrist and thought she may have blacked out. Wrist bandaged and head checked. No sign of head injury. Monitored. Patient used her arm for writing later on

Injuries during Specific Activities

These were received doing a range of specific recreation activity type such as tramping, rafting, biking etc. They are arranged below under specific headings in descending order. Some injuries are related to environmental and physical components specific to the activity while others are relatively independent of the specific activity type.

Land-based activities

- **Tramping**

There were 34 descriptive narratives identified from the NID data for '***Injuries during Tramping***' during the 2007-08 years. Only 7 of these could be presented here as few of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
3	5	Group was walking through the bush and slipped on a tree root and turned on her ankle - unable to walk unassisted.
3	5	XXX slipped while walking down the track - slipped and twisted knee. Walked to lodge where first aid was applied.
5	5	Student slid on snow hit ankle on rock.
5	5	Student walking along river bed to campsite - tripped on rocks and sprained her wrist
5	6	Tramping along an exposed ridge in very strong winds and persistent rain and one of the participants slipped on a descent falling awkwardly landing on his hand bending one of his fingers and fracturing it.
3	5	Tripped over rock and rolled ankle - taken back to the lodge by vehicle the next morning.
3	4	While walking along the track XXX slipped and rolled ankle. Instructor radioed for vehicle assistance as the ankle discoloured and became swollen immediately.

- **Mountaineering**

There were 5 descriptive narratives identified from the NID data for '***Injuries during Mountaineering***' during the 2007-08 years. None of these could be presented here as none of the organisations were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

- **Orienteering**

There were 5 descriptive narratives identified from the NID data for '***Injuries during Orienteering***' during the 2007-08 years. Only 3 of these could be presented here as only some of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
5	5	Rollled ankle while running in orienteering exercise. Some swelling but no sign of a fracture. RICE and kept overnight in lodge plus Panadol for pain relief. No change in pain by am so evacuated to XXX medical centre. Then evacuated to nearest medical centre.
4	7	Group was participating in a navigation activity. XXX slipped on a log and rolled her ankle.
3	5	Students completing navigation exercise XXX fell onto her knee - painful with reassurance she walked back to the lodge - first aid applied.

- **Rock Climbing/abseiling**

There were 4 descriptive narratives identified from the NID data for '***Injuries during Rock Climbing/abseiling***' during the 2007-08 years. Only 1 of these could be presented here as only few of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
5	5	XXX organised hostel staff to take internationals to XXX for indoor climbing. No approval or systems completed. Student was dared by others to jump from balcony he did and injured his leg with fracture

- **Caving/Cave tubing**

There were 11 descriptive narratives identified from the NID data for '***Injuries during Caving/Cave tubing***' during the 2007-08 years. All of these could be presented here as all of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
3	4	Caught foot between rocks stumbled over tube twisted ankle
5	5	Client jumped forwards off 3m ledge landing on bum on tube on water dislocating shoulder
5	6	Client paddling backwards in tube almost at cave exit. shoulder popped out no real distress.
5	5	Group coming down slide in high water flow one collided with XXX spraining his knee
5	5	XXX loosened a pack stuck in shaft while hauling it out of cave as it came free it shock loaded the rope which John had his wrist wrapped around
3	5	XXX was walking to cave entrance strained her achilles tendon
5	5	XXX walking in stream aggravated old knee injury temporary dislocation
4	5	rope rubbed XXX's finger raw while abseiling the 35m entrance pitch.
3	4	XXX decided to float (tube) over the waterfall (never recommended esp in high water flow) . Way was not clear she was forced to take the wrong line and made contact with rocks injuring her knees
4	6	Group waiting to use slide got excited and accidentally pushed XXX over edge he fell and landed on rocks

4	5	jumping off 1m waterfall into water made contact with rock injuring ankle
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- **Mountain biking**

There were 2 descriptive narratives identified from the NID data for '***Injuries during Mountain biking***' during the 2007-08 years. Both of these could be presented here as all of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Actual Severity	Potential Severity	Descriptive narrative
3	4	XXX lost control while taking a corner on the mountain bike. He was cut on his leg and arm
6	6	Group of Y12 students on leadership camp. At start of learning to be assistant leaders on a mountain bike skills course that all but 2 of the students had done before in Y10 an international student who had not been before caught her front wheel in gravel on a downhill slope of a well formed farm race and slowly went over the handlebars landing awkwardly on her outstretched left hand and her lower face unprotected by the properly fitting helmet.

Water-based activities

- **Kayaking**

There were 11 descriptive narratives identified from the NID data for '***Injuries during Kayaking***' during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

- **River Tubing/Rafting**

There were 4 descriptive narratives identified from the NID data for '***Injuries during River-tubing/Rafting***' during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

- **River-crossing/canyoning-gorging**

There were 2 descriptive narratives identified from the NID data for '***Injuries during River-crossing/canyoning-gorging***' during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

- **Sailing**

There was 1 descriptive narrative identified from the NID data for '***Injuries during Sailing***' during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Snow-based activities sports

- **Skiing/Snow Boarding**

These were entered as recreation incidents and appear on the non-ski part of the NID database. There were 13 descriptive narratives identified from the NID data for '***Injuries during Skiing/Snow-boarding***' during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

'Other' Activities– could not classify into other groups

There were 4 descriptive narratives identified from the NID data for '***Injuries during 'Other' Activities***' during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

APPENDIX 3 - 'Near Miss' Incident narratives

The data presented below for each near miss incident comprise the actual severity score, potential severity score and the narrative about what happened. In some cases injuries or illness were also involved, but the 'near miss' designation represented a conclusion that it could have been worse. In some cases the incidents were also entered as sperate injury or illness incidents.

The narratives are edited to remove specific individual and place names so that no specific individual, organisation or location could be identified (e.g. 'anonymised').

No charts have been prepared due to small sample size and wide range of low frequency responses. Other data is available from the database if required, subject to privacy constraints.

Overall there were 29 useable near-miss incident narratives identified and anonymised. However only 5 of these could be presented here, as only few of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Despite this major limitation the 'approved' narratives are presented here to illustrate the potential of narratives as a key information resource. It is important to acknowledge that only a small portion of the otherwise available narratives could be presented this way. With more approval to use narratives the content and value of this information resource will increase.

Near Misses during Initiatives

These were received doing organised activities associated with outdoor education and adventure based learning. This includes wide games, confidence courses, ropes etc. These would normally be directed activities under supervision and shared with other participants who could be watching and/or assisting them.

NOTE that there were 9 descriptive narratives identified from the NID data for '***Near misses during Initiatives***' during the 2007-08 years. Only 1 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Activity	Actual Severity	Potential Severity	Descriptive narrative
Ropes	3	3	Running a joint staff rescue update for 3 staff at the same time as having 4 senior leaders practicing belay set ups on the ground. Checked by themselves their partner and me. No one picked up that Sticht plate was threaded incorrectly - threaded through the device from one side to the other rather than a bight pushed through as per normal. Device still functioned safely but not correct. One participant climbed the XXXX with this set up and was lowered from the top

Near Misses during Specific Recreation Activities

These were received doing a range of specific recreation activity type such as tramping, rafting, biking, caving abseiling etc.

NOTE that there were 14 descriptive narratives identified from the NID data for '***Near misses during Specific Recreation Activities***' during the 2007-08 years. Only 3 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Activity	Actual Severity	Potential Severity	Descriptive narrative
Rafting	3	5	Client about to attempt a 2.5m rock jump but was hesitating. Her father pushed her off. She fell sideways and entered the water head first but did not hurt herself. She slipped off the rock with her foot caught slightly which turned her sideways.

Tramping	2	7	Breaking manuka sticks over a stump for firewood. One stick broke off hit ground and rebounded up and hit the person across the left eye. (luckily the eye closed in time to prevent injury).
Tramping	3	5	Rain warnings in place. River came up. Scouted for 1 hour. River Crossing practice and brief for 1 hour. Difficult fast crossing. Minor collapse of mutual support. Wash out possible but ok re-gathered. All out safe. A little shaken but ok.

Near Misses during 'Other' Activities

These were activities outside of Initiatives and specific recreation activities. This includes other reasons for outdoor visits such as field trip study or work related tasks, or general unspecified recreation/tourism.

There were 5 descriptive narratives identified from the NID data for '***Near misses during 'Other Activities'***' during the 2007-08 years. Only 1 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Activity	Actual Severity	Potential Severity	Descriptive narrative
Field Trip	2	8	Group departed for trip with no EOTC procedures in place and no sign offs for trip by Principal or BOT risk management incomplete details of trip incomplete

APPENDIX 4 - 'Other/Non-injury' Incident narratives

This presents narratives for the following incident types:

- Illness;
- Psychological;
- Equipment;
- Missing;
- Fatality

They are summarised together here because the number of individual incidents related to each is low. Narratives are entered under the respective headings. Any individual incident could include a number of incident types, and multiple incident types have been entered in respect to single cases. For example, an injury may involve a psychological component as a causal factor or as a complication following injury etc. Similarly an incident where someone went missing may also be recorded as a 'Near Miss'. So in some cases the details of these incidents were also entered multiple times in this narrative analysis depending on the incident type concerned. This allows a more comprehensive view.

The narratives are edited to remove specific individual and place names so that no specific individual, organisation or location could be identified (e.g. 'anonymised'). Other data is available from the database if required, subject to privacy constraints.

Overall there were 30 useable 'other' incident narratives identified and anonymised. However only 9 of these could be presented here, as only few of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available. These related only to the illness (6 narratives) and psychological (3 narratives) incidents types. Other narratives relating to equipment, missing or fatality incident types were present in the database but could not be used here without approval.

Despite this major limitation the 'approved' narratives are presented here to illustrate the potential of narratives as a key information resource. It is important to acknowledge that only a small portion of the otherwise available narratives could be presented this way. With more approval to use narratives the content and value of this information resource will increase.

‘Illness’ Incident Narratives

There were 13 descriptive narratives identified from the NID data for ‘***Illness Incidents***’ during the 2007-08 years. Only 6 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably ‘anonymised’ form) in the limited time available.

Activity	Actual Severity	Potential Severity	Descriptive narrative
Caving	7	8	XXX collapsed while walking in the streamway halfway through caving activity and started convulsing. Guides noticed cyanosis and mydriatic and unresponsive pupils along with some shallow ragged breathing. Help was called and he was evacuated out nearest exit.
Field Trip	5	5	Allergic reaction to sandfly bites with major swelling of lower limbs unrelieved by antihistamines
Free Time	4	6	Girls sprayed aerosol inside the long drop at the campsite. XXX used long drop and a reaction to the aerosol caused tingling light headedness and an asthma attack. After 40 minutes the symptoms eased and she was breathing normally.
Initiatives	3	7	Group was briefed about the solo activity each one dropped off. XXX under canopy on a closed cell mat. When the pick up was made he was found lying down and shivering. Assessment was made - he began the walk back assisted by two others. Warm clothing was given and he was monitored overnight. OK by the morning
Tramping	6	9	12 Trampers were near XXX Hut when 1 member felt very unwell. The team made her comfortable and warm and talked to her as she kept wanting to sleep. A mattress was brought down from the hut to get her off the rocks. As an afternoon mist was coming in they used the PLB and the XXX Helicopter came over. The local chopper was already on a case. Each time the trumper closed her eyes she stopped breathing, so she was propped up from behind and kept being talked to.
Other	5	5	Onset of illness which suddenly increase in pain. pain in arms neck and kidney area while transporting in to camp. Rasping in lungs with query infection. Patient did not mention condition till at location. Treated at site with cooling compress for cardiac reassurance and evacuated through river by tractor then ambulance. Confirmed pneumonia

‘Psychological’ Incident Narratives

There were 15 descriptive narratives identified from the NID data for ‘***Psychological Incidents***’ during the 2007-08 years. Only 3 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably ‘anonymised’ form) in the limited time available.

Activity	Actual Severity	Potential Severity	Descriptive narrative
Field Trip	4	8	Bullying and victimisation of student by group from XXX High School. Group had been disrespectful to Polytec tutor and smoking. Teachers went to separate lunch location and students unsupervised. Other incidents in the pm noticed or reported. Teacher decided against intervening. Polytec tutor separated groups for buses. XXX upset and angry. Teacher discussed with his mother and Principal re further action from the school
Initiatives	4	8	XXX threatened to kill another student
Caving	5	5	XXX freaked out while abseiling into cave and lost control of descent. YYY called to bottom belay who stopped her fall.

‘Equipment’ Incident Narratives

There were 4 descriptive narrative identified from the NID data for ‘**Equipment Incidents**’ during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably ‘anonymised’ form) in the limited time available.

‘Missing’ Incident Narratives

There were 4 descriptive narrative identified from the NID data for ‘**Missing Incidents**’ during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably ‘anonymised’ form) in the limited time available.

‘Fatality’ Incident Narratives

There were 4 descriptive narrative identified from the NID data for ‘**Fatality Incidents**’ during the 2007-08 years. None of these could be presented here as none of the organisations entering the respective incidents into the NID were able to give approval to use these narratives (in suitably ‘anonymised’ form) in the limited time available.

APPENDIX 5 - Incident Severity Scale

Note that incident reports require both 'actual' and 'potential' severity scores to be entered, with related narrative entry describing how the incident could have been potentially worse. Also note many people do enter incidents with scores < 3, and that in some cases this is encouraged to reduce reporting loads. It is recommended in many cases that incidents with severity of 6 or over are the subject of more in depth review.

Severity Ranking	Impact on Participation	Injury	Illness	Social / Psychological Damage	Equipment Damage	Environmental Damage	
1	Minor or short term impact on	Splinters, insect bites, stings	Minor irritant	Temporary stress or embarrassment.	1	Minor cost	Littering
2	individual(s) that doesn't have large effect on their participation in the programme.	Sunburn, scrapes, bruises, minor cuts.	Minor cold, infection, Mild allergy.	Temporary stress or embarrassment with peers.	2	>\$50	Minor damage to environment that will quickly recover.
Severity Scale 3 & above to be recorded on National Incident Database							
3	Medium impact on individual(s) that may prevent participation in the activity/programme for a day or two	Blisters, minor sprain, minor dislocation, cold/heat stress	Minor asthma, cold, upset stomach, etc.	Stressed. Beyond comfort level. Shown up in front of group.	3	>\$100	Scorched campsite, plant damage
4		Lacerations, frostnip, minor burns, mild concussion, mild/hypo hypothermia.	Mild flu, migraine.	Stressed. Wants to leave activity. A lot of work to bring back in.	4	>\$500	Burnt shrubs, cut live branches to burn, wash dishes in stream.
5		Sprains & hyperextensions, minor fracture.	Flu, food/hygiene related diarrhoea / vomiting	Distressed. Freezes on activities, requires 'emotional rescue'. Does not want to participate again.	5	>\$2,000	Walked through sensitive ecological area destroying some plant life, toileting close to water course
Any Incidents to people at grade 6 & above need to be reported to OSH							
6	Major impact on individual(s) that would mean they were unable to continue with large parts of the programme.	Hospital stay < 12 hours. fractures, dislocations, frostbite, major burn, concussion. Surgery. Breathing difficulties moderate hypo/hypothermia.	Medical treatment required Hospital stay < 12 hours e.g. Serious asthma attack, serious infection, Anaphylactic reaction.	Very distressed. Leaves activity and requires on site counselling. Unwilling to participate in activity ever again.	6	>\$8,000	Destroyed / killed some example of flora/fauna
7		Hospital stay > 12 hours e.g. Arterial bleeding, severe hypo / hypothermia. Loss of consciousness.	Hospital stay > 12 hours e.g. Infection or illness causing loss of consciousness, serious medical emergency.	Therapy / counselling required by professional.	7	>\$20,000	Killed, destroyed, polluted small area of environment.
8		Life changing effect on individual(s) or death	Major injury requiring hospitalisation e.g. Spinal damage, Head injury.	Major illness requiring hospitalisation e.g. Heart attack.	Long term counselling/therapy required after incident.	8	>\$50,000
9	Single death		Single death	Post-traumatic stress disorder, changed profession because of incident. Post-traumatic stress disorder.	9	>\$250,000	Fire or pollution etc resulting in area of wilderness being destroyed
10	Multiple fatality		Multiple fatality	Suicide because of incident.	10	>\$1,000,000	Major fire or pollution causing serious loss of environment or life.

APPENDIX 6 - High Severity Incident Narratives

The data presented below for each injury incident comprise the actual severity score, potential severity score and the narrative about what happened. Only the more significant incidents which scored above 6 in severity are included (refer Appendix 5 for severity score scale).

The narratives are edited to remove specific individual and place names so that no specific individual, organisation or location could be identified (e.g. 'anonymised'). Other data is available from the database if required, subject to privacy constraints.

There were 74 descriptive narratives identified from the NID data that related to incidents of ***'high actual and/or potential severity'*** during the 2007-08 years. Only 19 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Despite this major limitation the 'approved' narratives are presented here to illustrate the potential of narratives as a key information resource. It is important to acknowledge that only a small portion of the otherwise available narratives could be presented this way at this time. With more approval to use narratives the content and value of this information resource will increase.

Arranged by Actual Severity

There were 22 descriptive narratives identified from the NID data that related to incidents of '**high actual severity**' during the 2007-08 years. Only 3 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Activity	Actual severity	Potential Severity	Description
Caving	7	8	XXX collapsed while walking in the stream way halfway through caving activity and started convulsing. Guides noticed cyanosis and mydriatic and unresponsive pupils along with some shallow ragged breathing. Help was called and he was evacuated out nearest exit.
Mountain Biking	6	6	Group of Y12 students on leadership camp. At start of learning to be assistant leaders on a mountain bike skills course that all but 2 of the students had done before in Y10 an international student who had not been before caught her front wheel in gravel on a downhill slope of a well formed farm race and slowly went over the handlebars landing awkwardly on her outstretched left hand and her lower face unprotected by the properly fitting helmet.
Tramping	6	9	12 Trampers were near XXX Hut when 1 member felt very unwell. The team made her comfortable and warm and talked to her as she kept wanting to sleep. A mattress was brought down from the hut to get her off the rocks. As an afternoon mist was coming in they used the PLB and the YYY Helicopter came over. Each time the trumper closed her eyes she stopped breathing so she was propped up from behind and kept being talked to.

Arranged by Potential Severity

There were 52 descriptive narratives identified from the NID data that related to incidents of ***'high potential severity'*** during the 2007-08 years. Only 16 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

Activity	Actual severity	Potential Severity	Description
Tramping	6	9	12 Trampers were near XXX Hut when 1 member felt very unwell. The team made her comfortable and warm and talked to her as she kept wanting to sleep. A mattress was brought down from the hut to get her off the rocks. As an afternoon mist was coming in they used the PLB and the YYY Helicopter came over. Each time the trumper closed her eyes she stopped breathing so she was propped up from behind and kept being talked to.
Caving	7	8	XXX collapsed while walking in the stream way halfway through caving activity and started convulsing. Guides noticed cyanosis and mydriatic and unresponsive pupils along with some shallow ragged breathing. Help was called and he was evacuated out nearest exit.
Field Trip	4	8	Bullying and victimisation of student by group from XXX High School. Group had been disrespectful to YYY tutor and smoking. Teachers went to separate lunch location and students unsupervised. Other incidents in the pm noticed or reported. Teacher decided against intervening YYY tutor separated groups for buses. XXXX upset and angry. YYY discussed with his mother and Principal re further action from the school
Field Trip	2	8	Group departed for trip with no EOTC procedures in place and no sign offs for trip by Principal or BOT risk management incomplete details of trip incomplete
Orienteering	4	7	Group was participating in a navigation activity. XXX slipped on a log and rolled her ankle.
Initiatives	3	7	Group on rope activity pulling teacher along reasonably hard caused her to collide with the belay rope and give her a fright.
Initiatives	3	7	Group was briefed about the solo activity each one dropped off. XXX under canopy on a closed cell mat. When the pick up was made he was found lying down and shivering. Assessment was made - he began the walk back assisted by two others. Warm clothing was given and he was monitored overnight. OK by the morning
Tramping	2	7	Breaking manuka sticks over a stump for firewood. One stick broke off hit ground and rebounded up and hit the person across the left eye. (luckily the eye closed in time to prevent injury).

Mountain Biking	6	6	Group of Y12 students on leadership camp. At start of learning to be assistant leaders on a mountain bike skills course that all but 2 of the students had done before in Y10 an international student who had not been before caught her front wheel in gravel on a downhill slope of a well formed farm race and slowly went over the handlebars landing awkwardly on her outstretched left hand and her lower face unprotected by the properly fitting helmet.
Tramping	5	6	Tramping along an exposed ridge in very strong winds and persistent rain and one of the participants slipped on a descent falling awkwardly landing on his hand bending one of his fingers and fracturing it.
Caving/ Cave tubing	5	6	Client paddling backwards in tube almost at cave exit. shoulder popped out no real distress.
Free Time	5	6	The group was cooking tea and asked a teacher to refill the meths container for their trangia cooker. A flame shot up from the container burning the student on the arm and face.
Caving/ Cave tubing	4	6	Group waiting to use slide got excited and accidentally pushed XXX over edge he fell and landed on rocks
Free Time	4	6	Girls sprayed aerosol inside the long drop at the campsite. XXX used long drop and a reaction to the aerosol caused tingling light headedness and an asthma attack. After 40 minutes the symptoms eased and she was breathing normally.
Initiatives	3	6	Group were walking back from nightline - student slipped got stuck and her shoulder 'went back'. She moved and felt her shoulder click back into place it was numb and tingly but by the next morning had improved.
Initiatives	3	6	Student slipped coming down steps from the high poles course

APPENDIX 7 - Examples of Causal Narratives*

The current notes guiding the causal narratives ask entry-makers to “*Explain in detail what you think caused the incident. Include any suggestions, observations or recommendations regarding this incident*”. The examples below represent the range of causal narratives actually entered. Those listed are incidents with severity scores of 6 and over, and are included along with the corresponding descriptive narratives.

A view of these shows both the limitations and potential of narrative analysis. Some entries are so brief or ill-considered as to be practically useless, while the detailed analytical content made in others is potentially very useful. Most narratives were very brief, but even in a few sentences a lot of key points were often made. When combined with the descriptive narratives and sorted through use of selected classifying variables these causal narratives could provide quite specific and relevant interpretations of incidents and directions for actions.

One recommendation would be that more guidance be given to entry-makers on the desired content of causal narratives. Some have been willing to enter the incident record but have not appeared to understand what was requested for this particular narrative. One option may be to more specifically request, along with accompanying definitions, description of the ‘*immediate*’ causes and ‘*root*’ cause, as described by Haddock (2008).

Undertaking some in-depth case studies of narrative analysis which result in some published summary may also assist demonstrate the value of such baseline information. Appendix 8 presents an example of a case study analysis.

The narratives were edited to remove specific individual and place names so that no specific individual, organisation or location could be identified (e.g. anonymised). Other data is available from the database if required, subject to privacy constraints.

Causal narratives for incidents of severity score 6+

There were 22 causal narratives identified from the NID data that related to incidents of '**high actual severity**' during the 2007-08 years. Only 2 of these could be presented here as few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available. It is important to note that while the examples listed below are relatively sparse in content, this is not the case for many of the unpublished causal narratives, which together present a rich resource of learning opportunities. A key recommendation is that more approvals for use be obtained in the future.

Actual Severity	Descriptive narrative	Causal Narrative
7	XXX collapsed while walking in the stream-way halfway through YYY tour and started convulsing. Guides noticed cyanosis and mydriatic and unresponsive pupils along with some shallow ragged breathing. Help was called and he was evacuated out nearest exit.	Client contracted viral meningitis. This was the first he was aware anything was wrong. No relevant medical history
6	12 Trampers were near XXX Hut when 1 member felt very unwell. The team made her comfortable and warm and talked to her as she kept wanting to sleep. A mattress was brought down from the hut to get her off the rocks. As an afternoon mist was coming in they used the PLB and the YYY Helicopter came over. The local chopper was already on a case. Each time the trumper closed her eyes she stopped breathing so she was propped up from behind and kept being talked to.	Using an old ill-fitting pack which rubbed/pressed on a muscle near the front and caused a lack of good breathing after 5 or so hours. A new good fitting pack and a bit of salt has improved things and she is tramping good now.. .

APPENDIX 8 - Causal Case Study Examples

These examples were conducted to illustrate how the NID narratives and other classifying data (e.g. variables such as illness type, weather conditions etc) can be explored to investigate the influence of different potential causal factors in incidents.

Here narratives are selected first according to the citing of (A) hypothermia as an illness, and then according to the prevalence of (B) bad weather conditions.

There were three variables related to weather in the NID – *Precipitation* (1= Fine to 4=Wet), *Temperature* (1=Cold to 4=Hot), and *Wind* (1=Calm to 4=Windy). To provide an overall single indicator of good to bad weather an analysing the NID data, a *weather index* variable was created where 3= the driest, hottest and calmest conditions, while 12 represented the wettest, coldest and windiest conditions.

Both examples illustrated how prevailing conditions can cause incidents, contribute to them, or have little to do with them. They also illustrated how that prevailing conditions sometimes represent a potential latent hazard in incidents, where outcomes may have been considerably worse than what they turned out to be. This is another instance where the distinction of actual and potential severity ratings demonstrates its value.

Unfortunately the specific narrative content of these case studies cannot be presented here because few of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available.

It is important to note that while the examples listed below are relatively sparse in content, this is not the case for many of the unpublished causal narratives, which together present a rich resource of learning opportunities. A key recommendation is that more contributing organisations give approval for use of their narratives in the future. The narratives were edited to remove specific individual and place names so that no specific individual, organisation or location could be identified (e.g. anonymised').

Example - Hypothermia incident narratives

These narratives were selected when hypothermia was selected as the illness type in the respective NID data entries.

Note that bad weather was not always considered a causal factor in the narratives, and other environmental causes were sometimes specified. Where bad weather was not cited, the cooling conditions sometimes came from involvement in water-based activities with inadequate equipment, river crossing in cold conditions or from low temperatures in otherwise clear weather.

There were 6 causal narratives identified from the NID data that related to high-severity incidents of '**hypothermia**' during the 2007-08 years. None of these narratives could be presented here in full as none of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available. However the 'severity', 'weather' and 'environmental data' is shown to illustrate the potential utility of the wider data and narrative analysis approach.

Actual Severity	Potential Severity	Descriptive& Causal narratives	Precip	Temp	Wind	Weather Index	Environment Causes
4	6	<i>Cannot publish narrative content at present.</i>	4	4	4	12	Adverse weather
3	6		4	4	4	12	Adverse weather
4	10		4	4	1	9	Adverse weather
5	5		3	3	1	7	Terrain
6	9		1	3	2	6	Water
3	7		1	3	1	5	N/A

Example - Incidents during bad weather

These narratives are arranged according to the weather index, which combines all precipitation, temperature and wind scores.

Higher scores represent conditions that are respectively wetter, colder, and windier. Incidents were a mix of hypothermia, fatality through judgement error in bad conditions, slips and falls, and in one case a behavioural issue. Based on the narratives this bad weather sometimes had little to do with the incident type, although it did create conditions where potential severity rating was high.

There were 16 causal narratives identified from the NID data that related to incidents of '**bad weather**' during the 2007-08 years. None of these narratives could be presented here in full as none of the organisations entering respective incidents into the NID were able to give approval to use these narratives (in suitably 'anonymised' form) in the limited time available. However the 'severity' and 'bad weather' data is shown to illustrate the potential utility of the wider data and narrative analysis approach.

Actual Severity	Potential Severity	Descriptive & Causal narratives	Precip	Temp	Wind speed	Weather Index
4	6	<i>Cannot publish narrative content at present.</i>	4	4	4	12
3	6		4	4	4	12
9	10		4	4	4	12
5	6		4	4	4	12
2	5		4	4	4	12
2	5		4	4	4	12
3	3		4	4	4	12
5	5		3	4	4	11
4	4		4	4	3	11
9	9		2	4	4	10
10	10		4	3	2	9
4	10		4	4	1	9
6	5		3	3	3	9
4	5		4	3	2	9
2	5		4	3	2	9
1	5		2	3	4	9



OUTDOOR SAFETY

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