

The Safety Experience of New Zealand Adventure Tourism Operators

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Background: This survey examined parameters of the New Zealand adventure tourism industry client injury risk. The research also sought to establish priorities for intervention to reduce adventure tourism risk, and identify client injury control measures currently in place (or absent) in the New Zealand adventure tourism industry, with a view to establishing guidelines for the development of effective adventure tourism safety management systems. This 2003 survey builds upon an exploratory study of New Zealand adventure tourism safety conducted by us during 1999.

Method: A postal questionnaire was used to survey all identifiable New Zealand adventure tourism operators. The questionnaire asked respondents about their recorded client injury experience, perceptions of client injury risk factors, safety management practices, and barriers to safety.

Results: Some 27 adventure tourism activities were represented among the responding sample ($n = 96$). The highest client injury risk was reported in the snow sports, bungee jumping and horse riding sectors, although serious underreporting of minor injuries was evident across the industry. Slips, trips and falls (STF) were the major client injury mechanisms, and a range of risk factors for client injuries were identified. Safety management measures were inconsistently applied across the industry.

Conclusions: The industry should consider the implications of poor injury reporting standards and safety management practices generally. Specifically, the industry should consider risk management that focuses on minor (e.g., STF) as well as catastrophic events.

Adventure tourism is a rapidly expanding sector of New Zealand's tourism industry. Recent work by us and other authors has begun to explore the extent and nature of the risks to personal safety faced by the adventure tourist and the ability of the adventure tourism sector to control, through risk management, the injury risk to clients posed by their activities.¹⁻³ Indeed, health and safety issues associated with tourism and recreational activities undertaken by domestic and overseas visitors to tourism destinations are beginning to attract interest from researchers from diverse disciplines, as they examine the interconnections between health and safety and tourist behavior.^{3,4}

Early path-breaking studies into adventure tourism safety in New Zealand provided evidence that some New Zealand adventure activities, notably white water rafting, scenic flights and mountain recreation, present significant risks of serious and fatal injury to clients.^{3,5-8} More recently, the current authors, from an analysis of overseas visitor hospitalization data in New Zealand for the period 1982-1996, identified some 1,027 overseas visitor hospitalizations where adventure tourism activity of some form was being undertaken at the time of the injury.⁹ This figure represented 17% of all overseas visitor injuries during this period, and corresponded to an injury incidence rate of approximately eight hospitalized injuries per 100,000 overseas visitors (as determined from national annual visitor numbers data) for the period of the analysis. A further 99 (22%) fatalities due to participation in adventure pursuits were identified for the same period. The highest numbers of adventure tourism-related injuries and fatalities were sustained by recreationalists engaged in unguided, independent adventure activities, notably skiing and mountaineering. The highest numbers of commercial adventure tourism injuries were found for horse riding and cycling. Aviation and water-based incidents resulted in the most severe injuries.

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The role of a wider range of adventure tourism activities was examined in a survey of 142 New Zealand adventure tourism operators.¹⁰ This study found relatively high reported client injury rates among cycle tour and horse riding operators, these findings being in line with those of the hospitalization data analysis.⁹ It was noted that these activities, which arguably have a low level of “perceived risk” associated with them, presented a greater “actual risk” of injury than activities with higher levels of perceived risk (e.g., white water rafting, sky diving, and bungee jumping). Indeed, the perception of risk held by clients participating in adventure tourism activities may be an important moderator of client behavior, and thus a significant factor in injury risk.¹¹

While a number of catastrophic adventure tourism incidents, particularly those involving fatalities to overseas visitors participating in activities such as aviation, canyoning, white water rafting, and jet boating, have been highlighted in the news media, it is apparent that the majority of adventure tourism-related injuries arise from less dramatic events. Evidence in support of this contention was provided by exploratory research by the current authors,^{9,10} who identified falls as the most frequent cause of injury for adventure tourism clients, comprising 65% of all adventure tourism-related injuries among overseas visitors. These findings were supported by the responses of the adventure tourism operators surveyed, with most reporting slips, trips and falls (STF) on level surfaces to be events commonly leading to client injuries. The research also found that, rather than being the result of any one catastrophic event or initiating factor, adventure tourism injuries commonly have a number of interacting contributory causal factors.¹⁰ These individual, equipment, task, environmental and organizational contributory risk factors for adventure tourism injuries were organized into a conceptual model for adventure tourism client injury risk,¹⁰ designed to assist in operator risk assessment and other safety management activities where information about potential risk factors for adventure tourism activities is of benefit.

The present study builds on this earlier research, and in particular seeks to establish priorities for intervention to reduce adventure tourism risk, and identify client injury control measures currently in place (or absent) in the New Zealand adventure tourism industry, with a view to establishing guidelines for the development of effective adventure tourism safety management systems. The present research also aims to establish up-to-date information on client injury incidence across the adventure tourism sector and for individual activities within the industry. This is considered to be essential as a first step to understanding the actual level of risk associated with the various adventure tourism activities in New Zealand.

Methods

Prior to the construction of a survey instrument, existing data sources were examined to compile a database of operators within this sector. An extensive review of different secondary data sources was undertaken to establish the precise scope of the sector. The sources of listings used included the *NZ Outdoors Magazine* directory and various other publications in which operators advertised their businesses. It is recognized that this represents only partial coverage of the total population, since inclusion in such lists is based on a willingness to advertise in these publications. Other listings were obtained from the NZ Tourism government website (1995), and regional Yellow Pages. The resulting search yielded 360 companies. The initial mailing of 360 businesses was followed up 3 weeks later with a further reminder to prompt owners/managers. The survey was addressed to the owner or operations manager.

A postal questionnaire was developed, comprising three discrete sections: the business (ownership, activity sector, volume of business in the last year, domestic/international/day visitors); a second and more substantive section on injuries and risk factor perceptions; and a third section containing a small number of questions specifically concerned with cultural issues in adventure tourism safety. The questionnaire was very similar in content to the research instrument used for the 1999 survey of New Zealand adventure tourism operators,¹⁰ allowing some comparison of findings between the two surveys.

Results

Sample Characteristics

In total, 96 operators responded to the survey, giving a response rate of 31.9%, once business closures and duplications were excluded ($n = 59$). This is a disappointing outcome, although few small business surveys of this nature achieve response rates in excess of 40%.¹² The low response rate may be partially attributable to the fact that the timing of the survey was off-season for some businesses, with potential respondents being on leave or working in a winter job. The sensitive nature of much of the survey, including the request for information about client injury rates, may have also been a factor in the low response rate. It is also possible that the length of the questionnaire contributed to the low response rate, although a very similar questionnaire was used in the 1999 survey of New Zealand adventure tourism operators, yielding a response rate closer to 50% on that occasion.

The study sample was representative of the total population of operators in each region (as established in the operator database discussed above) plus or minus < 5%. This is a very successful survey outcome, and illustrates

wide geographic coverage as well as a good representation of the key clusters within New Zealand (Auckland and Bay of Plenty; Central North Island; Marlborough and the Nelson region; Canterbury and Otago). The major adventure tourism centers of Queenstown and Wanaka ($n = 13$), Auckland ($n = 8$), Rotorua ($n = 6$), Taupo ($n = 6$), Nelson ($n = 4$) and West Coast ($n = 5$) were well represented among businesses surveyed.

The dominant pattern of ownership was either joint ownership (41%) or sole ownership (36%). A further 19% of businesses were simply described as registered companies, although it is probable many of these would have also been solely or jointly owned. The majority of respondents described themselves as either the owner (35%), director (15%), or manager (38%). With regard to the length of operation, 8% had been in business for 2 years or less, 21% for 5 years or less, and 52% for 10 years or less.

The businesses surveyed were mostly very small, with just two employees (usually the owners) in 17% of cases, and five or fewer employees in 47% of cases. Only 27% of businesses surveyed employed 10 or more employees.

The surveyed operators predominantly provided land-based (46%) or water-based (35%) activities. A further 19% offered air-based activities. The 27 activity sectors

included in the survey represent a wide range of adventure experiences, including activities from right across the “soft”–“hard”, “passive”–“active” and high–low-risk activity continua.⁴ The most common activities surveyed were: scenic flights (15%), kayaking (14%), mountain guiding (6%), white water rafting (6%) and horse riding (6%).

Some 75% of activities took 10 h or less to complete, including travel to and from the activity site, and 40% took less than 4 h to complete. Operators reported 643,167 clients in the previous year of operation (January to December 2002), and the mean number of clients per business was 7,479 a year, although the number of clients ranged from under 20 to 128,000.

One-half (51%) of adventure tourism clients during the period of the analysis were estimated to be male, and just 14% were children under the age of 16 years. Approximately 15% of businesses had no child clients, and over 50% had 5% or fewer child clients. The proportion of male clients is perhaps surprising, in the light of previous studies that have shown young male adults to be the major consumers of this type of activity.³

Some 53% of clients were reported to be overseas visitors, 30% domestic clients, and 17% local leisure clients.

Table 1 Perceived Risk Factors for Adventure Tourism Operations

<i>Risk Factor</i>	<i>Number of Times Ranked as Number 1 Risk Factor (n)</i>	<i>Number of Times Ranked in Top 5 Risk Factors (n)</i>	<i>Proportion of Respondents Ranking Factor (%)</i>
<i>Client/behavioral factors</i>			
Horseplay/ignoring instructions	12	41	44
Client knowledge and abilities	9	43	46
Language/cultural factors	3	27	29
Short-cuts/risk-taking by clients	3	30	32
<i>Environmental factors</i>			
Weather conditions/changes	28	90	97
Unfamiliar operating environments	10	33	35
Slipping/tripping hazards	7	38	41
Exposure to water/drowning risk	14	33	35
<i>Task and equipment factors</i>			
Equipment failure	7	26	28
Equipment use/suitability	1	17	18
Operating at heights	3	17	18
Operating at high speeds	3	14	15
Degree of task difficulty	2	22	24
<i>Work organization and management</i>			
Staff experience/quality	7	38	41
Financial considerations	2	10	11
Operational decisions	6	24	26
Client/guide ratio	2	17	18
Absence of safety management systems	8	24	26

Safety Experiences of Operators

Operators were asked to rank the top five threats to client safety, from a list of factors generated largely from the findings of the 1999 survey of New Zealand adventure tourism operators.¹⁰ Table 1 provides a summary of responses to this question, organized under the subsystem categories: client/behavioral factors, environmental factors, task and equipment factors, and work organization and management.

The highest rankings were given for environmental factors, with 97% of respondents ranking weather conditions as a threat to client safety, and some 29% of operators ranking this factor as the number 1 threat to client safety. Unfamiliar operating environments, exposure to water/drowning risk and slipping and tripping hazards were also ranked as the number 1 threat to client safety in a marked proportion of cases, further emphasizing the importance of the New Zealand outdoor environment, a crucial element in the “excitement factor” for adventure tourism, as the primary risk area from the perspective of the operator.

Client/behavioral factors were also highly ranked, particularly the issues of clients ignoring instructions, and limitations in client knowledge and ability. Whereas operators can be expected to focus on clients and their behavior as areas of risk that fit with conventional models of accident causation from a management perspective, it is interesting to note that respondents also recognized the role of weaknesses in work organization and aspects of management in client safety. The most important of these appear to be related to staff experience and quality and the absence of quality safety management systems.

Respondents were also asked to elaborate on these risks by an open-ended question. This provided a range of interesting insights regarding perceived injury risks, although environmental hazards and weather conditions in the outdoors were by far the most frequently discussed areas of risk, with most responses reflecting the often unpredictable and extreme weather and environmental conditions in New Zealand’s outdoors. The difficulty that clients from other cultures experience when participating in novel activities in an outdoor environment, particularly those from landlocked countries and cultures where outdoor recreation is much less common than in New Zealand, was an important aspect of this issue. Clients not listening to safety talks or instructions, and difficulties in communicating with clients, were the next most frequently discussed risk areas. Client unfamiliarity with the local environment, clients overestimating their own abilities and inherent activity risks were the other major categories of response.

Respondents outlined the main categories of injury that their clients experienced. The most frequently reported threats to client safety were “underfoot” incidents, with

STF (49%) and stepping on/in or twisting ankle injuries (33%) the most commonly noted injury risks. Other frequently reported hazards included striking an object (30%), falls from a height (26%), and drowning or non-fatal submersion (18%). Activities for which STF were most commonly reported as a threat included kayaking, multiactivity operations, and ecotourism. Respondents’ further comments on the problem of STF suggest that the issue of walking on a sloped and often wet and muddy surface (e.g., a river bank or mountain footpath) carrying a backpack, kayak or some other load is the major source of STF risk in this industry. It is also apparent that some clients, particularly those inexperienced in New Zealand conditions and the activities in which they were participating, wore footwear and other apparel unsuitable for the activity. All horse riding operators reported falls from a height to be a major threat to client safety, while kayaking, multiactivity and hiking/tramping operators perceived foot or ankle injuries due to stepping on or in an object to be a major threat.

Operators were asked to record the number of injuries from their accident book in the last 12 months. Some 87 businesses responded to this question. In total, 1,095 injury incidents were recorded, of which 148 (16%) were serious harm incidents (requiring hospitalization), at an average of 1.6 serious harm incidents per operator. Some 44% of businesses recorded no injuries, and 37% reported between one and five injuries.

Client injury frequency and mean client injury incidence per million participation hours (PMPH) by activity sector are shown in Table 2. Client injury incidence PMPH was calculated from annual client numbers and activity duration information provided by operators, to allow meaningful risk comparisons between different activities to be made, in terms of accounting for the duration of client exposure to the activity. Activity sectors with fewer than five client injuries are not included in Table 2.

What is clear from Table 2 is that, with the exception of snow sports, the industry reports very few client injuries, with reporting rates being roughly in line with that found in the 1999 survey.¹⁰ Snow sports stand out as the activity carrying the greatest client injury risk, even where a measure of exposure is factored into the analysis (PMPH), with the client injury incidence for snow sports being markedly greater than that for any other activity. Horse riding is perhaps the next largest concern, when considering serious harm incidents in relation to all reported injuries for this sector.

Bungee jumping operators reported 62 injuries, although just three of these incidents led to serious harm to a client. This finding is at odds with that of the 1999 study, in which relatively few incidents were reported for bungee jumping, and there was a client injury incidence rate (PMPH) of just 117, compared to 477 in the

Table 2 Distribution of Client Injuries By Activity Sector

<i>Activity Sector</i>	<i>Client Injuries (n)</i>	<i>Serious Harm Injuries (n)</i>	<i>Mean Client Injury Incidence Rate (PMPH)</i>
Black water rafting	40	2	280.0
Bungee jumping	62	3	477.0
Cycle tours/mountain biking	19	1	304.0
Ecotourism activities	9	0	58.5
Education/personal and social development	7	4	3.0
Horse riding/pony trekking	35	13	759.5
Indoor climbing	13	0	250.0
Kayaking/canoeing	16	1	241.3
Multiactivity	24	1	247.5
Scenic flights	15	3	3.2
Snow sports	796	112	2,229.3
Walking/tramping	19	0	195.6
White water rafting	14	1	191.4

PMPH, per million participation hours.

present study. Notably fewer injuries were reported for cycle tours and mountain biking in the present study than in the 1999 survey, in which the highest client injury incidence for all adventure tourism sectors included in the survey was recorded for the cycle touring sector (although snow sports were not represented in the 1999 survey). The lowest client injury incidence was observed for educational and personal development activity providers, although this sector had a relatively high serious harm injury to all reported injuries ratio, suggesting that minor injuries may not be well reported by these operators.

Multiactivity operations also appear to present a relatively high level of injury risk to clients. This may reflect the degree of task difficulty associated with participating in two or more recreational pursuits over an extended period of time. Other factors in multiactivity injury risk are likely to include the risk of fatigue and exposure to unfamiliar tasks and environments.

Improving Client Safety and Barriers to Safety Improvements

A number of operators provided information on measures or systems that they had in place to reduce the risk of injuries to clients. Among the safety measures taken, 30 businesses reported having a safe operating plan, clear operational guidelines, or regulatory codes of practice. These businesses were most commonly concerned with marine or aviation activities. Some 16 businesses reported having a risk assessment procedure, 34 used staff training and selection as a preventive measure, 25 gave safety training or talks before or during activities, and 20 undertook regular equipment checks. Other measures identified included adherence to Civil Aviation Authority (CAA) or Maritime Safety Authority (MSA) regulations,

and auditing from the Department of Labour's Occupational Safety and Health Division (OSH) and other bodies. Interestingly, just one operator specifically mentioned being accredited to the tourism industry's "Qualmark" standards as a relevant factor in their safety management practice, although health and safety compliance (above industry standard) is one of the seven components of the scheme.

Operators were also asked to identify any barriers to improving safety for their clients. Unsurprisingly, given the large number of small businesses represented in the survey, the cost of compliance with safety measures was the most frequently mentioned barrier to safety. The closely related issue of having time for safety also featured strongly in respondents' comments. Interestingly, staff competence and experience issues were of as much concern as client factors. Moreover, staff recruitment and retention was a major concern for several operators.

Several respondents noted the requirement to retain a degree of realism in the natural environment, so that all risk was not removed, but the risk was managed. Others argued that the outdoor environment, in terms of terrain, weather conditions, and environmental changes, was beyond the control of the operator. The natural environment, in particular changeable and unpredictable weather conditions, was the second most frequently mentioned barrier to safety.

Discussion and Conclusions

This study has provided further evidence for several key areas of concern for client safety, first identified in the 1999 study of New Zealand adventure tourism operators.¹⁰ First, many businesses surveyed reported no or very few client injuries during the 1-year period of the analysis,

including minor injuries, suggesting a poor culture for injury recording (one respondent noted a need to improve in this area). This is unfortunate, as minor injuries and near-miss events represent an important potential learning opportunity for operators wishing to improve their safety and risk management systems. The relatively high ratio of “serious harm” injuries to all injuries for some operators further emphasizes this point. Indeed, it should be noted that those activity sectors for which relatively large numbers of client injuries were reported, but there was a very low ratio of serious harm injuries to all reported injuries, may simply have effective injury reporting systems, as opposed to a greater safety problem. For example, the single respondents for black water rafting and bungee jumping activities, industry sectors known in New Zealand for their advanced safety and risk management practices, both reported relatively large numbers of client injuries overall, but relatively few serious injuries as a proportion of all injuries (5%, compared to 14% for all sectors). Sectors with relatively high serious harm to all client injury ratios included horse riding (37%), education/personal development (57%), and scenic flights (20%). These figures may be indicative of immature client safety management systems in these sectors.

The highest injury counts, serious harm to all injuries ratios and client injury incidence rates were observed for land-based operators, particularly snow sports and horse riding. These findings are in line with those from analysis of hospitalizations of overseas visitors to New Zealand,⁹ and suggest that preventive efforts should start with these activities.

Respondents’ comments regarding key areas of risk and major injury categories reflect the high level of risk to clients from both STF injuries and other underfoot injuries. As with occupational STF,¹³ a range of risk factors appear to contribute interactively to STF risk, notably the nature of the underfoot environment (e.g., slopes and slippery ground), wet conditions, aspects of the task (e.g., carrying objects such as kayaks), and the use of inappropriate footwear by the client. Better choice of walking track or route to activities and route risk assessments may reduce these risks, as might provision of suitable footwear for clients.

Environmental factors, particularly fast-changing weather and water conditions, and client inexperience in New Zealand’s outdoor conditions, were the major risk factors for client injuries identified by respondents. Client factors such as ignoring instructions or not understanding briefings due to language difficulties further increase the risk of injuries in these hazardous and often unfamiliar environments.

The range of risk factors identified by respondents to this survey reflect the multicausal nature of adventure tourism injury events,¹⁰ and the role of interacting system

factors related to the client, equipment, task and physical, social and organizational environments in client injury causation. Attempts to control client injury risk must therefore take account of the risks associated with each of these factors (and their potential interactions), rather than focusing on one aspect, such as client behavior.

Operators’ injury prevention initiatives were many and varied, but inconsistently applied across the industry. The fact that relatively few operators reported the use of formal risk assessment/risk management procedures is of concern. This suggests one area for immediate attention by the industry. Reliance on client briefings and similar measures to ensure compliance with instructions, particularly during times of high stress during an incident (e.g., a raft turnover), is a poor strategy when used in isolation, as many clients are from overseas, often from non-English-speaking countries. Indeed, 37% of operators reported language barriers as a problem in regard to the management of client safety. Some operators reported using interpreters, signage and picture cards to overcome this problem. Active, close supervision of novice clients and clients with poor English understanding or activity skills, together with smaller client/guide ratios, are further potentially effective strategies to prevent client injuries.

Respondents’ comments on barriers to safety improvements were revealing in the sense that staff/guide issues were of as much concern as client factors. A particular concern was the difficulty in recruiting staff with the necessary experience and quality, with an emphasis on the need for depth of guide experience, rather than qualifications alone. The seasonal nature of this workforce, with many potential members of staff working in other sectors off-season, further exacerbates this problem. The largest identified barriers to safety efforts were cost and time resources. Much of the industry comprises small businesses, in which one or two owner/operators undertake a range of management functions. It should not be surprising, therefore, that many find it difficult to justify either time or expense in the safety area, beyond that required through compliance with regulatory bodies such as the CAA and the MSA. Recent changes in New Zealand’s occupational health and safety legislation (Health and Safety in Employment Amendment Act, 2002), however, which has been extended to cover maritime and aviation environments, will provide further impetus for operators to consider their situation with regard to staff and client health and safety. Safety-related knowledge and priorities may also be low in comparison with operational concerns in small business operations. In view of these assertions, interventions targeted across the adventure tourism sector should include improved knowledge of, and training in, risk management procedures, including risk assessment and control to reduce client injury risk in this potentially high-risk industry.^{14–16}

An important limitation of the study is the relatively low rate of response to the survey, with just under one-third of those surveyed participating in the study. The findings reported here should therefore be treated with some caution, as the possibility of respondent bias (e.g., more safety-aware operators may have responded) is greater with small samples such as this, and generalization to the wider industry is more problematic. However, many of the key findings reported here correspond closely to those of the 1999 survey,¹⁰ which achieved a response rate of almost 50%. Future research should, therefore, focus on activities identified here and in earlier research as carrying the greatest client injury risk, including horse riding and cycle touring, understanding operators' risk management practices, and developing best practice standards for improving client safety across the New Zealand adventure tourism industry.

Declaration of Interests

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