Safety in New Zealand's Adventure Tourism Industry: The Client Accident Experience of Adventure Tourism Operators

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Background: Injuries and fatalities among participants of adventure tourism activities have the potential to seriously impact on New Zealand's tourism industry. However, the absence of statistics for tourist accidents in New Zealand, and the lack of detailed academic research into adventure tourism safety, means the extent of the problem is unknown. The aims of the present study were to determine the incidence of client injuries across a range of adventure tourism activity sectors, and to identify common accident events and contributory risk factors.

Method: A postal questionnaire survey of New Zealand adventure tourism operators was used. Operators were asked to provide information related to their business; the number of recorded client injuries during the preceding 12 month period, January to December 1998; common accident and injury events associated with their activity; and perceived risk factors for accidents in their sector of the adventure tourism industry.

Results: The survey was responded to by 142 New Zealand adventure tourism operators. The operators' reported client injury experience suggests the incidence of serious client injuries is very low. Highest client injury incidence rates were found for activities that involved the risk of falling from a moving vehicle or animal (e.g., cycle tours, quad biking, horse riding, and white-water rafting). Slips, trips, and falls on the level were common accident events across most sectors of the industry. Perceived accident/incident causes were most commonly related to the client, and in particular, failure to attend to and follow instructions.

Conclusions: The prevalence of client injuries in activity sectors not presently covered by government regulation, suggests policy makers should look again at extending codes of practice to a wider range of adventure tourism activities. Further research considering adventure tourism involvement in overseas visitor hospitalized injuries in New Zealand, is currently in progress. This will provide supporting evidence for the risk associated with participation in a range of commercial and independently undertaken adventure activities.

The safety component of the tourism health and safety problem has received relatively little attention from tourism and safety management researchers.[1,2] The paucity of tourism safety literature is surprising, given the potential for damage to the tourism industry from negative events, such as client injuries and fatalities,[3,4] and the propensity for overseas visitors to incur serious, and even fatal injuries, during the course of their holiday. Studies of overseas visitor mortality and morbidity have found accidents to be a leading cause of death for Scottish[5] and US tourists,[6] and the main reason for overseas tourist hospital admissions in Queensland, Australia.[7] Moreover, these studies indicate overseas visitors are more likely to be injured than domestic residents and domestic tourists. US male residents, for example, have been found to have lower injury mortality rates than US travelers,[6] while 38% of overseas visitor admissions to Queensland hospitals were due to injury, compared with 15% of injury admissions for interstate visitors.[7]

These, and other studies,[8–12] have highlighted the issue of overseas visitor unfamiliarity with the marine and road environments of destination countries. However, no academic research has considered the risk to domestic and overseas tourists when participating in the increasing range of outdoor recreation experiences collectively known as adventure tourism.

Adventure tourism is a burgeoning sector of the global tourism industry, and has expanded in recent years as a major niche sector within New Zealand's tourism industry.[13] Approximately 10% of visitors to New Zealand participate in adventure tourism of some form, according to the International Visitor Survey 1992–1993. The most popular of these activities include scenic flights, jet boating, white-water rafting, mountain recreation and bungy jumping. While a number of studies have investigated aspects of client safety for various individual activities (e.g., white-water rafting in Australia,[14] mountain recreation in New Zealand,[15] and Australian marine tourism[10]), no published academic research has

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J Travel Med 2000; 7:239–245.

considered client safety, across a range of adventure activity sectors, for a specific country.

Indirect evidence of the contribution of adventure tourism towards injuries incurred by visitors to New Zealand, was identified by the present authors, from an analysis of claims made by overseas visitors under the New Zealand Accident Rehabilitation and Compensation Insurance Scheme (ACC). The researchers found "Recreation and Sport" claims to comprise over 44% of claims by overseas visitors. The authors suggest adventure tourism activities are most likely to be classified under these categories of claims. Further evidence for the role of adventure tourism in overseas visitor claims was found from analysis of location of accident, and age of claimants data. Largest proportions of claims were registered in regions known to be adventure tourism centers (e.g., Central Otago), and by overseas visitors in their 20s and 30s (most adventure tourists are known to be in this age group). The study concluded that, in the absence of any one agency or body responsible for investigating and collating information on tourist accidents in New Zealand, primary research investigating the true extent of the adventure tourism accident problem is urgently needed. The present paper presents findings from the first phase of a larger research program considering New Zealand adventure tourism safety from a number of perspectives. The main aims of the study were to determine the extent of the commercial adventure tourism injury problem in New Zealand, identify activities that involve the greatest injury risk, and possible risk factors for adventure tourism accidents.

Method

An accident experience questionnaire was posted to 300 adventure tourism businesses operating throughout the North and South Islands of New Zealand. This sample represented all identifiable New Zealand operations where adventure tourism was the major source of business. The database of operators was constructed from various sources, including the New Zealand Adventure Tourism Council's database of adventure tourism operators, tourist guides and brochures, fliers advertising adventure tourism operations, and a range of other publications. Operators representing 21 different activity sectors of the adventure tourism industry were surveyed (Table 1).

The questionnaire was designed to provide information on the operators' accident experience (in terms of injuries to their clients while participating in the

Table 1 Distribution of Adventure Tourism Activity Sectors Surveyed

Environment	*Activity Sector*	*Number of Operators*	*Percentage of Sample (%)*
Land-based	All terrain vehicles (ATV)	5	3.5
	Adventure education	4	3
	Bungy jumping	5	3.5
	Caving	2	1
	Cycle tours/mountain biking	5	3.5
	Eco tours	9	6
	Guided walk	15	10
	Horse riding	10	7
	Mountain recreation	11	8
	Quad biking	3	2
Subtotal		70	48
Water-based	Black-water rafting	3	2
	Diving	4	3
	Fishing	2	1
	Jet boating	5	3.5
	Kayaking	24	17
	Marine encounter (dolphins/seals)	7	5
	Wind surfing	3	2
	White-water rafting	10	7
Subtotal		61	42
Aviation	Ballooning	3	2
	Skydiving/parasailing	3	2
	Scenic flight	9	6
Subtotal		15	10
Total		142	100

activity they provide), and the perceived causes (risk factors) for accidents and incidents involving clients. Initial questions sought information on sample characteristics, including the nature, age, size and location of the business, and the operating experience of the business owner/operator and staff. Respondents were then asked to state the number of serious and minor, injuries recorded in their accident register (a legal document for the recording of injury incidents) for the preceding 12 month period. For the purpose of the questionnaire, serious injuries were defined as fatalities or incidents leading to hospitalization for 48 hours or more, and minor injuries were defined as cuts, bruises or other minor injuries not requiring 48 hours hospitalization. Operators were also asked to indicate injury and accident types incurred by clients of their business, and finally, to list the most common client, equipment, environment and management related causes of accidents/incidents (risk factors) for the activity provided by their business and other businesses operating the same activity. Descriptive analysis of quantitative data was undertaken using SPSS for Windows (version 8), and consisted of frequency distributions and cross tabulations of categorical data, and calculation of client injury incidence rates (per million participation hours) using injury counts and activity participation data provided by the operators. Qualitative data, in the form of the operators' perceptions of risk factors for adventure tourism accidents, was subjected to qualitative content analysis.

Results

Sample Characteristics

Some 142 (47%) of New Zealand adventure tourism operators surveyed returned fully completed questionnaires; an encouraging result for a small business survey concerning a sensitive topic. The need for anonymity mitigated against measures for increasing the response rate. No notable differences in response rates for activity sector or location of business were observed. Respondents who completed the questionnaire on behalf of the business were mainly comprised of sole or joint owner/managers of adventure tourism businesses (89%), with the remainder being nonowner managers (9%), and employees (2%).

The majority of the 142 adventure tourism businesses surveyed were either individually or jointly owned (95%). Together, these operators catered to 516,722 clients during the preceding year (1998), with client numbers for each operation ranging from 10 to 35,000 clients, for the main activity provided by the business. Respondents' estimates suggest approximately one-half of clients of businesses surveyed were overseas visitors, although this varied widely between activities and locations.

Table 1 shows the distribution of activities (the activity which the greatest number of clients of the business participate in) for adventure tourism businesses surveyed. Activities are organized under three main groupings, based on the type of environment in which they are undertaken: land-based, water-based, and aviation.

Land-based activities were the most common among businesses surveyed, comprising 48% of operators, with guided walks (15 operators), mountain recreation (11 operators), eco tours and horse riding (10 operators each), being the largest sectors. Water-based operations comprised 42% of the sample, with largest water-based sectors being kayaking (24 operators) and white-water rafting (10 operators). The majority of aviation-related businesses, which made up 10% of the sample, were scenic flight operators (nine operators).

More than one-third of operators surveyed had been in business for over 10 years, while 20% had been established for less than 5 years, reflecting the rapid growth in this sector in recent years. The most established businesses in the sample were from the rafting (white- and black-water), scenic flight, horse riding, mountain recreation, and kayaking sectors, with operators of these activities most commonly having been in business for over 10 years. Newer ventures included caving, quad biking, and bungy jumping, for which the majority of operators had been in business under 5 years.

A large proportion of operators had just one or two Full Time Equivalent (FTE) staff (33%), while 12% of businesses sampled had more than 10 FTE staff. Operators with lowest FTE staff numbers were from the caving, eco tours, quad biking, fishing, and wind surfing sectors. Largest operations were in the bungy jumping, jet boating, and rafting sectors. These differences were reflected in the number of clients reported by operators for their main activity for the preceding year, with largest client numbers in the jet boating, black-water rafting, and bungy jumping sectors of the sample (all with mean annual client numbers of over 10,000). Lowest numbers of clients came from operators in the quad biking, canyoning/caving, cycle tour, and guided walk sectors (all with mean annual client numbers of less than 1,000).

The geographical spread of adventure tourism operators surveyed covered the length and breadth of the North and South Islands of New Zealand, although seven main centers of adventure tourism activity emerged: Northland (8% of operators surveyed), Auckland (11%), Central North Island (11%), Rotorua (8%), Marlborough (8%), Canterbury (12%), and Queenstown and Wanaka (13%). Surprisingly, just seven operators from the popular Mount Cook, and Fiordland, locations were included among respondents. Adventure activities concentrated in these areas were found to include: diving (Northland), horse riding (Northland; Marlborough), kayaking (Central

North Island; Marlborough), white-water rafting (Central North Island; Canterbury), and mountain recreation (West Coast; Queenstown and Wanaka).

Largest proportions of overseas clients were reported by South Island adventure tourism operators, in particular the Queenstown/Wanaka, Mount Cook, Southland, and Canterbury regions. Lowest estimates were observed for North Island regions, notably, Northland, Auckland, Wellington, and the Central North Island. This division reflects the pattern of tourist activity in New Zealand, and the reputation of these South Island regions as leading suppliers of adventure tourism experiences.

Client Accident Experience of New Zealand Adventure Tourism Operators

Some 379 client injuries were recorded by the 142 businesses surveyed, giving an overall injury incidence rate of 0.74 injuries per 1,000 clients. More than one-half of operators (55%) reported no client injuries of any kind for the previous calendar year, while 15% reported just 1 injury, and 11% 2 injuries. The number of recorded client injuries ranged from 0 to 33. These figures suggest serious underreporting of client injuries, as informal contact with tourists, reported elsewhere, suggests minor accidents are commonplace in the New Zealand adventure tourism industry.

Just 13 of the 379 incidents recorded (3.4%) involved serious injuries: 13 operators reported 1 serious injury each. Notably, 54% of serious injuries were incurred by clients of activities undertaken in water-based operations (diving operators, n = 3; white-water rafting, n = 2; marine encounter operators, n = 2). Two of the 5 cycle tour operators surveyed also reported serious injuries to clients. These statistics suggest serious client injuries are relatively uncommon across the commercial adventure tourism industry, although the risk of serious injuries may be greater for certain activity sectors, notably those undertaken on, or in, the water.

Client injury incidence rates per 1 million participation hours (IMPH) were determined for each of the businesses surveyed, and operators assigned to one of four injury incidence groups: zero injuries; 1–99 IMPH (low incidence); 100–499 IMPH (moderate incidence); and 500+ IMPH (high incidence). It is noted that the majority of operators in the high incidence group had IMPH rates of over 3,000. Table 2 shows mean IMPH, and the

Table 2 Injuries per Million Participation Hours Grouped by Activity Sector

		Zero Client Injuries		*1–99 Client Injuries*		*100–499 Client Injuries*		*500+ Client Injuries*		*IMPH**	
Environment	*Activity Sector*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*Mean*	*SD*
Land-based	All terrain vehicles (ATV)	2	40	2	40	1	20	0	0	25	43
	Adventure education	1	25	3	75	0	0	0	0	33	45
	Bungy jumping	1	20	2	40	2	40	0	0	117	127
	Caving	0	0	0	0	0	0	2	100	6636	8293
	Cycle tours/mountain biking	0	0	0	0	2	40	3	60	7401	10273
	Eco tours	8	89	1	11	0	0	0	0	5	17
	Guided walking	12	80	2	13	1	7	0	0	20	48
	Horse riding	3	30	3	30	2	20	2	20	718	1344
	Mountain recreation	4	37	3	27	2	18	2	18	216	330
	Quad biking	0	0	0	0	0	0	3	100	3096	3112
Water-based	Black-water rafting	1	33	0	0	0	0	2	67	483	425
	Diving	1	25	2	50	1	25	0	0	125	144
	Fishing	0	0	0	0	1	50	0	50	3164	4096
	Jet boating	3	60	1	20	1	20	0	0	33	74
	Kayaking	20	83	3	13	1	4	0	0	14	62
	Marine encounter (dolphins/seals)	4	36	3	27	1	14	0	0	48	84
	Wind surfing	2	67	0	0	1	0	0	0	50	112
	White-water rafting	3	30	0	0	4	40	3	30	537	1131
Aviation	Ballooning	3	100	0	0	0	0	0	0	0	0
	Skydiving/parasailing	3	100	0	0	0	0	0	0	0	0
	Scenic flight	8	89	1	11	0	0	0	0	7	2
Total		78	55	26	18	20	14	18	13		

*IMPH = Injury incidence per 1 million participation hours.

distribution of adventure tourism operators surveyed by injury incidence group.

Some 18 (13%) businesses had client injury incidence rates of 500 or over IMPH. It is notable that 3 of the 5 cycle tour operators had client injury incidence of 500 or over IMPH. Further analysis showed cycle tour operators to have the highest mean injury incidence rate of all activity sectors surveyed (7,401 IMPH). Other activity sectors with a high proportion of operators in the moderate and high injury incidence groups were, caving (6626 IMPH), fishing (3164), quad bike (3096), horse riding (718), and black- (483) and white-water rafting (537). Lowest injury incidence rates were found for ballooning, eco tours, guided walking, scenic flights, kayaking, jet boating, and all terrain vehicles, all of which had the majority of operators in the zero and low client injury incidence groups.

It is notable that the risk of falling from a height while in motion is a factor for the majority of the relatively high injury incidence activity sectors: quad biking, cycling, horse riding, and black- and white-water rafting all involve this risk. Further analysis, considering operators' reporting of accident events which have occurred in their businesses, found "falls from a height" to occur most commonly in these activities. Thus, 80% of horse riding operators, 70% of quad bike operators, 60% of cycle tour operators, and 40% of white water rafting operators cited "falls from a height" as a type of accident clients had incurred while participating in their activity. The other notable activity for which operators commonly reported "falls from a height" as a type of accident incurred by clients, was mountain recreation (55% of operators). These activity sectors also, most commonly, reported high impact injuries such as limb fractures: horse riding (60% of cases), white-water rafting (30%), and mountain recreation (36% of cases). Similar patterns in the data were observed for bruising, and, to a lesser extent, head injuries. These findings suggest interventions to reduce the risk of injury in these sectors should focus on, reducing the risk of falling (e.g., restraints, speed reduction, instruction, choice of terrain), and the likelihood of injury in the event of unavoidable falls (e.g., elbow and knee padding, helmets, impact reduction techniques).

The most common type of accident experienced by clients of adventure tourism businesses surveyed were "slips, trips and falls on the level," with the majority of operators reporting clients received injuries following a fall on the level. This suggests adventure tourism injury prevention efforts should also focus on reducing the risk of slips, trips and falls among clients. Possible remedial measures to reduce the risk of injury to clients might include, provision of footwear appropriate for the terrain in which the activity is undertaken, and, where possible, avoidance of hazardous terrain. These measures are particularly important for activities such as mountain recreation, guided walking, rafting and caving, where underfoot surfaces may be wet, slippery, steep or uneven, and movement on foot may take place at speed, or in poor visual conditions.

Largest proportions of businesses in the moderate and high injury incidence groups were found for the Central North Island (53% of operators), Queenstown/Wanaka region (33% of operators), and Canterbury (30% of operators). All businesses located in the Bay of Plenty, Wanganui, and Taranaki regions of the North Island were from the zero accident group. These figures reflect the types of activities, and their associated level of risk, available in these locations.

Adventure Tourism Operators' Perceptions of Accident Risk Factors

Respondents' perceptions of risk factors for accidents and injury in their activity sector of the adventure tourism industry were sought. Figure 1 summarizes operators' responses.

Risk factors are organized into five broad areas of safety, which are shown to interact to produce the risk of accident and injury events: extra-organizational influences (factors outside the control of management which impinge on the organization of the activity); management and organizational factors (causal factors which may be attributed to management/guide activity or the organization of the activity provided); client factors (physical, psychological, social, cultural, experience, and skill factors which relate to the client participating in the activity); equipment factors (the availability, quality, fit, and appropriateness of equipment used for the activity, safety equipment etc.); and environmental factors (aspects of the physical environment in which the activity takes place). Client factors were mentioned most frequently by operators, and in particular, inattention to instructions, failure to follow instructions, and showing off/horseplay.

Discussion

The survey has provided an initial assessment of the extent of the New Zealand adventure tourism accident problem, and baseline data upon which further research will build. Relatively few serious client injuries were reported by operators, suggesting such events may be relatively rare in New Zealand's commercial adventure tourism sector. Notwithstanding the limitations of data based solely on adventure tourism operators' self-reported injury experience, these findings suggest that the adventure tourism injury problem indicated in other New Zealand research,[2] may be more the result of accidents during independent recreation, than participation in commercial adventure tourism. The low reported

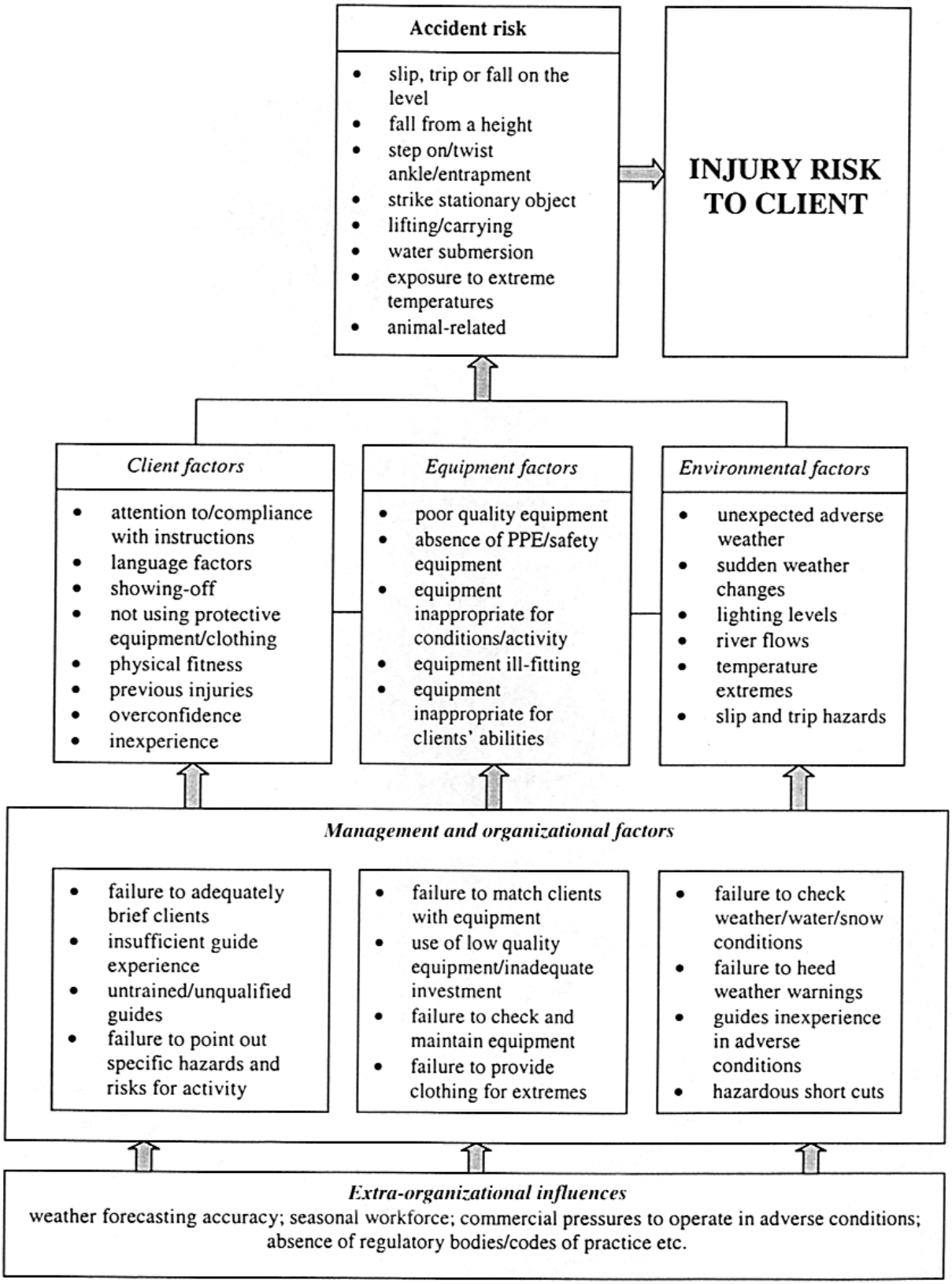

Figure 1 Operators' perceptions of risk factors for adventure tourism accidents.

incidence of minor injuries, however, suggests serious underreporting in this sector of the tourism industry. Further analysis of operators' responses to questions concerning their accident reporting behavior (not reported here) supports this view, and indicates a poor safety culture within certain sectors of the adventure tourism industry. This may be particularly true of smaller, unregulated sectors of the industry. Further research considering aspects of safety culture, and safety management among less well-regulated sectors of the adventure tourism industry is urgently required.

It is also noteworthy that adventure activities having a relatively high incidence of client injuries (with the exception of white-water rafting) represent the less well-regulated activity sectors of the adventure tourism industry. It is argued that the issue of regulation verses self-regulation for the adventure tourism industry should be revisited in the light of these findings, and recent well-publicized adventure tourism related fatalities in New Zealand and elsewhere. Specifically, policy makers should reconsider the extension of regulatory Codes of Practice to a wider range of New Zealand adventure tourism activities.

Highest injury incidence rates were observed for activities that involved the risk of falling from a height while in motion. Analysis of accident events, and injuries sustained, by clients of adventure tourism activities suggests, injury prevention measures should specifically focus on reducing the risk of falls from heights, and slip, trip and fall accidents on the level. These risks appear to be common across most sectors of the adventure tourism industry. Operators may also find the conceptual model presented in Figure 1 to be a useful tool in the identification and control of risks for their activity. The most important aspect of the model is the interaction between two or more factors, as the presence of any single factor alone may be insufficient to produce an accident risk. Thus, in rafting operations, failure on the part of management/guides to ensure all clients understand emergency procedure (management factor) may interact with language problems, and client understanding of what to do in the event of capsize (client factors), in fast river flow conditions (environmental factor). Likewise, failure to supply (management factor) or wear (client factor) appropriate footwear becomes an important risk factor in the presence of slippery underfoot conditions (environmental factor). The model does not claim to offer an exhaustive list of accident factors, but rather suggests a useful way for operators to think about the range of possible risks associated with their activity, and the ways such factors can interact to produce a risk of injury.

Further research, considering adventure tourism involvement in overseas visitor hospitalized injuries in New Zealand, is currently in progress. This research will provide further evidence of the risk associated with participation in a range of adventure tourism activities, and will highlight the relative risk for participation in independent adventure recreation versus commercial adventure tourism. Such research is vital if key risks are to be identified and removed or ameliorated.

The sustainability and continued growth of this niche sector of the tourism industry requires that safety issues be given the highest priority. Without a more public debate of adventure tourism safety, this high yield sector of the tourist industry may find its initial success could flounder in the new millennium.

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