

The Cost of Outdoor Recreation Accidents in New Zealand – Some Initial Indications from ACC Claims

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There has been considerable public focus in recent years on the management of risk in the outdoor recreation sector. This is evidenced by newspaper articles following high profile incidents, articles in outdoor journals, the development of risk management theory and an emphasis on risk management training for teachers, instructors and others involved in the delivery of structured outdoor recreation or education. Some in the sector believe there are very few accidents, but that the media 'jump' on these few, overpublicising them and giving the public a perception that there are many more. My own research into the prevalence of outdoor education incidents (Davidson, 2004) produced an incident rate for professional outdoor education provision in New Zealand that suggests that the risk is no greater than the risk faced by the average New Zealander in everyday life. This conclusion was based on the recorded incidents in twelve larger outdoor education centres and comparing this with the number of incidents registered with ACC in a particular year. However this comparison only relates to those involved in outdoor education activities while under professional supervision at larger outdoor centres. The vast majority of outdoor recreation occurs in New Zealand unsupervised. Is there a way to measure the total incident rate in outdoor recreation activities, measure the cost of these and compare them to other activities?

In New Zealand we have the government funded no-blame accident insurance scheme known as ACC. This scheme pays for all medical, lost income and rehabilitation costs associated with injuries. This gives New Zealand a fairly unique ability to gauge the cost of outdoor recreation incidents and compare these to other activities. This paper considers whether the following questions about outdoor recreation incidents can be answered by the ACC data:

- What is the total cost of ACC claims for outdoor recreation incidents?
- Are those costs on the increase or decrease?
- Which outdoor recreational activities are more costly in terms of ACC payments?
- Are safety agencies and their training schemes having any affect on incident rates?
- How do outdoor recreational activity claims compare with other activities?

My initial attempts at looking for data to address some of these questions through the ACC website reached a dead end. This was because the ability to extract data on individual outdoor activities was very difficult due to the limitations in coding being used within the ACC system. The opportunity came to explore the ACC data in more depth while participating on the Research Committee of the NZ Mountain Safety Council. A representative of ACC serving as a member of that committee and offered to dive deeper into the data to extract what was possible on outdoor recreation incidents.

After an exchange of emails with ACC, and then a visit to better understand the data and how it was derived, ended in a set of data for a range of outdoor recreational activities and some other common activities for comparison (Appendix A). The activities we selected to represent outdoor recreation, were chosen based on the activity categories contained in various outdoor related incident databases (National Incident Database, Wilderness Risk Management Incident Database, etc.) However we were limited in the data able to be obtained by the coding that occurred in the ACC claims documentation process.

The ACC claims within Appendix A for any activity have been aggregated from two sources:

- 1) those where the claim falls into one of the pre-defined ACC activity categories; and,
- 2) those that have been classified in the category of "Other" on the ACC claim forms, but where free text searches for key words have identified further activity claims.

When reading these data, the following definitions apply:

Claim numbers and costs

A claim is a lodgment by a person or care provider requesting that ACC assists through paying or helping to pay for medical, weekly compensation and/or rehabilitation costs associated with an injury. A person can have more than one claim. All claims registered by ACC are categorised according to the type of services they go onto receive. There are two main categories of claims used in the Injury Statistics publication.

Medical Fee Only Claims

Those claims where ACC pays a health professional for medical treatment but no payment is made directly to the claimant. About 85 percent of all claims are in this category and often involve only one or two visits to a health professional. A claim is deemed to be a treatment only claim if it has received medical, dental treatment or counseling alone.

Entitlement (Compensation or Rehabilitation) Claims

Those claims that have progressed beyond the treatments listed above. Compensation and support for returning to independence may have also been required. A claim is deemed to be involved in compensation or rehabilitation if it has received:

- income maintenance,
- death benefits,
- vocational rehabilitation, or
- support for independence.

A claim is new in the year the first payment is made. All other claims are ongoing. Ongoing claimants continue to receive payment after also being paid in a previous financial year and these claims may be of any duration. Therefore one incident may register as a

claim over a number of years if entitlements or medical fees continue to be paid in subsequent years to the initial claim.

The claims shown in Appendix A are the combined medical fees and entitlement claims in any year for the activity category shown. These claims include new and ongoing claims.

Financial Year

The ACC financial year runs from 1 July each year to 30 June of the following year.

Limitations in the data

1) Due to limitations in the ACC legislation, the data largely exclude those accidents resulting only in:

- (a) incapacity during the first week (for which ACC is not liable); and,
- (b) accidents which resulted in personal medical fees payments to health providers, or treatment by private health insurance (neither of which involve ACC claims).

2) Electronic lodgment of claims began in 2003. Prior to this ACC claims were filled out on paper forms (ACC45) and only 'important' fields from this data were hand punched into the ACC database. The percentage of electronic lodgments compared to paper forms has been steadily increasing since 2003 such that at the time of writing this paper it is estimated by ACC that approximately 75% of claims are now lodged electronically. This may mean that the quality of the data has been improving since 2003 and therefore the number of claims that can be identified by searches of the accident description category may increase, artificially raising the number of claims able to be identified in any category in years since 2003 compared to before 2003.

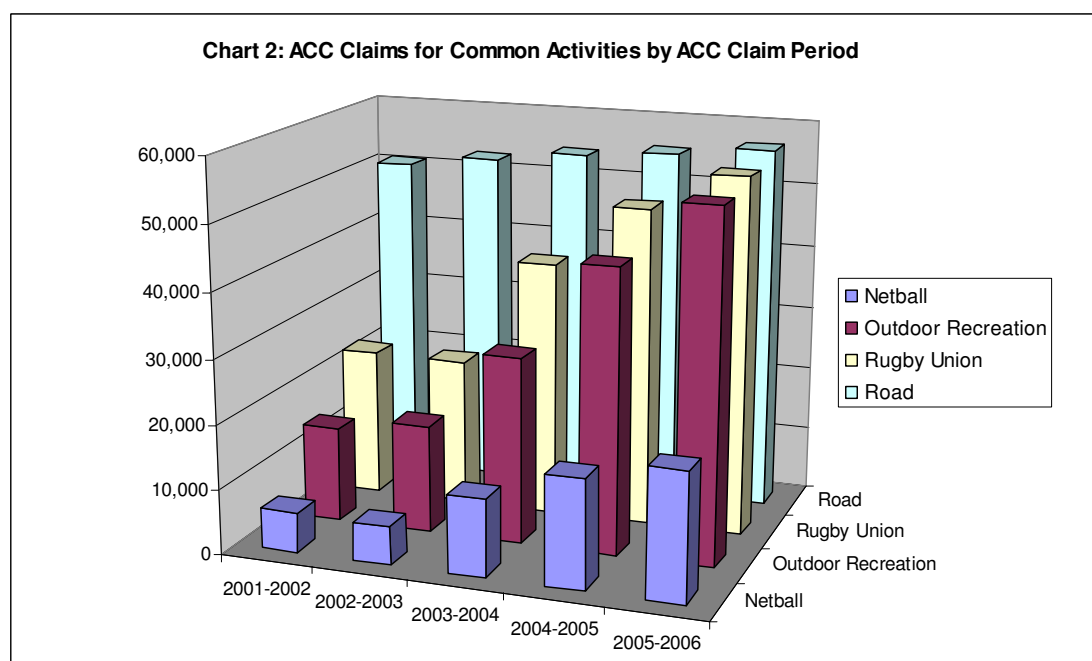
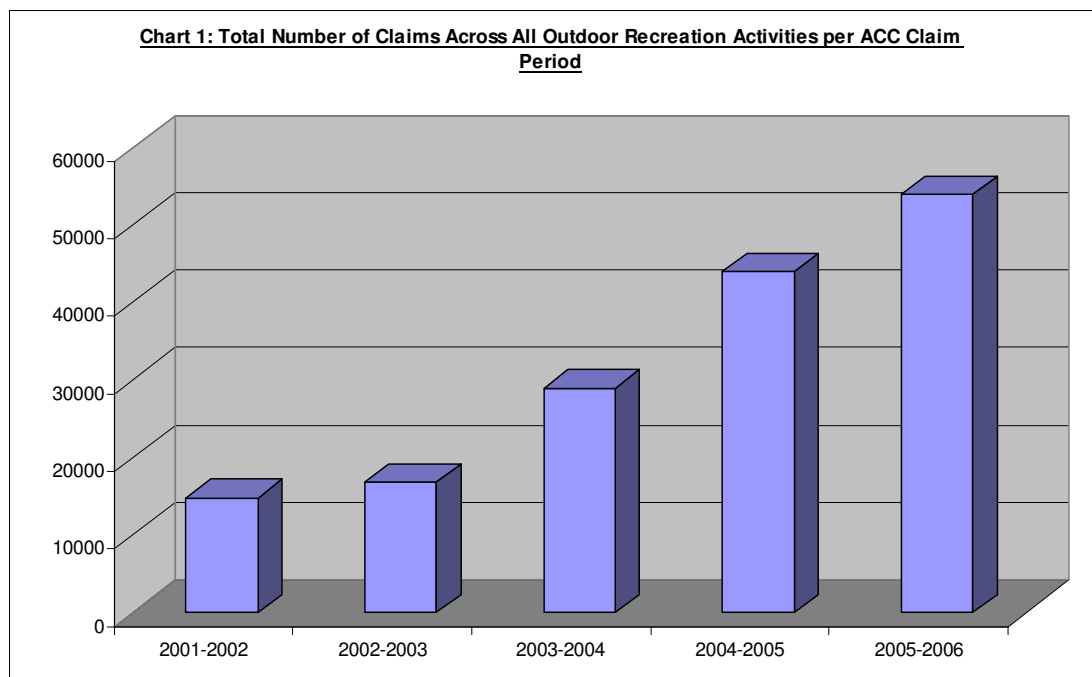
3) Mountain biking was only introduced as a category in 2003. To differentiate between road cycling and mountain biking incidents the following technique was used: Road cycling is defined as where 'road agency' is described as 'cycling' on ACC45 or where 'sport' is noted as 'cycling' and the 'scene of the accident' was 'road' or 'street'. Mountain biking is defined by 'sport' named on the ACC45, or where 'sport' is 'cycling' and the 'scene of the accident' is NOT 'road' or 'street'.

4) Prior to 1/7/2003 All swimming was categorised as 'swimming' and 'outdoor swimming' couldn't be distinguished from 'pool swimming'. Where the 'sport' on the ACC45 is noted as 'swimming' or 'other', accident descriptions have been used (where possible) to determine where swimming is noted as being at 'beach', 'river' and 'lake'.

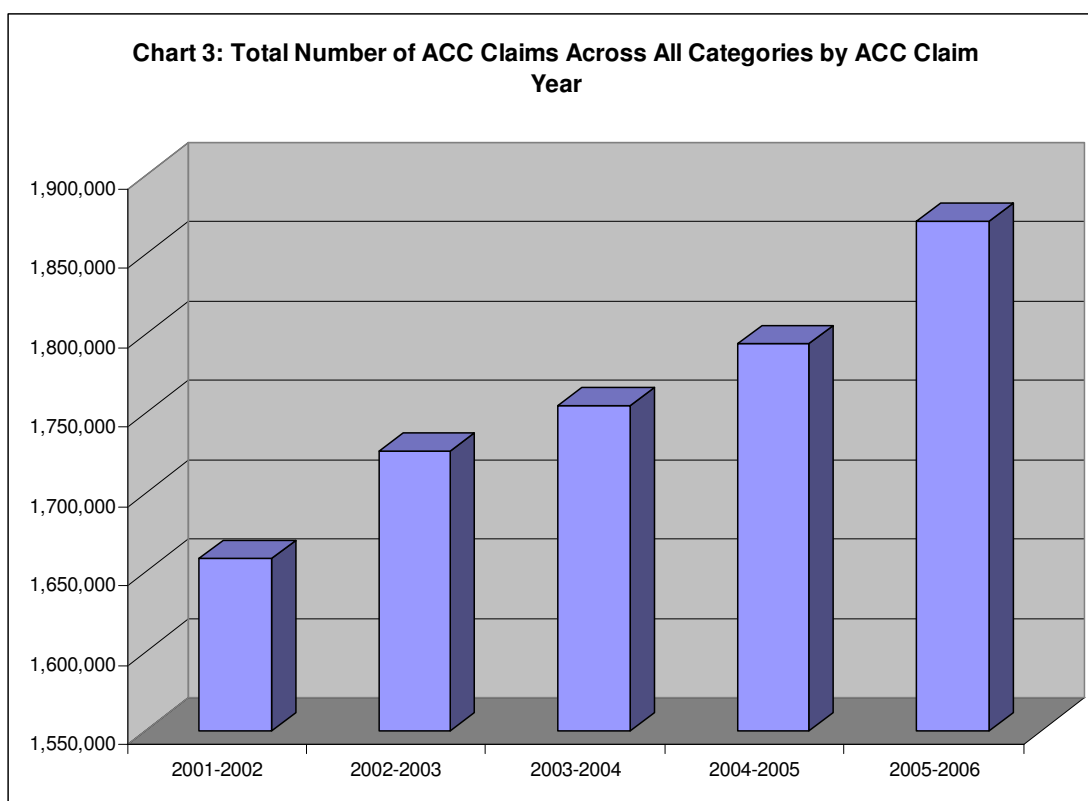
5) There was no separate category for snowboarding prior to 2002 and all claims prior to this are from free text searches of 'other' claims. There is a strong likelihood that some of the snowboarding claims prior to this date will have been reported under skiing. For this reason snowboarding claims may be understated prior to 2003 and skiing claims overstated.

Acknowledging these limitations, the data in Appendix A allowed a range of graphs to be plotted for the various outdoor recreation activities that helped address the questions posed earlier in this paper. It should be noted that because of these limitations ACC are nervous about using this data in time series analysis and the reader of this paper should be cautious about any interpretation of the findings.

A) Number of ACC outdoor recreation claims per year (Note: Claims mentioned in the following graphs and analysis include the total of new and ongoing for any year).

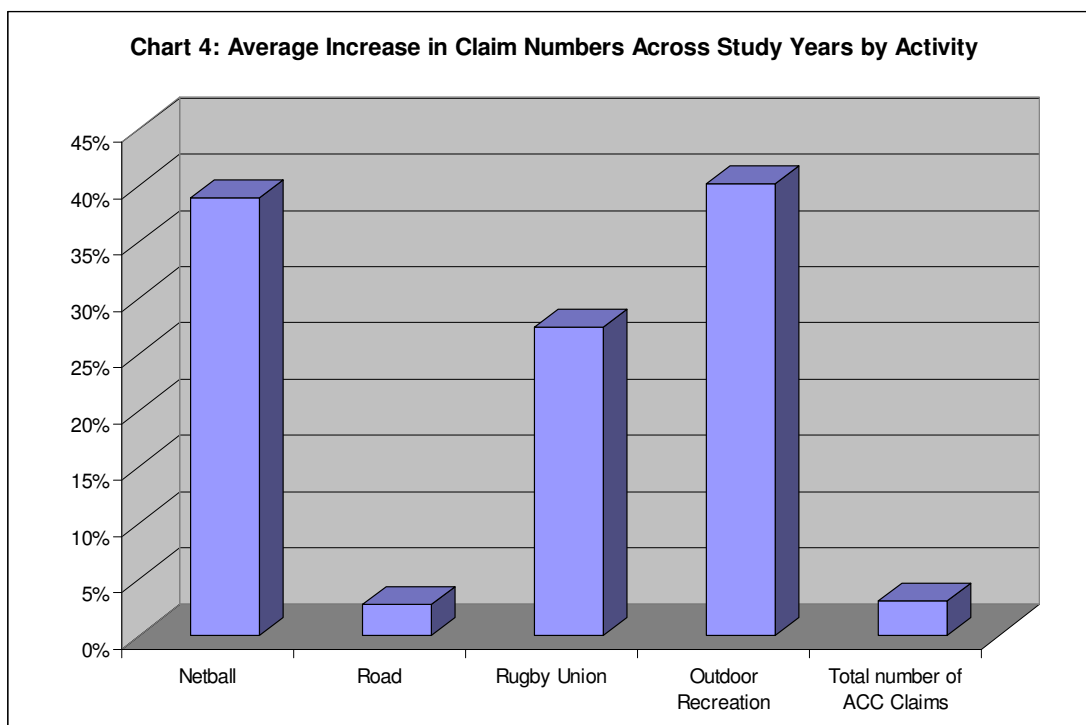


As shown in Chart 1, the total number of claims made to ACC in the cumulative total of all identified outdoor recreation incidents is increasing at a fairly steady rate over the five year study period. As mentioned in the limitations section, there is some doubt that this is all due to an increased number of incidents, or whether some part of this increase is due to an improved electronic reporting system (introduced in 2003), whereby it might be more easy to identify certain outdoor recreation incidents from the database. To get a gauge for this possible bias I have plotted some other common activities from the ACC database for the same period as a comparison, Chart 2. These activities (Netball, Rugby Union and Road Accidents) are well established categories in the ACC reporting structure and are therefore unlikely to be affected by the change in reporting format. The graphs show similar rates of increase in claims over the study period for netball and rugby, while road accidents have had a much smaller rate of increase. Also note that the total number of ACC claims (Chart 3) is also showing a steady rate of increase. Chart 3 will not be affected by the changes in reporting, because the claims will be counted even if the activity in which the claim occurred can't be identified. This tends to support the contention that the increases in these categories are real as opposed to reflecting increases in identifying the specific activity post 2003. Further tracking of data beyond this study period will need to be done to completely eliminate this potential bias.

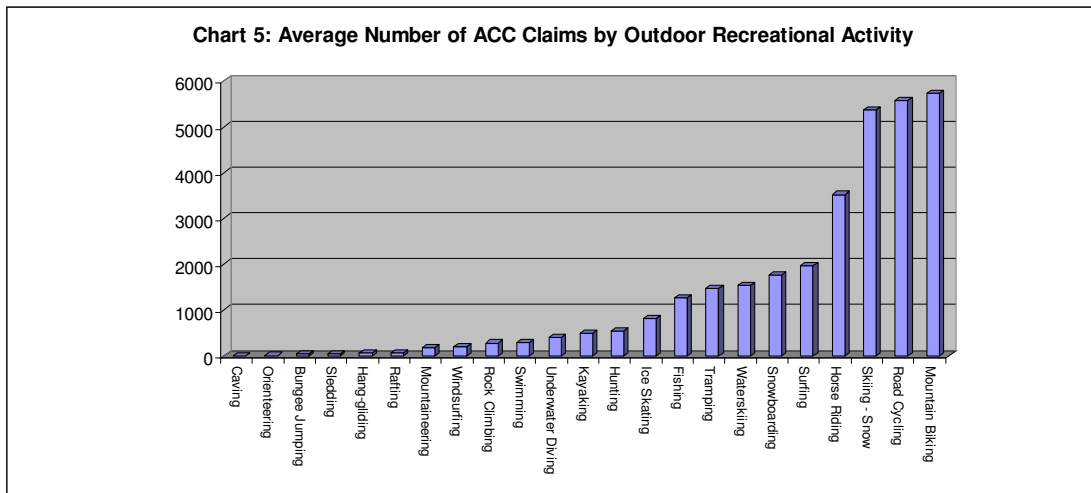


While the claim totals in the data include both new claims and ongoing claims, it seems unlikely that there has been an increase in the ratio of

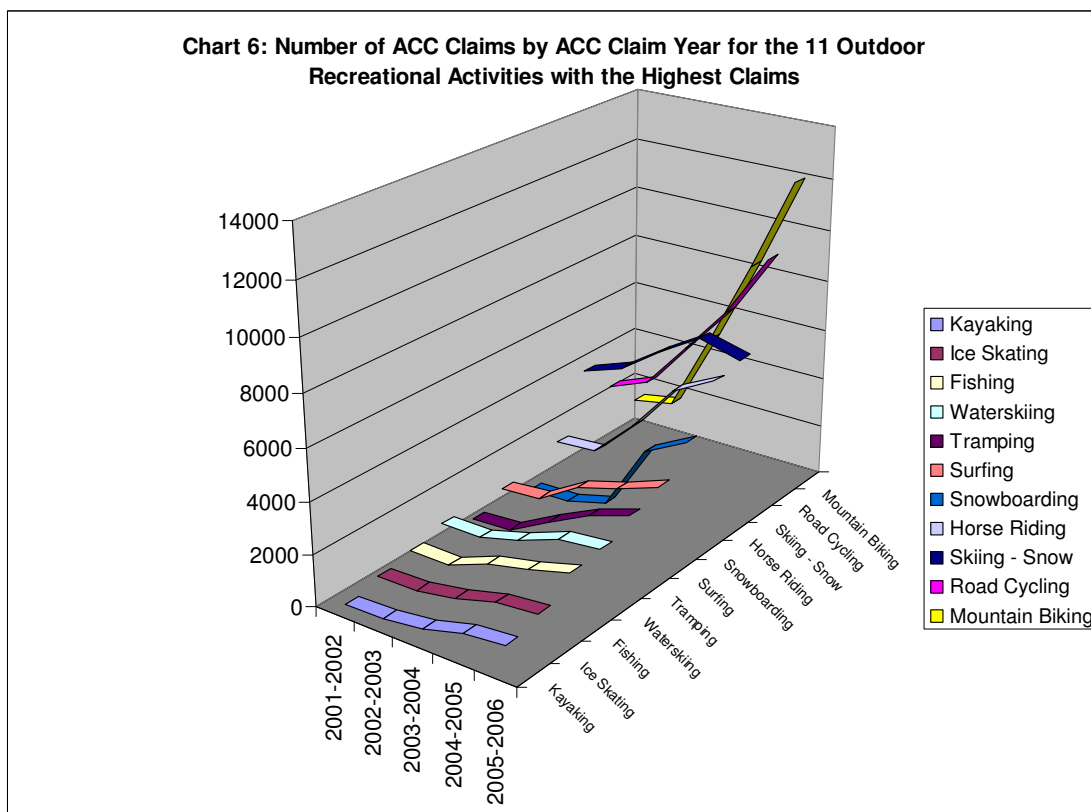
ongoing claims to new claims, and therefore the increases noted are due to increasing numbers of incidents across the study years. Chart 4 shows that this rate of increase over the study years is higher than any of the other activities chosen for comparison. At an average rate of 40% increase in claims per year, this increase is slightly higher than netball (39%), half again as much as the rate of annual increase in rugby claims (27%) and significantly more than the rate of annual increase for both road claims and total ACC claims (both 3%). The reasons for this increase are unknown at present. Possible reasons could be increases in participation rates, people claiming for less serious injuries than in the past, or other reasons. It will require further research to ascertain if there are factors that can be correlated to these observed increases.

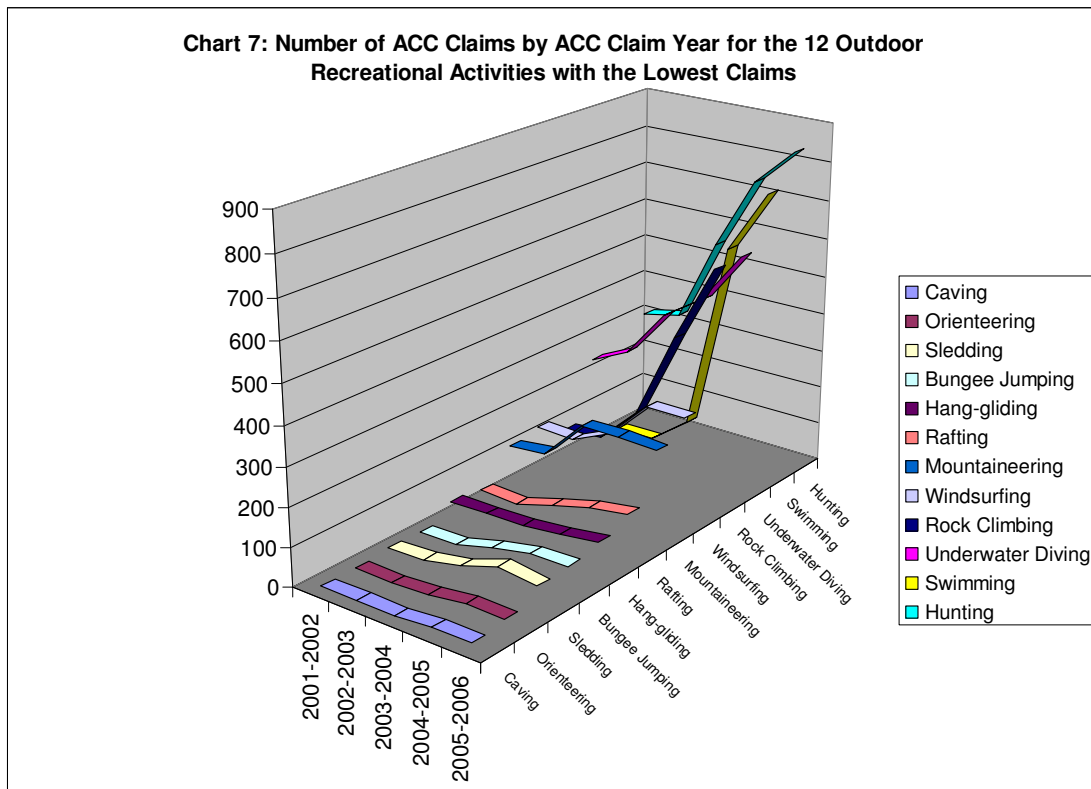


Further analysis allows us to look at the average number of claims for each activity (Chart 5). This reveals some interesting results with the greatest average number of claims coming from mountain biking followed by road cycling, skiing and horse riding. Other activities have a significant drop in average claim numbers compared to the top four.



Charts 6 and 7 show how the number of claims in any activity have changed over the study years.





These graphs show major claims increases occurring in both forms of cycling, horse riding and snowboarding (countered by a recent drop in the rate of skiing increases), and also hunting, swimming, underwater diving and rock climbing. Once again the issue is what is the reason for the increased claims? Possible explanations for the increased claims include:

- Increased participation.
- Increased accidents.
- Increased incidence/accessibility of seeking medical treatment for injuries (especially on ski fields where there is increased access to on-field medical staff and treatment).
- Increased propensity to visit medical professionals for even small injuries.
- A combination of these.
- Or other issues?

An easy conclusion to make might be to assume that the rapid increases in claim rates are indicative of increased participation in each of the recreational activities. Intuitively this would make sense as most of the activities noted for high increases in claims in Charts 6 and 7 are associated with perceived increased popularity in recent years (e.g. mountain biking).

Unfortunately ACC does not attempt to measure participation rates in the various sports/activities in which claims are made, and there seems to be no easily accessible research that gives an estimate of the participation rates within outdoor recreation activities in New Zealand. The best data on participation that could be obtained was "SPARC Facts" (SPARC, 2003). This document gives information about New Zealanders' involvement in sport and physical activity. It is a compilation of the Sport and Physical Activity Surveys which were carried out in 1997, 1998 and 2000. These three surveys interviewed a total of 12,500 adults (18 years and over) and 4,000 young people (5-17 year olds). The results of these surveys have been generalised to the overall population of New Zealand to give participation levels in various sport and leisure activities based on the population according to 2001 census data. However these 'participation levels' represent those individuals who indicated in the surveys that they had participated in that particular activity over the past four weeks and those that had participated over the past year. What isn't measured and reported is the level of participation - how many days each person took part in each activity over that year and therefore how many days (or hours) participation occurred across the New Zealand population in that activity. Without knowing this it is not possible to compare ACC claim rates in any detail between activity types.

I approached Grant McLean, the Manager for Research within SPARC, to see if more information could be achieved from the base data. Grant was very helpful, but upon reviewing the outdoor recreation activities that I was studying we found that only five of these had parallels in the SPARC research and even these categories could not differentiate skiing from snowboarding (grouped together as snowsports). The SPARC category for swimming could not differentiate outdoor swimming from swimming in pools for example.

While understanding these limitations, especially the issue that the SPARC participation figures do not measure participation levels during the year that respondents said they carried out the activity, it is possible to use these figures to compare the top four outdoor recreational activities in Chart 6 and two common sports (Netball and Rugby Union).

Table 1 shows this comparison. The SPARC participation rates are divided by the reported ACC Claims in the 2001-2002 year to produce a participant number per claim for each activity. This table suggests that of the activities compared, rugby union is the most prone to ACC Claim with one claim per 11 players. Snowsports (combined) is the outdoor recreation activity that is most prone to claim with a rate of 40 skiers per claim; a similar level to netball. Mountain biking and recreational cycling

are much less prone to claim using this measure than horse riding. This shows the power of knowing participation rates as it produces a very different order of 'accident prone activity' than claim number alone shown in Charts 6 and 7. More sophisticated levels of measuring participation rates would give more confidence in these results. Extending the participation levels to other outdoor activities would make these comparisons useful over a greater range of outdoor recreation.

Table 1: Comparison of SPARC Participation Rates with ACC Claims for Various Outdoor Recreation and Sporting Activities to Produce a Participant Number / Claim measure.

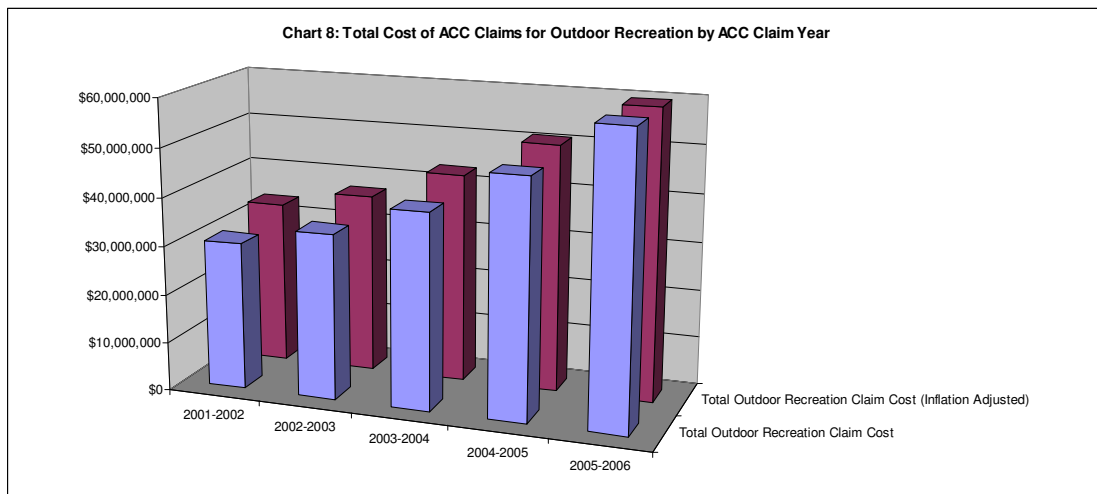
| | Total Participation (Youth 5-17 and Adult 18+ from SPARC, 2003) | ACC Claims for Claim Year 2001 - 2002 | Number of Participants per Claim |
|-----------------------------|--|--|---|
| Rugby Union | 258400 | 23035 | 11 |
| Snowsports | 171100 | 4231 | 40 |
| Netball | 255700 | 6212 | 41 |
| Horse Riding | 157000 | 1595 | 98 |
| Mountain Biking | 184300 | 1457 | 126 |
| Recreational Cycling | 548100 | 2670 | 205 |
| Tramping | 322800 | 480 | 673 |

In addition to the limitations discussed above, the SPARC data is also dated and may no longer be representative of current participation rates, or even those corresponding to the ACC Claims in the 2001 – 2002 year. As shown by the claim trends (Charts 6 and 7) over the ACC sample data periods, if there is assumed to be a correlation between participation rate and claim rate, there may have been significant changes in participation rates for various activities over a short time period.

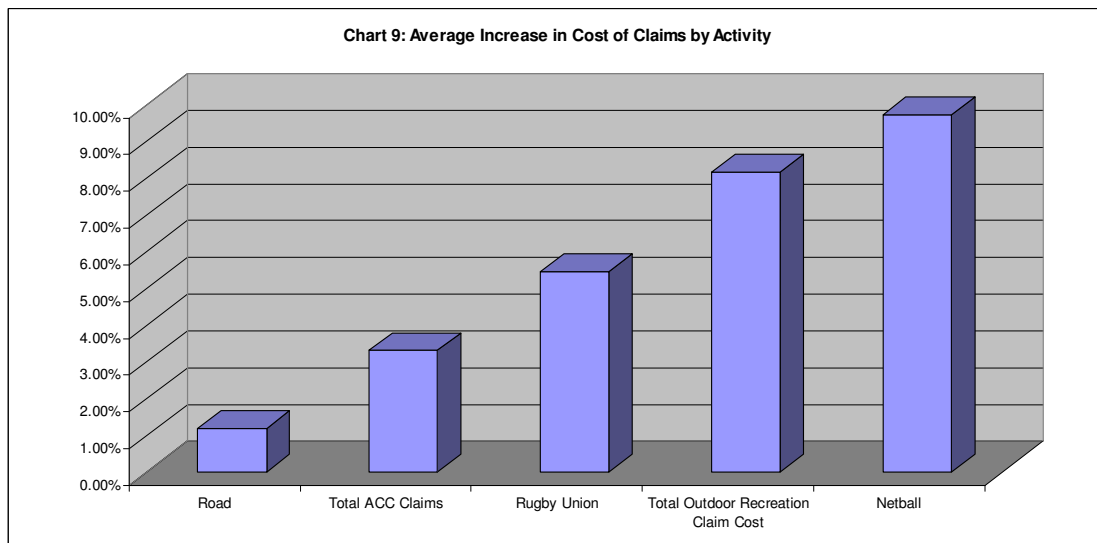
The reasons for the increased claims will therefore only be addressed by further research. SPARC is in the middle of conducting its latest sport and activity survey (due for completion in 2008) and the survey methodology is much more rigorous than in previous years, giving the promise of some excellent data for analysis. Unfortunately the outdoor recreation categories are still very limited and are not tied to national incident database categories. This will mean that it will still be difficult to make meaningful analysis of combined data about outdoor recreation incidents. A recommendation from this paper is that representatives from SPARC, ACC and the National Incident Database meet and align their activity categories so that meaningful research and analysis can be conducted in the future.

B) Cost of claims in each activity.

Chart 8 demonstrates how the total cost of ACC claims (new and ongoing) has been increasing each year for outdoor recreational activities. Because the effects of inflation can exaggerate these increases, I have used the Statistics NZ inflation calculator (<http://www.rbnz.govt.nz/statistics/0135595.html>) to give inflation adjusted figures. (NB: This adjustment only allows for an average level of inflation and does not take into account possible different rates of inflation of medical costs, etc.) The costs used in the rest of this paper have all been adjusted to 2006 dollar values.



The total cost of outdoor recreation ACC claims has clearly been increasing over the sampled years 2001/02 – 2005/06. The average annual increase over these years (Chart 9) is much greater than 'road accidents' and 'Total ACC Claims'. The rate of increase is only surpassed by that of 'Netball' in the sampled activities.



The average annual cost of claims for various activity categories (Chart 10) shows a different rank order than purely the number of claims (Chart 5). This is because the average cost/claim varies for the different activities (Chart 11). For example road cycling and mountain biking had similar average numbers of ACC claims per year, however road cycling had a much greater average annual claim cost than mountain biking. This is because the average cost per claim for road cycling is higher than for mountain biking. Those activities that are shown in Chart 11 as having the highest average cost per claim seem to be those where the highest energy sources (falls from height, high speed, bullets or deep/moving water) exist to cause major injury. These are hang gliding, underwater diving, mountaineering, hunting, rafting and road cycling. In these activities, if an incident occurs, it would appear to be one that requires a higher level of medical costs or entitlement costs.

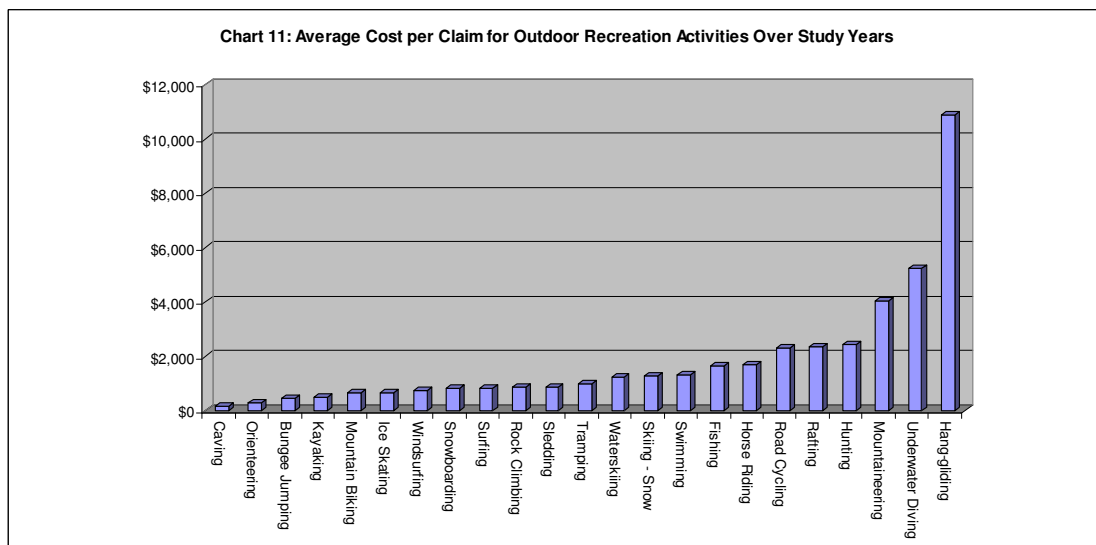
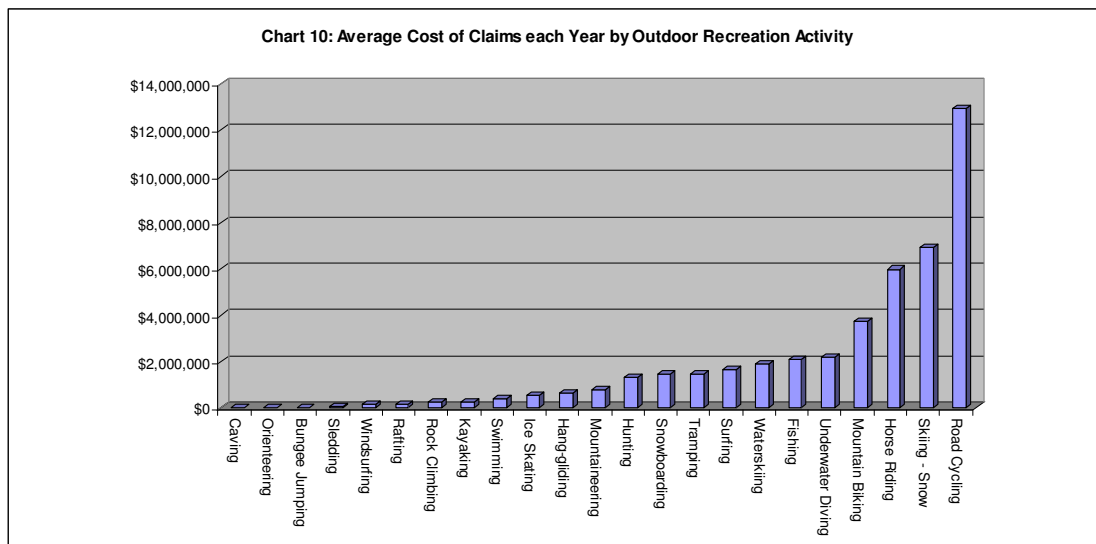
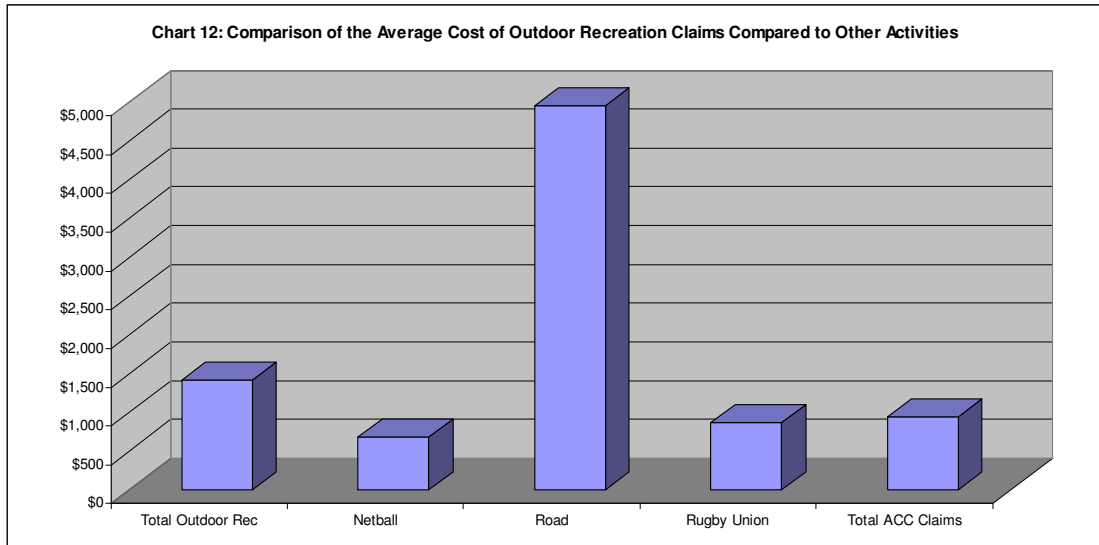


Chart 12 shows that the average cost of an outdoor recreation claim (\$1,417) is higher than most other activities studied within the exception of road accidents.



Further to this there are some interesting trends over time. Charts 13, 14, 15 and 16 show these trends for the various outdoor recreation activities. Charts 13 and 14 show that, for almost all activities, the cost of ACC claims has been increasing over the study period. However Charts 15 and 16 show that the average cost per claim is generally dropping. With the trend for increasing numbers of claims that has been discussed earlier, these Charts may be evidence to suggest that people are now seeking medical treatment for injuries of less severity than would have been the case in the past. These less severe injuries requiring lower cost treatments and/or shorter rehabilitation periods.

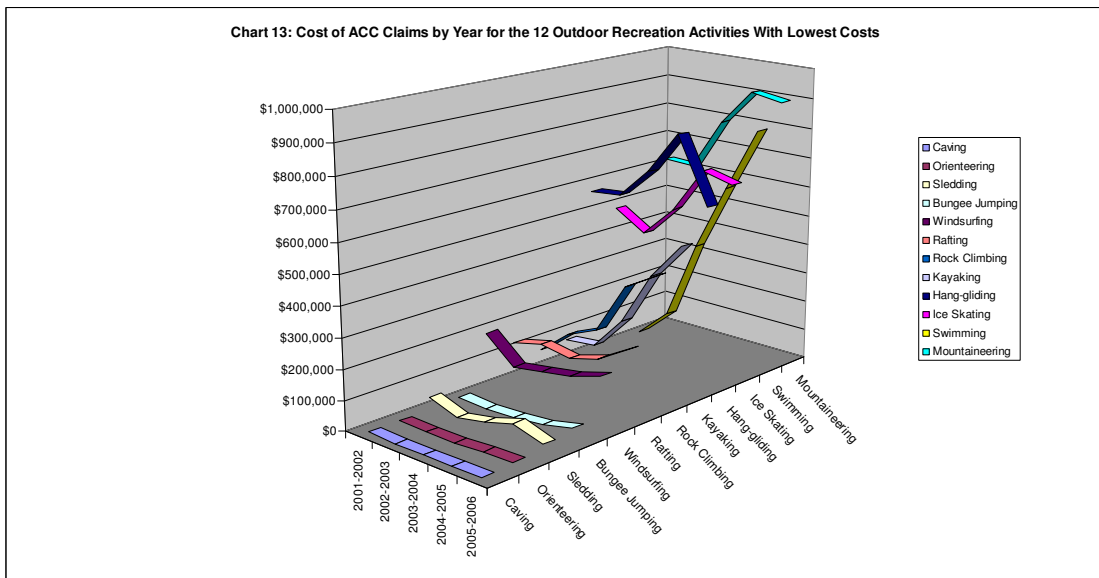


Chart 14: Cost of ACC Claims by Year for the 11 Outdoor Recreation Activities With Highest Costs

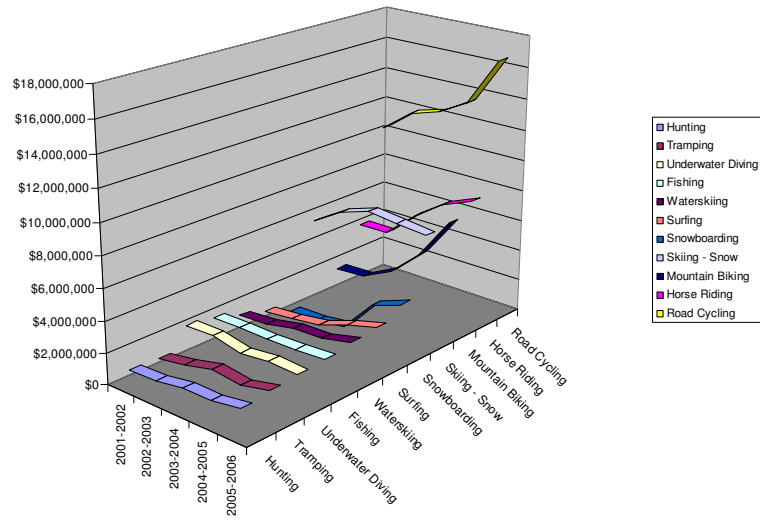
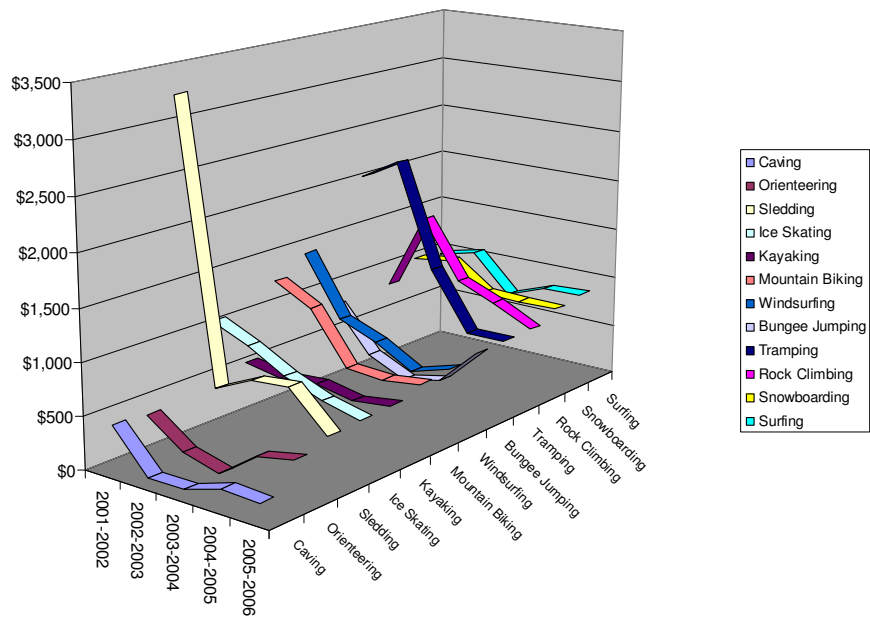
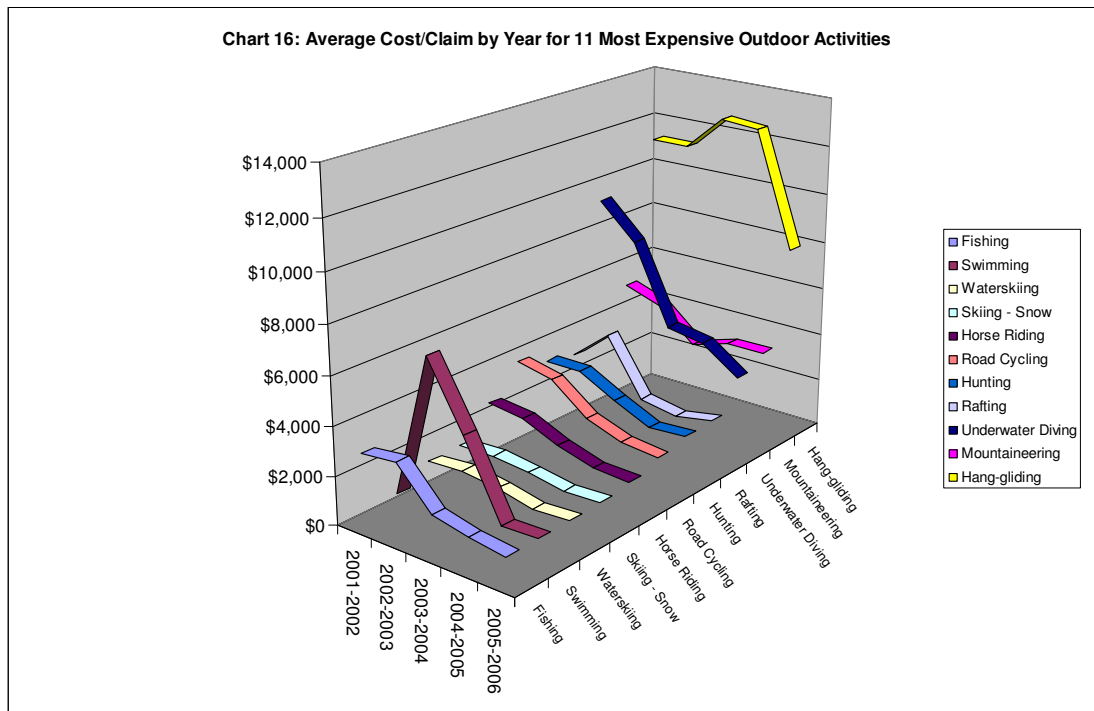


Chart 15: Average Cost/Claim by Year for 12 Least Expensive Outdoor Activities





C) Summary:

This paper began with a number of questions about the cost and number of accidents in outdoor recreation activities. With the help of ACC, data were produced for the number of claims and the cost of those claims across a number of outdoor recreation activities. There are a number of limitations in those data, and the reader of this paper should read and understand those limitations carefully before interpreting any of the results discussed in this paper. The following are reflections on information that has been revealed in this paper that goes towards addressing each of these questions.

- What is the cost of outdoor recreation incidents?
Outdoor recreation incidents are now costing the country a total of almost \$60 million per year in ACC claims.
- Are those costs on the increase or decrease?
The costs are increasing at a rate of over \$7 million per year. This is more than the increases in rugby(\$3.9M per year) and netball(\$1.4M per year) and is only surpassed by road claims(\$13.5M per year).
- Are some outdoor recreational activities more costly than others?
The five outdoor recreation activities with the greatest average number of claims (new and ongoing) over the study years are mountain biking, road cycling, skiing, horse riding and surfing. Of these, the limited information on participation rates indicates that the outdoor recreation activity that produces the greatest claim rate is snowsports (40 participants per claim), followed by horseriding (98ppc), mountain biking (126ppc) and road cycling (205ppc). These compare favourably with rugby (11ppc) and netball (41ppc).

The five outdoor recreation activities with the greatest average cost of claims over the study years were road cycling, skiing, horse riding, mountain biking and underwater diving. However because some activities produce more serious injuries, a more realistic comparison could be considered to be the average cost per claim in any activity. The top five outdoor recreational activities in terms of cost per claim are hang gliding, underwater diving, mountaineering, hunting and rafting.

- Are safety agencies and their training schemes having any affect on incident rates?

It is impossible to reach any conclusion about the efficacy of the efforts of safety agencies and their training programmes because there are too many variables at play and the data is too limited. However this paper provides some base levels that can now be used by safety agencies to set goals and to track impacts of future interventions.

- How do outdoor recreational activity claims compare with other activities?

Although there are major limitations in the data, initial indications are that outdoor recreation activities compare favourable with other 'more mainstream' activities in terms of claims. Only when all outdoor recreation activities claims are added together do they compare in magnitude with the number of claims in activities such as rugby or road accidents. However the rate of increase in claims over the study years is larger than any of the comparison activities at close to 40% per year. It is interesting to note that the average cost of an outdoor recreation claim is higher than all comparison activities other than road accidents. This seems to be indicative of higher energy sources involved in outdoor recreation, causing more severe incidents, compared to other sports.

The major finding of this paper is the need for further research. Questions raised include:

- What are the patterns of participation in outdoor recreation in NZ over the past five years?
- What is the increasing number of claims due to? (Increasing number of participants / increasing accidents / increasing people seeking medical attention / increasing medical treatments per injury / other?)
- What training or other intervention can be developed to curb the increasing trends in any or all of the outdoor recreation activities?

Researching this paper has shown that there is very little quality information on participation rates for outdoor recreation in New Zealand. There is also no consistency of classification of recreational activities between major data gatherers such as Sparc, ACC and the National Incident Database. A recommendation from this paper is that representatives of these three groups meet in an attempt to agree to

classification categories and to establish ways to meaningfully measure participation rates in future research projects.

I look forward to reading future research that will explore some of these research questions.

References:

Davidson, G. (2004). Fact or Folklore? Exploring "Myths" about Outdoor Education Accidents: Some Evidence from New Zealand. *Journal of Adventure Education and Outdoor Learning*, 4(1), 11-35.

SPARC (2003). *SPARC Facts: Results of the New Zealand Sport and Physical Activity Surveys (1997 – 2001)*. Wellington: SPARC