Accident Rate Comparisons

NZ with USA, UK, Australia

1990 - 2002

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Civil Aviation Authority

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Introduction

The UK CAA has recently produced an updated report on Aviation Safety in the UK, "Aviation Safety Review 1992-2001" (CAP735).

Previous safety reviews from the CAA UK (CAP673 & CAP701) had been used in a comparison of accident rates between New Zealand, the UK, USA and Australia in 1999 and 2000 (CAA NZ ref 98/SAT/034, 99/SAT/034), covering the period from 1988 to the end of 1999.

The updated information from the UK provided the impetus to update the safety comparison to the end of 2001 compared to the UK, and 2002 compared to the USA and Australia.

Summary

New Zealand accident and fatality rates for large aircraft are higher than those for the USA and Australia, but lower than those for the UK. The rates for smaller aircraft and helicopters are higher than all three nations.

Analysis

Data sources are given in the appendix.

Aircraft grouping

The 3 nations used in this comparison each group their aircraft using different criteria. NZ data was made to conform with the foreign criteria.

USA

Part 121 – Before 20 March 1997 aircraft with 30 or more seats, subsequently aircraft with 10 or more seats.

Part 135 – Aircraft with fewer than 30 or 10 seats.

Helicopters are included in Part 135 regardless of seating.

UK

Airline – scheduled operations by aircraft > 5,700 kg. Passenger and cargo operations are separate in the UK data, but have been merged because of the small volume of freight-only activity in New Zealand. The NZ equivalent was taken as all scheduled pax and freight operations in Safety Target Groups 1 and 2 (ie all aircraft 5,670 kg and above).

Small Airline (< 5,700 kg) and Air Taxi (< 15,000 kg) - these are separate in the UK data, and have been merged to better suit the NZ data for unscheduled operations. The NZ equivalent was taken as all pax and freight operations by aircraft below 5,670 kg.

Helicopters – all helicopters on public transport operations. The NZ equivalent was taken as all pax and freight operations by helicopters.

Australia

HCAT – High Capacity Air Transport. Aircraft with 38 or more seats.

LCAT – Low Capacity Air Transport. Aircraft with 37 or fewer seats.

Helicopters are included in LCAT.

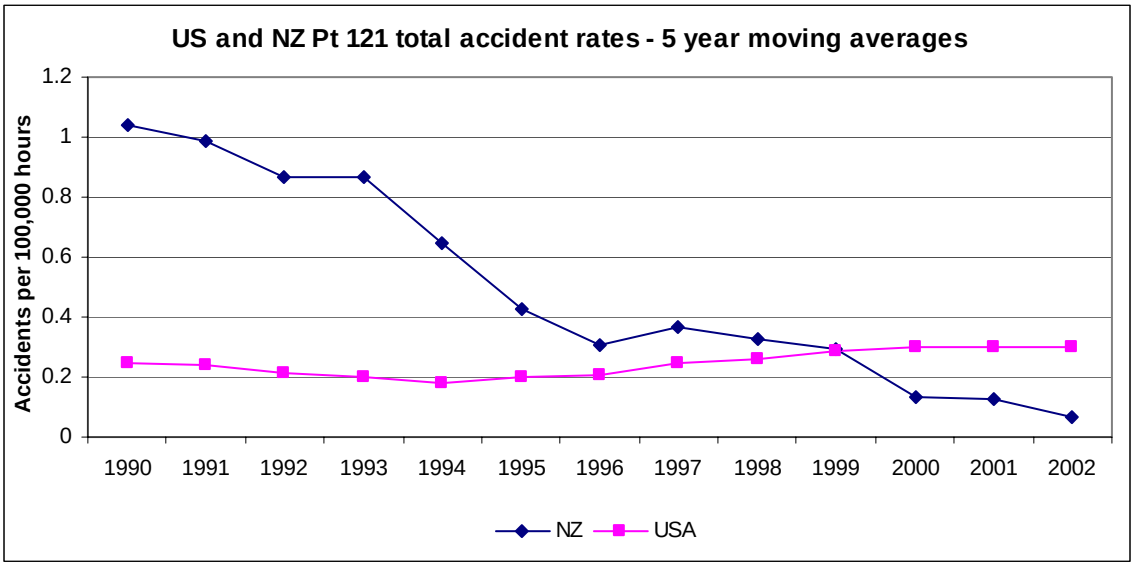
Total Accident Rates

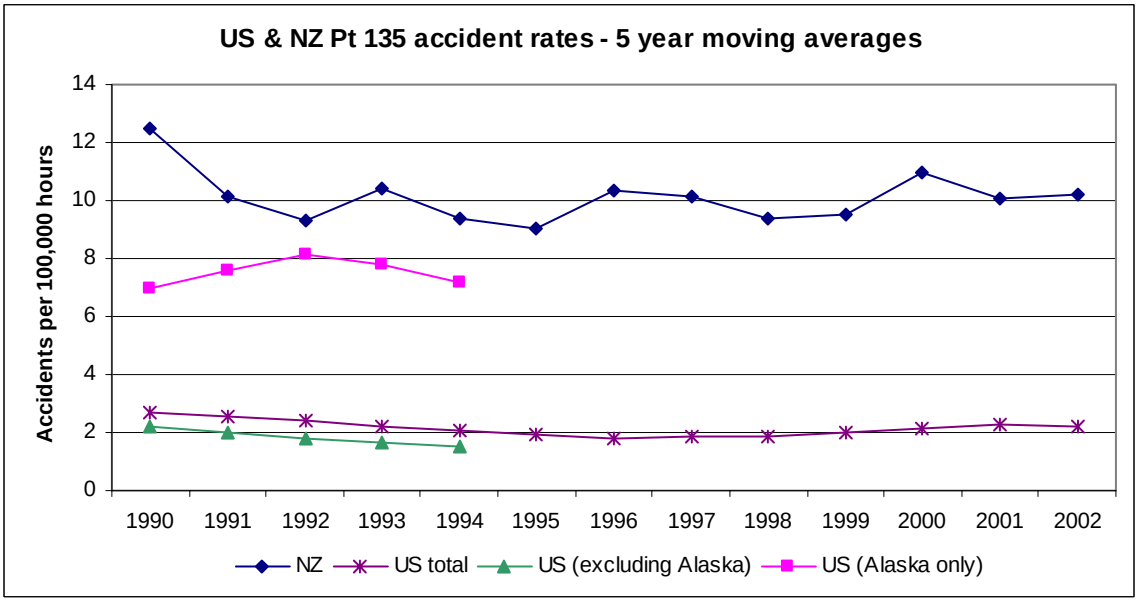
USA

The NZ rate for Part 121 aircraft has reduced steadily over the period covered and is now less than that for the USA.

New Zealand Part 135 rates have remained relatively static for the last 10 years, and are considerably more than the US rates.

The US Part 135 rate was modified by separating Alaskan data where this was available separately. Alaskan Part 135 aviation is regarded as a special case in the USA, but is still lower than the NZ rates.



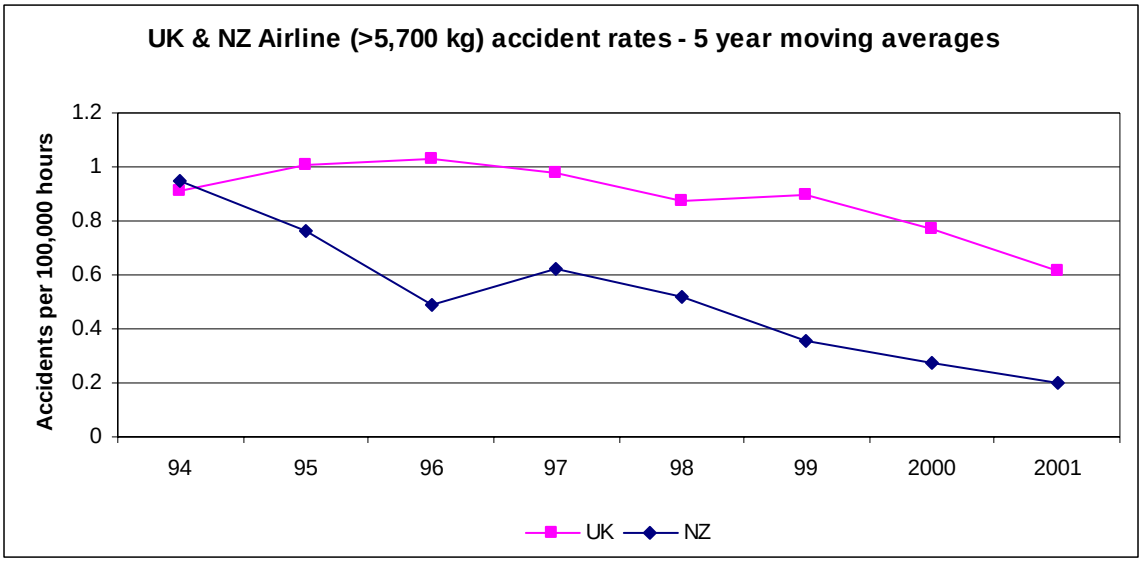


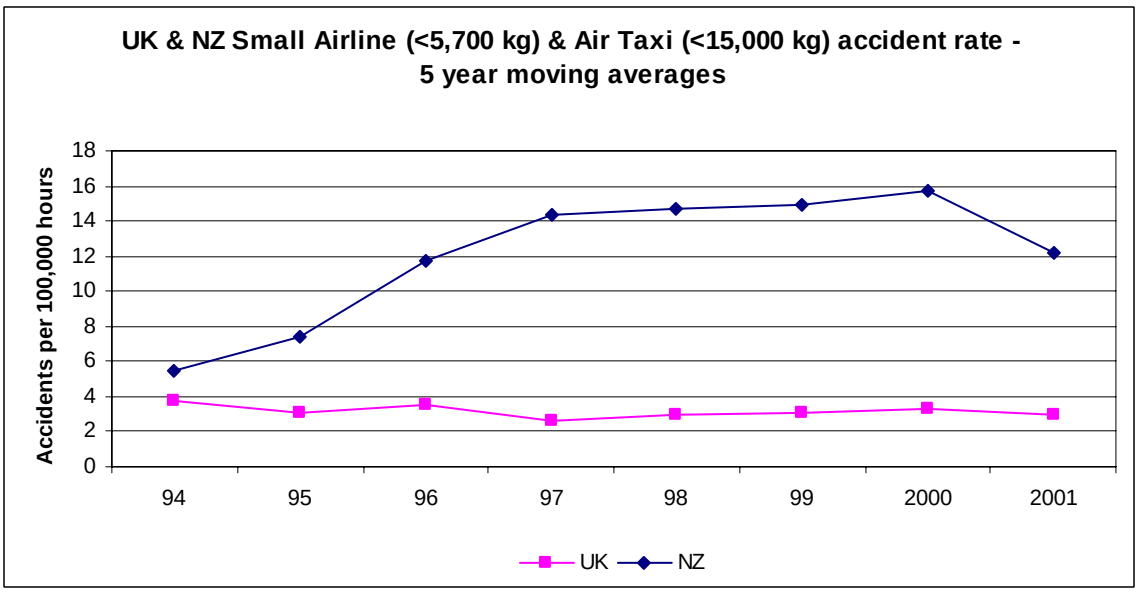
UK

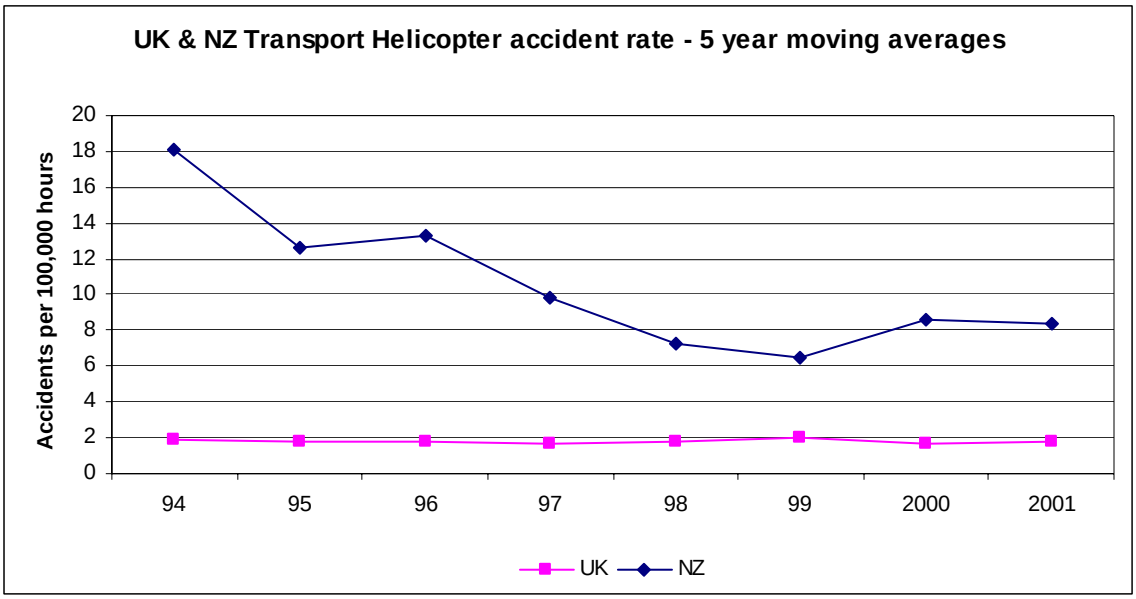
The New Zealand accident rate for larger aircraft (> 5,700 kg) engaged on airline operations is lower than the UK equivalent.

The rate for smaller aircraft and "Air Taxi" operations has steadily increased and is now considerably higher than their UK equivalents.

The rate for Helicopters has steadily decreased until the late 1990's but has flattened out well above the UK rate.



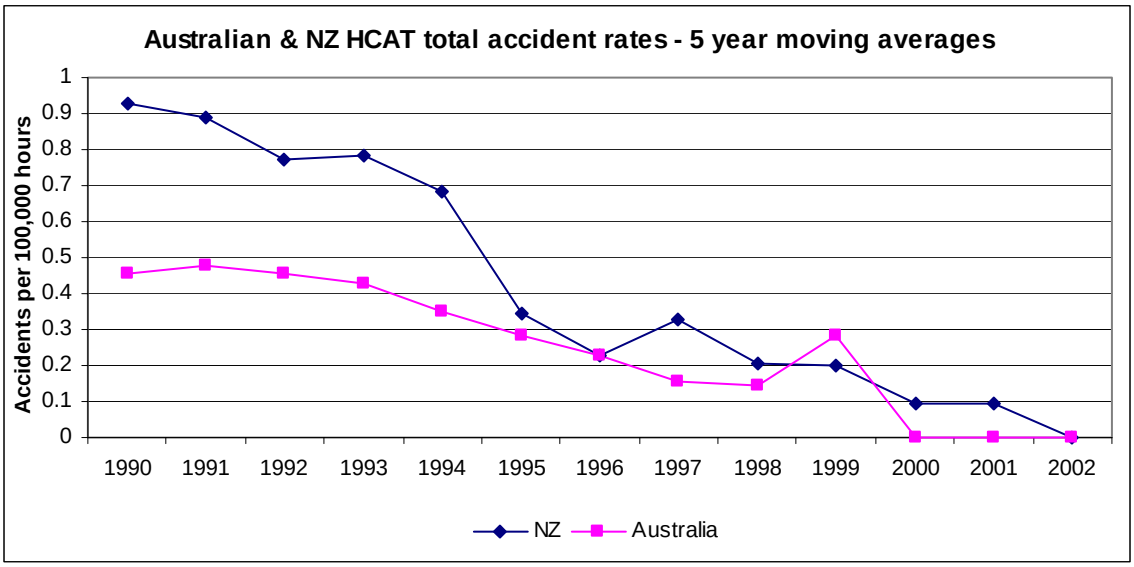


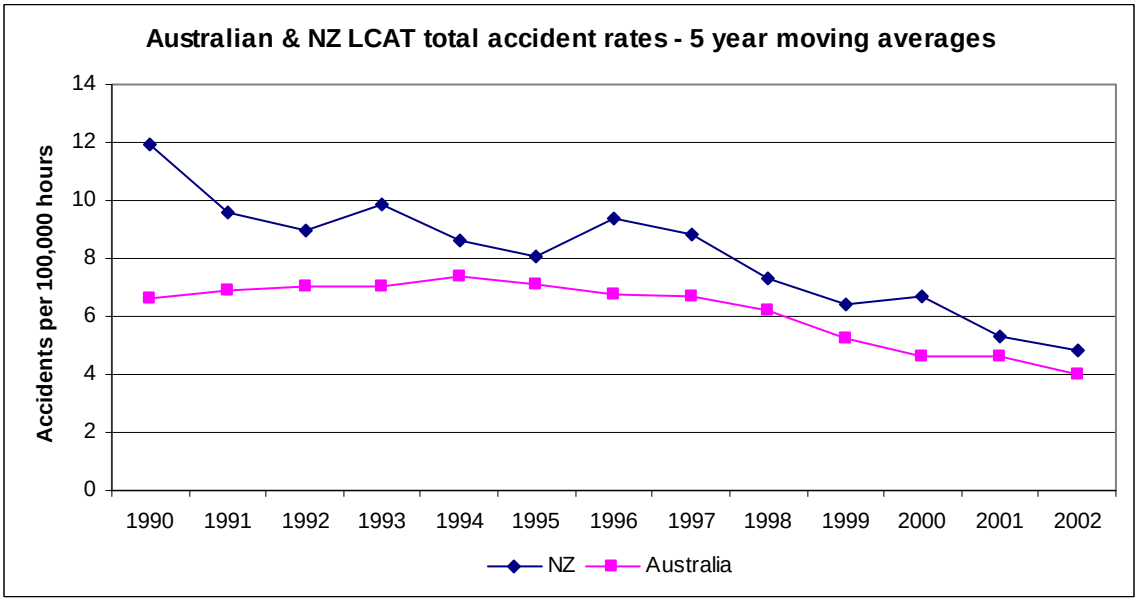

UK & NZ Transport Helicopter accident rate - 5 year moving averages
Accidents per 100,000 hours
20
18
16
14
12
10
8
6
4
2
0
94
95
96
97
98
99
2000
2001
UK
NZ

Australia

The NZ and Australian large aircraft (HCAT) accident rates have both reduced to zero for 2002.

The NZ small aircraft (LCAT) accident rate remains slightly higher than the Australian rate.

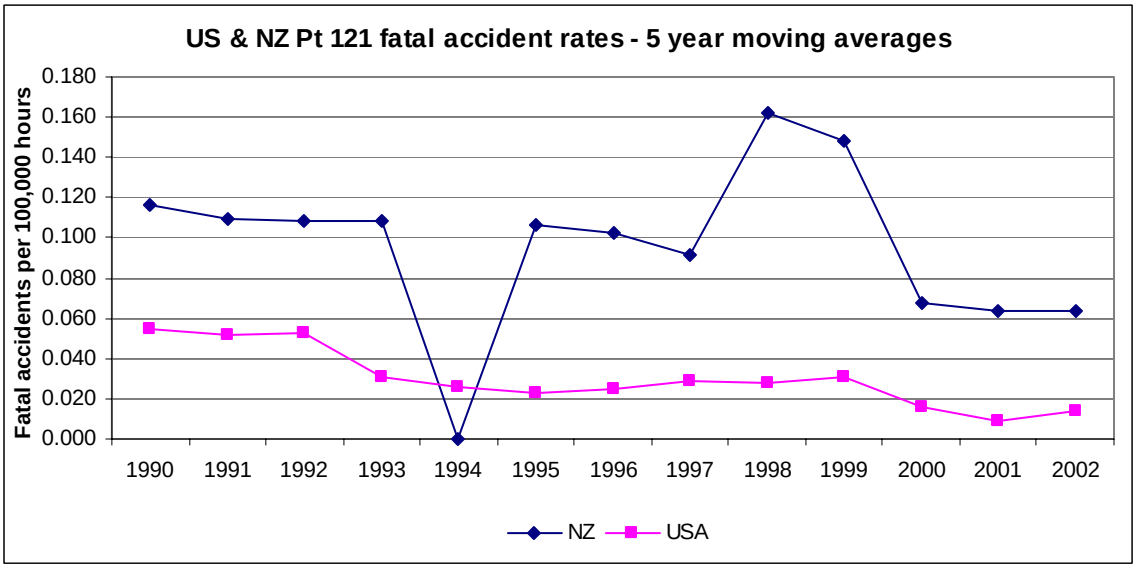


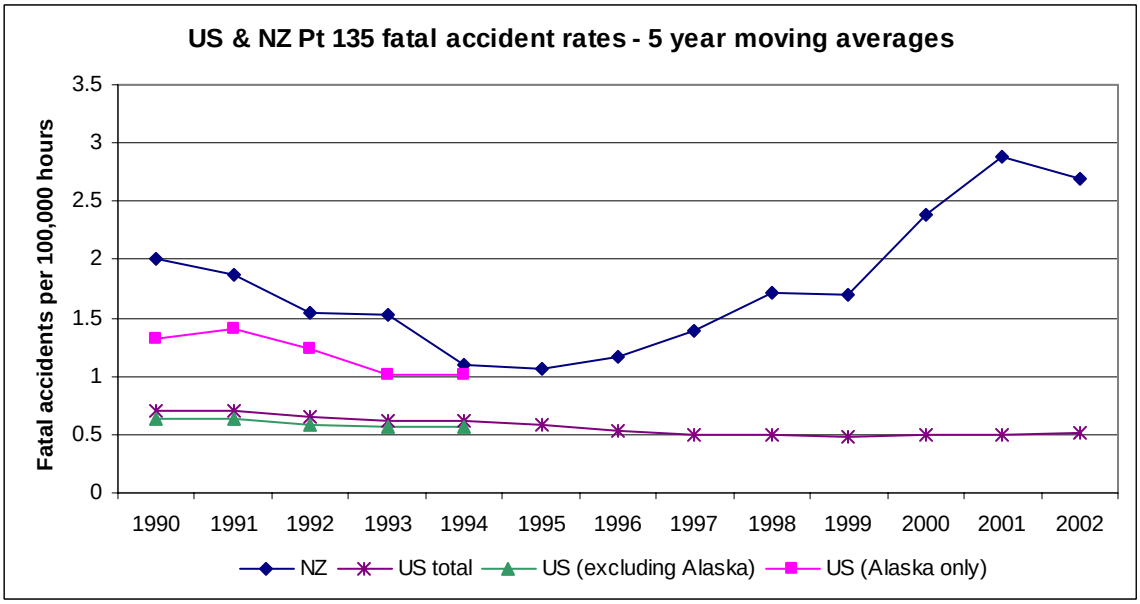


Fatal Accident rates

USA

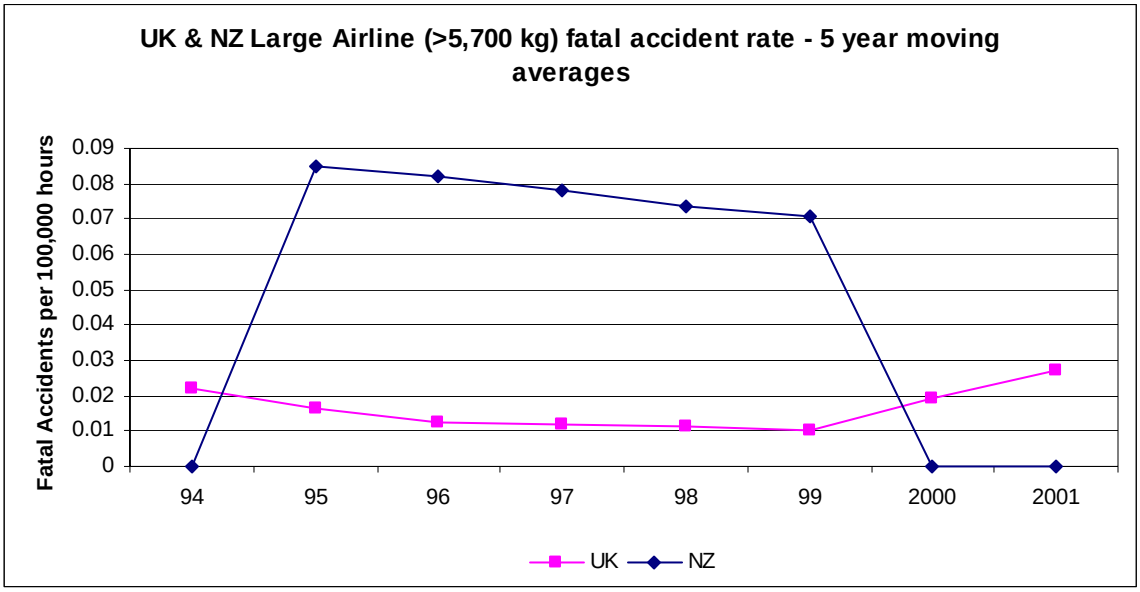
The NZ rates are considerably higher than the US equivalents.

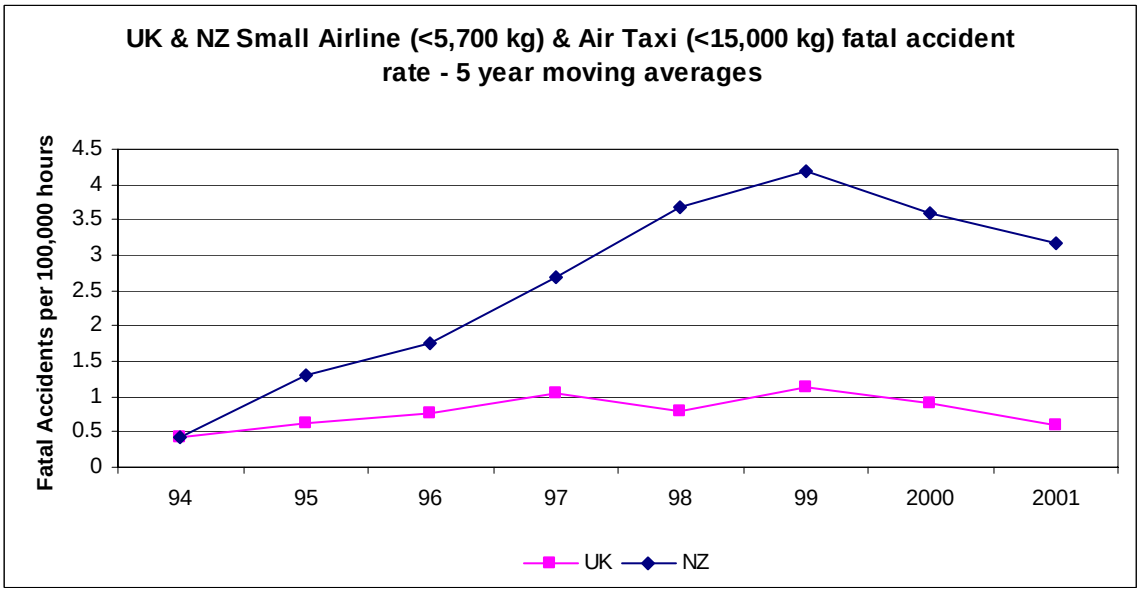


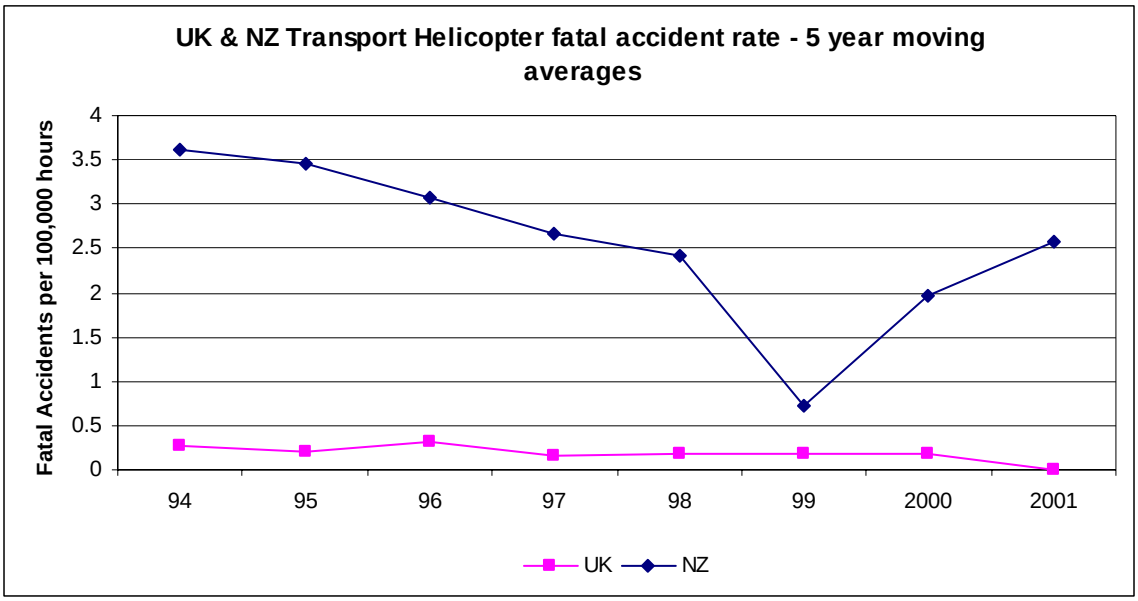


UK

The NZ rates are generally considerably higher than their UK equivalents, despite the large aircraft rate decreasing to zero in 2000.



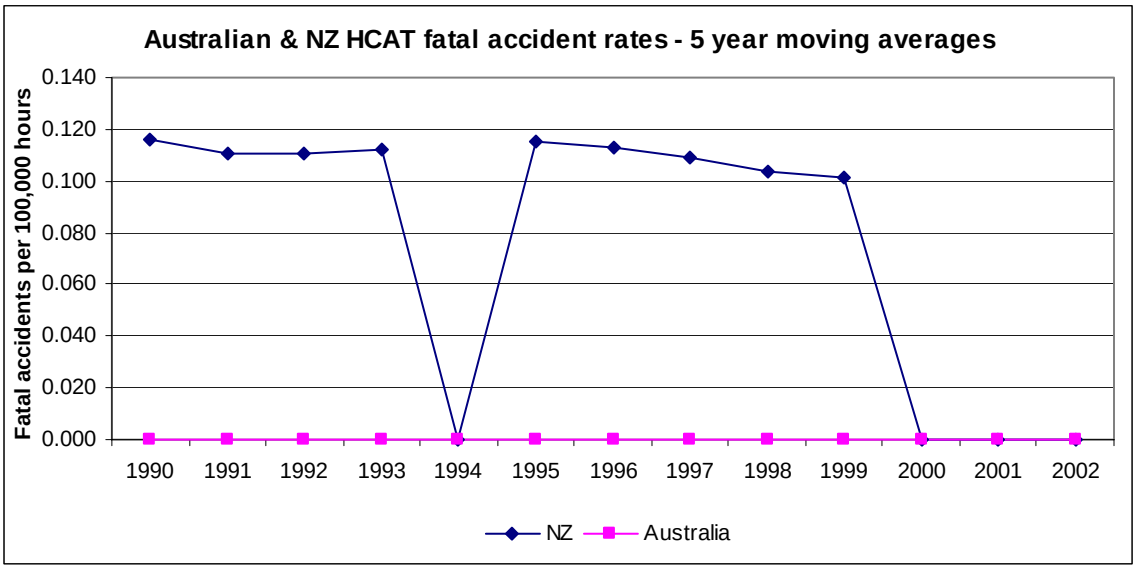


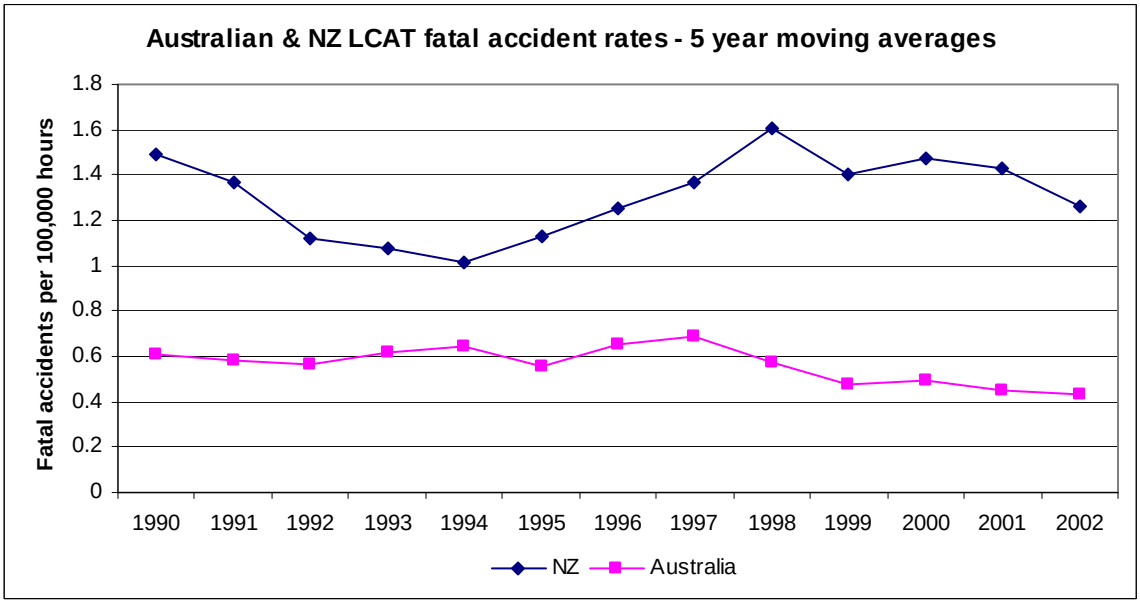

UK & NZ Transport Helicopter fatal accident rate - 5 year moving averages
Fatal Accidents per 100,000 hours
4
3.5
3
2.5
2
1.5
1
0.5
0
94
95
96
97
98
99
2000
2001
UK
NZ

Australia

The NZ rates are generally considerably higher than their Australian equivalents. Although the NZ large aircraft rate reduced to zero in 2000.

Note that the Australian fatal accident rate for large aircraft is ZERO, ie there has not been a fatal accident to a large aircraft between 1985 and 1999.





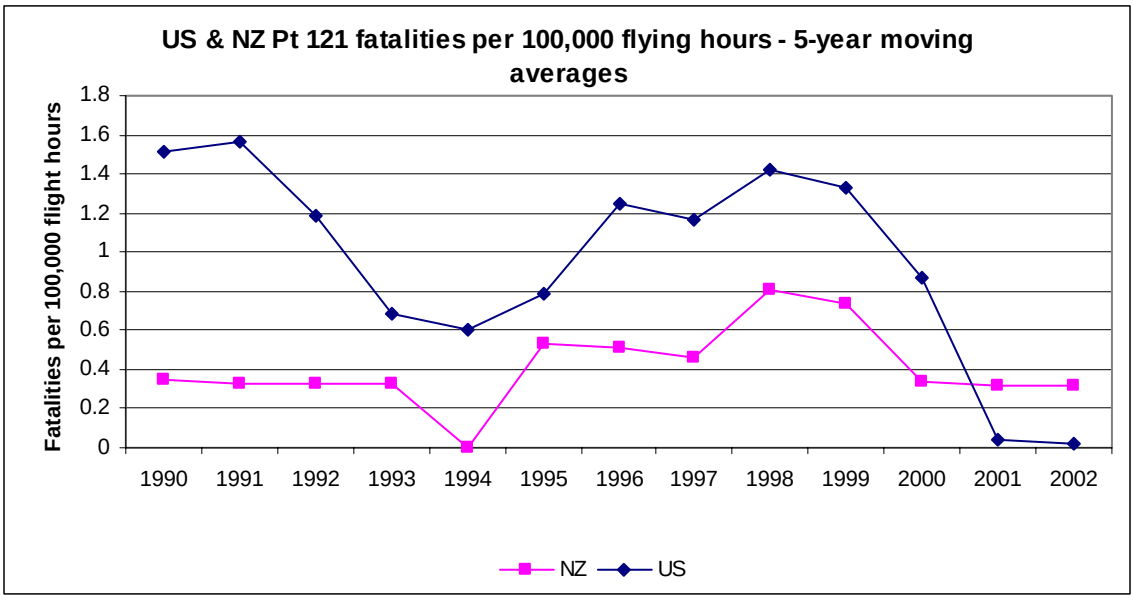
Fatalities

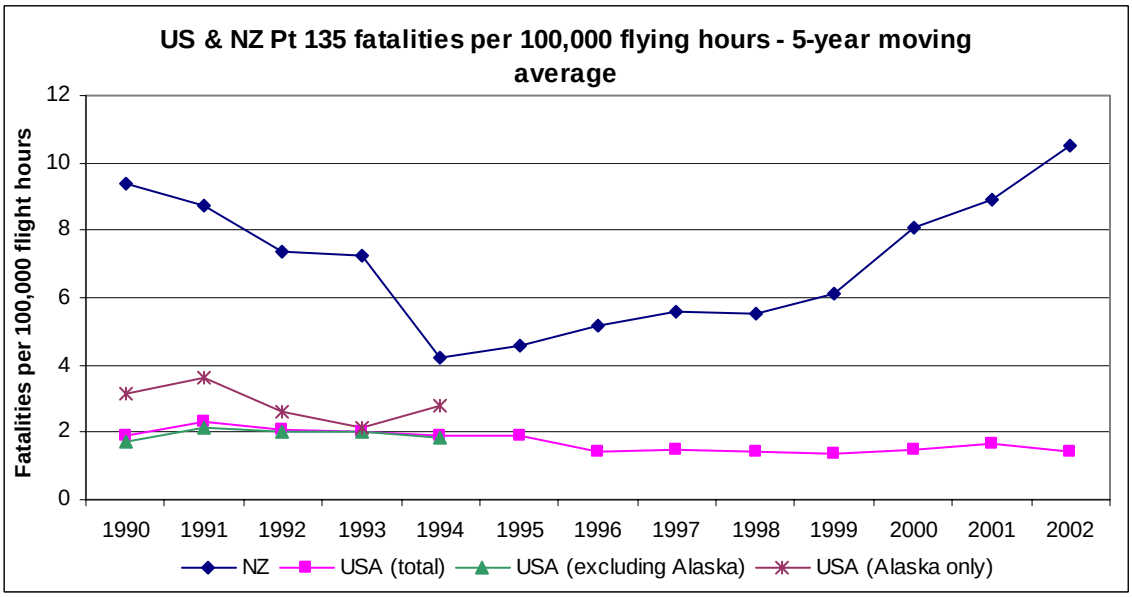
A 5 year average is not a good tool for comparing fatality rates for large aircraft accidents, as there are few such accidents in NZ, and hence considerable amounts of time between them.

It is used for commonality with the preceding accident and fatal accident rate comparisons, and because the UK data spans only 10 years and would be only a single point if a 10 year average were used.

USA

NZ has generally had a lower fatality rate for large aircraft (Part 121) than the USA until 2001 (excluding the casualties of Sept 11), but a much higher rate for smaller aircraft (Part 135).





Traffic volume and Mt Erebus

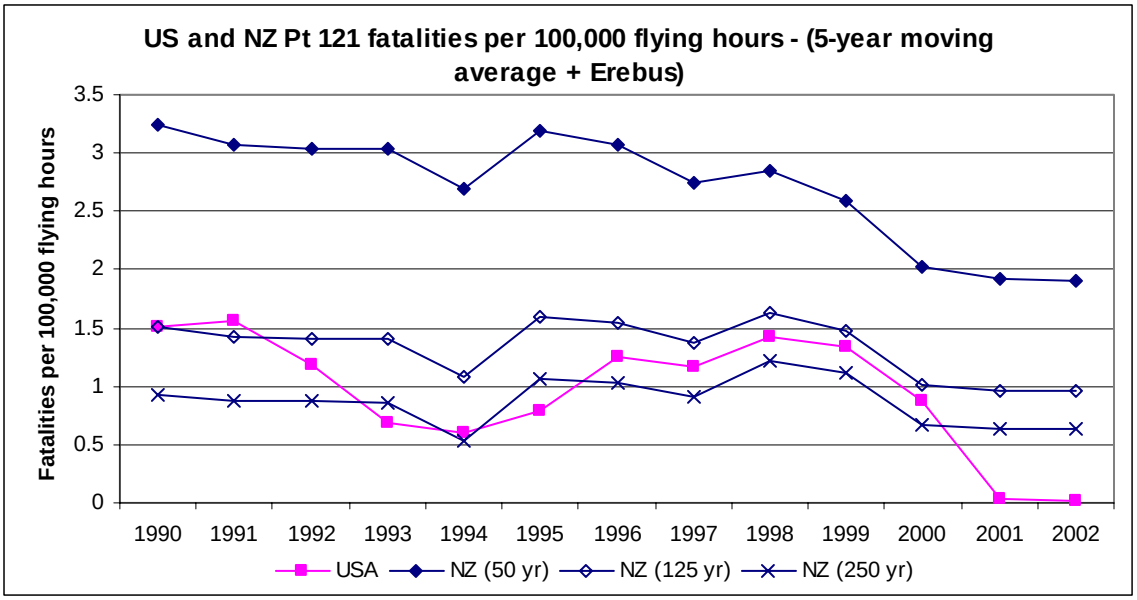
The volume of Part 121 air traffic in the USA is generally 50-60 times that in New Zealand. The USA therefore has catastrophic accidents (ie those with large numbers of fatalities such as ValueJet) fairly regularly, and these are reflected in the 5-year moving averages.

NZ has such accidents much less often, Mt Erebus in 1979 being the last, so they are not usually represented in a 5- or even a 10-year moving average, except for the period immediately after the event. Note that the 5-year moving average fatality rate after Erebus would have been approximately 35-40 fatalities per 100,000 hours until 1984.

Measuring the impact of Mt Erebus can be achieved by averaging the 257 fatalities over a longer period, and then adding them to the current moving average. This has been done below, with the fatalities averaged over 50, 125 and 250 years (ie 5, 2 or 1 fatality per year), and added to the existing moving average.

The result is that the NZ fatality rate becomes very similar to or higher than the USA rate.

The Mt Erebus crash has not been added to the accident rates as it is only a single occurrence, so the effect on those rates is not so great as the effect of 257 fatalities on the fatality rate.



UK

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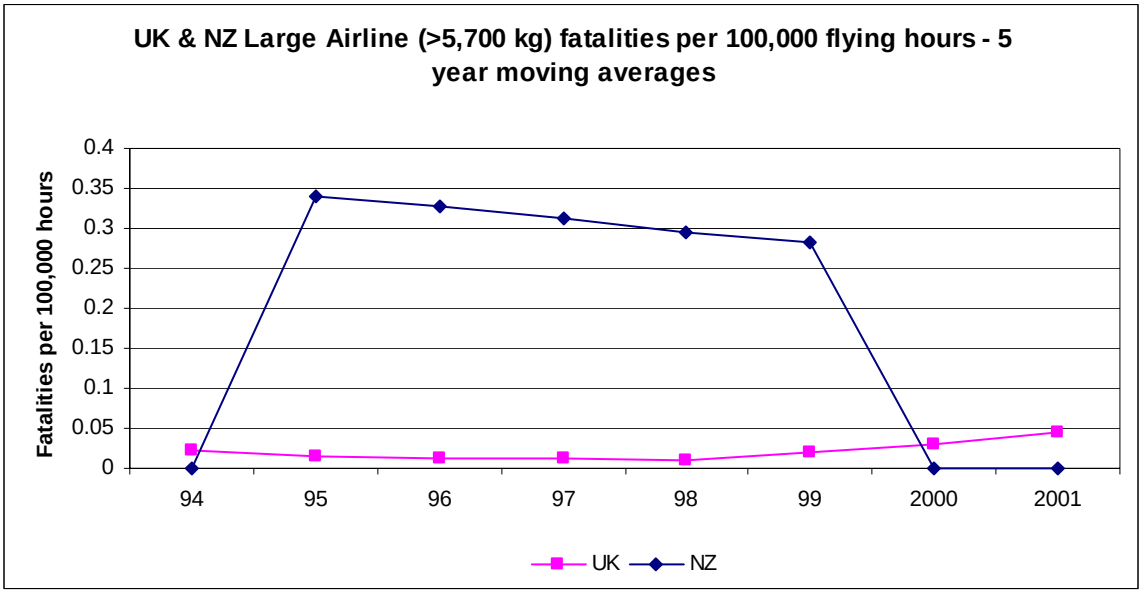

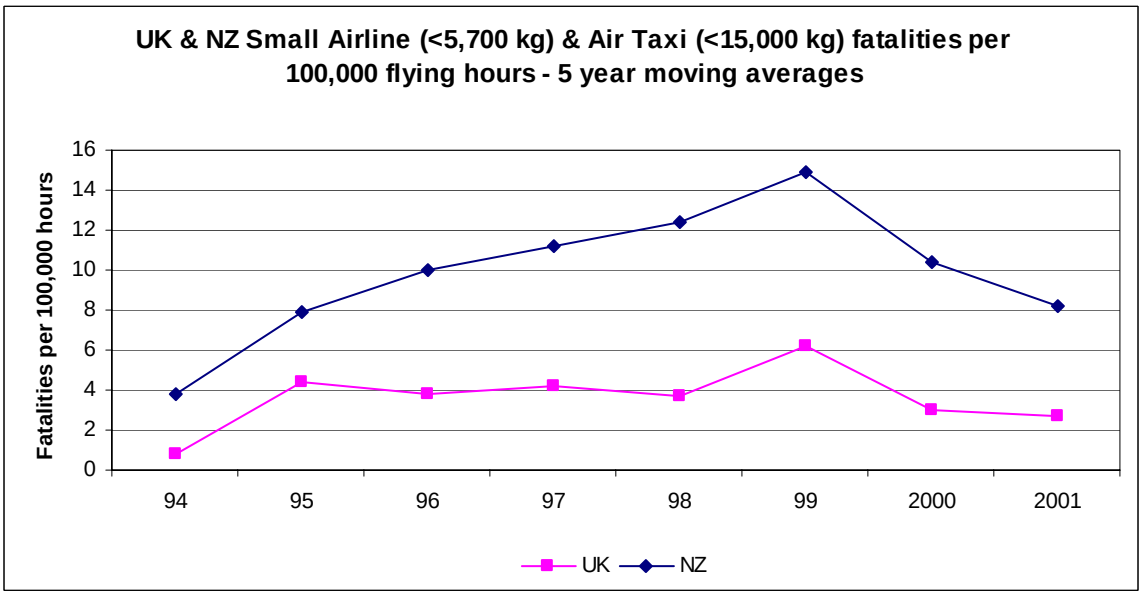

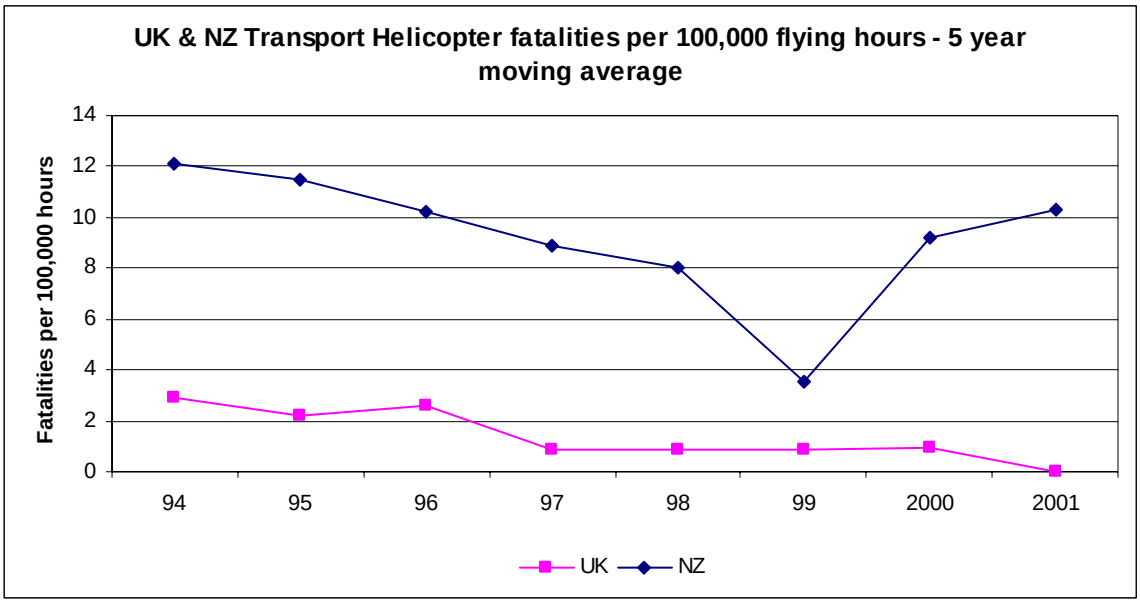
UK & NZ Transport Helicopter fatalities per 100,000 flying hours - 5 year moving average
Fatalities per 100,000 hours
14
12
10
8
6
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2
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2000
2001
UK
NZ

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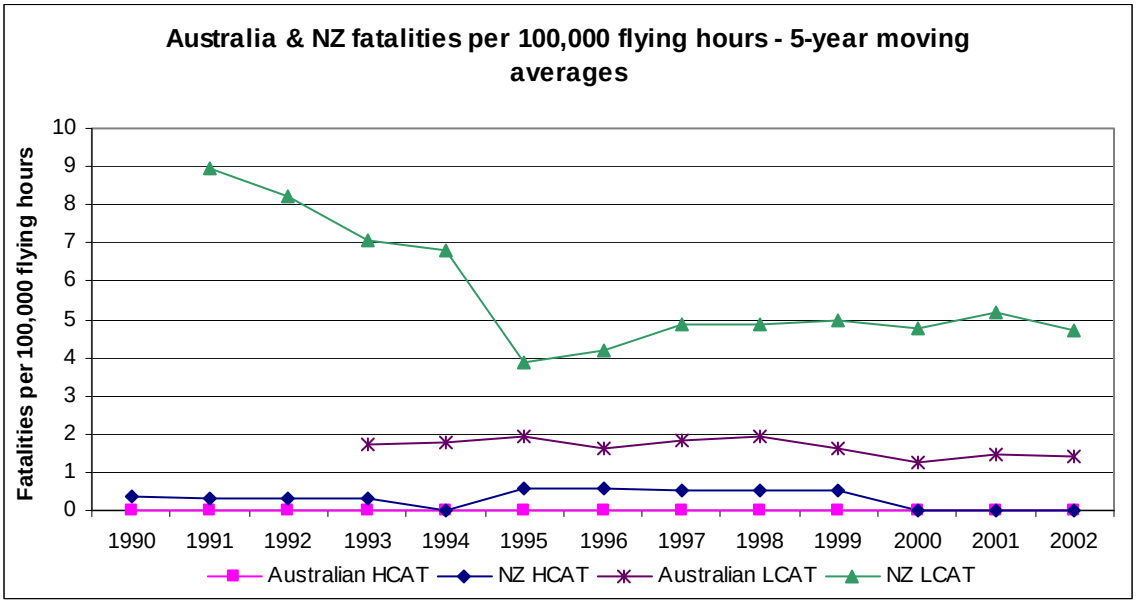

Appendix: Data sources

The comparisons with each set of foreign data was made with NZ data obtained from the CAA database using the criteria specified for the foreign data in each case.

USA

United States data was obtained from the NTSB web site:
http://www.ntsb.gov/aviation/Stats.htm tables 2, 5, 8 and 9.

The change to US Part 121 classification on 20 March 1997 was approximated by calculating the 1997 statistics for NZ operations including aircraft of 10-30 seats in the small aircraft category (Part 135) for the 1st quarter, and in the large aircraft category (Part 121) for the 2nd to 4th quarters.

The New Zealand and NTSB accident definitions were compared and found to be similar. Accident descriptions on the NTSB web site were checked, and slight differences in the definition were considered to have only minor effects if any.

UK

UK data is taken from the Aviation Safety Review 1992-2001, CAP735, published in 2002. This is also available in read-only format on-line at:
http://www.caa.co.uk/docs/33/CAP735.pdf

It covers the period until the end of 2001, and is the latest available at this time.

Previous editions of the Safety Review are available at:

http://www.caa.co.uk/docs/33/CAP701.pdf

http://www.caa.co.uk/docs/33/CAP673.pdf

Australia

Australian data was obtained from various documents available from the ATSB http://www.atsb.gov.au/aviation/stats/index.cfm, the Bureau of Transport and Regional Economics (BTRE) Avstats web page http://www.btre.gov.au/avstats/deppage.htm, and the now defunct BASI web site http://www.basi.gov.au/stats/stats1.htm.

Australian LCAT and Charter statistics were combined and approximated by totalling all NZ hours for revenue passenger and freight operations not included in the HCAT category.