

The Characteristics of Fatal Crashes During the Christmas/New Year Holiday Period



The ATSB is an operationally independent body within the Federal Department of Transport and Regional Services and is Australia's prime agency for transport safety investigations.

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EXECUTIVE SUMMARY

The Christmas/ New Year holiday period has traditionally been associated with a public perception of increased danger on Australian roads. Police enforcement and road safety education are heightened and fatal road crashes are traditionally given increased media attention. This report presents an analysis of the state/territory data relating to fatal crashes occurring during the 2002/03 Christmas/New Year holiday period and compares this with the remainder of the year, to identify both differences and similarities in the two data sets.

The data suggest that there is no significant difference in the daily fatality rate between the 2002/03 Christmas/New Year holiday period (4.5) and the remainder of the year (4.8). The number of fatalities during this holiday period has followed a similar trend to that of the remainder of the year. However, what cannot be known is the 'counterfactual' of how much worse the holiday fatality rate would have been if additional enforcement and fatigue reduction measures had not been in place. The data provide some support for similar road safety measures being effective during both periods.

The data also indicate some differences between the characteristics of crashes occurring during the holiday period and the remainder of the year. There was:

- an increase in the number of fatigue related crashes, single vehicle crashes and crashes occurring on roads with speed limits of 100 km/h and above;
- a lower number of heavy trucks involved in fatal crashes; and
- a significant increase in the number of metropolitan drivers involved in fatal crashes in rural areas (although the majority of drivers were still from rural areas).

The fact that despite these differences there is no significant divergence in the daily average fatality rates suggests there is likely to be a re-balancing of exposure and different risk factors during the Christmas/New Year holiday period. For example, while there are increases in private travel and travel in unfamiliar surrounds during the holiday period, there is a decrease in commuter travel and heavy vehicle travel as well as a greater public awareness of enforcement.

However, too much should not be made of these different characteristics. The analysis shows that the real problem areas for road safety are essentially the same during both periods. The major causal factors of fatal crashes during both the holiday period and the remainder of the year are:

- excessive speed;
- driver and rider alcohol intoxication; and
- fatigue.

This analysis is unable to assess the importance of other factors such as road quality and occupant protection, although other evidence underlines the importance of these. The effects of speeding on crash severity, low level speeding and fatigue are likely to be underestimated due to the difficulty in collecting evidence relating to these factors.

INTRODUCTION

The Christmas/New Year holiday period has traditionally been associated with a public perception of increased danger on Australian roads. Police enforcement and road safety education are heightened and fatal road crashes are given increased media attention. This report presents an analysis of the available data relating to fatal crashes occurring during the 2002/03 Christmas/New Year holiday period and compares this with

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the remainder of the year, to identify both differences and similarities in the two data sets.

Background to the study

The Federal Minister for Transport and Regional Services, the Hon John Anderson, announced on 6 January 2003 an Australian Transport Safety Bureau (ATSB) study into the characteristics of fatal road crashes occurring during the Christmas/New Year holiday period. Mr Anderson announced on 13 January 2003 that the study would take place in cooperation with states and territories.

Definition

The official Christmas/New Year holiday road crash reporting period lasts for 15 days. It extends from 00:01 am on the Friday before 25 December to 11:59 pm on the Friday after (or on) 1 January. This period is referred to as the holiday period. This reporting period has been agreed across all policing jurisdictions.

The non-holiday period referred to in the report is defined as any part of the calendar year falling outside these dates.

It is noted that road safety enforcement and education campaigns in many jurisdictions extend beyond this official reporting period into late January.

It is also noted there are other significant holiday periods throughout the year; however, with the exception of Easter, these holiday periods were considered to be outside the scope of this study.

DATA

Data sources

The report is based on the following data sources:

ATSB Monthly Crash Database

Summary crash data for the combined 2000/01, 2001/02 and 2002/03 holiday periods and remainder of 2000, 2001 and 2002 calendar years compiled by the ATSB based on state/territory data.

ATSB Fatal Crash Database

A detailed road crash data set coded by the ATSB using coronial documents for the years 1997 to 1999. Comprehensive coronial documents are only available up to 1999.

State/territory fatal crash data tables

Fatal crash data for the 2000/01, 2001/02 and 2002/03 Christmas/New Year holiday periods and the latest twelve-month period available were provided to the ATSB by the state/territory road authorities in each jurisdiction. The ATSB gratefully acknowledges the provision of these data by the New South Wales Roads and Traffic Authority; Vicroads; Queensland Transport; TransportSA; Western Australian Police Service; Western Australian Office of Road Safety; Tasmanian Department of Infrastructure, Energy and Resources; Northern Territory Police; Northern Territory Department of Infrastructure, Planning and Environment; and the Australian Capital Territory Department of Urban Services.

Data issues

The data available from routine crash statistics do not provide a comprehensive guide to potential countermeasures. For example:

- standard crash reports seldom identify road factors as a significant issue. This contrasts with extensive evidence about the substantial reductions in casualties that can be achieved from road improvements, including black spot treatments;
- the data tend not to point to the potential value of vehicle occupant protection measures (other than seatbelts), because the focus is on crash causation, rather than harm reduction.

The ATSB also notes that there are some differences in data definitions used by various jurisdictions (eg. rural/ metropolitan distinctions). Where possible, this limitation has been addressed by including data from the ATSB Fatality File, which is coded to a common national standard.

While it is important to bear these limitations in mind, they do not prevent a useful comparative analysis of the holiday period relative to the remaining year data.

Generally speaking, the number of holiday period crashes is too small for statistically meaningful comparisons between jurisdictions, even when data are aggregated over several years. This report concentrates on trends at a national level rather than within individual jurisdictions.

Issues relating to specific data items are discussed throughout the report.

Exposure data

In order to comment on the relative safety of the holiday period, some measure of activity on the road network, for example vehicle-kilometres travelled, is required. This is particularly relevant to the Christmas/New Year holiday period when it would be expected that patterns of travel might differ from the remainder of the year. Unfortunately, due to the difficulty in collecting these data, they are only available on an annual basis from the Australian Bureau of Statistics. For this reason, this study is unable to conclusively establish the relative safety of each period.

CONSULTATION

In the process of drafting the report, the ATSB consulted with state/territory road authorities and incorporated all significant comments from these agencies into the report.

TRENDS IN CHRISTMAS/NEW YEAR ROAD FATALITIES

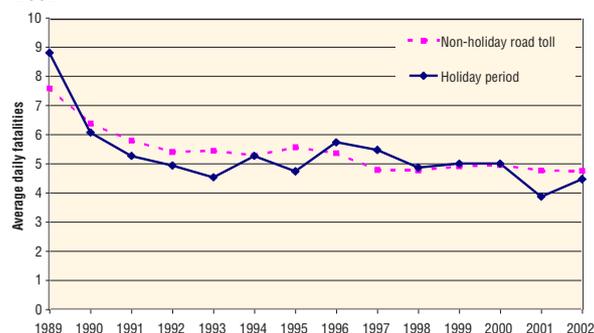
There were 67 road fatalities during the 2002/03 holiday period in Australia. This is the second lowest figure on record (the lowest was 58 in 2001/02). The number of road fatalities during the Christmas/New Year holiday period is around 4 per cent of total annual fatalities.

Figure 1 shows that the pattern of change in the daily average number of fatalities has been more-or-less parallel between the holiday period and the rest of the year. This

could suggest that similar factors may have influenced the number of fatalities during both periods.

The average number of fatalities per day in the holiday period is similar to that of the remainder of the year. There was an average of 4.5 deaths per day over the 2002/03 holiday period, compared with 4.8 for the rest of 2002.

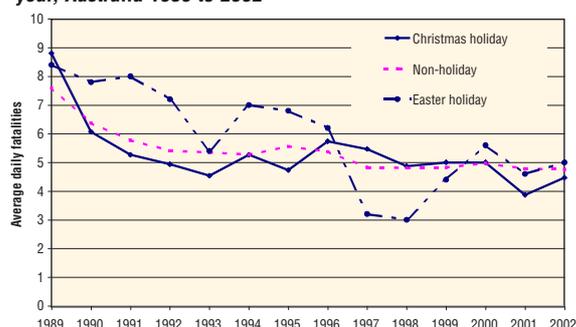
Figure 1: Average daily road fatalities during the Christmas/New Year holiday period and the remainder of the year, Australia 1989 to 2002¹



EASTER HOLIDAY PERIOD

Figure 2 shows the average daily number of fatalities during the Easter holiday period (5 days), the Christmas holiday period and the remainder of the year. Although there is greater chance fluctuation in the Easter period, due to the relatively low number of crashes, it follows a similar trend to the Christmas holiday period and the remainder of the year. These data provide further evidence that similar factors may have influenced the number of fatalities throughout all periods of the year.

Figure 2: Average daily road fatalities during the Christmas/New Year holiday period, Easter holiday period and the remainder of the year, Australia 1989 to 2002



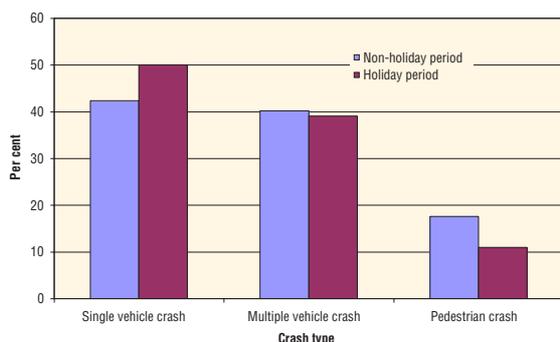
CRASH CHARACTERISTICS

Crash type

Figure 3 shows that during the holiday period compared with the non-holiday period:

- there was a higher proportion of single vehicle crashes (50 per cent compared with 42 per cent);
- there was a similar proportion of multiple vehicle crashes (39 per cent compared with 40 per cent);
- there were fewer pedestrian crashes (11 per cent compared with 18 per cent).

Figure 3:
Percentage of fatal crashes by crash type, Australia, combined 2000/01, 2001/02 and 2002/03 holiday periods and remainder of the 2000, 2001 and 2002 calendar years



Speed limit at crash zone

Figure 4 shows that during the holiday period compared with the non-holiday period:

- a higher proportion of crashes occurred on roads with speed limits of 100 km/h and above (59 per cent compared with 45 per cent);
- fewer crashes occurred in speed zones up to 60 km/h (25 per cent compared with 32 per cent).

The overall proportion of crashes that occur on roads with speed limits of 100 km/h and above has remained close to 45 per cent since 1989. The proportion on roads zoned up to 60 km/h has fallen, and the proportion on roads zoned between 65 and 95 km/h has risen

(see figure 5). Over this period, speed limits have been changed on many sections of road. Broadly, many urban arterials have been rezoned to limits of 70 or more (or replaced by higher quality roads with higher limits), and many sections of rural roads have been rezoned to limits below 100 km/h. The sections of rural road that have been zoned below 100 km/h have been those with a relatively high crash risk. There has also been extensive upgrading of 100 km/h and above roads to higher standards. It is therefore surprising that there has been no reduction in the proportion of crashes occurring in 100 km/h and above zones. This may be an indirect indication that other safety programmes, including enforcement measures, are having relatively less impact in rural areas than in urban areas.

Figure 4:
Percentage of fatal crashes by speed limit at crash zone, Australia, combined 2000/01, 2001/02 and 2002/03 holiday periods and remainder of the 2000, 2001 and 2002 calendar years

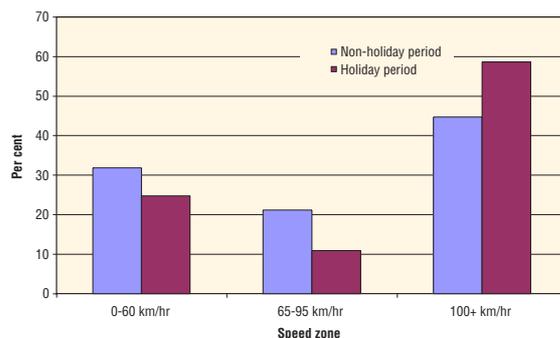
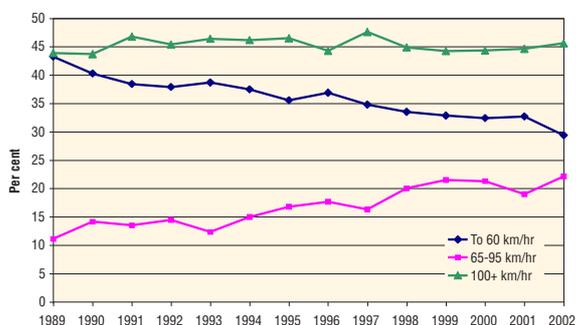


Figure 5:
Percentage of fatal crashes by speed limit at crash location, Australia, 1989 to 2002



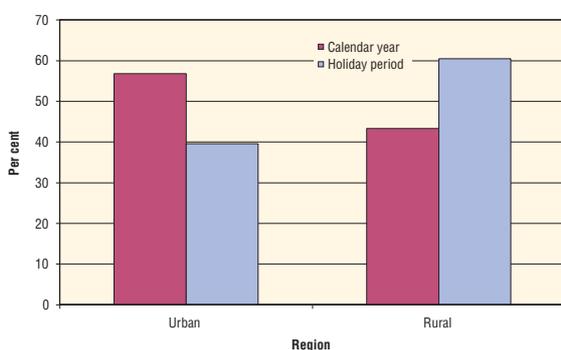
Location of crashes

State/territory data show that significantly more fatal crashes occur outside urban areas during the Christmas/New Year holiday period. Figure 6 shows that 60 per cent of fatal crashes occurring in New South Wales and Queensland during the combined 2000/01, 2001/02 and 2002/03 holiday periods occurred in rural areas, compared with 43 per cent during the 2002 calendar year.

New South Wales and Queensland are used as examples due to their compatible definitions of urban and rural areas². A similar trend is evident in Victoria, where 63 per cent of crashes during the 2000/01, 2001/02 and 2002/03 holiday period occurred outside metropolitan areas, compared with 52 per cent during the 2002 calendar year. However, in Victoria, this difference was not found to be statistically significant.

All remaining state/territories showed similar trends, or no difference between the periods, with the exception of South Australia, where metropolitan crashes actually increased during the holiday period. The relatively low numbers of crashes in these states/territories makes it very difficult to meaningfully analyse the data.

Figure 6:
Fatal crashes by region, New South Wales and Queensland, combined 2000/01, 2001/02 and 2002/03 holiday periods and 2002 calendar year



Heavy truck involvement

ATSB data show that during the 2000/01, 2001/02 and 2002/03 holiday periods compared with the remainder of the 2000, 2001 and 2002 calendar years, fewer crashes involved an articulated truck (4 per cent compared with 11 per cent). State/territory data indicate a similar trend, where fewer crashes involved a heavy truck (8.6 per cent during the 2000/01, 2001/02 and 2002/03 holiday periods compared with 17.4 per cent during the 2002 calendar year). This is likely to reflect the reduction in commercial traffic over this period.

Time of crash

ATSB data indicate that a higher proportion of crashes occurred between noon and 6pm (40 per cent compared with 33 per cent) than in the remainder of the calendar years, although this was not found to be statistically significant.

ROAD USER CHARACTERISTICS

Table 1 illustrates that during the 2000/01, 2001/02 and 2002/03 holiday periods compared with the remainder of 2000, 2001 and 2002 calendar years:

- there were significantly fewer pedestrian deaths (10 per cent compared with 16 per cent);
- the incidence of passenger fatalities was very similar (25 per cent compared with 24 per cent of total fatalities and 34 per cent compared with 35 per cent of vehicle occupant fatalities);
- there were no significant differences in the incidence of motorcycle or bicycle fatalities.

ATSB data also show there were no significant differences in the age and gender of fatally injured road users compared with the non-holiday period, and there was no evidence of different rates of seat belt use among people fatally injured in crashes between each period.

Table 1.

Road fatalities by type of road user, Australia, combined 2000/01, 2001/02 and 2002/03 holiday periods and remainder of the 2000, 2001 and 2002 calendar years

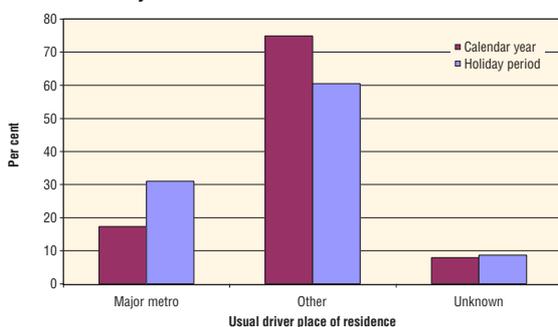
		Driver	Passenger	Pedestrian	Motor cyclist	Bicyclist	Other/unknown	Total
Non-holiday	No.	2316	1232	803	605	105	8	5069
	Per cent	45.7	24.3	15.8	11.9	2.1	0.2	100
Holiday	No.	99	50	19	25	6	1	200
	Per cent	49.5	25.0	9.5	12.5	3.0	0.5	100

Fatal crashes in rural areas

Data obtained from the states/territories indicate that the place of usual residence for the majority of drivers involved in fatal crashes that occurred in rural areas is rural for both periods. For example, figure 7 illustrates that across most states and territories³, the usual place of residence for 60 per cent of drivers involved in fatal rural crashes that occurred within the holiday period was outside metropolitan areas (most of this 'other' category would be rural residents), compared with about 75 per cent during the calendar year.

The data indicate that there are a greater number of metropolitan or urban drivers involved in rural crashes during the holiday period. Figure 7 indicates that 30 per cent of drivers involved in fatal crashes occurring in rural areas during the holiday period were from a metropolitan area, compared with 17 per cent during the non-holiday period.

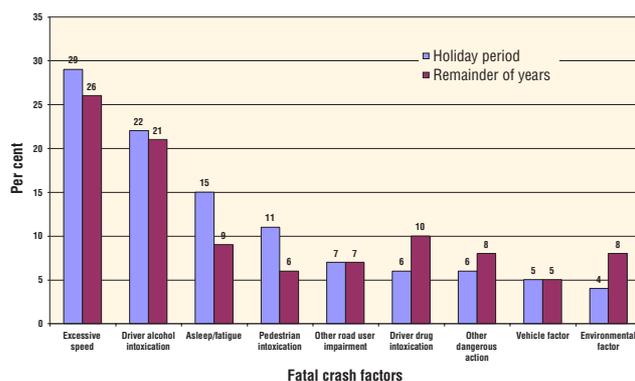
Figure 7: Drivers involved in fatal rural⁴ crashes by usual place of residence, Australian states/territories, excluding Queensland, combined 2000/01, 2001/02 and 2002/03 holiday periods and 2002 calendar year⁵



FACTORS CONTRIBUTING TO CRASHES

Figure 8 shows that the factors involved in fatal crashes during the holiday period are very similar to those during the remainder of the year. The biggest difference is in the greater proportion of fatigue-related crashes during the holiday period.

Figure 8: Percentage of factors involved in fatal crashes, Australia, Christmas/New Year holiday period, compared with remainder of the year, 1997 to 1999⁶



Fatigue

ATSB data indicate there was an increase in crash involvement due to fatigue during the holiday period. Figure 8 shows fatigue was involved in 15 per cent of fatal crashes during the holiday period, compared with 9 per cent during the non-holiday period. This difference was found to be statistically significant.

State/territory data for the 2000 to 2003 period could not be analysed due to different coding practices between the states/territories and the relatively low numbers of crashes when broken down to a state/territory level.

It should be noted that the involvement of fatigue is difficult to identify in fatal crashes. It is widely accepted that, because of lack of direct forensic evidence, crash reports underestimate fatigue as a causal factor. The figures provided should only be used as an indicator of the differences between the two periods rather than an absolute indicator of the number of fatigue crashes. The number of fatigue-related crashes in both periods is likely to be greater than recorded.

Excessive speed

Figure 8 shows that ATSB data indicate excessive speed was a factor in around 29 per cent of fatal crashes occurring during the holiday period. This was higher than the number of speed-related crashes identified in the non-holiday period (26 per cent); however, this was not found to be statistically significant.

There is some variation in the proportion of fatal crashes identified as being speed-related between state/territory data and ATSB data. Most of these differences are artificially introduced due to the different methods used by different bodies to identify speed-related crashes.

It should also be noted that:

- data on excessive speed as a crash cause do not capture the important contribution of speed to crash severity;
- the contribution of low-range speeding is likely to be under-reported (if a crashed vehicle was travelling at 90 km/h in a 60 zone, the evidence at the crash site will usually be unambiguous; if the vehicle was travelling at 65, the evidence that it was over the limit will be less clear, and may be considered relatively unimportant by the investigators);
- data on 'excessive speed' can include speeds 'too fast for conditions', as well as speeds over the limit.

For these reasons, speeding data need to be interpreted carefully and treated as an indicator rather than as quantitatively accurate.

Driver/rider intoxication

Figure 8 shows an increase in the number of crashes involving driver/rider alcohol intoxication during the holiday period, compared with the remainder of the year. Figure 8 also shows driver and rider drug and alcohol intoxication decreased during the holiday period. Neither difference was found to be statistically significant.

Due to the high number of cases in the state/territory data where the involvement of driver/rider intoxication is unknown, particularly in the 2002/03 holiday period and the 2002 calendar year, it is difficult to draw conclusive results from these data. However, they tend to indicate, like the ATSB data, that there is no significant difference in the number of crashes involving driver alcohol intoxication between the two periods.

The fact that there is no significant difference between the two periods is despite the sale of alcohol being high during the holiday period. This provides some indirect evidence of the efficacy of heightened drink driving enforcement measures over the holiday period.

Pedestrian intoxication

ATSB data show crashes involving pedestrian intoxication are higher during the holiday period. Figure 8 shows that 11 per cent of crashes involved pedestrian intoxication during the holiday period, compared with 6 per cent during the non-holiday period. This increase is statistically significant. This may be reflecting the fact that there is increased alcohol use during the period and road safety measures targeting pedestrians are not as heightened as those targeting other road users.

CONCLUSION

Analysis of the available data suggests that there is no significant difference in the daily fatality rate between the holiday period and the non-holiday period. The number of fatalities during the holiday period between 1989 and 2002 has followed a similar trend to that of the number of fatalities in the

remainder of the year. However, what cannot be known is the 'counterfactual' of how much worse the holiday fatality rate would have been if additional enforcement and fatigue reduction measures had not been in place. Nevertheless, the data provide some support for similar road safety measures being effective during both periods.

The data also indicate there are some differences between the characteristics of crashes occurring during the holiday period and the remainder of the year. There was:

- an increase in the number of fatigue related crashes, single vehicle crashes and crashes occurring on roads with speed limits of 100 km/h and above;
- a lower number of heavy trucks involved in fatal crashes; and
- a significant increase in the number of metropolitan drivers involved in fatal crashes in rural areas (although the majority of drivers were still from rural areas).

The fact that despite these differences there is no significant divergence in the daily average fatality rates suggest there is likely to

be a re-balancing of exposure and different risk factors during the Christmas/New Year holiday period. For example, while there are increases in private travel and travel in unfamiliar surrounds during the holiday period, there is a decrease in commuter travel and heavy vehicle travel as well as a greater public awareness of enforcement.

However, too much should not be made of these different characteristics. The analysis shows that the real problem areas for road safety are essentially the same during both periods. The major causal factors of fatal crashes during both the holiday period and the remainder of the year are:

- excessive speed;
- driver and rider alcohol intoxication; and
- fatigue.

This analysis is unable to assess the importance of other factors such as road quality and occupant protection, though other evidence underlines the importance of these. The effects of speeding on crash severity, low level speeding and fatigue are likely to be underestimated due to the difficulty in collecting evidence relating to these factors.

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1. For any year, the holiday period represents the dates in December of that year and the dates in January of the following year, that comprise the defined holiday period. For example, '1989' represents the holiday period commencing on 22 December 1989 and finishing on 5 January 1990. For any year, the non-holiday period represents the period excluding the holiday period dates in January and December of that year.
 2. Urban refers to metropolitan areas or any country area with a speed limit of 80 km/h or less.
 3. Data on driver's usual place of residence was unavailable for Queensland.
 4. The definition of 'rural' may differ between states/territories. For this reason, the data in the graph should be viewed as indicative rather than as definitive.
 5. 'Other' may include some interstate and international drivers.
 6. Crashes are recorded in the ATSB database as having up to three causal factors. Categories are not mutually exclusive and the total of all factors will not equal 100 per cent.