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Variations in road injury crash numbers in South Australia by time of year

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TITLE

Variations in road injury crash numbers in South Australia by time of year

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ABSTRACT

This report examines variations in road injury crash numbers in South Australia by time of year using injury and fatal crash data from 1982-2013. It was found that there was a statistically significant variation in injury crash numbers by month after accounting for different month lengths. January was found to have 11.7% fewer injury crashes per day than an average month and March was found to have 8.6% more. This pattern seems to have been in place over the entire time period examined. The period from 25 December to 5 January and public holidays were found to have very low injury crash rates and there were some indications that school holidays were associated with a lower injury crash rate. Rural areas of South Australia appeared to follow a different pattern with more injury crashes in the warmer months and fewer in the colder months. The limited available exposure measures do suggest that there is less vehicle travel in January consistent with January's low daily injury crash rate. The increasing number of large public events in March in recent years may be having an underlying effect on the number of injury crashes in March. However, there is no consistent observable evidence for this in the crash numbers so the size of any effect is probably not large. The proportional variation in fatal crash numbers from month to month is very large. Even with 32 years of fatal crash data, no statistically significant variation by month was found.

KEYWORDS

Road safety, crash data, crash rates, accident statistics, data analysis, month, public holiday, school holiday

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Summary

This report examines variations in road injury crash numbers in South Australia by time of year using injury and fatal crash data from 1982-2013.

It was found that there was a statistically significant variation in injury crash numbers by month after accounting for different month lengths. January was found to have 11.7% fewer injury crashes per day than an average month and March was found to have 8.6% more. This pattern seems to have been in place over the entire time period examined.

Examining crash rates by crash location indicates that rural injury crashes follow a different pattern with more injury crashes in the warmer months and fewer in the colder months.

An examination of particular types of days and days of the year revealed very low injury crash rates for the period from 25 December to 5 January, on public holidays and on Sundays. To a lesser extent there were also some indications of lower rates during school holidays. These can all be associated with less travel for work and school and presumably less travel overall leading to less exposure and less injury crashes as a result.

This fits with January being the lowest injury crash rate month (with many people on holidays) and March being the highest (very few public holidays and no school holidays) followed by November, May and February (all with minimal school holidays).

The limited available exposure measures do suggest that there is less vehicle travel in January consistent with January's low daily injury crash rate. While there are some indications that March may have a higher exposure, the evidence is not definitive.

The increasing number of large public events in March in recent years may be having an underlying effect on the number of injury crashes in March. However, there is no consistent observable evidence for this in the crash numbers so the size of any effect is probably not large.

The proportional variation in fatal crash numbers from month to month is very large. Even with 32 years of fatal crash data, no statistically significant variation by month was found.

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1 Introduction

Monthly counts of road injury crashes are a familiar measure of road safety and are often included in routinely published yearbooks of road accident data. It is natural to ask whether the month-to-month variation is similar every year (and, if so, what are the likely causes) or if the variation is largely random. It is very likely that the answer will depend on the geographical area being considered --- patterns of road traffic and social habits will vary from place to place, and the amount of traffic, the speed of vehicles, and alcohol consumption by road users will (along with others) be important factors affecting the numbers and severities of crashes.

This report examines month-to-month variation in injury and fatal crash numbers in South Australia. South Australia is approximately 1100 km west to east and 900 km north to south. Lack of rain means the population density is very low. The total population is currently about 1.7 million, of whom approximately 1.3 million live in the Adelaide metropolitan area. Road accidents are numerically dominated by those occurring in Adelaide, but (in the period covered by this report) 55% of fatal crashes occurred outside Adelaide. Far from Adelaide, the low population means that road crashes are few in number and month-to-month variations are difficult to discern; crashes are, however, very serious relatively often.

An important source of the variation in month-to-month road traffic is the summer holiday period, roughly from Christmas (25 Dec) to Australia Day (26 Jan). In addition to the summer holiday, there are variations associated with the seasons, school holidays, public holidays, and various other factors. It is thought the chief geographical contrast in within-year variation is captured by the metro Adelaide versus rural distinction, with the dip in road crashes in January being a metro phenomenon. The present report does not attempt a full examination of the contributions of the several causes of within-year variation in crash numbers, but concentrates on the main features only.

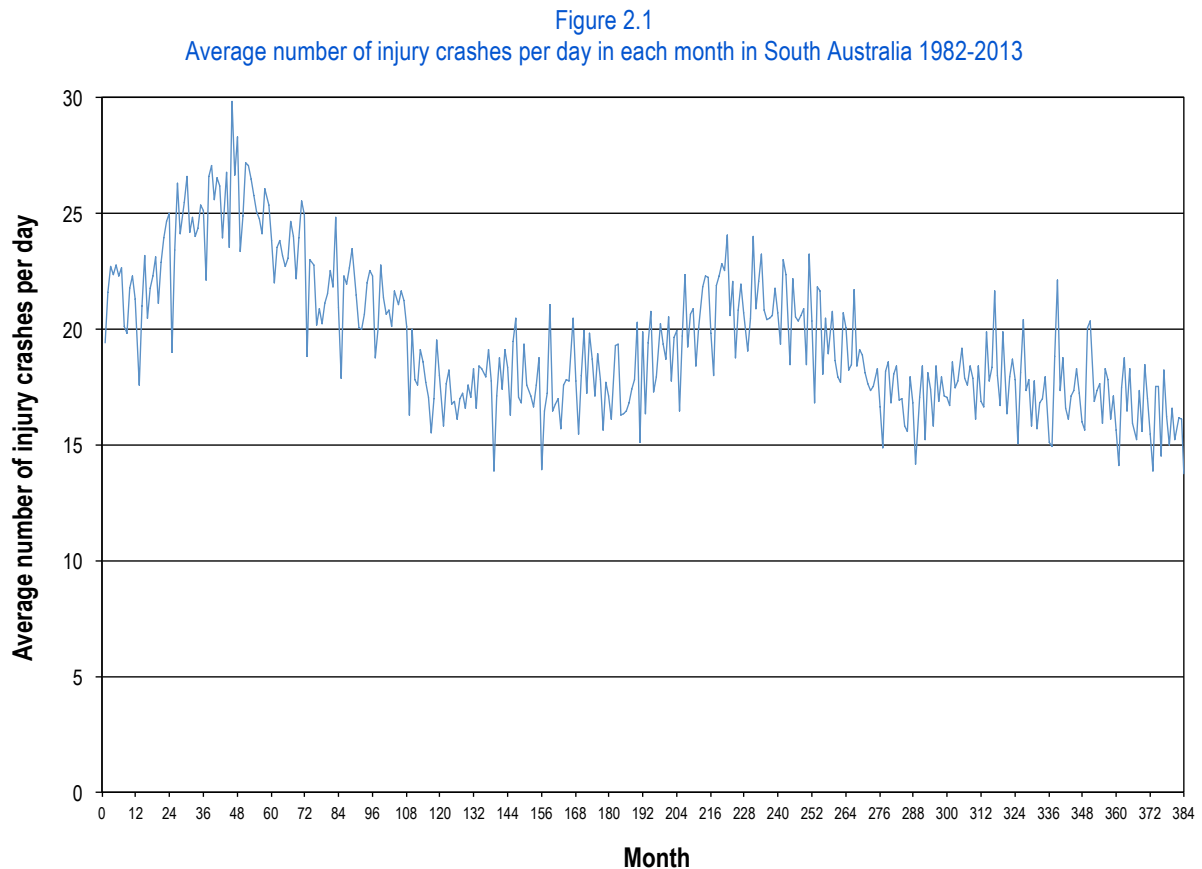
Of particular interest (because of past media reports) is the increasing prevalence of large public events occurring in South Australia in March and whether these events are having an effect on crashes in March. This is explored directly.

2 Injury crashes in South Australia

Crash numbers are highly variable so a large number of crashes are needed to detect small effects. The 32 years of South Australian injury crash data from 1982-2013 was chosen as the base data set for analysis. An injury crash here is a crash that has been reported to the police and in which at least one person in the crash is reported to have been injured at a level requiring at least some treatment by a doctor.

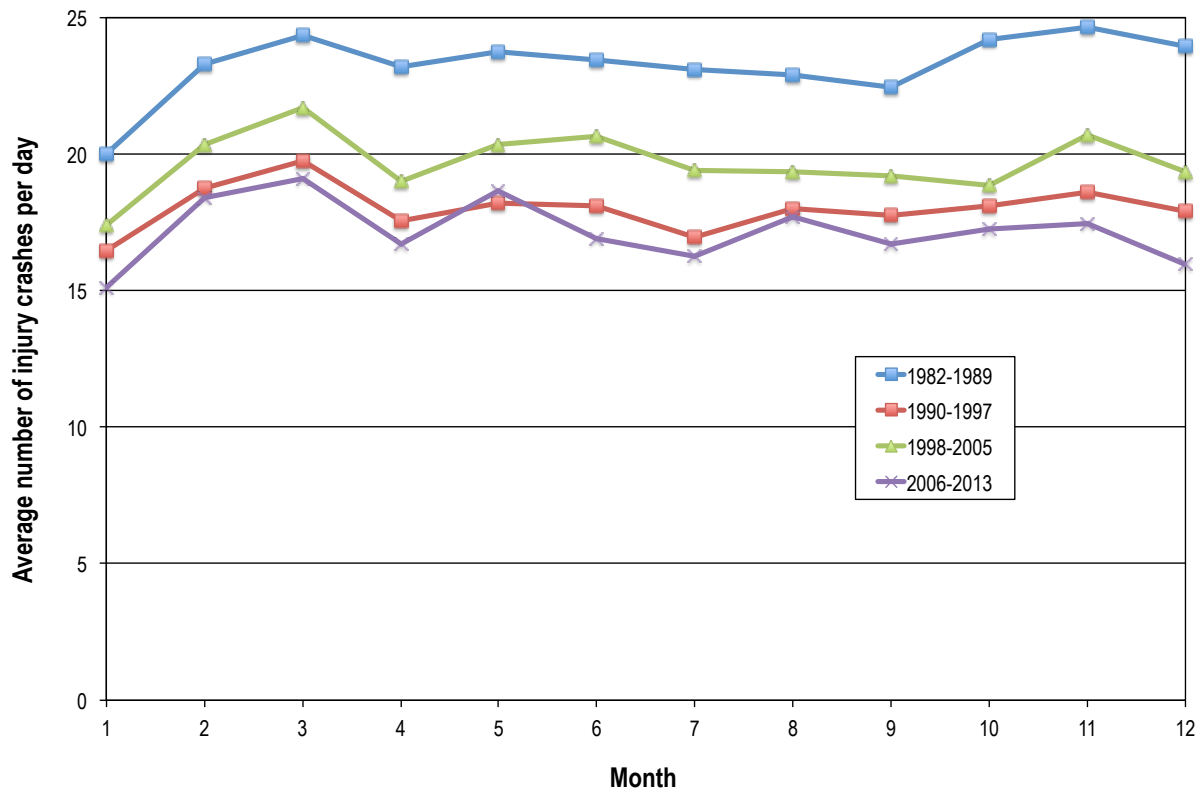
Table A.1 in Appendix A gives the raw numbers of injury crashes in each month of each year of the data. However, months can be different lengths (and not always the same in different years for February) meaning that raw injury crash counts are not directly comparable. In order to make the months comparable, the average number of injury crashes per day was calculated for each month in each year by dividing the corresponding number of injury crashes in a given month by the number of days in that month in the particular year (Table A.2 in Appendix A).

The resulting average number of injury crashes per day for each month from January 1982 (month 1) to December 2013 (month 384) are plotted in Figure 2.1.



In order to ascertain if there is a consistent monthly effect on injury crash numbers, the month results for groups of 8 years were averaged together and are shown in Figure 2.2. The general pattern of daily injury crash rate by month appears to have remained relatively stable over the 1982-2013 period. January has consistently been the lowest daily injury crash rate month and March has consistently been among the highest.

Figure 2.2
Average number of injury crashes per day by month in South Australia 1982-2013
for the given 8 year intervals

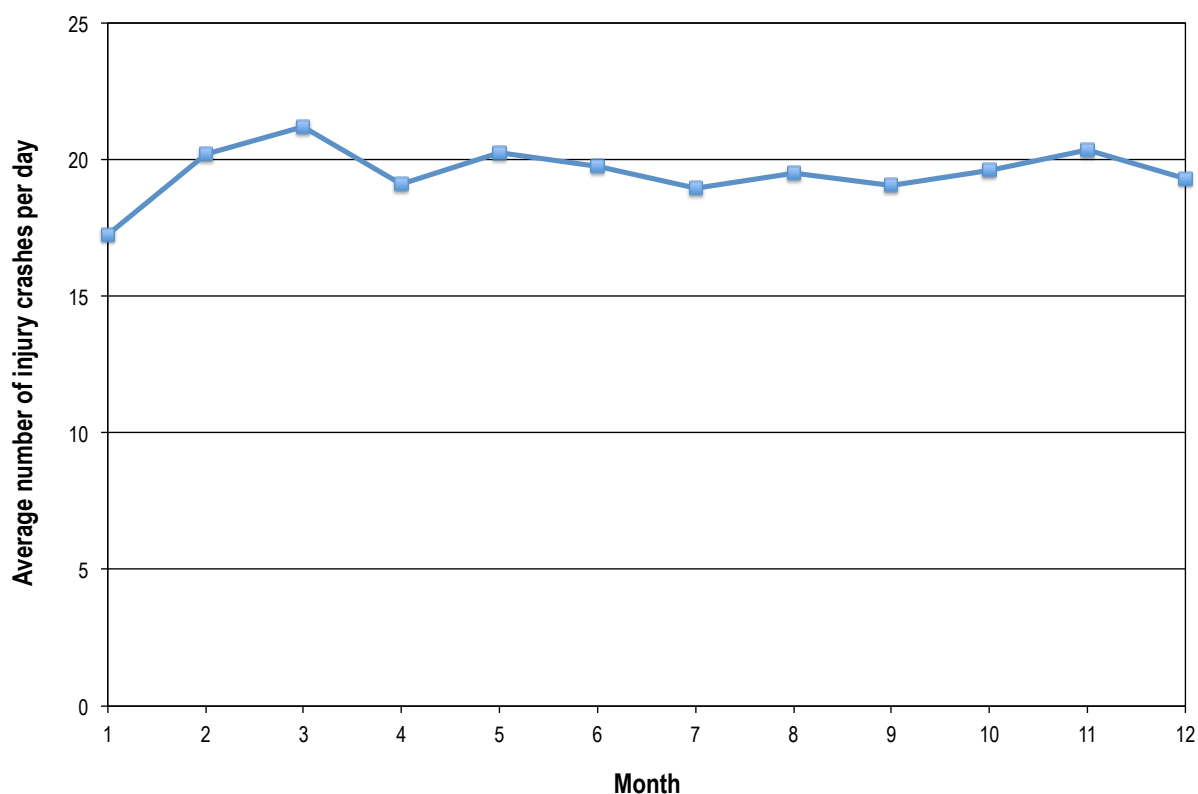


This general consistency over time means that it is reasonable to examine all 32 years of injury crash data as a single group to check for monthly effects. The average number of injury crashes per day for each month was calculated over the 32 years of data and is presented in Table 2.1 and plotted in Figure 2.3. The percentage difference for each month from the overall average was also calculated and is shown in Table 2.1. The two most extreme months are January with 11.73% fewer crashes per day than an average month and March with 8.60% more.

Table 2.1
Average number of injury crashes per day by month averaged over 1982-2013

Month	Average injury crashes per day	% difference from overall average
January	17.249	-11.73
February	20.198	3.36
March	21.222	8.60
April	19.120	-2.16
May	20.238	3.56
June	19.777	1.21
July	18.931	-3.12
August	19.491	-0.26
September	19.030	-2.62
October	19.593	0.26
November	20.345	4.11
December	19.305	-1.21
Overall average	19.542	

Figure 2.3
Average number of injury crashes per day by month averaged over 1982-2013



An analysis of variance was carried out on the average number of injury crashes per day for each month and year from 1982-2013 (actually the logarithm of the average number of injury crashes was used because proportional differences were considered more natural than absolute ones). Both month and year were put in as factors and both were highly statistically significant (both $p < 0.001$). Thus the month-to-month variation, though only a few percentage points, is sufficiently similar over the 32 years that we can conclude it is not entirely random and that the differences seen in Table 2.1 and Figure 2.3 are to some extent real ones.

As to individual months, January was the lowest in all four of the 8 year periods shown in Figure 2.2, and March was the highest in three. It can be seen in Appendix A that there is some degree of consistency even at the level of single years.

2.1 Location of crash

In order to explore the apparent differences in monthly injury crash rates, the crash data was disaggregated by location of the crash (inside and outside of Adelaide). The raw injury crash numbers are given in Tables A.4 and A.5 in Appendix A. The average number of injury crashes per day by month and location are shown in Table 2.2 along with the percentage differences from the overall averages.

Table 2.2
Average number of injury crashes per day by month averaged over 1982-2013
by crash location

Month	Average injury crashes per day		% difference from overall average	
	Adelaide	Rural	Adelaide	Rural
January	12.505	4.744	-16.36	3.33
February	15.693	4.505	4.97	-1.88
March	16.462	4.760	10.11	3.69
April	14.453	4.667	-3.33	1.65
May	15.737	4.501	5.26	-1.96
June	15.448	4.329	3.33	-5.70
July	14.663	4.268	-1.92	-7.03
August	15.207	4.284	1.71	-6.68
September	14.479	4.551	-3.15	-0.87
October	14.782	4.810	-1.13	4.78
November	15.662	4.682	4.76	1.99
December	14.317	4.989	-4.24	8.67
Overall average	14.951	4.591		

Over the time period examined 76% of injury crashes in South Australia occurred in Adelaide. Figure 2.4 shows the average number of injury crashes per day by month and crash location. Clearly the crashes in Adelaide are driving the observed South Australian monthly differences much more than the crashes outside this area.

Figure 2.5 compares the per cent difference in injury crashes per day in each month from an average month by crash location so that the monthly changes in the two areas can be directly compared. The low number of injury crashes in January and the apparent peak in March are a feature of the Adelaide crash data and are not present in the rural data.

An analysis of variance was carried out on the average number of injury crashes per day for each month and year from 1982-2013 (actually the logarithm of the average number of injury crashes per day was used) for both Adelaide and rural areas separately.

For crashes in Adelaide, both month and year were put in as factors and both were highly statistically significant ($p < 0.001$) indicating that the daily injury crash rate does vary by month and year. Results were similar to those for the whole of South Australia but with even more extreme differences for January and March.

For crashes in rural areas, both month and year were highly statistically significant ($p < 0.001$). However, the pattern for months was different from Adelaide: the warmer months generally had a higher injury crash rate than the colder months.

Figure 2.4
Average number of injury crashes per day by month and crash location
South Australia 1982-2013

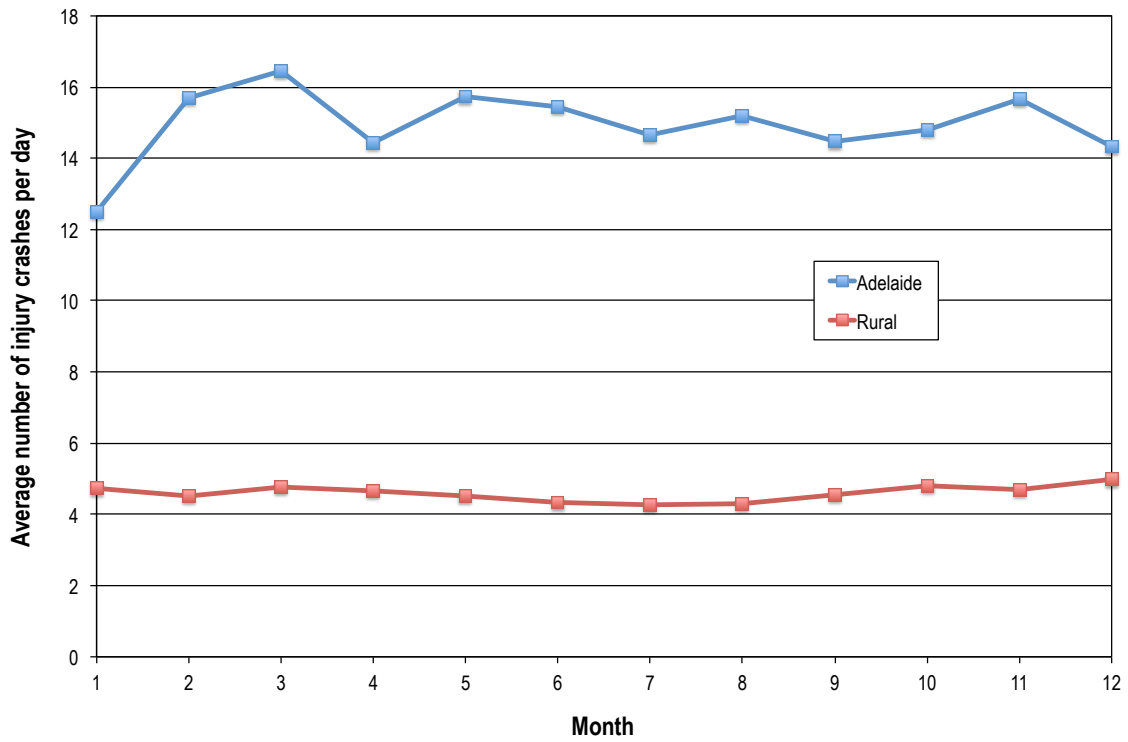
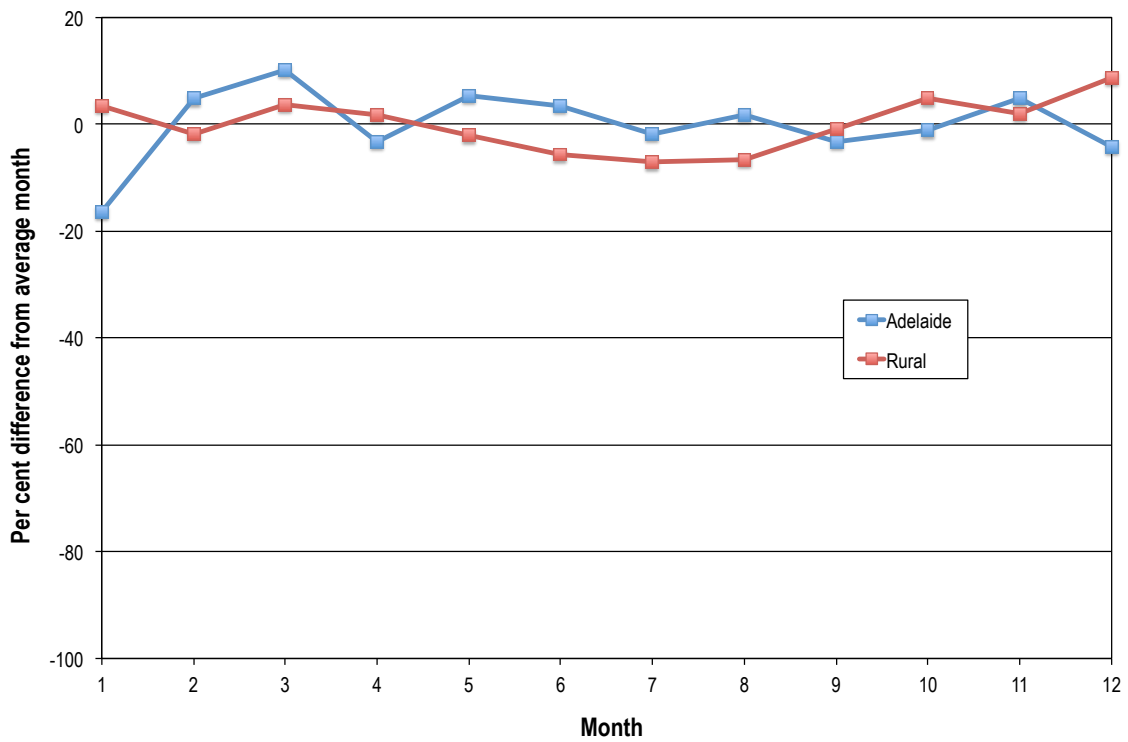


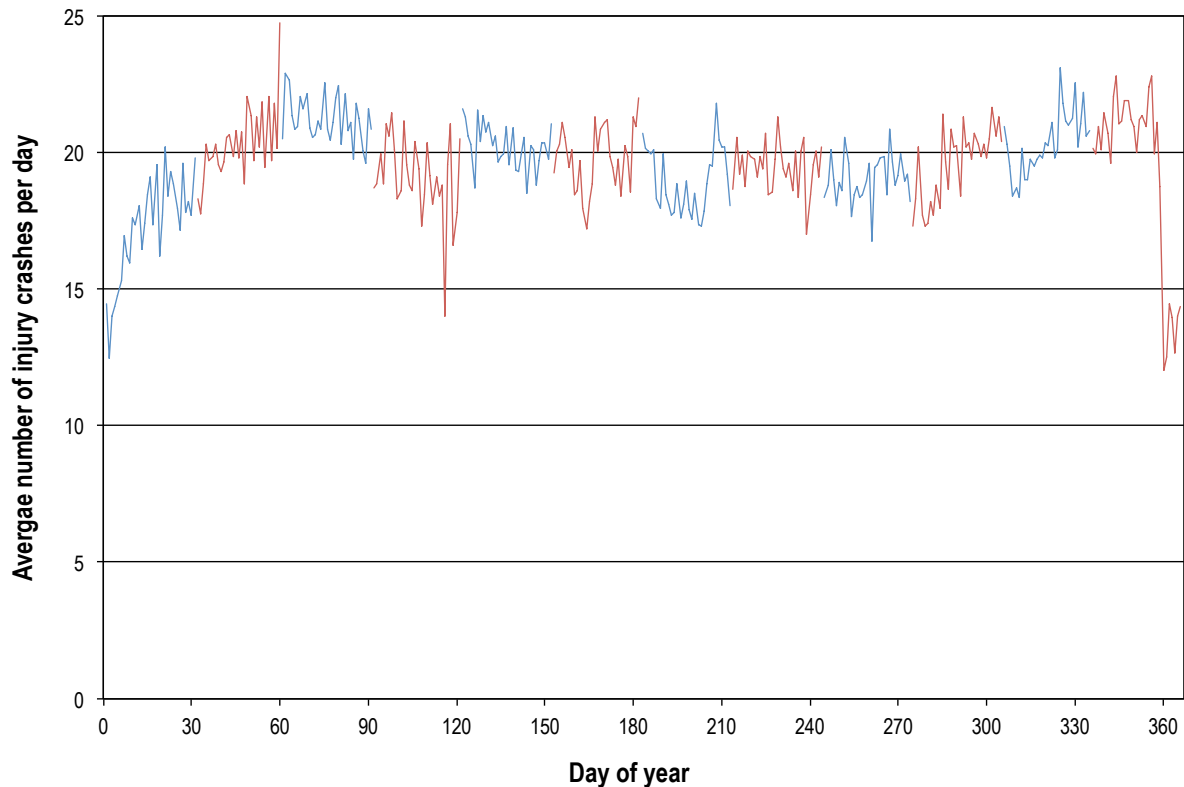
Figure 2.5
Per cent difference in injury crashes per day in each month from an average month by crash location
South Australia 1982-2013



2.2 Day of year

Up until this point, only calendar months have been considered as they are easily understood and provide large groupings for the relatively small number of injury crashes. However, it is instructive (if not statistically robust) to examine injury crash numbers at a finer scale. Figure 2.6 shows the average number of injury crashes per day over the 1982-2013 period for each day of the year (where day 1 is 1 Jan and day 366 is 31 Dec and the month line colours are alternated between blue and red).

Figure 2.6
Average number of injury crashes per day by day of year South Australia 1982-2013



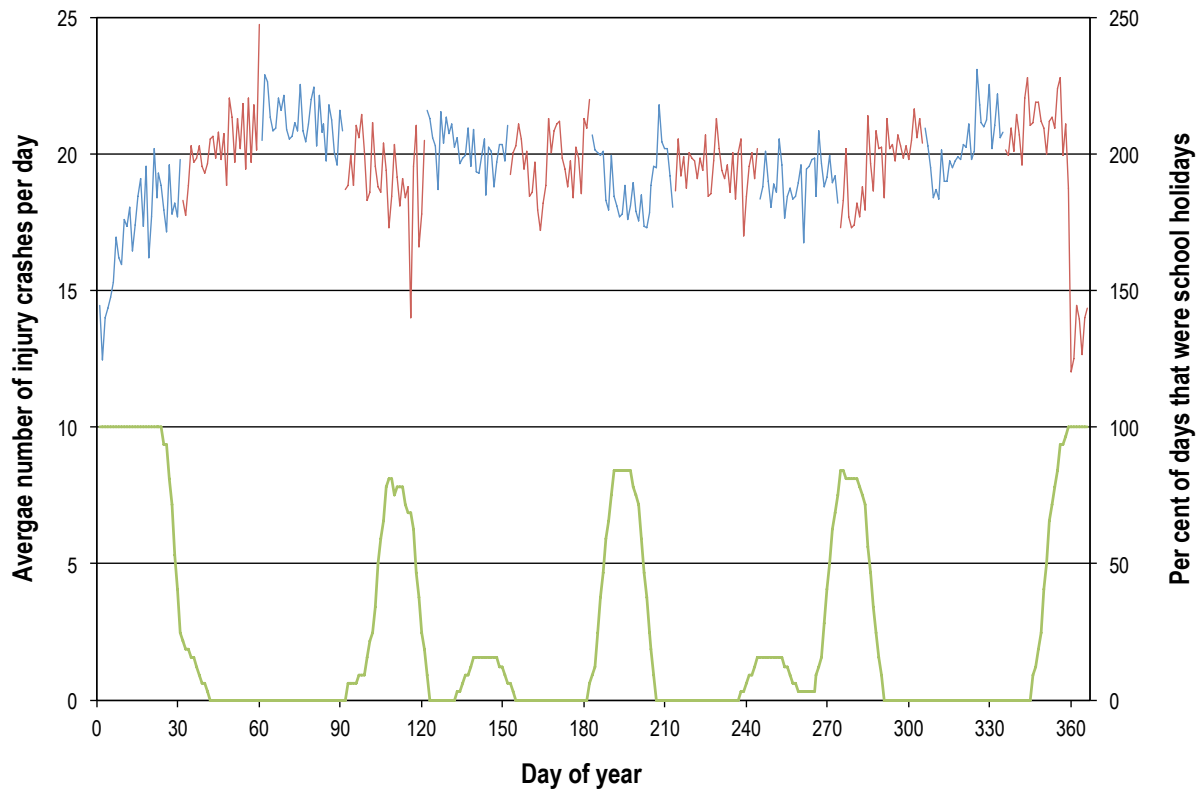
The period from 25 December through to 5 January had an average injury crash rate consistently below 15 crashes per day. The only other day below 15 was 25 April (ANZAC day public holiday in South Australia).

On the high end, 3 days in late February, 8 days in March, 1 day in June, 3 days in late November and 4 days in December had an average injury crash rate above 22 crashes per day. However, there was no clear distinction between these days and the rest of the year as there was for the low crash rate days. The one exception is 29 February which has a particularly high peak. However, this appears to be due to one particularly high day in 1992 and the fact that there were only eight 29 Februarys in the series.

2.3 School holidays

Figure 2.7 shows the average number of injury crashes per day over the 1982-2013 period for each day of the year and the percentage of each day of the year that was a school holiday (calculated by dividing the number of those days that were in a school holiday period by the number of those days in the 32 year period and multiplying by 100). It does appear that school holiday periods tend to be associated with a lower number of injury crashes even outside the Christmas and January periods.

Figure 2.7
Average number of injury crashes per day by day of year South Australia 1982-2013
and the per cent of those days that were school holidays



2.4 Day of week

For reference below, the average number of injury crashes by day of week are shown in Table 2.3. There is an increasing rate from Monday to Friday and relatively low rates on the weekend and especially on Sunday.

Table 2.3
Number of injury crashes in South Australia 1982-2013 by day of week

Day of week	Number of days	Average injury crashes per day
Monday	1670	18.01
Tuesday	1670	19.28
Wednesday	1669	20.05
Thursday	1669	21.64
Friday	1670	23.09
Saturday	1670	18.94
Sunday	1670	15.74
Total	11688	19.54

2.5 Public holidays

The dates of the weekday holidays associated with public holidays in South Australia between 1982 and 2013 were identified and the average number of injury crashes per day for each of them was calculated and is shown in Table 2.4. Note that the Anzac Day holiday fell and was observed on a Saturday four times during this period and these are excluded from the average.

Table 2.4
Average number of injury crashes per day on public holidays (Mon-Fri)
South Australia 1982-2013

Public holiday	Number of days	Average injury crashes per day
Christmas Day	32	11.84
Proclamation Day	32	12.19
Easter Monday	32	12.25
Queen's Birthday	32	12.47
Anzac Day	28	13.64
Good Friday	32	13.66
New Year's Day	32	13.72
Labour Day	32	14.22
Adelaide Cup	32	14.31
Australia Day	32	15.13
Total	316	13.34

All the public holidays exhibited very low average injury crash rates at levels below even a typical Sunday.

2.6 A closer look at March

Table 2.5 lists the major events and public holidays in South Australia that occurred in March for the years 1982-2013. It is apparent that March has become more busy over time.

Table 2.5
Events and public holidays in March in South Australia 1982-2013

Year	Events in March				Public Holidays	
1982	Fringe	Adelaide Festival				
1983						
1984	Fringe	Adelaide Festival				
1985						
1986	Fringe	Adelaide Festival			Easter	
1987						
1988	Fringe	Adelaide Festival				
1989					Easter	
1990	Fringe	Adelaide Festival				
1991					Easter	
1992	Fringe	Adelaide Festival	WOMADelaide			
1993						
1994	Fringe	Adelaide Festival				
1995						
1996	Fringe	Adelaide Festival				
1997			WOMADelaide		Easter	
1998	Fringe	Adelaide Festival	WOMADelaide			
1999						
2000	Fringe	Adelaide Festival				
2001						
2002	Fringe	Adelaide Festival		Clipsal 500	Easter	
2003			WOMADelaide	Clipsal 500		
2004	Fringe	Adelaide Festival	WOMADelaide	Clipsal 500		
2005			WOMADelaide	Clipsal 500	Easter	
2006	Fringe	Adelaide Festival	WOMADelaide	Clipsal 500		Adelaide Cup
2007	Fringe		WOMADelaide	Clipsal 500		Adelaide Cup
2008	Fringe	Adelaide Festival	WOMADelaide		Easter	Adelaide Cup
2009	Fringe		WOMADelaide	Clipsal 500		Adelaide Cup
2010	Fringe	Adelaide Festival	WOMADelaide	Clipsal 500		Adelaide Cup
2011	Fringe		WOMADelaide	Clipsal 500		Adelaide Cup
2012	Fringe	Adelaide Festival	WOMADelaide	Clipsal 500		Adelaide Cup
2013	Fringe	Adelaide Festival	WOMADelaide	Clipsal 500	Easter	Adelaide Cup

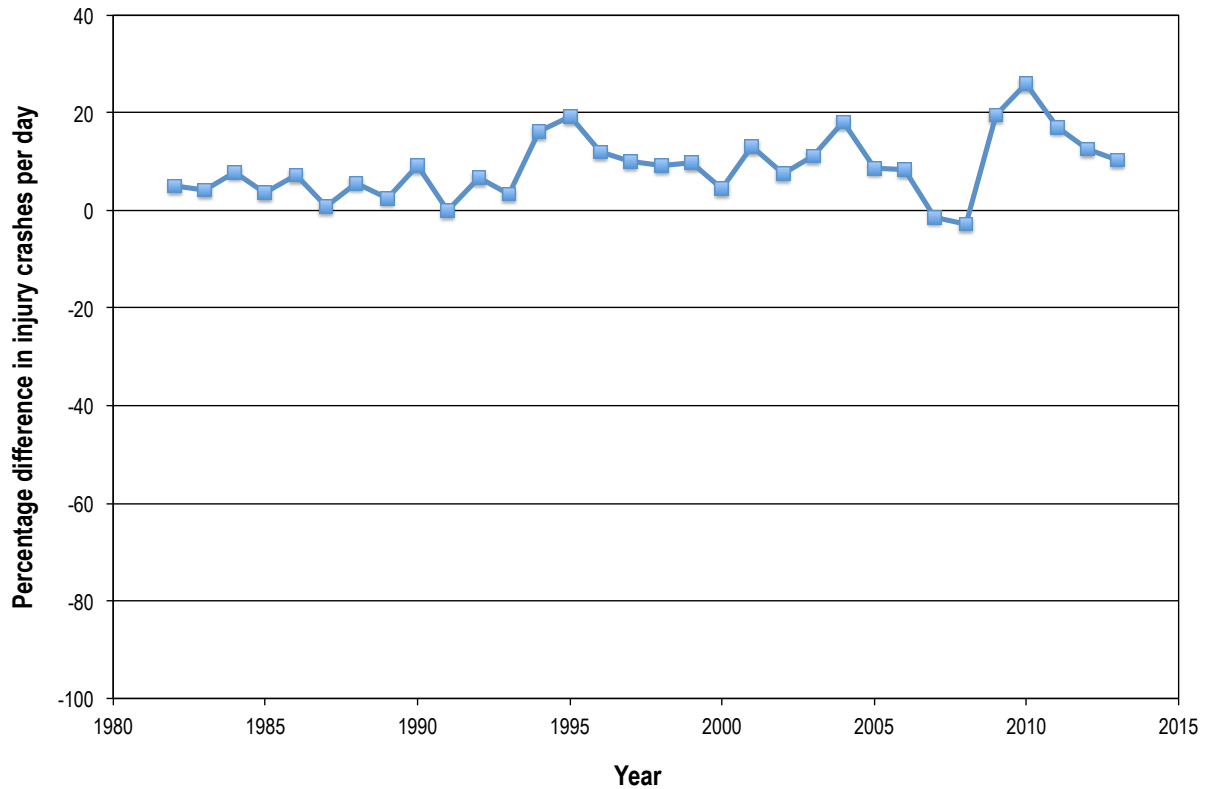
In order to examine changes in the March injury crash rate over time, the percentage difference between the average number of injury crashes per day in March and the injury crashes per day in an average month was calculated for each year from 1982-2013. The results of this calculation are shown in Table 2.6 (the calculations for all months can be found in Table A.3 in Appendix A).

Table 2.6
Comparing March injury crashes with an average month by year
South Australia 1982-2013

Year	Average number of injury crashes per day in March	Injury crashes per day in average month	Percentage difference of March from an average month
1982	22.677	21.571	5.129
1983	23.161	22.245	4.118
1984	26.258	24.378	7.710
1985	27.032	26.077	3.663
1986	27.161	25.312	7.308
1987	23.839	23.611	0.964
1988	22.774	21.545	5.706
1989	21.935	21.422	2.396
1990	22.742	20.837	9.141
1991	17.839	17.842	-0.016
1992	18.226	17.091	6.641
1993	18.290	17.712	3.268
1994	20.452	17.581	16.327
1995	21.065	17.665	19.245
1996	19.935	17.786	12.086
1997	19.355	17.593	10.016
1998	20.742	18.978	9.295
1999	22.323	20.312	9.896
2000	22.290	21.358	4.364
2001	23.968	21.190	13.109
2002	22.355	20.804	7.457
2003	21.645	19.451	11.278
2004	21.710	18.360	18.247
2005	18.581	17.079	8.790
2006	18.387	16.953	8.457
2007	17.484	17.725	-1.359
2008	17.774	18.302	-2.881
2009	20.387	17.068	19.448
2010	22.097	17.545	25.941
2011	20.355	17.391	17.041
2012	18.742	16.666	12.455
2013	17.516	15.881	10.298

The percentage differences from Table 2.6 are plotted in Figure 2.8. Although there is a slight upward trend, there is no clear relationship between the differences and the events in Table 2.5. Note that any upward trend in March could be the result of a downward effect in other months.

Figure 2.8
 Percentage difference in injury crashes of March from an average month by year in South Australia 1982-2013



Since the March events occur mostly in Adelaide, the percentage differences in March injury crashes occurring in Adelaide are shown in Figure 2.9. As most injury crashes in South Australia occur in Adelaide, it is very similar to Figure 2.8 and again shows no clear relationship between the differences and the events in Table 2.5.

Figure 2.10 shows the percentage differences in March injury crashes for crashes occurring in the inner Adelaide area (Adelaide CBD and North Adelaide). Again it is similar to Figure 2.8 with no clear relationship to the events in Table 2.5.

Figure 2.9

Percentage difference in injury crashes of March from an average month by year in Adelaide 1982-2013

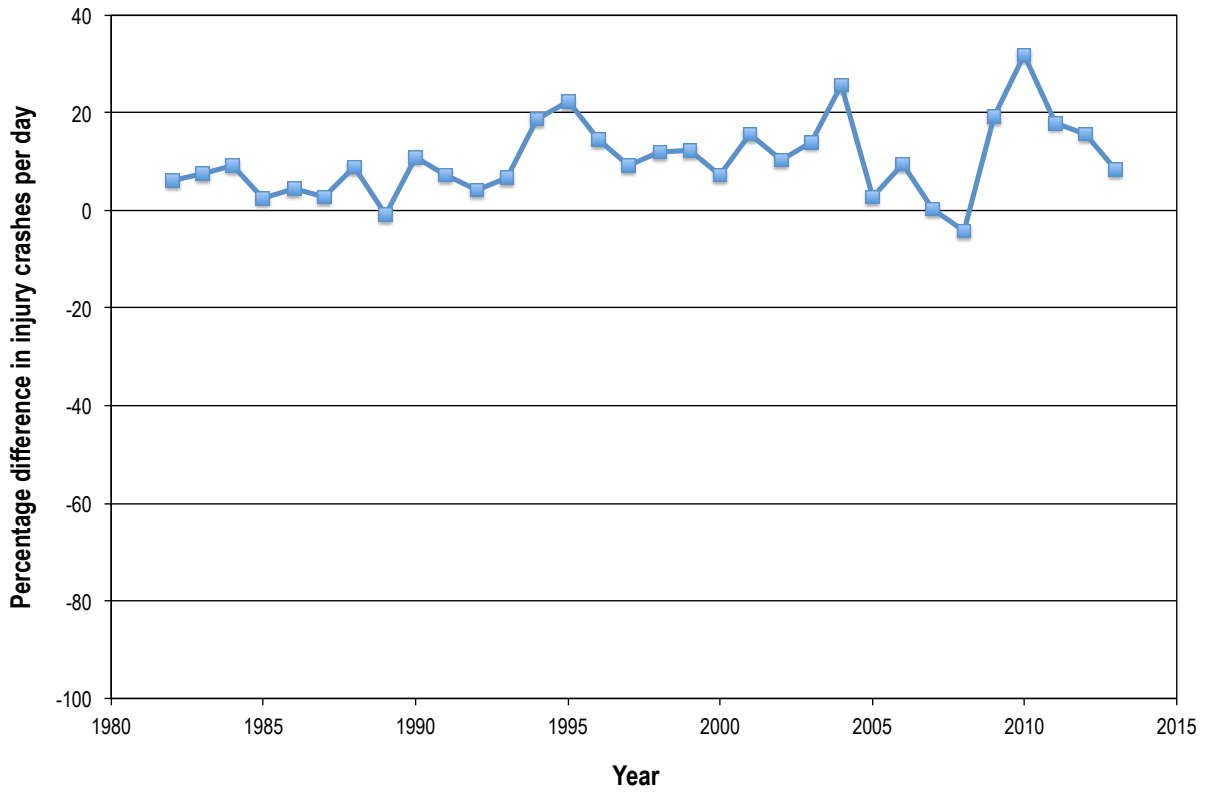
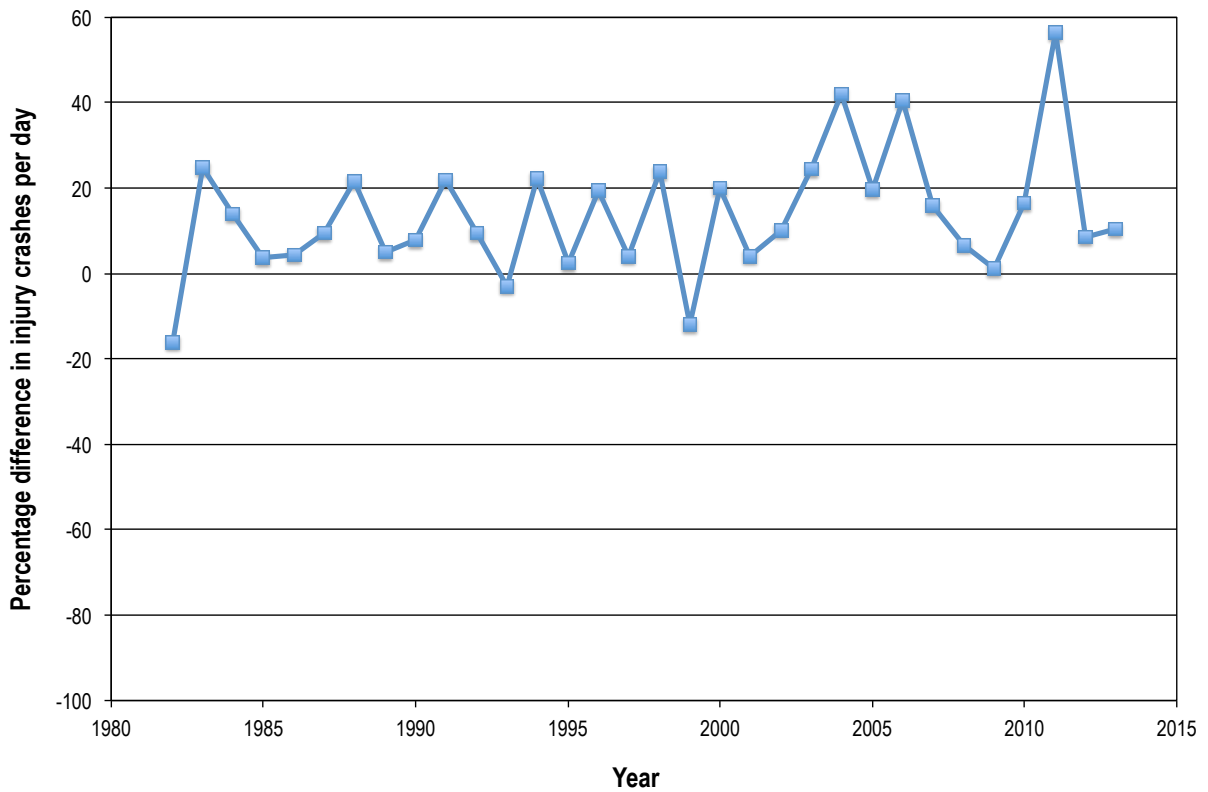


Figure 2.10

Percentage difference in injury crashes of March from an average month by year in the inner Adelaide area 1982-2013



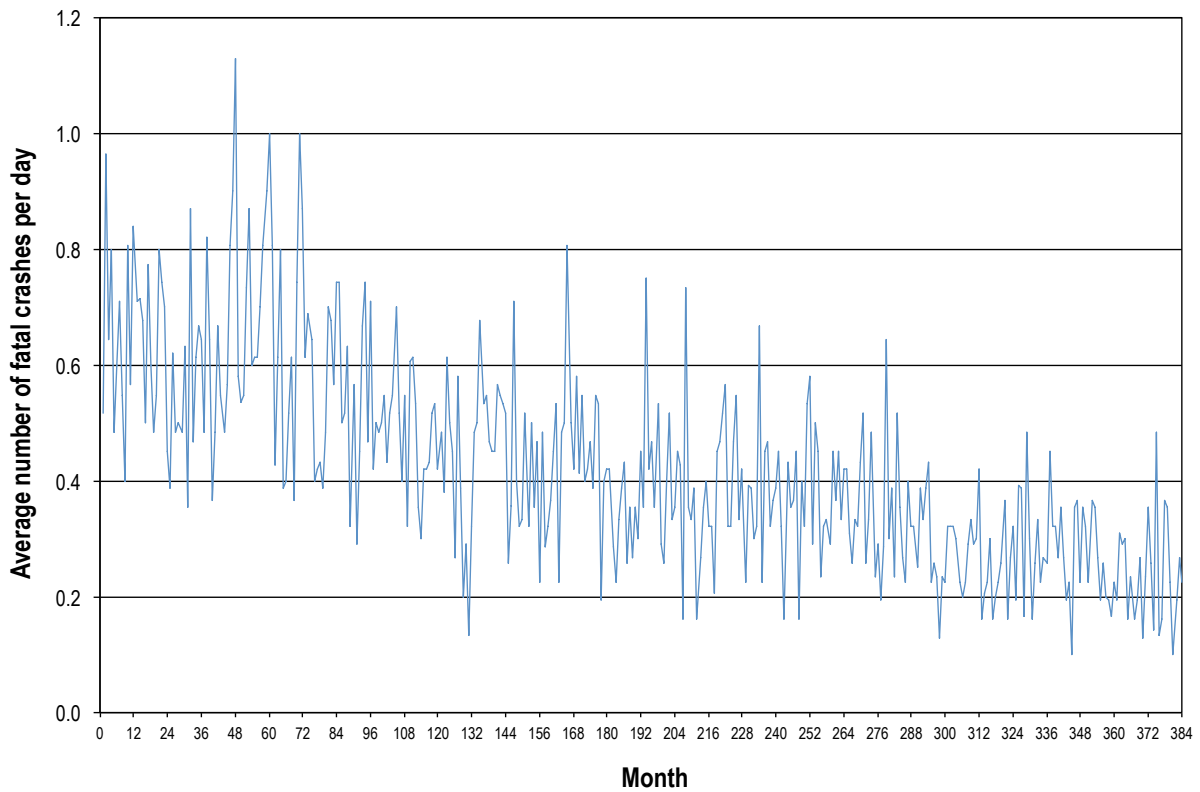
3 Fatal crashes in South Australia

Fatal crashes are much rarer than injury crashes and so are expected to be much more variable. The 32 years of South Australian fatal crash data from 1982-2013 was examined. Table B.1 in Appendix B gives the raw numbers of fatal crashes in each month of each year of the data. However, months can be different lengths (and not always the same in different years for February) meaning that raw fatal crash counts are not directly comparable.

In order to make the months comparable, the average number of fatal crashes per day was calculated for each month in each year by dividing the corresponding number of fatal crashes in a given month by the number of days in that month in the particular year (Table B.2 in Appendix B).

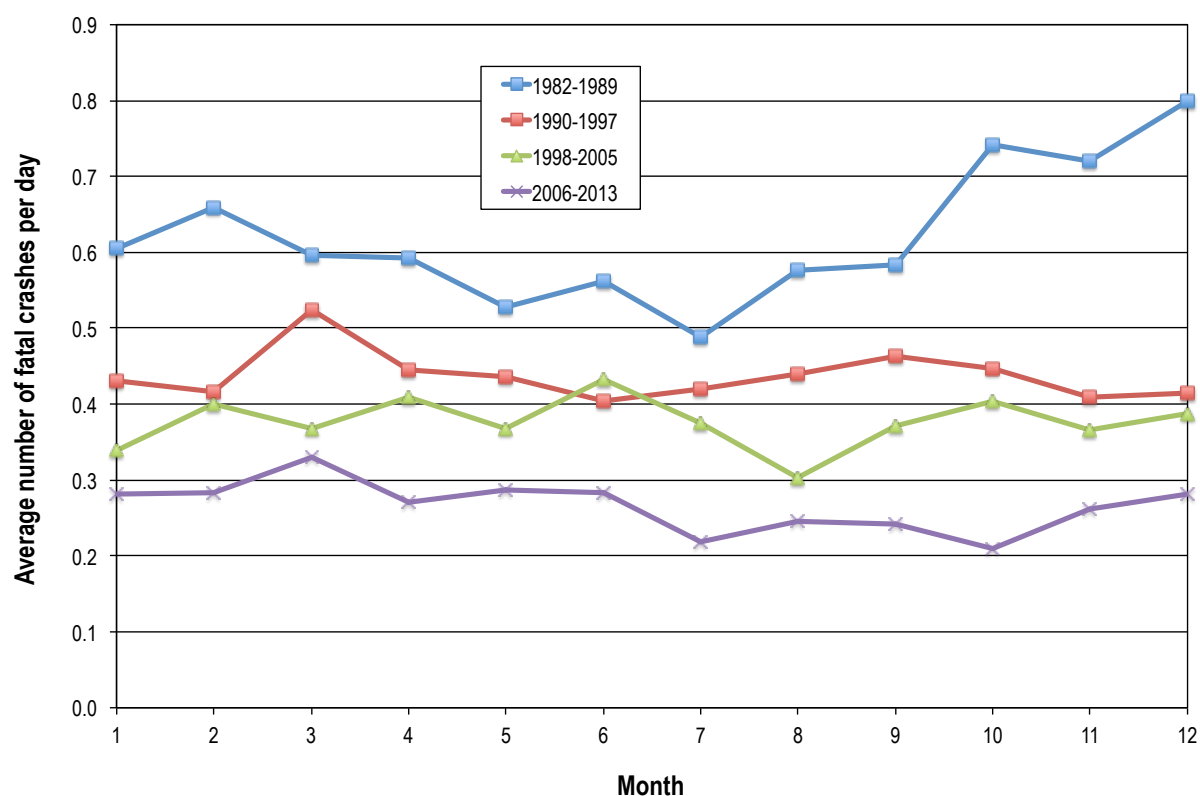
The resulting average number of fatal crashes per day for each month from January 1982 (month 1) to December 2013 (month 384) are plotted in Figure 3.1. There appears to be considerable month-to-month variation overlaid on top of a longer term downward trend.

Figure 3.1
Average number of fatal crashes per day in each month in South Australia 1982-2013



In order to ascertain if there is a consistent monthly effect on fatal crash numbers, the month results for groups of 8 years were averaged together and are shown in Figure 3.2. Unlike the corresponding comparison for injury crashes (Figure 2.2), no particular pattern of month-to-month variation can be seen that is similar in the four eight-year intervals.

Figure 3.2
Average number of fatal crashes per day by month in South Australia 1982-2013
averaged over the given 8 year intervals

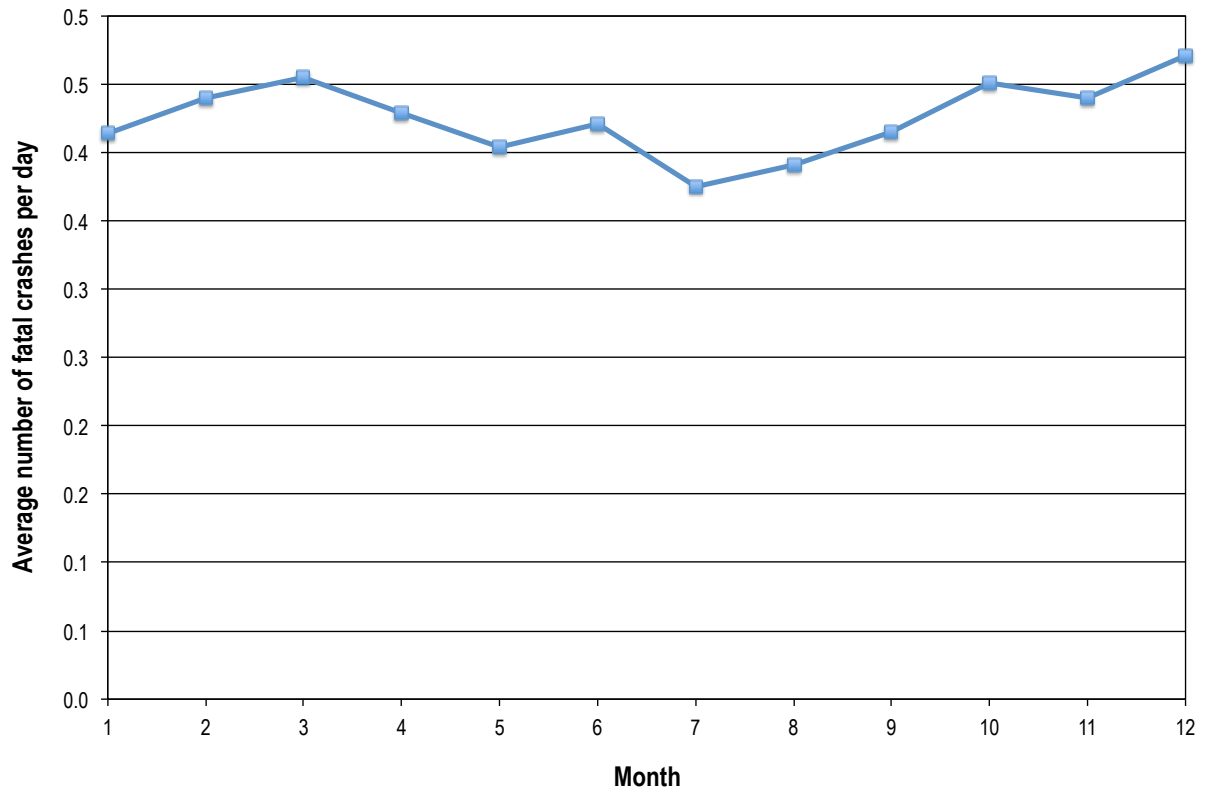


All 32 years of fatal crash data was analysed to check for monthly effects. The average number of fatal crashes per day for each month were averaged over the 32 years of data and are presented in Table 3.1 and plotted in Figure 3.3. The percentage difference for each month from the overall average was also calculated and is shown in Table 3.1.

Table 3.1
Average number of fatal crashes per day by month averaged over 1982-2013

Month	Average fatal crashes per day	% difference from overall average
January	0.414	-2.60
February	0.440	3.34
March	0.455	6.88
April	0.429	0.89
May	0.404	-4.97
June	0.421	-1.07
July	0.375	-11.84
August	0.391	-8.05
September	0.415	-2.54
October	0.451	5.93
November	0.440	3.34
December	0.471	10.67
Overall average	0.425	

Figure 3.3
Average number of fatal crashes per day by month averaged over 1982-2013



An analysis of variance was carried out on the average number of fatal crashes for each month and year from 1982-2013 (actually the logarithm of the average number of fatal crashes was used). Year was found to be statistically significant ($p < 0.001$) but month was not ($p = 0.297$).

Since the 1982-1989 period might be thought to be different from the following periods, an additional analysis of variance was carried out on the average number of fatal crashes for each month and year from 1990-2013. Year was found to be statistically significant ($p < 0.001$) but month was not ($p = 0.651$).

The variation in monthly fatal crash rates is too great for any monthly pattern to be detected with a reasonable degree of certainty.

3.1 Location of crash

In order to check for any differences in monthly fatal crash rates by area, the crash data was disaggregated by location of the crash (inside and outside of Adelaide). The raw fatal crash numbers are given in Tables B.4 and B.5 in Appendix B. The average number of fatal crashes per day by month and location is shown in Table 3.2 along with the percentage differences from the overall averages.

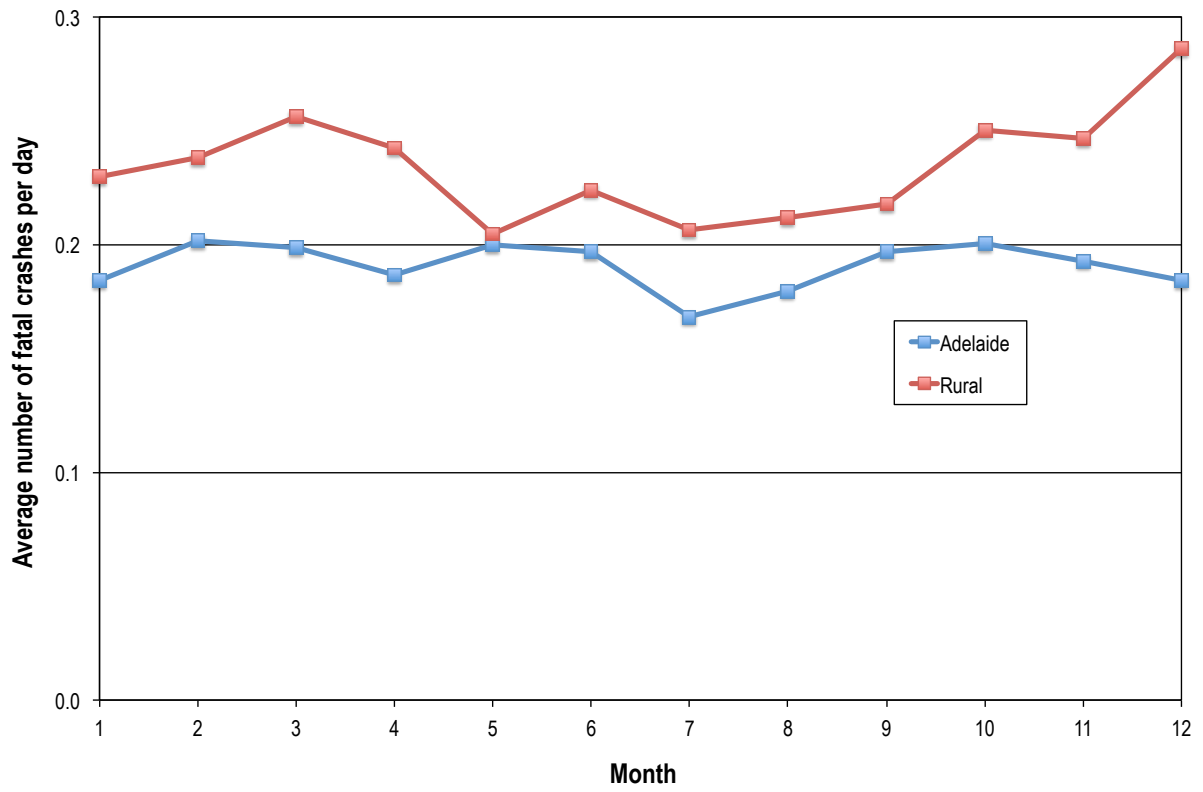
Table 3.2
Average number of fatal crashes per day by month averaged over 1982-2013
by crash location

Month	Average fatal crashes per day		% difference from overall average	
	Adelaide	Rural	Adelaide	Rural
January	0.184	0.230	-3.33	-2.00
February	0.202	0.238	5.63	1.47
March	0.199	0.256	4.06	9.17
April	0.186	0.243	-2.29	3.49
May	0.200	0.205	4.59	-12.75
June	0.197	0.224	3.16	-4.51
July	0.168	0.207	-11.78	-11.89
August	0.179	0.212	-5.97	-9.74
September	0.197	0.218	3.16	-7.17
October	0.201	0.250	5.12	6.59
November	0.193	0.247	0.98	5.26
December	0.184	0.286	-3.33	22.07
Overall average	0.191	0.235		

Over the time period examined 45% of the fatal crashes in South Australia occurred in Adelaide. Figure 3.4 shows the average number of fatal crashes per day by month by the location of the crashes.

An analysis of variance found no statistically significant difference by month for either the Adelaide ($p = 0.789$) or rural ($p=0.193$) areas.

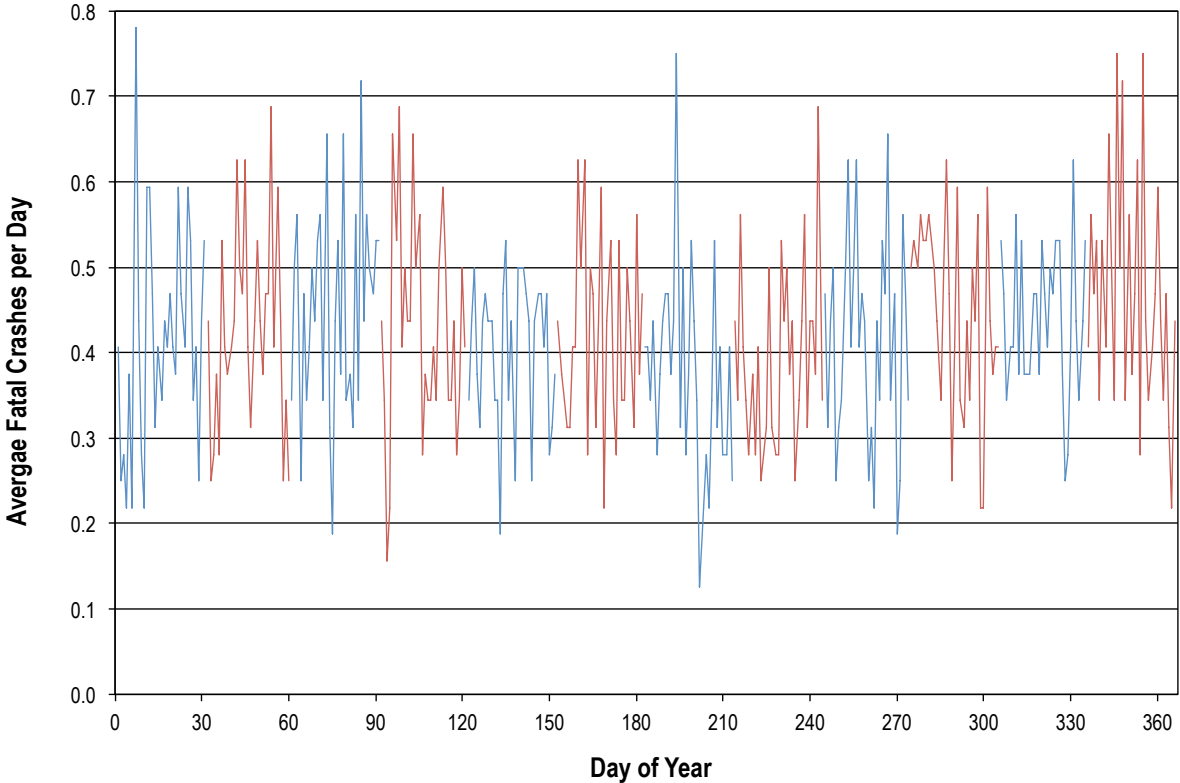
Figure 3.4
Average number of fatal crashes per day by month and crash location
by the location of the crash



3.2 Day of year

Figure 3.5 shows the average number of fatal crashes per day over the 1982-2013 period for each day of the year (1-366). The main point of this Figure is to demonstrate the much larger proportional variation in fatal crash numbers compared to injury crash numbers (Figure 2.6). No discernible patterns can be seen in the fatal crash data.

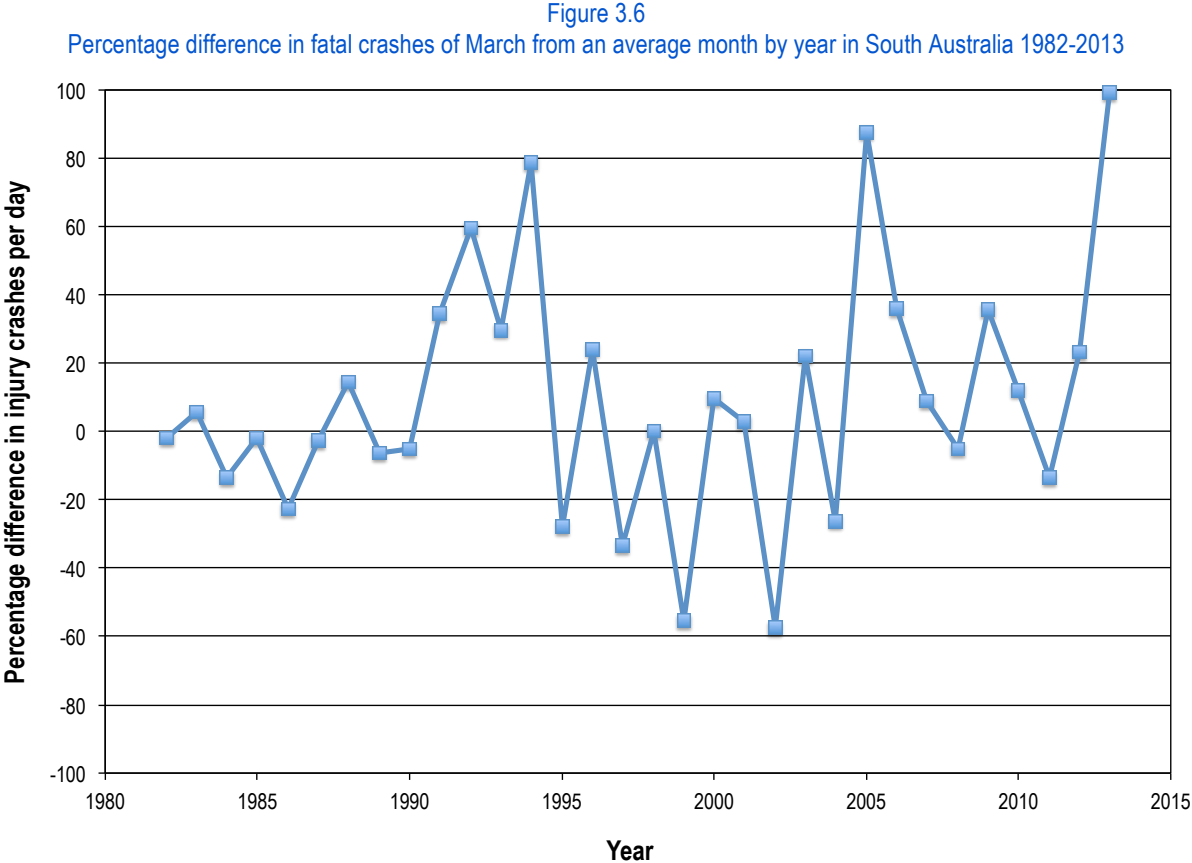
Figure 3.5
Average number of fatal crashes per day by day of year 1982-2013



Similar analyses to those for injury crashes (on school holidays and public holidays) were carried out for fatal crashes but the variation was so large that no patterns were apparent.

3.3 A closer look at March

In order to examine changes in the March fatal crash rate over time, the percentage difference between the average number of fatal crashes per day in March and the fatal crashes per day in an average month were calculated for each year from 1982-2013. The results of this calculation are shown in Figure 3.6 (the calculations for all months can be found in Table B.3 in Appendix B). No clear relationship is apparent between the differences and the events in Table 2.5.

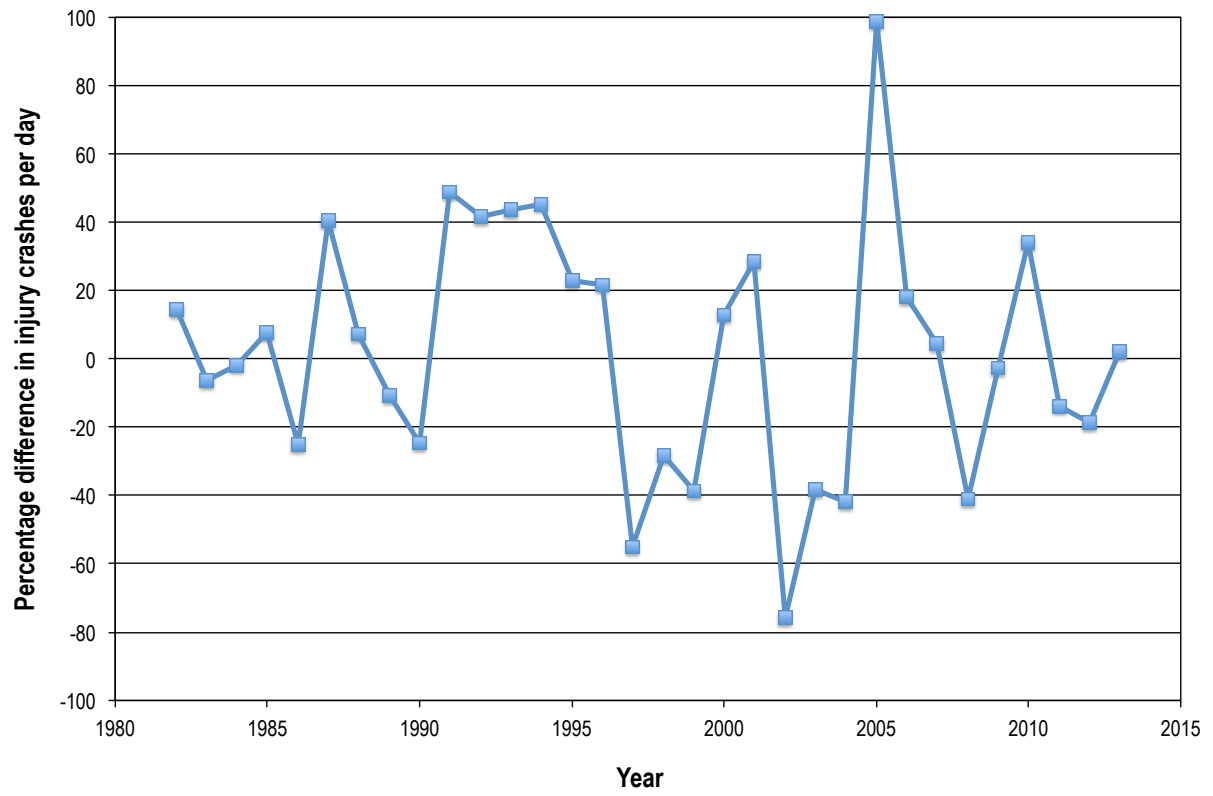


Since the March events occur mostly in Adelaide, the percentage differences in March fatal crashes occurring in Adelaide are shown in Figure 3.7. No clear relationship is apparent between the differences and the events in Table 2.5.

What Figures 3.6 and 3.7 do illustrate is that large variations in monthly fatal crash numbers can occur and that they are not indicative of a meaningful change.

Figure 3.7

Percentage difference in fatal crashes of March from an average month by year in Adelaide 1982-2013



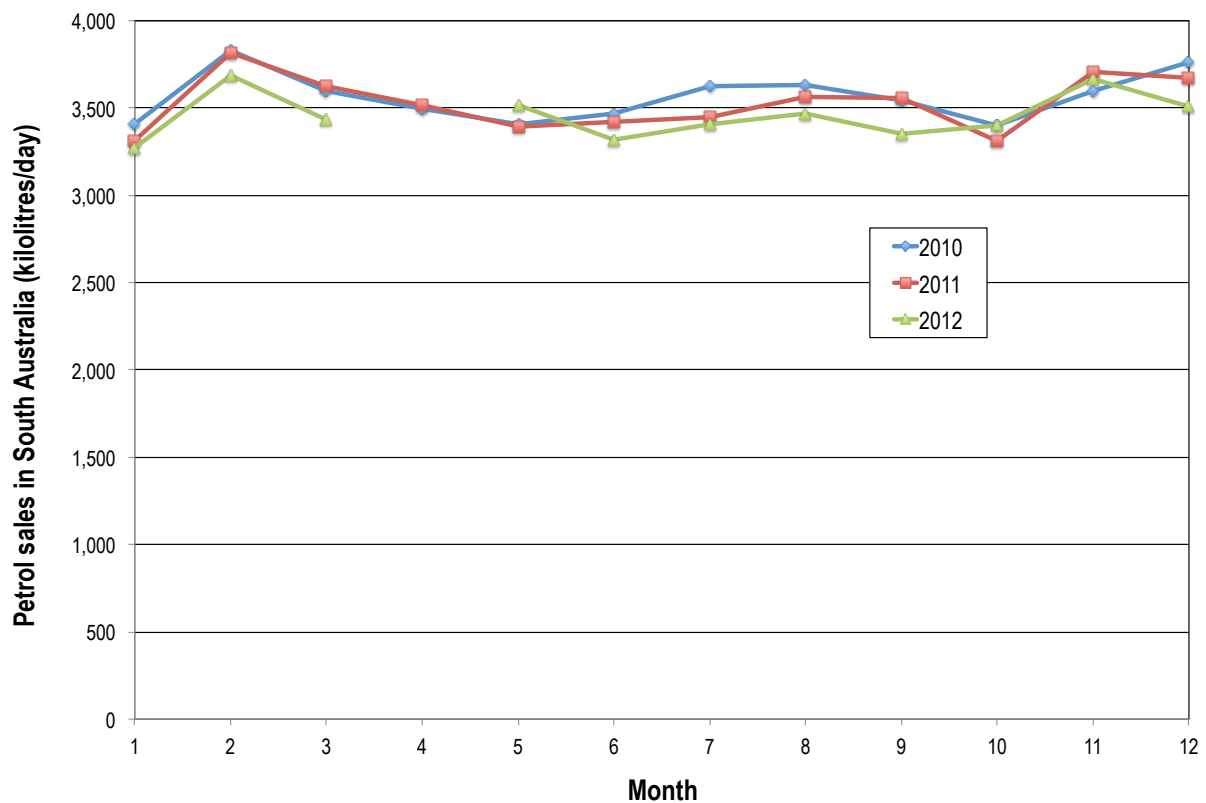
4 Exposure measures

Changes in exposure are an obvious factor that could lead to differences in monthly crash rates. If there is less travelling done then there will be fewer road crashes. Unfortunately, there is no wide-scale direct measure of exposure available but there are some proxies that can give some indications.

4.1 Petrol sales

Monthly petrol sales for South Australia were extracted from the Department of Industry and Science publication “Australian Petroleum Statistics”. The monthly sales were then divided by the number of days in each month to get average petrol sales per day in South Australia by month for the years 2010-2012. The results are presented in Figure 4.1. January is consistently a low month for petrol sales and February is consistently a high month. It is not clear from the publication if these are sales to wholesalers or the public so there may be a slight mismatch between date of sale and date of use.

Figure 4.1
Average petrol sales per day in South Australia by month 2010-2012



4.2 Vehicle counts

A permanent speed and vehicle measuring device has been installed at 228 South Road, Mile End (a major arterial road about 3 km from the centre of Adelaide) since 2009. Figures 4.2 and 4.3 show the weekly traffic flows (where week 1 starts on 1 January) in both directions for 2009-2011. There is clearly a large drop in traffic volume at the beginning of January and the end of December and a drop around Easter each year.

Figure 4.2
Weekly traffic flows for northbound traffic on South Road by year

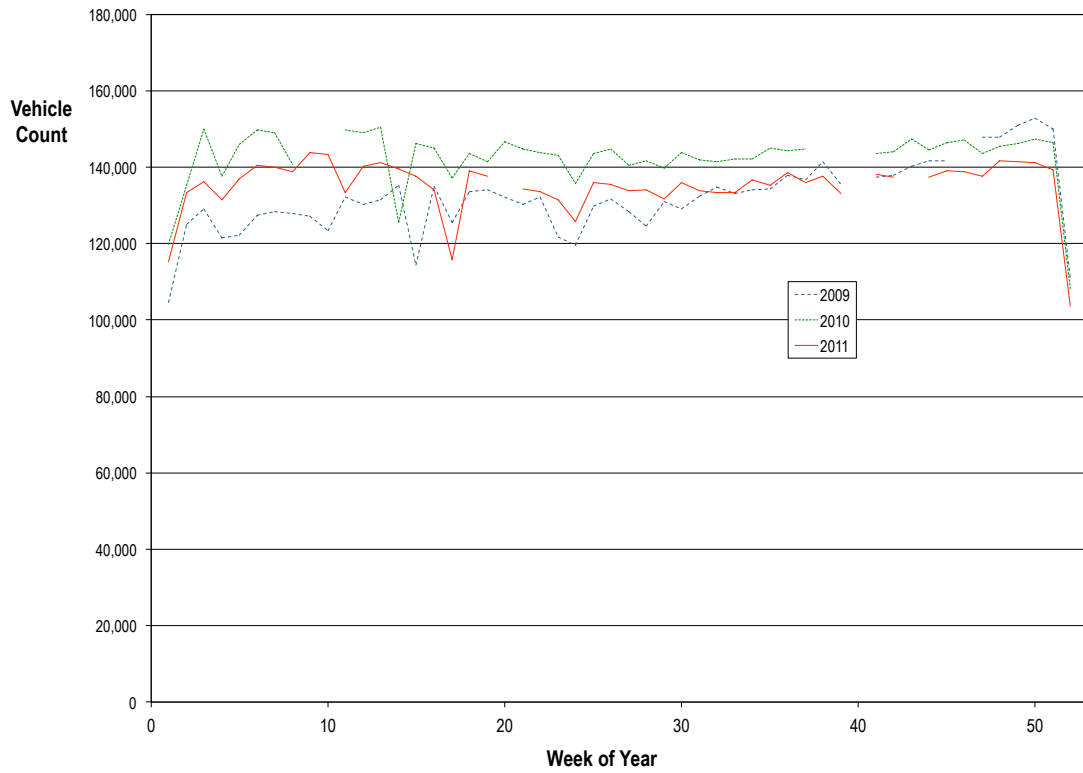
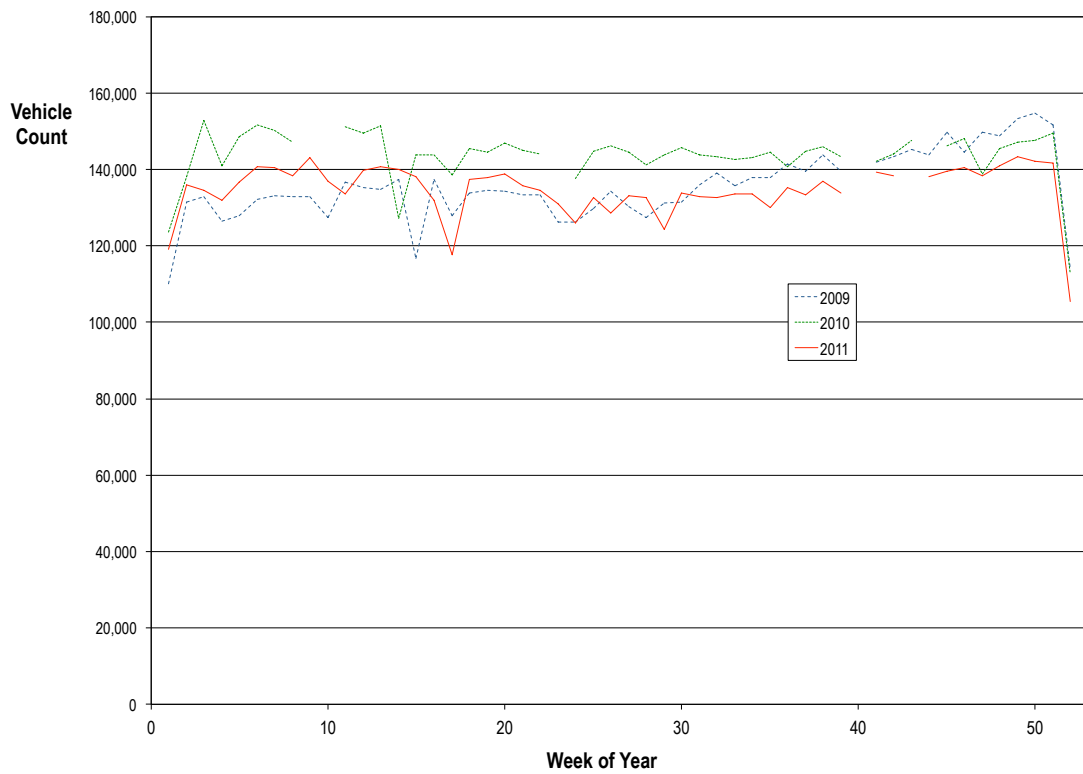


Figure 4.3
Weekly traffic flows for southbound traffic on South Road by year



5 Discussion

This report examined variations in road injury crash numbers in South Australia by time of year using injury and fatal crash data from 1982-2013.

5.1 Injury crash numbers

It was found that there was a statistically significant variation in injury crash numbers by month after accounting for different month lengths. January was found to have 11.7% fewer injury crashes per day than an average month and March was found to have 8.6% more. This pattern seems to have been in place over the entire time period examined.

Examining crash rates by crash location indicates that rural injury crashes follow a different pattern with more injury crashes in the warmer months and fewer in the colder months.

5.2 Holidays

An examination of particular types of days and days of the year revealed very low injury crash rates for the period from 25 December to 5 January, on public holidays and on Sundays. To a lesser extent there were also some indications of lower rates during school holidays. These can all be associated with less travel for work and school and presumably less travel overall leading to less exposure and less injury crashes as a result.

This fits with January being the lowest injury crash rate month (with many people on holidays) and March being the highest (very few public holidays and no school holidays) followed by November, May and February (all with minimal school holidays).

5.3 Exposure

The limited available exposure measures do suggest that there is less vehicle travel in January consistent with January's low daily injury crash rate. While there are some indications that March may have a higher exposure, the evidence is not definitive.

5.4 Events in March

The increasing number of large public events in March in recent years may be having an underlying effect on the number of injury crashes in March. However, there is no consistent observable evidence for this in the crash numbers so the size of any effect is probably not large.

5.5 Fatal crashes

The proportional variation in fatal crash numbers from month to month is very large. Even with 32 years of fatal crash data, no statistically significant variation by month was found.

Given that there was variation found for all injury crashes that we have interpreted as real rather than random, there is probably a similar sized variation in fatal crashes. However, this is not detectable in the presence of the large random variation in fatal crash numbers.

Fatal crashes are sufficiently few in number that it is difficult to use the data other than anecdotally. Injury crashes may be used to give guidance about fatal crashes, but this risks neglecting the important differences between them. The issue can be seen in the present study, as injury crashes are largely urban but most fatal crashes occur in rural areas. Considering the whole of South Australia, the

month-to-month patterns of injury and fatal crashes appear rather different, but when considering only rural areas, there are similarities between the month-to-month patterns of injury and fatal crashes.

5.6 Conclusions

The following conclusions can be made about injury and fatal crashes in South Australia from 1982-2013:

- Injury crashes did vary by month of the year in roughly the same pattern over time
- January had 12% fewer injury crashes than an average month
- March had 9% more injury crashes than an average month
- The period from 25 December to 5 January had a very low injury crash rate
- Public holidays had a low injury crash rate
- The injury crash rates seemed to be slightly lower during school holidays
- The main factor in low injury crash rates appears to have been less driving being done
- Rural injury crashes had a different pattern - higher rates in the warmer months and fewer in the colder months
- There was no discernible relationship between changes in the crash rate in March and the increasing number of events being held in March
- The large variation in fatal crash numbers meant that no monthly patterns were detectable

Acknowledgements

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The views expressed in this report are those of the authors and do not necessarily represent those of the University of Adelaide or the funding organisations.

Appendix A – Detailed injury crash numbers

This Appendix lists the raw crash numbers and derived averages and changes for each month of the 32 years examined in this report.

Table A.1 lists the number of injury crashes (crashes in which at least one person was injured at any level) that were recorded by police for each month from 1982-2013.

Table A.1
Number of injury crashes in South Australia by year and month

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	601	604	703	671	705	668	701	624	594	675	668	659	7873
1983	545	588	718	613	675	668	717	655	687	742	739	775	8122
1984	588	678	814	723	789	797	750	769	720	754	761	779	8922
1985	686	745	838	767	822	785	741	830	705	924	799	877	9519
1986	723	697	842	811	820	772	777	768	723	807	760	739	9239
1987	682	658	739	695	703	691	763	743	665	742	765	773	8619
1988	584	666	706	605	647	607	655	667	675	676	745	648	7881
1989	554	624	680	680	727	643	622	619	619	681	675	691	7815
1990	581	560	705	641	639	625	624	670	631	671	637	623	7607
1991	505	559	553	527	592	558	548	528	466	527	585	558	6506
1992	491	511	565	502	523	484	526	534	498	544	512	566	6256
1993	513	515	567	537	592	533	429	531	562	539	573	569	6460
1994	505	545	634	511	522	580	544	530	499	545	563	432	6410
1995	510	482	653	494	520	509	486	544	535	551	613	551	6448
1996	480	521	618	517	614	561	531	587	535	485	530	530	6509
1997	500	540	600	489	507	493	521	539	535	628	453	616	6421
1998	507	543	643	518	555	606	599	579	616	551	589	618	6924
1999	511	552	692	576	639	626	571	622	654	690	666	614	7413
2000	557	634	691	685	699	721	638	683	562	645	658	641	7814
2001	590	573	743	627	683	697	646	632	613	637	652	642	7735
2002	600	643	693	553	688	616	631	637	626	573	696	631	7587
2003	522	610	671	542	634	568	643	577	538	548	620	622	7095
2004	565	535	673	552	592	566	562	547	521	543	548	516	6720
2005	461	509	576	504	559	552	525	527	475	483	538	521	6230
2006	439	477	570	456	562	522	490	570	506	555	513	529	6189
2007	517	520	542	532	594	536	544	571	536	499	552	523	6466
2008	515	577	551	551	671	539	518	616	490	555	561	553	6697
2009	466	507	632	521	553	474	550	487	504	527	537	469	6227
2010	462	526	685	521	581	497	499	531	521	567	517	495	6402
2011	484	561	631	506	537	529	493	567	535	499	513	485	6340
2012	438	506	581	493	567	477	472	537	467	572	510	480	6100
2013	429	491	543	435	565	486	464	514	456	501	483	426	5793
Total	17111	18257	21052	18355	20076	18986	18780	19335	18269	19436	19531	19151	228339

Table A.2 presents the average number of injury crashes per day for each month from 1982-2013. The number is calculated by dividing the corresponding number of crashes in Table A.1 by the number of days in the particular month in the particular year.

Table A.2
Average number of injury crashes per day in South Australia by year and month

Year	Month												Average
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	19.387	21.571	22.677	22.367	22.742	22.267	22.613	20.129	19.800	21.774	22.267	21.258	21.571
1983	17.581	21.000	23.161	20.433	21.774	22.267	23.129	21.129	22.900	23.935	24.633	25.000	22.245
1984	18.968	23.379	26.258	24.100	25.452	26.567	24.194	24.806	24.000	24.323	25.367	25.129	24.378
1985	22.129	26.607	27.032	25.567	26.516	26.167	23.903	26.774	23.500	29.806	26.633	28.290	26.077
1986	23.323	24.893	27.161	27.033	26.452	25.733	25.065	24.774	24.100	26.032	25.333	23.839	25.312
1987	22.000	23.500	23.839	23.167	22.677	23.033	24.613	23.968	22.167	23.935	25.500	24.935	23.611
1988	18.839	22.966	22.774	20.167	20.871	20.233	21.129	21.516	22.500	21.806	24.833	20.903	21.545
1989	17.871	22.286	21.935	22.667	23.452	21.433	20.065	19.968	20.633	21.968	22.500	22.290	21.422
1990	18.742	20.000	22.742	21.367	20.613	20.833	20.129	21.613	21.033	21.645	21.233	20.097	20.837
1991	16.290	19.964	17.839	17.567	19.097	18.600	17.677	17.032	15.533	17.000	19.500	18.000	17.842
1992	15.839	17.621	18.226	16.733	16.871	16.133	16.968	17.226	16.600	17.548	17.067	18.258	17.091
1993	16.548	18.393	18.290	17.900	19.097	17.767	13.839	17.129	18.733	17.387	19.100	18.355	17.712
1994	16.290	19.464	20.452	17.033	16.839	19.333	17.548	17.097	16.633	17.581	18.767	13.935	17.581
1995	16.452	17.214	21.065	16.467	16.774	16.967	15.677	17.548	17.833	17.774	20.433	17.774	17.665
1996	15.484	17.966	19.935	17.233	19.806	18.700	17.129	18.935	17.833	15.645	17.667	17.097	17.786
1997	16.129	19.286	19.355	16.300	16.355	16.433	16.806	17.387	17.833	20.258	15.100	19.871	17.593
1998	16.355	19.393	20.742	17.267	17.903	20.200	19.323	18.677	20.533	17.774	19.633	19.935	18.978
1999	16.484	19.714	22.323	19.200	20.613	20.867	18.419	20.065	21.800	22.258	22.200	19.806	20.312
2000	17.968	21.862	22.290	22.833	22.548	24.033	20.581	22.032	18.733	20.806	21.933	20.677	21.358
2001	19.032	20.464	23.968	20.900	22.032	23.233	20.839	20.387	20.433	20.548	21.733	20.710	21.190
2002	19.355	22.964	22.355	18.433	22.194	20.533	20.355	20.548	20.867	18.484	23.200	20.355	20.804
2003	16.839	21.786	21.645	18.067	20.452	18.933	20.742	18.613	17.933	17.677	20.667	20.065	19.451
2004	18.226	18.448	21.710	18.400	19.097	18.867	18.129	17.645	17.367	17.516	18.267	16.645	18.360
2005	14.871	18.179	18.581	16.800	18.032	18.400	16.935	17.000	15.833	15.581	17.933	16.806	17.079
2006	14.161	17.036	18.387	15.200	18.129	17.400	15.806	18.387	16.867	17.903	17.100	17.065	16.953
2007	16.677	18.571	17.484	17.733	19.161	17.867	17.548	18.419	17.867	16.097	18.400	16.871	17.725
2008	16.613	19.897	17.774	18.367	21.645	17.967	16.710	19.871	16.333	17.903	18.700	17.839	18.302
2009	15.032	18.107	20.387	17.367	17.839	15.800	17.742	15.710	16.800	17.000	17.900	15.129	17.068
2010	14.903	18.786	22.097	17.367	18.742	16.567	16.097	17.129	17.367	18.290	17.233	15.968	17.545
2011	15.613	20.036	20.355	16.867	17.323	17.633	15.903	18.290	17.833	16.097	17.100	15.645	17.391
2012	14.129	17.448	18.742	16.433	18.290	15.900	15.226	17.323	15.567	18.452	17.000	15.484	16.666
2013	13.839	17.536	17.516	14.500	18.226	16.200	14.968	16.581	15.200	16.161	16.100	13.742	15.881
Average	17.249	20.198	21.222	19.120	20.238	19.777	18.931	19.491	19.030	19.593	20.345	19.305	19.542

Table A.3 presents the percentage difference in average crashes per day of a month in a given year from an average month in that year. It is calculated from Table A.2 by calculating the percentage change in a given month from the average for the year. A negative number indicates that that month had fewer average crashes per day than an average month in that year and a number greater than 0 indicates that it had more.

Table A.3
Percentage difference of a month from an average month in the same year

Year	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1982	-10.124	0.002	5.129	3.689	5.428	3.225	4.830	-6.685	-8.210	0.942	3.225	-1.451
1983	-20.969	-5.598	4.118	-8.145	-2.118	0.096	3.973	-5.018	2.943	7.598	10.735	12.384
1984	-22.195	-4.099	7.710	-1.142	4.402	8.976	-0.759	1.756	-1.552	-0.229	4.054	3.079
1985	-15.140	2.033	3.663	-1.957	1.684	0.343	-8.336	2.673	-9.883	14.301	2.133	8.487
1986	-7.858	-1.654	7.308	6.803	4.504	1.667	-0.976	-2.123	-4.786	2.848	0.086	-5.819
1987	-6.824	-0.471	0.964	-1.883	-3.955	-2.447	4.242	1.510	-6.118	1.373	8.000	5.609
1988	-12.560	6.594	5.706	-6.397	-3.128	-6.087	-1.930	-0.133	4.434	1.214	15.264	-2.978
1989	-16.578	4.031	2.396	5.809	9.473	0.052	-6.338	-6.790	-3.683	2.546	5.031	4.052
1990	-10.056	-4.018	9.141	2.541	-1.077	-0.019	-3.399	3.722	0.941	3.877	1.901	-3.554
1991	-8.695	11.897	-0.016	-1.541	7.035	4.250	-0.920	-4.537	-12.938	-4.717	9.295	0.888
1992	-7.326	3.100	6.641	-2.092	-1.286	-5.602	-0.720	0.790	-2.872	2.677	-0.141	6.830
1993	-6.567	3.847	3.268	1.064	7.821	0.311	-21.866	-3.289	5.769	-1.832	7.840	3.632
1994	-7.342	10.712	16.327	-3.116	-4.223	9.967	-0.186	-2.755	-5.391	-0.002	6.744	-20.736
1995	-6.868	-2.551	19.245	-6.783	-5.042	-3.953	-11.251	-0.660	0.953	0.619	15.672	0.619
1996	-12.943	1.010	12.086	-3.107	11.360	5.139	-3.693	6.463	0.267	-12.036	-0.671	-3.875
1997	-8.320	9.623	10.016	-7.348	-7.037	-6.591	-4.470	-1.169	1.367	15.150	-14.169	12.949
1998	-13.822	2.186	9.295	-9.017	-5.663	6.439	1.816	-1.584	8.196	-6.343	3.453	5.045
1999	-18.848	-2.945	9.896	-5.476	1.479	2.729	-9.320	-1.220	7.324	9.579	9.293	-2.491
2000	-15.874	2.359	4.364	6.907	5.572	12.525	-3.641	3.156	-12.290	-2.583	2.693	-3.188
2001	-10.183	-3.425	13.109	-1.369	3.975	9.643	-1.658	-3.789	-3.571	-3.028	2.564	-2.267
2002	-6.964	10.386	7.457	-11.393	6.681	-1.299	-2.157	-1.227	0.303	-11.150	11.519	-2.157
2003	-13.432	12.000	11.278	-7.119	5.142	-2.664	6.634	-4.311	-7.805	-9.121	6.247	3.152
2004	-0.729	0.483	18.247	0.220	4.015	2.761	-1.256	-3.892	-5.409	-4.595	-0.507	-9.338
2005	-12.930	6.436	8.790	-1.635	5.580	7.733	-0.842	-0.464	-7.295	-8.775	5.000	-1.598
2006	-16.469	0.485	8.457	-10.343	6.934	2.634	-6.765	8.457	-0.512	5.602	0.865	0.655
2007	-5.908	4.777	-1.359	0.049	8.105	0.801	-0.995	3.919	0.801	-9.184	3.810	-4.817
2008	-9.227	8.715	-2.881	0.356	18.270	-1.830	-8.698	8.576	-10.754	-2.176	2.177	-2.529
2009	-11.926	6.090	19.448	1.752	4.517	-7.428	3.950	-7.957	-1.569	-0.397	4.876	-11.359
2010	-15.059	7.069	25.941	-1.019	6.820	-5.578	-8.256	-2.373	-1.019	4.246	-1.779	-8.992
2011	-10.225	15.206	17.041	-3.016	-0.395	1.392	-8.556	5.170	2.542	-7.443	-1.675	-10.040
2012	-15.223	4.693	12.455	-1.397	9.746	-4.597	-8.642	3.939	-6.597	10.713	2.003	-7.094
2013	-12.858	10.422	10.298	-8.694	14.767	2.011	-5.749	4.408	-4.286	1.767	1.381	-13.468
All years	-11.732	3.359	8.598	-2.158	3.563	1.205	-3.122	-0.259	-2.617	0.262	4.110	-1.208

Table A.4 lists the number of injury crashes (crashes in which at least one person was injured at any level) that occurred in Adelaide for each month from 1982-2013.

Table A.4
Number of injury crashes in Adelaide by year and month

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	402	442	523	479	504	511	539	469	433	506	507	479	5794
1983	366	433	547	433	498	527	537	488	501	554	558	551	5993
1984	430	511	630	537	624	609	597	596	560	553	587	568	6802
1985	486	568	626	570	634	615	576	656	520	693	592	652	7188
1986	496	532	627	643	632	627	622	591	557	621	561	555	7064
1987	484	506	570	531	553	543	572	576	514	536	575	573	6533
1988	408	504	543	435	489	488	497	494	501	469	597	457	5882
1989	386	468	491	503	573	484	486	489	459	499	513	471	5822
1990	409	416	536	453	465	471	480	531	488	509	481	458	5697
1991	347	411	439	386	446	425	403	424	337	350	451	396	4815
1992	344	412	412	356	395	365	398	404	374	410	389	403	4662
1993	360	394	440	412	445	412	312	404	421	413	434	397	4844
1994	357	422	488	382	396	460	403	397	374	411	428	309	4827
1995	367	375	507	366	395	383	378	421	392	403	469	420	4876
1996	333	388	466	365	445	411	397	449	407	355	393	392	4801
1997	380	431	457	370	397	387	399	405	417	463	350	465	4921
1998	380	434	508	390	419	482	471	451	467	413	455	472	5342
1999	378	446	555	440	516	498	438	489	532	528	522	478	5820
2000	426	505	560	525	561	585	503	560	432	499	527	485	6168
2001	458	458	598	498	531	548	521	519	467	512	497	481	6088
2002	444	522	553	426	567	481	499	474	482	436	551	454	5889
2003	397	473	531	423	506	441	501	450	419	412	460	473	5486
2004	425	428	556	438	467	439	446	432	392	416	411	373	5223
2005	336	402	417	389	432	428	398	416	366	371	440	381	4776
2006	329	361	446	343	449	399	376	463	391	429	414	400	4800
2007	376	414	427	414	450	426	411	467	395	372	449	410	5011
2008	394	473	425	429	543	426	416	490	373	427	431	412	5239
2009	343	405	488	407	437	382	446	376	382	406	399	347	4818
2010	327	402	562	400	479	394	379	424	402	449	398	400	5016
2011	357	452	504	405	435	425	392	465	420	390	407	375	5027
2012	334	398	474	379	468	375	388	427	360	458	400	379	4840
2013	346	400	424	348	460	383	365	388	365	401	390	336	4606
Total	12405	14186	16330	13875	15611	14830	14546	15085	13900	14664	15036	14202	174670

Table A.5 lists the number of injury crashes (crashes in which at least one person was injured at any level) that occurred outside Adelaide for each month from 1982-2013.

Table A.5
Number of injury crashes in rural areas by year and month

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	199	162	180	192	201	157	162	155	161	169	161	180	2079
1983	179	155	171	180	177	141	180	167	186	188	181	224	2129
1984	158	167	184	186	165	188	153	173	160	201	174	211	2120
1985	200	177	212	197	188	170	165	174	185	231	207	225	2331
1986	227	165	215	168	188	145	155	177	166	186	199	184	2175
1987	198	152	169	164	150	148	191	167	151	206	190	200	2086
1988	176	162	163	170	158	119	158	173	174	207	148	191	1999
1989	168	156	189	177	154	159	136	130	160	182	162	220	1993
1990	172	144	169	188	174	154	144	139	143	162	156	165	1910
1991	158	148	114	141	146	133	145	104	129	177	134	162	1691
1992	147	99	153	146	128	119	128	130	124	134	123	163	1594
1993	153	121	127	125	147	121	117	127	141	126	139	172	1616
1994	148	123	146	129	126	120	141	133	125	134	135	123	1583
1995	143	107	146	128	125	126	108	123	143	148	144	131	1572
1996	147	133	152	152	169	150	134	138	128	130	137	138	1708
1997	120	109	143	119	110	106	122	134	118	165	103	151	1500
1998	127	109	135	128	136	124	128	128	149	138	134	146	1582
1999	133	106	137	136	123	128	133	133	122	162	144	136	1593
2000	131	129	131	160	138	136	135	123	130	146	131	156	1646
2001	132	115	145	129	152	149	125	113	146	125	155	161	1647
2002	156	121	140	127	121	135	132	163	144	137	145	177	1698
2003	125	137	140	119	128	127	142	127	119	136	160	149	1609
2004	140	107	117	114	125	127	116	115	129	127	137	143	1497
2005	125	107	159	115	127	124	127	111	109	112	98	140	1454
2006	110	116	124	113	113	123	114	107	115	126	99	129	1389
2007	141	106	115	118	144	110	133	104	141	127	103	113	1455
2008	121	104	126	122	128	113	102	126	117	128	130	141	1458
2009	123	102	144	114	116	92	104	111	122	121	138	122	1409
2010	135	124	123	121	102	103	120	107	119	118	119	95	1386
2011	127	109	127	101	102	104	101	102	115	109	106	110	1313
2012	104	108	107	114	99	102	84	110	107	114	110	101	1260
2013	83	91	119	87	105	103	99	126	91	100	93	90	1187
Total	4706	4071	4722	4480	4465	4156	4234	4250	4369	4772	4495	4949	53669

Appendix B – Detailed fatal crash numbers

This Appendix lists the raw fatal crash numbers and derived averages and ratios for each month of the 32 years examined in this report.

Table B.1 lists the number of fatal crashes (crashes in which at least one person was fatally injured) that were recorded by police for each month from 1982-2013.

Table B.1
Number of fatal crashes in South Australia by year and month

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	16	27	20	24	15	18	22	17	12	25	17	26	239
1983	22	20	21	15	24	18	15	17	24	23	21	14	234
1984	12	18	15	15	15	19	11	27	14	19	20	20	205
1985	15	23	20	11	15	20	17	15	17	25	27	35	240
1986	18	15	17	22	27	18	19	19	21	25	27	31	259
1987	25	12	19	24	12	12	16	19	11	23	30	27	230
1988	19	20	20	12	13	13	12	15	21	21	17	23	206
1989	23	14	16	19	10	17	9	14	20	23	14	22	201
1990	13	14	15	15	17	13	16	17	21	16	12	17	186
1991	10	17	19	16	11	9	13	13	13	16	16	13	166
1992	15	11	19	15	14	8	18	12	6	9	4	10	141
1993	15	14	21	16	17	14	14	14	17	17	16	16	191
1994	8	10	22	12	10	10	16	10	15	11	14	7	145
1995	15	8	10	11	14	16	7	15	15	25	15	13	164
1996	18	12	17	12	13	14	12	17	16	6	12	13	162
1997	13	8	7	10	12	13	8	11	8	11	9	14	124
1998	11	21	13	14	11	16	9	8	12	16	10	11	152
1999	14	12	5	22	11	10	12	5	8	11	12	10	132
2000	10	6	14	14	16	17	10	10	14	17	10	13	151
2001	7	11	12	9	10	20	7	14	14	10	11	12	137
2002	14	9	5	13	11	11	14	5	12	10	16	18	138
2003	9	14	14	7	10	10	9	14	11	14	10	13	135
2004	13	9	8	10	10	13	16	8	10	15	7	9	128
2005	6	8	20	9	12	7	16	11	8	7	12	10	126
2006	10	7	12	10	12	13	7	8	7	4	7	7	104
2007	10	9	10	9	7	6	7	9	10	9	9	13	108
2008	5	6	7	9	5	6	7	8	11	5	8	10	87
2009	6	11	12	5	15	9	5	8	10	7	8	8	104
2010	14	9	10	8	11	8	6	7	3	11	11	7	105
2011	11	9	7	11	11	8	6	8	6	6	5	7	95
2012	6	9	9	9	5	7	5	6	8	4	7	11	86
2013	8	4	15	4	5	11	11	7	3	6	8	7	89
Total	411	397	451	412	401	404	372	388	398	447	422	467	4970

Table B.2 presents the average number of fatal crashes per day for each month from 1982-2013. The number is calculated by dividing the corresponding number of crashes in Table B.1 by the number of days in the particular month in the particular year.

Table B.2
Average number of fatal crashes per day in South Australia by year and month

Year	Month												Average
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	0.516	0.964	0.645	0.800	0.484	0.600	0.710	0.548	0.400	0.806	0.567	0.839	0.657
1983	0.710	0.714	0.677	0.500	0.774	0.600	0.484	0.548	0.800	0.742	0.700	0.452	0.642
1984	0.387	0.621	0.484	0.500	0.484	0.633	0.355	0.871	0.467	0.613	0.667	0.645	0.561
1985	0.484	0.821	0.645	0.367	0.484	0.667	0.548	0.484	0.567	0.806	0.900	1.129	0.659
1986	0.581	0.536	0.548	0.733	0.871	0.600	0.613	0.613	0.700	0.806	0.900	1.000	0.708
1987	0.806	0.429	0.613	0.800	0.387	0.400	0.516	0.613	0.367	0.742	1.000	0.871	0.629
1988	0.613	0.690	0.645	0.400	0.419	0.433	0.387	0.484	0.700	0.677	0.567	0.742	0.563
1989	0.742	0.500	0.516	0.633	0.323	0.567	0.290	0.452	0.667	0.742	0.467	0.710	0.551
1990	0.419	0.500	0.484	0.500	0.548	0.433	0.516	0.548	0.700	0.516	0.400	0.548	0.509
1991	0.323	0.607	0.613	0.533	0.355	0.300	0.419	0.419	0.433	0.516	0.533	0.419	0.456
1992	0.484	0.379	0.613	0.500	0.452	0.267	0.581	0.387	0.200	0.290	0.133	0.323	0.384
1993	0.484	0.500	0.677	0.533	0.548	0.467	0.452	0.452	0.567	0.548	0.533	0.516	0.523
1994	0.258	0.357	0.710	0.400	0.323	0.333	0.516	0.323	0.500	0.355	0.467	0.226	0.397
1995	0.484	0.286	0.323	0.367	0.452	0.533	0.226	0.484	0.500	0.806	0.500	0.419	0.448
1996	0.581	0.414	0.548	0.400	0.419	0.467	0.387	0.548	0.533	0.194	0.400	0.419	0.443
1997	0.419	0.286	0.226	0.333	0.387	0.433	0.258	0.355	0.267	0.355	0.300	0.452	0.339
1998	0.355	0.750	0.419	0.467	0.355	0.533	0.290	0.258	0.400	0.516	0.333	0.355	0.419
1999	0.452	0.429	0.161	0.733	0.355	0.333	0.387	0.161	0.267	0.355	0.400	0.323	0.363
2000	0.323	0.207	0.452	0.467	0.516	0.567	0.323	0.323	0.467	0.548	0.333	0.419	0.412
2001	0.226	0.393	0.387	0.300	0.323	0.667	0.226	0.452	0.467	0.323	0.367	0.387	0.376
2002	0.452	0.321	0.161	0.433	0.355	0.367	0.452	0.161	0.400	0.323	0.533	0.581	0.378
2003	0.290	0.500	0.452	0.233	0.323	0.333	0.290	0.452	0.367	0.452	0.333	0.419	0.370
2004	0.419	0.310	0.258	0.333	0.323	0.433	0.516	0.258	0.333	0.484	0.233	0.290	0.349
2005	0.194	0.286	0.645	0.300	0.387	0.233	0.516	0.355	0.267	0.226	0.400	0.323	0.344
2006	0.323	0.250	0.387	0.333	0.387	0.433	0.226	0.258	0.233	0.129	0.233	0.226	0.285
2007	0.323	0.321	0.323	0.300	0.226	0.200	0.226	0.290	0.333	0.290	0.300	0.419	0.296
2008	0.161	0.207	0.226	0.300	0.161	0.200	0.226	0.258	0.367	0.161	0.267	0.323	0.238
2009	0.194	0.393	0.387	0.167	0.484	0.300	0.161	0.258	0.333	0.226	0.267	0.258	0.286
2010	0.452	0.321	0.323	0.267	0.355	0.267	0.194	0.226	0.100	0.355	0.367	0.226	0.288
2011	0.355	0.321	0.226	0.367	0.355	0.267	0.194	0.258	0.200	0.194	0.167	0.226	0.261
2012	0.194	0.310	0.290	0.300	0.161	0.233	0.161	0.194	0.267	0.129	0.233	0.355	0.236
2013	0.258	0.143	0.484	0.133	0.161	0.367	0.355	0.226	0.100	0.194	0.267	0.226	0.243
Average	0.414	0.440	0.455	0.429	0.404	0.421	0.375	0.391	0.415	0.451	0.440	0.471	0.425

Table B.3 presents the percentage difference in average fatal crashes per day of a month in a given year from an average month in that year. It is calculated from Table B.2 by calculating the percentage change in a given month from the average for the year. A negative number indicates that that month had fewer average crashes per day than an average month in that year and a number greater than 0 indicates that it had more.

Table B.3
Percentage difference of a month from an average month in the same year

Year	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1982	-21.395	46.858	-1.744	21.838	-26.308	-8.622	8.082	-16.482	-39.081	22.820	-13.698	27.733
1983	10.579	11.297	5.553	-22.092	20.632	-6.510	-24.605	-14.552	24.653	15.606	9.071	-29.631
1984	-30.938	10.737	-13.672	-10.795	-13.672	12.993	-36.693	55.390	-16.742	9.348	18.940	15.103
1985	-26.520	24.741	-2.027	-44.318	-26.520	1.239	-16.723	-26.520	-13.947	22.467	36.673	71.454
1986	-18.039	-24.381	-22.593	3.514	22.941	-15.307	-13.486	-13.486	-1.192	13.835	27.039	41.155
1987	28.286	-31.825	-2.503	27.260	-38.423	-36.370	-17.897	-2.503	-41.673	18.023	59.075	38.549
1988	8.841	22.471	14.570	-28.967	-25.530	-23.047	-31.258	-14.073	24.308	20.298	0.630	31.755
1989	34.744	-9.194	-6.265	15.020	-41.416	2.913	-47.274	-17.982	21.074	34.744	-15.248	28.885
1990	-17.693	-1.864	-5.030	-1.864	7.633	-14.949	1.301	7.633	37.390	1.301	-21.491	7.633
1991	-29.254	33.154	34.417	16.966	-22.180	-34.206	-8.030	-8.030	-4.965	13.193	16.966	-8.030
1992	25.999	-1.229	59.598	30.199	17.599	-30.561	51.198	0.799	-47.921	-24.401	-65.280	-16.001
1993	-7.503	-4.419	29.496	1.953	4.830	-10.791	-13.669	-13.669	8.325	4.830	1.953	-1.336
1994	-35.035	-10.093	78.654	0.696	-18.794	-16.087	29.930	-18.794	25.870	-10.673	17.479	-43.155
1995	7.941	-36.263	-28.039	-18.204	0.745	18.975	-49.627	7.941	11.539	79.902	11.539	-6.451
1996	31.205	-6.497	23.916	-9.614	-5.241	5.450	-12.530	23.916	20.514	-56.265	-9.614	-5.241
1997	23.623	-15.774	-33.434	-1.736	14.113	27.743	-23.925	4.604	-21.389	4.604	-11.562	33.132
1998	-15.376	78.865	0.011	11.294	-15.376	27.193	-30.762	-38.455	-4.605	23.090	-20.504	-15.376
1999	24.427	18.079	-55.562	102.046	-2.236	-8.161	6.652	-55.562	-26.529	-2.236	10.207	-11.124
2000	-21.695	-49.777	9.627	13.281	25.288	37.556	-21.695	-21.695	13.281	33.118	-19.085	1.796
2001	-39.991	4.404	2.873	-20.274	-14.273	77.170	-39.991	20.018	24.019	-14.273	-2.557	2.873
2002	19.405	-15.015	-57.355	14.572	-6.182	-3.055	19.405	-57.355	5.759	-14.711	41.012	53.521
2003	-21.607	35.011	21.945	-36.995	-12.896	-9.993	-21.607	21.945	-0.992	21.945	-9.993	13.235
2004	20.042	-11.162	-26.128	-4.582	-7.660	24.044	47.745	-26.128	-4.582	38.511	-33.207	-16.894
2005	-43.775	-17.001	87.416	-12.851	12.450	-32.218	49.933	3.079	-22.535	-34.404	16.198	-6.292
2006	13.225	-12.250	35.870	17.000	35.870	52.099	-20.742	-9.420	-18.100	-54.710	-18.100	-20.742
2007	8.994	8.605	8.994	1.365	-23.704	-32.424	-23.704	-1.905	12.627	-1.905	1.365	41.692
2008	-32.239	-13.080	-5.135	26.035	-32.239	-15.977	-5.135	8.417	54.042	-32.239	12.031	35.521
2009	-32.232	37.552	35.535	-41.644	69.419	5.040	-43.527	-9.643	16.711	-20.938	-6.631	-9.643
2010	57.062	11.786	12.187	-7.259	23.406	-7.259	-32.688	-21.469	-65.222	23.406	27.519	-21.469
2011	36.133	23.315	-13.370	40.670	36.133	2.306	-25.746	-0.994	-23.271	-25.746	-36.059	-13.370
2012	-17.859	31.709	23.212	27.319	-31.549	-0.974	-31.549	-17.859	13.172	-45.239	-0.974	50.592
2013	6.318	-41.145	99.346	-45.069	-33.551	51.060	46.187	-6.972	-58.802	-20.262	9.862	-6.972
All years	-2.599	3.340	6.881	0.893	-4.969	-1.066	-11.841	-8.050	-2.536	5.933	3.342	10.672

Table B.4 lists the number of fatal crashes (crashes in which at least one person was fatally injured) that occurred in Adelaide for each month from 1982-2013.

Table B.4
Number of fatal crashes in Adelaide by year and month

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	7	16	12	11	7	9	11	7	5	17	8	13	123
1983	7	10	9	7	14	11	7	8	17	9	7	7	113
1984	5	11	8	4	6	7	7	15	8	7	8	10	96
1985	8	14	11	5	9	10	9	8	9	10	12	15	120
1986	4	4	8	13	13	9	13	11	12	14	13	12	126
1987	13	1	12	12	5	6	3	7	6	11	15	10	101
1988	8	9	9	5	7	6	9	6	9	14	7	10	99
1989	16	8	7	6	3	9	5	6	9	8	9	6	92
1990	2	6	5	7	9	6	6	8	13	6	4	6	78
1991	3	4	10	8	4	6	7	6	9	6	12	4	79
1992	8	5	8	5	9	2	7	7	3	5	1	7	67
1993	6	9	11	7	8	10	5	7	6	7	8	6	90
1994	5	3	8	5	8	6	8	3	6	3	6	4	65
1995	5	3	8	4	10	10	2	6	6	10	5	8	77
1996	9	6	7	2	8	6	3	8	9	3	5	2	68
1997	5	6	2	2	7	9	1	4	3	5	1	7	52
1998	5	12	4	3	6	7	5	3	6	7	4	3	65
1999	3	6	3	8	6	6	4	2	5	3	7	4	57
2000	5	1	6	4	9	7	3	5	5	10	4	4	63
2001	6	6	7	4	2	9	3	9	3	5	5	5	64
2002	6	3	1	6	5	3	4	2	3	3	7	6	49
2003	4	5	3	6	6	2	4	6	8	3	6	4	57
2004	7	2	3	5	6	7	10	6	3	8	2	2	61
2005	3	7	8	5	4	3	3	3	4	1	5	1	47
2006	7	2	5	7	3	4	3	5	4	2	4	4	50
2007	2	3	4	6	5	3	3	4	4	2	6	3	45
2008	1	3	2	6	2	3	2	5	3	1	5	7	40
2009	5	6	3	2	4	4	2	2	2	4	1	1	36
2010	4	4	5	3	5	3	2	4	2	5	2	5	44
2011	6	3	3	4	3	4	4	3	4	4	1	2	41
2012	2	3	2	5	2	1	3	1	3	2	2	3	29
2013	6	1	3	2	3	1	9	1	0	4	3	2	35
Total	183	182	197	179	198	189	167	178	189	199	185	183	2229

Table B.5 lists the number of fatal crashes (crashes in which at least one person was fatally injured) that occurred outside Adelaide for each month from 1982-2013.

Table B.5
Number of fatal crashes in rural areas by year and month

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1982	9	11	8	13	8	9	11	10	7	8	9	13	116
1983	15	10	12	8	10	7	8	9	7	14	14	7	121
1984	7	7	7	11	9	12	4	12	6	12	12	10	109
1985	7	9	9	6	6	10	8	7	8	15	15	20	120
1986	14	11	9	9	14	9	6	8	9	11	14	19	133
1987	12	11	7	12	7	6	13	12	5	12	15	17	129
1988	11	11	11	7	6	7	3	9	12	7	10	13	107
1989	7	6	9	13	7	8	4	8	11	15	5	16	109
1990	11	8	10	8	8	7	10	9	8	10	8	11	108
1991	7	13	9	8	7	3	6	7	4	10	4	9	87
1992	7	6	11	10	5	6	11	5	3	4	3	3	74
1993	9	5	10	9	9	4	9	7	11	10	8	10	101
1994	3	7	14	7	2	4	8	7	9	8	8	3	80
1995	10	5	2	7	4	6	5	9	9	15	10	5	87
1996	9	6	10	10	5	8	9	9	7	3	7	11	94
1997	8	2	5	8	5	4	7	7	5	6	8	7	72
1998	6	9	9	11	5	9	4	5	6	9	6	8	87
1999	11	6	2	14	5	4	8	3	3	8	5	6	75
2000	5	5	8	10	7	10	7	5	9	7	6	9	88
2001	1	5	5	5	8	11	4	5	11	5	6	7	73
2002	8	6	4	7	6	8	10	3	9	7	9	12	89
2003	5	9	11	1	4	8	5	8	3	11	4	9	78
2004	6	7	5	5	4	6	6	2	7	7	5	7	67
2005	3	1	12	4	8	4	13	8	4	6	7	9	79
2006	3	5	7	3	9	9	4	3	3	2	3	3	54
2007	8	6	6	3	2	3	4	5	6	7	3	10	63
2008	4	3	5	3	3	3	5	3	8	4	3	3	47
2009	1	5	9	3	11	5	3	6	8	3	7	7	68
2010	10	5	5	5	6	5	4	3	1	6	9	2	61
2011	5	6	4	7	8	4	2	5	2	2	4	5	54
2012	4	6	7	4	3	6	2	5	5	2	5	8	57
2013	2	3	12	2	2	10	2	6	3	2	5	5	54
Total	228	215	254	233	203	215	205	210	209	248	237	284	2741