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NORTHERN IRELAND VEHICLE OCCUPANT FATALITY REPORT 2015

In depth Study Of n.51 Vehicle Occupant Fatalities In Northern Ireland Between 2011 And 2012

ABSTRACT

This report analyses n.48 cases of collisions equal to n.51 vehicle occupant fatalities, of which n.30 were the drivers of the vehicle responsible for the collision; n.14 were passengers in the vehicle responsible for the collision, while there were n.4 drivers of other vehicles and n.3 passengers in other vehicles fatally injured. The cases reported in this study are the outcome of investigations carried out by the Road Traffic Collision Investigation Unit of the Forensic Science Northern Ireland between January 2011 and December 2012. In n.29/51 fatalities (57%), only the driver was killed and there was no other occupant in the vehicle. In n.9 cases (17%) the passenger in the car involved in the collision was killed. Six deaths (12%) occurred in three collisions, both the driver and passenger were killed. In n.4 cases (8%) the driver of the other vehicle (not responsible for the collision) involved in the collision was killed and separately n.3 passengers (6%) in the other vehicle involved in the collision was killed. Based on the information available in the FSNI files, there were 67 other occupants injured, ranging from serious to slight. 35.3% (n.18) of those deceased was not wearing a seatbelt at the time of the collision. In n.24/48 cases the driver lost control of the vehicle and this caused the collision. In n.17 of these cases no other vehicle was involved. In n.18/48 cases, evidence of alcohol or drugs was found in the blood of the driver responsible for the collision. In n.8/15 cases where the driver was aged between 17 and 25 years, the driver had consumed alcohol over the legal limit, ranging from 97mg per 100 ml to approx. 280mg per 100 ml. In four of these cases, evidence of drugs e.g. cocaine, cannabis or Diazepam were found in the driver's blood. In one case evidence of the anti-depressant drug Citalopram was found. In total n.11/15 (73%) of young drivers had consumed alcohol and/or drugs.

Elaine Hardy PhD

Executive Summary

This report analyses n.48 cases of collisions equal to n.51 vehicle occupant fatalities, of which n.30 were the drivers of the vehicle responsible for the collision; n.14 were passengers in the vehicle responsible for the collision, while there were n.4 drivers of other vehicles and n.3 passengers in other vehicles fatally injured. Based on the information available in the FSNI files, there were 67 other occupants injured. These injuries ranged from serious to slight.

In n.29/51 fatalities (57%), only the driver was killed. In n.9 cases (17%) the passenger in the car involved in the collision was killed. Six deaths (12%) occurred in three collisions, both the driver and passenger were killed. In n.4 cases (8%) the driver of the other vehicle (not responsible for the collision) involved in the collision was killed and separately n.3 passengers (6%) in the other vehicle involved in the collision was killed.

These fatalities are equal to 77% of the total in Northern Ireland between 2011 and 2012 which were attended by the Forensic Science Northern Ireland (FSNI) Road Traffic Collision investigators. (There were n.66 recorded vehicle occupant fatalities in Northern Ireland during this period). The cases reported in this study are the outcome of investigations carried out by the Road Traffic Collision Investigation Unit of the Forensic Science Northern Ireland between January 2011 and December 2012.

There were five cases which the FSNI attended but no report was issued, typically because the driver of the vehicle died of natural causes, although in one case the driver was 4 times over the legal drink limit of 80mg per 100ml. All were single vehicle collisions and are not included in this report with the exception of the case where limited information is available.

35.3% (n.18) of those deceased was not wearing a seatbelt at the time of the collision. 61% were the drivers of the vehicles responsible for the collision, 39% were passengers (one was a driver of the other vehicle involved in a collision).

In n.24/48 cases the driver lost control of the vehicle and this caused the collision. In n.17 of these cases no other vehicle was involved – i.e. they were single vehicle collisions. In n.16 cases the vehicle responsible for the collision either veered onto the opposite lane or was in the opposite lane of travel and collided with an oncoming vehicle. In three cases, the driver was overtaking and collided with an oncoming vehicle.

Of the n.51 fatalities, there were n.13 females and n.36 males fatally injured (the sex of n.2 is not known). Drivers over the age of 25 years represented 69% of all drivers while deceased under the age of 30 years (drivers, passengers and OV drivers and passengers) represented 45%.

There were n.26 Coroners' inquest reports requested, all of which referred to the fatally injured driver of the vehicle and the findings were made available in relation to the collisions analysed in this study. These inquest reports provided evidence of BAC and drugs in the drivers as well as information regarding previous medical conditions which may have contributed to or caused the collision. There was evidence in n.18/48 (37.5%) cases of alcohol or drugs which may have contributed to the collision. In n.8/15 cases where the driver was aged between 17 and 25 years, the driver had consumed alcohol over the legal limit, ranging from 97mg per 100 ml to approx. 280mg per 100 ml. In total n.11/15 (73%) of young drivers had consumed alcohol and/or drugs.

With gratitude to the Forensic Science Northern Ireland Road Traffic Investigation Team and the Coroner's Service Northern Ireland for allowing access to the case files from which this report is based.

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1. Introduction

This study is an examination of n.48 collision scene reports from Senior Scientific Officers of the Road Traffic Collision Investigation Unit, Forensic Science Northern Ireland (FSNI). The Road Traffic Collision Investigation Unit attends road traffic fatalities in Northern Ireland. Over the two year period between 2011 and 2012, n.8 investigators attended the collision scenes. The attendance of the investigators was random and was simply based on which investigator was on call at the time of the collision. The findings of the reports relevant to single vehicle collisions where the driver was fatally injured are supported by n.26 Coroners' Verdicts.

The study and analysis of the findings of the Road Traffic Collision Investigation Unit – Forensic Science Northern Ireland and a selection of Coroners' reports was carried out by Elaine Hardy PhD, Research Analyst.

2. Background

This report analyses n.51 cases of vehicle occupant fatalities, equal to 77% of the total in Northern Ireland between 2011 and 2012 which were attended by the Forensic Science Northern Ireland (FSNI) Road Traffic Collision investigators. (There were n.66 vehicle occupant fatalities in Northern Ireland during this period[1]). The cases reported in this study are the outcome of investigations carried out by the Road Traffic Collision Investigation Unit of the Forensic Science Northern Ireland between January 2011 and December 2012.

3. Methodology

This qualitative and quantitative study analyses the findings of the Road Traffic Collision Investigation Unit cases of vehicle occupant fatalities between the period 2011 to 2012 as well as the relevant Coroners' inquests, to identify the circumstances leading to the event to determine why the collision happened and to draw conclusions from each case.

Both Microsoft Excel and SPPS software were used to analyse the data compiled from the case files to ensure accuracy and confidence that the cases are representative of vehicle occupant fatalities reported in Northern Ireland during the period examined.

The collision scenes were attended by an investigator, a PSNI photographer and mapper. The files that the investigators prepare include photographs of the collision scene, witness statements, as well as maps, diagrams, laboratory examinations and their findings which are compiled in a report from each collision investigation.

Typically, the investigator arrives at the collision scene within 2 to 4 hours following the collision. Each collision investigation takes approximately six months to complete. The case files from which this report is based, contain information from the Investigators' reports including their findings and comments.

There were n.26 Coroners' inquest reports requested and the findings were made available in relation to the collisions where the driver was killed. In some of the cases reported in the study there may not have been Coroners' verdicts because there may have been a prosecution; the person charged with an offence may have pleaded guilty or the family may have indicated that they did not want a public enquiry.

4. Data Collected On-Scene:

Vehicle data

- Vehicle registration number, manufacturer, model
- Mechanical factors data
- Contribution of design or maintenance defects to collision or injury causation

[1] In the United Kingdom, fatalities that occur up to 30 days following a collision are counted in the official statistics. The FSNI (road collision investigation unit) typically attends collision scenes where there has been a fatality, on the request of the PSNI, the PPS (Public Prosecution Service) or other government agencies. The FSNI does not attend every collision scene unless requested, although they may be requested to investigate a fatality at a later date.

- Collision or injury related cause factors
- Vehicle speed
- Vehicle systems: brakes, suspension, lighting

Collision scene, environment

- Road Topography
- Collision scene data
- Traffic and controls
- Verify collision configuration
- Preview collision cause factors
- Collision contribution of weather, view obstructions
- Collision contribution of road conditions and defects

5. Aims and Objectives

The aim of this study is to analyse each case study presented from the findings of the FSNI investigators and a selection of the Coroner's verdicts and provide the findings as an alternative source of information in relation to vehicle occupant fatalities in Northern Ireland.

The objective is to determine the primary cause and the contributory factors of the collisions which were attended by the FSNI Road Traffic Investigation Unit and from that information, to understand collision causation and ultimately endeavour to draw conclusions from other research and interviews with relevant stakeholders in order to provide a better understanding of vehicle occupant fatalities.

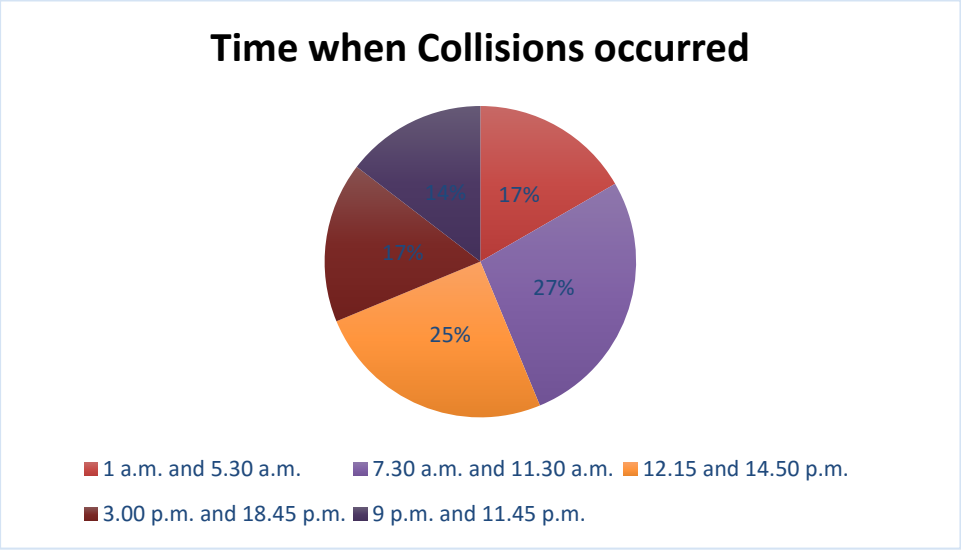
6. Collision scene and environment factors of n.51 vehicle occupant fatalities

The following information including all figures and tables refers to the n.51 vehicle occupant fatalities attended by the FSNI Road Traffic Investigation Unit, which occurred between January 2011 and December 2012. (NB: in four cases there is no information available as no report was required – although in all these cases, there was no other person or vehicle involved in the collision).

6.1 Time of collisions

There were n.48 cases (n.51 fatalities) with information regarding the time of the collision. The majority of the collisions occurred between 7.30 a.m. and 11.30 a.m. (n.13) followed by n.12 occurring between midday and 3 p.m. Overall, the majority of collisions involving cars or four wheeled vehicles occurred during the day – n.33 (69%) occurred between 7.30 a.m. and 18.45 p.m. While n.15 collisions (31%) occurred at night time or in the early hours of the morning.

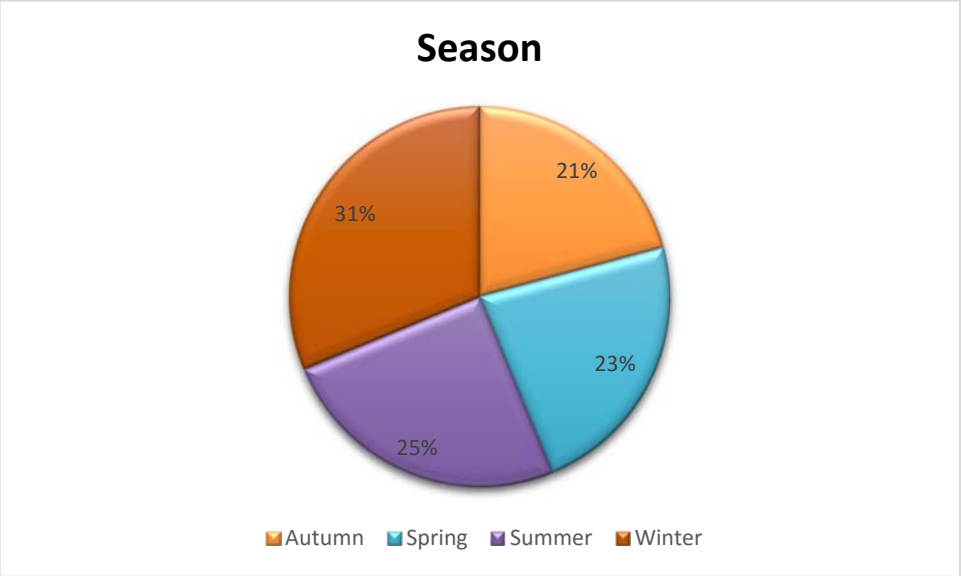
Figure one: Time of collisions



6.2 Seasons

Winter had the highest proportion of vehicle occupant collisions at 31% (n.15), followed by 25% in Summer (n.12); Spring (n.11) and Autumn (n.10). This suggests that the seasons had little influence as a factor of the collisions.

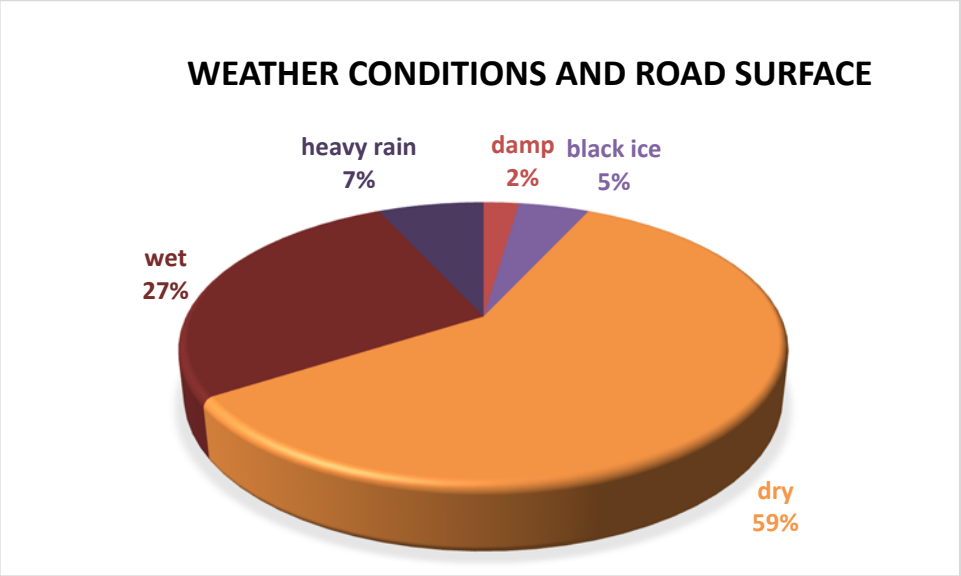
Figure two: Seasons



6.3 Weather conditions and road surface at the time of the collision

At the time of the collision, in 59% (n.26/48) of cases, the road surface was dry, while in 27% (n.12) of cases the road surface was wet. There were n.3 cases where there was heavy rain at the time of the collision and two cases in which there was black ice on the road. In one case the condition of the road was identified as “damp”.

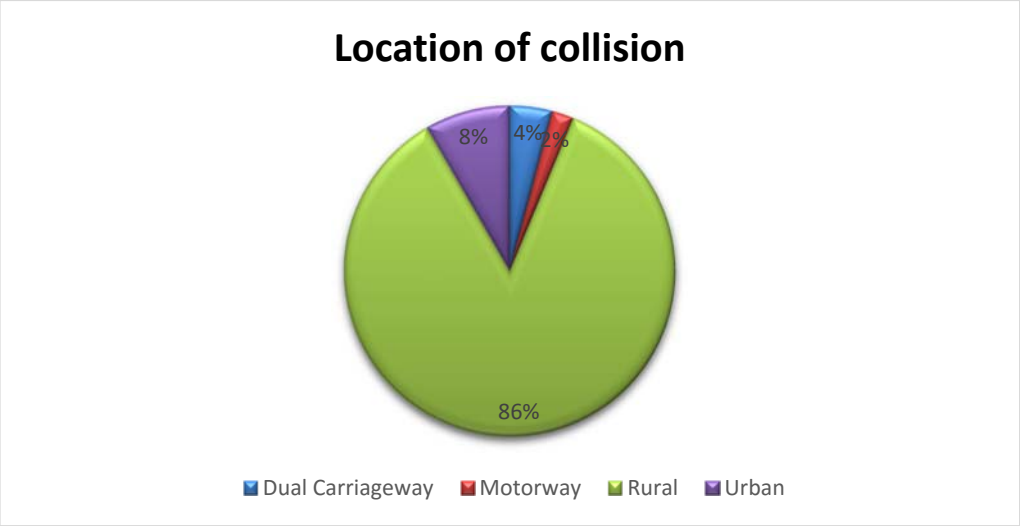
Figure three: Weather conditions and road surface at the time of the collision



6.4 Location of Collision

In n.41/48 cases (86%) the collisions occurred on a rural road which has a speed limit of 60 mph. N.4 collisions occurred on an urban road, with n.2 on a dual carriageway and only one collision occurred on a motorway.

Figure four: Location of Collision



7. Road Conditions

The investigators examine the road where the collisions occur looking for contaminants, surface irregularities, quality and markings. If the investigators suspect that there is an issue with the road surface, or to attempt to estimate the speed from the tyre marks, they would carry out a skid test, using a Skidman device to measure the coefficient of friction between the tyres and the road surface. If the investigators suspected that there was an issue with the traction of the road surface, or if they are to perform calculations based on the length of the tyre marks, then the investigators would conduct skid tests.

If there is a road test conducted at the scene, it is while the road is still closed or at a later stage when the road is open, whereby the investigators will drive through the collision scene to determine whether it is possible to negotiate part of the road through the collision scene at a specific speed. The investigators need to be satisfied that the driver was not travelling in excess of that speed to eliminate this as a factor in the collision and demonstrate that there was no issue with the road surface.

In n.39/48 cases, the condition of the roads was reported as “good” and in four cases “fair”, while two cases mention ice on the road. In four cases the road conditions were not known. In all known cases the investigators found that there were no contaminants or irregularities which may have contributed to the cause of the collision.

8. Speed of vehicle

In n.7/48 (14.6%) of the incidents, the investigators calculated that the vehicle was driven at excessive speed. In one case the speed was considered excessive for the conditions where the driver lost control on a bend. In four cases the speed was either not known or undetermined.

Table one: Estimated speed of vehicles

Deceased	Sex	Age Driver	Posted Speed Limit	Estimated Speed
Passenger	female	26-35	60	60
Passenger	Male	17-25	30	34
Passenger	Male	17-25	60	62
Driver	Male	17-25	60	60
Driver	Male	17-25	40	50
Driver	Male	50 -60	40	46
Passenger	female	17 - 25	60	59
Driver	Male	17-25	60	(for conditions) 40

The calculation or estimation can be based on the damage sustained (or lack of) by the vehicle; damage to road infrastructure, fences, trees and other objects as well as witness statements, CCTV or video footage or in the case of heavy goods vehicles, the reading from the tachograph would be examined.

The calculations of the speed of those vehicles refer to the minimum speed that the investigator was able to calculate based on the evidence available, although the range of speed may have increased the actual speed to a much higher level.

In n.38/48 (79%) cases the speed limit at the location of the collision was 60 mph for an unrestricted driver which would indicate that the area where the collision occurred was typically rural minor roads which are narrow and in many cases undulating which is a legacy nature i.e. not designed to modern safety standards. In two cases the speed limit was 70 mph, while in three cases the speed limit was 40 mph and in one case the speed limit at the location of the collision was 30 mph. In four cases the speed limit was not identified.

9. Vehicles involved in (and responsible for) the collisions

The vehicles responsible for the collisions were predominantly cars 93.8% (n.45/48). In one case the vehicle involved was a tractor and in another case the vehicle involved was a waste truck (both were single vehicle collisions). In another case the vehicle was a “jeep” type with a trailer attached.

9.1 Vehicle Defects

According to the investigators, vehicle defects were not the primary cause of any of the collisions where the drivers lost control, although there may have been defects which could have contributed to the collision. For example, there were n.7 cases (14.6%) where under inflated and/or bald tyres may have contributed to the loss of control of the vehicle. In one case the anti-roll bar link was missing and the anti-roll bar was no longer connected to the offside suspension arm and the rear axle assembly mounting was worn. In another case, the incorrect fitting of load sensing proportioning valve plus lack of load appears to have caused the rear wheel to lock. Overall, there were n.9/48 (18.8%) cases where vehicle defects may have contributed to the collision.

Typically, the vehicles involved in the collision are examined at the scene of the collision and are then taken to secured premises for further detailed examination. This includes examination of tyres, the steering system, braking system, suspension, interior of the vehicle, lighting units etc. The relevance of these examinations are to eliminate or identify any possible cause of or contribution to the collision.

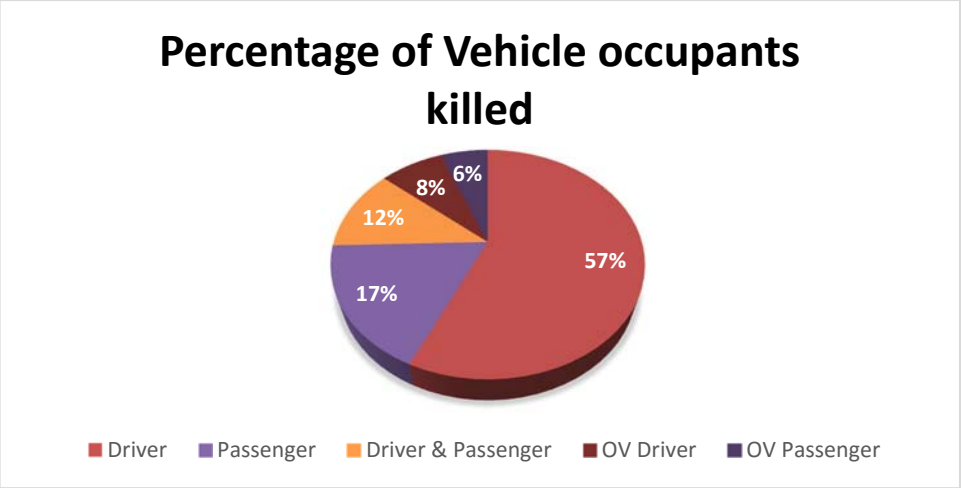
If the outcome of the examination of the vehicles is challenged for example in a court case, then additional tests may be carried out to collaborate or refute any such challenge which may include tests replicating the relevant defects identified with the vehicle involved in the collision.

10. Type of collision and deceased occupants

There were n.21 single vehicle collision fatalities (no other vehicle was involved). In n.10 of these fatalities, the drivers were aged between 19 and 24 years. N.8 were males and n.2 were females. There were n.9 fatalities where the age of the driver was between 33 and 71 years. In two cases, the age is not known. Of the n.21 fatalities, n.19 of the vehicles involved were cars. There was a waste truck and a tractor involved in the remaining two fatalities.

In n.29/51 fatalities (57%), only the driver was killed – i.e. there was no other occupant fatally injured in the vehicle. In n.9 cases (17%) the passenger in the car involved in the collision was killed. In n.6 cases (12%), both the driver and passenger was killed. In n.4 cases (8%) the driver of the other vehicle (not responsible for the collision) involved in the collision was killed and separately n.3 passengers (6%) in the other vehicle involved in the collision was killed. Based on the information available in the FSNI files, there were 67 other occupants injured. These injuries ranged from serious to slight.

Figure five: Vehicle Occupants fatality injured

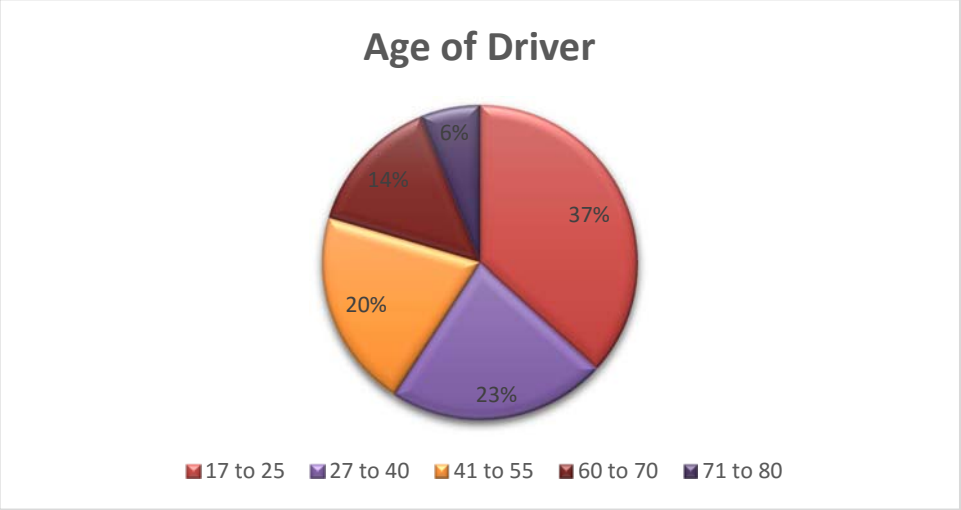


11. Vehicle Occupant Characteristics[2]

11.1 Age of Driver

In n.18/49 fatalities (37%) the age of the driver was between 17 to 25 years. In n.11/49 equal to 23%, the age of the driver was between 27 to 40 years. This is followed by n.10/49 where the age of the drivers was between 41 to 55 years. (There were no drivers deceased aged between 56 to 59 years). There were n.7 drivers (14%) aged between 60 to 70 years and three aged between 71 to 80 years.

Figure six: Age of Driver Responsible for collision



In n.29/48 cases, the driver responsible for the collision died as a result of injuries received. The highest proportion of drivers killed was between the age of 17 and 25 years (31%).

Table two: Age of deceased driver

Age	Frequency	Percentage
17 to 25 years	9	31.0
26 to 40 years	6	20.7
41 to 55 years	5	17.2
56 to 70 years	6	20.7
71 to 80 years	3	10.3
Total	**29**	**100**

[2] For a summary of the cases, see Annex one

11.2 Age of Deceased Vehicle Occupants

As the table and figure below indicates, the highest proportion of fatalities is in the age range of 21 to 30 years (24.5%), followed by the age range of 56 to 71 years (22.4%).

Table three: Age of all deceased occupants

Age of Deceased	Frequency	Percentage
Under 5	2	4.1
15 to 20	8	16.3
21 to 30	12	24.5
31 to 40	6	12.2
41 to 55	7	14.3
56 to 70	10	20.4
71 to 90	4	8.2
Total	**49**	**100**

There were n.8 vehicle occupants aged between 15 to 20 fatally injured (16.3%) and n.7 between the ages of 41 to 55 years (14.3%). There were n.11 occupants aged between 56 to 70 years (20.4%) and n.4 (8.2%) between the ages of 71 to 90 years.

In n.5 cases the driver of the vehicle responsible for the collision was related to the passenger fatally injured, in one case both the driver and relative (passenger) were fatally injured. (NB In two cases there was no age recorded).

Drivers over the age of 25 years represented 69% of all drivers.

Table four: Age and sex of drivers

Sex	Age				Total
	17-25	26-35	36- 50	51-80	
Female	1	3	3	3	10
Male	16	2	8	11	37
Total	**17**	**5**	**11**	**14**	**47**
	36.2%	**10.6%**	**23.4%**	**29.8%**	**100%**

N.B.: The age of one driver was unknown

11.3 Drivers aged between 17 and 25 years

There were n.15 drivers between the age of 17 and 25 years equal to 31.3% of all cases. There was one female driver, (in this case the car collided head on with another vehicle and a young relative passenger was killed), all the other drivers were male. In n.5 cases the male driver was the only occupant and the collisions were single vehicle. In n.5 other cases another vehicle was involved in the collision. In the remaining four cases, the collisions were single but a passenger was killed.

In two cases both the (male) driver and passenger were killed. In n.5 cases the passenger was killed in these cases, two passengers were female and the remaining males. In one case the driver (aged 26) of another vehicle was killed. With the exception of the case where the female driver was responsible for the collision and the passenger was a toddler, all passengers were aged between 17 and 25 years.

In n.8/15 cases (where the driver was aged between 17 and 25 years), the driver had consumed alcohol over the legal limit, ranging from 97mg per 100 ml to approx. 280mg per 100 ml. In four of these cases, evidence of drugs e.g. cocaine, cannabis or Diazepam were found in the driver's blood. In one case evidence of the anti-depressant drug Citalopram was found. In two other cases the driver had only consumed 10 mg of alcohol per 100 ml but one of the drivers was only 17 years of age. In total n.11/15 (73%) of young drivers had consumed alcohol and/or drugs. In n.4 cases the driver was not wearing a seatbelt.

In n.11/15 of the cases the primary cause of the collision was due to the driver losing control of the vehicle. In n.6 cases the driver was on the opposing lane and collided with another vehicle.

In n.6 cases the vehicle was being driven at a speed which was either in excess of the speed limit or in excess of the required speed for the conditions.

In two cases the driver did not have insurance; of these two cases, one did not have any road tax and only one had a provisional licence.

Three of the vehicles had either bald or underinflated tyres which may have contributed to the collision.

Of the n.15 cases, n.14 occurred on rural roads where the speed limit was 60 mph. In one case the speed limit was 30 mph although the driver only had a provisional licence. In n.14 cases the roads were in good condition (the remaining was in fair condition). In n.7 cases the weather conditions were wet (from damp to heavy rain).

11.4 Intoxicated drivers

The information regarding the blood alcohol content levels or drugs was made available from the Pathologists' reports some of which were provided with the Coroners' inquest findings. These are listed in table five. There was information for n.18/48 (37.5%) drivers responsible for the collision, who found to have alcohol or evidence of drugs in their blood at the time of the collision. The average was 164mg per 100 ml of alcohol.

Table five: Blood Alcohol Content and presence of drugs in drivers responsible for collision

Age of Driver	BAC Levels	Drugs
17 to 25	10	
	158	
	191	
	c.120	
	Significantly intoxicated*	
	10	
	169	Presence of cocaine
	c.200	Presence of cannabis
	97	Presence of cannabis; Diazepam 2.12
26 to 45	c.280	
	200	Presence of cannabis
		Diazepam; tramadol, presence of hydracodeine
	119	Presence of cannabis
	179	
		Presence of anti-psychotic drugs
	235	Presence of cannabis; sedative (Chlordiasepoxide .20mg/l)
46 to 70		Presence of prescribed anti-depressant and sedatives
	329	

NB: In Northern Ireland the legal limit of blood alcohol content for a vehicle driver is 80 mg per 100 ml.
**PSNI records indicate that the driver was significantly intoxicated at the scene of the collision such that he could not remember the collision.*

12. Seatbelts

There were n.18/51 (35.3%) cases where the vehicle occupant was not wearing a seatbelt at the time of the collision. In n.26 cases (51%) the occupant wore a seatbelt. In one case the driver of a tractor was outside the tractor when it fell on him. There were n.6 cases (11.7%) where the information regarding seatbelts was not available. In 61% (n.11/18) of the cases where no seatbelt was worn at the time of the collision, the driver was not wearing a seatbelt and in 39% of cases the passenger (and one OV driver) was not wearing a seatbelt.

Table six: Seatbelts worn

Seatbelt	Frequency	Percent
No information	6	11.7
No seatbelt	18	35.3
Tractor (n/a)	1	2.0
yes	26	51.0
Total	**51**	**100.0**

12.1 Seatbelt usage and impacts

The dynamics of collisions with regards seatbelt usage are important in order to limit the potential injuries of a vehicle occupant. According to an FSNI investigator, when a seatbelt is worn, there is effectively one impact, which is when the vehicle collides with another object. In that situation, because the person is held by the seatbelt and possibly has further protection from the release of an airbag, the impact is contained. However if no seatbelt is worn then there are potentially three stages of impact. The first is when the vehicle collides either with an inanimate or moving object. The second stage occurs when the person impacts the inside of the vehicle because there is nothing to hold him/her, the third stage occurs within the body when the internal organs, (such as the brain hitting the skull) are damaged and these three impacts are far more likely to cause injury than if the person were wearing a seatbelt. Also in this situation, it is likely that the person is thrown from car, either exiting the side or back window. According to the investigator, typically is it less likely that the person would exit through the front window.

13. Primary Cause of Collision

In n.24/48 (50%) cases the driver lost control of the vehicle and this caused the collision. In n.17/48 (35.4%) of the cases, no other vehicle was involved – i.e. they were single vehicle collisions.

In n.18/48 (37.5%) cases the vehicle responsible for the collision either veered onto the opposite lane or was in the opposite lane of travel and collided with an oncoming vehicle. In three of these cases, the driver was overtaking and collided with an oncoming vehicle.

There were two cases where black ice appeared to be the primary cause, in one case the truck veered off the road and turned over, in the second case the driver applied the brakes, but the ice on the road may have caused the driver to lose control and the car to rotate into an oncoming vehicle.

In one case the vehicle was a tractor which overturned on top of the driver who had previously exited from the cab. In another the driver died of natural causes, no other vehicle was involved, however, as there was no report, there is no explanation as to the cause of the collision.

13.1 Contributory causes of the collision

The contributory causes of the collision include impact with an obstacle such as a telegraph pole, tree or fence exacerbated by the vehicle overturning which occurred in n.10 cases (21%). As mentioned previously, there were n.7 (14.6%) cases where one or more tyres were under-inflated or bald. Intoxication either because of alcohol or drugs may have contributed to the collision in n.18 cases (37.5%). In one case the inexperience of the driver who only had a provisional licence may have contributed to the collision. In another, the driver attempted to carry out a “hand-brake” turn which may

have contributed to the loss of control of the vehicle, although in this particular case the loss of control may have been exacerbated because the driver was intoxicated.

Speed was a contributory factor in n.7/48 cases (14.6%). As mentioned previously, the investigators may drive through the scene either to show/indicate that the bend can be safely taken at a significantly higher speed than the calculated/estimated speed at loss of control under the same conditions at the time of the collision, or to confirm to a degree that the calculated/estimated speed is in the general area of the "maximum" speed for the bend under the same conditions at the time of the collision. In these circumstances, the investigators try to conduct the drive through under similar conditions, i.e. road dry/wet daylight/dark etc.

The limitations of these calculations are such that they exclude other contributory factors - for example the driver identified as speeding at 50 mph in a 40 mph zone may have been doing up to 80 mph - the reason for that is that there was CCTV footage of him doing those speeds prior to the collision. But the evidence from the calculations can only be based on what is available from the scene. Another case where the speed was identified as a minimum of 59 mph in a 60 mph zone, does not take into consideration that the driver was being followed by the police because of what they considered dangerous driving. In both cases the drivers lost control of the vehicle.

As previously mentioned, there were four cases that did not require reports from the Road Traffic Collision Investigation Unit because the drivers died of natural causes and the collisions were single vehicle. However there were five cases included in the reports which were subsequently subject to Coroners' Inquests. These indicated that were three cases where the deceased suffered a heart attack either prior or during the collision. In two of these cases, no other vehicle was involved, while in one case the driver veered onto the opposite lane and collided with two other vehicles. In one case the driver may have suffered a stroke prior to the collision with another vehicle, while in another case the driver may have had an epileptic fit prior to veering onto the opposite lane and colliding with two other vehicles. In total of the 51 fatalities, 9.8% were due to previous medical conditions.

14. Summary of the report

This report analyses n.48 cases of collisions with n.51 vehicle occupant fatalities, equal to 77% of the total in Northern Ireland between 2011 and 2012 which were attended by the Forensic Science Northern Ireland (FSNI) Road Traffic Collision investigators. There were further four cases in which no report was required because the collisions were single vehicle and the driver died of natural causes. . Based on the information available in the FSNI files, there were 67 other occupants injured. These injuries ranged from serious to slight.

There were n.26 Coroners' inquest reports requested and the findings were made available in relation to the drivers involved in the collisions analysed in this study. The information for the Coroners' verdicts included the Blood Alcohol Contents and evidence of drug use as well as other details regarding medical conditions which may have contributed or caused the collision and subsequent death of the drivers.

- In n.24/48 (50%) cases the driver lost control of the vehicle and this caused the collision. In n.17/48 (35.4%) of the cases, no other vehicle was involved – i.e. they were single vehicle collisions.

- In n.18/48 (37.5%) cases the vehicle responsible for the collision either veered onto the opposite lane or was in the opposite lane of travel and collided with an oncoming vehicle. In three cases, the driver was overtaking and collided with an oncoming vehicle.

- Overall, there were n.9/48 (18.8%) cases where vehicle defects may have contributed to the collision.

- Intoxication either because of alcohol or drugs may have contributed to the collision in n.18/48 cases (37.5%).

- In n.8/15 cases where the driver was aged between 17 and 25 years, the driver had consumed alcohol over the legal limit, ranging from 97mg per 100 ml to approx. 280mg per 100 ml. In four of these cases, evidence of drugs e.g. cocaine, cannabis or Diazepam were found in the driver's blood. In one case evidence of the anti-depressant drug Citalopram was found. In two other cases the driver had only consumed 10 mg of alcohol per 100 ml but one of the drivers was only 17 years of age. In total n.11/15 (73%) of young drivers had consumed alcohol and/or drugs.

- Speed was a contributory factor in n.7/48 cases (14.6%).

- Of the 51 fatalities, n.5 (9.8%) were considered to be due to previous medical conditions.

- There were n.18/51 (35.3%) cases where the vehicle occupant was not wearing a seatbelt at the time of the collision.

15. Conclusions

Driver licencing in Northern Ireland

In order to drive a car, the driver must have a valid driver licence. In Northern Ireland, learner drivers may obtain a 'provisional' licence from the age of 17 years[3], which allows them to drive (except on motorways) while displaying an L Plate and being supervised by another driver who is at least 21 years old and has held a full licence for at least three years.

To gain a full driving licence, a learner driver must pass the driving test, which comprises a theory test and practical test. The theory test, which must be taken before the practical test, which is in two parts, a multiple choice test which consists of 50 questions of which 43 must be correctly answered and a hazard perception test the pass mark for the car (and motorcycle) test is at least 44 out of 75. The practical driving test includes an eyesight check, safety questions, and about 40 minutes of on road driving which will include a section of independent driving and one of three reversing exercises selected by the examiner.

From the report, a small percentage (14.6%) drove at excessive speed - a significant proportion (37.5%) were either drunk or on drugs, but overall, 50% lost control and a further 37.5% either veered onto the opposite lane or was in the opposite lane of travel and collided with an oncoming vehicle. Based on this information, it would appear that there is an issue with skills and how to manage a vehicle in difficult situations. That raises the question of whether the lack of sufficient training and not preparing young people how to handle a vehicle on our roads especially in emergency situations is the underlying cause of road fatalities.

In Northern Ireland initial training is being addressed and proposals for new legislation are going through the Northern Ireland Assembly to introduce Graduated Driver Licensing (GDL) which will include a mandatory minimum learning period for learner car drivers, as well as a mandatory training syllabus and logbooks for both car and motorcycle learners.

Another factor is the high number of fatalities where the vehicle occupant did not wear a seatbelt. As mentioned, there were n.18/51 (35.3%) cases where the vehicle occupant was not wearing a seatbelt at the time of the collision. Perhaps if more emphasis on the importance of wearing a seatbelt rather than focussing on speed were subject to advertising campaigns, this might raise awareness amongst vehicle occupants – both drivers and passengers.

[3] Learner drivers can take their test on their 17th birthday and are not required to take a minimum period of training or to take professional training. However, although this in theory is possible, a driver would have to have a valid professional driving licence and have passed a theory test on their birthday, once passed would have to book a practical test (the learner driver cannot book a practical test until they pass the theory test). In reality this is very unlikely.

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- Peter Saleh, Senior Engineer, Austrian Institute of Technology, Austria
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Annex one: Profile and cause of collisions

Age	Sex	Vehicles involved	BAC or drugs Driver	Primary cause	Cause of fatality and/or contributory factors to collision
Under 5 years	Female	Single car		Driver lost control while negotiating left hand bend, left road and collided with a telegraph pole, then a mature tree and overturned onto its nearside	Car sustained severe impact at the rear nearside door position deforming the structure and penetrating into the rear passenger section where the child was seated. Abrasion indicates that the child's seatbelt was secured at the time of the collision
	Female	2 cars		Driver overtook prior to a dip and collided with oncoming car	Passenger's seatbelt inappropriately latched (no shoulder straps)
15 to 20 years	Female	2 vehicle		Severe right steer while overtaking caused loss of control and veered into oncoming cattle truck	Possible under inflated rear tyres may have exacerbated loss of control (Driver also killed)
	Female	2 vehicle		Driver lost control, rotated sideways into the path of an oil tanker	Front offside tyre incorrectly fitted plus bald and under inflated rear offside tyre, driver not wearing seatbelt
	Male	2 vehicle	10 mg	Driver lost control, rotated sideways into the path of an oil tanker	Front offside tyre incorrectly fitted plus bald and under inflated rear offside tyre, driver not wearing seatbelt (passenger also killed – see above)
	Male	Single car	158mg	Lost control, car hit wall and came to rest on its roof	Driver was not wearing a seatbelt and was thrown from the car
	Male	Single car		Lost control and crashed into a wall. Driver had provisional licence, no insurance	Inexperienced driver.
	Male	Single car	191mg	Lost control negotiating a moderate right hand bend, hit a ditch, then a tree and then slammed into a large tree	Under-inflated front nearside tyre. Driver may have attempted to negotiate bend at or above 40 mph - at a relatively high speed considering the nature of the bend.
	Female	Single car		Lost control, impacted tree and overturned.	Attempting to negotiate a left bend at a speed that was too high for the conditions. (Driver - no insurance or road tax)
	Female	Single car	c.120 mg	Lost control on a right hand bend, hit a gate support pillar and continued into a field and overturned	Hit verge, ground fell away and the speed of the car caused it to become airborne (c.8.7 metres) car rolled and overturned. Driver 50% over drink limit.

Annex one (cont): Profile and cause of collisions

Age	Sex	Vehicle	BAC or drugs Driver	Primary cause	Contributory factors to collision
21 to 25 years	Male	Single car	Yes (BAC not available)	Lost control on bend, car rolled to its offside and overturned on its roof, then collided with a message sign	Driver intoxicated, speeding above the posted speed limit and rear tyre under-inflated
	Female	2 vehicle		OV driver of jeep and trailer lost control, crossed onto opposing lane and impacted the oncoming car in which the deceased was travelling	Passenger in oncoming car was not wearing seatbelt
	Male	2 vehicle	10mg	Car veered on to opposing lane and impacted a Heavy goods vehicle	Not wearing a seatbelt and exited vehicle
	Male	Single car		Lost control going over crests on the road, car tumbled and came to rest on its roof	Excessive speed
	Male	Single car	169mg + presence of cocaine	Lost control, hit a pole and wooden fence. Deceased was fatally injured by fence	Attempting to do a hand brake turn while speeding and under the influence of alcohol
	Male	2 vehicle	c.200 mg presence of cannabis	Pulled out into the path of an oncoming car without slowing down	Driver and passenger (who subsequently died of his injuries) were not wearing seatbelts. (Passenger was also killed)
	Female	2 vehicle		Negotiating right hand bend, driver lost control, car crossed central reservation and impacted oncoming car	Collision resulted in the car being split into two pieces, deceased not wearing seatbelt and was ejected from rear seat of car
	Male	Single car		lost control, left road and hit tree	
	Male	2 vehicle	97mg presence of cannabis, Diazepam 2.12 mg/l	Lost control on a left bend, driver steered severely right and impacted oncoming car	Possible under inflated/bald front nearside tyre, also bald was the rear offside tyre; rear nearside tyre under inflated with nail embedded in the tread region. Anti-roll bar link was missing; not wearing seatbelt.
26 to 33 years	Male	2 vehicle	c.280 mg	Driver responsible for the collision was on the wrong side of the road and collided head on with the deceased's car	Driver collided with a car under the influence of alcohol
	Male	2 vehicle	c.200 mg presence of cannabis	Pulled out into the path of an oncoming car without slowing down	Driver and passenger (who subsequently died of his injuries) were not wearing seatbelts (Driver was also killed)
	Male	2 vehicle		Crossed onto the opposite lane and collided with a van	not wearing seatbelt
	Female	2 vehicle	Prescribed drugs present	Driving on the wrong side of the road and collided with a lorry	Diazepam tramadol also present hydracodeine possibly produced a degree of sedation causing distraction

Annex one (cont): Profile and cause of collisions

Age	Sex	Vehicles involved	BAC or drugs Driver	Primary cause	Contributory factors to collision
35 to 45 years	Male	Single car	119mg Traces of Cannabis	Lost control and impacted a telegraph pole then a tree before rolling over onto its roof	Steered left on a right hand bend and swerved. Brakes were applied during the course of the collision
	Male	Single car	179mg	Lost control on right hand bend, car impacted grass verge, rotated clockwise, overturned onto its roof	Over corrected on the turn and crossed the road onto a grass verge
	Female	2 vehicle		Driver lost control and car rotated along a crash barrier continuing a clockwise rotation before impacting a second car	
	Male	2 vehicle	Presence of anti-psychotic drugs	Car steered severely into the opposite lane into the path of an oncoming bus	Not wearing seatbelt and vision possibly affected by the sun.
	Male	2 vehicle	235mg + traces of cannabis + sedative (chlordiazepoxide) .20mg/l	Car crossed onto opposite lane, impacted oncoming car, became airborne and travelled 32 metres before contacting a field. Driver ejected from car	Not wearing seatbelt and intoxicated
	Male	2 vehicle		Severe right steer while overtaking caused loss of control and veered into oncoming cattle truck	Possible under inflated rear tyres may have exacerbated loss of control (Passenger was also killed)
49 to 55 years	Male	Waste truck		Lost control, veered off road which was covered in black ice, rolled upside down.	Driver trapped by clay type earth that filled the cab which made it difficult for firefighters to pull him out.
	Male	Single		Lost control while trying to avoid standing water on the road	Possibly due to bald rear nearside tyre coupled with presence of standing water contributed to the car moving to the left and resulted in the car travelling towards a wall.
	Male	2 vehicle	Presence of prescribed anti-depressant and sedatives	Car moved to the right, rotating into the path of an oncoming van	Ice on the road may have caused loss of control. Driver applied brakes prior to collision, may have been affected by prescribed medicine
	Male	2 vehicle		Lost control and spun into the path of another car, flipped and landed upside down.	Emergency braking, caused car to spin due to incorrect fitting of load sensing proportioning valve + lack of load caused rear wheel to lock.
	Male	3 vehicle		Driver veered onto the opposite carriageway and hit an oncoming car then a second oncoming car	Possible epileptic seizure prior to collision

Annex one (cont): Profile and cause of collisions

Age	Sex	Vehicles involved	BAC or drugs Driver	Primary cause	Cause of fatality and/or contributory factors to collision
61 to 70 years	Male	Single car		Lost control on slight right hand bend, car impacted grass verge, rotated clockwise, overturned on its roof and came to rest in a canal.	Driver drowned, possibly not wearing seatbelt
	Male	single car	329 mg	Lost control and careered into a river, driver drowned	Intoxicated
	Male	single tractor		Tractor left road and tipped over. Deceased was trapped underneath	Tractor moved forward while driver was exiting
	Male	2 vehicle		Driver responsible for the collision was on the wrong side of the road and collided head on with another car	Steered right on a left hand bend
	Male	2 vehicle		Pulled out into the path of an oncoming car	Deceased not wearing seatbelt
	Male	Single car		Death due to pre-existing medical condition	Heart Failure
	Female	2 vehicle		Narrow road, head on collision with car on the deceased passenger's side hitting a tree	
	Female	2 vehicle		Drifted onto grass verge, lost control and subsequently drove into the opposite lane resulting in a head on collision with another car.	
	Male	2 vehicle		Car overtook on a crest and impacted an oncoming car	Front seat passenger in oncoming car not wearing seatbelt
71 to 90 years	Male	3 vehicle		Driver distracted, crossed onto the opposite lane and collided with two cars, one of these cars was driven by the deceased	The deceased was not wearing seatbelt
	Male	Single car		Lost control and left the road onto a field	Suffered heart attack while driving
	Male	3 vehicle		Driver veered into opposite lane and collided with two oncoming cars	Deceased suffered possible heart attack
	Female	2 vehicle		Driver veered onto the opposite carriageway and hit an oncoming car.	Possible stroke prior to collision. Deceased not wearing seatbelt
	Male	2 vehicle		Driver responsible for the collision was on the wrong side of the road and collided head on with another car	Driver may have had lapse of concentration