

Road Casualties: Comparing Police Data (STATS19) with Other Sources of Information

Issue

The accidents and casualties data for Wales are based on personal injury accidents that are reported to the Welsh Government and then the Department for Transport (DfT) by the police. So these data are incomplete to the extent that personal injury accidents are not reported to the police; or are reported to the police but the details of the accident and casualties are not recorded accurately, or indeed not recorded at all.

Sources of mis-recording of road accidents and casualties in Wales

- Not all road accidents are "reportable" for the Stats19: for example:
 - When no injury occurs (a damage-only accident); or
 - The accident take place on private land away from the public highway; or
 - The collision was a deliberate act, for example a suicide or attempted murder.
- Some accidents are reported that should not be, for example damage-only accidents where someone involved reports the collision to the police so as to provide backing for an insurance claim.
- There is no legal obligation for drivers to report road accidents to the police, provided the parties concerned exchange personal details at the scene. *The requirements to stop, provide information and report a road traffic accident are set out in the Road Traffic Act 1988 (section 170), as amended by the Road Traffic Act 1991 (Schedule 4).*
- Some accidents that should be reported by drivers to the police are not reported. This may be because the driver is ignorant of the legal requirements or is reluctant to do so, for example, if the driver has been drinking or is uninsured.
- The police do not record all accidents reported to them. It has been suggested that up to one fifth of casualties reported to the police in England are not recorded in the Stats19 system; and
- It is often difficult for a police officer to judge whether a casualty should be classified as having a serious or slight injury. For example, the full severity of the injury may not be apparent until some time after the collision when the police officer is no longer present. Research has found that the police tend to underestimate the severity of the injury.

This is a potentially serious issue concerning the quality of the road casualty data. If this under-reporting is unrecognised, then the true magnitude of any road safety problems are not known, or could be underestimated. This could in turn lead to incorrect prioritising of policy measures to improve road safety, or could lead to less efficient or inappropriate countermeasures.

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The impact could, for example, be:

- That under reporting is greater for certain types of accident and casualty; and this would lead to a lack of priority in dealing with the relatively under-reported types. For example comparison of Stats19 data with hospital admissions data shows that the Stats19 relatively under represents serious injury casualties from cyclist accidents, particularly if no other vehicle is involved.
- If the degree of under-reporting changes over time, then the Stats19 data will not be a representative measure of progress towards meeting road safety casualty reduction targets. It has been argued that the divergence (in England) between falling levels of serious casualties from the Stats19 as compared with level of rising hospital admissions for road casualties suggests that the relative extent of under-counting in the Stats19 data is increasing over time.

The first point to note is that this is a long standing issue which affects the road casualty figures for both Wales and for Great Britain. It is also a problem internationally as most countries' road casualty data are based on police reports and so are affected by these issues (for discussion see Derriks and Mak, 2007¹); this is particularly important as globally, road traffic fatalities are consistently amongst the top three causes of death for people aged between 5 and 44 years old, with a global total of 1.3 million deaths in 2004 and between 20 to 50 million traffic injuries (see WHO 2009²).

In Great Britain, this issue has been raised in a number of policy and statistical contexts, and these discussions are summarised in the UK Statistics Authority Assessment³ of road casualty statistics produced by the DfT. Examples of occasions where this issue has been raised include 2006 National Statistics Quality Review of Road Accident Statistics⁴ or the House of Commons Transport Committee October 2008 report⁵ that expressed concern about the quality of the Stats19 data.

As a result of these concerns the DfT have estimated the total number of road casualties in Great Britain, including those not reported to the police. Their estimate is mainly based on results from the National Travel Survey⁶ (NTS), where questions about road accidents were added to the survey in 2007, giving four years of data to analyse. Taking the period 2004 to 2010 they estimate that the annual average level of traffic casualties was in the range of 660 to 800 thousand, with a central estimate of 730 thousand; this can be compared with an annual average of 237 thousand casualties of all severities reported to the police and recorded by the Stats19 survey over this 7 year period. That is, that the 'true' level of casualties is around over three times higher than the figure from the Stats19 statistics.

<http://www.dft.gov.uk/statistics/releases/reported-road-casualties-great-britain-annual-report-2011/>

¹ DERRIKS, H.M. & MAK, P.M. (2007): UNDERREPORTING OF ROAD TRAFFIC CASUALTIES, Harry M. Derriks and Peter M. Mak, Ministry of Transport, Public Works and Water management, The Netherlands, June 2007. Published by the OECD at: http://www.oecd.org/document/53/0,3746,en_2649_34337_2002165_1_1_1_1,00.html

² WHO (2009): Global status report on road safety 2009
http://www.who.int/violence_injury_prevention/road_safety_status/2009/en/index.html

³ UK Statistics Authority (July 2009): Road Casualty Statistics, Department for Transport, Assessment Report 4
<http://www.statisticsauthority.gov.uk/assessment/assessment/assessment-reports/index.html>

⁴ DfT (June 2006): NSQR Series Report No.45 - Review of Road Accident Statistics
<http://www.ons.gov.uk/about-statistics/methodology-and-quality/quality/nat-stats-qual-revs/qual-revs-by-theme/travel-and-transport/index.html>

⁵ House of Commons (October 2008): Transport Committee - Second Special Report Ending the Scandal of Complacency: Road Safety beyond 2010
<http://www.publications.parliament.uk/pa/cm200809/cmselect/cmtran/422/42202.htm>

DfT response to the recommendations of this report in relation to Stats19 data:
<http://www.publications.parliament.uk/pa/cm200809/cmselect/cmtran/136/13604.htm>

⁶ For more information about the National Travel Survey, including a copy of the questionnaire, the 2010 results and a description of the methodology, please see the documents at the following link:
<http://www.dft.gov.uk/pgr/statistics/datatablespublications/nts/>

This analysis can be repeated for Wales, and it is repeated in the section below, in this case using results from the Crime Survey for England and Wales (CSEW) rather than the National Travel Survey. This is because the sample size in the CSEW is rather larger. This analysis shows a similar result: The CSEW suggests that there were around 39 thousand road traffic casualties in Wales during 2010 (strictly October 2009 to September 2010) for adults aged 16 and over. This can be compared with the Stats19 figure of 9 thousand total road traffic casualties for adults in Wales during 2010.

Differences of this scale show that the two data sources are, in fact, measuring different things. And the two data sources will both contain 'issues' about the measurement of data that may, or may not, exacerbate the differences between them.

In other words, these differences are a reminder that the Stats19 data are reporting about road traffic accidents and casualties that result in police involvement; and that these are the 'tip of the iceberg' of the totality of road traffic collisions and/or accidents. This totality will cover everything from minor damage-only collisions to, the comparatively rare, major traffic incidents; some of this totality will involve insurance companies because an insurance claim is made, some will involve the Health Service because people go to hospital or to their GP following the accident, and some will involve the police because the accident has resulted in serious injuries or in traffic disruption (or someone involved wants to report an accident as part of making an insurance claim).

So the difference between the survey results and the Stats19 results are just an acknowledgement of the nature of the reality of traffic incidents (to use a neutral term): there a great many very minor incidents together with a small number of more serious incidents which 'call-in' official involvement; and for practical reasons the boundary between them is defined by whether or not the police get involved. It is perhaps analogous to the way that that Crime Survey for England and Wales produces quite different figures for the incidence of crime than are produced by the official police reported crime statistics.

Another way of looking at this situation is to list the strengths and weaknesses of the two data sources:

Crime Survey for England and Wales

Positives

- A large survey that is a representative sample of people aged 16 and over living in private households in (England and) Wales.
- Produces results about involvement in road accidents for Wales that are broadly in line with those for England, and are broadly in line with results for Great Britain from the National Travel Survey.
- It asks about people's experience of road traffic accidents (see **Annex One** for a list of the questions)
- It is not affected by the way that people report traffic accidents to the police and way that police procedures might affect recording of traffic accidents

Negatives

- The results may be affected by 'telescoping'. What this means is that is while the questions ask about involvement in accidents, and any injuries, over the last 3 years and the over the last 12 months; then, because an accident is a dramatic life-event, people recall earlier accidents and injuries as having taken place during these periods. So the effect of telescoping (which is a general issue in surveys) is to exaggerate the prevalence of road traffic accidents.
- The results might also be affected by the opposite effect of people forgetting that they were involved in a traffic accident; while this can apply in a general way to questions asked in a survey, it seems unlikely for traffic accidents given their dramatic impact on most people, whether or not their were injured.
- The results will not cover fatalities.

- The relatively small numbers in the sample that have been involved, or injured, in road traffic accidents means that it will not produce any accurate information about the incidence of the rarer, more serious accidents/collisions that result in seriously injured casualties and fatalities.
- Despite the wording of the questions (as shown in Annex One), work by the DfT (on the NTS data) has shown that some of the accidents reported by respondents are outside the scope of the Stats19; for example the accident takes place on private land (like supermarket car parks); or it is a pedestrian falling over, without any involvement from vehicles; or the traffic accident took place outside the Wales, or even outside the UK; or the respondents to the survey reported having injuries when in fact, they didn't have any.

Stats19 data

Positives

- Covers road traffic accidents that are reported to the police
- It will cover the rarer, more serious accidents which result in more serious injuries, in deaths, or in serious traffic disruption.
- It will also cover accidents that tend to be well-reported, for example collisions between more than one motor vehicle (or motor vehicle and pedestrian/pedal cyclist) that result in serious injury or death.
- It provides a lot of detail about the circumstances of each accident.

Negatives

- The systematic differences in the way that people report, and do not report, accidents to the police means that some sort of serious accidents are systematically under recorded in the Stats19 data, for example pedal cyclist accidents that do not involve other vehicles.
- The process of data acquisition can be affected by police procedures, for example in some cases the police have found it difficult to record accurate grid references for the location of accidents.

So in conclusion, the Stats19 is a measure of 'the road traffic accidents that are of sufficient significance to result in police involvement'. And for most policy purposes that is the information that is needed, firstly because remedial action will generally only need to be taken in the case of more serious accidents, and because often this action can often only be taken on the basis of the detailed information about each individual accident. It becomes an issue for road safety if:

- The process of police involvement means that certain sorts of serious accidents are under-reported, thereby causing an inappropriate policy response. For example there is clear evidence that pedal cycle accidents that do not involve other vehicles are only infrequently reported to the police, that means that the true risks of serious injury from pedal cycling are systematically underrepresented in the official stats19 data.
- The same is true, to a lesser extent, for pedestrian casualties.
- The other road safety issue is, perhaps, where a large number of minor collisions might be an advance indication of road safety issues at a particular location. As these would not be covered by the Stats19 data, then police, local authorities and the Welsh Government would not be aware of this situation and so would not be able to make any pre-emptive action before a more serious collision or accident takes place that results in a serious injury or death.

The following three sections of this article look at the issues set out above:

- **The first section** provides an indication of the totality of road accidents in Wales. It is based on figures from the Crime Survey for England and Wales. It also shows the comparable figures from the Stats19 data to show the relative size, if you like, of the 'tip of the iceberg' that represent the accidents that tend to have more serious consequences resulting in police involvement, as compared with the larger group of traffic collisions or accidents that were resolved without any police involvement at all.

- **The second section** compares hospital admissions resulting from road traffic accidents with the 'seriously injured' casualties recorded by the Stats19 data. Both of these come from administrative data sources reflecting procedures carried out by hospitals in Wales and by police forces in Wales. There is no reason to expect the resulting figures to be identical, but as they are measuring the administrative outcomes from the same process (that is people getting seriously hurt in road traffic accidents) then there should be a broad correspondence (to put it no more strongly than that) between the two sets of figures.
- More interestingly, any systematic divergence between the two sets of administrative data may, however, show the circumstances when serious road accidents are less likely to be reported to the police.
- **The third section** compares police Stats19 road traffic fatalities data with the official mortality statistics.

Summary of results, conclusions and further work

Section 1: The totality of traffic incidents in Wales

This section provides an estimate, both of total levels of involvement in road traffic accidents and the injuries arising from road traffic accidents. It compares this with the police reported road traffic casualties. It shows that for adults aged 16 and over and resident in Wales, during 2010 there were around:

- 200 thousand adults estimated to have some sort of involvement in a road traffic accident;
- 39 thousand of these were injured, in some way; and this can be compared with
- 9 thousand casualties of all types in accidents reported to the police.

This suggests that, as it appears that road accidents have a greater incidence in Wales than had been previously suspected, then one piece of further work might to investigate this further in order to establish more clearly the nature this involvement and these injuries that are not reported on the Stats19; and this would form the basis of deciding if, and how, this finding should be used to inform road safety policy in Wales.

Section 2: Hospital admissions data on road casualties in Wales

There are a number of systematic differences between the two administrative sources of data about serious injuries arising from road accidents. These differences might throw light on the sorts of serious accidents which may be under-reported in the Stats19 data. For example Stats19 data are lower than hospital admissions for single vehicle accidents ('no other vehicle involved'). This is the case for car occupants; it is even more the case for motor cyclists and for pedal cyclists, where the Stats19 records 8 cases compared with hospital admissions of 164.

Some other differences are that the hospital admissions figures show a higher proportion of children pedal cyclists being admitted to hospital as compared with seriously injured casualties from the Stats19. In a similar way, a higher proportion of elderly car occupants are being admitted to hospital as compared with the seriously injured casualties from the Stats19.

Section 3: Road Traffic Fatalities

This section compares the Stats19 figures on road traffic fatalities with the official mortality data. The two series are of similar magnitude, even though they do not match in any individual year. There is no tendency for either series to be systematically lower or higher than the other. And there is no systematic difference in the trend between these two data series over time, they both, broadly, fall during the 2000's. It is of note that the very low 2010 fatalities figure coming from the Stats19 data was not matched by the mortality data, which showed a low figure, but not an exceptionally low figure.

Section 1: The totality of traffic incidents in Wales

Table 1 below provides a survey-based estimate, both of involvement in road traffic accidents and injuries from road traffic accidents. It compares this with the police reported road traffic casualties. It shows that for adults aged 16 and over and resident in Wales, during 2010 there were around:

- 200 thousand adults estimated to have some sort of involvement in a road traffic accident;
- 39 thousand of these were injured, in some way; and this can be compared with
- 9 thousand casualties of all types in accidents reported to the police.

It is difficult to carry out further analysis of the results from these two sources of information about involvement in and injuries from traffic accidents, as differences of this size simply suggest that these two data sources are measuring different things.

One immediate policy-related conclusion is, however, that the CSEW data does show that the experience of involvement in road traffic accidents and the subsequent injuries (for definitions see the box below) are more pervasive within Welsh society (and other societies) than had previously been thought when our views about this issue were framed by the police-reported figures about road accidents from the Stats19 system. This might affect opinions about the relative importance of road safety policy. This view will hold even if we cannot use the CSEW data for taking specific road safety policy interventions because it is insufficiently precise or detailed, and because it will only partly cover the most serious accidents resulting in serious injuries and deaths.

This conclusion is robust because the differences between the CESW data and the Stats19 data are so large that they will not be eliminated by the 'negatives' listed against the CSEW in the 'issues' section above. They are also not affected by whether the CESW results used are for the most recent 12 months, as is done here, or for the previous 3 years.

Definitions of consequences of road accidents in the CEW, from Annex One:

Involvement: "...have you been in any type of road accident, no matter how minor? Please include any accidents in which you were involved as a pedestrian, driver, passenger, cyclist or motorcyclist, even if no other party was involved. Only include incidents that happened on a public road, including pavements and cycle lanes on the public road."

Injury: "...have you been in a road accident on a public road in which you were injured in some way? Please include incidents where you were in a vehicle, on a bicycle or motorbike, or a pedestrian."

Table 2 and Table 3 show the results from the CSEW for Wales, for England and for England and Wales together. The CESW data shows that large minorities of some age groups were involved in traffic accidents. Table 2, for example, shows that around a quarter of people in Wales aged between 20 and 34 had been involved in a road traffic accident at some point in the last 3 years; and that around 8 per cent of this group had been injured. While these figures seem high, the survey produces similar figures for England, and this order of magnitude is confirmed by similar results from the National Travel Survey.

It is possible to make the following remarks about the data shown in these tables:

- The CESW data show a decline in involvement in road accidents in the older age groups as compared with younger groups, as is also shown, very broadly, by the Stats19 data. The exception is a curious peak in the incidence of both involvement and injuries for the aged 55 to 64 age group compared with the younger aged 45 to 54 group. This is not shown by the Stats19 data in Table 1.
- The figures for involvement suggest 'telescoping', as described above, with the figures for most age groups for the last 12 months being higher than a third of the figures for the last three years. It is not possible to tell if there has been any telescoping from earlier periods boosting the 'last

three years' numbers; for example if an accident from, say, 5 years previously is recalled as having happened more recently.

- The figures for injuries do not show any evidence of telescoping as the figures for the age groups from 20 to 54 for injuries over the last 12 months are very broadly around a third of the figures for over the last three years. For young people aged between 16 and 19 it is likely that the involvement and injury figures for the last 12 months should be closer to the three year figure as the Stats19 data show how risk of becoming a road casualty increases from age 16 onwards.
- The figures for older people are less reliable than those for younger age groups, that is for the people in the aged 75 to 84 group and especially the aged 85 and over group. This is because of the (1) smaller sample sizes in these groups (as shown by the 'unweighted base' column in these tables which shows the sample sizes of the CSEW), (2) the lower incidence of involvement in accidents and (3) the Stats19 data in Table 1 show how these older groups are more likely to be a serious casualty, or fatality, than is the case in younger groups; and this implies that many older people injured in road traffic accidents will not be in a position to report it, subsequently, to a survey like the CSEW.

What next? If the results of the CESW suggest that road accidents have a greater incidence in Wales than had been previously suspected, then it might be useful to investigate this issue in more depth. For example Annex One shows the full suite of questions asked about road safety and accidents, and this could be looked at to see what light it might throw on the nature of people's involvement and the outcome of any injuries. It might be possible to take this further with some follow-up research to establish more clearly the nature of this involvement and these injuries that are not reported on the Stats19; and this would form the basis of deciding if, and how, this finding should be used to inform road safety policy in Wales.

Table 1: Estimates of the total numbers of road traffic casualties and police reported casualties, Wales 2010

Numbers and percentage

	CSEW - involvement in road accidents in last 12 months			CSEW - injuries in road accidents in last 12 months		Police reported casualties (Stats19) - 2010		
	Population, mid-2011	% involvement	Numbers involved	% involvement	Numbers involved	Total casualties	Seriously injured casualties	Killed
All people	3,063,758	..	..	..	..	9,955 *	998	89
All adults (Age 16+)	2,507,917	7.8	197,000	1.6	39,000	8,887	894	85
Age 0-15	555,841	..	..	..	..	1,026	104	4
Age 16-19	159,939	8.9	14,000	3.1	5,000	1,325	138	16
Age 20-24	212,576	13.7	29,000	3.6	8,000	1,432	153	14
Age 25-34	360,865	11.3	41,000	2.3	8,000	1,742	149	12
Age 35-44	393,587	11.6	46,000	1.3	5,000	1,516	126	15
Age 45-54	423,033	5.4	23,000	1.0	4,000	1,218	122	11
Age 55-64	391,524	6.1	24,000	1.5	6,000	810	85	4
Age 65-74	302,703	3.2	10,000	0.5	2,000	474	56	4
Age 75-84	188,359	3.3	6,000	0.3	600	304	53	7
Age 85+	75,331	0.5	300	0.0	0	66	12	2

Source: CSEW is the 'Crime Survey for England and Wales' covering period October 2010 to September 2011

Source: Police reported road casualties (Stats19): Welsh Government; population: Stats Wales

* Note: total of 9,955 includes 42 casualties where the age was unknown, all slight casualties

Table 2: Crime Survey for England and Wales: Involvement in road accidents, October 2010 to September 2011

Numbers and percentage

	England			Wales			England and Wales		
	Unweighted base	% Last 3 years	% Last 12 months	Unweighted base	% Last 3 years	% Last 12 months	Unweighted base	% Last 3 years	% Last 12 months
All adults	41,229	16.5	8.2	3,730	15.6	7.8	44,959	16.4	8.2
Males	18,523	18.9	9.5	1,675	18.7	9.1	20,198	18.9	9.5
Females	22,706	14.1	6.9	2,055	12.9	6.7	24,761	14.1	6.9
Age 16-19	1,430	17.6	9.8	120	12.7	8.9	1,550	17.3	9.8
Age 20-24	1,950	23.2	11.1	189	25.1	13.7	2,139	23.3	11.2
Age 25-34	5,695	20.3	10.5	461	24.8	11.3	6,156	20.5	10.6
Age 35-44	7,278	19.5	9.5	579	19.9	11.6	7,857	19.5	9.6
Age 45-54	6,825	17.6	9.0	574	12.3	5.4	7,399	17.4	8.8
Age 55-64	7,132	14.3	6.9	714	13.7	6.1	7,846	14.3	6.9
Age 65-74	5,834	9.3	4.2	603	7.0	3.2	6,437	9.2	4.1
Age 75-84	3,888	6.9	3.2	374	7.5	3.3	4,262	6.9	3.2
Age 85+	1,188	3.6	1.2	116	7.7	0.5	1,304	3.8	1.1

Table 3: Crime Survey for England and Wales: Injuries in road accidents, October 2010 to September 2011

Numbers and percentage

	England			Wales			England and Wales		
	Unweighted base	% Last 3 years	% Last 12 months	Unweighted base	% Last 3 years	% Last 12 months	Unweighted base	% Last 3 years	% Last 12 months
All adults	41,228	4.1	1.8	3,730	4.3	1.6	44,958	4.1	1.8
Males	18,523	4.5	2.0	1,675	4.8	1.6	20,198	4.6	2.0
Females	22,705	3.7	1.6	2,055	3.8	1.5	24,760	3.7	1.6
Age 16-19	1,429	5.3	3.2	120	3.6	3.1	1,549	5.2	3.2
Age 20-24	1,950	7.4	3.0	189	8.2	3.6	2,139	7.5	3.1
Age 25-34	5,695	5.6	2.5	461	8.0	2.3	6,156	5.8	2.5
Age 35-44	7,278	5.4	2.3	579	4.5	1.3	7,857	5.4	2.3
Age 45-54	6,825	4.1	1.7	574	3.7	1.0	7,399	4.1	1.7
Age 55-64	7,132	2.5	1.0	714	3.5	1.5	7,846	2.5	1.0
Age 65-74	5,834	1.4	0.5	603	0.9	0.5	6,437	1.4	0.5
Age 75-84	3,888	0.8	0.3	374	1.2	0.3	4,262	0.8	0.3
Age 85+	1,188	0.8	0.2	116	3.9	0.0	1,304	1.0	0.2

Source, for both tables: Crime Survey for England and Wales, Office for National Statistics (Annex One shows relevant CSEW questions)

Note for both questions: Unweighted base relates to last 3 years measure; last 12 months one will be similar

Section 2: Hospital admissions data on road casualties in Wales

This section sets out figures for road casualties admitted to Welsh hospitals as reported by the Patient Episode Database for Wales (PEDW), and compares it with the seriously injured road traffic casualty figures reported by the police in Wales on the Stats19 system.

The reasons why the hospital admissions data on road casualties and the police recorded data on seriously injured casualties should be similar:

- They are measuring the administrative outcomes from the same process, that is people getting seriously hurt in road traffic accidents, and so there should be a broad correspondence (to put it no more strongly) between the two sets of figures.

Reasons why the hospital admissions data on road casualties and the police recorded data on seriously injured casualties should **not** be similar:

- The Stats19 data definition of seriously injured is given in the box below. It is, in principle wider than admissions to hospital. So the hospital admissions figures should be a sub-set of the Stats19 figures
- But in practise, a proportion of road casualties go straight to hospital without involving the police and are admitted, either immediately or later as a result of a GP referral.
- There is evidence that some serious casualties are classified by the police, on the evidence available to them at the scene of the accident, as being slight casualties. And these slight casualties are then, subsequently, admitted to hospital.

Stats19, Seriously injured: A *casualty* is seriously injured if the injuries sustained require that he/she is detained in hospital as an 'in-patient', or sustains any of the following injuries whether or not detained in hospital: fractures, concussion, internal injuries, crushings, severe cuts and lacerations, severe general shock requiring medical treatment, injuries causing death 30 or more days after the accident. An injured casualty is coded as seriously or slightly injured by the police on the basis of information available within a short time of the *accident*. Generally, this will not include the results of a medical examination, but may include the fact of being detained in hospital, the reasons for which may vary from area to area.

Establishing whether or not the two set of figures are similar or different has, in itself, no great relevance to decisions about road safety policy; other than a broad similarity between the two sources is helpful in coming to a conclusion that both are of reasonable quality. A more interesting analysis starts with looking for any systematic divergence between these two sets of administrative data. On the assumption that if any biases and omissions in the hospital data will affect all records equally, then these divergences will show the circumstances when serious road casualties are less likely to be reported to the police.

This, as set out in the 'issue' section above, means that if these divergences result in certain types of serious road traffic casualty being underrepresented in the Stats19 data, then this situation may lead to incorrect prioritising of policy measures to improve road safety, or could lead to less effective or inappropriate policy measures.

Table 4 compares the hospital admissions with police recorded seriously injured road casualties in Wales. It makes this comparison by type of road user (pedestrian, pedal cyclist, motor cyclist and car occupant) with an 'all road users' group' covering these four groups together with other road users, that is in lorries, buses and so on. For each of these groups, it also shows the number of admissions and casualties by (1) whether or not it was a single vehicle accident ('no other vehicle involved') or involved more than one vehicle; (2) by gender and (3) by broad age band.

In summary there were 1,407 hospital admissions and 1,126 seriously injured road casualties from the Stats19 data. So the hospital admissions figure was 25 per cent higher than the casualties figure. But within this total, this table shows the following main points of similarity and difference between the two sources of information:

Single vehicle and multiple vehicle accidents:

- The Stats19 data are lower than hospital admissions for single vehicle accidents ('no other vehicle involved'). This is the case for car occupants; it is even more the case for motor cyclists and for pedal cyclists, the Stats19 records 8 cases compared with hospital admissions of 164.
- In contrast, where there was more than one vehicle involved in the accident, the resulting Stats19 casualty data are higher than hospital admissions.
- This difference meant that, overall, the hospital admissions figures were 3 per cent higher for car occupants, 18 per cent higher for motor cyclists and 133 per cent higher for pedal cyclists.
- And for pedestrian admissions and casualties, the hospital admissions were 14 per cent higher than the casualty figures.

Gender

- Despite these differences in the overall figures, the gender split was fairly similar between the two sources and reflects the gender differences in types of road user, and to a lesser extent gender differences in behaviour.
- These differences are limited for car occupants, so here, 52 per cent of hospital admission and 53 per cent of Stats19 casualties were men.
- Pedal cyclists and motorcyclists are predominantly male and this is reflected in both sets of data, with men comprising 81 per cent of pedal cyclist hospital admissions compared with 83 per cent of seriously injured casualties from the Stats19 data. The corresponding figures for motorcyclists were 92 per cent and 90 per cent respectively.
- For pedestrians the differences reflect gender differences in behaviour. Here some 61 per cent of hospital admissions were men compared with 60 per cent of seriously injured casualties from the Stats19. Apart from the general risk factors such as age (either young or old), one of the specific risk factors associated with becoming a serious pedestrian casualty is drinking alcohol, which lead to 'spikes' in the number of pedestrian casualties around 11pm and 2am on Friday and weekend nights; and Stats19 data shows that men are much more likely to become a road traffic casualty at these times than women.

Age band

- Table 4 shows a broad similarity in the relative incidence of both admissions and serious casualties for the three broad aged groups shown, that is children (aged 0 to 15), working age adults (aged 16 to 64) and the elderly (aged 65 and over). The exceptions to this are:
- Pedal cyclists: The hospital admissions figures show a higher proportion of children being admitted to hospital as compared with seriously injured casualties from the Stats19, 28 per cent of admissions as compared with 19 per cent of casualties. The difference in numbers is starker as there were 70 hospital admissions for child pedal cyclists, as opposed to 20 reported seriously injured children from the Stats19 data.
- Car occupants: The hospital admissions figures show a higher proportion of the elderly being admitted to hospital as compared with the seriously injured casualties from the Stats19, 28 per cent of admissions compared with 16 per cent of casualties. In terms of numbers, the difference is 146 hospital admissions as opposed to 82 reported seriously injured elderly car occupants. This may reflect the greater fragility of older people, or that they are have a greater risk of being involved in a single vehicle accident.

Table 5 summarises the differences set out in table 4. It sets out the percentage differences between the hospital admissions figures and the Stats19 serious casualties figures. So the total figure in table 5 for 'all road users' for Wales of 25%, is the percentage difference between the corresponding numbers from table 4 of 1,407 (hospital admissions) and 1,126 (Stats19 casualties).

Table 5 shows these figures for Wales together with the corresponding figures for England, the latter taken from table 1 in the DfT publication 'Reported Road Casualties in Great Britain: 2011; Hospital admissions data on road casualties in England'.

<http://www.dft.gov.uk/statistics/releases/reported-road-casualties-great-britain-annual-report-2011/>

The English hospital admissions are taken from their Hospital Episode Statistics (HES) which is analogous to the Welsh PEDW data. Table 5 shows that the differences between hospital admissions and Stats19 serious road casualties are consistently higher for England than for Wales. The pattern of systematic differences between the two data sources is, however, similar.

The Patient Episode Database for Wales (PEDW) contains all inpatient and day case activity undertaken in NHS Wales plus data on Welsh residents treated in English trusts. It is based on the monthly Admitted Patient Care extracts received from Welsh NHS and English sites. These extracts are used to update the Patient Episode Database for Wales (PEDW) which is used to provide an analysis about relevant hospital activity.

Table 4: Comparison of hospital admissions and police recorded seriously injured road casualties, Wales 2011

	<i>Numbers and percentage</i>									
	Pedestrians		Pedal cyclists		Motor cyclists		Car occupants		All road users	
	Hospital admission	Stats19	Hospital admission	Stats19	Hospital admission	Stats19	Hospital admission	Stats19	Hospital admission	Stats19
Total	278	237	249	107	258	218	528	513	1,407	1,126
Other vehicle(s) involved	269	237	67	99	107	153	266	354	..	663
No other vehicle involved	0	0	164	8	126	65	199	159	..	463
Not known	9	0	18	0	25	0	64	0	..	0
As proportion of all 'known'										
% Other vehicle(s) involved	100%	100%	29%	93%	46%	70%	57%	69%	..	59%
% No other vehicle involved	0%	0%	71%	7%	54%	30%	43%	31%	..	41%
Male	170	143	201	89	237	196	275	273	939	733
Female	108	94	48	18	21	22	253	240	468	393
% Male	61%	60%	81%	83%	92%	90%	52%	53%	67%	65%
% Female	39%	40%	19%	17%	8%	10%	48%	47%	33%	35%
Age 0-15	102	81	70	20	4	2	34	19	214	126
Age 16-64	122	114	163	83	244	209	348	412	931	856
Age 65+	54	42	16	4	10	7	146	82	262	144
% Age 0-15	37%	34%	28%	19%	2%	1%	6%	4%	15%	11%
% Age 16-65	44%	48%	65%	78%	95%	96%	66%	80%	66%	76%
% Age 65+	19%	18%	6%	4%	4%	3%	28%	16%	19%	13%

Source: NHS Wales Informatics Service (PEDW), Information and Statistics; Welsh Government, Transport Statistics

Table 5: Comparison of differences between hospital admissions and police recorded seriously injured road casualties, Wales and England, 2011

Hospital admissions divided by police recorded seriously injured road casualties (all from Table 4 above), as percentage and minus 100% to show the percentage by which admissions are higher or lower

	<i>Percentage</i>									
	Pedestrians		Pedal cyclists		Motor cyclists		Car occupants		All road users	
	Wales	England	Wales	England	Wales	England	Wales	England	Wales	England
Total	17%	60%	133%	219%	18%	23%	3%	91%	25%	92%
Other vehicle involved	14%	58%	-32%	11%	-30%	-3%	-25%	26%	..	72%
No other vehicle	..	..	1950%	2346%	94%	46%	25%	116%	..	71%
Unknown	..	..	..	..	..	..	..	..	..	..
Male	19%	66%	126%	215%	21%	24%	1%	79%	28%	86%
Female	15%	51%	167%	237%	-5%	13%	5%	107%	19%	104%
Age 0-15	26%	64%	250%	807%	100%	506%	79%	157%	70%	215%
Age 16-64	7%	54%	96%	131%	17%	19%	-16%	72%	9%	66%
Age 65+	29%	84%	300%	274%	43%	48%	78%	184%	82%	173%

Source: NHS Wales Informatics Service (PEDW), Information and Statistics; Welsh Government, Transport Statistics

Section 3: Road Traffic Fatalities

A final comparison that can be made is between the Stats19 figures on road traffic fatalities with the official mortality data.

Clearly they are both covering people killed in road traffic accidents, but there are a number of definitional differences between the two sources of data.

Stats19 data

- The police Stats19 description of a 'fatal' injury includes only those cases where death occurs in less than 30 days as a result of the accident.
- 'Fatal' does not include death from natural causes, suicide or murder.
- The Stats19 data covers fatalities from accidents taking place in Wales regardless of the place of residence of those involved in the accident.

Mortality data

- The Government mortality data is based on deaths of residents registered during the year.
- The underlying cause of death is as given on the death register and based on the doctor's or coroner's certificate of cause of death: this is known as the original cause of death and are based on the International Classification of Diseases, Injuries and Cause of Death.
- Figures for individual cause categories exclude deaths for babies aged under 28 days.
- The figures below are of fatalities caused by motor vehicle traffic accidents.

The table below shows these figures:

Table 6: Number of fatalities caused by road traffic accidents, Wales 2001 to 2011

	Number of deaths	
	Government mortality data	Police reported Stats19 data
2001	151	187
2002	141	147
2003	182	173
2004	162	201
2005	195	180
2006	171	162
2007	166	161
2008	128	142
2009	143	125
2010	123	89
2011	..	121

The two series are of similar magnitude, even though they do not match in any individual year. There is no tendency for either series to be systematically lower or higher than the other. And there is no systematic difference in the trend between these two data series over time, they both, broadly, fall during the 2000's. It is of note that the very low 2010 fatalities figure coming from the Stats19 data was not matched by the mortality data, which showed a low figure, but not an exceptionally low figure.

Road Safety questions in the 2010-11 British Crime Survey Core Questionnaire

13.1 ROAD SAFETY AND ACCIDENTS

DFTACC1 [ASK ALL]

I'd now like to ask you some questions about road safety.

In the last 3 years, that is since [DATE], have you been in any type of road accident, no matter how minor? Please include any accidents in which you were involved as a pedestrian, driver, passenger, cyclist or motorcyclist, even if no other party was involved. Only include incidents that happened on a public road, including pavements and cycle lanes on the public road.

1. Yes
2. No

DFTACC2 [ASK IF DFTACC1 = YES]

How many times have you been involved in a road accident, no matter how minor, in the last 3 years?

DFTACC3 [ASK IF DFTACC1 = YES]

And how many times have you been involved in a road accident in the last 12 months, that is since the first of [DATE]?

DFTACC4 [ASK IF DFTACC1 = YES]

Thinking again about the last 3 years, that is since [DATE] have you been in a road accident on a public road in which you were injured in some way? Please include incidents where you were in a vehicle, on a bicycle or motorbike, or a pedestrian.

1. Yes
2. No

[Include incidents where the respondent was directly involved - do not include incidents where the respondent was only a witness. incidents while riding a horse should be included, even if no other party was involved. incidents that did not happen on a public road (e.g. on private roads, in public parks, in car parks, in petrol stations) should not be included.]

DFTACC5 [ASK IF DFTACC4 = YES]

How many times have you been involved in a road accident in which you were injured in the last 3 years?

DFTACC6 [ASK IF DFTACC3>0 AND DFTACC4 = YES]

And how many times, if any, have you been involved in a road accident in which you were injured in the last 12 months, that is since the first of [DATE]?

DFTACC7 [ASK IF DFTACC4 = YES]

I would now like to ask you some details about the [most recent] incident in which you were injured.

At the time of the incident, were you

1. a car occupant
2. a cyclist
3. a motorcyclist
4. a pedestrian
5. or in another vehicle (including van)?

DFTACC8 [ASK IF DFTACC4 = YES]

(Apart from the one you were travelling in) were any (other) vehicles or pedestrians also involved in the incident?

CODE ALL THAT APPLY

1. No, no other vehicles/pedestrians were involved
2. Yes, a car [yes if involved multiple cars]
3. Yes, a bicycle
4. Yes, a motorcycle
5. Yes, a pedestrian
6. Yes, another type of vehicle

DFTACC9ADFTACC9N [ASK IF DFTACC4 = YES]

Looking at this card what type of injuries did you receive?

CODE ALL THAT APPLY

1. Minor bruising or minor cuts
2. Severe cuts
3. Sprains
4. Whiplash
5. Fracture/broken bones
6. Concussion
7. Internal injuries
8. Burns
9. Crushing
10. Slight shock
11. Severe shock (required hospital treatment)
12. Other (SPECIFY)

DFTAC10ADFTAC10I

[ASK IF DFTACC4 = YES]

As a result of your injuries, did you receive any medical attention at any time following the accident? CODE ALL THAT APPLY

1. No - no medical attention received
2. Yes - first aid at roadside
3. Yes - at GP surgery
4. Yes - at a minor injuries/accidents unit
5. Yes - at Accident and Emergency
6. Yes - as an inpatient in hospital (at least one night spent on a hospital ward)
7. Yes - other (SPECIFY)

DFTACC11 [ASK IF DFTACC4 = YES]

Did the police attend the scene of the accident?

1. Yes - they attended because I called them
2. Yes - they attended as a result of someone else calling them
3. Yes - they were there when it happened/they drove past just after the accident occurred
4. No

DFTACC12 [ASK IF DFTACC10 = NO OR DK]

Was the accident reported to the police at some point after the accident?

1. Yes - I reported the accident
2. Yes - someone else reported the accident
3. No