



## Introduction

This methodology note describes the estimation of casualties arising from reported road accidents involving at least one motor vehicle driver or rider over the legal alcohol limit for driving, in Great Britain.

Figures are derived from the STATS19 forms completed by the police plus toxicology data for road fatalities from coroners and procurators fiscal.

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## Further information

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## Drink-drive legal limits and definitions

For the purpose of these drink-drive statistics, a **drink-drive accident** is defined as being a reported incident on a public road in which someone is killed or injured, and where at least one of the motor vehicle drivers or riders involved met one of these criteria:

- refused to give a breath test specimen when requested by the police (other than when incapable of doing so for medical reasons)
- failed a roadside breath test by registering over 35 micrograms of alcohol (reduced to over 22 micrograms in Scotland only from 5 December 2014) per 100 millilitres of breath.
- died and was subsequently found to have more than 80 milligrams of alcohol (reduced to 50 milligrams in Scotland only from 5 December 2014) per 100 millilitres of blood.

**Drink-drive casualties** are defined as all road users killed or injured in drink-drive accidents.

## Data sources

Two sources of data are used to estimate the number of drink-drive accidents in Great Britain. These are:

- **Coroners' data:** Information about the level of alcohol in the blood of road accident fatalities aged 16 or over who die within 12 hours of a road accident is provided by coroners in England and Wales and by procurators fiscal in Scotland.
- **STATS19 breath test data:** The personal injury road accident reporting system (STATS19) completed by police provides data on injury accidents in which the driver or rider survived and was also breath tested at the roadside. If the driver or rider refused to provide a breath test specimen, then they are considered to have failed the test unless they are deemed unable to take the test for medical reasons.

The number of fatal accidents where a driver or rider died with an illegal alcohol level is estimated from the coroners' and procurators' fiscal data. The number of accidents where a surviving driver or rider

had an illegal alcohol level is an estimate based on a calculation of the proportion of these alcohol-related accidents which can be identified from the STATS19 breath test data.

## Completeness of data and reliability of drink drive estimates

Both sources of data from the police and coroners on drink-drive accidents are incomplete.

- In the case of the STATS19 breath test data, some drivers and riders are not breath tested since it is not always possible to administer a test to all drivers involved. Some drivers and riders not tested might have failed if a test could have been administered. Others may have departed the scene of the accident before the police arrive.
- In the case of coroners and procurators fiscal data, toxicology data are not available for all killed drivers/riders recorded in Stats19 and are typically available for around 60-70% of relevant cases.

Adjustments to the reported data are required to estimate the actual number of drink-drive accidents and their related casualties.

Two adjustments are applied to the data: one to account for the incompleteness of coroners and procurators fiscal data, and one to account for hit and run accidents (where a breath test cannot be administered).

## Adjustment for coroners' and procurators fiscal' data

For many drivers or riders killed in road accidents, a post-mortem blood alcohol level is not available, either because the casualty died more than twelve hours after the accident, or because no test was carried out, or because some of the data are not reported to the Department by coroners and procurators fiscal.

To take account of this, the proportion of reports received indicating that the deceased driver/ rider was over the drink-drive limit is applied to reports that are not received. The same coroners adjustment factor is applied for all breakdowns of accidents and casualties relating to killed drivers over the limit, and therefore does not take into account differences in response rate between subgroups.

The coroners' data adjustment is therefore:

$$DE = \frac{CF}{CR} * FD$$

- DE is the estimate of drivers fatalities above the legal limit from the coroners' data. This is produced for the number of accidents and casualties (by severity) for accidents where a fatality of a driver occurred.
- FD is the number of all drivers fatalities in reported road accidents.

- CR is the number of all records returned from the coroners
- CF is the number of records returned from the coroners where the alcohol level recorded is above the legal limit.

## Adjustment for hit and run

The breath test failures (including refusal to provide a sample) need to be adjusted to take account of drivers who have departed the scene of the accident before a police officer arrived (called 'hit and run' in this section).

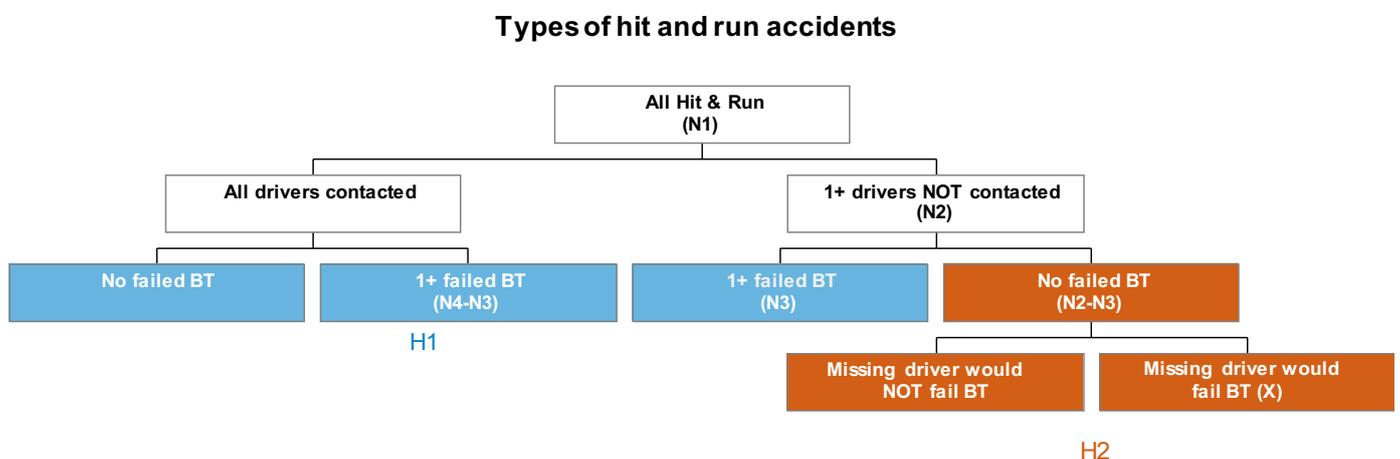
This involves an estimate of drink-drive accidents from recorded hit and run drivers where no other driver has failed a roadside breath test or refused to provide one.

This adjustment is based on the 1993 TRL article entitled "The actual number of non-fatal drink/drive accidents" [available here](#).

There are four component parts which are as follows:

- N1 is the total number of accidents where at least one driver was recorded in STATS19 as a hit and run.
- N2 is the number of hit and run accidents (N1) where at least one driver was not contacted at the time.
- N3 is the number of hit and run accidents (N1) where at least one driver was not contacted at the time (N2) and at least one other driver failed a breath test or refused to provide a sample. We already know that alcohol was involved in the accident, so we do not need to estimate what proportion of those not tested in these accidents might have failed.
- N4 is the number of hit and run accidents (N1) where at least one driver failed a breath test or refused to provide a sample.

These component parts combine into two types of hit and run accidents, H1 and H2, as shown in the diagram below:



H1 are hit and run accidents where either all drivers are contacted, or at least one driver was not contacted but one other driver failed a breath test or refused to provide a sample. The total number of H1 hit and run accidents is  $N1 - (N2 - N3)$ .

H2 are hit and run accidents where at least one driver was not contacted and there are no failed breath tests. The total number of H2 hit and run accidents is  $N2 - N3$ .

The number of drink-drive accidents within type H1 is known and is  $N4$ . The number of drink-drive accidents within type H2 is unknown ( $X$ ) and needs to be estimated.

It may reasonably be assumed that the police test hit and run drivers whenever practicable, so all drink-drive accidents within type H1 can be identified from the STATS19 data; however, there is no direct evidence to identify drink-drive accidents within type H2.

In order to estimate their number ( $X$ ), some assumption must be made about the proportion which would have yielded a positive test if a test had been possible. The proportions for groups H1 and H2 would be equal if it were a matter of chance whether the police can trace a hit and run driver successfully.

Alternatively, the proportion would be lower for within type H2 than for within type H1 if the police were more likely to successfully trace a hit and run driver when they have particular reason to, and the lower percentage of hit and run drivers in fatal accidents may suggest this.

The article suggests that the true drink-drive rate for hit and run accidents of type H2 is  $\Delta$  times the (known) drink-drive rate for hit and run accidents of type H1, and assumes that  $\Delta$  lies between 0.5 and 1. Our estimates use the central value in this range of 0.75. Further details can be found in TRL's 1993 report PR40: [The Actual Number of non-fatal drink-drive accidents](#).

Thus,

$$(H2 \text{ drink-drive accidents} / H2 \text{ accidents}) = 0.75 *$$

$$(H1 \text{ drink-drive accidents} / H1 \text{ accidents})$$

Therefore, the estimate of the number of H2 type drink-drive accidents ( $HR$ ) is estimated for each severity level from STATS19 data as follows:

$$HR = 0.75 * (N2 - N3) * \frac{N4}{N1 - (N2 - N3)}$$

The adjustment factor (separately calculated for each severity level) adds this estimate of hit and run drink-drive accidents proportionally to failed breath tests:

$$HAF = \frac{FB + HR}{FB}$$

- FB is the number of failed breath tests.
- HR is the estimate of hit and run drink-drivers to add to known cases as calculated above.
- HAF is the hit and run factor.

The hit and run factor (HAF) is used to estimate the number of drink-drive accidents and casualties (by severity) from STATS19 data by multiplying the appropriate factor with the recorded number of accidents and casualties where one of the drivers involved has failed a breath test (or refused to provide a specimen).

## Timeliness and uncertainty

Combining these results with the estimated drink-drive fatalities from coroners' and procurators fiscal' data described above (DE) gives the estimated total of accidents and casualties believed to have involved at least one driver or rider over the drink-drive limit.

We do not have published uncertainty ranges for these estimates due to the complexity involved in attempting to derive them. In order to avoid the impression of false accuracy we round to the nearest 10, but this should not be taken as an indication of that being our assumed level of uncertainty.

Coroners' and procurators fiscal' data is typically available for analysis a year later than the main road accident data. This is due to the time required to obtain information on fatalities from police forces and then get records from coroners and procurators fiscal. Typically around half of the data expected to be available for analysis are ultimately available for inclusion in the provisional estimates. The estimates for fatalities depend mainly on coroners' data and are particularly susceptible to revision between the provisional and final figures.