

A valuation of road accidents and casualties in Great Britain: Methodology note

Introduction

Since 1993, the valuation of both fatal and non-fatal casualties has been based on a consistent willingness to pay (WTP) approach. This approach encompasses all aspects of the valuation of casualties, including the human costs, which reflect, pain, grief and suffering; the direct economic costs of lost output and the medical costs associated with road accident injuries. In addition to casualty related costs for each accident there are also costs related specifically to accidents, comprising of damage to property, police costs, and the costs of insurance administration.

The value of each of these cost elements is determined separately and then combined to produce overall values of costs per casualty for different levels of severity¹. This note provides an overview of how these costs are estimated.

Casualty costs

Table 1 shows a summary of the average costs per casualty for each of the associated cost elements, using 2012 prices.

Table 1: Average value of prevention of road casualties by severity and element of cost: GB 2012

Accident Severity	Casualty related costs		
	Lost output	Medical and Ambulance	Human costs
Fatal	585,716	1,006	1,117,101
Serious	22,566	13,671	155,226
Slight	2,385	1,012	11,363
All injury accidents	6,091	2,434	30,258

These costs are totalled in order to estimate to average value of prevention of a casualty by severity – as in table [RAS60001](#).

Lost output is calculated as a measure of the loss of productive capacity of an individual as a result of an injury in a road accident, which is calculated per casualty for each level of severity. The cost of lost output is calculated as described in detail in O'Reilly (1993). These costs were last calculated in 1997 and are indexed over time to GDP per head in order to produce new estimates. Similar indexing is used for all other casualty and accident costs to produce updated figures.

Medical and ambulance costs are the estimated costs associated with a casualty's use of the ambulance service, hospital accident and emergency department costs, hospital in-patient costs and blood transfusion services. Further costs are also calculated based on WTP estimates. Costs for fatalities are based on 1984-85 Department of Health data,

¹ Based on severity definitions available at: <https://www.gov.uk/transport-statistics-notes-and-guidance-road-accident-and-safety>

indexed over time to GDP per head. Costs for serious and slight casualties were re-valued in the early 1990s and cost calculations are carried out as detailed in Hopkin and Simpson (1995) based upon evidence from two studies undertaken on road accident patients in the Manchester area.

Human costs reflect the non-resource element of the costs associated with human life or the effects of injury, such as the pain and distress felt by the accident victims or their relatives, as well as the intrinsic loss of enjoyment of life in the case of fatalities. Costs are based on estimates of people's WTP for small reductions in the risk of exposure to such effects - the most recent study to obtain such estimates being the 1997 study carried out by the research team in Newcastle, York, Brighton and Bangor by Chilton et al (1997).

Accident costs

Table 2 shows a summary of the average costs per accident for each of the associated cost elements, using 2012 prices.

Table 2: Average value of prevention of road accidents by severity and element of cost: GB 2012

£ 2012			
Accident Severity	Casualty related costs		
	Lost output	Medical and Ambulance	Human costs
Fatal	635,233	5,529	1,247,433
Serious	25,157	15,095	171,356
Slight	3,163	1,342	15,073
All injury accidents	13,429	3,364	51,370

In this table the casualty related costs are higher as, on average there is more than one fatal casualty per fatal accident, for example. Similarly to Table 1, these costs are totalled in order to estimate the average value of prevention of an accident, by severity.

These costs are combined with other accident related costs - consisting of police costs, insurance and administration costs, and damage to property - to produce an estimate of the total value of prevention of accidents (see Table 3).

Police costs relate to the cost of time spent attending and reporting accidents by police officers. These costs were last estimated in 2009 following consultation with each of the 51 police forces in England, Wales and Scotland. Estimates are made of the number and rank of officers involved in any accident, and the number of hours' involvement for each person. This time is then converted into monetary value using the Association of Chief Police Officer's (ACPO) resource/operational costs for each rank of officer². This produced an estimated cost for each police force for each type of accident considered. Using STATS 19 data, national average police costs were produced weighted by the number of accidents in each police force region in 2009.

Insurance and administrative costs are estimated by calculating the average handling cost per claim. Estimates of this cost were based on the average time spent processing

² see "Paying the bill 2: ACPO/APA Guidance on charging for police services": <http://www.acpo.police.uk/documents/finance/2010/201006FRPTB01.pdf>

insurance claims, plus an allowance for overheads and expenses. Combining these estimates with the average number of transactions per claim enables the average cost per transaction to be calculated, which is then used to estimate the administrative costs per claim by looking at the average number of transactions per claim³. The latest estimates of these costs were made in 1995 using information provided by insurance companies.

Damage to property is also taken into account when estimating the total value of prevention of road accidents – this includes both damages to vehicles and other third party property. A survey of insurance claims from the early 1990s was used to obtain estimates of damage costs by location and severity. Detailed explanations of the methodology used to derive these costs are found in Simpson and O'Reilly (1994) and Hopkin and Simpson (1995).

The estimation of the total value of prevention of road accidents is calculated by taking estimates of the total number of personal injury accidents in Great Britain⁴ and multiplying by the average cost of an accident as outlined in Table 3 below.

Table 3 (RAS60003): Total value of prevention of road accidents by severity and element of cost: GB 2012

Accident severity	£ million 2012						
	Cost Elements						Total
	Casualty related costs			Accident related costs			
	Lost output	Medical and Ambulance	Human costs	Police costs	Insurance and admin	Damage to property	
Fatal	1,040	9	2,042	29	1	19	3,139
Serious	526	315	3,582	44	4	108	4,578
Slight	389	165	1,854	67	15	381	2,871
All injury accidents	1,955	490	7,478	139	19	508	10,589
Damage only accidents	0	0	0	77	124	4,332	4,533
All accidents	1,955	490	7,478	217	143	4,840	15,122

Further value of prevention estimates are calculated, breaking down these values by road type. These estimates are calculated in a similar way, using STATS19 data to provide an estimate of the number of personal injury accidents occurring on each road type, and the dividing the overall values (calculated as described above) by the proportion of accidents occurring on each road type.

Future methodology updates

The National Travel Survey from January 2013 covers residents of England only, and therefore 2012 results are the final set for Great Britain as a whole. For this reason, revisions will be made to the methods used to derive the NTS estimates of the total number of personal injury accidents, which are used to calculate the above estimates of the value of prevention of road accidents. Similarly, these NTS estimates are used in the calculations for deriving similar costs displayed in [WebTAG Unit 3.4.1](#), and so similar revisions will be necessary in this case also.

³ More detail provided is in Simpson and O'Reilly (1994)

⁴ Derived from *Survey data on road accidents* available at:

<https://www.gov.uk/government/publications/reported-road-casualties-great-britain-annual-report-2012>

These revisions are likely to use NTS estimates for England to estimate the figures for Great Britain as a whole. Details of these changes will be published alongside the corresponding article in Reported Road Casualties Great Britain 2013 which will be published in September 2014.

References

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