

Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Original Research

Down but not out: incidence and estimated costs to society of road casualties in Strathclyde, Scotland



M. Campbell^a, D.H. Stone^{a,*}, K.F. Kleinberg^a, R. McLean^b

^aPaediatric Epidemiology and Community Health (PEACH) Unit, University of Glasgow, UK

^bUniversity of Glasgow, UK

ARTICLE INFO

Article history:

Received 27 June 2013

Received in revised form

24 October 2013

Accepted 23 December 2013

Available online 17 March 2014

Keywords:

Road safety

Epidemiology

Injury

Deprivation

Costs

Record linkage

ABSTRACT

Objectives: To investigate the recent epidemiological patterns and costs of road traffic casualties (RTCs) in Strathclyde, Scotland.

Study design: Retrospective record-linkage epidemiological study using routine data sources.

Methods: A linked police-hospital database was analysed to describe the epidemiology of RTCs from 2004 to 2009. Using UK government methodology, the costs of road casualties to the National Health Service (NHS) and society were assessed.

Results: RTC rates declined over the study period. Males were at higher risk than females as were those residing in more socially deprived addresses. The estimated costs of RTCs in Strathclyde amounted to £400 million annually. Of this, around one twentieth (£20 million per year), was attributable to direct NHS costs.

Conclusions: Road casualties remain a major public health threat in Strathclyde, and contribute to health inequalities. RTC costs to society amount to almost a tenth of NHS revenue expenditure. Cost-effective road safety measures should be deployed more widely.

© 2014 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

Introduction

Road traffic casualties (RTCs) are responsible for an enormous amount of suffering through injury and death. Many RTCs are believed to be avoidable, a view supported by the long-term downward trend in the numbers of victims in many countries. The number of road casualties is, however, under-reported in the current police recording system.^{1,2} and the financial costs may be greatly underestimated.³ The aim of this study was to investigate the recent epidemiological patterns and estimate the costs of RTCs in Strathclyde, Scotland, for the years 2004–2009 inclusive.

Methods

Strathclyde Police provided STATS19 (RTC) data. STATS19 is a UK-wide system of road casualty reporting by police officers that has been in operation for many years. These included information on casualty type, severity, location, time and date, road type, and direction of travel.

The Information Services Division (ISD) of NHS Scotland performed a linkage of their SMR01 (hospital discharge) database with STATS19. The linkage methods involved matching postcodes, age, sex and date (of RTC and admission) and a default partition (based on high probability). This

* Corresponding author. PEACH Unit, University of Glasgow, Queen Mother's Hospital, 8th Floor – Tower Block, Dalnair Street, Glasgow G3 8SJ, UK. Tel.: +44 141 201 0171; fax: +44 141 201 6943.

E-mail address: david.stone@glasgow.ac.uk (D.H. Stone).

0033-3506/\$ – see front matter © 2014 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

<http://dx.doi.org/10.1016/j.puhe.2013.12.014>

Table 1 – Annual casualties by severity: numbers, percentages and rates (per 100,000 population), Strathclyde 2004–9.

Year	Fatal		Serious		Slight		Total	
	No. (%)	Rate	No. (%)	Rate	No. (%)	Rate	No. (%)	Rate
2004	107 (1.3)	4.85	1049 (12.8)	47.56	7039 (85.9)	319.11	8195 (100)	371.5
2005	91 (1.2)	4.13	913 (11.8)	41.40	6694 (87.0)	303.52	7698 (100)	349.0
2006	95 (1.3)	4.30	1004 (13.5)	45.49	6312 (85.2)	285.99	7411 (100)	335.8
2007	95 (1.4)	4.30	852 (12.2)	38.55	6031 (86.4)	272.85	6978 (100)	315.7
2008	93 (1.5)	4.20	988 (15.8)	44.64	5191 (82.8)	234.53	6272 (100)	283.4
2009	72 (1.2)	3.25	809 (13.6)	36.48	5053 (85.2)	227.83	5934 (100)	267.6
Total	553 (1.3)		5615 (13.2)		36,320 (85.5)		42,488 (100)	

resulted in a linked dataset of 42,488 casualties available for analysis after the removal of duplicates.

Information on social deprivation, using the Scottish Index of Multiple Deprivation (SIMD), was obtained from the Scottish Government for the 12 local authority areas covered by the Strathclyde Police force. The SIMD is a relative measure of deprivation and can be used to compare small geographical areas (data zones) by providing a relative ranking from the most to least deprived.⁴ Analysis by SIMD was possible on only 34,720 casualties as SIMD category of home address was not recorded on the remaining 7768 (18%).

The epidemiological patterns of RTCs (all ages) were examined in Strathclyde including gender ratio, injury severity, and time trend using the linked database. Then it was attempted to estimate the costs of these injuries both to determine the potential resultant losses to society and the possible benefits of avoiding their occurrence. The UK Department for Transport (DfT) 'Willingness To Pay' (WTP) methodology was used.⁵ The WTP approach to casualty avoidance encompasses both direct economic and indirect human costs including an amount to reflect the pain, grief, suffering and lost output as well as ambulance and other medical costs. It attaches a monetary value to each of the three severity levels in STATS19. The classification of the severity of a casualty as fatal, serious (requiring hospital treatment) or slight⁶ is determined by the reporting police officer and is dictated by severity of the injury to the most severely injured casualty.

Results

Epidemiology

Table 1 shows the casualty numbers, percentages and rates, derived from the linked database, for Strathclyde over the study period, 2004–2009. For all severity categories, there was a clear decline in rates over the study period with little difference between fatal, serious and slight categories (with reductions in rates of 33%, 23% and 30% respectively). A linear regression analysis was performed to quantify the change in total casualty rate. For each year, the rate decreased by 21.1 per 100,000, almost one standard deviation (95% CI –22.3 to –17.8; $F(1,4) = 316.94$, $P < 0.001$). Table 2 shows that males overall had consistently higher rates of casualties than females, though there was an annual decline in rates for both genders. The overall male:female rate ratio was 1.3:1.

Deprivation

The most socially deprived residents in Strathclyde were more likely to be injured in an RTC. Table 3 shows deprivation as SIMD quintiles for the 34,720 (82%) of the casualties for which this information was available for the study period. The distribution of the casualties was skewed in the direction of the most deprived quintile to a significantly greater extent than the distribution of the total population, ($\chi^2 = 654.76$, $df = 4$, $P = 0.0001$). The differences are almost entirely confined to the extreme ends of the distribution (deprivation quintiles 1 and 5).

Costs of road casualties

Based on the DfT's WTP values, the estimated total human costs over the study period for all road casualties identified on the linked database were £2.4 billion or £400 million per year. Of this, approximately one twentieth may be attributed to direct medical and ambulance costs (Table 4).

Discussion

The data from this study suggest that the long-term decline in road casualty incidence in Strathclyde is continuing. From 2004 to 2009 the road casualty rate decreased by 28% overall with little difference in the decline between severity categories. Whatever the explanation, that decline is worthy of celebration. Nevertheless, this study has revealed three specific concerns from a public health perspective.

First, road casualties remain persistently socially patterned thereby contributing to health inequalities. The distribution of casualties was significantly skewed towards the least affluent deprivation quintiles, based on postcode of residence. The extent to which this finding may have been biased as a result

Table 2 – Casualty rate (per 100,000 population) per year by gender, Strathclyde, 2004–9.

Year	All casualties (per 100,000)	Male (per 100,000)	Female (per 100,000)
2004	371.52	427.77	319.99
2005	349.04	412.01	291.21
2006	335.78	384.24	291.15
2007	315.69	364.99	270.20
2008	283.38	322.05	247.60
2009	267.55	303.64	234.07

Download English Version:

<https://daneshyari.com/en/article/1087438>

Download Persian Version:

<https://daneshyari.com/article/1087438>

[Daneshyari.com](https://daneshyari.com)