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Changes in safety on England's roads: analysis of hospital statistics

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Abstract

Objective To compare trends in the numbers of people with serious traffic injuries according to police statistics and hospital episode statistics (HES).

Design Descriptive study based on two independent population based data sources.

Setting Police statistics and hospital episode statistics in England.

Main outcome measures Rates of injury and death and their change over time reported in each data source, for 1996 to 2004.

Results According to police statistics, rates of people killed or seriously injured on the roads fell consistently from 85.9 per 100 000 in 1996 to 59.4 per 100 000 in 2004. Over the same time, however, hospital admission rates for traffic injuries were almost unchanged at 90.0 in 1996 and 91.1 in 2004. Both datasets showed a significant reduction in rates of injury in children aged ≤ 15 , but the reduction in hospital admission rates was substantially less than the reduction shown in the police statistics. The definition of serious injury in police statistics includes every hospital admission; in each year, none the less, the number of admissions exceeded the number of injuries reported in the police system.

Conclusions The overall fall seen in police statistics for non-fatal road traffic injuries probably represents a fall in completeness of reporting of these injuries.

Introduction

Government policy in England aims to reduce the number of people killed or seriously injured on the roads by 40% overall, and by 50% for those aged ≤ 15 , by 2010 compared with the baseline average rate in 1994-8.¹ In the first review of progress, the Department for Transport used police statistics (the STATS19 system) to show that the number of people seriously injured in England had fallen by 21% overall and by 32% for children between the baseline years and 2002.¹ While the number of children killed had fallen, however, the total number of adults killed had not. This contrasts with recent trends in continental Europe, where death rates have fallen more substantially than

rates of non-fatal road injury.² We wondered if the divergence between the figures for those killed and those seriously injured in England might have resulted, at least in part, from less complete reporting of non-fatal injuries in the police system. To understand these divergent trends, we analysed hospital admission statistics for traffic injuries in England.

Method

The Department for Transport provided us with STATS19 "Killed or Seriously Injured" data for England for 1996-2004. The STATS19 data are based on personal injuries that occur on public roads and that become known to the police.³ We analysed data on hospital admissions using the Department of Health's hospital episode statistics (HES) system for 1996-2004. We selected ICD-10 (international classification of diseases, 10th revision) codes for transport injuries, excluding admissions for non-traffic accidents. The HES system includes data about all people who go through a formal process of admission to a hospital ward, including people who do not stay in hospital overnight and excluding people who attend the emergency department but are not admitted.

Results

The police statistics showed a reduction in the number of people killed or seriously injured, with a fall from 1996 to 2004 (from 85.9 to 59.4 injuries per 100 000 total population), but the hospital statistics did not (figure, table; the table shows alternate years from 1996 to 2004, data for all years are on bmj.com). Over the same period, the police statistics for non-fatal serious injuries alone fell from 79.7 to 54.0 per 100 000; the corresponding figures for admissions for non-fatal injuries were 88.8 and 90.1. We analysed admissions

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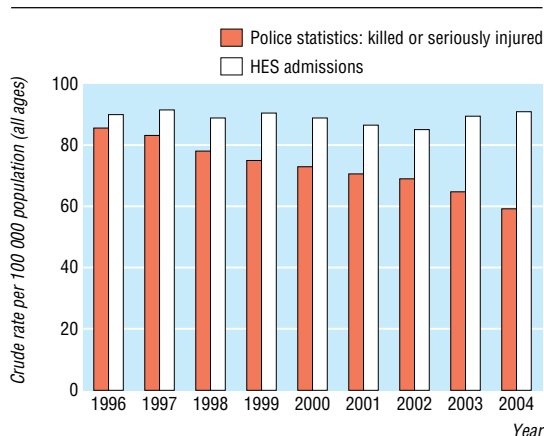
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Another figure showing change in road injuries in the police statistics and HES is on bmj.com.



Traffic injury rates for England measured from police statistics for people killed or seriously injured and from admissions to hospital (HES), all ages

with a length of stay of two days or more as a proxy for severity of injury and found a small but significant reduction over time. To determine if a true fall in admission rates could have been masked by an increase in readmissions for the same injury, we used linked HES data, available for the financial years 1998-9 to 2002-3, to distinguish between episodes of admission and numbers of people admitted. There was no appreciable change over time in re-admission rates.

Both datasets showed a fall in all injuries and in non-fatal injuries in children aged ≤ 15; but the fall in non-fatal injuries recorded in hospital statistics was much less than that in police statistics (table). For all ages combined, admission rates showed a significant decline for pedestrians; police statistics but not hospital statistics showed a decline for car occupants; and both sets of statistics showed a significant and substantial increase in admission rates for motorcyclists (table).

Discussion

Though police statistics suggest a reduction in serious traffic injuries in the past 10 years,^{1 3} hospital statistics show that there has been no appreciable reduction in injuries serious enough to warrant hospital admission. One possibility is that rates of serious injury may have declined in the later years, and that those who were injured were increasingly more likely to have been admitted, such that equal and opposite effects on admission rates cancelled out each other. This, however, seems implausible. A second possibility is that trends in police and hospital statistics could have differed because of differences in definitions. The definition of serious injury in the police statistics includes all injuries resulting in hospital admission, but the definition is wider than this. If the reduction in injuries is real rather than an artefact, it can only have been a reduction in injuries that were not serious enough to warrant hospital admission. Furthermore, the fact that

Department for Transport's police statistics* and Department of Health's hospital episode statistics (HES)† for traffic injuries in England, expressed as rates per 100 000 population,‡ with average annual percentage changes, showing alternate years 1996-2004 (all years can be found on bmj.com)

Source of injury statistics and type of injury (ICD-10 codes†)	1996	1998	2000	2002	2004	Average annual percentage change 1996-2004 (95% CI)
Police: seriously injured or killed	85.9	78.4	73.2	69.0	59.4	-4.1 (-4.7 to -3.5)
HES: traffic injuries (V01-V69)	90.0	89.1	89.0	85.3	91.1	-0.2 (-1.0 to 0.5)
Police: seriously injured	79.7	72.6	67.3	63.0	54.0	-4.4 (-5.0 to -3.8)
HES: non-fatal traffic injuries (V01-V69)	88.8	87.9	88.0	84.3	90.1	-0.2 (-1.0 to 0.5)
Police: killed§	6.2	5.8	5.9	6.0	5.4	-1.0 (-2.0 to 0.0)
HES: fatal injuries§ (V01-V69)	1.2	1.1	1.0	1.0	0.9	-2.2 (-4.0 to -0.3)
Children (age 0-15):						
Police: seriously injured or killed	58.8	51.6	44.3	39.4	34.4	-6.6 (-7.1 to -6.2)
HES: traffic injuries (V01-V69)	107.8	101.4	103.5	90.6	97.3	-1.9 (-3.2 to -0.6)
Police: seriously injured	56.5	50.0	42.7	37.8	32.9	-6.7 (-7.1 to -6.3)
HES: non-fatal traffic injuries	107.2	101.1	103.0	90.4	97.0	-1.9 (-3.2 to -0.6)
Police: killed§	2.3	1.6	1.6	1.6	1.5	-4.8 (-7.6 to -2.0)
HES: fatal injuries§ (V01-V69)	0.6	0.4	0.5	0.3	0.3	-7.0 (13.1 to -0.5)
Pedestrians:						
Police	20.3	18.4	16.7	15.0	12.8	-5.5 (-6.0 to -4.9)
HES (V01-V09)	20.6	20.4	18.8	17.7	17.6	-2.5 (-3.1 to -1.9)
Cyclists:						
Police	7.1	6.2	5.2	4.5	4.2	-6.8 (-7.6 to -6.0)
HES (V10-V19)	19.6	18.8	18.5	15.2	18.1	-2.2 (-4.3 to -0.3)
Motorcycle riders:						
Police	11.7	12.0	13.5	13.6	12.0	1.4 (-0.4 to 3.2)
HES (V20-V29)	13.9	14.8	17.8	19.0	19.9	5.3 (4.2 to 6.4)
Car occupants:						
Police	42.4	37.6	34.1	32.3	27.4	-5.0 (-5.6 to -4.4)
HES ¶(V30-V49)	32.4	31.6	30.4	30.1	32.1	-0.5 (-1.5 to 0.4)
HES: injuries with stay of at least 2 days	49.8	48.7	48.5	46.5	45.8	-1.0 (-1.4 to -0.7)

*Department for Transport's Killed or Seriously Injured Statistics, compiled in the STATS19 system.

†Analysed by using the field Epiorder=1 to count admissions rather than "finished consultant episodes," using ICD-10 codes for transport accidents (V01-V69), excluding admissions coded as non-traffic accidents.

‡Crude rates for all ages; denominator restricted to people aged ≤15 in the data for children.

§Police statistics include all deaths outside hospital and all in hospital within 30 days of sustaining injury; HES include only deaths in hospital after injury.

¶Includes three wheeled vehicles.

What is already known on this topic

It is government policy in England to reduce substantially the number of people killed or seriously injured on the roads

Non-fatal serious injuries reported through the police fell substantially from 1996 to 2004

What this study adds

The reduction in non-fatal road traffic injuries reported in police statistics probably represents an increase in under-reporting of these injuries, or a reduction in minor injuries, or both

Hospital statistics show that there has been no appreciable reduction in injuries that are serious enough to warrant hospital admission

the police definition includes all hospital admissions, and that the hospital admission figures from HES are higher than the STATS19 figures, means that there must be under-reporting in the STATS19 system (con-

firmed earlier research published for the Department for Transport¹). The findings from hospital admission statistics cast doubt on whether there were reductions in serious road injuries from 1996 to 2004 and on whether the government's targets either overall or for children will be met by 2010. The increase in deaths and serious injuries of motorcyclists requires further investigation in its own right.

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Awareness of driving while sleepy and road traffic accidents: prospective study in GAZEL cohort

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Abstract

Objectives To examine the association between self assessed driving while sleepy and the risk of serious road traffic accidents (RTAs).

Design Prospective cohort study.

Setting France.

Participants 13 299 of the 19 894 living members of the GAZEL cohort, workers and recent retirees of a French national utility company followed up since 1989.

Main outcome measures Frequency of driving while sleepy in the previous 12 months, reported in 2001; rate ratios for serious RTAs in 2001-3, estimated by using generalised linear Poisson regression models with time dependent covariates.

Results The risk of serious RTAs increased proportionally with the frequency of self reported driving while sleepy. After adjustment for sociodemographic characteristics, driving behaviour variables, work conditions, retirement, medical conditions and treatments, depressive symptoms, and sleep disorders, the adjusted rate ratios of serious RTAs for participants who reported driving while sleepy in the previous 12 months "a few times" or "once a month or more often" were 1.5 (95% confidence interval 1.2 to 2.0) and 2.9 (1.3 to 6.3) respectively compared with those who reported not driving while sleepy over the same period. These

associations were not explained by any reported sleep disorders.

Conclusions Self assessed driving while sleepy was a powerful predictor of serious RTAs, suggesting that drivers' awareness of their sleepiness while driving is not sufficient to prevent them from having RTAs. Messages on prevention should therefore focus on convincing sleepy drivers to stop driving and sleep before resuming their journey.

Introduction

Published estimates of road traffic accidents (RTAs) attributable to sleepiness range from 3% to 33% according to studies conducted in France,¹ the United States,^{2,3} and Australia.⁴ Little is known about the extent to which drivers are able to assess accurately that they are sleepy while driving.^{2,5} In the 2005 poll of the National Sleep Foundation, 60% of America's adults who drive or have a licence reported that they had driven a motor vehicle when feeling sleepy within the previous year.⁶ A recent survey in France showed that about 6% admitted to having driven while sleepy at least once during the previous three months.⁷ We did a prospective study in a large French cohort to examine the association between self reported frequency of

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