Year-round daylight saving and serious or fatal road traffic injuries in children in the north-east of England

Jean Adams, Martin White and Peter Heywood

Abstract

Background  It has been suggested that year-round daylight saving would reduce road traffic injuries.

Methods and results  Using 15 years of police data from north-east England, we estimate that 6.9 (95 per cent CI 1.5–12.6) fewer serious or fatal road traffic injuries to child pedestrians would have occurred in this area over this period had year-round daylight saving operated (equivalent to 0.5 per year).

Conclusion  The results suggest that operating daylight saving year-round would have a small but tangible effect on the number of serious and fatal road traffic injuries in children in this area. Further work is required to assess the community wide impact of year round daylight saving.

Keywords: children, daylight saving, road traffic injuries, road traffic accidents

Introduction

In the UK, daylight saving (Greenwich Mean Time plus 1 h) has operated between the last Sunday of March and the last Sunday of October since 1972, although other forms of daylight saving have occurred since 1916. This results in 1 h of daylight being shifted from the early morning to the evening during the summer months in order to bring daylight hours more into line with those of human activity. It has been suggested that extending daylight saving year-round would reduce road traffic injuries (RTI) as road traffic crashes and collisions that occur in daylight generally result in less serious injuries than those that occur in darkness. Although previous analyses from the USA have confirmed this, no recent work in this area has been published using UK data. We investigated the effect of maintaining daylight saving throughout the year on the number of serious or fatal RTI to child pedestrians.

Methods and results

The British police record a variety of information on each road traffic accident involving injuries they become aware of, following data checking and cleaning, report this as STATS19 data. We accessed checked and cleaned STATS19 data on RTI to child pedestrians, aged less than 16, resident in Northumberland and Tyne and Wear in the north-east of England, that took place during the winter months (i.e. November to March when daylight saving is not currently operated) from November 1988 to March 2003 inclusive. All injuries (n = 2894) were categorized as ‘slight’ (described in the Instructions for the Completion of Road Accident Reports as ‘e.g. sprains, bruises, cuts judged not to be severe, and slight shock requiring roadside attention’) versus serious (described as ‘e.g. fractures, internal injuries, severe cuts and lacerations, crushing, concussion, severe general shock requiring hospital treatment, detention in hospital as an in-patient either immediately or later, and injuries to casualties who die 30 or more days after the accident from injuries sustained in that accident’) or fatal (described as ‘where death occurs in less than 30 days as a result of the accident’). Serious and fatal injuries were labelled ‘serious’.

Using sunrise and sunset tables for Newcastle upon Tyne, we determined the light conditions when each injury occurred assuming that daylight occurred between sunrise and sunset and darkness between sunset and sunrise. Of 2460 injuries that occurred in daylight, 610 (24.8 per cent) were serious. Of 434 injuries that occurred in darkness, 133 (30.6 per cent) were serious. Thus the proportion of injuries that are serious in daylight is 5.8 (95 per cent CI 1.3–10.6) percentage points less than the proportion of injuries that are serious in darkness (two-sided p value = 0.01).

If daylight saving had been operating year-round, 211 injuries that actually took place in daylight in the morning would have taken place in darkness. A further 330 that actually took place in darkness in the evening would have taken place in daylight. Thus a further 119 injuries would have taken place in daylight...
rather than darkness. Extrapolation from above suggests this would result in 6.9 (95 per cent CI 1.5–12.6) fewer serious injuries over the 15 years of study in the study area (or 0.5, 95 per cent CI 0.1–0.8, per year).

Serious and fatal RTI to children in the area covered by this analysis account for about 3 per cent of the total in Great Britain. Although our results are not necessarily directly applicable to all latitudes across Great Britain, this suggests that 15.3 (95 per cent CI 3.3–26.7) serious or fatal RTI in children/year would have been avoided across Great Britain were daylight saving to be operated year round.

Discussion

Main finding of this study

We have estimated that operating daylight saving year-round would have resulted in around seven fewer serious or fatal RTI to child pedestrians over a period of 15 years in Northumberland and Tyne and Wear (or 0.5/year). Although the effect size in terms of serious and fatal injuries avoided per year in the study area is small, the 95 per cent confidence intervals exclude unity, and when extrapolated across the whole of the UK equate to more than 15 serious or fatal injuries avoided per year.

What is already known on this topic?

Previous work has estimated that year-round daylight saving would lead to a reduction in fatal pedestrian injuries in the USA of between 5 and 13 per cent. These figures are broadly in line with ours. However, given that pedestrian fatalities per head of population are more than twice as great in the USA compared with the UK, it is likely that the overall effect of year-round daylight saving would be greater in the USA than in the UK.

What this study adds

We have found that RTI to child pedestrians in daylight are around 6 per cent less likely to be serious or fatal than those in darkness. This study confirms previous reports that year-round daylight saving is likely to reduce serious and fatal RTI and extends these to child pedestrians in the UK. Given the small absolute number of such injuries, the public health benefits of extending daylight saving year-round in the UK are likely to be small, but tangible.

Limitations of this study

Our data is subject to a number of limitations: it includes only those RTI recorded by the police and relies on police assessments of what is a ‘serious’ injury. Although not all injuries occurring on public roads are included in STATS19 returns, the STATS19 system is the most comprehensive database on RTI in Great Britain.

Our analysis assumes that imposing daylight saving year-round would have no effect on the incidence of childhood RTI – just the severity of these injuries – and that the effects of all other determinants of injury severity (e.g. weather) would have remained unaltered had lighting conditions changed. Further work is required to determine the validity of these assumptions. In addition, we have not taken into account the wider effects of daylight saving in winter including those on industry, commerce and personal lifestyles – including possible increases in active transport such as walking and cycling.

Although we have made an initial estimate of the effect on serious RTI in children of year-round daylight saving across Great Britain, this is likely to be inaccurate and further analyses are required to examine the national effect of year-round daylight saving.

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References