Road traffic fatalities by light conditions: a comparative analysis between the US and the UK

# Introduction

The number of pedestrian fatalities in the United States has risen steadily since 2009 (Sanders, Schneider, and Proulx 2022; Ferenchak, Gutierrez, and Singleton 2022; Wang and Cicchino 2020). A key risk factor in these pedestrian deaths is darkness (Ferenchak, Gutierrez, and Singleton 2022; Sanders, Schneider, and Proulx 2022). Despite less pedestrian flow at night, three-quarters of pedestrian fatalities in the US occur in the dark. Also, the rate of pedestrian deaths in the dark in the US is increasing.

Several questions arise:

* What happens to other vulnerable road users such as cyclists? Is the number of fatality cyclists increasing as much as the number of pedestrians? And how does the darkness influence fatality in cyclists?
* Is the increase in pedestrian fatalities and darkness a trend unique to the US or is it also happening in other Western countries like the United Kingdom?

Using road safety data and travel data from the US and UK, this study estimates and compares trends in the risk of travelling in the dark by modes of transport (pedestrians, cyclists, and other road users) between the US and the UK.

# Data and method

## Data

#### Road safety data

* US Fatality Analysis Reporting System (FARS) data – National Highway Traffic Safety Administration (NHTSA)
* UK Road Safety Data (STATS19) – Department for Transport (DfT)

#### Travel data

* US National Household Travel Survey – Federal Highway Administration (FHWA)
* UK National Travel Survey – DfT

## Method

# Results

## Road traffic fatalities by light conditions and type

### US 2011-2020 (FARS data)

Table 1. Road traffic fatalities by light conditions and type, US 2011-2020

| Type | Light conditions | Light conditions in detail | Num. | % |
| --- | --- | --- | --- | --- |
| Pedestrians | Daylight | Daylight | 7676 | 20.96 |
| Pedestrians | Dark | Dark - Lighted | 14316 | 39.09 |
| Pedestrians | Dark | Dark - Not Lighted | 12821 | 35.00 |
| Pedestrians | Dark | Dark - Unknown Lighting | 472 | 1.29 |
| Pedestrians | Dark | Dawn | 603 | 1.65 |
| Pedestrians | Dark | Dusk | 739 | 2.02 |
| Cyclists | Daylight | Daylight | 2482 | 48.33 |
| Cyclists | Dark | Dark - Lighted | 1257 | 24.47 |
| Cyclists | Dark | Dark - Not Lighted | 1110 | 21.61 |
| Cyclists | Dark | Dark - Unknown Lighting | 43 | 0.84 |
| Cyclists | Dark | Dawn | 103 | 2.01 |
| Cyclists | Dark | Dusk | 141 | 2.75 |
| Others | Daylight | Daylight | 94891 | 52.80 |
| Others | Dark | Dark - Lighted | 27897 | 15.52 |
| Others | Dark | Dark - Not Lighted | 47816 | 26.61 |
| Others | Dark | Dark - Unknown Lighting | 1092 | 0.61 |
| Others | Dark | Dawn | 3527 | 1.96 |
| Others | Dark | Dusk | 4495 | 2.50 |

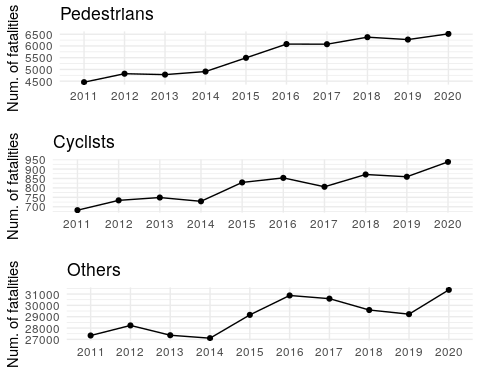


Figure 1. Road traffic fatalities by year and type, US 2011-2020

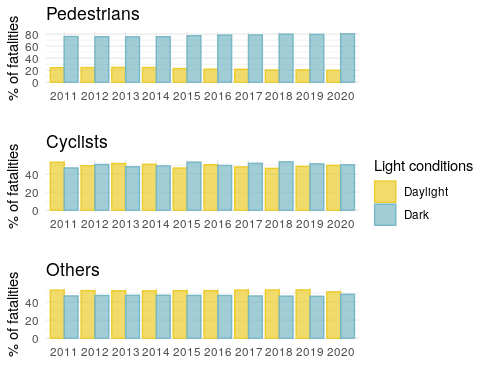


Figure 2. % of road traffic fatalities by light conditions, year, and type, US 2011-2020

### UK 2011-2020 (STATS19 data)

Table 2. Road traffic fatalities by light conditions and type, UK 2011-2020

| Type | Light conditions | Light conditions in detail | Num. | % |
| --- | --- | --- | --- | --- |
| Pedestrians | Daylight | Daylight | 1985 | 46.00 |
| Pedestrians | Dark | Darkness - lights lit | 1466 | 33.97 |
| Pedestrians | Dark | Darkness - lights unlit | 79 | 1.83 |
| Pedestrians | Dark | Darkness - no lighting | 705 | 16.34 |
| Pedestrians | Dark | Darkness - lighting unknown | 80 | 1.85 |
| Cyclists | Daylight | Daylight | 808 | 74.13 |
| Cyclists | Dark | Darkness - lights lit | 157 | 14.40 |
| Cyclists | Dark | Darkness - lights unlit | 10 | 0.92 |
| Cyclists | Dark | Darkness - no lighting | 110 | 10.09 |
| Cyclists | Dark | Darkness - lighting unknown | 5 | 0.46 |
| Others | Daylight | Daylight | 7446 | 61.81 |
| Others | Dark | Darkness - lights lit | 1859 | 15.43 |
| Others | Dark | Darkness - lights unlit | 93 | 0.77 |
| Others | Dark | Darkness - no lighting | 2450 | 20.34 |
| Others | Dark | Darkness - lighting unknown | 199 | 1.65 |

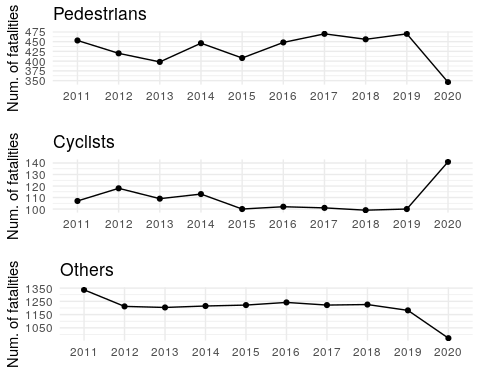


Figure 3. Road traffic fatalities by year and type, UK 2011-2020

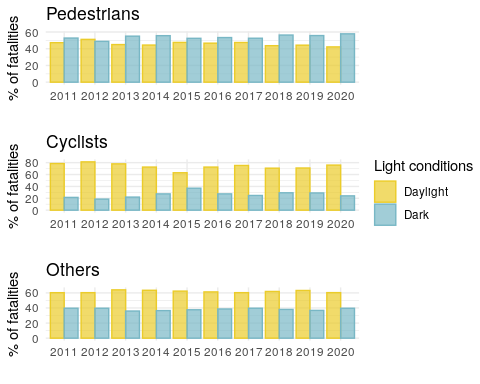


Figure 4. UK % of road traffic fatalities by light conditions, year, and type, UK 2011-2020

# Dicusssion

# Conclusions

# References

Ferenchak, Nicholas N., Risa E. Gutierrez, and Patrick A. Singleton. 2022. “Shedding Light on the Pedestrian Safety Crisis: An Analysis Across the Injury Severity Spectrum by Lighting Condition.” *Traffic Injury Prevention* 23 (7): 434–39. <https://doi.org/10.1080/15389588.2022.2100362>.

Sanders, Rebecca L., Robert J. Schneider, and Frank R. Proulx. 2022. “Pedestrian Fatalities in Darkness: What Do We Know, and What Can Be Done?” *Transport Policy* 120 (May): 23–39. <https://doi.org/10.1016/j.tranpol.2022.02.010>.

Wang, Jin, and Jessica B. Cicchino. 2020. “Fatal Pedestrian Crashes on Interstates and Other Freeways in the United States.” *Journal of Safety Research* 74 (September): 1–7. <https://doi.org/10.1016/j.jsr.2020.04.009>.