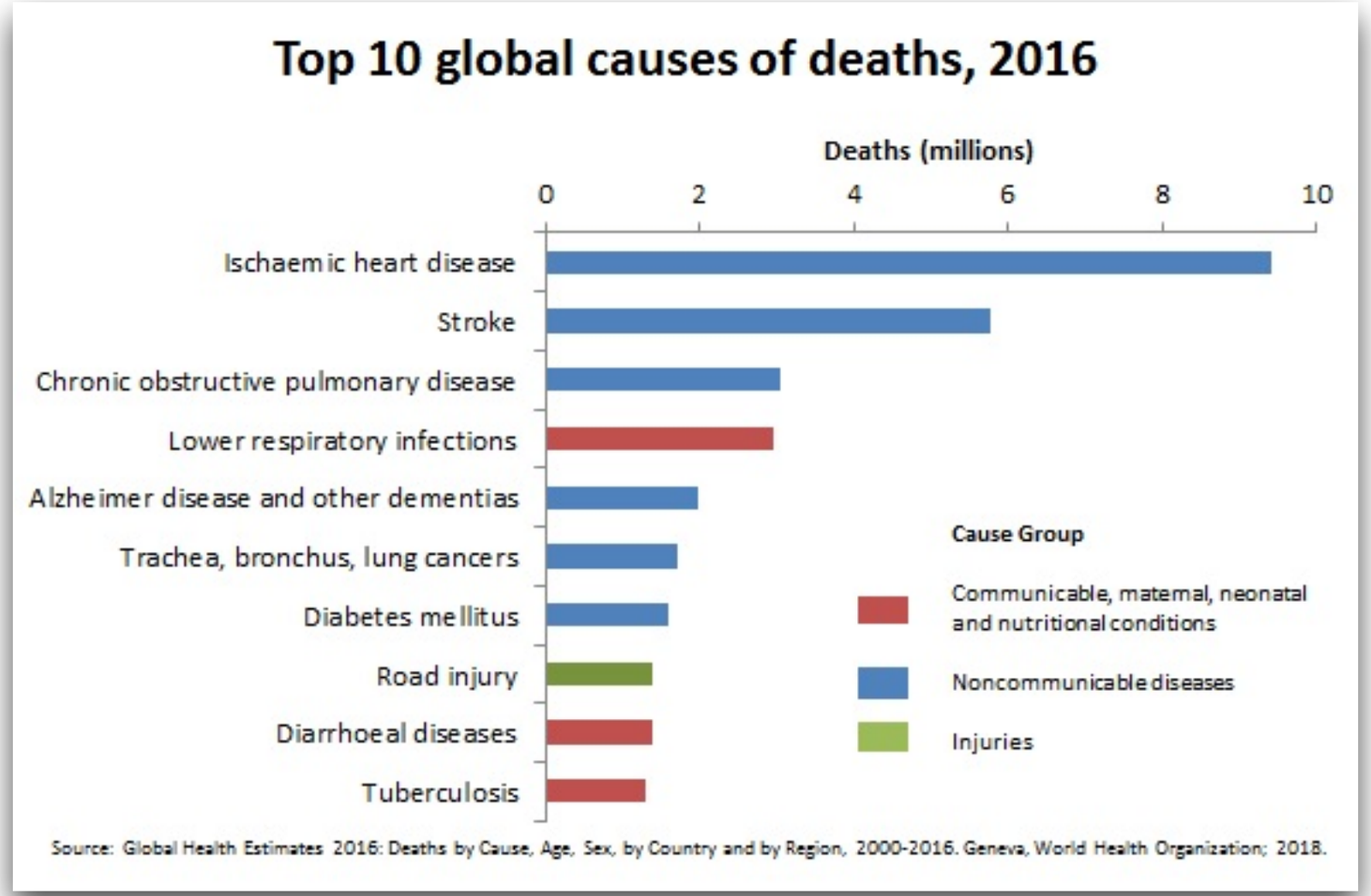
Reproducible road safety research

an exploration of the shifting spatial and temporal distribution of car-pedestrian crashes

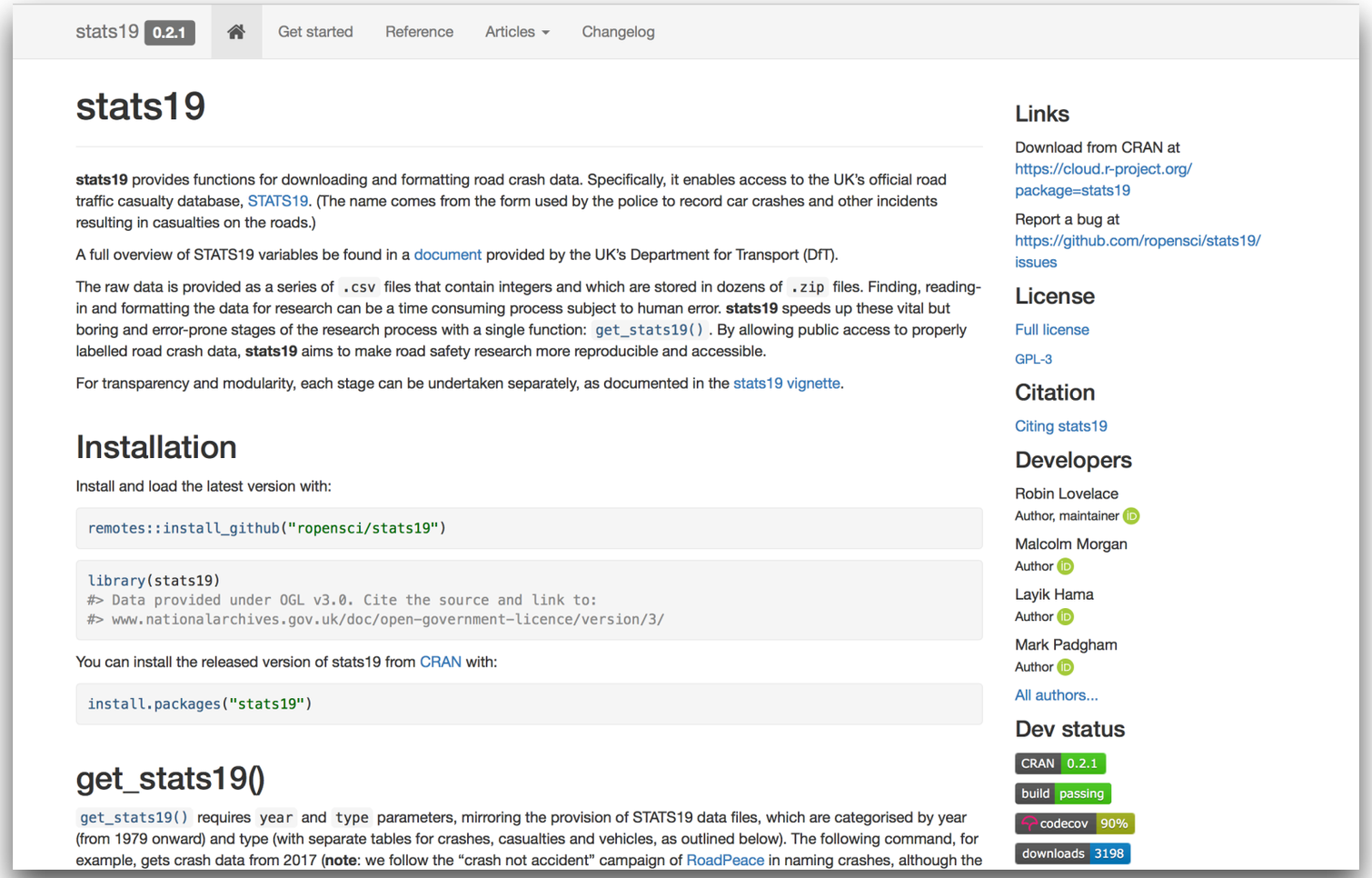
Robin Lovelace
Layik Hama
Roger Beecham

call to action



call to action : road safety research

call to action



stats19 0.2.1 | Get started | Reference | Articles | Changelog

stats19

stats19 provides functions for downloading and formatting road crash data. Specifically, it enables access to the UK's official road traffic casualty database, STATS19. (The name comes from the form used by the police to record car crashes and other incidents resulting in casualties on the roads.)

A full overview of STATS19 variables be found in a document provided by the UK's Department for Transport (DfT).

The raw data is provided as a series of `.csv` files that contain integers and which are stored in dozens of `.zip` files. Finding, reading-in and formatting the data for research can be a time consuming process subject to human error. **stats19** speeds up these vital but boring and error-prone stages of the research process with a single function: `get_stats19()`. By allowing public access to properly labelled road crash data, **stats19** aims to make road safety research more reproducible and accessible.

For transparency and modularity, each stage can be undertaken separately, as documented in the stats19 vignette.

Installation

Install and load the latest version with:

```
remotes::install_github("ropensci/stats19")
```

```
library(stats19)
#> Data provided under OGL v3.0. Cite the source and link to:
#> www.nationalarchives.gov.uk/doc/open-government-licence/version/3/
```

You can install the released version of stats19 from CRAN with:

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install.packages("stats19")
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get_stats19()

`get_stats19()` requires `year` and `type` parameters, mirroring the provision of STATS19 data files, which are categorised by year (from 1979 onward) and type (with separate tables for crashes, casualties and vehicles, as outlined below). The following command, for example, gets crash data from 2017 (**note**: we follow the "crash not accident" campaign of RoadPeace in naming crashes, although the

Links

Download from CRAN at https://cloud.r-project.org/package=stats19

Report a bug at https://github.com/ropensci/stats19/issues

License

Full license

GPL-3

Citation

Citing stats19

Developers

Robin Lovelace
Author, maintainer

Malcolm Morgan
Author

Layik Hama
Author

Mark Padgham
Author

All authors...

Dev status

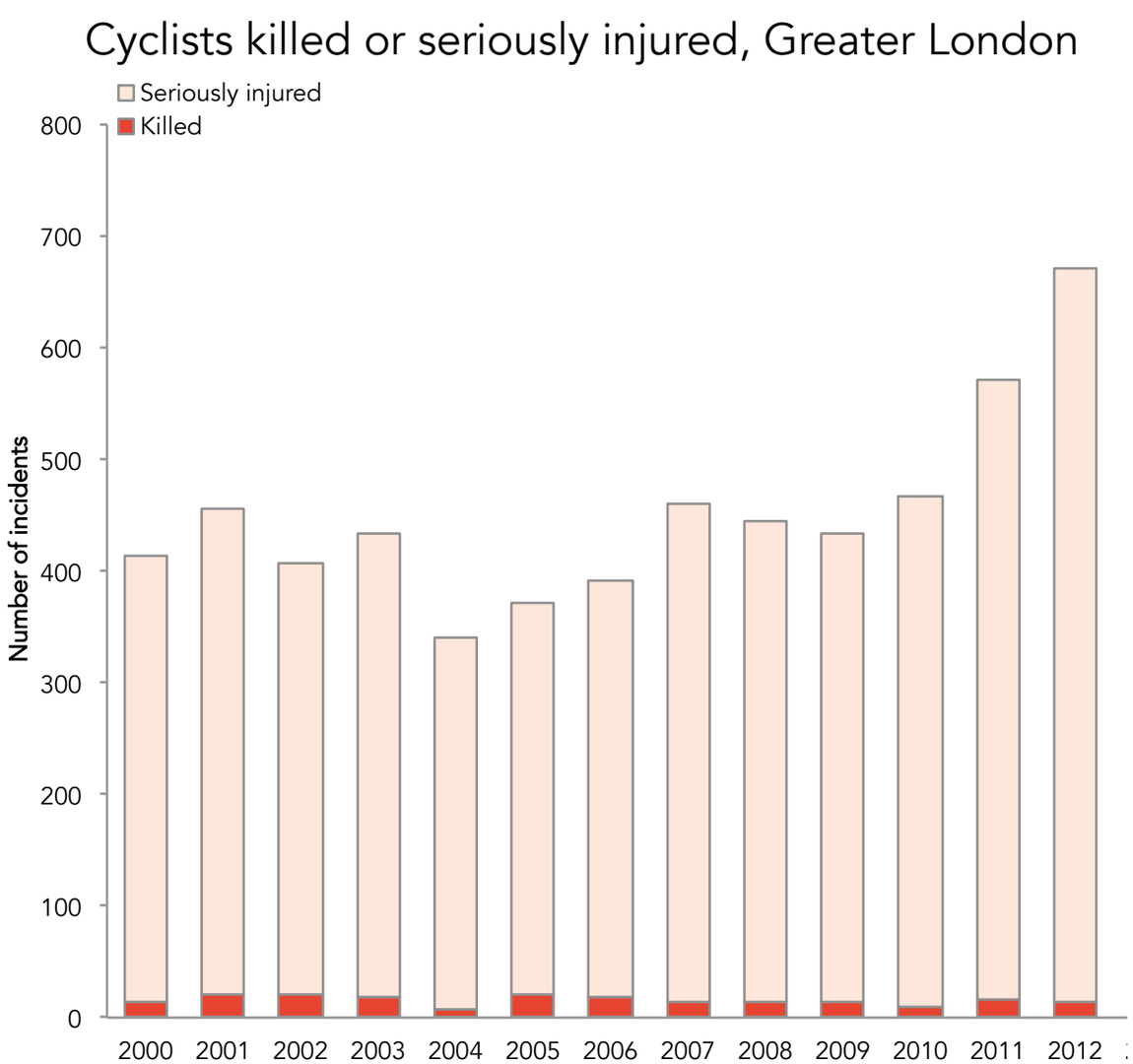
CRAN 0.2.1

build passing

codecov 90%

downloads 3198

call to action



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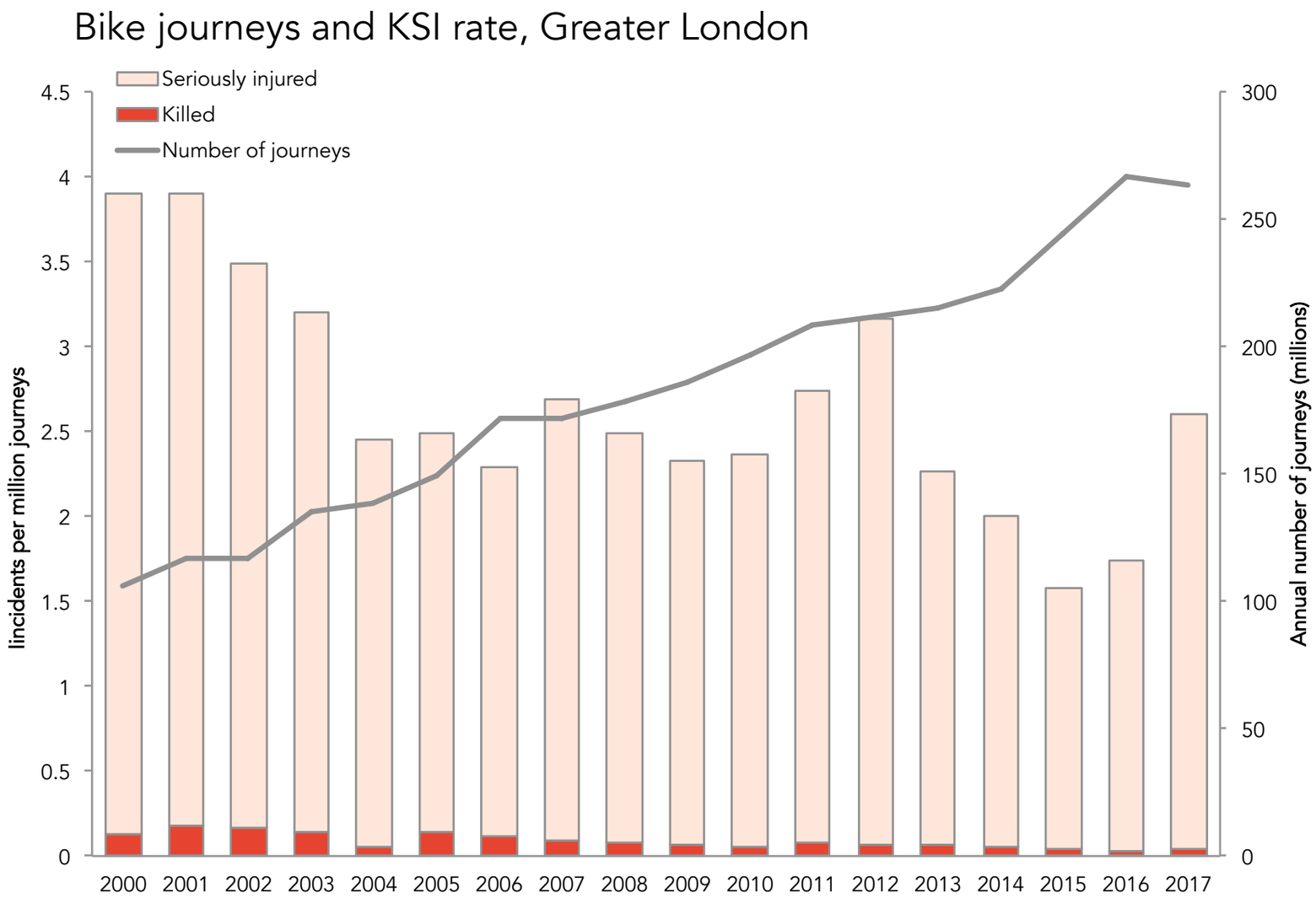

denominator neglect

`stats19` package : why and how

reproducible road safety research

citizen science : tools to inform

Road Safety Data

Published by: Department for Transport
Last updated: 08 November 2018
Topic: Not added
Licence: Open Government Licence

Summary

These files provide detailed road safety data about the circumstances of personal injury road accidents in GB from 1979, the types of vehicles involved and the consequential casualties. The statistics relate only to personal injury accidents on public roads that are reported to the police, and subsequently recorded, using the STATS19 accident reporting form.

View full summary

stats19 data

accidents

`accident_index ..`

crash time, location (~10m resolution), admin location, road context and weather and light conditions

casualties

`accident_index ..`
`vehicle_reference ..`
`casualty_reference ..`

casualty sex, age, severity, passenger type, home area demos

vehicles

`accident_index ..`
`vehicle_reference ..`

vehicles type, age, capacity, manoeuvre type, driver sex, age, home area demogs, purpose

stats19 package

stats19

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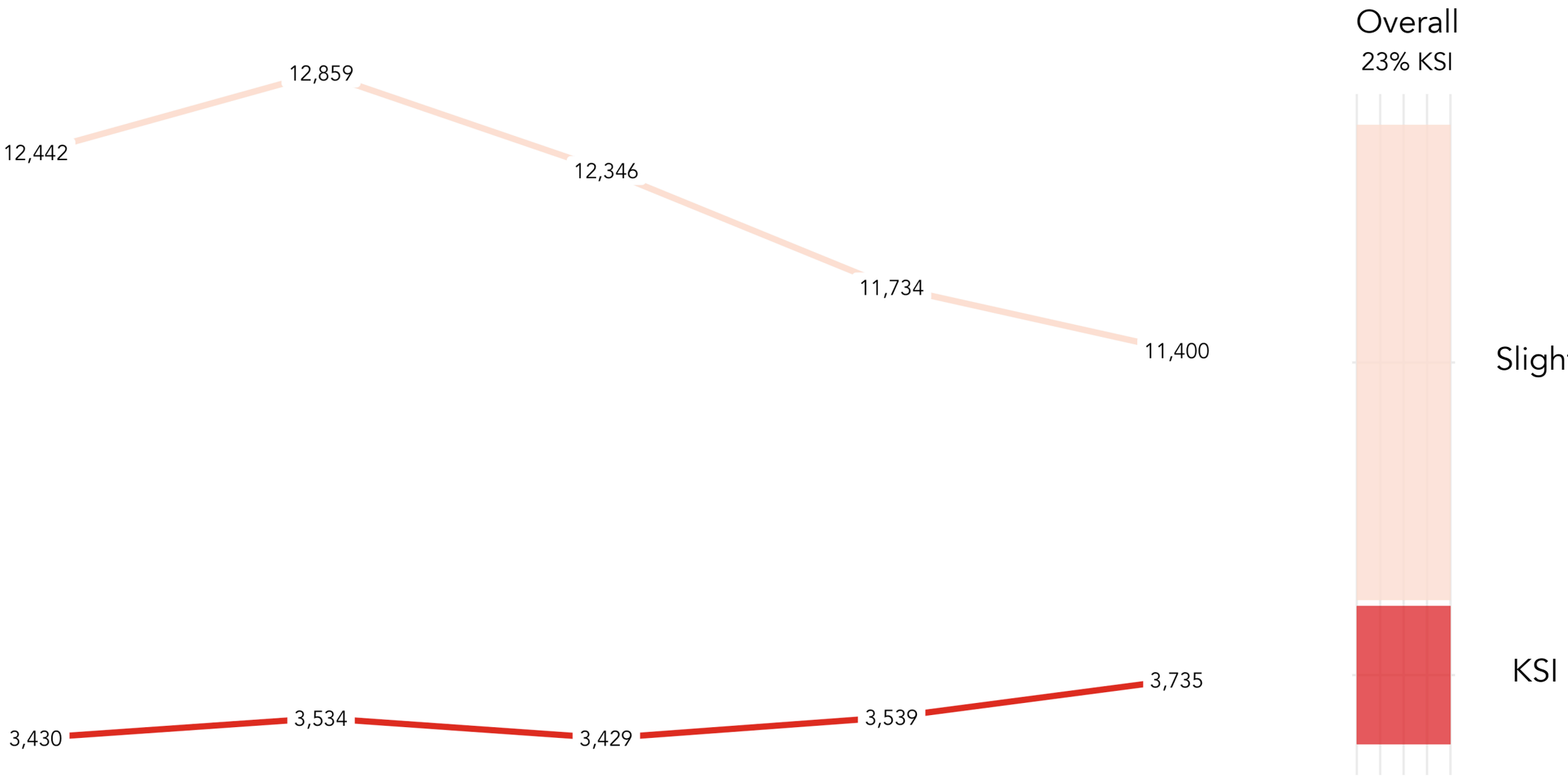
codecov 90%

downloads 3198

stats19 package

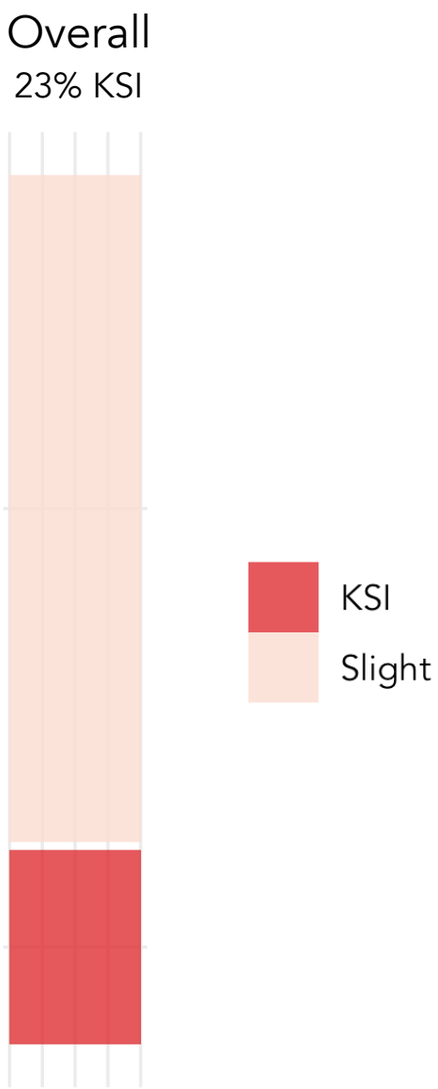
```
install.packages("stats19")

get_stats19(
  year = <yyyy>,
  type = <"Accidents">
         <"Casualties">
         <"Vehicles">
)
```

stats19 package



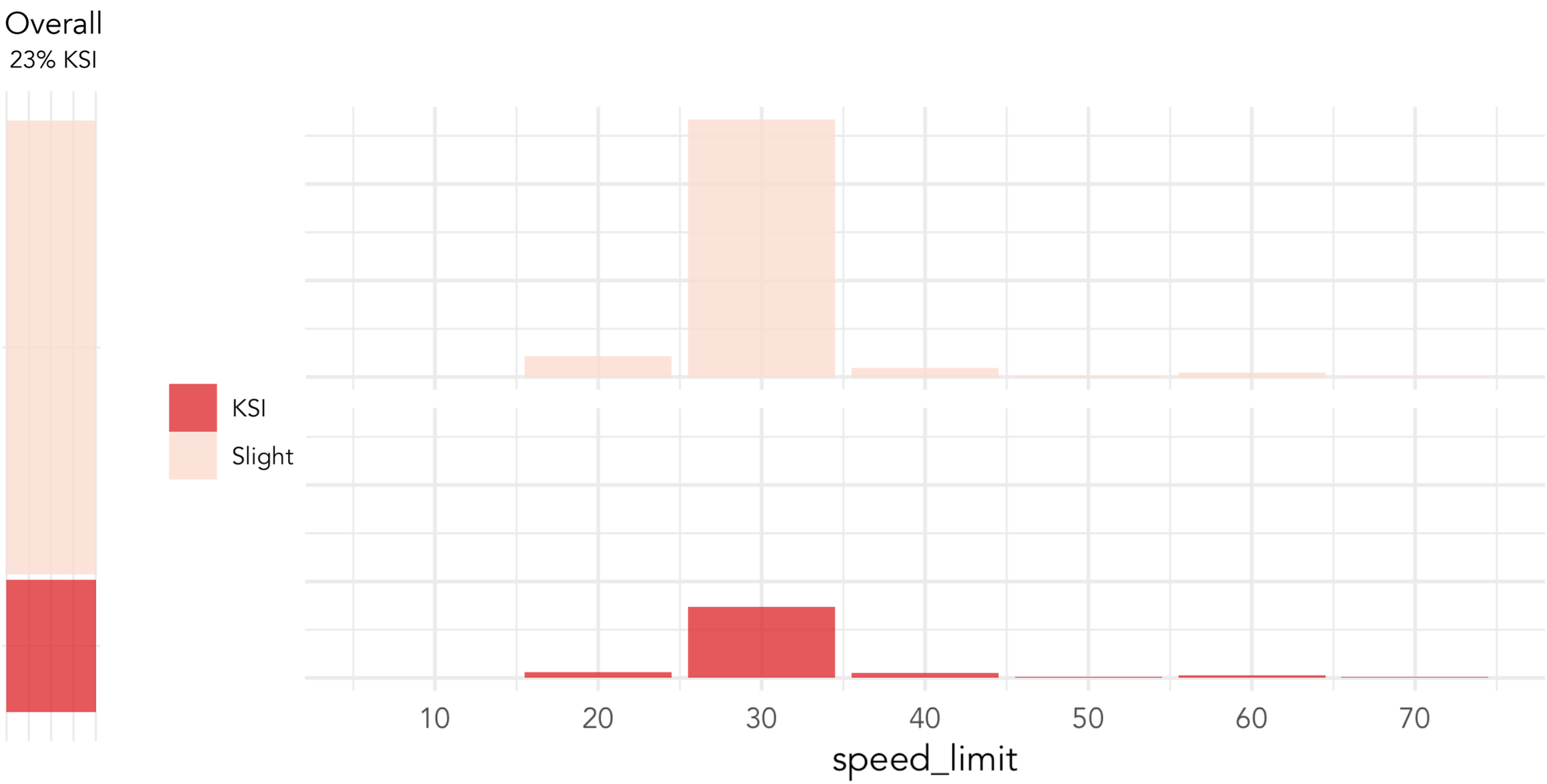
Car-pedestrian casualties

2013-2017



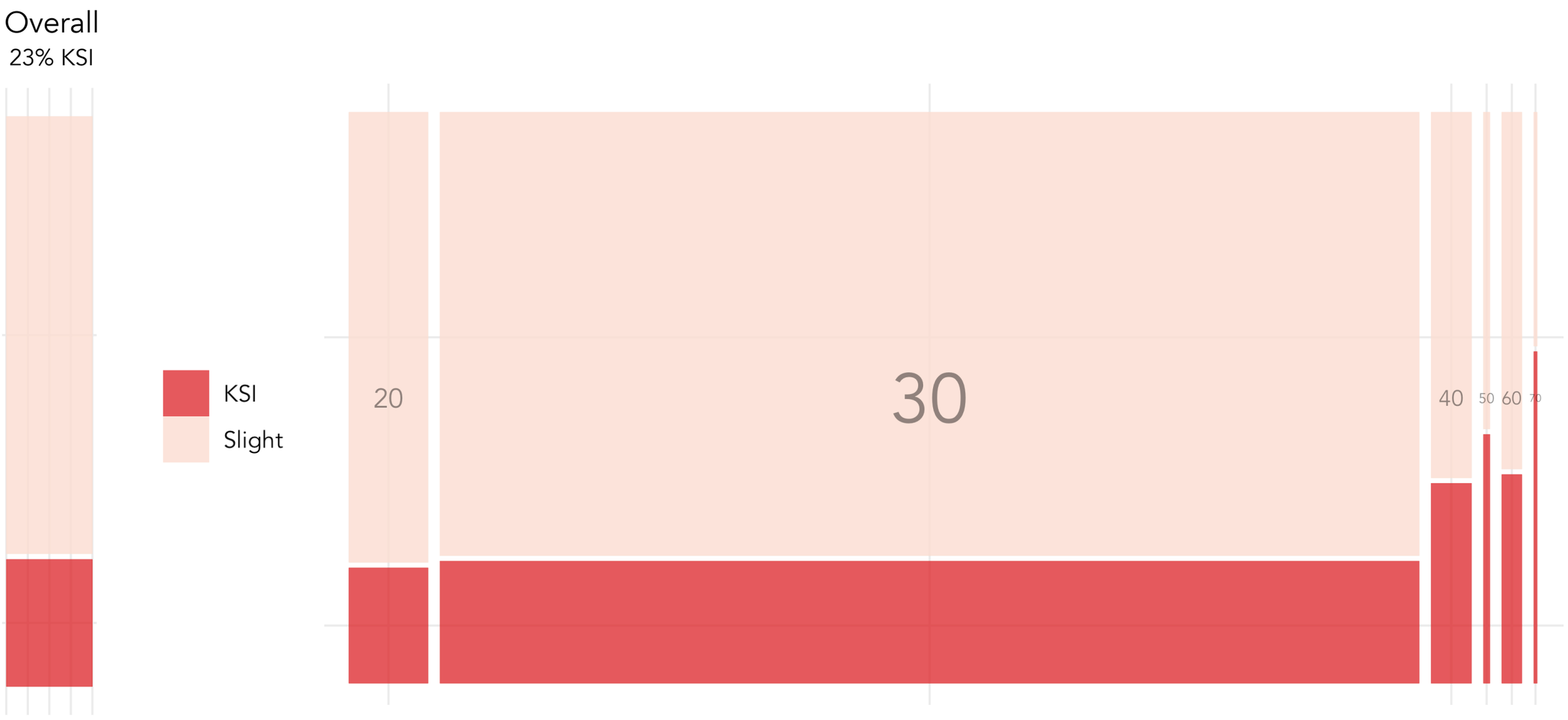
Car-pedestrian casualties

by mph road



Car-pedestrian casualties

by mph road



Car-pedestrian casualties

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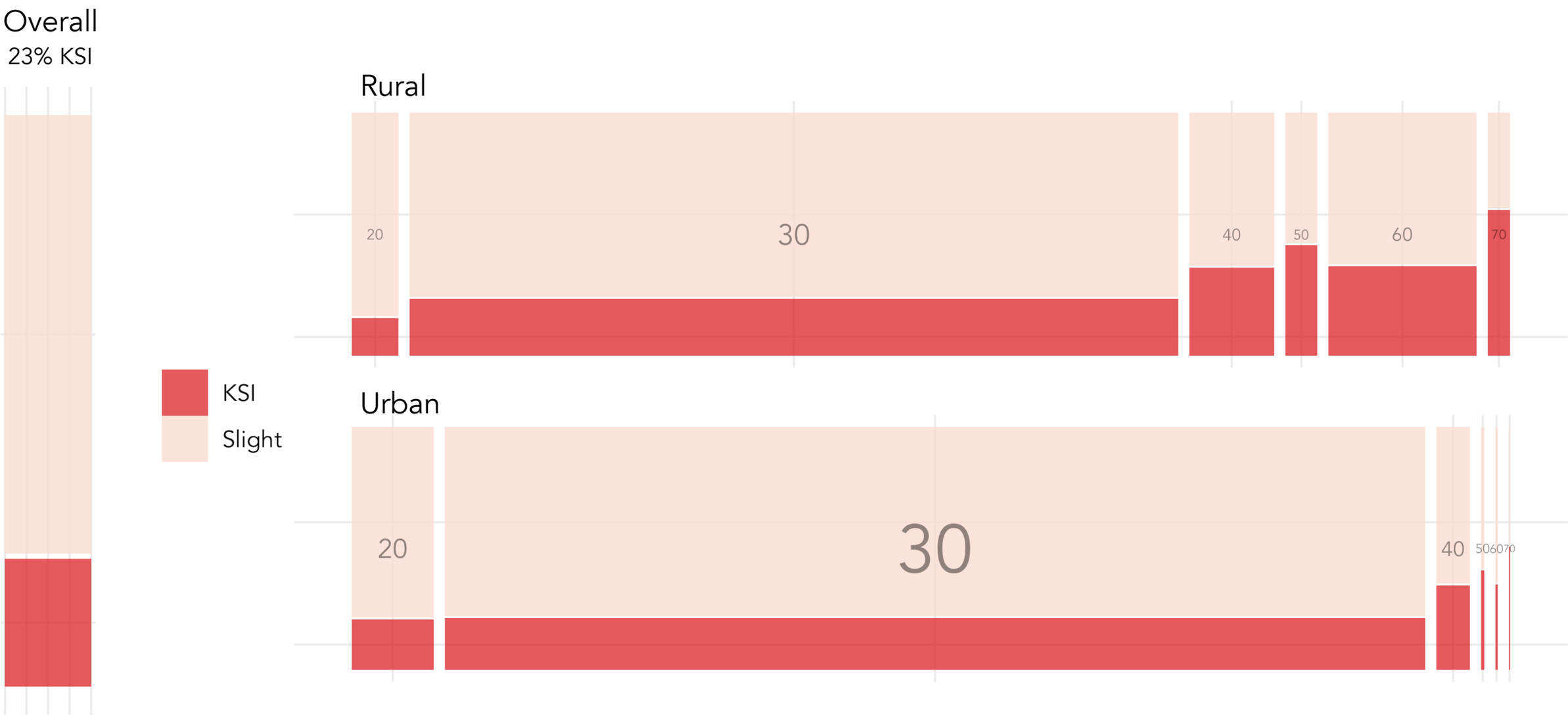
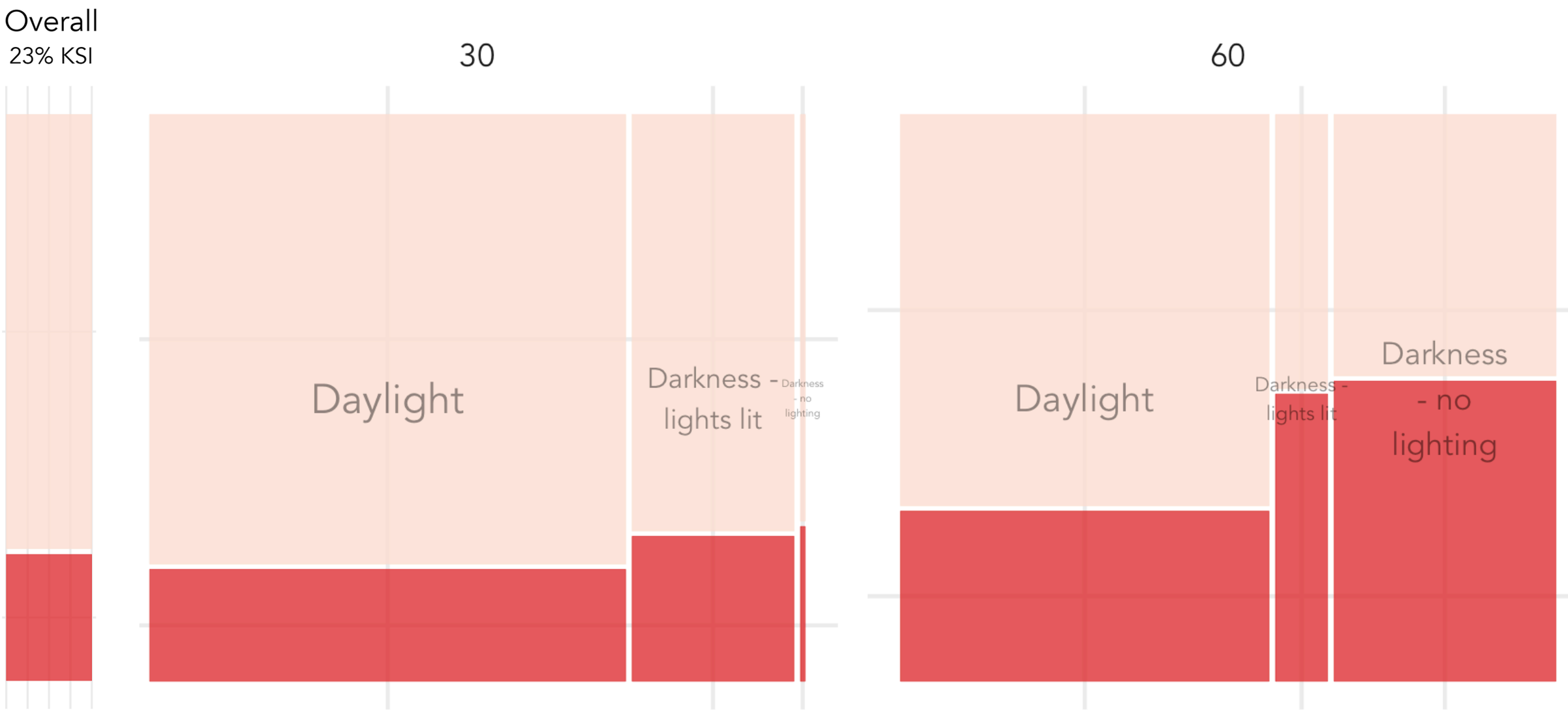


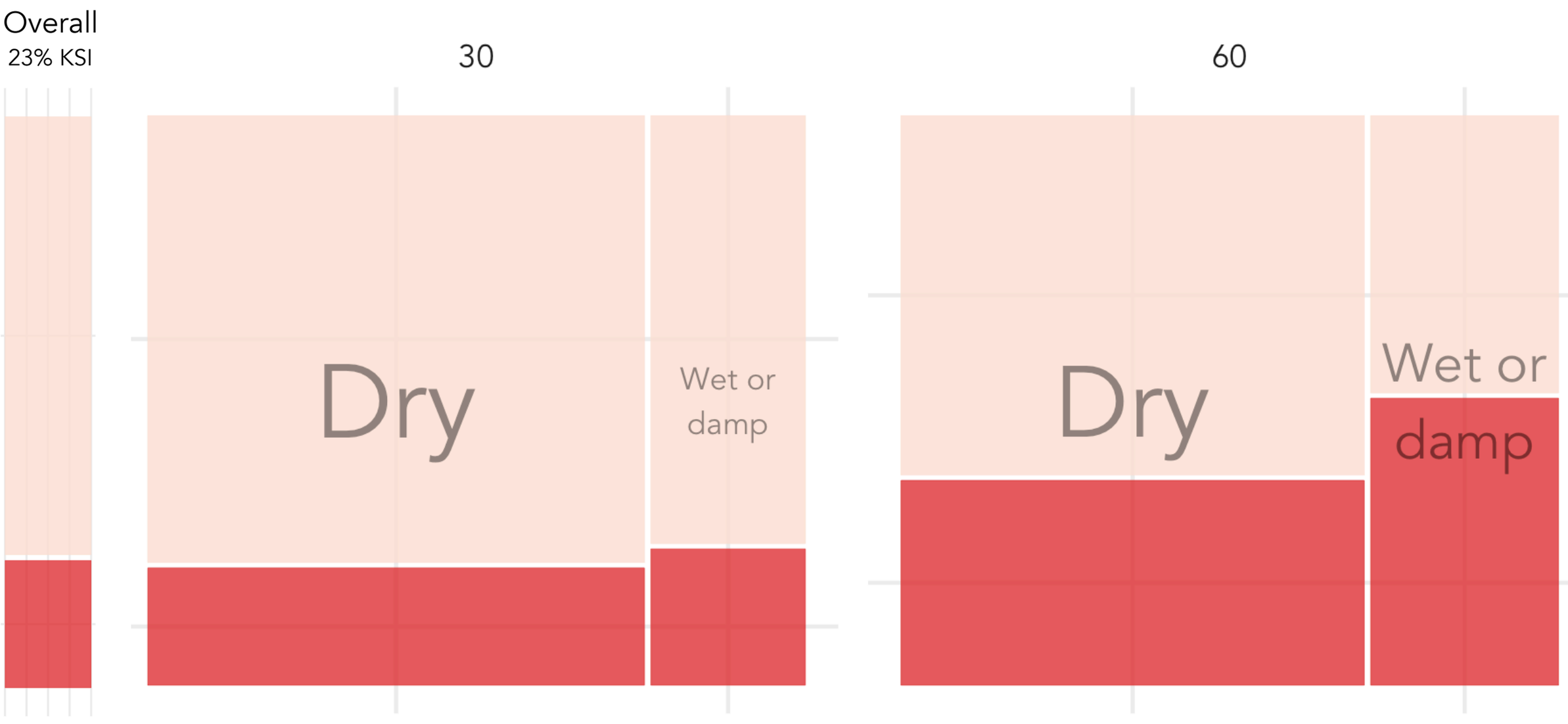
Car-pedestrian casualties

by mph road



Car-pedestrian casualties

30mph | 60mph by lighting condition



Car-pedestrian casualties

30mph I 60mph by surface condition

$$\text{risk-ratio}_{\text{force}} = \frac{\text{ksi}_{\text{force}}}{\text{ksi}_{\text{nat}}}$$

Car-pedestrian casualties

30mph roads by Police Force

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Car-pedestrian casualties

30mph roads by Police Force

stats19 package

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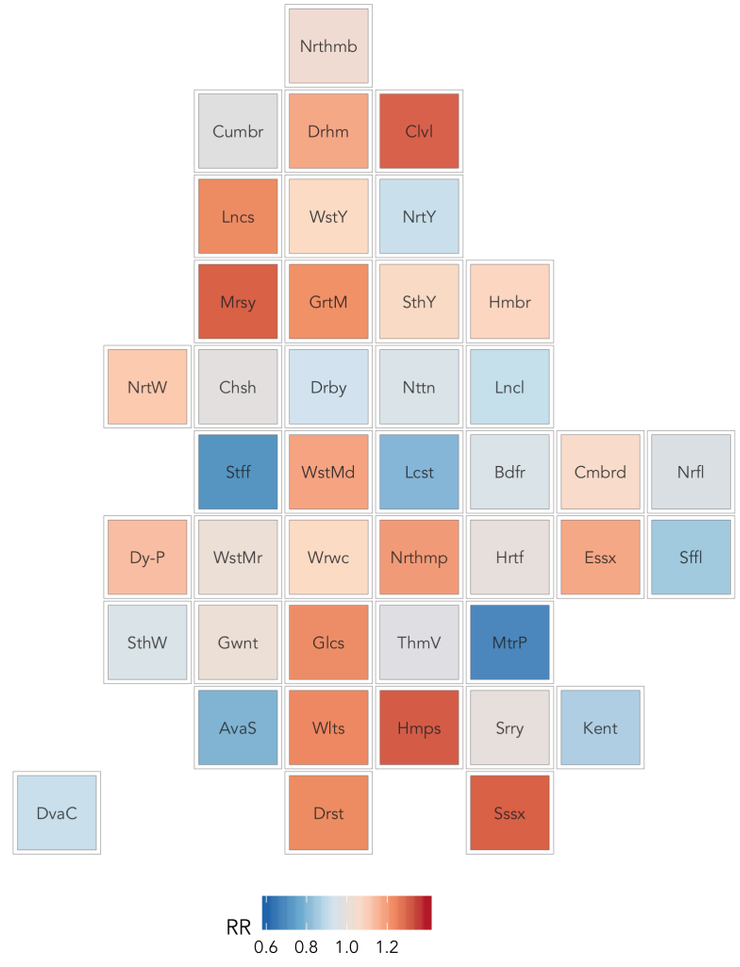
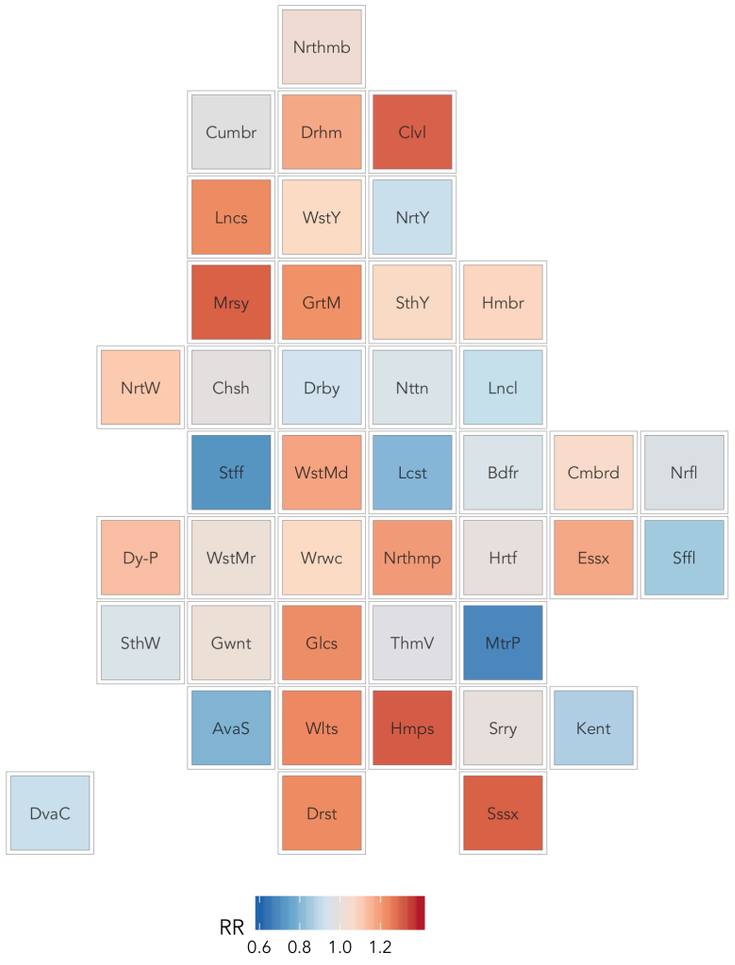
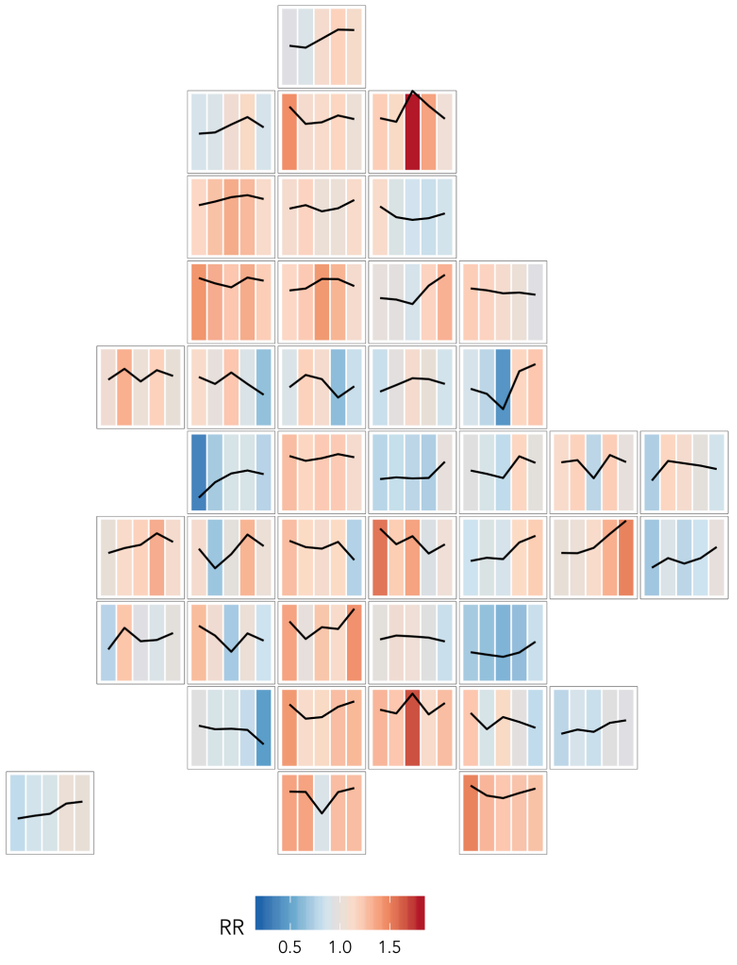


Car-pedestrian casualties

30mph roads by Police Force

stats19 package

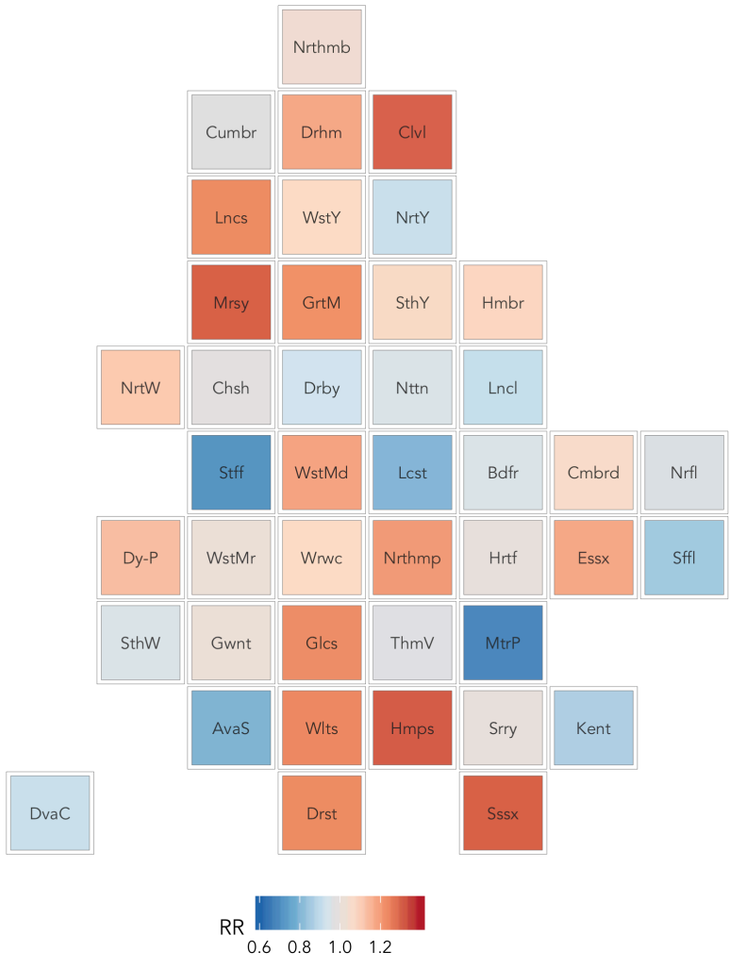


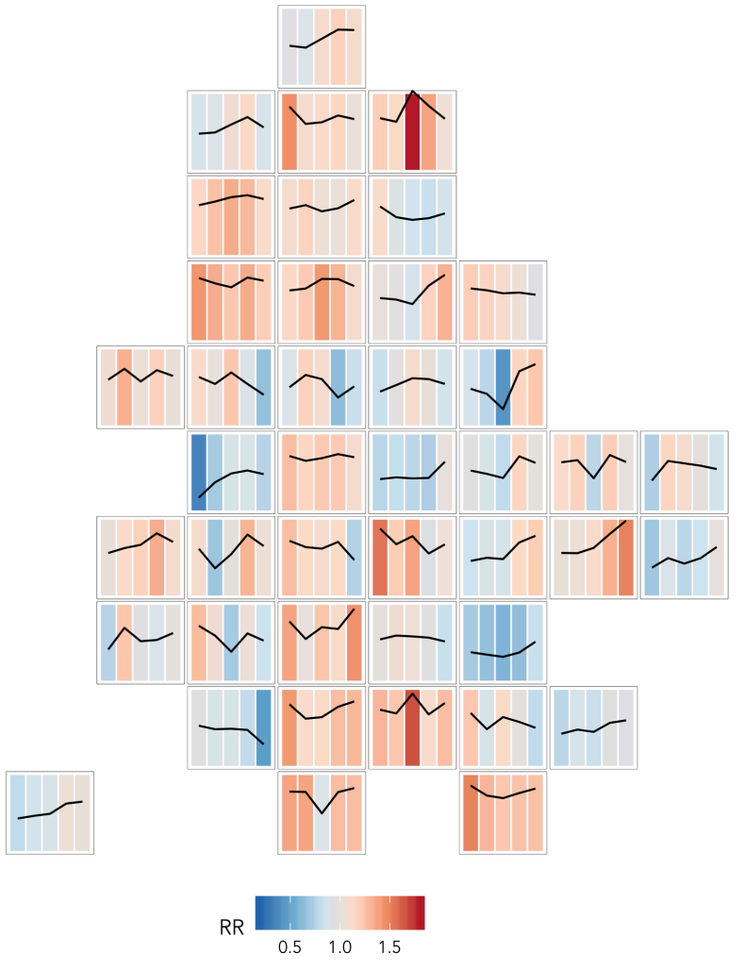


Car-pedestrian casualties

30mph roads by Police Force, year-on-year

stats19 package





Car-pedestrian casualties

30mph roads by Police Force, year-on-year

call to action : exposure

denominator	datasets	
vehicle miles travelled	National Travel Survey	DfT
traffic volume on network	Census Travel demand survey TfL count data	TfL
temporal traffic volume on network	ATC data	DfT

Contents lists available at ScienceDirect

Accident Analysis and Prevention

journal homepage: www.elsevier.com/locate/aap

Cycling injury risk in London: A case-control study exploring the impact of cycle volumes, motor vehicle volumes, and road characteristics including speed limits

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ARTICLE INFO

Keywords:
Cycling
Injury
motor traffic
Risk
Safety in numbers

ABSTRACT

Cycling injury risk is an important topic, but few studies explore cycling risk in relation to exposure. This is largely because of a lack of exposure data, in other words how much cycling is done at different locations. This paper helps to fill this gap. It reports a case-control study of cycling injuries in London in 2013-2014, using modelled cyclist flow data alongside datasets covering some characteristics of the London route network. A multilevel binary logistic regression model is used to investigate factors associated with injury risk, comparing injury sites with control sites selected using the modelled flow data. Findings provide support for 'safety in numbers': for each increase of a natural logarithmic unit (2.71828) in cycling flows, an 18% decrease in injury odds was found. Conversely, increased motor traffic volume is associated with higher odds of cycling injury, with one logarithmic unit increase associated with a 31% increase in injury odds. Twenty-mile per hour compared with 30mph speed limits were associated with 21% lower injury odds. Residential streets were associated with reduced injury odds, and junctions with substantially higher injury odds. Bus lanes do not affect injury odds once other factors are controlled for. These data suggest that speed limits of 20 mph may reduce cycling injury risk, as may motor traffic reduction. Further, building cycle routes that generate new cycle trips should generate 'safety in numbers' benefits.

Aldred et al. 2018

call to action : cumulative knowledge building

Researcher-Centered Design of Statistics: Why Bayesian Statistics Better Fit the Culture and Incentives of HCI

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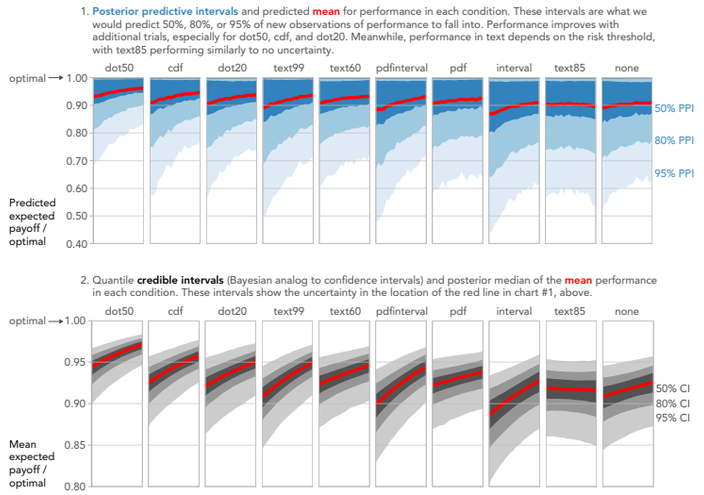

Uncertainty Displays Using Quantile Dotplots or CDFs Improve Transit Decision-Making

Michael Fernandes[1], Logan Walls[1], Sean Munson[1], Jessica Hullman[1], and Matthew Kay[2]

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[2]University of Michigan
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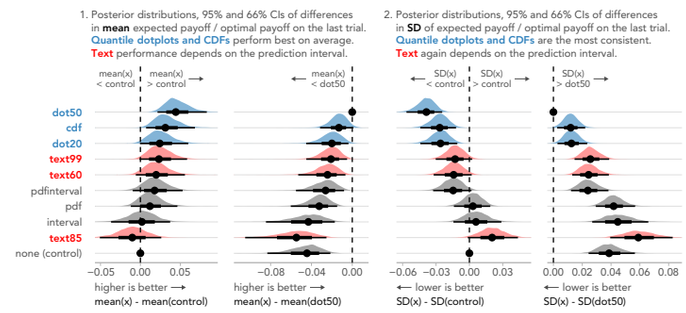
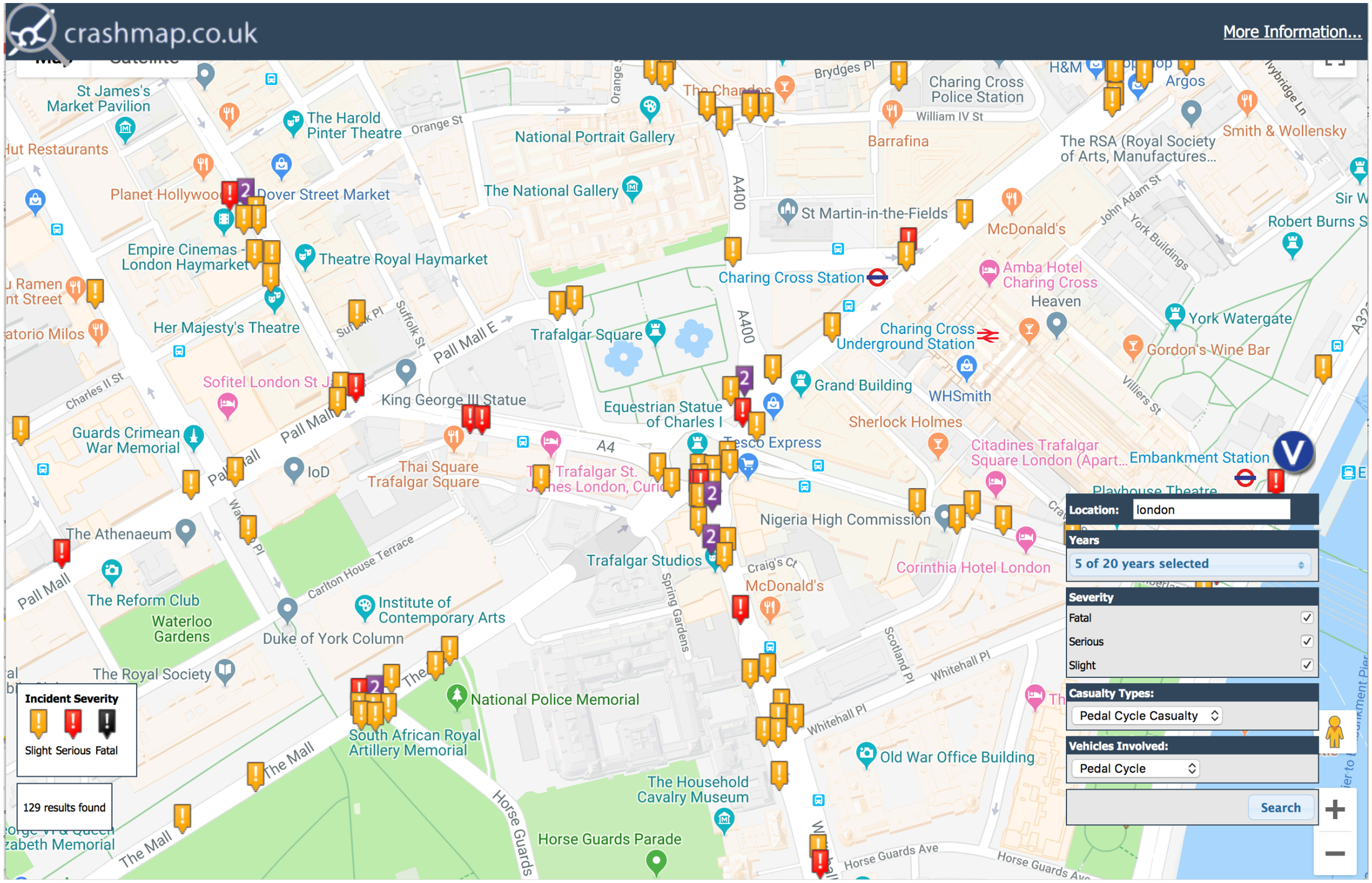
mjskay@umich.edu



Beyond Weber's Law: A Second Look at Ranking Visualizations of Correlation

Matthew Kay and Jeffrey Heer

call to action : citizen science



`paper`

https://github.com/Robinlovelace/stats19-gisruk

`stats19`

https://itsleeds.github.io/stats19/