Data Visualisation Assignment 1

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Programme code: TU256
Class code: Data Visualisation SPEC9995: 2020-21
Part time, post graduate.
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Introduction

For Data Visualisation, I've chosen to highlight pedestrian road traffic incidents, and some of the little known insights into pedestrian traffic incidents.

Data Set
The data set comes from kaggle.com. The user references UK government open data and mentions that 3 data sets have been combined to produce the final dataset. The data is from Road Traffic incidents in 2015.
(Road Accidents Incidence https://www.kaggle.com/akshay4/road-accidents-incidence)

The data itself is made up of quite a number of features, for every type of traffic accident. Pedestrian, cyclist, car, taxi and truck accidents are recorded, 285,331 incidents for the year 2015 being reported.

Target Audience
Target audience are parents of younger children, road safety officers like the lolly pop ladies, the 11 and 12 year olds themselves and any road user.

For ages 11 and 12, these are the typical ages for acquiring road sense and new freedoms, and there are bound to be errors of judgement.

The hope is there is a modification of other road users behaviour, and attention is given for such a vulnerable age pedestrian group. There are pointers given for area's to give attention to.

Data exploration
The dataset combines all traffic accident information, from pedestrian, cycling as well as cars, taxis, trucks. Filtering was required to separate out all the different categories, filtering the dataset to just pedestrians. There were 4 records without sex of casualty, they were deleted. That left 24,039 records of pedestrian accidents. I further narrowed the selection down to just those 17 years of age and below, to 7,229 records.

I concentrated on features that where relevant to pedestrians, such as pedestrian location, pedestrian movement, casualty sex, casualty severity, age of casualty. Each feature did have missing values, and each record with missing values was deleted as they were not significant numbers. The full list of features are in the references.

After data exploration, I reduced the feature set to be explored to pedestrian movement, casuality severity, count of age casuality, sex of casuality.

All Pedestrian Traffic Accident Data exploration.
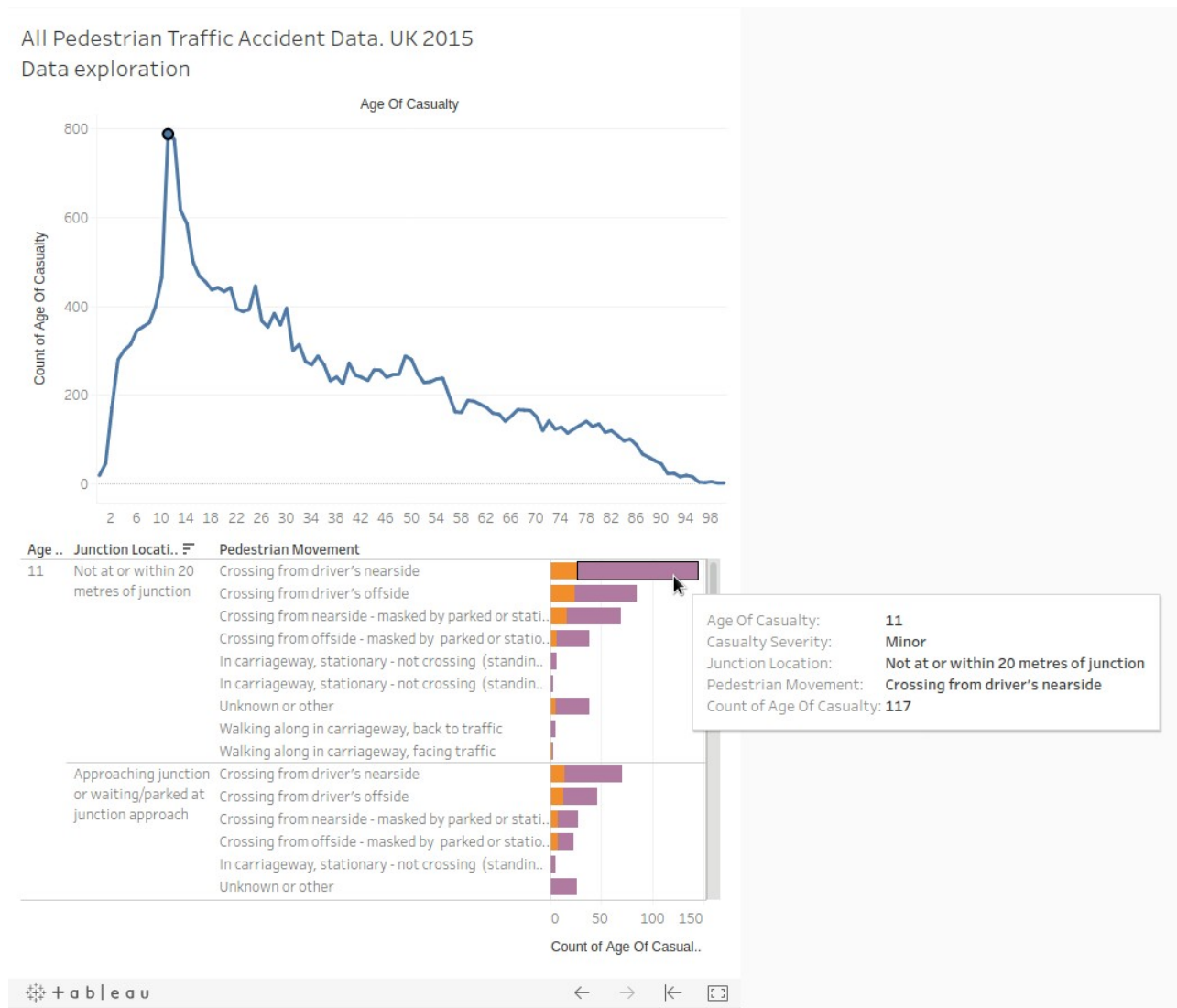
Using Tableau Public, by selecting the age of pedestrian casualty, the data can be explored in detail. The bottom graph shows two features and the number of each casualties for each casualty severity category; Fatal, Serious or Minor.

https://public.tableau.com/views/PedestrianExploration/Dashboard1?:language=en-GB&:display_count=y&:origin=viz_share_link

Insights from the data
For ages 11 and 12 these are the peak ages for being involved in a pedestrian accident. The boys are more likely to be involved than the girls. Most pedestrian accidents are from the nearside of the car (kerbside). Most accidents are minor accidents, however, there are a smaller number of serious accidents, and some fatal accidents.

These insights were gained by filtering the data initially by accident type to obtain only pedestrian data, then by sex, then dividing down the data to detailed type of accident. Null or missing values were deleted.
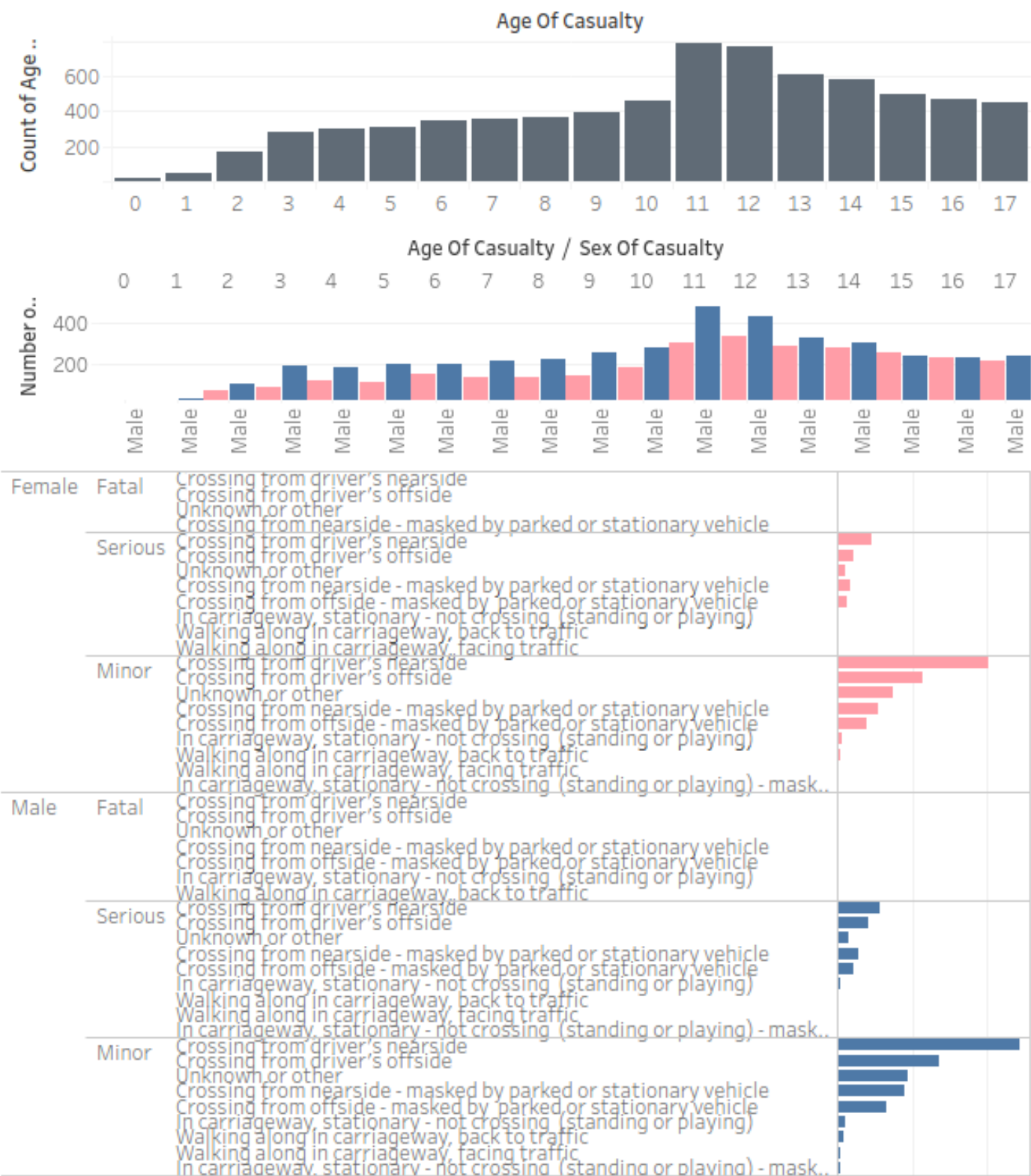
Detailed insights from the data for each age and sex can be filtered by Tableau Public by clicking on each age bar and sex bar. Detailed counts can be found by hovering over each bar. Reset by the clicking the reset icon at the bottom of each dashboard.

Young Pedestrian Traffic Accidents. UK data 2015

Peaks at 11/12 years old.

Boys more than Girls.

From vehicle nearside (kerbside) most prevalent.

Age Of Casualty

Count of Age ..

600
400
200

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Age Of Casualty / Sex Of Casualty

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Number o..

400
200

Male (repeated across each age group)

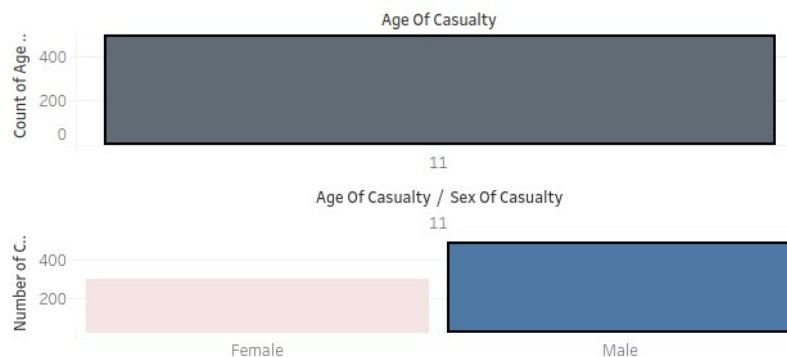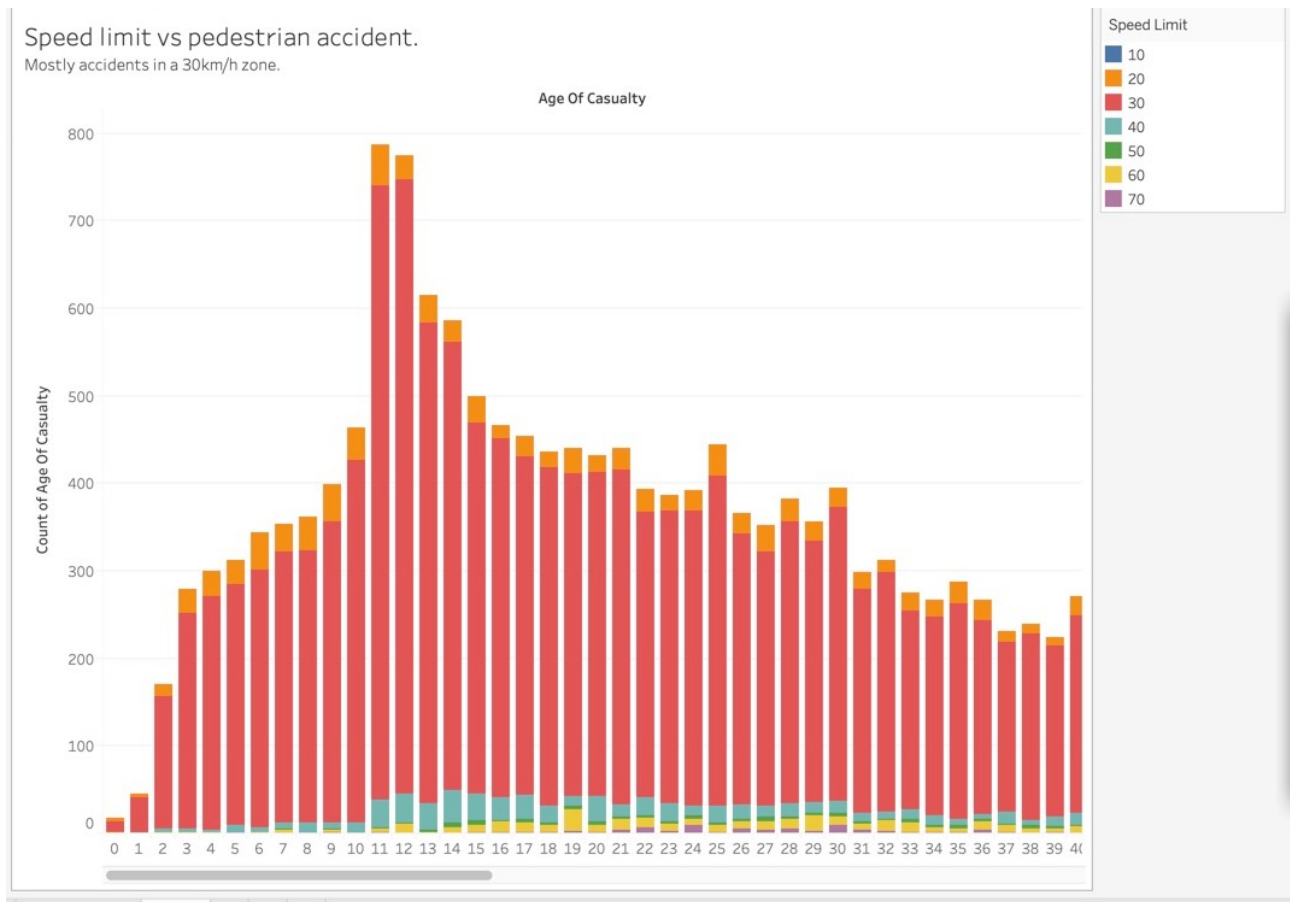|			
Female	Fatal	Crossing from driver's nearside / Crossing from driver's offside / Unknown or other / Crossing from nearside - masked by parked or stationary vehicle	
	Serious	Crossing from driver's nearside / Crossing from driver's offside / Unknown or other / Crossing from nearside - masked by parked or stationary vehicle / Crossing from offside - masked by parked or stationary vehicle / In carriageway, stationary - not crossing (standing or playing) / Walking along in carriageway, back to traffic / Walking along in carriageway, facing traffic	
	Minor	Crossing from driver's nearside / Crossing from driver's offside / Unknown or other / Crossing from nearside - masked by parked or stationary vehicle / Crossing from offside - masked by parked or stationary vehicle / In carriageway, stationary - not crossing (standing or playing) / Walking along in carriageway, back to traffic / Walking along in carriageway, facing traffic / In carriageway, stationary - not crossing (standing or playing) - mask..	
Male	Fatal	Crossing from driver's nearside / Crossing from driver's offside / Unknown or other / Crossing from nearside - masked by parked or stationary vehicle / Crossing from offside - masked by parked or stationary vehicle / In carriageway, stationary - not crossing (standing or playing) / Walking along in carriageway, back to traffic	
	Serious	Crossing from driver's nearside / Crossing from driver's offside / Unknown or other / Crossing from nearside - masked by parked or stationary vehicle / Crossing from offside - masked by parked or stationary vehicle / In carriageway, stationary - not crossing (standing or playing) / Walking along in carriageway, back to traffic / Walking along in carriageway, facing traffic / In carriageway, stationary - not crossing (standing or playing) - mask..	
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Data exploration example

Young Pedestrian Traffic Accidents. UK data 2015
Peaks at 11/12 years old.
Boys more than Girls.
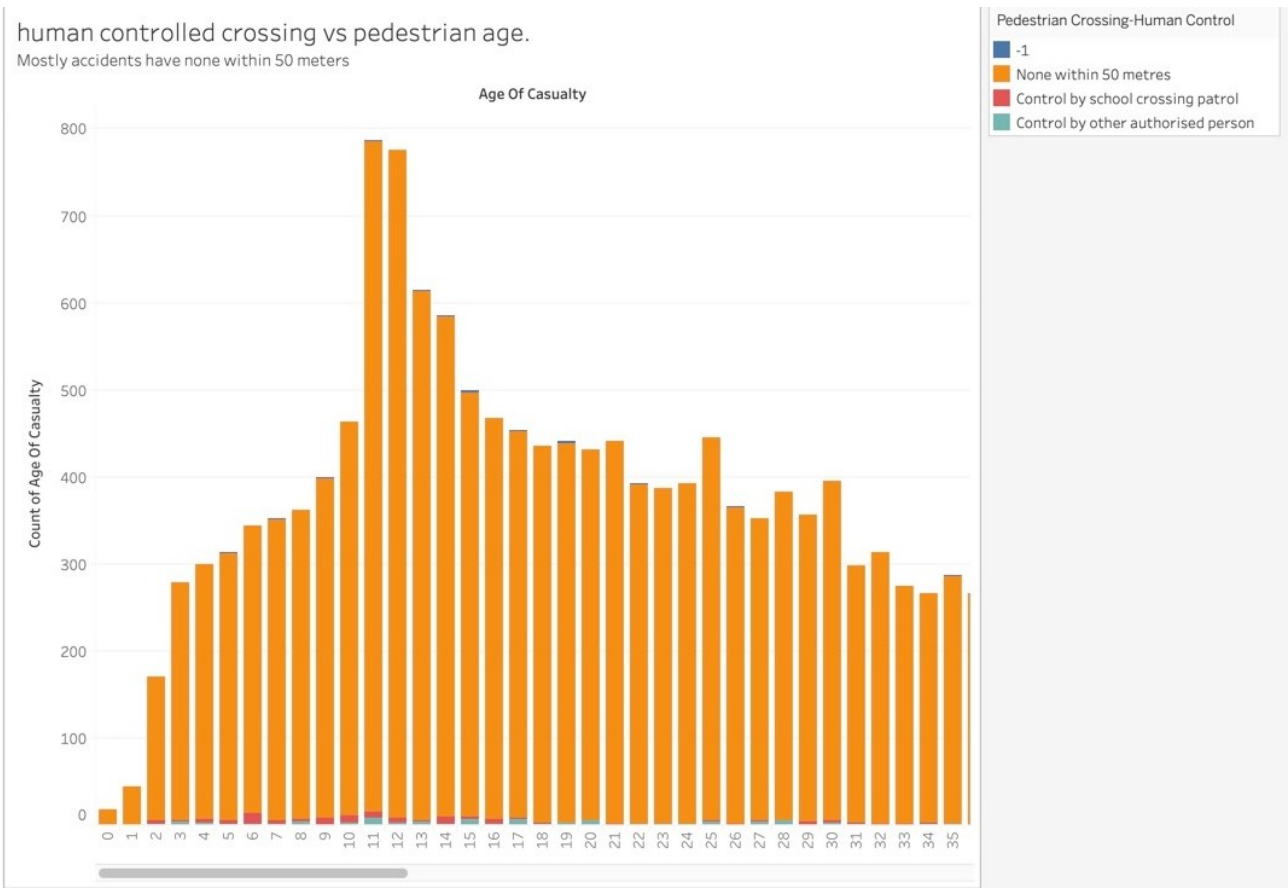From vehicle nearside (kerbside) most prevalent.

Previous iterations.
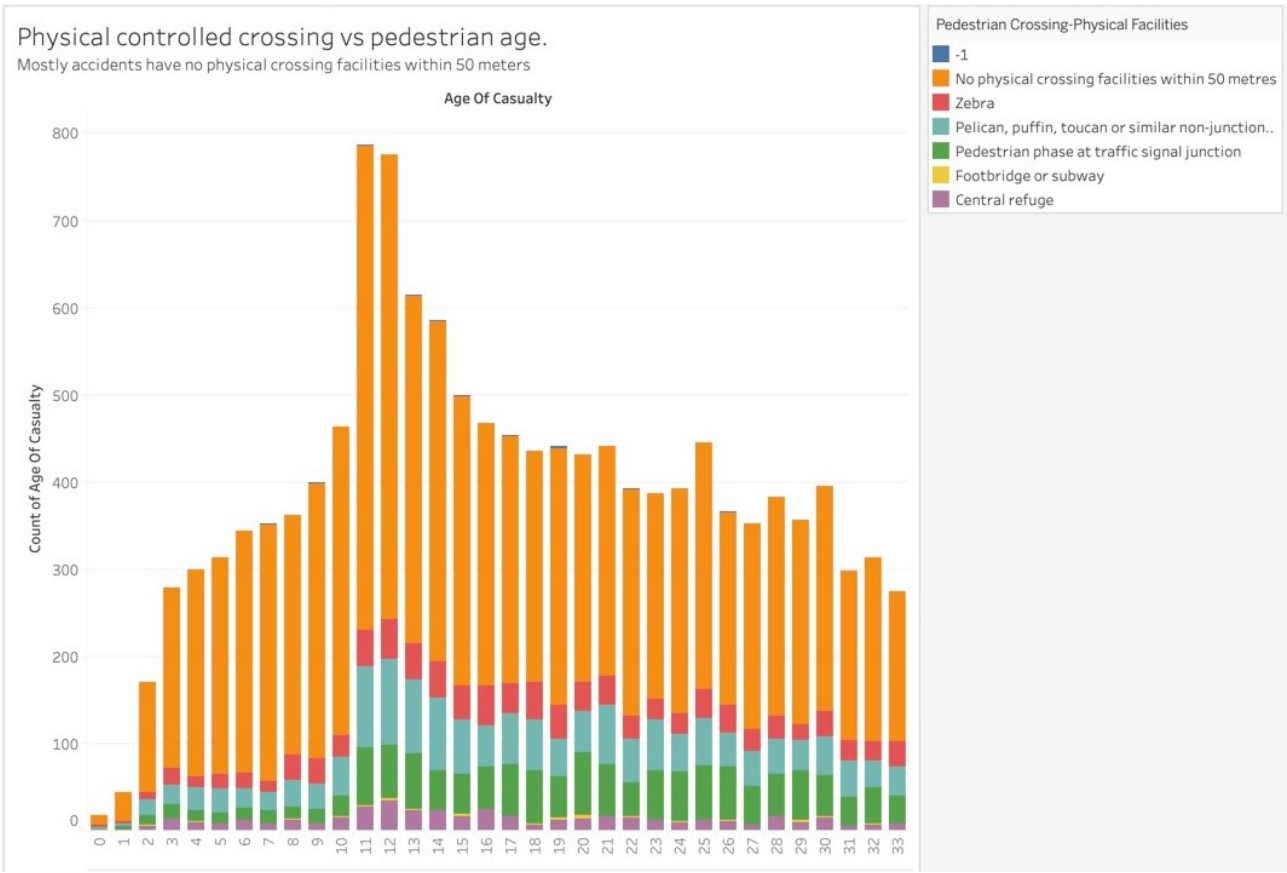
Speed limit vs pedestrian accident.

Most accidents for pedestrians happen in a 30km/hour zone. Its the place where cars and pedestrians interact most.

Human controlled crossing vs pedestrian age.

human controlled crossing vs pedestrian age.
Mostly accidents have none within 50 meters

Age Of Casualty

Pedestrian Crossing-Human Control
- -1
- None within 50 metres
- Control by school crossing patrol
- Control by other authorised person

The vast majority of accidents happened where there were no human officals controlling the crossing.

Physical controlled crossing vs pedestrian age.

Physical controlled crossing vs pedestrian age.
Mostly accidents have no physical crossing facilities within 50 meters

Pedestrian Crossing-Physical Facilities
- -1
- No physical crossing facilities within 50 metres
- Zebra
- Pelican, puffin, toucan or similar non-junction..
- Pedestrian phase at traffic signal junction
- Footbridge or subway
- Central refuge

Over half pedestrian accidents took place where there were no traffic lights or other zones like pelican crossings and the like. Although, there were still accidents at physically controlled zones.

Light conditions vs pedestrian accident rate.
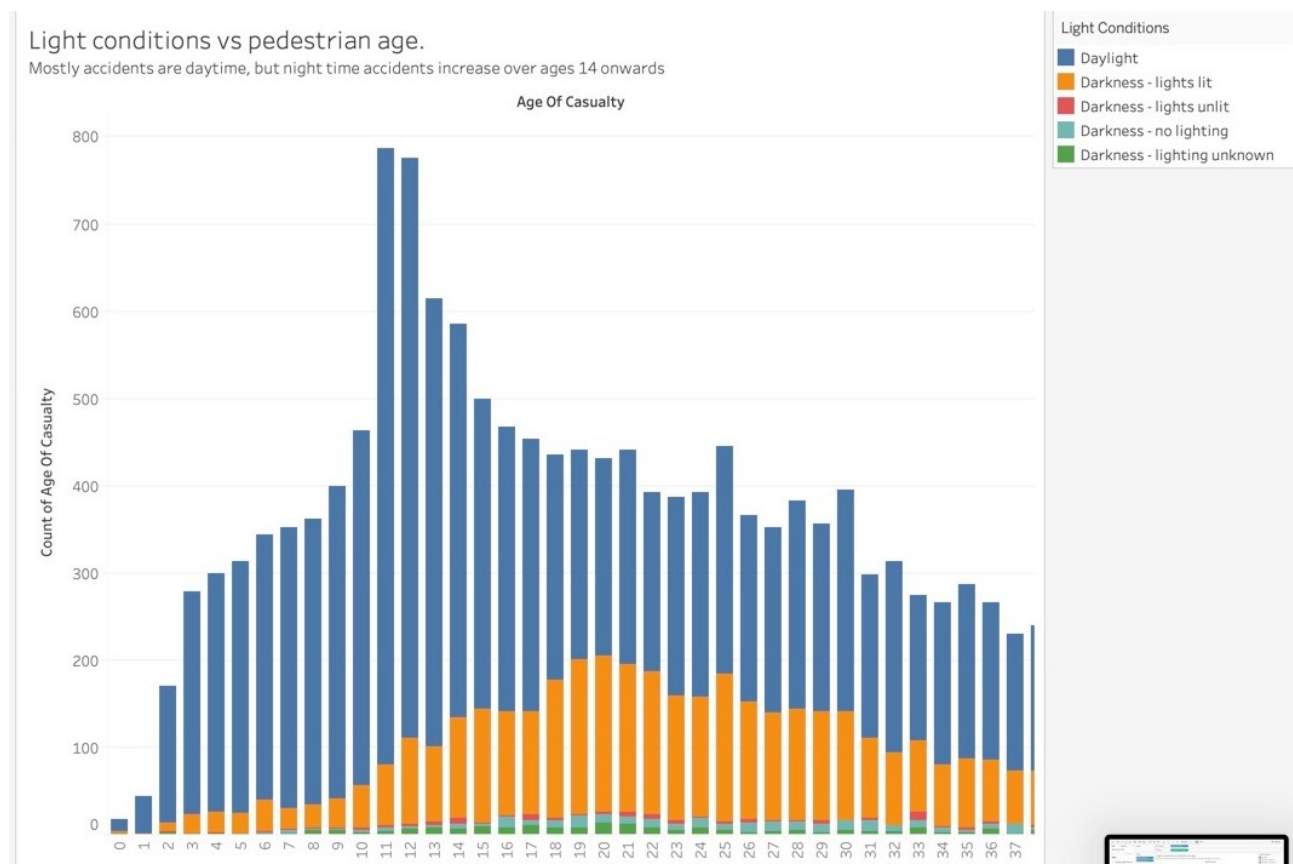
Light conditions are not a great fraction of pedestrian incidents until later ages.

Summary

To being to change behaviour, the first place to start is information. While all young pedestrians are vulnerable, the 11 and 12 year olds are more vulnerable.

Reference information:

Data set comes from Kaggle
https://www.kaggle.com/akshay4/road-accidents-incidence
3 data sets from UK open data (https://data.gov.uk) have been combined to produce a 2015 data set.

Feature set

Casualty
Accident Index
Vehicle Reference
Casualty Reference
Casualty Class
Sex of Casualty
Age of Casualty
Age Band of Casualty
Casualty Severity
Pedestrian Location
Pedestrian Movement
Car Passenger
Bus or Coach Passenger
Pedestrian Road Maintenance Worker (From 2011)
Casualty Type
Casualty IMD Decile
Casualty Home Area Type

Accident Circumstances
Accident Index
Police Force
Accident Severity
Number of Vehicles
Number of Casualties
Date (DD/MM/YYYY)
Day of Week
Time (HH:MM)
Location Easting OSGR (Null if not known)
Location Northing OSGR (Null if not known)
Longitude (Null if not known)
Latitude (Null if not known)
Local Authority (District)
Local Authority (Highway Authority - ONS code)
1st Road Class
1st Road Number
Road Type
Speed limit
Junction Detail
Junction Control
2nd Road Class
2nd Road Number
Pedestrian Crossing-Human Control

Pedestrian Crossing-Physical Facilities
Light Conditions
Weather Conditions
Road Surface Conditions
Special Conditions at Site
Carriageway Hazards
Urban or Rural Area
Did Police Officer Attend Scene of Accident
Lower Super Ouput Area of Accident_Location (England & Wales only)

Vehicle
Accident Index
Vehicle Reference
Vehicle Type
Towing and Articulation
Vehicle Manoeuvre
Vehicle Location-Restricted Lane
Junction Location
Skidding and Overturning
Hit Object in Carriageway
Vehicle Leaving Carriageway
Hit Object off Carriageway
1st Point of Impact
Was Vehicle Left Hand Drive
Journey Purpose of Driver
Sex of Driver
Age of Driver
Age Band of Driver
Engine Capacity
Vehicle Propulsion Code
Age of Vehicle (manufacture)
Driver IMD Decile
Driver Home Area Type