ASSESSMENT 2: DATA ANALYSIS

Part A: Proposal

36103 Statistical Thinking for Data Science

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1   Introduction

Death from road traffic crashes continue to be major global public health problems across Australia (*Injury in Australia: Transport injuries* 2021). A road traffic fatality results from a complex interaction of **human**, **technical** and **environmental** factors, and different causes behind road vehicle crashes require different measures to reduce their impacts. Identifying the risk factors that contribute to road traffic deaths is important in identifying interventions that can reduce the risks associated with those factors.

Our group study assesses how strongly the variation between some environmental factors and the increased risk of vehicle crash-related mortality in Victoria, Australia. The findings are relevant in the context of impact based warnings for both **road users**, **road maintenance** and **traffic management authorities**, as well as **rescue forces**. On the one hand, this is relevant for raising the effectiveness of road weather warning services, while on the other hand, it may help rescue and medical services to project the number of emergencies in designated regions in case weather forecasts foresee bad conditions for road transport.

2   Research Questions

The reason why the study was conducted to identify the following problems.

- **Human:**

Are certain age groups more likely to cause accidents?

Are certain locations more dangerous more in certain weather?

Is alcohol a main cause to car accidents - Alcohol by location - Alcohol by age group

The level of damage done related to alcohol - number of people injured

- **Technical:**

Are older cars (year of manufacturing) more likely to car crash?

Are taxis/buses/bicycles causing accidents?

If there are more accidents in certain speed zones

Passenger seating position / driver is more injured? (Questions on whether driver protecting themselves or the passenger)

Were they wearing a seatbelts and/or helmet

- **Environment:**

Are certain cars more dangerous in certain weather conditions?

Could road surface types lead to more accidents?

Which time / hour of days likely to have more accidents? Which day of week

3 Data

3.1 Accident

A data set with anonymized information from government of all road accidents in Victoria, Australia from 2006 until 2020 is used (Department of Transport 2006). The data provided allows users to analyse Victorian fatal and injury crash data based on time, location, conditions, crash type, road user type, object hit etc.

3.2 Weather

Weather datasets contains about 14 years of daily weather observations from many locations across Australia and were collected by [API source]. Data given includes a weather table describing daily mean, maximum, and minimum temperature and precipitation for the year of 2006 - 2020. This data was used to perform a preliminary exploration to determine what, if any, predictive value weather has on crash and injury data when analyzed at the level of incident.

4 Methods

5 Model

6 Limitations

We don't have the data for cars driving that didn't get into an accident. Therefore, instead of predicting accidents, we are predicting deaths when accidents do occur.

7   Bibliography

Department of Transport (2006), 'Victoria Car Accident Dataset 2006 - 2020'.

URL:

https://vicroadsopendatastorehouse.vicroads.vic.gov.au/opendata/Road_Safety/ACCIDENT.zip

Injury in Australia: Transport injuries (2021).

URL: *https://www.aihw.gov.au/reports/injury/transport-injuries*

8   Appendix(ces)

8.1   Appendix A: additional tables

Insert content for additional tables here.

8.2   Appendix B: additional figures

Insert content for additional figures here.

8.3   Appendix C: code

Insert code (if any) used during your dissertation work here.