

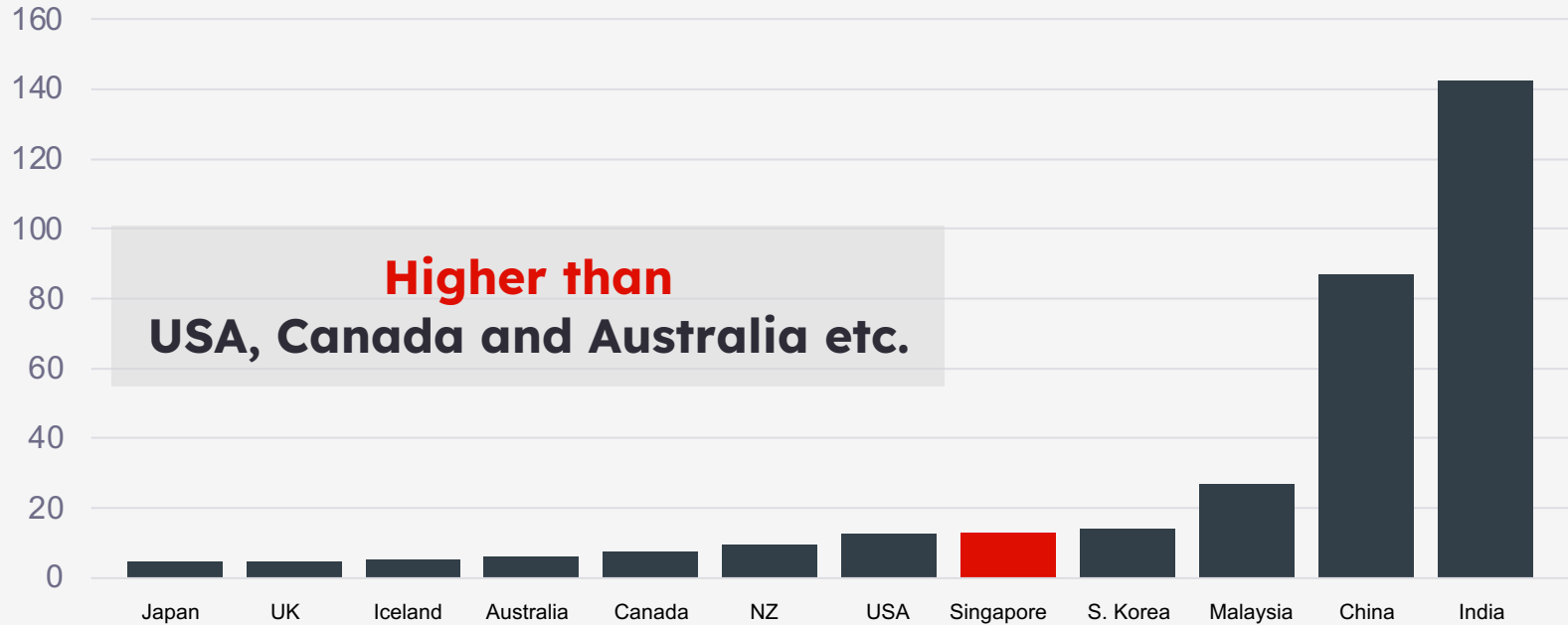


# MINIMIZING ROAD ACCIDENTS ON RAINY DAYS

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DSI 39

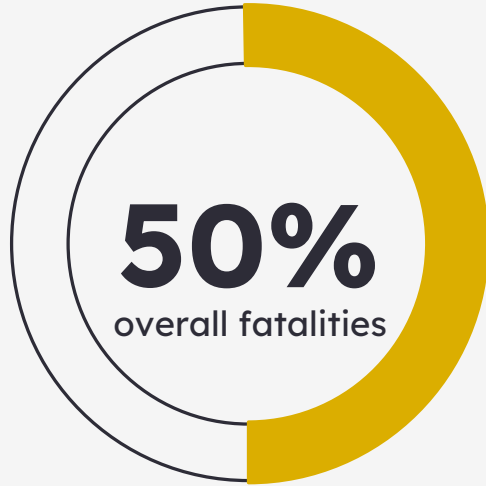


## Estimated Road Traffic Deaths Per 100K Vehicles (2018)

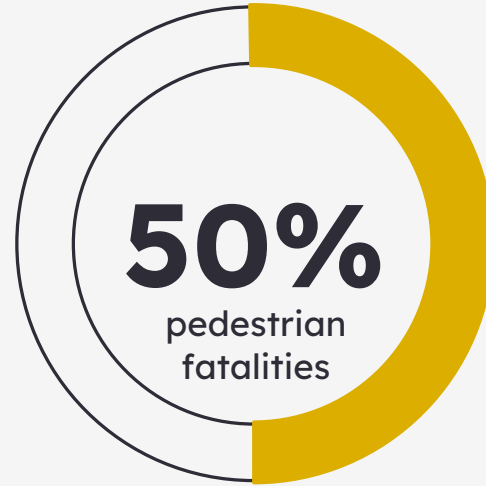


Road Fatalities per 100k Vehicles (2018)

Source: <https://www.valuechampion.sg/probability-car-accident>



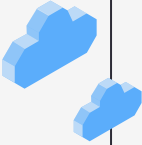
**motorcyclists & pillion riders**



**elderly**



Source: <https://www.budgetdirect.com.sg/car-insurance/research/road-accident-statistics-in-singapore>

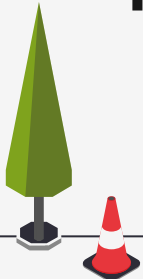


Problem statement:

Rainy days **can impede our navigation skills** due to:

- more slippery surfaces
- reduced visibility

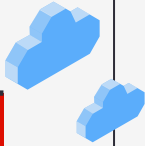
**To what extent** does weather play a part in road safety?  
**How can we minimize** road accidents stemmed from  
rainy weather?



Note:

A rain day is defined as a day with 0.2 mm rainfall recorded at a rainfall station (NEA, 2023)

# So what?



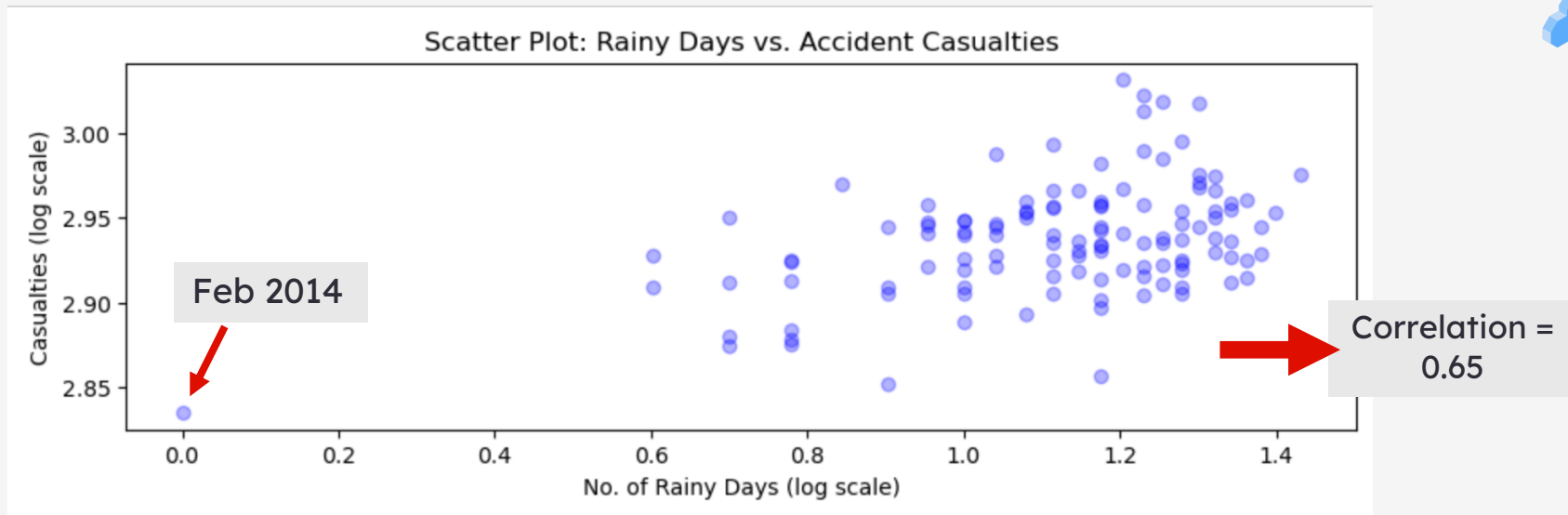
Aim	Research
Find out if <b>rainy days</b> affect <b>number of road accident casualties</b>	<ul style="list-style-type: none"><li>• No. of rainy days vs no. of casualties</li></ul>
Find out if rainy days <b>aggravate road accidents</b>	<ul style="list-style-type: none"><li>• No. of rainy days vs no. of fatalities</li></ul>
Identify type of vehicles <b>more prone to road accident</b>	<ul style="list-style-type: none"><li>• No. of casualties by vehicle types</li></ul>
Provide recommendations to <b><u>improve road safety</u></b>	

## Note:

- The research was conducted using datasets from Jan 2010 – Dec 2019 (10 years).
- Datasets from 2020 onwards were excluded due to the effects of Covid-19.
- Personal Mobile Devices (PMD) were also removed as they only came into existence from 2017 onwards.



# Outlier



## Weather Situation Update & Outlook (10 Feb 2014)

**Singapore, 10 February 2014** – Various parts of Singapore received daily rainfall ranging from 0.2mm to 50.6mm over the weekend (8-9 February 2014), following a dry spell that started in mid January 2014. Meteorological Service Singapore reports that all 64 rainfall stations across the island recorded no rainfall from 16 January to 7 February 2014, except for 0.2mm of rainfall at Jurong on 2 February 2014.

Source: <http://www.weather.gov.sg/weather-situation-update-outlook-10-feb-2014/>



# No. of rainy days vs no. of casualties

Strong  
correlation =  
0.73

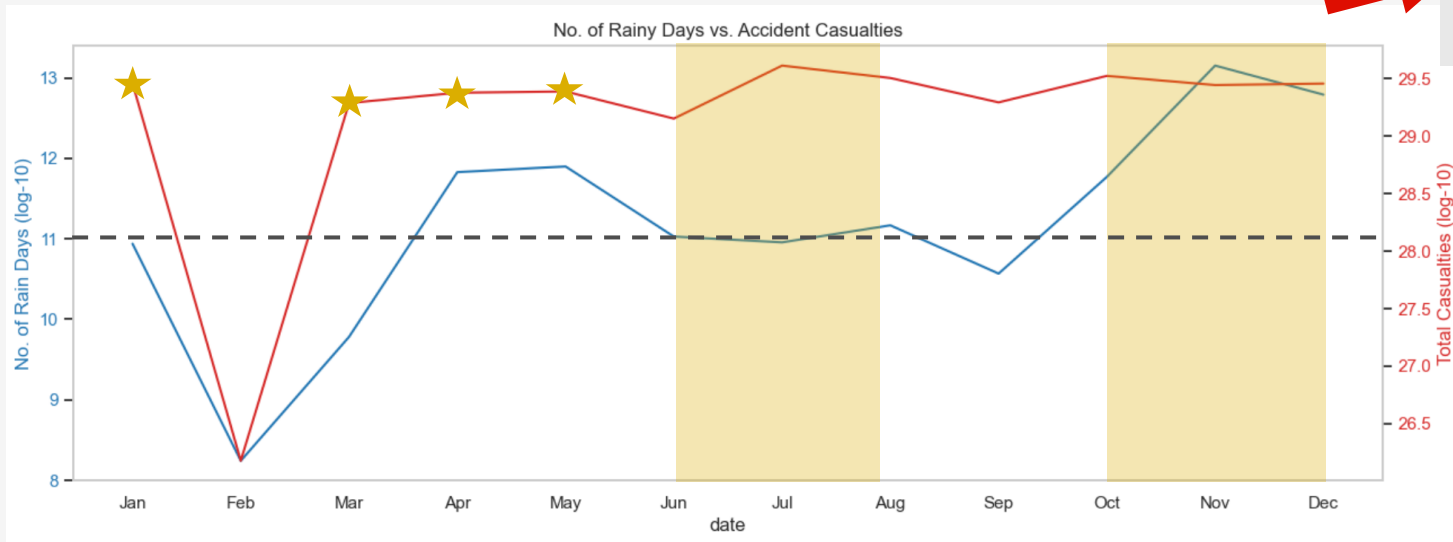
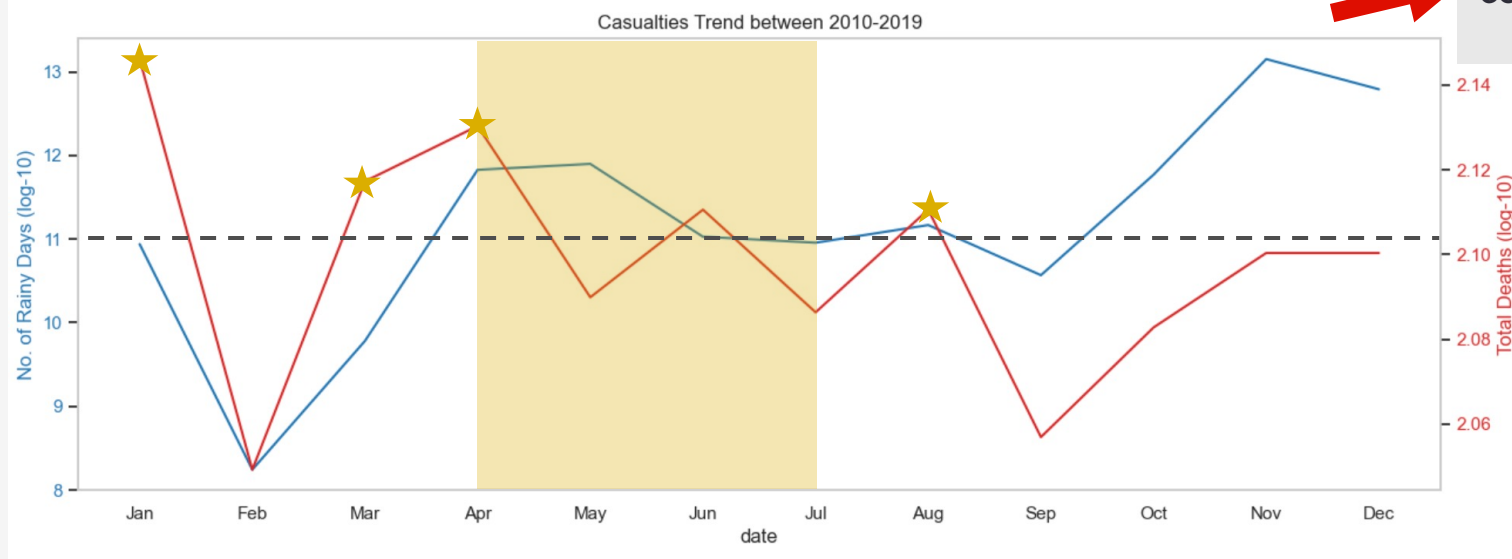


Chart: Aggregated no. of rainy days and casualties of each month over 2010-2019

- Move in different directions
- Months that requires attention



# No. of rainy days vs no. of fatalities



Moderate  
correlation =  
0.58

Chart: Aggregated no. of rainy days and fatalities of each month over 2010-2019

- Move in different directions
- Months that requires attention





# No. of rainy days vs no. of injured

High  
correlation =  
0.73

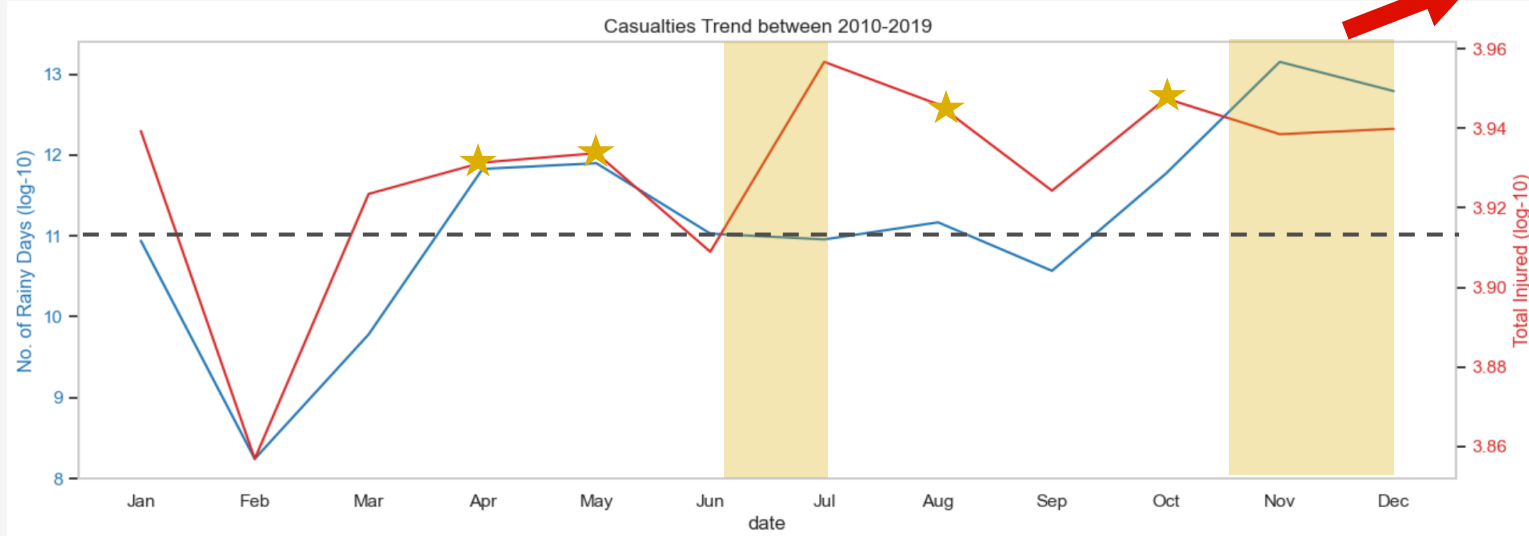
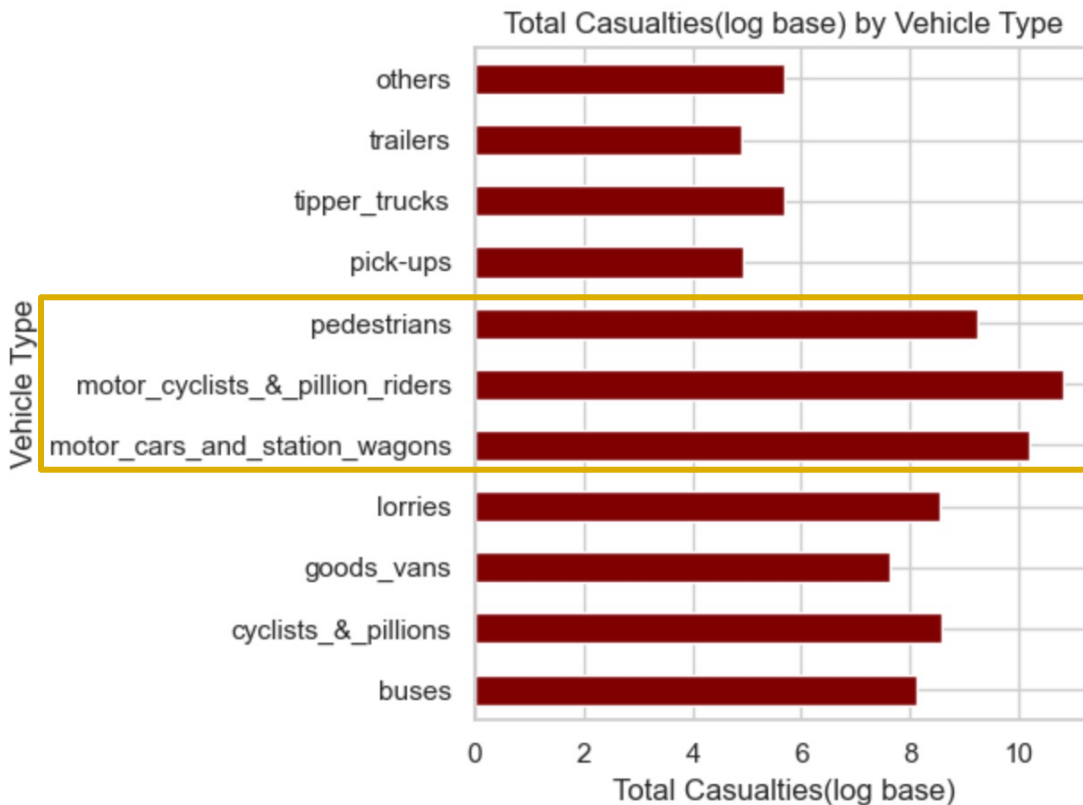


Chart: Aggregated no. of rainy days and injured of each month over 2010-2019

- Move in different directions
- Months that requires attention



# No. of casualties by vehicle types



## Top 3 vehicle types

1. Motorcyclists and pillion riders
2. Motor cars and station wagons
3. Pedestrians














# Conclusion

1. Rainy days have a **significant impact** on the number of road accident casualties that result in **injuries but not fatalities**
2. Fatalities are likely affected by **other factors**
3. **Jan, Mar and Apr** consistently had high number of casualties with relatively high number of rainy days
4. Organisations should tailor road safety measures to **motorcyclists and pillion riders, motor cars and station wagons and pedestrians**

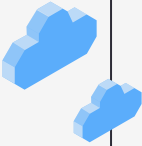


# Recommendations

Who	When	What	Targeted at
LTA	Jan, Mar, Apr	<ul style="list-style-type: none"> <li>Regular checks on <b>clearer signages, anti-skid surfaces</b></li> <li>Regular road maintenance</li> </ul>	 
Town Council, Traffic Police, IMDA	Throughout the year	<ul style="list-style-type: none"> <li><b>Workshops</b> on road safety</li> <li><b>Introduce apps</b> that can help drivers be more informed of road/weather conditions</li> </ul>	   
PUB	Jan, Mar, Apr	<ul style="list-style-type: none"> <li>More frequent checks on our <b>drainage system</b> during rainy season</li> </ul>	 
App development companies	Throughout the year	<ul style="list-style-type: none"> <li>Real-time traffic &amp; weather monitoring <b>app</b></li> <li>Suggest <b>alternative routes</b></li> <li>Platform to <b>swiftly inform relevant organisations</b> of poor road conditions</li> </ul>	  



# Limitations/Future research



## Accuracy

How many road accidents happened on a rainy day?



## Other factors

Other causes of road accidents?

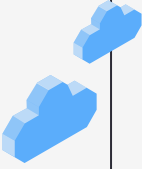


## Geolocation data

Are specific locations more prone to accidents because of rain?



# RESOURCES



- <https://www.budgetdirect.com.sg/car-insurance/research/road-accident-statistics-in-singapore>
- <https://www.directasia.com/blog/reduce-risk-road-accidents-singapore>
- <https://www.motorist.sg/article/173/the-5-most-common-causes-for-road-accidents-in-singapore>
- <https://msgt.com.sg/accident-hotspots-in-singapore-to-watch-out-for/>
- <http://www.smj.org.sg/article/geospatial-analysis-severe-road-traffic-accidents-singapore-2013%E2%80%932014>
- <https://tablebuilder.singstat.gov.sg/>
- <https://www.valuechampion.sg/probability-car-accident>
- <https://www.weather.gov.sg/wp-content/uploads/2020/03/Annual-Climate-Assessment-Report-2019.pdf>

