Number of Traffic Accidents Resulting in Injured Persons

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Introduction

Traffic accidents in Singapore have become a pressing concern in recent years, with a noticeable uptick in incidents since the easing of COVID-19 restrictions. Recent statistics reveal a troubling rise in injury-causing accidents, reversing a decade-long trend of declining road accidents. Lawmakers and safety experts are now scrutinising potential causes, ranging from distracted driving to the effectiveness of existing penalties under the Road Traffic Act. With road accidents increasingly capturing public attention, we aim to better visualise the causes of road accidents in hopes of aiding Singapore in implementing better measures to improve road safety through higher prevalence causes[1].

Previous Visualization

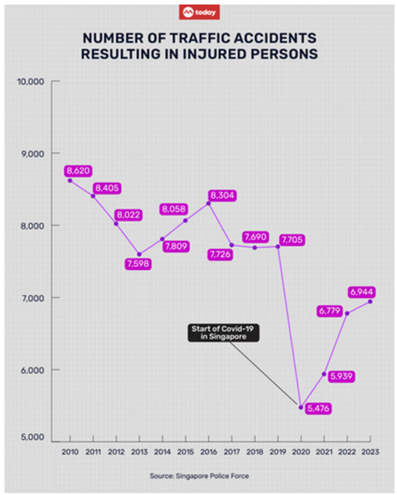


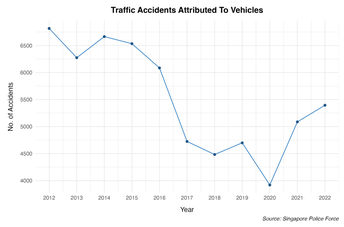
Figure 1: Trend analysis of traffic accidents resulting in Injured persons by Singapore Police Force.

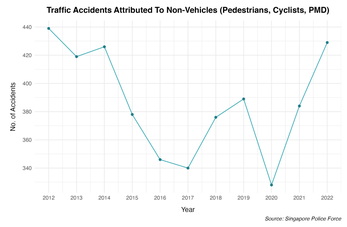
Initial Data Analysis

The initial graph depicts the number of traffic accidents resulting in injured persons in Singapore from 2010 to 2023. It shows a general decline from 8,620 accidents in 2010 to 7,598 in 2014. However, this downward trend reverses, with fluctuations peaking at 8,304 in 2016. A significant drop was observed starting in 2019, coinciding with the onset of the COVID-19 pandemic in Singapore, with the number of accidents falling to a low of 5,476 in 2020, likely due to reduced traffic during lockdowns. Post-pandemic, there is a notable upward trend, with accidents increasing year-on-year, reaching 6,944 by 2023. This rise in traffic incidents post-2020 indicates a regression in road safety as more vehicles returned to the roads but unfortunately does not go into detail regarding the specific causes. With the introduction of PMD or similar motorised vehicles in Singapore in the early 2016s, traffic accidents no longer just include cars and motorcycles, making the data more ambiguous.

[1]R. Loh, "The big read: To tackle rising fatal traffic accidents and worsening road culture, we need to first understand the problem," CNA, https://www.channelnewsasia.com/singapore/big-read-rising-traffic-accidents-road-culture-4328841

Improved Visualisation





Vehicle Causes	Min Accidents	Max Accidents	2012 to 2022	Accidents
Driving Under Influence	11	164 (98)	(115)	1097
Failure to Give Way	750	1173 (751)	(898)	9932
Improper Lane and Speed Management	458	924 (677)	(811)	8030
Improper Parking and Vehicle Control (While Stationary)	0	43 (17)	(0)	220
Improper Vehicle Control (While in Motion)	2273	3947 (3663)	(3947)	35980
Other Causes Of Accidents Attributed To Vehicles	0	808 (0)	(808)	3264
Reckless and Distracted Driving	0	31 (31)	(0)	133
Traffic Signal Violations	140	284 (158)	(237)	2025

Non-Vehicle Causes	Min Accidents	Max Accidents	2012 to 2022	Accidents
Other Causes Of Accidents Attributed To Pedestrians	55	134 (62)	(128)	1057
Substance Influence	2	4 (4)	(2)	33
Unsafe Activities in Public Areas	2	151 (151)	(6)	554
Unsafe Crossing Behaviors	181	303 (212)	(303)	2610

Suggested Improvements (random for now)

1. *Add a plot title and a source note* so that the figure can be understood in isolation (e.g., when shared on social media).
2. *Identify missing data clearly.* Rendering unknown incidence fully transparent will distinguish it from zero incidence,
3. *Include labels for every state.* To avoid overplotting, use two-letter abbreviations instead of full state names and stagger the labels along the y-axis.
4. *Add a title to the color legend.*
5. *Avoid using a rainbow color palette.* It lacks a meaningful progression through color space and is not colorblind-friendly. Consider using a sequential ColorBrewer palette instead.

Implementation

Data

- Data about several traffic accidents resulting in injuries can be found in the public records of the Singapore Police Force (SPF) public data. However, SPF released publicly available SingStat data only goes up from 2012 to 2022; the years 2023, 2011, and 2020 are absent[2]. We filled in the gaps with inferred information from another police report article.
- Records of PMD are only available after 2016.[3]

Software

We used the Quarto publication framework and the R programming language, along with the following third-party packages:

- *readxl* for data import
- *tidyverse* for data transformation, including *ggplot2* for visualization based on the grammar of graphics
- *knitr* for dynamic document generation

Further Suggestion for Interactivity

Conclusion

The team has effectively implemented the improvements into a visualisation poster. Readers can comprehend and quickly determine which accidents are more common if additional context regarding the events is provided. Moreover, the poster makes excellent visuals by using a colorblind-friendly palette, for better visualisation. Sparklines were included to make it possible for readers to rapidly comprehend and make sense of each accident.

[2]https://tablebuilder.singstat.gov.sg/table/TS/M651361
[3]https://www.police.gov.sg/-/media/4E82276DD8944CD798DCB65EEDFDCA7B.ashx