

Case Study - Dutch Traffic Accidents

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7CS035 - Data Visualization

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Executive Summary

Unveiling the Tapestry of Dutch Traffic: A Comprehensive Visual Analysis of Accident and Casualty Patterns in 2016

Through insightful data visualization and analytics, this study derived a profound understanding of intricate accident, casualty, and lethal casualty patterns in the Dutch traffic dataset from January to December 2016. Time series plots revealed two high-traffic peak periods for incidents, while comparison bar charts showed pronounced weekday variations with Thursdays and Fridays highest for accidents but Saturdays for lethal casualties. Line charts indicated the most casualties occurred in September yet the most lethal accidents happened in July. Further bar charts displayed four-way intersections exhibiting the highest accident rates, though road bends proved disproportionately more lethal. Choropleth maps visualized concentrated lethal casualties in urban areas and dry weather. Multivariate scatter plots presented vehicle-specific seasonal casualty variations, especially involving passenger cars. In summary, the thoughtful visualizations enabled impactful data-driven insights, providing invaluable understanding of intricate Dutch traffic accident patterns to inform future traffic safety policies and interventions. The multifaceted visual analytics methodology yielded actionable insights into the nuances of accidents across multiple dimensions.

Time with maximum accidents

17:00

Number accidents: **538**

Day with maximum accidents

Thursday

Number accidents: **20K**

Month with maximum accidents

November

Number accidents: **12K**

Time with maximum casualties

17:00

Number casualties: **82**

Time with maximum lethal casualties

16:40

Number lethal casualties: **6**

Day with maximum casualties

Friday

Number casualties: **3.4K**

Day with maximum lethal casualties

Saturday

Number lethal casualties: **89**

Month with maximum casualties

September

Number casualties: **2.2K**

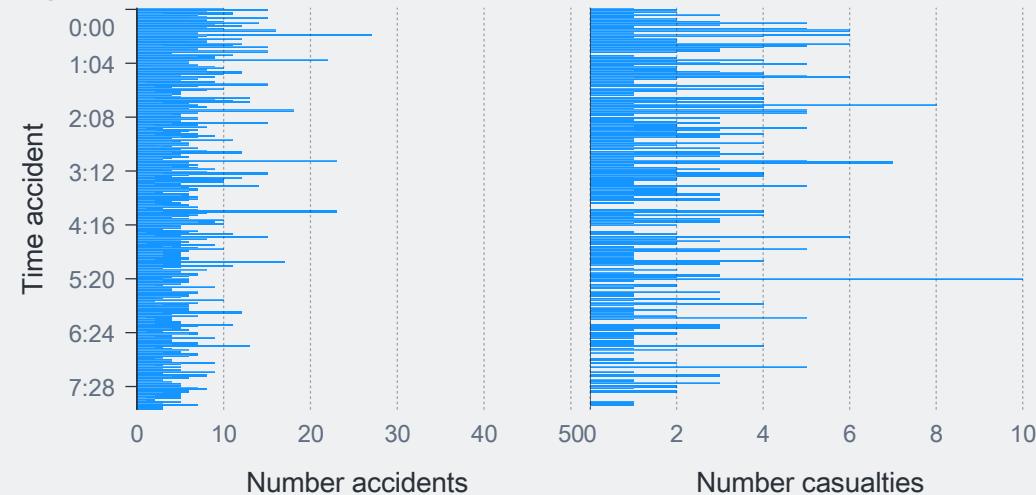
Month with maximum lethal casualties

July

Number lethal casualties: **67**

HawkEye: Distribution

Figure A: Time of Accident with Number of Casualties



A1.1

Figure B: Accident Distribution and Casualties by Day

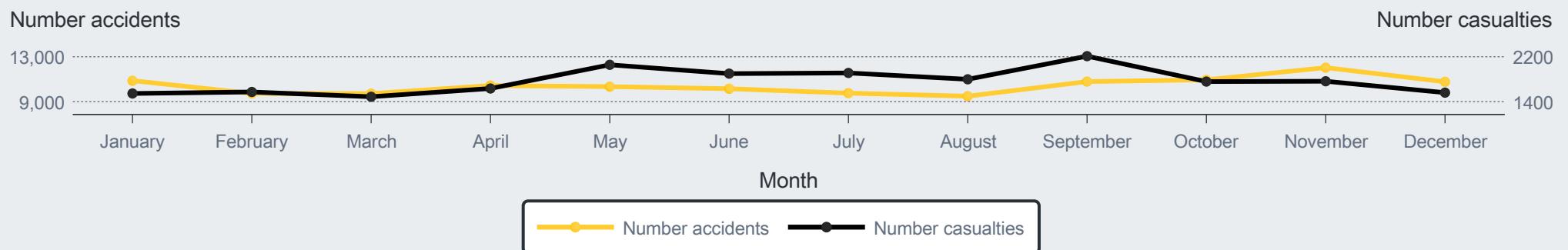


Figure A shows two peak periods for accidents/casualties: 6:30-9:30 and 14:00-19:00.

Figure B indicates more casualties proportional to accidents on Thursdays and Fridays, fewer on Sundays.

From May to January, casualties were disproportionately higher than accidents. February to April had more proportional accident/casualty rates.

Figure C: Month wise distribution for accidents and casualties



Month on Month

Overview 1: Month on Month: Accidents

Number accidents



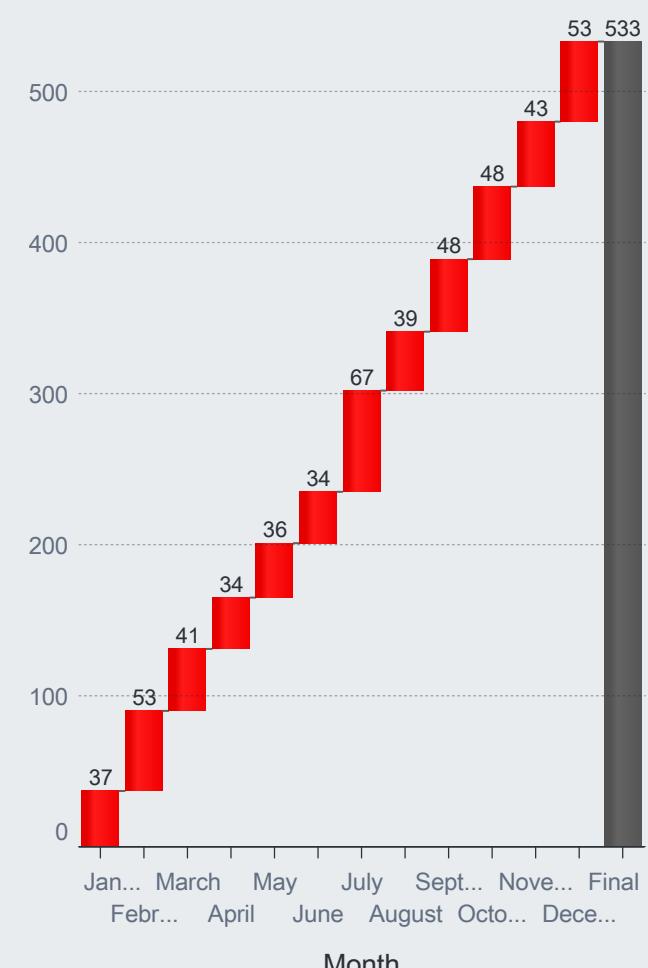
Overview 2: Month on Month: Casualties

Number casualties



Overview 3: Month on Month: Lethal Casualties

Number lethal casualties



Day: Cause of Casualty

Figure D: Lethal Casualties and Hit and Run Accidents

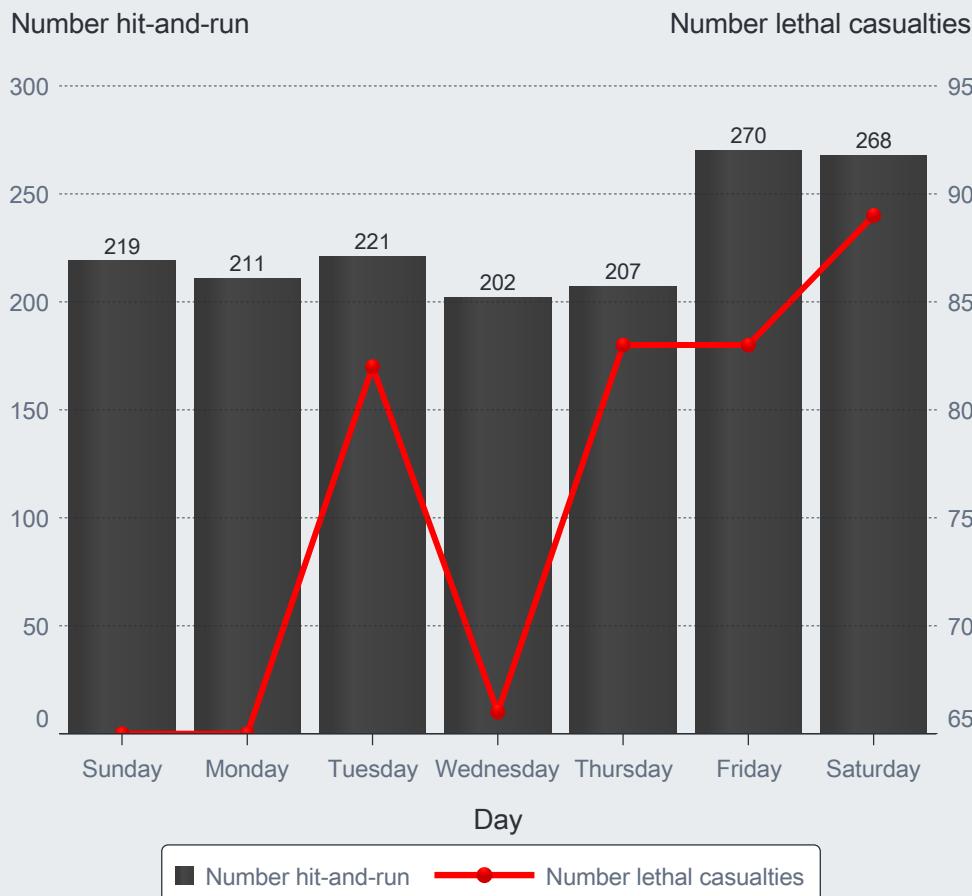
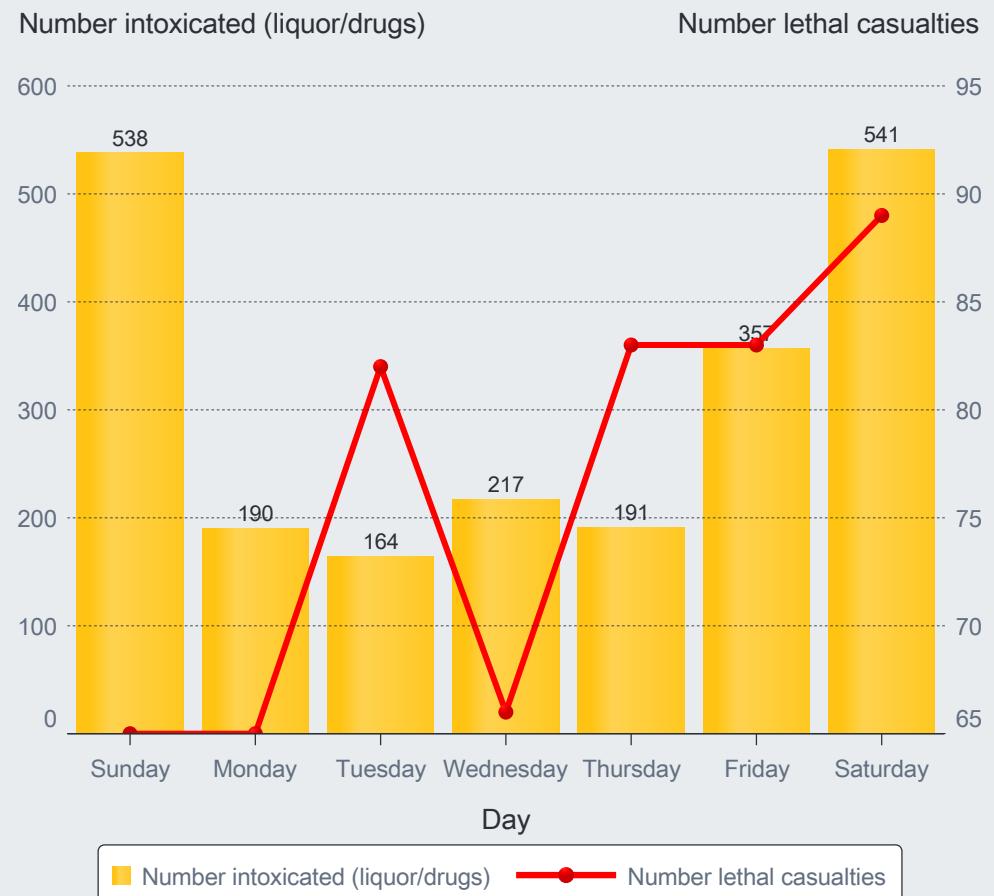


Figure E: Intoxication and Lethal Casualties



Drenthe Flevoland Friesland Gelderland Groningen Limburg Noord-Brabant Noord-Holland Overijssel Utrecht Zeeland Zuid-Holland

Figure D reveals hit and run cases are highest on Friday and Saturday in line with the number of lethal casualties however, for Sunday, the number of lethal casualties are very low when compared with hit and run cases.

Day: By Road Type

Figure F: Accidents and Road Situation by Day

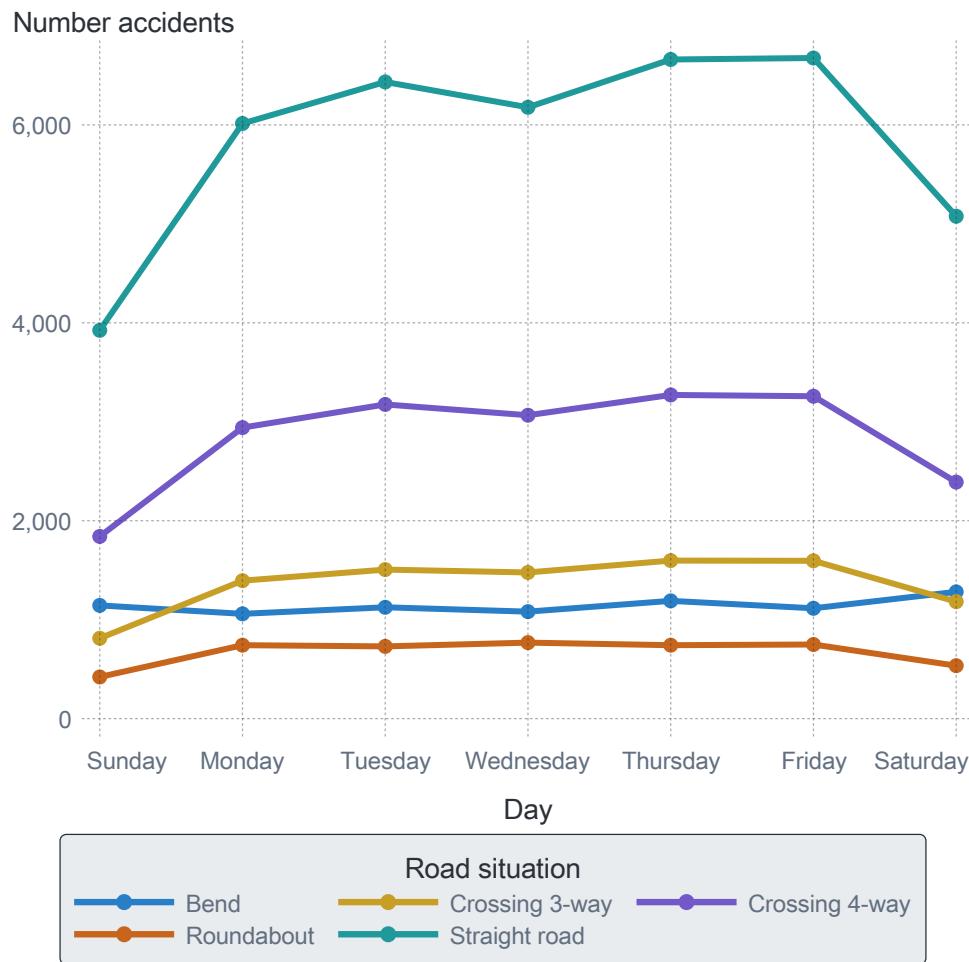
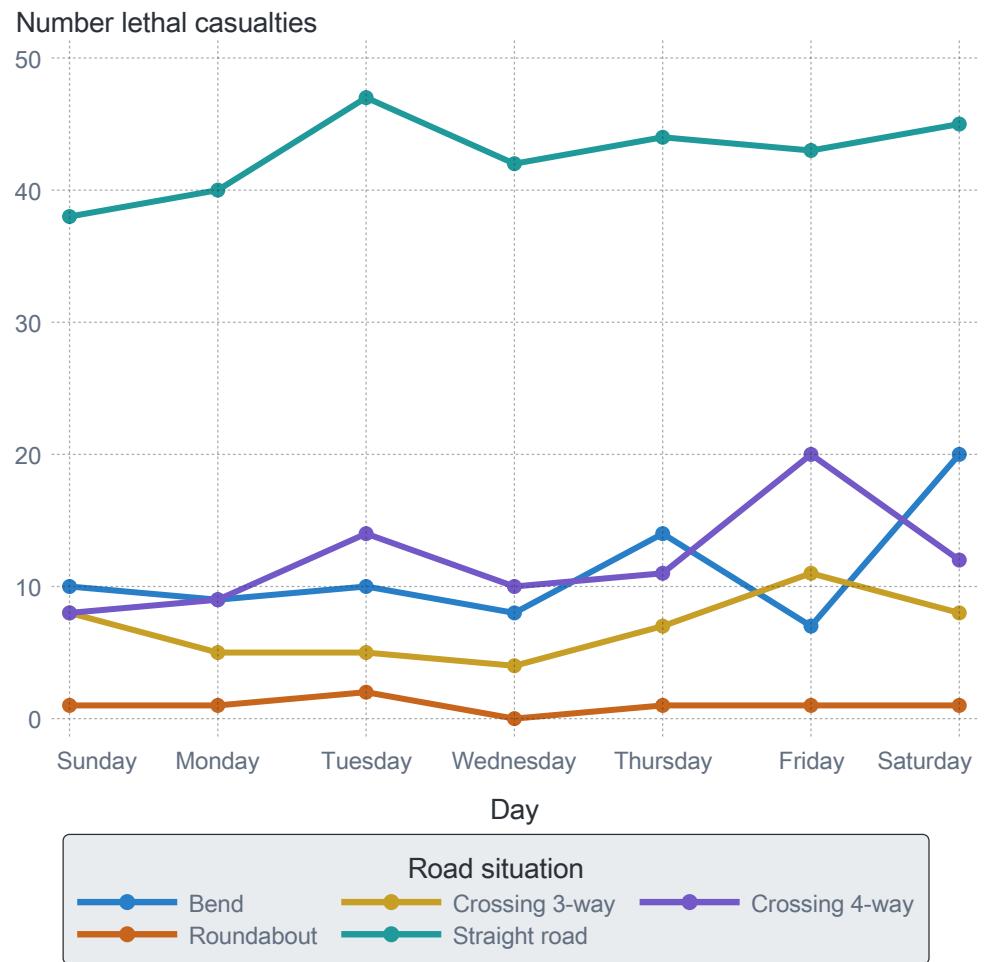


Figure G: Lethal Casualties and Road Situation by Day



Straight roads and four way crossings had the highest number of both accidents and casualties.

However, bends caused a disproportionately high number of casualties relative to the number of accidents occurring on bends.

In contrast, three-way crossings caused more accidents but fewer proportional lethal casualties.

Month: Cause of Casualty

Figure H: Lethal Casualties and Accidents by Month

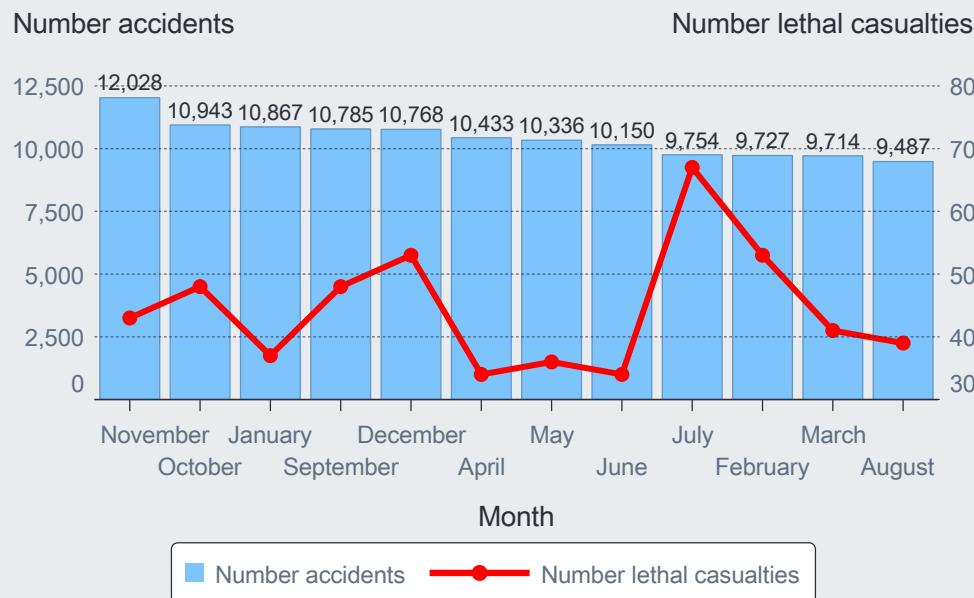


Figure J: Lethal Casualties and Hit and Run Accidents by Month

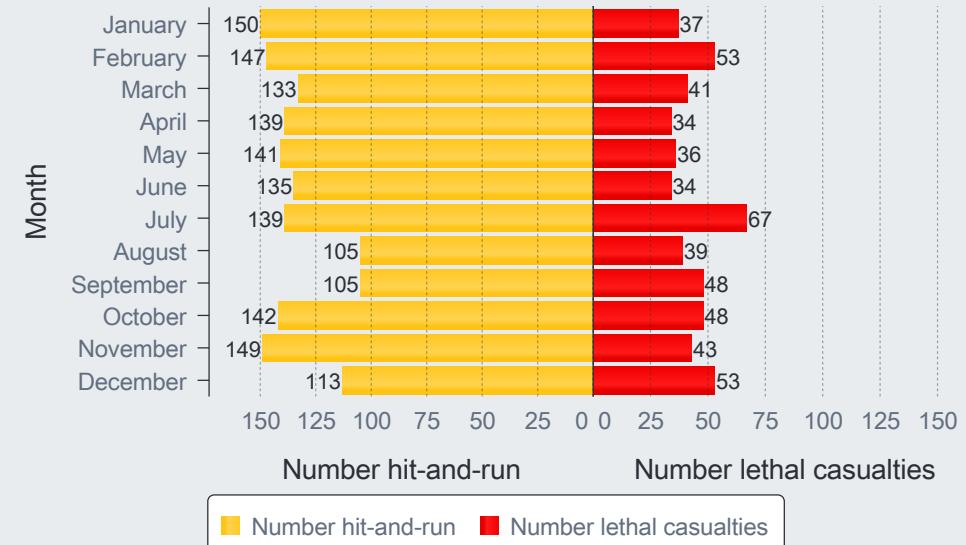
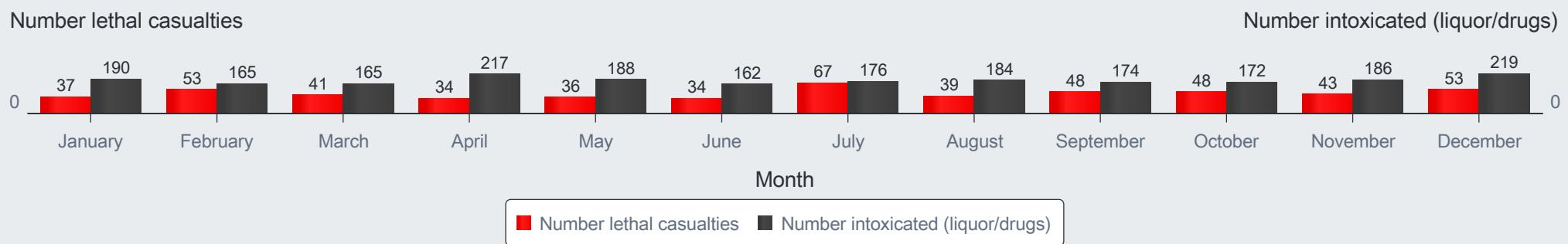


Figure I: Lethal Casualties and Intoxication by Month



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Month: By Road Type

Figure K: Accidents and Road Situation by Month

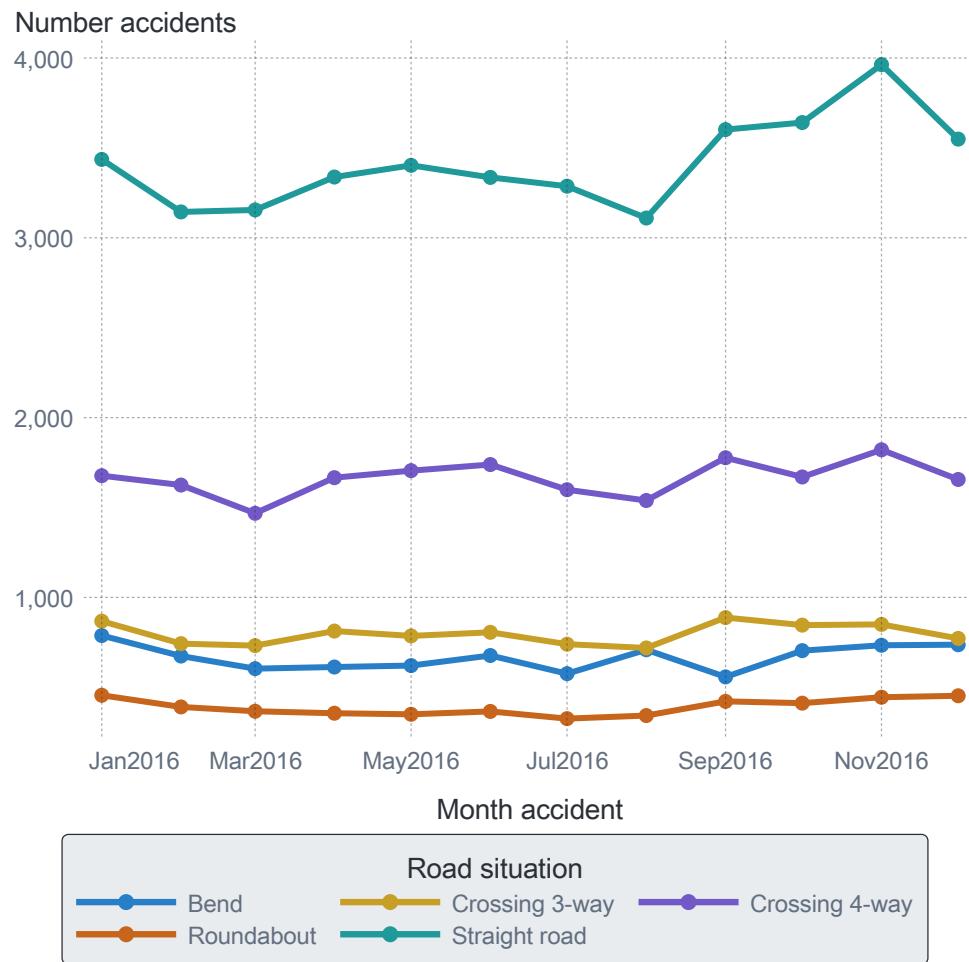
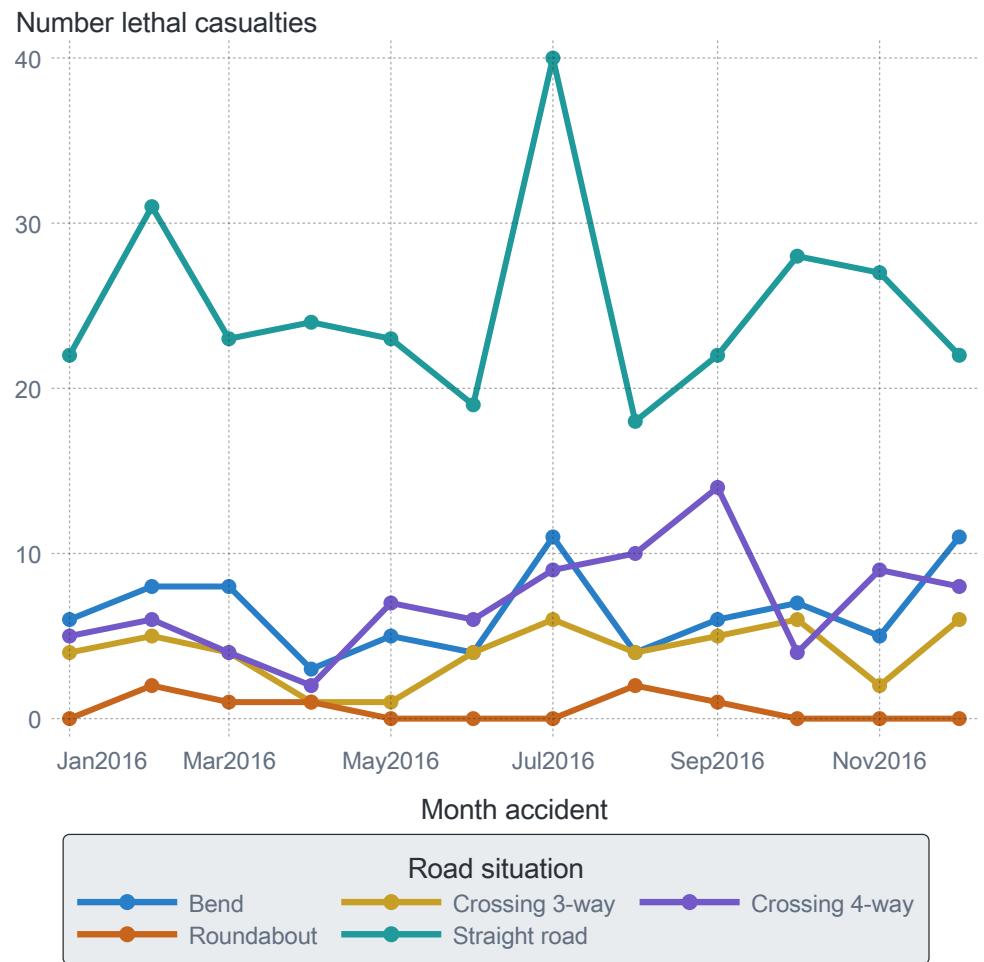


Figure L: Lethal Casualties and Road Situation by Month



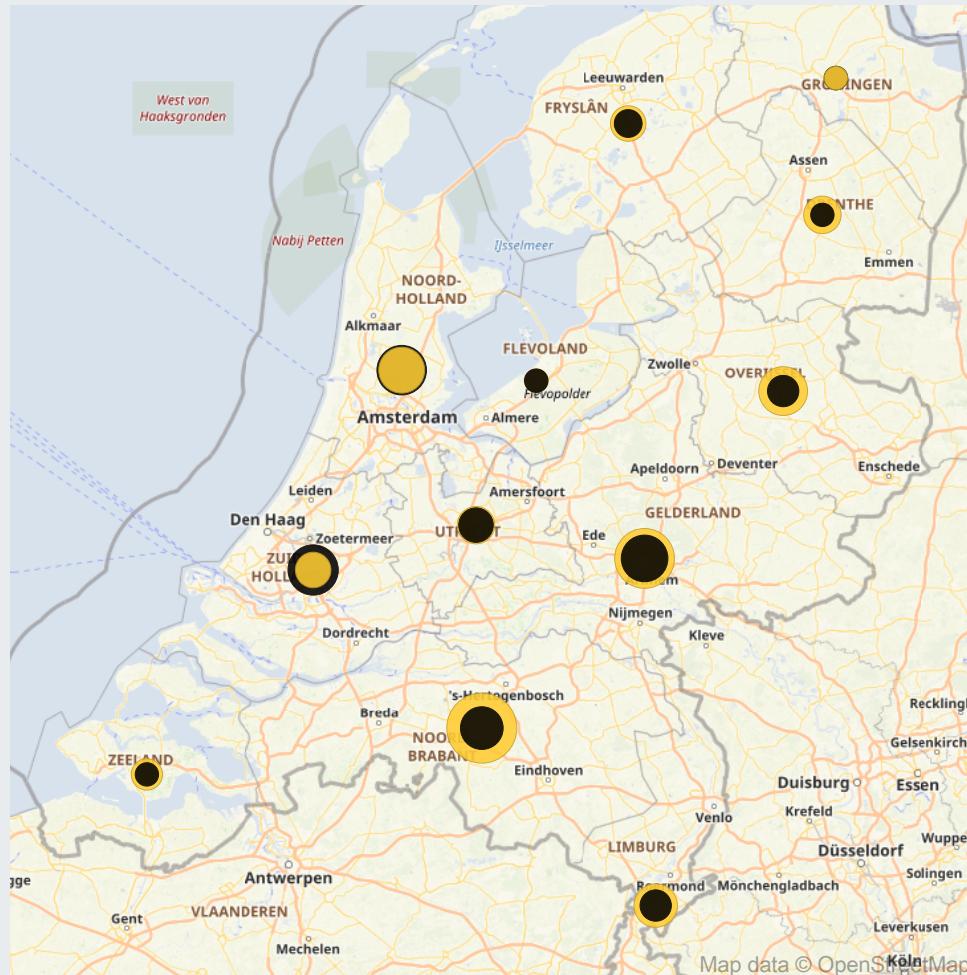
Straight roads and four way crossings had the most accidents and casualties.

Bends caused fewer accidents but more proportional lethal casualties.

Three-way crossings had more accidents but fewer proportional lethal casualties, with similar patterns by day and month.

Geography and Lethal Casualties

Map 1: Lethal Casualties by Type of Area



70 —
≤23 —

Urban/built-up area

● BI ● BU

Number lethal casualties

A4.1

Map 2: Lethal Casualties by Top 2 Weather Conditions



79 —
≤26 —

Weather condition 2

● Dry ● Rain

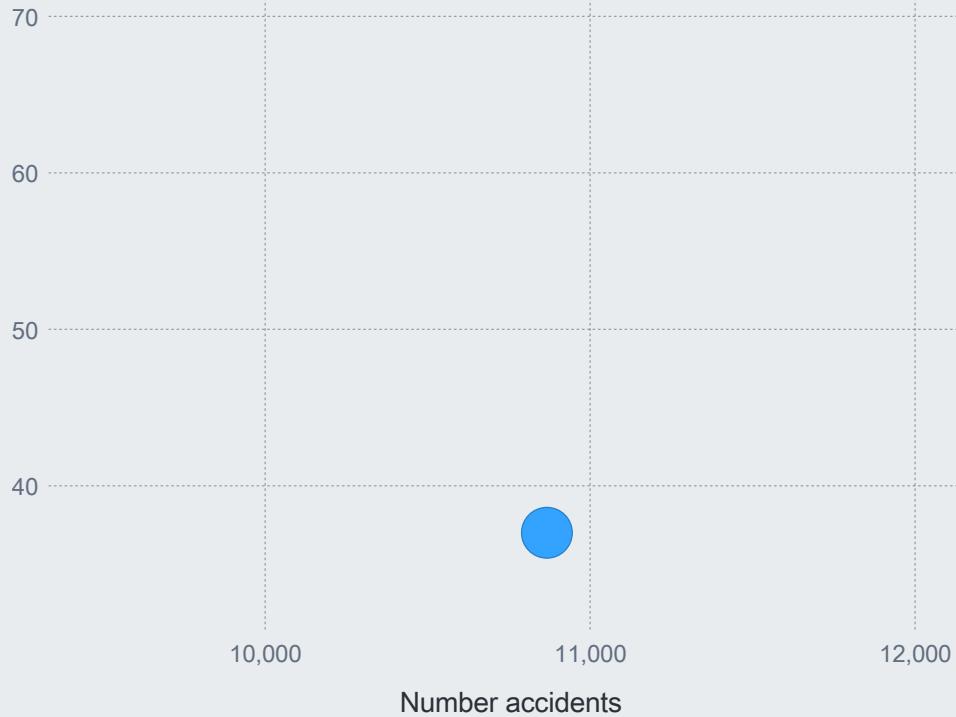
Number lethal casualties

A4.2

Vehicles, Parties, and More

Figure M: Monthly distribution of lethal casualties by parties involved

Number lethal casualties



Number parties involved

17633
14263

Month

- January ● February
- March ● April
- May ● June
- July ● August
- September ● October
- November ● December

Figure N: Monthly distribution of lethal casualties by passenger cars

Number lethal casualties



Number bikes

2397
1467

Month

- January ● February
- March ● April
- May ● June
- July ● August
- September ● October
- November ● December

Vehicles, Parties, and More -2

Figure O: Monthly distribution of lethal casualties by bikes
Number lethal casualties

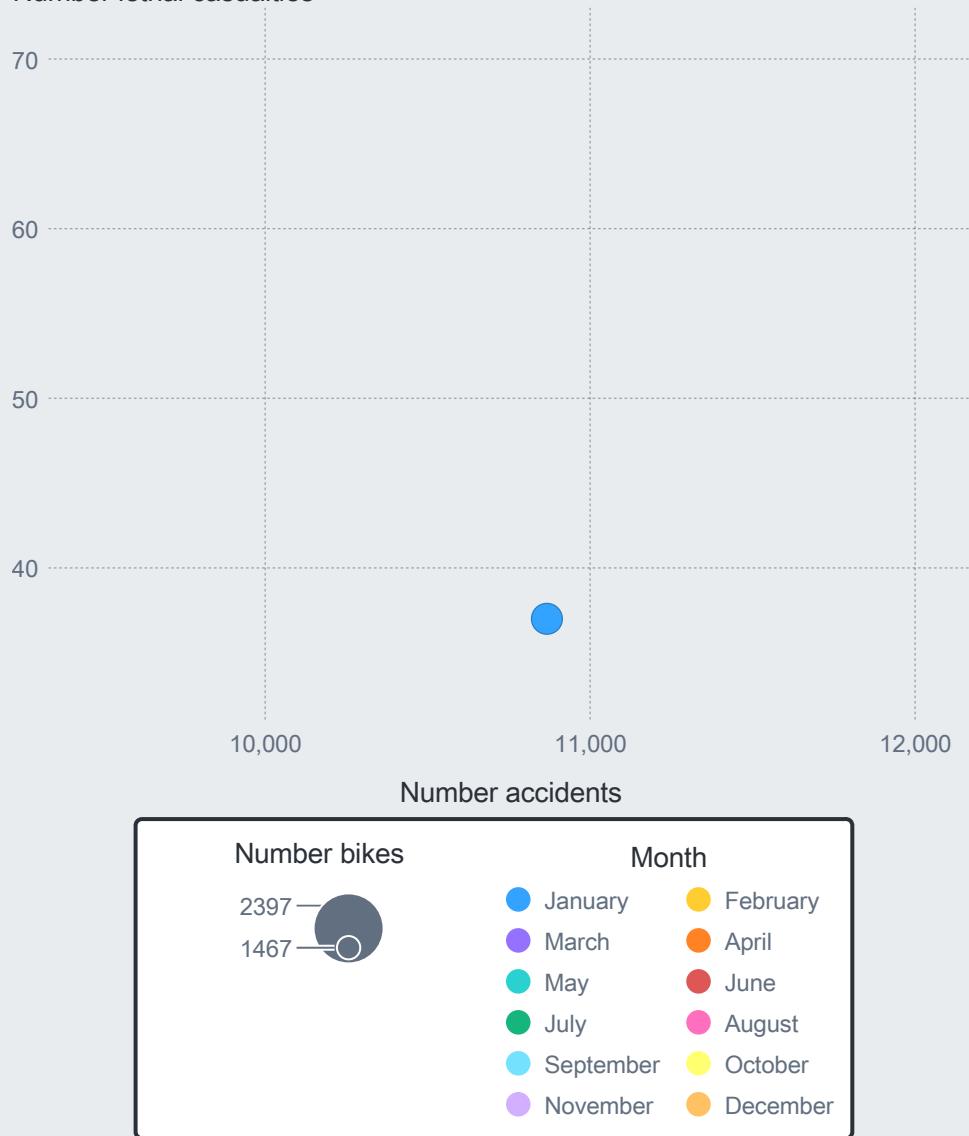
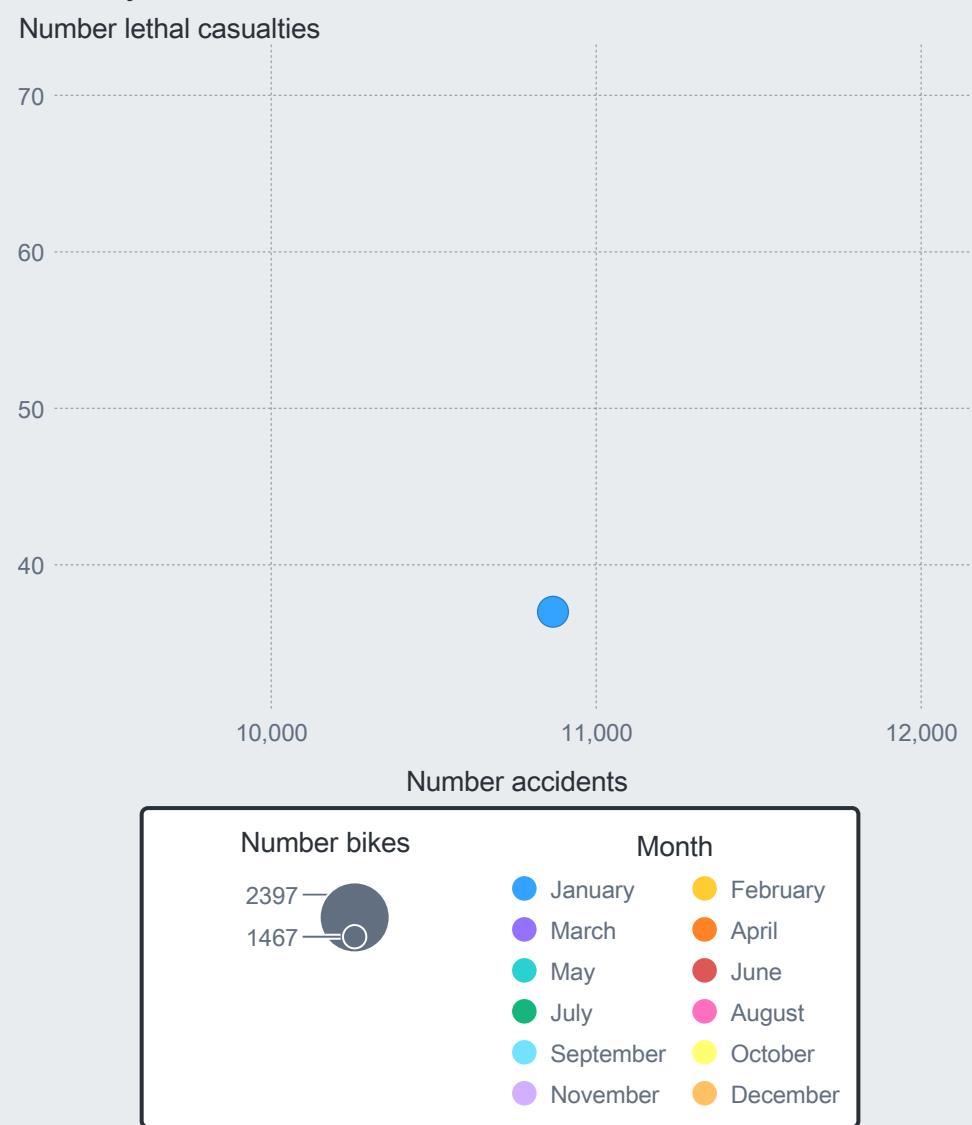


Figure P: Monthly distribution of lethal casualties by motorcycles
Number lethal casualties



Vehicles, Parties, and More - 3

Figure Q: Monthly distribution of lethal casualties by trucks

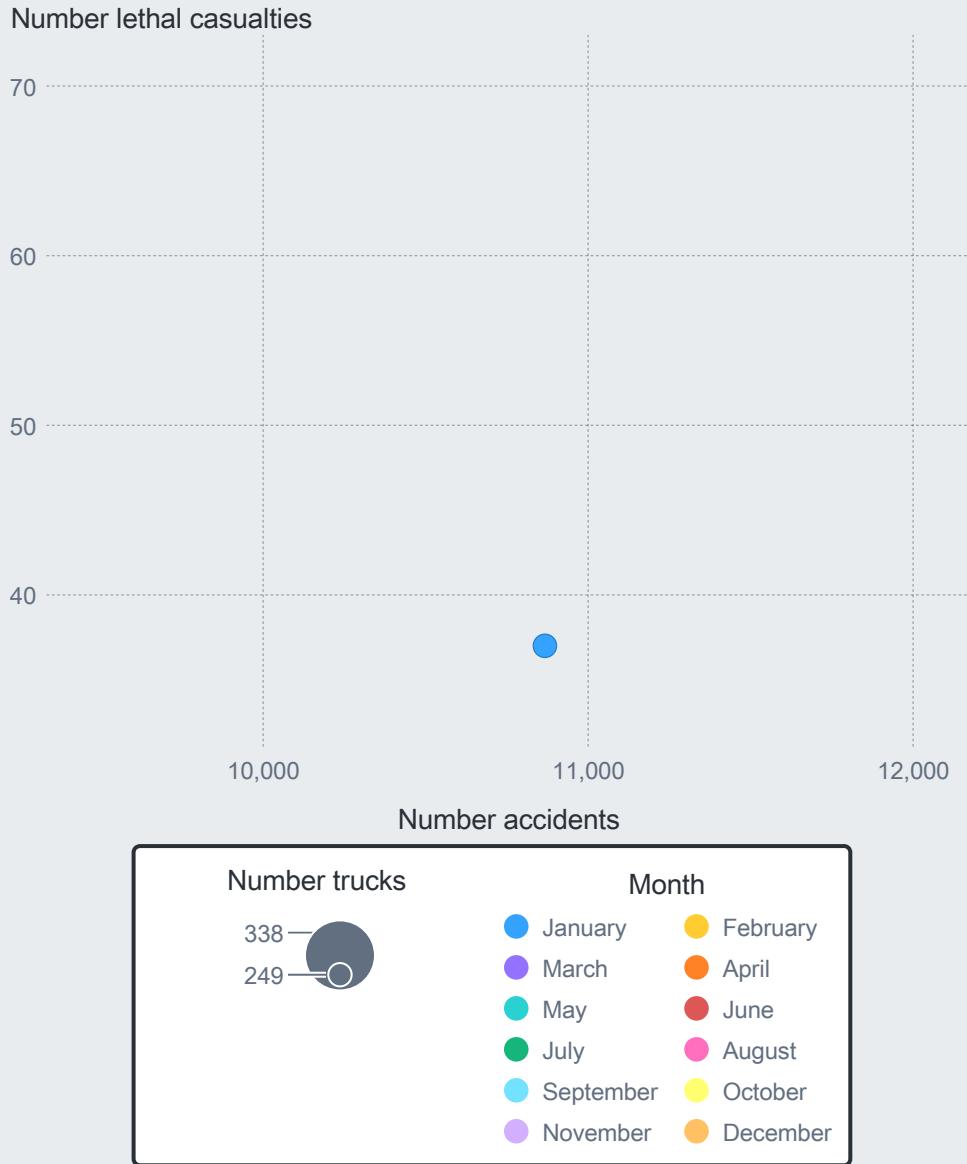
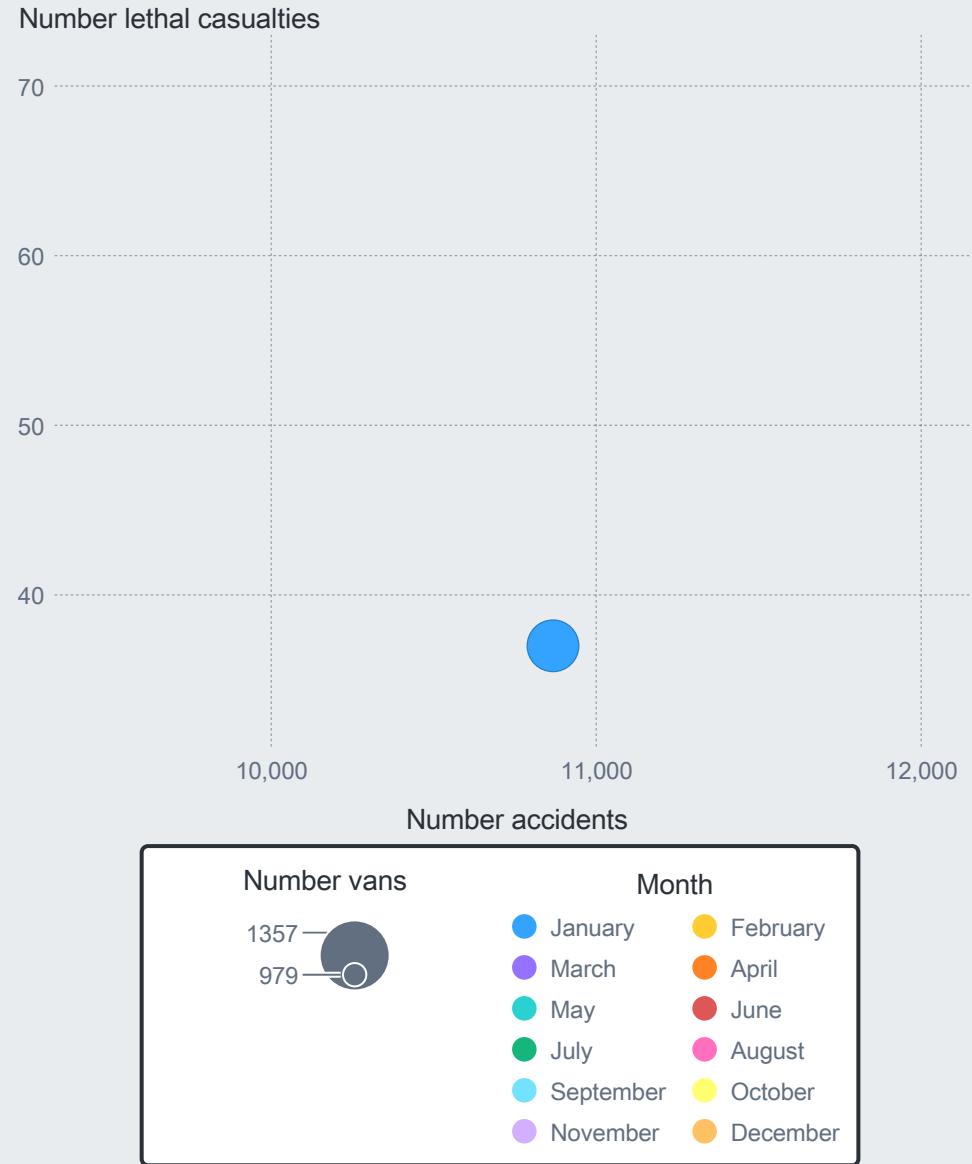


Figure R: Monthly distribution of lethal casualties by vans



Appendix

A1.1 Figure A: Time of Accident with Number of Casualties

Warnings: Only 3,000 rows of the data appear.

A2.1 Figure F: Accidents and Road Situation by Day

Filters: Road situation NOT MISSING

A2.2 Figure G: Lethal Casualties and Road Situation by Day

Filters: Road situation NOT MISSING

A3.1 Figure K: Accidents and Road Situation by Month

Filters: Road situation NOT MISSING

A3.2 Figure L: Lethal Casualties and Road Situation by Month

Filters: Road situation NOT MISSING

A4.1 Map 1: Lethal Casualties by Type of Area

Filters: Urban/built-up area NOT MISSING

A4.2 Map 2: Lethal Casualties by Top 2 Weather Conditions

Ranks: Top 2 of Weather condition 2 by Number accidents

Filters: Urban/built-up area NOT MISSING