Canada Car Accident

1999 - 2014

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Canada Car Accident 1999 - 2014

- **Overview**
- Analysis and Conclusions

Data Source

- Canada, 1999 – 2014, CSV from Kaggle
- Collision data: Date, Time, Severity, Road condition, Weather, etc.
- Vehicle data: Type, Model year
- Person data: Sex, Age, Position, Treatment, Safety device, etc.

C_YEAR	C_MNTH	C_WDAY	C_HOUR	C_SEV	C_VEHS	C_CONF	C_RCFG	C_WTHR	C_RSUR	C_RALN	C_TRAF	V_ID	V_TYPE	V_YEAR	P_ID	P_SEX	P_AGE	P_PSN	P_ISEV	P_SAFE	P_USER
1999	1	1	20	2	2	34	UU	1	5	3	3	1	6	1990	1	M	41	11	1	UU	1

- About 6 million registered collisions
- Most are numbers in string
- Special values: e.g., not applicable, unknown

Data Loading & Preparation

- Load data through *pandas.read_csv*, all cleanup/analysis in Python
- Team analyzed all fields, each analysis covers relationship of two

Correlation combination	Collision date (day of week, hour)	Collision severity	Number of vehicles involved in collision	Collision configuration	Roadway configuration	Weather condition	Road surface	Road alignment	Traffic control	Vehicle type	Vehicle model year	Person sex	Person age	Person position	Medical treatment required	Safety device used	Road user class
Collision date (day of week, hour)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Collision severity	B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Number of vehicles involved in collision	C	C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Collision configuration	C	C	C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Roadway configuration	B	B	B	B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Weather condition	B	B	B	B	B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road surface	B	B	B	B			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road alignment	R	R	R	R				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Traffic control	B	B	B	B	B	B			NA	NA	NA	NA	NA	NA	NA	NA	NA
Vehicle type	R	R	R	R		R				NA	NA	NA	NA	NA	NA	NA	NA
Vehicle model year	R	R	R	R		R				R	NA	NA	NA	NA	NA	NA	NA
Person sex	P	P	P	P		P						NA	NA	NA	NA	NA	NA
Person age	P	P	P			P							NA	NA	NA	NA	NA
Person position	C	C	C	C		C								NA	NA	NA	NA
Medical treatment required	P	P	P									P	P		NA	NA	NA
Safety device used	C	C	C					C								NA	NA
Road user class	P	P	p	P		P									P		NA

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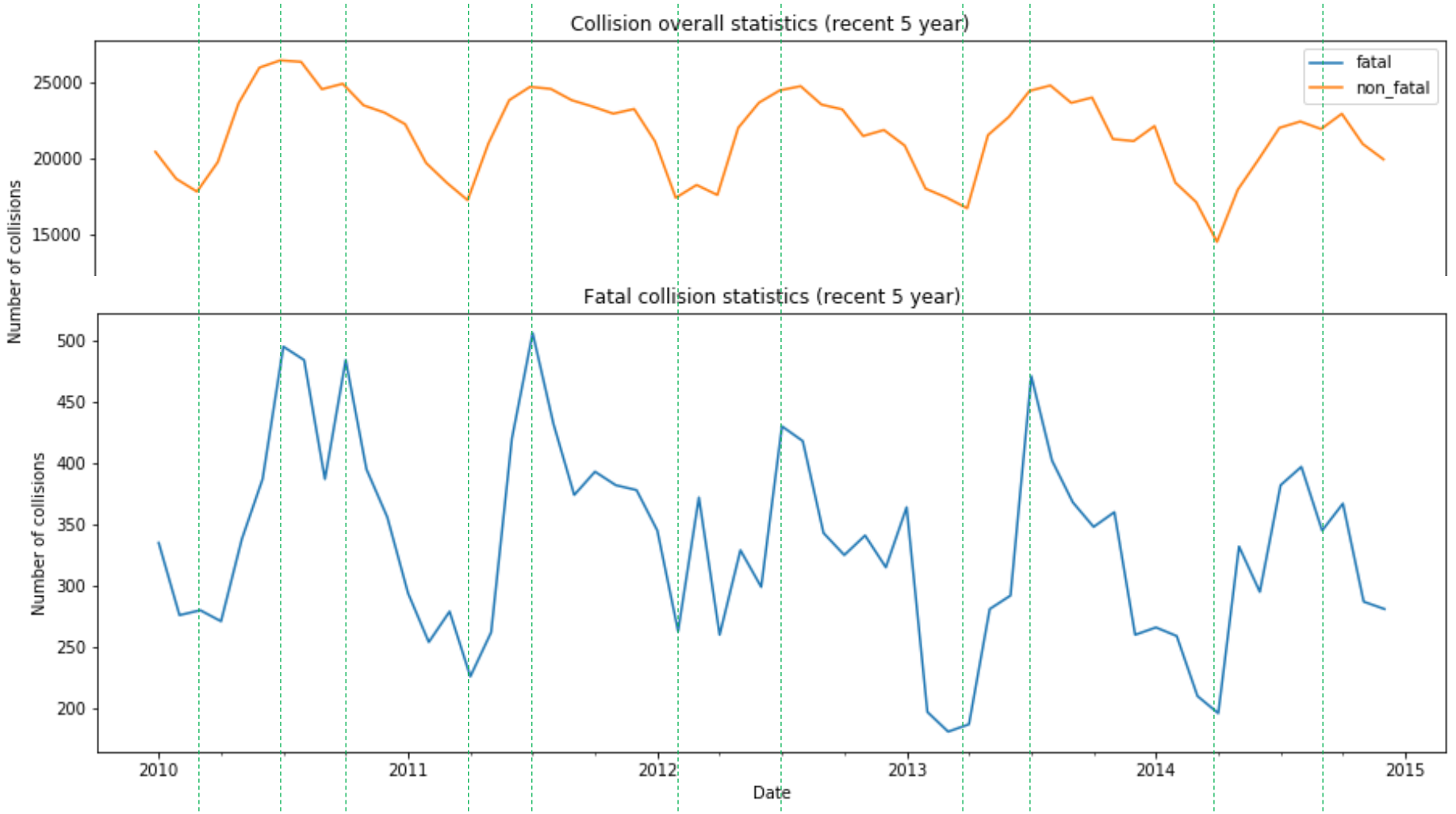
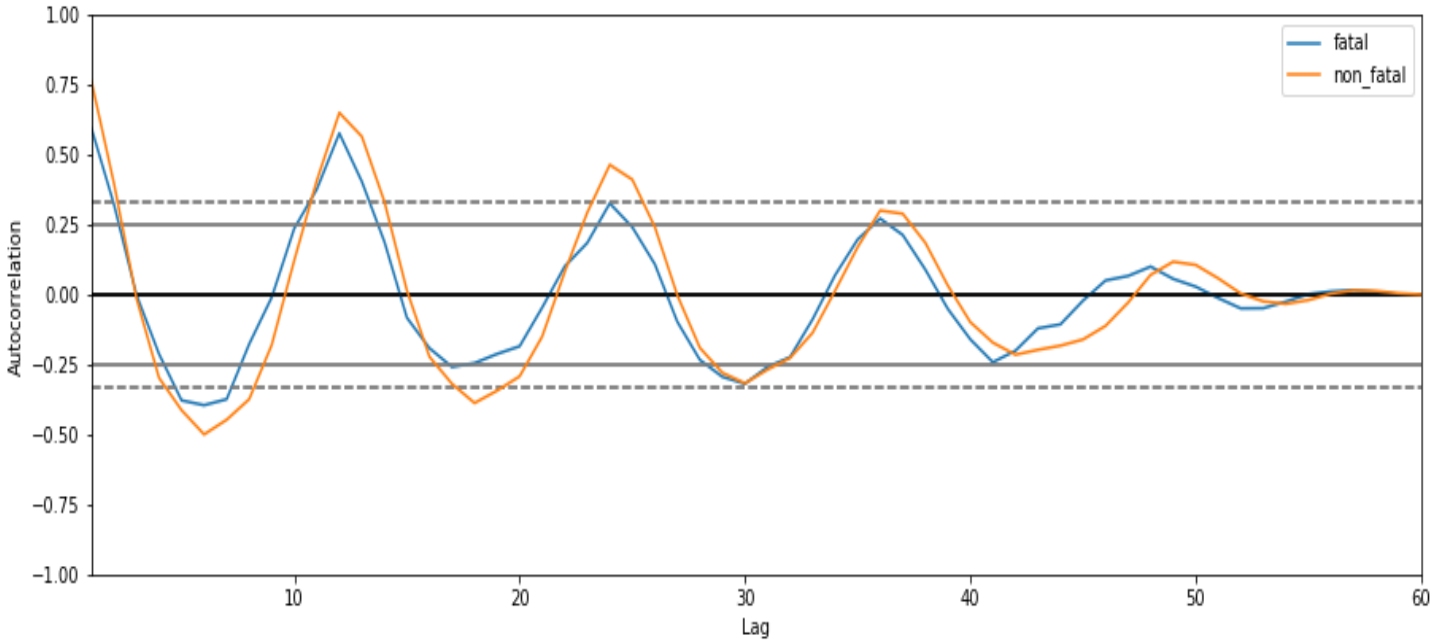
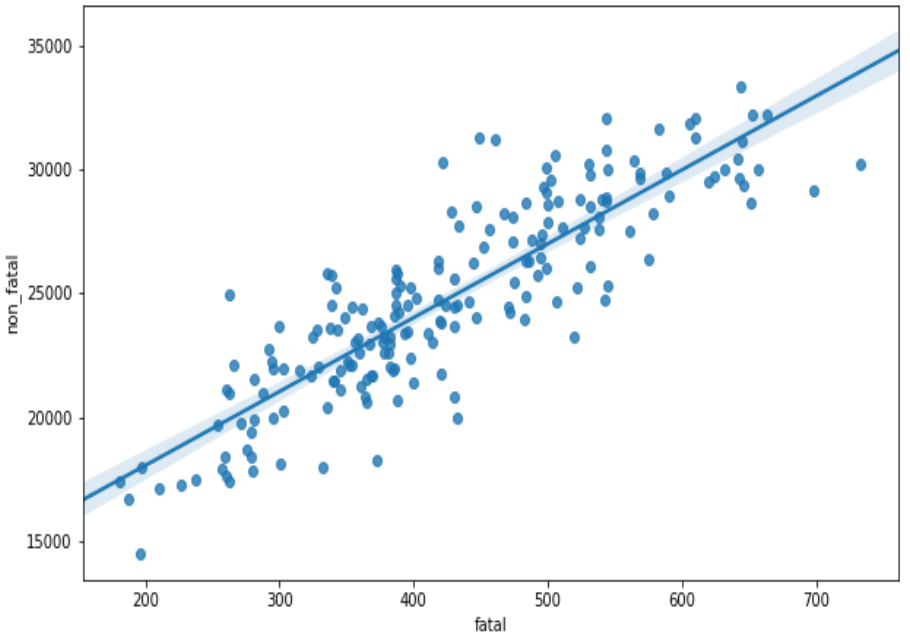
- Overview
- **Analysis and Conclusions**

1. Fatal and Non-fatal Collision



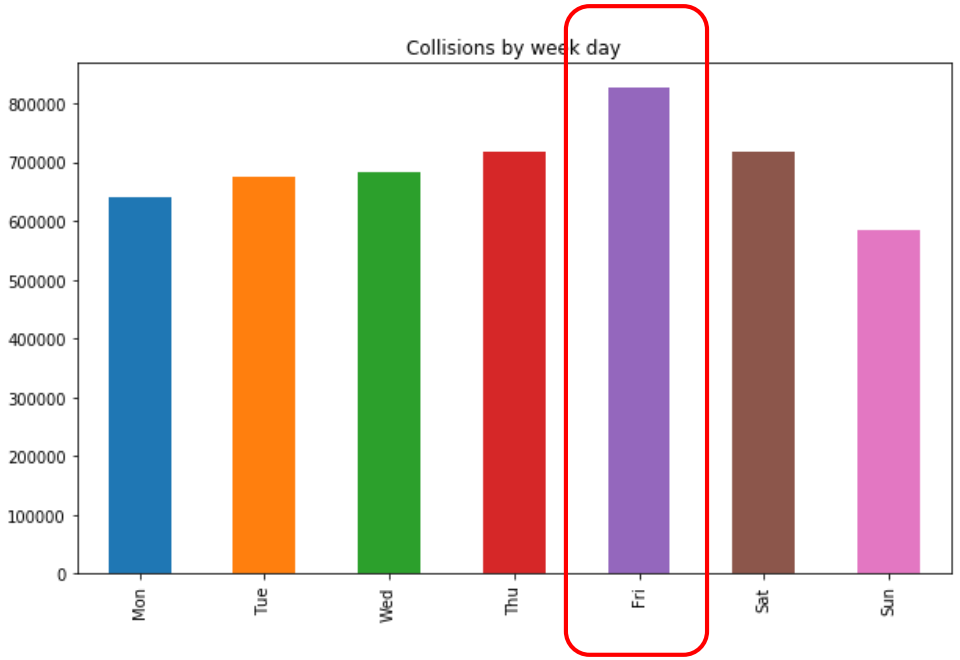
1. Fatal and Non-fatal Collision (cont')





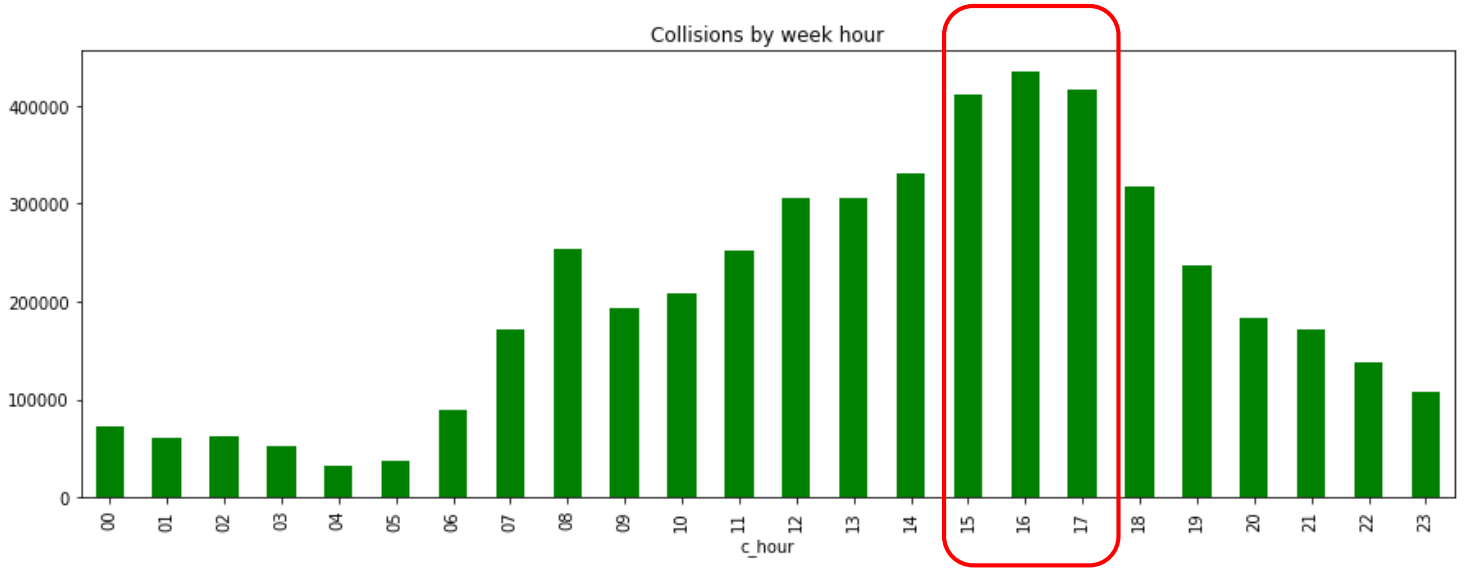
- The autocorrelation of fatal and non-fatal collisions both follow a similar pattern, which is a seasonal cycle of 12-month period.
- The distribution of fatal and non-fatal collisions show a strong linear correlation.

2. Collision Distribution by Week Day and Hour

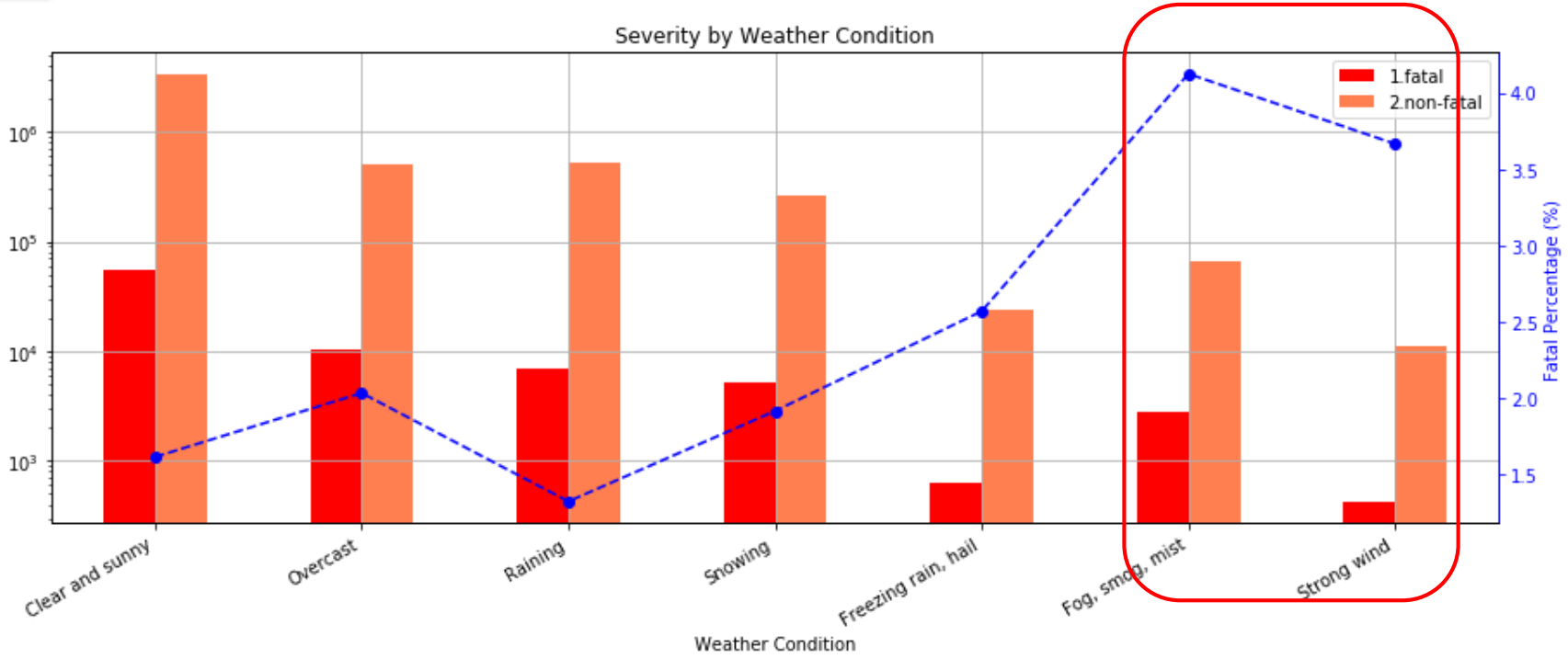


Week Day

Day Hour

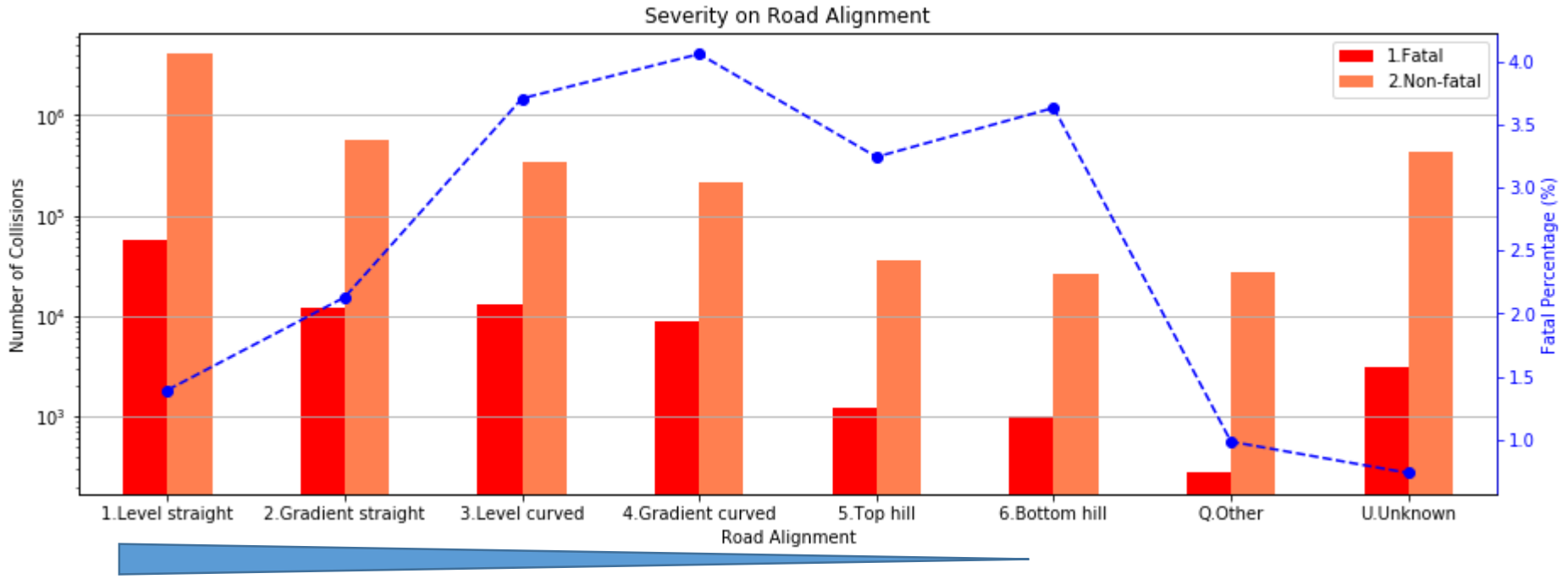


3. Weather and Collision Severity



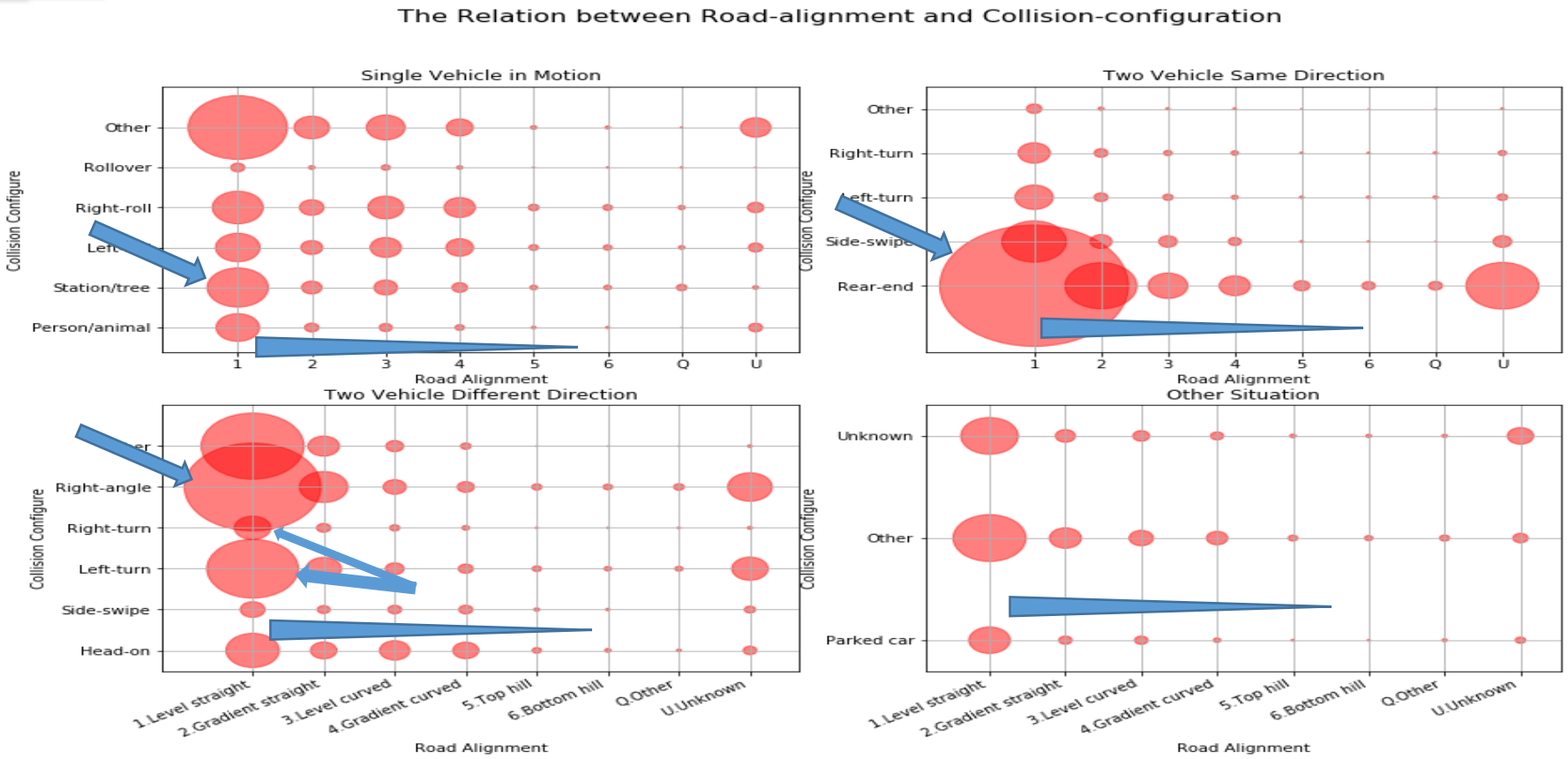
- Majority of collisions took place in clear and sunny days.
- Most dangerous weather for drivers was weather with limited visibility: fog, smog, mist and weather with strong wind.

4. Road Alignment and Collision Severity



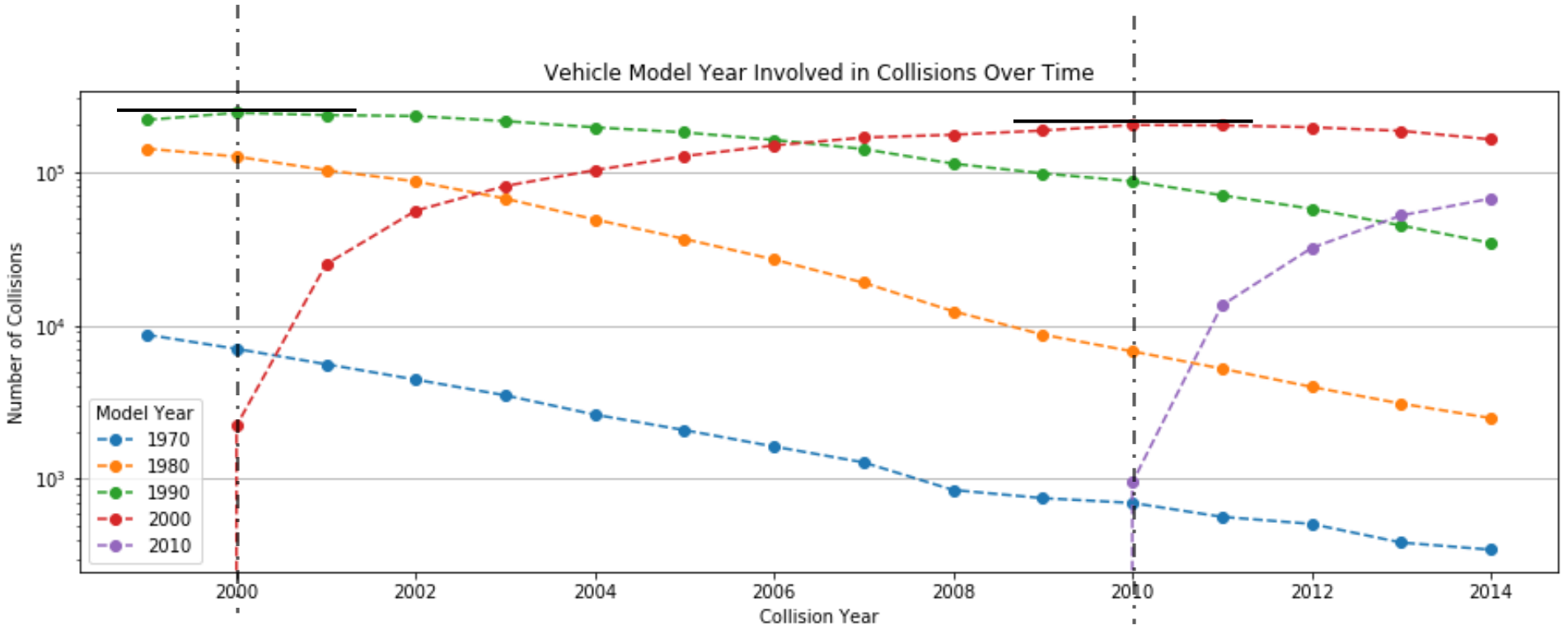
- Most collisions happened in level and aligned road.
- Bad road alignment may lead to higher risk of fatal accidents.

5. Road Alignment and Collision Configuration



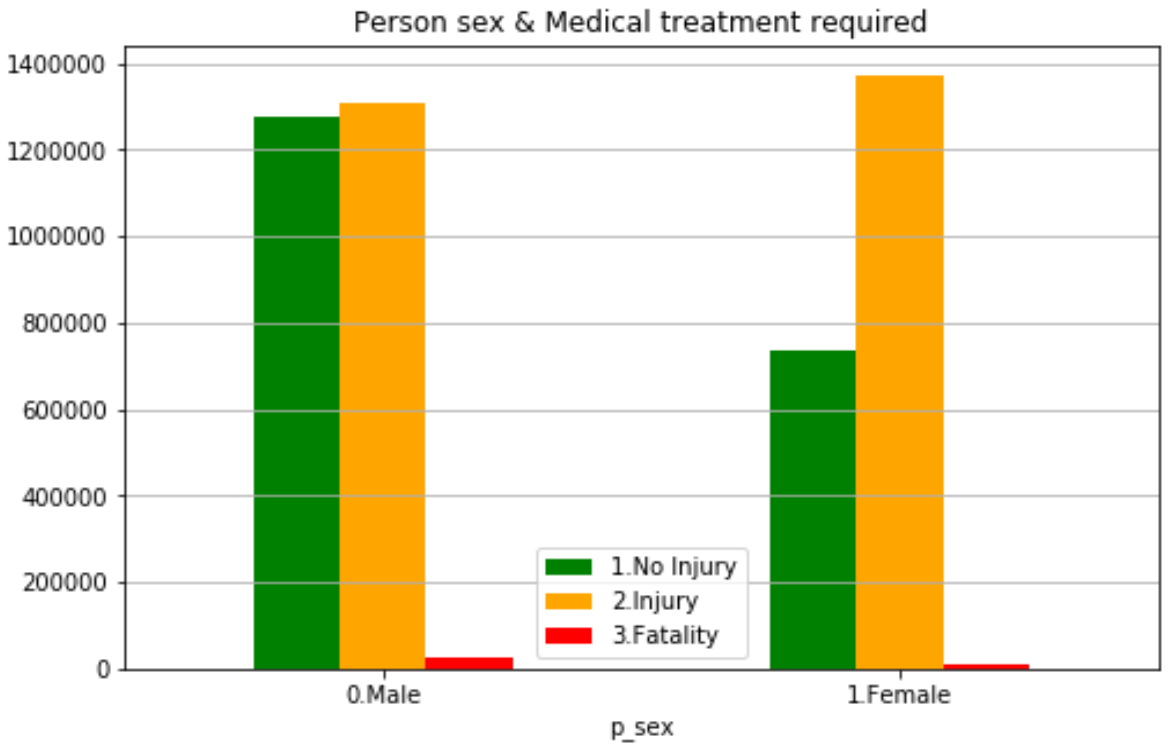
- Rear-end collision is the most frequent collision type followed by right-angle collision.

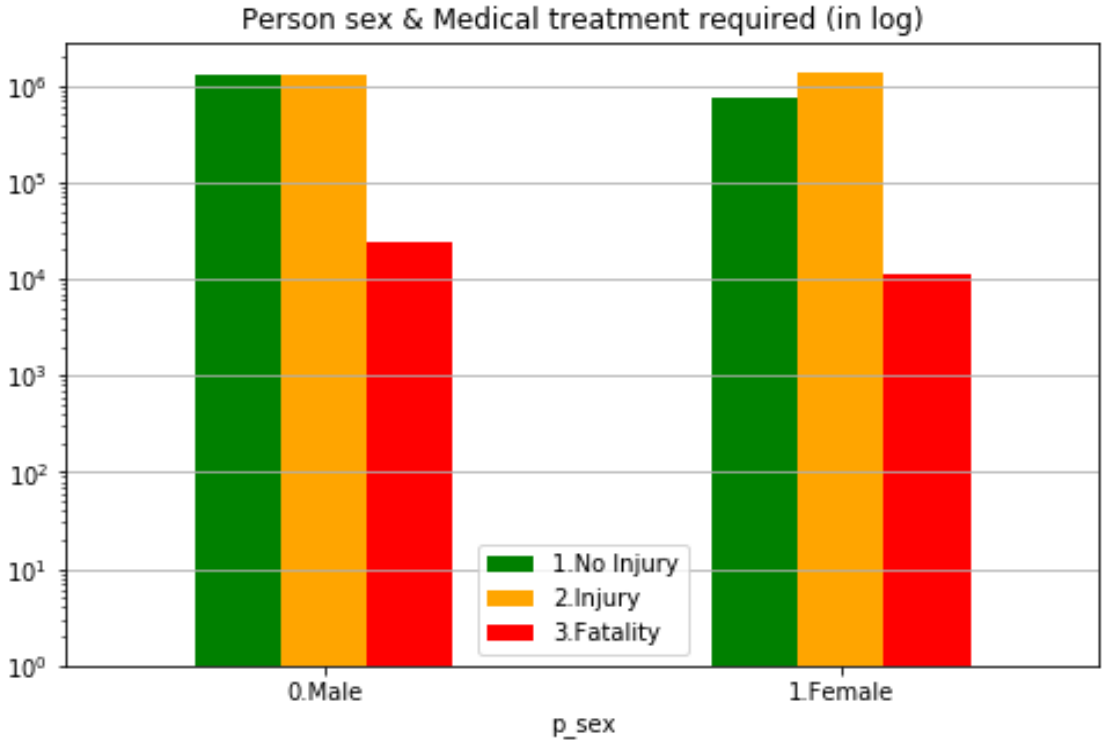
6. Vehicle Model Year Involved in Collision



- The collision rate for vehicle models peaks in their 10th year.

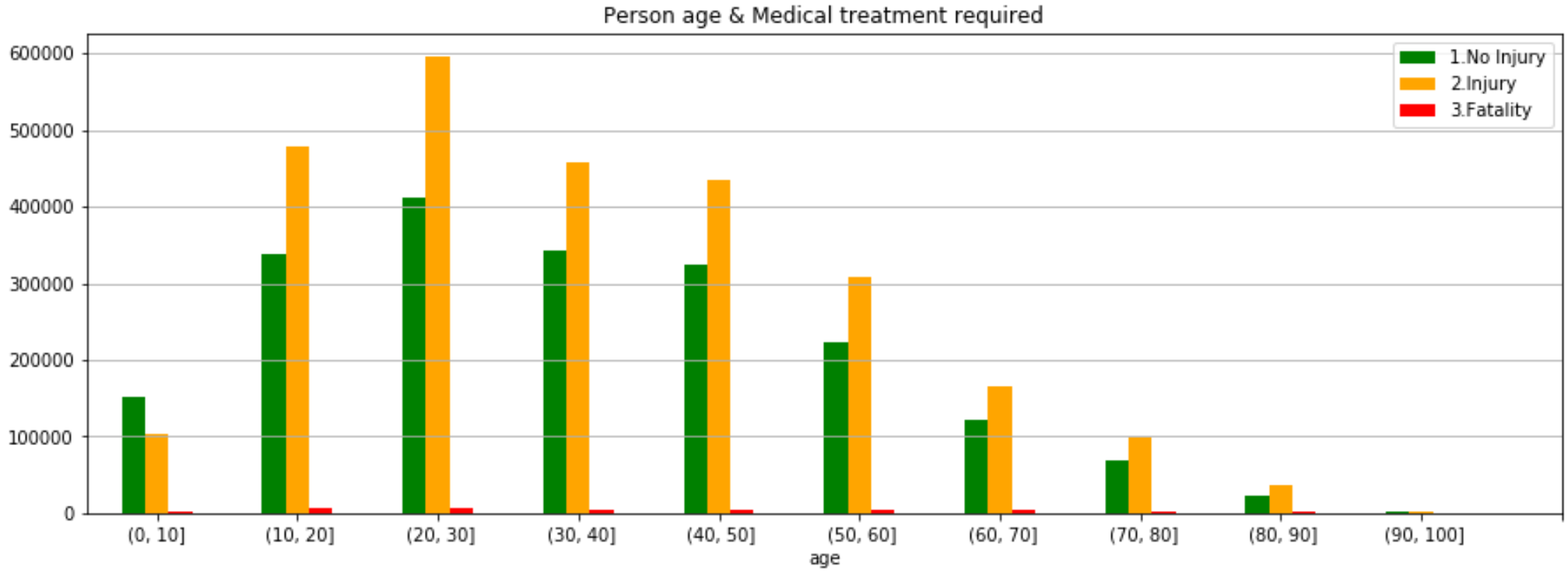
7. Person Sex





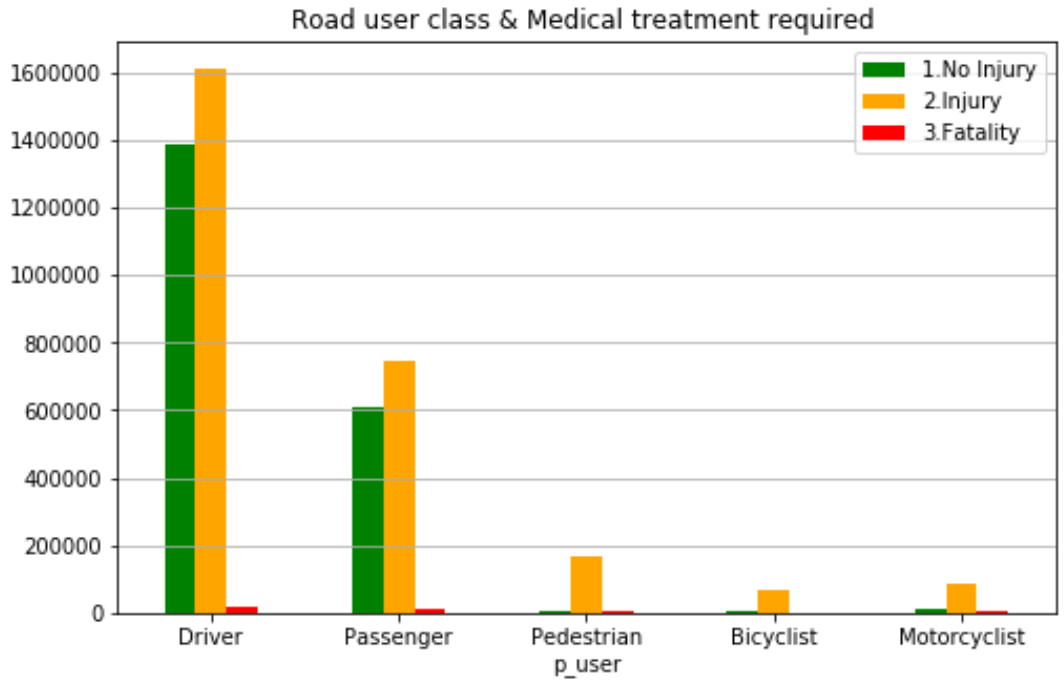
- Females are more likely to get injured in an accident.
- Males are more likely to be involved in fatal accidents.

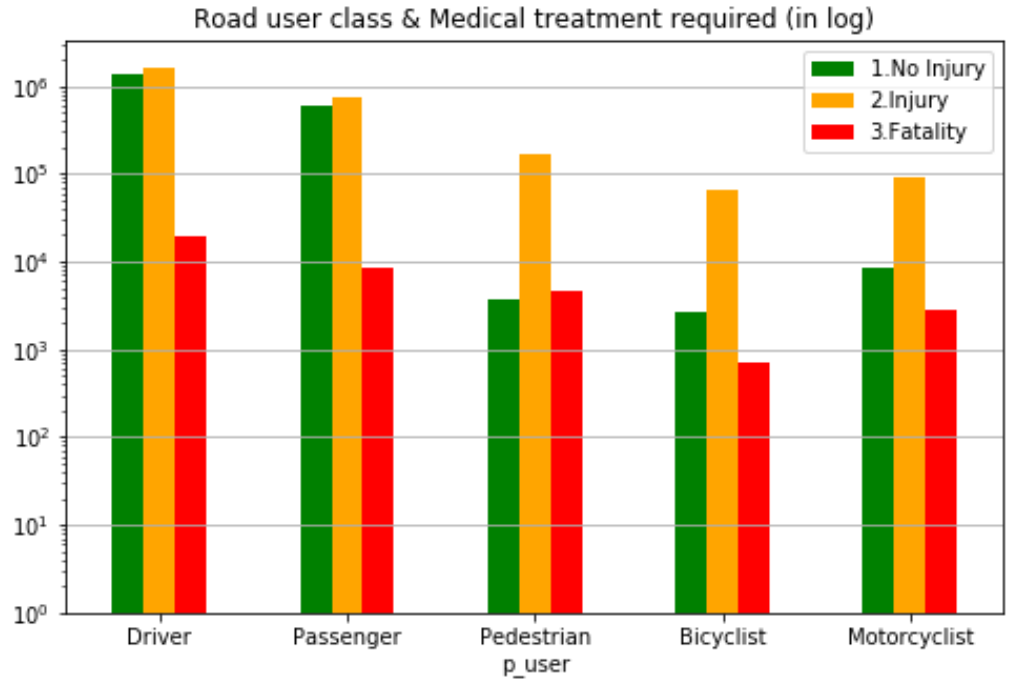
8. Person Age



- People aged from 21 to 30 are most prone to accidents.
- Probability of accidents decreases while age increases.

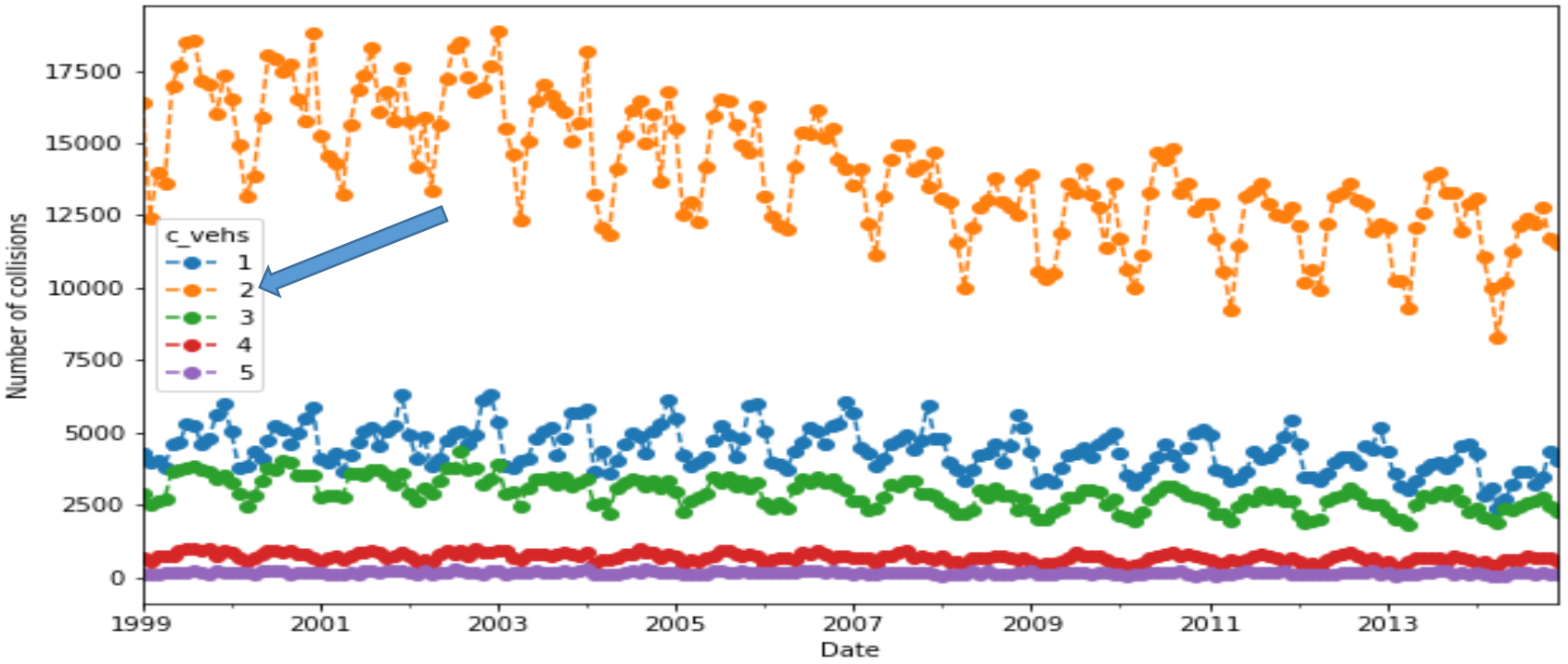
9. Road User Class





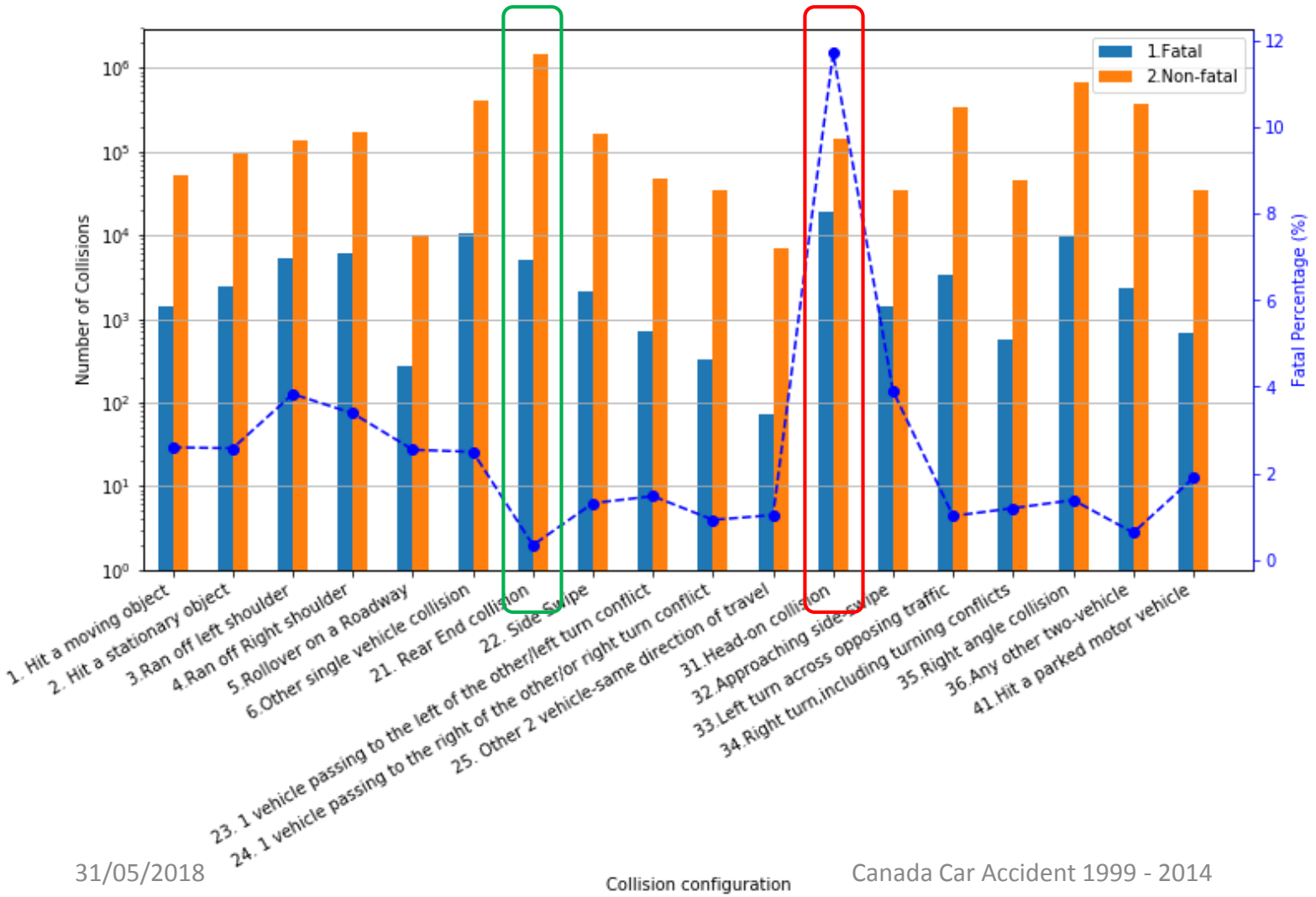
- Drivers are twice as likely to get hurt or die than that of passengers.
- Bicyclists are relatively safer.

10. Number of Vehicles Involved in Collision



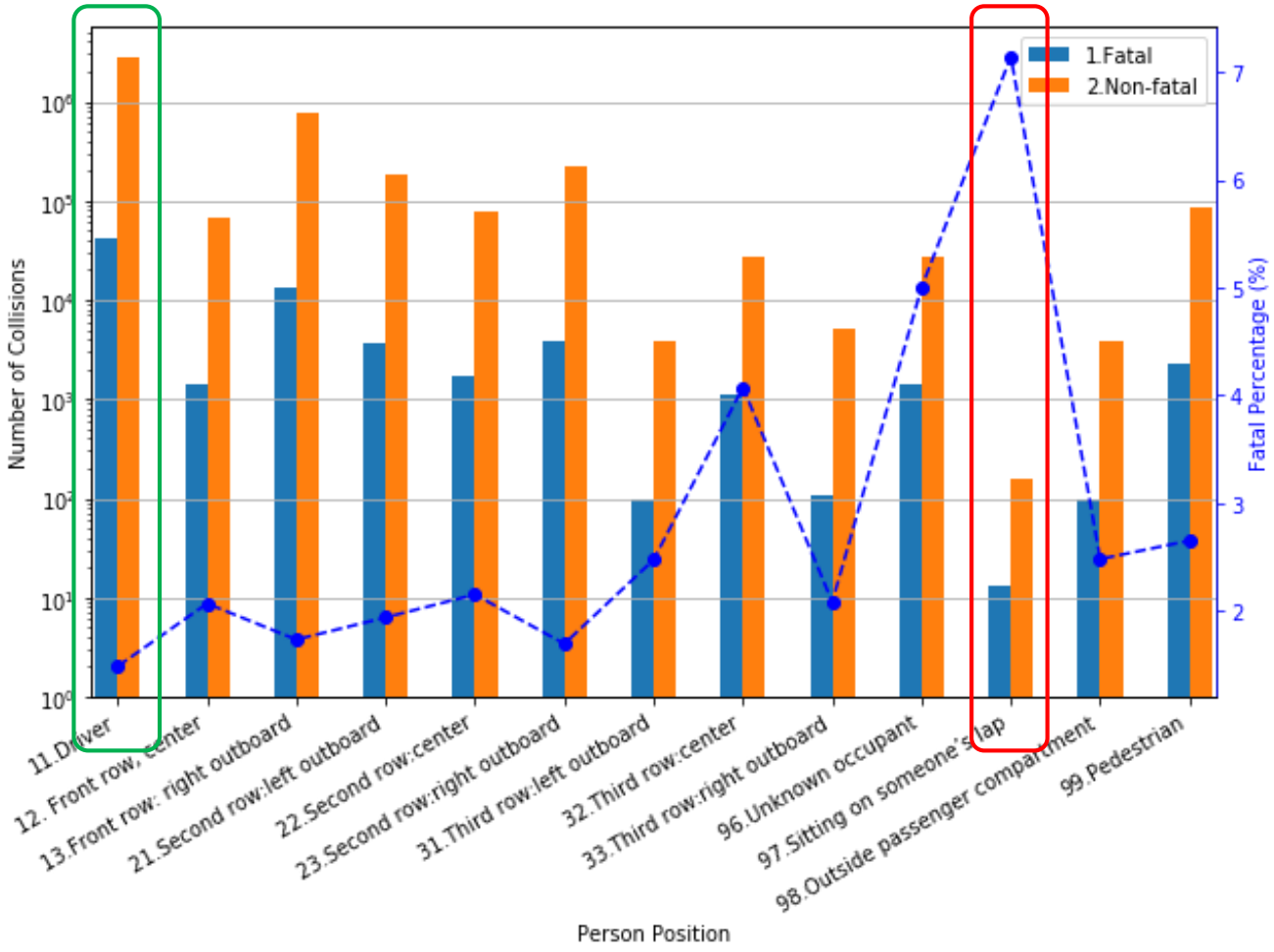
- Most frequent number of vehicles involved in collisions at all time was 2.

11. Collision Configuration and Severity



- Rear-end collision is the most common type of collision.
- Head-on collision has the highest fatality rate.

12. Person Position and Collision Severity



- Drivers are more likely to be involved in collisions, but surprisingly, the fatal rate is the lowest.
- Sitting on someone's lap has the highest fatality rate.

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Thank You