Final Project Presentation

Airline Safety

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Data and Information Visualization
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Data Intake Report

Data Storage Location : https://github.com/fivethirtyeight/data/tree/master/airline-safety

Tabular Data Details : airline-safety.csv

Source : Aviation Safety Network

Total number of observations	**56 Rows**
Total number of files	**1**
Total number of features	**8 Columns**
Base format of the file	**.csv**
Size of the data	**3.6+ KB**

Information of Data

Column	Definition
airline	Airline (asterisk indicates that regional subsidiaries are included)
avail_seat_km_per_week	Available seat kilometers flown every week
incidents_85_99	Total number of incidents, 1985–1999
fatal_accidents_85_99	Total number of fatal accidents, 1985–1999
fatalities_85_99	Total number of fatalities, 1985–1999
incidents_00_14	Total number of incidents, 2000–2014
fatal_accidents_00_14	Total number of fatal accidents, 2000–2014
fatalities_00_14	Total number of fatalities, 2000–2014

```
airline_safety = pd.read_csv("https://raw.githubusercontent.com/fivethirtyeight/data/master/airline-safety/airline-safety.csv")
df = airline_safety.copy()
df.head()
```

	airline	avail_seat_km_per_week	incidents_85_99	fatal_accidents_85_99	fatalities_85_99	incidents_00_14	fatal_accidents_00_14	fatalities_00_14
0	Aer Lingus	320906734	2	0	0	0	0	0
1	Aeroflot*	1197672318	76	14	128	6	1	88
2	Aerolineas Argentinas	385803648	6	0	0	1	0	0
3	Aeromexico*	596871813	3	1	64	5	0	0
4	Air Canada	1865253802	2	0	0	2	0	0

```
df.info()
```
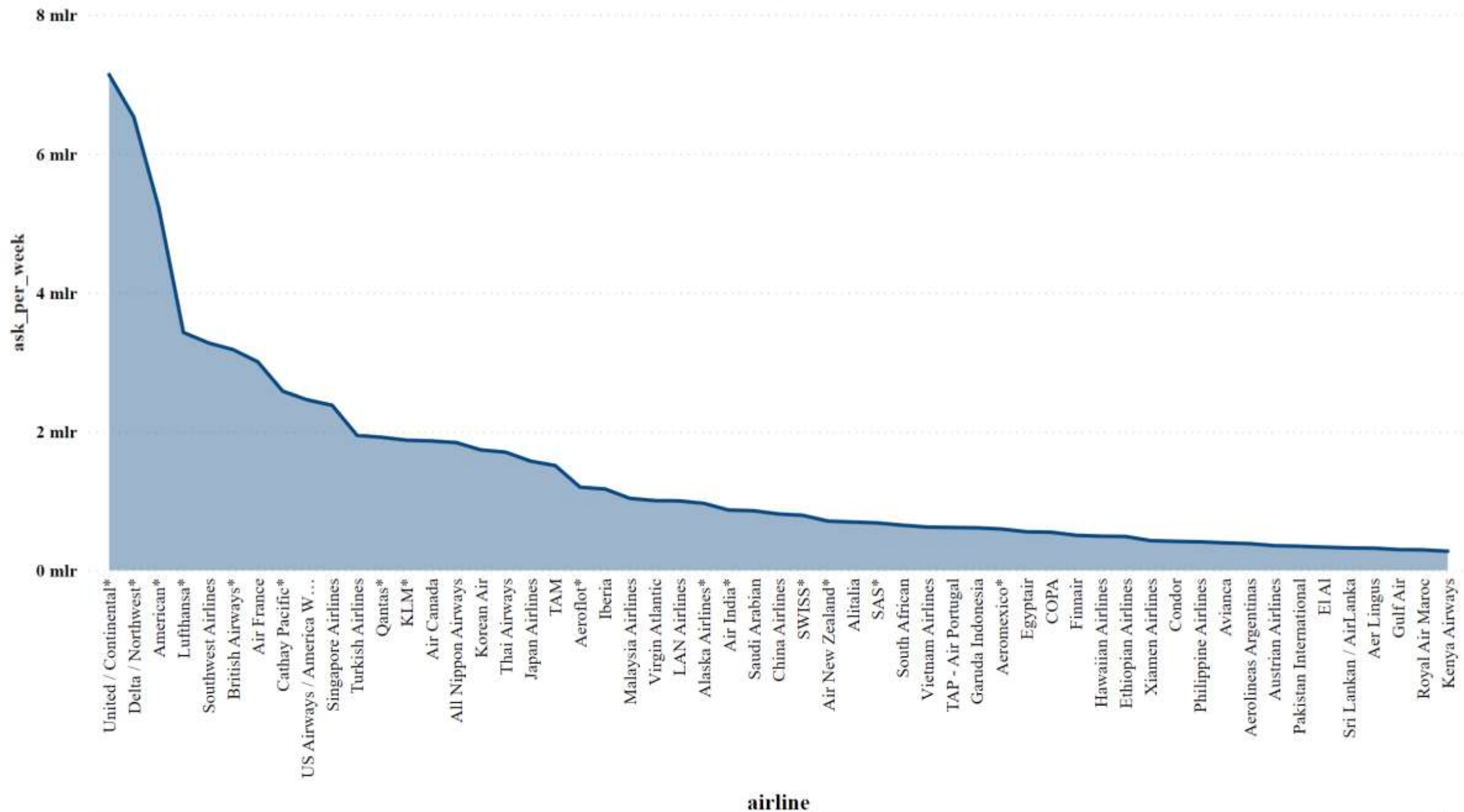
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 56 entries, 0 to 55
Data columns (total 8 columns):
 #   Column                 Non-Null Count  Dtype
---  ------                 --------------  -----
 0   airline                56 non-null     object
 1   avail_seat_km_per_week 56 non-null     int64
 2   incidents_85_99        56 non-null     int64
 3   fatal_accidents_85_99  56 non-null     int64
 4   fatalities_85_99       56 non-null     int64
 5   incidents_00_14        56 non-null     int64
 6   fatal_accidents_00_14  56 non-null     int64
 7   fatalities_00_14       56 non-null     int64
dtypes: int64(7), object(1)
memory usage: 3.6+ KB
```

Column	Levels of Measurement
airline	Nominal
avail_seat_km_per_week	Interval
incidents_85_99	Ratio
fatal_accidents_85_99	Ratio
fatalities_85_99	Ratio
incidents_00_14	Ratio
fatal_accidents_00_14	Ratio
fatalities_00_14	Ratio

New Column	Definition	Levels of Measurement
total_incidents	incidents_85_99 + incidents_00_14	Ratio
total_fatal_accidents	fatal_accidents_85_99 + fatal_accidents_00_14	Ratio
total_fatalities	fatalities_85_99 + fatalities_00_14	Ratio
fatal_accident_ratio	total_fatal_accidents / total_incidents	Ratio

Ask per Week by Airline

ask_per_week (y-axis): 0 mlr, 2 mlr, 4 mlr, 6 mlr, 8 mlr

airline (x-axis): United / Continental*, Delta / Northwest*, American*, Lufthansa*, Southwest Airlines, British Airways*, Air France, Cathay Pacific*, US Airways / America W..., Singapore Airlines, Turkish Airlines, Qantas*, KLM*, Air Canada, All Nippon Airways, Korean Air, Thai Airways, Japan Airlines, TAM, Aeroflot*, Iberia, Malaysia Airlines, Virgin Atlantic, LAN Airlines, Alaska Airlines*, Air India*, Saudi Arabian, China Airlines, SWISS*, Air New Zealand*, Alitalia, SAS*, South African, Vietnam Airlines, TAP - Air Portugal, Garuda Indonesia, Aeromexico*, Egyptair, COPA, Finnair, Hawaiian Airlines, Ethiopian Airlines, Xiamen Airlines, Condor, Philippine Airlines, Avianca, Aerolineas Argentinas, Austrian Airlines, Pakistan International, El Al, Sri Lankan / AirLanka, Aer Lingus, Gulf Air, Royal Air Maroc, Kenya Airways

ASK per Week by Airline

ASK per week by Airline

3,276,525,770.00 (4.2%)

3,426,529,504.00 (4.4%)

5,228,357,340.00 (6.7%)

6,525,658,894.00 (8.4%)

7,139,291,291.00 (9.2%)

51,942,430,266.00 (67.0%)

airline

- United / Continental*
- Delta / Northwest*
- American*
- Lufthansa*
- Southwest Airlines
- Others

xViz
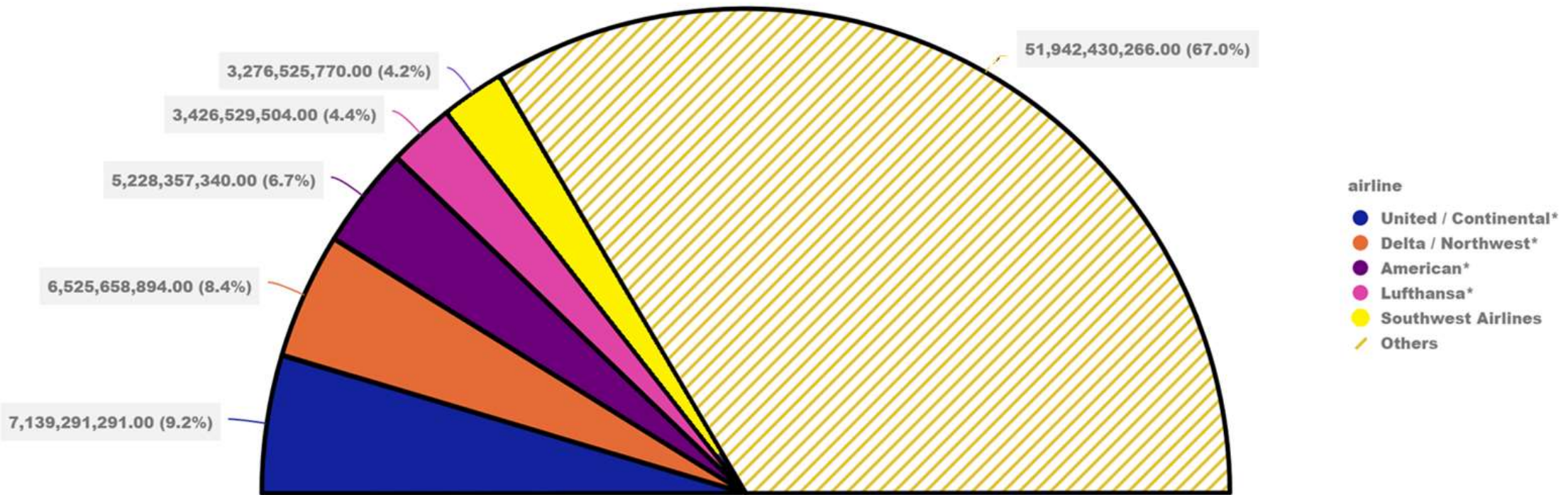
Distribution of Incidents

● incidents_85_99   ● incidents_00_14

402 (63,51%)

231 (36,49%)
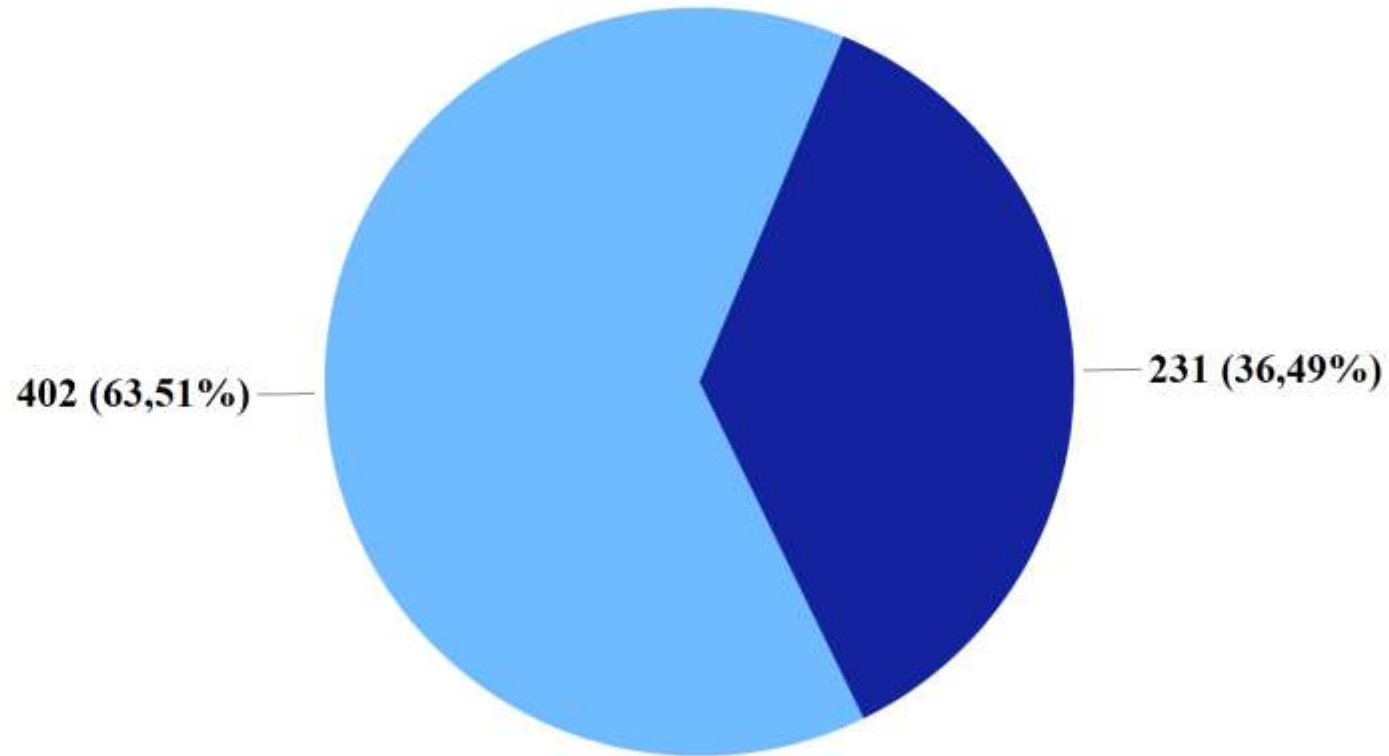
Distribution of Fatal Accidents

● fatal_accidents_85_99   ● fatal_accidents_00_14

37 (23,27%)

122 (76,73%)
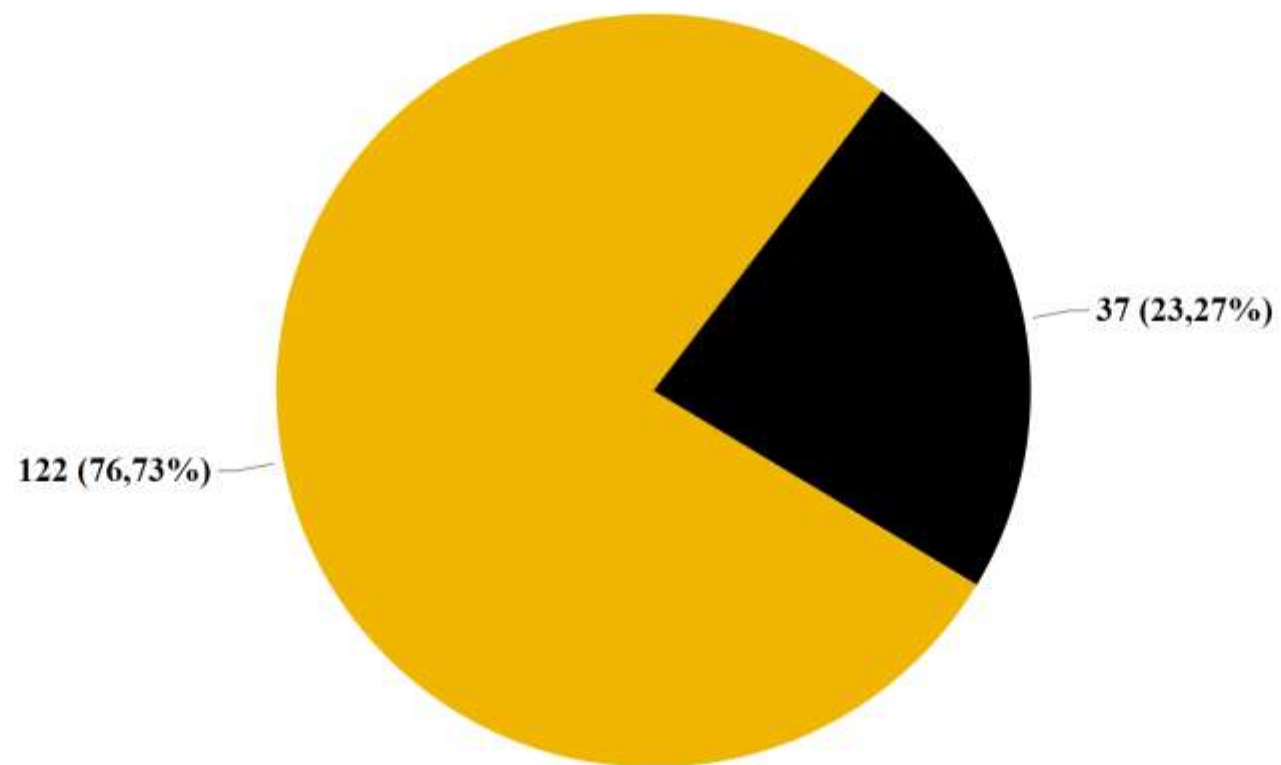
Distribution of Fatalities

● fatalities_85_99 ● fatalities_00_14

66,94%

33,06%
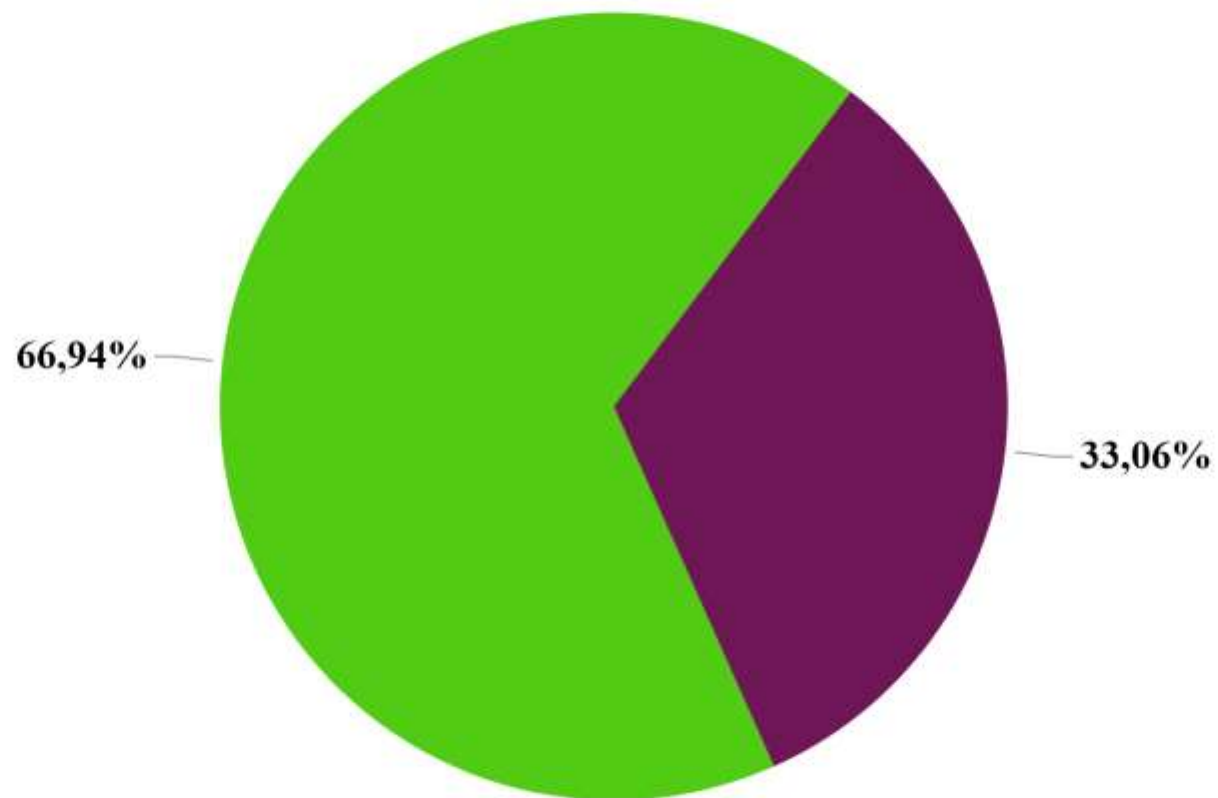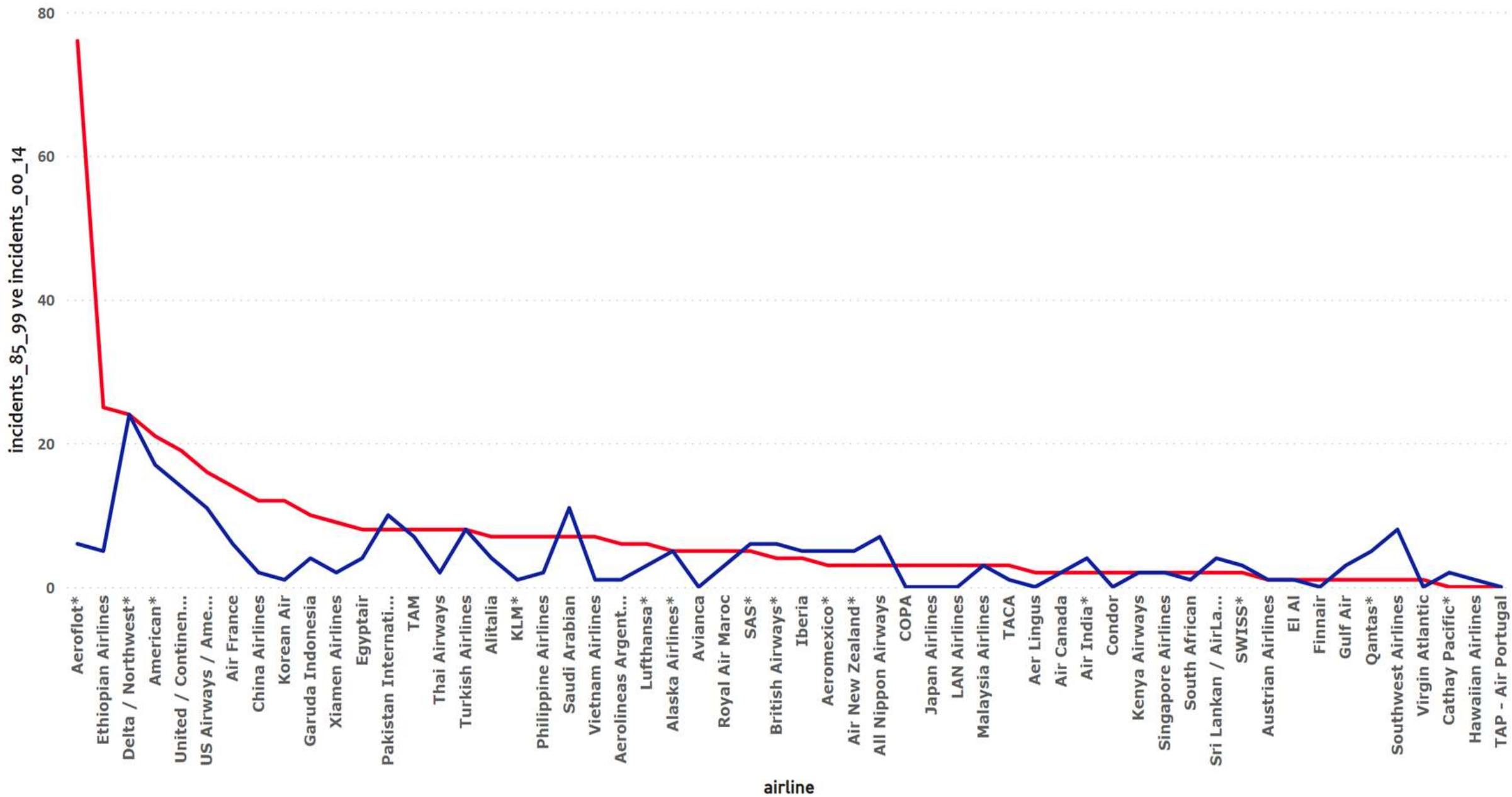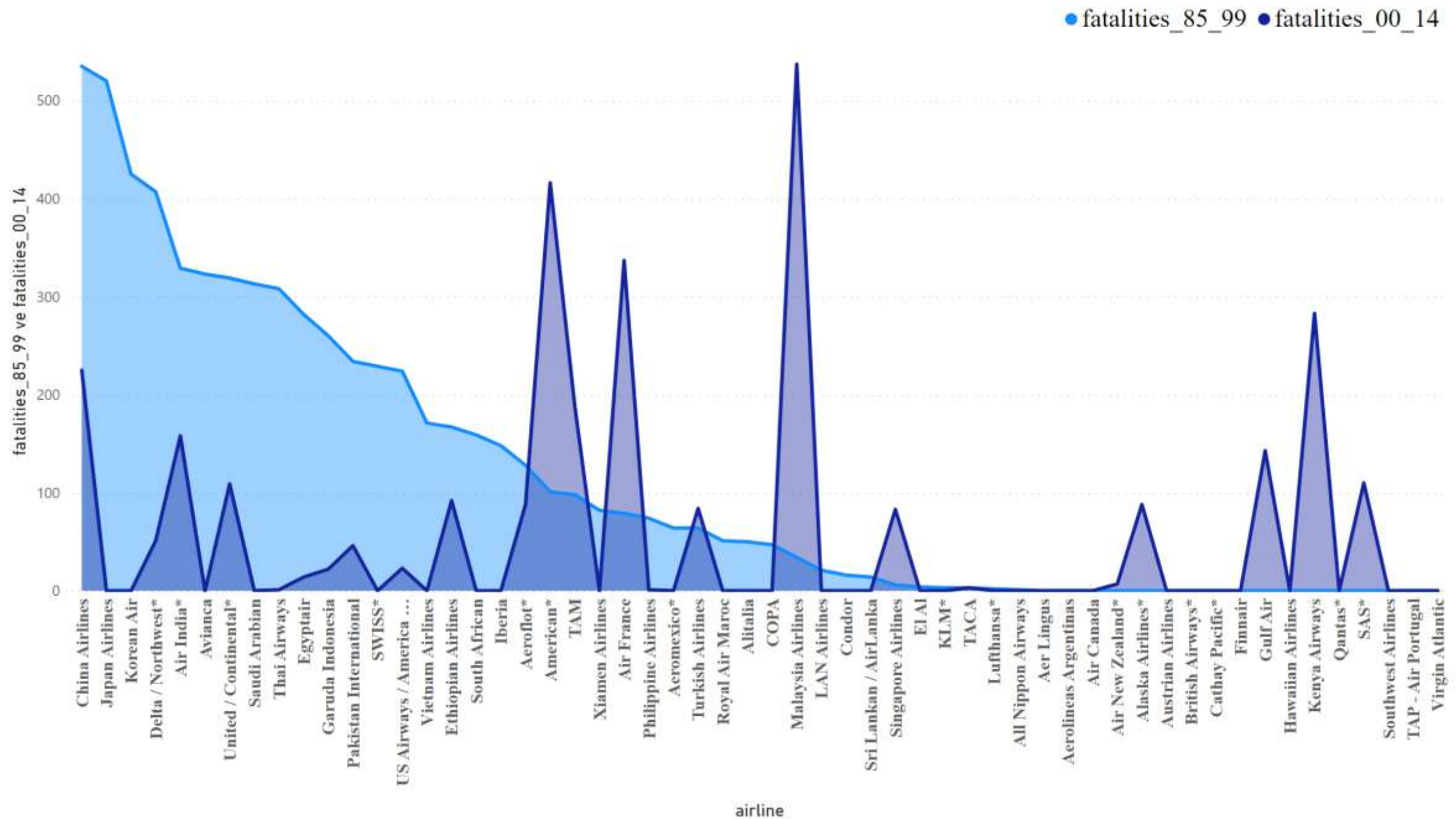
Fatal Accident by Airline

- fatal_accidents_85_99 - fatal_accidents_00_14
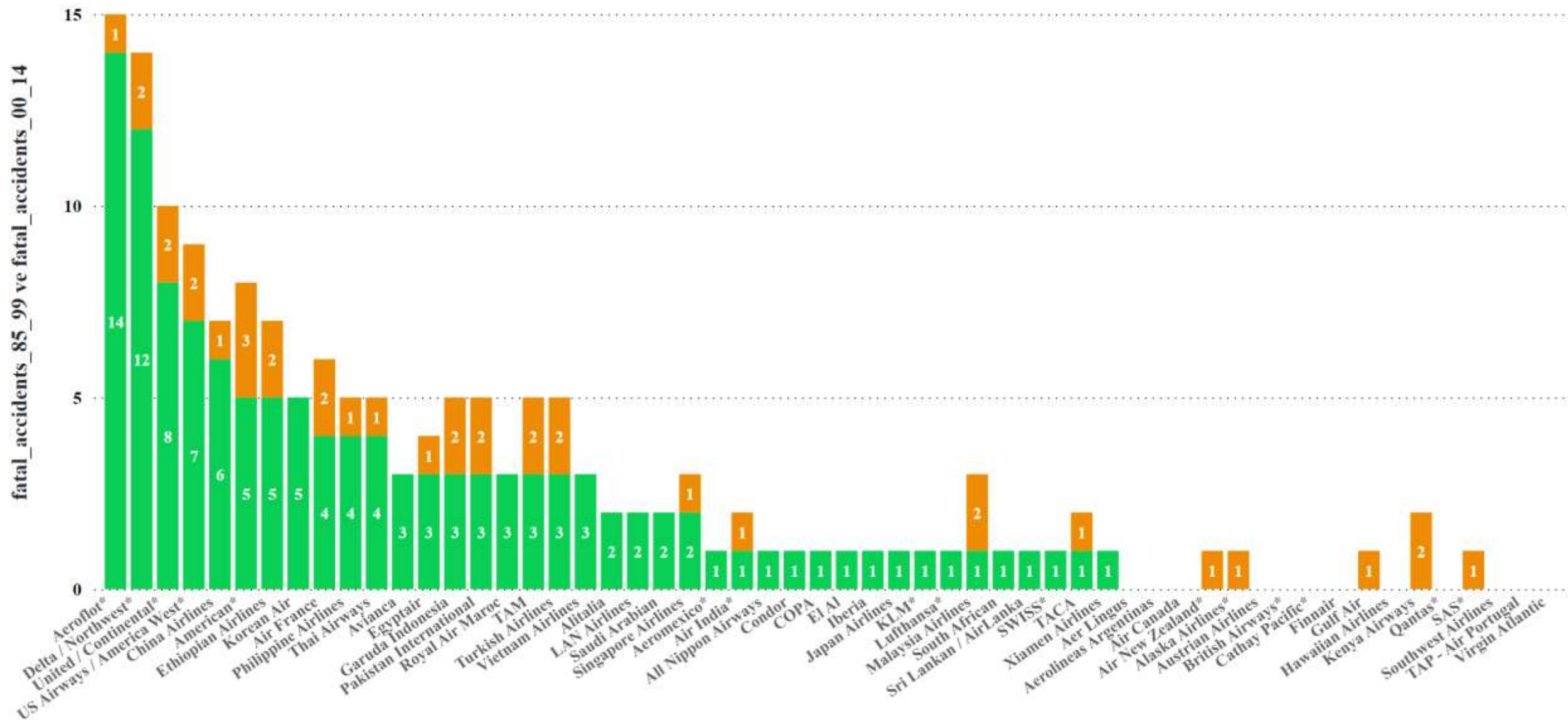
Distribution of Fatalities

airline	fatal_accidents_85_99	fatalities_85_99	fatal_accidents_00_14	fatalities_00_14
Aeroflot*	14	128	1	88
Delta / Northwest*	12	407	2	51
United / Continental*	8	319	2	109
US Airways / America West*	7	224	2	23
China Airlines	6	535	1	225
American*	5	101	3	416
Ethiopian Airlines	5	167	2	92
Korean Air	5	425	0	0
Air France	4	79	2	337
Philippine Airlines	4	74	1	1
Thai Airways	4	308	1	1
Avianca	3	323	0	0
Egyptair	3	282	1	14
Garuda Indonesia	3	260	2	22
Pakistan International	3	234	2	46
Royal Air Maroc	33	51	0	0
TAM	3	98	2	188
Turkish Airlines	3	64	2	84
Vietnam Airlines	3	171	0	0
Alitalia	2	50	0	0
LAN Airlines	2	21	0	0
Saudi Arabian	2	313	0	0
Singapore Airlines	2	6	1	83
Aeromexico*	1	64	0	0
Air India*	1	329	1	158
All Nippon Airways	1	1	0	0
Condor	1	16	0	0
COPA	1	47	0	0
El Al	1	4	0	0
Iberia	1	148	0	0
Japan Airlines	1	520	0	0
KLM*	1	3	0	0
Lufthansa*	1	2	0	0
Malaysia Airlines	1	34	2	537

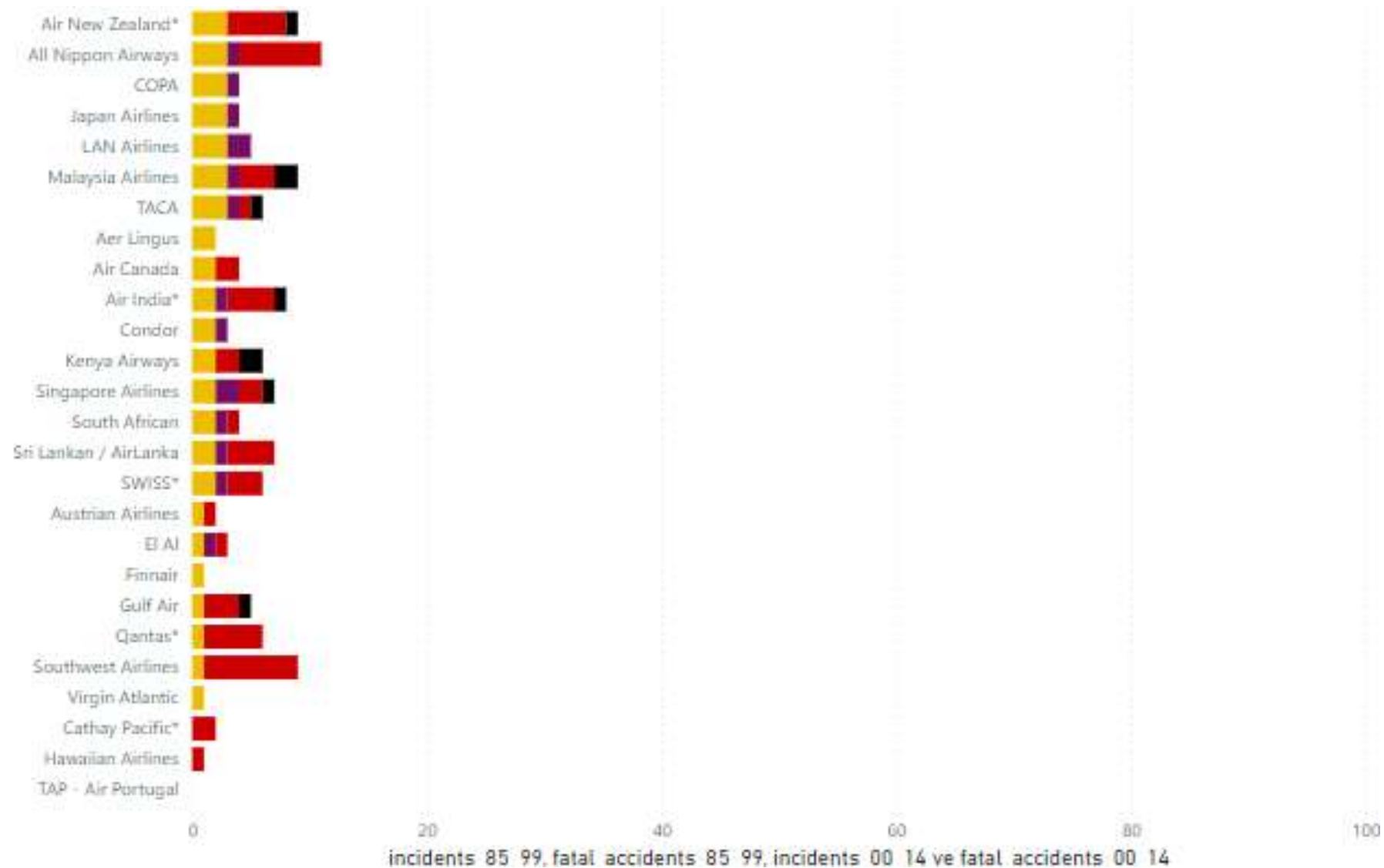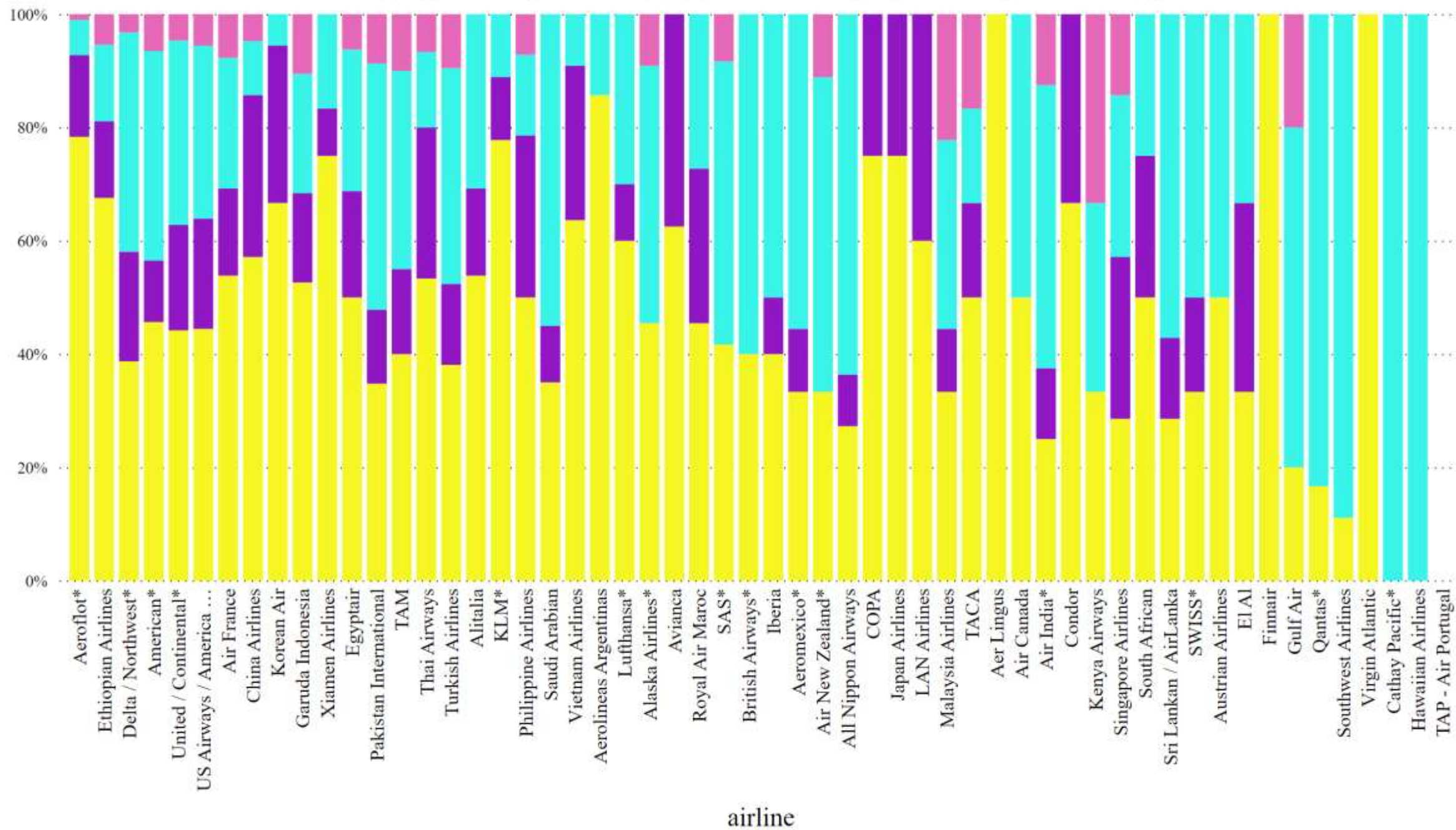| airline	fatal_accidents_85_99	fatalities_85_99	fatal_accidents_00_14	fatalities_00_14
South African	1	159	0	0
Sri Lankan / AirLanka	1	14	0	0
SWISS*	1	229	0	0
TACA	1	3	1	3
Xiamen Airlines	1	82	0	0
Aer Lingus	0	0	0	0
Aerolineas Argentinas	0	0	0	0
Air Canada	0	0	0	0
Air New Zealand*	0	0	1	7
Alaska Airlines*	0	0	1	88
Austrian Airlines	0	0	0	0
British Airways*	0	0	0	0
Cathay Pacific*	0	0	0	0
Finnair	0	0	0	0
Gulf Air	0	0	1	143
Hawaiian Airlines	0	0	0	0
Kenya Airways	0	0	2	283
Qantas*	0	0	0	0
SAS*	0	0	1	110
Southwest Airlines	0	0	0	0
TAP - Air Portugal	0	0	0	0
Virgin Atlantic	0	0	0	0
Toplam	**122**	**6295**	**37**	**3109**

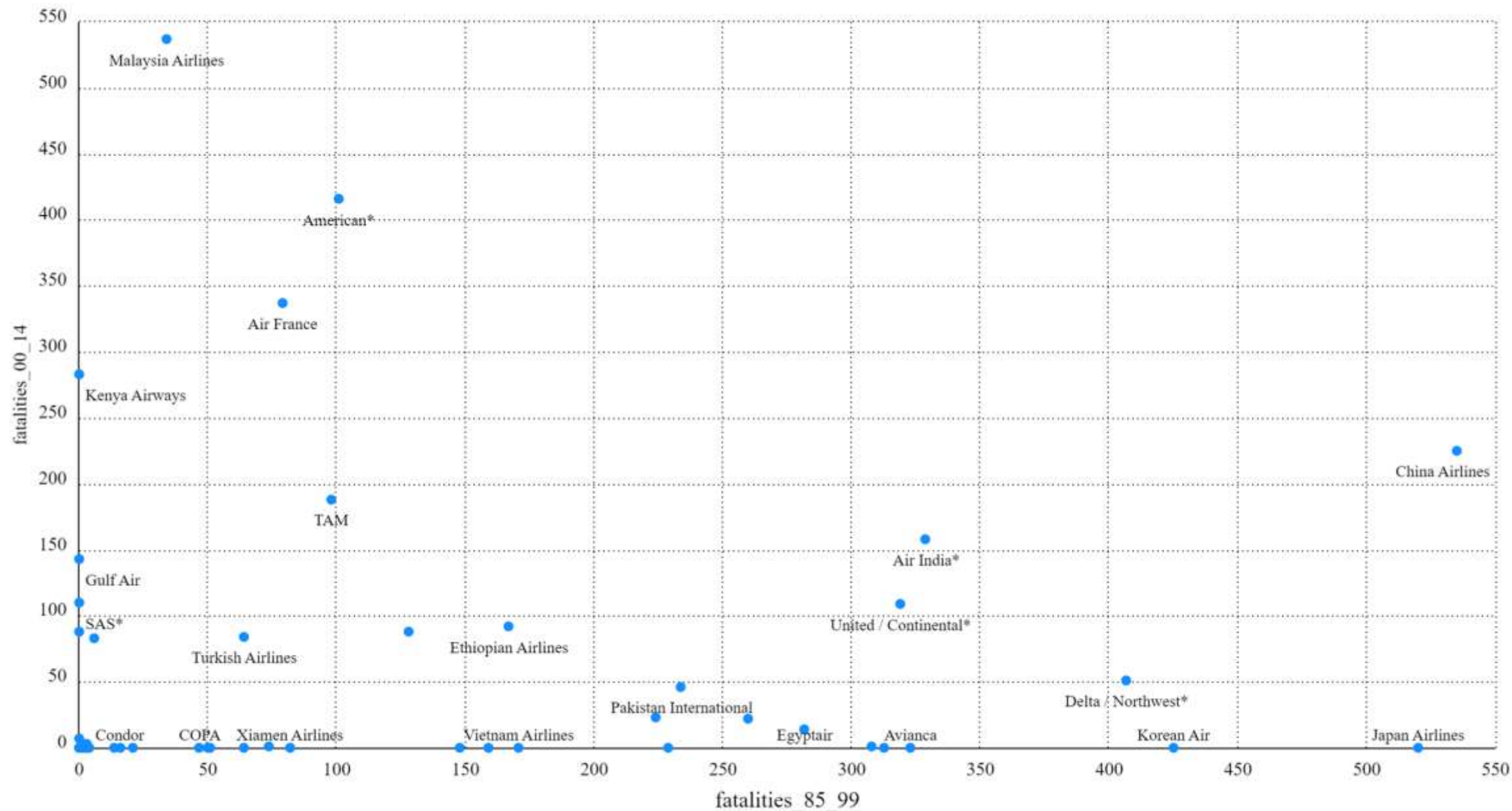# incidents_85_99, fatal_accidents_85_99, incidents_00_14, fatal_accidents_00_14

DÜZENLEYEN AIRLINE

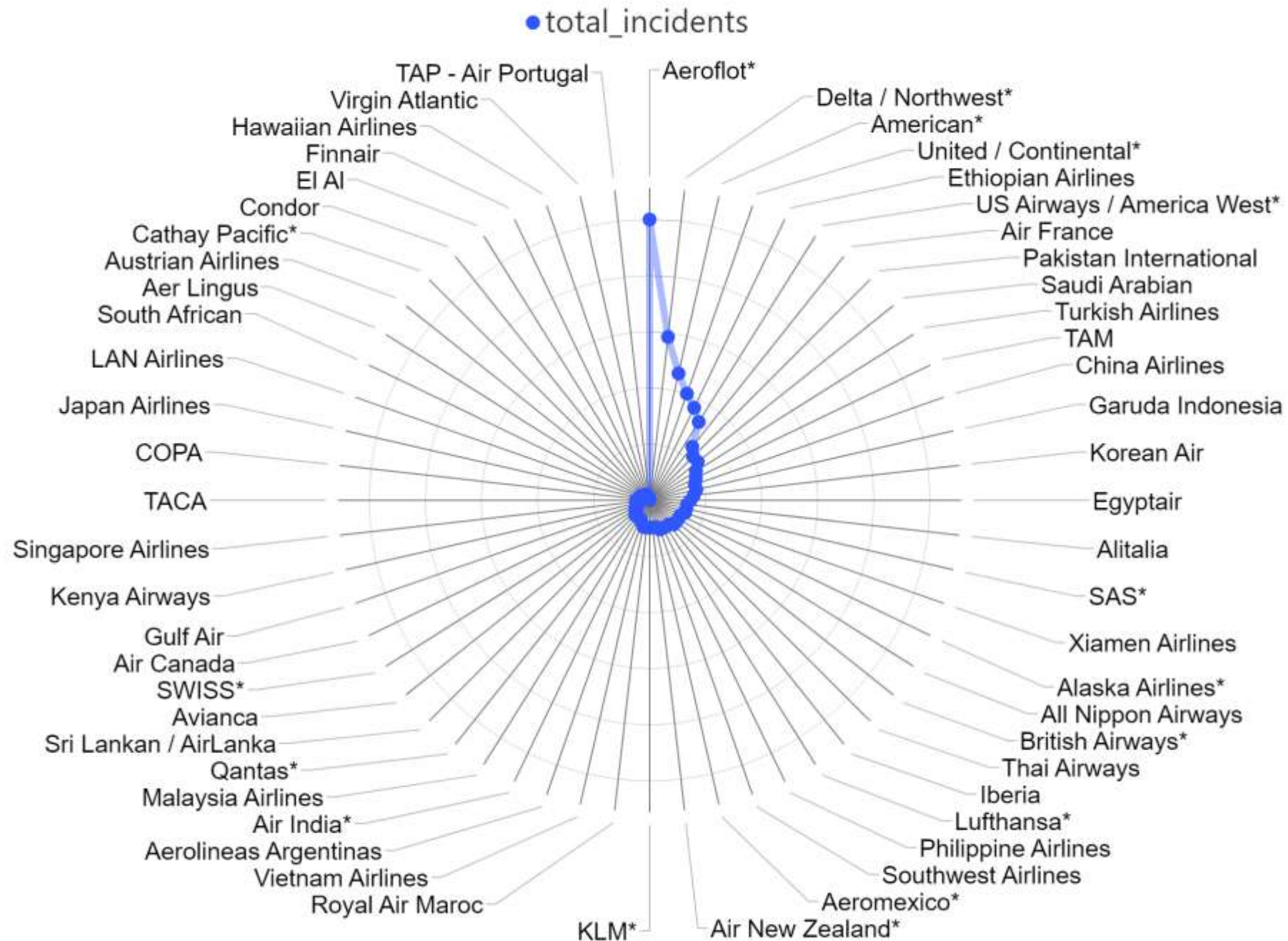● incidents_85_99 ● fatal_accidents_85_99 ● incidents_00_14 ● fatal_accidents_00_14

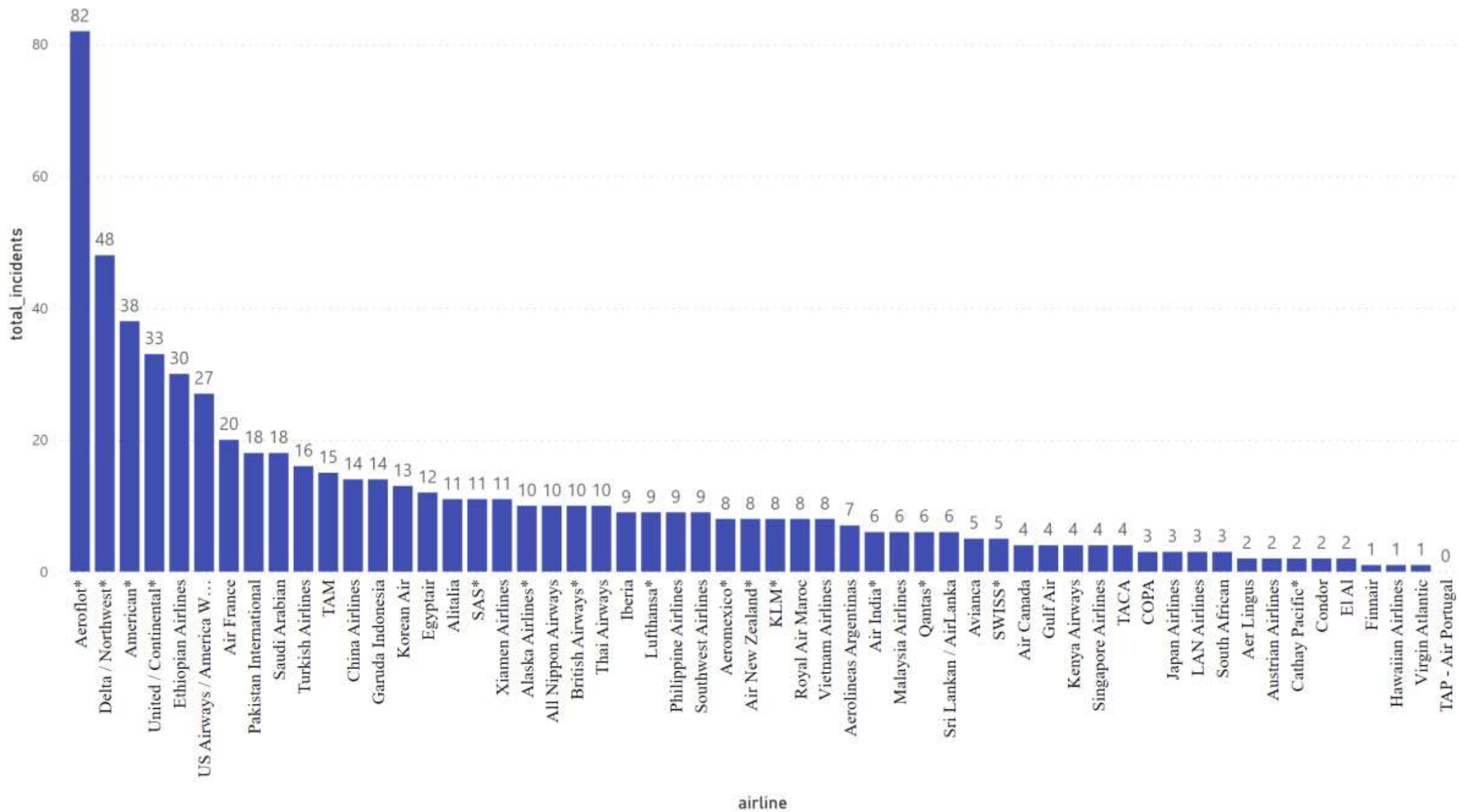Legend: ● incidents_85_99 ● fatal_accidents_85_99 ● incidents_00_14 ● fatal_accidents_00_14

airline

Total Incidents by Airline

● total_incidents

Total Incidents by Airline

Total Incidents by Airline

633

82 (13.0%)

48 (7.6%)

38 (6.0%)

33 (5.2%)

30 (4.7%)

402 (63.5%)

airline

- Aeroflot*
- Delta / Northwest*
- American*
- United / Continental*
- Ethiopian Airlines
- Others

xViz
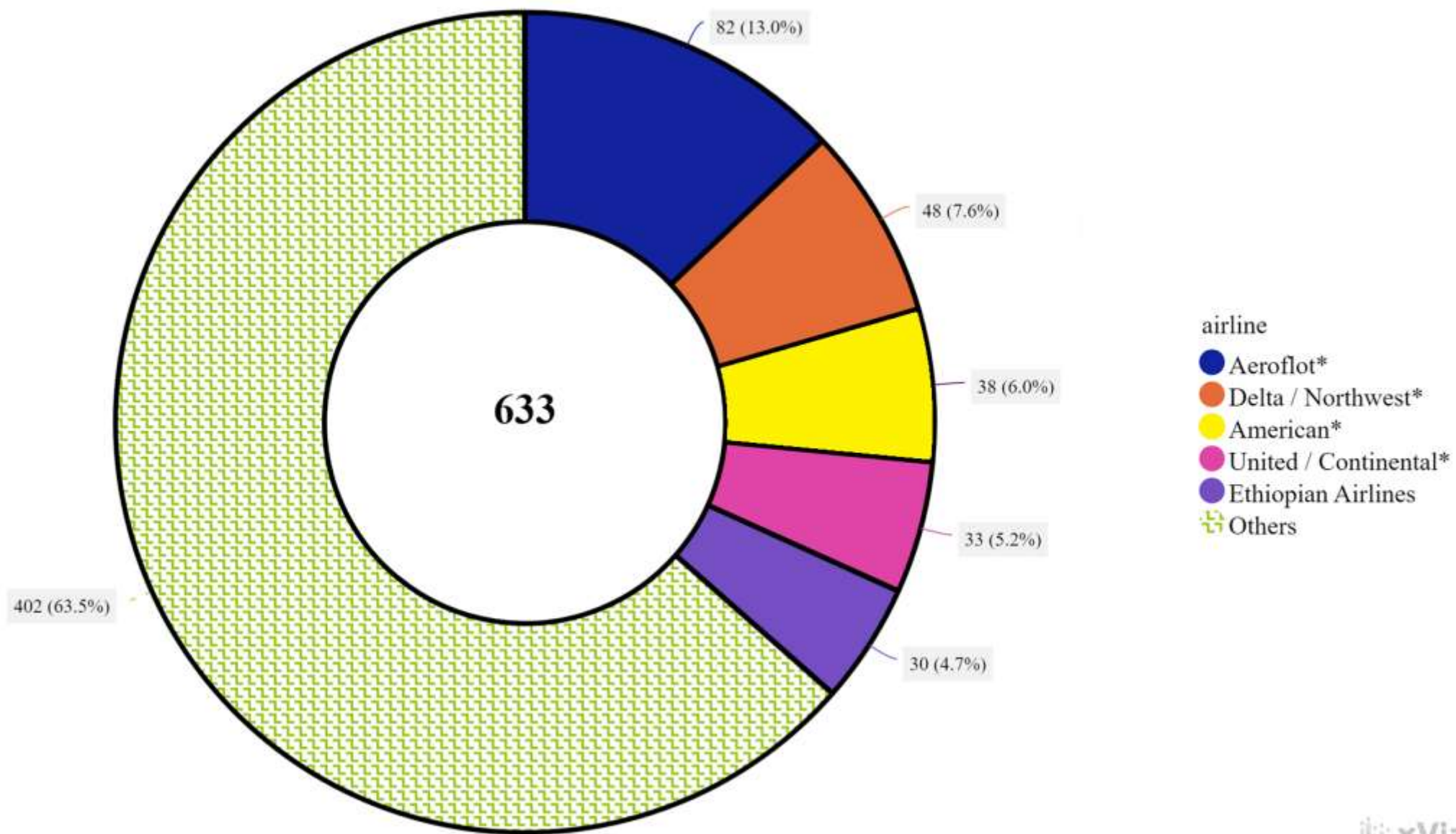
Total Fatal Accidents by Airline

15
(9.4%)

14
(8.8%)

10
(6.3%)

9
(5.7%)

8
(5.0%)

103
(64.8%)

airline

- Aeroflot*
- Delta / Northwest*
- United / Continental*
- US Airways / America West*
- American*
- Others

xViz
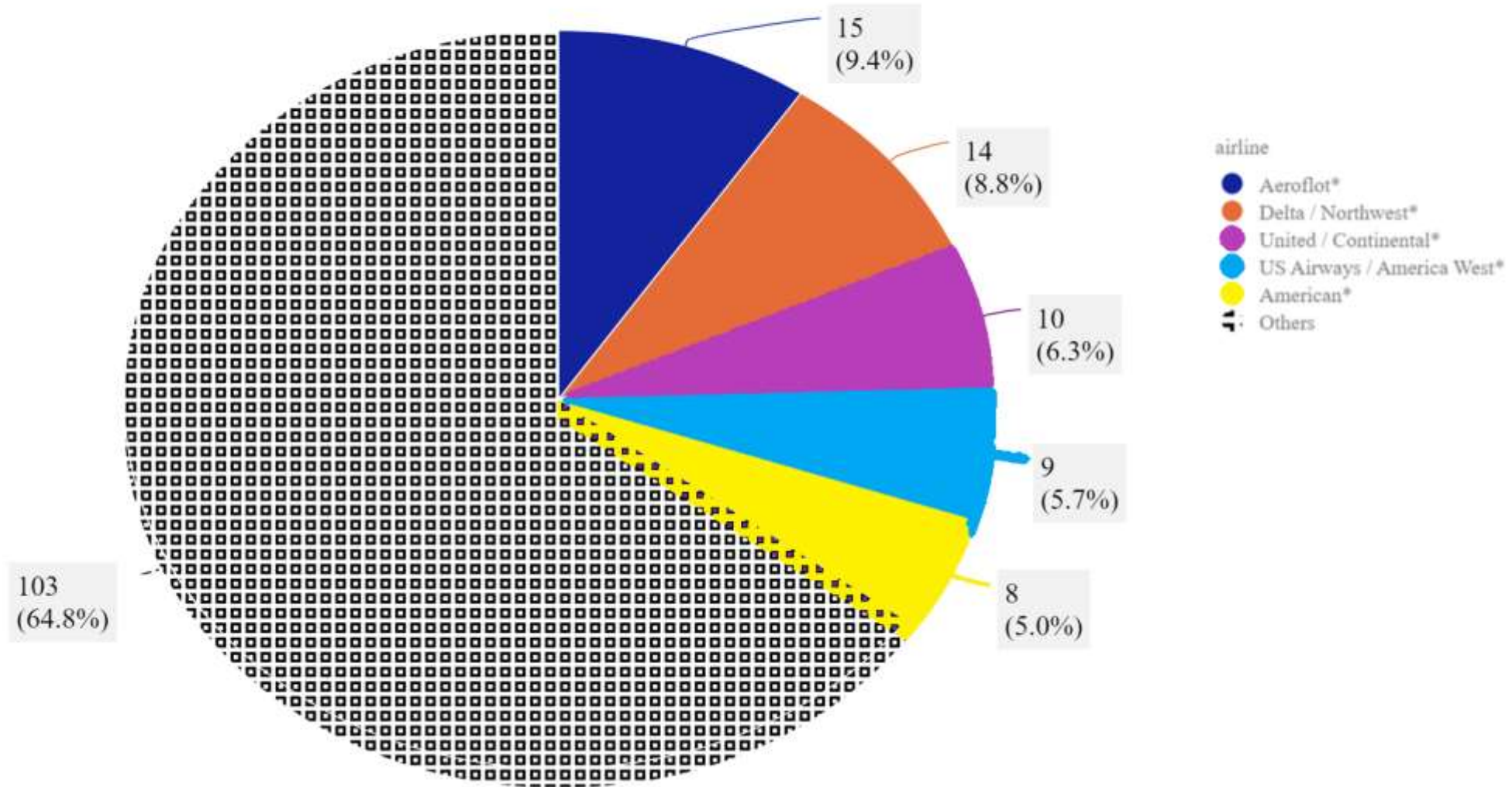
Total Fatalities by Airline

760
(8.1%)

571
(6.1%)

520
(5.5%)

517
(5.5%)

487
(5.2%)

6549
(69.6%)

9404

airline

- China Airlines
- Malaysia Airlines
- Japan Airlines
- American*
- Air India*
- Others

xViz
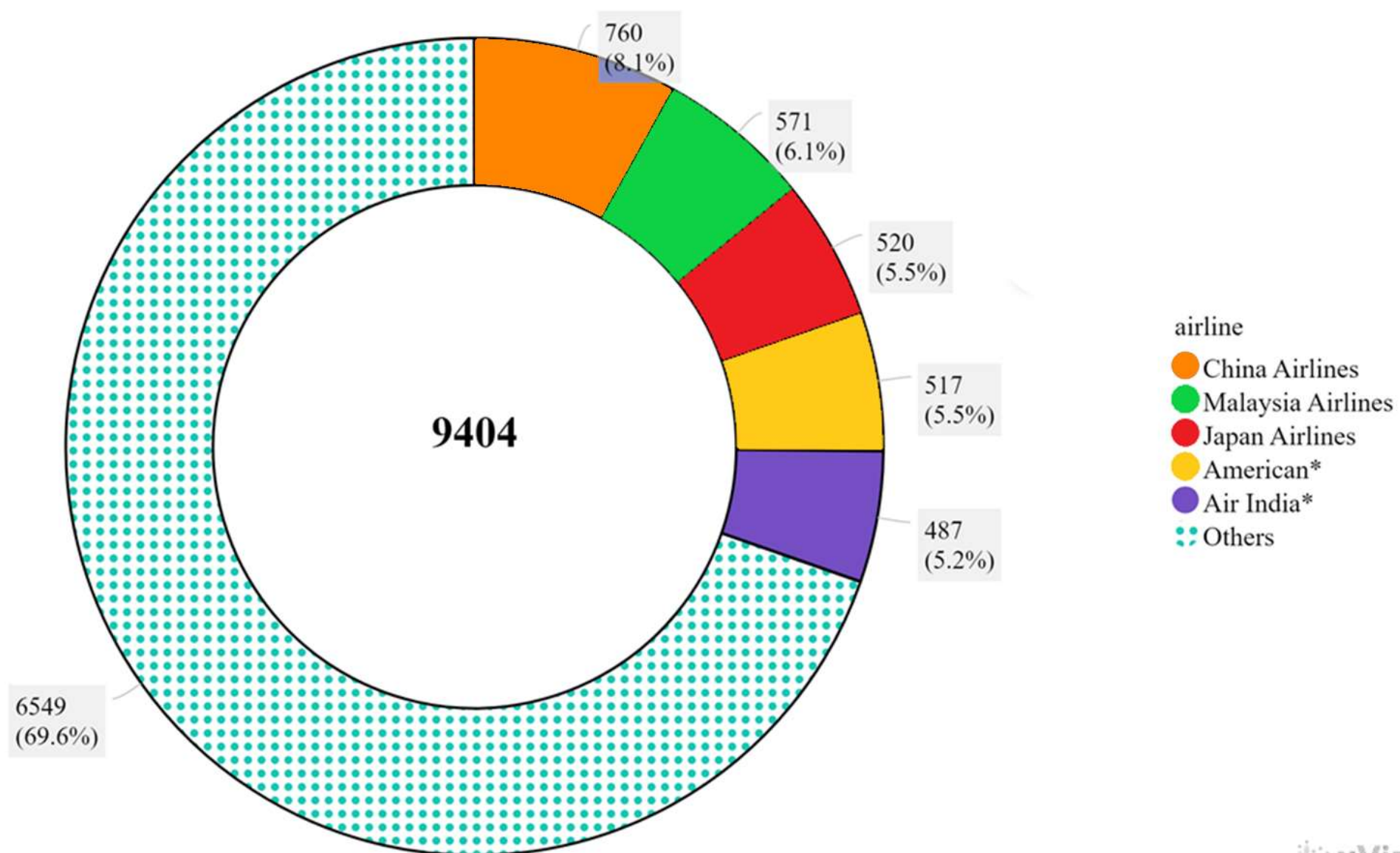
Fatal Accidents Ratio by Airline

13.90
Total

0.50 (3.6%)

0.56 (4.0%)

0.60 (4.3%)

0.67 (4.8%)

0.75 (5.4%)

10.83 (77.9%)

airline
- Singapore Airlines
- LAN Airlines
- Avianca
- Philippine Airlines
- China Airlines
- Others

xViz
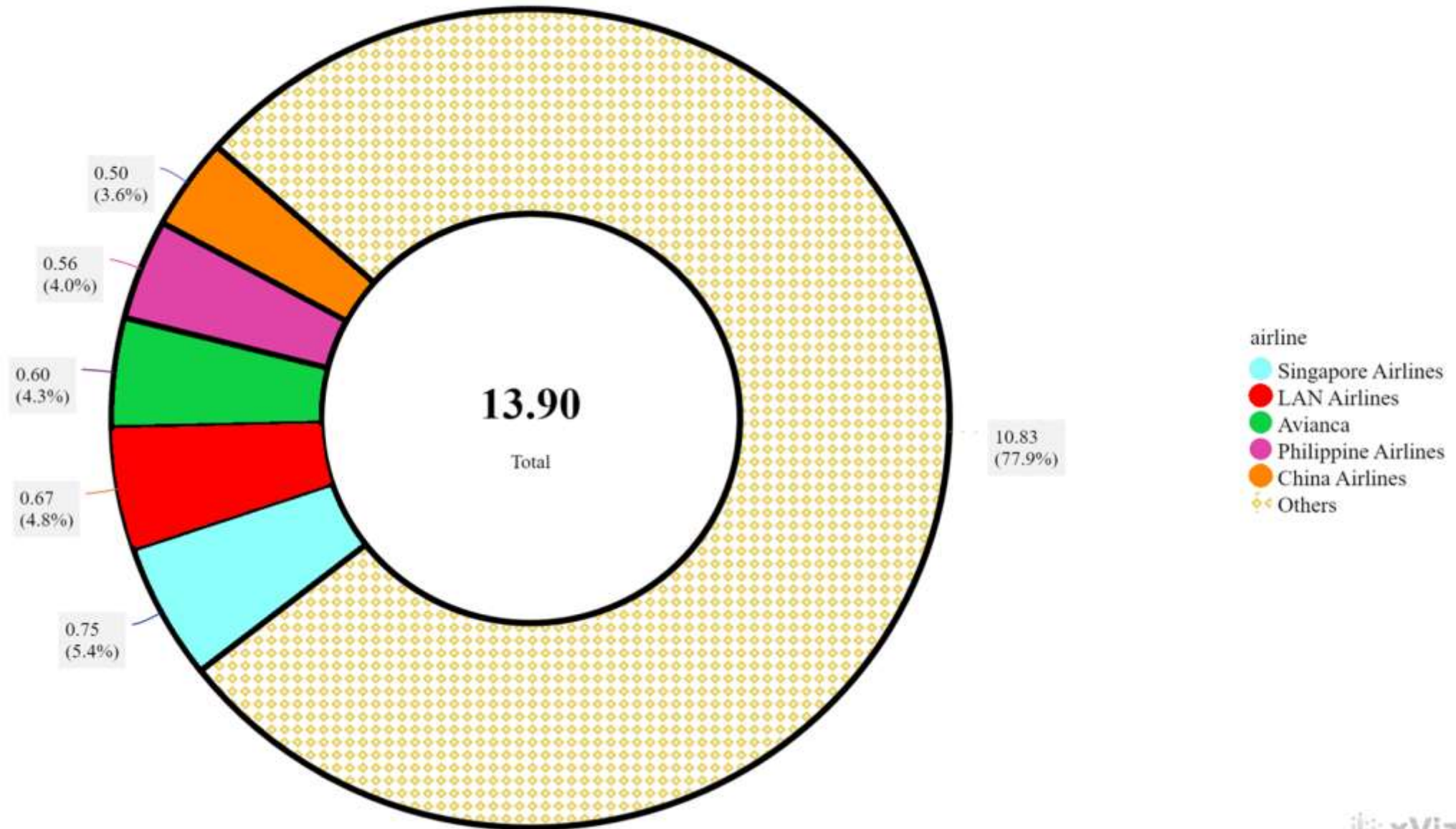
airline	total_incidents	total_fatal_accidents
Aer Lingus	2	0
Aeroflot*	82	15
Aerolineas Argentinas	7	0
Aeromexico*	8	1
Air Canada	4	0
Air France	20	6
Air India*	6	2
Air New Zealand*	8	1
Alaska Airlines*	10	1
Alitalia	11	2
All Nippon Airways	10	1
American*	38	8
Austrian Airlines	2	0
Avianca	5	3
British Airways*	10	0
Cathay Pacific*	2	0
China Airlines	14	7
Condor	2	1
COPA	3	1
Delta / Northwest*	48	14
Egyptair	12	4
El Al	2	1
Ethiopian Airlines	30	7
Finnair	1	0
Garuda Indonesia	14	5
Gulf Air	4	1
Hawaiian Airlines	1	0
Iberia	9	1
Japan Airlines	3	1
Kenya Airways	4	2
KLM*	8	1
Korean Air	13	5
LAN Airlines	3	2

airline	total_incidents	total_fatal_accidents
Lufthansa*	9	1
Malaysia Airlines	6	3
Pakistan International	18	5
Philippine Airlines	9	5
Qantas*	6	0
Royal Air Maroc	8	3
SAS*	11	1
Saudi Arabian	18	2
Singapore Airlines	4	3
South African	3	1
Southwest Airlines	9	0
Sri Lankan / AirLanka	6	1
SWISS*	5	1
TACA	4	2
TAM	15	5
TAP - Air Portugal	0	0
Thai Airways	10	5
Turkish Airlines	16	5
United / Continental*	33	10
US Airways / America West*	27	9
Vietnam Airlines	8	3
Virgin Atlantic	1	0
Xiamen Airlines	11	1
Toplam	**633**	**159**
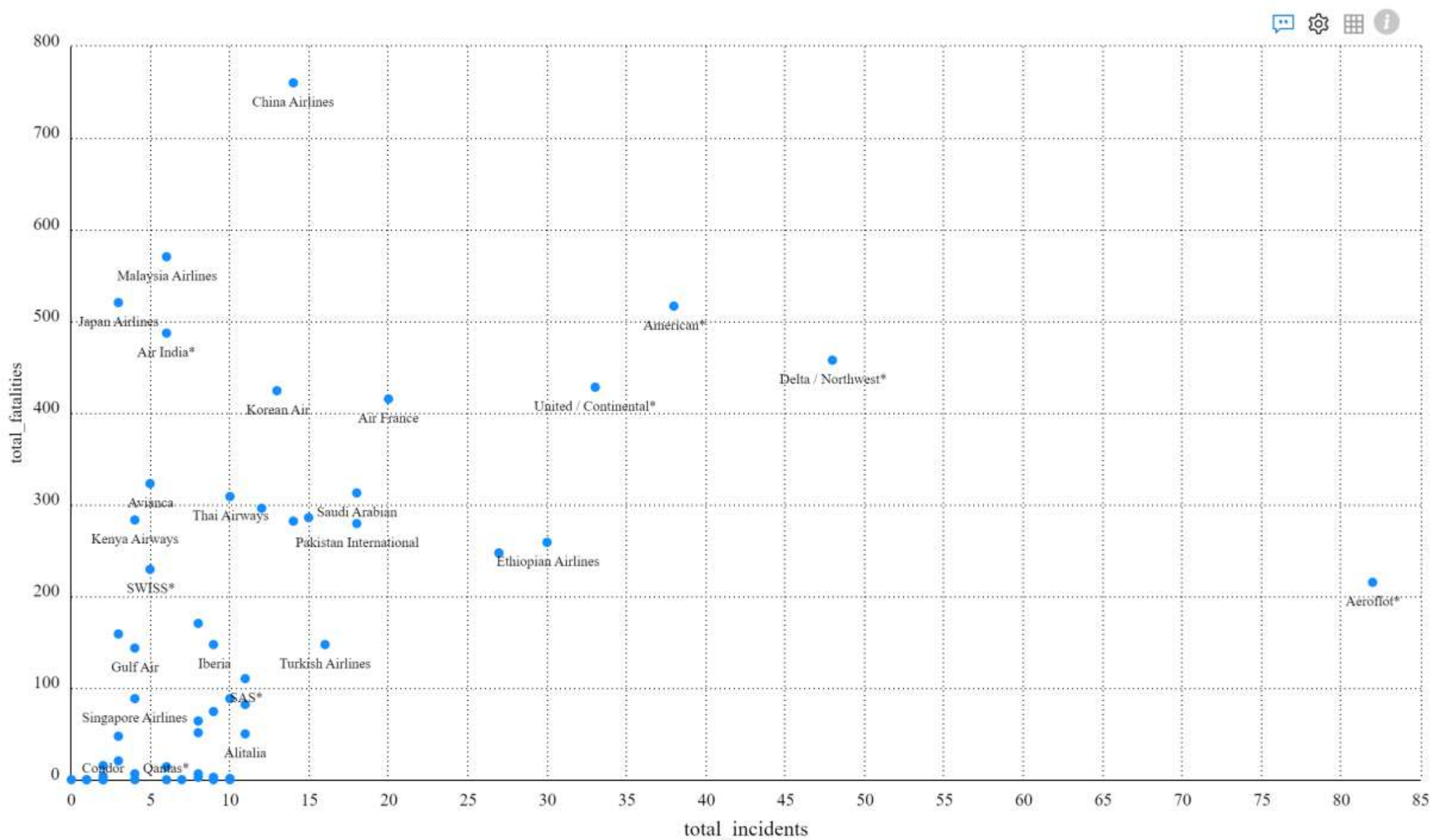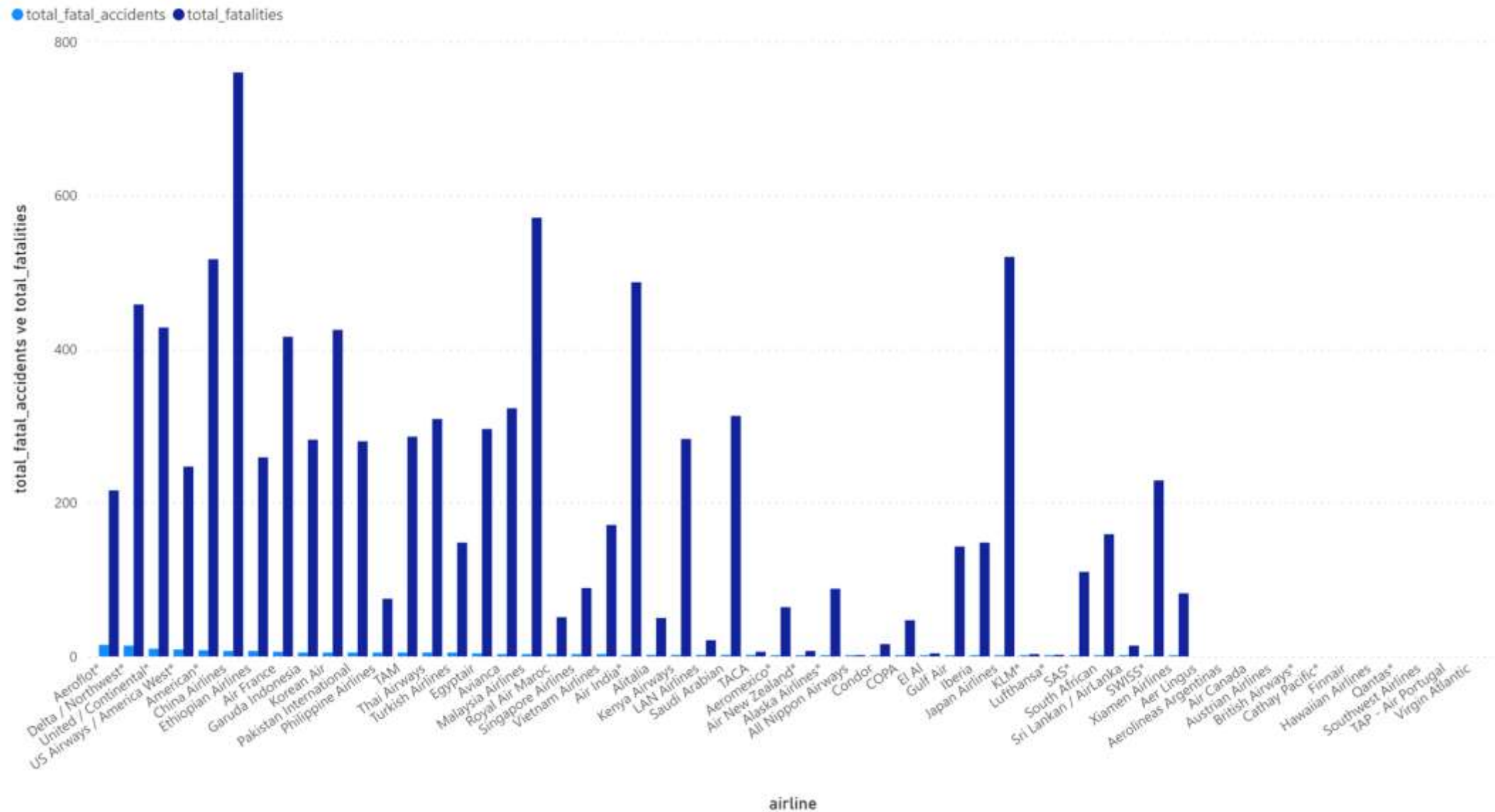
Total Fatal Accidents and Total Fatalities
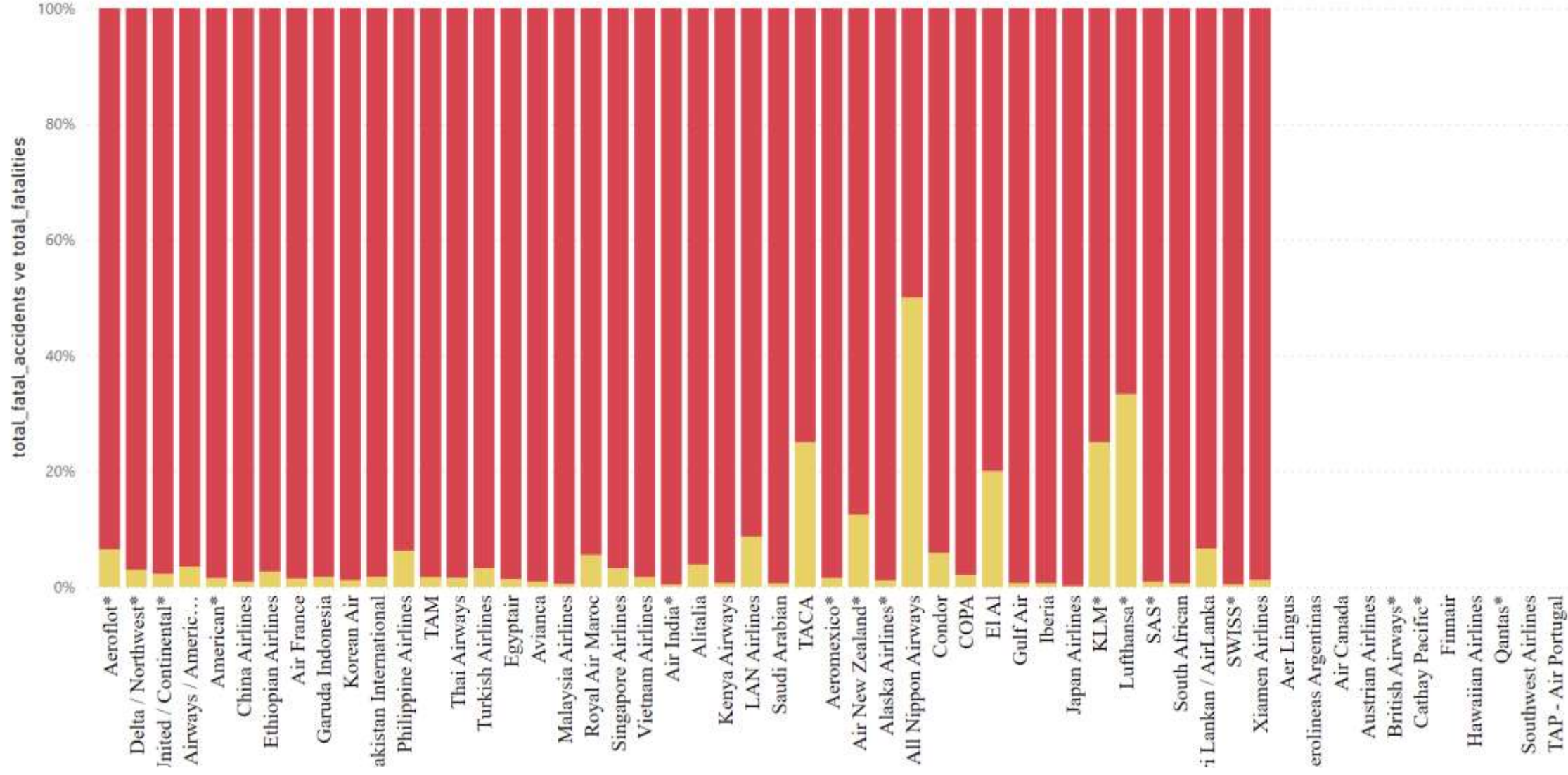
Fatal Accidents Ratio and ASK per Week by Airline

Scatter plot of fatal_ratio (y-axis, 0 to 0.8) versus ask_per_week (x-axis, 0bn to 7.5bn) for various airlines:

- Singapore Airlines
- LAN Airlines
- Avianca
- Philippine Airlines
- Condor
- Malaysia Airlines
- Thai Airways
- Vietnam Airlines
- Air India*
- Korean Air
- Japan Airlines
- US Airways / America West*
- Air France
- United / Continental*
- Delta / Northwest*
- Pakistan International
- Ethiopian Airlines
- American*
- SWISS*
- Aeroflot*
- Sri Lankan / AirLanka
- Air New Zealand*
- KLM*
- Iberia
- SAS*
- Lufthansa*
- Finnair
- Virgin Atlantic
- Qantas*
- Cathay Pacific*
- Southwest Airlines

THANK YOU ☺