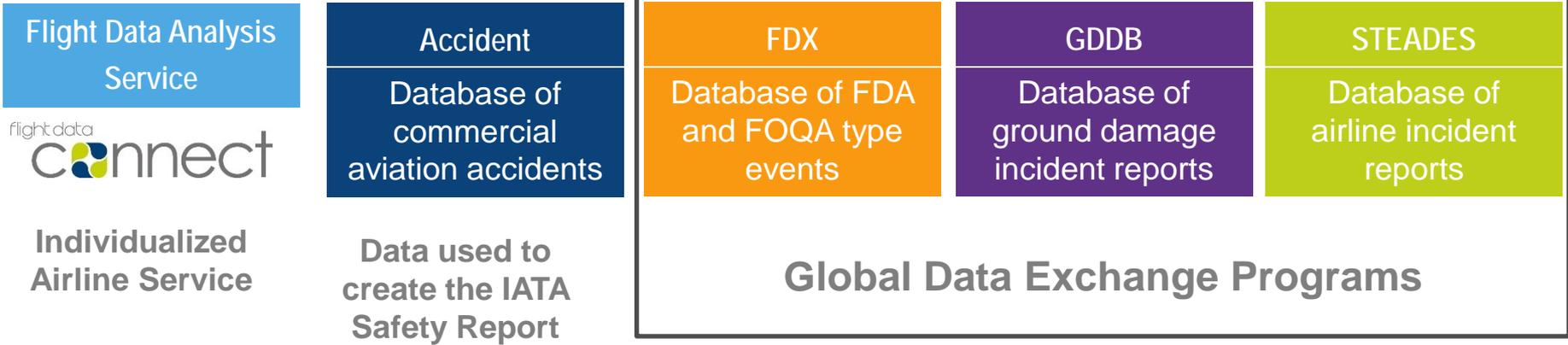


# Runway Safety Data

Global Runway Safety Symposium  
Lima, 20-22 November



# Global Aviation Data Management (GADM)





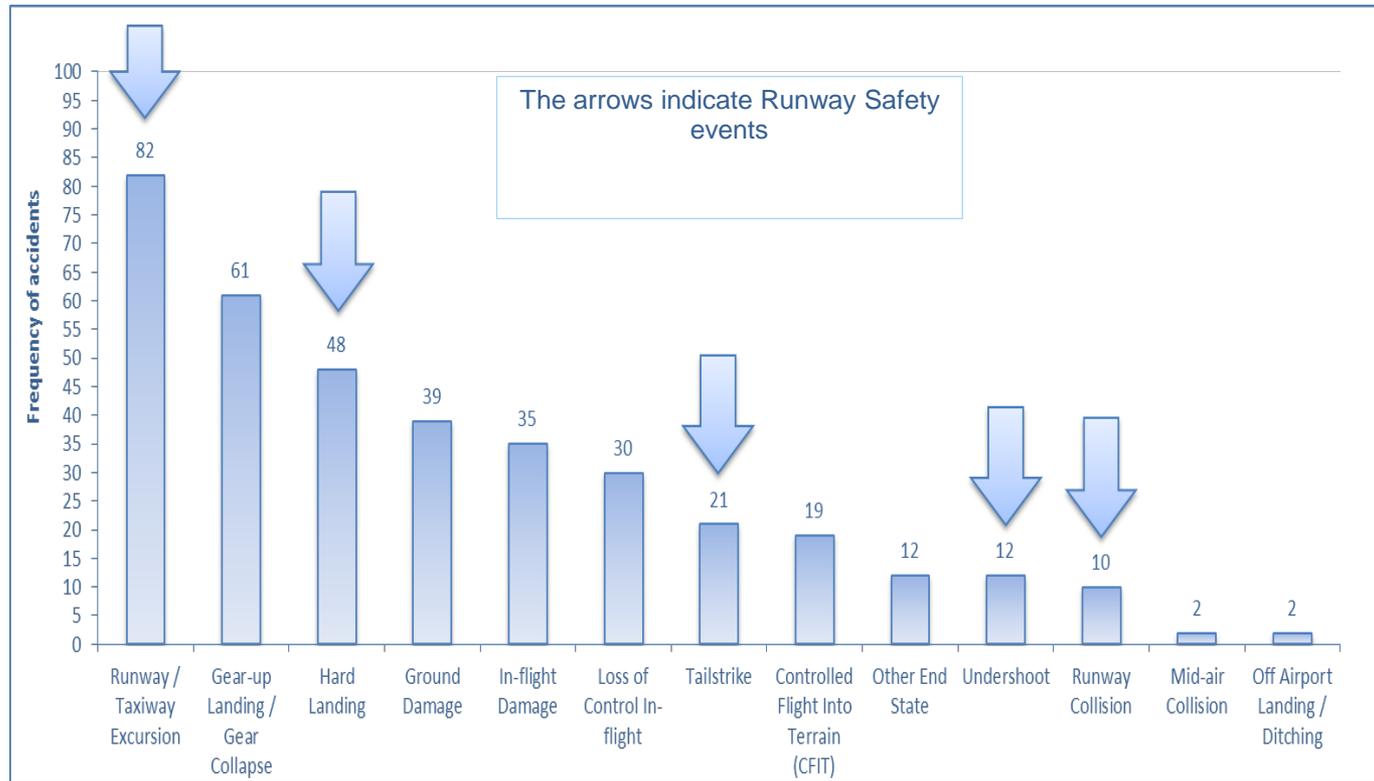
# IATA Safety Data

- This presentation covers data GADM accident Database using data from January 2012 through December 2016.
- There were a total of 375 commercial accidents during this period:
  - Of which, 373 could be assigned an accident category or End State
- 55 Fatal Accidents
  - of which, 54 could be assigned an accident category or End State
- 1,634 total fatalities

# IATA Safety Data

- Out of the 375 commercial accidents during this period:
  - 173 accidents occurred on the runway environment
  - 4 of which were fatal accidents and resulted in 21 fatalities

# Frequency of Accident Categories

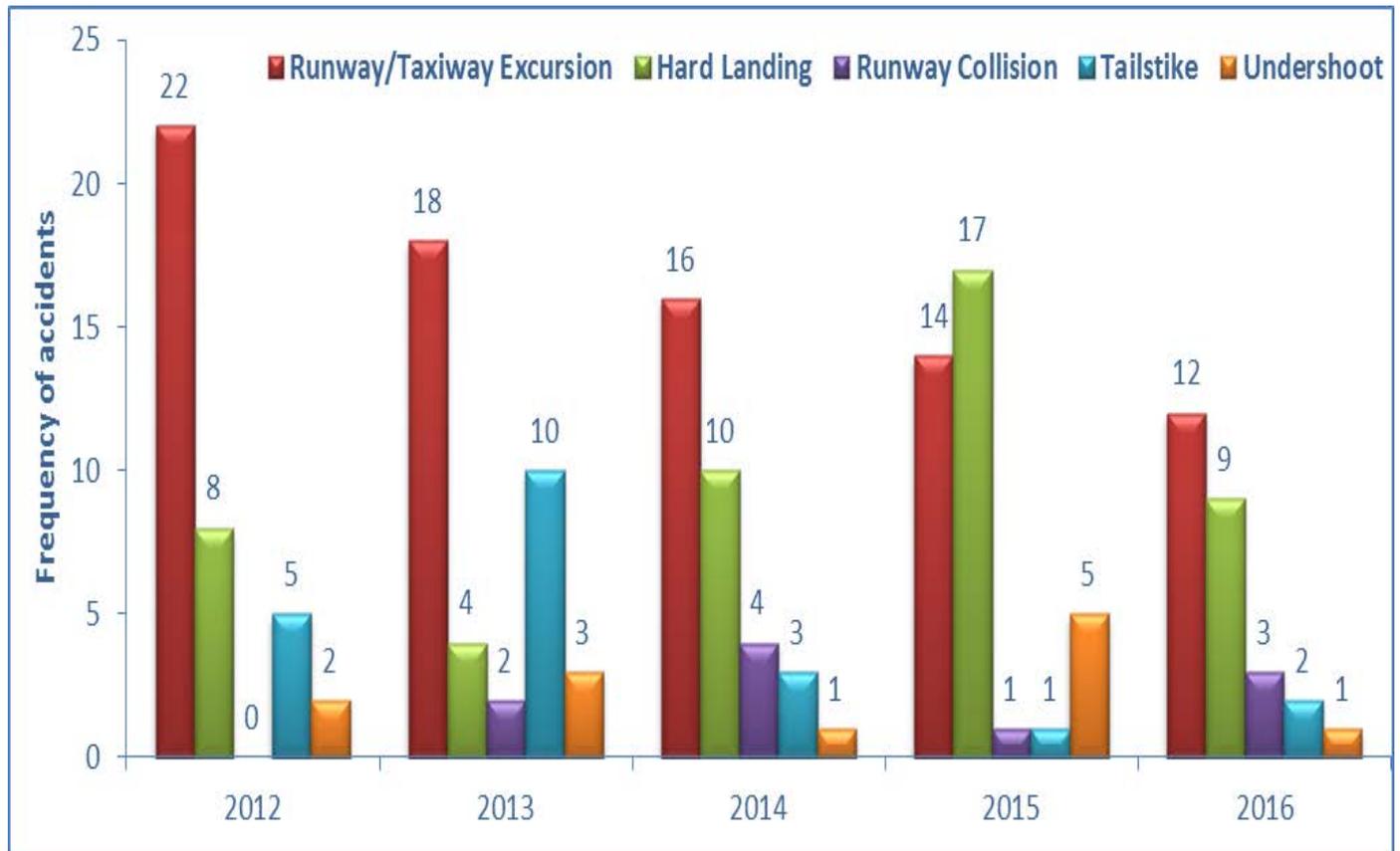




# Top Fatal Accident Categories

<i>Accident Category</i>	<b>Number of Accidents</b>	<b>Fatal Accidents</b>	<b>Number of Fatalities</b>
<i>Loss of Control In-flight (LOC-I)</i>	30	27	949
<i>Controlled Flight Into Terrain (CFIT)</i>	19	16	259
<i>Other End State</i>	12	4	318
<i>Inflight Damage</i>	35	3	86
<i>Runway / Taxiway Excursion</i>	82	3	14
<i>Undershoot</i>	12	1	7

# Runway Safety Accident Count



# Runway Safety Accident Rates per Million sectors

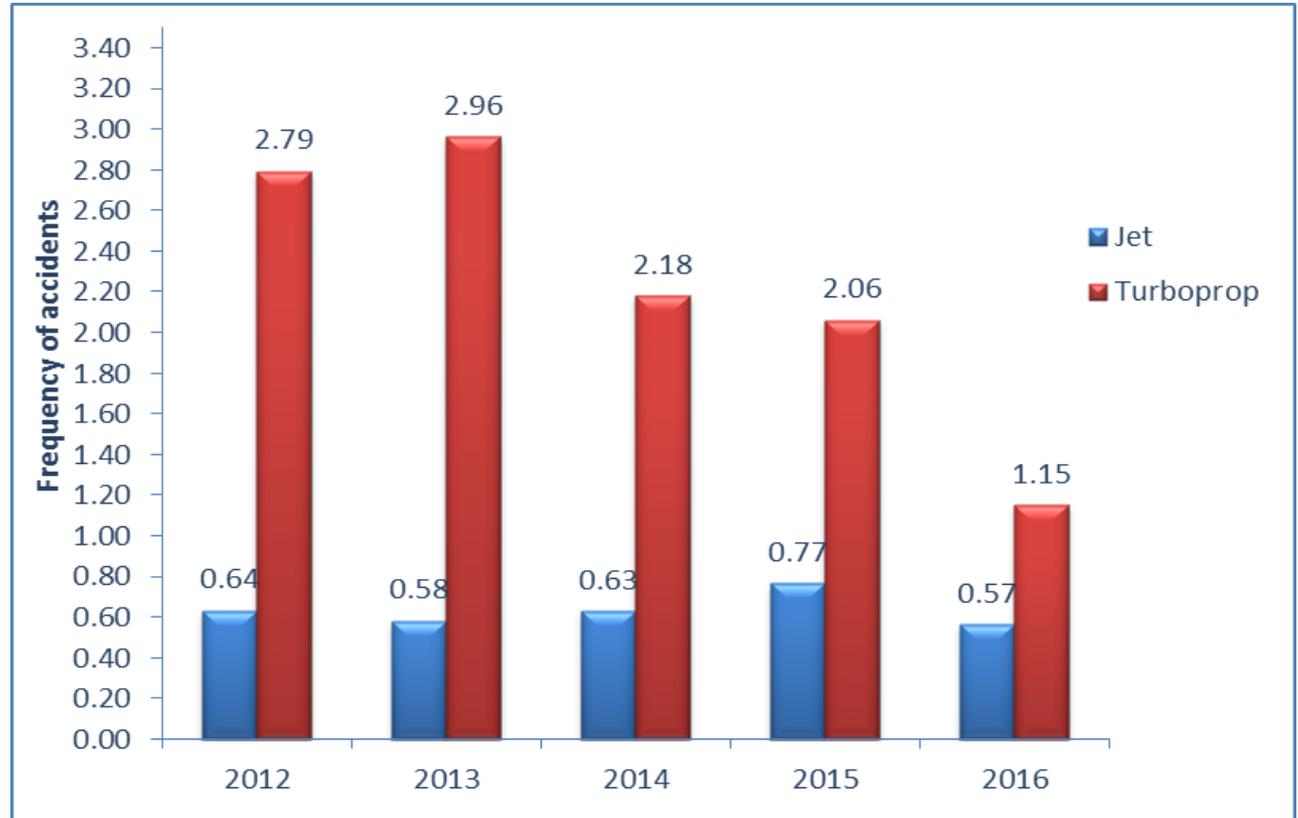




# IOSA vs. Non-IOSA Accident Rates

<i>Category</i>	<b>Global Runway Safety</b>	<b>Hard Landing</b>	<b>Runway Excursion</b>	<b>Tailstrike</b>	<b>Runway Collision</b>	<b>Undershoot</b>
<i>All Accident rates</i>	0.93	0.26	0.44	0.11	0.05	0.06
<i>IOSA</i>	0.52	0.16	0.19	0.11	0.02	0.02
<i>Non-IOSA</i>	1.77	0.45	0.93	0.11	0.11	0.14

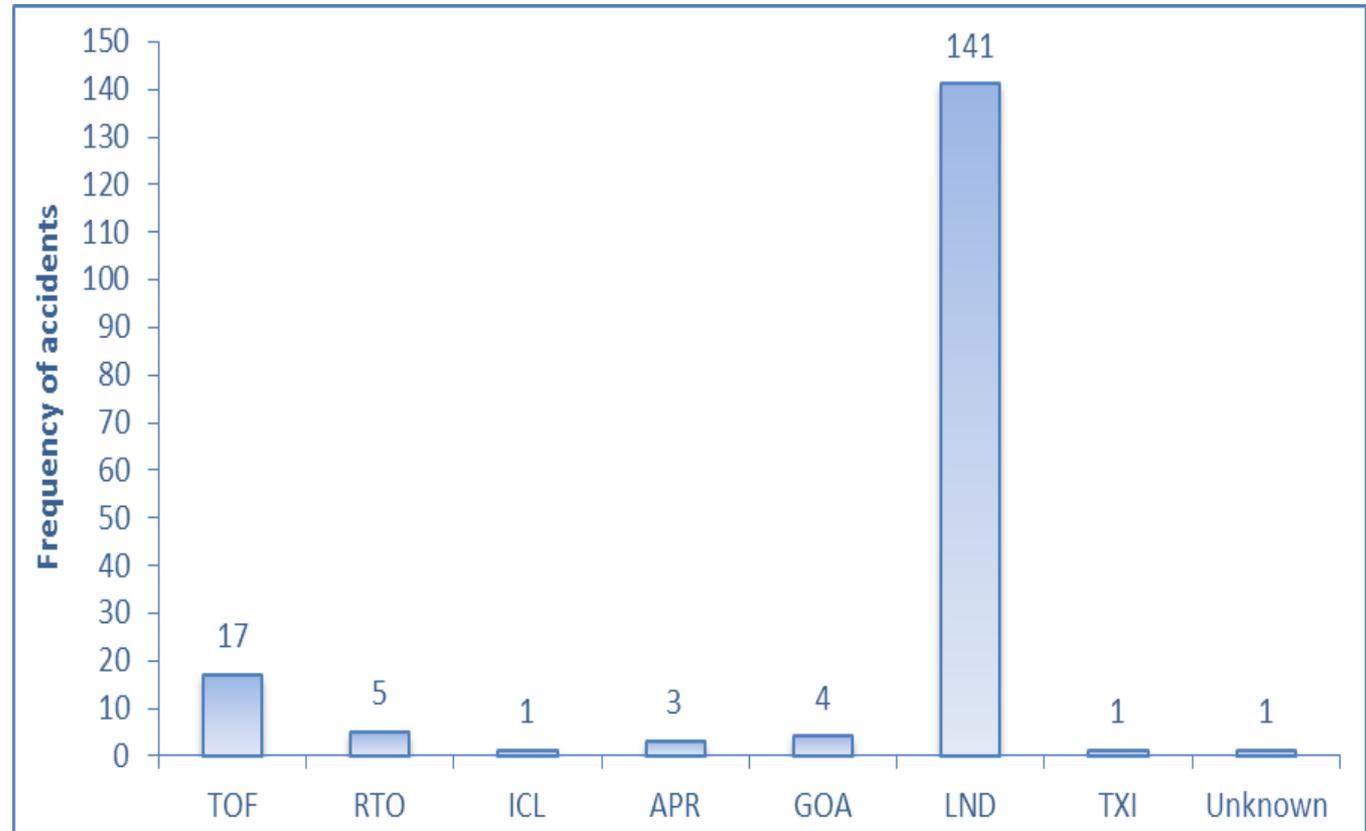
# Distribution of jet / turboprop runway safety accident rates



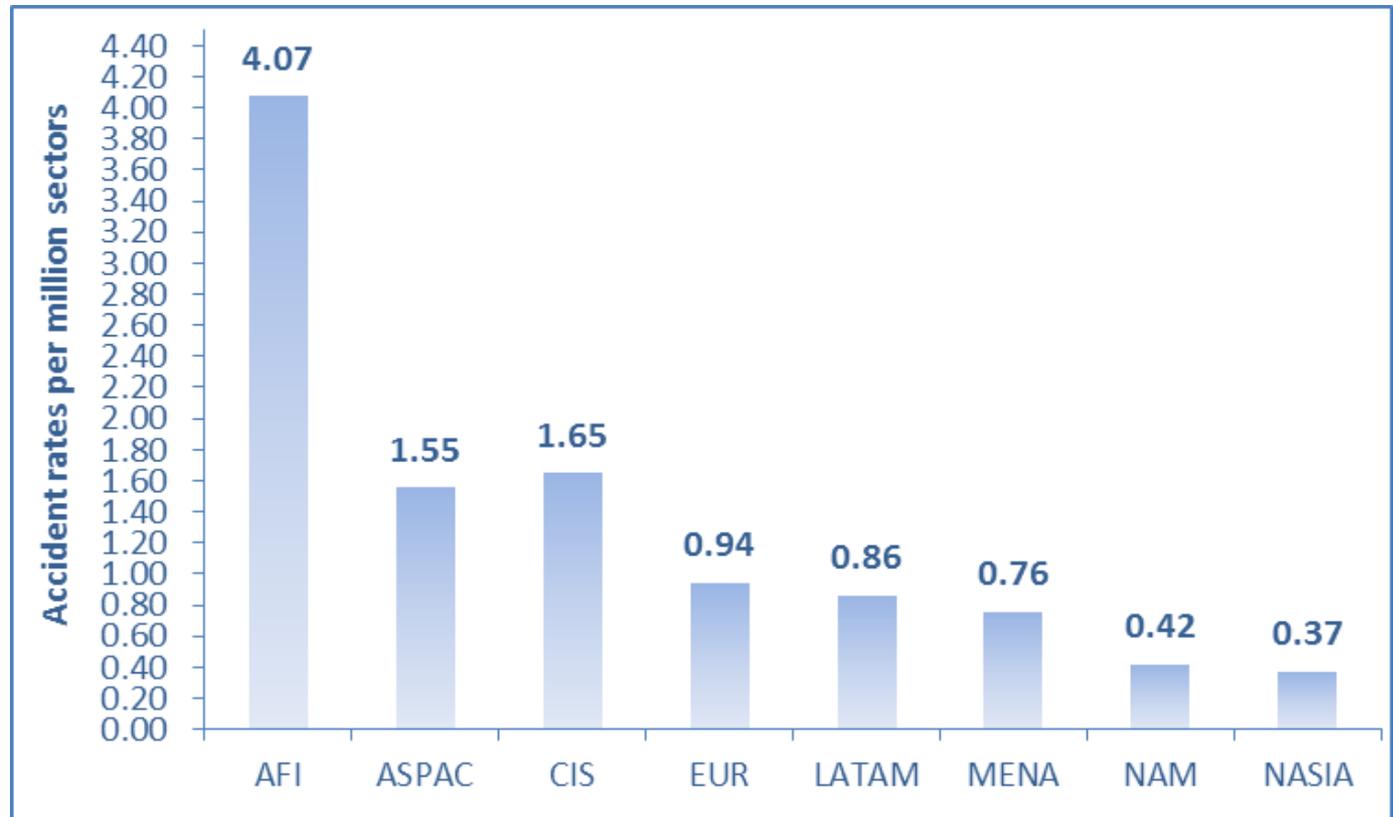
# Jet and turboprop operations by runway safety accident category

	Jet	Turboprop
<i>Runway / Taxiway Excursion</i>	41	41
<i>Hard Landing</i>	31	17
<i>Runway Collision</i>	3	7
<i>Tail strike</i>	16	5
<i>Undershoot</i>	6	6

# Frequency of Runway Safety Accidents by Phase of Flight



# Runway Safety Accident Rates by IATA region of operator





# Runway Safety Contributing Factors

Latent Conditions (deficiencies in...)	
Regulatory Oversight	36%
Safety Management	29%
Flight Operations	21%
Flight Ops: Training Systems	17%
Flight Ops: SOPs & Checking	12%
Environmental Threats	
Meteorology	48%
Airport Facilities	23%
Contaminated runway/taxiway - poor braking action	17%
Wind/Windshear/Gusty wind	31%
Poor Visibility / IMC	15%
Airline Threats	
Aircraft Malfunction	5%
Gear / Tire	3%
Operational Pressure	3%
Contained Engine Failure/ Powerplant Malfunction	1%
Brakes	1%

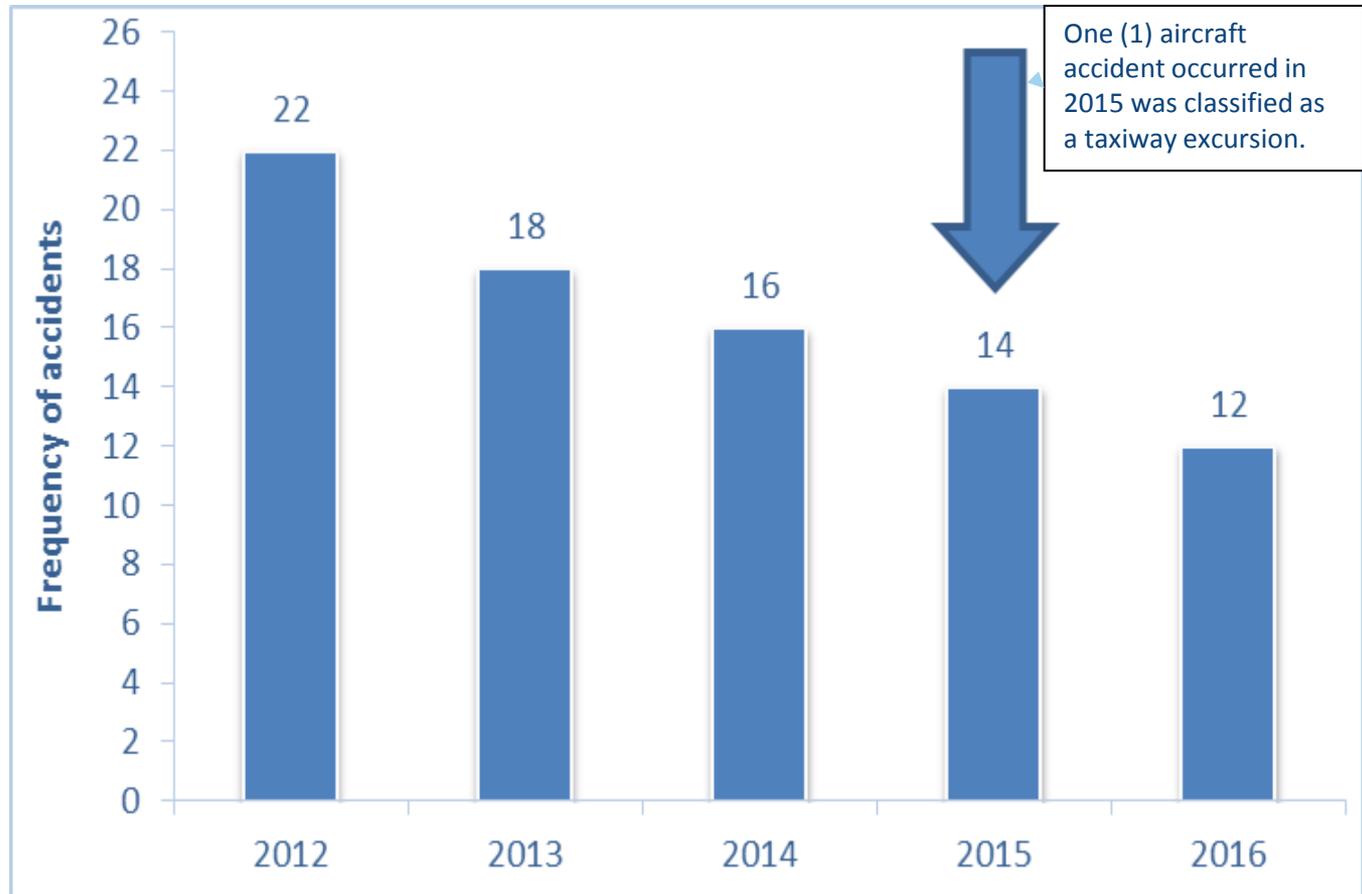
Errors (related to...)	
Manual Handling / Flight Controls	58%
SOP Adherence / SOP Cross-verification	29%
Intentional	23%
Failure to GOA After Destabilized Approach	19%
Pilot-to-Pilot Communication	5%
Undesired Aircraft States	
Long/floated/bounced/firm/off-center / crabbed land	45%
Vertical / Lateral / Speed Deviation	26%
Abrupt Aircraft Control	12%
Continued Landing after Unstable Approach	17%
Unstable Approach	21%
Countermeasures	
Overall Crew Performance	29%
Monitor / Cross-check	19%
Contingency Management	11%
Taxiway/Runway Management	5%
Leadership	6%



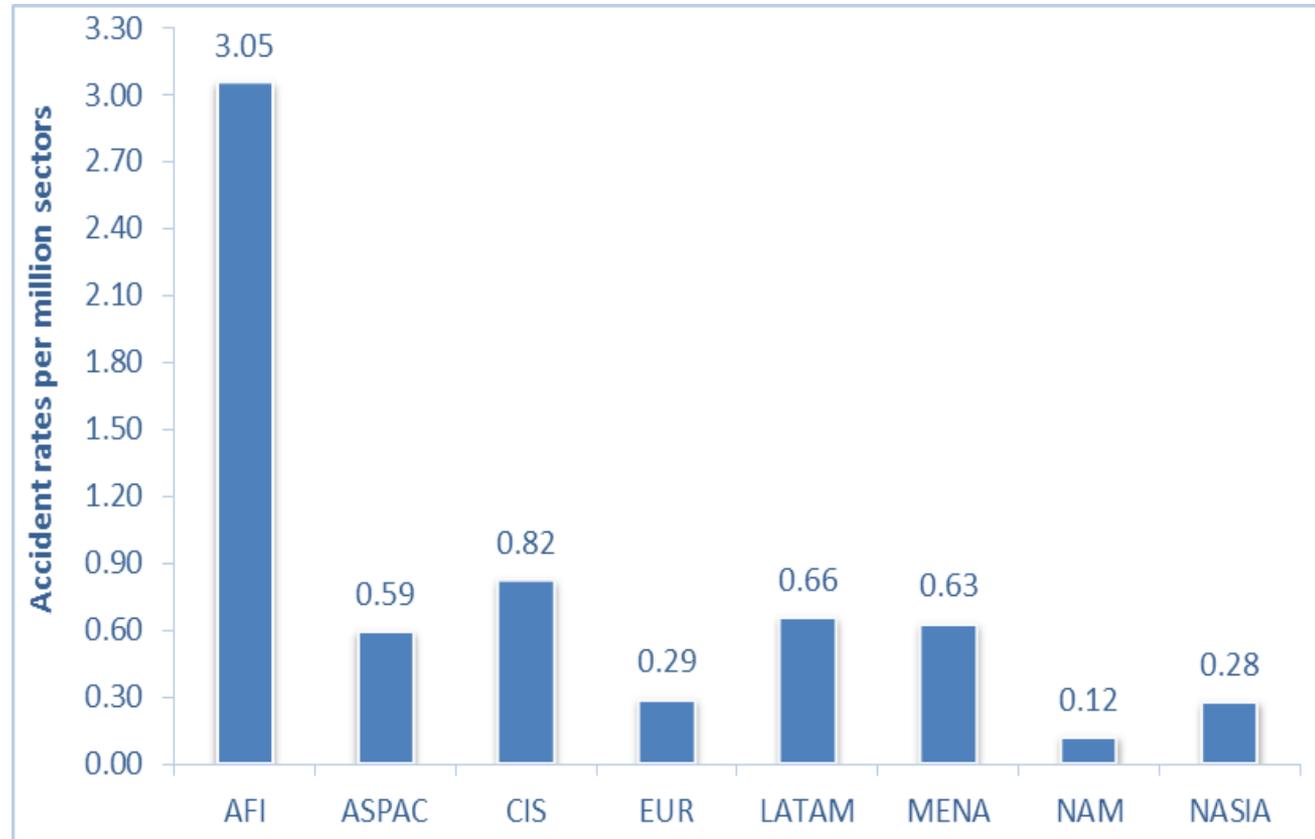
# Runway Excursion Data

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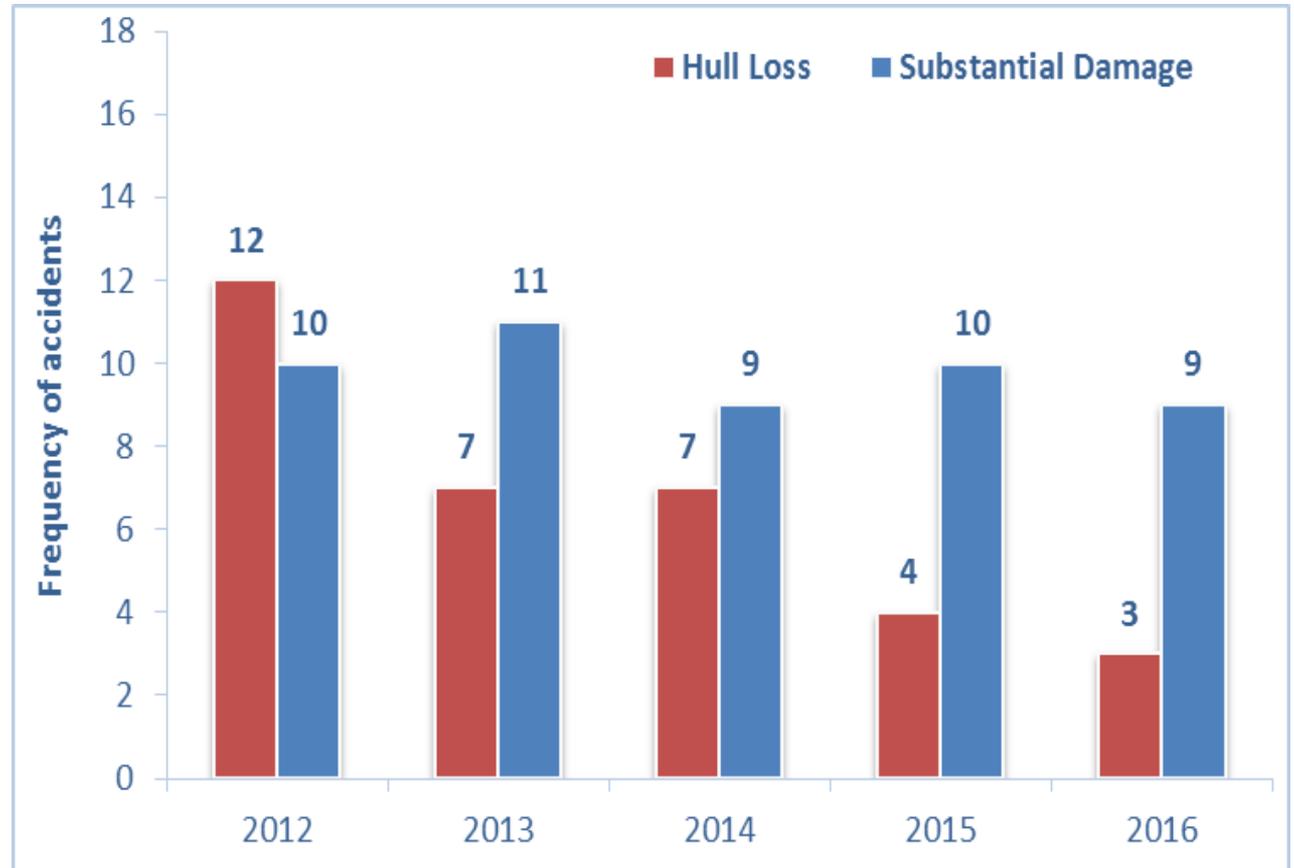
# Frequency of Runway Excursions by Year



# Runway Excursion Rates by IATA Region of Operator



# Runway Excursion Accidents by severity

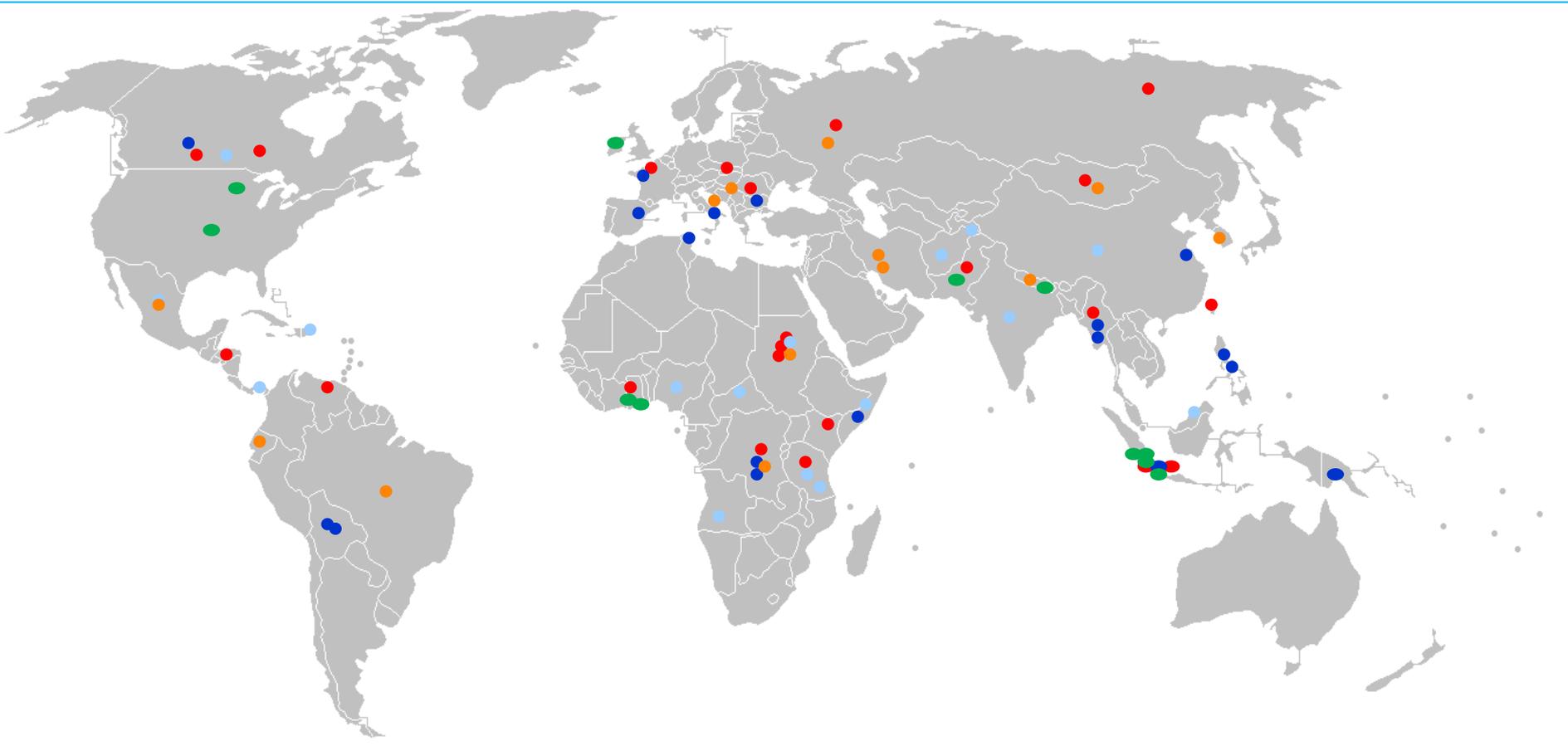


# Runway Excursion Accidents Contributing Factors

Latent Conditions (deficiencies in...)	
Regulatory Oversight	45%
Safety Management	40%
Flight Operations	17%
Flight Ops: Training Systems	14%
Flight Ops: SOPs & Checking	12%
Environmental Threats	
Meteorology	49%
Airport Facilities	37%
Contaminated runway/taxiway - poor braking action	35%
Wind/Windshear/Gusty wind	25%
Poor Visibility / IMC	17%
Airline Threats	
Aircraft Malfunction	11%
Gear / Tire	5%
Brakes	3%
Contained Engine Failure/Powerplant Malfunction	2%
Operational Pressure	2%

Errors (related to...)	
Manual Handling / Flight Controls	48%
SOP Adherence / SOP Cross-verification	32%
Intentional	25%
Failure to GOA After Destabilized Approach	17%
Unknown	6%
Undesired Aircraft States	
Long/floated/bounced/firm/off-center/crabbed land	46%
Vertical / Lateral / Speed Deviation	18%
Loss of aircraft control while on the ground	14%
Continued Landing after Unstable Approach	14%
Unstable Approach	14%
Countermeasures	
Overall Crew Performance	31%
Monitor / Cross-check	22%
Contingency Management	31%
Taxiway / Runway Management	11%
FO is assertive when necessary	5%

# Runway Excursion Accidents



2012 Accidents

2014 Accidents

2016 Accidents

2013 Accidents

2015 Accidents

# Runway Excursions

Runway excursions are known to have low fatality risk, but high frequency of occurrence. However, due to their high frequency of occurrence, they continue to receive attention. Further reduction in the occurrence of runway excursions, remains a top priority for IATA and the industry.



# Runway Incursion Data

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# Runway incursion: 5 Years Rate

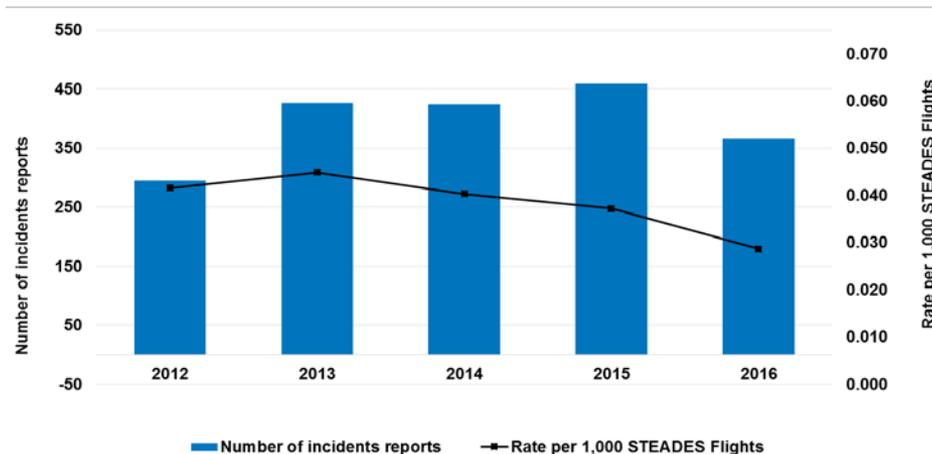
	Total STEADES Database- RWY Incursion (Q1 2012-Q4 2016)	Total STEADES Database (Q1 2012-Q4 2016)
<b>Number of reports</b>	1,971 reports	952,031 reports
<b>Rate*</b>	0.038 reports per 1,000 flights	18 reports per 1,000 flights
<b>Frequency</b>	1 reports per 26,507 flights 1 reports per day	1 reports per 55 flights 522 reports per day

*\*Sectors are based on IATA SRS (Schedule Reference Service) Database.*

*STEADES flights represent 36 percent of global SRS flights.*

*The above rate represents the lower measure of the true number of such events that are occurring, due to the different reporting cultures of members, as such the true number of events occurring could be higher.*

## Runway incursion: Global Yearly Distribution



*\*Sectors are based on IATA SRS (Schedule Reference Service) Database.*

- This graph shows the yearly distribution of the **total number of reports (1,971)** for the period 2012 Q1 to 2016 Q4 inclusive.
- 2013 had the highest rate with 0.045 reports per 1,000 STEADES flights.
- The lowest rate was for 2016 with 0.029 reports per 1,000 STEADES flights.



# Wildlife Strike Data

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# Hull Loss accident with Fatalities

- In September 2012, A Dornier Do-228, from Kathmandu to Nepal with 16 passengers and 3 crew, was on initial climb out of Kathmandu's when the crew reported a bird strike and engine failure.
- The crew attempted to return but the plane crashed outside of the airport perimeter
- All occupants perished and the aircraft was destroyed. The bird was identified as a black eagle.



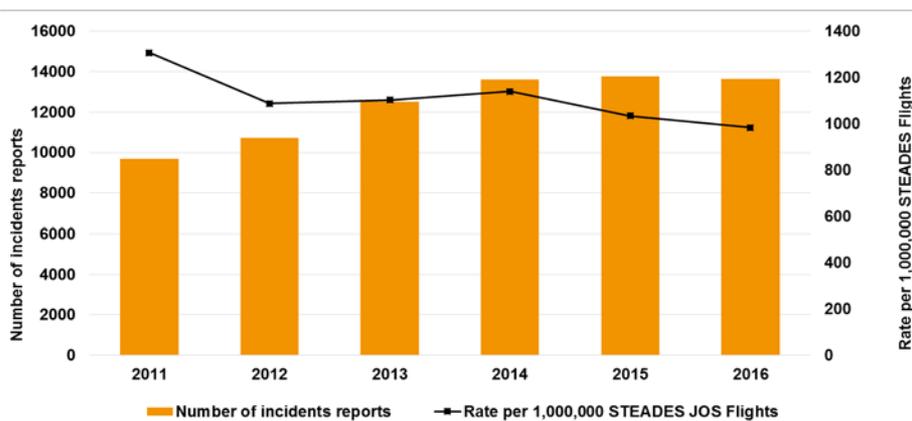
# Wildlife strike overview: 6 years rate

	Total STEADES Database (2011-2016)	IATA Accident Database Wildlife Strikes (2011-2016)	IATA Accident Database All Accidents (2011-2016)
Number of incidents / Accidents	73,955 Incidents	17 Accidents*	471 accidents
Rate <i>(based on JOS flights)</i>	1,091 incident per 1,000,000 flights	0.077 accident per 1,000,000 flights	2.15 accident per 1,000,000 Flights
Frequency	1 incident per 917 flights 34 incidents per day	1 accident per 13,014,175 flights 1 accident every 129 days	1 accident per 464,270 flights 1 accident every 5 days

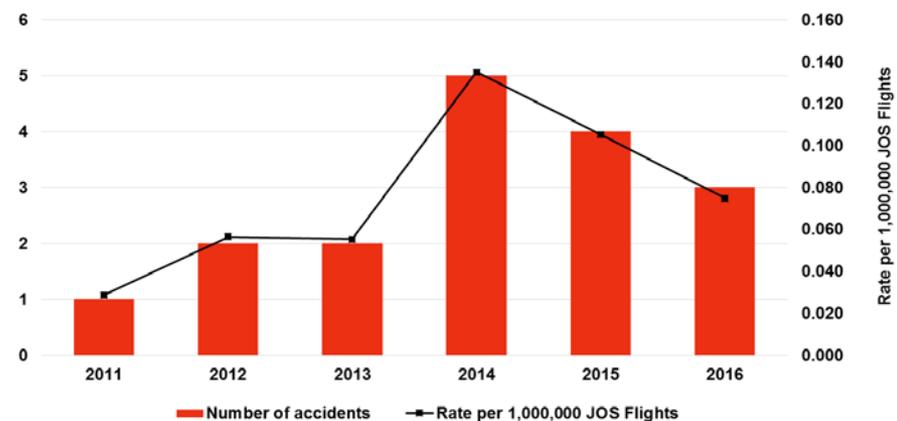
- Two accidents classified as hull loss (one with fatalities), 15 classified as Substantial damage.
- 12 Accidents were caused by bird strike, 5 by animal strikes.

# Wildlife strike: Yearly Distribution

## Incidents-Yearly distribution



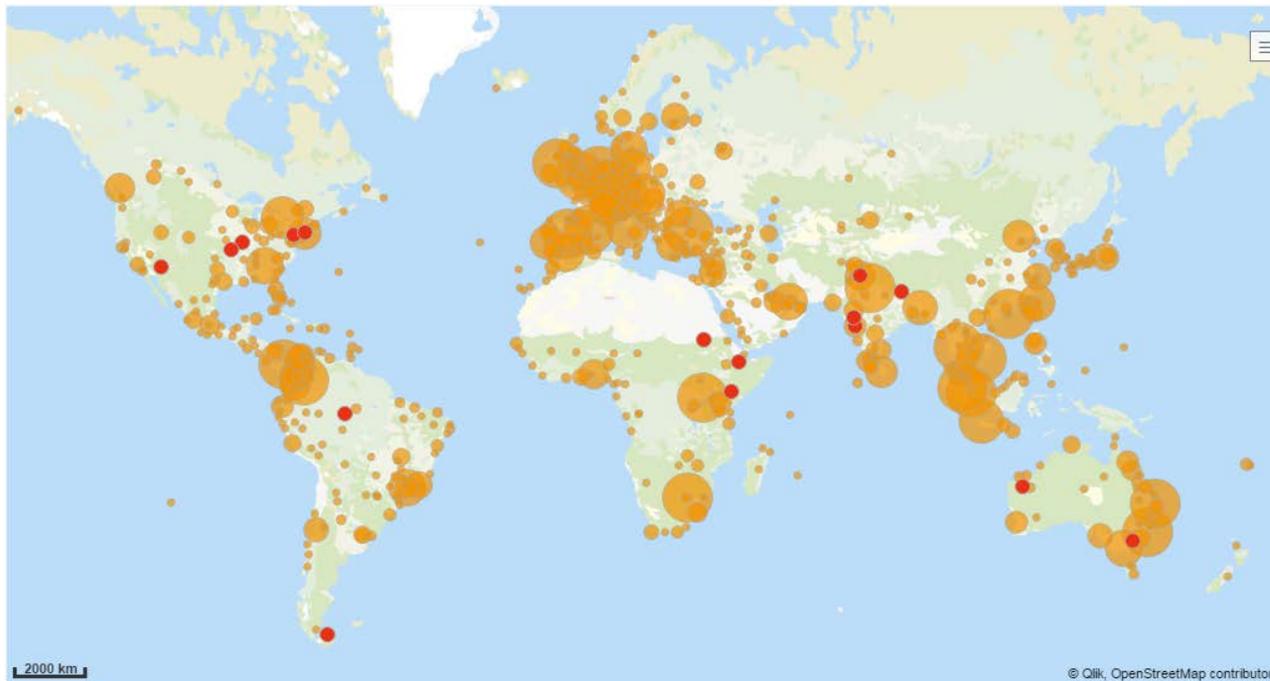
## Accidents-Yearly distribution



- The number of incidents increased from 2011 until 2015, but the rate remained stable since 2012
- The number of accidents has been progressively increasing up to 2014, and then decreased in the two following years, with a rate per 1,000,000 JOS flights\* for 2016 that is significantly lower than in 2014, but consistently higher compared to 2011.

\* Source for flights: Ascend) – a FlightGlobal Advisory Service  
 Note: World fleet includes in-service and stored aircraft operated by commercial airlines

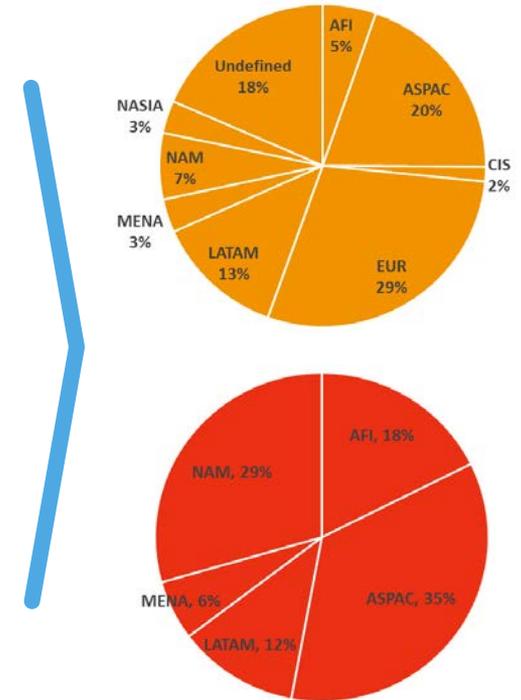
# Wildlife strike: Map Distribution



 Incidents

 Accidents

Region of occurrence distribution





When it's bird vs. airplane, both lose

'We had a loud bang': Jet leaving Charlotte hits deer, makes emergency landing

Plane from Dubai grounded in city as bird-hit dents wing

# Summary

- Wildlife strikes present a real threat to aviation safety and represent 3.6 percent all aviation accidents.
- With the right stakeholders in place an effective wildlife management plan can be effective.
- It takes a real commitment from all the stakeholders especially those outside of the airport like local government to ensure all the hazards can be mitigated effectively.





to represent, lead and serve the airline industry