Passenger Health and AED Onboard Aircraft

Paulo M. Alves, MD, MSc, FAsMA

Global Medical Director, Aviation Health, MedAire

MedAire
An International SOS Company

Disclosure

- Dr. Paulo M. Alves is a full-time employee of MedAire
- MedAire provides ground-based medical support for commercial and business aviation
- MedAire is a CAPSCA member
- Opinions not necessarily represents the employer’s position

Do we have a problem?

- Most frequent abnormal event affecting passengers
  - 1 for every 30,300 pax
- Most frequent reason for flight diversions for some major international operators
  - 1 for every 1.20 million pax
- More deaths on board for medical reasons than aviation accidents
  - 1 for every 16.7 million pax

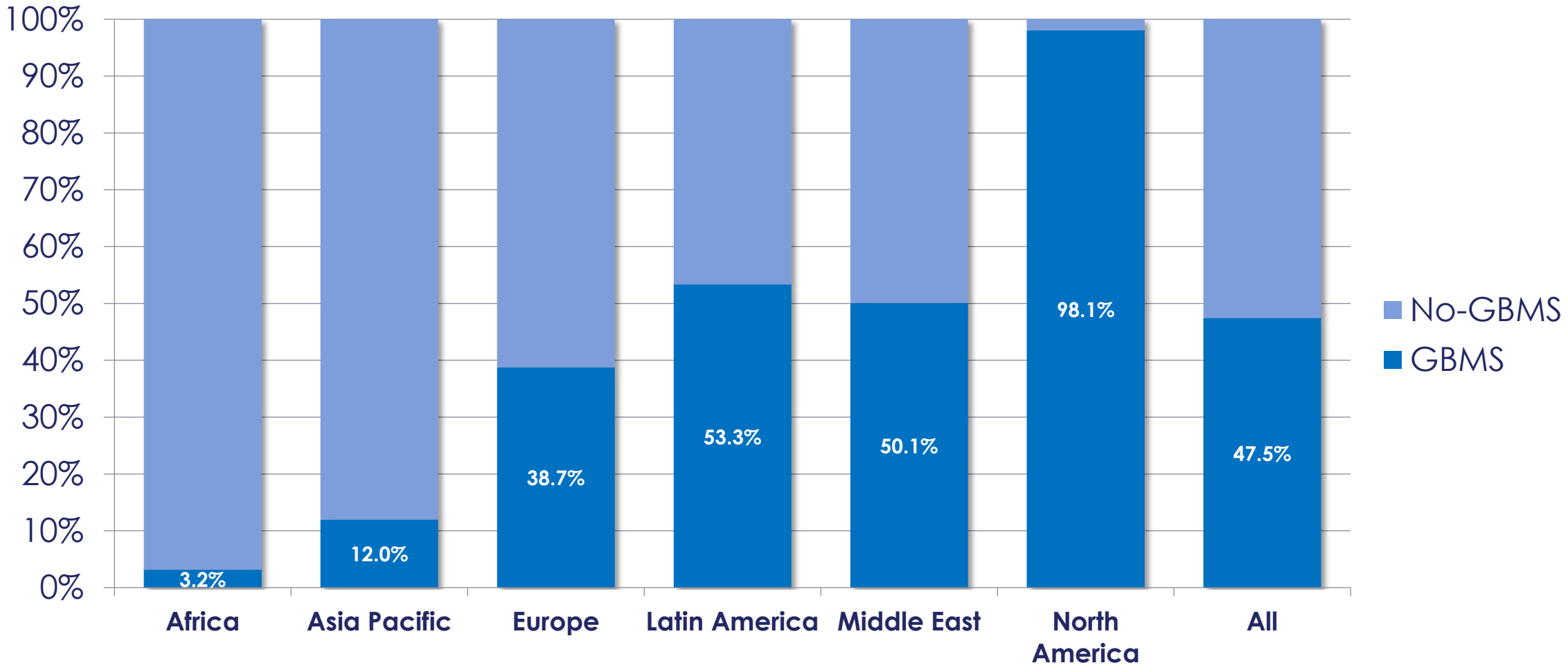
- Alves PM, Kumar KR et al. -In-Flight Medical Events on Commercial Airline Flights - 2025;8;(9):e2533934. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2839407

How does Ground-Based Medical Support (GBMS) work?

- How does the pax look?
- Medical certificate
- Self-disclosed

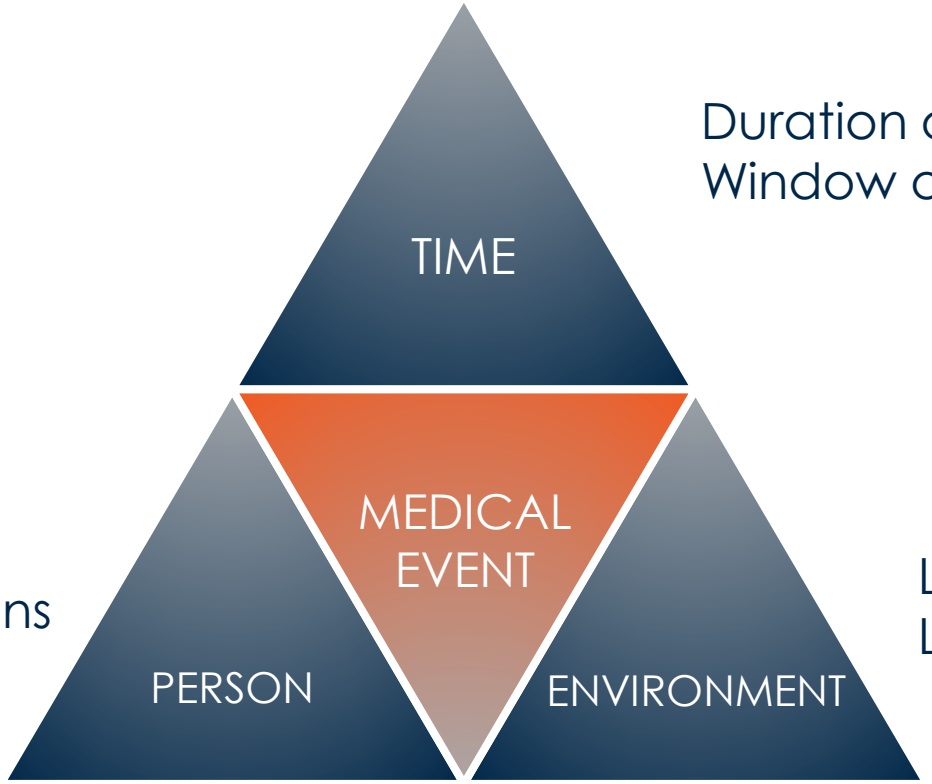
- Clinical situation / resources on board
- Time gained
- Risk/benefit

Pax Coverage % by GBMS per Region



- Data source: cirium.com – Sep/2022 – Regular airlines
- Medaire

The triangle of In-Flight Medical Events



Duration of Exposure
Window of Observation

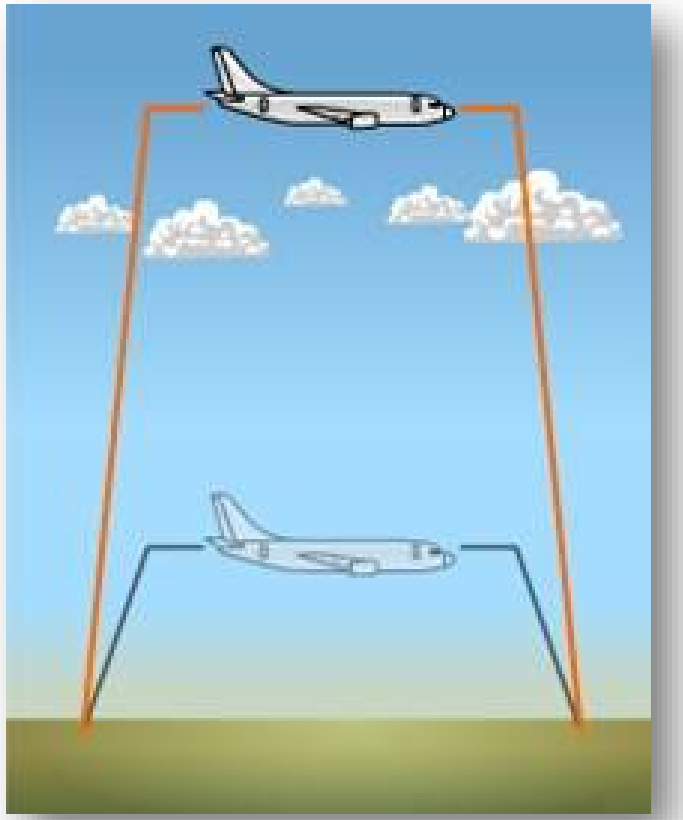
Risk Factors
Pre-existing conditions

Low atmospheric pressure
Low relative humidity

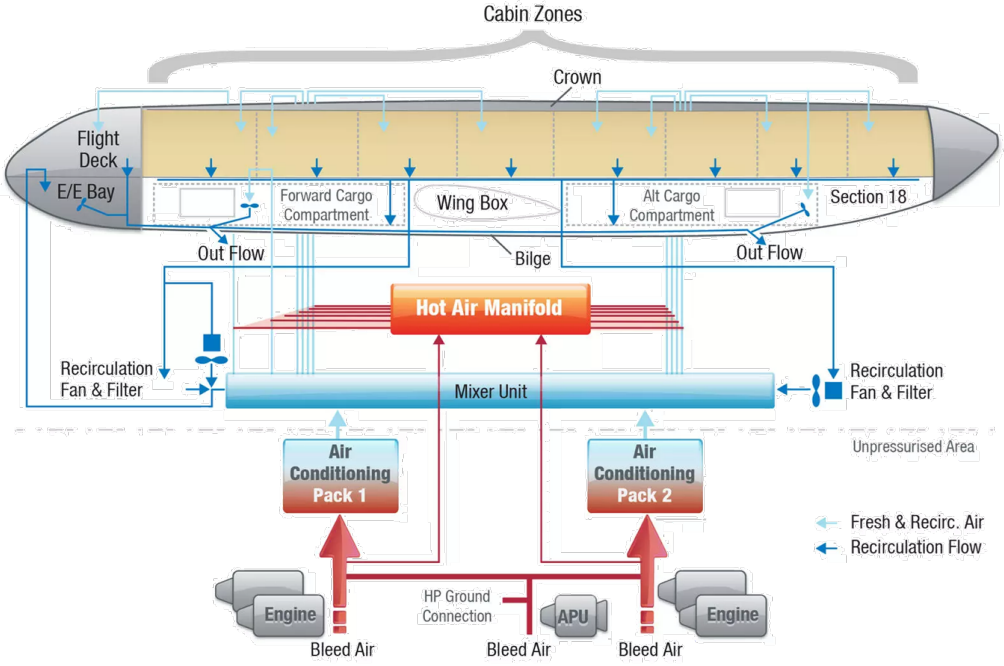
Note: **Case Definition:**
For GBMS a case occurs when a call is made.

MedAire
An International SOS Company

The Cabin Environment



- Cabin pressure equivalent to 6,000 to 8,000 feet
  - Gas expansion
  - Mild hypobaric hypoxia
- Air recirculation / Filtration / Cabin ventilation

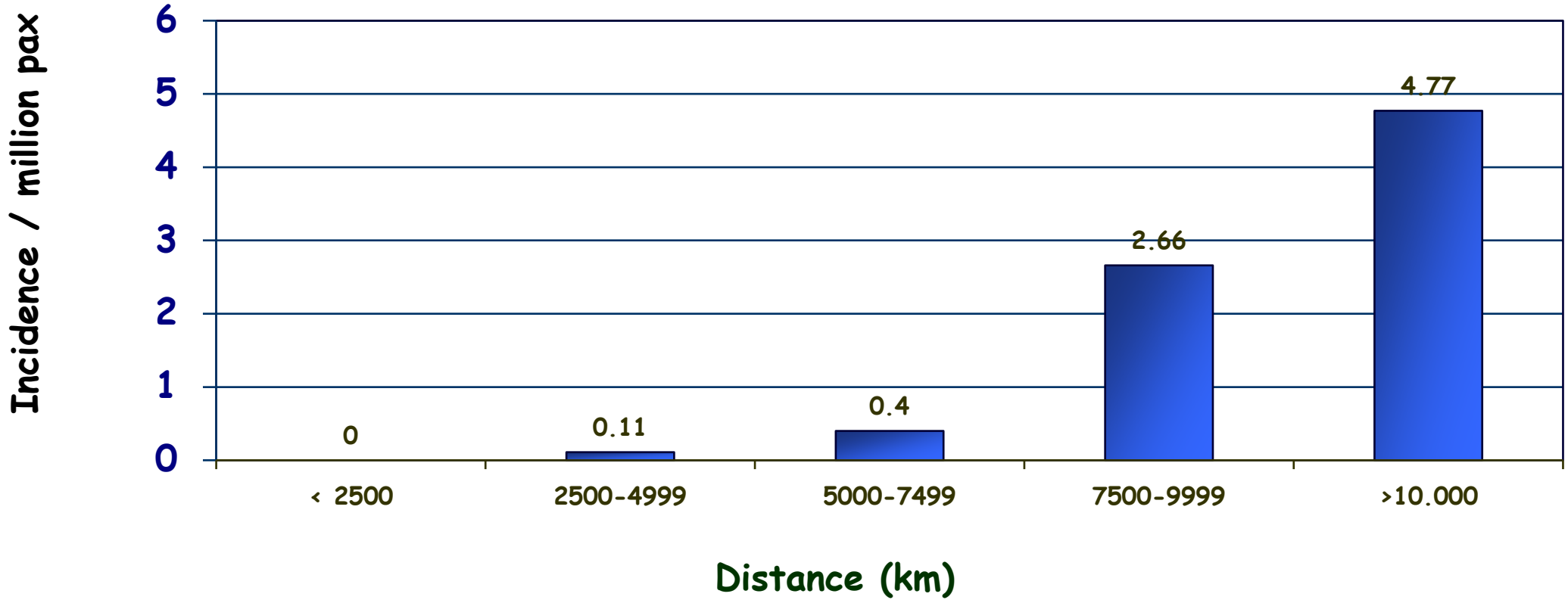


MedAire
An International SOS Company

The Travel Experience

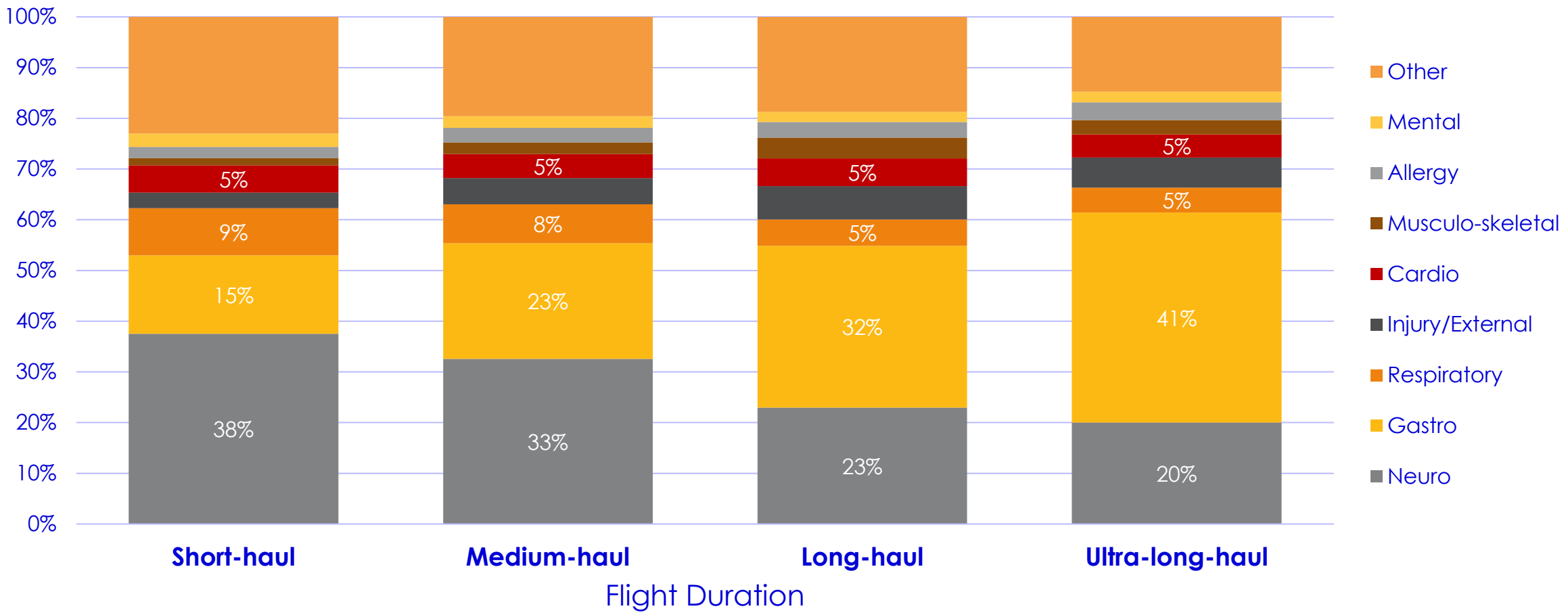
- Sleep deprivation
  - Risk for epilepsy/syncope(?)
- Medication schedule
  - Risk for diabetic passengers
- Prolonged seating / immobilization
  - Risk for DVT
- Airports
  - Distances to walk
  - Weights to carry
  - Anxiety

Severe pulmonary thromboembolism associated with air travel (Lapostolle et al. NEJM)



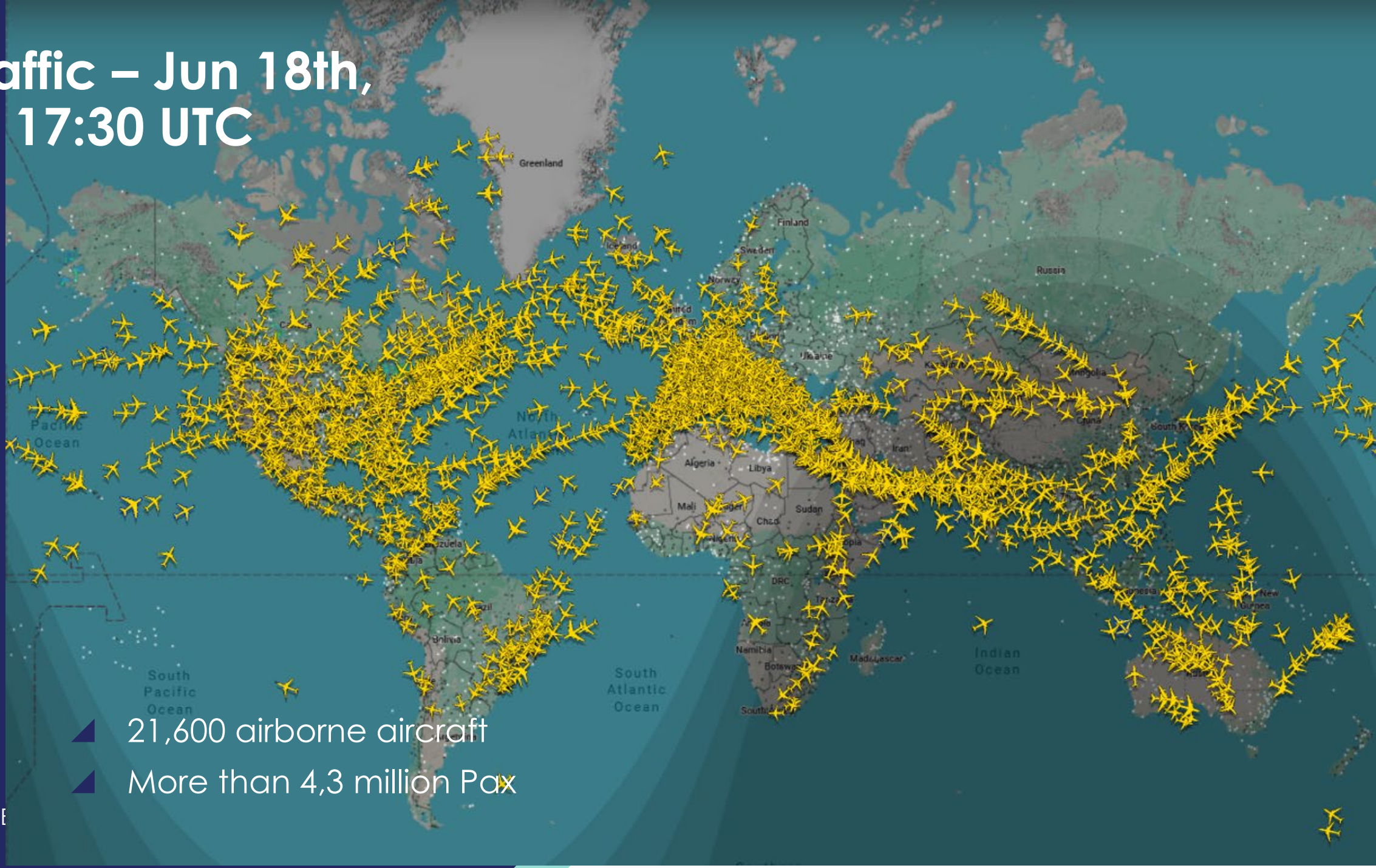
MedAire
An International SOS Company

Medical Categories and Flight Duration



MedAire
An International SOS Company

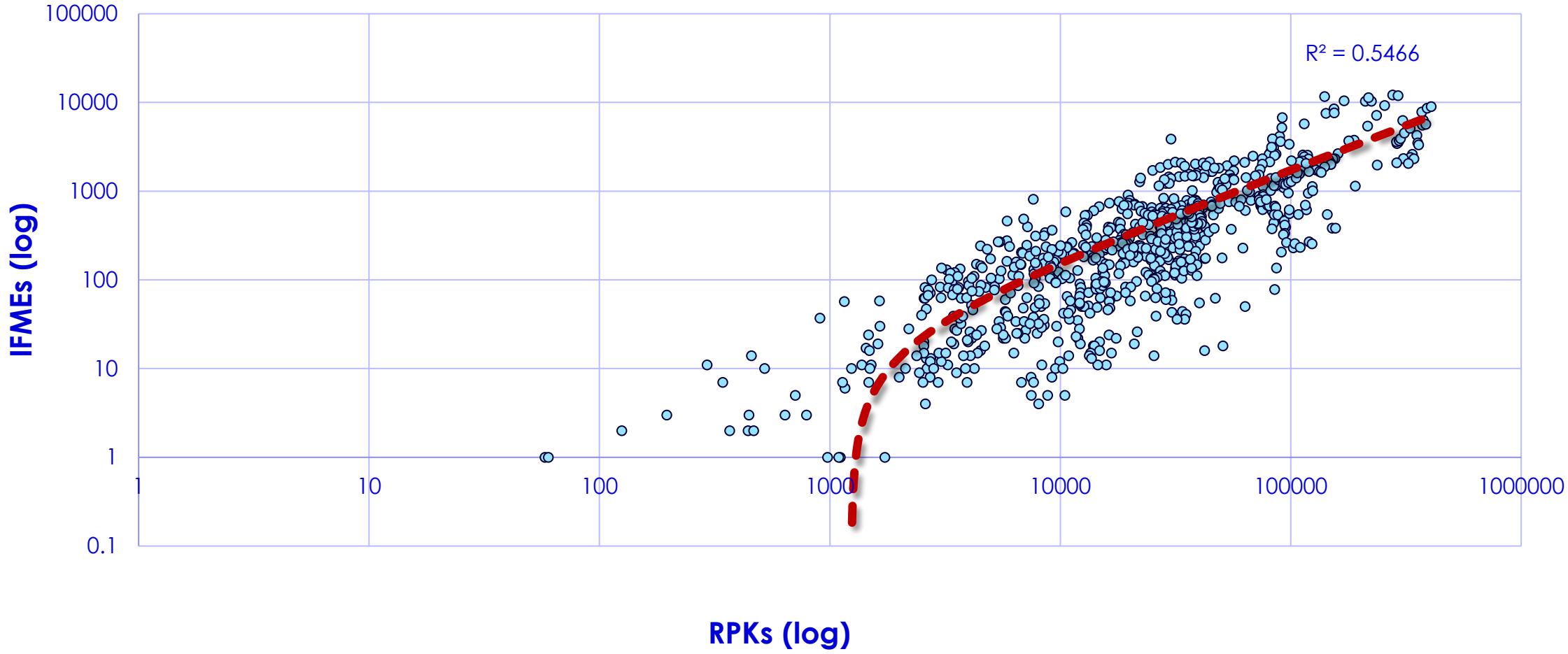
Air Traffic – Jun 18th, 2026. 17:30 UTC



- 21,600 airborne aircraft
- More than 4,3 million Pax

MedAire
An International SOS Company

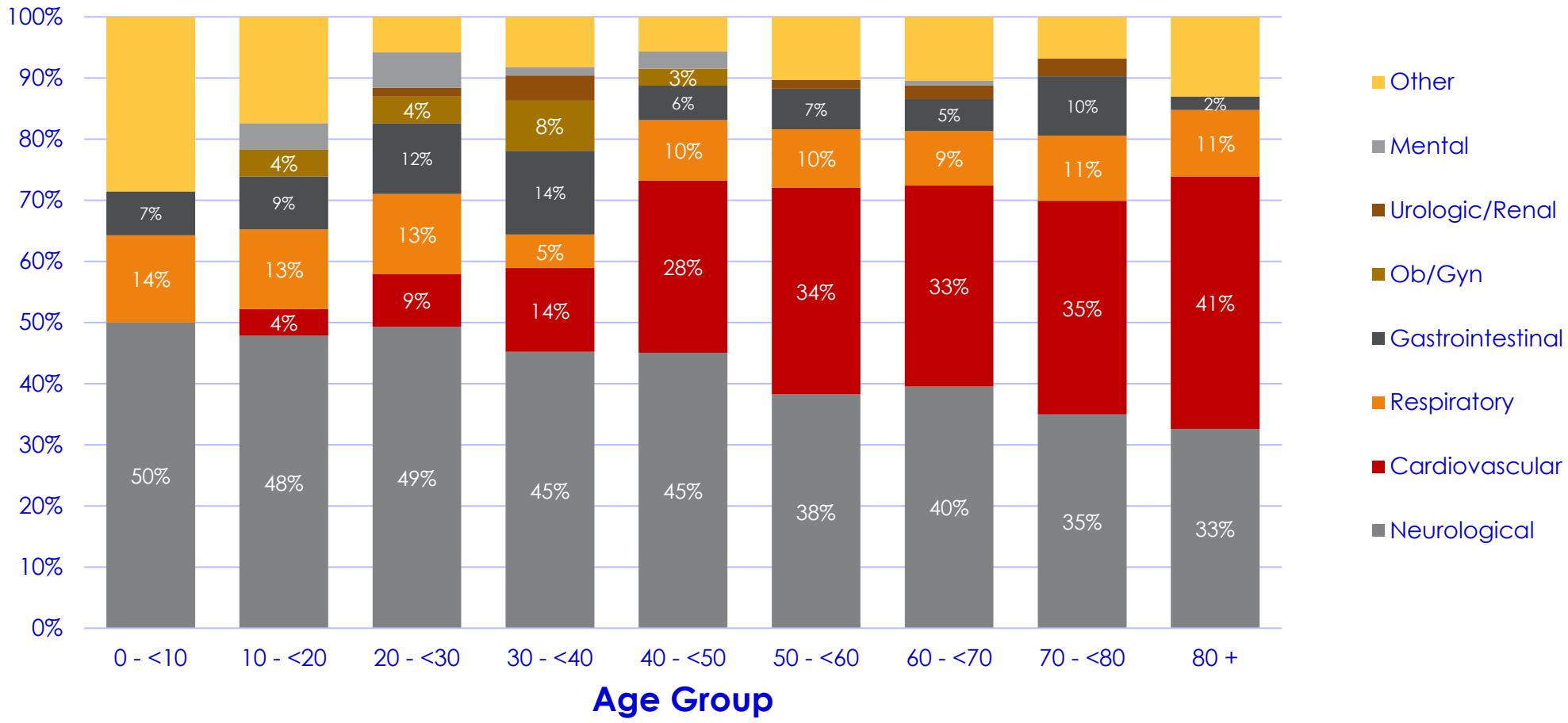
In-Flight Medical Events and RPKs (*)



(*) RPK = Revenue Pax * Kilometer

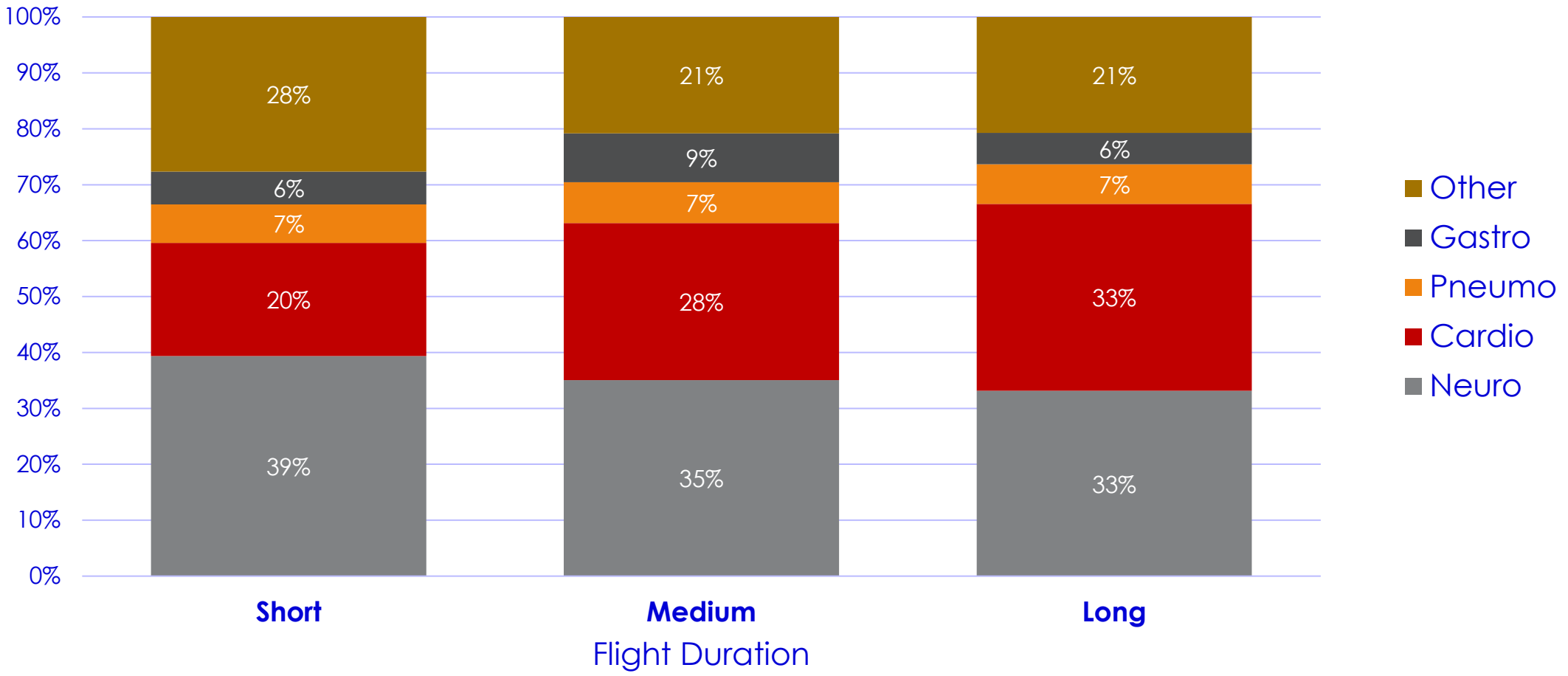
MedAire
An International SOS Company

Diagnostic Categories per Age Group Diverted Cases



MedAire
An International SOS Company

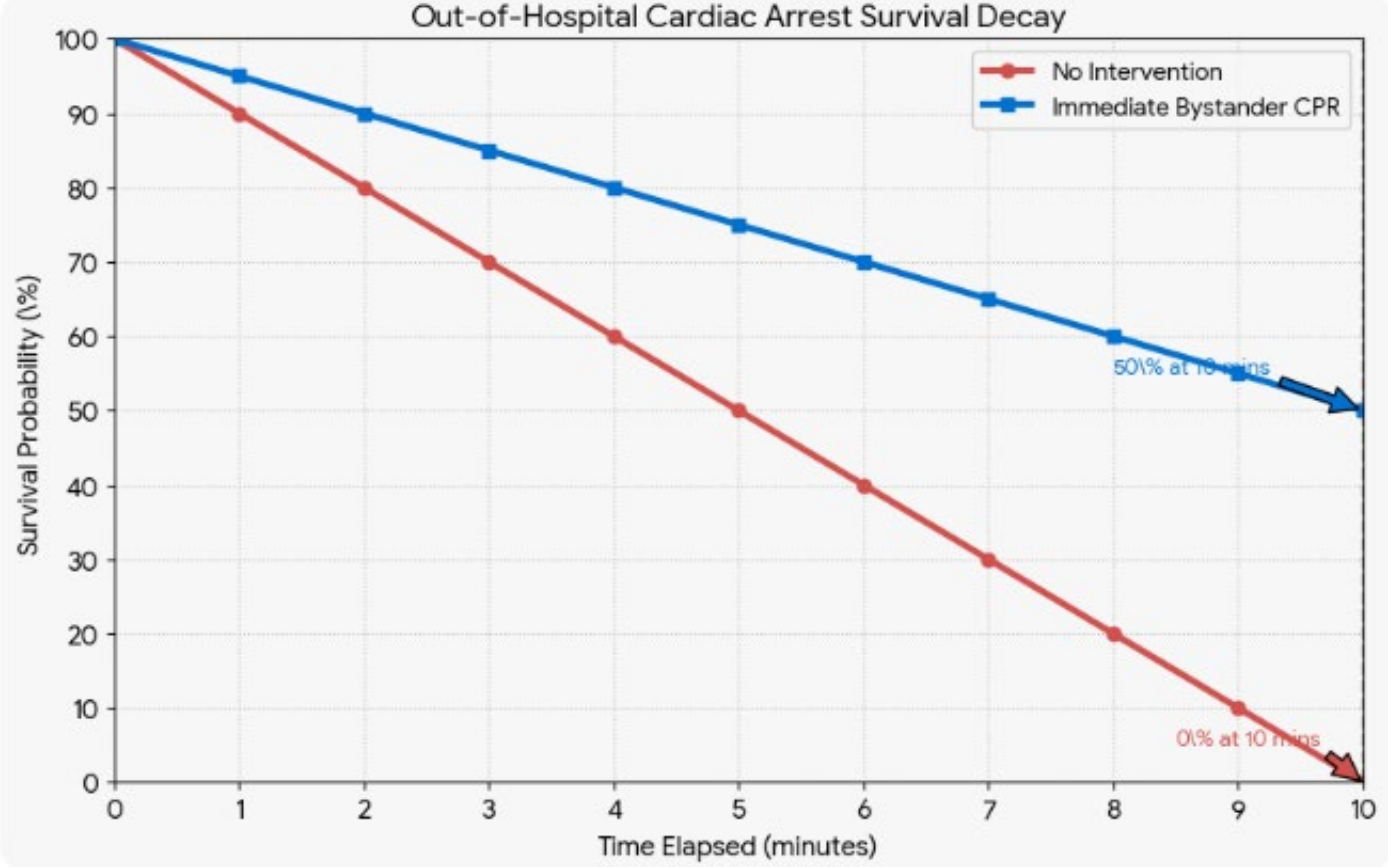
Diagnostic Categories – Diverted Flights



MedAire
An International SOS Company

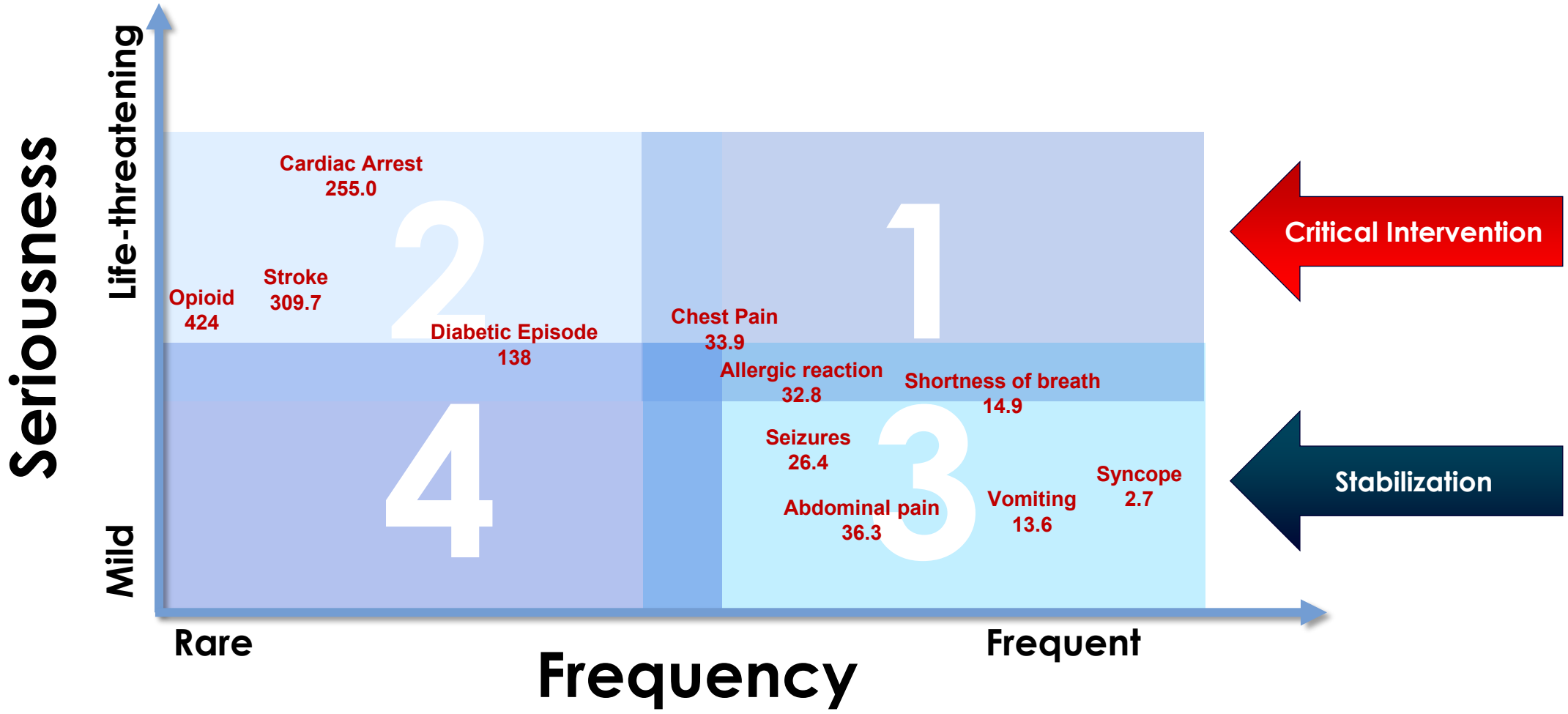
Background

- 55% of all tracked sudden cardiac arrests (SCA) occur out-of-hospital
  - More than 350,000 cases annually in the United States alone
- 16.3% occur in public settings (Airports, gyms, stores, streets)
- Chances of survival decrease around 10% by elapsed minute



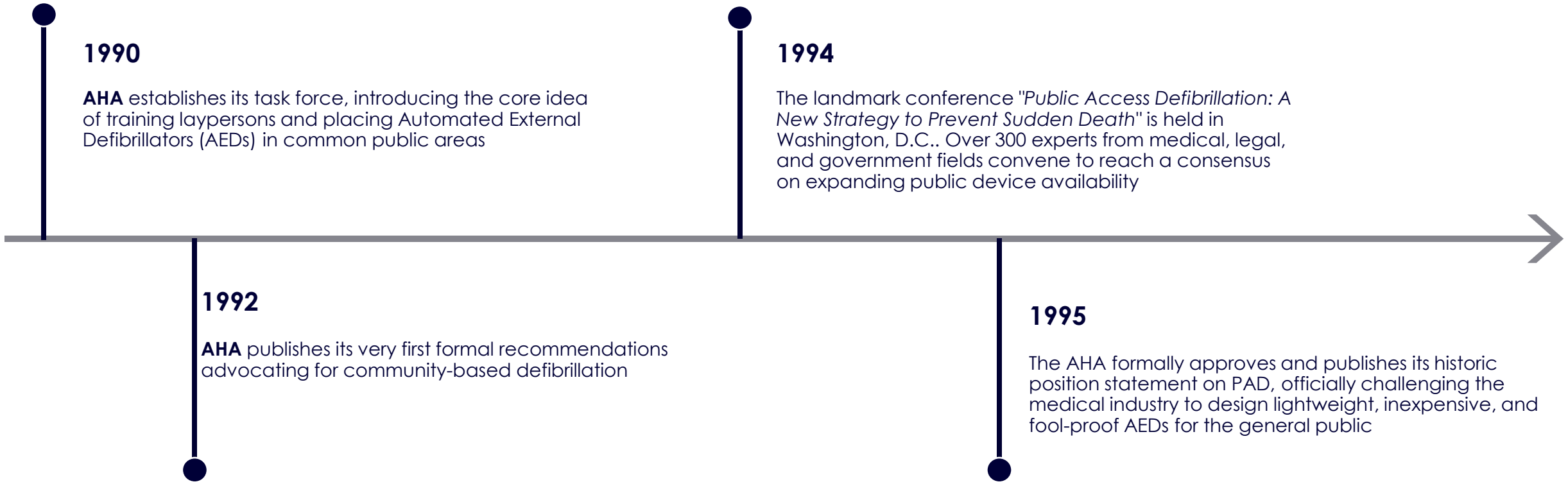
MedAire
An International SOS Company

Rationale: Risk Matrix - Thousand Pax for One Case



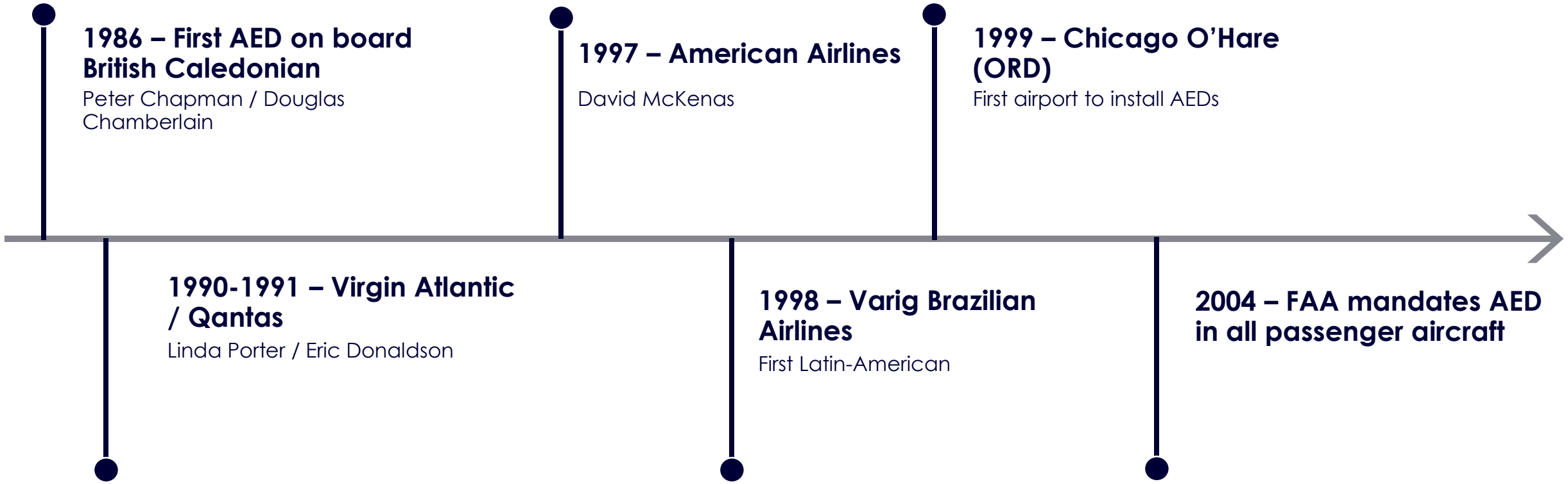
MedAire
An International SOS Company

Public Access Defibrillation Timeline



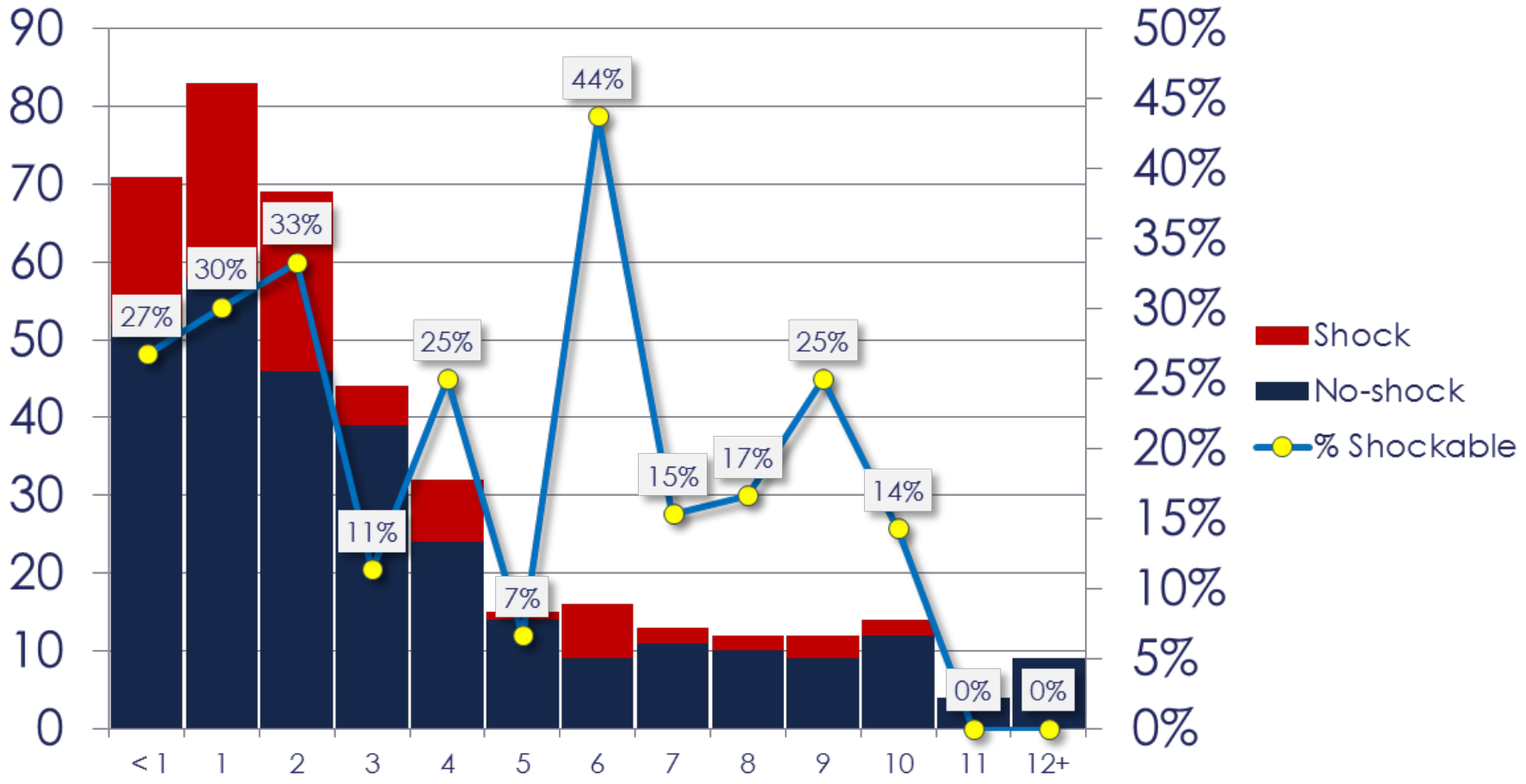
MedAire
An International SOS Company

AED in Aviation Timeline



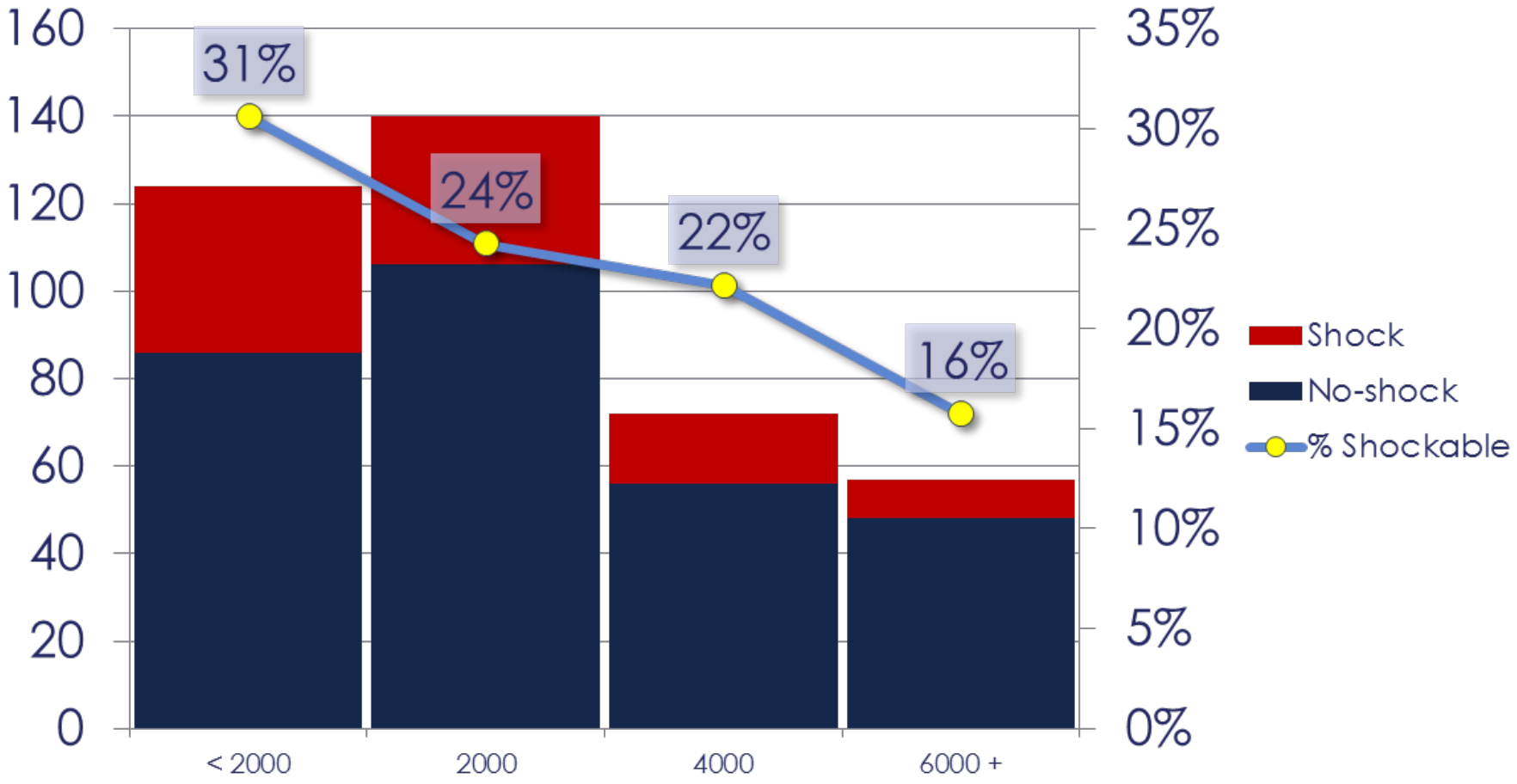
MedAire
An International SOS Company

Hours into flight
Shock versus No-shock



MedAire
An International SOS Company

Flight distance (km)
Shock versus No-shock



MedAire
An International SOS Company

Conclusions

In-Flight Medical Events are relatively infrequent	• Shear numbers are high given increasing passenger traffic
Ground-based medical support is an established practice	• Main source of research data on the matter
Nature of events are not different on the ground	• Relative frequency is different
AEDs became an established practice	• Most major African airlines already carry them

MedAire
An International SOS Company