Hands on the Ground

Paulo M. Alves, MD, MSc, FAsMA

Disclosure

- Paulo Alves is a full-time employee for MedAire
- No other conflict of interests to disclose
- Opinions are the author's only and not necessarily represent the author's company

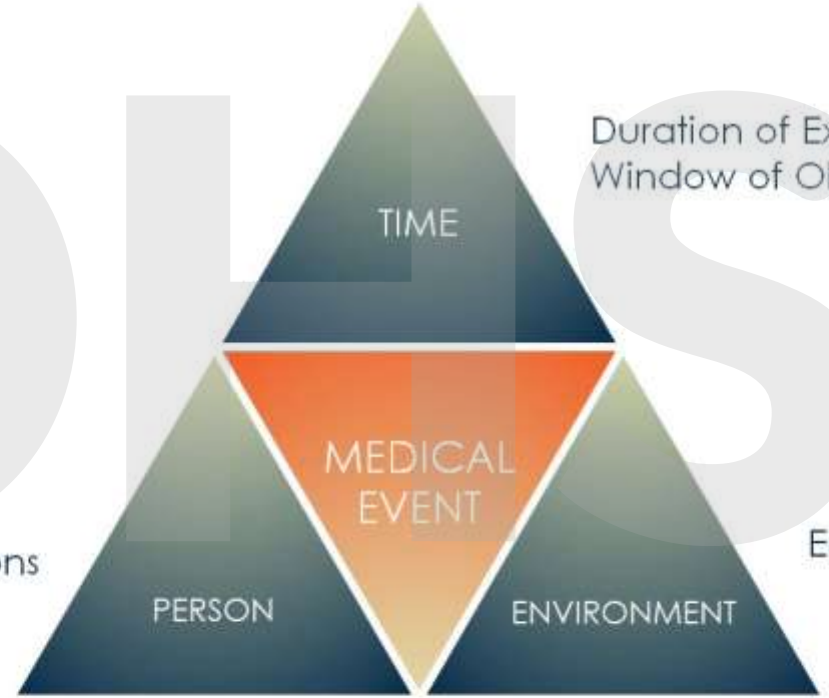
Topics to cover

- What are the resources?
- Communication cycle between plane and ground
- Are all airlines the same?
- How do you interact with flight crew/ volunteers?
- Medical volunteers- helping hands or pain in the seat?
  - How to work as a team.
- Real life examples

What defines an in-flight medical event (IFME)?

- ☐ Any health related event
- ☐ When a doctor/medical volunteer is needed
- ☑ When a flight attendant (or someone else) decides so

The triangle of In-Flight Medical Events



Duration of Exposure
Window of Observation

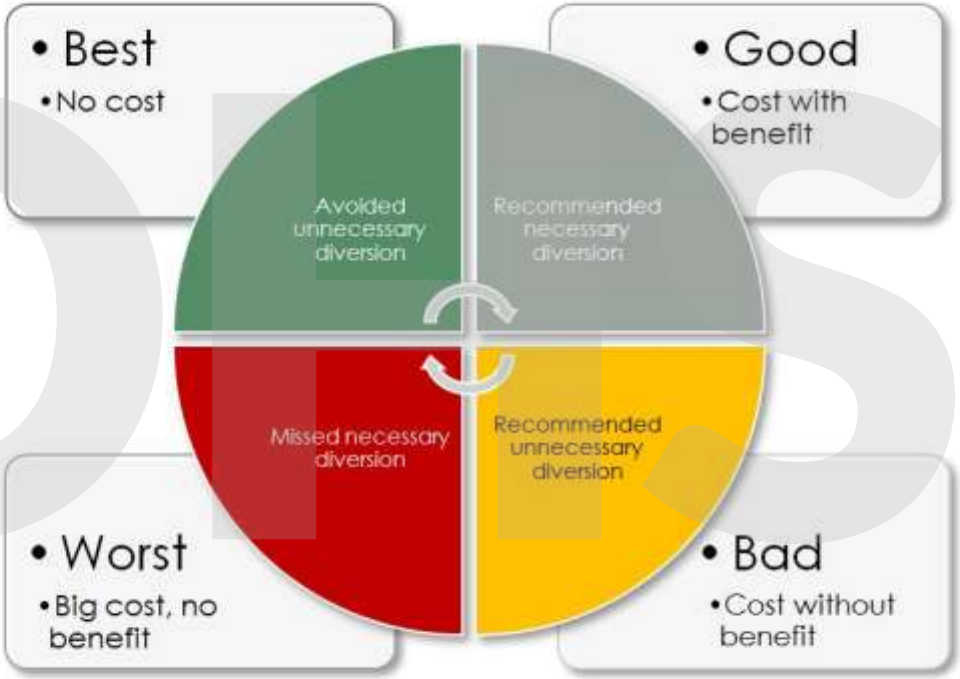
Risk Factors
Pre-existing conditions

Environmental agents

World airline traffic

The captain and medical events

A general cost/benefit model on diversions



Is There a Doctor Onboard?

- Around 70-80% of the flights have medical volunteers
- **20-30% don't!!!**

The doctor passenger

University of Illinois survey 2014 *

- Never faced the situation (57.7%) or only once before (21.1%)
- Doesn't handle emergencies often (62.3%)
- Is not familiar with the EMK (81.2%)
- Doesn't know the correct cruising cabin altitude (61.6%)
- Not familiar or comfortable with AEDs (46%)

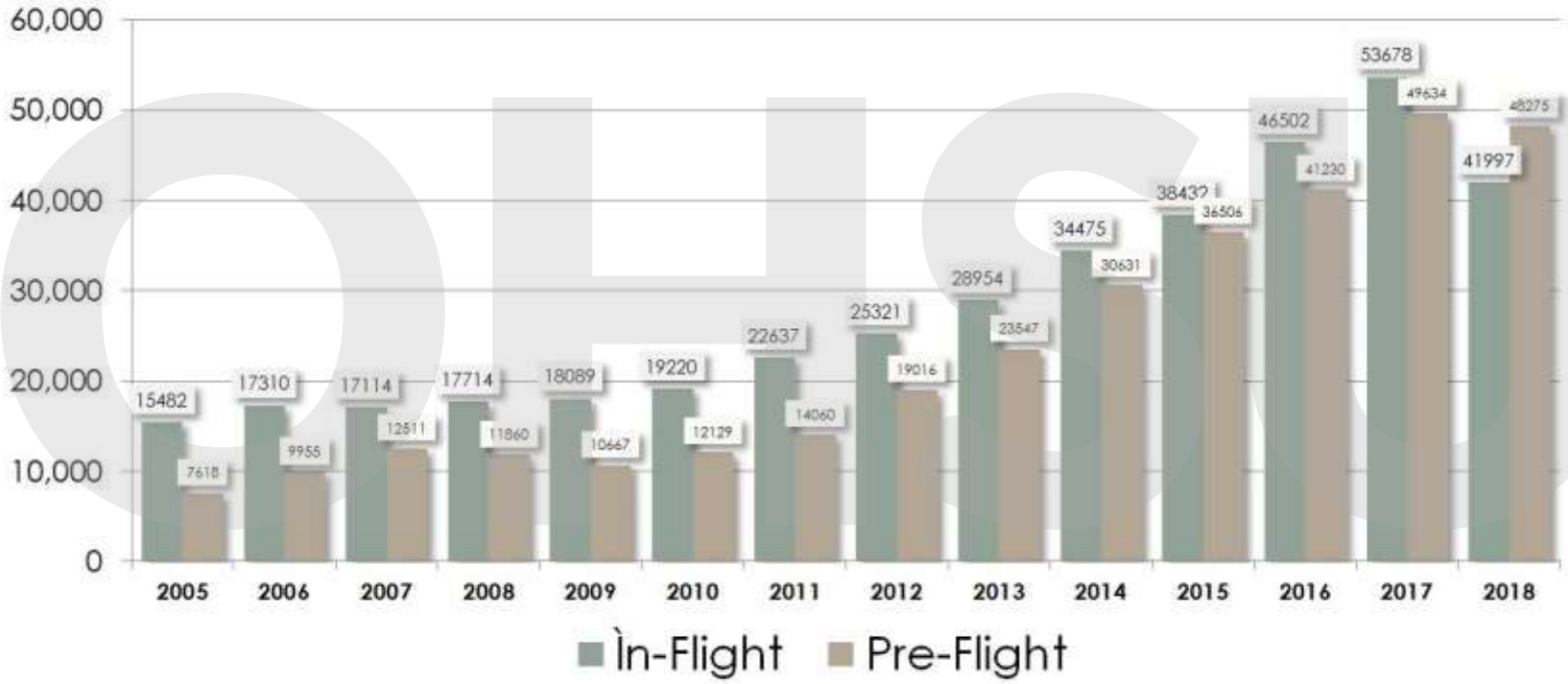
(*) Chatfield E, Bond WF, McCay B, Thibeault C, Alves PM, Squillante M, Timpe J, Cook CJ, Bertino RE. Cross-sectional survey of physicians on providing volunteer care for in-flight medical events. Aerosp Med Hum Perform. 2017;88(9):876–879.

Pre-flight Passenger Assessment

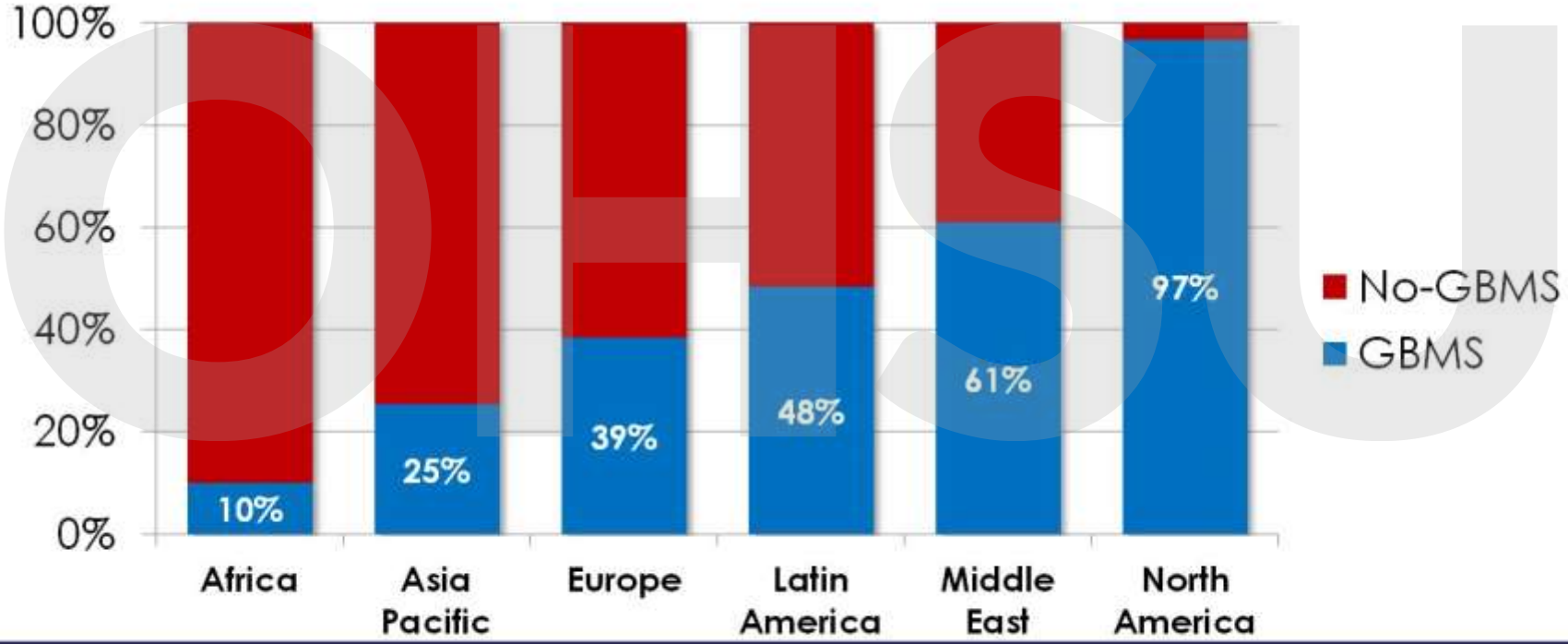
- Pre-boarding
- Post-boarding

Ground based medical advice

MedAire YOY Casuistics



Pax Coverage Comparison by Market
(2018) – 90% of total global traffic



Air to ground communication

HF
VHF

SatCom
ACARS

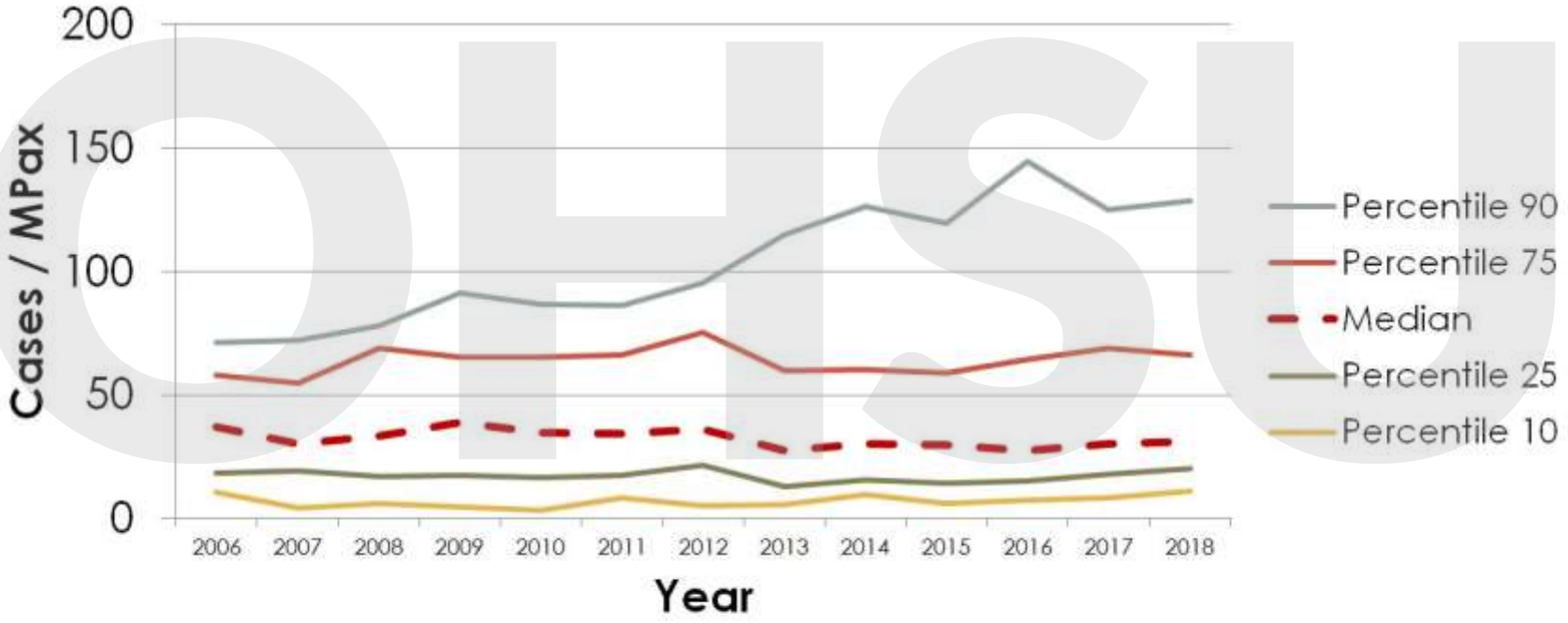
ARINC
Stockholm Radio

Airline

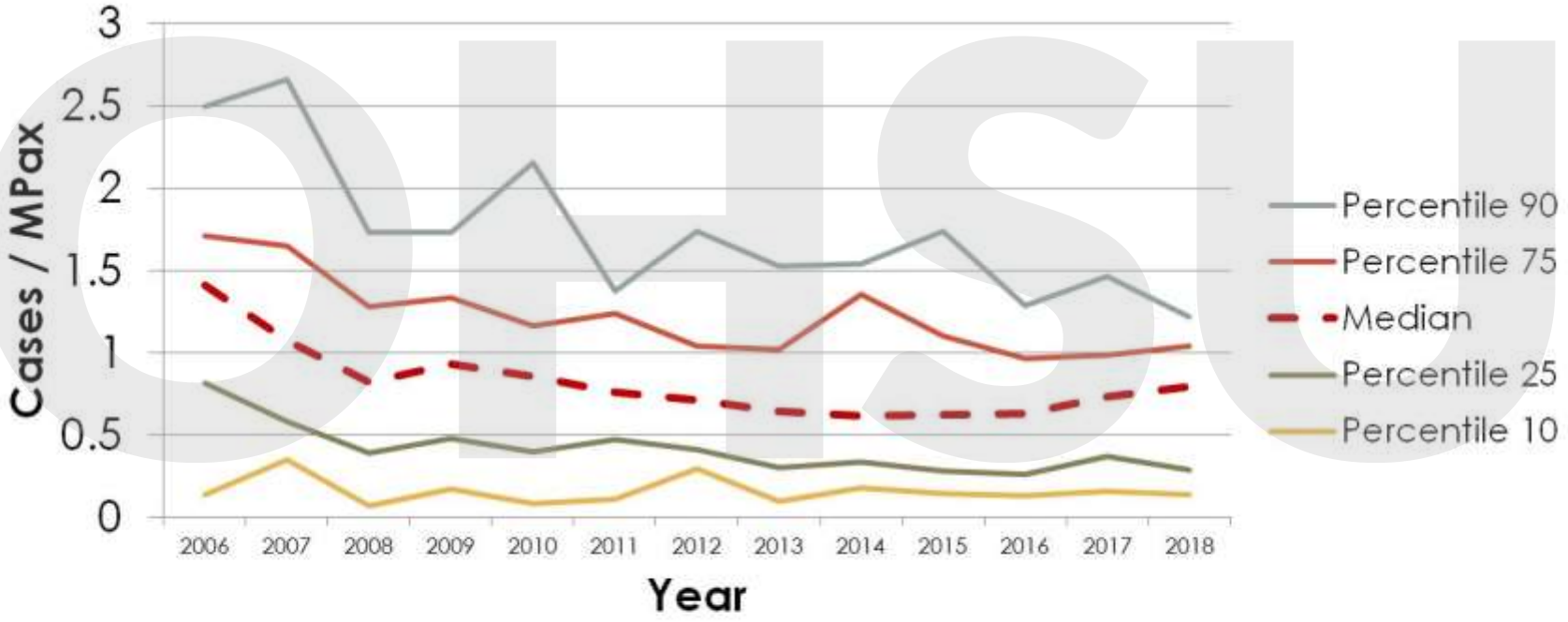
GBMS

Landline
phone patch

Airlines compared - IFMEs



Airlines compared - Diversions



Telemedicine

Local / Communication / Remote

The regulatory framework

Training / Medical Kits / Crew certification

Other stakeholders

IATA

AMA

American College of Emergency Physicians

American Academy of Pediatrics

AOA
AMERICAN OSTEOPATHIC ASSOCIATION

FAA Requirements EMK

- Sphygmomanometer
- Stethoscope
- Airways, oropharyngeal (3 sizes)
- Self-inflating manual resuscitation device with 3 masks
- CPR mask (3 sizes)
- IV Admin Set: Tubing w/ 2 Y connectors
- Saline solution, 500 cc
- Analgesic, non-narcotic, tablets, 325 mg
- Antihistamine tablets, 25 mg
- Antihistamine injectable, 50 mg
- Atropine, 0.5 mg, 5 cc
- Aspirin tablets, 325 mg
- Bronchodilator, inhaled
- Dextrose, 50%/50 cc injectable
- Epinephrine 1:1000
- Epinephrine 1:10,000
- Lidocaine, 5 cc, 20 mg/ml
- Nitroglycerine tablets, 0.4 mg

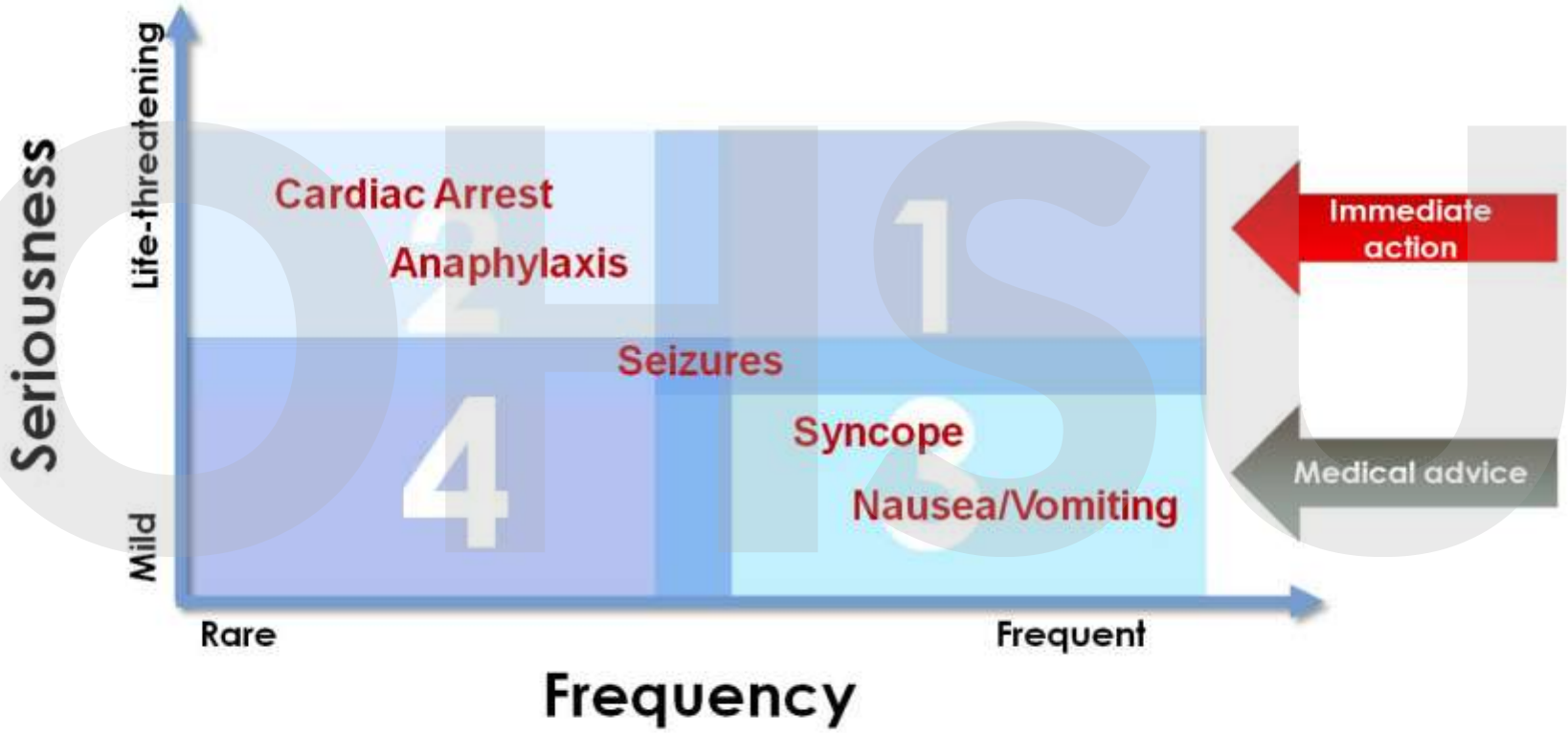
What is missing?

- Airway management
  - Supraglottic?
  - ETT?
- Auto-injector?
- Anti-convulsant
- Antiemetic
- Naloxone?
- Pulse oximeter
- Electronic BP cuff
- Glucometer
- EKG

Automated External Defibrillators

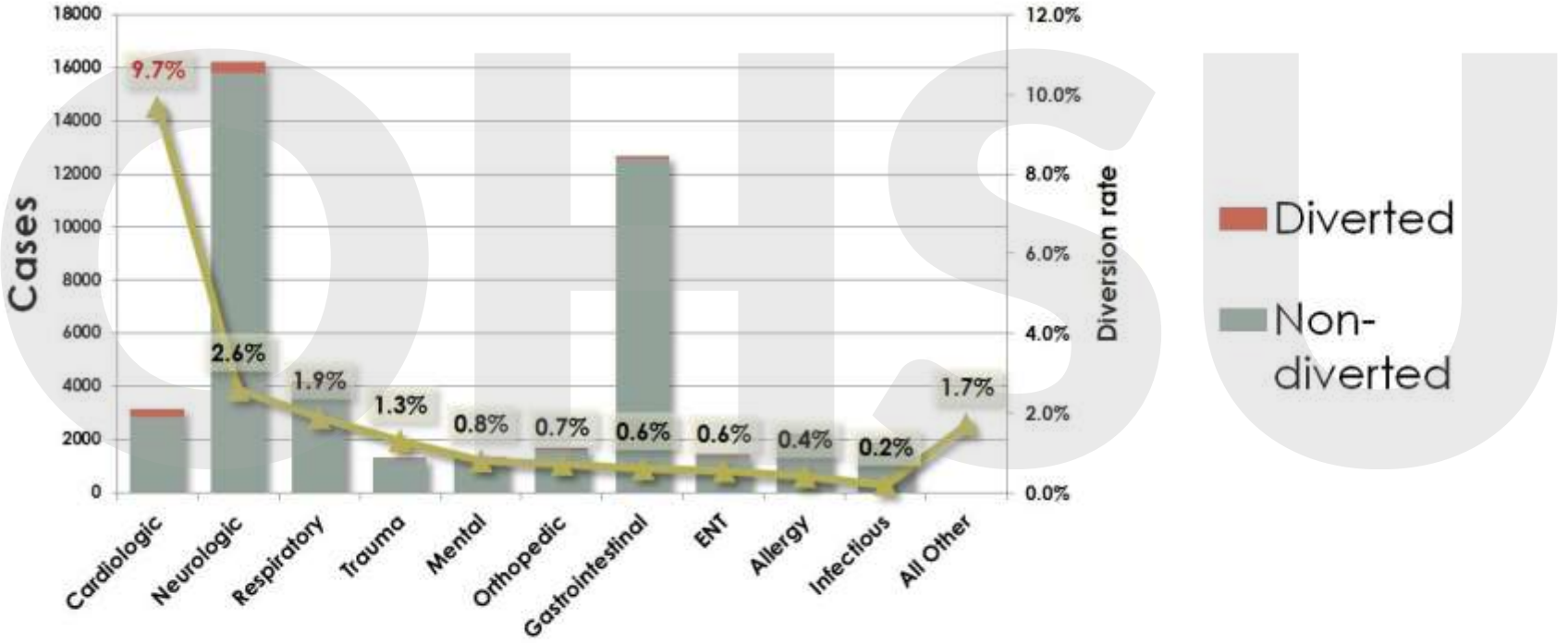
- Only required in a few countries
- Adopted by most international airlines
- Frequently used as monitors (should they?)

Rationale

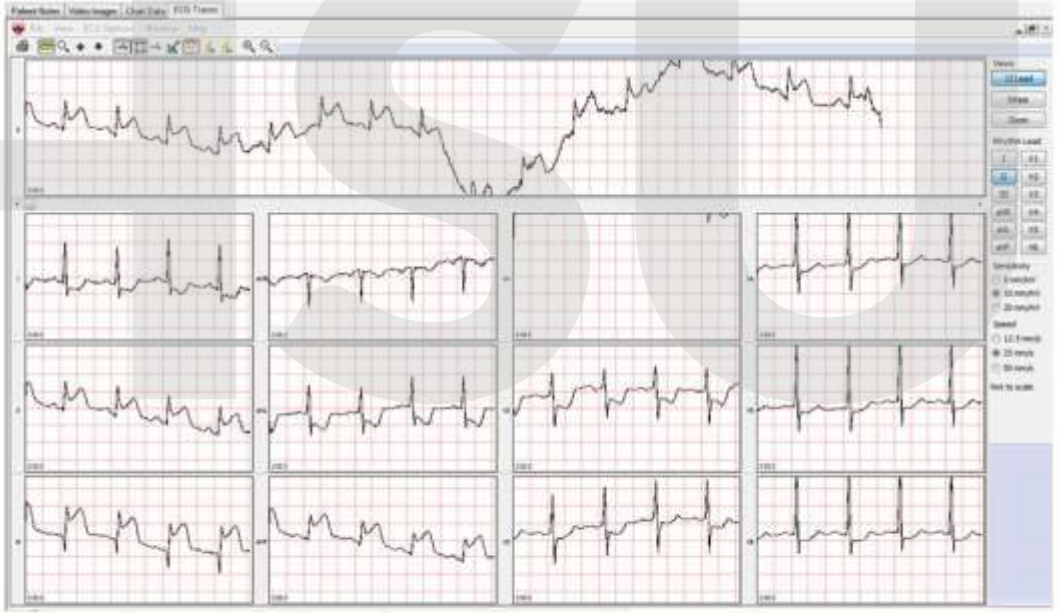

Seriousness
Life-threatening
Mild
Cardiac Arrest
Anaphylaxis
Seizures
Syncope
Nausea/Vomiting
1
2
3
4
Immediate action
Medical advice
Rare
Frequent
Frequency

Medical diversions

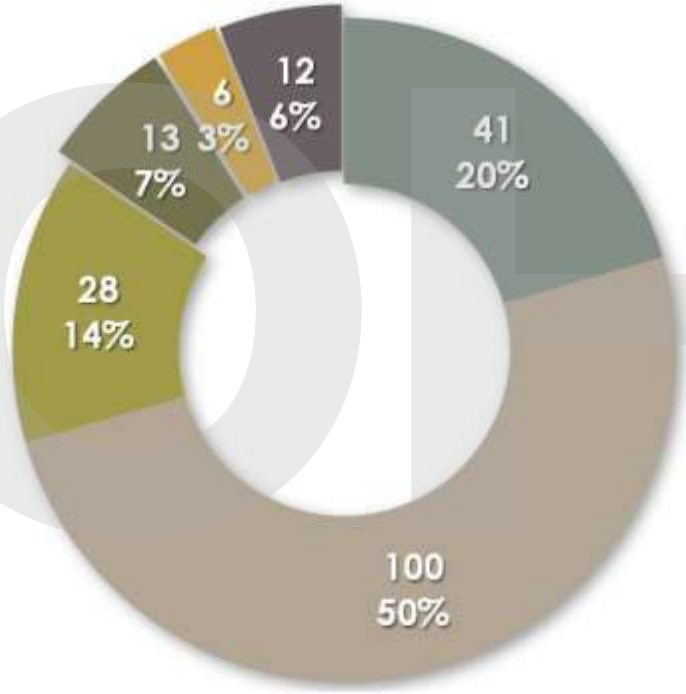
Source MedAire: 2012-2013 data



In-flight EKGs



Quality of Electrocardiograms Obtained in Flight by Airline Flight Attendants (*)



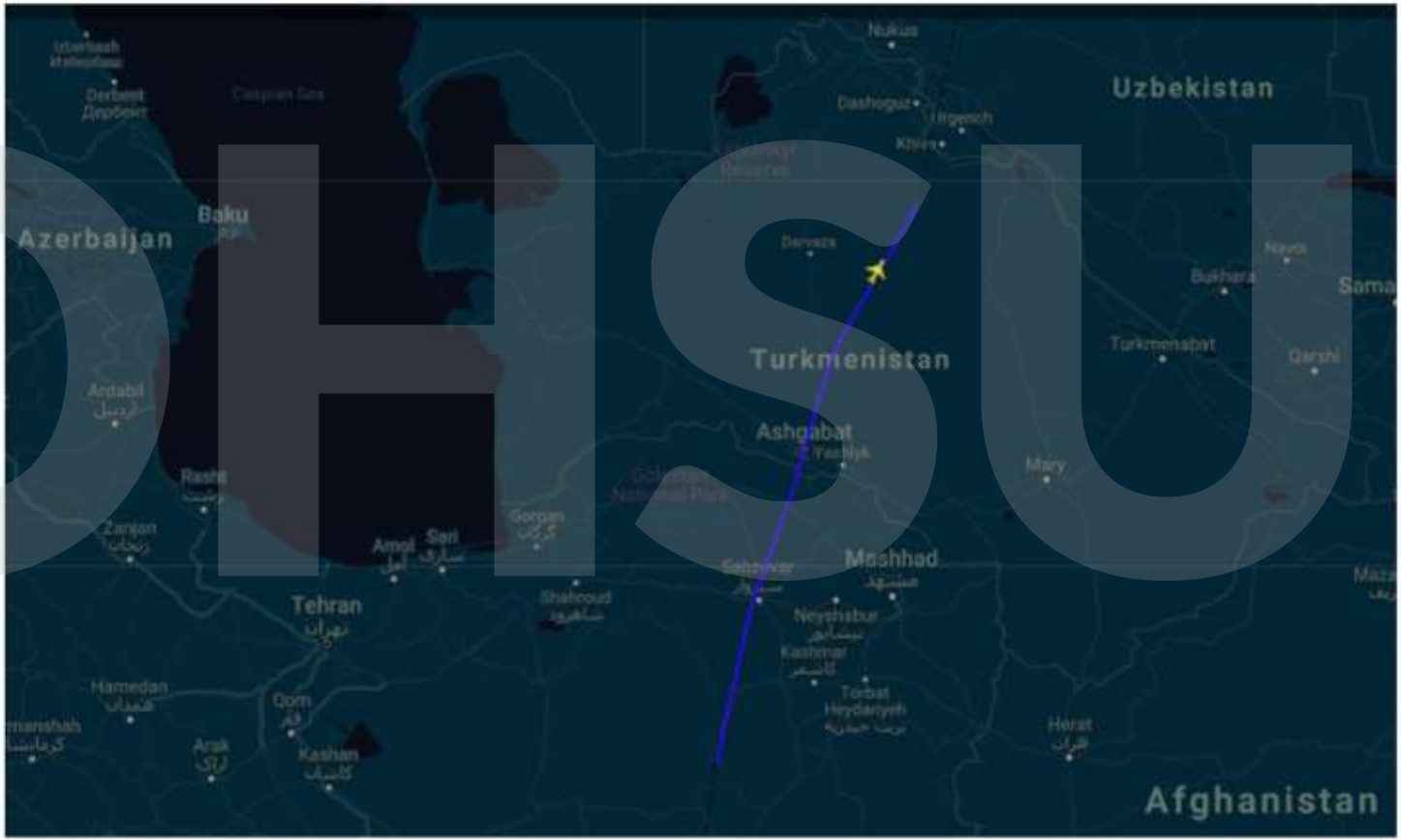
- 5-Excellent
- 4- Very good
- 3-Readable
- 2-Could extract some info
- 1-Can't extract info
- 0-No tracing

(*) Alves et al. - Aerosp Med Hum Perform. 2019; 90(4):405–408

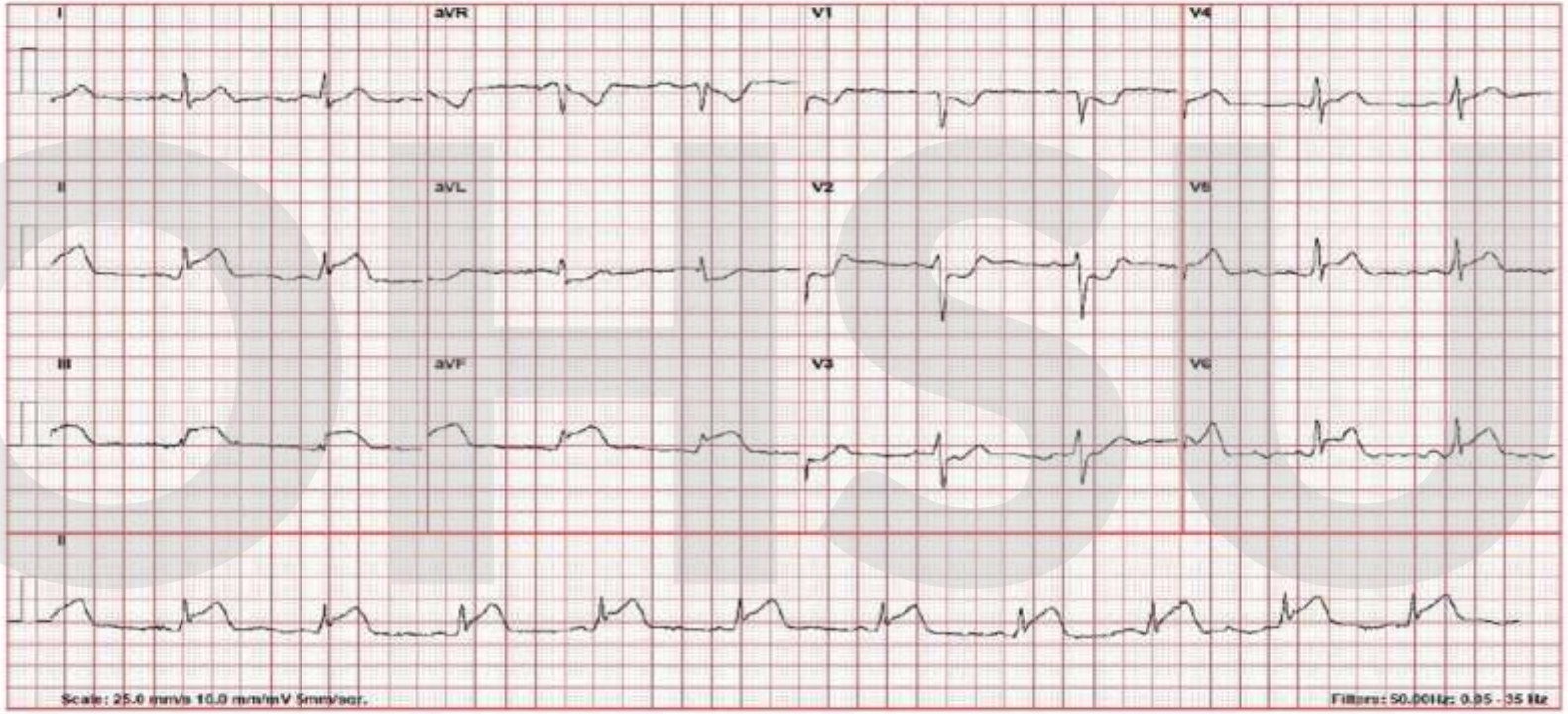
Case Study 1

- 52 years-old (American) male
- Chest pain radiating to left arm
- Dubai – Seattle
- 12 hours remaining in-flight

Aircraft position – Case 1



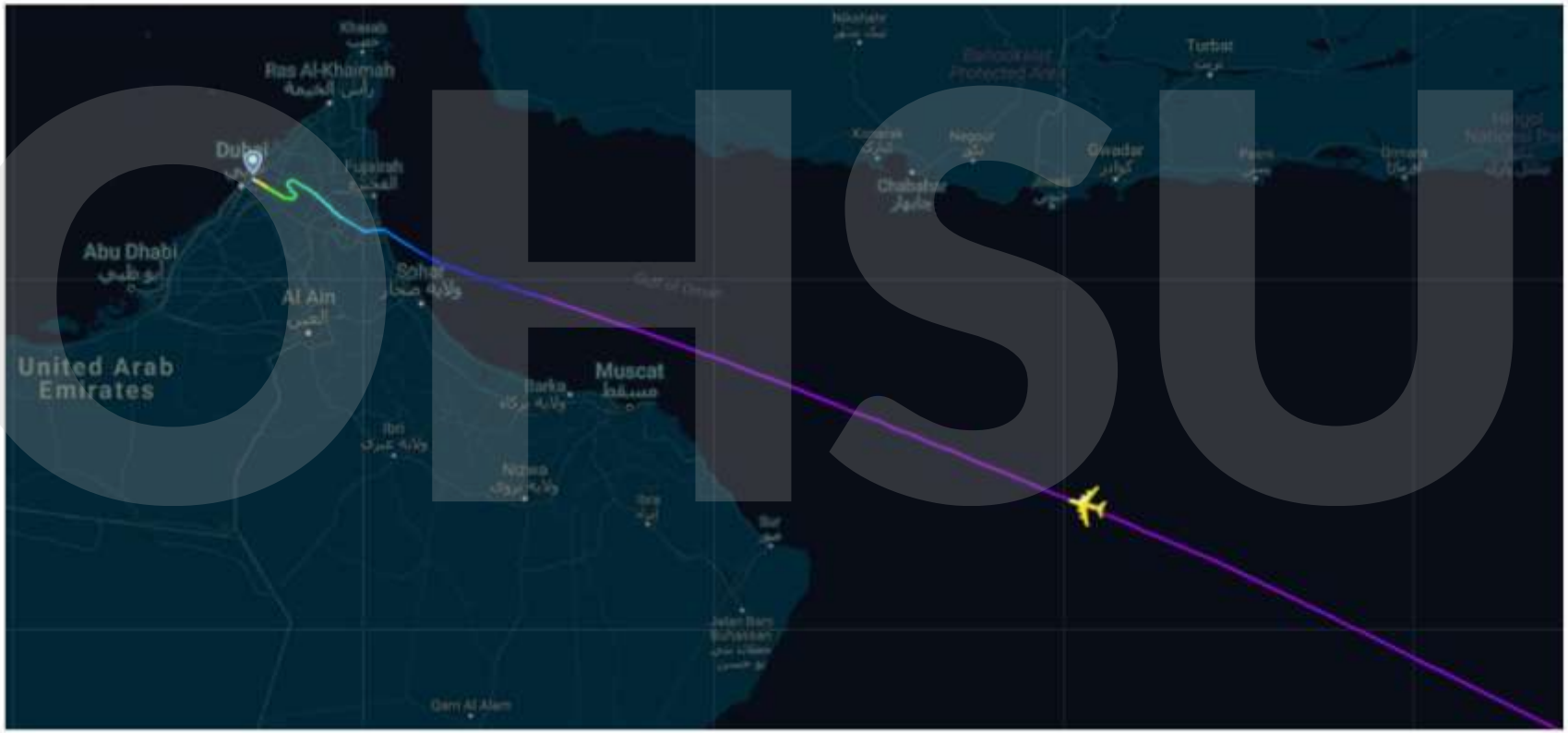
ECG Case 1


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Scale: 25.0 mm/s 10.0 mm/mV 5mm/ear.
Filters: 50.00Hz; 0.05 - 35 Hz

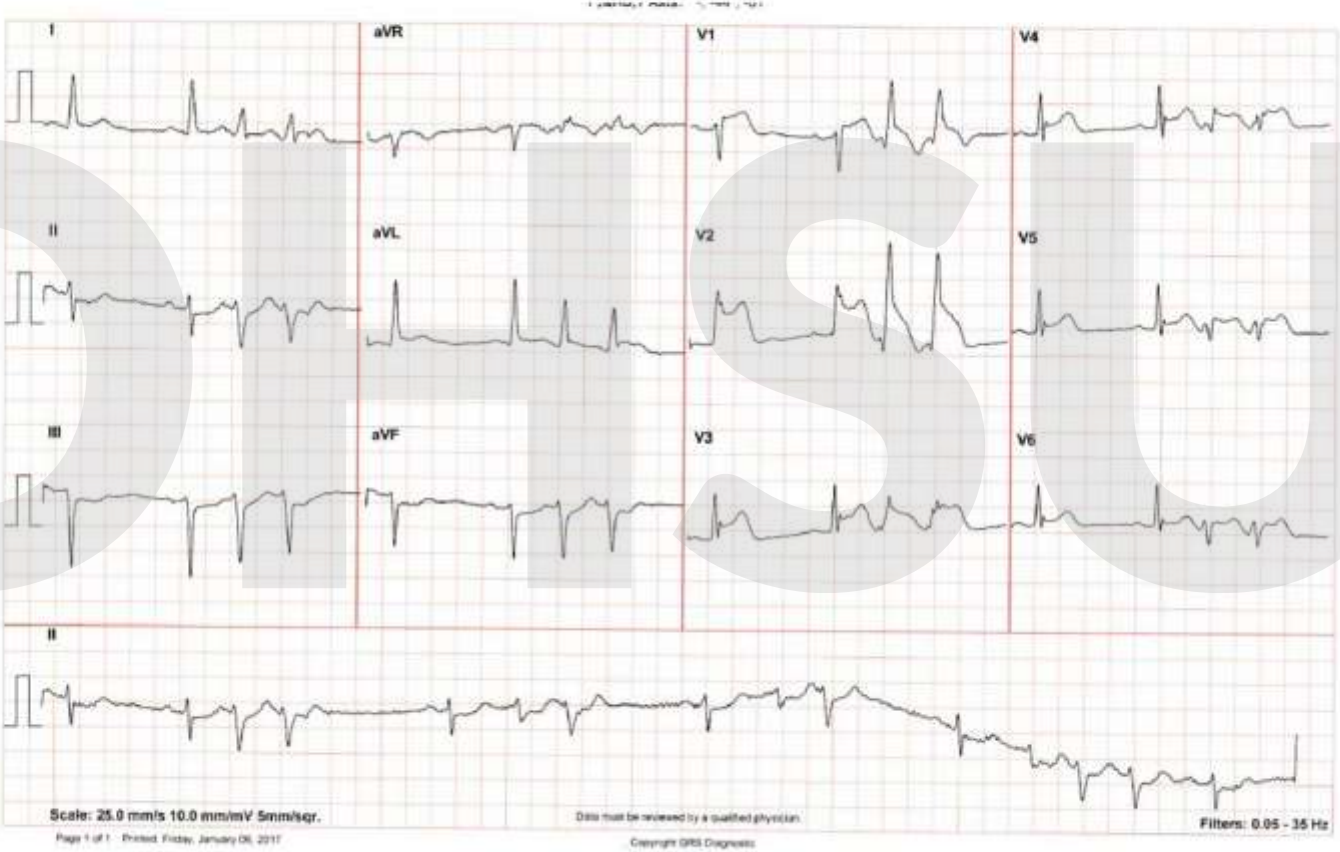
Case Study 2

- 54 years-old male
- Chest pain radiating to left arm
- Singapore – Dubai
- 2 hours remaining in-flight

Aircraft position – Case 2



ECG Case 2


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Scale: 25.0 mm/s 10.0 mm/mV 5mm/sqr.
Data must be reviewed by a qualified physician.
Filters: 0.05 - 35 Hz
Page 1 of 1 Printed: Friday, January 06, 2017
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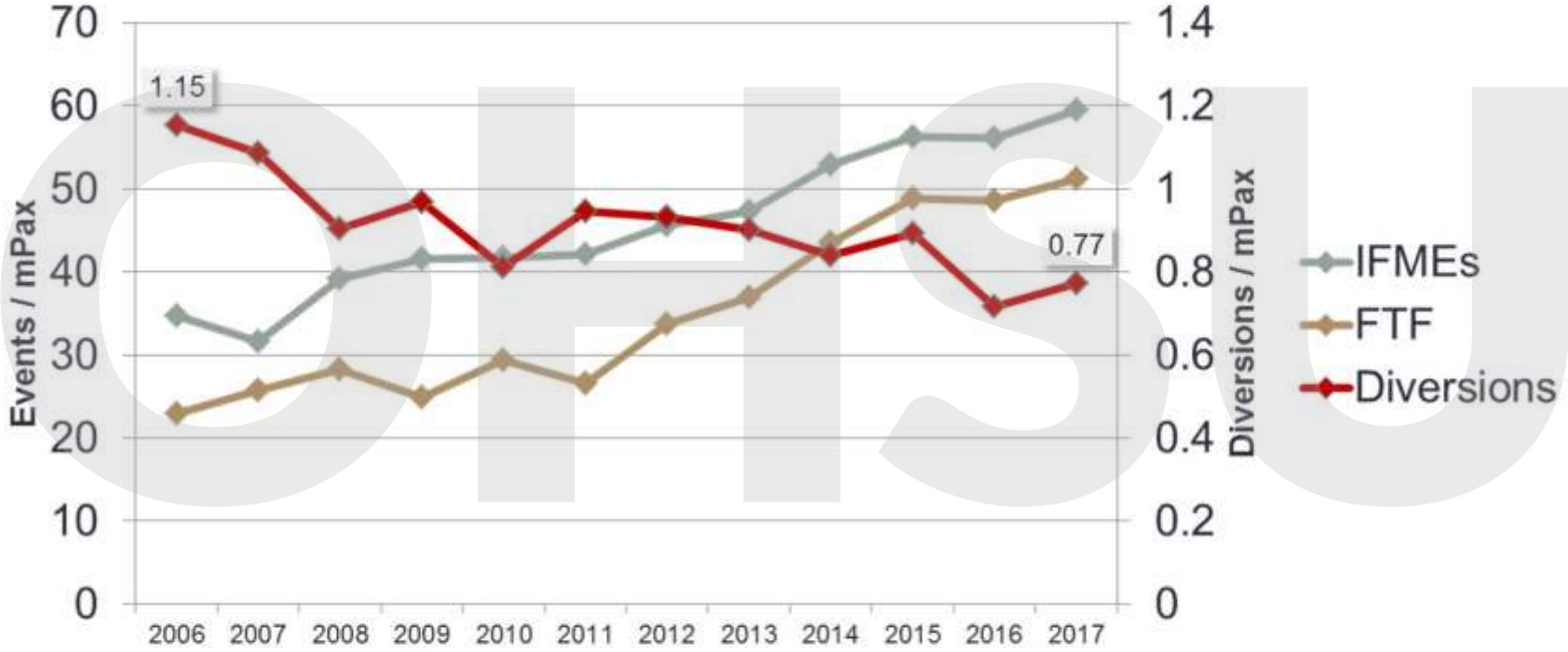
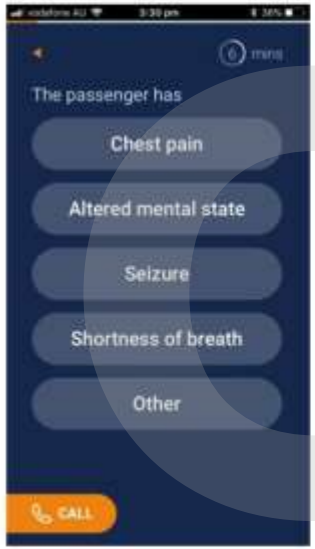
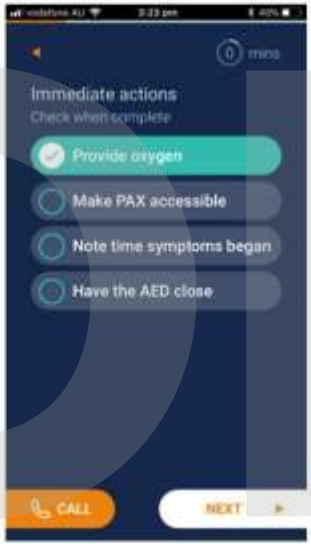
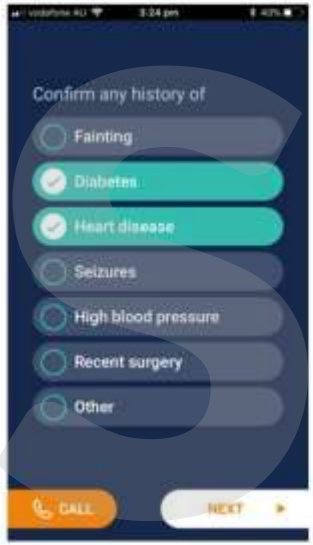
Correlation between IFMEs, FTFs and Diversions



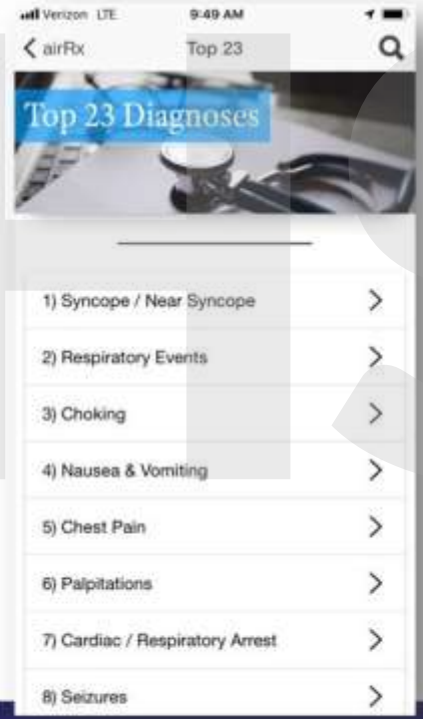
Helping the Crewmember







Helping the Medical Volunteer



Conclusions

- Medical advice from the ground became a best practice
  - Medical volunteers are still welcome (eyes / hands)
- Airlines vary significantly
  - Operational aspects / Culture / Procedures
  - Available resources on board
  - Passenger demographics
- Better assessment tools needed