Age and performance in pilots

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International Aerospace Medicine Congress

Bogota, 4 April 2019

ICAO

b Havana 1945

HQ Montreal/Geneva

Company

Represents airlines

280 Airlines, 120 Nations

b Chicago 1944

HQ Montreal

UN Organisation

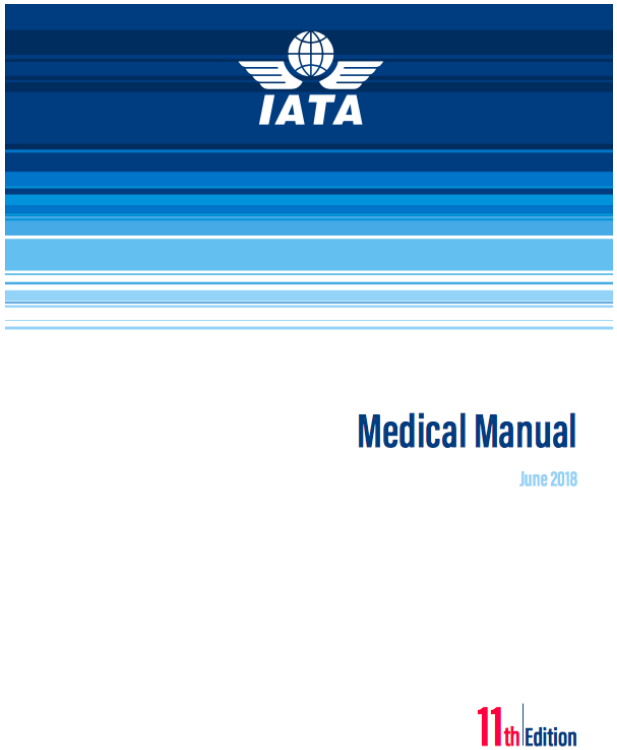
Sets global standards

All states adhere

Disclosure:

Opinions are my own

No official IATA position on this matter



Capt Liney Lozano (27 yrs)

History

1919 – International Commission for Air Navigation (ICAN)
- Age 45 years limit

1947 – ICAO takes over from ICAN – no age limit

1959 – FAA Age 60 limit imposed (PIC and co-pilot)

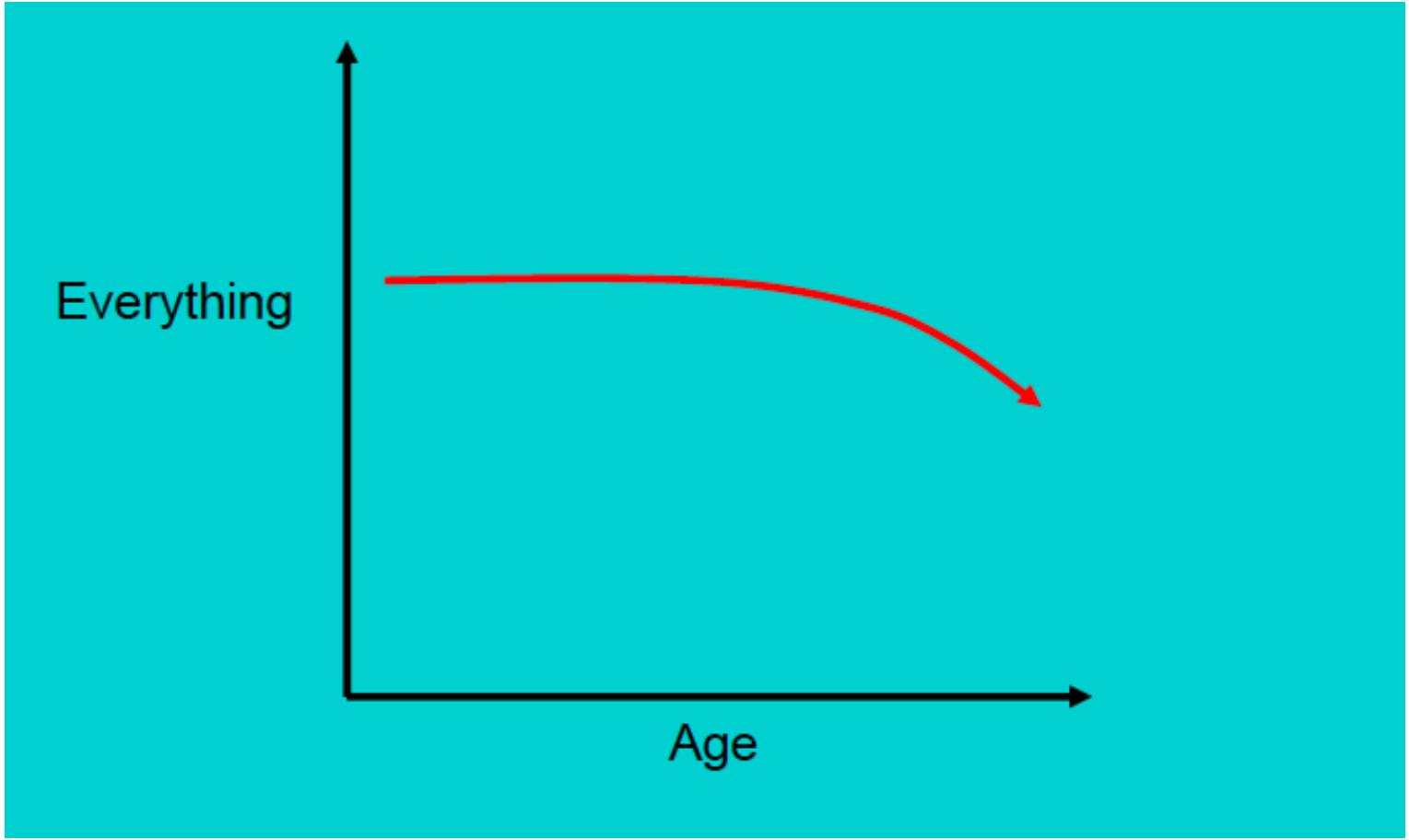
based on supply-demand politics - Govt, Unions, airlines

1960 – IATA recommends upper age limit of 60 to members

1963 – ICAO Recommendation (not mandatory)
- Age 60 limit for PIC; no mention of co-pilot

2008 - ICAO increased limit to 65 for multi-crew airline operations

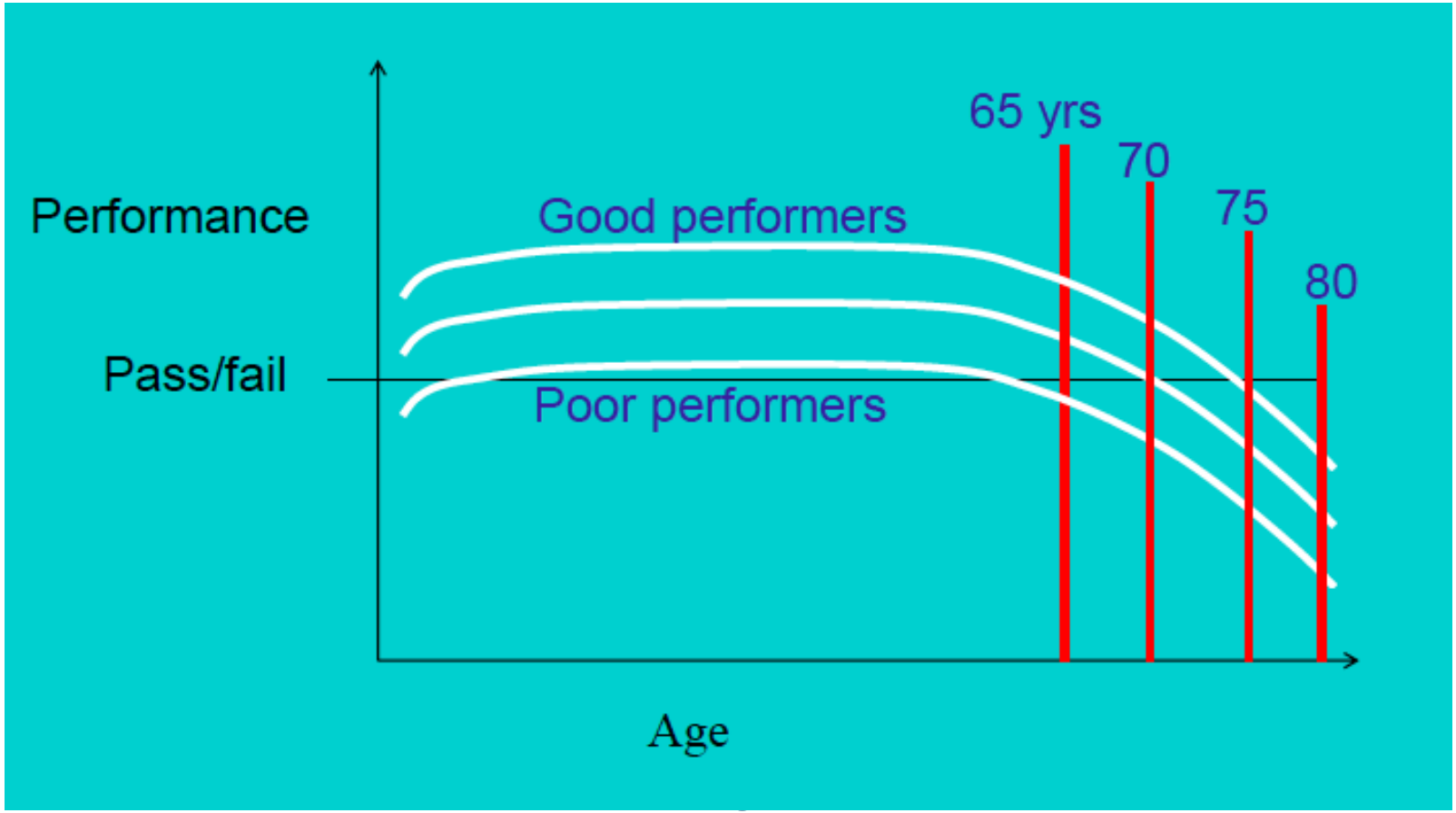
The Biology

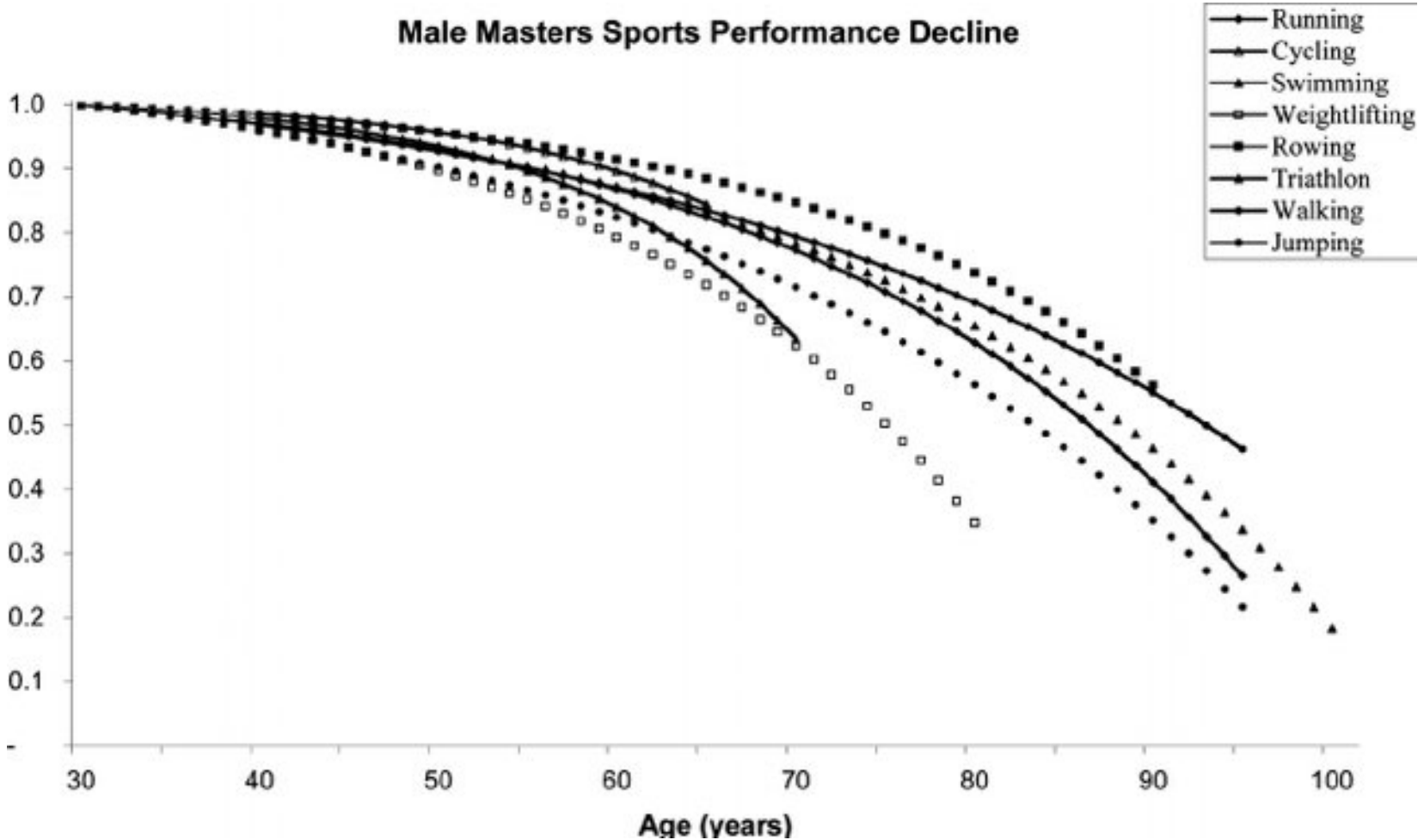


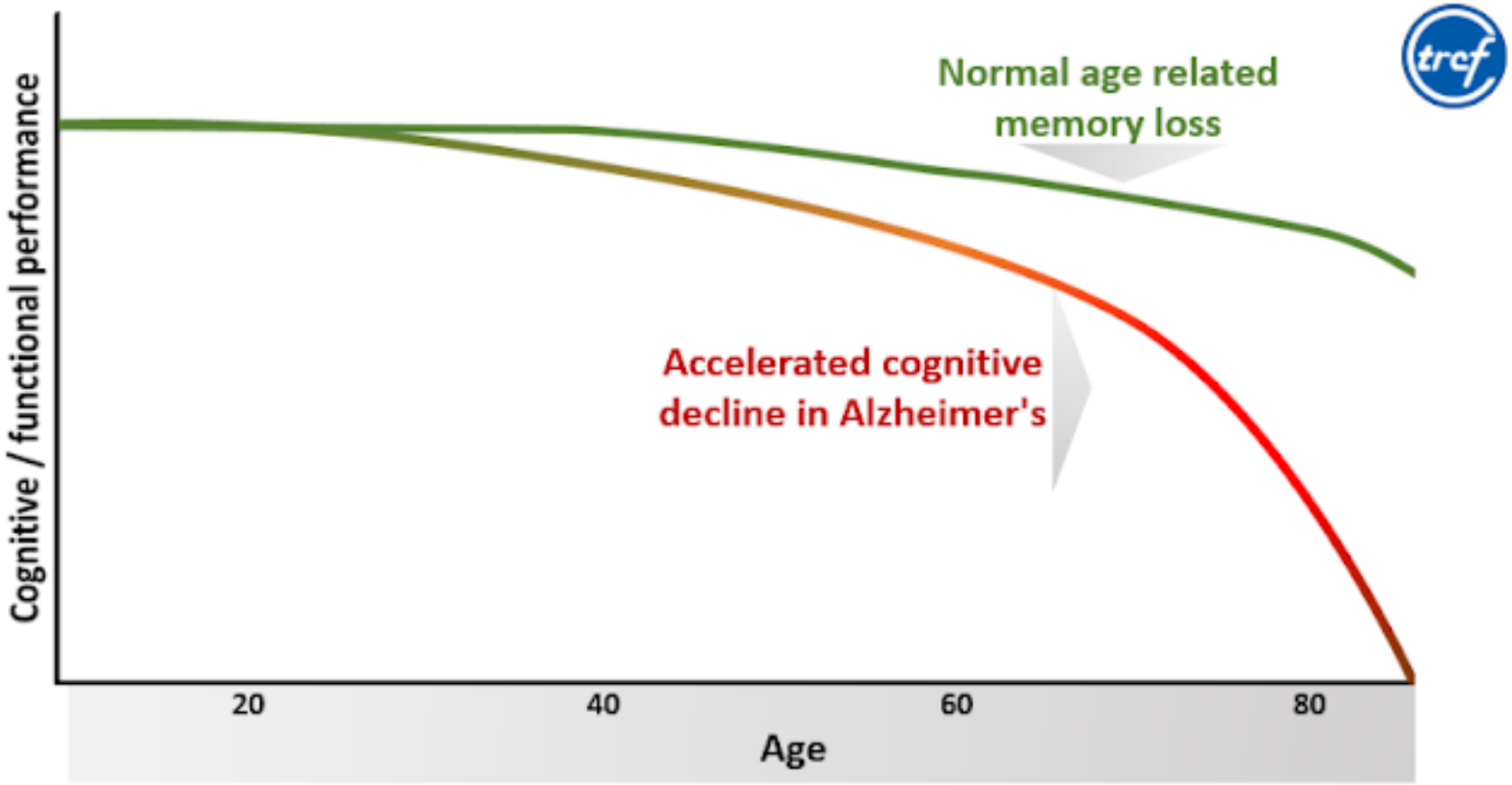
“Everything”

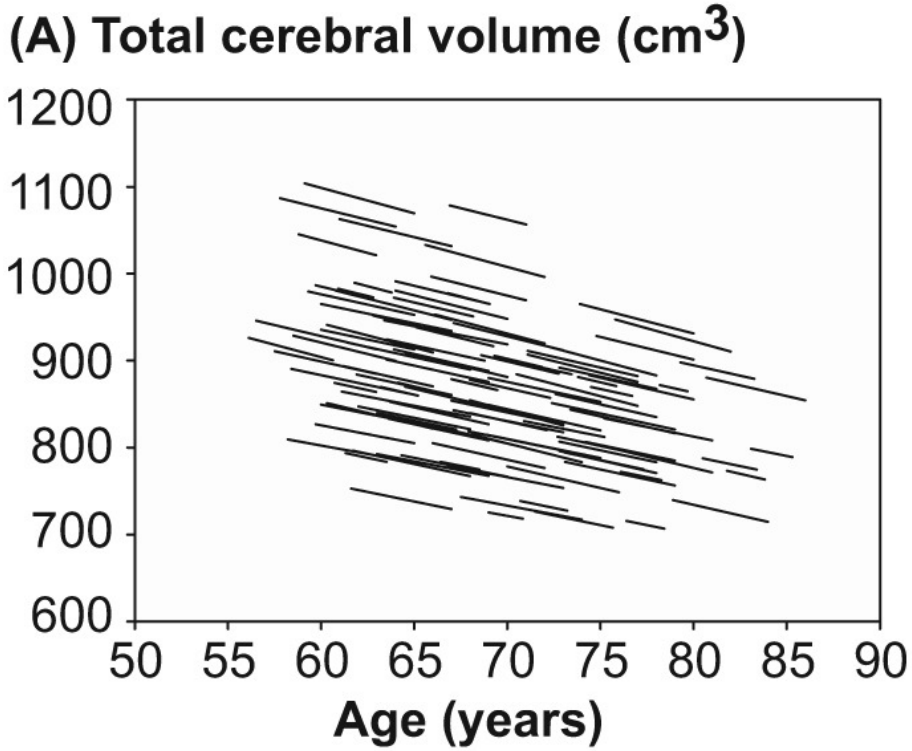
- Neural processing speed – especially for rapid complex decision-making and reaction time
- Mental flexibility
- Vision (cataract) and Hearing (presbyacusis)
- Physical mobility
- Physical conditions (cardiovascular, renal colic, prostate problems disturbing sleep)
- Fatigue vs endurance

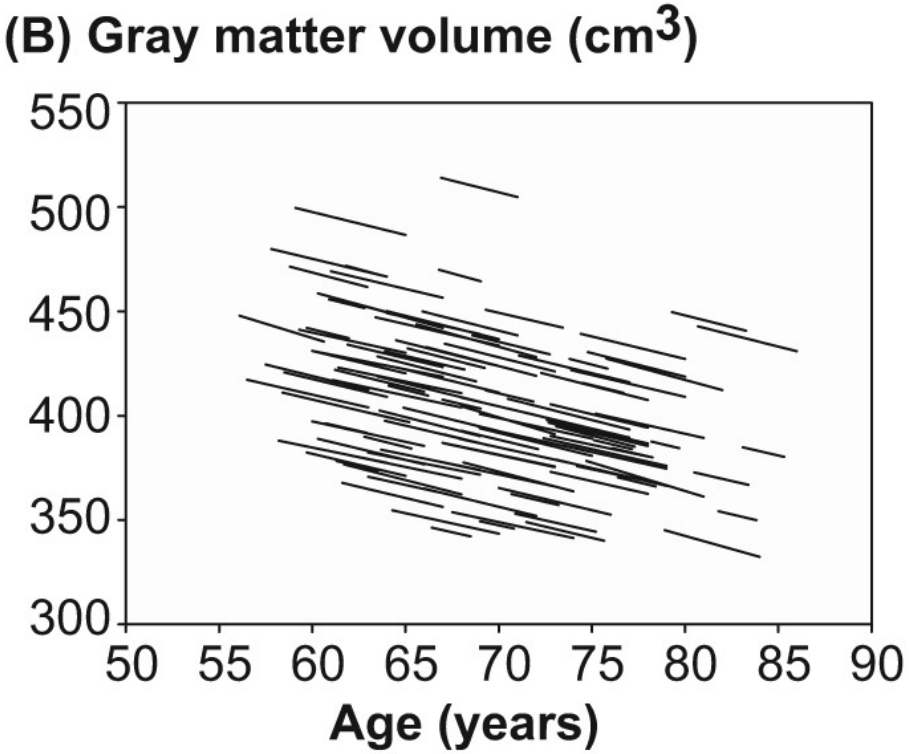
Individual Variation




Male Masters Sports Performance Decline
Running
Cycling
Swimming
Weightlifting
Rowing
Triathlon
Walking
Jumping
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
-
30
40
50
60
70
80
90
100
Age (years)


Normal age related
memory loss
Accelerated cognitive
decline in Alzheimer's
Cognitive / functional performance
20
40
60
80
Age

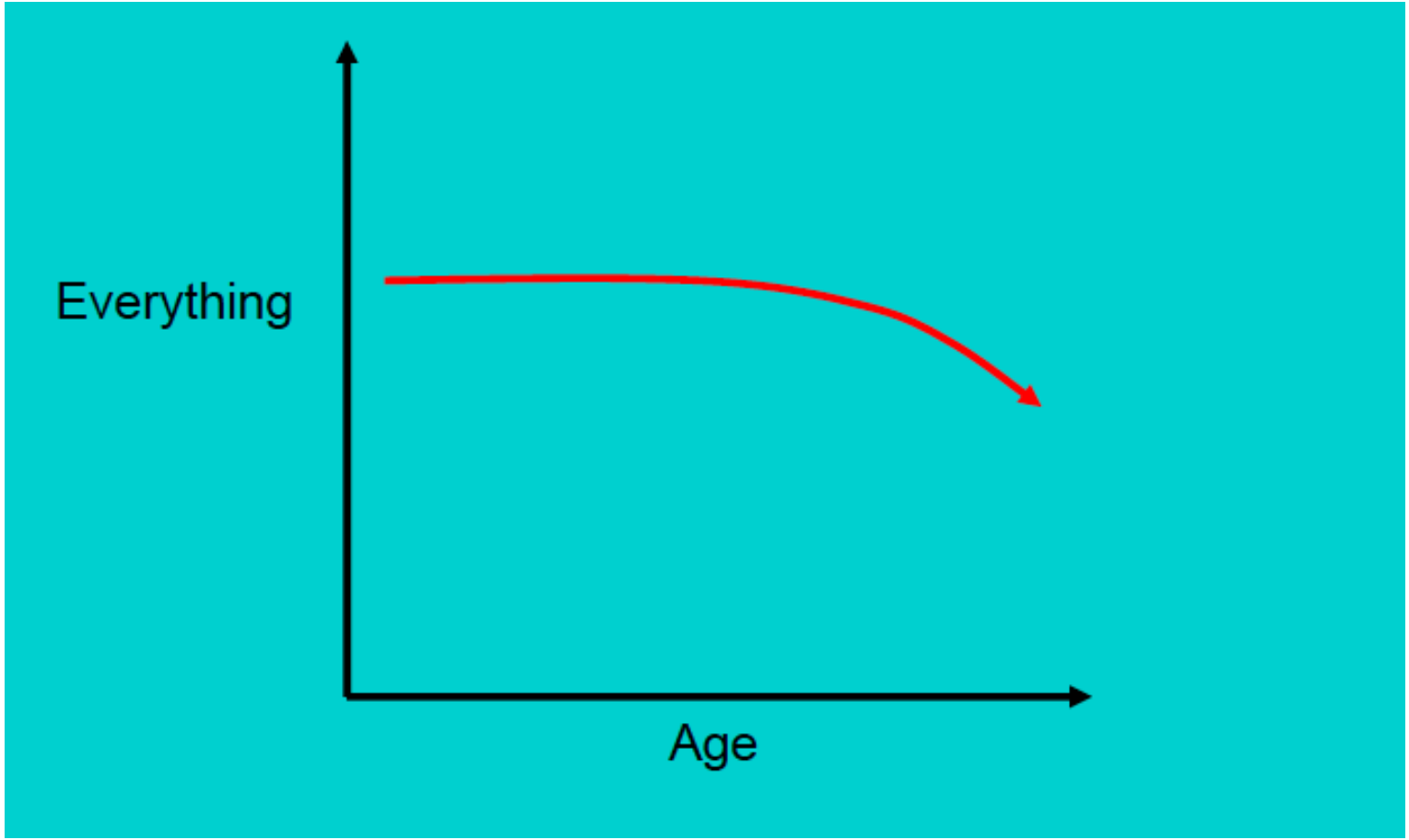




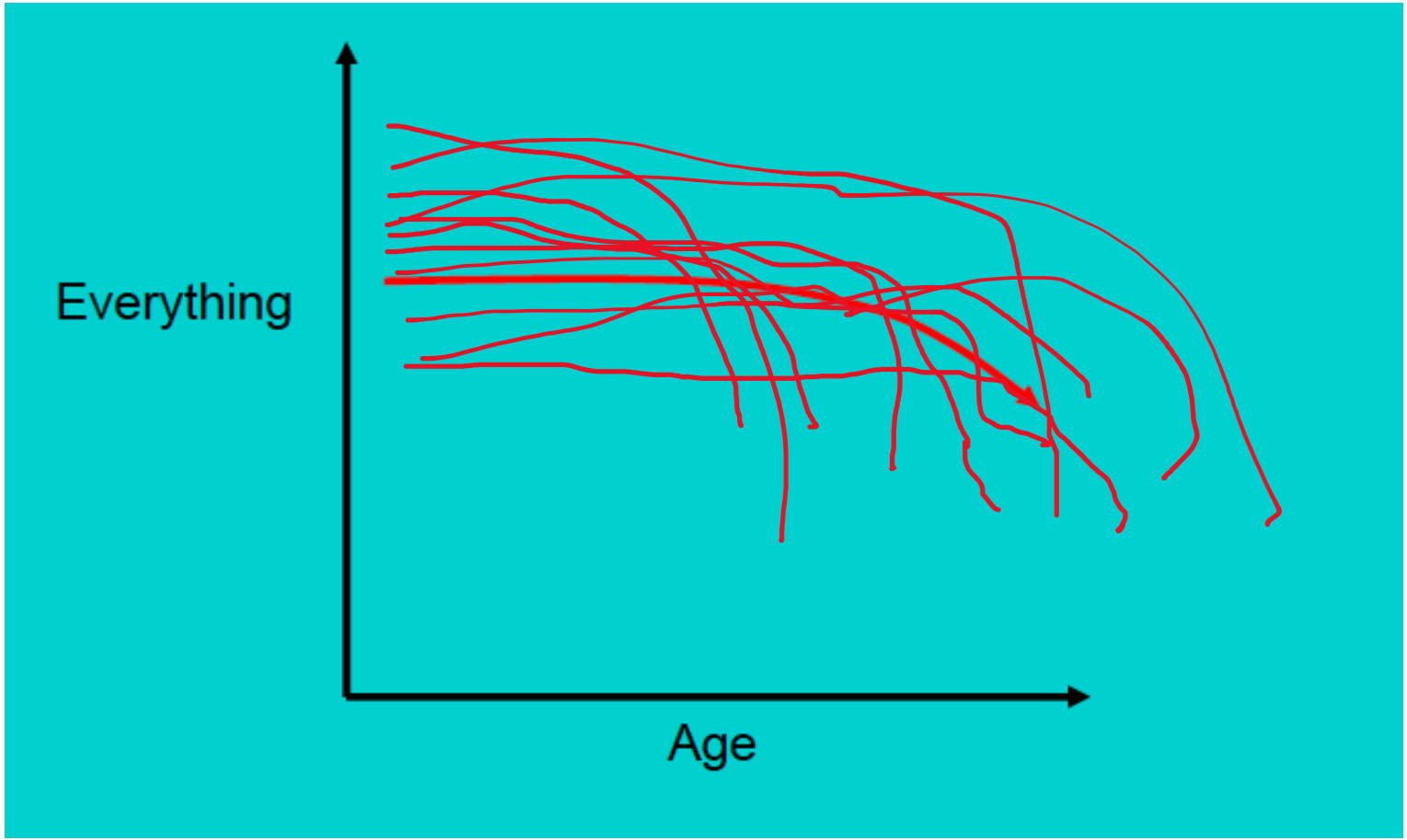
Decline in processing speed but not executive function, attention and memory. Faster cerebral and white matter atrophy were related to faster decline in verbal memory.

Leong RLF et al. Longitudinal brain structure and cognitive changes over 8 years in an East Asian cohort (2017) Neuroimage 147: 852-60
https://doi.org/10.1016/j.neuroimage.2016.10.016

The Biology



The Biology



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EASA
European Union Aviation Safety Agency

Final Report EASA_REP_RESEA_2017_1

Research Project:

Age Limitations Commercial Air Transport Pilots

CURRENTLY - Commercial Air Transport Pilots

- ↗ SINGLE PILOT Ops to AGE 60
- ↗ MULTICREW Ops to AGE 65

Analysed mainly risk of incapacitation in flight

- ↗ Mostly not preventable (GI, LASER, headache)
- ↗ Severely under-reported

Main Findings

- Loss of medical certification (“grounding”)
  - in 6 EU States
  - Clear increase with age (51-60 vs younger)
  - 19% cardiovascular conditions

- Considering effectiveness of cardiovascular screening and risk prediction….

Caution

“Although not in the context of the current research in which only total incapacitation was to be considered, it should be considered that inadequate pilot performance is a causal factor in 35-75% of accidents. Considerations concerning age limitations should therefore not solely be based on the medical fitness, but also on other aspects like individual cognitive and sensory performance in order to generate a more complete picture of the pilot’s ability to fly safely.”

Recommendations

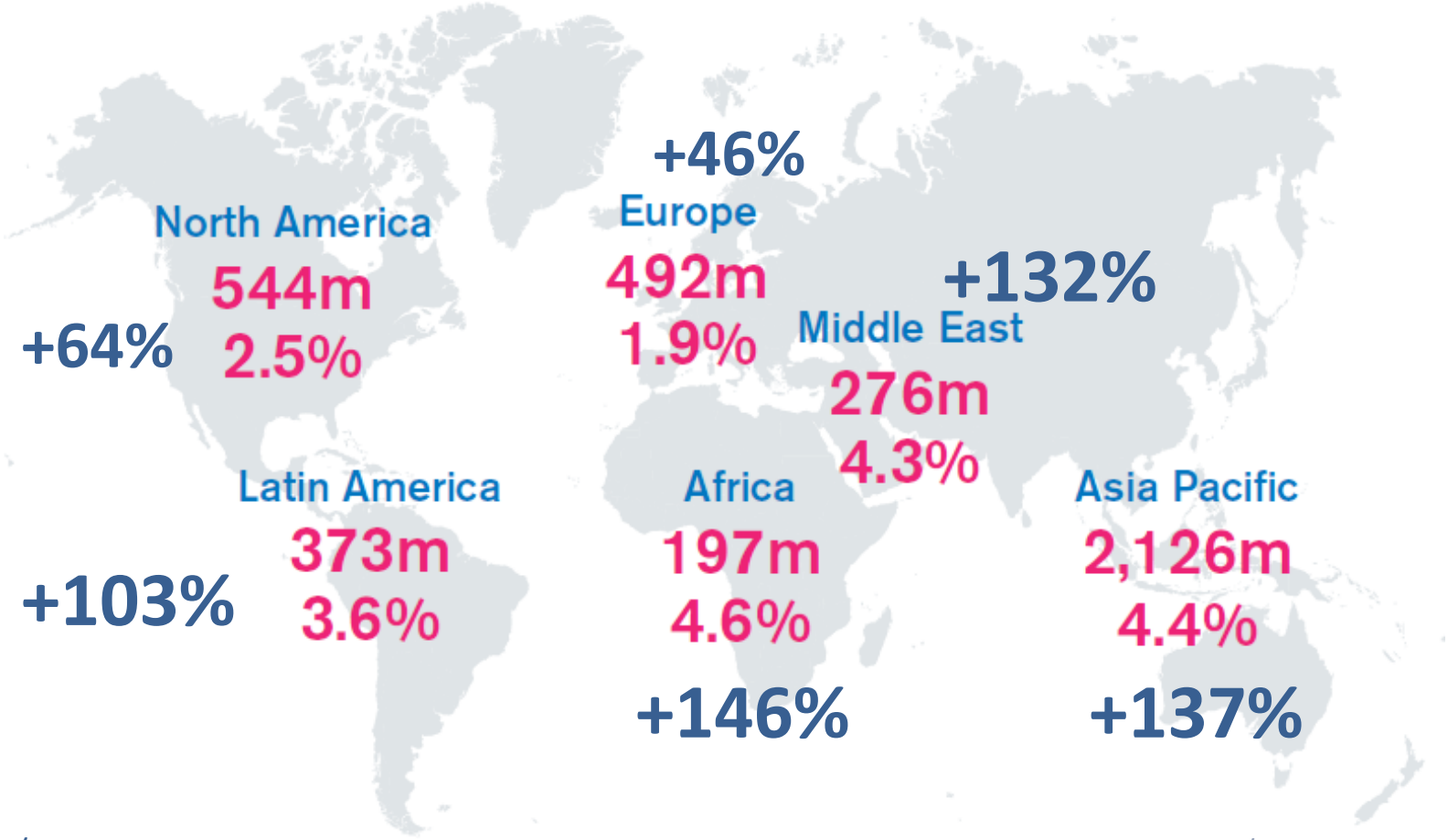
- ↗ Increase Single-pilot limit to 65
  - ↗ Add increased screening after age 60
  - ↗ Including Coronary CT Angiography/Calcium Score
  - ↗ Proficiency check or Simulator check 6-monthly
- ↗ Maintain Multi-pilot limit at 65, gather more data
  - ↗ What happens to the pilots who stop flying
  - ↗ Incapacitation events
  - ↗ Assessments of cognitive performance (line/sim)

Since the age 60 limit introduced

- ↗ Pilots are living longer
- ↗ Incapacitation training introduced in 1970s
- ↗ Aircraft are less demanding to fly
- ↗ Various protections in-built
- ↗ Therefore the risk of an incapacitation cause accident is less

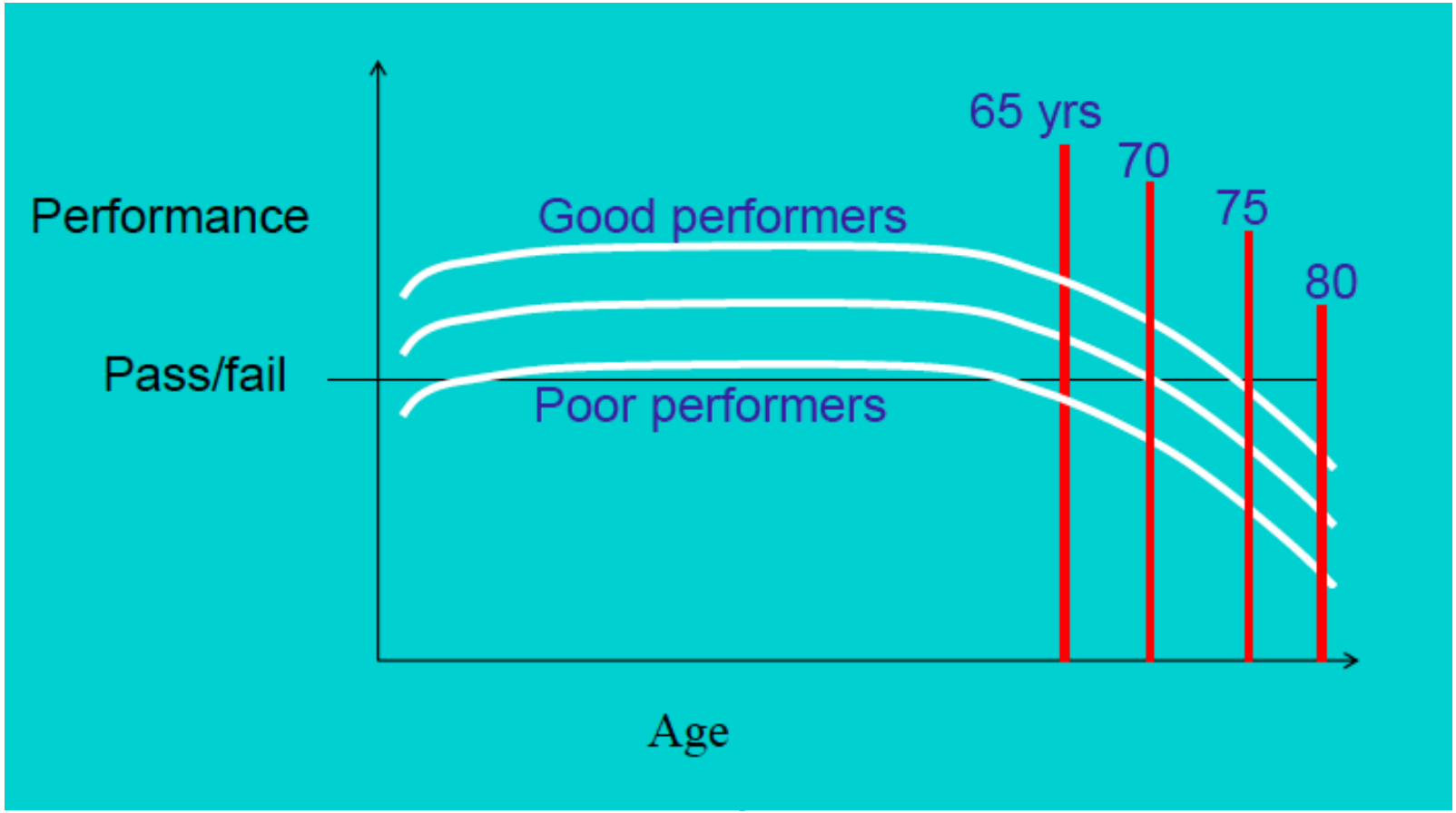
Evans 2006

20-year passenger growth outlook (2017-37)



Source: IATA/Tourism Economics

Individual Variation



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4 April 2019