

# Is the cabin environment safe?

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# Multiple Layers of Safety Throughout the Journey



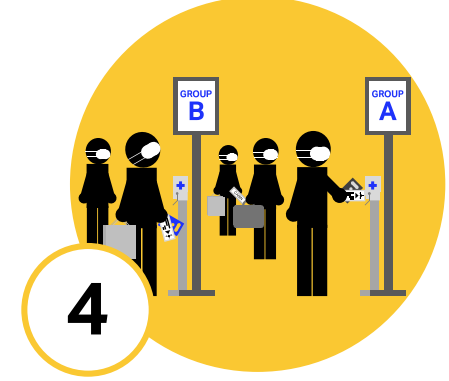
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**Health screening** including self-declaration and temperature screening



**2**  
More **contactless and self-service** processes



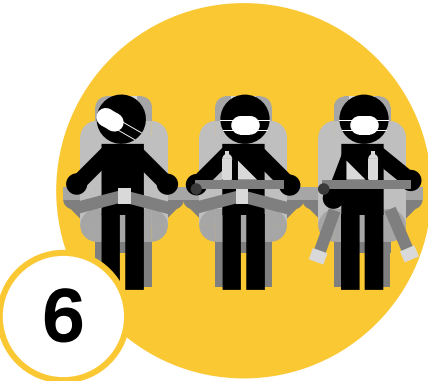
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More frequent and deeper **cleaning and sanitization** in airport and aircraft



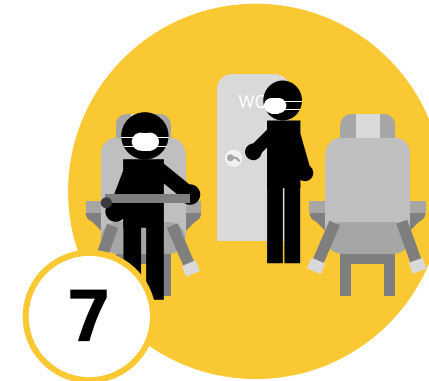
**4**  
**Physical distancing** at the airport where possible



**5**  
**Mask wearing** for passengers and crew



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**7**  
**Limited movement** during flight to avoid passengers congregating



**8**  
**Contactless procedures** for customs and border protection

# What are passengers saying?

- **86% say that they felt safe when traveling**
  - Survey sample was of people who had traveled since June
- But **mixed messages on cabin air quality**
  - 60% say that cabin air is as clean as a hospital
  - 60% say that cabin air is dangerous
  - And their biggest concern is catching COVID-19 from the person next to them

Is this concern evidenced by the number of cases of onboard transmission?



# Flight-associated spread: up to 44 people in 2020 (1.2 billion pax)

Sector	Author	Month	Primaries	Secondaries	Comment
Guangzhou-Toronto	Schwartz	Jan	1	0	
Singapore-Hangzhou	Chen	Jan	15	1	Possible
Bangui-Yaounde	Eldin	Jan	1	1	Possible (by exclusion, questionable assumptions)
Tel Aviv-Frankfurt	Hoehl	Mar	7	2	Possible
Various-Greece	Pavli	Feb-Mar	21	5	Includes 1 cabin crew, 891 traced
Milan-Seoul	Bae	Mar	7	2	Probable, masks worn, asymptomatic primaries, 1 on the original flight + 1 on a subsequent flight
London-Hanoi	Khanh	Mar	1	15	Probable
New York-Taipei	Freedman	Mar	11	0	Masks worn
Boston-Hong Kong	Choi	Mar	2	2	Whole genome sequencing, both cabin crew
Sydney-Perth	Speake	Mar	3	11	8 definite/3 probable, whole genome sequencing,
Dubai-Hong Kong	Freedman	Jun-Jul	85	2	Possible, masks worn, 6 flights/1 with secondary
IATA Medical	MAG	Feb-Mar	1100	3	Possible, informal data, includes 2 cabin crew*
CDC	In media	2020	1600	TBD	
Total			2853	44	Includes 6 cabin crew

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See also:

<https://www.nejm.org/doi/full/10.1056/nejmc2001899> Wuhan to Germany

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7055038/pdf/eurosurv-25-8-2.pdf> Wuhan-Thailand

<https://www.nownews.com/news/20200422/4046494/> CI 011

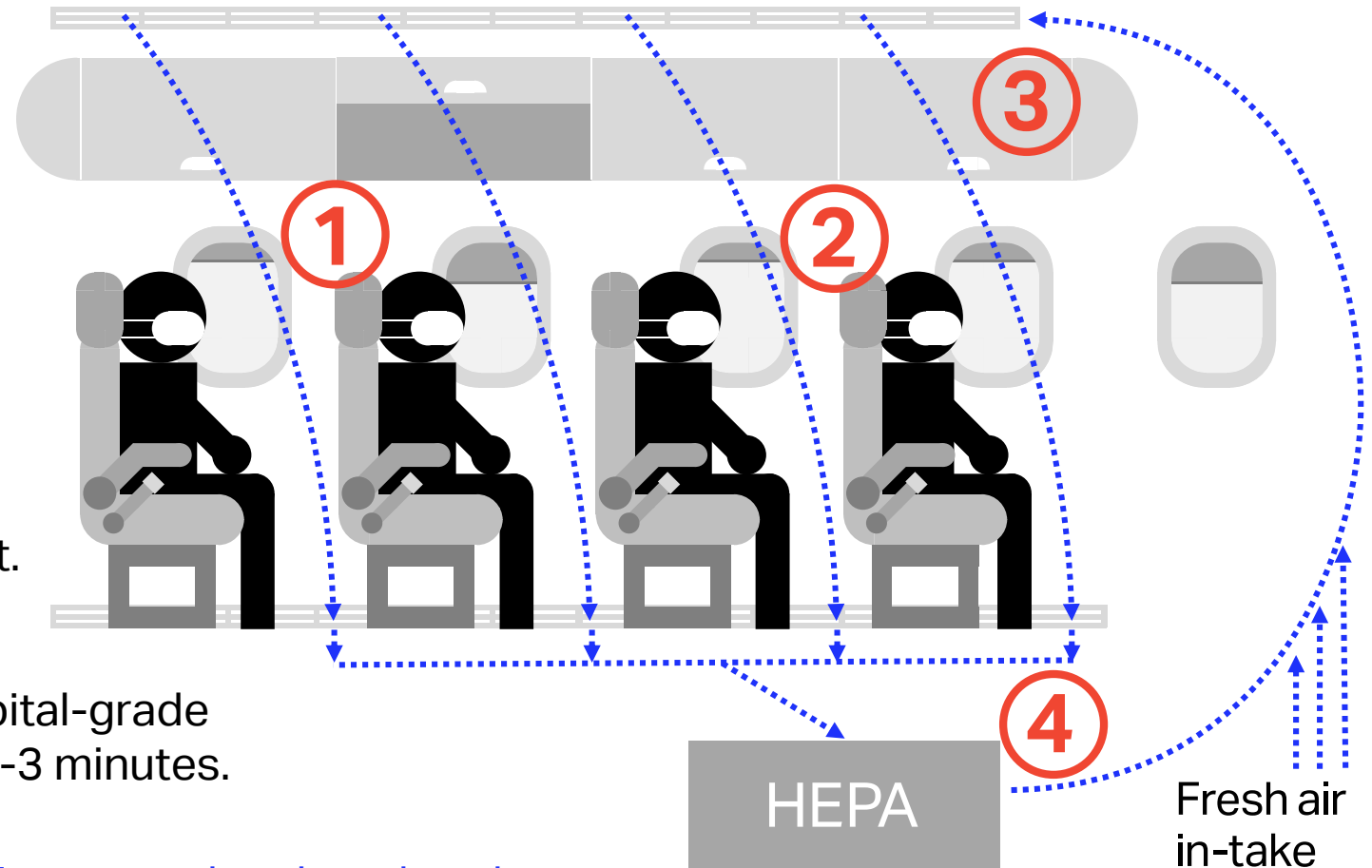
# What does this tell us?

- **44 cases among 1.2 billion**
  - **1 case for every 27.3 million travelers**
- **Even if we missed 90% of infections in this count...**
  - **It would be 1 case for every 2.73 million travelers**

Perhaps the more important question is why is it so rare?

# Factors lowering the risk of COVID-19 transmission onboard aircraft

- ① Seats and passengers face forward meaning limited face-to-face interactions.
- ② Seat backs act as a solid barrier.
- ③ Research to date suggests airflow exchange rates and direction are less conducive to droplet spread than other indoor environments, or modes of transport.
- ④ Modern jet airliners deliver high air flow and replacement rates, combined with hospital-grade HEPA filters. Cabin air is exchanged every 2-3 minutes.



Unlike other modes of transport, the cabin environment already makes the transmission of viruses difficult and we have seen little evidence of onboard transmission.



# Manufacturer's presentations



**Bruno Fargeon**  
**Airbus**



**Dan Freeman**  
**Boeing**



**Luis Carlos Affonso**  
**Embraer**

# What have we learned?

- Risk of COVID-19 transmission on board appears to be low
  - Reflecting design characteristics of the aircraft
  - Enhanced by mask-wearing
- In addition, precautions along the travel experience will help people to travel, safely in the COVID-19 pandemic

# Safety from departure to arrival



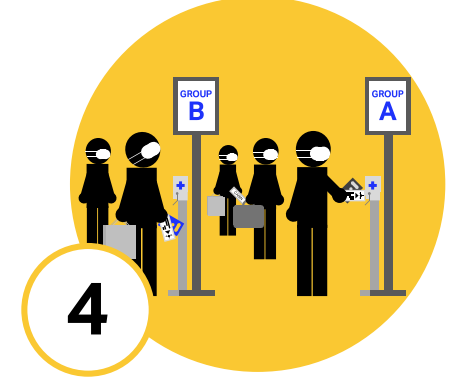
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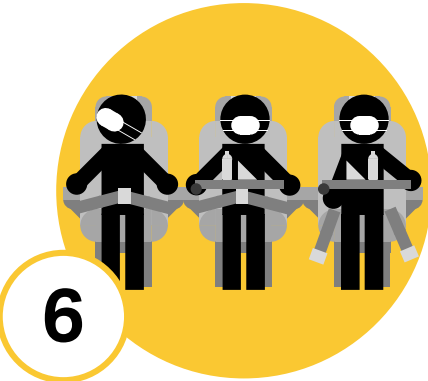
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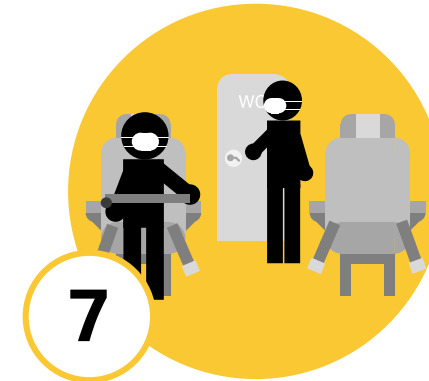
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# Some of the many industry and academic collaborations

