



## COVID-19 and Borders

### Challenges to address:

- Risk of **transmission in-flight** (the whole journey)
  - ICAO CAPSCA and the CART "Take-off guidance"
  - Applies to domestic also
- Risk of **importation by countries**
  - Government decisions on borders, quarantine etc
  - Situation now contrary to IHR

## On board transmission: published studies

Guangzhou-Toronto 22 Jan (Schwartz et al): Canada's 1st case unwell at the time of flight, 25 close contacts (2m and crew) - no secondaries.

Singapore-Hangzhou flight 23 Jan (pre-print Yang et al) 325 pax, 1 unwell, 10 total cases; postulated in-flight spread, but did not exclude pre-flight infection, no evaluation of seating location.

Singapore to Hangzhou 24 Jan (Chen et al) 335 pax, of 16 who tested positive, only 1 may have been infected during the journey.

Bangui CAR – Yaoundé Cameroon 24 Feb (Eldin et al): questionable assumption based on low known prevalence Marseille and CAR

Hezhiang study – March (Qian et al) 11 “definite” cases alluded to, no information

Repatriation flights to Greece (UK, Spain, Turkey) March (Lytras et al): 3.6% PCR +ve: “indicates substantial community transmission in these countries”

Tel Aviv-Frankfurt March: Group of 7 cases with 2 possibly secondaries across aisle

Milan-Incheon 31 March: 7 asymptomatic primaries, one supposed secondary but.....

## On board transmission: other reports

New York – Taipei 31 Mar (public report): 12 people symptomatic at the time, 328 other passengers and crew members tested negative. Masks.

Dubai – Hong Kong 20 Jun (media reports) 26 pax positive. No secondaries (?1 possible). Masks.

IATA Jan-Mar: 70 airlines asked (45% travel), 18 asked directly (14% travel)

- 4 suspected passenger to crew events and 5 suspected pilot-to-pilot
- 3-4 passenger to passenger

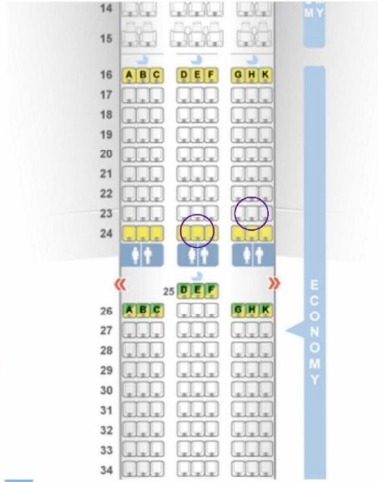
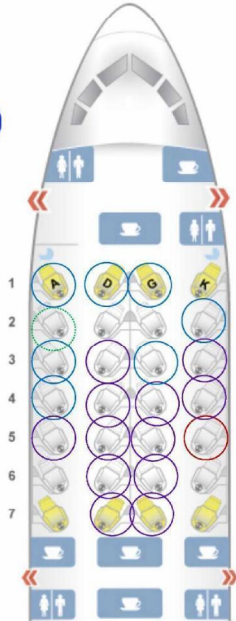
4 worked on in detail

- 1100 confirmed pax (approx. 125K total pax)
- 2 cases pax to crew and 1 pax to pax NB predict approx. 72 based on Shenzhen paper for other spread scenarios)
- Further analysis underway on contact tracing

However two apparent super-spreader events (unpublished).....

# VN54

2 Mar 2020  
B787



SECOND flight investigation:  
A330 – 5 hour flight Mar 2020  
3 primaries, up to 11 secondaries  
(9 definite/probable) based on  
genetic sequencing

- Index case
- Other cases
- Non-case
- Lost to follow-up



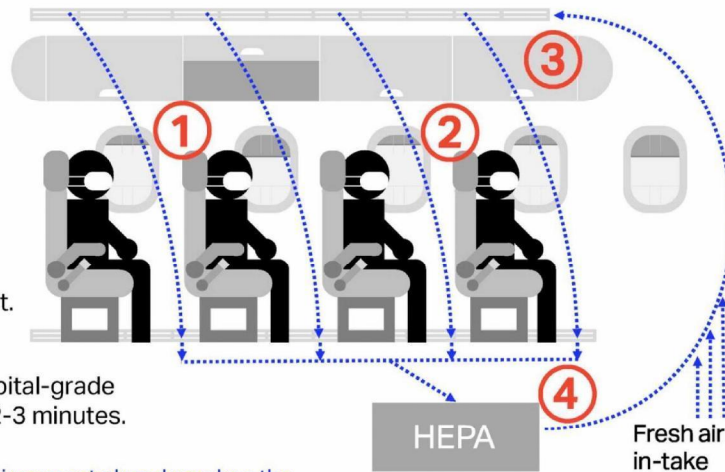
## Factors lowering the risk of COVID-19 transmission onboard aircraft

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.

Comparison: high speed trains in China, looking at over 2300 index cases (Dec-Feb): Average attack rate of 0.32% for close contacts (within 3 rows), with greater risk from closer proximity.



## Risk of importation

*“...it is going to be almost impossible for individual countries to keep their borders shut for the foreseeable future. Economies have to open up, people have to work, trade has to resume. So how do we reopen and how do we re-engage in global commerce and the movement of people and goods and services but do it in a way in which we minimise the risks associated with that, of moving the disease with those people, goods and services?”*

Dr Mike Ryan,  
WHO Press Briefing 27 Jul 20

## Travel Bans cannot continue indefinitely

*“...Then it is about how you de-risk or take the risk out of that process by ensuring that sick people don't travel, by having the proper health checks along the way, that when people arrive in a second country that they're monitoring their symptoms or whatever they're implementing, whatever the rules of that country are.”*

Dr Mike Ryan,  
WHO Press Briefing 27 Jul 20

## Effects of travel and border measures

WTTC 10 Jun: Loss of 197 million jobs in travel and tourism sector in 2020  
<https://wttc.org/News-Article/More-than-197m-Travel-Tourism-jobs-will-be-lost-due-to-prolonged-travel-restrictions>

UNWTO: A loss of USD 910 to 1,170 billion in international tourism receipts in 2020 <https://webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2020-05/Barometer%20-%20May%202020%20-%20Short.pdf>

UNCTAD: USD 1.2 to 3.3 trillion global GDP loss in 2020 due to the break in international tourism  
<https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2810>

And WTO: World trade decline 13-32% and global GDP around 5%  
[https://www.wto.org/english/news\\_e/pr858\\_e.htm](https://www.wto.org/english/news_e/pr858_e.htm)



## IHR re travel measures

Such measures shall not be more restrictive of international traffic and not more invasive or intrusive to persons than reasonably available alternatives that would achieve the appropriate level of health protection.

## WHO EC 4<sup>th</sup> meeting: Advice to State Parties

Implement, regularly update, and share information with WHO on appropriate and proportionate travel measures and advice, based on risk assessments; implement necessary capacities, including at points of entry, to mitigate the potential risks of international transmission of COVID-19 and to facilitate international contact tracing.

## Recommended measures

Measure	IATA	ICAO CART	Comment
Temperature Screening	Yes	Yes	Insensitive – reassuring. ?deterrent
Symptom Screening	Yes	Yes	Ineffective (eg EK380 DXB-HKG 26 cases)
Enhanced cleaning/disinfection	Yes	Yes	
Crew layover measures	Yes	Yes	
Passenger contact tracing	Yes	Yes	
Airport measures – distancing, contactless steps, sanitizing, etc	Yes	Yes	
Physical distancing on board	No	No	Unsustainable and probably unjustified
Face coverings (source control)	Yes	TBA	Reduce forward droplet displacement 90%
Quarantine	No if...	-	Effective but 83% would not travel
Antibody testing/immunity pass	No	No	
COVID-19 testing	Yes	TBA	Likely to be crucial to progress

# COVID-19 Testing: Key Considerations

## **Efficacy**

RT-PCR "gold standard" - can filter out nearly all infectious passengers

RT-LAMP has potential for very large reduction in passenger risk >10x

Antigen tests less reliable but faster

Others coming eg epigenetic tests, daily low cost test

## **Speed (at scale)**

Major challenge if intended to be used in an airport setting

## **Acceptability**

Saliva less invasive, can avoid need for HCW and PPE

## **Cost**

## Quarantine and testing

### **Assess risk at destination and origin:**

- Current infection rates, relative to population size;
- Trend in infection rates (decreasing, stable, increasing) compared to a previous time period;
- Effectiveness of overall public health response to COVID-19 in each country.

### **Coming from lower to higher risk:**

- No rationale for quarantine (traveler presents lower risk than community)

### **Similar risk:**

- Risk similar, but if add a negative test, risk lower than either community

### **Higher risk:**

- Can quarantine be avoided or reduced by strategic testing?

## Key Considerations: When to Test?

- **On arrival**
  - Risks unexpected quarantine for traveler and companions
- **On departure (at airport)**
  - Risk last minute cancellation for traveler and companions
  - Time, space and performance constraints
- **Prior to departure**
  - Allows a period of incubation beyond: ~10%
  - Removes complications at the departure airport
  - Relies on:
    - Mutual recognition between origin and destination countries
    - Secure protocol for data transfer between governments

## Example: Iceland

Testing at the border as an alternative to a 14-day quarantine.

Between 15 June and 14 July

- 36 738 tests performed.
- 84 positive samples

All positive samples analysed to determine if they indicate an active infection or a prior infection

- 12 found to be contagious
- 71 (86%) had antibodies,
- 1 under examination at time of study.

Since then 125 cases –

31 July second test requirement introduced (after 4-6 days with special precautions

St Vincent – similarly added 5 day delay

**Underlying assumption:**  
Tourists unlikely to become major sources of contagion, as limited interaction with the local population

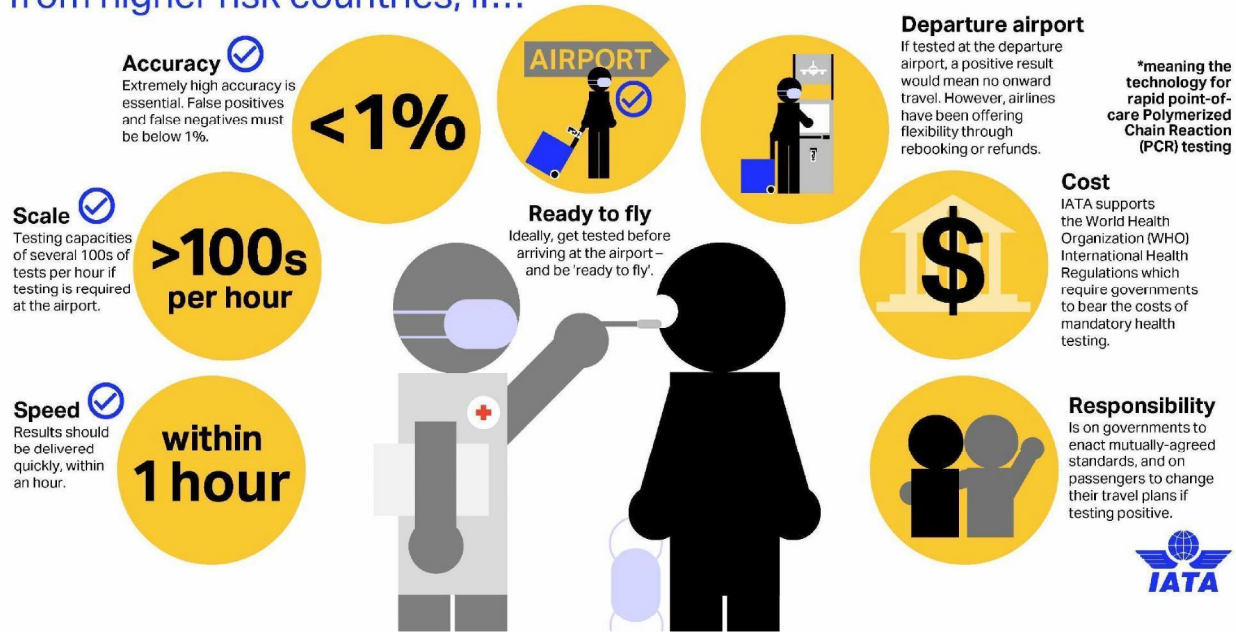


## Example: Singapore

### **SafeTravel – for business travellers to Singapore from China and Malaysia**

- Pre-departure (48h) AND post-arrival COVID-19 PCR tests,
- abide by a pre-declared controlled itinerary during their visit, and
- download and use TraceTogether contact tracing app for entire period of stay.
- reciprocal travel is similar... results???

## COVID-19 testing\* could be a useful layer of protection for travelers from higher risk countries, if...





## Questions and Discussion

- Perspectives on the biosafety measures. What have we missed?
- How to balance the risks of border restrictions against the risk of importation?  
Is it acceptable to just wait?
- Thoughts on the role of testing as a way ahead?
- How to approve, verify and fraud-proof pre-flight tests?
- Can quarantine be avoided in some cases, using testing?
- Can quarantine be reduced or made smarter in other cases?
- Are your States (doing quarantine and testing) collecting data on rates and timing of positive tests during quarantine?
- What's happening now with border measures?
- How do we "close the loop" between public health and airlines on contact tracing?
- What is the definition of recovered? Do discharged patients require a test?