

Pre-Departure Screening for Coronavirus...Part of the Solution for Airlines?

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BACKGROUND

There are currently seven Coronaviruses that can cause human respiratory diseases, but only SARS-CoV, MERS-CoV, and SARS-CoV-2 (i.e., COVID-19) have caused large outbreaks with high mortality. On January 30, 2020, the World Health Organization (WHO) declared the prevalence of COVID-19 a Public Health Emergency of International Concern (PHEIC).¹¹ While advances are being made daily in controlling the transmission of Coronavirus during air travel, this update will focus on the status of passenger pre-departure testing.

COVID-19 AND AIRLINES

The risk of coronavirus infection during air travel, while still somewhat uncertain, can be mitigated when recommended public health procedures are followed.¹³ To minimize the risk of transmission of coronavirus during air travel, airlines can screen or test passengers before flight, physically distance them while embarking and disembarking, provide physical barriers and limit access to aisles and restrooms during flight, and disinfect aircraft between flights. However, the effectiveness of symptom-based screening is limited because people with COVID-19 may have no symptoms at the time of screening, possibly allowing asymptomatic infected passengers to board.^{1,9,17}

The International Air Transport Association (IATA) conducted a recent survey that showed that 83% of passengers said they would not travel if there was a chance of being quarantined at their destination, although 88% of passengers agreed they would be willing to undergo pre-departure testing. Airlines have called for pre-departure COVID-19 testing for international passengers in the hopes of replacing quarantines, and many companies have introduced rapid antigen tests that are affordable and can be administered by non-professional medical staff.⁵

TESTING

The two broad categories of tests are diagnostic tests and antibody tests. Diagnostic tests detect whether there is an active viral infection. Currently there are two types of diagnostic tests (reverse-transcriptase polymerase chain reaction - RT-PCR) that detect the virus's genetic material, and antigen tests that detect specific proteins on the surface of the virus.⁶

Presently, nasopharyngeal (NP) swabbing, followed by nucleic acid amplification testing (NAAT) RT-PCR is recognized as the gold standard for detection of SARS-CoV-2 infection, but it requires specialized materials, special equipment, trained personnel, and laboratory analysis.^{4,8} Although recent studies have demonstrated

that saliva-based testing may be a viable alternative to NP and oropharyngeal swabbing,¹⁶ due to the increased cost, turn-around time, and laboratory requirements for RT-PCR, more rapid, less expensive alternatives have been sought.

There are two major categories of rapid tests: SARS-CoV-2 rapid molecular tests (e.g., RT-PCR or RT-LAMP) and SARS-CoV-2 rapid antigen tests. Rapid molecular tests detect viral RNA, while rapid antigen tests usually detect SARS-CoV-2 antigens.⁸

Compared with RT-PCR, rapid antigen detection tests are relatively easy to produce, cheaper, easier to use, with faster turn-around times, and depending on the assay do not require dedicated equipment or laboratory analysis.²¹ While antigen tests can provide a diagnosis faster than RT-PCR tests, antigen tests have a greater chance of a false negative.⁶

The CDC recently changed its recommendations to include testing to reduce the risk of travel-related transmission of COVID-19,^{1,2} and the ICAO Council Aviation Recovery Task Force (CART) has been developing guidance on the inclusion of testing as an element of the overall risk management process. In addition, in October the CDC promulgated new interim guidance strongly recommending masks be worn by passengers and employees on all forms of public transportation in the United States.³

PRE-DEPARTURE TESTING

A September 22nd IATA media brief stated that quarantine measures were harming the industry's recovery and suggested the alternative was systematic testing of passengers before departure.⁵ The goal of pre-departure testing would be to limit the potential transmission of COVID-19 during air travel. While testing is not universally recommended by public health authorities as a routine screening method, within days of the September 22nd IATA media brief, six major airlines offered pre-departure passenger testing for COVID-19,²⁰ most beginning on October 15th.^{7,10,12,14,18,19,22}

CONCERNS WITH PRE-DEPARTURE TESTING

Significant challenges to the airlines' decision to conduct pre-departure Coronavirus testing have been raised, mainly that testing is not supported by the currently available technology. Additionally, a negative test result may not rule out whether an



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individual is infected. A passenger may become infected during the period between sampling and departure, which would return a negative test result, suggesting the absence of infection when the passenger is not free from infection. Conversely, a false positive test result could prevent an uninfected passenger from boarding.¹⁵

Operational concerns related to pre-departure testing could include possible crowding at airport testing sites, leading to increased exposure and the risk of additional cases, and logistical and financial issues such as reimbursement of airline ticket costs and unplanned accommodation costs resulting from a positive test.¹⁵

SARS -CoV-2 has reached world-wide pandemic proportions and is now considered to be a community spread disease. It must be assumed that there will frequently be infected passengers who present for boarding, some of whom could be asymptomatic.¹

CONCLUSION

Unfortunately, at the time of this writing, it is too soon to tell whether the use of pre-departure testing will reduce the requirement to quarantine at destination or have an impact on in-flight transmission. We are still awaiting final recommendations from the ICAO CART. If successful, however, it could be an additional risk mitigation measure, keeping in mind that no single measure can provide a complete solution.

As we approach a very different holiday season please stay safe, take care, follow the CDC/WHO guidelines, and have a Happy New Year!

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