

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

Charles DeJohn, D.O., M.P.H.

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



CONTACT DETAILS:

Email: President@asma.org • **Web site:** www.asma.org • **Facebook:** Aerospace Medical Association • **Twitter:** @Aero_Med

Reprint & Copyright © by the Aerospace Medical Association, Alexandria, VA.

DOI: <https://doi.org/10.3357/AMHP.9112PP.2020>

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!

REFERENCES

- Buitrago-Garcia D, Egli-Gany D, Counotte MJ, Hossmann S, Imeri H, et al. Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: a living systematic review and meta-analysis. *PLoS Med.* 2020;17(9):e1003346.
- Centers for Disease Control and Prevention. Federal government adjusts COVID-19 entry strategy for international air passengers. [Accessed 9/25/20]. Available from: <https://www.cdc.gov/media/releases/2020/s-0909-covid-19-entry-strategy-air-passengers.html/>.
- Centers for Disease Control and Prevention. Interim Guidance - Wearing of face masks while on public conveyances and at stations ports and similar transportation hubs. October 20, 2020. [Accessed 10/21/20]. Available from: <https://www.cdc.gov/quarantine/masks/mask-travel-guidance.html>.
- Centers for Disease Control and Prevention. Interim Guidance for Rapid Antigen Testing for SARS-CoV-2. September 4, 2020. [Accessed 10/16/20]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/lab/resources/antigen-tests-guidelines.html#table2>.
- de Juniac A. Remarks of Alexandre de Juniac at the IATA Media Briefing on 22 September 2020. [Accessed 9/30/20]. Available from <https://www.iata.org/en/pressroom/speeches/2020-09-22-01/>.
- Food & Drug Administration. Corona testing basics. July 2020. [Accessed 9/9/20]. Available from: <https://www.fda.gov/consumers/consumer-updates/coronavirus-testing-basics>.
- Genovese D. United Airlines offering rapid COVID-19 tests to passengers. *Fox Business News.* September 24, 2020. [Accessed 9/28/20]. Available from: <https://www.foxbusiness.com/lifestyle/united-airlines-coronavirus>.
- Infectious Diseases Society of America. Rapid Testing. September 4, 2020. [Accessed 10/16/20]. Available from: <https://www.idsociety.org/covid-19-real-time-learning-network/diagnostics/rapid-testing/>.
- Kim N. What Is the Risk of Catching the Coronavirus on a Plane. *Medscape.* September 10, 2020. [Accessed 10/14/20]. Available from: <https://www.medscape.com/viewarticle/937174>.
- Leggate J. Italian airline Alitalia offers COVID tested flights to prevent coronavirus spread. *Fox News.* September 22, 2020. [Accessed 9/30/20]. Available from <https://www.foxnews.com/travel/italian-airline-alitalia-covid-test-flights-coronavirus>.
- Li C, Zhao C, Bao J, Tang B, Wang Y, Gu B. Laboratory diagnosis of coronavirus disease-2019 (COVID-19). *Clin Chim Acta.* 2020; 510:35-46.
- Muts J. German Lufthansa airline plans rapid COVID-19 testing for passengers. *Fox News.* September 23, 2020. [Accessed 9/30/20]. Available from: <http://www.foxnews.com/health/german-lufthansa-airline-plans-rapid-coronavirus-testing-for-passengers>.
- Nir-Paz R, Grotto I, Strolov I, Salmon A, Mandelboim M, et al. Absence of in-flight transmission of SARS-CoV-2 likely due to use of face masks on board. *J Travel Med.* 2020; taaa117.
- Palma K. Here are the U.S. airlines offering COVID-19 testing to travelers. *Boston* October 1, 2020. [Accessed 10/6/20]. Available from: <https://www.boston.com/travel/coronavirus/2020/10/01/airlines-testing-coronavirus>.
- Pan American Health Organization. Resuming non-essential international travel in the context of the COVID-19 pandemic - Advice on the use of COVID-19 related testing. October 5, 2020. [Accessed 10/7/20]. Available from: <https://www.who.int/news-room/articles-detail/public-health-considerations-while-resuming-international-travel>.
- Plebani M, Aita A, Cattelan AM, Bonfante F, Padoan A, et al. Frequent testing regimen based on salivary samples for an effective COVID-19 containment strategy. *medRxiv* 2020.
- Pombal R, Hosegood I, Powell D. Risk of COVID-19 During Air Travel. *JAMA.* October 1, 2020. DOI: 10.1001/jama.2020.19108. [Accessed 10/4/20]. Available from: https://jamanetwork.com/journals/jama/fullarticle/2771435?utm_campaign=articlePDF&utm_medium=articlePDFlink&utm_source=articlePDF&utm_content=jama.2020.19108.
- Schmidt A. Hawaiian Airlines offering coronavirus testing to travelers. *Fox Business News.* September 26, 2020. [Accessed 10/30/20]. Available from: <https://www.foxbusiness.com/lifestyle/hawaiian-airlines-coronavirus-testing-passengers>.
- Settembre J. American Airlines rolling out coronavirus testing for passengers. *Fox News.* September 30, 2020. [Accessed 9/30/20]. Available from: <https://www.foxnews.com/travel/american-airlines-passenger-testing-covid-19>.
- Usherwood T, Zhang L, Tripathi A. The Path Forward for COVID-19 Diagnostics. *Mol Diagn Ther.* 2020. Online ahead of print.
- van Beek J, Igloi Z, Boelsums T, Fanoy E, Gotz H, et al. From more testing to smart testing: data-guided SARS-CoV-2 testing choices. *medRxiv* 2020.
- Woodyard C. As American United other airlines roll out passenger testing for COVID here's what you need to know. *USA Today;* September 29, 2020. [Accessed 10/7/20]. Available from: <https://www.usatoday.com/story/travel/airline-news/2020/09/29/airlines-covid-19-tests-what-know-american-united-others/3568884001/>.