



HHS Public Access

Author manuscript

Health Secur. Author manuscript; available in PMC 2024 October 23.

Published in final edited form as:

Health Secur. 2024 ; 22(5): 398–401. doi:10.1089/hs.2023.0130.

Estimated Airline Compliance With Predeparture SARS-CoV-2 Testing for Passengers on Flights to the United States, January 2021 to June 2022

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Abstract

In the early years of the COVID-19 pandemic, unprecedented public health measures were designed and implemented to mitigate the spread of SARS-CoV-2. On January 26, 2021, US Centers for Disease Control and Prevention (CDC) staff began daily audits of documents of arriving passengers at 18 US international ports of entry to ensure documentation of either a negative predeparture antigen or nucleic acid amplification test result for SARS-CoV-2 or recent recovery from COVID-19. This case study briefly describes the results of those audits. The CDC found a very low rate of issues overall. Of the 483,251 passengers selected for audit, 2,142 (0.44%) had issues with their COVID-19 test documentation and 1,182 (0.24%) provided documentation of recovery from COVID-19 rather than a negative test result. The low rate of issues noted during traveler audits indicated airlines were largely compliant with the order. However, the burden of SARS-CoV-2 infections within the United States was high during much of this period, which suggests that implementing a predeparture testing requirement earlier in the pandemic might have had more impact on spread. Digital solutions could reduce the burden of similar interventions in the future on airlines, public health authorities, and other partners.

Keywords

SARS-CoV-2; COVID-19; Epidemic management/response; National strategy/policy; Public health preparedness/response; Ports of entry; Travel health

Introduction

The COVID-19 pandemic gave rise to unprecedented public health measures designed to mitigate the spread of SARS-CoV-2, the virus that causes COVID-19. One example was an order issued January 12, 2021, amended January 25, and finally signed December 2 by the US Centers for Disease Control and Prevention (CDC).¹ This order required that all international airline passengers arriving in the United States provide a negative predeparture antigen or nucleic acid amplification test result for SARS-CoV-2 obtained within a specified time period prior to departure (initially 3 days, later reduced to 1 day), or, alternatively, provide documentation of recent recovery from COVID-19 (within the past 90 days) as defined in the order. The order applied to all passengers ages 2 years and older boarding a flight bound for the United States and departing from any foreign country, unless they met the criteria for a limited number of exemptions. Airlines and other aircraft operators were required to confirm that all applicable passengers were compliant with the order. Procedures for verifying test results varied from airline to airline with regard to timing as well as the systems used for verification.

On January 26, 2021, when the amended order became effective, CDC staff at 18 US international ports of entry began daily audits of compliance by checking the documents of arriving international passengers for evidence that they had adhered to the requirements.

The audits continued until the CDC rescinded the order on June 12, 2022.² This case study summarizes the results of the audits conducted from January 26, 2021, to June 11, 2022.

Audit Process

During each day of the audit period, a convenience sample of flights was selected based on CDC staffing availability and country-specific SARS-CoV-2 case counts. For each selected flight, audits were performed on 10% to 15% of the total passengers or on a minimum of 5 passengers, depending on the total passenger volume of the flight. On flights with more than 5 passengers, CDC staff selected every other passenger, every third passenger, or every fourth passenger as they disembarked the flight, to achieve the desired percentage of audits. Crew members on duty, military personnel on orders, and federal law enforcement officers on official duty were exempt from the testing requirement and thus also exempt from the audits. This selection process was described in the amended order.¹

During the audits, CDC staff checked for compatibility between SARS-CoV-2 testing and personal identification documents (eg, the same name plus birth date or other identifier on both documents) and for testing dates within the prescribed time window. For passengers without a negative test result, CDC staff checked that the passenger had documentation of recovery (comprising a positive SARS-CoV-2 test result on a specimen collected no more than 90 days before the flight plus a letter signed by a licensed healthcare provider or public health official stating that the person had been cleared to travel) or, alternatively, documentation of a humanitarian or emergency exemption issued by the CDC. Passengers with inadequate documentation were asked for additional information, including contact information and brief travel history, and CDC staff recorded a description of the identified testing issue. The CDC then shared information on travelers noted to have issues with their documents with the local health department of jurisdiction, based on the traveler's reported final destination, for further management.

The audits also included the collection of flight information, including departure and arrival dates, times, and locations; carriers; flight numbers; and numbers of passengers and crew members on board. Data collected during the audits were entered into the CDC Port Health Activity Reporting System and were analyzed descriptively and visualized using Power BI (Microsoft, Redmond, WA). The data analyzed and reported here were collected as part of public health operational response work consistent with applicable federal law and CDC policy.

Audit Findings

From January 26, 2021, through June 11, 2022, a total of 20,123 flights were selected for audit. These flights carried 2,845,452 passengers, representing approximately 0.5% of 98,109,850 total international inbound passengers entering the United States during this time period.^{3,4} Of the passengers on the flights selected for audit, 483,251 (17.0%) individuals were selected for audit. The selected passengers originated from 186 countries and arrived on 152 different commercial airlines.

Of all the passengers selected for audits, only 2,142 (0.4%) had issues with their COVID-19 test documentation. The most commonly recorded issues were lack of testing documentation (n=765, 35.7%), testing documents that lacked secondary identifiers (eg, date of birth, age, passport number; n=588, 27.5%), mismatched identifiers (eg, name on testing document did not match name on personal identification; n=228, 10.6%), and testing dates that preceded the prescribed time window (n=212, 9.9%) (Figure). Notably, the prescribed time window was modified in November 2021 to require a negative test result within 1 day of departure instead of 3 days, yet no change was seen in the number of issues found during audits before and after this change in requirements. Documentation of recovery from COVID-19, rather than a negative test result, was presented for 1,182 (0.2%) audited passengers, and this proportion also remained consistent over the course of the analysis period.

Limitations

A modeling study done prior to this analysis suggested that predeparture testing, when used as part of a layered strategy to mitigate transmission, might lead to reducing SARS-CoV-2 positivity rates among incoming travelers.⁵ However, while the overall audits conducted by the CDC between January 2021 and June 2022 found a very low rate of noncompliance with testing requirements, the burden of SARS-CoV-2 infections in the United States was high during much of this period, as were the number of travelers on commercial aircraft presumed to be infectious during their travel.⁶⁻⁸ The low rate of issues found among travelers selected for audits likely reflects high compliance of airlines with the order. It is possible that the predeparture testing requirement might have had more impact on spread if implemented earlier in the pandemic; however, testing capacity in the United States was limited at that time and a testing requirement might not have been feasible. Digital solutions to increase operational efficiency and minimize fraud, such as electronic test results directly linked to traveler tickets or reservations and automated results, might also have had an impact.

We note at least 3 limitations to the data used in this evaluation. First, the CDC audits relied on a small convenience sample, which may not have been representative of all travelers entering the United States during this time. Second, there was no mechanism for airlines or CDC staff to detect when passengers presented fraudulent documentation. Third, no information was available about people who did not travel to the United States as intended as a result of the CDC's order, whether due to inability to obtain a test result within the specified time period, inability to obtain documentation of recovery from COVID-19, positive test results for SARS-CoV-2 at predeparture, or denial of boarding by the airline for failing to meet the requirements.

Additionally, there was no direct way to quantify the extent to which the CDC's January 2021 order led to a decrease in passengers entering the United States while infectious with SARS-CoV-2.¹ However, there is some evidence suggesting that the proportion of travelers arriving with SARS-CoV-2 infection increased when the order was no longer in place.⁶

Conclusion

Estimated airline compliance with this order was high as few audited travelers were noted to have issues with their testing or recovery documentation. The findings of this evaluation highlight the need for more robust information systems and digital solutions to evaluate public health interventions such as the one described here and provide recommendations for decision making and strategy adaptation. Future iterations of similar orders might also benefit from innovative approaches to improve efficiency in documentation review and reduce burden on travelers and airlines.

Acknowledgments

We would like to thank all the CDC Port Health Protection Branch and Travel Risk Assessment and Mitigation Branch staff who carried out these audits as well as the CDC port health station officers in charge for their leadership during the COVID-19 pandemic. Work on this report by ES and JH was supported in by an appointment to the Applied Epidemiology Fellowship Program administered by the Council of State and Territorial Epidemiologists and funded by CDC Cooperative Agreement Number 1NU38OT000297-03-00. The findings and conclusions of this report are those of the authors and do not necessarily reflect the official position of the CDC.

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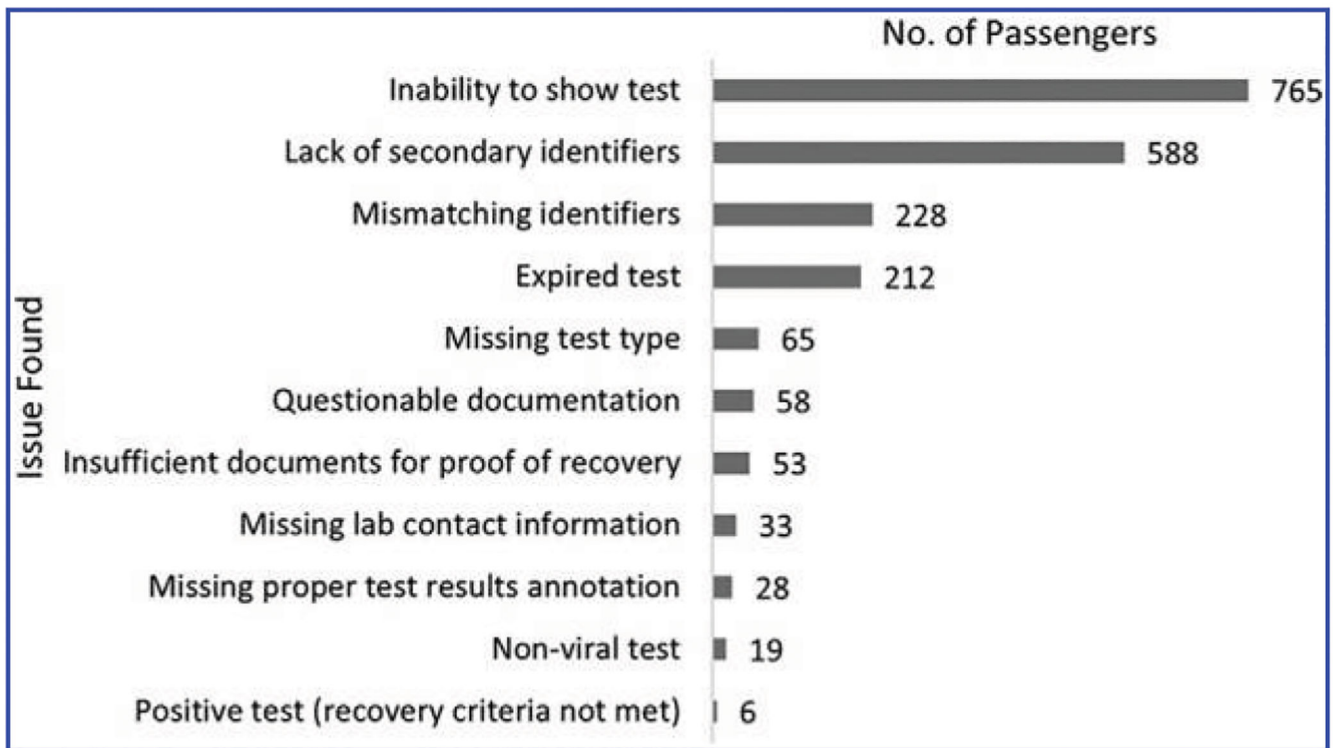


Figure. Issues noted with documentation to meet the requirements of a US Centers for Disease Control and Prevention testing order for international air passengers to the United States during the COVID-19 pandemic, as determined during entry audits conducted January 2021 to June 2022.