

# Alaska performs test-negative analysis of SARS-CoV-2 vaccine effectiveness using routinely collected data

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CATEGORY: Interoperable Data Systems

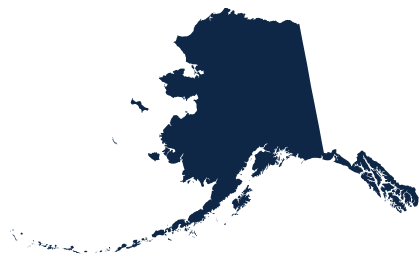
By linking school COVID-19 test results to the immunization information system, Alaska calculated vaccine effectiveness and provided evidence that fully vaccinated individuals were more protected from illness.

During the COVID-19 pandemic, there was great interest in understanding the effectiveness of COVID-19 vaccination. However, assessing vaccine effectiveness can be challenging for many reasons, including because a person's likelihood of getting tested might be associated with their vaccination status. A common method epidemiologists use to help overcome this challenge is to perform a test-negative analysis. In this type of analysis, the vaccination status of people who test positive is compared to the vaccination status of people who test negative. The more effective the vaccine, the more we expect the positive test results to occur among unvaccinated people. Importantly, this design is most valid when everyone in the analysis is getting tested for the same reason, such as having symptoms.



## The “What”

In the spring of 2022, Alaska Division of Public Health (DPH) performed a test-negative analysis using SARS-CoV-2 test results submitted by schools that used SimpleReport, a web-based tool created by the Centers for Disease Control and Prevention (CDC) to facilitate test result reporting to health departments. Schools were able to submit patients' symptom onset date, and that allowed DPH to restrict the analysis to people who were symptomatic. They linked test results to records from Alaska's immunization information system and determined who was up to date on COVID-19 vaccination. In an analysis adjusted for age and calendar day, DPH found that people who were up to date were 61% (95% CI: 44%-72%) less likely to test positive than those who were unvaccinated.



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DPH's analysis found that **fully vaccinated individuals** were **61% less likely to test positive for COVID-19** as compared to those who were unvaccinated.

### The "So What"

A test-negative analysis is a standard way of analyzing vaccine effectiveness and has advantages over alternatives such as analyzing the per-capita incidence of reported cases by vaccination status. This analysis provided evidence that people who were up to date on COVID-19 vaccination had substantial partial protection against symptomatic illness, and this finding was publicly communicated in a report to increase awareness about the impact of COVID-19 vaccination and satisfy a desire for Alaska-specific analyses.



### The "Now What"

This specific analysis is not being performed routinely. It was restricted to reports from school-based testing, so it could not be continued when schools were not in session or if school-based testing programs for SARS-CoV-2 ended. While not a substitute for formal vaccine effectiveness studies that collect additional data (e.g., data on potential confounders such as mask wearing) specifically for the purpose of analyzing vaccine effectiveness, this approach demonstrates the feasibility of using routinely collected surveillance data to generate

preliminary estimates of vaccine effectiveness. Similar techniques could be applied in response to an emerging SARS-CoV-2 variant.

This project demonstrates the value of reporting both positive and negative lab results and including clinical data (e.g., presence of symptoms) with lab reports, and it demonstrates the importance of patient-level linkages of data systems, such as case-based surveillance and immunization information systems.