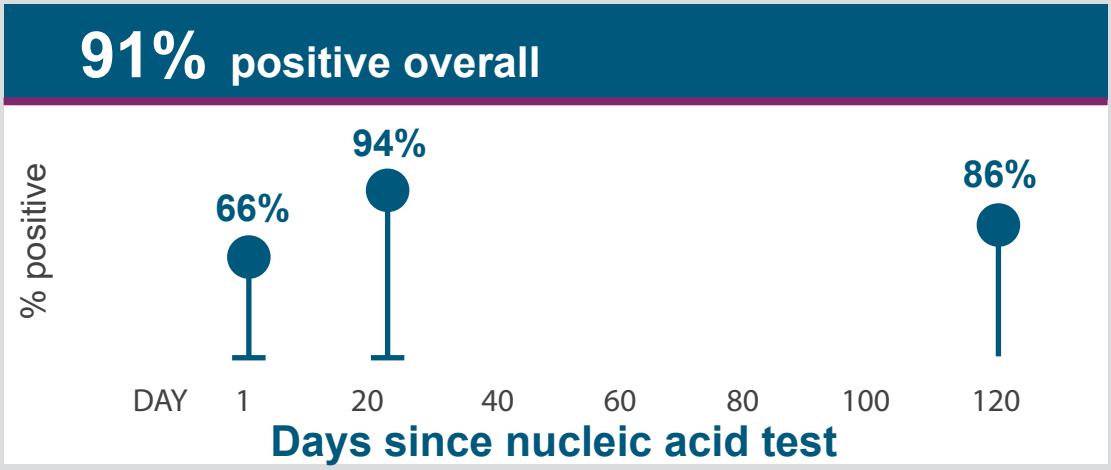
Key Summary of Published Article

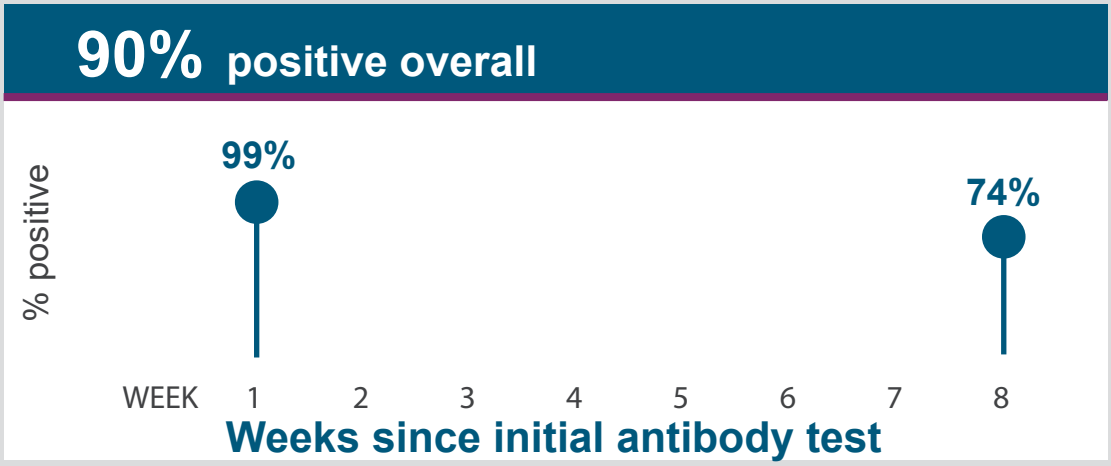
SARS-CoV-2 (COVID-19)
Persistence of Antibody (IgG) Over Time

How often are SARS-CoV-2 antibody (IgG) tests positive after an initial positive nucleic acid or antibody test, and does positivity change over time?

Results of antibody test after positive nucleic acid test



Results of repeat antibody test after initial positive antibody test



SARS-CoV-2 IgG positivity rate is high following a positive PCR or IgG test but depends on the time between tests and wanes over time.

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SARS-CoV-2 (COVID-19)
Persistence of Antibody (IgG) Over Time

Article Title: Insights From Patterns of SARS-CoV-2 Immunoglobulin G Serology Test Results From a National Clinical Laboratory, United States, March-July 2020

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Background

- Infection with SARS-CoV-2 causes an antibody response in most people, but few studies to date have addressed the duration and clinical implications of the immune response.
- While large clinical and epidemiological studies are in progress, real-world data from clinical laboratory testing may provide some immediate insights into the likelihood and duration of an IgG response after infection.
- **Objective:** The investigators of this study examined SARS-CoV-2 RNA and IgG test results from a large US reference laboratory to better understand patterns of immune response to SARS-CoV-2 infection.

Methods

- This retrospective analysis included deidentified results from SARS-CoV-2 nucleic acid amplification tests (NAAT; March 9-July 10, 2020) and IgG serology tests (April 21-August 11, 2020) performed at Quest Diagnostics.
- Test results were analyzed to determine the following:
  - Seropositivity rates: determined using results from paired specimens of individuals who were tested sequentially or simultaneously by SARS-CoV-2 NAAT and IgG serology
  - Persistence of seropositivity: determined using results from individuals tested for SARS-CoV-2 IgG after a previous positive SARS-CoV-2 IgG result
  - Sero-concordance (agreement) within households: determined using results of individuals from the same household who were tested by SARS-CoV-2 IgG serology within 2 days of each other

Results

- The analysis included test results from over 6.6 million SARS-CoV-2 NAATs and over 2.4 million SARS-CoV-2 IgG tests.
- The seropositivity rate for paired sequential specimens was 90.6% (19,434 of 21,452) among individuals with an initial positive NAAT result, dropping to 9.7% (7,831 of 80,968) among those with an initial negative NAAT result.
  - Factors significantly associated with seropositivity included age (≥35 years), residence in the northeast, and male sex.
  - Seropositivity waned over time, from a peak of 94% at day 22-28 to 86% by day 99-121.
- Among individuals with simultaneous NAAT and IgG testing, the seropositivity rate was 66.6% (5,619 of 8,434) among those with positive NAAT result and 16.2% (55,170 of 341,098) among those with negative NAAT results.
  - Factors significantly associated with seropositivity included age (≥35 years), residing in the northeast, male sex, and presence of at least 1 chronic condition (as indicated by International Classification of Diseases codes).
- Persistence of seropositivity after an initial positive IgG result was 90.2% overall, declining from 98.6% (at the end of week 1) to 74.3% by 2 months; the frequency of persistence was higher among patients ≥55 than among younger patients (P<0.001).
- Concordance within 134,791 households was 92%; among households with at least 1 positive adult and child, the adult was positive first in 36% and the child was positive first in 8%.

Conclusions

- Over 90% of patients who tested positive by NAAT also test positive by subsequent IgG serology testing.
- IgG serology testing can identify an immune response to SARS-CoV-2 that varies by age, sex, and time since exposure.
- Loss of detectable IgG seropositivity occurs over weeks or months, and more quickly in younger people.

Reference

1. Centers for Disease Control and Prevention. United States COVID-19 cases and deaths by state. Updated October 6, 2020. Accessed August 31, 2020. https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html

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