

# SARS-CoV-2 Positivity Rate And Vitamin D Levels

**?** Are SARS-CoV-2 positivity rates associated with circulating vitamin D levels?

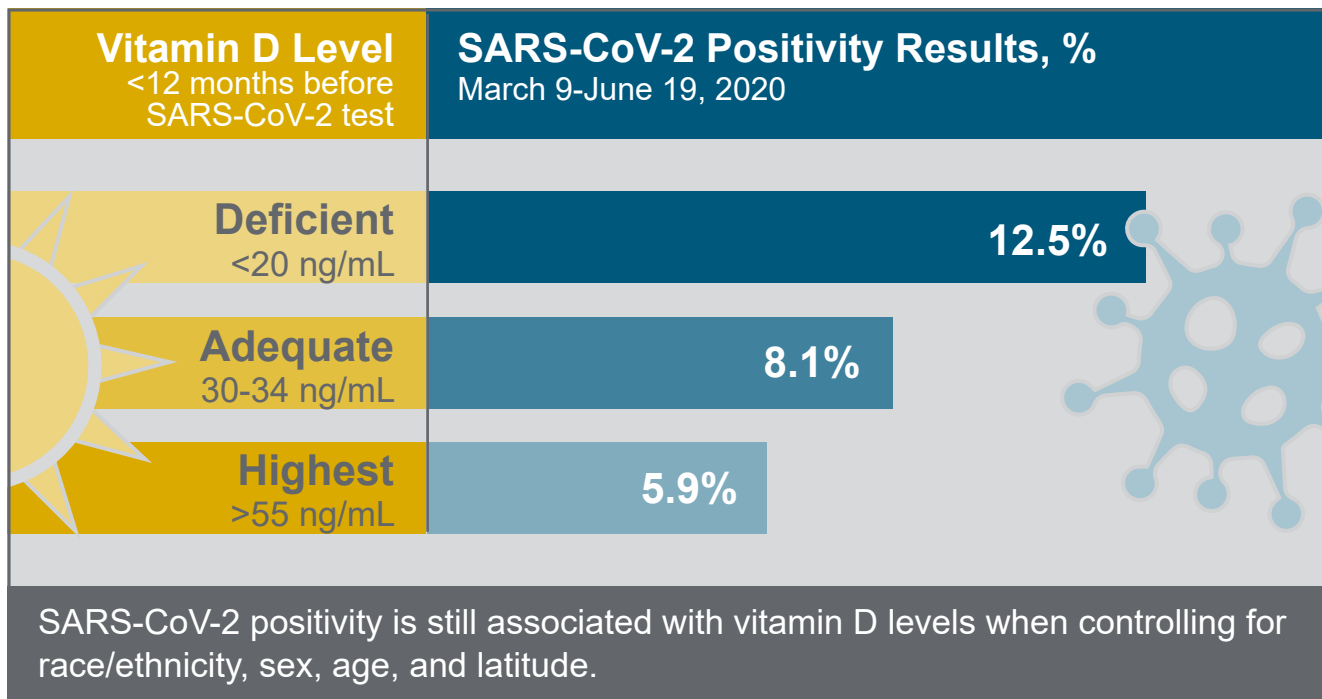
## Background

Low levels of vitamin D have been linked to higher risk of upper respiratory virus infections. However, few studies have specifically evaluated whether SARS-CoV-2 positivity rates are associated with vitamin D levels.

## Study Population and Results

 >190,000 patients

 All 50 states represented



**→** SARS-CoV-2 positivity rates are higher among people with low vitamin D levels and lower among people with high levels of vitamin D.

# SARS-CoV-2 Positivity Rate And Vitamin D Levels

## Article Title: SARS-CoV-2 Positivity Rates Associated With Circulating 25-Hydroxyvitamin D Levels

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### Background

- Studies suggest that 25-hydroxyvitamin D (25[OH]D) may protect against flu and other respiratory infections by interacting with certain immune cells and suppressing harmful immune responses.<sup>1,2</sup>
- However, the role of 25(OH)D in SARS-CoV-2 infection is uncertain. Recent studies report contradictory findings and are based on small study populations outside the United States.<sup>3,4</sup>
- **Objective:** In this study, investigators examined the relationship between SARS-CoV-2 positivity rates and circulating 25(OH)D levels in a large population in the United States.

### Methods

- Using a Quest Diagnostics database, investigators analyzed deidentified results from patients who were tested for SARS-CoV-2 March 9 to June 19, 2020 and for 25(OH)D levels in the preceding 12 months; the most recent 25(OH)D result was used if multiple results were available.
  - SARS-CoV-2 positivity was defined as any positive test result.
  - Results from patients with missing zip code data or inconclusive SARS-CoV-2 test results were excluded.
- The relationship between SARS-CoV-2 positivity and serum 25(OH)D levels was examined in the total study population and among demographic groups stratified by region (northern, central, southern latitudes), age, sex, and race/ethnicity (Black, Hispanic, White).

### Results

- The total study population included 191,779 patients, who represented all 50 states and the District of Columbia.
- SARS-CoV-2 positivity rates declined with increasing 25(OH)D levels in the total population (odds ratio [OR] = 0.979 per ng/mL 25[OH]D). The decline in positivity rates leveled off as 25(OH)D levels approached 55 ng/mL.
- SARS-CoV-2 positivity rates were higher among patients with “deficient” 25(OH)D levels (<20 ng/mL) than among those with “adequate” levels (30 to 34 ng/mL): 12.5% (95% CI 12.2-12.8%) vs 8.1%; (95% CI 7.8-8.4%)
  - Rates were even lower among patients with 25(OH)D levels ≥55 ng/mL: 5.9% (95% CI 5.5-6.4%).
- SARS-CoV-2 positivity rates were higher among patients from predominately Black and Hispanic zip codes, as well as among patients <60 years old and male patients.
- After adjusting for all demographic factors, the association between lower SARS-CoV-2 positivity rates and higher 25(OH)D levels remained significant (OR=0.984 per ng/mL 25[OH]D;  $P<0.001$ ).

### Conclusions

- These findings provide evidence for the relationship between lower SARS-CoV-2 positivity rates and higher circulating 25(OH)D levels.
- They may also support future research into the utility of vitamin D supplementation in reducing the risk of SARS-CoV-2 infection and disease.

### References

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