CDC Genomic Surveillance

Published Sequences from NS3, CDC Sequencing Contracts, and Other CDC Sequencing Efforts

<table>
<thead>
<tr>
<th>CDC Sequencing Capacity Per Week</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NS3</td>
<td>750</td>
</tr>
<tr>
<td>Illumina/Helix</td>
<td>3,000</td>
</tr>
<tr>
<td>LabCorp</td>
<td>2,000</td>
</tr>
<tr>
<td>Quest</td>
<td>2,000</td>
</tr>
<tr>
<td>Aegis</td>
<td>2,000</td>
</tr>
<tr>
<td>Fulgent</td>
<td>5,000</td>
</tr>
<tr>
<td>Infinity</td>
<td>1,000-3,000</td>
</tr>
<tr>
<td>Broad</td>
<td>525-5,000</td>
</tr>
<tr>
<td>Total</td>
<td>16,275-22,750</td>
</tr>
</tbody>
</table>

CDC COVID Data Tracker – updated weekly

SARS-CoV-2 Sequences Available in Public Databases

April 13th
279K+ Sequences
Variant Classifications

- The SARS-CoV-2 Interagency Group (SIG) established variant classifications
  - Each variant class includes possible attributes of lower classes; variant status might escalate or deescalate based on scientific evidence

- **Variant of Interest**: contains specific genetic markers associated with changes to receptor binding, reduced neutralization by antibodies generated against previous infection or vaccination, reduced efficacy of treatments, potential diagnostic impact, or predicted increase in transmissibility or disease severity

- **Variant of Concern**: evidence of an increase in transmissibility, more severe disease (increased hospitalizations or deaths), significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures

- **Variant of High Consequence**: clear evidence that prevention measures or medical countermeasures (MCMs) have significantly reduced effectiveness relative to previously circulating variants

## Variants of Interest

<table>
<thead>
<tr>
<th>Pango lineage</th>
<th>Spike Protein Substitutions</th>
<th>Nextstrain</th>
<th>First Detected</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1.526</td>
<td>(L5F*), (T9S1), (D253G), (S477N*), (E484K*), D614G, (A701V*)</td>
<td>20C/S:484K</td>
<td>United States (New York) November 2020</td>
<td>• Reduced susceptibility to the combination of bamlanivimab and etesevimab monoclonal antibody treatment; however, the clinical implications of this are not known. Alternative monoclonal antibody treatments are available. • Reduced neutralization by convalescent and post-vaccination sera</td>
</tr>
<tr>
<td>B.1.526.1</td>
<td>D80G, ΔA144, F157S, L452R, D614G, (T791I*), (T859N*), D950H</td>
<td>20C</td>
<td>United States (New York) October 2020</td>
<td>• Potential reduction in neutralization by some EUA monoclonal antibody treatments • Potential reduction in neutralization by convalescent and post-vaccination sera</td>
</tr>
<tr>
<td>B.1.525</td>
<td>Δ67V, Δ69/70, ΔA144, E484K, D614G, Q677H, F888L</td>
<td>20A/S:484K</td>
<td>United Kingdom/Nigeria December 2020</td>
<td>• Potential reduction in neutralization by convalescent and post-vaccination sera • Potential reduction in neutralization by some EUA monoclonal antibody treatments</td>
</tr>
<tr>
<td>P.2</td>
<td>E484K, (F565L*), D614G, V1176F</td>
<td>20J</td>
<td>Brazil April 2020</td>
<td>• Potential reduction in neutralization by some EUA monoclonal antibody treatments • Reduced neutralization by post-vaccination sera</td>
</tr>
<tr>
<td>B.1.617</td>
<td>L452R, E484Q, D614G</td>
<td>20A</td>
<td>India February 2021</td>
<td>• Potential reduction in neutralization by some EUA monoclonal antibody treatments • Slightly reduced neutralization by post-vaccination sera</td>
</tr>
<tr>
<td>B.1.617.1</td>
<td>(T95I), G142D, E154K, L452R, E484Q, D614G, P681R, Q1071H</td>
<td>20A/S:154K</td>
<td>India December 2020</td>
<td>• Potential reduction in neutralization by some EUA monoclonal antibody treatments • Potential reduction in neutralization by post-vaccination sera</td>
</tr>
<tr>
<td>B.1.617.3</td>
<td>T19R, G142D, L452R, E484Q, D614G, P681R, D950N</td>
<td>20A</td>
<td>India October 2020</td>
<td>• Potential reduction in neutralization by some EUA monoclonal antibody treatments • Potential reduction in neutralization by post-vaccination sera</td>
</tr>
</tbody>
</table>
## Variants of Concern

<table>
<thead>
<tr>
<th>Name (Pango lineage)</th>
<th>Spike Protein Substitutions</th>
<th>Name (Nextstrain)</th>
<th>First Detected</th>
<th>Known Attributes</th>
</tr>
</thead>
</table>
| B.1.1.7              | Δ69/70, Δ144Y, (E484K*), (S494P*), N501Y, A570D, D614G, P681H, T716l, S982A, D1181H (K1191N*) | 20/501Y.V1 | United Kingdom | • ~50% increased transmission  
• Likely increased severity based on hospitalizations and case fatality rates  
• Minimal impact on neutralization by EUA monoclonal antibody therapeutics  
• Minimal impact on neutralization by convalescent and post-vaccination sera |
• Reduced neutralization by convalescent and post-vaccination sera |
• Significant reduction in neutralization by certain EUA monoclonal antibody therapeutics  
• Moderate reduction on neutralization by convalescent and post-vaccination sera |
| B.1.427              | L452R, D614G | 20C/S:452R | US-California | • ~20% increased transmissibility  
• Significant reduction in neutralization by some, but not all, EUA therapeutics  
• Moderate reduction in neutralization using convalescent and post-vaccination sera |
| B.1.429              | S13I, W152C, L452R, D614G | 20C/S:452R | US-California | • ~20% increased transmissibility  
• Significant reduction in neutralization by some, but not all, EUA therapeutics  
• Moderate reduction in neutralization using convalescent and post-vaccination sera |

### National Prevalence of SARS-CoV-2 Variants

- **Prevalence of B.1.1.7 continues to increase and is estimated at 59.6%**
- **The prevalence of B.1.427 and B.1.429 continue to decrease**
- **Prevalence of B.1.526 remains steady around 8.7%**
- **Prevalence of P.1 increased to 3.7% and B.1.351 increased to 1%**
Regional Prevalence of SARS-CoV-2 Variants

Regional proportions of B.1.1.7 are greater than 60% in HHS Regions 3 through 8.

The combined proportions of B.1.427 and B.1.419 decreased in HHS Regions 8 through 10 but remain greater than 15%.

In HHS Regions 1 through 6, 9, and 10, the proportion of P.1 is greater than 2%.

The regional proportion of B.1.351 is greater than 1% in HHS Regions 3, 4, 9, and 10.

HHS Region 2 continues to have the highest proportion of B.1.526 at 22.6%.