## WHO SARS-CoV-2 Variants of Concern (VOCs)

<table>
<thead>
<tr>
<th>WHO name</th>
<th>PANGO lineage*</th>
<th>Earliest documented samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>B.1.1.7</td>
<td>9/2020</td>
</tr>
<tr>
<td>Beta</td>
<td>B.1.351</td>
<td>5/2020</td>
</tr>
<tr>
<td>Gamma</td>
<td>P.1</td>
<td>11/2020</td>
</tr>
<tr>
<td>Delta</td>
<td>B.1.617.2</td>
<td>10/2020</td>
</tr>
<tr>
<td><strong>Omicron</strong></td>
<td>B.1.1.529</td>
<td>11/2021</td>
</tr>
</tbody>
</table>

*VOCs also include descendent lineages

Source: WHO
SARS-CoV-2 B.1.1.529 (Omicron) Variant

- Novel variant first reported in Botswana (11/11) and South Africa (11/14)
- Larger number of mutations (~50) than previous variants, some anticipated to impact transmissibility and antibody binding
- Variant cases rapidly increased in Gauteng province, South Africa, and present in all other S.A. provinces
- Confirmed cases (205) now reported from 18 countries (not yet from USA)
- Called ‘Omicron’ by WHO and named the fifth SARS-CoV-2 variant of concern on 11/26/2021
Omicron Mutations

- Unusual constellation of changes across the SARS-CoV-2 genome, with >30 mutations in spike protein

- Mutation profile very different from other variants of interest/concern

- Some mutations also found in previous variants (e.g., Delta) and have been associated with increased transmissibility and immune evasion

- Other mutations not well characterized

Image source: https://www.gisaid.org/hcov19-variants/
Selected USG Omicron Research Activities

- CDC implementing enhanced surveillance via the National SARS-CoV-2 Strain Surveillance (NS3) Program
- Ongoing communication and information-sharing between HHS and South African government
- *In vitro* neutralization data with vaccinee sera, convalescent plasma, monoclonal antibodies, and oral antiviral treatments anticipated in 2 to 4 weeks (possibly sooner)
- Pending these data, the effect of this variant on virus transmission, severity of disease, and how well current vaccines and treatments work remains speculative
Potential Properties of Omicron*

- **Transmission**
  - May have increased transmission compared to the original pandemic virus
  - Difficult to infer if more transmissible than Delta

- **Vaccine effectiveness**
  - Significant reductions in neutralizing titer possible
  - As with other variants, partial immune escape may occur, but vaccines likely will still protect against severe disease

- **Disease severity**
  - Severity estimates are difficult given small number of cases
  - Preliminary information from South Africa suggests no unusual symptoms associated with variant

*Based on Data for Other Variants with Similar Mutations*
How to Fight Omicron

- Get vaccinated
- Get boosted
- Use masks
- Avoid crowds and poorly ventilated spaces -- choose outdoors rather than indoors when possible
- Keep your distance
- Wash your hands often
- Test -- and isolate if appropriate