COVID-19 VACCINE SUPPLY CHAIN: HOW WE WILL VACCINATE THE GLOBE

The COVID-19 pandemic has challenged the global vaccine supply chain in an unprecedented way. As billions of people need vaccines around the world, the demand for raw materials, manufacturing capabilities, and distribution capacity has skyrocketed. To ensure people get safe and effective vaccines as quickly as possible, biotechnology companies have leveraged global partnerships and innovative collaborations to reach patients all around the world. It is critically important to support the ability of innovators to scale up manufacturing. Vaccine makers are set to produce over 12 billion doses in 2021 and an additional 16 billion doses by July 2022.

Manufacturing Partnerships and Doses Committed

Across five of the leading COVID-19 vaccine makers, over 300 total partnerships have boosted manufacturing of vaccines as of October 2021. These innovative collaborations will drive the production of billions of vaccine doses in many countries around the world.

<table>
<thead>
<tr>
<th>Vaccine Maker</th>
<th>Partnerships</th>
<th>Estimated Doses 2021-2022</th>
<th>Geographic Partnerships/Manufacturing Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>6+</td>
<td>4 billion</td>
<td></td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>10+</td>
<td>1.5 billion</td>
<td></td>
</tr>
<tr>
<td>Moderna</td>
<td>15+</td>
<td>4 billion</td>
<td></td>
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<tr>
<td>Novavax</td>
<td>20+</td>
<td>2.2 billion</td>
<td></td>
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<tr>
<td>Pfizer/Biontech</td>
<td>5+</td>
<td>7 billion</td>
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</tbody>
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Source: Press Release Data, October 2021

Vaccine Production Across the Globe

Many countries around the world are helping produce COVID-19 vaccines. As of October 2021, every country highlighted is involved in some part of the manufacturing process.
Many vaccine makers have also committed hundreds of millions of vaccines in 2021-2022 to COVAX, a global program focused on delivering COVID treatments to patients in poor and under-developed countries. As of October 2021, COVAX has shipped over 400 million doses to 144 participating countries. In addition to bilateral deals, vaccine manufacturers have committed doses to low- and middle-income countries through regional deals.

### Billions of Vaccine Doses Expected

According to October 2021 forecasts, vaccine production could generate over 12 billion doses in 2021 and an additional 16 billion doses by July 2022 if the ability to scale up manufacturing is not jeopardized.

### Doses Committed to COVAX and Other Regional Organizations (as of October 2021)

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**Johnson & Johnson**

- 500 million doses to COVAX;
- 400 million doses to the African Union

**AstraZeneca**

- 171 million doses to COVAX

**Moderna**

- 534 million doses to COVAX;
- 110 million doses to the African Union;
- 34 million doses to UNICEF and the Pan American Health Organization

**Pfizer/BioNTech**

- 2 billion doses committed to low and middle income countries, including 1 billion doses to the US government for donation to COVAX & the African Union and 40 million directly to COVAX

**Sinovac**

- 200 million doses to COVAX

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Source: Press Release Data, October 2021