September 2021 snap shot COVID-19 data

Information for these slides is from public sources. IFPMA is not involved in the collection of this data.

7th September 2021
Despite a big increase in vaccination rates, infections are on the rise, deaths appear to be falling

An analysis of the current dominant variant, infections and deaths globally over time

- B.1.1.7 (Alpha) dominant
- B.1.351 (Beta) dominant
- P.1 (Gamma) dominant
- B.1.617.2 (Delta) dominant
- B.1.621 (Mu) dominant
- No data/non-VoC(I) dominant

Cases globally

Deaths globally

People fully vaccinated (per 100)
Airfinity forecasts have been realistic to observed production

Comparison of Airfinity forecasts (made in early February) vs observed production up until July

Airfinity forecast generated in February 2021

Date updated: 1\textsuperscript{st} September
Vaccine production could exceed 12 billion doses in 2021

Currently, nearly 1.5 billion doses are being produced per month, and this is expected to continue growing.

Forecasted on 24/08/2021

*80% of the population aged 12 and over
Contracted production and supply chain agreements have increased steadily throughout the pandemic.

Cumulative number of contracted production and supply chain agreements

Of the 12 billion doses forecast to be produced in 2021, 73% is expected from in-house production.

Number of contracted production and supply agreements over time

Date updated: 1st September
Decisions on boosters impact availability, all booster scenarios leave high stock levels to enable redistribution

Estimated redistribution doses following the vaccination of 80% of adults, teenagers and following boosters up until mid-2022

Available dose for redistribution analysis is calculated using Airfinity supply forecasts to each country, which are based on production scale-up forecasts. Surplus doses scenarios firstly account for initial vaccination campaigns – sufficient doses to fully vaccinate all eligible people – before then accruing supply for boosters, with the remaining supply being counted as available for redistribution. The following scenarios are calculated from supply to mid-2022. The scenarios shows the real-world uptake of vaccines and boosters for all (based on current data) and then compares this against an 80% uptake rate under different vaccination and booster scenarios, to show how many doses could be remaining from agreed supply of approved vaccines.

Analysis uses this scenario, with real-world uptake/hesitancy rates and then assumes that all those fully vaccinated get a booster 6 months later.

- Real-world uptake and boosters for all 6 months after initial full vaccination
- 80% of adults
- 80% of over 12s and high-risk boosters
- 80% of over 12s and all boosters

Updated 25th August
Western countries can provide booster shots and still have more than a 1.2 bn doses in 2021 to redistribute

Available supply per month, split into booster allocation for eligible and willing adults & teens and remaining supply of +SRA authorised vaccines only

*Vaccine stock (per month, from supply excluding booster rollout, which is depicted below)

Boosters campaign (for everyone over 12 years, with real-world uptake)

Cumulative available doses (rolled over from earlier supply)

Pledged donations and deliveries to date

Over 1 billion doses have been pledged to be donated by the G7 (& EU), of which less than 15% has been delivered. Analysis shows that over 1.2 billion doses could be available for donation by the G7 in 2021 alone, while still maintaining domestic booster campaigns for all adults.

*Vaccine availability analysis is not exclusive of already-pledged doses; this is shown in cumulative stock graph, and is broken down per country in appendix

*SRA authorised vaccines only: only vaccines approved by a Stringent Regulatory Authority are included (+ Novavax)
Vaccine effectiveness remains high with delta variant

Vaccines remain effective against highly virulent delta reducing risk of hospitalisation and infection

**Vaccine effectiveness against hospitalisation**

- AstraZeneca: 99% (Airfinity meta analysis overall), 99% (Airfinity meta analysis against delta)
- Pfizer/BioNTech: 92% (Airfinity meta analysis overall), 92% (Airfinity meta analysis against delta)

**Vaccine effectiveness against infection**

- AstraZeneca: 76% (Airfinity meta analysis against delta), 76% (Airfinity meta analysis overall)
- Pfizer/BioNTech: 65% (Airfinity meta analysis against delta), 65% (Airfinity meta analysis overall)
- Moderna: 77% (Airfinity meta analysis against delta), 77% (Airfinity meta analysis overall)
- Bharat/ICMR/NIV: 78% (Airfinity meta analysis against delta), 78% (Airfinity meta analysis overall)
Oral antivirals and monoclonals forecasted to have a great impact on standard of care in next 12 months

Last 12 months COVID-19 a further 8 treatments have been approved with 5 impacting standard of care

### Outpatient

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Mild</th>
</tr>
</thead>
</table>

### Inpatient

<table>
<thead>
<tr>
<th>Moderate</th>
<th>Severe</th>
<th>Critical</th>
</tr>
</thead>
</table>

- **Corticosteroids** (NICE)
- **Prophylactic anti-thrombotic therapy** (NIH, NICE, ERS, WHO)

#### Previous SEPT 2020

- REGEN-COV (NIH)

#### Current SEPT 2021

- REGEN-COV/Vir-7831/LY-CoV555-LY-CoV016 (NIH)
- Remdesivir: (NIH, NICE) in combination with corticosteroids

#### Forecasted SEPT 2022

- Molnupiravir, AT527, Camostat, Nitazoxanide, Peginterferon, PF-07321332
- AZD7442, BRII-196, BRII-298, Ty027
- Ravulizumab-Cwz, Lanadelumab, Infliximab, Canakinumab, Lenzilumab
- Baracitinib, Empagliflozin, Sargramostin, Tofacitinib, Fluvoxamine, Budesonide, Famotidine

**Antivirals and monoclonals are forecasted to address much of the COVID-19 outpatient need**

**A combination of candidate types, including antithrombotic, IL-6 inhibitors and anti-inflammatory agents are forecasted to address the COVID-19 inpatient need**

Updated as of: 02/09/21
MORE INFORMATION

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Media and Communications Manager
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Sarah@airfinity.com
Methodology and assumptions on stock supplies

- Forecasted supply is calculated from purchased doses only and excludes any call option (i.e. the option to expand the deal).
- Only approved vaccines have been included (plus Novavax, which is expected to be granted approval soon).
- The analysis runs to mid-2022, therefore excludes prepurchase agreements due to be delivered to these countries in H2 2022.
- Analysis assumes that no vaccine facility pauses production to reconfiguration of an updated variant-targeting vaccine (that are yet to be approved).
- Analysis uses scenario where eligible populations (in most cases everyone over 12 years old) are offered a vaccine and are then given a booster at least 6 months after completing initial full vaccination course, with a real-world uptake rate of (ranging from 65-85%) of the eligible population.
The distribution potential mainly consist of mRNA vaccines

Forecast of available doses split by vaccine*

*These are surplus doses calculated from secured supplies from governments, not surplus doses produced by companies in 2021
**Promising COVID-19 vaccine candidates in the pipeline**

Overview of candidates and clinical trial phase

Number of variant updated vaccines in development: **32**

Number of vaccines with an another form of administration other than injection in development: **85**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Protein Subunit</th>
<th>Genetic Vaccine (DNA)</th>
<th>Genetic Vaccine (viral vector)</th>
<th>Genetic Vaccine (mRNA)</th>
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<td>154</td>
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<td>Phase I</td>
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<td>6</td>
<td>4</td>
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<tr>
<td>Phase I/II</td>
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<td>17</td>
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<td>6</td>
<td>2</td>
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<tr>
<td>Phase II</td>
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<td>10</td>
<td>2</td>
<td>5</td>
<td>7</td>
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<tr>
<td>Phase II/III</td>
<td>29</td>
<td>11</td>
<td>3</td>
<td>10</td>
<td>1</td>
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<td>Phase III</td>
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<tr>
<td>Phase IV</td>
<td></td>
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</tbody>
</table>

**Predicted* efficacy against wild type virus from results published so far**

- **Vaccine (Inovio)**: 57%
- **Vaccine (Clover)**: 80%
- **Vaccine (Sanofi/GSK)**: 69%

*Using the airfinity model

Date updated: 1st September

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Vast majority of vaccine manufacturing and supply chain announcements have involved a collaboration

An analysis of the number of collaborations confirmed for vaccine manufacturing

<table>
<thead>
<tr>
<th>Source of Materials</th>
<th>Distribution and Storage</th>
<th>Adjuvant</th>
<th>Fill/Finish</th>
<th>Tech and Fill/Finish</th>
<th>Fill/Finish</th>
<th>Tech</th>
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<td>307</td>
<td>11</td>
<td>12</td>
<td>20</td>
<td>49</td>
<td>231</td>
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</tbody>
</table>

**Definitions:**

**Source of materials:** Public announcements to supply raw materials for vaccine candidates

**Distribution and storage:** Public announcements to distribute and/or store vaccines after production (separate from procurement deal)

**Adjuvant:** Public announcements to produce and supply adjuvant for vaccine formulations

**Fill and finish:** Public announcements to fill and finish vaccines into vials and syringes

**Tech:** Public announcements to produce active vaccines or vaccine components.

Date updated: 1st September
# Overview of clinical development for COVID-19 treatment candidates

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Type</th>
<th>Company</th>
<th>Route of Administration</th>
<th>Latest Trial Data</th>
<th>Rolling Review</th>
<th>Filing</th>
<th>Approved (Country list)</th>
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</thead>
<tbody>
<tr>
<td><strong>Outpatient</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Molnupiravir (MK-4482)</td>
<td>Antiviral</td>
<td>Merck/Ridgeback Therapeutics</td>
<td>Oral</td>
<td>III</td>
<td>Yes</td>
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<tr>
<td>Fluvoxamine</td>
<td>Antidepressant</td>
<td>47 suppliers</td>
<td>Oral</td>
<td>III</td>
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<tr>
<td>Budesonide</td>
<td>Corticoids</td>
<td>64 suppliers</td>
<td>Inhaled</td>
<td>III</td>
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<tr>
<td>AT-527</td>
<td>Antiviral</td>
<td>Roche/Atea Pharmaceuticals</td>
<td>Oral</td>
<td>II</td>
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<tr>
<td>PF07321332</td>
<td>Antiviral</td>
<td>Pfizer</td>
<td>Oral</td>
<td>II/III</td>
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<tr>
<td>Vir-7831 (Sotrovimab)</td>
<td>Monoclonal</td>
<td>GSK/Vir Biotechnology</td>
<td>IV/IM</td>
<td>II/III</td>
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<td>US, EU, Canada, Australia, UAE, Kuwait</td>
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<tr>
<td>REGEN-COV (Casirivimab/Indevimab)</td>
<td>Monoclonal</td>
<td>Roche/Regeneron</td>
<td>IV/subQ</td>
<td>III</td>
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<td>AstraZeneca</td>
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<td><strong>Inpatient</strong></td>
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<tr>
<td>Baricitinib</td>
<td>Anti-inflammatory</td>
<td>Eli Lilly/Nacto Pharma</td>
<td>Oral</td>
<td>III</td>
<td></td>
<td></td>
<td>US, Russia, Mexico, Japan, India</td>
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<tr>
<td>Tofacitinib</td>
<td>Anti-inflammatory</td>
<td>Shuoyuan Chemicals</td>
<td>Oral</td>
<td>III</td>
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<tr>
<td>Enoxaprin (LMWH)</td>
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<td>IV/subQ</td>
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<td>Apixaban (LMWH)</td>
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<td>Tocilizumab</td>
<td>Monoclonal IL-6 blocker</td>
<td>Roche/Genetech</td>
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<td>US, UK China, Russia, India, Pakistan, Mexico</td>
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<tr>
<td>Sarilumab</td>
<td>Monoclonal IL-6 blocker</td>
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<td>III</td>
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<td>UK</td>
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<td>REGEN-COV (Casirivimab/Indevimab)</td>
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<td>US, EU, UK, Canada, Japan, Brazil, Bahrain, Panama, Switzerland</td>
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<tr>
<td>Empagliflozin</td>
<td>Antidiabetic</td>
<td>Boehringer Ingelheim/Eli Lilly</td>
<td>Oral</td>
<td>II/III</td>
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| Better than SOC | Moderately better than SOC | Equal to SOC | Rejected/worse than SOC | No/insufficient data |
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THE WORLD’S TRUSTED COVID-19 PLATFORM

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Airfinity has built the world’s leading COVID-19 science and market intelligence platform.

The company is headquartered in London and partners with organisations worldwide.

Airfinity’s COVID-19 data was seen by more than 2 billion people in 2020.

“Airfinity has been instrumental in our country’s COVID response”

Head of Government Vaccine Task Force