

## pandemic response catalyst conversations: Vaccines and Therapies and the Need for Speed Fact Sheet

### Which vaccine candidates are leading in the push for rapid development?

As of September 17, there are [132 Covid-19 vaccine candidates](#) under development, with **40** of these in the [human trial phase](#).

Major vaccine candidates furthest along in their development include:

Vaccine Developer / Manufacturer	Trial Phase	Vaccine Type
Moderna / National Institute of Allergy & Infectious Diseases	Phase 3	mRNA vaccine
BioNTech / Fosun Pharma / Pfizer	Combined Phases 2 & 3	mRNA-based vaccine
CanSino Biologics Inc. / Beijing Institute of Biotechnology	Phase 3 – approved for limited use	viral vector vaccine
Gamaleya Research Institute	Phase 3 – approved for early use	viral vector vaccine
University of Oxford / AstraZeneca	Combined Phases 2 & 3	chimpanzee adenovirus vaccine vector
Sinovac	Phase 3 – approved for limited use	formalin-inactivated vaccine
Wuhan Institute of Biological Products / Beijing Institute of Biological Products / Sinopharm	Phase 3 – approved for limited use	2 inactivated Covid-19 vaccines
University of Melbourne / Murdoch Children’s Research Institute	Phase 3	repurposed Bacillus Calmette-Guerin vaccine to protect against tuberculosis

\*Visit [The New York Times’s](#) or [WHO’s](#) webpage on coronavirus vaccines for further information.

Both [WHO](#) and the [CDC](#) say they do not expect widespread Covid-19 vaccinations until the **end of 2021**.

### What is the current outlook on therapies for Covid-19?

According to Jared Silverman, head of translational discovery at the Bill & Melinda Gates Medical Research Institute, “Covid-19 is a disease where, if you’re thinking about therapeutics or small molecules, you can be thinking about prophylaxis, out-patient treatment of mild disease, or treatment of severe disease in the hospital.”



As of September 17, around [eight antivirals](#) are being explored to directly block Covid-19, in addition to treatments that elicit a strong immune response or reduce the immune system's reaction to the virus. [Two therapeutics are most promising](#):

- Gilead Science's **remdesivir** is an antiviral that has shown promising evidence of blocking the virus and was the first drug to receive emergency authorization from the FDA.
- **Dexamethasone and corticosteroids** have shown promising evidence of reducing symptoms caused from the immune system's reaction to Covid-19.

### How do vaccine developers test candidates for safety and efficacy?

According to Audrey Chang, head of process solutions services R&D at MilliporeSigma, "Following current Good Manufacturing Practice (cGMP) ensures products are consistently produced to quality standards appropriate to their intended use."

Biosafety testing services, in combination with readily deployable biomanufacturing platforms, are critical to manufacturing at scale. Testing allows manufacturers to tailor vaccine development to the individual candidate, taking into consideration:

- The current **regulatory landscape**, meeting traditional vaccine safety standards that have seen success – e.g., polio, rotavirus vaccines – and directly interacting to support expedited testing and manufacturing plans.
- Whether **quality-by-design** concepts hold true – building quality testing into all stages of the manufacturing process (not just a product batch) and using rapid and alternative technologies to detect contaminating agents.
- **Knowledge-sharing** amongst the global scientific community is at an all-time best during the pandemic with preprints and data available in real time.
- **Aligned lot release programs** for the use of multiple manufacturing sites to ensure plentiful supply of Covid-19 treatment and therapies.

### What are some common strategies employed to accelerate development?

According to David Onions, independent consultant, "We need to ensure that there's fundamental science going on because we can respond quickly – and we have responded quickly to the coronavirus – because we know a lot about coronaviruses, all sorts of coronaviruses, and that's by people being funded to do fundamental virology."

Various Covid-19 accelerators are supporting current rapid development efforts, including major players like:

- [Operation Warp Speed \(OWS\)](#): Formed by the US Department of Health and Human Services, OWS's goal is to deliver [300 hundred million doses](#) of safe and effective Covid-19 vaccines by **January 2021**.
- [Access to Covid-19 Tools \(ACT\) Accelerator](#): **WHO** is working in collaboration with scientists, business, and global health organizations

through the ACT Accelerator to speed up pandemic response, including a specific [therapeutics pillar](#) and [vaccine pillar \(COVAX\)](#).

- **[Coronavirus Treatment Acceleration Program \(CTAP\)](#)**: The **FDA**, along with issuing emergency use authorizations to **[five Covid-19 treatments](#)**, has created CTAP specifically to accelerate therapeutic development.

**For more information:**

Scientists are collaborating to source solutions to Covid-19 challenges on the Pandemic Response CoLab, an open platform from MIT's Center for Collective Intelligence and Community Biotechnology Initiative. MilliporeSigma is a founding member of the online community, which works to harness collective intelligence and better address public health crises. Join the conversation and view the contributions at [www.PandemicResponseCoLab.org](http://www.PandemicResponseCoLab.org).