Human Challenge Studies

In new guidelines issued on May 6, the World Health Organization has said that well-designed human challenge studies could not only accelerate coronavirus (COVID-19) vaccine development but also make it more likely that the vaccines ultimately deployed will be far more effective.

Note:

In human challenge studies, healthy participants are first administered the candidate vaccine and then deliberately exposed to novel coronavirus.

In conventional clinical trials, healthy participants are administered the candidate vaccine, and the safety and efficacy of the vaccine is assessed through natural infection.

Compare and select

- The guidelines say that human challenge studies will be “substantially faster” to carry out vaccine field trials as far fewer participants need to be exposed to candidate vaccines to “provide (preliminary) estimates of efficacy and safety”.
- It says this approach will make it possible to compare the efficacy of multiple vaccine candidates and select the most promising vaccines for larger studies.
- In addition to accelerating vaccine development, human challenge studies can help validate tests for immunity to the virus, identify correlates of immune protection, and investigate the risks of transmission by infected individuals.

Successes and risks

While human challenge studies are ethically controversial, such studies have been performed safely in tens of thousands of people in the last 50 years and helped accelerate the development of vaccines against typhoid and cholera. Such a study for Zika virus was also conducted.

Guidelines for human challenge studies

1. According to the guidelines, challenge studies would be least risky for young healthy adults aged 18-30 years, as the hospitalisation rates in this age group is about 1% and fatal infection rates around 0.03%.

2. Human challenge studies are to be carried out only in specialised centres where close monitoring and ready access to early supportive treatment for participants, including critical care if required is available.

3. Potential benefits and risks should be assessed, quantified and compared with other
feasible study designs, and the expected benefits should be maximised and the risks minimised.

Meanwhile, the U.S. National Institutes of Health is also preparing the ground for human challenge trials for COVID-19 vaccines.

Prof Andrew Pollard, who is leading the trial of the vaccine developed by the team at the University of Oxford’s Jenner Institute told The Guardian that there is “huge interest” in the possibility of challenge trials among those working on coronavirus vaccines. “At the moment, because we don’t have a rescue therapy, we have to approach challenge studies extremely cautiously,” Pollard said.

**Issues**

1. But a March 27 study in the *Morbidity and Mortality Weekly Report* found that 20.8% of patients aged 20–44 had severe disease which required hospitalisation, and 4.2% of patients developed critical disease, which required admission to an ICU.

2. But what makes such studies for COVID-19 particularly risky and challenging is the fact that pathogenesis(manner of development of disease) of the disease is poorly understood and there is no approved treatment available in case participants develop the disease.

**Ethical framework**

Recognizing the uncertainties, risks from SARS-CoV-2 human challenge studies appear comparable to the risks from some other research and activities similar to research.

Meanwhile, NBC News reports that that the multinational testing company SGS and London-based hVIVO are planning human challenge studies. Nearly 20,500 people from 102 countries have already volunteered to participate in such studies.