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Covid-19: Chinese vaccines may need changes to improve efficacy, admits official

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China may need to replace its coronavirus vaccines or change the way they are administered in order to make them sufficiently effective against the SARS-CoV-2 virus, the head of China's Centre for Disease Prevention and Control said this weekend.

"We will solve the problem that current vaccines don't have very high protection rates," said George Gao, director general of the Chinese CDC, on 11 April at a Chengdu conference on covid-19 vaccines. "It's now under consideration whether we should use different vaccines from different technical lines for immunisation."

Existing vaccines might see changes in dosage, dosing interval, or number of doses, said Gao, or their administration might be mixed with vaccines based on different technologies. "Everyone should consider the benefits mRNA vaccine technology can bring for humanity," said Gao. "We must follow it carefully and not ignore it just because we already have several types of vaccines already."

Gao's comments were widely seen as either an inadvertent slip or a deliberate attempt to pressure China's government into pursuing mRNA vaccines, rather than a planned official admission. His words spread rapidly on Chinese social media before being censored. Chinese citizens continue to discuss the surprise admissions online, using deliberate misspelling to evade censors.

Gao later told journalists that his comments had been misinterpreted, and that he was referring to problems with all covid vaccines, not just China's. Chinese state media repeated that claim.

China's leading vaccines¹ are largely based on inactivated virus technology of long standing, while the Oxford AstraZeneca, Johnson and Johnson, and Sputnik vaccines use non-coronavirus live viral vectors altered to exhibit the coronavirus spike protein. Pfizer and Moderna's vaccines use the latest technology, messenger RNA.

China's pharmaceutical firms say they are rapidly mastering mRNA technology. Asked about Gao's comments, another Chinese health official, Wang Huaqing, said, "The mRNA vaccines developed in our country have also entered the clinical trial stage."

The phase III trials of China's existing vaccines remain unpublished. For CoronaVac, the vaccine made by private company Sinovac, phase 1 and II data has been published²—showing a limited antibody response—while state owned Sinopharm has only said that its two vaccines have efficacy of 79.4% and 72.5%, based on interim results.

The phase III Sinovac trials conducted in Brazil, Chile, Indonesia, Turkey, and the Philippines have so far

given sharply disparate unpublished results, with Brazilian researchers finding 50.7% efficacy, or 62.3% with longer dosing intervals,³ while Turkish researchers reported 83.5% efficacy.⁴ Sinovac's efficacy was not diminished by the Brazilian P.1 variant, researchers there said.

A study of the Sinovac rollout by the University of Chile reported that the vaccine was 56.5% effective two weeks after second doses were administered in the country. However, they also reported that one dose was just 3% effective (rising to 27.7% within two weeks of the second dose, and 56.5% two weeks later).⁵

Responding to Gao's comments, Siti Nadia Tarmizi, a spokeswoman for Indonesia's covid-19 vaccine programme, said that her country's phase III Sinovac trial will report efficacy of 65%.⁶ "The ability to form antibodies in our bodies is still very good," she said.

The Sinopharm company and the United Arab Emirates, which uses a Sinopharm vaccine, have both recently experimented with an extra third dose, hoping to increase antibody response.

For some governments, shortage of Chinese vaccines remains a bigger headache than worries about efficacy, as the pace of deliveries has fallen off. In Turkey, most vaccination sites were closed this week as President Erdogan's government publicly complained about delays in receiving promised doses of the Sinovac vaccine. Egypt has received only a small fraction of its order. Brazil's government has publicly asked China for more.

Many observers question if Chinese production can meet existing commitments, even as China's government makes new promises abroad. Health official Wang Huaqing said this weekend that China expects to manufacture about three billion vaccine doses in 2021, of unspecified type. To date, China has exported about 80 million doses.

Over 60 countries have approved a Chinese vaccine and shortfalls in production or efficacy could darken the pandemic outlook for low-income countries, at a time when India is restricting vaccine exports in response to its own surge in cases.

- 1 Baraniuk C. What do we know about China's covid-19 vaccines? *BMJ* 2021;373:n912. doi: 10.1136/bmj.n912 pmid: 33836994
- 2 Zhang Y, Zeng G, Pan H, et al. Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine in healthy adults aged 18-59 years: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial. *Lancet* 2020. [www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30843-4/fulltext](http://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30843-4/fulltext). pmid: 33217362
- 3 Costa AG. Clinical study proving greater effectiveness of Coronavac is sent to *Lancet*. CNN Brasil. 11 April 2021. www.cnnbrasil.com.br/saude/2021/04/11/estudo-clinico-que-comprova-maior-eficacia-da-coronavac-e-enviado-para-lancet

- 4 Turkish study revises down Sinovac covid-19 vaccine efficacy to 83.5%. Reuters. 3 March 2021. www.reuters.com/article/health-coronavirus-turkey-sinovac-int-idUSKBN2AV18P.
- 5 Chik H, Baptista E. Chile covid-19 vaccination drive adds to Sinovac efficacy data. South China Morning Post. 9 April 2021. www.scmp.com/news/china/science/article/3128886/chile-covid-19-vaccination-drive-adds-sinovac-efficacy-data
- 6 Indonesia satisfied with effectiveness of Chinese vaccine. AP News. 12 April 2021. <https://apnews.com/article/beijing-clinical-trials-coronavirus-pandemic-china-coronavirus-vaccine-ac30beade16b1b00e26660cadcb3c468>.

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