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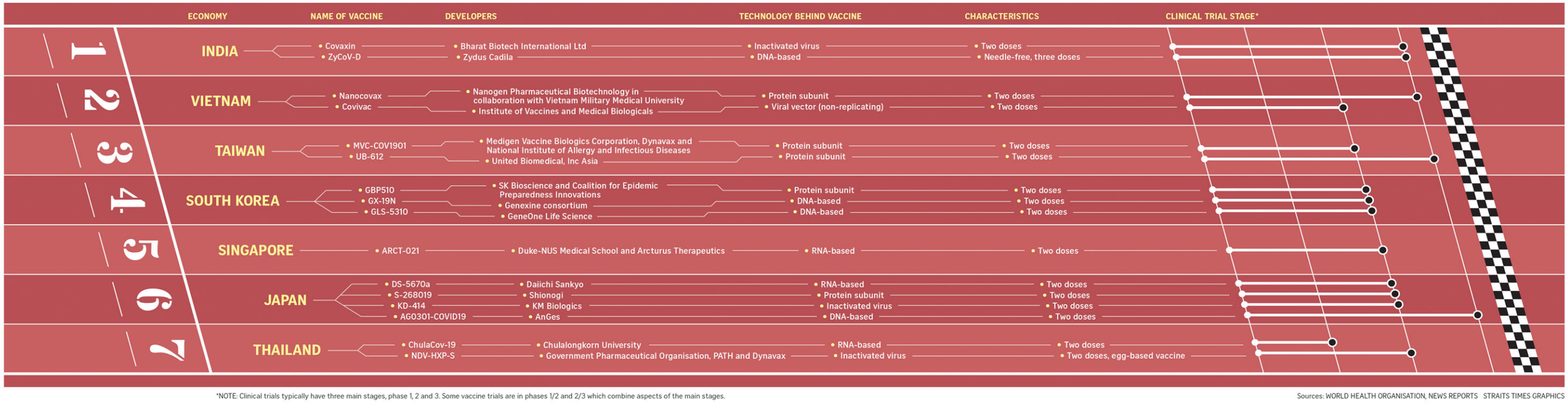
Asia's home-grown vaccines

A number of Covid-19 vaccine candidates are in the pipeline, as economies across Asia race to develop their own jabs



*NOTE: Clinical trials typically have three main stages, phase 1, 2 and 3. Some vaccine trials are in phases 1/2 and 2/3 which combine aspects of the main stages.

Sources: WORLD HEALTH ORGANISATION, NEWS REPORTS STRAITS TIMES GRAPHICS

Thailand

Developers hoping local jabs can be used as boosters

BANGKOK • Since April, Thailand has been caught in a spiralling wave of Covid-19 infections, largely fuelled by a more transmissible Delta variant that threatens to overwhelm its healthcare system.

As caseloads log about 20,000 new infections daily, the country has been scrambling to secure more Covid-19 vaccine shots.

Thailand's inoculation drive currently relies on shots by foreign vaccine developers – Sinovac, AstraZeneca, Sinopharm and Pfizer.

To reduce the reliance on imported vaccines and shore up the nation's supply of shots, local scientists have been working on a number of home-grown jabs. Three of six vaccine candidates started clinical trials earlier this year.

While none of the candidates has been approved for use yet, vaccine developers hope the shots will serve as booster jabs in the near future.

So far, scientists have reported favourable results for two of the vaccines that have entered clinical trials – the mRNA-based ChulaCov-19 and the NDV-HXP-S shot that uses an inactivated virus.

ChulaCov-19, which will begin phase two clinical trials next week, yielded a high efficacy rate in preventing Covid-19 infections, said Chulalongkorn University researcher Kiat Ruxrungtham. The NDV-HXP-S vaccine, by the Government Pharmaceutical Organisation, has started its next phase of trials.

The third, the DNA-based Covigen vaccine, is in phase one of human trials.

Another candidate that will begin human trials next month is the plant-based Baiya Sars-CoV-2 Vax 1. One of the scientists behind it, Dr Suthira Taychakhoonavudh, said there is a sense of urgency for home-grown jabs, but the process cannot be rushed. "We hope to tackle issues to do with sustainability and security of vaccine supply," she said.

Human trials will start later this year for two vaccines that are administered via nasal spray.

Tan Tam Mei

Vietnam

Work being done on 2 vaccines amid tech transfer deals

BANGKOK • Vietnam initially had four Covid-19 vaccine candidates as it tried to capitalise on its head start from successfully containing earlier waves of the outbreak.

At this point, two candidates are in the clear lead: Nanocovax, developed by Nanogen Pharmaceutical Biotechnology in collaboration with Vietnam Military Medical University, and Covivac, developed by the health ministry's Institute of Vaccines and Medical Biologicals. Human trials have started on these vaccine candidates alongside preparatory work undertaken by Vietnam to manufacture vaccines from Russia, the United States and Japan under technology transfer deals.

The state-owned Company for Vaccine and Biological Production No. 1, or Vabiotech, is involved in two of these deals. It will produce the Sputnik V vaccine by Gamaleya National Research Centre of Epidemiology and Microbiology as well as a recombinant DNA protein vaccine by Japanese pharmaceutical company Shionogi. Meanwhile, Vietnamese conglomerate Vingroup will produce an mRNA vaccine being developed by Arcturus Therapeutics.

These technology transfer deals will see much of the vaccine coming on-stream next year, putting into doubt Hanoi's ambition to secure 170 million doses by the end of this year. The deals also raised questions about the state's commitment to developing its home-grown vaccines, which are undergoing second- and third-stage trials.

Prime Minister Pham Minh Chinh put some of the doubts at rest last Saturday when he gave the approval for over 8.8 billion dong (S$535,000) from the national Covid-19 vaccine fund to be used to support the clinical trials of Covivac.

The fund, which was launched in June to raise money for the country's vaccination drive, has amassed 8.6 trillion dong in donations. Major donors include foreign investors like South Korea's Samsung and Thailand's Charoen Pokphand Group.

Tan Hui Yee

Taiwan

First local vaccine to be available starting Monday

TAIPEI • After over a year of trial and error, Taiwan's first locally developed Covid-19 vaccine will finally be available to the public from Monday.

Some 600,000 doses of Medigen Vaccine Biologics Corp's vaccine will be ready for administration, said the island's Central Epidemic Command Centre (CECC).

The manufacturer had received emergency use authorisation from the Food and Drug Administration last month, a development which was questioned by many Taiwanese as Medigen had not launched phase three clinical trials.

The CECC said that based on Medigen's phase two trials, Medigen's vaccine has the potential to be around 90 per cent effective against Covid-19, as the antibody concentration in those who received the Medigen vaccine was over three times higher than a control group of 200 people who had received AstraZeneca vaccine.

"I think the government could have pledged its support for a local vaccine way earlier last year, either with funding or promising to purchase the vaccine in bulk once it comes out," said Dr Chi Chia-yu, an associate investigator at the National Institute of Infectious Diseases and Vaccinology. She thinks the government's actions would have spurred more manufacturers to enter the race to develop a vaccine and perhaps sped up the process.

Leading politicians in Taiwan have now voiced their faith in local vaccines. President Tsai Ing-wen shared photos of herself registering to receive the Medigen vaccine on social media, while Vice-President William Lai said he would wait for the UB-612, produced by United Biomedical, Inc Asia (UBI Asia). But it looks like he may have to wait a while longer to get vaccinated.

On Monday, the FDA said its panel of experts have rejected UB-612 for emergency use authorisation, as it did not meet required standards. UBI Asia said it will be appealing against the FDA's decision.

Katherine Wei

South Korea

Aiming to be among top 5 global vaccine producers by 2025

SEOUL • South Korean President Moon Jae-in has pledged to provide all available support to develop home-grown vaccines for Covid-19, even throwing in a 2.2 trillion won (S$2.6 billion) investment package to help local drugmakers.

"We will strive to take a leap forward to become one of the top five global vaccine producers by 2025," he said this month, adding that vaccines will also become one of South Korea's three national strategic technologies, alongside semiconductors and batteries.

Experts say South Korea, which boasts one of the world's largest production capabilities for biopharmaceutical products and exported US$5.1 billion (S$7 billion) worth of such goods last year, is well placed to become a major force in the global vaccine industry.

Dr Jerome Kim, director general of the Seoul-based International Vaccine Institute, said: "Speed, scale, quality and a well-recognised regulatory authority should work in South Korea's favour."

There are seven local firms conducting clinical trials in various stages for four types of Covid-19 vaccines.

SK Bioscience is the first to win approval to begin phase three trials on its protein antigen vaccine GBP510. The firm intends to enter the final stage of testing early next year and launch the vaccine by mid-next year.

South Korea's Health Ministry has said it will roll out home-grown vaccines for public use next year.

But Dr Kim noted that most South Koreans would be fully vaccinated by then. As at Thursday, 47.3 per cent of the population have received their first shot of Covid-19 vaccines. About 21 per cent are fully vaccinated.

"For that reason, the GBP510 vaccine may be a booster or could be used in particular age groups where other vaccines might be considered riskier or are considered lower priority for vaccination – infants and toddlers, for example," he said.

Chang May Choon

India

Promising pipeline of vaccines, but affordability is key

BANGALORE • When Indian Prime Minister Narendra Modi took a shot of the country's first indigenous Covid-19 vaccine on March 1, he said: "Remarkable how our doctors and scientists have worked in quick time to strengthen the global fight against Covid-19."

Three months earlier, Covaxin, developed by Bharat Biotech International using the whole inactivated coronavirus, had received emergency approval from India's drug regulator – even before the key third phase of its human clinical trial proved the extent of its efficacy against the coronavirus.

It was rolled out along with the Oxford-AstraZeneca vaccine manufactured by the Serum Institute of India, known as Covishield, in January. Since then, 12 million doses of Covaxin have been administered. The efficacy data, still not peer reviewed, is said to be 77.8 per cent against symptomatic infections.

India is racing to develop more indigenous Covid-19 vaccines to inoculate its 1.3 billion population quickly, and also for export. It is the world's primary maker and exporter of affordable vaccines for diphtheria, tetanus, human papillomavirus and hepatitis B.

India now has at least 15 domestic Covid-19 vaccines in different stages of development.

A needle-free three-dose vaccine by Zydus Cadila is in the third phase of its clinical trial. Called ZyCoV-D, it is the world's first plasmid DNA vaccine. It uses a genetically engineered, non-replicating version of a type of DNA molecule coded to make the spike protein of Sars-CoV-2. It is also being tested on those aged 12 to 18.

Biological E is working on an antigen, and Gennova Pharmaceuticals on an mRNA vaccine, in collaboration with American companies.

Ms Malini Aisola, co-convener for the watchdog All India Drug Action Network, said "a promising pipeline" of local vaccines could become available in the next few months or more likely next year, but it was important for India to "scale up manufacturing and increase affordability of the vaccines".

Rohini Mohan

A farmer receiving the Covishield vaccine in a field on his farm, during a door-to-door vaccination drive in Gujarat, India, last month. PHOTO: REUTERS

Japan

Four in running, but regulations causing lags

TOKYO • Four drugmakers are conducting human clinical trials for Covid-19 vaccines, though approvals remain months away.

Despite its global reputation as a leader in pharmaceutical drugs, Japan lags in vaccine development due to its own chequered history. A 1992 court decision that said the government was liable to pay damages to those who suffer adverse side effects led Tokyo to tighten regulatory approval to the point where it became untenable for firms to invest in research.

As a result, Japan has had to play catch-up.

With one in two Japanese having received at least one dose of either the Pfizer or Moderna vaccine, its home-grown vaccines will likely be used for Japan's vaccine diplomacy or as booster immunisation shots to foreign-made vaccines.

Clinical trials are now focused on proving that the vaccines are no less effective than Pfizer or Moderna vaccines, with test subjects to be scouted abroad given the shrinking domestic pool.

Biotech start-up AnGes was the first in Japan to begin human clinical trials in June last year, and has tested its DNA-based vaccine on 500 people.

It was followed by pharmaceutical firm Shionogi, whose recombinant protein vaccine uses genetically modified insect cells to produce the Covid-19 spike protein.

The firm, which is also developing once-a-day pill treatments for Covid-19 patients, said it can produce 120 million doses of vaccine a year after it wins approval.

Daiichi Sankyo aims to roll out its messenger RNA vaccine next year. KM Biologics, a subsidiary of food giant Meiji Holdings, plans to roll out 35 million doses of its inactivated virus vaccine within six months of reaching approval.

Walter Sim