KEVIN FRAYER/GETTY

Barricades have been set up around some communities in China with many COVID-19 cases.

WILL OMICRON FINALLY OVERPOWER CHINA'S COVID DEFENCES?

The country needs to control the virus until it has boosted vaccination rates in older people.

By Dyani Lewis

All eyes are on China as it attempts to quash its largest COVID-19 outbreaks since the early days of the pandemic. More than 62,000 people across all 31 of its provinces are infected, most of them with the fast-spreading BA.2 Omicron variant.

The outbreaks have plunged tens of millions of people into lockdown. President Xi Jinping announced last month that China would stick to its 'dynamic zero-COVID strategy', which aims to stamp out infections and prevent the virus from spreading through communities. This policy stands in contrast to a global trend towards easing restrictions and attempting to co-exist with the circulating virus.

China's hard-line approach to eliminating COVID-19 seems to be softening. In his speech, Xi also flagged a more pragmatic strategy, asking that officials limit the economic impact of control measures. In practice, this means that people with asymptomatic cases of COVID-19 are being sent to dedicated isolation centres rather than hospitals, and are monitored for shorter periods than previously required. But some researchers are divided about whether the virus will spread out of control before the government has time to prepare.

Testing boost

"They've demonstrated time and time again that they can control outbreaks," says epidemiologist Ben Cowling at the University of Hong Kong. The country successfully controlled the hyper-transmissible Omicron variant during the Beijing winter Olympics in February, despite predictions that large outbreaks would occur, he says. He anticipates that the aggressive testing efforts under way will see case numbers continue to rise in the short term, but that numbers will fall back to zero after that.

If cases do drop, the government will probably spend the next year boosting the low vaccination rates in older people and establishing primary health-care infrastructure to ease pressure on hospitals, says economist Xi Chen at Yale University in New Haven, Connecticut, who studies China's public-health system.

But others say that China needs to brace itself for a growing outbreak. As *Nature* went to press, new infections had exceeded 16,000 confirmed cases a day. "It's growing quickly – I think it's out of control now," says Michael Osterholm, an infectious-diseases epidemiologist at the University of Minnesota in Minneapolis. Case numbers are unlikely to come back down to zero, he says, and trying to keep the virus suppressed would require such severe restrictions that "it surely will bring down their economy".

If Omicron runs out of control, the effects could be devastating – and similar to the current outbreak in Hong Kong, where deaths have surged and hospitals are overwhelmed. An analysis by Airfinity, a life-sciences market-analytics firm in London, suggests that more than one million people in mainland China could die during an Omicron wave, partly because of lower levels of protection in older people. Only 50% of people over the age of 80 are fully vaccinated, according to the Chinese government.

Lessons from Hong Kong

Recent experience in Hong Kong has highlighted the cost of low vaccination rates in older people. In early March, there were close to 900 cases of COVID-19 per 100,000 residents in Hong Kong, the highest level recorded anywhere in the world during the pandemic. Deaths have also surged, to nearly 300 a day last month. Experts blame low vaccination rates in older people for the region's high mortality rate. Only about one-third of those aged over 80 years are fully vaccinated, and 90% of deaths have been in people who are not fully vaccinated.

Mainland China faces a similar predicament if the current outbreak is not controlled. China's overall vaccination rate is higher than 85%. That has been achieved with the introduction of a digital vaccination-passport system – required for entry into many public buildings and workplaces – and a colour-coded 'health code' that indicates whether someone poses an infection risk. But Cowling says that older people are less likely to use facilities that require a vaccination passport and have been able to remain unvaccinated.

Fifty-two million people aged over 60 years are yet to be fully vaccinated. The most vulnerable – those aged over 80 years – are the least well vaccinated, with only 20% having received the primary vaccination course and booster shot. Work by Cowling and his colleagues that is yet to be peer reviewed indicates that the Sinovac vaccine, one of the two main vaccines used in China, is effective at reducing severe cases and deaths, but that the third shot is necessary to confer high levels of protection in those over 60 (E. McMenamin *et al*. Preprint at medRxiv https://doi.org/hnww; 2022).

Deaths from COVID-19 could be "much worse" than the 1 million estimated by Airfinity if Omicron spreads through the population, says Lu Jiahai, an infectious-diseases epidemiologist at Sun Yat-sen University

in Guangzhou, China. The government is "taking responsibility for people's lives, so will not change or relax the current prevention and control strategy", he says.

Exit strategy

China's large domestic economy has made a zero-COVID strategy more sustainable than it has been in places with smaller populations, such as New Zealand and Singapore. But it can't last forever. The stock market index is falling, suggesting that China's economy is suffering, and Cowling says that disruptive outbreaks will become more frequent as the virus circulates freely elsewhere.

Boosting vaccination rates in older people will be a priority, but many live in rural areas, so this will take time. Lu says that China will probably wait until the vaccination rate reaches 80% in that group before easing restrictions further.

Chen says that, at the moment, there are few family doctors in China, which means people rely on hospitals as their first port of call. He suspects that most COVID-19 restrictions will be in place for another year. This would allow the government to build up a fledgling family-doctor network as well as dedicated isolation facilities to treat people with mild or asymptomatic COVID-19 and ease pressure on the hospital system. If the country isn't prepared, re-opening could be "a disaster in terms of the health-care system", says Chen.

Chinese authorities also need to prepare the public for what's to come, says Chen. Many people rely on the government's willingness to use all means necessary to control the virus at the expense of the economy, he says.

JOE BIDEN BIDS AGAIN TO BOOST US SCIENCE SPENDING

But the president faces a divided Congress, which might not go along with the plan.

By Jeff Tollefson, Max Kozlov, Amy Maxmen & Alexandra Witze

US President Joe Biden released his latest budget request to Congress on 28 March, calling for significant new investments in clean energy and public health. The proposal for fiscal year 2023 includes roughly US$200 billion for research and development programmes, according to the American Association for the Advancement of Science in Washington DC. It comes just weeks after Congress finalized a spending package for the current fiscal year that cut back considerably on the science funds that Biden had requested — signalling more challenges ahead.

Although Congress modestly increased funding for most science agencies in 2022, it heavily scaled back some of the administration's most ambitious proposals. For instance, the Advanced Research Projects Agency—Health (ARPA-H), a new high-risk, high-reward agency meant to accelerate innovations in health and medicine, received $1 billion rather than the $6.5 billion the president requested last year.

"The president's request is certainly very solid, and the increases for science go right across the board," says Michael Lubell, a physicist at the City College of New York who tracks federal science-policy issues. But Lubell says concerns about the rising cost of living owing to inflation, as well as economic uncertainty around Russia's invasion of Ukraine, could make it hard for Biden's party, the Democrats, to boost government spending on anything without also putting new taxes in place to increase revenue. "Science is one of the least contentious issues," Lubell adds, "but it's not something that puts food on the table tomorrow."

Health priorities

A standout in Biden's budget proposal is the request for a mandatory $81.7 billion over five years to prepare the United States for future pandemics and other biological threats. "This new pandemic-preparedness effort is designed to address the deficiencies with our public-health system that we have witnessed" in the past few years, says Jennifer Kates, director of global health and HIV policy at KFF, a non-profit health-policy organization headquartered in San Francisco, California. Kates, however, notes that the pitch will probably struggle to get approval in Congress, both because it's a large financial demand and because the funds would be mandatory until 2027, as opposed to being at the discretion of policymakers each year. In making the budget mandatory, the administration is hoping to avoid the cycle of panic and neglect that often follows health emergencies, Kates says.

More than one-third of the preparedness funds are slated for the US Centers for Disease Control and Prevention (CDC). On top of the normal budget increase proposed for the agency, this would mean a whopping 171% boost in funds for the CDC compared with 2021. (The White House has not yet released its official budget numbers for 2022.) The budget request for the agency includes funds earmarked for coronavirus sequencing and surveillance, for efforts to modernize public-health data collection and for the CDC's new Center for Forecasting and Outbreak Analytics, where disease-modelling specialists will analyse data that can help to guide public-health decisions.

Under Biden's plan, the National Institutes of Health (NIH) would also receive a dramatic increase in funds, with much of the jump related to pandemic preparedness. The biomedical agency would get a total of $62.5 billion, representing a 46% increase from 2021. Of that, $12.1 billion would go towards researching and developing vaccines, diagnostics and therapeutics against pathogens of pandemic concern, and to expanding laboratory and clinical-trial infrastructure.

Another $5 billion of the NIH's proposed budget would go to ARPA-H in 2023. Although ARPA-H is included in the NIH's budget request, policymakers continue to spar over whether the health-innovations agency should be housed in the NIH, or whether it should be a separate branch of the Department of Health and Human Services. Some think that the NIH is too bureaucratic and conservative in its approach to biomedical research.

However, without the sums budgeted for pandemic preparedness and ARPA-H, the NIH would actually receive only $275 million more than Congress allocated for the agency in 2022, says Jennifer Zeitzer, the director of public affairs at the Federation of American Societies for Experimental Biology in Rockville, Maryland. Because the NIH is the largest public funder of biomedical research in the world, Zeitzer says, this level of funding is inadequate. "It would be very unusual for a Democratic president — or any president — to not propose [a more substantive] baseline increase for NIH," she adds.

Even so, the Biden administration proposed modest increases to several research areas, including those related to mental and maternal health, health disparities and inequities, and sexual orientation and gender identity. The request also proposes more funding for the Cancer Moonshot initiative, a programme that is attempting to reduce the cancer death rate by at least 50% over the next 25 years.

The request would also boost the Food and Drug Administration's budget by nearly 39% compared with 2021 — to $8.4 billion