he stringent, 12-week lockdown from which China emerged at the beginning of April 2020 was so effective in controlling the coronavirus epidemic that just six newly confirmed sporadic cases emerged in Wuhan

in the following two months.

Cognisant of the new challenges the country could face in the post-lockdown phase - assessing risks of the virus, avoiding new waves and resuming normal economic and social life - researchers undertook a city-wide SARS-CoV-2 nucleic acid screening programme in the epicentre of the COVID-19 pandemic.

Nearly 93% of Wuhan's population of 10.7 million people aged over six years took part in the mass screening programme between 14 May and 1 June 2020. The vast majority of participants (9,865,404) had no previous diagnosis of COVID-19 and 34,424 were recovered patients.

Testing

Residents of the city used an app to upload their personal information including ID number, name, sex, age and place of residence. A unique personal barcode was generated for each participant and trained staff interviewed each individual regarding their history of COVID-19 and previous nucleic acid testing.

Researchers used PCR testing for viral RNA and samples were matched to barcoded sample tubes. All information was entered into a central database and contact tracing investigations were conducted on participants who tested positive for SARS-CoV-2, to manage their close contacts.

Of the recovered COVID-19 patients, 107 tested positive again. However, there was no evidence that these repositive cases were infectious - in line with other research. For example, a study in Korea found no

HOW INFECTIOUS ARE ASYMPTOMATIC COVID-19 CASES?

A Wuhan study suggests that when coronavirus has been brought under control, asymptomatic COVID-19 patients do not pass on the virus.



confirmed COVID-19 cases among 790 contacts of 285 repositive cases.

> In the Wuhan study, there were no new symptomatic cases among

> > the more than 9.8 million people with no history of COVID-19. However, there were asymptomatic cases among 300 participants (132 males and 168 females), the youngest being 10 years old and the eldest 89 years old.

Patients were considered to be asymptomatic if they tested positive without symptoms or history of the virus and had negative virus cultures indicating there was no "viable virus". These cases also suggested low levels of viral load and a short duration of viral shedding. Researchers tested 1,174 close contacts of these asymptomatic patients and found no positive cases and no evidence of transmission, suggesting the asymptomatic participants were not infectious. However, antibody testing of

the 300 patients found that 63.3% of them had previously had COVID-19.

Caution

Generalising these results elsewhere, particularly to countries or settings where COVID-19 outbreaks have not been brought under control, is problematic, according to Professor Fujian Song, Professor of Research Synthesis & HSR at Norwich Medical School at the University

of East Anglia, who collaborated with

[₹] colleagues from Wuhan on the research.

"The asymptomatic cases identified in the screening programme were truly asymptomatic, as none of them showed clinical symptoms before and during the follow-up isolation," he says.

Asymptomatic cases in China are centrally isolated for two weeks and discharged from quarantine centres (usually designated hotels) only after people have received two negative PCR tests.

Song adds that the asymptomatic cases in the study were identified between four and eight weeks after the relaxation of the 70-day lockdown in Wuhan. So by then the epidemic in Wuhan was effectively under control.

In addition, up to 60% of the 300 asymptomatic cases tested positive for a SARS-CoV-2 antibody, meaning they were likely to have been previously infected, and they had only inactive remains of viral RNA, which may not be true in locations with high SARS-CoV-2 virus transmission. "We found that asymptomatic positive rates in different districts of Wuhan were correlated with the prevalence of previously confirmed cases," he adds. "Infected individuals in other settings may be temporarily asymptomatic or pre-symptomatic (they may become symptomatic after some days), and they can spread the virus even before the onset

of symptoms."

So not only are the results of the study not generalisable, it is difficult or impossible for many countries to impose "sufficiently" stringent and long-lasting lockdown measures, particularly after the virus has widely spread to the whole country. "COVID-19 outbreaks can be suppressed by lockdown measures. If the lockdown measures are sufficiently stringent, the outbreak could be almost extinguished," Song says. In addition, public health measures, including wearing masks and social distancing, have been successful in reducing the virulence of the virus. Where these haven't been stringent enough, the virulence of SARS-CoV-2 will not be reduced.

FUJIAN SONG

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Implications

"The results of the mass testing programme in post-lockdown Wuhan has confirmed the effectiveness of stringent lockdown measures in the suppression of outbreaks and facilitated the return to normality in Wuhan," Song says. "And the screening programme in Wuhan showed the feasibility of mass testing of the population, which may have encouraged decision makers in other countries to use mass testing as one of the nonpharmaceutical intervention measures for the control of COVID-19."

There is a great deal that other countries can learn about the control of infectious diseases from the study's findings, Song says. "It is almost certain, earlier or later, that a new virus similar to or more fatal than SARS-CoV-2 will emerge. The development of treatment and vaccines will always take at least some months.

"In such anticipatable circumstances, strict lockdown measures are the only control measures known to be effective to minimise the destructive consequences."