

Coronavirus: SCIENCE



Ms Jiang (fourth from left), diagnosed with the coronavirus infection after arriving in Singapore for a holiday, posing for a photo with doctors and nurses at the National Centre for Infectious Diseases to thank them for caring for her when she was warded from Jan 23 until she was discharged last Friday. PHOTO: MS JIANG

Discharged patient thanks medical team's 'hearts of gold'

2nd person confirmed to have coronavirus is also given clean bill of health by hospital

Salma Khalik
Senior Health Correspondent

For some years now, Ms Jiang, 53, who wants to be known only by her surname, had been hearing about how clean Singapore is and how friendly the people here are. She yearned to visit, and her daughter, who had been to Singapore with a classmate some years back, saved from her salary to give her mother a treat.

Little did Ms Jiang expect to become Singapore's second confirmed coronavirus patient, just three days after she arrived for a holiday.

But one thing has panned out – she has found people here as friendly as she had been told,

though much of the friendliness she experienced was from the medical staff who cared for her.

She has recovered and was discharged last Friday – the second patient to get a clean bill of health out of 40 identified so far.

"The medical team really have hearts of gold," she said in Mandarin. She said they had taken good care of her even though she is a foreigner. When she thanked them, they replied: "It is our job."

She added: "I was not afraid, because of the wonderful medical team you have here. I am but an ordinary mother, but I was brave and overcame it. From the experience, I also became stronger."

Ms Jiang arrived in Singapore on the morning of Jan 21, but started feeling unwell that afternoon. She

did not think much of it till the following day, when she started coughing and was running a temperature.

She went to Raffles Hospital, but since she had come from Wuhan – the epicentre of the outbreak – the hospital sent her to Tan Tock Seng Hospital's (TTSH) Emergency Department at 9pm in an ambulance.

She was transferred to the National Centre for Infectious Diseases (NCID) on Jan 23 at 1am, and was immediately warded in an isolation room.

She said: "I thought I had the common cold. I have had such symptoms before, which were like the common cold."

Even after she was sent to TTSH, she said: "I didn't believe I caught the coronavirus infection, I comforted myself, thinking it was just the typical pneumonia."

But the following day, her worst fears were confirmed when she was told she had the coronavirus.

In the two days of sightseeing she managed to get in before she sought medical care, she had taken the MRT and taxis to Orchard Road, Marina Bay Sands and Gardens by the Bay. Now, she would very much like to go home as soon as possible.

"To be honest, Singapore is a wonderful country, in terms of its climate and in other areas too. But this is not my homeland after all.

"I understand that there was a chartered flight on Feb 5 for Wuhanese to return to China," she said. But she missed it as she was still in hospital.

All commercial flights between Singapore and Wuhan have been suspended because of the outbreak.

The doctor caring for her at the NCID had apologised that he could not discharge her in time for the chartered flight. He had explained that she still had some strain of the virus in her then, so it was not safe for her to be discharged.

She told him: "I should thank you. You are being responsible to me, to others and your profession by not discharging me. There is no need for you to apologise to me, I should thank you instead."

She said if the doctor had discharged her earlier, before she was fully well, she might have spread the disease to others.

"This is definitely unacceptable. I must be cleared of my virus thoroughly and be given a clean bill of health before I can go home."

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Expert: S'pore taking right measures to contain coronavirus

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Senior Health Correspondent

Singapore is doing what is needed to try to contain the coronavirus outbreak, said an infectious diseases expert who headed the World Health Organisation's (WHO) global response to Sars in 2003.

Professor David Heymann of the London School of Hygiene and Tropical Medicine said this may make things inconvenient for people, but "you have to put precautionary measures in until you understand what the potential of this outbreak is".

"So every precautionary measure based on national assessment should be followed," he added.

Prof Heymann currently chairs the Strategic and Technical Advisory Group for Infectious Hazards, which provides independent advice to WHO on potential threats to global health security.

He said Singapore "is not overdoing it" with the measures it has introduced.

Singapore moved to code orange on Friday and new measures include cancelling large-scale events if possible.

Earlier measures include not allowing non-residents who had been in Hubei in the past fortnight, or people holding passports issued in Hubei, from entering.

In a telephone interview from London with The Sunday Times, he said: "Singapore has been identifying cases, isolating them, done contact tracing, everything that's necessary to do to stop the outbreak."

This is what the WHO is recommending – to try to ring-fence or contain the disease.

But he added: "It's very difficult when before the disease is known, it's already out in the community. Some of the people coming in to China were exposed."

Singapore is now the country with the most number of coronavirus patients outside of China. This excludes the cruise ship docked in Japan which is classified as an international conveyance.

Prof Heymann said the high num-

ber is probably due to "multiple introductions" given the high number of visitors from China.

A major problem is that too much is unknown about the disease, which surfaced only at the end of last year.

Among the unknowns, which may even be more important in fighting a disease, he said, is "we don't yet fully understand the spectrum of the disease, how many cases are mild, like a cold, how many cases are severe".

"It looks like this is a relatively mild outbreak compared with Sars. But there is mortality, especially in the elderly, and those with diabetes, chronic diseases, et cetera."

Early indications point to less serious illness in children, but he added that more data is needed.

Prof Heymann also said that the current understanding of the virus' mortality rate is "skewed", because, until recently, China was only looking at people with pneumonia, in other words, those who are seriously ill.

But there are probably many more with the disease in a milder form who are not picked up, so the base number of patients could be much larger.

It is only recently that China is starting to pick up less severe cases.

Experts are still not clear about how transmissible the virus is. Early data points to droplets, he said. If it is airborne, the infection rate could be 10 times worse.

He said how severe the illness in



A major problem, though, is that too much is unknown about the virus, says infectious disease expert David Heymann.

a person is depends both on the person's own immune system, as well as how large the viral load is when the person is infected.

If someone who is very sick sneezes or coughs in the person's face, the viral load could be high.

If the infection is passed by someone with a mild illness, much like the common cold, the viral load would be low. But if the person getting infected has other medical conditions, he could still get seriously ill even with a low viral load, said Prof Heymann.

On how long the virus remains infective on surfaces, he said it can be transmitted so long as it remains moist. Once it dries up, it is no longer infective.

As to whether someone who recovers can get the infection again, he said it is not clear how long the antibodies last, but there is no life-long immunity for coronavirus infections.

But he said infection controls everywhere, and definitely in Singapore, are at a standard where there should not be any hospital transmission.

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How contact tracers track down the people at risk of infection

There are seven teams comprising 10 people here, working in two shifts from 8.30am till 10pm, seven days a week. Their job – calling people to check if they are "close contacts" of coronavirus patients.

This group of contact tracers was activated when Singapore confirmed its first case of coronavirus infection last month.

Their job is a critical part of ring-fencing the virus by rounding up patients who may have been infected.

Close contacts are people who have had prolonged physical contact with or stayed in the same place as the patient.

It could include, for instance, someone driving the patient from the airport to a hotel, at a time when the person does not yet seem sick.

Any close contact must be quarantined for 14 days from their last contact with the patient.

But contact tracing does not start with these teams.

It begins in the hospital.

Dr Olivia Oh, assistant director in the Communicable Diseases Division of the Ministry of Health (MOH), said the hospital where the patient is warded would do an activity map – this refers to everything the patient has done and the people he has been with over the previous two weeks.

Her colleague, Mr Pream Raj, also an assistant director in the division, added: "The mapping is detailed, 24 hours, minute by minute, with no gaps."

If there are gaps, then the contact tracing team would call a patient to try and jog his memory. And if the patient is too sick, they would approach his next of kin instead.

He said although 14 days may seem like a long time ago, most people have routines, so it is not that difficult to recall what they had been doing.

If they had meals with people, and because of Chinese New Year many did, they need to remember who was there. If it was at a restaurant, they need to recall if any of the serving staff spent much time with them, or if the contact was casual.

For the 17 patients from China who were confirmed with the virus here, Dr Oh said they would start the contact tracing from the time they arrived in Singapore, assuming that they had caught the virus

while still in China.

They would get the list of passengers sitting in the same row, as well as two rows in front and two rows behind the patient, from the airline, and get in touch with them.

Mr Raj said the airlines, taxi companies and Grab, since quite a number of the visitors use that service, have all been very cooperative – they are obliged to provide all information required under the Infectious Diseases Act.

Sometimes, patients have no taxi receipt, remembering only that they were in a blue cab. The contact tracers would go through the closed circuit television footage at the hotel driveway to identify the taxi.

He added that they try to identify and get in touch with all possible close contacts of a patient to verify that what the patient had said was correct within 24 hours.

If the person is deemed at risk of infection, an MOH officer, together with a Cisco guard, would serve notice of quarantine to the person, who will then be given the choice of staying at home or going to a government quarantine facility if his home premises are not suitable.

For home quarantine, the person must have a room and toilet that is not shared with anyone else.

The locations of where individual patients had been is also cross-referenced with other patients' activity maps to see if there are any overlaps.

These are analysed by another team and any links are flagged, and further cross-checks made.

Mr Raj said several such links have been found.

It could be anything from both patients attending the same event to meeting the same person.

Salma Khalik

RETRACING PATIENTS' FOOTSTEPS

The mapping is detailed, 24 hours, minute by minute, with no gaps.



MR PREAM RAJ, assistant director in the Communicable Diseases Division of MOH.

How contact tracing is done

Interview
Hospital maps the patient's movements and contacts for the last 14 days.

Investigation
Contact tracing team calls all the people he has interacted with to verify and get more details of interaction.

Identification
Decision made as to whether a person is a close contact and hence at risk of getting an infection. The team also checks if the close contact is well or not.

Notification
If the close contact is **WELL**
The person has to be quarantined for 14 days from last contact with patient.

If the close contact has **CORONAVIRUS SYMPTOMS**
The person has to be treated as suspect case and hospitalised.

• Data from all patients is analysed for any possible links not known to them. These are checked out to see if more people might be at risk of infection or to identify source of infection.

Source: MOH SUNDAY TIMES GRAPHICS

Made-in-Singapore diagnostics test implemented in hospitals here

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A made-in-Singapore diagnostic test kit that detects the presence of the novel coronavirus (2019-nCoV) with high accuracy has been rolled out at some public hospitals here.

Plans are in place to scale up production so the kits can be deployed

at other hospitals and laboratories which are not offering 2019-nCoV tests, said the Agency for Science, Technology and Research (A*Star), whose scientists developed the pre-packed reagents.

This will widen the network of facilities in Singapore that can accurately screen patients for the coronavirus, reducing the wait time for results and allowing those infected to be treated quickly.

The test kit was developed by scientists at A*Star's Experimental Drug Development Centre and Bioinformatics Institute.

A number of public hospitals here last weekend received 5,000 test kits in total, and Singapore has the capability to produce more, A*Star said. Singapore also sent 10,000 of the test kits to China to help prevent further spread of the coronavirus.

Currently, to determine if some-

one has been infected with 2019-nCoV, samples are first taken from the patient. These are then processed by laboratory technologists at the hospitals. The technologists mix reagents together in a tube before placing the sample in it, then feed it into a machine which can take between two and four hours to register a reading.

But the entire process could take up to a day, said Prof Lin, highlight-

ing factors such as the time to transport the sample, and sort the data.

However, a test kit could expedite this process at some laboratories by reducing the time required for preparing the reagent mix.

Such tests are pre-packed with reagents mixed in the right quantities, and with quality control tubes included. All that is required is for technologists to place the patient's sample in the tube before feeding it

to the machine.

The diagnostics test kit also makes the procedure easier, allowing more laboratories in Singapore – including those with less experience working with reagents required to test for 2019-nCoV – to conduct them as well, without compromising accuracy.

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