Coronavirus: Testing

AI tool developed to detect abnormal chest X-rays quickly

Rapid flagging of pneumonia in suspected Covid-19 cases allows for earlier intervention

Shabana Begum

An artificial intelligence-powered tool has been developed to detect abnormal chest X-rays quickly during Covid-19 screening at the National Centre for Infectious Diseases (NCID).

With rapid flagging of pneumonia cases, doctors can intervene earlier as more severe findings on chest X-rays may mean an urgent need for supplemental oxygen therapy and ventilation for patients.

Suspected Covid-19 patients who have pneumonia must be admitted to the hospital.

Everyone who visits the NCID Screening Centre who is suspected of Covid-19 or who has respiratory symptoms must do a chest X-ray.

Previously, each X-ray image was reviewed by a radiologist within an hour. The radiologists had to analyse each X-ray result in sequence, which was time-consuming.

Now, the AI tool, called Radi-Logic, can analyse each X-ray image within three seconds and highlight abnormal chest X-rays on a computer quickly, helping radiologists prioritise which images to review. This allows radiologists to report such cases in about 50 minutes, after each patient completes the procedure.

The tool has an accuracy of up to 96.1 per cent, and has been used in the screening centre since May.
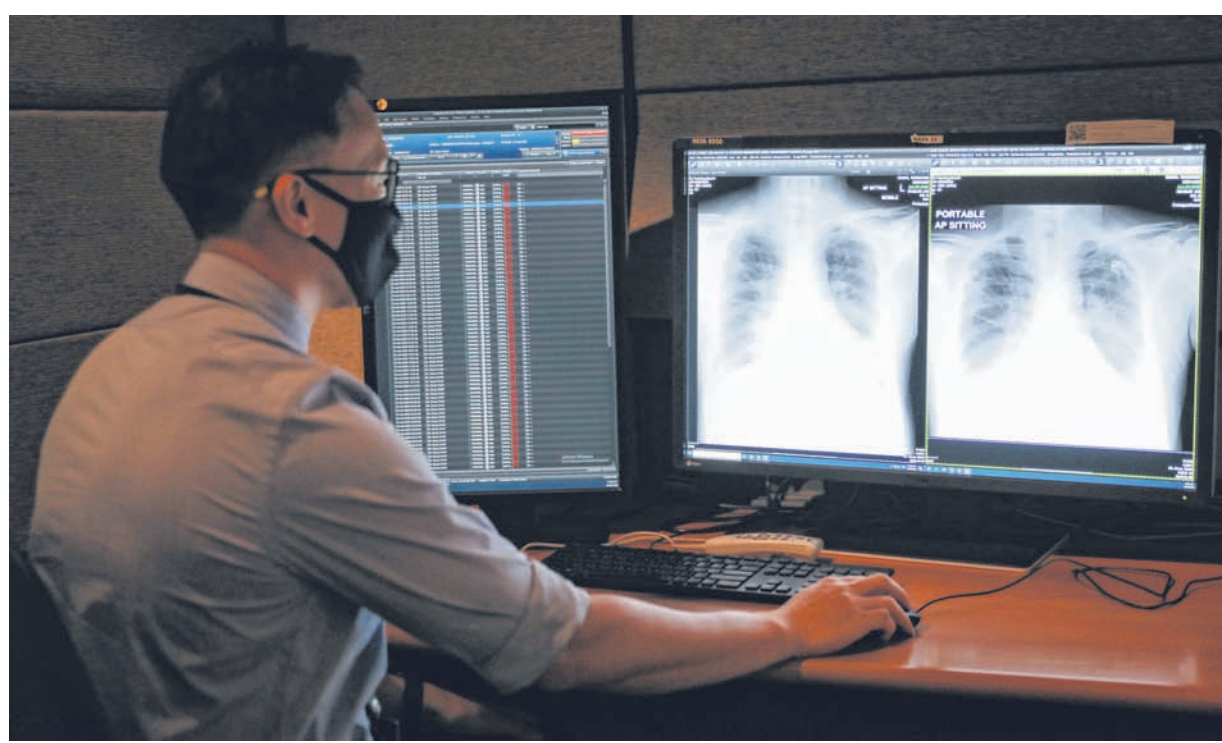
The screening centre saw 200 to 300 X-ray images a day during the peak of the pandemic in April.

Currently, there are 100 images coming in each day.

"The AI tool is performing close to human capabilities and it helps us prioritise the workflow to enhance our efficiency and diagnostic confidence," said Adjunct Associate Professor Tan Cher Heng, senior consultant at Tan Tock Seng Hospital's (TTSH) department of diagnostic radiology. He is also part of the team that developed the tool.

RadiLogic is not the first AI system for chest X-rays, but the team believes that it is the first chest X-ray AI tool developed for Covid-19 in Singapore.

Programmed through deep learning, RadiLogic was fed with 1,000 anonymised abnormal chest X-rays from Covid-19 patients and 4,000 anonymised normal chest X-rays to train it to detect pneumonia accurately.

White patches or haziness over parts of the lungs in the X-ray image indicate lung infections and pneumonia. The bigger the patches, the more serious the infection.

The tool was developed by radiologists from TTSH and researchers from the Agency for Science, Technology and Research's Institute of High Performance Computing, and Institute for Infocomm Research.

The team is hoping to deploy the tool to Covid-19 screening sites such as community care facilities and border control checkpoints, where radiologists are not on-site, and other hospitals such as Singapore General Hospital.

The team is also working to enhance the tool's AI capabilities in a few ways.

One is to train the system to distinguish between Covid-19 pneumonia and other types of lung infection, while another one is to zero in on abnormal regions and indicate the probability of pneumonia.

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Dr Ting Yong Han, consultant in diagnostic radiology (clinical) at TTSH, looking at a chest X-ray of a Covid-19 patient that was flagged by the AI tool, RadiLogic, which can analyse an image within three seconds. ST PHOTO: ONG WEE JIN

S'pore, South Korea set up fast lane for essential travel

Toh Ting Wei

Singapore and South Korea have concluded a fast-lane arrangement which will allow for essential business and official travel between the two countries from tomorrow.

Singapore's Ministry of Foreign Affairs (MFA) said yesterday that the arrangement will help restore connectivity and support economic recovery. It added that the necessary public health safeguards will be in place.

Eligible travellers will have to abide by the mutually agreed terms and prevailing public health measures in both countries.

These conditions include pre-departure and post-arrival testing, as well as the need to adhere to a controlled itinerary for the first 14 days after their arrival.

More details about the fast-lane arrangement and application process will be published on the safetravel.ica.gov.sg website by tomorrow.

MFA said that Foreign Minister Vivian Balakrishnan and his South Korean counterpart Kang Kyung-wha spoke on the phone yesterday, with both welcoming the conclusion of the fast-lane talks.

It said the ministers also reaffirmed the importance of bilateral cooperation to jointly overcome both countries' common challenges amid the Covid-19 pandemic.

This the second fast lane Singapore has announced in as many days, after a pact with Brunei was announced on Tuesday.

The Republic has also agreed on fast-lane arrangements with China and Malaysia since it started to gradually reopen its borders in June.

Separately, it has unilaterally opened its borders to short-term visitors, including tourists, from Brunei and New Zealand. The application window to come into Singapore under this scheme opened on Tuesday.

These measures are part of efforts to gradually revive the local aviation sector amid the pandemic.

Changi Airport registered just 86,000 passengers passing through in July, a 98.5 per cent drop compared with the same period last year.

Airlines and airports worldwide are continuing to struggle as well.

Industry group International Air Transport Association said on Tuesday that international traffic in July was 91.9 per cent below the levels last year. It added that there is deep industry frustration with government policies, such as travel restrictions, which are continuing to "annihilate" travel demand.

Its director-general and chief executive Alexandre de Juniac said: "Too many governments are fighting a global pandemic in isolation with a view that closing borders is the only solution.

"It's time for governments to work together to implement measures that will enable economic and social life to resume, while controlling the spread of the virus."

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Foreign workers enjoying a game at Labrador Park yesterday afternoon. They were among some 50 workers chosen to go on the outing by the Ministry of Manpower, which had collaborated with the Alliance of Guest Workers Outreach to organise the excursion. ST PHOTO: NG SOR LUAN

Workers enjoy afternoon out in parks after months in dorms

Cara Wong

After months of being cooped up in their dormitories, some 50 foreign workers had the chance to stretch their legs in Labrador Park and Hort-Park yesterday afternoon, as part of a trial run to allow more healthy workers out of their dormitories on rest days.

The workers, who are either recovered Covid-19 patients or have tested negative for the coronavirus in the last 14 days, played games, ate and went for walks in the park, in small groups of five.

They were chosen by the Ministry of Manpower (MOM), which had collaborated with non-governmental organisation (NGO) Alliance of Guest Workers Outreach (AGWO) to organise the outing.

MOM's director of engagement for the foreign manpower management division, Mr Tan Shu Xiang, said the outing was to allow the workers to relax and enjoy themselves, especially as the last few months have been challenging for many of them.

"We understand that we need to look after both their physical and their mental well-being," he said.

The ministry is also exploring more of such recreational options for the workers, now that most have returned to work, he added.

Workers are still largely restricted to their workplaces and dorms, or approved locations like recreation centres, as part of measures to control the virus spread among the population.

"We will gradually allow more and more workers to be able to enjoy their days off by coming out of the dormitories," said Mr Tan, adding that this will have to be done in a calibrated manner.

AGWO chairman Samuel Gift Stephen and Hope Initiative Alliance (HIA) president Ezekiel Tan said that AGWO, which falls under HIA, plans to continue organising a series of outings and activities under Project Sunshine, together with MOM and other agencies and NGOs.

"To use the exact words that they (workers) have used, they feel imprisoned (in the dormitories) and for them, just getting out of the dorm itself is a relief," said Pastor Stephen, adding that the workers were very excited yesterday.

Bangladeshi construction worker Talukder Sharif, 24, said the outing was the first time in some five months that he had stepped outside his factory-converted dormitory.

He has spent most of his time in the dormitory watching movies and praying, and is still waiting to return to work.

"After such a long time I can go outside, we are very happy to come to this park," he said.

Pastor Stephen said he hopes workers can see, through this activity, that Singaporeans care for them.

"They see the news and see Singaporeans are freely going around. So now by bringing them out, we are also saying that... we are here with you."

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Three new clusters at dorms; 49 new cases reported

Ng Keng Gene

Three new coronavirus clusters in worker dormitories were announced by the Ministry of Health (MOH) yesterday.

The first, Changi Lodge II at 80 Tanah Merah Coast Road, was linked to six cases, while North Coast Lodge in Admiralty was linked to seven cases. Two new patients from Toh Guan Dormitory at 19A Toh Guan Road East were linked to five previous cases.

Multiple locations in Orchard Road were added to the list of places infectious patients visited. They include Apple Orchard Road, Cineleisure Orchard and Lucky Plaza. Also on the list were Universal Studios Singapore, Skyline Luge Sentosa and shops in VivoCity.

MOH provides the list of locations that infectious patients visited for at least 30 minutes and the times they visited to get people who were at those places at the same time to monitor their health closely for two weeks from the date of their visit. The full list of locations and times is on MOH's website. It has said close contacts would have been notified and there is no need to avoid these places as they would have been cleaned if necessary.

Three community cases were reported yesterday: a Singaporean, a work pass holder and a work permit holder. All three were unlinked as of yesterday, and MOH said close contacts have been isolated and placed on quarantine, and will be tested at the start and end of their quarantine periods.

Three imported cases were also reported yesterday. Of these, two are a work pass holder and a work permit holder who arrived here separately from India and the Philippines on Aug 21. Both were placed on 14-day stay-home notices and were tested while serving their notices at dedicated facilities.

The remaining imported case is a seaman who was tested upon arrival from Indonesia on Aug 26. He was isolated while awaiting his test result, which came back positive on Tuesday.

Migrant workers staying in dorms made up the remaining 43 of 49 new cases announced yesterday, taking Singapore's total to 56,860.

The average number of new daily cases in the community in a week has increased from two cases two weeks ago to three in the past week.

The number of unlinked cases in the community has remained stable at an average of one case per day over the past two weeks.

With 142 cases discharged yesterday, 55,876 patients have fully recovered from the disease.

A total of 75 patients remained in hospital yesterday, with none in intensive care, while 867 were recuperating in community facilities.

Singapore has had 27 deaths from Covid-19 complications, while 15 who tested positive have died of other causes.

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Update on cases

New cases: 49
Imported: 3 (1 work pass holder, 2 work permit holders)
In community: 3 (1 Singaporean, 1 work pass holder, 1 work permit holder)
In dormitories: 43

Active cases: 942
In hospitals: 75 (0 in ICU)
In community facilities: 867

Deaths: 27

Patients with Covid-19 who died from other causes: 15

Total discharged: 55,876
Discharged yesterday: 142

TOTAL CASES: 56,860