



Singapore's TraceTogether system was highly effective at the height of the pandemic, and remains part of the nation's toolkit to be employed if evidence should point to a surge that necessitates contact tracing, says the writer. ST FILE PHOTO

Tracking Covid-19 data remains necessary to keep virus at bay

Knowing which indicators to look out for is an essential strategy, given that keeping Singapore open is vital

Kho Yung Khean

Covid-19 remains a public health emergency of international concern, the World Health Organisation (WHO) declared last week, affirming that the global risk to human health and transmission remains high.

The silver lining was the WHO's emphasis that the world may be arriving at an inflection point.

Higher levels of population immunity due to vaccination and infection, along with effective public health interventions, will limit the impact of the virus on morbidity and mortality, it said. Better diagnostic tools, more effective antivirals and public health measures have also helped.

One death is one too many. But compared with the peak of more than 14,000 Covid-19-related deaths a day globally in January 2021, we are now in the low thousands.

The world is reverting steadily to somewhat of a pre-pandemic normal. Restrictions have eased – for example, Germany recently ended mask mandates on public transport – and air travel, including to and from China, is returning to pre-Covid-19 levels.

The current status of the pandemic comes from an evidence-based, data-driven approach based on diligent and consistent collection of a variety of indicators and parameters that have shaped public health policies, guidelines and recommendations.

Public health surveillance – defined by the WHO as “the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation and evaluation of public health practice” – has unlocked a post-pandemic normal for us all. This tracking of a spectrum of Covid-19 public health data points has enabled the authorities to develop and test public health interventions to find the most successful combination of measures for reducing transmission and the effects of the disease, including severe illness and death.

But going into the fourth year since Covid-19 struck, how useful are these indicators in informing

the way forward? Do we really need to monitor all this?

DEVELOPING USEFUL VACCINES AND VACCINE POLICY

The reality is that Covid-19 has been stemmed only by the incredible human ingenuity unleashed on an unprecedented scale to tackle the problem, requiring a powerful nexus of research, business and government collaboration like never before.

Case in point: The rapid testing kits we now take for granted and other diagnostic tools like reverse transcription polymerase chain reaction tests were born on the work of a global network of researchers – aided by pharmaceutical manufacturers – turning these tests out at breakneck speed, and assistance from public policymakers on funding, approvals and other support.

But this network needs Covid-19 data to power up. In vaccine development, global surveillance data on genomic sequencing paved the way for faster vaccine development than would have been otherwise possible. Pfizer-BioNTech and Moderna, powered by the United States' Operation Warp Speed and drawing on the expertise of researchers, developed vaccines in record time.

Since then, the tracking and sharing of virus evolution in international databases such as the global science initiative GISAID have helped epidemiologists monitor trends in the circulating virus and detect emerging variants of concern.

Discovering the increased resistance of Omicron – with its mutated spike protein – to vaccination also paved the way for more effective vaccines. This insight was key to the eventual development of Pfizer's and Moderna's bivalent vaccines that could target Omicron sub-variants BA.4 and BA.5 along with the ancestral strain, which maintained population resistance to Covid-19.

And armed with the knowledge that the dominant strain of Covid-19 at any one time could be different, the US Food and Drug Administration recently proposed that Covid-19 vaccines be updated and administered annually, in the same manner scientists assess and predict likely viral influenza strains and formulate vaccines.

The jury is still out on whether Covid-19 will follow a seasonal pattern like influenza, but the continuous tracking and sharing of indicators such as genomic

sequencing data can inform future decisions.

Keeping a close watch on how the virus evolves will additionally allow researchers to detect if new diagnostic tools, therapeutics and vaccines are needed to continuously update our armamentarium against Covid-19.

DATA CAN CONFIRM IF VACCINATION REMAINS EFFECTIVE

But the ability to develop vaccines, though admirable, is insufficient in the fight against Covid-19. We also need to know if they work and whether they can protect vulnerable populations.

Looking at serious cases has helped. A study published in 2022 using the Covid-19 case fatality rate (CFR) – the proportion of deaths related to the disease – showed a high CFR of 4.46 per cent in people over 70 years old in Hong Kong, compared with 0.48 per cent in Singapore.

Cross-referencing the CFR with Hong Kong's full vaccination coverage of 35 per cent and booster coverage of 76 per cent as at March 2022, and Singapore's full vaccination coverage of 92 per cent and booster coverage of 71 per cent in the same period, the data clearly demonstrates vaccination to be one of the most important factors in preventing high mortality rates from Covid-19.

Apart from clarifying the effectiveness of vaccination as an intervention tool to flatten the curve and keep it flat, such data also lays the foundation for public

As life in Singapore has reverted to pre-pandemic norms for the most part, with many returning to workplaces and schools, hopes of putting the pandemic behind us abound. This new normal is also reflected in the evidence-based ebb and flow of agile surveillance strategies to respond to the pandemic.

communications about the importance of Covid-19 vaccination and the need to preserve a proactive focus on vaccination strategies.

OMICRON: UNDERSTANDING IMPACT OF A NEW STRAIN

Still, knowing that different Covid-19 strains can have vastly different effects has brought into sharper focus the importance of pandemic surveillance, where various indicators can be tracked and triangulated to determine if Singapore is on the right track.

Monitoring the trajectory of a disease outbreak allows the authorities to determine if healthcare capacities – hospital beds, intensive care unit (ICU) beds and manpower allocation, along with laboratory testing, contact tracing and vaccination capacities – need to be ramped up to cope with a surge in demand.

The Delta variant taught us that lesson, which we applied to Omicron. The extensive use of indicators in January 2022, including the seven-day moving average of cases, week-on-week infection ratio, hospital capacity, deaths and vaccination coverage helped build a comprehensive operating picture of the Omicron wave's progression in and impact on Singapore.

An Omicron spike was always expected, but based on the virus' mutation, epidemiologists predicted the surge would peak quickly but fall off sharply. This was confirmed when the number of deaths and hospitalisations because of severe illness stayed low compared with those for the ancestral strain and Delta.

This is also why Singapore had the confidence to open up air travel and relaxed most Covid-19 rules on gatherings and mask-wearing in April 2022. Armed with a strong grasp of how to deal with a Covid-19 swarm from Delta and Omicron, and reinforced by a highly vaccinated population, Singapore can be confident about weathering future waves and spikes in cases.

DO WE NEED TO TRACK ALL THE DATA?

After these long years of Covid-19, some people may ask if tracking all this data is necessary and if we can't simply what is monitored.

Focusing on a single indicator alone, however, is like seeing one piece of a jigsaw puzzle; it reveals only a part of the complex situation.

In July and October 2022, while Singapore was experiencing a surge of infections driven by the newer Omicron variants, cases briefly rose to a daily count of 16,000, but the number of deaths, patients with severe illness and those requiring ICU admission remained low. Looking at the full suite of indicators allowed the authorities to conclude that most infections were accompanied by mild to moderate symptoms, and the healthcare system could cope.

Had we fixated on the number of new infections alone, the authorities might have tightened restrictions – an unnecessary move, in retrospect.

Staying on top of new developments to consistently update our knowledge is key. The

world is in a better position but not out of the woods regarding Covid-19. The emergence of variants of concern, new scientific data on the virus and our immunity and other developments may change our understanding and require our response to the pandemic to evolve further.

This is not an easy ask, when tracking Covid-19 data is a resource-heavy commitment requiring continuous investment into surveillance and health systems, and an army of laboratory technicians, bioinformaticians, epidemiologists and other skilled professionals to keep them going.

The running costs of laboratories using specialised equipment and storage of data can be high, not to mention the resources needed to continue training front-line workers and field officers to implement surveillance protocols.

Multilateral agencies such as WHO play an important role in data gathering, discussions with experts and the publication of internationally accepted guidelines so that best practices can be shared to some extent. But this challenge is far greater for lower-resourced nations without the wherewithal to put in place comprehensive public health surveillance.

PUBLIC HEALTH SURVEILLANCE CONTINUES

As life in Singapore has reverted to pre-pandemic norms for the most part, with many returning to workplaces and schools, hopes of putting the pandemic behind us abound.

This new normal is also reflected in the evidence-based ebb and flow of agile surveillance strategies to respond to the pandemic.

For example, TraceTogether, Singapore's digital system of contact tracing, was highly effective at the height of the pandemic. But as we pivoted from individual contact tracing to community or personal responsibilities of testing and self-reporting Covid-19 cases, the contact tracing system no longer had to be at the forefront of our Covid-19 response. This has freed up healthcare resources for other outbreak responses.

The opposite must also hold true – systems like TraceTogether are a part of the nation's toolkit to be employed if evidence should point to an inevitable surge in the near term, necessitating contact tracing.

But instead of giving in to our optimism and jettisoning data collection, public health surveillance using various indicators as a barometer of the local and global situation must continue. This will power our data-informed strategy to prepare and respond to any potential developments.

As we continue our battle with the pandemic, trying to find certainty in an uncertain world, we must not abandon our quest to find more parts of this jigsaw puzzle to make our world safer, and our view of it a little clearer.

• Dr Kho Yung Khean is a scientific officer at Duke-NUS Medical School's Centre for Outbreak Preparedness.