

Executive Summary: COVID-19

25th March 2020

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The Executive Summary is produced weekly contains in-depth analysis.

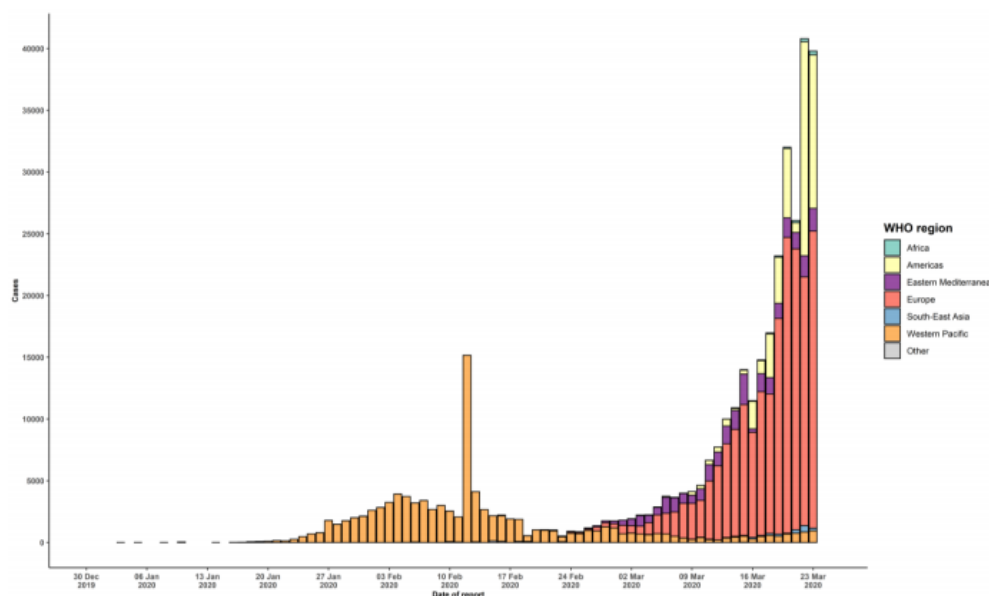
International SOS publishes a COVID-2019 [Daily Case Summary](#).

INTRODUCTION

The world is moving into uncharted waters. The majority of countries are already affected by the coronavirus pandemic, and those that have not been will soon feel its effects.

Confirmed case numbers are growing exponentially outside industrial Asia and most countries are attempting to “flatten the curve.”

Chart from [WHO Situation Report 24](#)



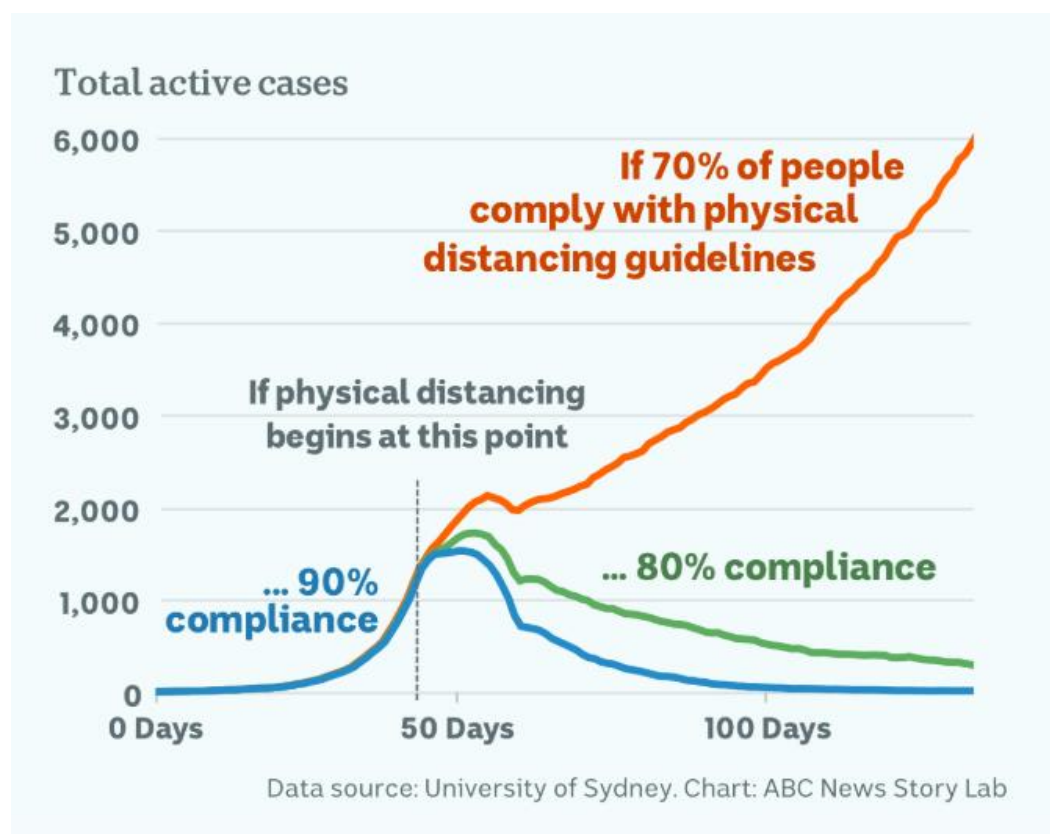
IMPORTANT EPIDEMIC CONTROL CONCEPTS

The introduction of interventions has a lag-time for results of at least a week

Speaking to the [media](#) on 24 March 2020, Nobel prize winner, Peter Doherty, has explained that any strict new public health interventions will not produce any instant slowdown in the number of confirmed cases recorded. These interventions would take a week or more for a change to the disease trajectory to be seen.

Study shows that the Australian epidemic can only be controlled if eight out of 10 Australians stay home.

To effectively slow the spread of coronavirus, a [study](#) has shown that the vast majority of people will need to stop nearly all of their in-person social interaction. This concept is almost certainly relevant to any country or location trying to “flatten the curve”.



SELECTED GLOBAL UPDATE

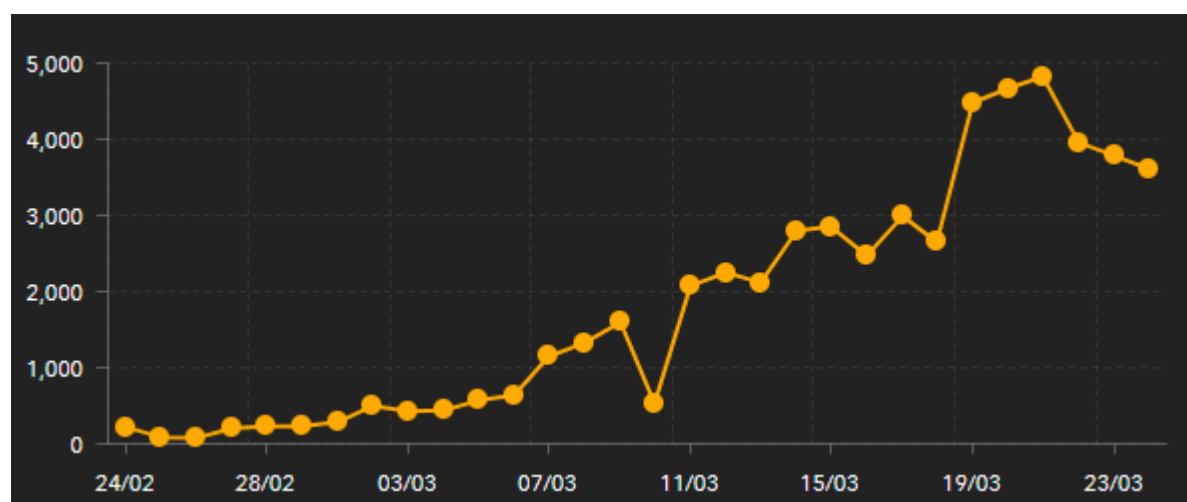
Italy update

There is a glimmer of good news from Italy with the number of new cases confirmed trending down for the last three days.

Data and chart from:

[Dipartimento della Protezione Civile](#), COVID-19 Italia - Monitoraggio della situazione

DATE	NEW CONFIRMED CASES
19 March	4,480
20 March	4,670
21 March	4,821 (apparent peak)
22 March	3,957
23 March	3,780
24 March	3,612



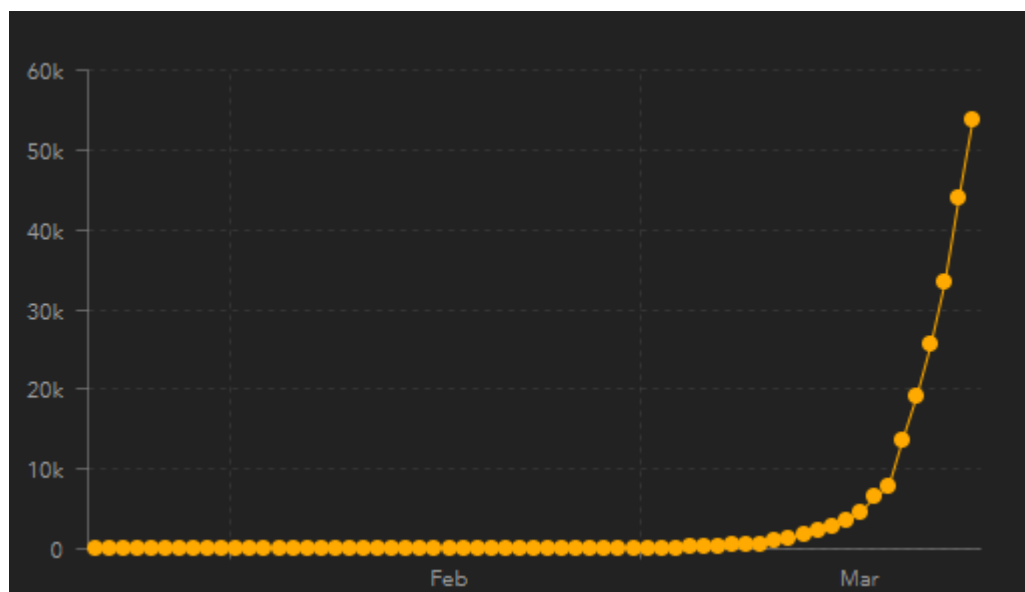
Of course, this means that a high number of cases are still be confirmed daily and these new cases combined with the existing hospitalized COVID-19 cases mean that the health services will remain severely strained.

USA update

The epicurve in the USA remains almost vertical with the total cases now at 55,231

Data and chart from: [Johns Hopkins University](https://coronavirus.jhu.edu/data/cases)

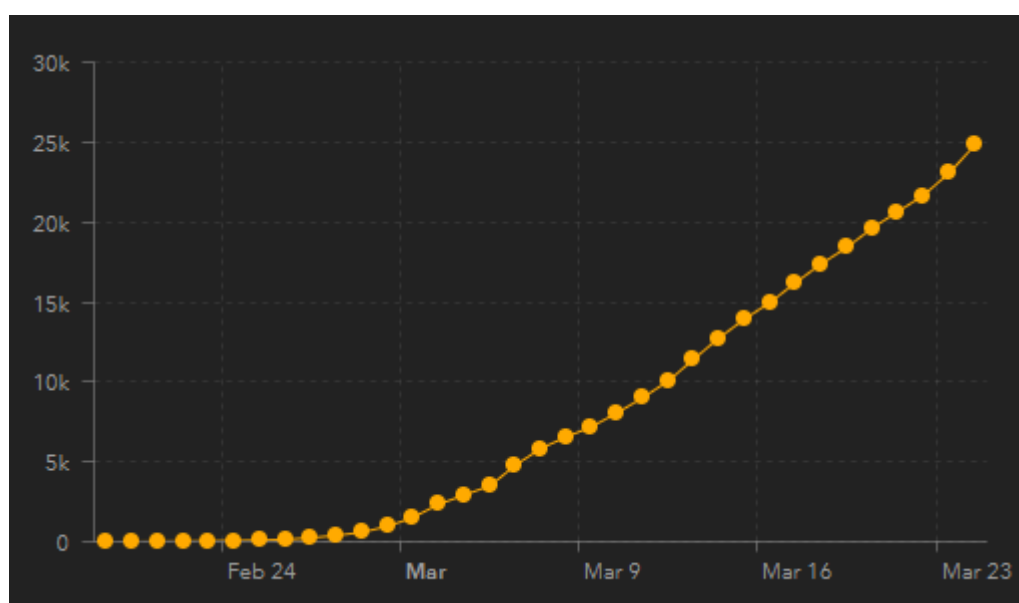
DATE	CONFIRMED CASES
19 March	13,700
20 March	19,100
21 March	25,500
22 March	33,300
23 March	43,800
24 March	53,700



Iran update

Data and chart from: [Johns Hopkins University](https://coronavirus.jhu.edu/data/cases)

DATE	CONFIRMED CASES
19 March	18,400
20 March	19,600
21 March	20,600
22 March	21,600
23 March	23,000
24 March	24,800



Deaths: 1,934

As a percentage of confirmed cases, the Iranian death rate is 7.7%. This probably indicates that there are many undiagnosed cases in Iran. Taking an average death rate of 2%, the number of cases should be more like 96,000

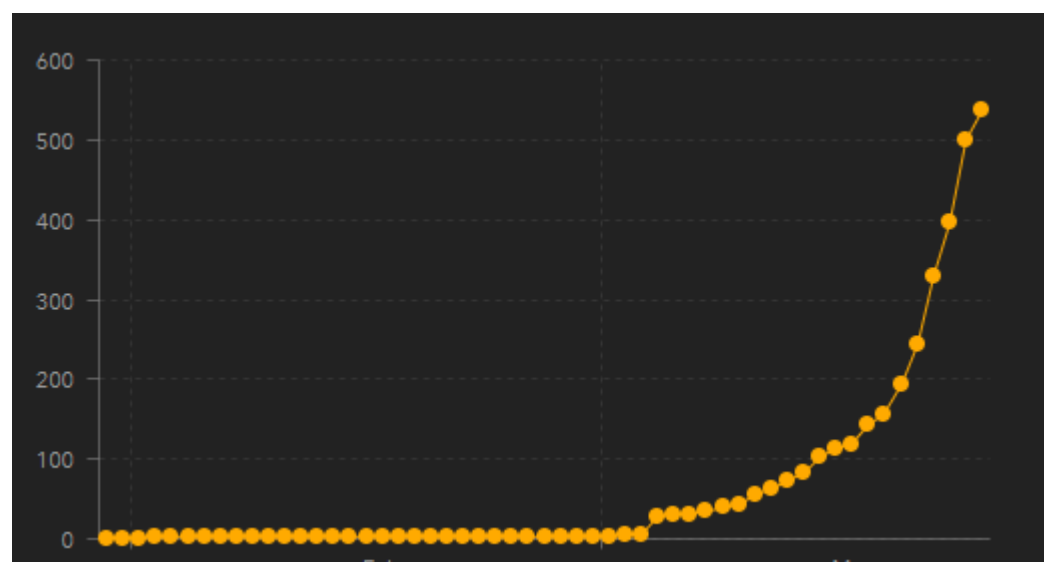
[WHO](#) has delivered a new shipment of emergency medical supplies to the Islamic Republic of Iran as part of COVID-19 response measures.

India update

The number of cases in India is growing exponentially, although from a low base.

Data and chart from: [Johns Hopkins University](#)

DATE	CONFIRMED CASES
19 March	194
20 March	244
21 March	330
22 March	396
23 March	499
24 March	536



China update

Beijing prepares for 300,000 workers to return from Wuhan

Hundreds of thousands of workers stranded in Hubei will begin returning to Beijing and Shanghai today, 25 March. Workers from Wuhan will be able to leave on 8 April. Special trains will arrive directly at Beijing West Railway Station. Only those with a green QR code will be allowed to leave. After registration, all arrivals will be placed in 14 days quarantine. Schools in Hubei will remain closed for the time being.

Overseas Chinese students heading home

[ChinaWire](#) reports that tens of thousands of overseas Chinese students are travelling back to China due to fears of the coronavirus overtaking Western countries and campuses shutting their gates. Government data indicates that over 662,000 Chinese were studying overseas in 2018.

Chinese air routes are re-opening

[The Economist](#) reports that domestic capacity in China has already doubled from its February lows. Capacity has increased from 4.2M seats per week in late February to 8.6M seats now. On 4 March, the Government has been offering subsidies to carriers that resume international flights. Airlines that serve China are displaying much more caution on international routes with seat capacity still being revised down.

USE OF TECHNOLOGY IN EPIDEMIC MANAGEMENT

In this section, we are giving some examples of how mobile phones and apps are being used for epidemic management. Tracking and quarantining of contacts is vital to “flatten the curve”.

Quarantine

The location of cell phones can be tracked using triangulation technology. In Taiwan, cell phones are used to enforce quarantine. If a person in quarantine leaves a specific area, or even their cell phone goes flat, they will be quickly contacted, on their landline, by several government departments and the police will be dispatched.

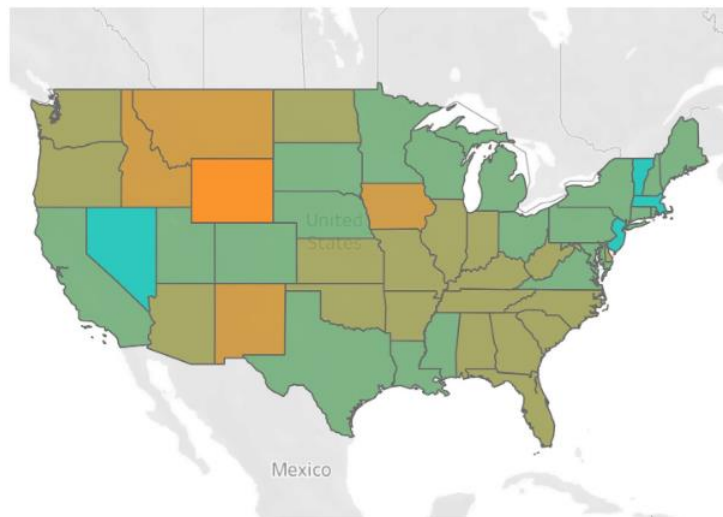
Return to work in China

All of Wuhan is being assigned one of three colour codes: Green, Orange and Red zones. Green are virus free, in orange zones there may have been some recent transmission and red zones are “hot zones.” QR codes are being given to each resident, both in hard copy and attached to apps such as Alipay. As of two days ago, those with green QR codes are given unrestricted access to Wuhan for two hours daily. A green QR code on Alipay is required to pay for items and to access public transport, when it restarts. A similar system is being built into WeChat.

Social Distancing in the USA

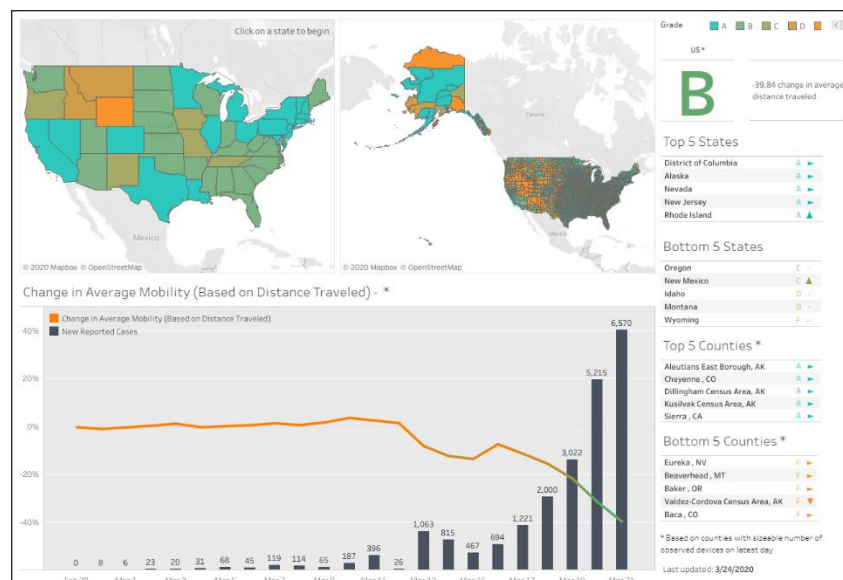
Using US smartphone data, [unacast](#), has identified places where residents are engaging in more social distancing in green, and less in orange.

Map 1: Social distancing data from [unacast](#)



“unacast” has created a “[Social Distancing Scoreboard](#)”. Washington D.C. gets an 'A' while Wyoming an 'F'.

Chart 1: Sample Social Distancing Scorecard from unacast



A VIEW FROM THE LAB: PROF JOHN OXFORD

UK launches whole genome sequence alliance to map spread of COVID-19.

This 20-million-pound investment hopefully will be of benefit to scientists, clinicians and public health agencies in obtaining rapid sequencing data. This will be shared with hospitals, regional NHS centres and the British Government.

The whole virus genome from patients who have had confirmed COVID-19 will be used to search for any changes in the virus on a national scale and hopefully to understand how the virus is spreading, and perhaps less likely, whether different strains are emerging.

The coordinating group, the Wellcome Sanger Group, anticipates that clusters of cases in hospitals, care homes and the community will be analysed for the first time. This should uncover how the virus is spread and help with appropriate infection control measures.

Profile of patients requiring intensive care treatment

The Intensive Care National Audit and Research Centre has provided the first index profile of those patients needing intensive care - a total of 196.

Seventy-one percent were male with a median age of 64, although 37% were under 60. Eighteen patients had severe co-morbidities with underlying heart problems or lung disease.

Interestingly, 63% were overweight, obese or morbidly obese. Two patients had been pregnant within the last six weeks.

A warning not to rush to deploy COVID-19 vaccines and drugs

In a personal world view article in "[Nature](#)", Professor Shibo Jiang, a virologist from Shanghai, warns not to rush to deploy COVID-19 vaccines and/or drugs.

He noted that earlier work with SARS had uncovered some abnormal immune responses in animal models. He noted that some virus fragments elicited more potent or even less risky immune responses than others. Decades ago, vaccines developed against the coronavirus, feline infectious peritonitis virus, increased rather than decreased a cat's risk of developing the disease caused by the virus.

He noted that more than 100 COVID-19 treatments are listed in China's Public Trials Registry. Most of these have been "repurposed", having been developed against other viruses.

UK survey of concern

Helen Ward, of the Business School at Imperial College London, has described a report commissioned to You Gov involving 2,100 adults.

- 77% were worried by the outbreak
- 93% took at least one measure to protect themselves
 - 83% hand washed more frequently
 - 52% avoided crowds and
 - 50% avoided social events.
 - 36% avoided public transport
 - 31% avoided going out.

Where is the virus found?

Tan et al in JAMA, 11th March 2020 examined 1,070 specimens from 205 patients, with a mean age of 44 years. 19% had severe illness. Examination using PCR found 93% positives from broncho alveolar lavage specimens, 72% positive from sputum, 63% from nasal swabs, 32% from pharyngeal swabs. Perhaps most interesting virologically was detection of live virus in 29% of the faeces samples. Virus RNA was detected in 1% of blood samples.

JOURNAL / ARTICLE CORNER

Loss of sense of smell (anosmia) a marker for COVID-19 infection

[ENT UK](#) have reported to Public Health England there is already good evidence from South Korea, China and Italy that significant numbers of patients with proven COVID-19 infection have developed anosmia/hyposmia.

In Germany it is reported that more than two in three confirmed cases have anosmia. In South Korea, where testing has been more widespread, 30% of patients testing positive have had anosmia as their major presenting symptom in otherwise mild cases.

There is potential that if any adult with anosmia, but no other symptoms, was asked to self-isolate for seven days, we might be able to reduce the number of otherwise asymptomatic individuals who continue to act as vectors.

We await further research on this topic.

Coronavirus not mutating fast. Good for vaccine.

Peter Thielen, a molecular geneticist at the Johns Hopkins University Applied Physics Laboratory, told [The Washington Post](#) that there are only about four to 10 genetic differences between the strains infecting people in the U.S. and the virus that emerged in Wuhan, China.

“That’s a relatively small number of mutations for having passed through a large number of people,” he said. “At this point the mutation rate of the virus would suggest that the vaccine developed for SARS-CoV-2 would be a single vaccine, rather than a new vaccine every year like the flu vaccine.”

Although one team of scientists earlier this year suggested there might be two distinct strains of the virus with different levels of typical disease severity (R and L strains), that conjecture has not been embraced by the scientific community.

The “Wakayama Model” – A Japanese model of local action

The “Wakayama Model” describes how one district broke with the government, adopted its own strict coronavirus testing policies and managed to win the battle against coronavirus.

Wakayama is famous for winding mountain paths, Buddhist pilgrimage trails and picturesque ports and has an independent spirit.

On 31 January, a doctor in the small town of Yuasa developed a respiratory illness and soon there were four more cases. At that time, PCR tests were in short supply and reserved for people who had come back from China or close contacts of cases. The local public health department decided to test the doctor and the four other cases – they were positive. There was an invisible chain of transmission.

Everyone who had contact with the doctor was traced. This took three days of interviewing and phoning to build a list of 470 who needed testing.

The public health official convinced Tokyo to conduct hundreds of tests. He also travelled to Osaka to get their labs to do another 150 tests, and the rest of the tests were performed in Wakayama. By 25 February all had been tested and another 10 cases found. No further cases were found for two weeks.

The team was active again in early March contact tracing people who had been to a live music club in Osaka, where a case was identified.

SARS-COV-2 infection in children

On 18 March, 2020, [The New England Journal of Medicine](#) published a study designed to determine the spectrum of disease in children. The study evaluated children infected with SARS-CoV-2 and treated at the Wuhan Children’s Hospital. All children, symptomatic and asymptomatic, and known to have had contact with a confirmed case SARS-CoV-2 infection, had nasopharyngeal or throat swabs for PCR testing. Children were monitored until 8 March 2020.

The report describes a spectrum of illness from SARS-CoV-2 infection in children. In contrast with infected adults, most infected children appeared to have a milder clinical course. Asymptomatic infections were not uncommon.

Details are in the detailed table below however highlights include:

Median age	6.7 years
Fever present at any time	41.5%
No symptoms or x-ray changes	15.8%
No symptoms but +ve x-ray	7%
ICU + ventilation	1.7%
Discharged	87%

Table 1. Epidemiologic Characteristics, Clinical Features, and Radiologic Findings of 171 Children with SARS-CoV-2 Infection.*

Characteristic	Value
Age	
Median (range)	6.7 yr (1 day–15 yr)
Distribution — no. (%)	
<1 yr	31 (18.1)
1–5 yr	40 (23.4)
6–10 yr	58 (33.9)
11–15 yr	42 (24.6)
Sex — no. (%)	
Male	104 (60.8)
Female	67 (39.2)
Diagnosis — no. (%)	
Asymptomatic infection	27 (15.8)
Upper respiratory tract infection	33 (19.3)
Pneumonia	111 (64.9)
Exposure or contact information — no. (%)	
Family cluster	154 (90.1)
Confirmed family members	131 (76.6)
Suspected family members	23 (13.5)
Unidentified source of infection	15 (8.8)
Contact with other suspected case	2 (1.2)
Signs and symptoms	
Cough — no. (%)	83 (48.5)
Pharyngeal erythema — no. (%)	79 (46.2)
Fever — no. (%)	71 (41.5)
Median duration of fever (range) — days	3 (1–16)
Highest temperature during hospitalization — no. (%)	
<37.5°C	100 (58.5)
37.5–38.0°C	16 (9.4)
38.1–39.0°C	39 (22.8)
>39.0°C	16 (9.4)
Diarrhea — no. (%)	15 (8.8)
Fatigue — no. (%)	13 (7.6)
Rhinorrhea — no. (%)	13 (7.6)
Vomiting — no. (%)	11 (6.4)
Nasal congestion — no. (%)	9 (5.3)
Tachypnea on admission — no. (%)†	49 (28.7)
Tachycardia on admission — no. (%)‡	72 (42.1)
Oxygen saturation <92% during period of hospitalization — no. (%)	4 (2.3)
Abnormalities on computed tomography of the chest — no. (%)	
Ground-glass opacity	56 (32.7)
Local patchy shadowing	32 (18.7)
Bilateral patchy shadowing	21 (12.3)
Interstitial abnormalities	2 (1.2)

* Percentages may not total 100 because of rounding.

† The normal ranges of respiratory rate (in breaths per minute) were as follows: 40 to 60 for newborns, 30 to 40 for children younger than 1 year of age, 25 to 30 for those 1 to 3 years of age, 20 to 25 for those 4 to 7 years of age, 18 to 20 for those 8 to 14 years of age, and 12 to 20 for those older than 14 years of age. Tachypnea refers to a respiratory rate higher than the upper limit of the normal range according to age.

‡ The normal ranges of pulse rate (in beats per minute) were as follows: 120 to 140 for newborns, 110 to 130 for children younger than 1 year of age, 100 to 120 for those 1 to 3 years of age, 80 to 100 for those 4 to 7 years of age, 70 to 90 for those 8 to 14 years of age, and 60 to 70 for those older than 14 years of age. Tachycardia refers to a pulse rate higher than the upper limit of the normal range according to age.

Reduced lung function after COVID-19

Doctors in Hong Kong have found a drop of 20% to 30% in lung capacity in two or three out of 12 patients who had been discharged. “They gasp if they walk a bit more quickly,” a top infectious diseases expert said, according to the [South China Morning Post](#). He added, however, that patients could do cardiovascular exercises to improve their lungs.

NEXT WEEK

We are tracking the early and significant interventions in King County, Washington State, USA. We hope to be able to show a downturn in the epidemic curve then.

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