

# The Taiwan Model for Combating

# COVID-19







# Abstract

2020 is definitely an impactful year for people around the world. No one has expected the COVID-19 pandemic to have such far-reaching consequences for human society. Over 70 million people have been infected and 1.6 million of people have died of the virus. Taiwan is also affected by the pandemic. In mid-December 2020, a total of 742 COVID-19 cases, including 7 deaths, were confirmed in Taiwan. Compared to the COVID-19 outbreaks in other countries, Taiwan's response to COVID-19 has been rather effective.

Such a successful outcome of Taiwan's approach to tackling the pandemic is anything but coincidental. Besides continuously fine-tuning and improving the country's disease prevention strategies, the collective efforts of the entire nation have also helped contribute to minimizing the impact of the pandemic on the people's daily lives. As we further optimized Taiwan's containment of the pandemic, we demonstrated Taiwan's successful management of the pandemic, establishing the "Taiwan Model" for combating COVID-19 that has been widely recognized by the international community.

*Ministry of Health and Welfare  
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# Past Lessons Learned Serve as Future Guidelines



The SARS outbreak that occurred in 2003 heavily affected Taiwan. Taiwan's experience battling SARS serves as an important reevaluation process for Taiwan's capacity to tackle infectious diseases. Since then, the government has adopted several major reforms concerning the communicable disease prevention system, the healthcare system, and others:

## **Ensure effective cross-ministry communication**

During the 2003 SARS outbreak, the command center was only formed

temporarily. Afterwards, a National Health Command Center (NHCC) was established when the Communicable Disease Control Act was amended, which is staffed with personnel from relevant ministries to facilitate the coordination of cross-ministry efforts, smooth cross-ministry communication, as well as responsibility assignment.

## **Set up real-time disease surveillance systems**

Taiwan has set up more diversified disease surveillance systems such as the Real-time



Emergency Department-based Infectious Disease Surveillance System, which is an automatic reporting system that allows the hospital to directly upload each day's patient diagnosis codes to the computer system of the Taiwan Centers for Disease Control (Taiwan CDC). Taiwan CDC's computer system can instantly translate the uploaded data into epidemic curves. This system helps monitor the occurrence of emerging infectious diseases, which facilitates the formulation of relevant response measures.

**Establish a medical officer mechanism for disease prevention**

In the past, Taiwan CDC was understaffed with personnel having a medical background. To address the lack of professionalism and increase the agency's credibility when dealing with hospitals, Taiwan CDC started to recruit a significant number of medical officers based on the US mechanism for medical officers, which improves the competence and trustworthiness of epidemiological investigation and disease diagnosis.

**Implement comprehensive nosocomial infection control**

The 2003 SARS outbreak severely damaged the healthcare system in Taiwan. Hospitals were ordered to lock down due to nosocomial infection, which showed that there was room for further improvement when it came to nosocomial infection control. As of now, inspection for nosocomial infection control has become a routine practice in Taiwan, which is considered a huge change in the healthcare system in Taiwan.



# Do Not Underestimate the Enemy and Prepare for the Worst



On December 31, 2019, a Taiwan CDC medical officer came across a post on the internet that included a screenshot of messages among healthcare workers in Wuhan, China about a disease outbreak. Immediately, Taiwan CDC contacted China and the World Health Organization (WHO) to confirm the emergence of viral pneumonia. On the following day, Taiwan CDC began to adopt a series of control measures, making Taiwan the first country in the world to implement border control in this pandemic.

## **On January 1, 2020**

Taiwan CDC started to implement onboard quarantine of all direct flights arriving from Wuhan, China. On the following day, Taiwan CDC formed a response team and issued a notification letter to the medical community to request physicians to report all suspected cases showing symptoms and having a history of travel to Wuhan.

## **On January 7, 2020**

Taiwan CDC issued a travel notice of Level 1: Watch for Wuhan, China.

## **On January 12, 2020**

Taiwan CDC sent experts to Wuhan, China to visit the Hubei Provincial Center for Disease Control and Prevention and the hospital caring for COVID-19 patients.

## **On January 15, 2020**

Taiwan CDC formally listed COVID-19 as a Category V Notifiable Disease and raised the travel notice level for Wuhan, China to Level 2: Alert.

## **On January 21, 2020**

Taiwan confirmed the first COVID-19 case and raised the travel notice level for Wuhan, China to Level 3: Warning, advising the citizens to avoid all non-essential travels to Wuhan.



**On March 19, 2020**

Foreign nationals were barred from entering Taiwan except those holding Alien Resident Certificates and special entry permits.

**On March 21, 2020**

Taiwan raised the travel notice level for all countries around the world to Level 3: Warning.



To thoroughly implement border control measures and manage individuals undergoing home quarantine/isolation after they enter Taiwan, we have turned to big data and technology systems and utilized smartphones and the internet to deploy innovative technology systems against infectious diseases, including:

**Computerize entry quarantine process**

Taiwan launched the "Traveler Entry Health Declaration and Home Quarantine Computerized System (Quarantine System for Entry)" to greatly optimize the entry quarantine capacity in Taiwan and the process of traveler clearance.

**Utilize the existing National Health Insurance (NHI) system to keep track of the citizens' travel history**

When the outbreak first occurred in China, the NHI database was immediately integrated with the travel history data from the National Immigration Agency

database to instantly flag cases with a history of travel to affected areas in the NHI MediCloud System. Subsequently, the history of contact and occupation were included for specific individuals to allow healthcare workers to obtain first-hand information concerning the patient's history of travel, occupation, contact, and cluster (TOCC) to facilitate triage and safeguard the health and safety of the frontline health workers.

**Managing and caring for individuals undergoing home quarantine/isolation through mobile phones**

We monitored individuals undergoing home quarantine/isolation through the "Digital Fencing Tracking System", which utilizes the positioning system on the phones to remind the people under home quarantine/isolation to remain in the designated area. Once an individual under home quarantine/isolation moves away from the designated area, the system will send out a warning message to the individual and an alert to public health personnel, civil affairs personnel, and policemen for following up on the individual to ensure the individual's whereabouts is closely monitored and the implementation of community-based services. Afterwards, a LINE Bot system known as the "Disease Containment Expert" and a two-way messaging reporting mechanism were developed to allow individuals under home quarantine/isolation to voluntarily report their health status to the competent authority on a daily basis and for them to receive relevant disease prevention information. Relevant information reported is integrated into the "Outbreak Tracing System" for the front-line care workers.

# Early Deployment and Commitment to Transparency

Framework of Level 1 COVID-19 Central Epidemic Command Center



On January 20, 2020, Taiwan activated the Central Epidemic Command Center (CECC), which consists of three levels and is upgraded according to the severity of the pandemic. On January 23, 2020, China imposed a lockdown in Wuhan. Based on the traveler traffic, prevention measures implemented by the governments around the world, and human behavior, we expected the international outbreaks to gradually escalate and upgraded CECC to Level 2. As the pandemic quickly escalated, on February 27, 2020, CECC was upgraded to the highest level, Level 1, involving higher levels of officials from all ministries. The organizational structure of CECC is as follows:

**Intelligence Section**  
Pandemic Surveillance Group

**Operation Section**  
Border Control Group, Community Transmission Prevention Group, and Emergency Response Group

**Logistics Section**  
Resource Coordination Group, R&D Group, Information Management Group, Administration Group, Public Information Group, and Legal Group

From the activation of CECC to the promotion of the "New Lifestyle for Epidemic Prevention" on June 7, 2020, a daily press briefing was hosted nonstop. Sometimes, up to 3 press briefings were held to timely share the latest development of the pandemic with the citizens, making policies and information transparent to the public, in order to instill public trust and



healthcare facilities.

#### **Reserve basic health workforce**

We have conditionally limited the country's healthcare professionals from traveling overseas while identifying the essential health workforce and ensuring their health and safety. For instance, the government must first protect infectious disease specialists through offering them accommodation and meals at no-cost or deep discounts to reduce their risk of infection in the community.



#### **Hospital visiting restriction measures**

During this pandemic, the visiting hours and the number of people accompanying a patient are regulated. When the number of imported cases confirmed in Taiwan increased, it was announced that visitors were not allowed in the hospital except when a family member was needed to accompany the patient in surgery, an intensive care unit, and a hospice ward for the doctor to explain the patient's condition or when the hospital requested for the family member to be present.

To identify suspected sources of infection early and break the chain of infection, CECC implemented a reinforced community-based surveillance program

to conduct retrospective screening for COVID-19, which led to the discovery of the 19th COVID-19 case in Taiwan. Unfortunately, he was also the first COVID-19-associated death in Taiwan. The local government sought expert advice right away, synchronized information with CECC, and collaborated with policemen, civil affairs personnel, and public health personnel to retrieve footage from dashboard cameras, footage from street surveillance cameras, records from the eTag Electronic Toll Collection (ETC) System, and phone records to screen for all possible contacts. The central and local governments worked together to identify the source of infection through scientific, refined epidemiological investigation, successfully preventing the further transmission of the disease.

Compared to the mass COVID-19 testing strategy adopted by other countries, Taiwan has opted for "precision disease prevention". CECC thought the existing implementation of prevention measures, including thorough patient diversion and case isolation, outweighed the significance of mass screening as such practices are more aligned with and appropriate for the outbreak situation in Taiwan. Further, Taiwan has a rather comprehensive National Health Insurance system compared to other countries and easy access to healthcare. Hence, physicians can immediately determine whether a case needs to undergo testing. As a result, the medical record in the National Health Insurance database and the existing surveillance systems can act similarly as mass screening.





# Taiwan Can Help, and Taiwan Is Helping!



As the outbreak in Taiwan has remained stable, we have gradually eased the border control restrictions to ensure the development of our economy while keeping COVID-19 at bay. Simultaneously, extending a helping hand to the international community, we are willing and able to collaborate with our international partners to jointly ward off COVID-19.

## **Evacuating citizens from Peru**

On March 16, 2020, Peru declared a state of national emergency, closing their borders and shutting down airports without prior warning. Taiwan coordinated charter flights with other countries, including Japan, Singapore, Malaysia, and the U.S., to evacuate citizens. A total of 84 stranded travelers were evacuated from Peru to return to their respective countries.

During the beginning of the pandemic,

Taiwan has provided assistance to several countries in Latin America through onsite public health projects and proactively arranged bilateral and multilateral video conferences for a number of healthcare facilities and several officials from other countries to share our experience in preventing COVID-19 and our smart disease prevention technology systems such as the Digital Fencing Tracking System.

## **Share Taiwan's disease prevention experience**

We have set up a section, "The Taiwan Model for Combating COVID-19" on our Ministry of Foreign Affairs' website and another section, "Crucial Policies for Combating COVID-19" on our Ministry of Health and Welfare's website, which present major domestic disease prevention policies along a scrollable timeline and

illustrate how Taiwan has established the "Taiwan Model" to combat the virus through our National Health Insurance system, keeping information transparent and available to the public, and adopting innovative technology.

As Taiwan has successfully tackled the threat posed by COVID-19, we have gained support from many countries around the world to participate in the WHO. Before the virtual World Health Assembly held on May 18, 2020, a total of 29 administrative departments in other countries voiced their strong support for Taiwan's participation. On the day of the virtual conference, 24 countries expressed their support for Taiwan's participation.

#### **Donation of medical supplies**

Since Taiwan has been successful in controlling the outbreak and our production of medical supplies has gradually met our own needs, we have been donating medical supplies and testing equipment to countries in need. The decision to make such donations was not merely made by the government. It was well supported by the general public. On April 27, 2020, CECC launched the humanitarian assistance initiative, "Taiwan can help, Health for all" program, which allows the citizens to donate masks to other countries.



The superior quality and user-friendliness of Taiwan's medical supplies have attracted many countries' interest in purchasing the products. Simultaneously, we have provided a list of medical supply manufacturers to interested countries to help them obtain the medical supplies they want. During this pandemic, Taiwan has donated over 50 million face masks, thermal imaging cameras, forehead thermometers, automated temperature scanning systems, personal protective equipment (PPE), rapid nucleic acid detection devices, electric hospital beds, physiologic monitors, rapid diagnostic reagents, hydroxychloroquine, and others. Over 80 donee countries have received donations, including the U.S., Canada, as well as countries in Latin America and the Caribbean, Europe, Asia-Pacific, Southeast Asia, West Asia, and Africa.





# Solidarity Is Key to Taiwan's Success Against COVID-19



Up until now, life has remained normal in Taiwan. Students have continued to attend school, and people have continued to go to work and travel. "Solidarity" has been the key to Taiwan's success against COVID-19. Each of the 23.6 million people has helped contribute to that success.

At the press briefing, Commander Shih-Chung Chen, Deputy Commander Tsung-Yen Chen, Convener Shan-Chwen Chang, Chief of the Pandemic Surveillance Group Jih-Haw Chou, and Spokesperson Jen-Hsiang Chuang, have calmly and tirelessly explained the latest development of the pandemic and made important announcements concerning disease prevention strategies with professionalism to the general public, which has become

an important force in stabilizing the society. Nevertheless, besides them, many members of the national teams have also played an important role in contributing to Taiwan's success against COVID-19.

## **National Face Mask Team**

After the first COVID-19 case was confirmed in Taiwan, face masks became a hot commodity. Hence, when the government announced the proposal to build 60 face mask production lines on January 31, 2020, many machine tool manufacturers put aside their business competitiveness and proactively responded to the government's proposal. Within 2 months, they assembled 92 new face mask production lines producing over tens



of millions of face masks daily, which has helped ensure Taiwan is self-sufficient for face masks and turn Taiwan into the second largest face mask producer in the world from a country that used to import face masks.

To ensure each citizen can obtain face masks fairly, beginning February 6, 2020, we have launched the Name-Based Mask Distribution System for the citizens to purchase a specific number of face masks at 6,000 NHI-contracted pharmacies in the nation using the NHI card. The government has also made the face mask stockpile information available to the public, which enabled private engineers to develop an online platform that shows real-time information about the availability of face masks, including the location of the stores that carry face masks and the percentage of face masks in stock, across Taiwan, which facilitates the purchase of face masks. To meet the different needs of the citizens with different lifestyles and further facilitate face mask buying for the general public, the government offered different methods for face mask purchase,

including pre-ordering online and through the mobile phone app, and adding physical distribution channels of over 10,000 convenience stores to carry face masks, which ensures every citizen can purchase an appropriate amount of face masks at a location closest to their houses. As our face mask production capacity has greatly increased, we are not merely able to provide a sufficient amount of face masks for the people in Taiwan, but also allow people to send face masks to Taiwanese nationals overseas.

Since the beginning of the pandemic, the logistics service providers have been fulfilling the needs of delivering the face masks. The clerks at the NHI-contracted pharmacies and convenience stores have been cooperating with the government policies in assisting the sales of face masks for more than half a year. Many experts from the private sector have also proactively participated in public affairs. Everyone in the nation has selflessly and passionately dedicated themselves to the implementation of public health policies, which is the real reason why the Name-Based Distribution Mask System has been a success.



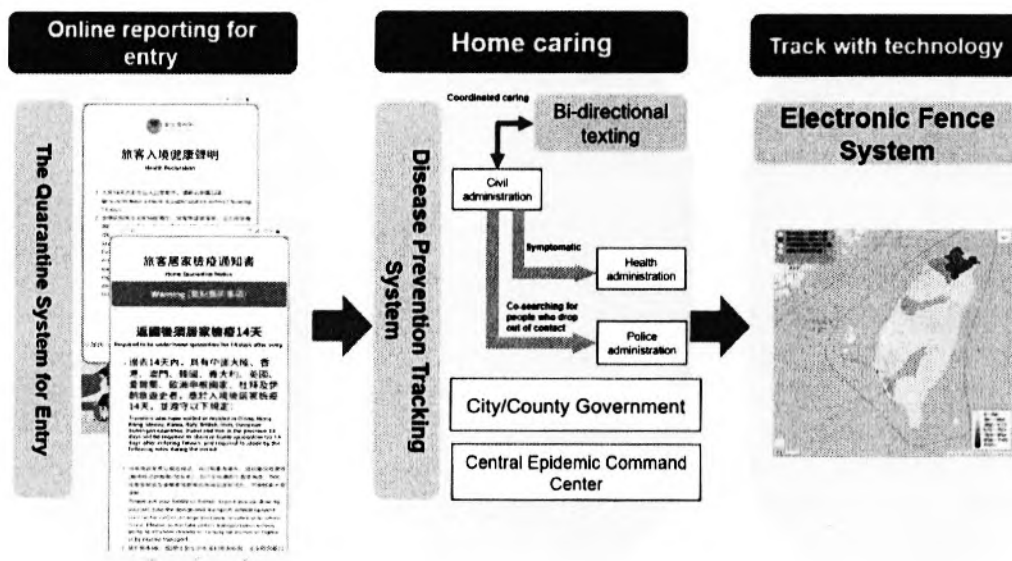


**National Disease Prevention Technology Team**

In January 2020, the Executive Yuan formed the Disease Prevention Big Data Task Force. After the CECC was upgraded to Level 1, the Information Management Group was formed, inviting telecommunications service providers and private information technology experts to work with the government to establish the world's first smart disease prevention system. In accordance with the principles of adequacy, necessity, and proportionality, while ensuring human rights and protecting privacy, we have been able to closely manage and monitor individuals undergoing home quarantine/isolation to see if they leave their designated area without permission, which is highly commended and inquired by over 10 countries around the world. On top of that, our handling of the COVID-19 outbreak on the Diamond Princess cruise ship docked in Taiwan was exemplary. To keep track of the electronic

footprints of the 3,000 passengers on the cruise ship, the government utilized the location service on mobile phones to cross verify the sites visited by these passengers and big data to analyze the obtained information in order to identify possible contacts of the passengers in the most efficient manner.

The research and development accomplishments of the biotechnology industry in Taiwan are well noticed. Based on previous research accomplishments, Academia Sinica and the National Health Research Institutes (NHRI) made major breakthroughs in developing "rapid test reagents" within a short period of time, and the technique has been subsequently transferred to private companies. Adopting the strategies of "Drug repurposing" and developing novel drugs for COVID-19 treatment, remarkable results have been achieved. As of now, they are fully committed to developing a vaccine for COVID-19.



Besides, Taiwan used to depend on the import of medical supplies. To prevent supply shortages, many traditional manufacturers stepped up to help. The Taiwan Food and Drug Administration (TFDA) even launched a counseling initiative through assigning one person to counsel one factory and established a green channel for regulatory clearance similar to the Emergency Use Authorization (EUA) in the U.S., greatly increasing our domestic production capacity in a short period of time.

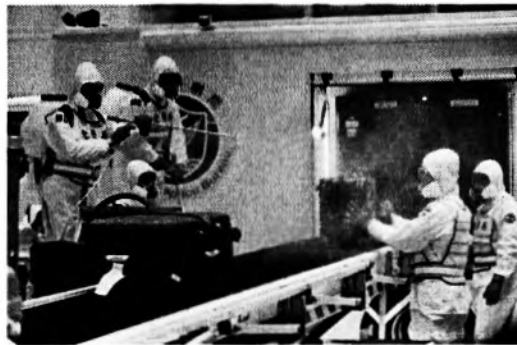
Through collaborative efforts between industry, government, academia, and research sectors, Taiwan has not only timely satisfied its domestic needs for medical supplies, but also further improved its domestic research and development and manufacturing supply chains.

### **The unsung heroes**

Throughout the entire battle against COVID-19, many unsung heroes have put in their efforts. On February 11, 2020, CECC established a COVID-19 call center that was signed up by more than 600 registered nurse volunteers who became involved in providing telephone care work, helping to eliminate the anxiety of people undergoing home quarantine/isolation and offering professional nursing consultation services. Many other healthcare workers have been willing to participate in various specimen collections, testing, and treatment of cases, and charter flight missions in visiting severely affected areas and bringing Taiwanese nationals home safely even when they are aware of the

risk involved in partaking in such activities. On top of that, there are also volunteers who assist with frontline quarantine officers in quarantine activities for all inbound travelers at the airport, helping to ensure the health and safety of the people in Taiwan. Furthermore, more than 10,000 pharmacy volunteers have helped with the distribution of name-based masks, working hand in hand with the pharmacists in the pharmacies across the nation to promote people's personal protection efforts. Social workers have been caring for homeless people, providing assistance at social welfare institutions, delivering medical supplies to and promoting disease awareness among the disadvantaged and minority groups who lack epidemic prevention resources, as well as accompanying people in need during the outbreak.

The people contributing to each and every disease prevention effort include the drivers providing transportation services in getting the passengers home safely; the frontline workers helping to make people undergoing home quarantine/isolation through their 14-day requirement, such as village and neighborhood chiefs, village clerks, local public health personnel, and







civil affairs personnel by offering all kinds of assistance such as providing daily supplies and mental health support; the national military service members who have helped clean and disinfect the charter flight before and after each mission; and cleaners who have assisted in the handling and disposal of waste and garbage produced by confirmed and suspected cases at healthcare facilities and group quarantine facilities. It is because of these unsung heroes who work persistently behind the scene, acting as staunch support and ensuring thorough implementation of disease prevention efforts, and have collectively contributed to Taiwan's success against COVID-19.

**Every Taiwanese that contributes to our success in combating COVID-19**

During this COVID-19 pandemic, every Taiwanese citizen has demonstrated, whether in terms of public health or civic virtue, the quality of a mature citizen through actively cooperating with

government policies. Even during the peak of the global pandemic, which coincided with the most important religious festival in Taiwan celebrated by tens of thousands of people every year, it was difficult to strike a balance between maintaining the tradition of hosting the religious celebration and implementing disease prevention efforts. Fortunately, most religious groups were willing to fully support government disease prevention policies and voluntarily postponed the hosting of the religious celebration or host a virtual celebration instead. All government agencies have been working closely together, and the central and local governments have ensured smooth and effective communication, which have helped build a robust decision-making network. Everyone in the nation has treated the fight as their own personal matter. This model of engaging everyone has helped gel the nation together to jointly overcome the challenges, reaping the success against COVID-19.



# As Crisis Turns into Opportunity, People Adopt New Life for Disease Prevention

In Taiwan, elderly people often refer to "crisis" as a combination of "danger" and "opportunity". Under this circumstance, Taiwanese people have successfully turned the COVID-19 pandemic from a crisis into an opportunity. After experiencing the SARS outbreak and the H1N1 flu pandemic, Taiwanese people have adopted the good personal hygiene habits of frequent hand-washing with soap and water, wearing face masks, and taking body temperatures. On top of that, Taiwanese people are kind-hearted and believe in mutual assistance. As a result, the disease prevention policies formulated by the government have been implemented smoothly.

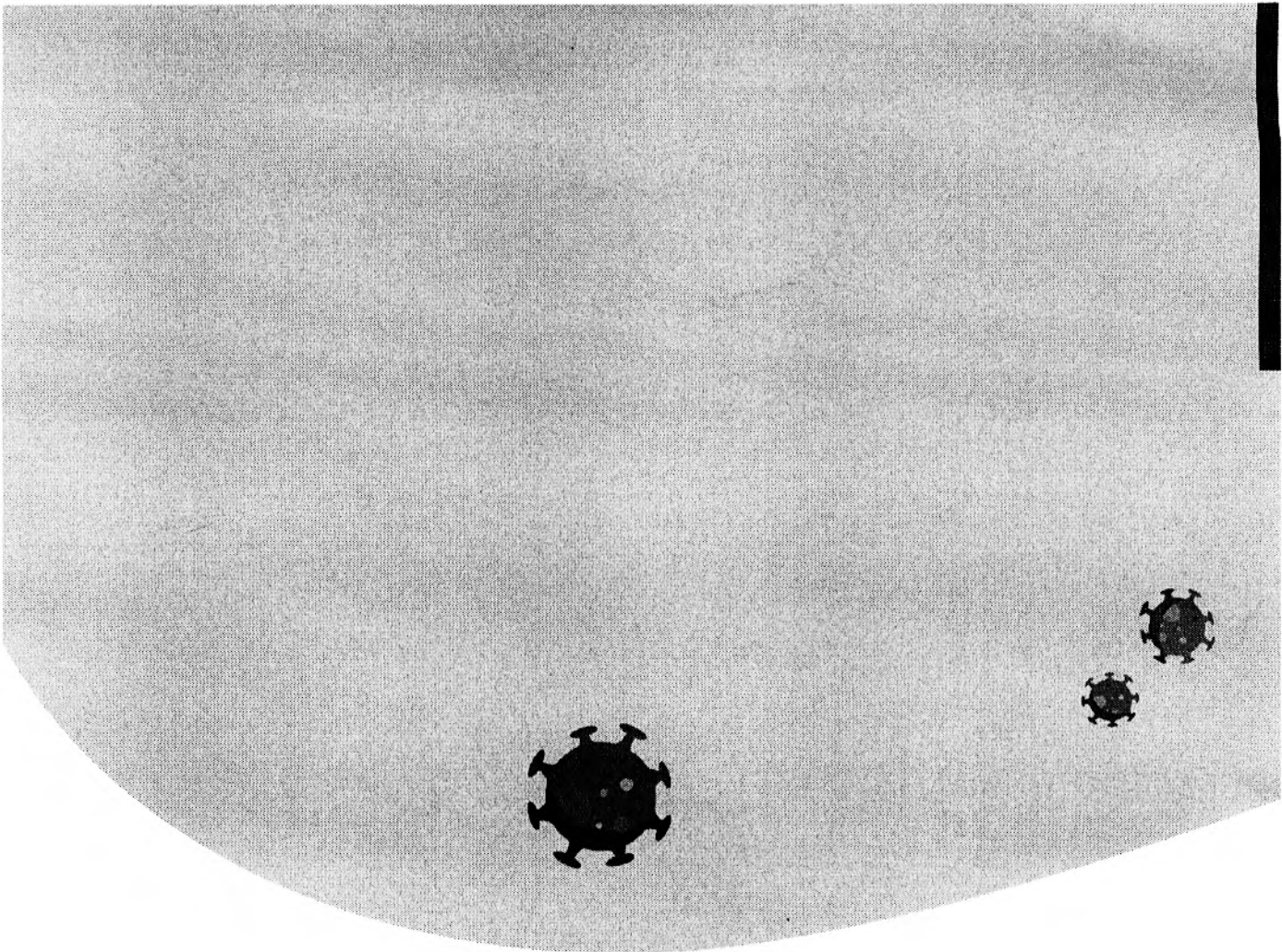
In the past, enterovirus activity begins to increase in March and reaches its peak around May and June. Nevertheless, due to the COVID-19 pandemic and public cooperation with the disease prevention policies such as frequent hand-washing and wearing face masks, 2020's enterovirus activity dropped by 80% compared to that in the previous year, and the number of severe influenza cases and influenza-associated deaths in 2020 also drastically decreased. Since June 7, 2020, CECC has been promoting the "New Lifestyle for Epidemic Prevention", encouraging the general public to maintain

the good habits of frequent hand-washing with soap and water, wearing face masks, and maintaining social distancing, in order to ensure the people can relax and enjoy life while effectively warding off COVID-19.

As the pandemic persists and an end to the pandemic is yet to be seen, Taiwan will remain a force for good in the international community and continue to work with like-minded countries in the pursuit of mutual benefits. As the international community observes Taiwan's public health achievements, they will support Taiwan's participation in international organizations, closing the gap in global health security.







Ministry of Health and Welfare, R.O.C. (Taiwan)

