

Tackling the COVID-19 Pandemic: Experiences from Asia

East Coast, USA (EDT)
April 16, 2020
8:30 PM-9:30 PM

Hong Kong Time, Taipei Standard Time
April 17, 2020
8:30 AM-9:30 AM

Korea Standard Time
April 17, 2020
9:30 AM-10:30 AM



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Hong Kong's Approach to COVID-19

CUGH Webinar

17 April 2020

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Hong Kong

- **Population: 7.5 million**
- **Visitors per year: 55.9 million in 2019**
 - Mainland China: 43 million
 - Elsewhere: 12 million
- **Economy**
 - International business, trade, financial hub, services, tourism
 - Investment gateway between Mainland and World

Recent major events

- **1997: avian influenza H5N1**

- 18 cases (6 deaths) HK
- >1.5 million chickens slaughtered

- **2003: SARS**

- 8,096 cases (774 deaths) worldwide
- 1,755 cases (299 deaths) HK

- **2009: H1N1 swine flu**

- 214 countries
- >30,000 cases (80 deaths) in HK

- **2019 social unrest**



Legacy of SARS

Public

- Outbreaks viewed seriously
- Attentive to guidance
- Societal norms
 - Daily cleaning lift buttons... etc
 - Masks common
 - Double chopsticks

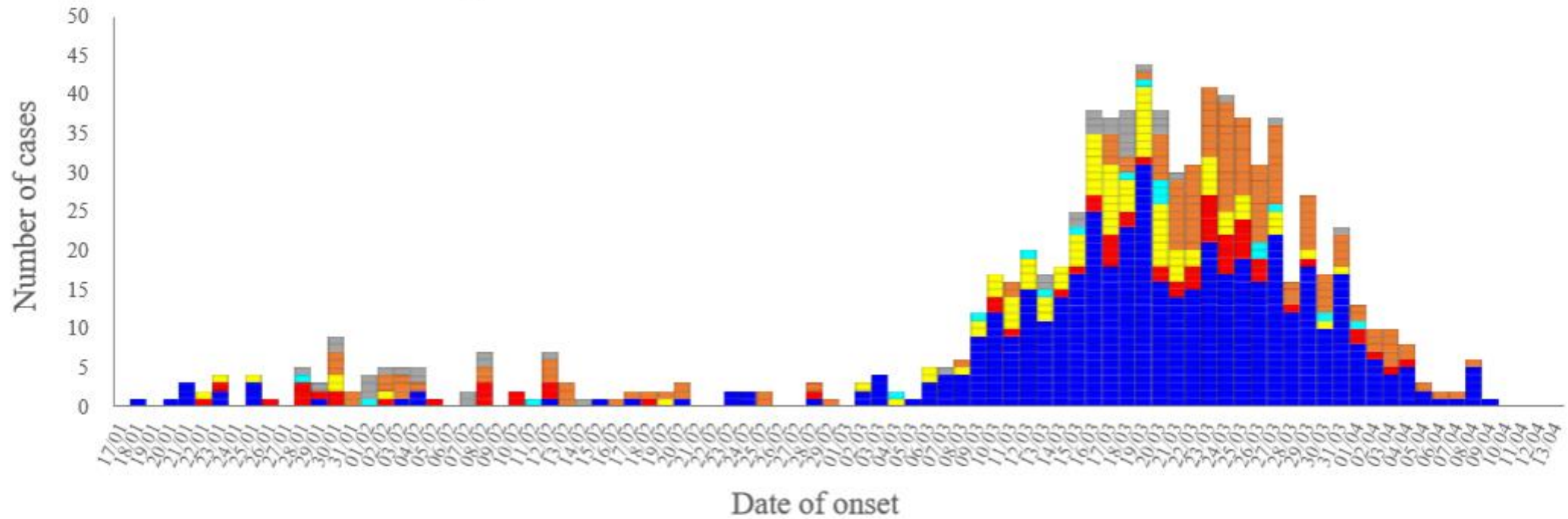
Government

- Highest level attention
- Structural
 - Centre for Health Protection
 - Health system
 - Academic EID programs
- Actions
 - Traveller quarantine in 2009

Hong Kong 2020

Epidemic curve of confirmed and probable cases of COVID-19 in Hong Kong (as of 13 Apr 2020)

Number of confirmed and probable cases = 1010



■ Imported case

■ Local case

■ Possibly local

■ Close contact of imported case

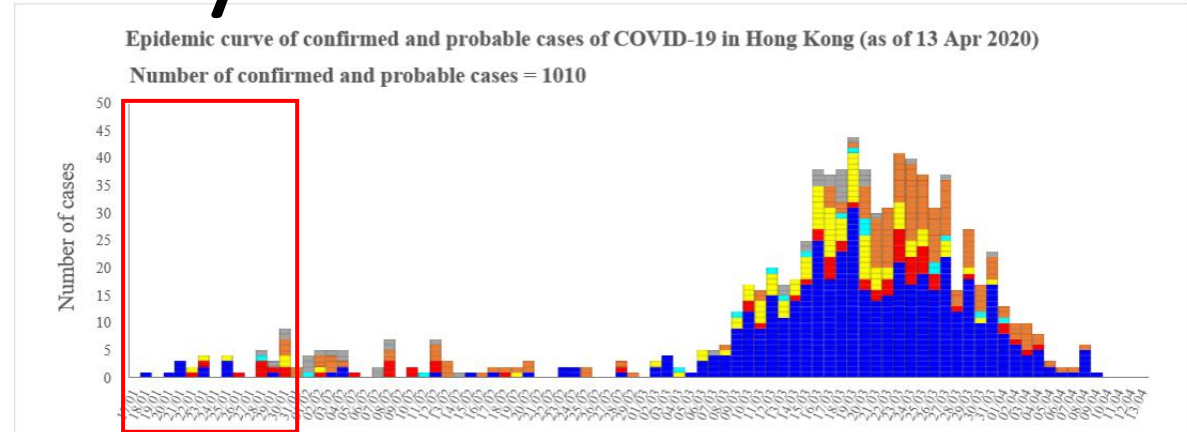
■ Close contact of local case

■ Close contact of possibly local case

Source: Hong Kong Centre for Health Protection

January 2020

- Travelers from



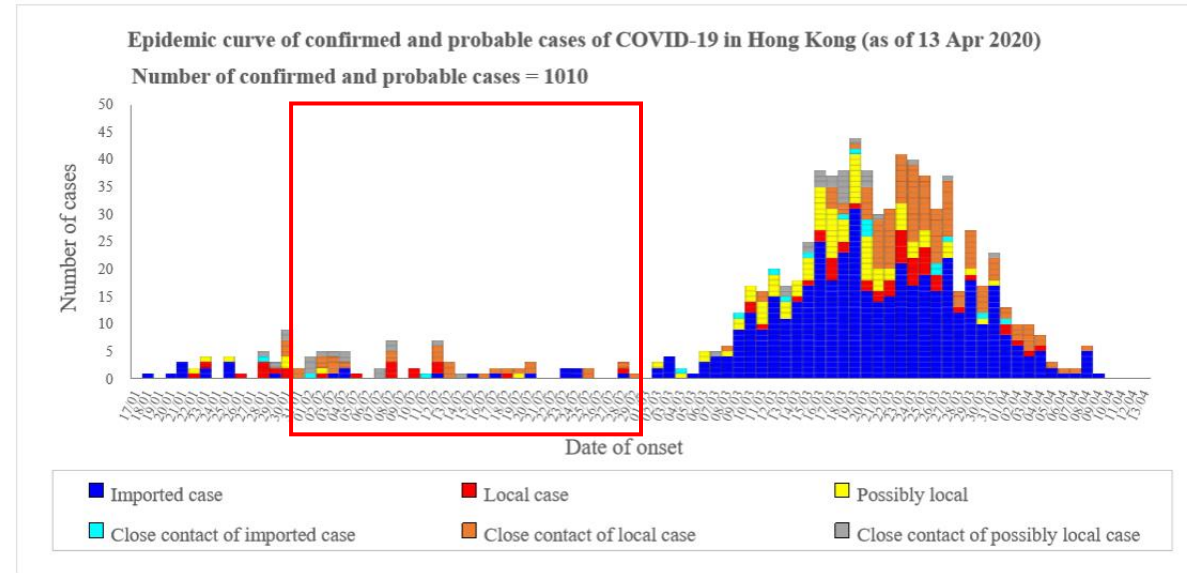
Measures

31 Dec	GOV vows vigilance after Wuhan reports infections
4 Jan	Preparedness and Response Plan launched: serious response level
23 Jan	2 infections confirmed
24 Jan	Health declaration required: all passengers at high-speed rail station
25 Jan	Response raised to highest emergency level <ul style="list-style-type: none"> • All Wuhan trains / flights stopped • All mainland checkpoints require health declaration; temperature screening at departures • School holiday extended
27 Jan	Entry ban into HK for Hubei residents / travelers in previous 14 days
28 Jan	<ul style="list-style-type: none"> • 6 border entry points suspended • Mainland stops permits for visitors to Hong Kong • Work-at-home arrangement for civil servants

February 2020

- **Mixed sources of infection**

- Travelers
- Contacts
- Local



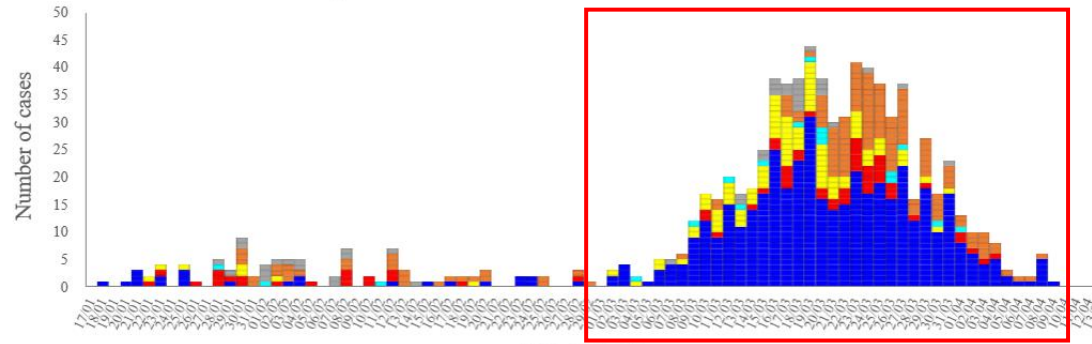
Measures

- | | |
|--------------|--|
| 4 Feb | <ul style="list-style-type: none">• First local death• Borders closed with China (except HK-Zhuhai-Macau Bridge, Shenzhen Bay Port, airport) |
| 8 Feb | <ul style="list-style-type: none">• All people entering HK from Mainland placed in quarantine |
| | |

March-April 2020

- **Major surge**
 - Returning residents
 - Contact
 - Local

Epidemic curve of confirmed and probable cases of COVID-19 in Hong Kong (as of 13 Apr 2020)
Number of confirmed and probable cases = 1010



Measures

23 Mar	<ul style="list-style-type: none"> • Ban on restaurants / bars selling alcohol
25 Mar	<ul style="list-style-type: none"> • No entry or transit for any incoming non-residents from overseas • All returning residents quarantined (home or hotel)
28 Mar	Extend social-distancing laws <ul style="list-style-type: none"> • A ban on public gatherings of more than 4 people • Closure of leisure venues, including cinemas, party rooms and gyms • Restaurants and bars must half capacity / keep tables 1½ metres (5 feet) apart
1 - 3Apr	Closure of karaoke lounges, nightclubs, mahjong, pubs, bars
6 Apr	Ban on entry of non-residents extended indefinitely
8 Apr	All incoming travelers into airport tested for coronavirus
10 Apr	Beauty and massage parlours closed

Basket of Measures (adjusted over time)

- Cross-government mobilization
 - Public health
 - Surveillance
 - Case investigations & contact tracing
 - Isolation of cases
 - Quarantine of contacts
 - Testing
 - Scientific community mobilized
 - Communications
 - Press, website, videos
- Border & traveler restrictions
 - Social distancing
 - Government, businesses, schools
 - Restaurants, bars, gymsetc
 - Masks, handwashing etc
 - Hospitalization costs covered by HK

HK and global challenges going forward

- Monitor domestic & external risks
- Health system capacity if surge
- Normalization
 - Economic & emotional toll
 - Risk of uncontrolled infections
 - Tailor domestic & border measures
- Return of overt social unrest

Multilateral cooperation

- 2001 WHA Resolution 54.14
Global health security:
 - Global strategy for prevention of movement of communicable diseases across national borders
- 2005 revised International Health Regulations (IHR)
- 2014 Global Health Security Agenda (GHSA)

Lessons from South Korea for COVID-19

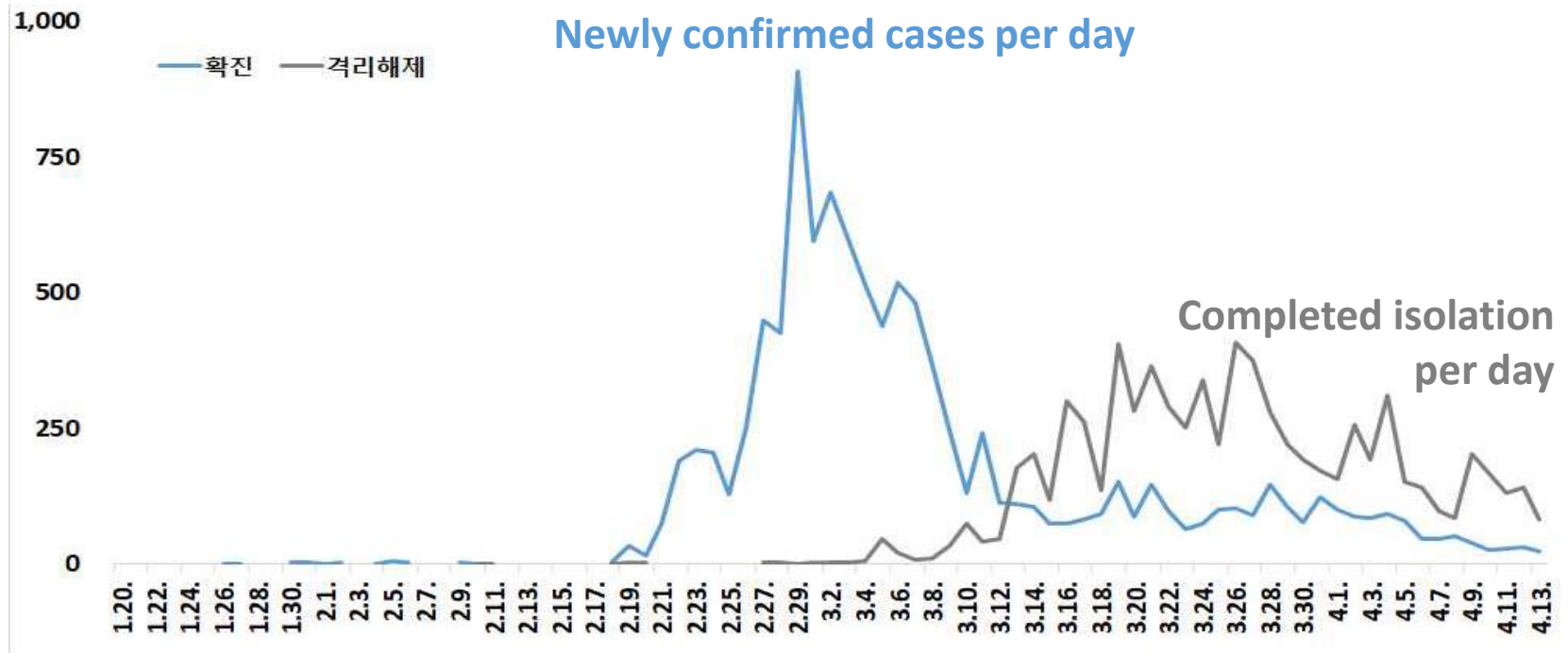
Juhwan Oh, *MD, MPH, PhD*

Seoul National University Hospital

Seoul National University College of Medicine

5 phases based on number of new cases per day

Source: Korea CDC



0 case 0-5 new cases per day up to 909 909-100 99-50 new cases below 49

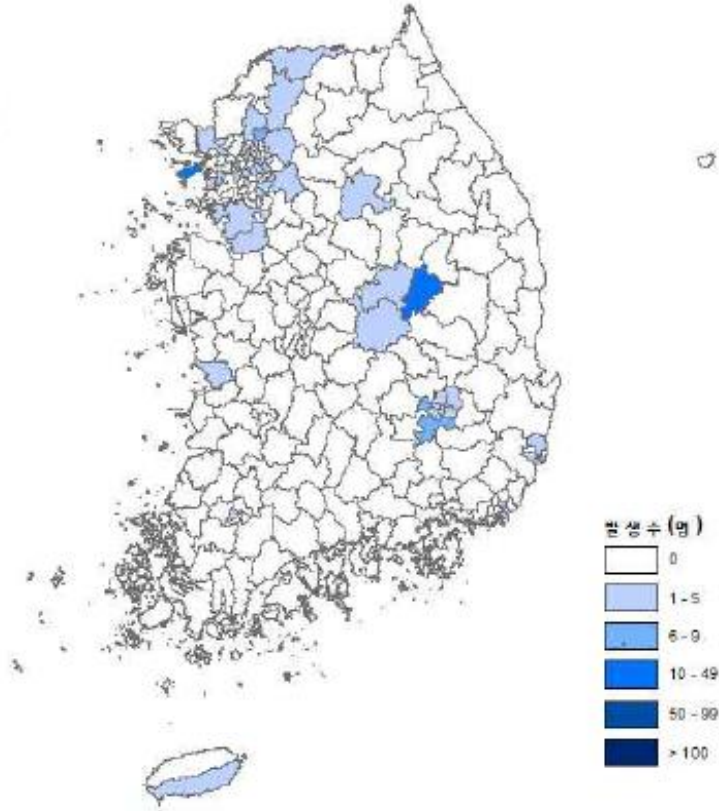
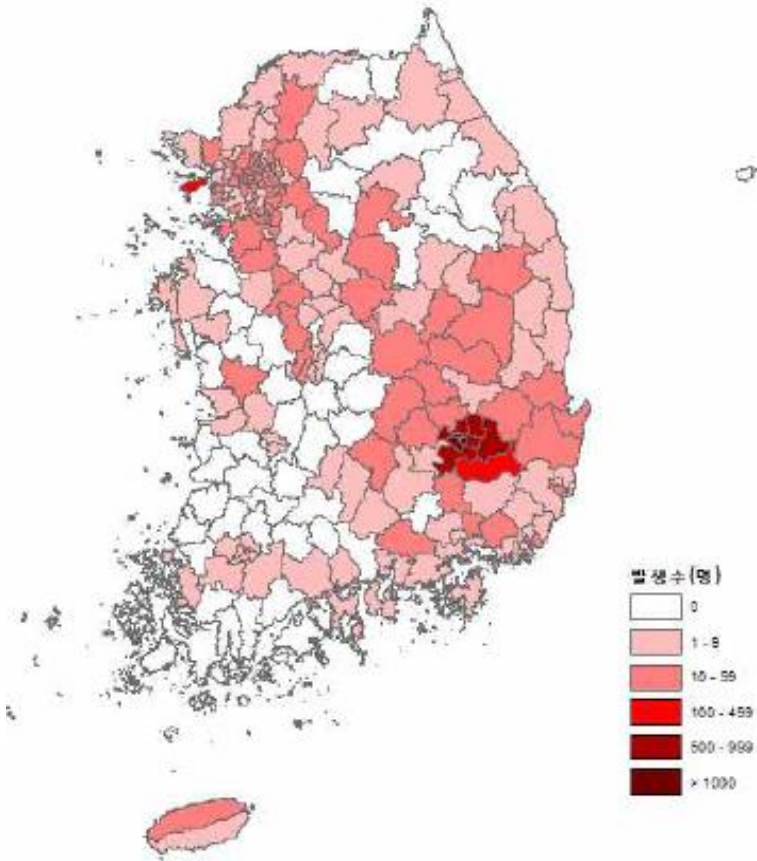
<h1>0</h1> <p>21 days</p>	<h1>1</h1> <p>28 days</p>	<h1>2</h1> <p>12 days</p>	<h1>3</h1> <p>14 days</p>	<h1>4</h1> <p>21 days</p>	<h1>5</h1> <p>7 days</p>
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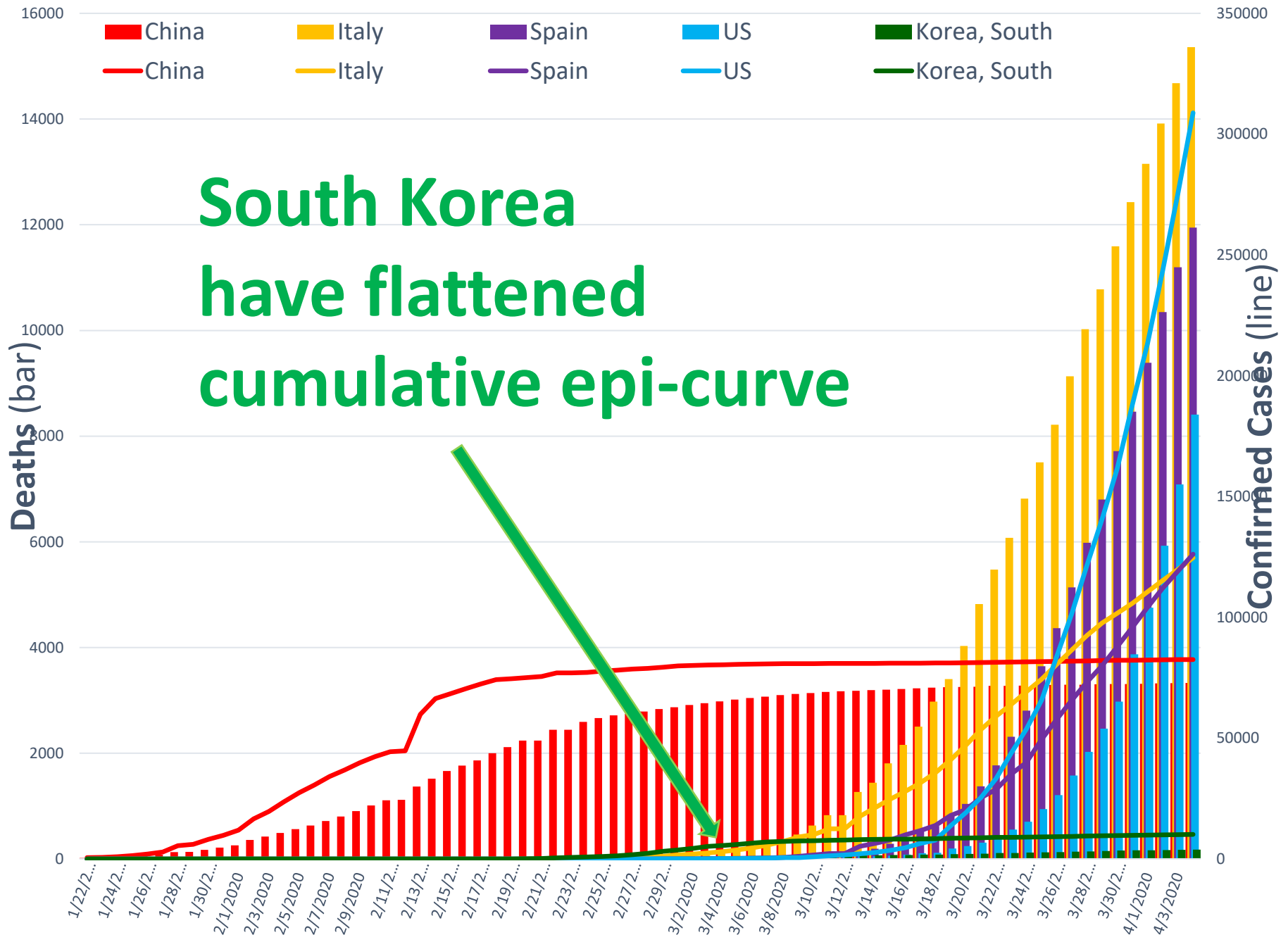
Confirmed cumulative cases across districts

Source: Korea CDC

('20.1.1.~4.15.)

('20.4.9.~4.15.)





Early Phases Responses

Phase 0

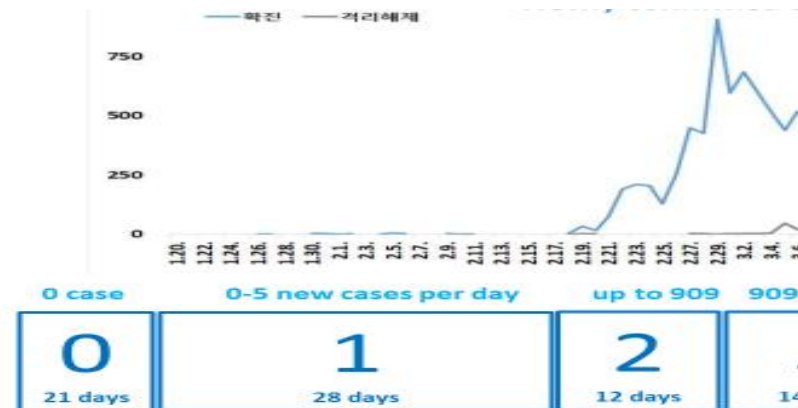
0 case period

- Early recognition of **the threat (China Epidemic)**
- Rapid activation of **national response protocol**

Phase 1

0-5 new cases per day

- Rapidly establishing wide-spread **diagnostic capacity**



Phase 2. Rapid System Transformation

Establishing national center for disaster relief *led by* prime minister

with **declaration of the highest (4th) level (Red) of epidemic crisis** on Feb 23

Treatment System Re-design (Separate two-tiers systems)

Critically ill patients (5%)

Severe patients (10-15%)

COVID ONLY hospitals vs Non-COVID hospitals

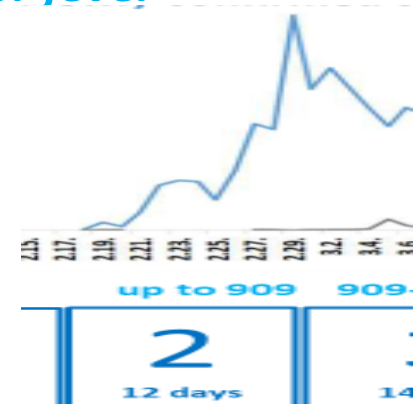
Mild-to-moderately ill patients (80%)

observation admission center

Triage at initial entry point] *all respiratory symptom or fever*

Prevention System Re-design

Local contact tracing, Diagnostic test, Isolation



When someone *diagnosed*

Prevention Acton Begins

Initiating contact tracing

- *Testing the contacted persons*
 - *Isolating until result comes (at home)*
- *Admission to observation centers if positive results*

Treatment Action Starts

Admission to facility

- *Close monitoring even without Sx by CCTV and phone within dormitory via health professionals*
- *Conservative treatment for those with symptom*

Prevention System Re-design

Local contact tracing

by (temporary) district EIS officers

by provincial/central EIS officers

Diagnostic test

Evaluation through local screening/triage centers

at district centers

Isolation

*at home or at public isolation dormitory (incoming
travelers)*

Free food and living stuff were provided for those isolated

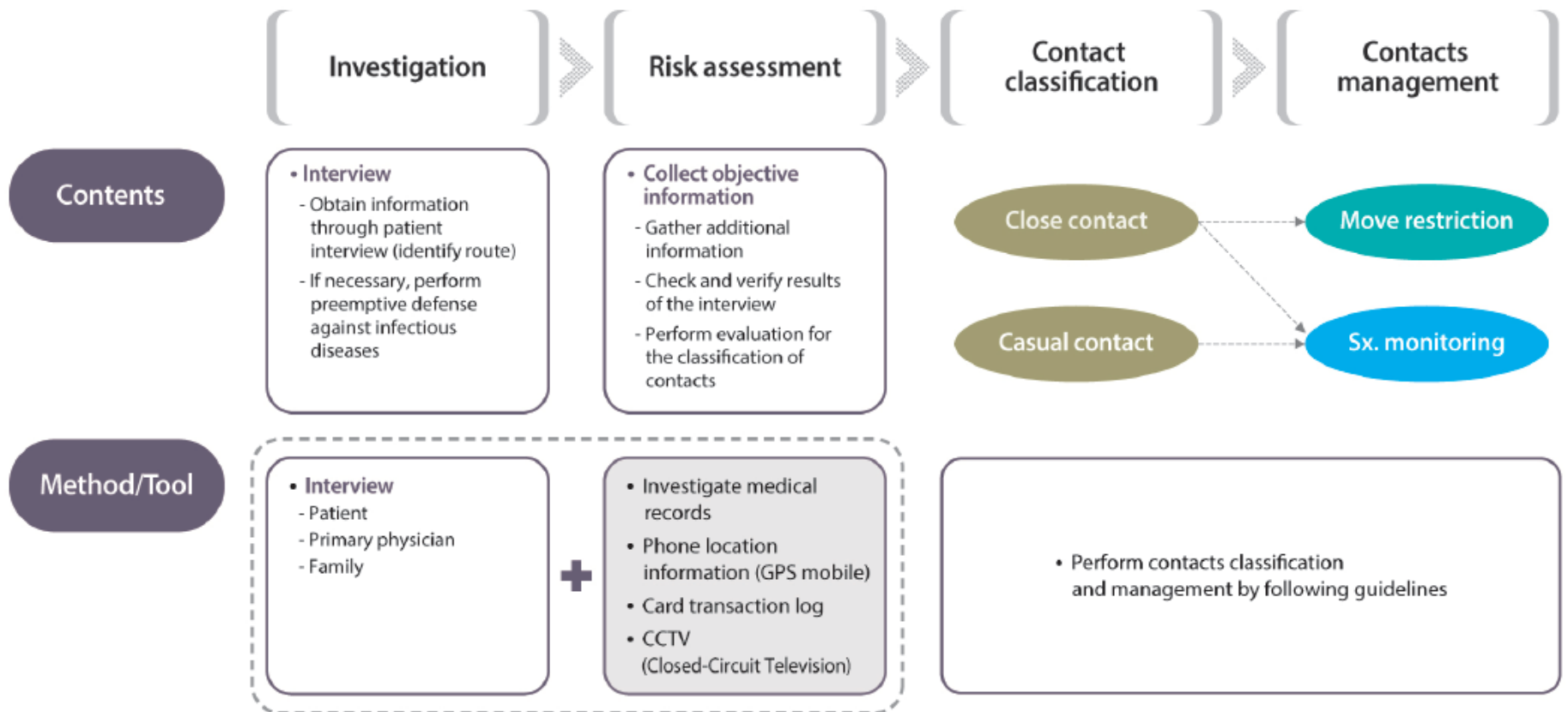


Figure 1. Stepwise approach in monitoring contacts when a patient with COVID-19 is detected. GPS = global positioning system.



Osong Public Health and Research Perspectives

Journal homepage: <http://www.kcdcphrp.org>

Short Communication

Contact Transmission of COVID-19 in South Korea: Novel Investigation Techniques for Tracing Contacts



COVID-19 National Emergency Response Center, Epidemiology & Case Management Team,
Korea Centers for Disease Control & Prevention*

Korea Centers for Disease Control and Prevention, Cheongju, Korea

ABSTRACT

Article history:

Received: February 13, 2020

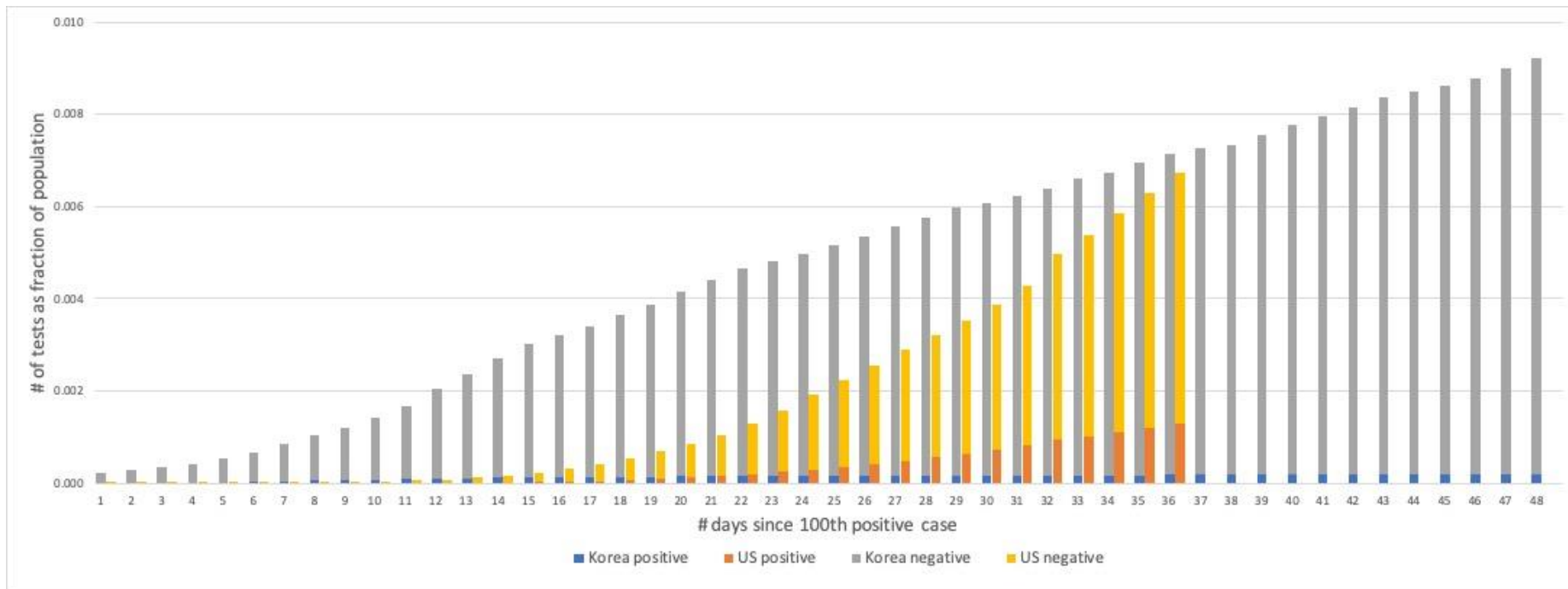
Revised: February 18, 2020

Accepted: February 18, 2020

In the epidemiological investigation of an infectious disease, investigating, classifying, tracking, and managing contacts by identifying the patient's route are important for preventing further transmission of the disease. However, omissions and errors in previous activities can occur when the investigation is performed through only a proxy interview with the patient. To overcome these limitations, methods that can objectively verify the patient's claims (medical facility records, Global Positioning System, card

Aggressive Contract Tracing with Test

: cum. number of tests per population

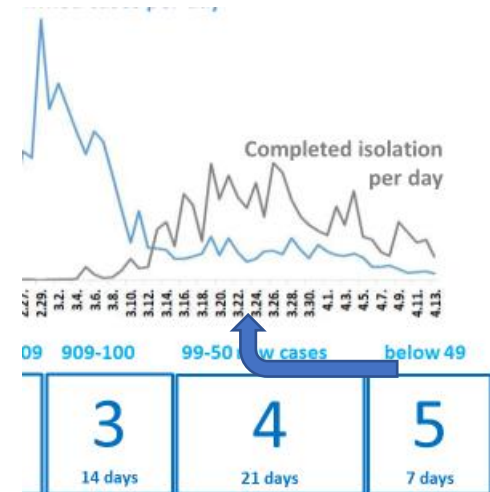


Re-design towards two-tiers systems

COVID					Non-COVID				
University Hospital 1 COVID Section					Non-COVID Section of the same hospital				
University Hospital 2 COVID Section					Non-COVID Section of the same hospital				
COVID Hospital 1	COVID Hospital 2	COVID Hospital 3	COVID Hospital 4	COVID Hospital 5	Non-COVID Hospital 5	Non-COVID Hospital 4	Non-COVID Hospital 3	Non-COVID Hospital 2	Non-COVID Hospital 1
Observation center 1	Observation center 2	Observation center 3	Observation center 4	Observation center 5	Observation center 6	Observation center 7	Observation center 8	Non-COVID ambulatory clinic	Non-COVID ambulatory clinic
Triage Center	Triage center	Triage center	Triage center	Triage center	Triage center	Triage center	Triage center		
<i>Phone call, non-contact registrar first to be properly positioned</i>									

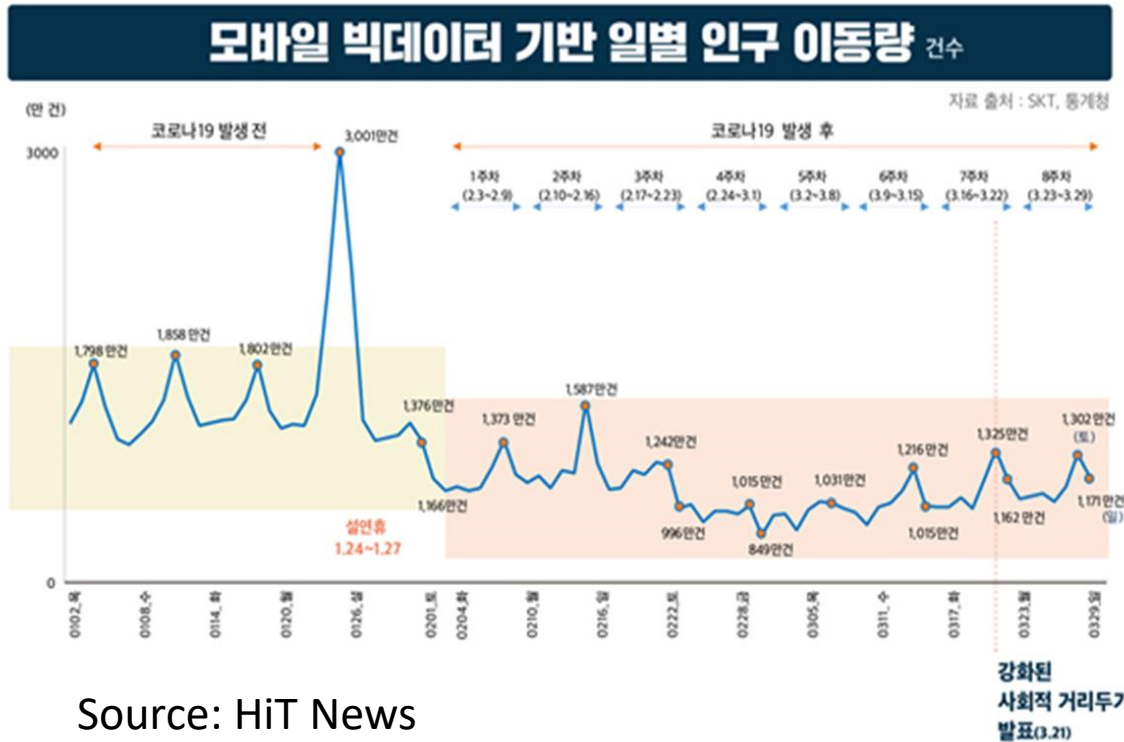
Phase 3-5 Active social distancing encouraged by government for preventing re-surgings

- *(Since March 22)* Strong recommendation **to minimize non-essential mobility or social gathering**
 - Delayed school re-opening from winter break (equivalent to school closure) through online class
 - Discouraged in-person religious worship or indoor gym activities
 - Encourage home-based work
- Exit via stressing quarantine in daily life
- *Unlike US or EU,*
NO banning of most of ordinary businesses *such as restaurant, bar*



Population Mobility Statistics based on mobile big data (from January to March)

- Publicly provided information by SK Telecom & Korea Statistical Office

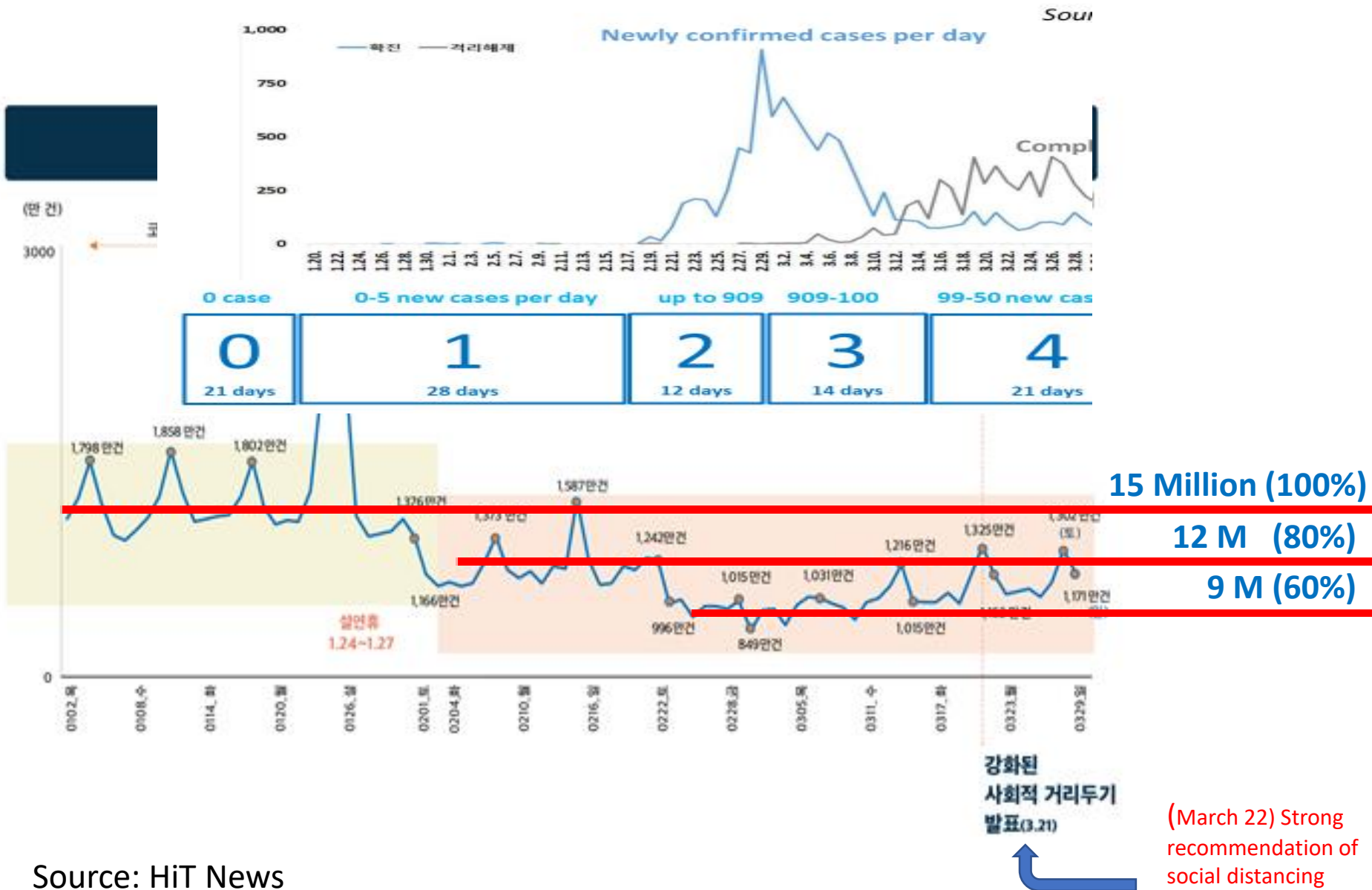


Source: HiT News

(March 22) Strong recommendation of social distancing



To prevent rebound of already, voluntarily, reduced population mobility



Decreasing number of newly affected cases with unknown origin
 (orange colored) from 15% to 5% or lower [March 1-31]

일별 감염경로 현황



Source: HiT News

(March 22) Strong recommendation of social distancing

Universal Health Coverage for COVID

100%
Out-of-pocket

90-100%
Covered by
Health Insurance

0-10%
Co-
payment

**Medical bill for
All COVID-19
related medical cost
has been covered by Tax
based on legal framework**

Transferable Lessons

- Aggressive technical response in prevention (Public health) & treatment (Medicine)
 - Aggressive *contact-tracing, quarantine (isolation) & testing*
 - Aggressive *triage* based COVID vs non-COVID separation & *closed monitoring for mild cases* & *tireless clinical service for critically ill cases*
- Prompt transformative response by steady government commitment (President-PM office /MoHW /KCDC /Provincial Government/District Health center)
- Trust between citizen/public & government
 - *Transparent risk communication & Public engagement*
- Proactive Health Professionals' voluntary sacrifice



Responses to COVID-19 outbreak in Taiwan

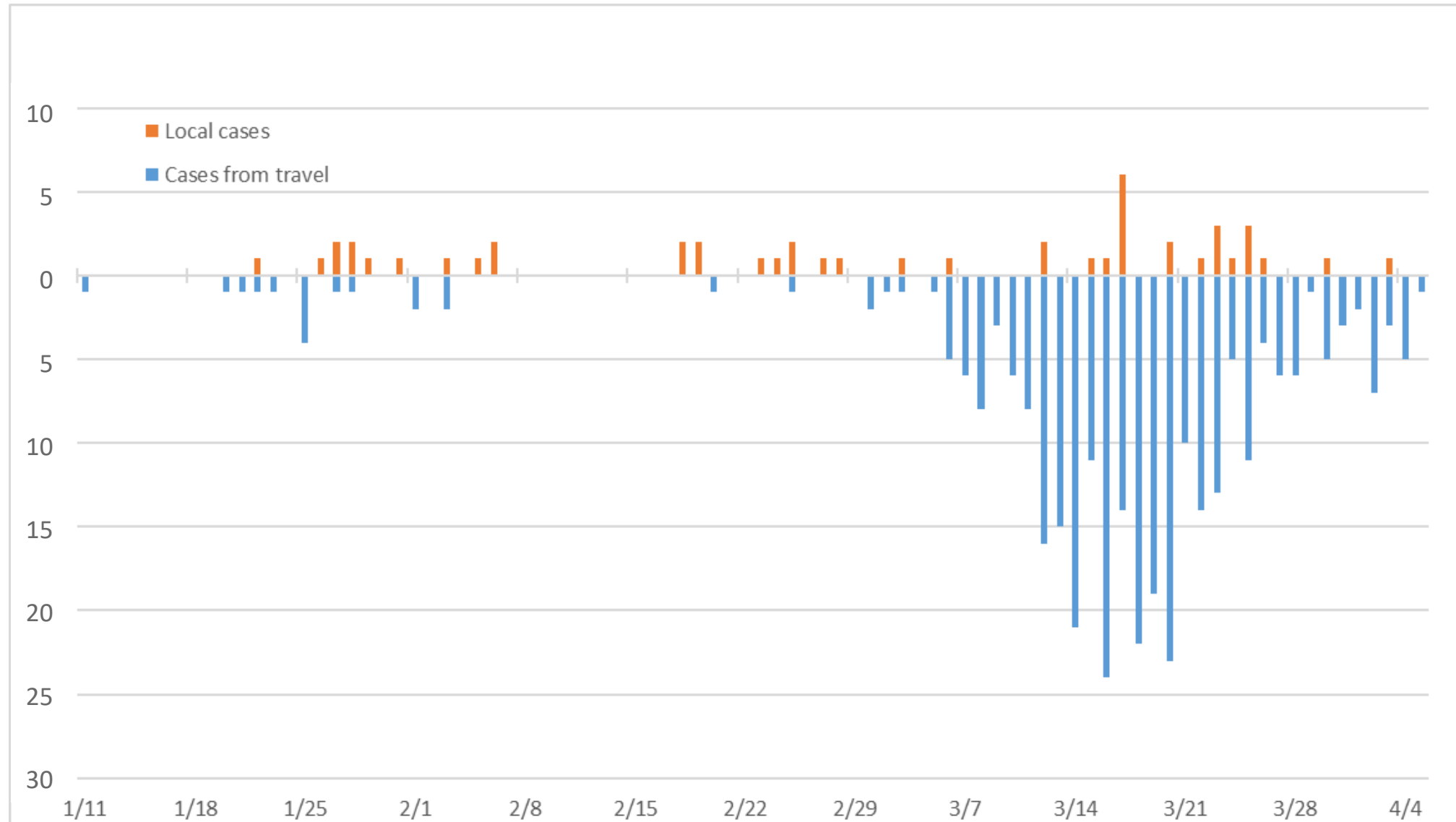
Chang-Chuan Chan, ScD

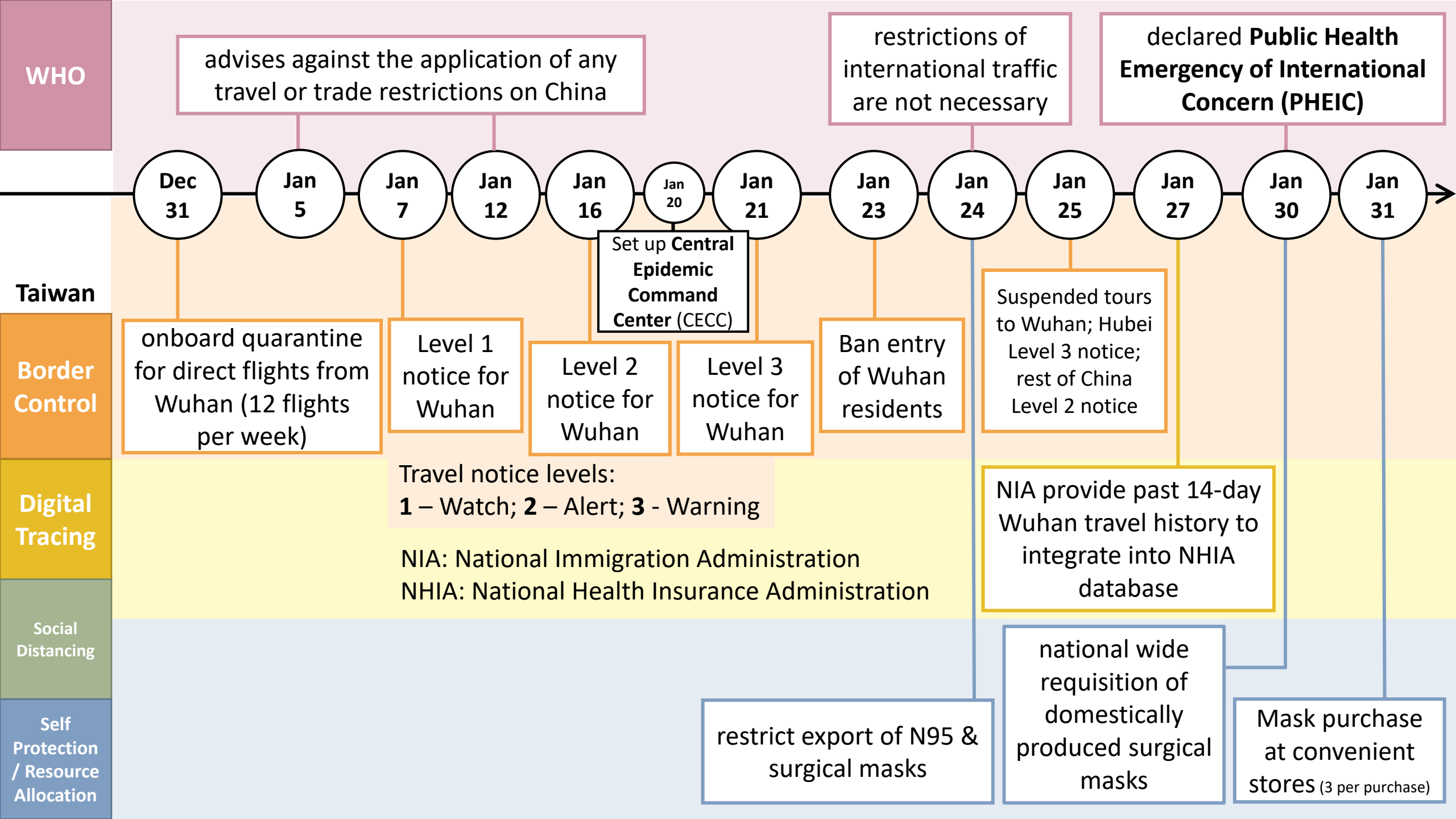
Dean, Professor, College of Public Health

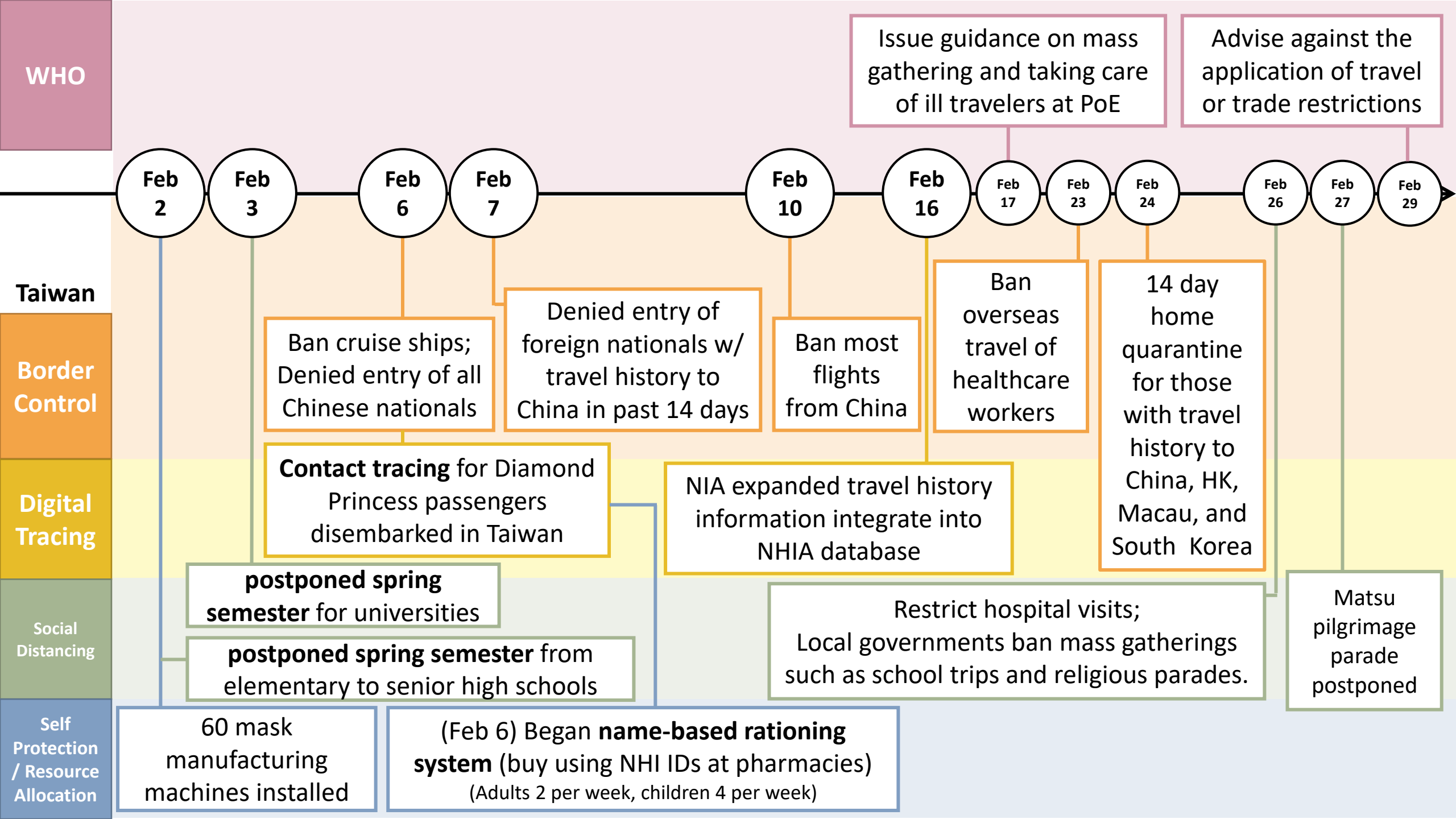
National Taiwan University

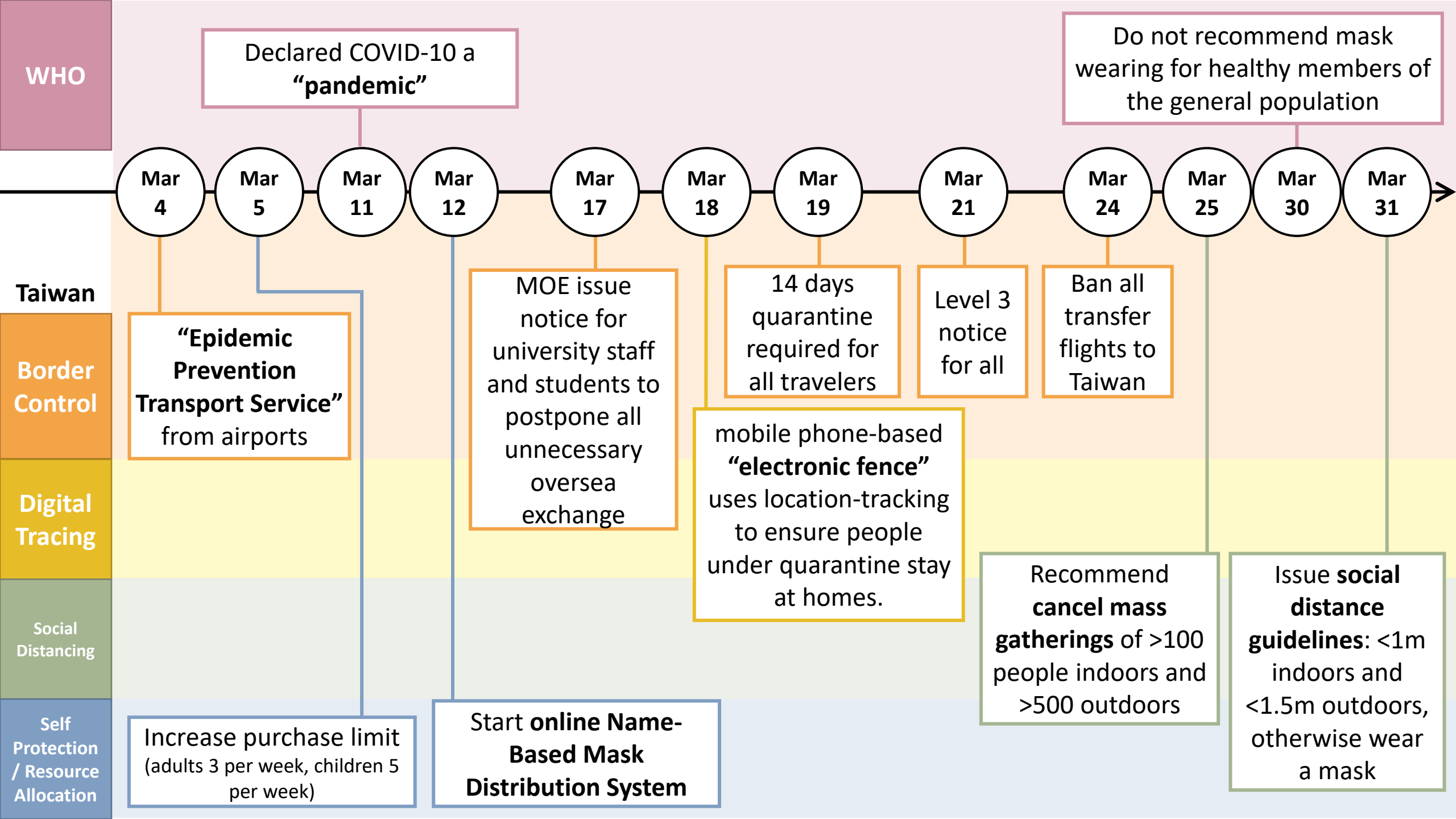
Confirmed cases of COVID-19 by onset date (Taiwan)

Data source: <https://www.cdc.gov.tw/> updated: 2020/04/14









WHO

Declared COVID-10 a **“pandemic”**

Do not recommend mask wearing for healthy members of the general population

Taiwan

Border Control

Digital Tracing

Social Distancing

Self Protection / Resource Allocation

Mar 4

Mar 5

Mar 11

Mar 12

Mar 17

Mar 18

Mar 19

Mar 21

Mar 24

Mar 25

Mar 30

Mar 31

“Epidemic Prevention Transport Service” from airports

MOE issue notice for university staff and students to postpone all unnecessary oversea exchange

14 days quarantine required for all travelers

mobile phone-based **“electronic fence”** uses location-tracking to ensure people under quarantine stay at homes.

Level 3 notice for all

Ban all transfer flights to Taiwan

Increase purchase limit (adults 3 per week, children 5 per week)

Start **online Name-Based Mask Distribution System**

Recommend **cancel mass gatherings** of >100 people indoors and >500 outdoors

Issue **social distance guidelines**: <1m indoors and <1.5m outdoors, otherwise wear a mask

WHO

Apr 3

Apr 5

Apr 8

Apr 9

Apr 10



Taiwan

Border Control

Digital Tracing

Social Distancing

Self Protection / Resource Allocation

Launched new SMS function for those in quarantine to report health status

Issue stricter regulations for home quarantine

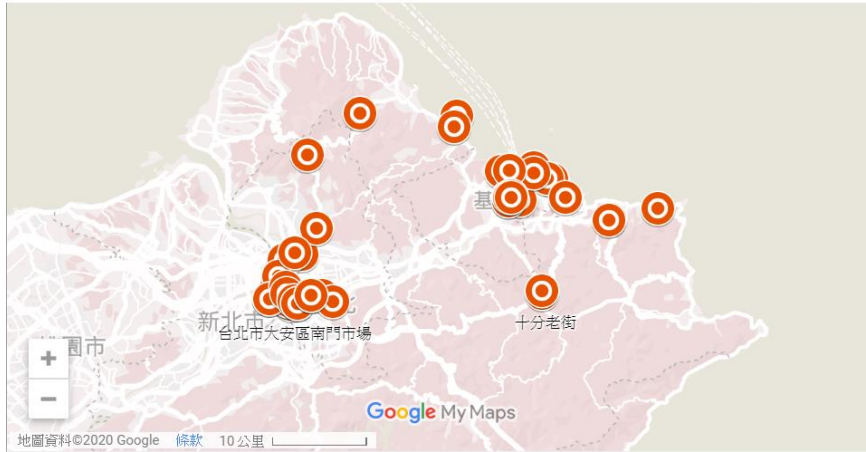
All host/hostess clubs and ballrooms to suspend operations

Crowd control imposed at tourist hotspots, night markets, and temples

Mandate wearing face masks on public transportations

Online application to send masks to close relatives overseas

Digital tracing – Diamond Princess



警訊通知
[警示]因武漢肺炎疫情，1月31日
6AM至5:30PM若赴以下地點<http://bit.ly/2SpSxeT> 請自主健康管理至
2/14，留意發燒或呼吸道症狀。疫情
指揮中心1922
類型：警訊通知

SMS message

確認

- 2694 passengers disembarked in northern Taiwan on Jan 31st
- Used mobile sensor data cross-validated by other big sensor surveillance data to identify 627,386 potential contact persons with mobile geo-positioning method and rapid analysis
- SMS message to citizens who might have contact with the passengers
- National Health Insurance data linked with contact population to follow up hospital visits
- 69 contacts were tested by RT-PCR (all negative)

Done in
1 day

The Matsu detour



Evolution of Name-Based Mask Distribution System

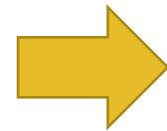


Name-Based Mask Distribution System 1.0



- 1. Time-consuming
- 2. Close contact

photo by udn.com



Name-Based Mask Distribution System 2.0

Two-step Mask Reservation Using Mobile Phone:

- 1. Login with NHI Card
- 2. Finish Mobile Device Binding Procedure

Option 1 QR Code Scan

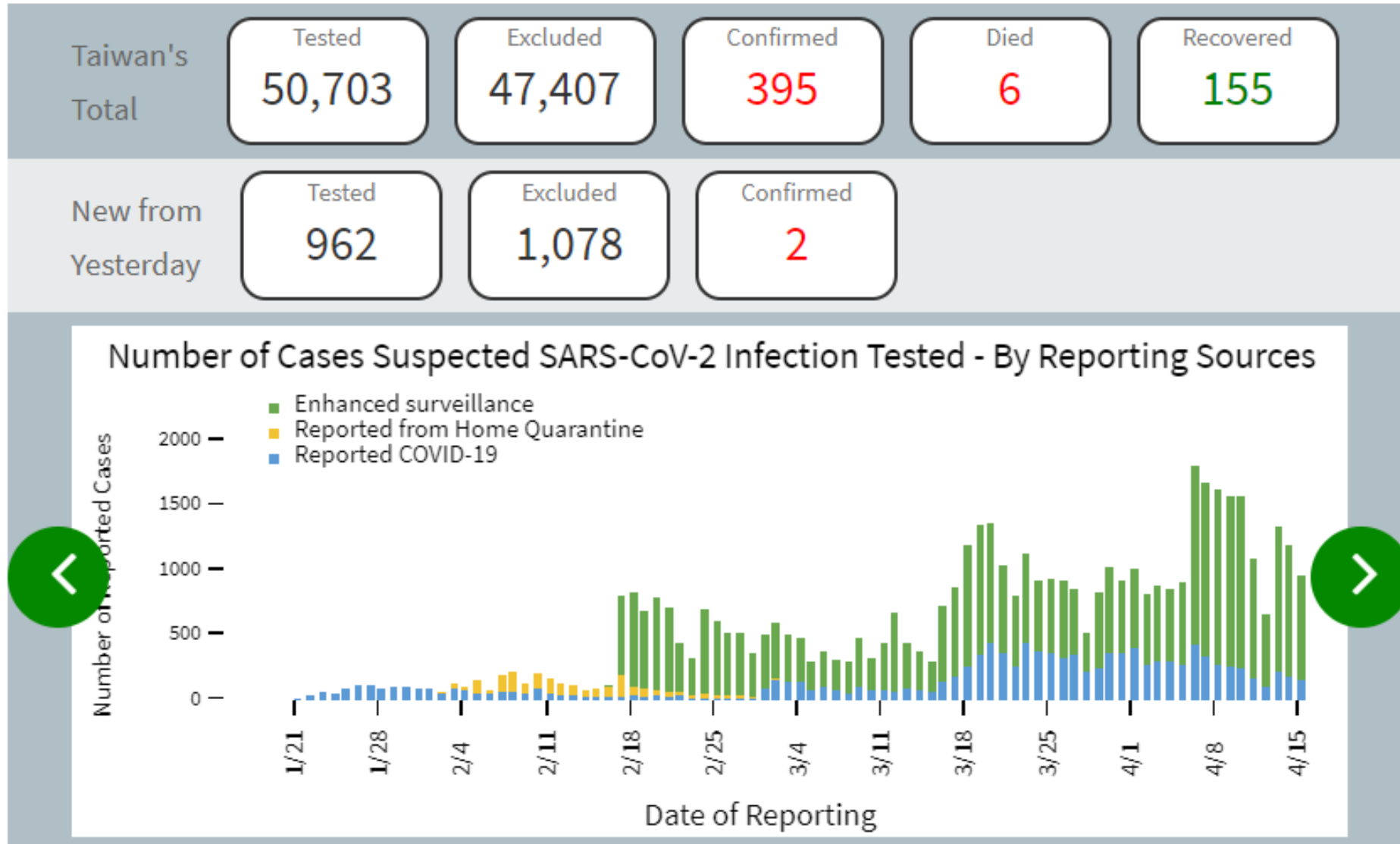
1. Log into the registration website using NHI Card
2. Click **mobile device verification**
3. Produce device **verification code**

Option 2 Certification Code Typing

1. Download **NHI Express APP**(全民健保行動快易通APP)
2. Click **My Health Bank**
3. Choose **device verification**

- ✓ Register the NHI Card is needed for first-time users
- ✓ Information needed:
 - Household number (please check the household certificate)
 - Address
 - Phone number, E-mail
 - **Setting NHI Card password**

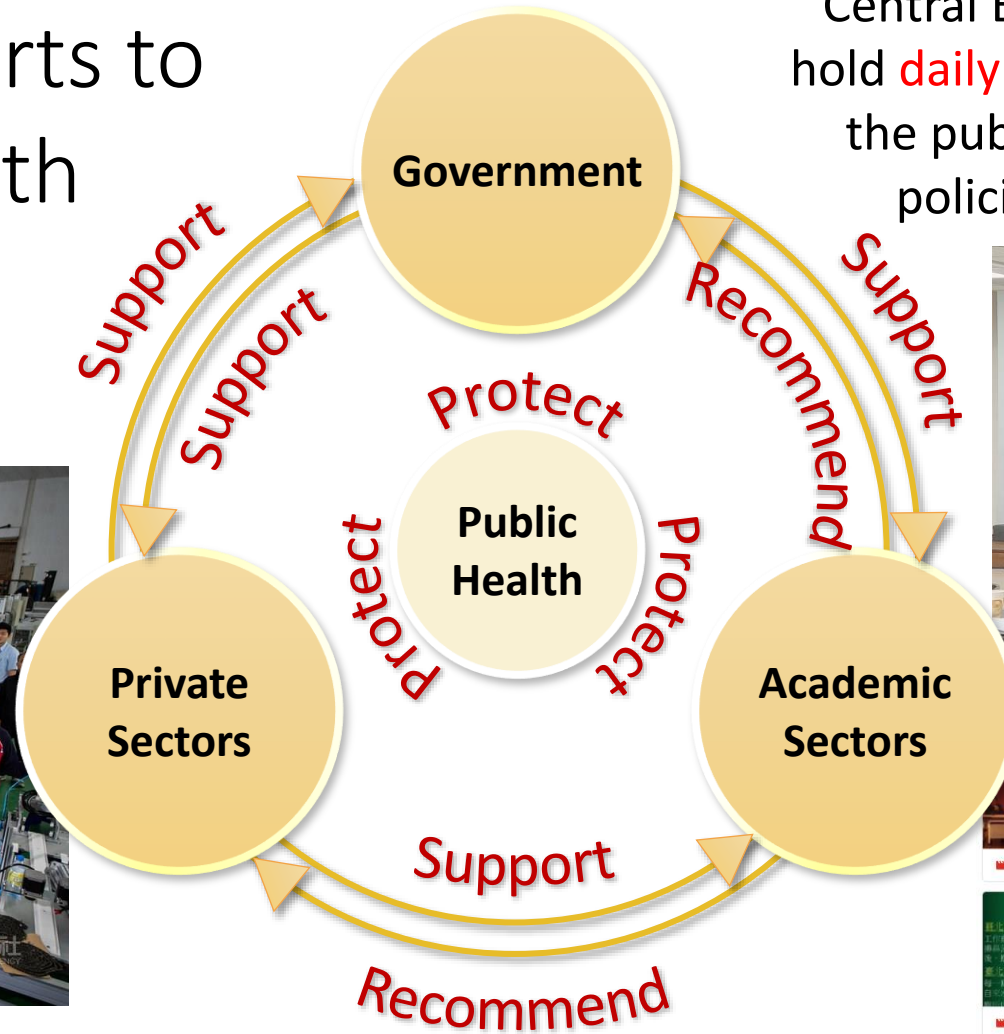
Did all of these responses work?



Our combined efforts to protect public health



More than 100 technicians from companies across Taiwan **volunteered** their time, expertise, and resources to assemble **92 surgical face mask production lines in 40 days** that boost Taiwan's **daily production capacity from 4 million to 15 million**.



Central Epidemic Command Center (CECC) hold **daily administrative briefings** to inform the public of the current outbreak status, policies, and information on COVID-19.



National Taiwan University College of Public Health hold **weekly press conferences** to provide **scientific details** on national and international developments, and recommend containment policies based on scientific findings and data analysis.

How did we achieve this?

- Our society as a whole **learned harsh lessons from the 2003 SARS outbreak:**
 - **we should be ready for newly emerging diseases**
 - **we cannot expect timely and accurate disease outbreak data from China**
- **Early border control policy** is our most important and successful containment measure
- Efforts were significantly enhanced by our **advanced information technology, digital communication networks, and big data science**
- Clear and effective **communication**
- Taiwanese people are **familiar** with the necessary personal measures to avoid infection, very **supportive** of government's policies, and have **complied** faithfully with infection-control measures.
- Taiwan's **single-payer National Health Insurance (NHI) system** enables us to mobilize the healthcare resources of the entire country during an outbreak.

We are in the first inning of the ball game



Photo by Central News Agency / April 12, 2020