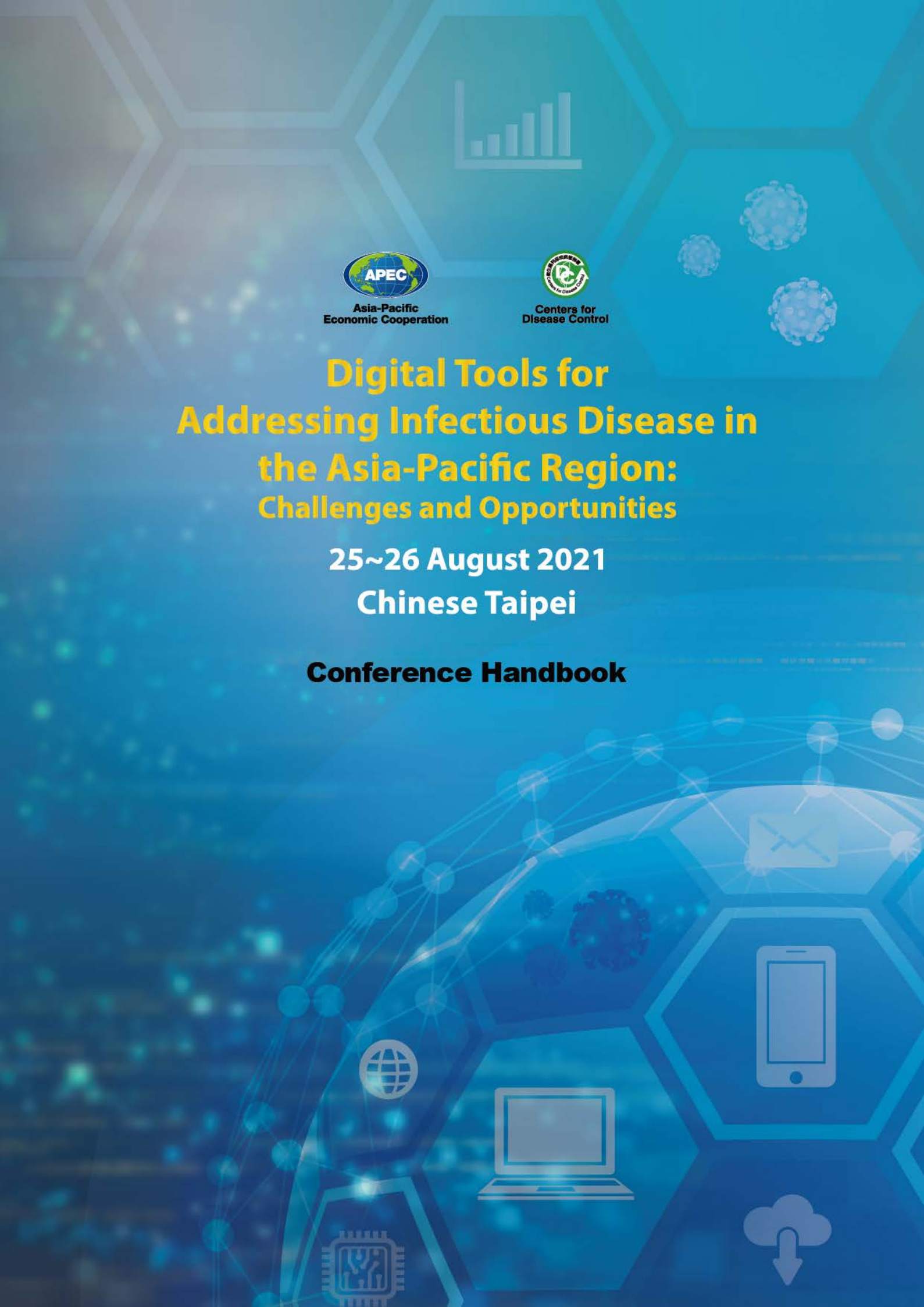

Digital Tools for Addressing Infectious Disease in the Asia-Pacific Region: Challenges and Opportunities

25~26 August 2021
Chinese Taipei

Conference Handbook

Asia-Pacific Economic Cooperation

Centers for Disease Control

Contents

Jui-Yuan Hsueh | Distinguished Guest

- Position: Political Deputy Minister
- Organization: Ministry of Health and Welfare
- Economy: Chinese Taipei

Educational Background

- 1997.09~2001.01 Master of Law, National Taiwan University
- 1993.09~1997.06 Bachelor of Law, National Taiwan University
- 1973.09~1980.06 Doctor of Medicine, Taipei Medical University

Professional Career

- Administrative Deputy Minister, Ministry of Health and Welfare (2017.08~2010.07)
- Director, Public Health Bureau, Pingtung County Government (2015.02~2017.07)
- Deputy Superintendent, Taipei Medical University Shuang Ho Hospital, Ministry of Health and Welfare (2008.07~2015.02)
- Director-General, Bureau of Medical Affairs, Department of Health, Executive Yuan (2004.03~2008.05)
- Deputy Director-General, Bureau of Medical Affairs, Department of Health, Executive Yuan (2003.04~2004.03)
- Senior Secretary, Bureau of Medical Affairs, Department of Health, Executive Yuan (2002.04~2003.04)

Date: 25-26 August 2021

Time zone: GMT+8

Wednesday, 25 August 2021		
Time	Subject	Moderator / Speaker
08:50-09:00	Registrations	
09:00-09:15	Opening Remarks	**Jui-Yuan Hsueh** Deputy Minister Ministry of Health and Welfare Chinese Taipei
09:15-09:25	Group Photo	
09:25-09:55	**Keynote Speech** Chinese Taipei Model: From Surveillance, Resource Mobilization to Multisector Collaboration	**Moderator** **Jih-Haw Chou** Director-General, Centers for Disease Control, Ministry of Health and Welfare Chinese Taipei **Speaker** **Chien-Jen Chen** Academician, Genomics Research Center, Academia Sinica Chinese Taipei
Session I	**Surveillance: Detection, Forecasting and Risk Assessments**	**Moderator** **Marjorie Pollack** Deputy Editor, ProMED-mail United States
09:55-10:10	New Zealand's COVID-19 Experience: The Role of Digital Tools	**Shaun Hendy** Professor, Pūnaha Matatini, University of Auckland New Zealand
10:10-10:25	Surveillance: Detection, Forecasting and Risk Assessments The Philippine Experience	**Enrique A. Tayag** Director IV, Knowledge Management and Information Technology Service, Department of Health The Philippines
10:25-10:40	Covid-19 Surveillance and Risk Assessment in Chinese Taipei	**Jen-Hsiang Chuang** Deputy Director-General, Centers for Disease Control, Ministry of Health and Welfare Chinese Taipei
10:40-10:55	**Panel Discussion I**	

Wednesday, 25 August 2021		
Time	Subject	Moderator / Speaker
10:55-11:05	Break Time	
Session II	**Response: Resources, Allocation and Mobilization**	**Moderator** **Vikki Carr delos Reyes** Medical Specialist III, Epidemiology Bureau, Department of Health The Philippines
11:05-11:20	ISRAEL vs. COVID Technology vs. Virus	**Ido Hadari** Venture Partner, ALIVE Israel Healthtech Fund; Chief, Government Relations & Communications, Maccabi Healthcare Services Israel
11:20-11:35	COVID-19 in Bavaria, Germany – Challenges and Lessons Learned from a Public Health Perspective	**Merle Böhmer** Epidemiologist, Bavarian Health and Food Safety Authority; Institute of Social Medicine and Health Systems Research, Otto-von-Guericke-University Germany
11:35-11:50	Experience Sharing on Developing the Oxford COVID-19 Government Response Tracker (OxCGRT)	**Toby Phillips** Executive Director, the Oxford COVID-19 Government Response Tracker (OxCGRT) United Kingdom
11:50-12:05	COVID-19 and Mass Gathering Events in Japan	**Tomoya Saito** Director, Center for Emergency Preparedness and Response, National Institute of Infectious Diseases Japan
12:05-12:20	**Panel Discussion II**	

Thursday, 26 August 2021		
Time	Subject	Moderator / Speaker
Session III	**Innovation and Collaboration: Industry, Academia, Government**	**Moderator** **Wei-Sen Li** Secretary General, National Science and Technology Center for Disaster Reduction Chinese Taipei
09:00-09:15	Digital Health for COVID-19 Decision Support and Epidemic Intelligence in Singapore	**I-Cheng (Mark) Chen** Head, National Centre for Infectious Diseases (NCID) Research Office Singapore
09:15-09:30	Spreading Knowledge Faster than Outbreaks	**Kamran Khan** CEO, BlueDot Canada
09:30-09:45	COVID-19 Digital Epidemiology, Demography and Creating Tools to Reach a Diverse Population	**Benjamin Rader** Graduate Research Fellow, Computational Epidemiology Lab, Boston Children's Hospital United States
09:45-10:00	How to be the Helper in the COVID-19 with Surgical Robot Technology	**Chieh-Hsiao Chen** CEO, Brain Navi Biotechnology Chinese Taipei
10:00-10:20	**Panel Discussion III**	
10:20-10:30	Break Time	

Thursday, 26 August 2021		
Time	Subject	Moderator / Speaker
Session IV	**Data Privacy and Protection**	**Moderator** **Hong-Wei Jyan** Director-General, Department of Cyber Security, Executive Yuan Chinese Taipei
10:30-10:45	Privacy in a Pandemic: The Work of the Global Privacy Assembly and Australia's Experience	**Angelene Falk** Information Commissioner and Privacy Commissioner, Office of the Australian Information Commissioner Australia
10:45-11:00	Danish Experience Sharing sundhed.dk – Danish Health Care Online	**Morten Elbæk Petersen** CEO, sundhed.dk - The Danish eHealth Portal Demark
11:00-11:15	Corona-Warn-App Behind the Scenes	**Thomas Klingbeil** Director, Innovation Enablement, Technology & Innovation at SAP Company Germany
11:15-11:30	**Panel Discussion III**	
11:30-11:45	Closing Remarks	**Jih-Haw Chou** Director-General, Centers for Disease Control, Ministry of Health and Welfare Chinese Taipei

Jih-Haw Chou | Moderator

- Position: Director-General
- Organization: Centers for Disease Control,Ministry of Health and Welfare
- Economy: Chinese Taipei

Educational Background

- MPH (Environmental Toxicology), University of California at Berkeley, U.S.A.
- MPH (Epidemiology), National Taiwan University
- DDS, Taipei Medical College
- LLB, Fu Jen Catholic University

Professional Career

- Deputy Director-General, Centers for Disease Control, Chinese Taipei
- Health Commissioner, Taipei County Health Department
- Deputy Health Commissioner, Taipei County Health Department
- Director, Div. Research, Planning and Development, Taipei City Health Department
- Branch Chief, National Quarantine Service, Department of Health, Executive Yuan
- Specialist, Bureau of Communicable Disease Control, Department of Health, Executive Yuan

Publications

- Lo Yi-Chun, Chuang Jen-Hsiang, Huang Yen-Fang, Liu Ding-Ping, Chou Jih-Haw. GBD 2017 and HIV estimates for Taiwan. LANCET HIV , vol. 7 , no. 4 , page E224-E224 , 2020.
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Chien-Jen Chen | Speaker

- Position: Academician
- Organization: Genomics Research Center, Academia Sinica
- Economy: Chinese Taipei

Educational Background

- Sc.D., Department of Epidemiology, School of Hygiene and Public Health, Johns Hopkins University
- M.P.H., Graduate Institute of Public Health, College of Medicine, National Taiwan University
- B.Sc., Department of Zoology, College of Science, National Taiwan University

Professional Career

- Distinguished Research Fellow, Genomic Research Center, Academia Sinica
- Vice President, Chinese Taipei
- Vice President, Academia Sinica
- Minister, National Science Council, Executive Yuan
- Minister, Department of Health, Executive Yuan

Publications

- Liu Z, Derkach A, Yu K, Yeager M, Chang YS, Chen CJ, Gyllensten U, Lan Q, Lee MH, McKay J, Rothman N, Yang HI, Hildesheim A, Pfeiffer R. 2021. Patterns of human leukocyte antigen class I and class II associations and cancer. Cancer Res. (SCI journal)
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Chinese Taipei Model: From Surveillance, Resource Mobilization to Multisector Collaboration

Chien-Jen Chen

Abstract

Emerging infectious diseases threaten human health and sustainable development significantly. The catastrophic COVID-19 pandemic originated from Wuhan, China in December 2019 is a good example. Chinese Taipei is one of few economies with the lowest COVID-19 mortality and positive GDP growth in the first phase of COVID-19 containment (from December 2019 to November 2020). Chinese Taipei's success was based on experiences of combating pandemics of SARS in 2002-2003 and new H1N1 influenza in 2009-2010. Key elements of epidemic prevention in Chinese Taipei include prudent action, raid response, early deployment, transparency, public trust and solidarity.

Chinese Taipei learned the potential emergency of COVID-19 on December 31, 2019 through the stringent surveillance of emerging infectious diseases domestically and internationally from various information resources including social media. Chinese Taipei Center for Disease Control (CDC) immediately sent an alert e-mail to the World Health Organization (WHO) and China CDC through the International Health Regulation (IHR) focal points to request for the clarification of the clustering of atypical pneumonia cases in Wuhan. China reported 27 atypical pneumonia cases to WHO afterward. Chinese Taipei started the on-board quarantine of all passengers from Wuhan on the same day.

To integrate and coordinate inter-ministerial efforts to contain epidemic and maintain economic growth, the Central Epidemic Command Center (CECC) was activated after the National Security Council Meeting was held by the President in Chinese Taipei. All ministries are involved in CECC's activities to assure the efficacy and efficiency of the multisector collaboration. CECC also mobilizes resources for the mass production and name-based distribution of facemasks and other personal protection equipment.

From the very beginning of the pandemic, the government has ensured that the public has open access to COVID-19 information. CECC has held daily press briefings since January 2020, which generate accurate news across a broad spectrum of media outlets. CECC has quickly established its authority and earned the trust of the public. Public trust has a stabilizing influence on society, encourages citizens to follow government guidance and rules, and makes the public less vulnerable to disinformation attacks. It creates a virtuous cycle of good governance and good citizenship. Transparency, public trust and solidarity are natural products of the vibrant democracy in Chinese Taipei.

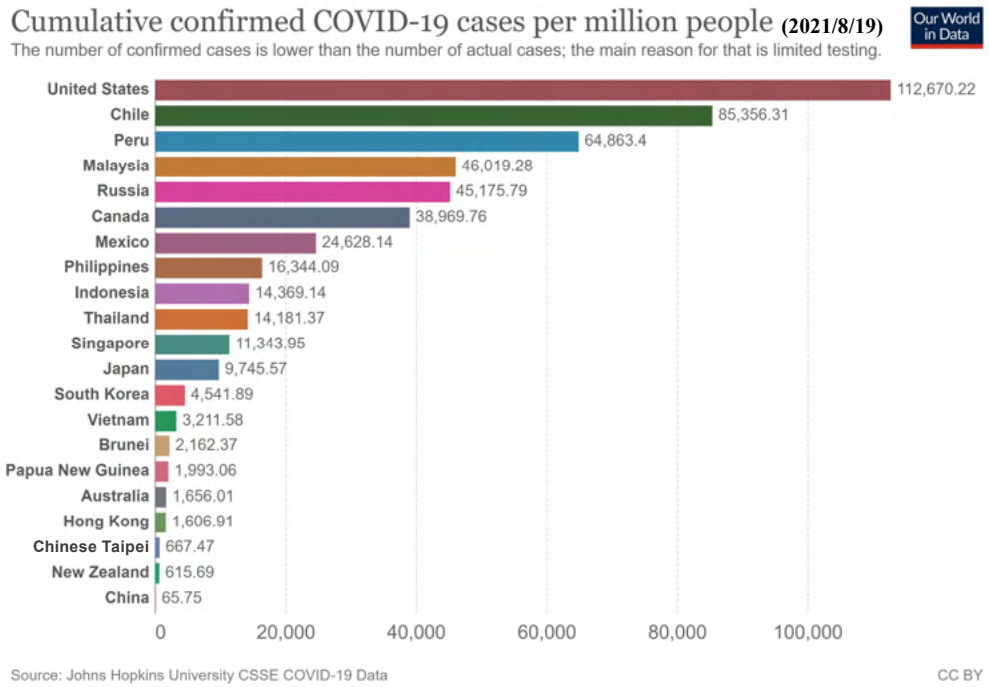
Information and communication technology, digital tools and artificial intelligence are widely used in the epidemic prevention strategies including stringent boarder control and quarantine of inbound passengers, mandated reporting and testing of suspected cases, mobilization of healthcare facilities for isolation and treatment of confirmed cases, infection control in hospitals and nursing homes, tracing and isolation of close contacts of confirmed cases, non-pharmaceutical intervention including social distancing and avoidance of large gathering, as well as registration and selection of vaccine for immunization.

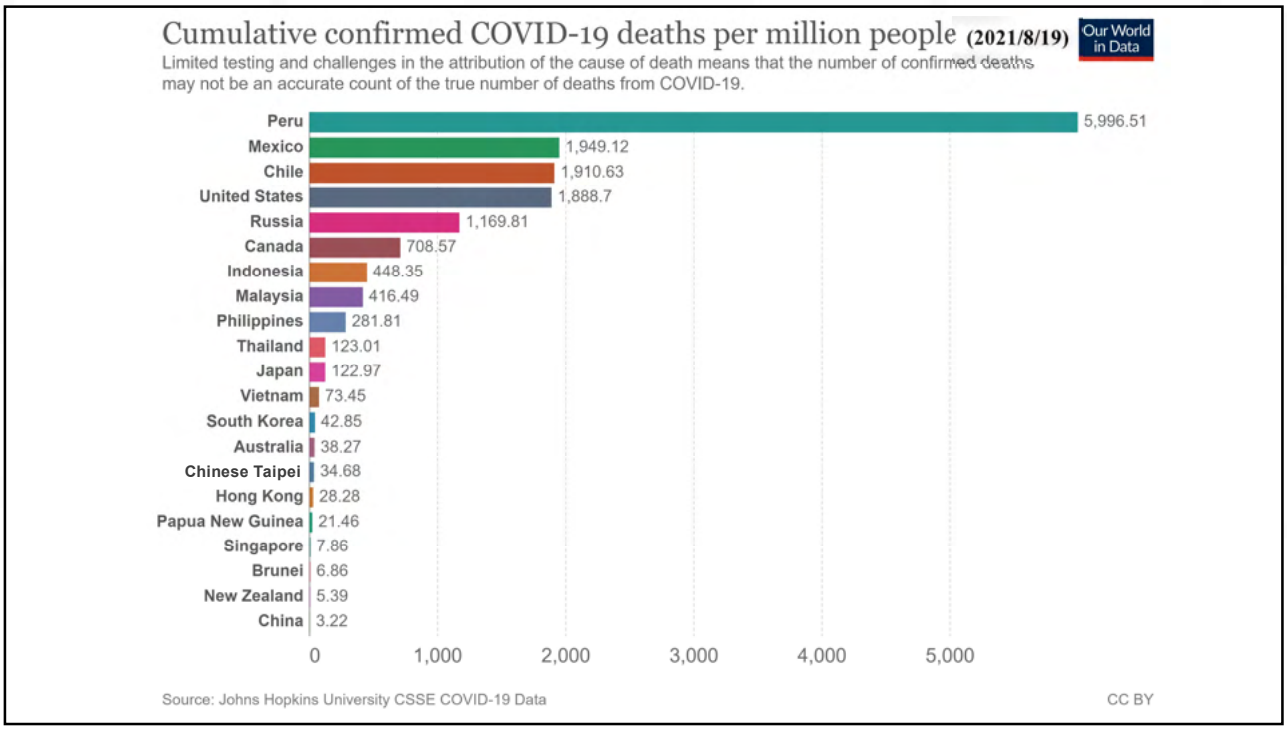
In the second phase of COVID-19 containment (from December 2020 till now), the immunization has become the most important strategy. No economy can fight against COVID-9 alone, all nations ought to work together and help each other to increase the vaccine coverage in the world.

APEC Virtual Conference, 2021-8-25

Chinese Taipei Model: From Surveillance, Resource Mobilization to Multisector Collaboration

Chien-Jen Chen, Sc.D., Ph.D.
Genomics Research Center, Academia Sinica



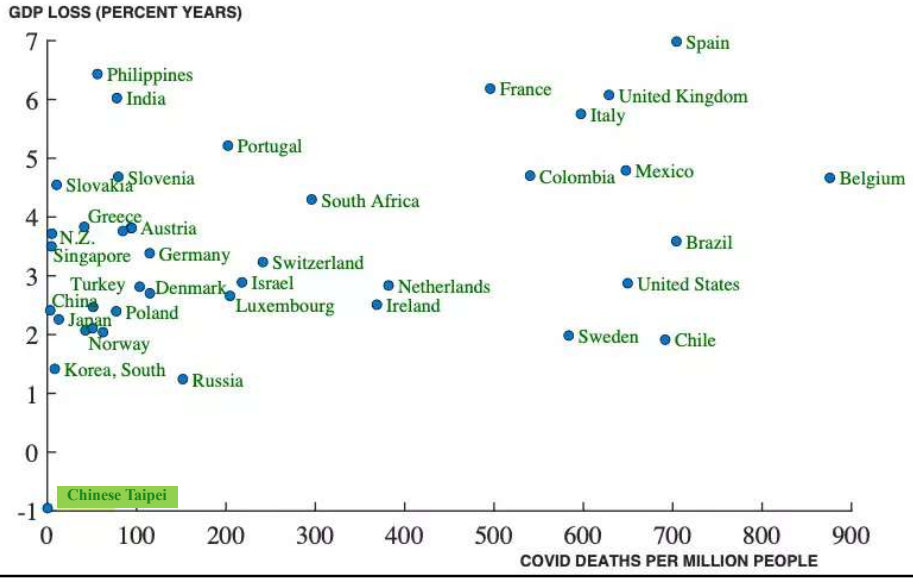


Two Phases of Pandemic Containment

- **December 2019 – November 2020**
  Interruption of viral transmission
- **December 2020 – Now**
  Interruption of viral transmission and
  Increase in herd immunity via immunization

COVID-19 Mortality and GDP Loss

(Report of US National Bureau of Economic Research, October 2020)



Phase I Effort in Chinese Taipei: Prudent action, Rapid Response, Early Deployment, Transparency, Public Trust and Solidarity

2020.1.22

2020.3.19

Reform of Epidemic Prevention System in Chinese Taipei after SARS Outbreak in 2003

1. Amendment of Communicable Disease Control Act and regulations
2. Restructuring of Ministry of Health and Chinese Taipei CDC
3. Designation of healthcare institutions to function as responding or isolation hospitals
4. Enhancement of hospital infection control through annual accreditation
5. Standardization of procedures for communicable disease surveillance and reporting domestically and internationally
6. Optimization of border quarantine and home isolation
7. Recruitment and training of infectious disease specialists
8. Establishment of National Health Command Center (NHCC)
9. Promotion of epidemic prevention R&D: PPE and pharmaceuticals
10. International collaboration in emerging infectious disease control

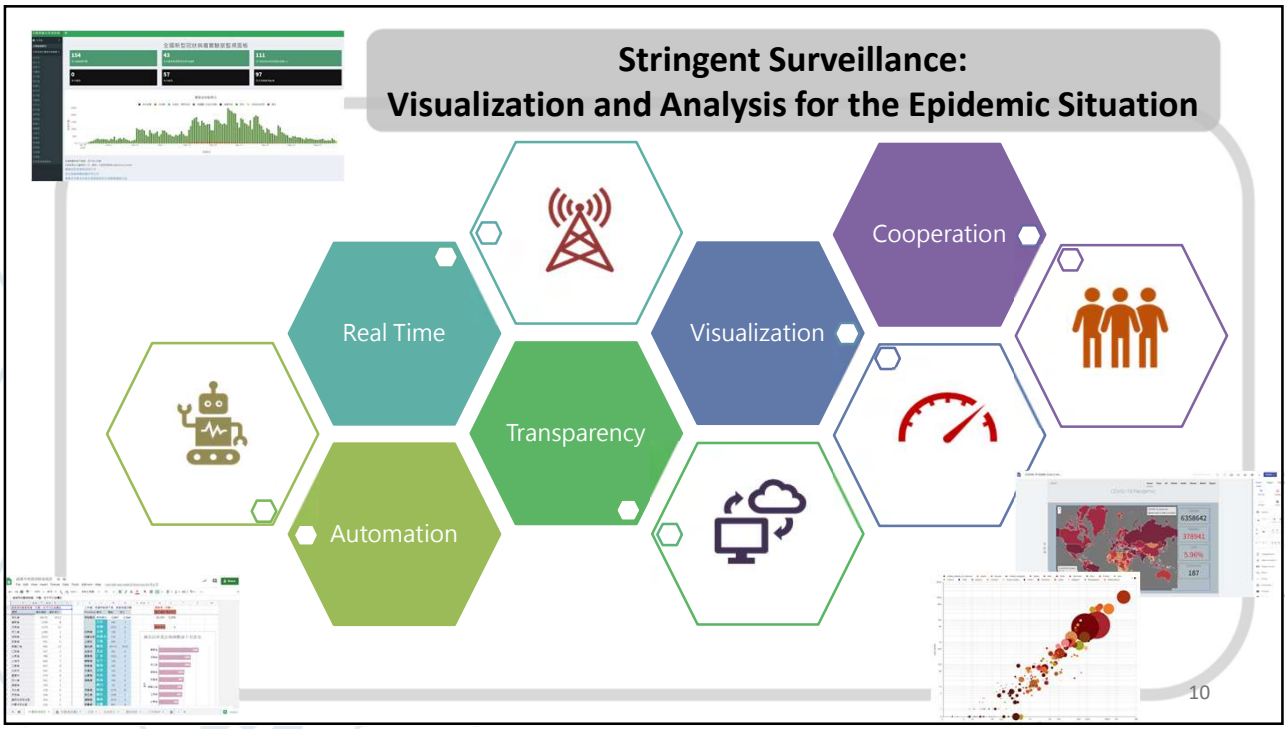
Containment of COVID-19 Pandemic in Chinese Taipei:

Prudent Action, Rapid Response, Early Deployment, and Transparency

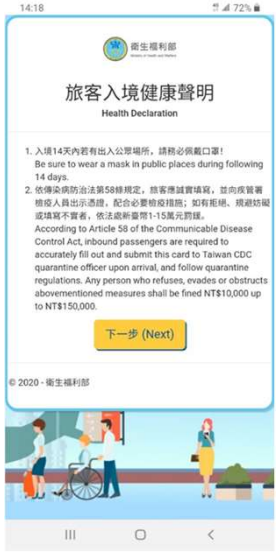
2019/12/31	Awareness of atypical pneumonia cases in Wu-Han Reporting e-mails to inform WHO and China CDC On-board quarantine of passengers from Wu-Han
2020/1/2	Strengthening suspected case reporting and hospital infection control of health care system
2020/1/5	Advisory Committee on Atypical Pneumonia in China organized by Chinese Taipei CDC
2020/1/6	Request for onsite visit to Wuhan sent by Chinese Taipei CDC
2020/1/7	Level 1 travel notice for Wu-Han announced by Chinese Taipei CDC, and causal agent 2019-nCoV announced by WHO

Rapid and Precise Responses to COVID-19 Pandemic: No City Lockdown, No Mass Testing, Smart Technology

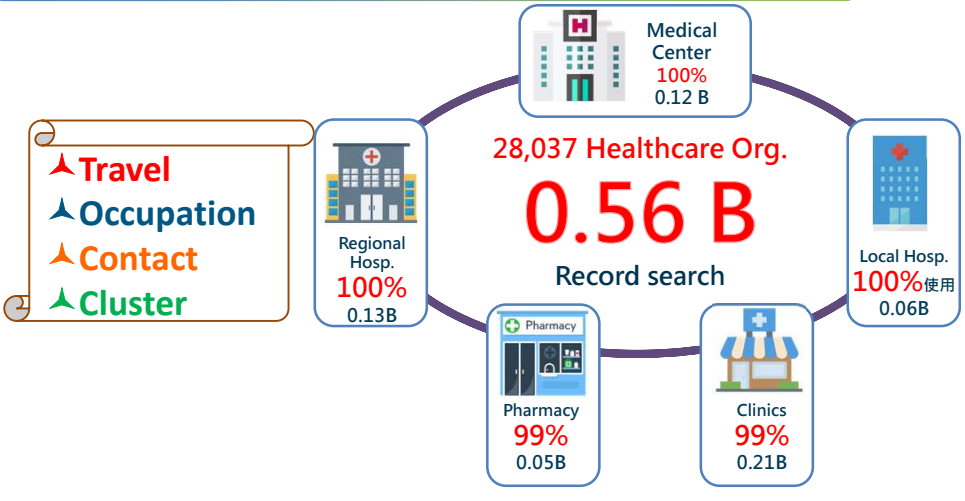
1. Prudent surveillance of pandemic status using ICT and AI technology
2. Rapid announcement of travel warning using cellular broadcast
3. Strict border control using e-quarantine system
4. In-depth tracing of close contacts of confirmed cases using ICT and big data analysis
5. Mandatory home isolation/quarantine of close contacts and inbound passengers using digital fencing tracking and line bot system
6. Precision (targeted) testing of notified suspects with symptoms/signs
7. Mobilization of health care system for isolation treatment (20,000 isolation rooms and 14,000 ventilators) using big data monitoring
8. Enhancement of hospital infection control using disinfection robots



Digital Quarantine and NHI MediCloud

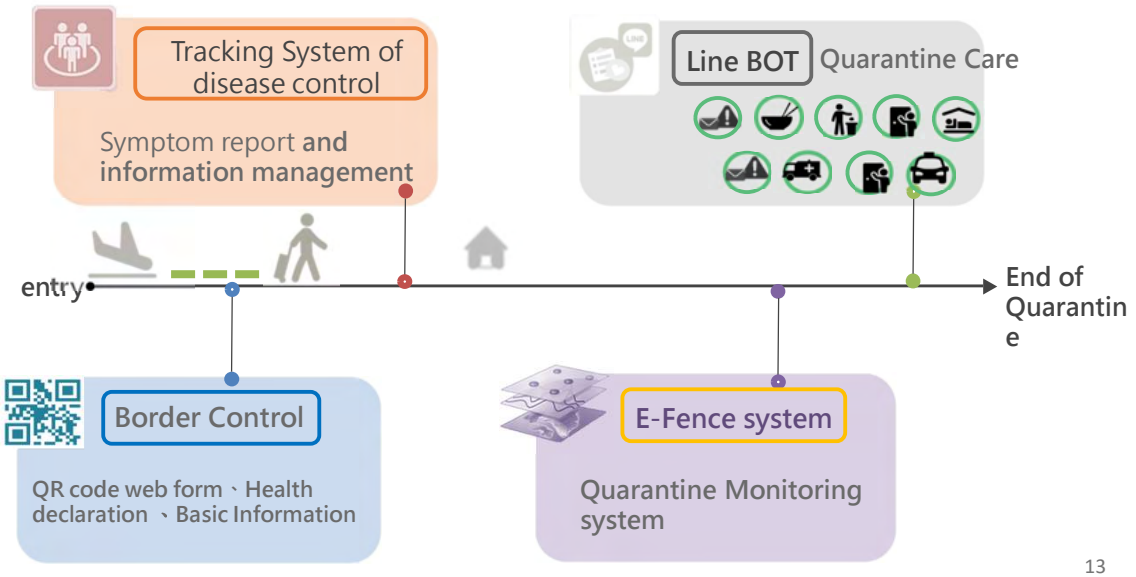


TOCC Reminder in NHI MediCloud



✸ 統計期間：109/02~109/12

Smart Tracing System



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Big Data and Artificial Intelligence

Quarantine System for Entry

Home Quarantine Tracking System

LINE Bot System: Disease Containment Expert

Digital Fencing Tracking System

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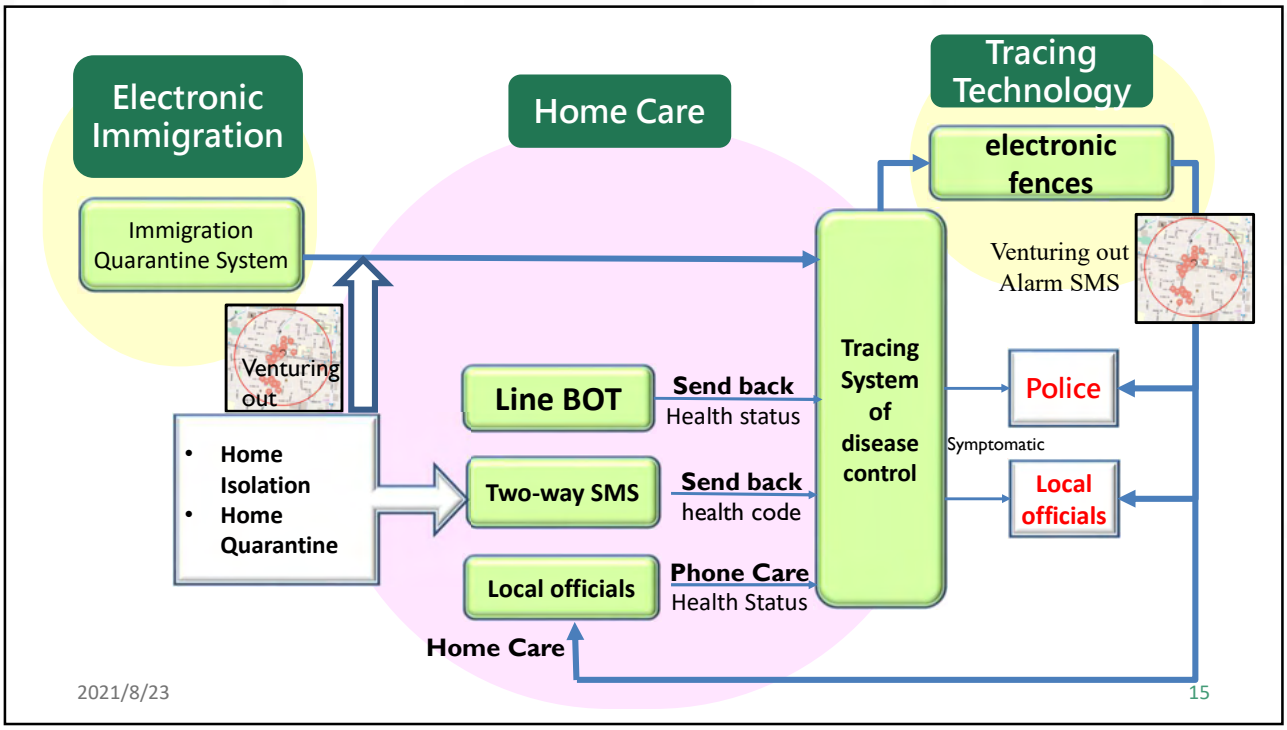
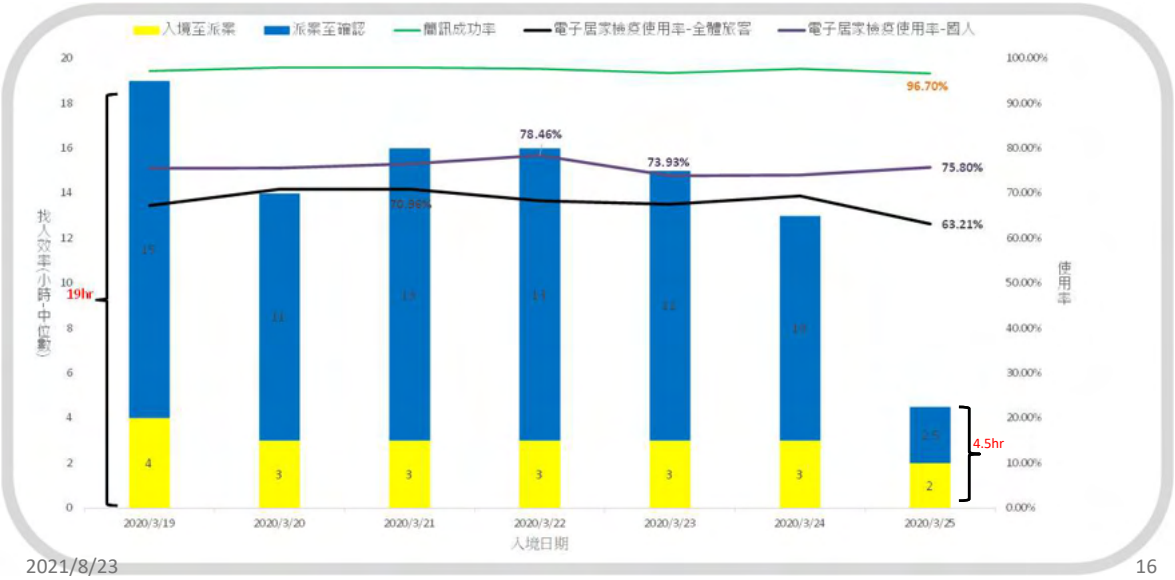


High Efficiency of Digital Tracing Technology



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Digital Fencing System for Home-based Quarantine/Isolation

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Isolation Type Statistic

Map Allocation by district

Spatial Statistic

Current number of home isolation, quarantine, warning isolation and warning quarantine

Bar chart shows the number of confirmed cases, home isolation and home quarantine of every city.

Out of Fence List (location/show on map)

Warning table reveals individuals that were outside of geofencing. Click on the locate button can jump to individual location.

Map visualizes
- Choropleth map of confirmed cases of every city/county
- Choropleth map of home isolation / quarantine of every city/county
- Choropleth map of home isolation / quarantine of every district
- Individual real time location

2021/8/23

Care and Support Services for Isolated or Quarantined Persons

Local government hotline

Meal delivery

Garbage collection

Settlement

Epidemic compensation

Family visits

Suspected symptoms: Designated ambulance

Non-suspected symptoms: Medical care arrangement

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Low Penalty rate for violation of guidelines by Isolated/Quarantined Persons*

	Home isolation	Home quarantine	Health self-management**
Total number	65,367	677,874	733,990
Symptomatic case number	8,013 (12.26%)	16,489 (2.4%)	892 (0.12%)
Confirmed case number	4,675 (7.15%)	412 (0.06%)+	279 (0.038%)
Symptomatic confirmed case no.	3,168 (4.85%)	404 (0.06%)	127 (0.017%)
Asymptomatic confirmed case no.	1,507 (2.31%)	8 (0.001%)	152 (0.020%)
Penalty Number (%)	36 (0.06%)	1,894 (0.28%)	23 (0.003%)

*by **June 13, 2021**
+ 107 detected at border entry and 305 detected during home quarantine
**Since January 10, 2021, the subjects of health self-management have been revised included reported cases who have been tested negative, people whose home quarantine/isolation period expired, and enhanced health management period expired.

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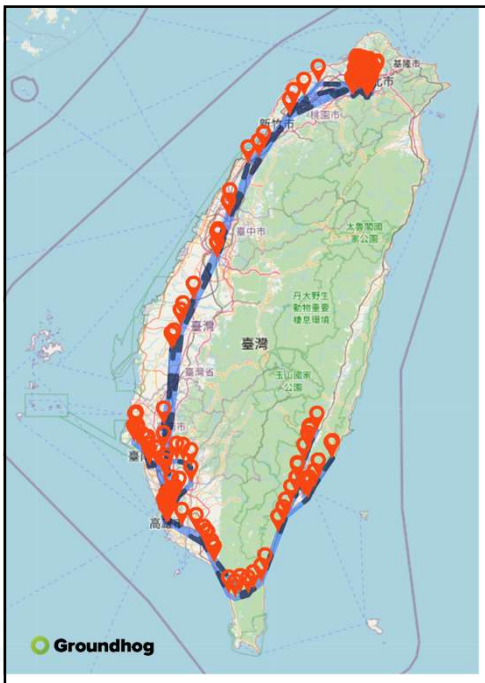
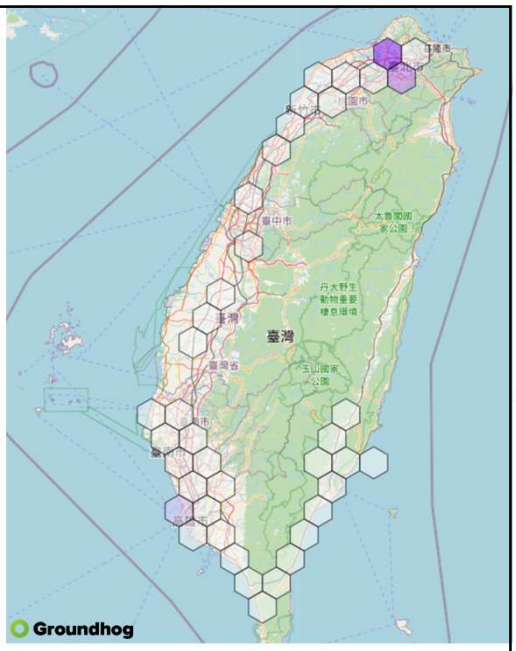


Track of the specific confirmed case

Hot Zones of the specific confirmed case



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Guidelines for Contact-information-based Measures

Clearly inform

Keeping only 28 days

Only for disease control

Release on CDC website

Only for contact investigation

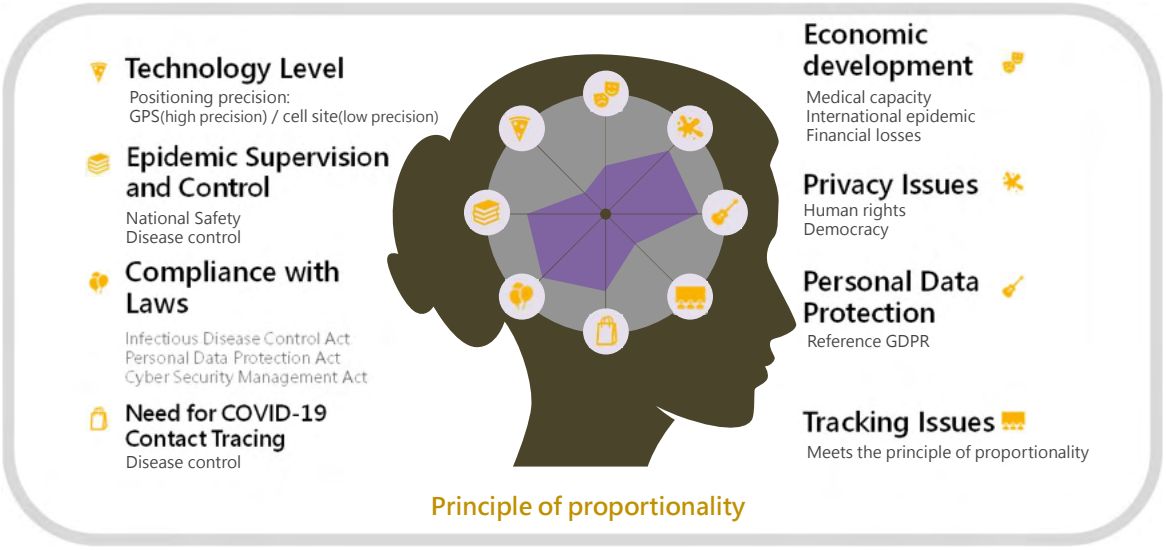
Responsibility to protect

Cybersecurity requirements

http://at.cdc.tw/8QI4h

Paper or Electronic form

Trade-off between Privacy Protection and Disease control



GDPR: General Data Protection Protection

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Chinese Taipei Value: Democracy, Transparency and Solidarity

- From the very beginning of the pandemic, the government has ensured that the public has open access to transparent COVID-19 information.
- CECC has held daily press briefings since January 2019 to announce epidemic status, regulatory guidelines, public health education, risk communication, and disinformation rectification through generating accurate news across a broad spectrum of media outlets.
- CECC quickly established its authority and earned the trust of the public.
- Public trust has had a stabilizing influence on society, encouraging citizens to follow government guidance and rules, and making the public less vulnerable to disinformation campaigns.
- A virtuous cycle of good governance and good citizenship: the more the public trust, the more people are willing to cooperate.
- Transparency, public trust and solidarity are natural products of democracy.

Early Deployment for COVID-19 Containment

1. Adequate and name-based supply of PPEs and other medical materials through mass production and name-based e-rationing
2. Enforcement of non-pharmaceutical interventions including personal hygiene, social distancing, avoidance of large-scale gathering, and environmental sanitation using online education and cell broadcast
3. Engagement in Financial relief and economic stimulus using e-allocation
4. Implementation of contact information registration using QR codes
5. Research and development of rapid diagnostics, anti-virals and vaccines
6. Promotion of immunization using registration and reservation Apps
7. International collaboration: PPEs, pharmaceuticals, technologies

National Mask Team: International Champion Cup

Requisition of 73 factories to expand 92 production lines

Average production per day:

1.8 million in January UP! 21 million in May

Integrate raw materials, machines, production lines

Ensure stable power supply

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Use Masks Properly to Protect Yourself and Others!
Name-Based Distribution System
Face Mask Purchasing
Two-step
Mask Reservation Using Mobile Phone:
1. Login with NHI Card
2. Finish Mobile Device Binding Procedure
Option 1 QR Code Scan
Option 2 Certification Code Typing
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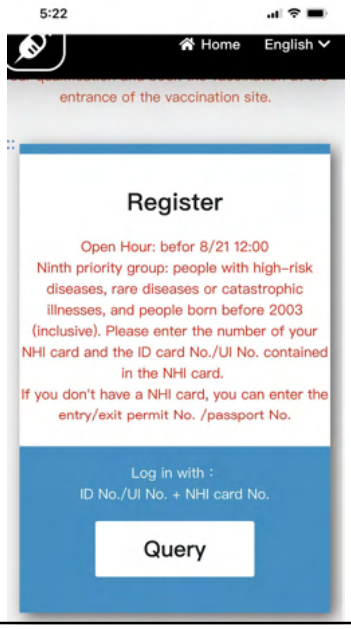
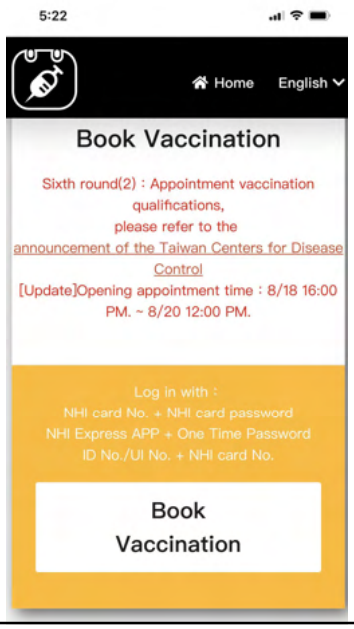
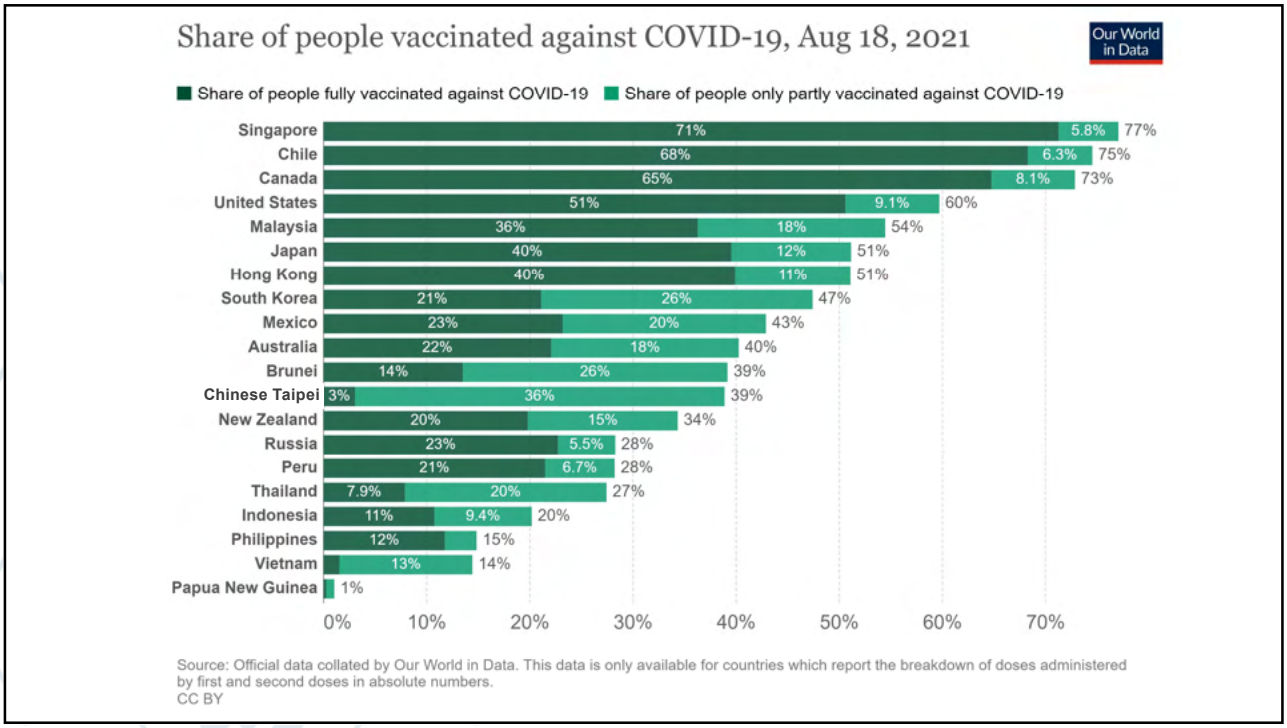
AttentionCOVID-19
Keep hands clean
Take temperature
Wear a mask
Maintain social distance
Register contact information
Clean and disinfect environment
Safe Entry QR Code for COVID-19 Prevention: Registration of Contact Information
方法一：掃描店家QR Code，民眾按下連結，傳送簡訊給1922
五秒三步驟
掃描QRCode
自動出現場所代碼簡訊
與收件人1922
送出簡訊即完成實聯
方法二：使用疾管家官方LINE帳號，開啟掃描功能，掃描店家QR Code，按下連結並發送簡訊
使用疾管家
LINE頻道的附加功能
方法三：若是沒有照相功能的手機，民眾只要打開簡訊功能，在收件人輸入1922，訊息欄位輸入店家代碼再發送簡訊
沒有照相功能的手機
如何使用？

COVID-19 Vaccination Registration and Reservation App







Containment of Future Pandemics: Global Solidarity and International Collaboration

- Infectious diseases respect no border.
- Any pandemic of emerging infectious disease is detrimental to global health, economic development, social stability, national security, and regional peace.
- No country can fight pandemics alone.
- Transparency and honesty in information and technology sharing are the best policy.
- WHO should play a better coordinating role with professionalism and political neutrality.
- Help each other through international collaboration without nationalism and deglobalization is the key for the successful containment of future pandemics.

Every cloud has a silver lining.

Global Solidarity

Chinese Taipei Model: From Civic Technology to Civic Engineering

33

Marjorie Pollack | Moderator

- Position: Deputy Editor
- Organization: ProMED
- Economy: United States

Educational Background

- MD - Medical College of Pennsylvania
- ABIM certified
- Epidemiology – CDC Epidemic Intelligence Service
- Preventive Medicine Residency – CDC

Professional Career

- Medical Epidemiologist CDC
- Consultant Medical Epidemiologist since 1980 – worked in over 50 countries
- Epidemiology and Surveillance Moderator/ Associate Editor/ Liaison Editor Regional Networks/ Deputy Editor, ProMED

Publications

- Petersen E, McCloskey B, Hui DS, Kock R, Ntoumi F, Memish ZA, Kapata N, Azhar EI, Pollack M, Madoff LC, Hamer DH, Nachega JB, Pshenichnaya N, Zumla A. COVID-19 travel restrictions and the International Health Regulations - Call for an open debate on easing of travel restrictions. Int J Infect Dis. 2020 May;94:88-90. doi: 10.1016/j.ijid.2020.04.029. Epub 2020 Apr 17
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Shaun Hendy | Speaker

- Position: Professor
- Organization: Te Pūnaha Matatini, University of Auckland
- Economy: New Zealand

Educational Background

- PhD in Physics, University of Alberta, Canada
- BSc(Hons) First Class in Mathematical Physics, Massey University, New Zealand

Professional Career

- Director of Te Pūnaha Matatini, a Centre of Research Excellence for Complex Systems and Networks
- Professor of Physics, University of Auckland
- Industry and Outreach Fellow, Callaghan Innovation
- Industry and Outreach Fellow, Industrial Research Ltd (IRL)
- Professor of Computational Physics, VUW
- Distinguished Scientist, IRL
- Deputy Director, MacDiarmid Institute for Advanced Materials and Nanotechnology, VUW
- Principal Scientist, IRL
- Senior Scientist, IRL
- Senior Lecturer in Materials Science, School of Chemical and Physical Sciences, VUW
- Research Scientist, IRL

Publications

- D. Vasques Filho, D. R. J. O'Neale and S. C. Hendy, "Local connections drive global structure for technological innovation", Frontiers in Big Data 4, 50 (2021).
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- N. Steyn, R. N. Binny, S. C. Hendy, A. James, A. Lustig, and M. J. Plank, "Managing the risk of a COVID-19 outbreak from border arrivals", Journal of the Royal Society Interface 18, 20210063 (2021).
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New Zealand's COVID-19 Experience: The Role of Digital Tools

Shaun Hendy

Abstract

New Zealand has principally relied on short, sharp lockdowns and border controls to maintain its elimination status during the COVID-19 pandemic. While digital tools, such as smartphone QR-code scans and Bluetooth proximity tracing, are available in New Zealand, they are not mandatory and have not been widely adopted by the public. In this talk I review the use of these digital tools in the New Zealand context, drawing on modelling studies of their effectiveness. These studies suggest that at current levels of uptake, digital tools would have a minimal impact on controlling an outbreak. Finally I look ahead to the prospects of border reopening in 2022, post New Zealand's vaccination roll-out and the prospect for digital tools to play a role in this phase of the country's response.

New Zealand's COVID-19 Experience: The Role of Digital Tools

March 2020 – August 2021

Professor Shaun Hendy MNZM FRSNZ
Wednesday 25 August 2021

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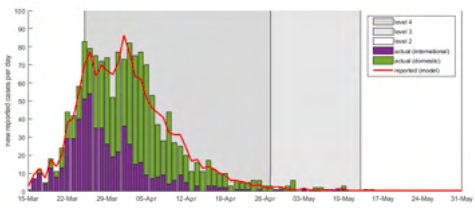
ROYAL SOCIETY TE APĀRANGI

March outbreak: "Go hard, go early"

Date	
3 Feb	Foreign nationals travelling from, or transiting through, mainland China must self-isolate for 14 days
28 Feb	First case detected in a person in their 60s who has travelled to Auckland from Iran
14 March	Anyone entering the country must self-isolate for 14 days, except those arriving from the Pacific*
19 March	All indoor gatherings of more than 100 people are to be cancelled**
21 March	Alert Level System introduced
23 March	Stay at home order (Alert Level 3)
26 March	Non-essential businesses closed (Alert Level 4)
28 April	Limited business reopening
14 May	Stay-at-home order relaxed
18 May	Schools reopen
21 May	Bars reopen
25 May	Gathering size restrictions lifted to 100
8 June	Domestic restrictions fully relaxed (no domestic cases for 17 days)



Confirmed cases: 1542

Fatalities: 22

Estimate detection ~50% of cases (consistent with later serology testing)

Last case detected May 21

After the first wave, New Zealand went 100 days without a domestic case

* R_0 for arrivals was never above one

** R_0 was dominated by a dozen superspreading events

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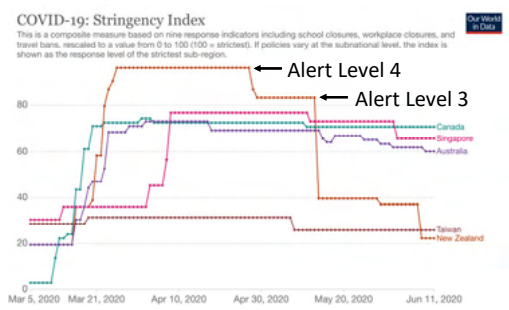
ROYAL SOCIETY TE APĀRANGI

March-April lockdown

- The response to the first wave in March 2020 was amongst the most stringent in the world
- New Zealand Alert Level 4
  - Stay at home order
  - Only supermarkets, pharmacies, clinics, petrol stations and utilities remained open
  - Travel restricted to recreation in local neighborhood
- This was combined with a test, trace, and isolate operation
  - Testing was initially recommended for symptomatic individuals with travel or close contacts
  - Quarantine and/or isolation was self-managed



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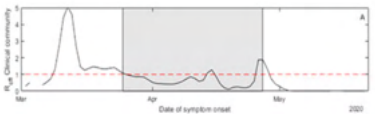

Domestic cases

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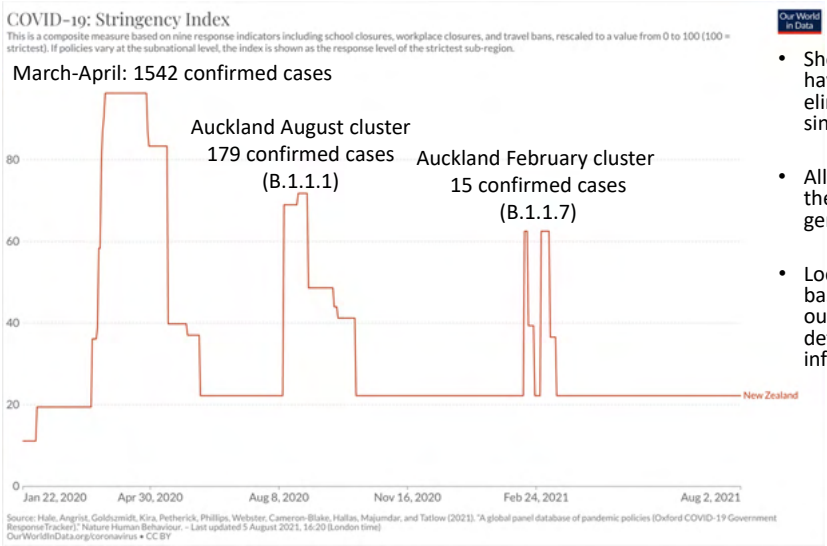
ROYAL SOCIETY TE APĀRANGI

A. James, M. Plank, S. Hendy, R. Binny, A. Lustig, and N. Steyn "Model-free estimation of COVID-19 transmission dynamics from a complete outbreak", PLoS One 16(3): e0238800 (2021).

To the present



Our World in Data

- Short snap lockdowns have maintained elimination of the virus since May 2020
- All cases detected at the border are genomically sequenced
- Lockdown decisions based on modelled outbreak size at detection, use genomic information as an input

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ROYAL SOCIETY TE APĀRANGI

Digital tools for contact tracing

- Contact tracing is managed by Public Health Units attached to District Health Boards
- These have been highly effective for dealing with these small border-related clusters; lockdowns free up surge capacity for tracing
- New Zealand also has a voluntary QR-code based smart-phone app, which also has opt-in Bluetooth tracing
- The app was released in late May 2020, but didn't see significant uptake until August 2020
- Unlikely this has had a significant effect in control, but has helped give decision-makers confidence when border incursions have 'fizzled'

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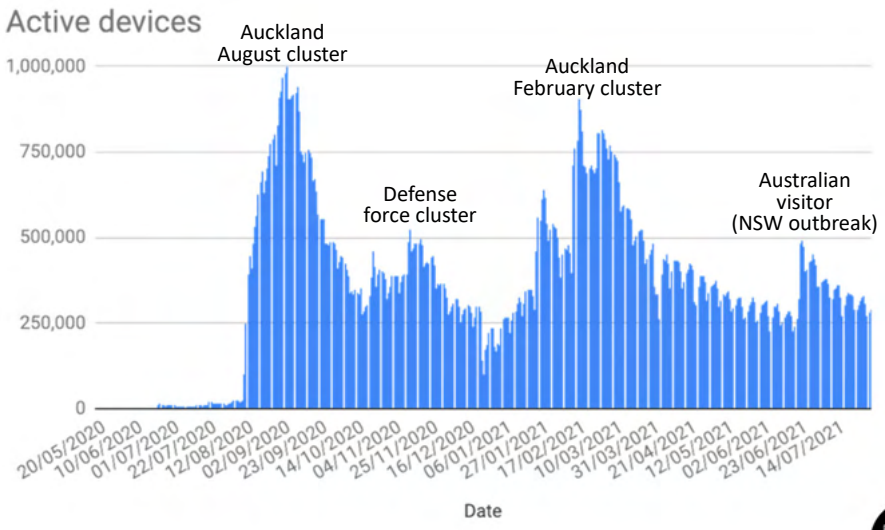
Active devices (QR scans)



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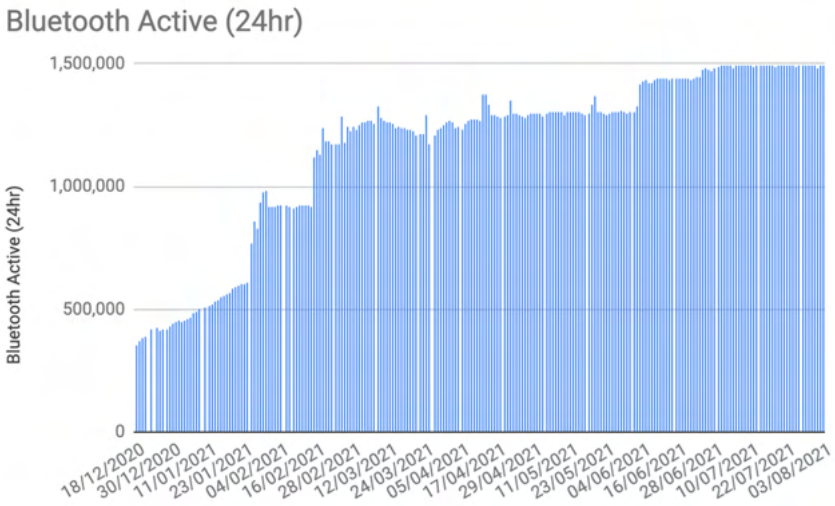
Active Bluetooth users



30%

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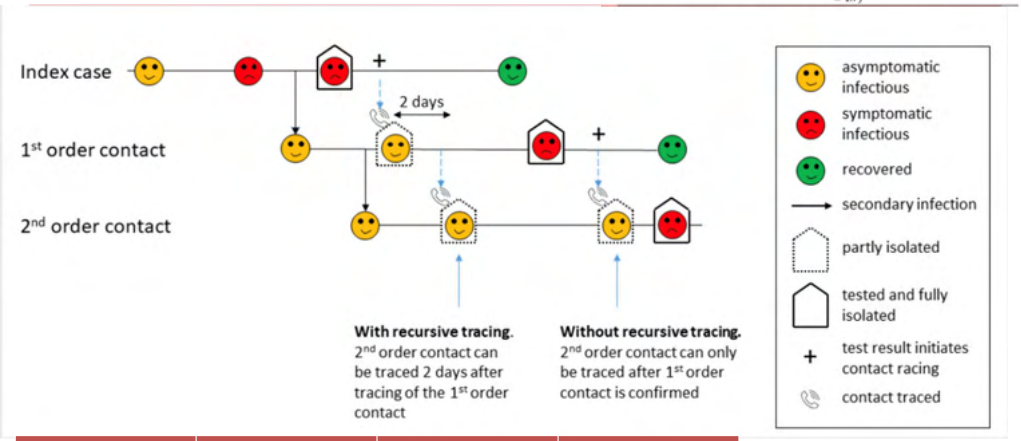
Contact tracing model

	Probability traced manually	Manual tracing time (days)	Probability traced digitally (provided index case and contact are both users)
Home	100%	0	-
School	80%	0.5	P_d
Work	50%	$\Gamma(\text{mean} = 3, \text{s.d.} = 1.7)$	P_d } default 90%
Casual	25%	$\Gamma(\text{mean} = 3, \text{s.d.} = 1.7)$	P_d



	P(Manually traced)	T(Manually traced)	P(Digitally traced)
Home	100%	0	-
School	80%	0.5 days	P_d
Work	50%	$\Gamma(3 \pm 1.7)$	P_d
Casual	25%	$\Gamma(3 \pm 1.7)$	P_d

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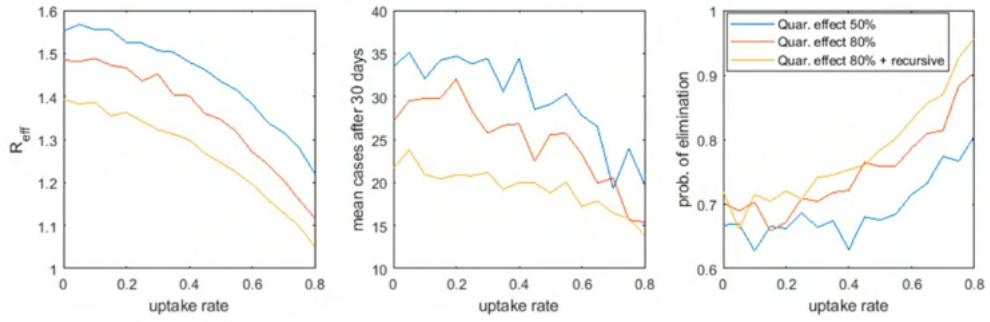
Contact tracing model

- At current uptake rates, digital contact tracing solutions have only a marginal effect



App	P_d	Uptake	
		40%	60%
QR-code	40%	R_{eff} =1.47	1.44
Bluetooth app	90% (50% quarantine)	1.47	1.42
COVID-Card	90%	1.41	1.34

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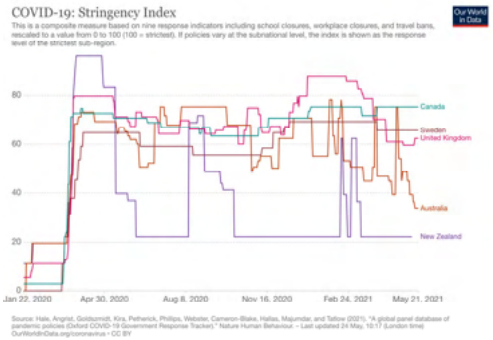
Reflections

- The elimination strategy has been highly effective in New Zealand, allowing it to enjoy relatively few domestic restrictions during 2020-21



- Tight border controls and a “go hard, go early” approach to detections in the community has been the principal tool in controlling the virus
- As we look to open the border in 2022, we will increasingly come to relay on contact tracing and self-quarantine to manage outbreaks. Digital technologies may still have an important role to play

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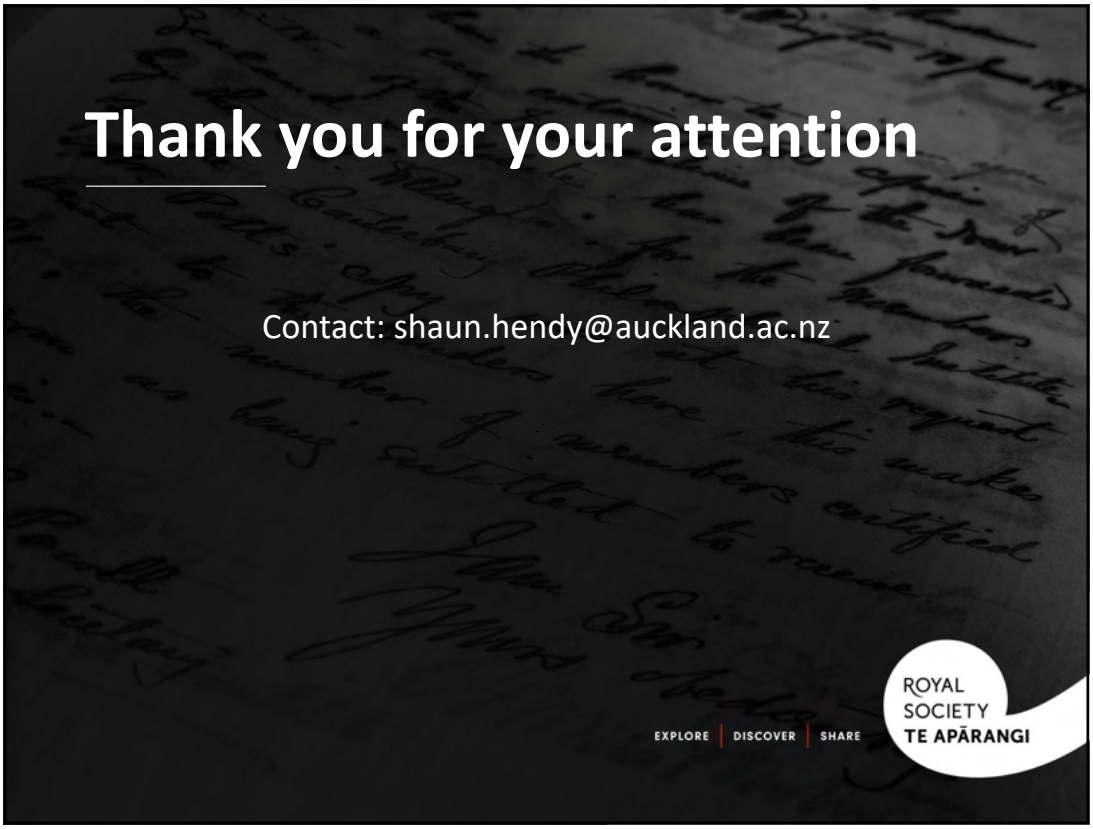
Thank you for your attention
Contact: shaun.hendy@auckland.ac.nz
ROYAL SOCIETY TE APĀRANGI
EXPLORE | DISCOVER | SHARE

Enrique A. Tayag | Speaker

- Position: Director IV
- Organization: Department of Health
- Economy: The Philippines

Educational Background

- Public Health Specialist in Applied Epidemiology
- Doctor of Medicine

Professional Career

- Department of Health Philippines
- Director Infectious Disease Office
- Director National Epidemiology Center
- Director Bureau of Local Health System Development
- Director Knowledge Management and Information Technology Service/Data Protection Officer

Publications

- Co-Author in Outbreak of Henipavirus Infection, the Philippines, 2014, (Dispatch) Emerging Infectious Diseases Journal, February 2015, Vol. 21, No. 2
- Co-Author in A community-based gastroenteritis outbreak after typhoon Haiyan, Leyte, Philippines, 2013, Western Pacific Surveillance and Response Journal (WHO WPSAR), January-March 2015
- Co-Author in region-wide synchrony and traveling waves of Dengue across eight countries in SE Asia, Proceedings of National Academy of Sciences, October 2015
- Contributing Author in Clinical Practice Guidelines in Adult Immunization 2018
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Surveillance: Detection, Forecasting and Risk Assessments – The Philippine Experience

Enrique A. Tayag

Abstract

The Philippines continues to restrict mobility in high risk areas, that includes the National Capital Region, by imposing strict lockdowns. COVID-19 vaccination however, continued in priority populations despite this containment strategy. For many months now, the Department of Health has adopted digital tools that allowed decision makers to analyze data so that the Inter-Agency Task Force on Emerging Diseases or the IATF is able to guide COVID-19 response. IATF Resolutions were made known to the public in various media formats so that individual or community actions are guided and monitored accordingly. There remain challenges and opportunities in the use of digital tools that somehow allowed government to recalibrate its response, even as it copes with the negative impact on the economy; and more importantly, deal effectively with the consequences of a widespread disruption in the health system. It is imagined that the adoption of digital tools will bring just enough cushion in mitigating the harmful impact of this Pandemic and ensure business continuity in the mostly affected sectors. These tools should be exploited and much more so, we must explore more innovations so that technology, science, and public health finally converge, towards an economic and social advantage with better health outcomes. Agility is the name of the game.

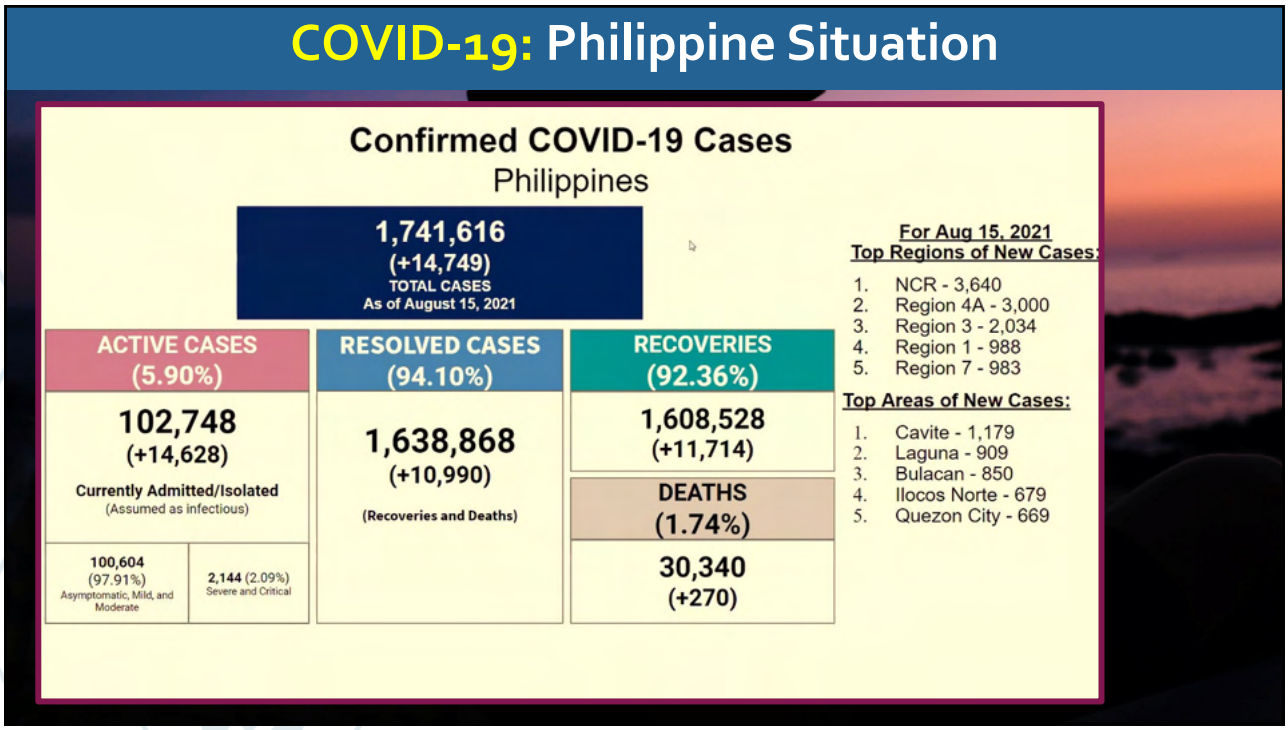
Digital Tools for Addressing Infectious Diseases in the Asia-Pacific Region: Challenges and Opportunities

Surveillance: Detection, Forecasting and Risk Assessments
The Philippine Experience

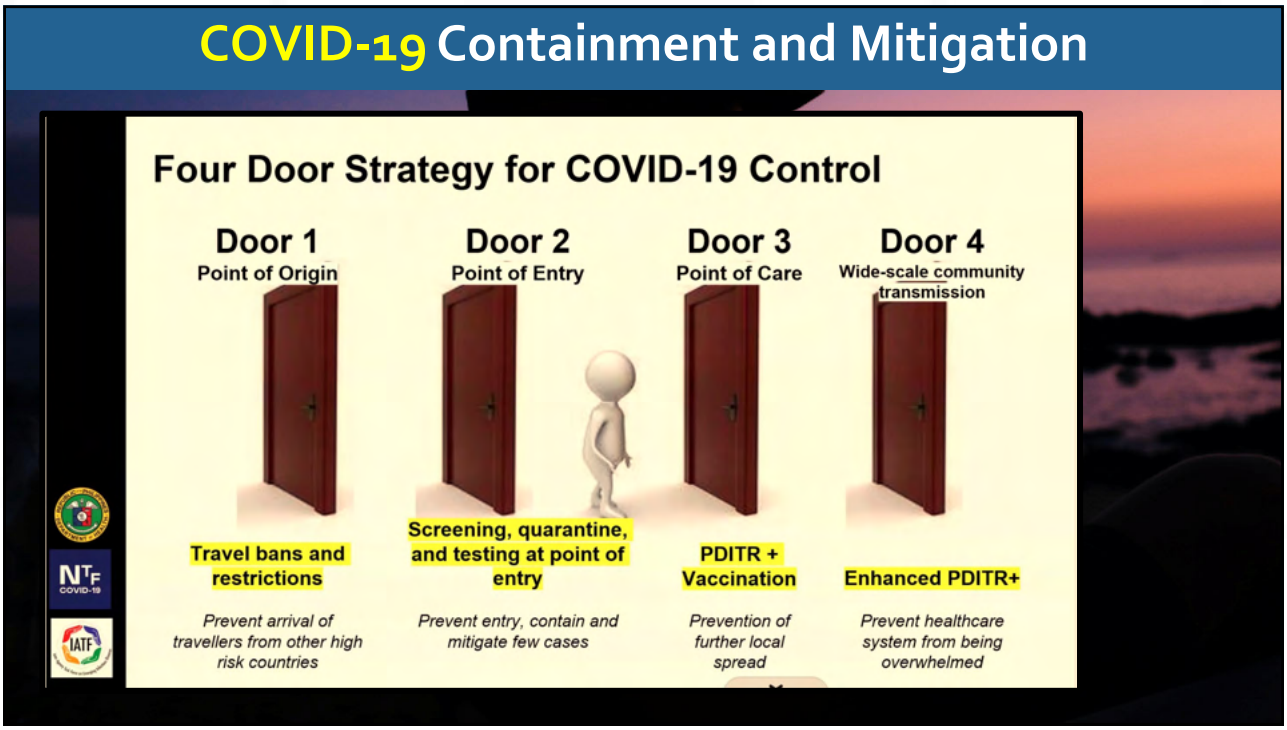
Enrique A. Tayag, MD, PHSAE, FPSMID, CESO III
Director IV
Knowledge Management and Technology Service
Department of Health

August 25, 2021

COVID-19: Philippine Situation



COVID-19 Containment and Mitigation



Digital Tools: Challenges and Opportunities

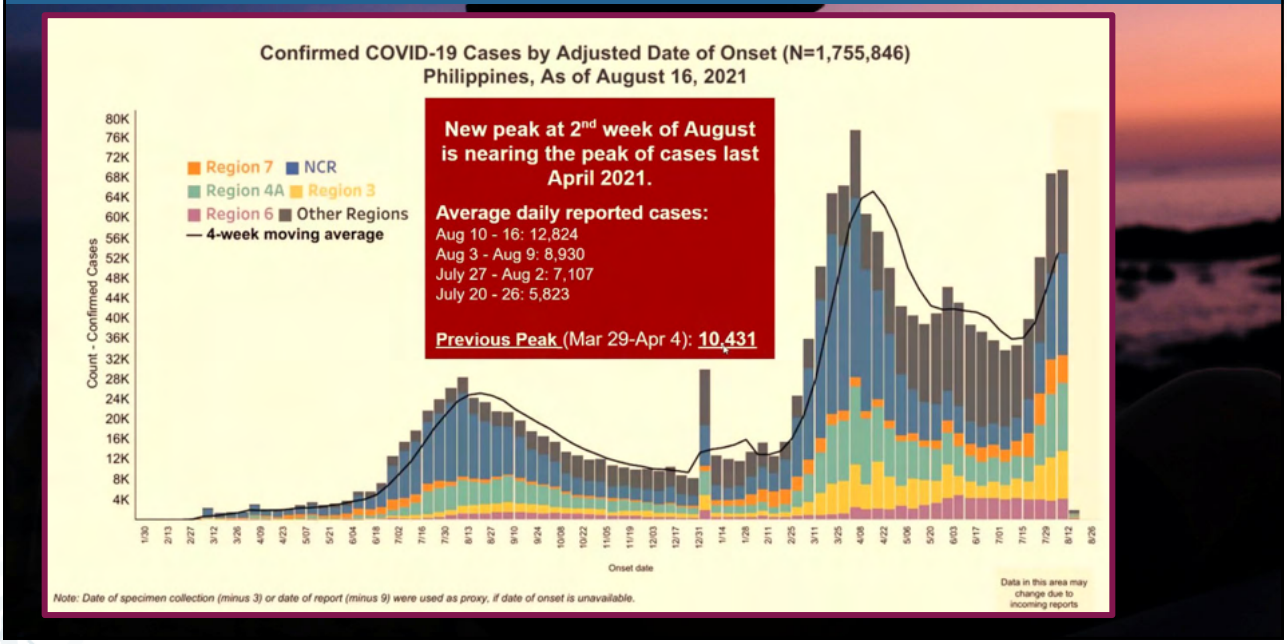
Challenges

- ❑ Infrastructure/Connectivity
- ❑ Interoperability of Health Information Systems
- ❑ Adoption of digital tools
- ❑ Data sharing
- ❑ Data privacy
- ❑ Cybersecurity
- ❑ IT Human resources for Health

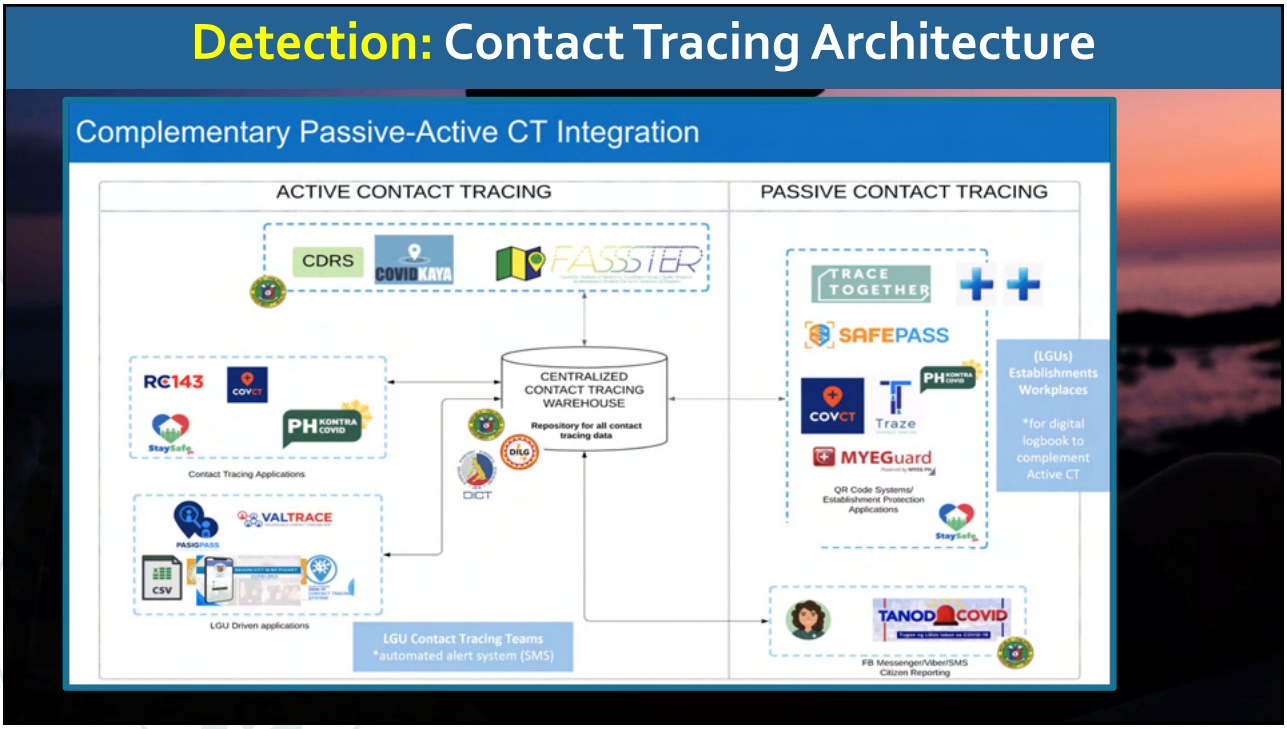
Opportunities

- ❑ Need for timely, accurate information to guide decision-making
- ❑ Plethora of digital tools
- ❑ Big Analytics
- ❑ Changing consumer behavior
- ❑ Cloud computing
- ❑ Artificial intelligence

Detection: Case-based Surveillance

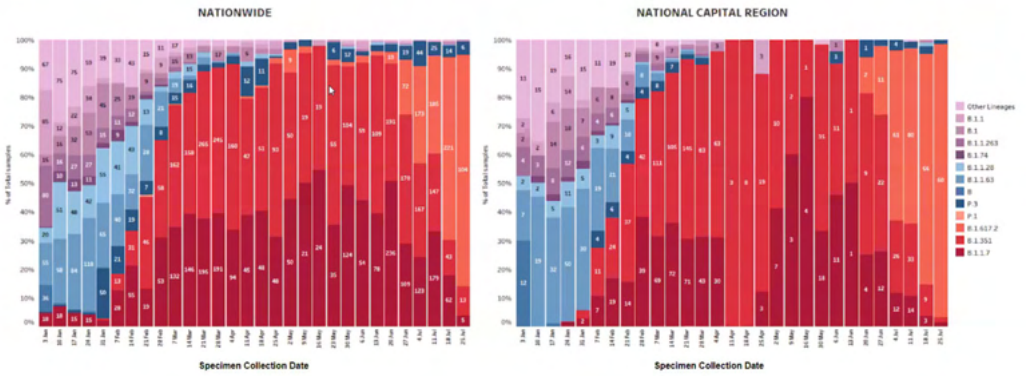


Detection: Contact Tracing Architecture



Detection: Genomic Surveillance

Percent of Delta variant detected increased from 6% in June to 42% of lineages detected in July



Detection: COVID-19 Testing

	South Korea	Thailand	Vietnam	Japan	Philippines	OUR GOAL by June 2021 Philippines
Population	51 mn	69 mn	97 mn	126 mn	110 mn	110 mn
Testing capacity per day	~20k	~25k	~15k	~22k	~70k	~70k
Daily testing capacity per 1,000 population	390	360	150	170	700	700
Tests done	1.2M	468k	280k	429k	800k	10 Mn
Tests per day	17,211	6,746		9,360	19,369	30,000

Risk Assessment Matrix

Nationally, risk classification now moderate
NCR, Regions 1, 2, 7, 10, CAR, NCR at high risk
Region 1 and 2 at high risk ICUR; 9 regions with local Delta Variant Cases

Region	Total Active Cases as of August 3, 2021	Risk classification (TWGR and ADAR)	Health System Capacity		Delta Variant Cases
			HCUR	ICU	
			Aug 1	Aug 1	
(A)		(M)	(N)	(O)	
PHILIPPINES	63,137	Moderate	51.00%	59.67%	216
1	3,859	High	59.01%	72.78%	5
2	2,150	High	55.97%	72.66%	0
7	6,365	High	55.13%	63.41%	32
10	3,299	High	55.56%	67.90%	14
CAR	1,075	High	59.09%	64.37%	0
NCR	14,441	High	46.52%	54.82%	46
3	6,990	Moderate	54.08%	65.44%	20
6	5,005	Moderate	59.19%	59.68%	5
12	1,787	Moderate	46.10%	55.56%	0
4A	10,003	Moderate	62.02%	68.50%	28
5	972	Low	34.55%	46.07%	0
8	1,747	Low	54.47%	50.55%	10
9	661	Low	28.88%	48.21%	0
11	2,777	Low	55.68%	63.67%	4
4B	796	Low	37.35%	30.43%	0
Caraga	759	Low	32.43%	43.94%	0
BARMM	289	Minimal	24.42%	4.55%	0

LEGEND

*Previous 6 weeks comparison includes report date from June 20, 2021 - July 31, 2021 based on dataset from COVIDKaya as of Aug 3, 2021.

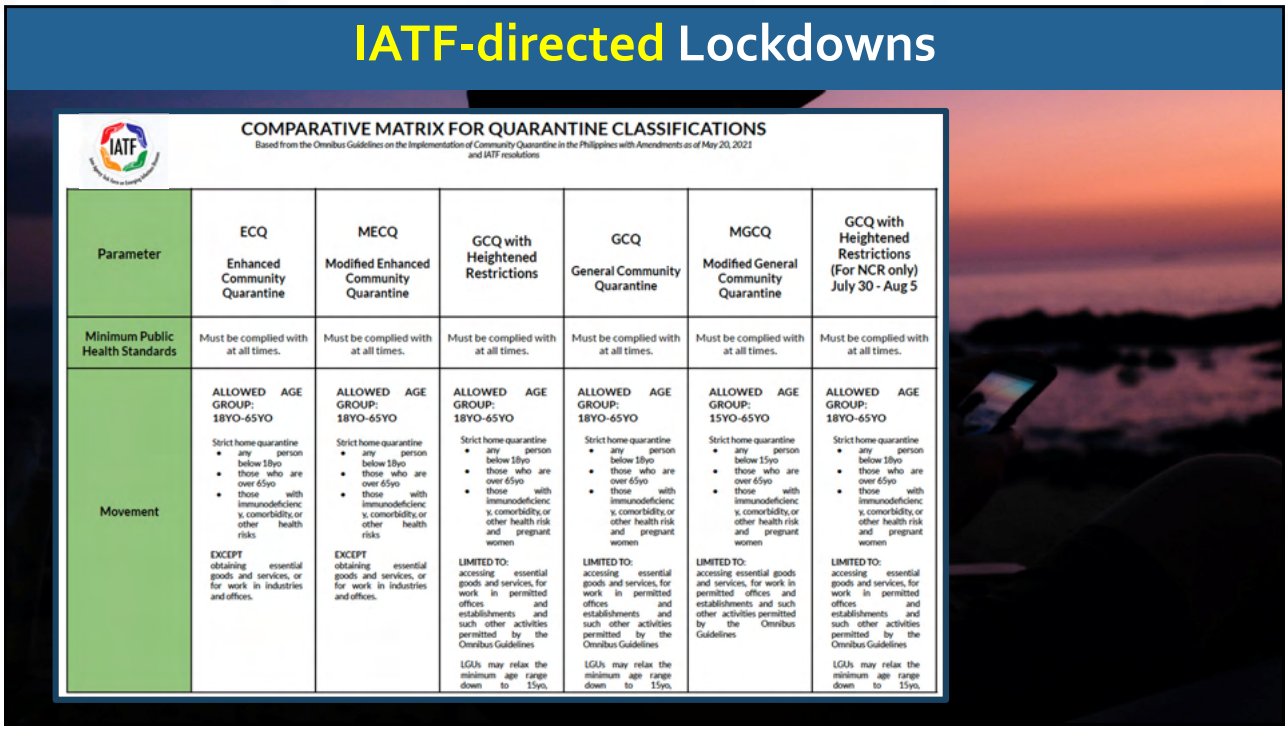
Actions after Risk Assessments

Key Messages

- The impact of the Delta variant is **now observed nationally** and in select regions and areas.
  - **Half of provinces, HUCs, and ICCs** already showing **increase in cases and/or health care utilization**
- Given ongoing Delta VOC transmission, we need to **immediately address observed case increases, closely monitor health care utilization, and consider implementing higher CQ as pre-emptive measures** to contain delta VOC spread.
- All localities whose case and HCUR are high and critical risk must **urgently increase health systems capacity to prevent fatalities** from occurring resulting from poor accessibility and/or availability of critical care services.
- All localities exhibiting case increases but health care utilization retained at low to moderate risk must likewise **increase health systems capacity** to prevent health care capacity from being overwhelmed.

Department of Health, Philippines

IATF-directed Lockdowns

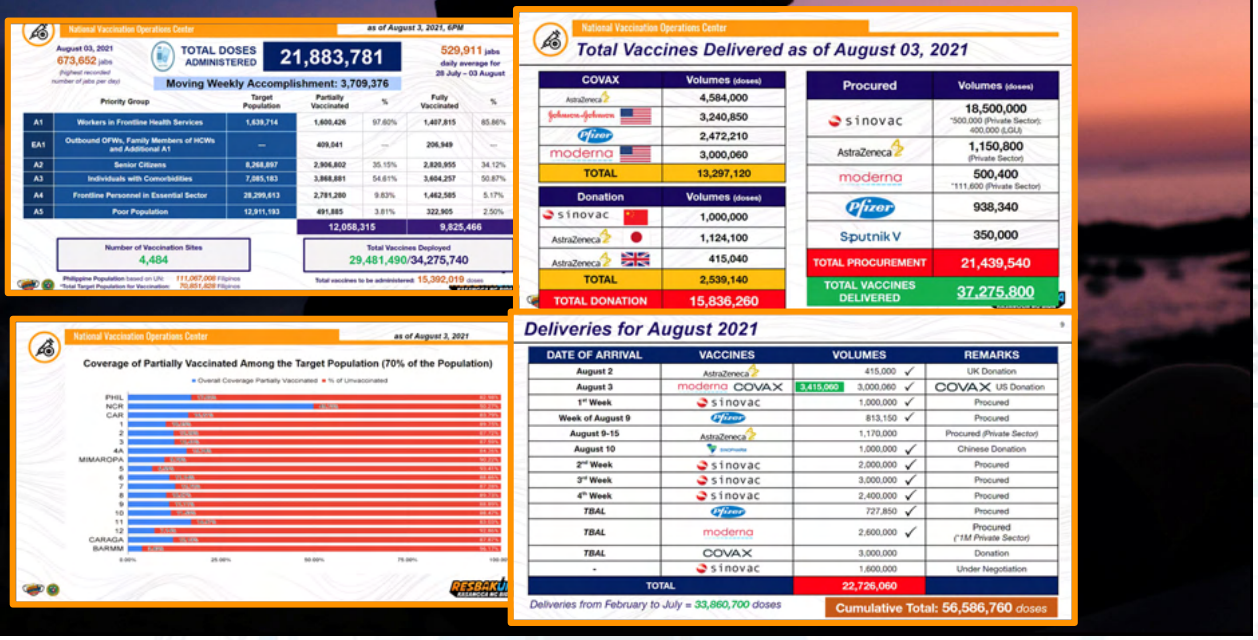


COMPARATIVE MATRIX FOR QUARANTINE CLASSIFICATIONS

Based from the Omnibus Guidelines on the Implementation of Community Quarantine in the Philippines with Amendments as of May 20, 2021 and IATF resolutions

Parameter	ECQ Enhanced Community Quarantine	MECQ Modified Enhanced Community Quarantine	GCQ with Heightened Restrictions	GCQ General Community Quarantine	MGCQ Modified General Community Quarantine	GCQ with Heightened Restrictions (For NCR only) July 30 - Aug 5
Minimum Public Health Standards	Must be complied with at all times.	Must be complied with at all times.	Must be complied with at all times.	Must be complied with at all times.	Must be complied with at all times.	Must be complied with at all times.
Movement	ALLOWED AGE GROUP: 18YO-65YO Strict home quarantine • any person below 18yo • those who are over 65yo • those with immunodeficiency, comorbidity, or other health risks EXCEPT obtaining essential goods and services, or for work in industries and offices.	ALLOWED AGE GROUP: 18YO-65YO Strict home quarantine • any person below 18yo • those who are over 65yo • those with immunodeficiency, comorbidity, or other health risks EXCEPT obtaining essential goods and services, or for work in industries and offices.	ALLOWED AGE GROUP: 18YO-65YO Strict home quarantine • any person below 18yo • those who are over 65yo • those with immunodeficiency, comorbidity, or other health risk and pregnant women LIMITED TO: accessing essential goods and services, for work in permitted offices and establishments and such other activities permitted by the Omnibus Guidelines LGUs may relax the minimum age range down to 15yo,	ALLOWED AGE GROUP: 18YO-65YO Strict home quarantine • any person below 18yo • those who are over 65yo • those with immunodeficiency, comorbidity, or other health risk and pregnant women LIMITED TO: accessing essential goods and services, for work in permitted offices and establishments and such other activities permitted by the Omnibus Guidelines LGUs may relax the minimum age range down to 15yo,	ALLOWED AGE GROUP: 15YO-65YO Strict home quarantine • any person below 15yo • those who are over 65yo • those with immunodeficiency, comorbidity, or other health risk and pregnant women LIMITED TO: accessing essential goods and services, for work in permitted offices and establishments and such other activities permitted by the Omnibus Guidelines	ALLOWED AGE GROUP: 18YO-65YO Strict home quarantine • any person below 18yo • those who are over 65yo • those with immunodeficiency, comorbidity, or other health risk and pregnant women LIMITED TO: accessing essential goods and services, for work in permitted offices and establishments and such other activities permitted by the Omnibus Guidelines LGUs may relax the minimum age range down to 15yo,

Dashboard for COVID-19 Vaccination



National Vaccination Operations Center — as of August 3, 2021, 6PM

August 03, 2021: 673,652 jabs (highest recorded number of jabs per day)

TOTAL DOSES ADMINISTERED: 21,883,781

529,911 jabs daily average for 28 July – 03 August

Moving Weekly Accomplishment: 3,709,376

Priority Group	Target Population	Partially Vaccinated	%	Fully Vaccinated	%
A1 Workers in Frontline Health Services	1,639,714	1,600,426	97.60%	1,407,815	85.86%
EA1 Outbound OFWs, Family Members of HCWs and Additional A1	—	409,041	—	206,949	—
A2 Senior Citizens	8,268,897	2,906,802	35.15%	2,820,955	34.12%
A3 Individuals with Comorbidities	7,085,183	3,868,881	54.61%	3,604,257	50.87%
A4 Frontline Personnel in Essential Sector	28,299,613	2,781,280	9.83%	1,462,585	5.17%
A5 Poor Population	12,911,193	491,885	3.81%	322,905	2.50%
		12,058,315		9,825,466	

Number of Vaccination Sites: 4,484

Total Vaccines Deployed: 29,481,490/34,275,740

Philippine Population based on UN: 111,067,000 Filipinos

Total Target Population for Vaccination: 70,851,820 Filipinos

Total vaccines to be administered: 15,392,019 doses

National Vaccination Operations Center

Total Vaccines Delivered as of August 03, 2021

COVAX	Volumes (doses)
AstraZeneca	4,584,000
Johnson & Johnson	3,240,850
Pfizer	2,472,210
moderna	3,000,060
TOTAL	13,297,120

Donation	Volumes (doses)
sinovac	1,000,000
AstraZeneca	1,124,100
AstraZeneca	415,040
TOTAL	2,539,140
TOTAL DONATION	15,836,260

Procured	Volumes (doses)
sinovac	18,500,000 (*500,000 Private Sector; 400,000 LGU)
AstraZeneca	1,150,800 (Private Sector)
moderna	500,400 (*111,600 Private Sector)
Pfizer	938,340
Sputnik V	350,000
TOTAL PROCUREMENT	21,439,540
TOTAL VACCINES DELIVERED	37,275,800

National Vaccination Operations Center — as of August 3, 2021

Coverage of Partially Vaccinated Among the Target Population (70% of the Population)

Overall Coverage Partially Vaccinated ■ % of Unvaccinated

PHIL, NCR, CAR, 1, 2, 3, 4A, MIMAROPA, 5, 6, 7, 8, 9, 10, 11, 12, CARAGA, BARMM

0.00% 25.00% 50.00% 75.00% 100.00%

RESBAKUNA

Deliveries for August 2021

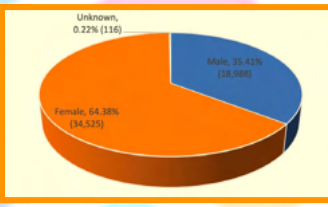
DATE OF ARRIVAL	VACCINES	VOLUMES	REMARKS
August 2	AstraZeneca	415,000 ✓	UK Donation
August 3	moderna COVAX	3,415,060 3,000,060 ✓	COVAX US Donation
1st Week	sinovac	1,000,000 ✓	Procured
Week of August 9	Pfizer	813,150 ✓	Procured
August 9-15	AstraZeneca	1,170,000	Procured (Private Sector)
August 10	Sinopharm	1,000,000 ✓	Chinese Donation
2nd Week	sinovac	2,000,000 ✓	Procured
3rd Week	sinovac	3,000,000 ✓	Procured
4th Week	sinovac	2,400,000 ✓	Procured
TBAL	Pfizer	727,850 ✓	Procured
TBAL	moderna	2,600,000 ✓	Procured (*1M Private Sector)
TBAL	COVAX	3,000,000	Donation
-	sinovac	1,600,000	Under Negotiation
TOTAL		22,726,060	

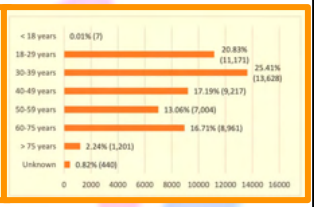
Deliveries from February to July = 33,860,700 doses

Cumulative Total: 56,586,760 doses

Tracking AEFI with Vigiflow

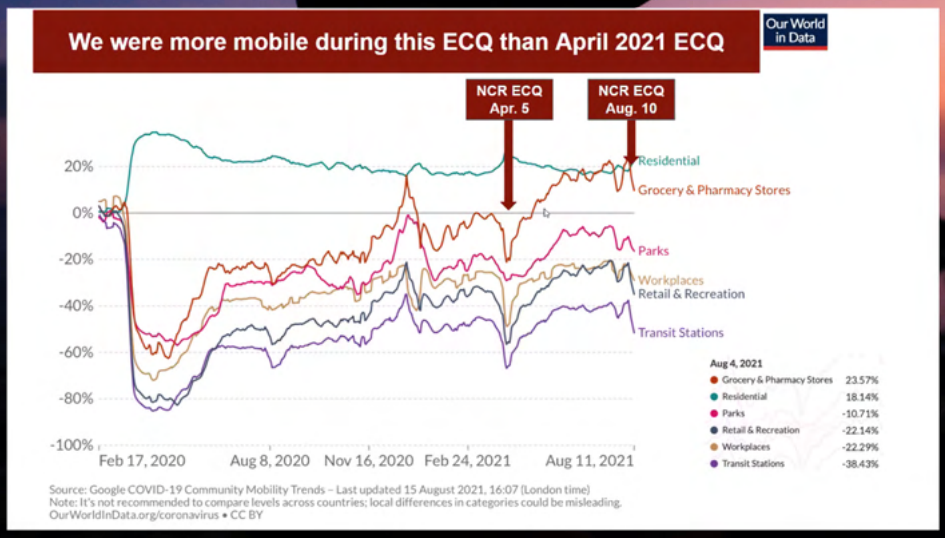
Indicators	Value
No. of individuals partly vaccinated	11,747,581
No. of fully vaccinated individuals	9,115,963
Total number of doses administered	20,863,544
No. of suspected adverse reaction reports	**53,629** (0.26% of doses administered)
No. of suspected serious adverse reaction reports	**1,439** (0.007% of doses administered)



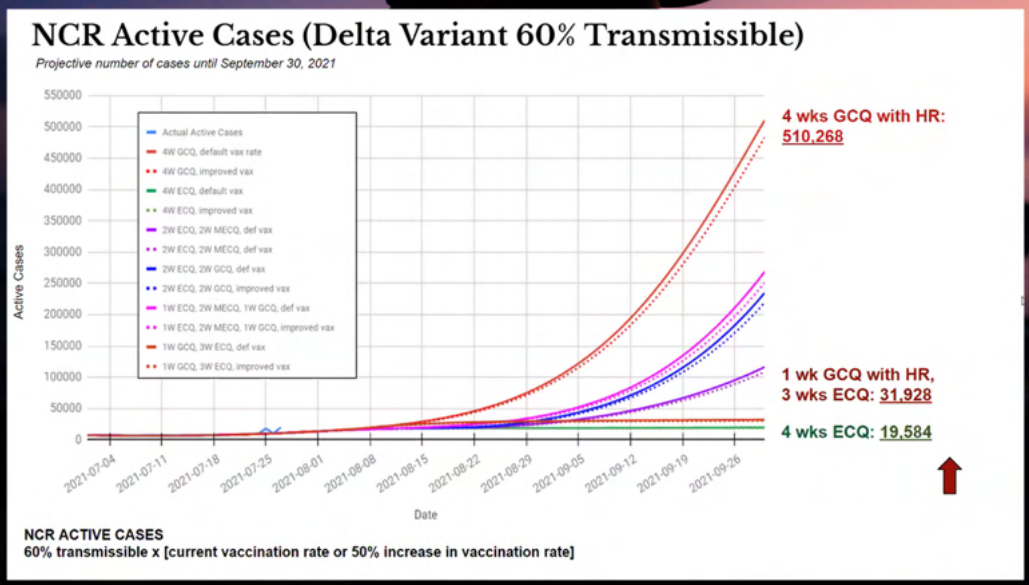


Vaccine	Date started	Number of individuals partly vaccinated[b]	Number of fully vaccinated individuals[b]	Total number of reports[a]	Reports of non-serious events	Reports of serious events
CoronaVac	01 Mar 2021	7,044,592	5,093,246	21,446	20,722	724
AstraZeneca	07 Mar 2021	3,124,335	908,113	28,699	28,098	601
Sputnik V	04 May 2021	249,708	64,167	606	598	8
Comirnaty	13 May 2021	1,252,739	1,099,189	1,883	1,795	88
Moderna	30 June 2021	76,207	23,528	317	312	5
Janssen	20 July 2021	-	1,927,720	678	665	13
TOTAL		**11,747,581**	**9,115,963**	**53,629**	**52,190**	**1,439**

Mobility during Lockdowns



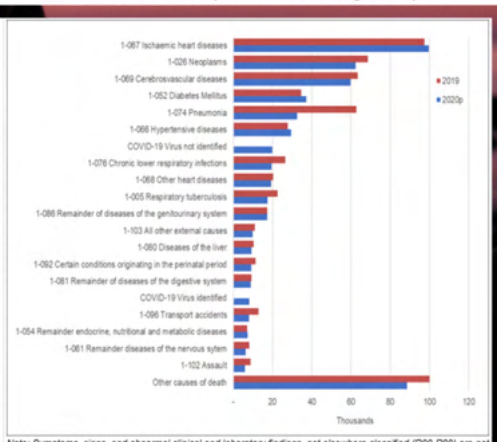
Forecasting: Hammer and Dance



Registered Deaths in the Philippines, 2020

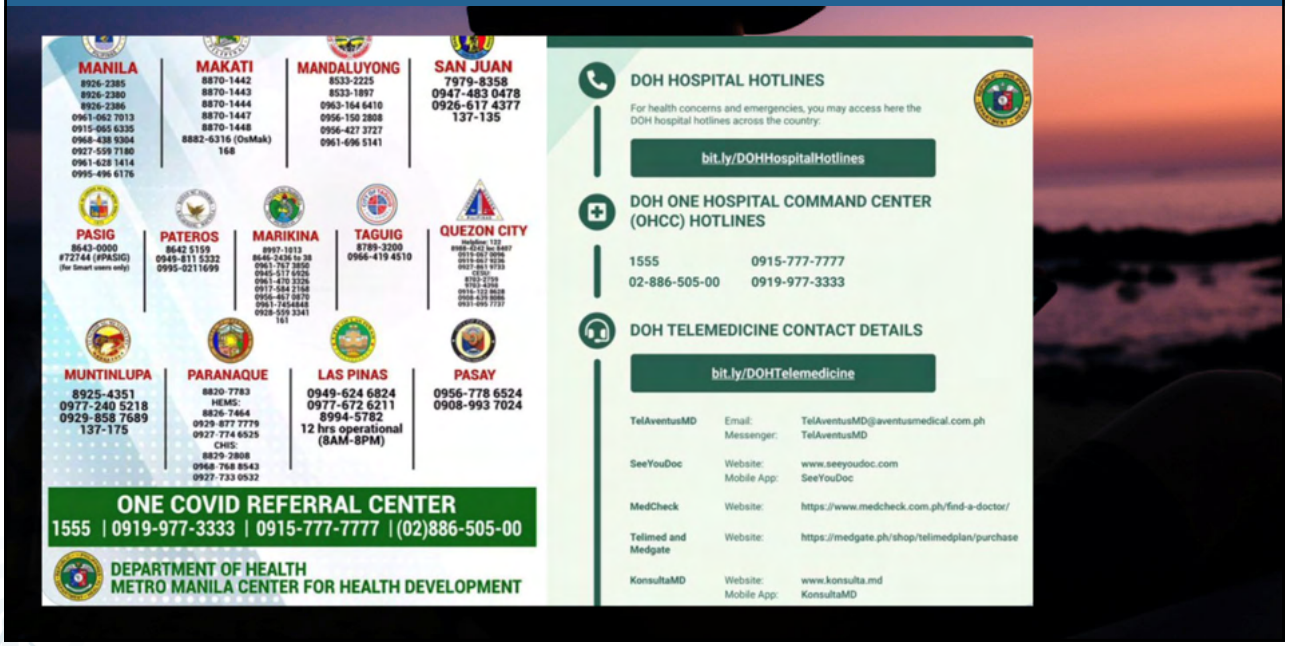
Registered deaths due to COVID-19 accounted for a total of 27,967 deaths or 4.9 percent of the total registered deaths in 2020. By classification, COVID-19 with virus not identified was the seventh leading cause of death in the country with 19.8 thousand cases or 3.4 percent of the total deaths in 2020. Meanwhile, registered deaths due to COVID-19 with virus identified accounted for 8.2 thousand or 1.4 percent of the total deaths in 2020, pushing its rank to number 16. (Table 1 and Figure 1)

Cause of Death	2020[p]	Rank	Average (2015-2019)	Rank	Difference
Total	575,875		586,630		
1-067 Ischaemic heart diseases	99,680	1	82,547	1	17,133
1-026 Neoplasms	62,289	2	65,503	2	-3,214
1-069 Cerebrosvascular diseases	59,736	3	60,106	3	-370
1-052 Diabetes Mellitus	37,265	4	32,991	5	4,274
1-074 Pneumonia	32,574	5	56,830	4	-24,256
1-066 Hypertensive diseases	29,511	6	29,806	6	-295
COVID-19 Virus not identified	19,758	7			19,758
1-076 Chronic lower respiratory infections	19,463	8	24,868	7	-5,405
1-068 Other heart diseases	19,298	9	24,592	8	-5,294
1-005 Respiratory tuberculosis	17,433	10	23,260	9	-5,827
1-086 Remainder of diseases of the genitourinary system	17,241	11	17,356	10	-115
1-103 All other external causes	9,799	12	10,416	14	-617
1-080 Diseases of the liver	9,225	13	9,556	15	-331
1-092 Certain conditions originating in the perinatal period	9,161	14	10,740	13	-1,579
1-081 Remainder of diseases of the digestive system	8,990	15	8,810	16	180
COVID-19 Virus identified	8,209	16			8,209
1-096 Transport accidents	8,017	17	11,612	11	-3,595
1-054 Remainder endocrine, nutritional and metabolic diseases	7,206	18	6,603	18	603
1-061 Remainder diseases of the nervous sytem	6,327	19	6,790	17	-463
1-102 Assault	6,008	20	11,311	12	-5,303
Other Causes of Death	88,685		92,932		6,507

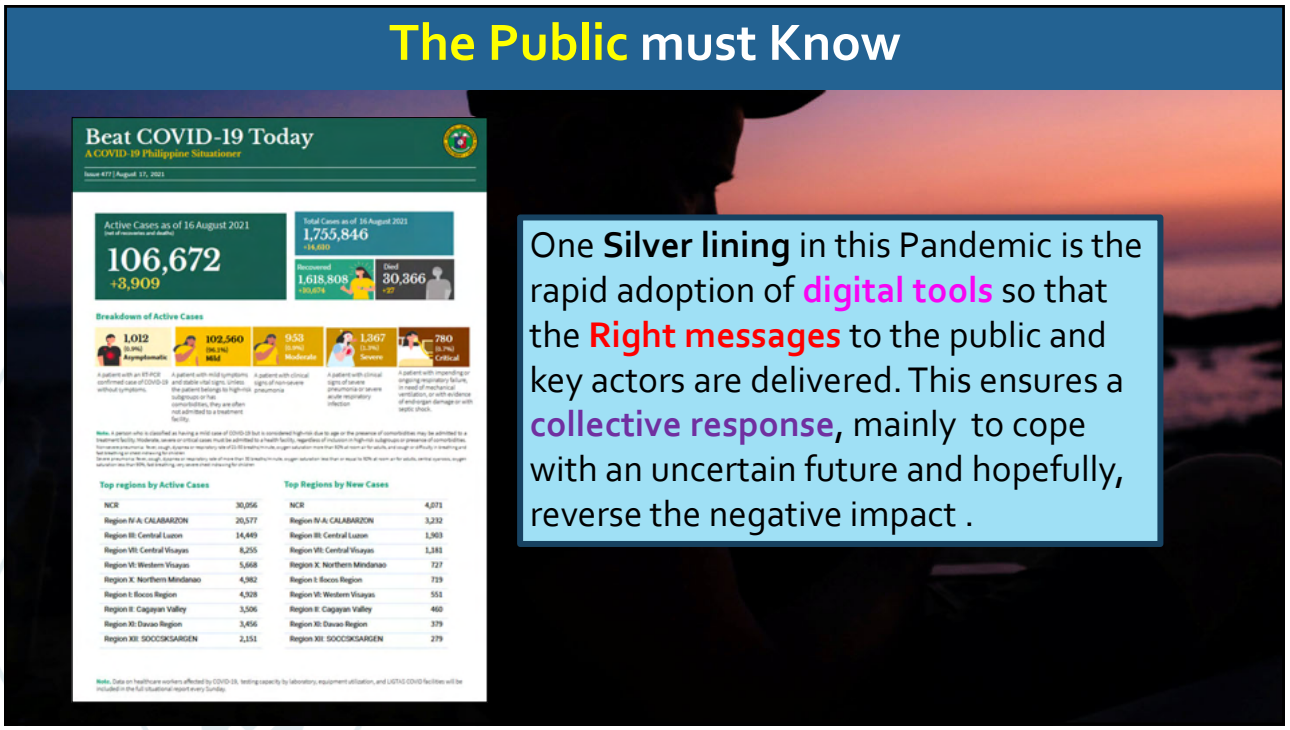


Note: Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99) are not included in the analysis due to the unspecified nature of these causes.
[p] - Preliminary

Access to Health Information and Services



The Public must Know



One **Silver lining** in this Pandemic is the rapid adoption of **digital tools** so that the **Right messages** to the public and key actors are delivered. This ensures a **collective response**, mainly to cope with an uncertain future and hopefully, reverse the negative impact .

Jen-Hsiang Chuang | Speaker

- Position: Deputy Director-General
- Organization: Centers for Disease Control, Ministry of Health and Welfare
- Economy: Chinese Taipei

Educational Background

- PhD, Biomedical Informatics, Columbia University, USA
- MS, Public Health, National Yang-Ming University
- MD, Medical School, National Yang-Ming University

Professional Career

- Associate Professor, Biomedical Informatics, National Yang-Ming University, Chinese Taipei
- Director, Epidemic Intelligence Center, Centers for Disease Control, Ministry of Health and Welfare, Chinese Taipei

Publications

- Iuliano AD, Roguski KM, Chang HH, et al. Estimates of global seasonal influenza-associated respiratory mortality: a modelling study. Lancet. 2017 Dec 14. pii: S0140-6736(17)33293-2.
- Tsao HM, Chang CM, Chuang JH, Liu DP, Pan ML, Wang DW*. Toward Automatic Reporting of Infectious Diseases. Stud Health Technol Inform. 2017;245:808-812.
- Chen CC, Chuang JH, Wang DW, Wang CM, Lin BC, Chan TC*. Balancing geo-privacy and spatial patterns in epidemiological studies. Geospat Health. 2017;12(2):573.
- Lo YC*, Tsai MS, Sun HY, Hung CC, Chuang JH*. National Trend and Characteristics of Acute Hepatitis C among HIV-Infected Individuals: A Matched Case-Control Study-Taiwan, 2001-2014. PloS one. 2015; 10(10):e0139687.
- van Panhuis WG, Choisy M, Xiong X, et al. Region-wide synchrony and traveling waves of dengue across eight countries in Southeast Asia. Proc Natl Acad Sci U S A. 2015. pii: 201501375.

Covid-19 Surveillance and Risk Assessment in Chinese Taipei

Jen-Hsiang Chuang

Abstract

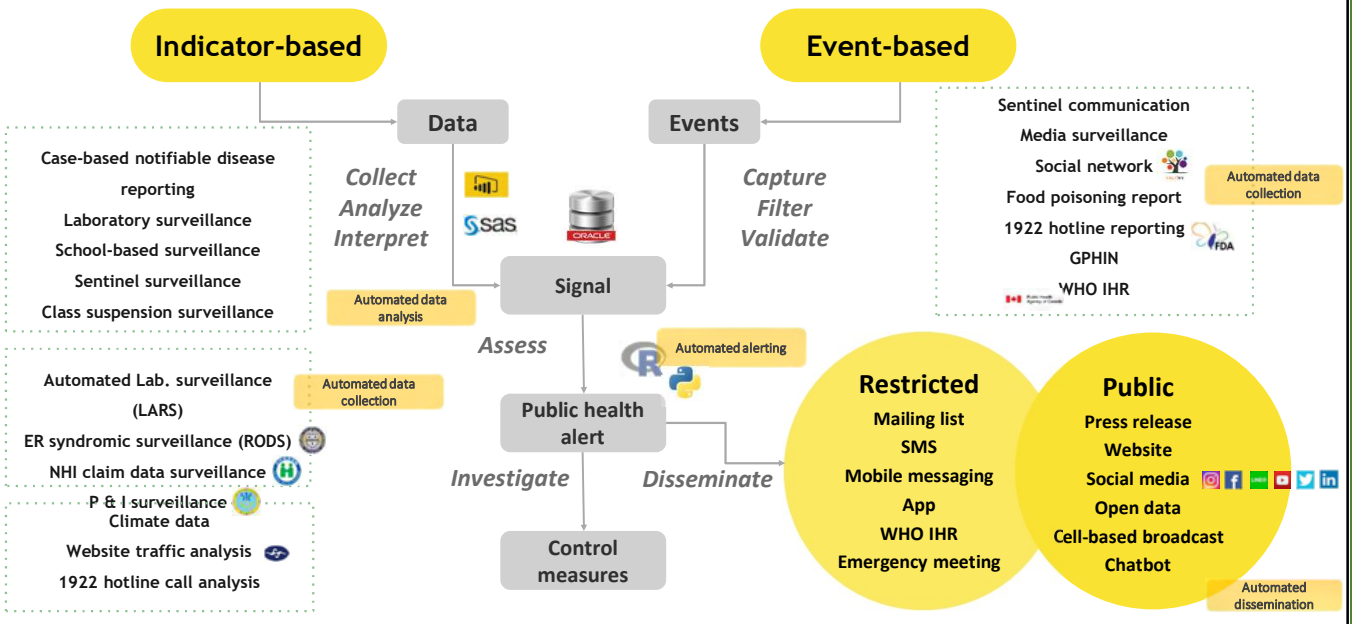
After the SARS outbreak in 2003, Centers for Disease Control has established a comprehensive framework of infectious disease surveillance systems, including notifiable disease surveillance, syndromic surveillance, laboratory surveillance, and event-based surveillance systems. Several digital tools were also introduced to facilitate data collection, analysis, signal detection, and risk assessment.

When the COVID-19 outbreak in Wuhan became a pandemic outbreak, these surveillance systems were soon adapted to monitor the COVID-19 epidemic, both internationally and domestically. In this speech, we will share our experience in establishing COVID-19 surveillance with the assistance of novel digital tools.

COVID-19 Surveillance and Risk assessment in Chinese Taipei

Prof. Jen-Hsiang Chuang
Deputy Director General
Centers for Disease Control, Ministry of Health and Welfare

Epidemic Intelligence Framework with Automation Efforts in Chinese Taipei Centers for Disease Control



COVID-19 surveillance in Chinese Taipei

International

Event-based surveillance
Rapid risk assessment

Domestic

Case-based surveillance
Syndromic surveillance
Laboratory surveillance

3

International epidemic surveillance

- **Objectives**
  - Monitor epidemics in other countries
  - Risk assessment for imported cases
  - Understand the epidemiological and virological characteristics
- **Methods**
  - Event-based surveillance
  - Dashboard/tabulation
  - Qualitative/quantitative evaluation

4

International intelligence surveillance

- WHO
  - IHR Event Information site
- Official website.
- Google News
- ProMED
- CIDRAP
- News media
- Scientific publications

World Health Organization

KCDC
Korea Centers for Disease Control & Prevention

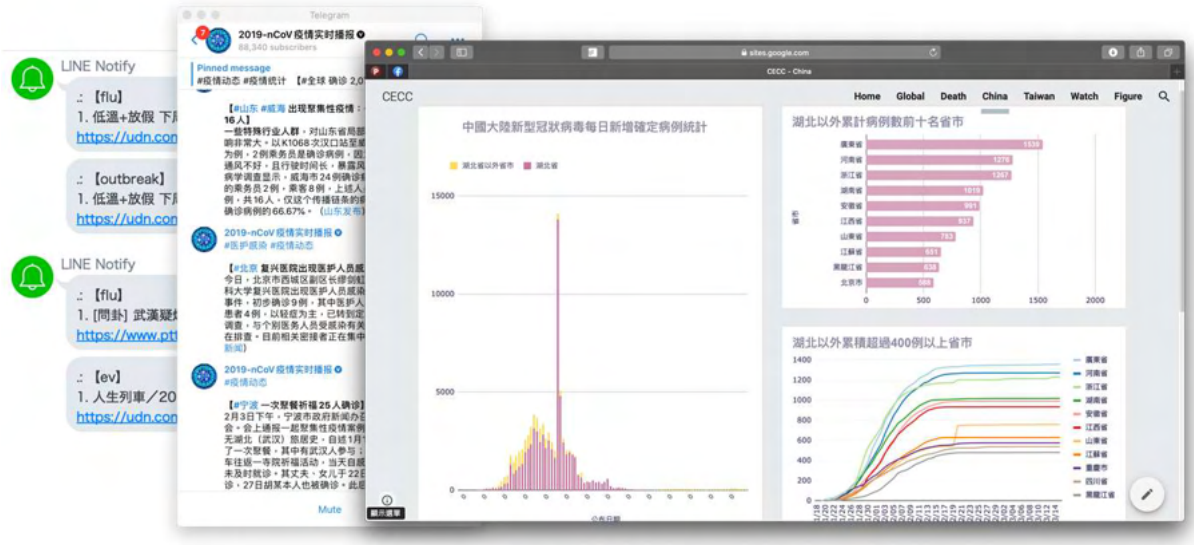
ProMED mail
Program for Monitoring Emerging Diseases

REUTERS

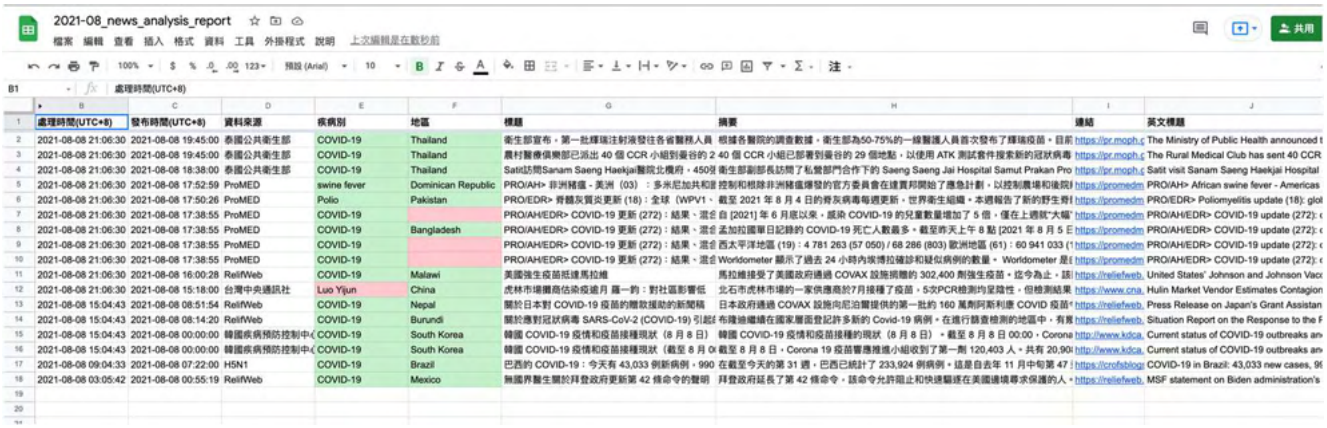
AP

中华人民共和国国家卫生健康委员会
National Health Commission of the People's Republic of China

Event-based systems and visualized dashboards



Using Nature Language Processing (NLP) to facilitate the data collection



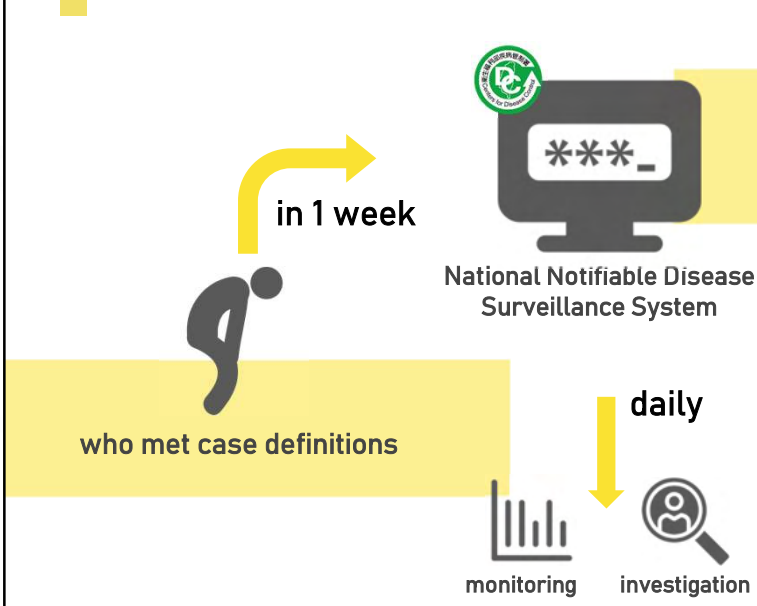
處理時間(UTC+8)	發布時間(UTC+8)	資料來源	疾病別	地區	標題	摘要	連結	英文標題
2021-08-08 21:06:30	2021-08-08 19:45:00	泰國公共衛生部	COVID-19	Thailand	衛生部宣布，第一批輝瑞注射液發往各省醫務人員	根據各醫院的調查數據，衛生部為50-75%的一線醫護人員首次發布了輝瑞疫苗，目前	https://pr.moph.g	The Ministry of Public Health announced t
2021-08-08 21:06:30	2021-08-08 19:45:00	泰國公共衛生部	COVID-19	Thailand	農村醫療俱樂部已派出 40 個 CCR 小組到曼谷的 2	40 個 CCR 小組已部署到曼谷的 29 個地點，以使用 ATK 測試套件搜索新的冠狀病毒	https://pr.moph.g	The Rural Medical Club has sent 40 CCR
2021-08-08 21:06:30	2021-08-08 18:38:00	泰國公共衛生部	COVID-19	Thailand	Satit訪問Sanam Saeng Haekjai醫院北模府，450張	衛生部副部長訪問了私營部門合作下的 Saeng Saeng Jai Hospital Samut Prakan Pro	https://pr.moph.g	Satit visit Sanam Saeng Haekjai Hospital
2021-08-08 21:06:30	2021-08-08 17:52:59	ProMED	swine fever	Dominican Republic	PRO/AH> 非洲豬瘟 - 美洲（03）：多米尼加共和國	控制和根除非洲豬瘟爆發的官方委員會在建貿邦開始了應急計劃，以控制農場和後院	https://promedm	PRO/AH> African swine fever - Americas
2021-08-08 21:06:30	2021-08-08 17:50:26	ProMED	Polio	Pakistan	PRO/EDR> 脊髓灰質炎更新 (18)：全球（WPV1、	截至 2021 年 8 月 4 日的脊灰病毒每週更新，世界衛生組織，本週報告了新的野生脊	https://promedm	PRO/EDR> Poliomyelitis update (18): glol
2021-08-08 21:06:30	2021-08-08 17:38:55	ProMED	COVID-19		PRO/AH/EDR> COVID-19 更新 (272)：結果、混合	自 [2021] 年 6 月底以來，感染 COVID-19 的兒童數量增加了 5 倍，僅在上週就"大幅"	https://promedm	PRO/AH/EDR> COVID-19 update (272):
2021-08-08 21:06:30	2021-08-08 17:38:55	ProMED	COVID-19	Bangladesh	PRO/AH/EDR> COVID-19 更新 (272)：結果、混合	孟加拉國單日記錄的 COVID-19 死亡人數最多，截至昨天上午 8 點 [2021 年 8 月 5 日	https://promedm	PRO/AH/EDR> COVID-19 update (272):
2021-08-08 21:06:30	2021-08-08 17:38:55	ProMED	COVID-19		PRO/AH/EDR> COVID-19 更新 (272)：結果、混合	西太平洋地區 (19)：4 781 263 (57 050) / 68 286 (803) 歐洲地區 (61)：60 941 033 (1	https://promedm	PRO/AH/EDR> COVID-19 update (272):
2021-08-08 21:06:30	2021-08-08 17:38:55	ProMED	COVID-19		PRO/AH/EDR> COVID-19 更新 (272)：結果、混合	Worldometer 顯示了過去 24 小時內埃博拉確診和疑似病例的數量。 Worldometer 是	https://promedm	PRO/AH/EDR> COVID-19 update (272):
2021-08-08 21:06:30	2021-08-08 16:00:28	ReliefWeb	COVID-19	Malawi	美國強生疫苗抵達馬拉維	馬拉維接受了美國政府通過 COVAX 設施捐贈的 302,400 劑強生疫苗。迄今為止，該	https://reliefweb.	United States' Johnson and Johnson Vacc
2021-08-08 21:06:30	2021-08-08 15:18:00	台灣中央通訊社	Luo Yijun	China	虎林市場圍商估染疫逾月 羅一鈞：對社區影響低	北石市虎林市場的一家供應商於7月接種了疫苗，5次PCR檢測均呈陰性，但檢測結果	https://www.cna.	Hulin Market Vendor Estimates Contagion
2021-08-08 15:04:43	2021-08-08 08:51:54	ReliefWeb	COVID-19	Nepal	關於日本對 COVID-19 疫苗的贈款援助的新聞稿	日本政府通過 COVAX 設施向尼泊爾提供的第一批約 160 萬劑阿斯利康 COVID 疫苗	https://reliefweb.	Press Release on Japan's Grant Assistan
2021-08-08 15:04:43	2021-08-08 08:14:20	ReliefWeb	COVID-19	Burundi	關於應對冠狀病毒 SARS-CoV-2 (COVID-19) 引起	布隆迪繼續在國家層面登記許多新的 Covid-19 病例。在進行篩查檢測的地區中，有異	https://reliefweb.	Situation Report on the Response to the F
2021-08-08 15:04:43	2021-08-08 00:00:00	韓國疾病預防控制中心	COVID-19	South Korea	韓國 COVID-19 疫情和疫苗接種現狀（8 月 8 日）	韓國 COVID-19 疫情和疫苗接種的現狀（8 月 8 日）。截至 8 月 8 日 00:00，Corona	http://www.kdca.	Current status of COVID-19 outbreaks an
2021-08-08 15:04:43	2021-08-08 00:00:00	韓國疾病預防控制中心	COVID-19	South Korea	韓國 COVID-19 疫情和疫苗接種現狀（截至 8 月 0	截至 8 月 8 日，Corona 19 疫苗響應推進小組收到了第一劑 120,403 人，共有 20,90	http://www.kdca.	Current status of COVID-19 outbreaks an
2021-08-08 09:04:33	2021-08-08 07:22:00	H5N1	COVID-19	Brazil	巴西的 COVID-19：今天有 43,033 例新病例，990	在截至今天的第 31 週，巴西已統計了 233,924 例病例，這是自去年 11 月中旬第 47	https://crofsblogs	COVID-19 in Brazil: 43,033 new cases, 9
2021-08-08 03:05:42	2021-08-08 00:55:19	ReliefWeb	COVID-19	Mexico	無國界醫生關於拜登政府更新第 42 條命令的聲明	拜登政府延長了第 42 條命令，該命令允許阻止和快速驅逐在美國邊境尋求保護的人	https://reliefweb.	MSF statement on Biden administration's

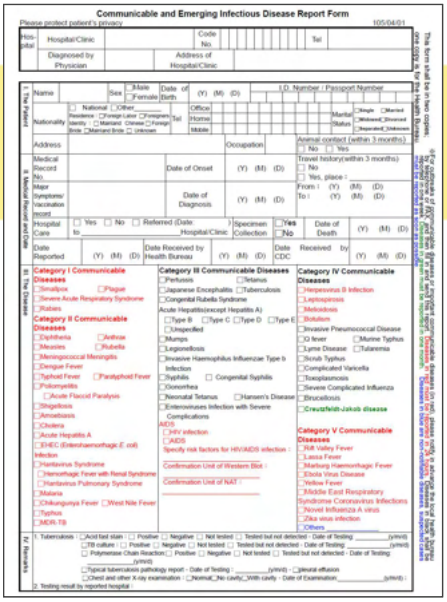
Collaborated with Acer Value Lab.

Domestic surveillance

- **Objectives**
  - Early detection -> early intervention
  - Monitor the epidemic to balance and preserve the public health and healthcare resources
- Event-based surveillance
- Case-based surveillance
- Laboratory surveillance
  - Respiratory disease
  - Clusters
- **Methods**

Notifiable Case Reporting





9

COVID-19 automatic reporting via IC-chipped National Health Insurance (NHI) Card

"My Health Bank" app

Users can check their test results using the personal health app

Get COVID-19 testing at hospitals/testing station

Upload COVID-19 rapid antigen screening/PCR test results to NHI via IC chip cards

Exchange data from NHIA to CDC per hour

National Notifiable Disease Surveillance System

Automatically report positive cases as COVID-19 suspected/confirmed cases to CDC

Monitor the COVID-19 test-positive rate

Ensure timely COVID-19 notification

*NHIA: National Health Insurance Administration
*CDC: Chinese Taipei Centers for Disease Control

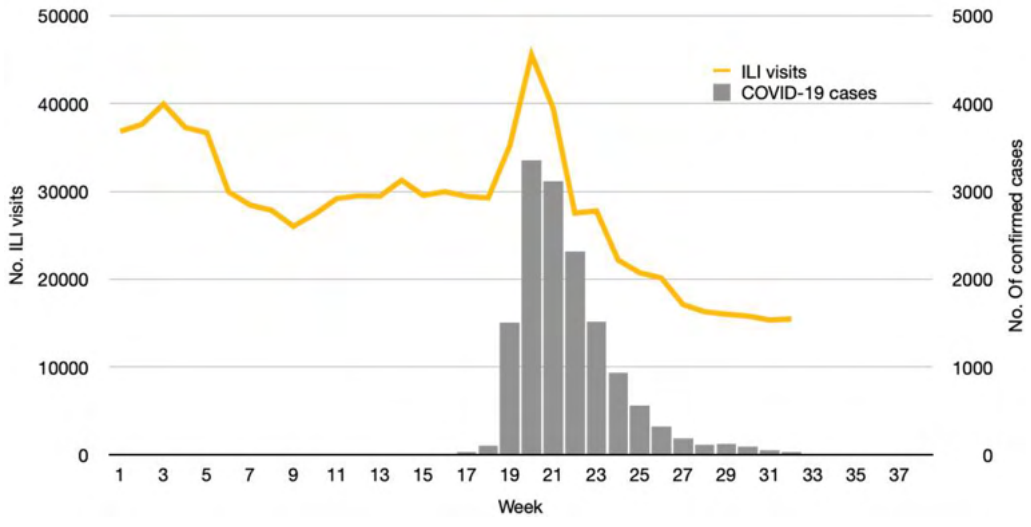
10

Syndromic Surveillance

- **NHI medical visits**
  - Source
    - National Health Insurance database
  - Coverage rate
    - > 99% whole population
- **Real-time Outbreak and Disease Surveillance System (RODS)**
  - Source
    - ER of 180 more hospitals
  - Coverage rate
    - 85-90% ERs
    - 97% ER visits nationwide
  - Items of regular surveillance
    - ILI, EV infections, diarrhea, conjunctivitis

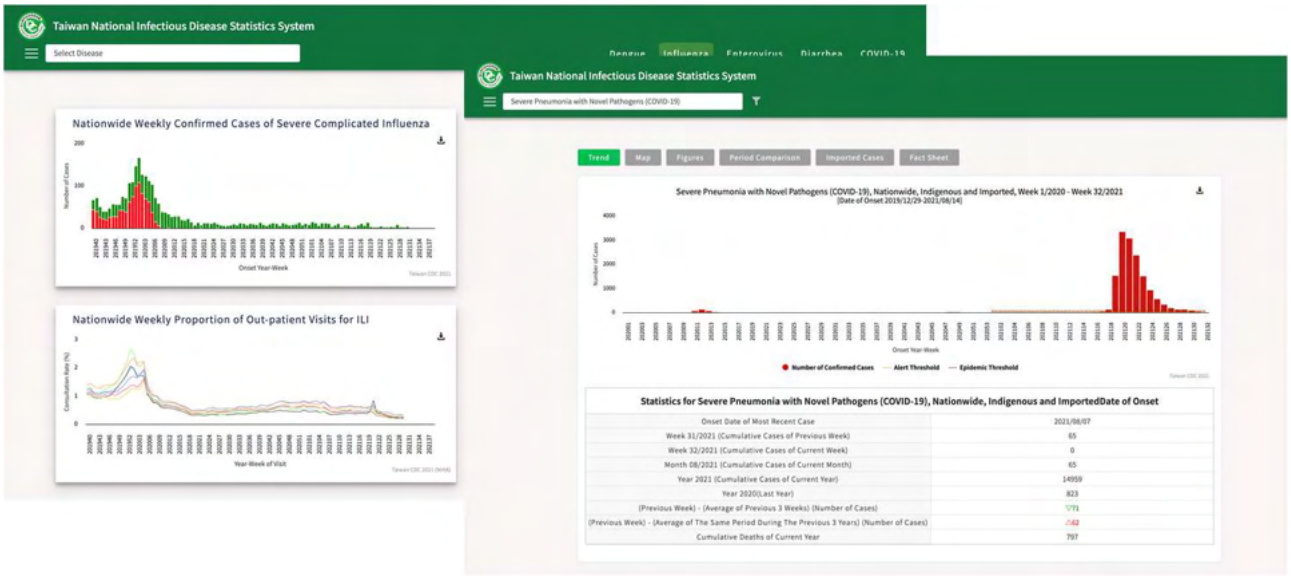
11

Correlation between ILI visits and number of COVID-19 cases



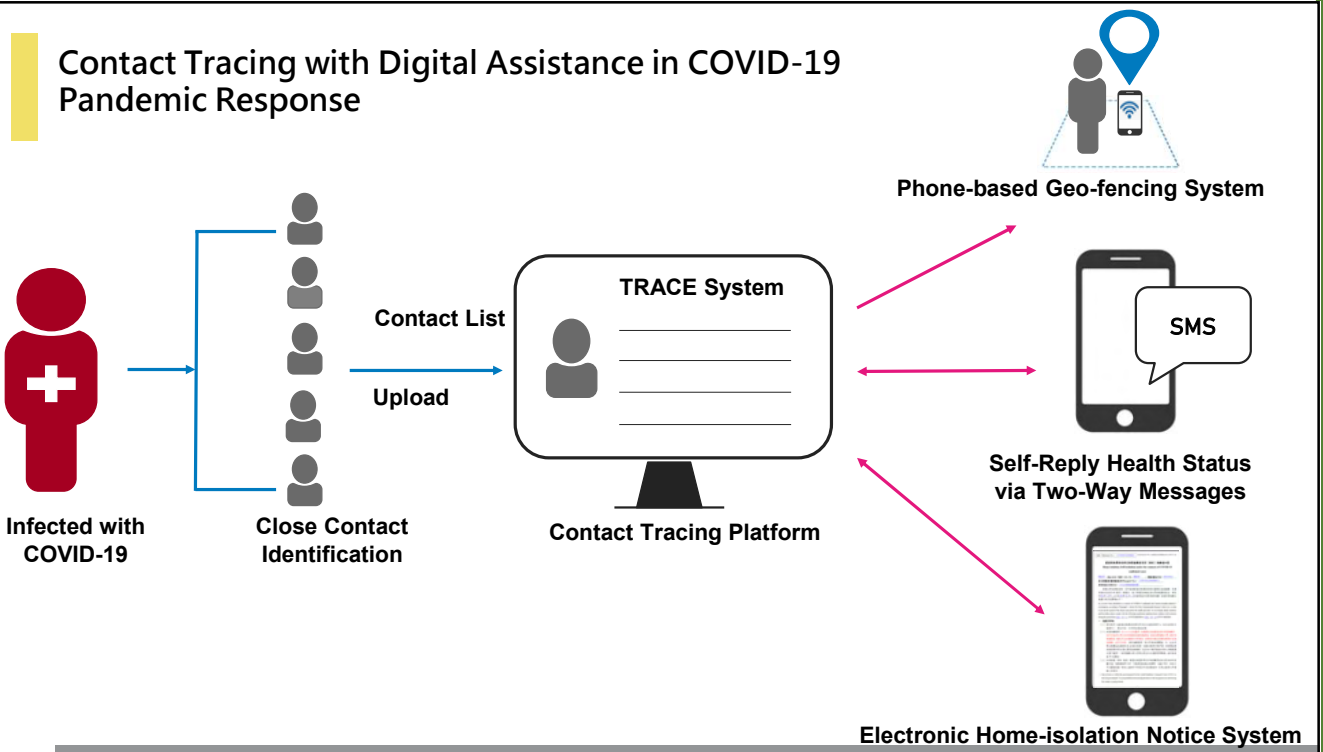
12

NIDSS of CDC nidss.cdc.gov.tw



13

Contact Tracing with Digital Assistance in COVID-19 Pandemic Response



14

Digital tools used in COVID-19 responses

Jobie et al. Nature Medicine (2020)

15

Surveillance → Action

Surveillance system

Lab examination

Risk assessment

Quarantine/Isolation

Contact tracing

16

From detection to action

批踢踢實業坊 › Gossiping

作者 nomorepipe (不管了啦)
標題 [問卦] 武漢疑爆發非典型肺炎冠狀病毒群聚感染？
時間 Tue Dec 31 02:24:19 2019

現在中國網路正在沸沸騰騰討論中

昨天中國官方公告說有不明原因肺炎群聚感染

https://imgur.com/XSiIV69

https://imgur.com/ulr1RQL

武漢大學送檢驗確診7例非典型肺炎(SARS)病例

https://imgur.com/ICcPozD

檢驗報告驗出冠狀病毒核酸陽性

https://imgur.com/tEAUIBE

該報告使用基因定序技術可以排除不是過去2003年的技術

協和紅十字會醫院確診一例非典型肺炎合併冠狀病毒感染

https://imgur.com/gk8cPGu

根據群聚感染地點在海鮮市場，不過中國網友說這地方有土撥鼠、蛇窯、鹿、猴

所以交互感染可能就比較高

2019年12月31日通報世界衛生組織(WHO)「國際衛生條例」(IHR)聯繫窗口電郵內文:

News resources today indicate that at least seven atypical pneumonia cases were report
Wuhan, CHINA. Their health authorities replied to the media that the cases were believ
SARS; however the samples are still under examination, and cases have been isolated fo
treatment.

I would greatly appreciate it if you have relevant information to share with us.

Thank you very much in advance for your attention to this matter.

Best Regards,

中衛流行疫情指揮中心 2020/04/11

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嚴重特殊傳染性肺炎中央流行疫情指揮中心
工作彙報

一、 中國大陸疫情概況：病例單日增加數仍逾3,000例，逾400例，多省市發生社區傳播及群聚，疫情控制

- 截至2月6日24時，31省市區（不含港澳）累計增3,143例。病例中4,821例重症，636例死亡；另計密切接觸者314,028人，追蹤中186,045人。
- 重點省市疫情現況與評估
  - 一級流行地區
    - 湖北省：已出現廣泛社區傳播，昨日增加數下降。所有17個二級行政區陸續於1/23已宣布，即日起定點醫院只收治確診重症，不符合以上要求者，新就診的由定點收治區指揮部安排送往社區隔離點或方艙醫院治醫院要及時辦理出院手續，通知所在區方艙醫院。
  - 二級流行地區
    - 中國大陸：實施「封閉式管理」省市如下：省)山東省(5區)；浙江省(4區)；江蘇省(3治區(2區)；福建省(福州)；黑龍江省(哈爾市：雲南(昆明)；江西省(景德鎮)；安徽省津市等地區，包括人員進出量體溫、出示每2天限1人外出採購等措施。北京及上
    - 廣東省：已出現社區傳播，並持續擴大，輸出至上海、香港及澳門。深圳市新增病傳播。
    - 浙江省：已出現社區傳播，新增病例數近例。
    - 河南省：前日新增87例，新增病例數近報告病例已涵蓋該省所有二級行政區，並無症狀傳染者報告。

嚴重特殊傳染性肺炎中央流行疫情指揮中心
工作彙報

一、 中國大陸疫情概況

- 截至1月26日24時，中國大陸累計確診2,744例新型冠狀病毒感染，較昨日新增769例，其中461例重症，80例死亡。31省市區（不含新疆維吾爾自治區、西藏無確診或疑似病例。累計密切接觸者32,799人，追蹤中30,
- 個案流病資料剖析
  - 確診個案最早發病日2019/12/1，無華南市場接觸史。病例年齡歲，肺炎個案最小年齡為9個月（北京），55.6%為男性。根據資料粗估，重症率為16.8%，致死率介於2.9-14.6%(統計資料區
  - 1/26中國大陸國家衛健委主任馬曉偉表示潛伏期約10天(介於潛伏期即具傳染性，與SARS不同。
  - 湖北省出現醫院群聚及醫護人員感染死亡病例。目前廣東省病15.4%病例發病前無湖北旅遊史，已出現14起群聚事件。
  - WHO表示，1/22後新增個案僅<15%具市場/動物暴露史，且有家庭次代傳播。另英國皇家學院1/25公布估計新冠傳染力(R0)，3.5)，推斷持續性人傳人才足以解釋目前疫情規模，且控制措施斷6成傳播鏈才能控制疫情；死亡率可達2%，與西班牙流感學者1/24於期刊發表則推估R0為2.0-3.3。

嚴重特殊傳染性肺炎中央流行疫情指揮中心工作彙報

109/03/17 08:00

全球病例	全球死亡	受影響國家	臺灣病例	臺灣死亡
179,588	7,086	145	67	1

一、 全球疫情概況

歐洲、美國疫情急速上升，成為病例輸出國，疫情已達全球大流行。

- 全球累計179,588例確診，新增13,481例；確定病例分布於145個國家/地區，新增6國；病例數以中國大陸80,881例、義大利27,980例、伊朗14,991例、西班牙9,191例及韓國8,236例為多；病例中7,086例死亡，以中國大陸3,226例、義大利2,158例、伊朗853例、西班牙309例及法國148例為多。
- 美國新增1,148例確診，新增及累計病例仍以華盛頓州、紐約州、加州為多；美國CDC新增評估伊利諾州具社區傳播疫情，該州累計約100例確診。
- 重要防治措施
  - 瑞士宣布3/16-4/19進入緊急狀態，僅允許超市、藥局等提供必要服務的商店及場所營業，另將加強與德、法、奧地利間邊境管制；法國同日宣布3/17中午起15天內，除工作、就醫等必要性目的外不得外出。
  - 加拿大宣布關閉邊境，僅允許具美加國籍或居留身分旅客入境。
  - 菲律賓3/16起將實施社區管制的範圍由馬尼拉都會區擴大至全呂宋島；馬來西亞宣布3/18-3/31期間禁止國人出境及外籍人士入境。

各洲確診個案數及國家數統計

分區	確診數	全影響國家數	報告本土病例國家數*	報告本土病例國家**
亞洲	91,914 (+495)	25 (+0)	19	中國大陸、韓國、日本、新加坡、香港、泰國、菲律賓、印尼、臺灣、越南、馬來西亞、巴基斯坦、印度、汶萊、斯里蘭卡、馬爾地夫、柬埔寨、澳門、孟加拉
歐洲	64,367 (+10,264)	47 (+0)	35	義大利、西班牙、德國、英國、荷蘭、奧地利、冬聯、聖馬利諾、斯洛伐克、克羅埃西亞、法國、瑞士、丹麥、挪威、比利時、瑞典、捷克、愛爾蘭、芬蘭、斯洛維尼亞、愛沙尼亞、冰島、愛爾蘭、羅馬尼亞、波蘭、盧森堡、保加利亞、阿爾巴尼亞、塞爾維亞、匈牙利、白俄羅斯、亞美尼亞、波士尼亞與赫塞哥維納、北馬其頓、馬克蘭
中東	16,590 (+1,196)	14 (+0)	11	伊朗、阿拉伯聯合大公國、卡達、以色列、巴林、沙烏地阿拉伯、伊拉克、科威特、黎巴嫩、巴勒斯坦、土耳其
美洲	5,358 (+1,403)	26 (+2)	15	美國、哥斯大黎加、巴哈馬、加拿大、巴西、智利、秘魯、阿根廷、巴拿馬、厄瓜多、哥倫比亞、威利維亞、牙買加、巴拉圭、蓋亞那
大洋洲	306 (+49)	2 (+0)	2	澳洲、紐西蘭
非洲	366 (+74)	31 (+4)	9	埃及、南非、阿爾及利亞、摩洛哥、塞內加爾、突尼西亞、盧安達、衣索比亞、喀麥隆
總計	178,901 (+13,481)	145 (+6)	91	

* 依WHO及各國公布疫調資料判列，另計入台港澳，因此可能多於WHO研判國家數
** 本表不含鑽石公主號隔離檢疫期間確診之687例個案，其未知感染源本土病例之國家以紅字標示

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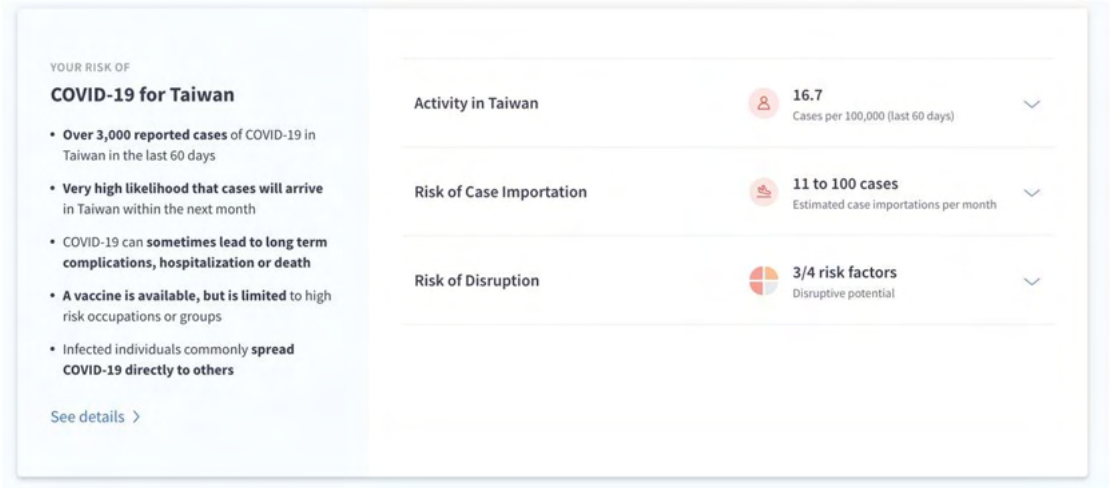
Table 1. Top 20 passenger destination cities from Wuhan, China, January–March 2018 and corresponding IDVI of destination countries

Destination city	Population* (in millions)	Destination province	Destination country	IDVI	Direct volume***	Total volume***
Bangkok	8.28	Bangkok Metropolis	Thailand	0.711	38 457	41 080
Hong Kong	7.39	Hong Kong SAR	Hong Kong SAR	0.664**	23 608	23 707
Tokyo	9.27	Tokyo	Japan	0.926	18 581	20 001
Taipei	2.62	Taipei	Taiwan	0.710	15 086	17 645
Phuket	0.39	Phuket	Thailand	0.711	14 097	16 656
Seoul	9.78	Seoul	Korea (South)	0.879	11 771	13 727
Singapore	5.61	Singapore	Singapore	0.878	8599	13 123
Kota Kinabalu	0.25	Sabah	Malaysia	0.761	12 340	12 661
Macau	0.62	Macau SAR	Macao SAR	0.664**	10 918	10 932
Denpasar Bali	0.79	Bali	Indonesia	0.563	7759	9065
Sydney	5.23	New South Wales	Australia	0.913	5093	8431
Dubai	3.14	Dubay	The UAE	0.765	6389	7389
Kuala Lumpur	1.81	WP Kuala Lumpur	Malaysia	0.761	2393	6822
Kaohsiung	2.77	Kaohsiung City	Taiwan	0.710	6373	6617
Osaka	2.69	Osaka	Japan	0.926	3062	5745
Krabi	0.46	Krabi	Thailand	0.711	5012	5718
Melbourne	4.94	Victoria	Australia	0.913	0	5648
Surat Thani	0.13	Surat Thani	Thailand	0.711	5044	5624
Chiang Mai	0.13	Chiang Mai	Thailand	0.711	4354	5293
Penang	1.77	Pulau Pinang	Malaysia	0.761	4436	5059

*2018 estimates (The UN).
**IDVI value estimated for China.
***IATA data between January and March 2018, inclusive.
SAR, Special Administrative Region.

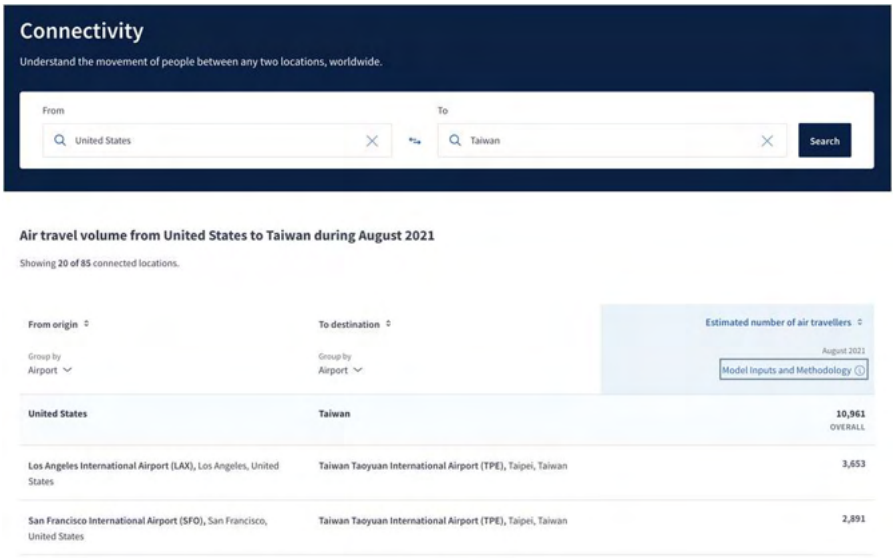
Bogoch, I., et al. Journal of Travel Medicine. 2020.

Risk of case importation



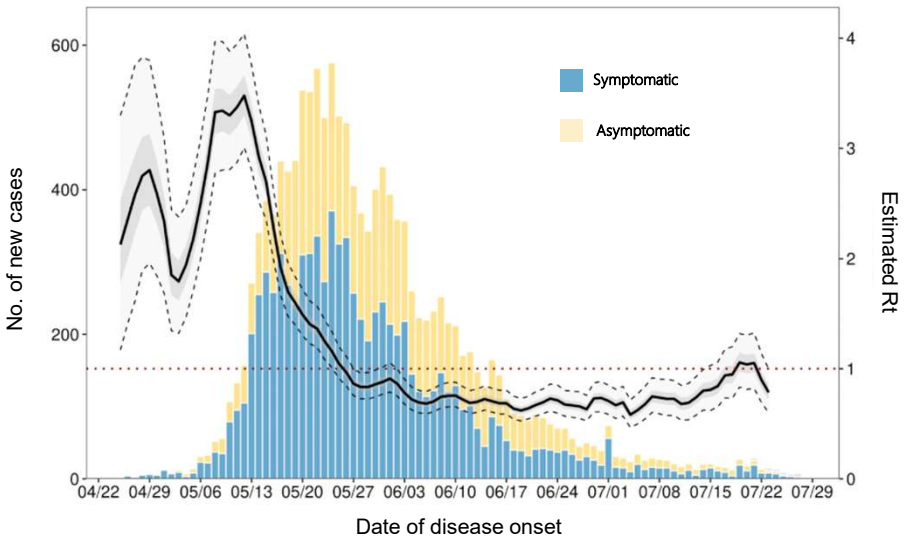
Data from Insight system made by Bluedot Inc.

Dashboard for air travel data



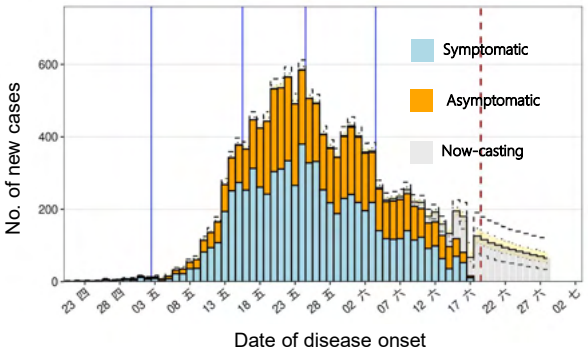
Data from Insight system made by Bluedot Inc. 21

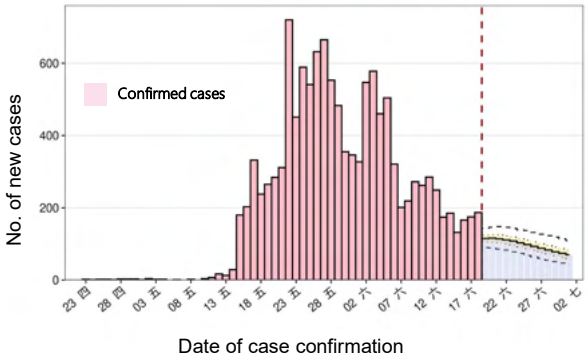
Real-time Rt estimation for the evaluation of ongoing outbreak



Collaborated with Prof. Andrei Akhmetzhanov from NTU. 22

Stage-wise Rt estimation for intervention evaluation





R (<5/2)	2.41 (1.92-2.97)
R (5/2-5/15)	2.84 (2.49-3.26)
R (5/15-5/24)	1.52 (1.26-1.88)
R (5/24-6/3)	0.91 (0.77-1.07)
R (6/3-)	0.72 (0.65-0.81)

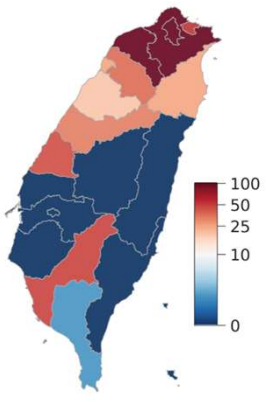
- Rt estimated in different stage to reflect the influence of interventions at different alert levels

Collaborated with Prof. Andrei Akhmetzhanov from NTU. 23

End-of-outbreak probability estimation

	county	estimate	IQR
1	台北市	100.0 (95% CI: 99.9, 100.0)	100.0-100.0
2	新北市	100.0 (95% CI: 99.9, 100.0)	100.0-100.0
3	桃園市	100.0 (95% CI: 97.1, 100.0)	100.0-100.0
4	基隆市	52.9 (95% CI: 20.1, 73.1)	44.1-60.2
5	高雄市	47.7 (95% CI: 18.5, 63.1)	40.0-54.2
6	彰化縣	43.9 (95% CI: 15.4, 63.4)	35.5-51.0
7	新竹縣	37.0 (95% CI: 15.2, 50.4)	30.8-42.0
8	台中市	32.4 (95% CI: 13.0, 52.2)	26.5-38.4
9	宜蘭縣	24.8 (95% CI: 7.3, 37.2)	19.6-29.4
10	新竹市	24.8 (95% CI: 10.7, 36.2)	20.8-28.7
11	苗栗縣	19.1 (95% CI: 0.0, 52.1)	8.4-30.1

	county	estimate	IQR
12	屏東縣	2.6 (95% CI: 0.3, 6.9)	1.8-3.5
13	嘉義縣	0.0 (95% CI: 0.0, 1.0)	0.0-0.0
14	嘉義市	0.0 (95% CI: 0.0, 0.5)	0.0-0.0
15	台東縣	0.0 (95% CI: 0.0, 1.2)	0.0-0.0
16	台南市	0.0 (95% CI: 0.0, 3.6)	0.0-0.7
17	澎湖縣	0.0 (95% CI: 0.0, 0.3)	0.0-0.0
18	花蓮縣	0.0 (95% CI: 0.0, 4.0)	0.0-0.1
19	連江縣	0.0 (95% CI: 0.0, 0.2)	0.0-0.0
20	雲林縣	0.0 (95% CI: 0.0, 1.2)	0.0-0.0
21	南投縣	0.0 (95% CI: 0.0, 2.9)	0.0-0.6



Collaborated with Prof. Andrei Akhmetzhanov from NTU.

24

Surveillance → Action

25

Thanks for your attentions!!
謝謝!!

Vikki Carr de los Reyes | Moderator

- Position: Medical Specialist III
- Organization: Epidemiology Bureau, Department of Health
- Economy: The Philippines

Educational Background

- Doctor of Medicine
- Field Epidemiology Training Program

Professional Career

- Disease Surveillance Program Manager
- FETP Training Officer

Publications

- Risk assessment of Ebola Reston virus in humans in the Philippine, 2019
- Outbreak of Henipavirus Infection, Philippines, 2014
- Contact tracing the first Middle East respiratory syndrome case in the Philippines, February 2015
- Consumption of barracuda in the Caribbean Sea linked to ciguatera fish poisoning among Filipino seafarers
- An assessment of the case notification system 16 months after Typhoon Haiyan in Region 8, the Philippine

Ido Hadari | Speaker

- Position: VP Communications & Government Affairs
  Venture Partner ALIVE VC Israel HealthTech Fund
- Organization: Maccabi Healthcare Services
- Economy: Israel

Educational Background

- M.B.A. University of Haifa, Israel
- M.A. in Communications from the Hebrew University in Jerusalem, Israel

Professional Career

Ido D. Hadari serves as VP for Communications & Government Affairs at Maccabi Healthcare services in Israel and as Venture Partner at ALIVE Israel Health-tech fund.

He is senior healthcare and government relations expert, dedicated to the field of healthcare for over two decades. Served also as a senior consultant for UNICEF headquarters in Ukraine.

Bringing extensive experience from high level positions in the Israeli health system. With a wide angle from the Hospital point of view (Galilee Hospital), the national point of view (Ministry of Health) and the community medical services (Maccabi).

Lectures in Israel and abroad on a wide range of subjects including E-Health & Tele- Health, Health economics, Management Under Budget Restraints, Crisis Management and more.

Hadari holds two Master's degrees – M.A. in Communications from the Hebrew University in Jerusalem, and M.B.A. granted by the University of Haifa.

ISRAEL vs. COVID
Technology vs Virus

Ido Hadari

Abstract

In order to survive Public Health threats like COVID-19, we must recruit the public. People need to follow hygiene guidelines, lockdown restrictions and conduct PCR tests if asked to. When the COVID vaccination roll-out started in Israel, public recruitment faced the ultimate test.

Smart and easy to use technologies made it possible.

Internet, cellular phones and social networks are globally spread. Since the COVID pandemic started and eliminated social meetings and gatherings, the use of digital communication increased significantly.

This trend met a most important principle in crisis management: relying on pre-existing platforms without creating new ones.

The digital capabilities and technological infrastructure of the Israeli HMOs made this long battle much a lot easier and smoother than it would have been without them.

Patients scheduled their appointments for the vaccination by apps with a simple process. Later they received reminders and detailed instructions prior to the vaccination date.

The Maccabi HMO in Israel analyzed the data daily. It allowed us to target patients who hadn't yet scheduled their vac-appointment. The next step was to contact them digitally, in their language and in accord with their cultural preferences, to encourage them to schedule the appointment.

That's how we have achieved the fastest and highest vaccination coverage in the world.

The COVID war is the first time in the modern era where all humanity is fighting against the same foe. A major and vital step is to collaborate in the technology arena. We still have a lot to achieve but it will be achieved faster and with more success if we join forces. That's relevant at government level and at the health institutions level.

ISRAEL vs. COVID

Technology vs. Virus

Ido Hadari M.A, M.B.A
Director of Communications & Government Affairs, Maccabi Health Care Services
Venture Partner, ALIVE – Israel Health-Tech Fund

Maccabi The Best Healthcare Group in Israel | alive | unicef | State of Israel Ministry of Health משרד הבריאות

Starting Point – Maccabi Healthcare Services

- ✓ 2.5M members
- ✓ 5,000 MD's - 20,000 employees
- ✓ Over 100,000 Patient visits per day
- ✓ 25% of Doc visits are digital
- ✓ AI starts to "meet" patients

High digital engagement

1,815,000 Holds unique password

50,000,000 Annual Entrance #

75% From ages 65-75 are using digital services

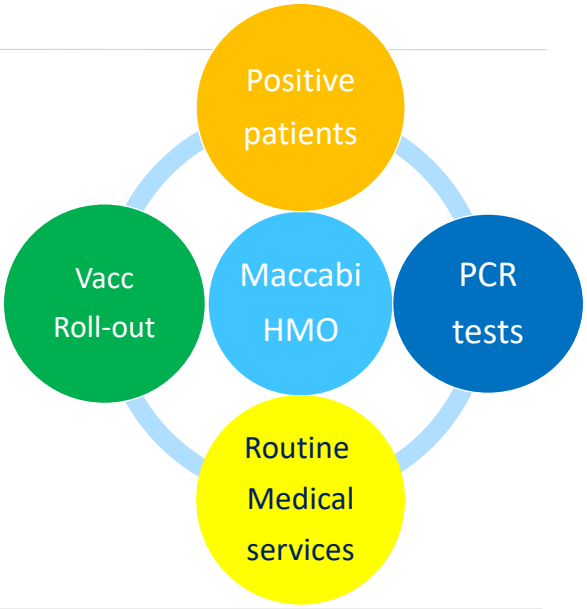
4,000,000 Digital doctor visits

Maccabi The Best Healthcare Group in Israel

2

The COVID

- ✓ Transformation to Tele-Health
- ✓ Pick of 20,000 positive patients
- ✓ 98% – treated at home
- ✓ Fully digitized PCR process
- ✓ Vaccination Rollout



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The Best Healthcare Group in Israel

3

Vaccination Rollout

It's Like a Puzzle

- ✓ Supply
- ✓ Logistics
- ✓ Public engagement

Photo by Sigmund on Unsplash

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The Best Healthcare Group in Israel

4

The Greatest Civil Event in the Israeli History, Ido Hadari

Supply & Logistics

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Public recruitment

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Public Health Emergency

So… The public must be recruited:

- ✓ Trust & Confidence
- ✓ Information & Instructions
- ✓ 2 Way communication

Photo by Ryoji Iwata on Unsplash

Cognitive & Psychological

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ALL media channels

Photo by Nathan Dumlao on Unsplash

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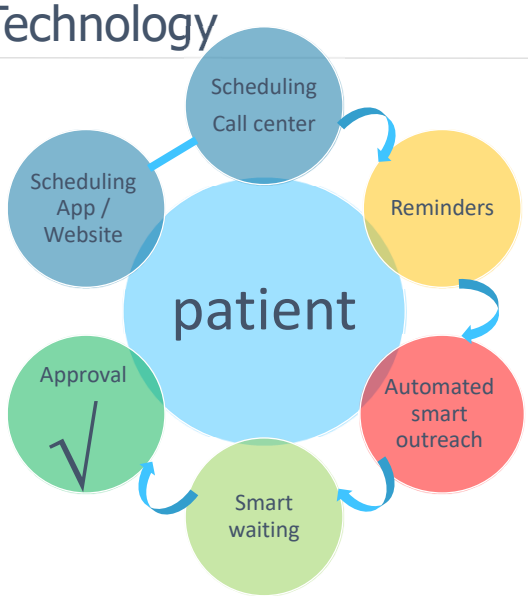
Engagement Technology



Maccabi The Best Healthcare Group in Israel

The Next Pandemic

- Mysterious
- Global emergency
- Recent scars
- Economical threat

Photo by Ashkan Forouzani on Unsplash

Anticipation for immediate & significant response

We must do better

WHAT?

Data sharing

Tele-Health

Mass virus tests

Isolation & lockdowns enforcement

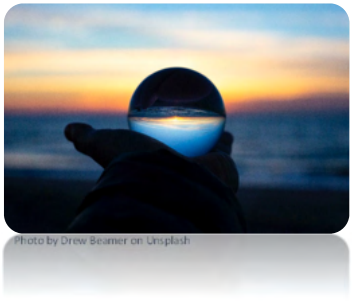


Photo by Drew Beamer on Unsplash

HOW?

No-box thinking

Global perspective

Innovative Regulation

Fighting the COVID

"The world needs to be well prepared and united… to digitally detect, protect, respond, and prepare the recovery f or COVID 19. No single entity or single country initiative will be sufficient. We need everyone."

Bernardo Mariano Junior, director of WHO's Department of Digital Health and Innovation

Fighting the Pan-Demic

PAN-TECHNOLOGY !

In Israel, if you are realistic, you have to believe in MIRACLES

David Ben-Gurion, the 1st Prime Minister

Thank You

Maccabi
The Best Healthcare Group in Israel

Merle M. Böhmer | Speaker

- Position: Epidemiologist
- Organization: Taskforce Infectiology | Department for Infectious Disease Epidemiology
- Economy: Germany

Educational Background

- PhD in Medical Sciences (Charité, Berlin)
- MSc in Applied Epidemiology (Charité, Berlin)

Professional Career

- Teaching assignment at the Institute of Social Medicine and Health Systems Research, Otto-von-Guericke-University, Magdeburg, Germany
- Epidemiologist (senior researcher) at the Taskforce Infectiology | Department for Infectious Disease Epidemiology, Bavarian Health and Food Safety Authority, Munich, Germany
- Postdoc at the Department for Epidemiology and Preventive Medicine, University of Regensburg, Regensburg Germany
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Publications

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COVID-19 in Bavaria, Germany: Challenges and Lessons Learned from a Public Health Perspective

Merle M. Böhmer

Abstract

The first cases of COVID-19 occurred in the German federal state of Bavaria (~13 million inhabitants) as early as January 2020. By 15 August 2021, 659,373 COVID-19 cases had been reported to the Bavarian Health and Food Safety Authority (LGL), of which 15,371 (2%) died. Presumably, a major advantage at the beginning of the pandemic was that Bavaria was the only German federal state with an infectious disease rapid response team on regional level. The first outbreak of COVID-19 could therefore be contained through quickly and consistently implemented measures such as contact tracing, isolation and quarantine. This may have delayed larger virus spread in Germany by a few weeks. Large-scale community transmission did not occur until March 2020, when SARS-CoV-2 was brought into the country mainly by travellers returning from risk-areas. In the following, several control measures were implemented in Bavaria, among them contact tracing, border controls, travel bans, contact restrictions, school closures, extensive testing, and wearing masks.

Right in the beginning, a major challenge became apparent: the 76 Bavarian health office responsible for case management and contact tracing on local level were very heterogeneously equipped –both in terms of staffing and further areas, for example digitalisation. Bavaria reacted to this situation, among other things, by declaring a state-wide emergency and supporting the local health offices with contact tracing teams (CTTs) and personnel from the armed forces. One problem to be mentioned in this context is that there was initially a lack of specialised personnel and the training took some time.

At the beginning of the pandemic, only the regular electronic reporting system

for infectious diseases was in place. However, this system was not designed for pandemic management with thousands of cases to be processed daily. Furthermore, a functioning digital system for contact tracing was largely lacking.

Also with regard to the vaccination campaign – undoubtedly an essential component in fighting COVID-19 – there is a need for improvement. Bavaria, for example, does not have a digital vaccination register. Many important resources were for example unnecessarily tied up because GPs had to call their patients individually to ask whether they had already received a vaccination at one of the vaccination centres.

In order to adequately counter the current COVID-19 pandemic as well as future outbreak situations in Bavaria, it is therefore important to strengthen the public health sector at local level in the long term. First, monetary and other enticements should be provided to make medical work in the public health service more attractive. Second, it must be ensured that employed public health professionals are well trained in infection control and are enabled to expand their knowledge on an ongoing basis. Furthermore, a state-wide, uniform, digital reporting system that can be quickly adapted for new pathogens/situations and can also be used for contact tracing might be helpful for successful control of pandemic situations. Moreover, in order to optimise the current vaccination campaign, but also with regard increasing vaccination rates in general, the implementation of a central, digital vaccination register would be reasonable.

Disclaimer: *The views and opinions expressed herein do not necessarily state or reflect those of LGL or the Bavarian State Ministry of Health and Care.*

Bavarian Health
and Food Safety Authority

COVID-19 in Bavaria, Germany:

Challenges and Lessons Learned from a Public Health Perspective

LGL

Merle M. Böhmer, PhD, MSc
Epidemiologist

APEC conference | Chinese Taipei/online | 25-26 August 2021

The Beginnings of COVID-19 in Germany

THE Call

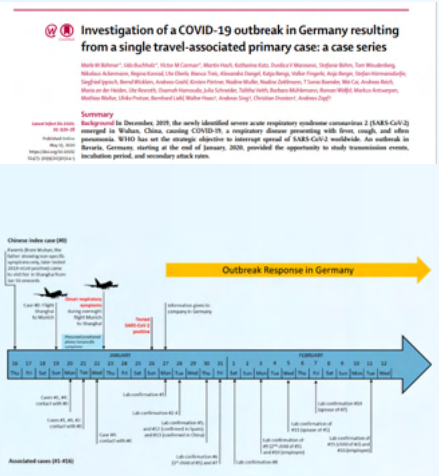
27 January, 2020

The Beginnings of COVID-19 in Germany

- **Afternoon of January 27, 2020: The Bavarian Taskforce Infectiology was informed about the first infection with SARS-CoV-2 in a German citizen.**
  - *Case #1 works at an automotive supplier (Webasto) near Munich, Bavaria*
  - *Contact to a confirmed COVID-19 case (patient 0) from China on January 20/21*
  - *Was symptomatic during weekend before (Jan 25/26) with fever and mild respiratory symptoms*

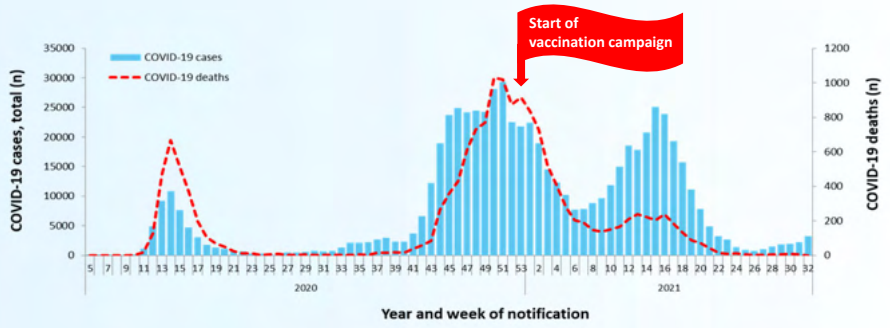
Source: www.sueddeutsche.de

The Beginnings of COVID-19 in Germany



- Outbreak response started immediately after detection of 1st case
- Patients presented partially with mild, non-specific symptoms
- Infectiousness before symptoms onset, on the day of symptom onset as well as during mild prodromal symptoms
  - ➡ **Poses a huge challenge on implementation of public health measures**
- Incubation period is often very short
- Neverless, first outbreak was controlled!
  - ➡ **may have Germany granted valuable time before intense transmission**
  - ➡ **<u>But</u>: successful long-term and global containment of COVID-19 may be difficult to achieve!**

Course of the COVID-19 Pandemic in Bavaria, Germany



- Notified COVID-19 cases*: **n=659,373**
  - *thereof COVID-19 deaths*:* ***n=15,371 (2.3%)***
- Vaccination coverage*:
  - *at least 1 dose:* ***60.5%***
  - *fully vaccinated:* ***55.1%***

*as of 15 August 202

Implementation of Control Measures, e.g.

- Contact tracing
- Quarantine
- Isolation
- Border controls
- Travel bans
- Contact restrictions
- School closures
- Extensive testing
- Wearing masks in public

Challenge 1 Public Health Response on Local Level

Federal state level

- LGL: large public health authority
- Taskforce Infectiology (rapid response team)

but

Local level

- 96 districts | 76 local health authorities
- Heterogeneously equipped in terms of
  - *staffing*
  - *further areas (e.g. digitalisation)*

Challenge 1 Public Health Response on Local Level

Response in Bavaria

- Declaration of state-wide emergency
- Support for local health authorities
  - *contact tracing teams*
  - *personnel from armed forces*

Source: www.bundeswehr.de

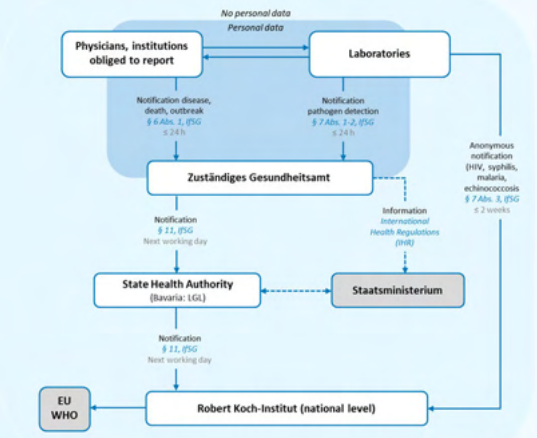
but

- Specialised personnel scarce
- Training of personnel takes time

Source: www.landkreis-landshut.de

Challenge 2 Electronic Reporting System

Well-established reporting system



But

- ! system not designed for pandemic management with thousands of cases to be processed daily
- ! Functioning digital system for management of contact tracing was largely lacking
- ! Local level in Bavaria: no uniform notification software used
  - ➢ *5 different software providers*

Challenge 3 Vaccination Register

Bavaria (also rest of Germany)

- No digital vaccination register available!

Example:

Many important resources were unnecessarily tied up because GPs had to call their patients individually to ask whether they had already received a vaccination at one of the vaccination centres.

Vaccination Register

Some Lessons Learned, so far…

1

Public health sector should be strengthened at local level in the long term:
- through monetary and other enticements
- including comprehensive and continuous training in infection control

2

Digital reporting system should be improved:
- should be easily adaptable for new pathogens/situations
- should be suitable for contact tracing
- should be uniform on local, regional (and national) level

3

Implementation of state-wide digital vaccination register might be reasonable:
- optimizing management of pandemic vaccination campaign
- increasing coverage of standard vaccinations
- but: data protection law need to be adjusted

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COVID-19 in Bavaria, Germany:

Challenges and Lessons Learned from a Public Health Perspective

LGL

Merle M. Böhmer, PhD, MSc
Epidemiologist

APEC conference | Taiwan/online | 25-26 August 2021

Toby Phillips | Speaker

- Position: Executive Director
- Organization: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, Oxford University
- Economy: The United Kingdom

Educational Background

- Master of Public Policy

Professional Career

- Executive Director, Oxford COVID-19 Government Response Tracker
- Program Director, Centre for Policy Development
- Head of Policy and Research, Pathways for Prosperity Commission
- Australian Public Service

Publications

- Government responses and COVID-19 deaths: Global evidence across multiple pandemic waves, PLOS ONE
- How are young adults being supported during COVID-19 and beyond? A global scan of policy responses, International Public Policy Observatory
- A Year of Living Distantly: Trends in the Use of Stay-at-Home Orders Over the First 12 Months of the COVID-19 Pandemic, SSRN
- A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker), Nature Human Behaviour
- Education during the COVID-19: crisis Opportunities and constraints of using EdTech in low-income countries, Revista de Educación a Distancia (RED)

Developing the Oxford COVID-19 Government Response Tracker (OxCGRT)

A global panel database of pandemic policies

Toby Phillips

Abstract

In March 2020, researchers and students at Oxford's Blavatnik School of Government developed the Oxford COVID-19 Government Response Tracker (OxCGRT), a dataset that addresses the need for continuously updated, readily usable and comparable information on policy responses to the pandemic. From 1 January 2020, the data capture government policies related to closure and containment, health, economic policy, and vaccination campaigns for more than 180 countries, plus several countries' subnational jurisdictions. Building the database in real time during an unfolding global crisis has unique challenges: significant policy variation within jurisdictions, and the emergence of new policy interventions over time. Developing this dataset has enabled researchers and policymakers to explore the effects of policy responses on the spread of COVID-19 cases and deaths, as well as on economic and social welfare.

Developing the Oxford COVID-19 Government Response Tracker

A global panel database of pandemic policies

Wednesday 25 August

Toby Phillips
Executive Director, OxCGRT
toby.phillips@bsg.ox.ac.uk
Twitter: @TobyMPhillips

What is the Oxford COVID-19 Government Response Tracker (OxCGRT) for?

- Back in March 2020, we wanted to know what was happening and answer key research questions on these new pandemic policies.
  - The data didn't exist, so we created it.
- OxCGRT provides a systematic cross-national, cross-temporal measure of how government responses have evolved over the full period of the disease's spread.
- Helps answer two critical research questions:
  - What leads governments to adopt different policies?
  - What effects do government responses have, How do effects vary across different populations, countries, and contexts?

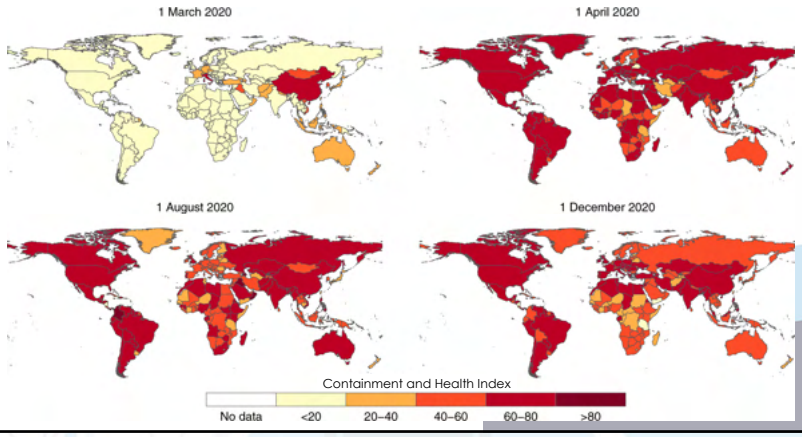
Our approach (see www.bsg.ox.ac.uk/covidtracker)

- 23 indicators in closure and containment, health, and economic policy (latest missing from table: elderly care homes)
- Recorded on ordinal scale to capture not just the presence but also the degree of response.
- 4 simple linear indices that are normalized to vary from 0 to 100.
- 185+ countries.
- Subnational coding for the US, Brazil, UK, Canada, China (and growing to include Australia and India).
- The database is freely available online and updated continuously.

ID	Name	Type	Targeted/ General?
Containment and Closure			
C1	School closing	Ordinal	Geographic
C2	Workplace closing	Ordinal	Geographic
C3	Cancel public events	Ordinal	Geographic
C4	Restrictions on gathering size	Ordinal	Geographic
C5	Close public transport	Ordinal	Geographic
C6	Stay at home requirements	Ordinal	Geographic
C7	Restrictions on internal movement	Ordinal	Geographic
C8	Restrictions on international travel	Ordinal	No
Economic Response			
E1	Income support	Ordinal	Sectoral
E2	Debt/contract relief for households	Ordinal	No
E3	Fiscal measures	Numeric	No
E4	Giving international support	Numeric	No
Health Systems			
H1	Public information campaign	Ordinal	Geographic
H2	Testing policy	Ordinal	No
H3	Contact tracing	Ordinal	No
H4	Emergency investment in healthcare	Numeric	No
H5	Investment in Covid-19 vaccines	Numeric	No
H6	Facial coverings	Ordinal	Geographic
H7	Vaccination Policy	Ordinal	Cost
H8	Protection of elderly people	Ordinal	Geographic
Vaccine Policies			
V1	Vaccine prioritisation	Categorical	No
V2	Vaccine eligibility/availability	Categorical	No
V3	Vaccine financial support	Categorical	No
Miscellaneous			
M1	Other responses	Text	No

Supporting decision-makers

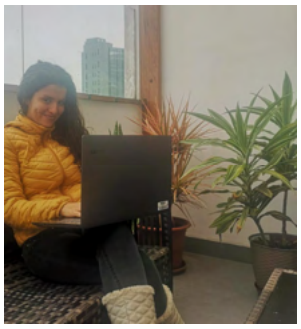
- Policymakers around the world use our data to understand what is happening, in real time.

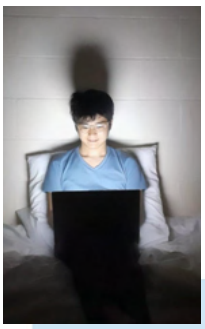


4

Our approach (see www.bsg.ox.ac.uk/covidtracker)

- **Collaborative citizen science**: Data is collected and reviewed in real time by a team of global volunteers. Around 200 at any given time. Almost 1000 people over the course of the project.





- Human judgement > automation.

Our volunteers (see www.bsg.ox.ac.uk/covidtracker)

Data is collected from public sources by a team of over one hundred Oxford University students and staff from every part of the world.

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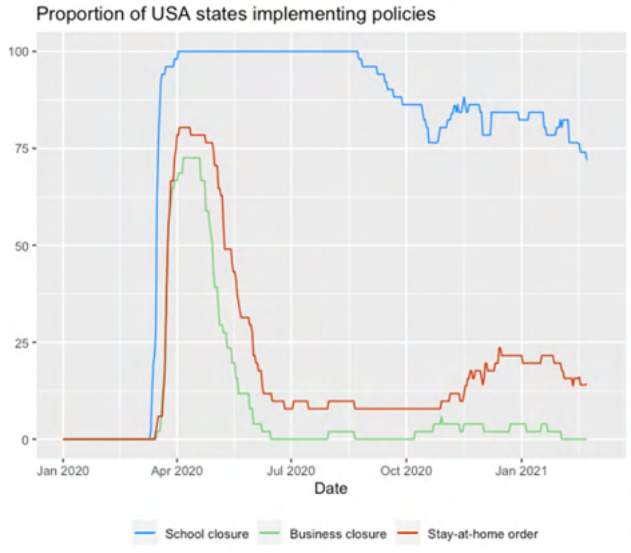
Nupur Suhas Bhise, Oksana Matilash, Olga Romanova, Olivia Route, Onkar Deep, Pamela Gongora Salazar, Pamela Quevedo Joia Duarte da Costa, Paola Del Carpio Ponce, Paola Schietekat Sedas, Paraskevas Christodoulopoulos, Patricia Silva Castillo, Patrick Rehill, Paul Anderson, Paul Lawson, Pedro Arcain Riccetto, Pedro Riquelme Gonzalez, Pedro Santana Schmalz, Pollyana Pacheco Lima, Prabhakar Chandramouli, Prakrit Prasad, Pranav Bhatia, Prarthna Srivastava, Praveen Rajendran, Precious Oluwadara Olajide, Prianka Rao, Primrose Adjepong, Priya Lakshmy Tbalasubramaniam, Priyanka Bijlani, Purna Chandra Panda, Qianyi Ye, Qing Yang, Qingling Kong, Qiyuan Dong, Quynh Lam Vo (Lam), Rachel Dixon, Rachelle Koch, Rafa Andre Silva, Rafael Goldszmidt, Rahima Hanifa, Rancy Chadha, Randy Taufik, Raymond Pottebaum, Rayssa Deps Bolelli, Rene' Landers, Rhona Rahmani, Ricardo Miranda Rocha Leitao, Richard Florance, Richard James Chapler, Jr., Robert Gorwa, Roda Mohammed, Rodrigo Furst de Freitas Accetta, Rose Wachuka Macharia, Rotimi Elisha Alao, Roxana Tatiana Flores Ibarra, Roy Barnes, Ruolan Xie, Rushay Naik, Ruwa Mahdi, Sa'id Gaya, Saba Mahmood, Safa Khan, Sagar Grewal, Sakina Bano Mendha, Salim Salamah, Sam Webster, Samantha Harris , Samson Leung, Samuel Kidane, Samuel Smith, San Jameson, Sandra Nwaobi, Sandra Sajeev, Saptarshi Majumdar, Sara Sethia, Sasidhar Gali, Scarlett Harbin-Owens, Scott Latham, Scott McCullers, Sena Pradipta, Serene Singh, Seun B. Adebayo, SeungCheol Ohk, Seungeun Yi, Shabana Basij-Rasikh, Shane Fitzsimons, Shannon Costello, Shannon Murray, Shannon Smith, Sharon Farrell, Shelly Lim, Shengchang Zhang, Shirley Chen, Shiwen Lai, Shoaib Khan, Shubo Zhang, Siddharth K Prakash, Silvia Shen, Simon Powell, Simphiwe Stewart, Siqi Liu , Siu Cheng, Siyang Jiang, Sonya Amin, Sophie Pearlman, Soumaya Belaid, Stefaan Sonck Thiebaut, Stefan Holzheuser, Stephanie Guyett, Stephen Hayes, Suganthan Asokan, Suryodeep Mondal, Swathi Rayasam, Syed Shoaib Hasan Rizvi, Sze Oh, Sze Tung Lam, Tais Pelinson Gomes da Silva, Tamoi Fujii, Tania Calle, Tanyah Hameed, Tatianna Mello Pereira da Silva, Tatsuya Yasui, Taynã Mendes, Tebello Qhotsokoane, Teresa Soter Henriques, Terrence Epie, Teruki Takiguchi, Tetsekela Anyiam-Osigwe, Thayla Bicalho Bertolozzi, Thayslene Marques Oliveira, Theo Bernard, Thi Yen Chi Nguyen, Thiago William Pereira Barcelos, Thomas Benson, Thomas Birdseye, Thomas Boby, Thomás Castanheira Manfrinatti, Thomas Mbuotidem Jeremiah, Thomas Rowland, Thomas Stubbs, Tilbe Atav, Tim Nusser, Tina Chim, Tiphaine Le Corre, Tiwa Igbomuaye, Toby Phillips, Tom Hale, Trevor Edobor, Twan van der Togt, Ubah Dashir, Ulla Mikkelsen, Ulrike Gruber-Gremlich, Ursula Panzner, Ursule Demael, Uttara Narayan, Vedant Shukla, Veronique Gauthier, Vian Wagatsuma, Victor Mtaki, Victoria Cavero, Vijay Krishna Palepu, Vinicios Javaroni, Vinicius Sanches Pontirolle, Vinicius Tadeu Silvério dos Santos, Viviane de Assis Ignacio, Walter Vinicius Ribeiro Cancelieri, Wei Sean Melvin Ting, Will Bennett, Will Marshall, William Dowling, William Hart, Winni Yang, Xema Pathak, Xiangyun Ren, Xingyan Lin, Xingyue Yang, Xinrui Wang, Yanjun Lu, Yanying Lin, Yaowen Deng, Yash Kamath, Yasmin de Sousa Pinheiro, Ye Chen, Yexuan Zhu, Yingju Zheng, Yishan Yuan, Yiwen Sun , Yiwen Zhang, Yixin Pu, Yizhou Pan, Yueying Zhang, Yulia Taranova, Yuxi Zhang, Yuxin Ma, Zachary Adnane, Zachary Parsons, Zara Abdurahaman, Zara Raheem, Zelie Kasten, Zhengyu Zhang, Zijia Tan, Zile Huma, Zilin Tu, Ziqi Zhou, Ziqing Huang, Zixuan Fu, Ziya Utku Karadeniz, Ziyue Chen, Zoe Lin, Zoha Minal Imran, Zongyue Liu, Zunaira Mallick.

Some challenges building our system on the fly

Significant subnational variation

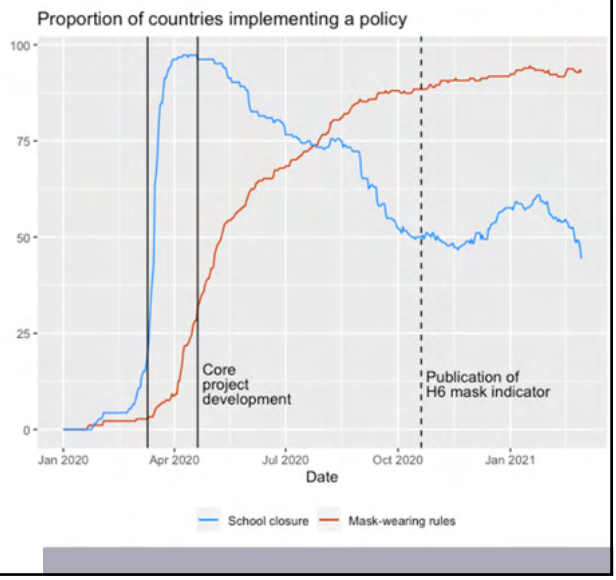
- We report the most stringent policy in a jurisdiction.
- For most indicators, we capture subnational variation with a binary variable:
  1 = policy applies country-wide
  0 = policy is geographically targeted
- But this doesn't tell the user how many people are affected, or *where* the relevant most-stringent policy is.



8

Common approaches change over time

- We launched the project with 7 indicators, and quickly expanded to 11 in the first month.
  - These were based on salient policies at the time.
- It has been a constant game of catch up, adding new indicators.
- Now, if we want to add a new indicator, it requires recording 230,000 data points.



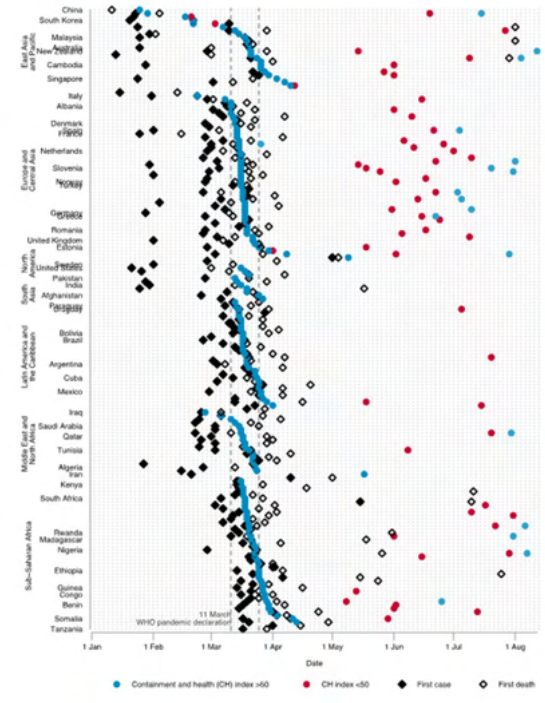
9

A few patterns and findings

A few patterns

- Early pandemic (March-April 2020):
  - The initial ramp up – global convergence
  - Policy sequencing in the initial ramp up, and in early easing
- Divergence and early easing (May 2020 onwards):
  - Strong initial behavioural responses: early data
  - Lesser global consistency in policy easing, and thereafter ("flexibilization")
- As the pandemic extends (into 2021):
  - Regional tendencies in stay-at-home policies
  - Path-dependency in stay-at-home policies

Jumping on the bandwagon?



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Regional trends

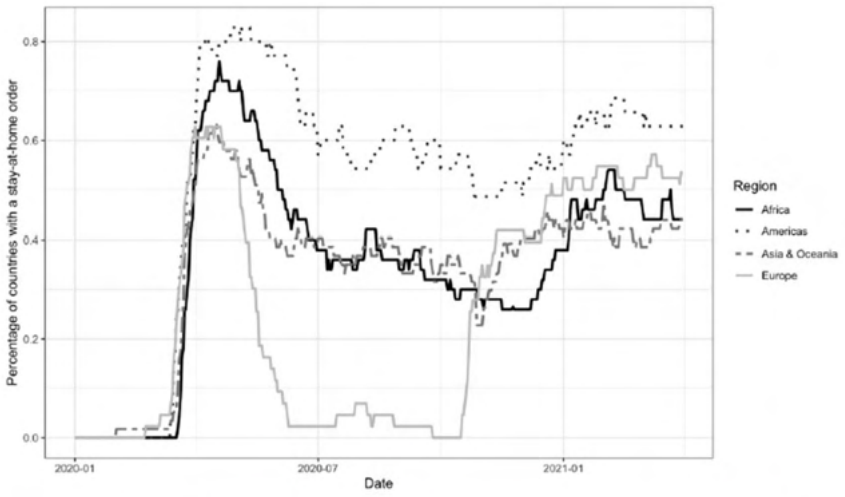
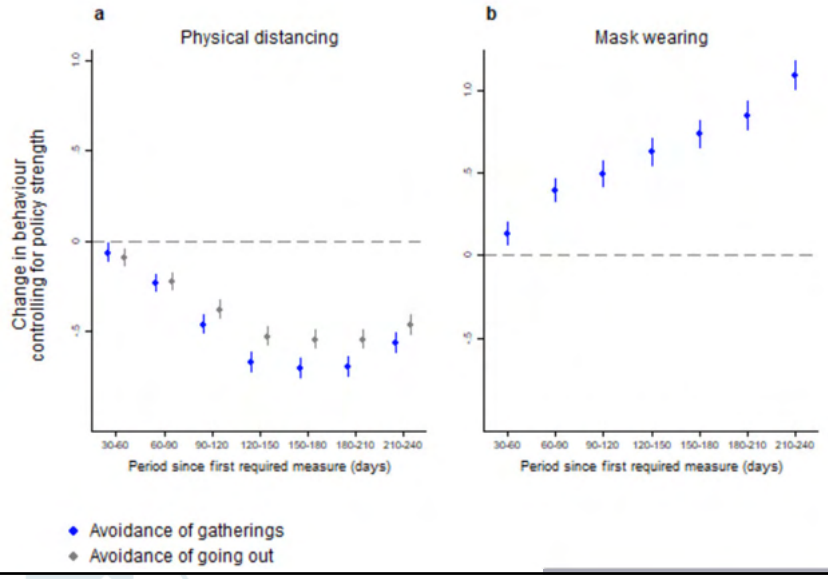


Figure 1. The proportion of countries implementing stay-at-home orders varied significantly between regions over the middle months of 2020

Patterns in compliance



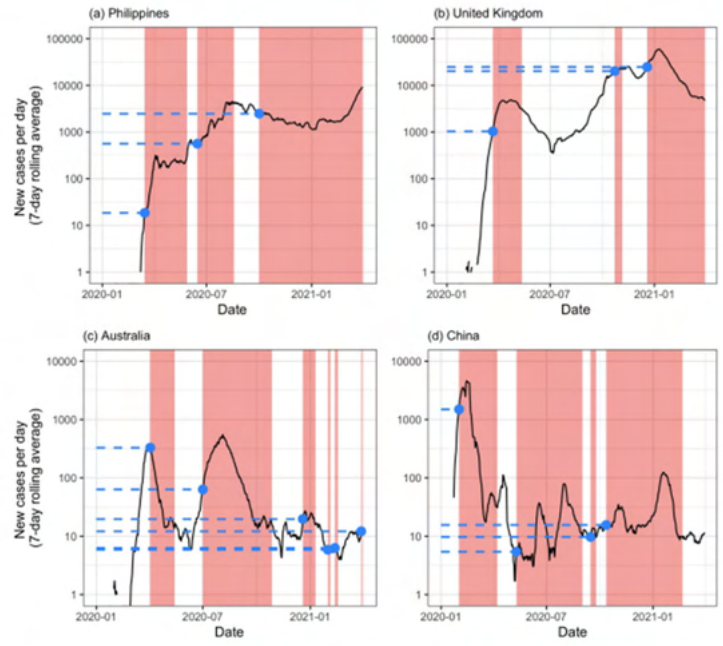


Figure 2. Reported case levels at the point of implementing stay-at-home orders in four countries

Path-dependence in stay-at-home Policies (1)

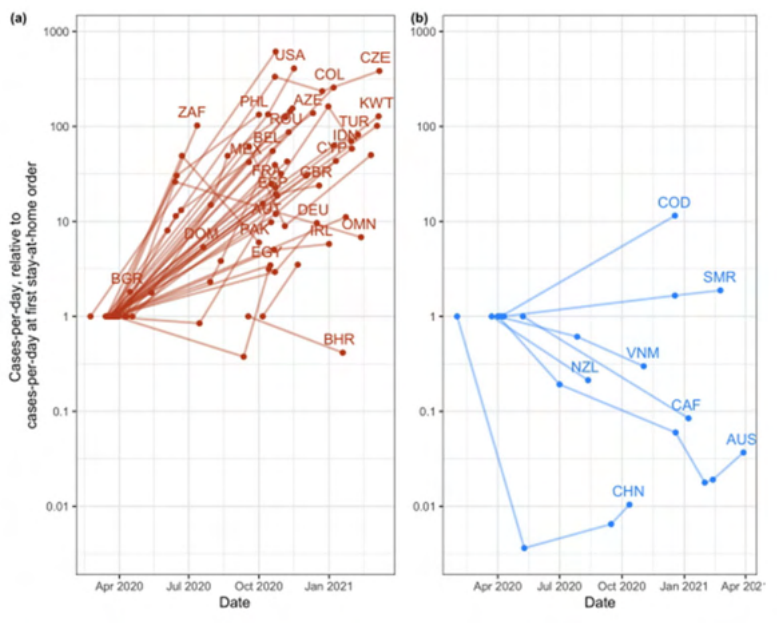


Figure 3. Countries implement stay-at-home orders at different levels of daily confirmed COVID-19 cases as the pandemic progresses

Path-dependence in stay-at-home Policies (2)

What's next?

- More jurisdictions (Australia, India, US counties)
- Exemptions for vaccinated people
- More detailed indicators for testing, tracing, surveillance

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Thank you.

Tomoya Saito | Speaker

- Position: Director
- Center for Emergency Preparedness and Response, National Institute of Infectious diseases
- Economy: Japan

Educational Background

- MD in Keio University School of Medicine
- MPH in Johns Hopkins Bloomberg School of Public Health
- PhD in Keio University Graduate School of Medicine

Professional Career

- Keio University
- Ministry of Health Labour and Welfare
- National Institute of Public Health
- National Insitute of Infectious Diseases

Publications

- Misaki T, Saito T, Okabe N. Building a robust interface between public health authorities and medical institutions in a densely populated city: State-of-the-art integrated pandemic and emerging disease preparedness in the Greater Tokyo Area in Japan. In: Inoculating Cities: Case Studies of Urban Pandemic Preparedness. Ed. Katz R and Boyce M. Academic Press, London, United Kingdom. 2021.
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- Naruse H, JindaiK and Saito T. Fictional heroes take on real public health problems: Japan's use of manga and anime in health campaigns. BMJ opinion. https://blogs.bmj.com/bmj/2019/06/11/fictional-heroes-take-on-real-public-health-problems-japans-use-of-manga-and-anime-in-health-campaigns

COVID-19 and Mass Gathering Events in Japan

Tomoya Saito

Abstract

Since the emergence of COVID-19, Japan has focused on early detection and active field investigation to discover its characteristics. We identified the three environmental risk factors for forming COVID-19 clusters, which is called “3Cs” (Closed spaces, Crowded places and Close-contact settings), and have taken measures to prevent such environment and behavior to control the disease. Although Japan does not have a law that enforces a city lockdown, the Government of Japan (GOJ) has encouraged “behavior change” to citizens to refrain from high-risk environment. In addition, by declaring a state of emergency, GOJ asked people to refrain from unnecessary going out to reduce the social contact to contain a surge of epidemic. A vaccination campaign has been implemented since February 2021, but it is becoming increasingly difficult to control the people’s behavior, and we are now facing the fifth wave of an unprecedented surge of cases.

Japan has scheduled to host the Tokyo Olympics and Paralympics in 2020 (Tokyo2020) but postponed the event for a year due to the COVID-19 pandemic. The countermeasures policy against COVID-19 for Tokyo2020 was drafted in December 2020, but the emergence of more infectious variants made it necessary to strengthen the countermeasures. In March 2021, stakeholders decided not to accept overseas spectators. Stakeholders once agreed for the

domestic spectator limit to be set at 50% of venue capacity, up to a maximum of 10,000 people at all venues taking into consideration the government's restrictions on public events in June 2021; however, no spectators were admitted in most venues considering the worsening epidemic situation. Other related mass gathering events such as live site events were all canceled.

Under the "Playbook", athletes and stakeholders were expected to take prevention measures and to be screened frequently during the visit. The 14-day self-quarantine was imposed on all entrants to the country in principle, except for visits to pre-approved locations such as training grounds.

In this talk, the interim results of a screening program and enhanced surveillance will be presented and discussed.

Wei-Sen Li | Moderator

- Position: Secretary General
- Organization: National Science and Technology Center for Disaster Reduction
- Economy: Chinese Taipei

Educational Background

- Ph. D, National Central University

Professional Career

- Secretary General, National Science and Technology Center for Disaster Reduction
- Adjunct Associate Professor, National Cheng Kung University
- Adjunct Assistant Professor, National Central University

Publications

- Yanling Lee, Kenji Watanabe, Wei-Sen Li (2019). Public Private Partnership Operational Model-A conceptual study on implementing scientific-evidence-based / integrated risk management at regional level. Journal of Disaster Research. Vol. 14 No. 4
- Yanling Lee, Kenji Watanabe, Wei-Sen Li (2018). Enhancing Regional Digital Preparedness on Natural Hazards to Safeguard Business Resilience in the Asia-Pacific. Springer International Publishing: Chap 14Wei-Sen Li, Hongey Chen (2017, Feb). Innovations and Investments on Science and Technology for Disaster Risk Reduction. 2017 11th APEC Emergency Preparedness Working Group Meeting, Nha Trang, Viet Nam..
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- Wei-Sen Li, Hongey Chen (2017, Feb). Innovations and Investments on Science and Technology for Disaster Risk Reduction. 2017 11th APEC Emergency Preparedness Working Group Meeting, Nha Trang, Viet Nam..
- Wei-Sen Li, Hongey Chen (2017, Feb). Reviews and Reflections on 2016 Typhoon Season in Chinese Taipei. 2017 11th APEC Emergency Preparedness Working Group Meeting, Nha Trang, Viet Nam.

I-Cheng Mark Chen | Speaker

- Position: Consultant
- Organization: National Public Health and Epidemiology Unit National Centre for Infectious Diseases
- Economy: Singapore

Educational Background

- MBBS, MPH, PhD

Professional Career

Dr Mark Chen is an epidemiologist working in the area of communicable diseases surveillance, at the National Public Health and Epidemiology Unit and the Infectious Diseases Research and Training Office in the National Centre for Infectious Diseases Singapore.

Publications

- Bulletin of the World Health Organization 99 (2), 92
- Value in Health 24 (5), 714-723
- Sexually Transmitted Infections 97 (3), 215-220
- The Lancet Microbe Volume 2, Issue 6, June 2021, Pages e240-e249
- The Lancet Infectious Diseases 21 (3), 333-3432

Digital Health for COVID-19 Decision Support and Epidemic Intelligence in Singapore

I-Cheng (Mark) Chen

Abstract

In the early phase of the COVID-19 pandemic, before testing was widely available, we built and then attempted a syndromic surveillance algorithm to look for signals in data from electronic healthcare records. The surveillance algorithm relied on free text notes coded using a Natural Processing Language algorithm we had previously developed, and could discern a faint signal of excess consults in a period coinciding with the rise in confirmed cases of COVID-19 in Singapore.

While the need for such a syndrome based system has now been superseded by widespread testing of all acute respiratory illness episodes for COVID-19, it provides proof-of-concept that a similar system could be routinely used to scan for case definitions to detect other infections of concern.

We also discuss how such a system may need to be paired with digital health surveillance systems for gathering data not just on syndromes but also healthseeking behaviour directly from the public, both for COVID as well as other infections. The future may involve an interactive loop where digital health is also used with surveillance data to drive healthseeking behaviour, self-testing, and then further collates the results to feed into our systems for infectious disease surveillance using integrated digital health modalities.

Kamran Khan | Speaker

- Position: CEO/Founder
- Organization: BlueDot
- Economy: Canada

Educational Background

- MPH, School of Public Health, Columbia University, New York City, New York, United States
- MD, Department of Medicine, University of Toronto, Toronto, Ontario, Canada
- Dr. Khan also holds various certificate in preventative medicine, infectious disease and clinic effectiveness.

Professional Career

- Founder, BlueDot Inc. Toronto, Ontario, Canada
- Professor, Department of Medicine, Division of Infectious Diseases, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada
- Professor, Institute of Health Policy, Management, and Evaluation, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada
- Clinician-Scientist, Division of Infectious Diseases, Department of Medicine, St. Michael's Hospital, Li Ka Shing Knowledge Institute, Toronto, Ontario, Canada

Publications

- Estimating internationally imported cases during the early COVID-19 pandemic. Nature Communications. 2021 Jan;12 (1):311. PMID:33436574. JIF 12.12. Coauthor or Collaborator.
- Modelling airport catchment areas to anticipate the spread of infectious diseases across land and air travel. Spatial and Spatiotemporal Epidemiology. 2021 February; 36 (100380). Accepted. Coauthor or Collaborator.
- Establishment and lineage dynamics of the SARS-CoV-2 epidemic in the UK. Science. 2021 January 8. PMID:33419936. JIF 41.484. Coauthor or Collaborator
- The Lancet Infectious Diseases. 2020 July 30; PMID:32738934. JIF 24.446. Coauthor or Collaborator.
- Coast-to-Coast Spread of SARS-CoV-2 during the Early Epidemic in the United States. Cell. 2020. PMID:32386545. JIF: 36.216. Coauthor or Collaborator.

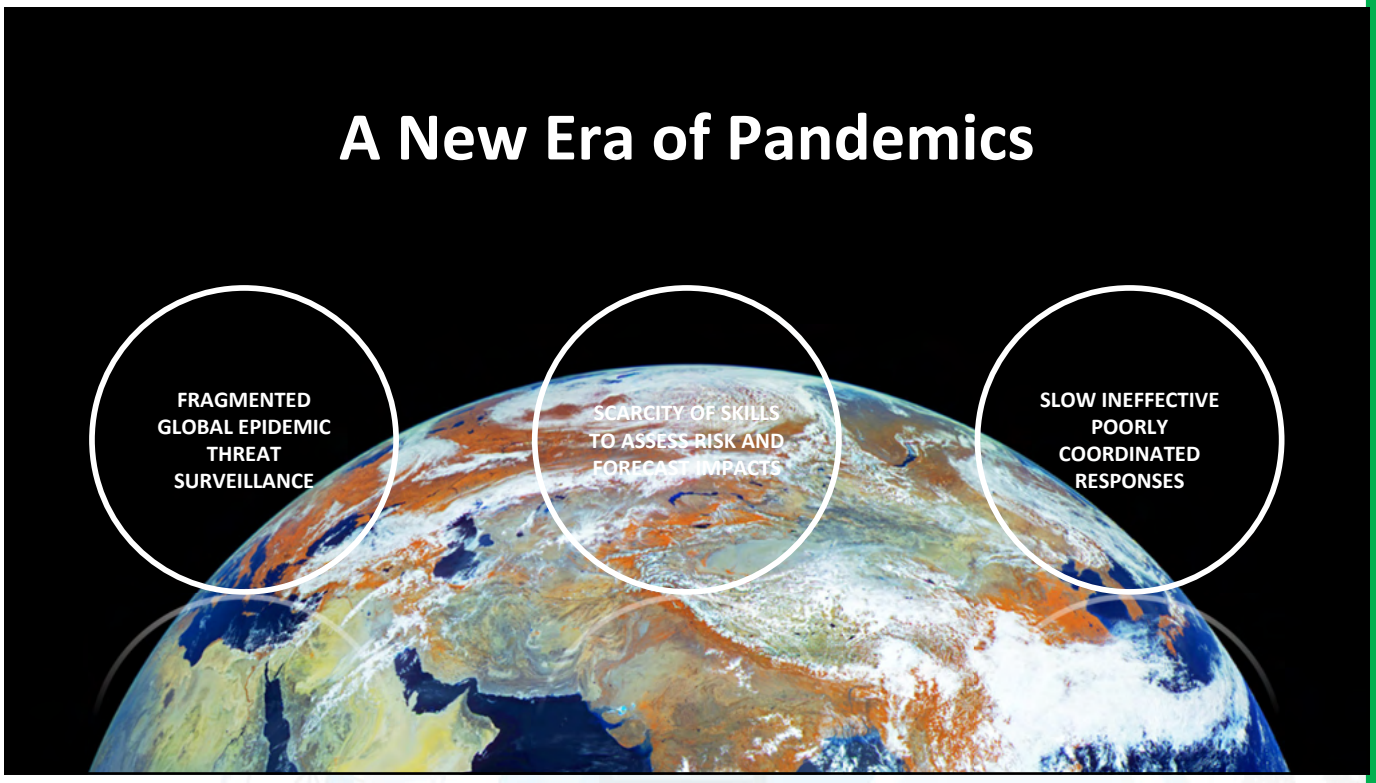
Spreading Knowledge Faster than Outbreaks

Kamran Khan

Abstract

The world has entered a new era of epidemics and pandemics. To prevent or mitigate their health, economic, and social impacts, public and private sector organizations must move faster than epidemics themselves. This presentation will discuss an eight-year initiative building a global epidemic intelligence platform to strengthen early threat detection, facilitate rapid risk assessments, and empower timely responses to emerging epidemics. Specifically, the presentation will describe how the platform was utilized to generate timely insights and inform public health interventions and policies over the course of the COVID-19 pandemic.


Spreading Knowledge Faster than Outbreaks
Digital Tools for Addressing Infectious Diseases in the Asia-Pacific Region: Challenges and Opportunities
Kamran Khan MD, MPH, FRCPC
Founder & CEO
BlueDot
Professor
Faculty of Medicine, Division of Infectious Diseases
Dalla Lana School of Public Health
University of Toronto
Physician-Scientist
St. Michael's Hospital
Li Ka Shing Knowledge Institute


A New Era of Pandemics
FRAGMENTED GLOBAL EPIDEMIC THREAT SURVEILLANCE
SCARCITY OF SKILLS TO ASSESS RISK AND FORECAST IMPACTS
SLOW INEFFECTIVE POORLY COORDINATED RESPONSES

该文件称，根据上级紧急通知，武汉市部分医疗机构陆续出现不明原因肺炎病人。各医疗机构要强化门急诊管理，严格执行首诊负责制，发现不明原因肺炎病人积极调动力量就地救治，不得出现拒诊推诿情况。

文件还强调，各医疗机构要有针对性地加强呼吸、感染科、重症医学等多学科专业力量，畅通绿色通道，做好门诊和急诊之间的有效衔接，完善医疗救治应急预案。

因相关文件中均写的是"不明原因肺炎"，网上迅速有"SARS冠状病毒"的传言。

不过，在12月31日下午，武汉市卫健委发布了最新的情况通报。

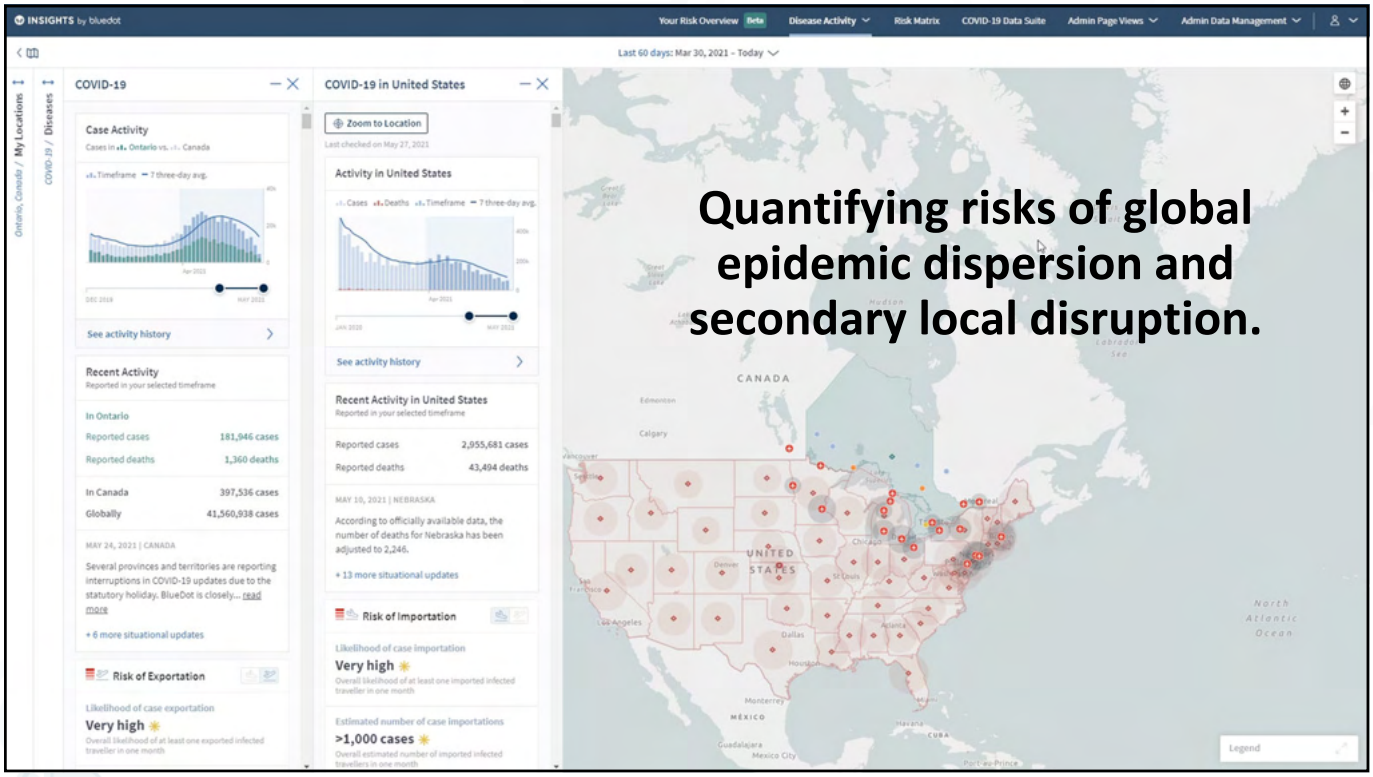
情况通报披露，近期部分医疗机构发现接诊的多例肺炎病例与华南海鲜城有关联，市卫健委接到报告后，立即在全市医疗卫生机构开展与华南海鲜城有关联的病例搜索和回顾性调查，目前已发现27例病例，其中7例病情严重，其余病例病情稳定可控，有2例病情好转拟于近期出院。

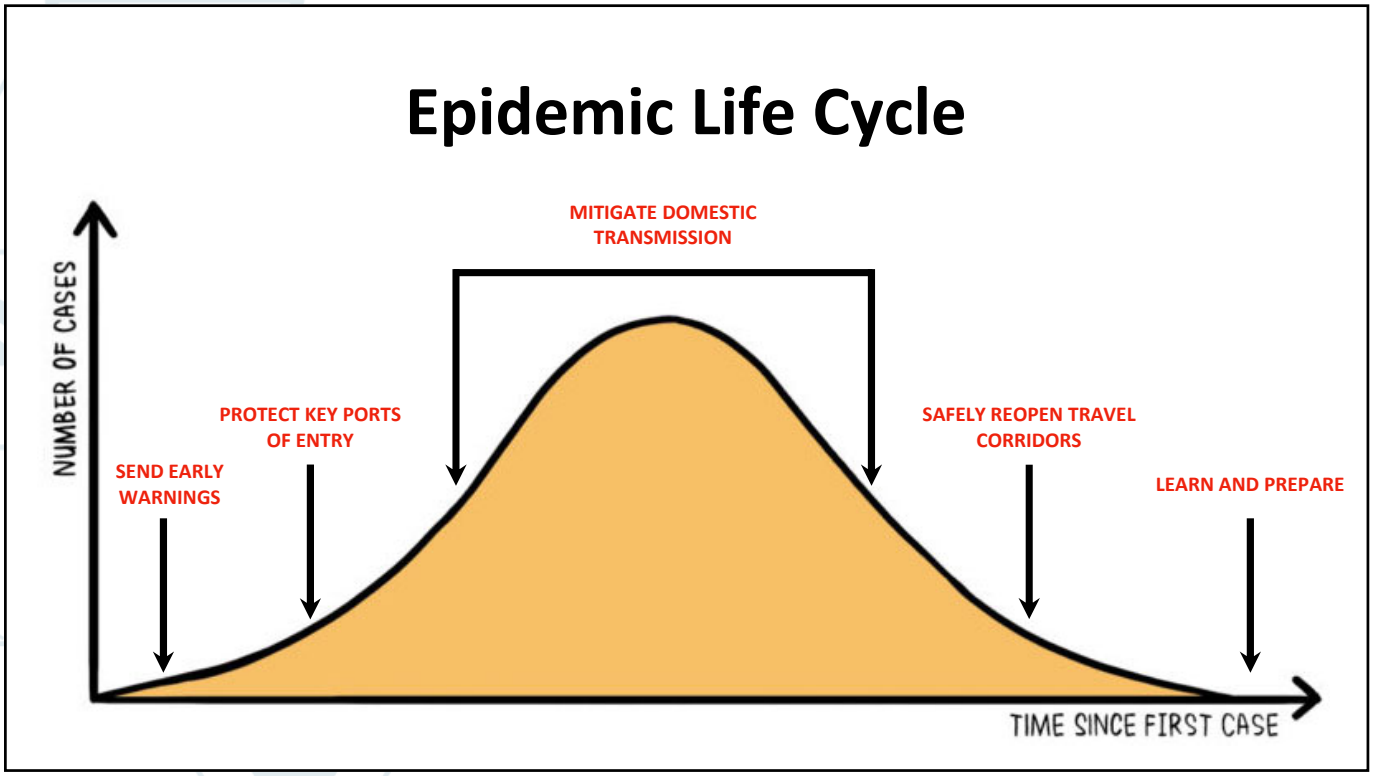
病例临床表现主要为发热，少数病人呼吸困难，胸片呈双肺浸润性病灶。目前，所有病例均已隔离治疗，密切接触者的追踪调查和医学观察正在进行中，对华南海鲜城的卫生学调查和环境卫生处置正在进行中。

Leveraging AI to augment human capacity for global threat detection.

Integrating global threat detection with local human population mobility analytics.

Linking local and global human population mobility analytics.


INSIGHTS by bluedot
Your Risk Overview
Disease Activity
Risk Matrix
COVID-19 Data Suite
Admin Page Views
Admin Data Management
Last 60 days: Mar 30, 2021 - Today
COVID-19
COVID-19 in United States
Case Activity
Zoom to Location
Activity in United States
See activity history
Recent Activity
In Ontario
Reported cases 181,946 cases
Reported deaths 1,360 deaths
In Canada 397,536 cases
Globally 41,560,938 cases
Several provinces and territories are reporting interruptions in COVID-19 updates due to the statutory holiday. BlueDot is closely... read more
+ 6 more situational updates
Risk of Exportation
Likelihood of case exportation
Very high
Recent Activity in United States
Reported cases 2,955,681 cases
Reported deaths 43,494 deaths
According to officially available data, the number of deaths for Nebraska has been adjusted to 2,246.
+ 13 more situational updates
Risk of Importation
Likelihood of case importation
Very high
Estimated number of case importations
>1,000 cases
Quantifying risks of global epidemic dispersion and secondary local disruption.
CANADA
UNITED STATES
MÉXICO
CUBA
North Atlantic Ocean
Legend


Epidemic Life Cycle
MITIGATE DOMESTIC TRANSMISSION
PROTECT KEY PORTS OF ENTRY
SAFELY REOPEN TRAVEL CORRIDORS
SEND EARLY WARNINGS
LEARN AND PREPARE
NUMBER OF CASES
TIME SINCE FIRST CASE

Deliver early-warning signals in near-real-time.

Near real-time disease alerts based on what's relevant to you.

New Event —

Undiagnosed respiratory syndrome in China

With sources from: NEWS MEDIA

You are receiving this notification because you've set Unknown to "Always Notify".
To edit your disease preferences, visit your custom settings.

LOCAL TRANSMISSIBILITY UNKNOWN: Insufficient data about Unknown's potential for local transmission.

From: BlueDot Insights <Insights@bluedot.global>
Date: December 31, 2019 at 9:59:53 AM EST
To:
Subject: Undiagnosed respiratory syndrome in China

Brief

Cases of unidentified severe pneumonia have been reported in Wuhan, Hubei. On late, December 30, 2019, the Wuhan Health and Medical Commission issued an emergency alert highlighting that there have been more than 20 cases of a severe respiratory syndrome in individuals associated with the Wuhan South China Seafood Market. The cause is not yet identified. The National Health Commission sent a group of specialists on December 31, 2019, for further inspections to the Market. The Provincial Center for Disease Control and Prevention continues to analyze specimens from affected cases to identify the cause of the disease. While investigations are ongoing, all cases remain under isolation and contact tracing has started. Local health officials remind the public to remain vigilant and that official information will be provided as soon as it is available.

Mode of Transmission

-

Incubation Period

-

BlueDot protects people around the world from infectious diseases with data-driven technologies.
Update notification settings

Predict the most at-risk ports of entry.

Journal of Travel Medicine, 2020, 1–3
doi: 10.1093/jtm/taaa008
Rapid Communi

Rapid Communication

Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel

Isaac I. Bogoch[1,2,*], Alexander Watts[3,4], Andrea Thomas-Bachli[3,4], Carmen Huber[3,4], Moritz U.G. Kraemer[5,6] and Kamran Khan[1,3,4]

[1]Department of Medicine, University of Toronto, Toronto, Canada, [2]Divisions of General Internal Medicine and Infectious Diseases, University Health Network, Toronto, Canada, [3]Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Canada, [4]BlueDot, Toronto, Canada, [5]Department of Zoology, University of Oxford, Oxford, UK and [6]Centre for the Mathematical Modelling of Infectious Diseases, London School of Hygiene & Tropical Medicine, London, UK

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Submitted 8 January 2020; Revised 9 January 2020; Editorial Decision 10 January 2020; Accepted 10 January 2020

Abstract

There is currently an outbreak of pneumonia of unknown aetiology in Wuhan, China. Although there are still several unanswered questions about this infection, we evaluate the potential for international dissemination of this disease via commercial air travel should the outbreak continue.

Key words: SARS, air travel, coronavirus, pneumonia, outbreak, zoonosis

On 30 December 2019, a report of a cluster of pneumonia of unknown aetiology was published on ProMED-mail, possibly related to contact with a seafood market in Wuhan, China.[1] Hospitals in the region held an emergency symposium, and support from federal agencies is reportedly helping to determine the source of infection and causative organism. The seafood market has since been closed, but purportedly sold a variety of live animal species. On 5 January 2019, the World Health Organization (WHO) published a document outlining their request for more information from Chinese public health authorities, and detailed 44 patients had 'pneumonia of unknown aetiology', with 121 close contacts under surveillance (www.who.int/csr/don/05-january-2020-pneumonia-of-unkown-cause-china/en/). The WHO reported that 11 patients were severely ill, and many affected individuals had contact with the Huanan Seafood market. Some patients were reported to have fever, dyspnea and pulmonary infiltrates on chest radiography. At the time of publication, limited information has been produced directly by Chinese public health authorities; however, media reports documenting interviews with such authorities have stated that the aetiology is not yet identified, that there are now 59 affected patients, and that severe acute respiratory syndrome (SARS), the Middle East respiratory syndrome (MERS), avian influenza and several other common respiratory pathogens have been ruled out (http://news.hebei.com.cn/system/2020/01/05/100154729.shtml). On 8 January 2019, news outlets and ProMED-mail reported that genetic sequencing demonstrated a novel coronavirus as the potential causative organism.[2] Given the recent history of zoonotic transmission of a coronavirus emerging from a live-animal market in China in 2002, and the potential for novel pathogens to rapidly spread globally via commercial air travel,[3,4] we sought to evaluate international travel patterns from Wuhan, China in order to anticipate patterns of disease dispersion should this outbreak evolve.

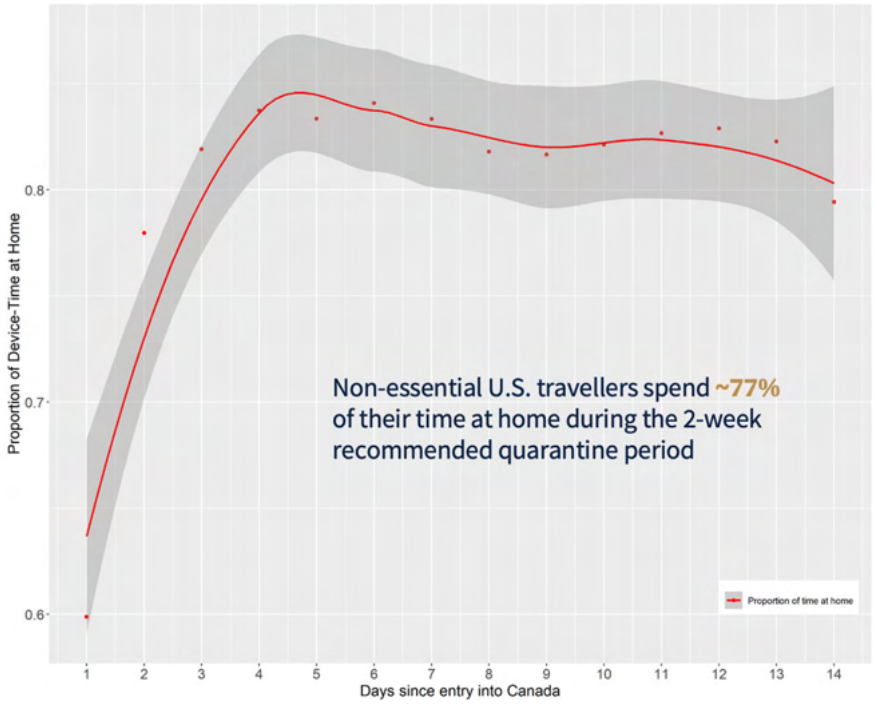
We evaluated 2018 travel data generated from the International Air Transport Association (IATA) to quantify passenger volumes originating from the international airport in Wuhan, China, between January and March, inclusive. IATA data accounts for ~90% of passenger travel itineraries on commercial flights, excluding transportation via unscheduled charter flights (the remainder is modelled using market intelligence). These data represent direct origin (Wuhan) to destination trips, and indirect

Table 1. Top 20 passenger destination cities from Wuhan, China, January–March 2018 and corresponding IDVI of destination countries

Destination city	Population* (in millions)	Destination province	Destination country	IDVI	Direct volume***	Total volume***
Bangkok	8.28	Bangkok Metropolis	Thailand	0.711	38 457	41 080
Hong Kong	7.39	Hong Kong SAR	Hong Kong SAR	0.664**	23 608	23 707
Tokyo	9.27	Tokyo	Japan	0.926	18 581	20 001
Taipei	2.62	Taipei	Taiwan	0.710	15 086	17 645
Phuket	0.39	Phuket	Thailand	0.711	14 097	16 656
Seoul	9.78	Seoul	Korea (South)	0.879	11 771	13 727
Singapore	5.61	Singapore	Singapore	0.878	8599	13 123
Kota Kinabalu	0.25	Sabah	Malaysia	0.761	12 340	12 661
Macau	0.62	Macau SAR	Macao SAR	0.664**	10 918	10 932
Denpasar Bali	0.79	Bali	Indonesia	0.563	7759	9065
Sydney	5.23	New South Wales	Australia	0.913	5093	8431
Dubai	3.14	Dubay	The UAE	0.765	6389	7389
Kuala Lumpur	1.81	WP Kuala Lumpur	Malaysia	0.761	2393	6822
Kaohsiung	2.77	Kaohsiung City	Taiwan	0.710	6373	6617
Osaka	2.69	Osaka	Japan	0.926	3062	5745
Krabi	0.46	Krabi	Thailand	0.711	5012	5718
Melbourne	4.94	Victoria	Australia	0.913	0	5648
Surat Thani	0.13	Surat Thani	Thailand	0.711	5044	5624
Chiang Mai	0.13	Chiang Mai	Thailand	0.711	4354	5293
Penang	1.77	Pulau Pinang	Malaysia	0.761	4436	5059

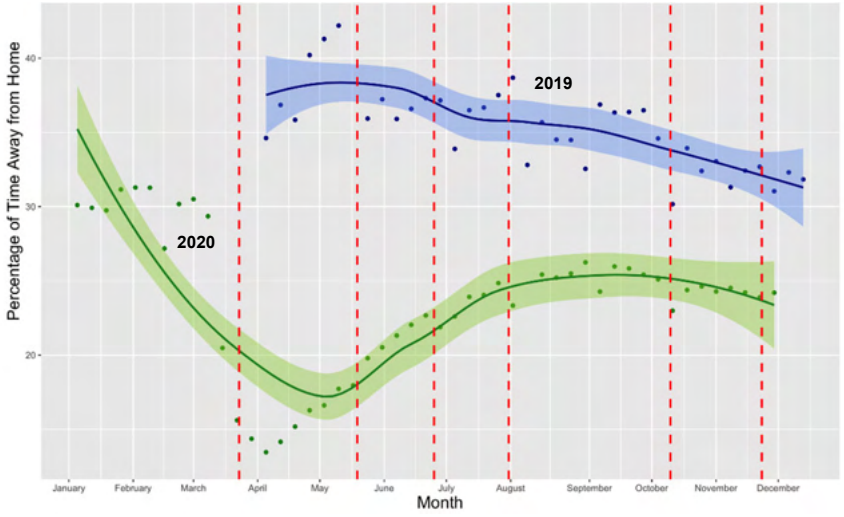
Submitted 8 January 2020;

Understand cross-border adherence to quarantine.

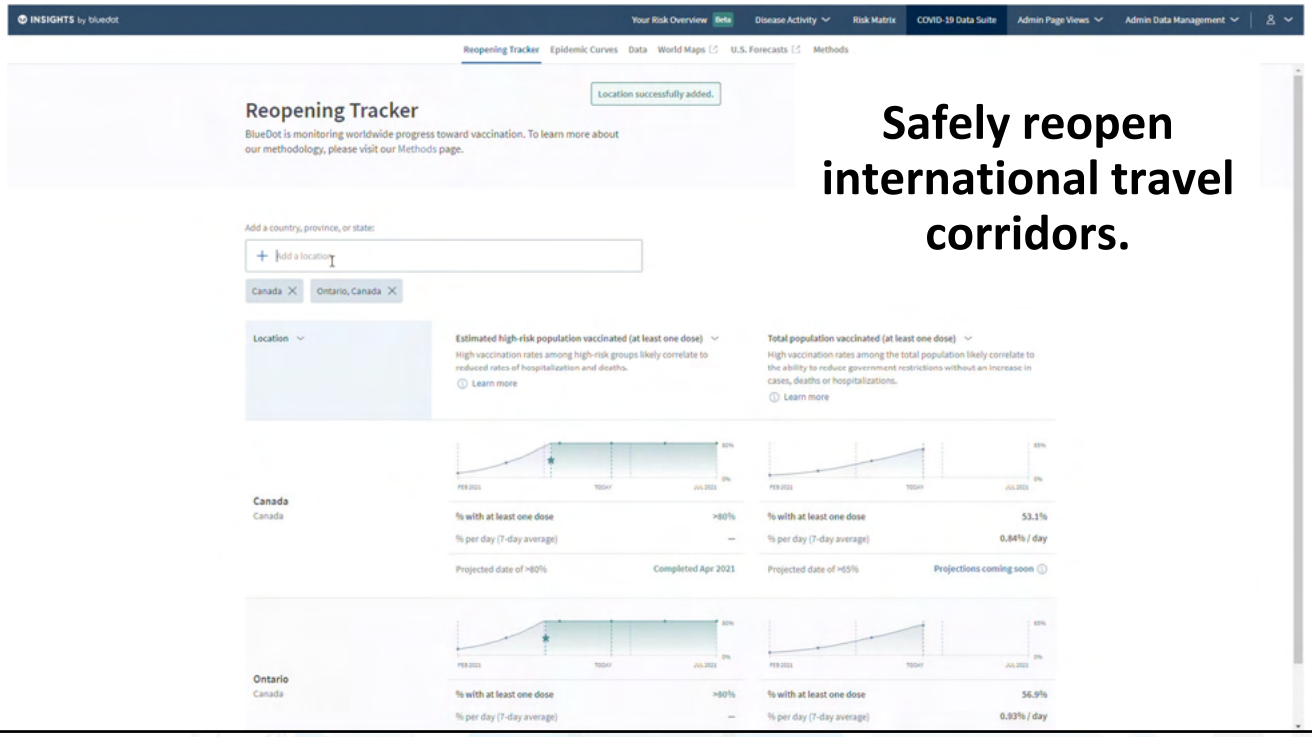


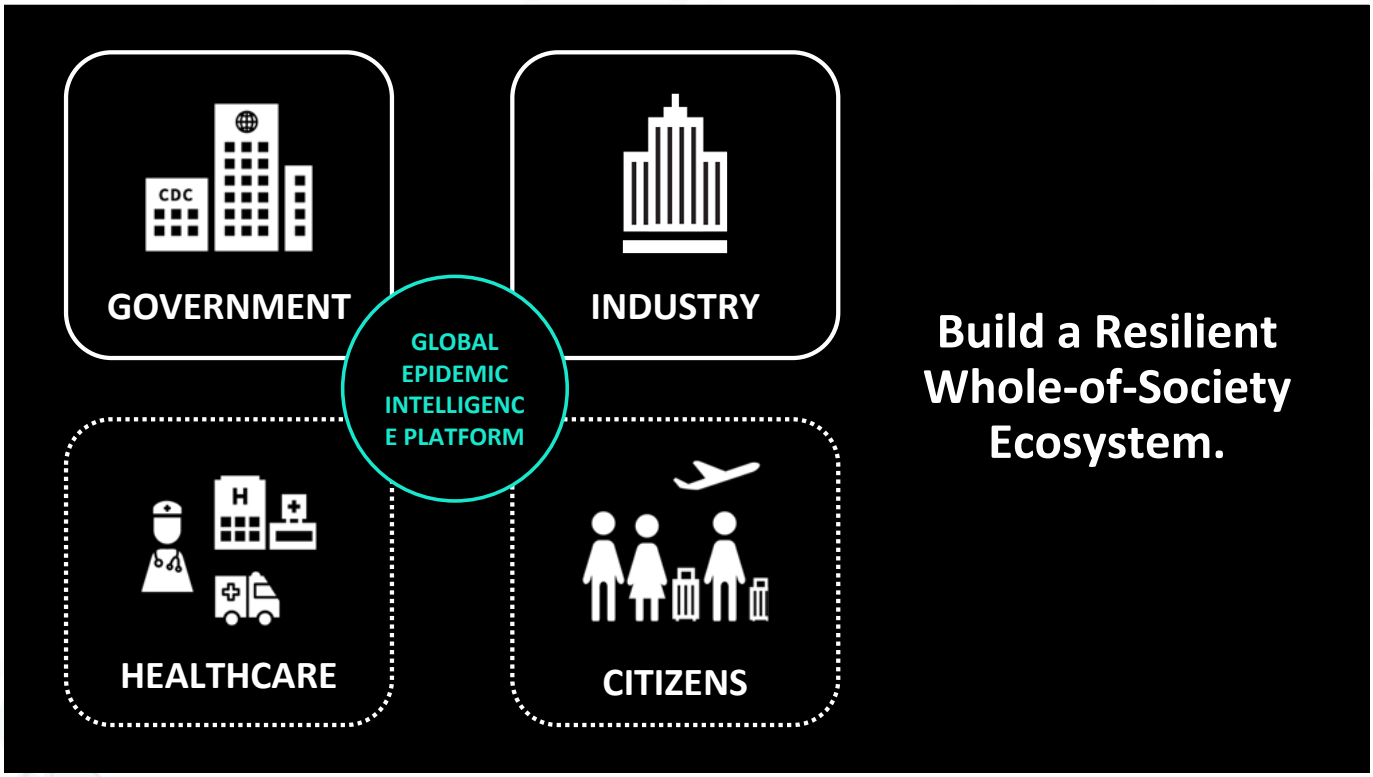
Evaluate local social distancing measures.

Understand population trends over the long haul.



Safely reopen international travel corridors.




CDC
GOVERNMENT
INDUSTRY
GLOBAL EPIDEMIC INTELLIGENCE PLATFORM
H
HEALTHCARE
CITIZENS
Build a Resilient Whole-of-Society Ecosystem.


Thank You

Benjamin Rader | Speaker

- Position: Research Fellow
- Organization: Computational Epidemiology Lab, Innovation & Digital Health Accelerator, Boston Children's Hospital
- Economy: United States

Educational Background

- PhD Candidate, Department of Epidemiology, Boston University
- Master of Public Health (MPH), Northwestern University

Professional Career

- Various roles in applied/research epidemiology

Publications

- Associations between changes in population mobility in response to the COVID-19 pandemic and socioeconomic factors at the city level in China and country level worldwide: a retrospective, observational study. Coauthor or Collaborator
- The effect of seasonal respiratory virus transmission on syndromic surveillance for COVID-19 in Ontario, Canada. Coauthor or Collaborator.
- Mask-wearing and control of SARS-CoV-2 transmission in the USA: a cross-sectional study. Coauthor or Collaborator
- Socioeconomic Disparities in Subway Use and COVID-19 Outcomes in New York City. Coauthor or Collaborator.
- Crowding and the shape of COVID-19 epidemics. Coauthor or Collaborator.

COVID-19 Digital Epidemiology, Demography and Creating Tools to Reach a Diverse Population

Benjamin Rader

Abstract

The COVID-19 pandemic has ushered in a wide range of digital tools to help track the global spread of disease. A subset of these – syndromic surveillance systems – are meant to capture disease trends and get information in the hands of public health decision makers at a time scale not typically achievable by traditional public health apparatuses. These tools generally aim to gather information on a large and representative sample to accurately report on transmission patterns in the broader population. However, these tools are often only able to capture a small segment of the population whose behaviors are not generalizable. Here, I will present three different tools that aim to overcome this barrier and capture novel information in three unique populations – the young, the privacy-concerned, and individuals residing in low- and middle- income countries. These three systems highlight how thinking carefully about sample demographics can improve syndromic surveillance and our ability to track COVID-19.

Boston Children's Hospital
Until every child is well

COVID-19 Digital Epidemiology, Demography and Creating Tools to Reach a Diverse Population

Benjamin Rader
Graduate Research Fellow
Computational Epidemiology Lab (HealthMap)
Boston Children's Hospital

Boston Children's Hospital

HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

Agenda

- Targeting the right demographic
- Privacy first public health
- Big Data

Boston Children's Hospital

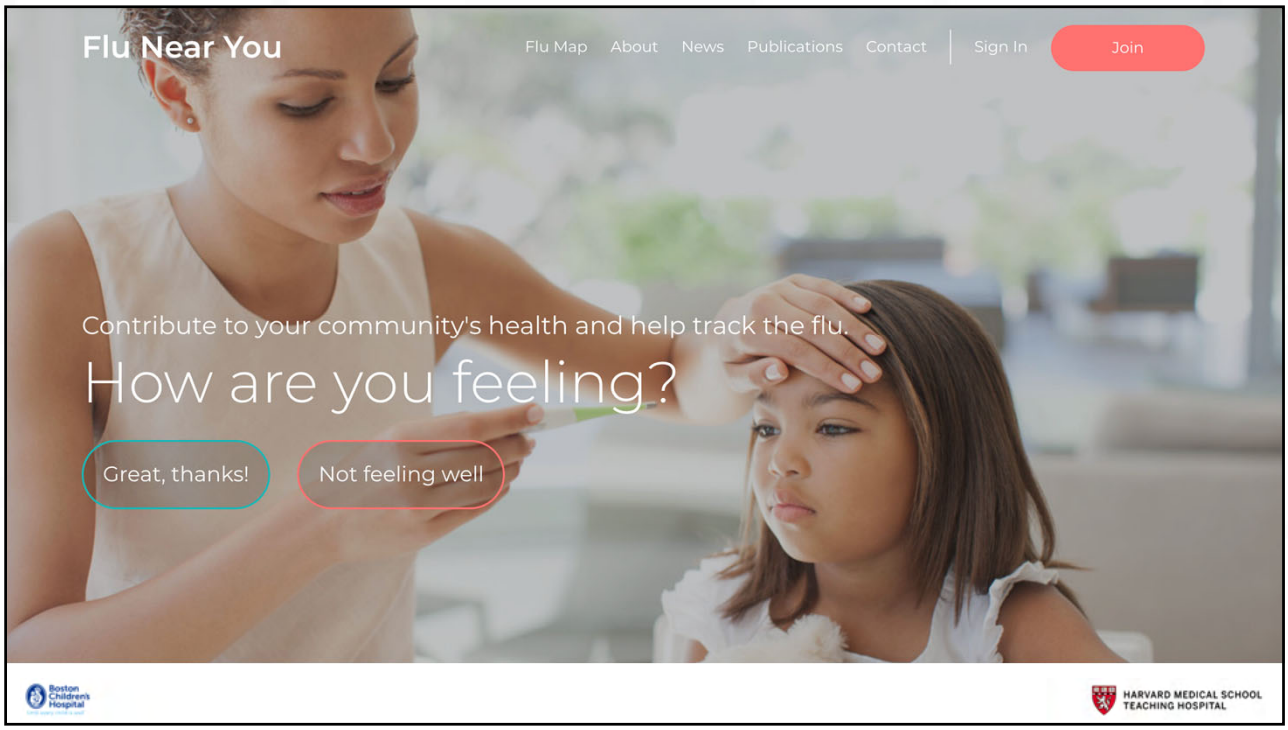
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

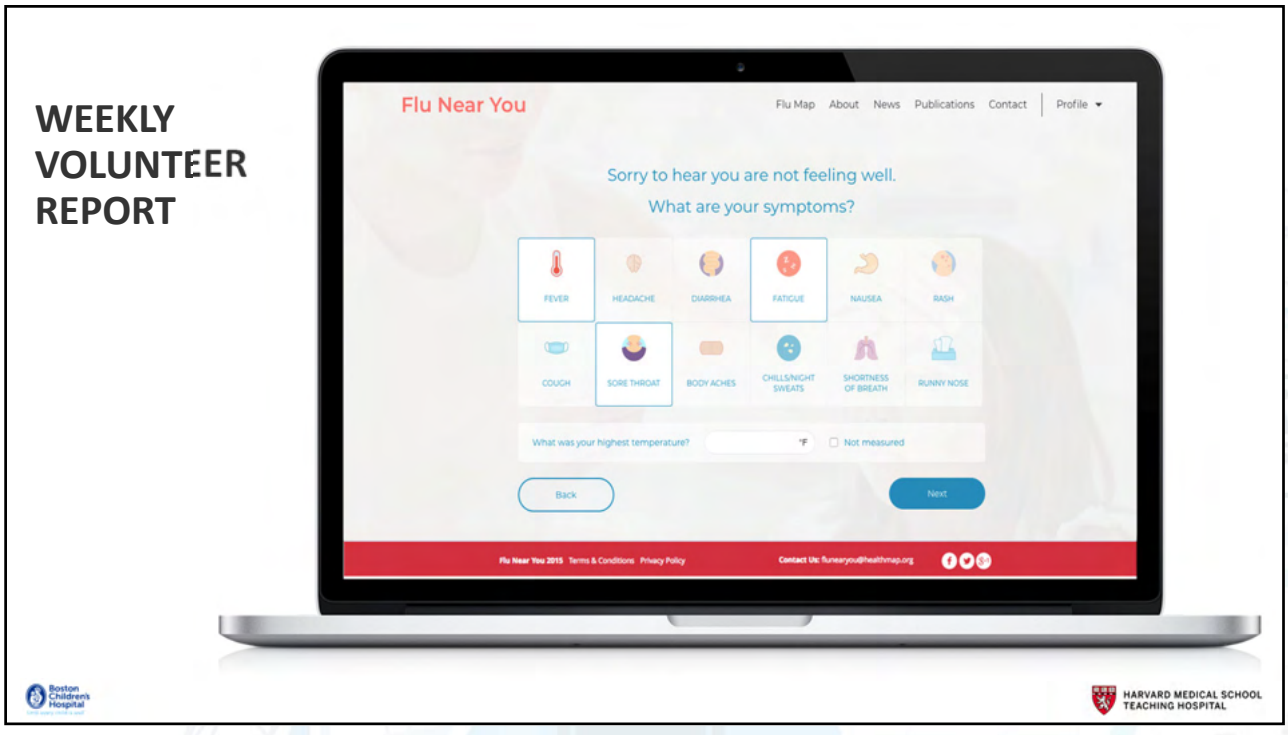
Agenda

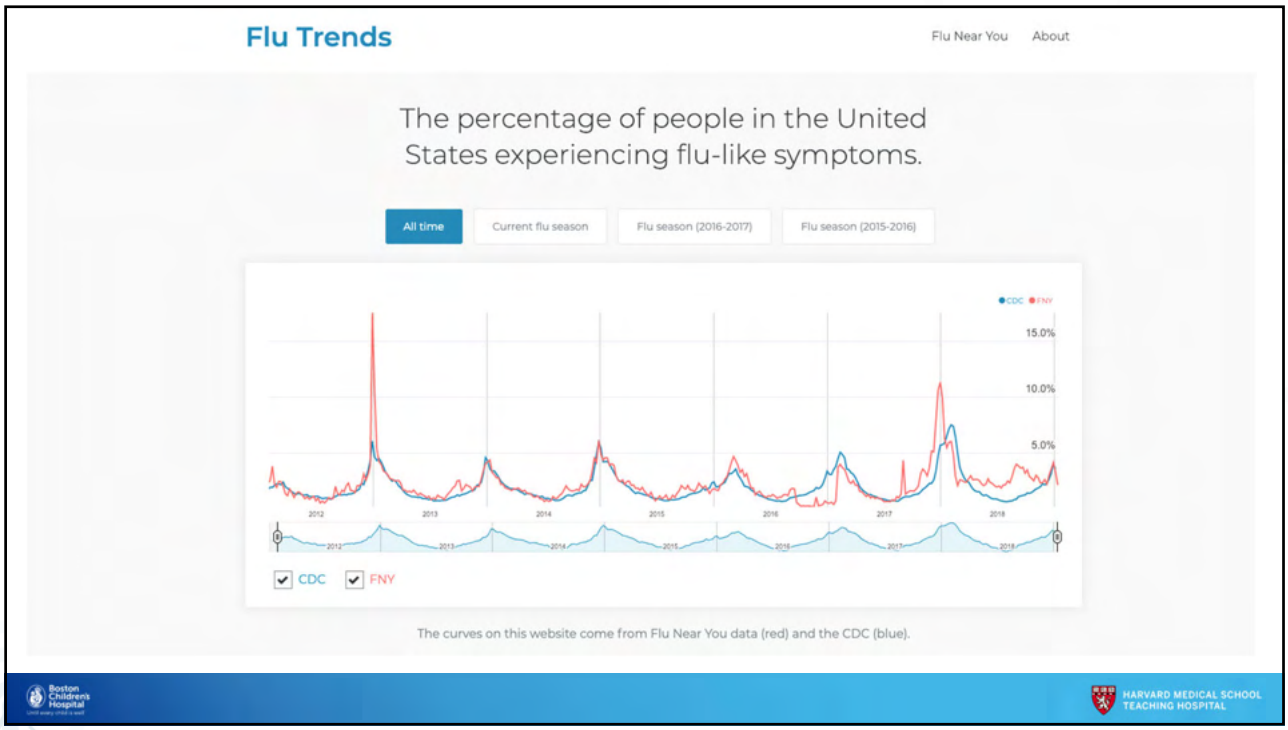
Targeting the right demographic

flu near you
do you have it in you?

- Been operating for the last decade plus
- Crowdsourced, Participatory, Syndromic Surveillance system
- Weekly Emails, Push Notifications
- Feed data directly to the U.S. Centers for Disease Control and Prevention


Flu Near You
Flu Map
About
News
Publications
Contact
Sign In
Join
Contribute to your community's health and help track the flu.
How are you feeling?
Great, thanks!
Not feeling well
Boston Children's Hospital
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL


WEEKLY VOLUNTEER REPORT
Flu Near You
Flu Map
About
News
Publications
Contact
Profile
Sorry to hear you are not feeling well.
What are your symptoms?
FEVER
HEADACHE
DIARRHEA
FATIGUE
NAUSEA
RASH
COUGH
SORE THROAT
BODY ACHES
CHILLS/NIGHT SWEATS
SHORTNESS OF BREATH
RUNNY NOSE
What was your highest temperature?
°F
Not measured
Back
Next
Flu Near You 2015 Terms & Conditions Privacy Policy
Contact Us: flunearyou@healthmap.org
Boston Children's Hospital
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL


Flu Trends
Flu Near You
About
The percentage of people in the United States experiencing flu-like symptoms.
All time
Current flu season
Flu season (2016-2017)
Flu season (2015-2016)
15.0%
10.0%
5.0%
2012
2013
2014
2015
2016
2017
2018
CDC
FNY
The curves on this website come from Flu Near You data (red) and the CDC (blue).
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0.06
0.04
0.02
0.00
%ILI (blue)
Jan
Tracking the Pandemic
Late 2019-2020
Boston Children's Hospital
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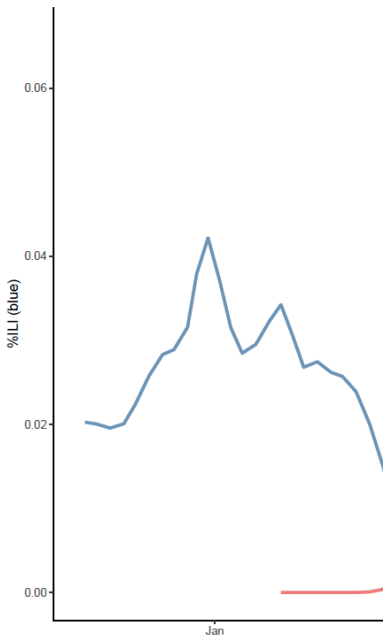
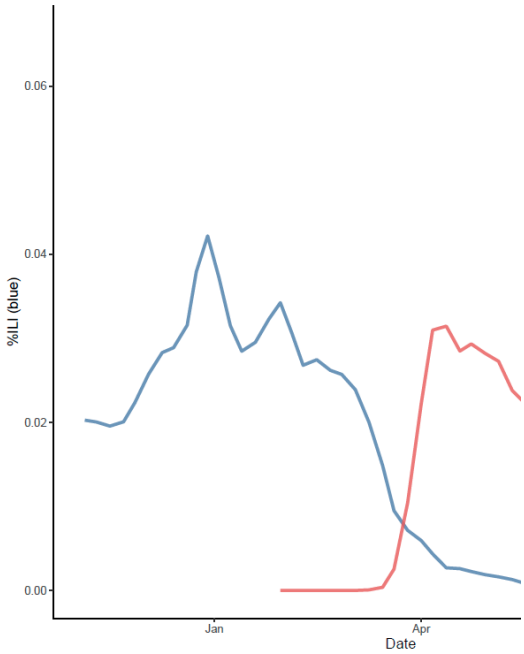
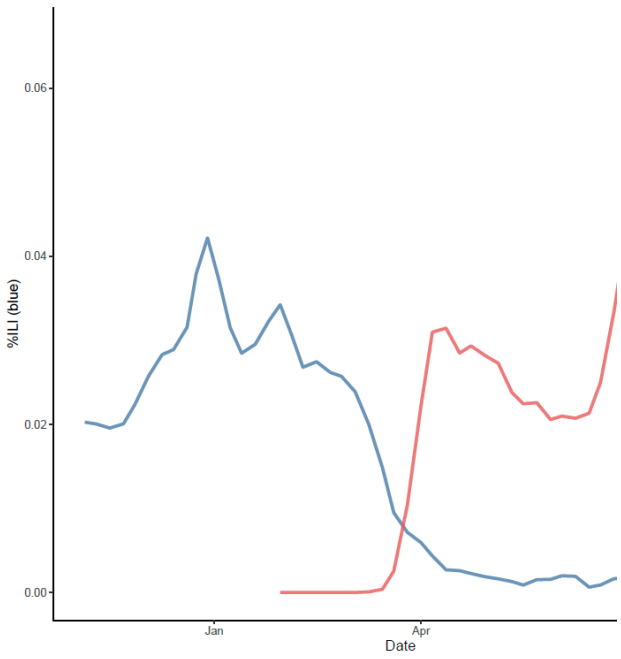


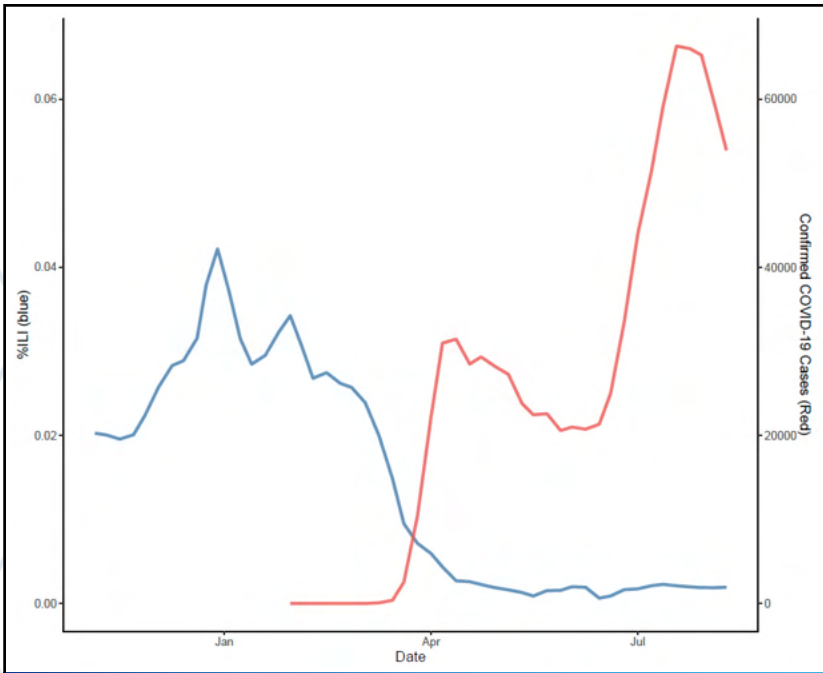
Tracking the Pandemic
Late 2019-2020



Tracking the Pandemic
Late 2019-2020

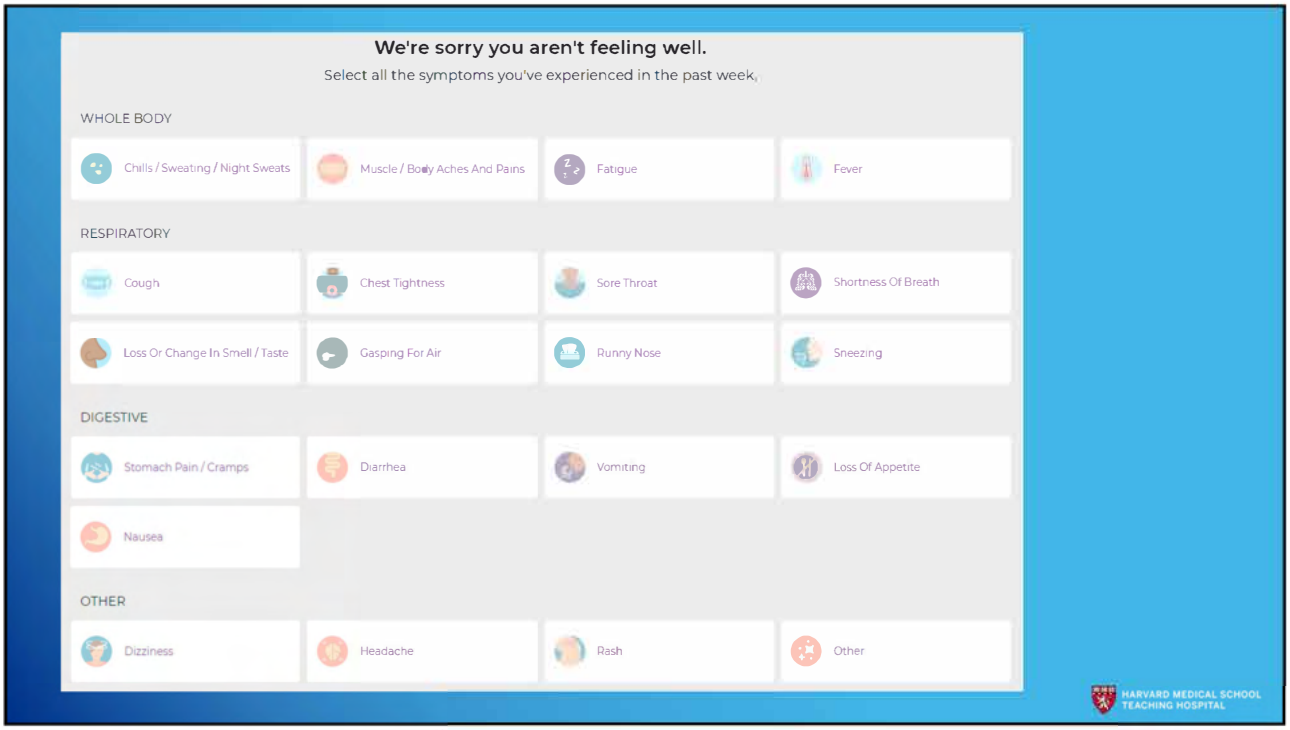


Tracking the Pandemic
Late 2019-2020



Systems that are meant to track something are not always adaptable


MARKETS
BUSINESS
INVESTING
TECH
POLITICS
CNBC TV
TECH
How volunteers from tech companies like Amazon, Apple and Google built a coronavirus-tracking site in six days
Christina Farr
HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL


We're sorry you aren't feeling well.
Select all the symptoms you've experienced in the past week.
WHOLE BODY
Chills / Sweating / Night Sweats
Muscle / Body Aches And Pains
Fatigue
Fever
RESPIRATORY
Cough
Chest Tightness
Sore Throat
Shortness Of Breath
Loss Or Change In Smell / Taste
Gasping For Air
Runny Nose
Sneezing
DIGESTIVE
Stomach Pain / Cramps
Diarrhea
Vomiting
Loss Of Appetite
Nausea
OTHER
Dizziness
Headache
Rash
Other
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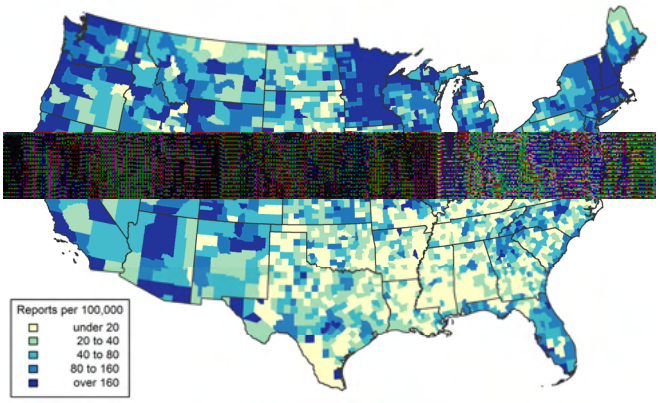
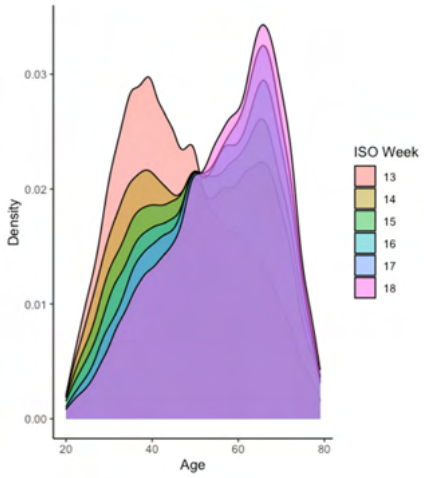
TEACHING HOSPITAL

CNY Reports and CLI Reports in USA



CNY Reports* per 100,000 People



*CNY report analyses presented are restricted to females or males ages 20-79 years

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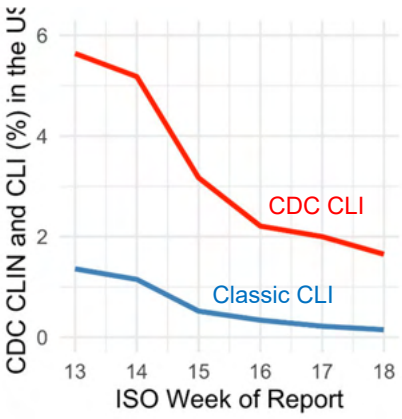
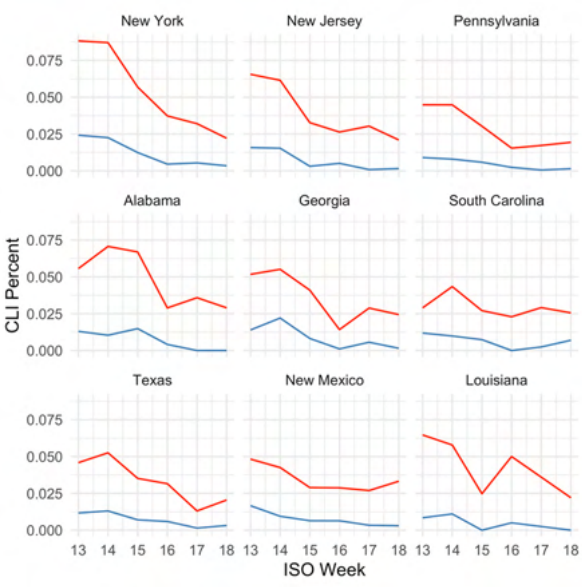
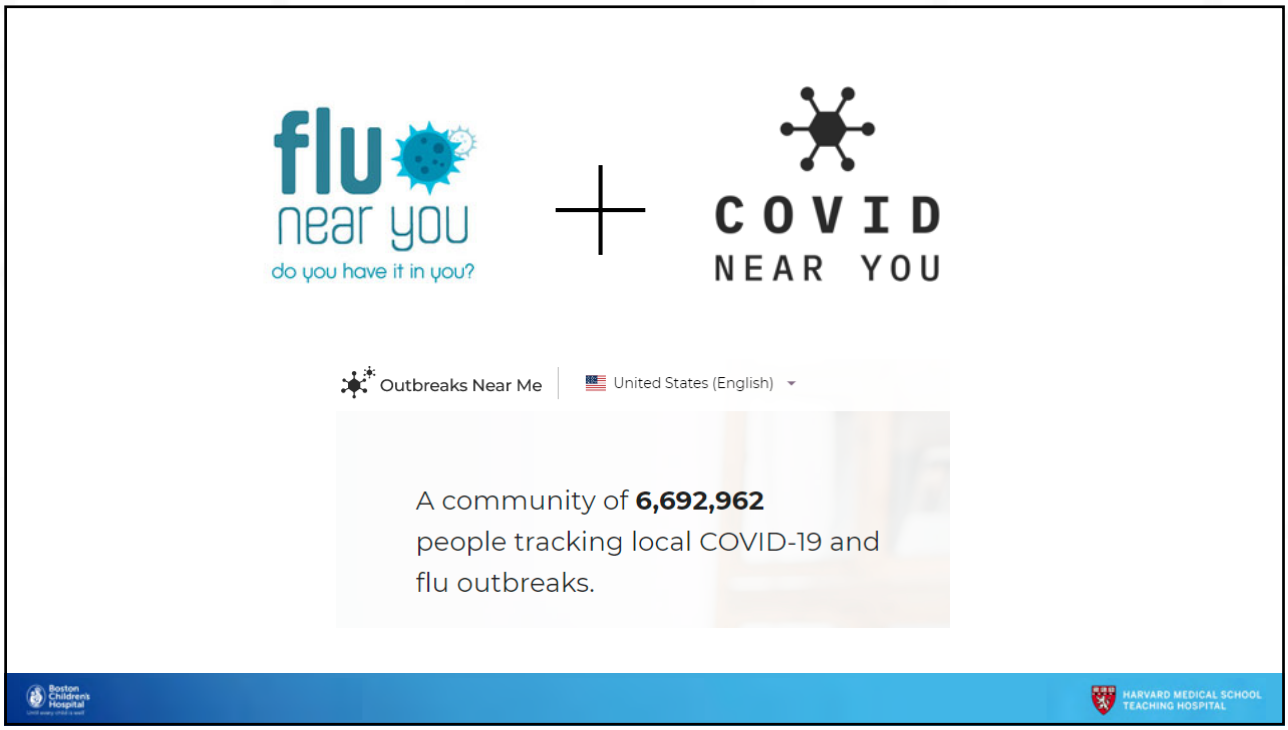
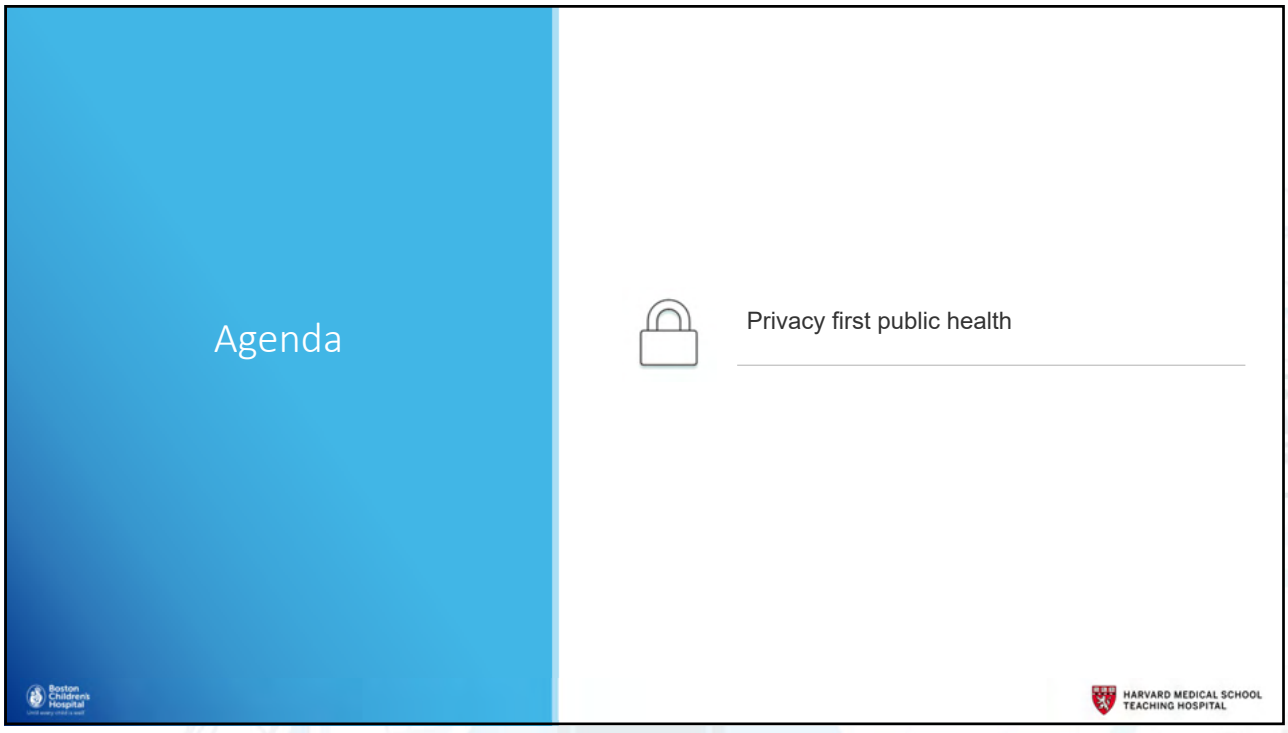
CLI Burden





HARVARD MEDICAL SCHOOL TEACHING HOSPITAL


flu near you
do you have it in you?
COVID NEAR YOU
Outbreaks Near Me
United States (English)
A community of 6,692,962 people tracking local COVID-19 and flu outbreaks.
Boston Children's Hospital
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL


Agenda
Privacy first public health
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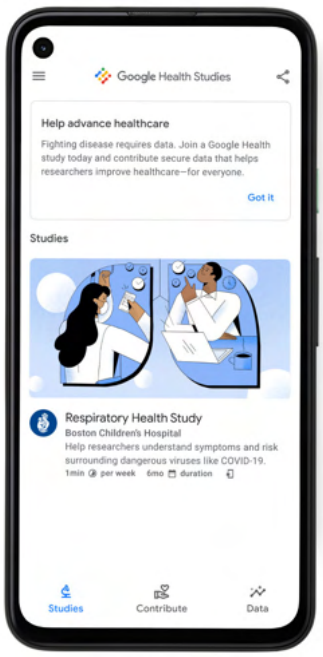
Collaboration with Google

- Launched December 2020
- Available on Google Health Studies app
- Provides users with an opportunity to contribute to health research led by academic institutions
- Respiratory Health Study is the first study launched in the app



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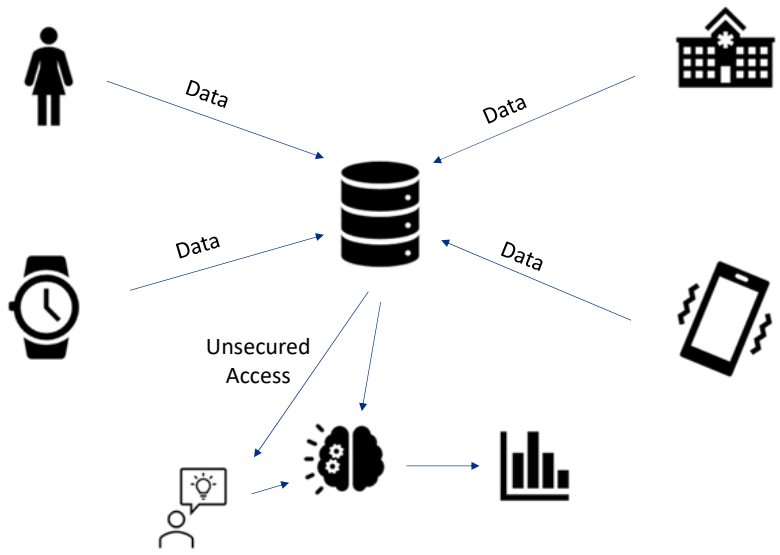
Traditional Learning



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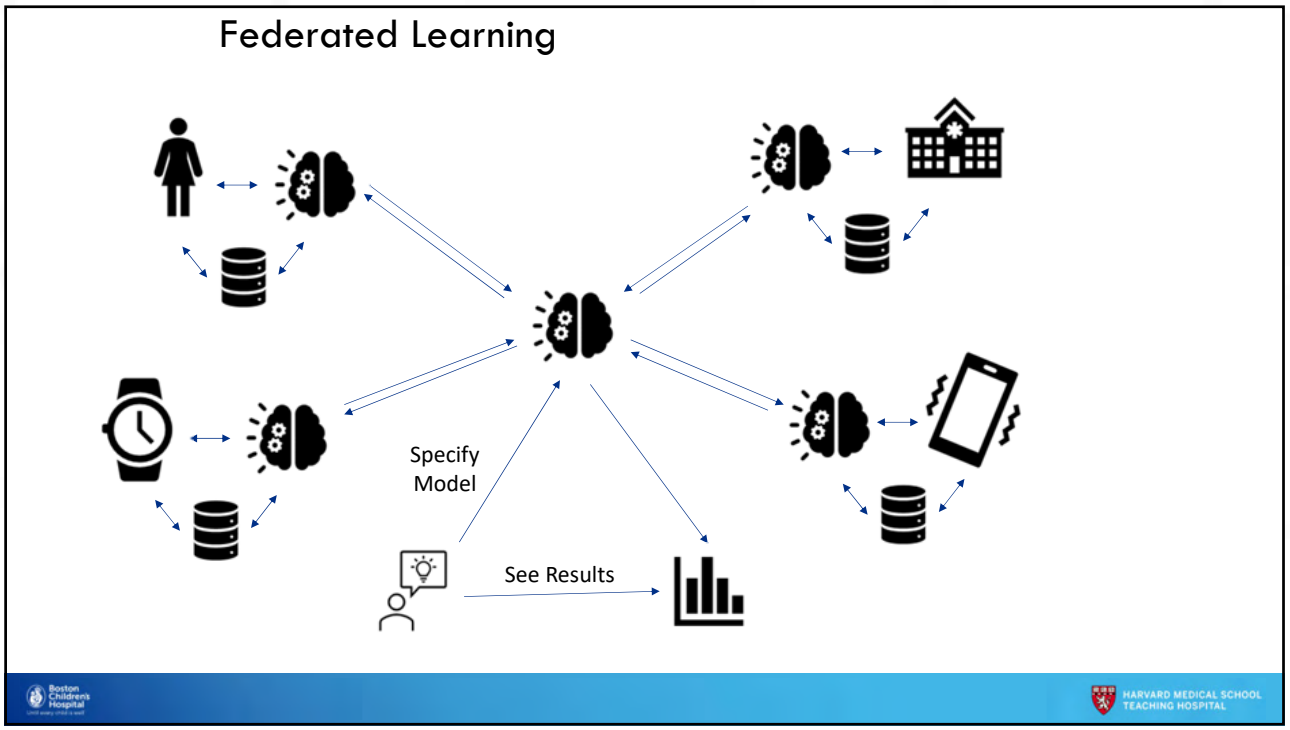
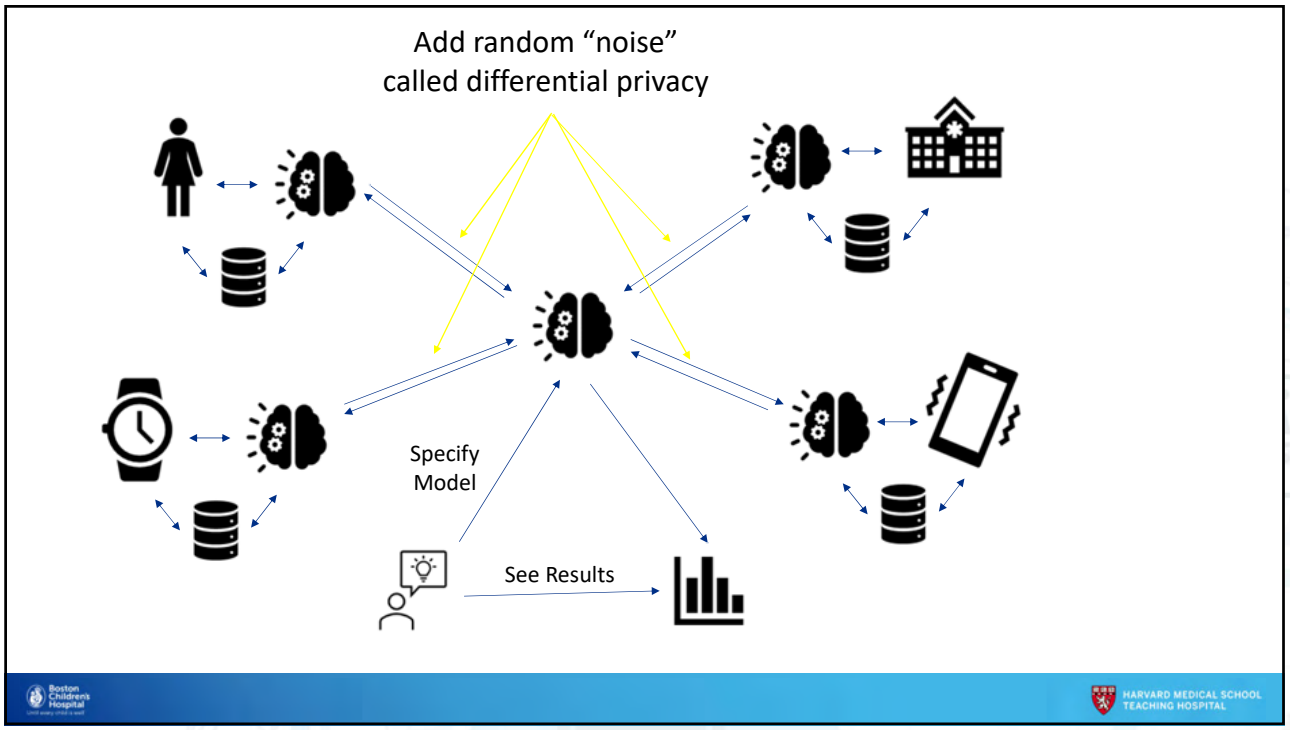
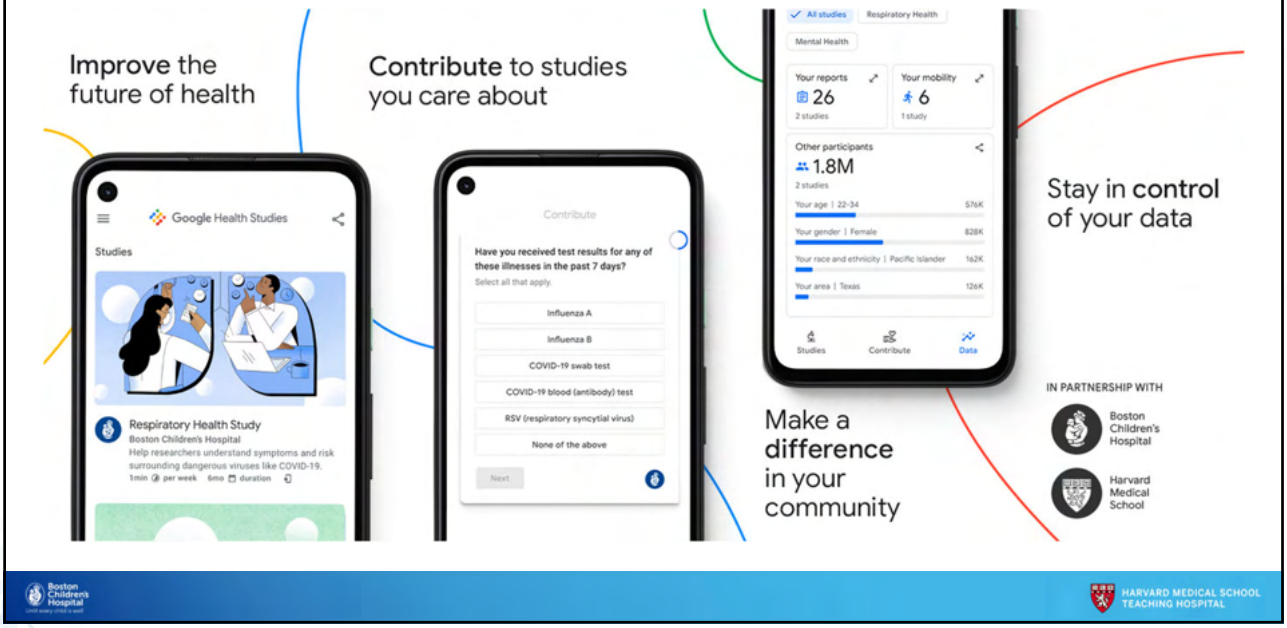

Federated Learning
Specify
Model
See Results
Boston Children's Hospital
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL


Add random "noise"
called differential privacy
Specify
Model
See Results
Boston Children's Hospital
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

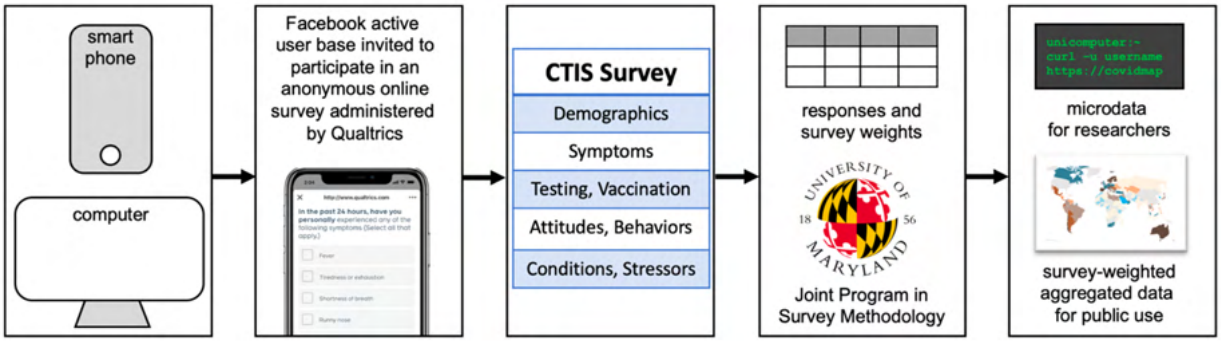
Why should I enroll?



Agenda

- Big Data

COVID Trends and Impact Survey
Syndromic Surveillance Data



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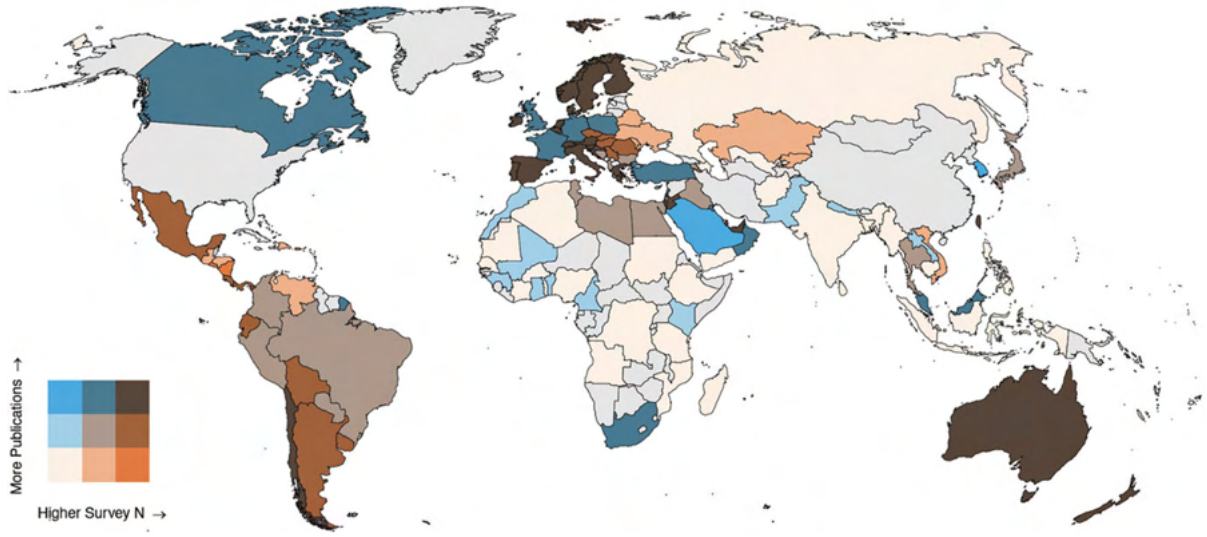
Global Coverage



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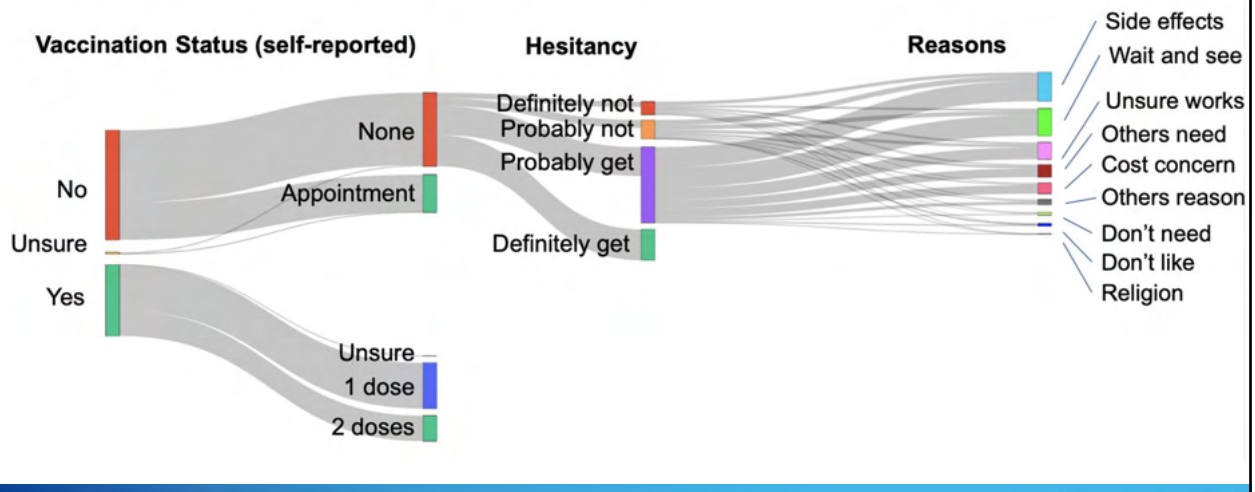
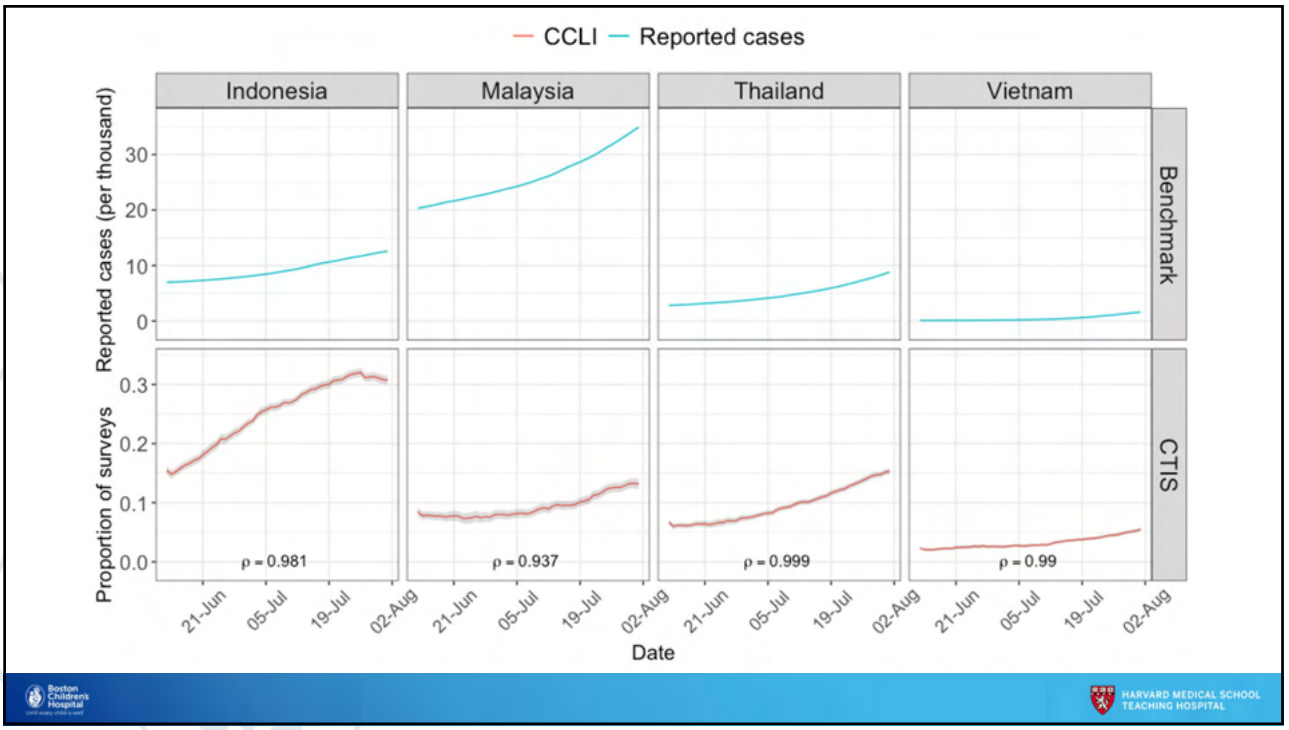
Vaccine Hesitancy in Thailand





Boston Children's Hospital
Until every child is well

Questions?

Benjamin Rader
benjamin.rader@childrens.harvard.edu

Boston Children's Hospital

HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

Chieh-Hsiao Chen | Speaker

- Position: Chief Executive Officer
- Organization: Brain Navi Biotechnology Co., Ltd.
- Economy: Chinese Taipei

Educational Background

- Fellowship of Stanford- Chinese Taipei Biomedical program (STB program), Medical School of Stanford University
- PhD Degree: Institute of Biomedical Engineering, NCKU
- Medical Degree: Kaohsiung Medical University

Professional Career

- Director, Department of Urology, China Medical University Beigang Hospital
- Chief Medical Officer and Founder of iXensor Inc.
- Chief Executive Officer of Brain Navi Biotechnology Co., Ltd.

How to be the helper in the COVID-19 with Surgical Robot technology

Chieh-Hsiao Chen

Abstract

Brain Navi Biotechnology was founded in 2015 with headquarters and primary research and development centers in Chinese Taipei, located in Hsinchu Biomedical Science Park. It takes Chinese Taipei's advantages in R & D and production in the electronics industry, selecting Chinese Taipei as a research and development and production base. Brain Navi mainly focuses on designing and developing medical devices that can assist surgeons during their medico-surgical interventions, with the outstanding doctors, researchers, and developers in Chinese Taipei to combine technical and clinical application experience, developing products driven by demand.

Standardize the procedure of sample collection is to protect medical staff from the cross-infectious environments. It only takes less than 30 minutes, from nasal swabbing to generate the RT-PCR report. High accuracy with the gold standard, nasopharynx swab, to prevent the false negative. Zero-contact is essential for both medical staff and testing subjects.

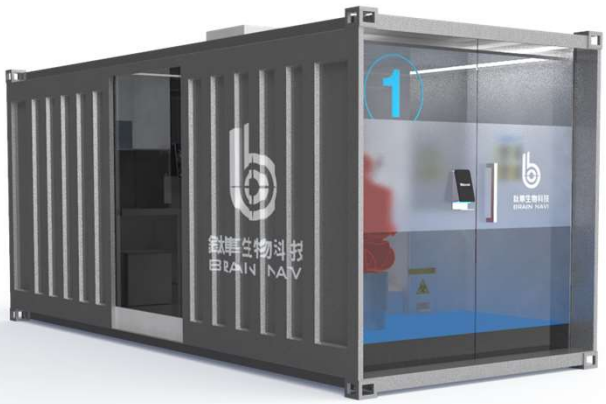
Innovation Features:

1. Zero- Contact: Testing subject and medical staff are isolated in different safety zone so that no need to put on another protection while proceeding sample collecting or pipetting.

2. Large-scale Testing: The combination of Nasal Swab Robot and Roche Liat system, the station can generate the PCR report in 30 mins.

3. Procedure Standardize: For medical staff, Lower the learning curves of the procedure, they are capable to do more than just sample collection.

4. High Accuracy: With Brain Navi Nasal Swab Robot, customize nasopharynx depth of each testing subject can lower the false-negative result.



BRAIN NAVI

How to combat COVID-19 with robotic technology

Zero-Contact Medical Station

BRAIN NAVI

OUTLINE

- ► Company Introduction
- ► SMART platform innovation
- ► How to use the SMART in COVID-19 outbreak
- ► Clinical Proven in Chinese Taipei

Company Introduction

Brain Navi Biotechnology

Background
- Foundation: August. 2015
- Members: 30 persons
- Location: Hsinchu Biotech Science Park
- Chinese Taipei

IP
- 20 patented received
- 31 patented on progressing

Company's Vision
" Make Surgery Precise, Make Life Bright."

Company's Mission
To develop innovative navigation and robotic techniques for surgeons to improve accuracy, streamline surgical procedures and reduce leaving curve.

Multiple Awards Winners

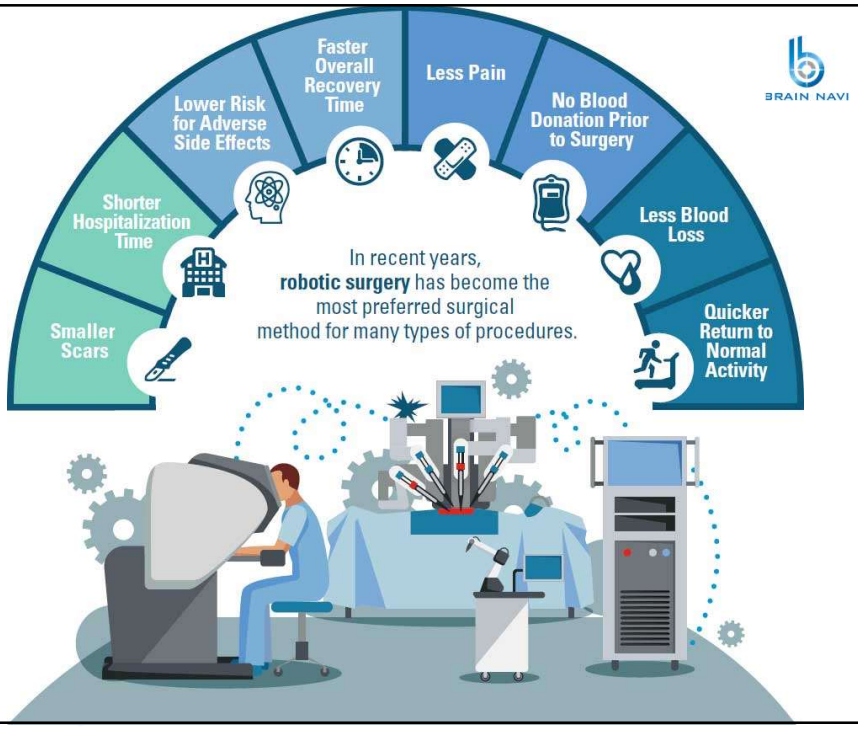
BRAIN NAVI

- 2019. 07.26
  NaoTrac received 2019 Taipei Biotech Awards – Innovation Silver Medal Award
- 2019.12.06
  NaoTrac received Certificate of the 16th National Innovation Award in Development of Navigation System for Brain Surgery
- 2020.12.01
  Brain Navi Nasal Swab Robot received the 17th National Innovation Award - Innovative Epidemic Prevention Technology
- 2020.12.02
  Chinese Taipei representative team for APICTA
- 2020.12.15
  SNQ National Quality Certificate for NaoTrac

For more milestone, please visit https://brainnavi.com/

REAL-TIME
is one of the important features with robotic surgery

Robot-assisted surgery
$12B in 2025



SMART™

Surface Mapping Auto-registration Technology

Merging | Positioning | Targeting

Machine Vision

AI Technology

Robotic Arm

Real-time present during the Surgeries.

SMART™

BRAIN NAVI

Surface Mapping Auto-registration Technology

On-going Project

Nasal Swab Robot,
Autonomous Nasal Swab Robot to help

NaoTrac,
Autopilot Neurosurgical Navigation Robot

FairyGo,
Autonomous Tooth Implantation Navigation Robot

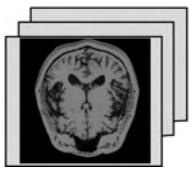
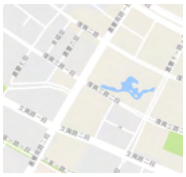
Liver RFA project,
Collaboration between Brain Navi and NCKU

Up-coming Application

Top 10 Cancers Early Treatment

Surgical Navigation System Development

BRAIN NAVI

	Computer Assisted Surgery		Global Positioning System
Medical Images		⇔	 Maps
Robot or Position Tracker		⇔	 Satellite
Surgical Navigation		⇔	 Navigation

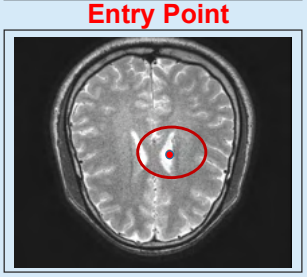
Surgery Pathway Design Mold

BRAIN NAVI

Surgeons can design the surgery pathway during pre-surgery.

The pathway can be shown in the **3D Mold** section

Entry Point



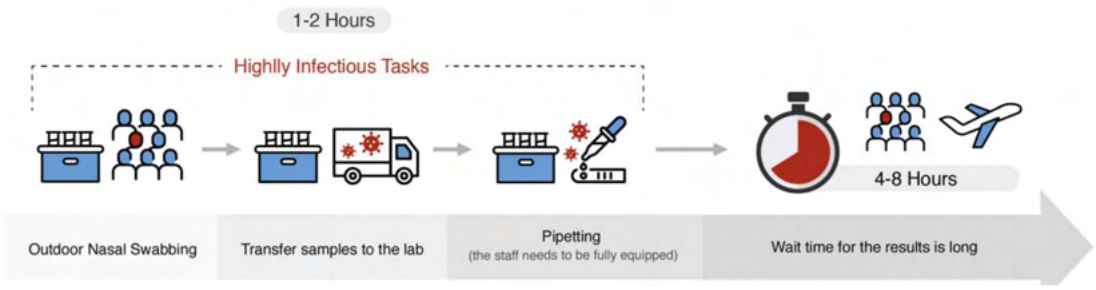
Target Point

Surgical Path

Company Confidential

BRAIN NAVI

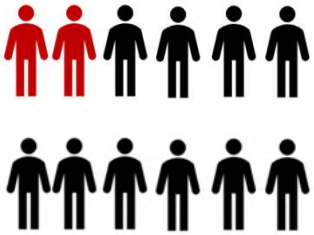
Solution nowadays



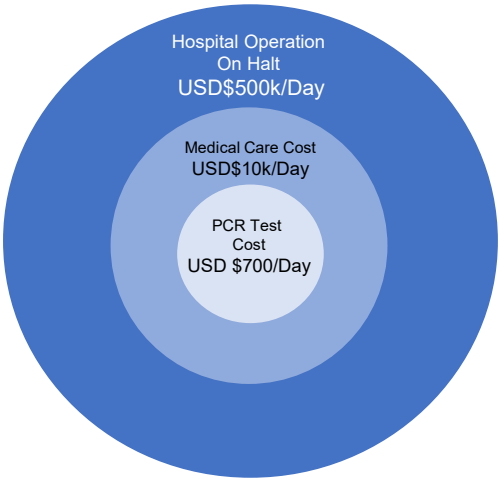
Indirect Cost for the Hospital

12 Members Medical Team

2 Infected 、10 Quarantined



Indirect Cost of USD$500k/Day



Robot is Saving Lives

** It's the 3X fast speed version to show the full operation.

FIRST EVER

Zero-Contact Medical Center

A complete Zero Contact Robotic Solution to prevent transmissions of infections of "highly infectious diseases" like COVID-19

TOTAL SOLUTION

WORLD No. 1

The first and only
"Nasal Swab Robot"
authorized by Chinese Taipei FDA
and CE Mark Class I*

中 華 民 國 衛 生 福 利 部
MINISTRY OF HEALTH AND WELFARE, REPUBLIC OF CHINA (TAIWAN)
Date: 08060 No: OCT 13 2020
證 明 書
Certificate

Ministry of Health and Welfare, Republic of China (Taiwan) hereby certifies that according to Article 48-2 of the Pharmaceutical Affairs Act for responding to the necessity of emergency public health circumstances, the medical device as described below is legally approved in the Republic of China (Taiwan) and may be manufactured, exported, and freely sold.

Manufacturer : Brain Navi Biotechnology Co., Ltd.

Manufacturing Plant Location : Ste. 5C, 5F, No. 6-2, Sec. 2, Sheng Yi Rd., Zhubei City, Hsinchu County, Taiwan

Device Name and Model (Type) :
"Brain Navi Biotechnology" Automatic Nasopharyngeal Swab Robot and Accessories (Emergency use of COVID-19) / NSR

Approval Number : Case-Specific Approval of Disease Control for Manufacture No. 1096810485

Expiry Date : Dec. 31, 2021

Please refer to the content of Approval Letter No. 1096810485 for other matters to be complied with.

APPROVED

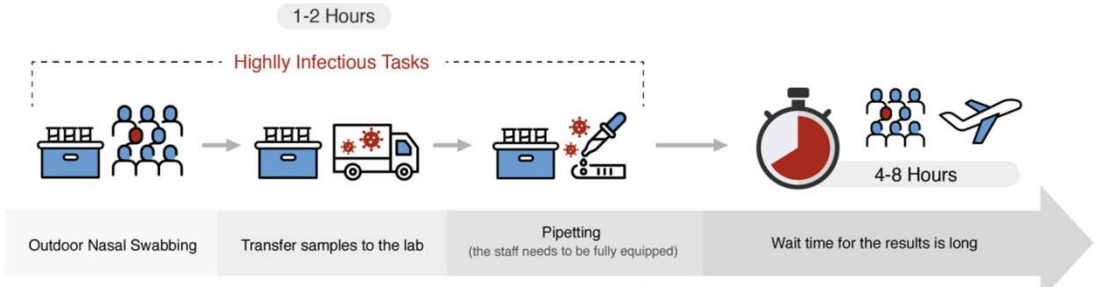
Signed by Shou-Mei Wu
Director General
Food and Drug Administration
for Shih-Chung Chen, D.D.S.
Minister
Ministry of Health and Welfare,
Republic of China (Taiwan)

Transformation

Nasal Swab Robot

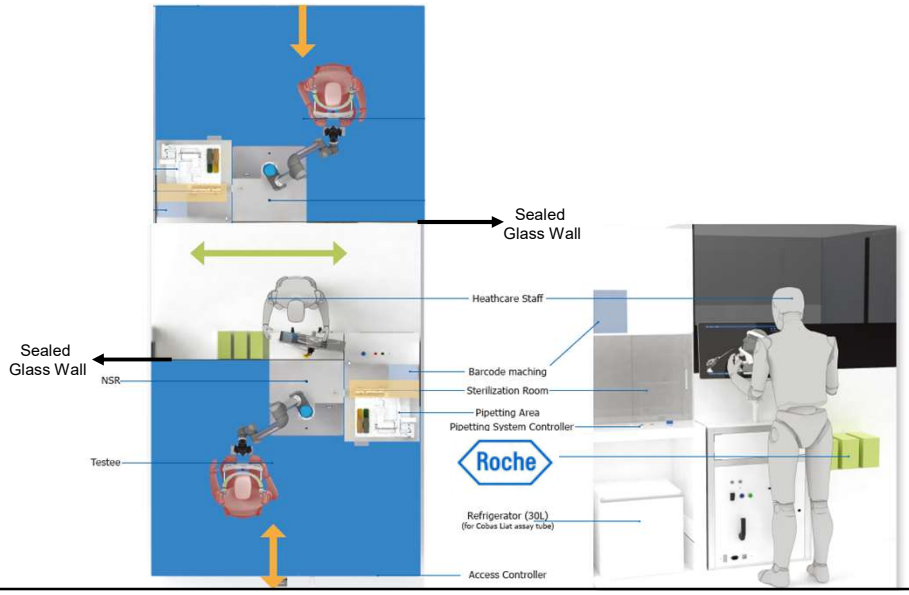
Clinical Needs

Total Solution in 25 mins



Zero-Contact COVID-19 Medical Center – Interior Overview

BRAIN NAVI

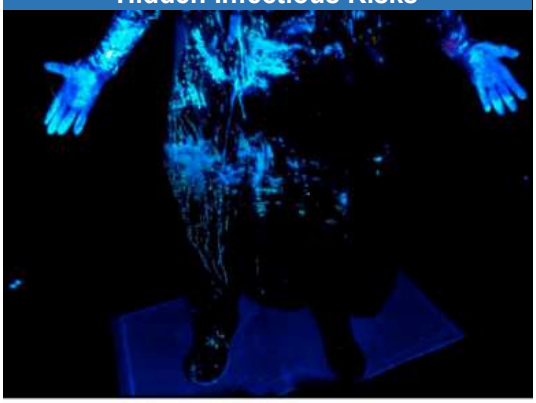


Zero Contact – Reduce Cross-Infection

BRAIN NAVI

Zero Contact – Reduce PPE Usage

Hidden Infectious Risks



Zero-Contact Medical Station – Safety Features

- Ventilation Cycles: Test Room is 50 times/hr. Control Room is 127 times/hr. ,
- Test Room at -8Pa Negative Pressure
- Control Room at +8Pa Positive Pressure
- Pressure Difference > 16Pa

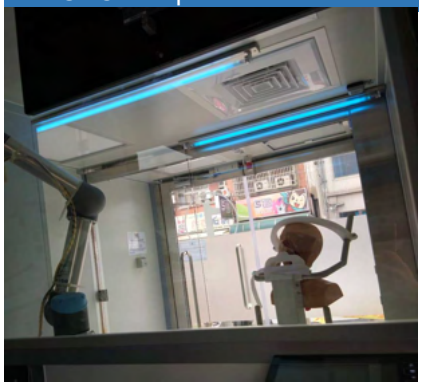
Negative 8Pa Pressured Room

UVC Sanitization

HEPA Filter

Zero-Contact Medical Station – Safety Features

UVC Lamps Sanitaization



Fully Automated Indoor Environmental Quality Control

Zero-Contact Medical Center Advantages

BRAIN NAVI

RT-PCR Report in	Large Scale Testing	Save Medical Manpower
25 mins	480p / 20HR	3p /20HR

Extendable

Transportable

Zero-Contact Medical Center Advantages

BRAIN NAVI

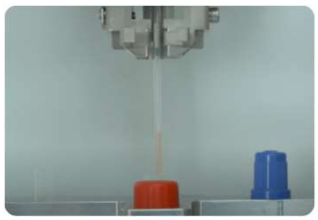
Protect Medical Staff and Lab Technicians to Maintain Critical Healthcare Services

CORONAVIRUS CALIFORNIA

1 dead, 60 infected in COVID-19 outbreak at San Jose Kaiser hospital

By Chris Nguyen

Workers at a lab that processes 50,000 coronavirus tests a day have been hit by their own COVID-19 outbreak



Suitable for Large-Scale Testing Location

BRAIN NAVI

- Airports
- Companies/Factories
- Hospitals
- Recreational Parks
- Universities
- Military Camps
- Hotels

Proven Technology

童綜合醫療社團法人 童綜合醫院 Tungs' Taichung MetroHarbor Hospital

中國醫藥大學 China Medical University

亞東紀念醫院 FAR EASTERN MEMORIAL HOSPITAL

佛教慈濟醫療財團法人 花蓮慈濟醫院 Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation

衛生福利部 臺北醫院 TAIPEI HOSPITAL

臺北榮民總醫院 Taipei Veterans General Hospital

中國醫藥大學新竹附設醫院 CHINA MEDICAL UNIVERSITY HSINCHU HOSPITAL

台大醫院 NTUH

臺北市立聯合醫院 TAIPEI CITY HOSPITAL

敏盛綜合醫院 Min-Sheng General Hospital

天成醫療社團法人 天晟醫院 Ten-Chan General Hospital

NTU CANCER CENTER 台大癌醫中心

新竹馬偕紀念醫院 Hsinchu MacKay Memorial Hospital

新竹國泰綜合醫院 Hsinchu Cathay General Hospital

奇美醫療財團法人 奇美醫院 Chi Mei Medical Center

衛生福利部 苗栗醫院 Miaoli General Hospital

秀傳醫療社團法人秀傳紀念醫院 Show Chwan Memorial Hospital

台積電慈善基金會捐贈零接觸採檢站給台大醫院，台積電慈善基金會董事長張淑芬（中）與台大醫院院長吳明賢（右二）等人合影。（圖／台積電慈善基金會提供）

How to contribute

CHANNELS PARTNERSHIPS
- Pharmaceuticals
- Medical appliances

RAISING MONEY FOR ROBOTS
- Help us collect funds to buy NSR Robots to make it available in different countries

FUNDING
- Development support
- Support the Globalization to saves lives

Join us to help SAVING LIFES…

BRAIN NAVI

THANK YOU

Hong-Wei Jyan | Moderator

- Position: Director General
- Organization: Department of Cyber Security, Executive Yuan
- Economy: Chinese Taipei

Educational Background

- M.S. degree in Computer Science and Information Management from National Chung Cheng University

Professional Career

- Director General of Department of Information Management, National Development Council (NDC)
- Deputy Director of Research, Development, and Evaluation Commission(RDEC)
- Section chief of Overseas Compatriot Affairs Commission (OCAC)
- Technical specialist of Central Weather Bureau (CWB)
- Ministry of Transportation and Communications (MOTC)
- Private sectors.

Angelene Falk | Speaker

- Position: Australian Information Commissioner and Privacy Commissioner
- Organization: Office of the Australian Information Commissioner
- Economy: Australia

Educational Background

Ms Falk was admitted as a legal practitioner to the Supreme Court of NSW in 1998 and holds an Honours Degree of Bachelor of Laws and a Bachelor of Arts from Monash University, a Graduate Diploma in Intellectual Property Law from Melbourne University and a Graduate Diploma in Legal Practice.

Professional Career

Ms Falk was appointed Australian Information Commissioner and Privacy Commissioner in August 2018. She leads the Office of the Australian Information Commissioner (OAIC) in fulfilling its functions across privacy, freedom of information and government information management.

Ms Falk is a member of the National Data Advisory Council, and sits on the Executive Committee of the Global Privacy Assembly (GPA), formerly known as the International Conference of Data Protection and Privacy Commissioners (ICDPPC). She chairs the GPA's Strategic Direction Sub-Committee and is co-chair of its Digital Citizen and Consumer Working Group.

Ms Falk has held senior positions in the OAIC since 2012. She served as Deputy Commissioner from 2016 and acting Australian Information Commissioner and Privacy Commissioner from March 2018.

Over the past decade Ms Falk has worked extensively with Australian Government agencies, across the private sector and internationally, at the forefront of addressing regulatory challenges and opportunities presented by rapidly evolving technology and potential uses of data. Ms Falk's experience extends across industries and subject matter, including data breach prevention and management, data sharing, credit reporting, digital health and access to information.

Publications

- The OAIC has published a range of guidance and advice on COVID-19 available at www.oaic.gov.au/covid-19-advice-and-guidance.
- The OAIC is required to report on the privacy protections that apply to Australia's COVIDSafe contact tracing system. The latest report for the period November 2020 to May 2021 is at www.oaic.gov.au/covidsafe-report-nov-2020-may-2021

Privacy in a pandemic: The work of the Global Privacy Assembly and Australia's experience

Angelene Falk

Abstract

The use of personal information and digital solutions to respond to the COVID-19 pandemic has brought a number of privacy issues to the fore. Ensuring that robust privacy practices remain central to COVID responses has been a top priority for the Global Privacy Assembly (GPA) and Office of the Australian Information Commissioner (OAIC).

In the early stages of the pandemic, the GPA established a working group on COVID-related privacy and data protection issues. The working group's goal is to build and strengthen the global privacy community's collective capacity in responding to data protection and privacy issues. Its key activities have included development of a Compendium of Best Privacy Practices in Response to COVID-19 and establishing a common position on novel policy issues.

The OAIC is focused on providing timely guidance to assist regulated entities to implement programs and services, including digital tools, while ensuring that the personal information collected is only that which is reasonable, necessary and proportionate.

The *Privacy Act 1988* (Cth) was amended on 14 May 2020 to protect data in the Australian Government's COVIDSafe contact tracing app and the National COVIDSafe Data Store. The OAIC has an independent oversight function and is actively monitoring and regulating compliance with the Privacy Act that governs the COVIDSafe app, including through conducting assessments (audits).

The OAIC also published extensive guidance and advice and is engaging with other COVID privacy issues as they arise.

Australian Government
Office of the Australian Information Commissioner

Privacy in a pandemic

The work of the Global Privacy Assembly and Australia's experience

Angelene Falk
Australian Information Commissioner and Privacy Commissioner

@OAICgov

OAIC

Privacy challenges

- Significant increase in data sharing
- Requirements to provide personal information for contact tracing, leading to the introduction of Bluetooth and QR code apps
- Digital vaccine certificates or 'passports'
- Increased use of digital platforms for work and at home

@OAICgov

OAIC

The Global Privacy Assembly's COVID-19 response

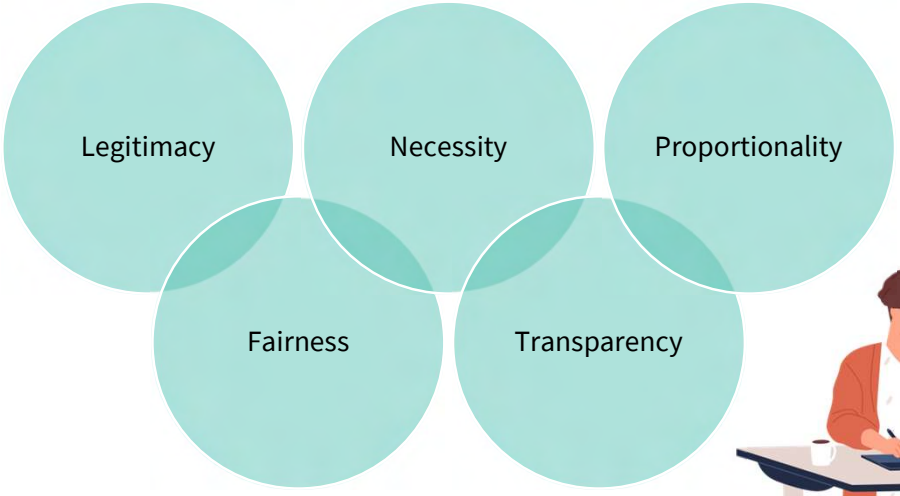
1. **Advancing global privacy in a digital age**
   - Common position established on novel policy issues such as the sharing of health data
2. **Maximising the GPA's voice and influence**
   - Joint statements
   - Events with industry, governments, civil society
3. **Capacity building for the GPA and its members**
   - Compendium of best practices in relation to COVID-19

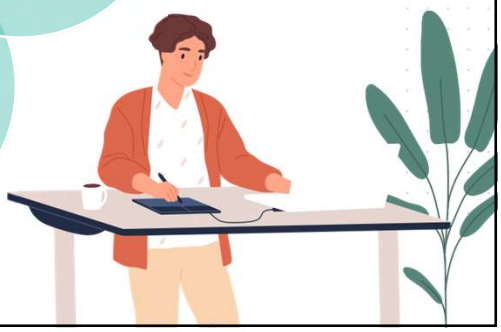
GPA
Global Privacy Assembly

@OAICgov

OAIC

Return to core privacy principles





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Importance of trust

50% consider their privacy is more at risk in a COVID-19 environment than usual

60% agree that some privacy concessions must be made to combat COVID-19 for the greater good

54% are more concerned about the protection of their personal information as a result of COVID-19

75% agree COVID-19 does not excuse business or government from meeting their usual privacy obligations

Source: Australian Community Attitudes to Privacy Survey 2020 (www.oaic.gov.au/acaps2020)

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COVIDSafe app

- The app is voluntary
- Personal information collected can only be used for contact tracing
- It is a criminal offence to misuse data collected through the app
- Data is held on the phone for 21 days
- Data cannot be accessed for law enforcement purposes

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QR code check-in apps

- State and territory government apps only store information for a certain period (generally 28 days)
- Only the minimum amount of information permitted can be collected
- Information collected can generally only be used for contact tracing purposes

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OAIC

Guidance and advisory

Privacy for organisations and agencies

Coronavirus (COVID-19) Vaccinations: Understanding your privacy obligations to your staff
Advice on handling information about employees' vaccination status

Coronavirus (COVID-19): Understanding your privacy obligations to your staff
Privacy advice for entities during the COVID-19 pandemic

Privacy obligations regarding COVIDSafe and COVID app data
Explains the privacy protections built into the COVIDSafe system

Assessing privacy risks in changed working environments: Privacy Impact Assessments
Tips on key privacy issues to consider in remote working arrangements

Guidance for businesses collecting personal information for contact tracing
Advice on privacy protections and contact tracing for businesses and venues

Guidance for digital check-in providers collecting personal information for contact tracing
Draft privacy guidance for contact tracing digital check-in providers

Guidance for state and territory health authorities regarding COVIDSafe and COVID app data
Guidance for health authorities to uphold privacy protections

Draft guidelines: Requirements to collect personal information for contact tracing purposes
Suggestions to harmonise requirements for collecting contact tracing information

Individuals

The COVIDSafe app and my privacy rights
Information for individuals on how the Privacy Act applies to the COVIDSafe app

The COVIDSafe app and my privacy rights in other languages
COVIDSafe app privacy information in 10 community languages

COVID-19 check-in apps privacy FAQs
Frequently asked questions about COVID-19 check-in apps

COVID-19: Vaccinations and my privacy rights as an employee
How the Privacy Act applies to your COVID-19 vaccination information at work

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OAIC


Australian Government
Office of the Australian Information Commissioner
Thank you
corporate@oaic.gov.au
1300 363 992
oaic.gov.au/covid-19
oaic.gov.au/sign-up
@OAICgov
OAIC

Morten Elbæk Petersen | Speaker

- Position: CEO
- Organization: sundhed.dk
- Economy: Denmark

Educational Background

Master's degree in Economics and Social Science from the University of Odense

Professional Career

Morten Elbæk Petersen has been the CEO of the Danish eHealth portal, sundhed.dk, since it was founded in 2003. He has more than 20 years of management experience in public administration with a primary focus on implementing eHealth, quality development, prevention and patient empowerment. The Danish eHealth portal pioneers open access to medical records and is in this regard unique worldwide.

Morten Elbæk Petersen holds a Master's degree in Economics and Social Science from the University of Odense. He also serves as an external lecturer and examiner for Public Health IT Masters programmes at Danish universities.

In 2015, Morten received HIMSS Europe eHealth Leadership Award.

Since 2017 Morten has been member of the advisory board of the Clinnova project which was an EU supported initiative started by the Ministry of health in Luxembourg.

In 2018, Morten became member of the independent International Scientific Advisory Board of the German MII (Medical Informatics Initiative), which is funded of German Federal Ministry of Education and Research.

Danish Experience Sharing: sundhed.dk – the Danish health care online

Morten Elbæk Petersen

Abstract

In this presentation, Morten Elbæk Petersen, CEO at the national, publicly-owned, Danish eHealth portal, sundhed.dk will introduce the audience to the portal and the additional app: MyHealth – providing 24-hour access to personal health data and general information about health prevention and diseases for Danish citizens and health professionals.

As part of the Danish health care sector, sundhed.dk plays a crucial role in supporting transparency and patient empowerment and providing health professionals with the possibility to access patient health data residing outside of local systems and across sectors and boundaries.

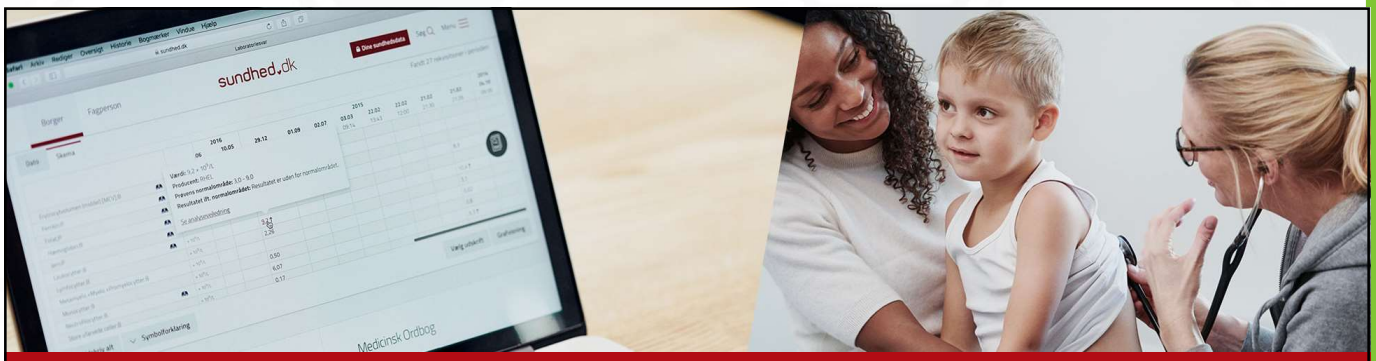
Sundhed.dk was launched in 2003 as a collaboration between the state, the regions and the municipalities, sundhed.dk is an integrated part of national eHealth strategies and is governed by its own political board with representatives from each of its partner organizations.

By July 2021 sundhed.dk counts 8. mio. visits each month and 5,8 mio. download of the app: MyHealth has been registered. Today sundhed.dk is considered a critical, national infrastructure in the Danish Health care sector, online.

To understand the positioning and popularity of sundhed.dk, it is necessary to highlight some core factors: A public health care sector built within a democratic setting and financed by state taxes, a long tradition in Denmark for registration of health data, a high level of IT-maturity and a trust-based culture within the Danish society.

When the COVID-19 pandemic had spread to Denmark in February 2020, sundhed.dk got an even more significant role than ever. And, due to the already widespread use of sundhed.dk and the app MyHealth the starting point for quickly developing additional, digital tools and services, to support the citizens during the pandemic, was present.

Sundhed.dk has played a crucial role during the COVID-19 pandemic, providing citizens with different digital tools to help them through the pandemic. The most essential to mention is easy access to COVID-19 test results and on top of that, the first version of the Corona-pas.



DANISH EXPERIENCE SHARING
SUNDHED.DK – DANISH HEALTH CARE ONLINE

DIGITAL TOOLS FOR ADDRESSING INFECTIOUS DISEASES IN THE ASIA PACIFIC REGION: CHALLENGES AND OPPORTUNITIES

26 AUGUST 2021

sundhed.dk

AGENDA

- The Danish Health care system and core factors
- Sundhed.dk – what does it offer?
- Sundhed.dk and the COVID-19 pandemic

sundhed.dk

THE DANISH HEALTH CARE SECTOR AND CORE FACTORS

- Universal coverage
- Free and equal access
- High ICT-maturity
- Culture of confidence among citizens and health care professional

ORGANIZATION OG GOVERNANCE

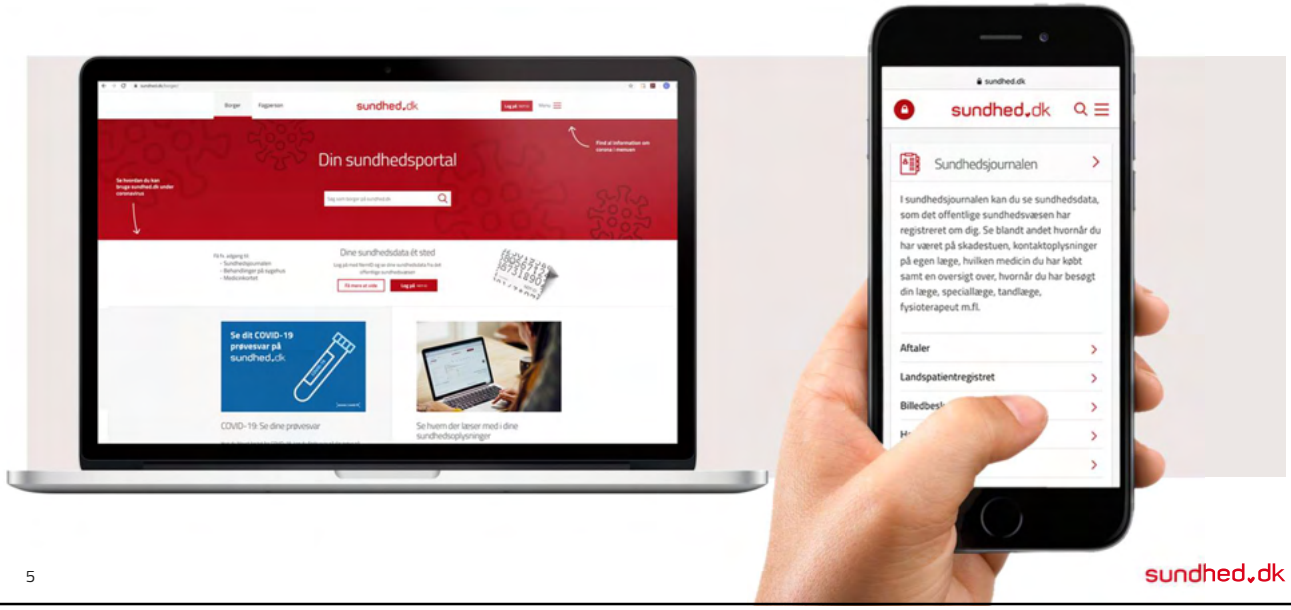
Sundhed.dk Political Board

Sundhed.dk Steering Group

CEO

Sundhed.dk Organization
[70 employees]

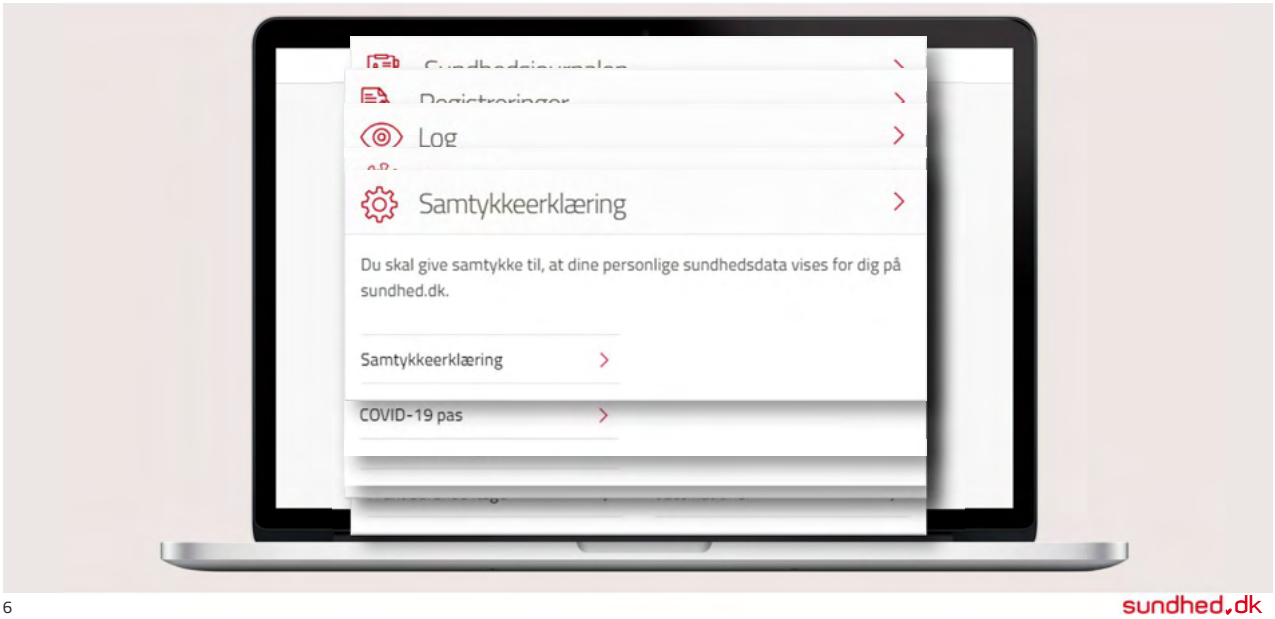
SUNDHED.DK IN BRIEF



5

sundhed.dk

CITIZENS – ACCESS TO PERSONAL DATA AND INFORMATION



6

sundhed.dk

MORE THAN 4 MIO DOWNLOADS OF OUR APP MYSUNDHED

7

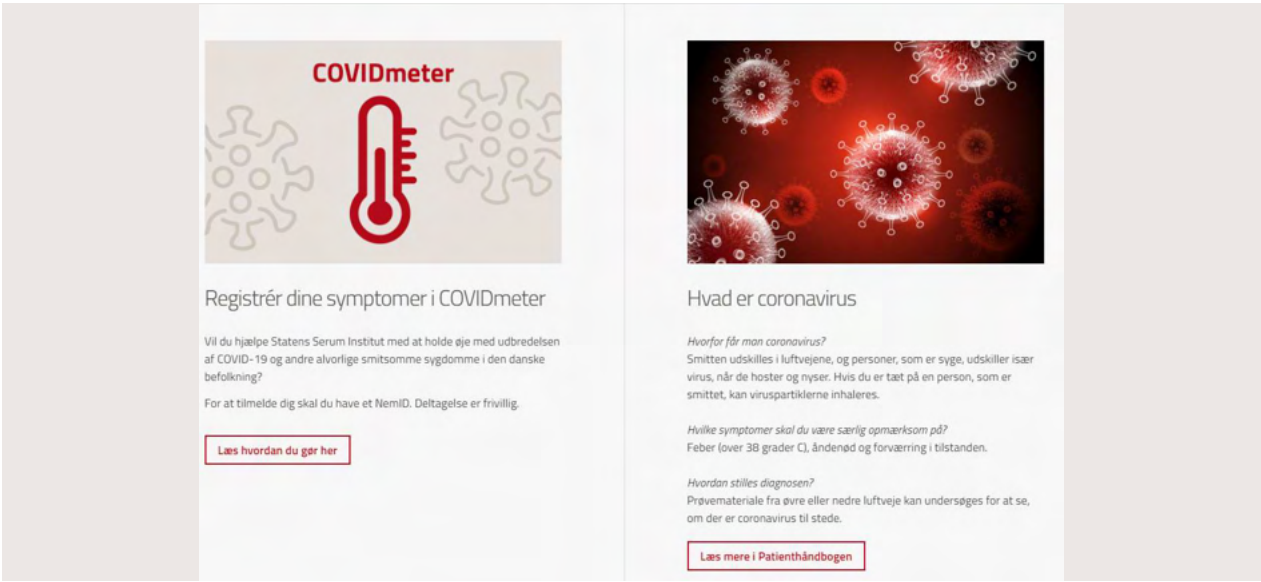
sundhed.dk

SUNDHED.DK AN THE COVID-19 PANDEMIC

sundhed.dk

VISIT YOUR PSYCOLOGY OR DENTIST ONLINE

A DEDICATED COVID-19 THEME SITE



10

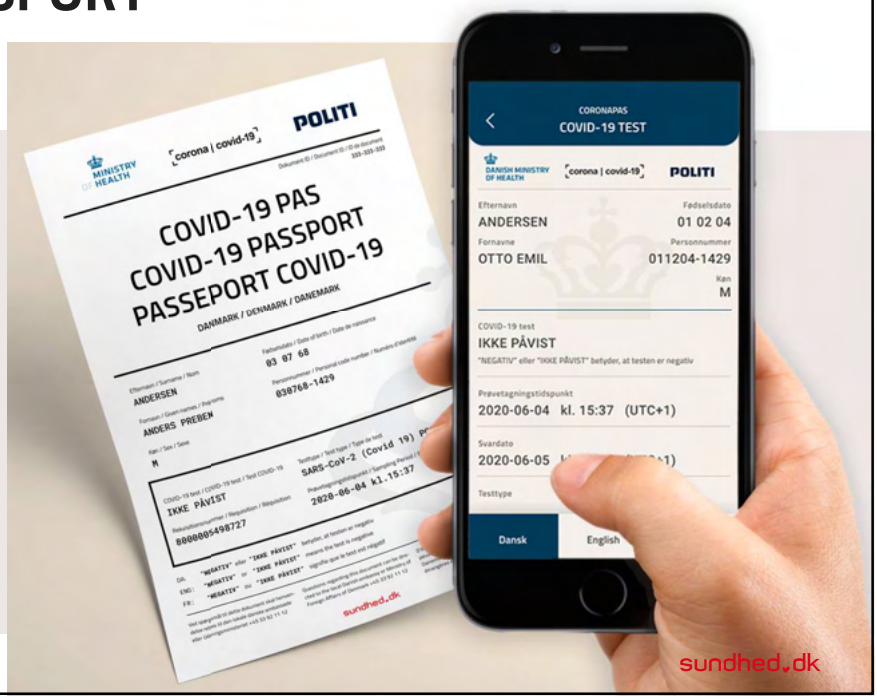
sundhed.dk

COVIDMETER – MONITORING AND TRACING

11

sundhed.dk

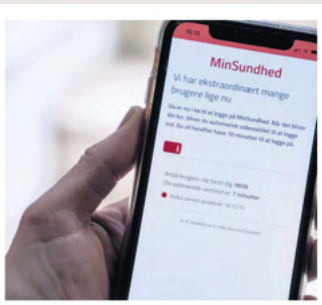
THE CORONA PASSPORT



12

sundhed.dk

REOPENING SOCIETY WITH THE CORONA PASSPORT



Appen Min Sundhed fotograferet på en smartphone. Også i den kom
tid kan der være ventetid på at få adgang.

GENÅBNING AF ERHVERV OG SKOLE

Liberale serviceerhverv må genåbne. Det gælder blandt andet fr
rer, massører, tatovører, kosmetologer, solarier og køreskoler.

Elever i 5.-8.-klasse kan komme fysisk i skole på halv tid. Det san
gælder ikke-afgangselever på ungdomsuddannelser - for eksem
elever i 1.g og 2.g. Tidligere måtte de komme én dag om ugen til
udendørs undervisning.

På de videregående uddannelser kan afgangsstuderende på udd
nelser med mange praksiselementer vende fysisk tilbage på hal
tid. Alle øvrige studerende kan vende tilbage med 20 procent fy
fremmøde. Tidligere var der fjernundervisning.

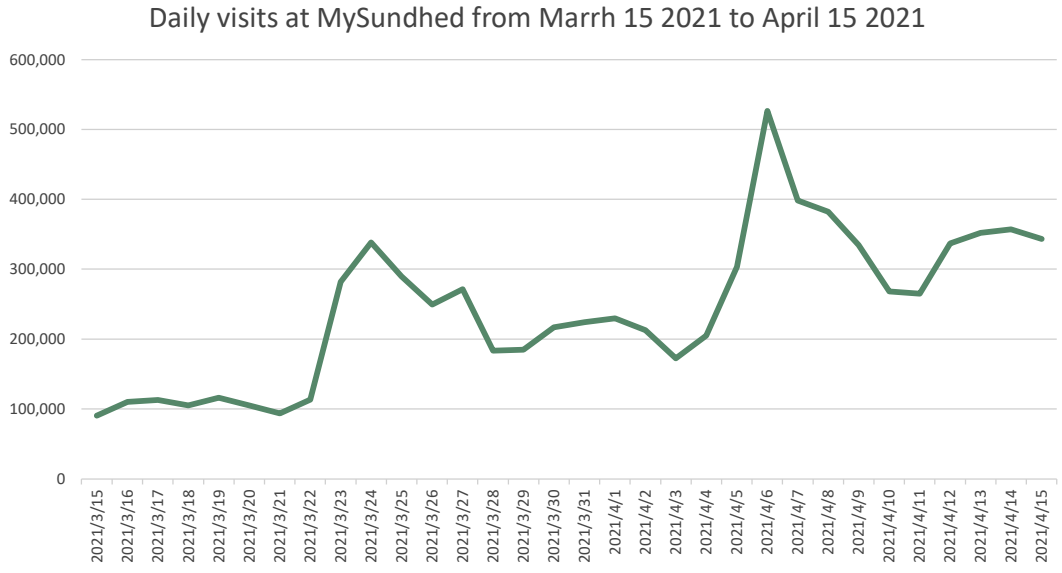
På erhvervsuddannelserne må elever i skolepraktik møde op til
dervisningen 100 procent af tiden. Tidligere var der kun 50 proce
fysisk fremmøde.

Ikke-afgangselever på voksenuddannelser må have 50 procent
fysisk fremmøde. Tidligere var de henvist til fjernundervisning.

Nu skal coronapasset for alvor stå sin prøve

sundhed.dk

VISITS AT MYSUNDHED AT REOPENING DAY



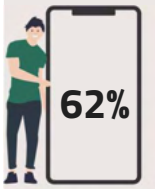
sundhed.dk

SUNDHED.DK – A CRITICAL SERVICE IN COVID-19

8 mio.
Visits a month
Juli 2021

2 out of 3 know sundhed.dk
That means that 3,2 mio. out of 4,9 mio. Danish people over the age of 15 know sundhed.dk

Sundhed.dk is the application most healthcare professionals use



Most visits from mobiles

Citizens
- Personal services
- Data/records

Health care professionals
- Patientdata
- Administrative værktøjer

sundhed.dk

Thank you for your time!

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sundhed.dk

Thomas Klingbeil | Speaker

- Position: Director – Innovation Enablement
- Organization: Solution Architect of the German Corona-Warn-App, SAP SE
- Economy: Germany

Educational Background

- M. Sc. IT Systems Engineering at Hasso Plattner Institute, University Potsdam, Germany

Professional Career

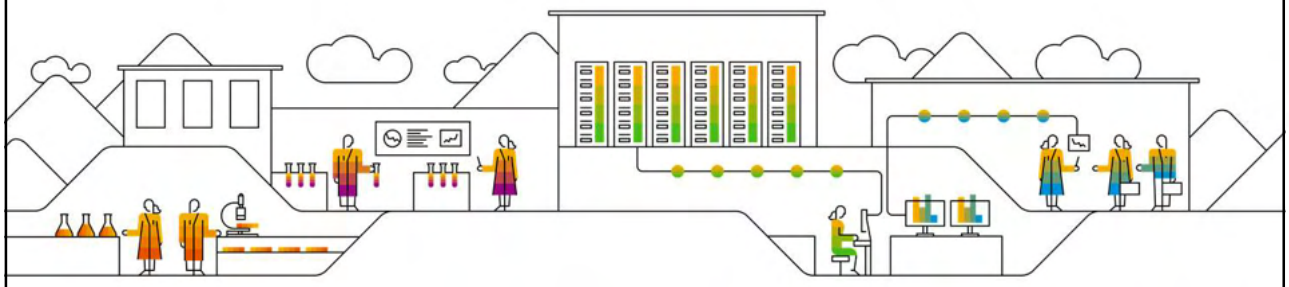
Thomas Klingbeil has a background in IT Systems Engineering from the Hasso Plattner Institute in Potsdam. At the SAP Innovation Center in Potsdam he is a fullstack developer and architect. His main focus in on strategic innovation projects. His tasks include working with and evaluating new technologies, as well in the hardware and software field.

German Experience Sharing

Thomas Klingbeil

Abstract

The German Corona-Warn-App was published on June 16, 2020 and has been downloaded more than 32 million times since then. While the main purpose of the app is to notify users about possible exposures to infected people, many new features have been added and the architecture has been changed accordingly. In this session, Thomas Klingbeil, Solution Architect of the Corona-Warn-App, will give an overview of the app and offer a view behind the scenes regarding those new features and their influence on the overall architecture.



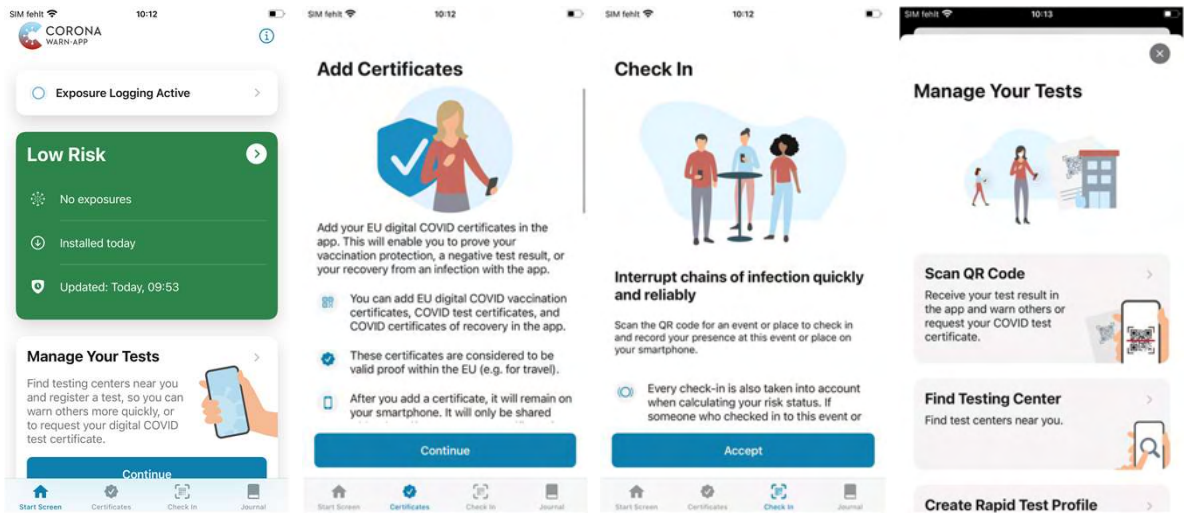
Corona-Warn-App
Behind the scenes

Thomas Klingbeil, SAP SE
August 26, 2021

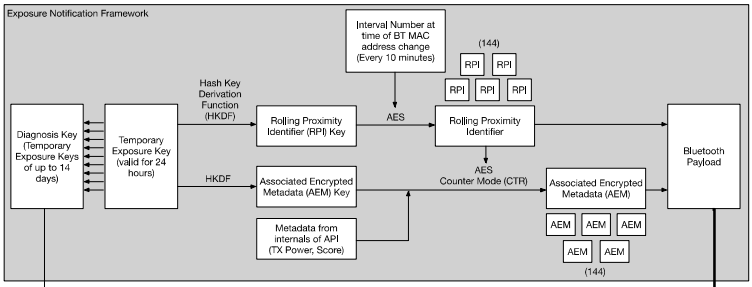
PUBLIC

THE BEST RUN SAP

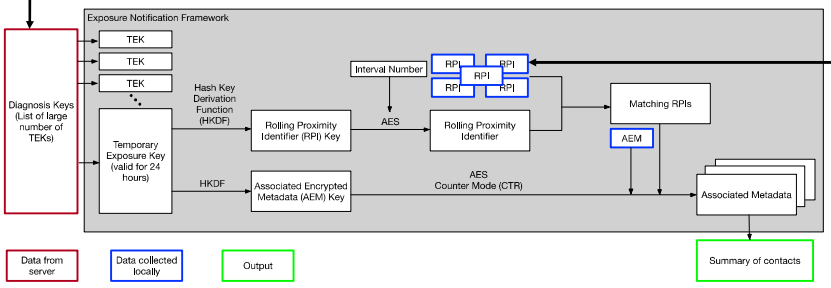
Introduction:
Corona-Warn-App? What‘s that?



Exposure Notification Terminology



through server



BLE Beacon mechanics

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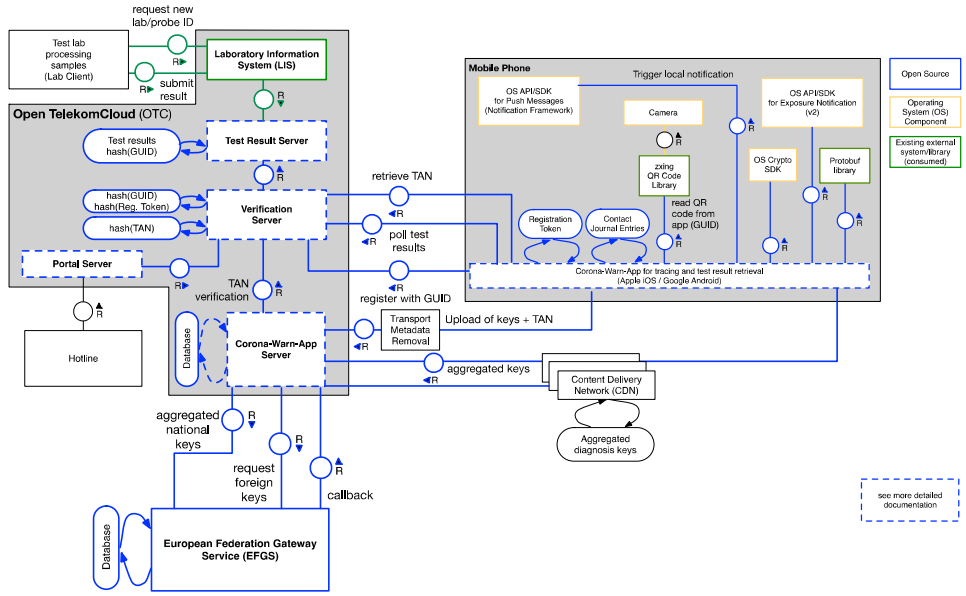
Architecture Overview (simplified)



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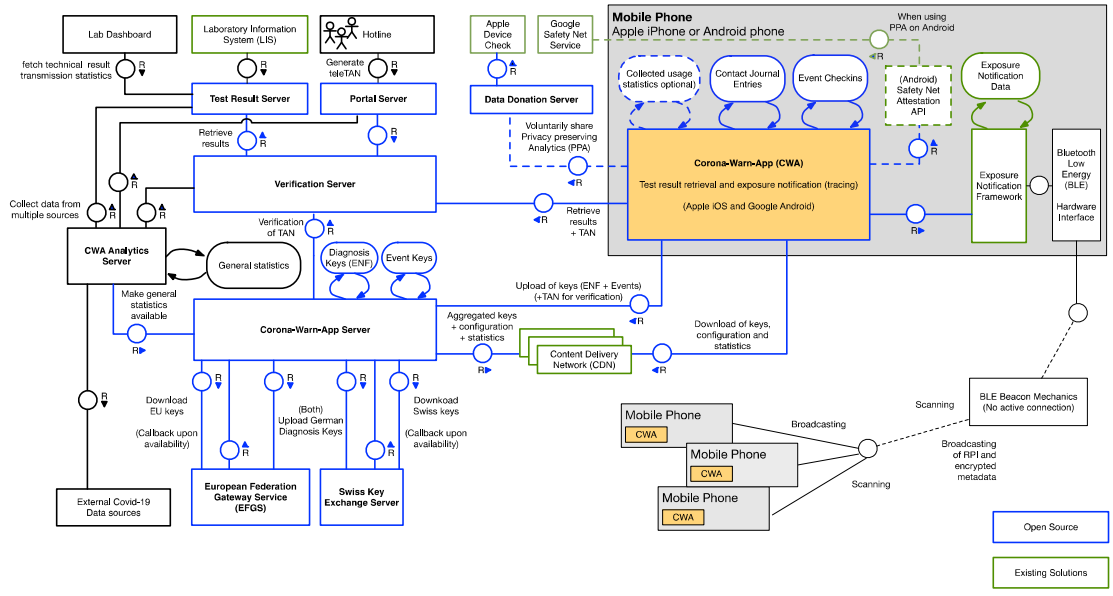
Architecture Overview (without test/vaccination certificates)



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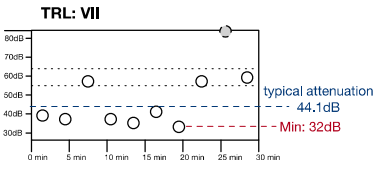
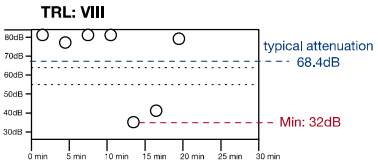
Risk calculation

How the risk is being calculated

- Information about encounters (calculated at device receiving the RPI), provided in 30 minute exposure windows
  - number of scan instances (=duration of the encounter)
  - signal attenuation (minimum/average per scan instance)
    - reported TX power – RX = attenuation
    - low attenuation → close
    - higher attenuation → farther away



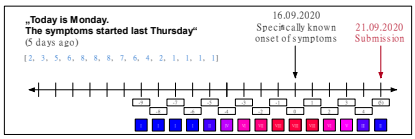
- Information provided within the uploaded keys
  - Transmission Risk Level (= infectiousness)



Transmission Risk Level - based on symptom status

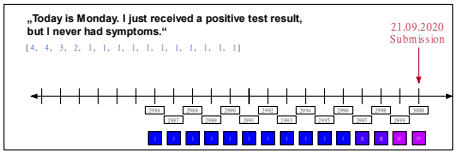
Deriving the Transmission Risk Level from
Days since Onset of Symptoms (specific date is known)

Value range (EFGS): -14 to 21

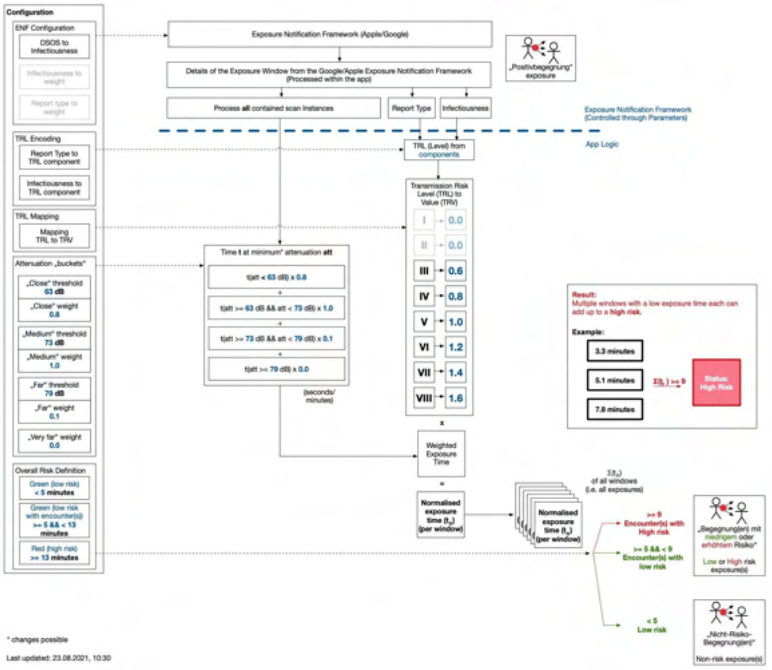


Transmission Risk Level - based on symptom status

Deriving the Transmission Risk Level from
Days since Onset of Symptoms (explicitly no symptoms)
—> technically „days since submission "
Value range (EFGS): 2986 to 3000



Risk calculation



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Thank you!

Learn more at

www.coronawarn.app
https://github.com/corona-warn-app

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Digital Tools for Addressing Infectious Disease in the Asia-Pacific Region: Challenges and Opportunities

25~26 August 2021 Chinese Taipei