

# **Lessons Learned from COVID-19 Response in Aviation and Development of Electronic Forms for International Communicable Disease Control at Airports in Thailand**

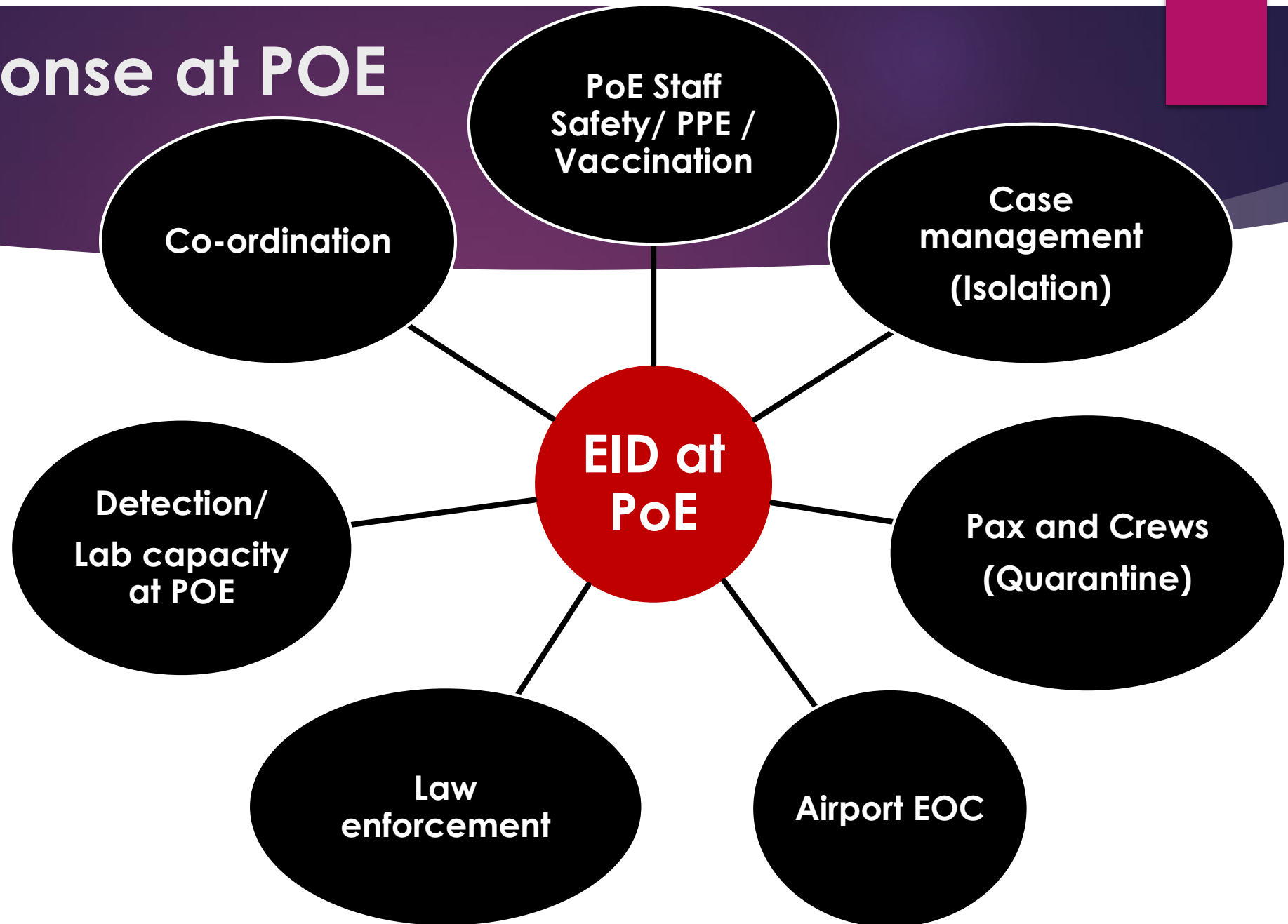
## **16 November 2023**

**ROME BUATHONG, MD. MIH. FETP. TRAVEL MED.**

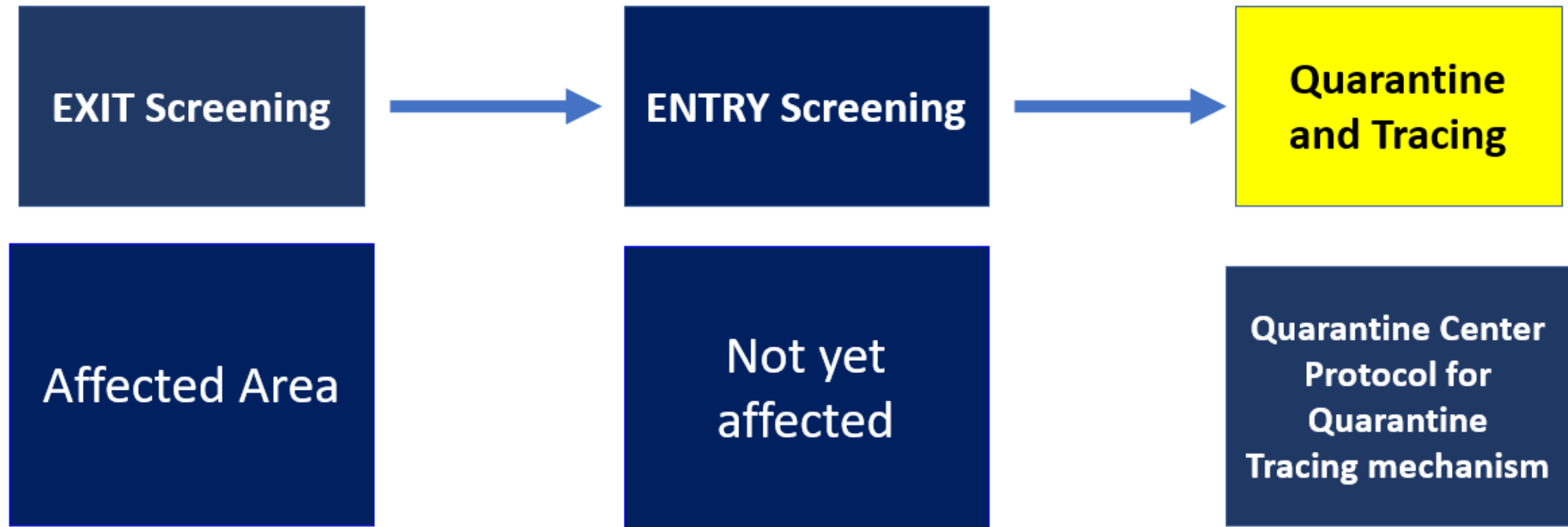
**DIRECTOR OF DIVISION OF INTERNATIONAL COMMUNICABLE DISEASE CONTROL PORT AND QUARANTINE**

**DEPARTMENT OF DISEASE CONTROL**

# EID Response at POE

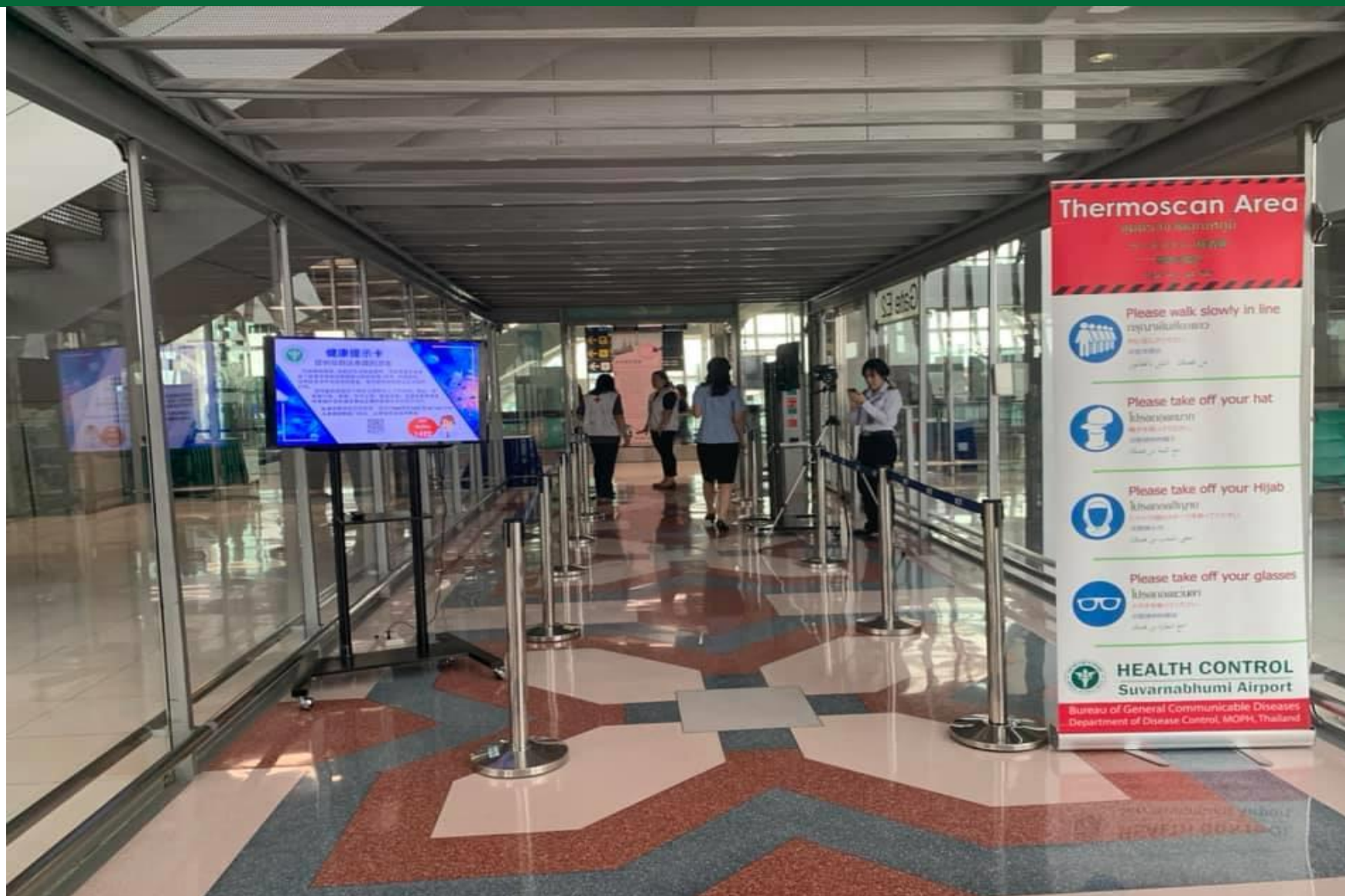


# Principle of International Spreading of Disease





# Target flight screening from epidemic areas at BKK, 3<sup>rd</sup> January – 26<sup>th</sup> March 2020







# Two steps temperature checking by distance thermo-scan and tympanic temperature



Airport SVB.

Flight CZ3057 Date 18.11.63

Total Passenger 173 Crew 6 Pilot 2

คนที่	Thermoscan	<u>Ear Temp.</u>	ความต่าง
1	36.8	36.6	1.9
2	35.5	37.2	1.7
3	35.1	37.2	2.1
4	35.5	36.9	1.4
5	34.7	36.6	1.9
6	35.3	37.4	2.1
7	35.5	37.1	1.6
8	35.3	36.9	1.6
9	35.5	37.0	1.5
10	35.8	37.1	1.3
Mean	35.3	37.0	1.7

SET ALARM @ 36.3 °C

คนที่	Alarm (°C)	<u>Ear Temp.</u> วัดทางหู (°C)	Do you have any RESP. symptom? มีอาการทางเดินหายใจหรือไม่
1	36.4	37.3	No
2	36.5	37.1	No
3	36.4	37.7 → 37.5	No
4	36.7	37.3	No
5	36.7	38.0 → 37.8	Yes. ⇒ Refer
6	36.7	37.2	No
7	36.4	37.0	No
8	36.8	38.3	Yes ⇒ Refer
9	36.4	37.6	No
10	36.5	37.6 → 37.7	No ⇒ P/U
11	36.9	36.8	No





# Symptom screening and physical examination



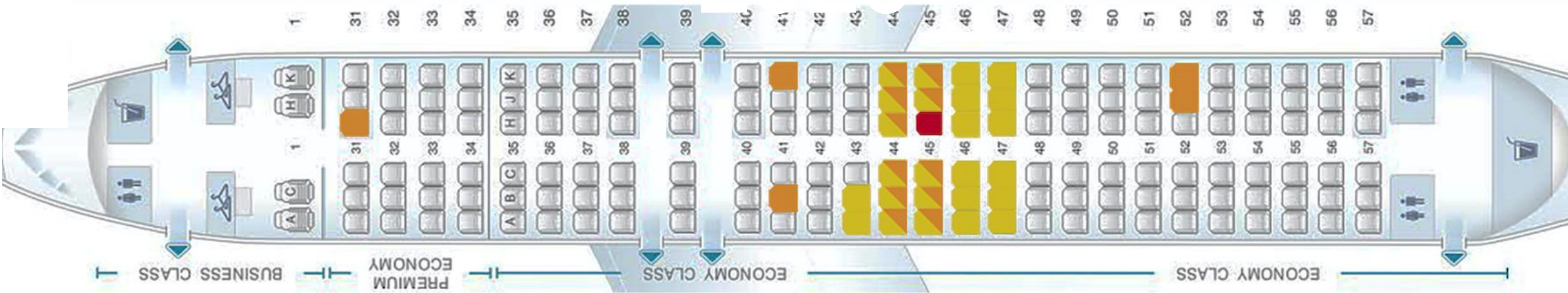


# Safety refer to designated hospital





# First confirmed case detected at BKK airport on 8<sup>th</sup> January 2020



- A female passenger from Wuhan arrived at BKK airport on 8 Jan 2020 at 11:20 AM.
- History of URI on 5 Jan 2020
- Isolated at Infectious disease institute, DDC
- Molecular sequencing confirmed on 10 Jan 2020
- Declaration on 13 Jan 2020
- Her closed contacts were all negative PCR



= index case



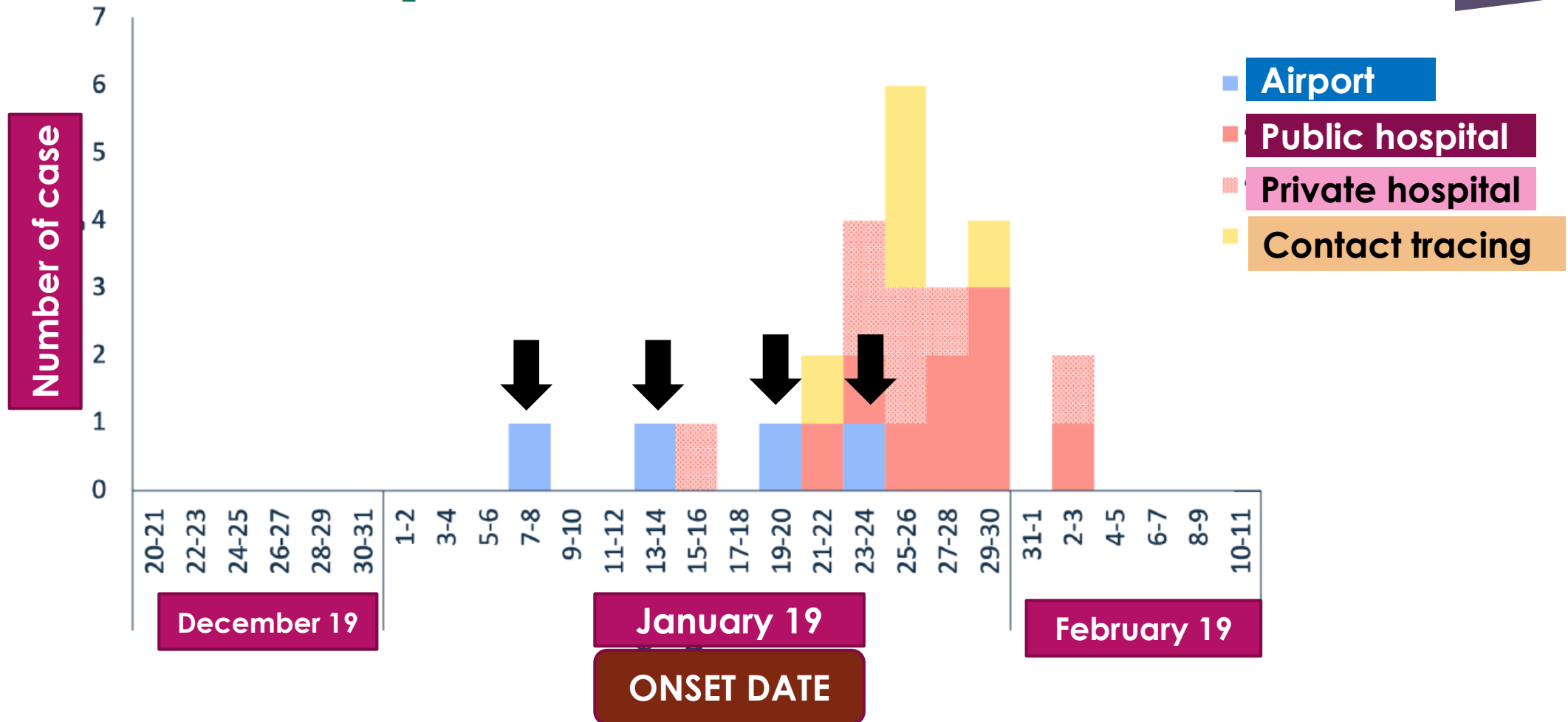
= high risk closed contact (2 seats)



= high risk closed contact (tour group)

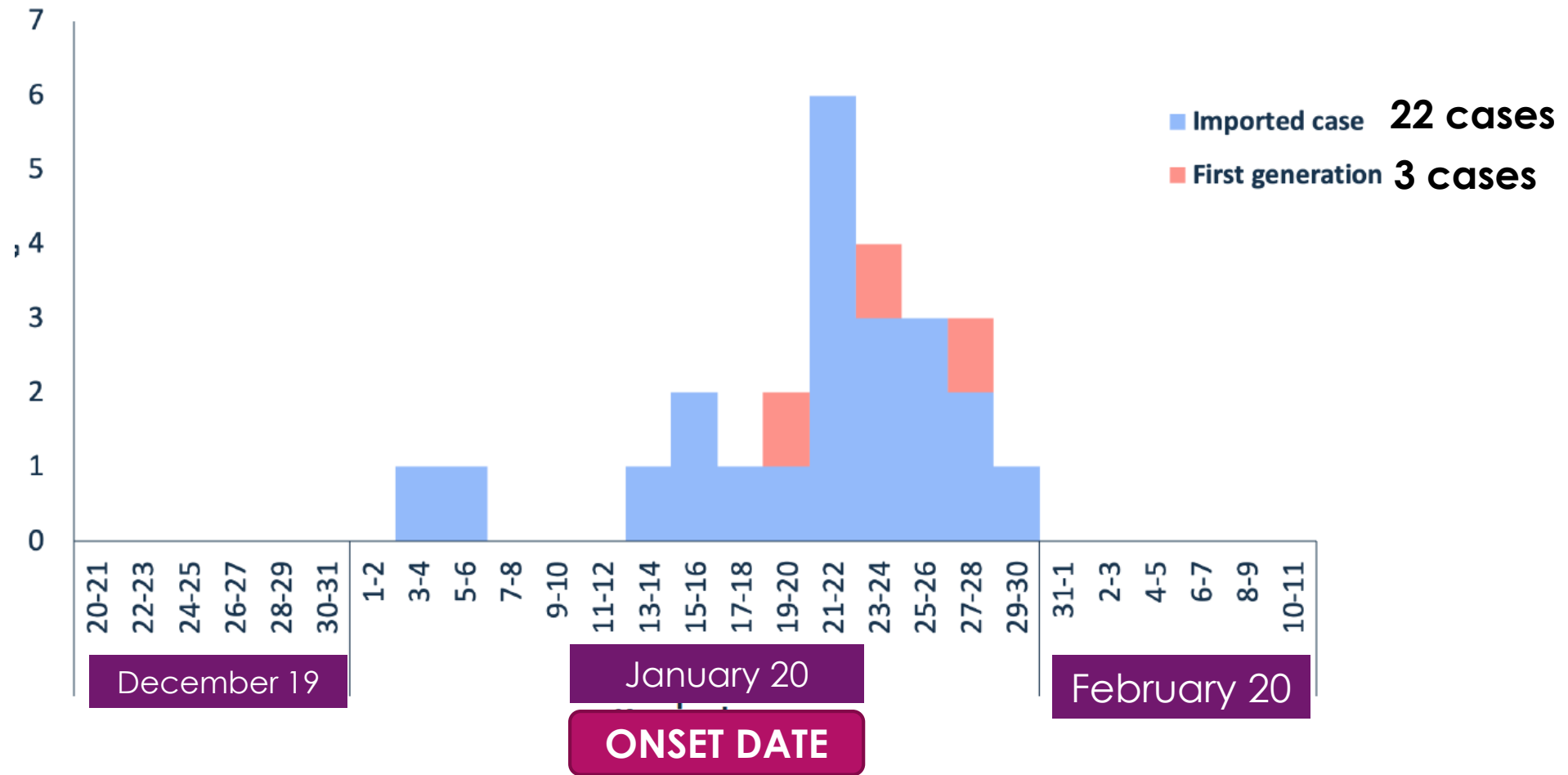
# First two cases detected at BKK airport on January 2020

9



# Epidemic curve of 25 confirmed nCoV-19 in January 2020

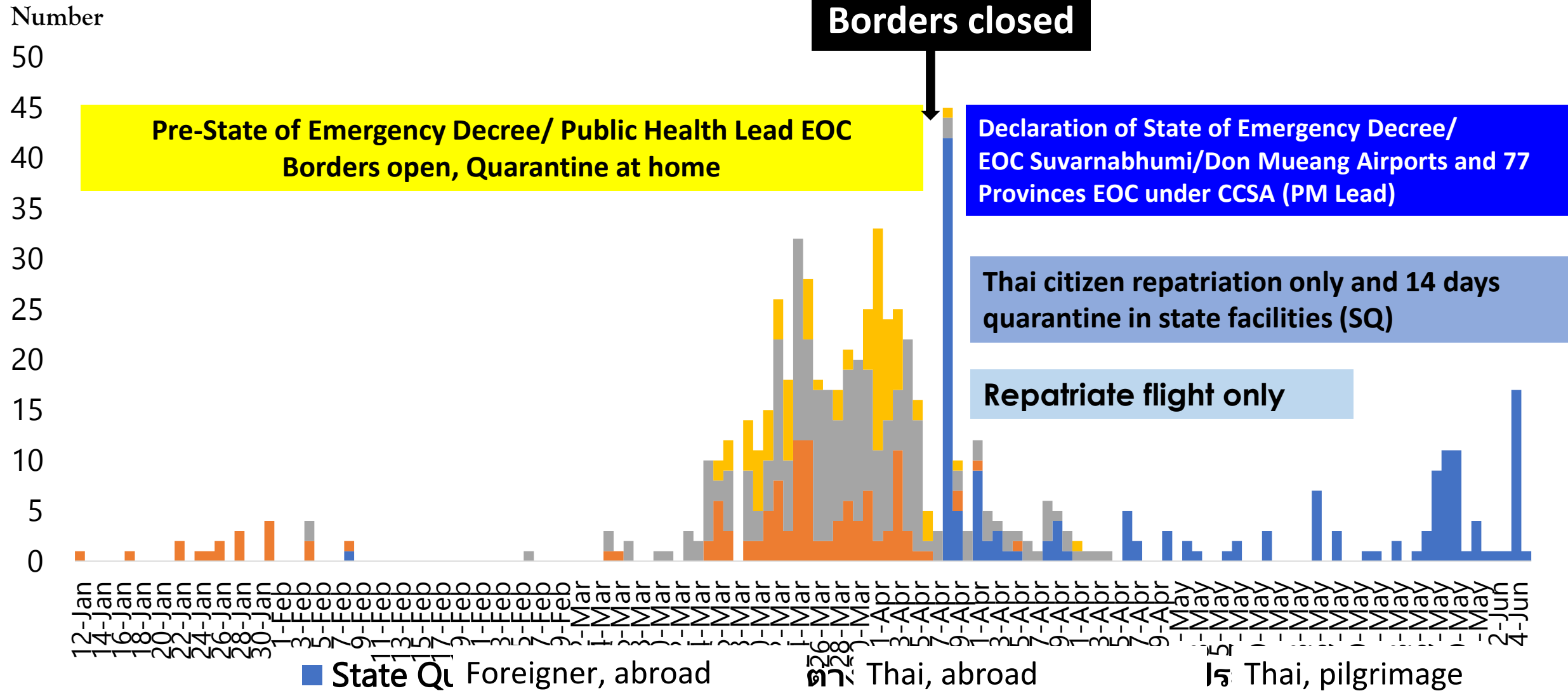
10





# Lesson Learnt : Early case detection at airport

- First case detection at airport is rarely succeed but there is possible.
- Single use of distance thermo-scan is not recommended for detected low grade fever (BT 38 °C)
- Need compare with core temperature and reduced set point of alarm and double check with tympanic ear temperature
- Calculates R0 or reproductive number frequently to detect the human transmissibility



# THAILAND International Passenger in Million



# PHASE of ENTRY RESTRICTION

- **Phase 1 : Completely Quarantine** in Quarantine Facilities  
start from **April 2020 – June 2020 (only Thai citizen)**  
**July 2020 - October 2021 (foreigner allowed)**  
all travelers must register and receive permit entry
- **Phase 2 : Extended quarantine for major variants**  
from 14 to 21 days
- **Phase 3 : Sandbox Program with Vaccination** in some area  
start from **October 2021** (Phuket-> Samui ->others)
- **Phase 4 : Test and Go**  
start from **November 2021**

# PHASE of ENTRY RESTRICTION

- **Phase 5 : No Quarantine** but required pre-departure PCR test  
start from **May 2022**
- **Phase 6 : End of Quarantine** but required Thailand Pass  
start from **June 2022**  
end of pre-departure lab PCR test requirement
- **Phase 7 : Travel freedom**  
start from **October 2022**

# What is required before entry Thailand?

- ▶ **Certificate of Entry (COE)** from Embassy or Consular for all people (both Thai and foreigner)
- ▶ **Quarantine facility confirmation letter**
- ▶ **RT-PCR for COVID-19**, 72 hours before check-in
- ▶ **Health insurance** (coverage at least 100,000 USD)
- ▶ **Fit to fly certificate**
- ▶ **Visa** if needed



# arrival formalities at airport



Seat and  
prepare  
docs

Interview,  
temperature  
check,  
verify docs

Take a  
bus to  
Quarantine  
facilities

Immigration  
and  
Custom  
formalities



# Process upon arrival

**Step 1 : Verify entry documents** by Port Health Officer

valid then stamped → step 2

not valid then **reject entry**

**Step 2 : Screening individual temperature and interviewing COVID-19 suspected symptoms**

if having  $> 37.3^{\circ}\text{C}$  or the symptoms → **PUI**  
**then transfer to hospital**

passed health screening → step 3

# Process upon arrival

## Step 3 : Immigration Formality

foreigner valid visa → step 4

foreigner not visa or not valid visa → **reject entry**

(note there is no exempted visa)

## Step 4 : Designated Luggage Claim

(only belt 21/22/23)

## Step 5 : Designated Custom Screening

(only Exit C for only passenger, Exit B for only staff)

# Process upon arrival

**Step 6** : Dedicated Exit and Seal Route Transportation

Exit 10-SQ (Thai)

Exit 9-ASQ (Foreigner and Thai)

Exit 8-AHQ (Hospital quarantine for other disease)

Exit 7-Special

Exit 4-Airline crews (airport hotel quarantine)

Exit 3-Domestic passenger

**Step 7** : Arrival at accommodation

# Quarantine Center at DIPQ, DDC (a role model)





# Quarantine Center at DIPQ, DDC





# Thailand's COVID-19 Quarantine facilities

November 2020, AYQ was initiated in Phuket.



กองด่านควบคุมโรคติดต่อระหว่างประเทศและกักกันโรค

## Lesson Learnt : early phase of closed border

- We have **quarantine center before covid-19** and quickly adapted to maximize the number of quarantine facilities
- **Health insurance before entry** is crucial benefit for the country
- Airport has an existing **separate track between ill vs non-ill pax**
- **Low volume of passenger** (1000 – 2000 pax a day) then checking hard copy document and interview all pax was feasible

# Initiation of Sandbox Program on July 2021 during vaccination era

25

## Eligible criteria

- **Area must be well defined** with controllable entry and exit such as island (Phuket and Samui)
- **Traveller** must be **fully vaccination** at least 14 days of last dose
- **Local people** must be **fully vaccination** at least **70% of population**
- **Hospital bed occupancy** in the hospital is not exceed than %
- **Traveller must register and receive the granted pre-approval certificate (COE or Thailand Pass)**
- **Direct flight to sandbox only**

## Protocol

- After PCR test result negative upon arrival then the traveller has freedom travel within the island (sandbox)
- If second test negative and complete 14 or 7 days of staying in the sandbox then the traveller can go out the island (sandbox)

## Sandbox program came with 3 issues

- ▶ **Vaccination approval** : Pre- vs On arrival
- ▶ **Verify docs and data entry at PoE** : Manual vs Electronic
- ▶ **Limited direct flight** : USM is short runway

### **The decision**

Vaccination : **Pre-arrival approval by human and AI**

Verify docs : **Electronic**

**Initiate Sandbox flight to USM and HKT**



กองด่านควบคุมโรคติดต่อ  
ระหว่างประเทศและกักกันโรค

# Pre-arrival registration with Thailand Pass during COVID-19

## Pre-Arrival registration



**CERTIFICATE OF ENTRY (COE)**  
**Pre-Entry registration**  
[at//tp.consular.go.th](http://tp.consular.go.th)  
(Data controller by Department of Consular Affair)





**THAILAND PASS**  
**TPHS**

1. Hotel verify booking
2. Port health verify vaccine and health insurance
3. Granted Thailand Pass

## Arrival (Port health screening)

### POE SCREENING


Scan QR Code/document check/  
Electronic health declaration




**Designated lab center**  
collection and test  
samples for COVID-19



Traveler download tracking  
application that link to  
COSTE/COSTE SHA



**Check-in/Report  
symptom/Lab Report  
result to COSTE/COSTE  
SHA**



**Quarantine Facilities**

This mechanism still use in EIDs and 13 quarantinable diseases





THAILAND PASS

AIR TRAVEL

Mr.



Departure from  
United States of America

Arrival Date  
21 July 2022

Valid for Entry from  
21 July 2022

Valid for Entry until  
24 July 2022

Submitted at  
18 July 2022

Thailand Pass ID  
62d4e367c7d50d94672fdd6a

Quarantine

When arriving in Thailand, please present Thailand Pass QR Code to immigration and disease control officers.  
Please note that if you enter Thailand using a PCR or Antigen test result your test result must remain valid at the time of departure.



THAILAND PASS

AIR TRAVEL

Mr.



Departure from  
Singapore

Arrival Date  
01 May 2022

Valid for Entry from  
01 May 2022

Valid for Entry until  
04 May 2022

Submitted at  
28 April 2022

Thailand Pass ID  
626ac2307d68868cc817bfd0

SandBox

When arriving in Thailand, please present Thailand Pass QR Code to immigration and disease control officers.  
Please note that if you enter Thailand using a PCR or Antigen test result your test result must remain valid at the time of departure.



THAILAND PASS

AIR TRAVEL

Ms.



Departure from  
Vietnam

Arrival Date  
17 April 2022

Submitted at  
15 April 2022

Duration of stay  
Less than 5 days

Thailand Pass ID  
625948e73940929e2b1bf1c7

Test & Go

When arriving in Thailand, please present Thailand Pass QR Code to the immigration and disease control officers.



**Vaccination : Pre-arrival approval by  
human and AI**


# Application Pre-Approve Vaccination Certificate

COE

 Login  
COE THAILAND

ชื่อผู้ใช้

รหัสผ่าน

 เข้าสู่ระบบ

v.0.1.0-ALPHA

# Application Pre-Approve Vaccination Certificate

กรมควบคุมโรค									
รายชื่อผู้รอพิจารณาเอกสาร Vaccine Certificate ( ⚠️ รอพิจารณา )									
#	ประเทศต้นทาง	สัญชาติ	ชื่อ - สกุล	เข้ามาอยู่ที่เมือง	วัคซีนเข็มที่ 1	วัคซีนเข็มที่ 2	วันที่ลงทะเบียน	วันที่คาดว่าจะ/วันที่ออกเดินทาง	เปิดเอกสาร
1	เนเธอร์แลนด์	Dutch		Phuket	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 25 JUL 2021	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 29 AUG 2021	Jul 13, 2021	Aug 5, 2021	
2	สวิตเซอร์แลนด์	Swiss		Phuket	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 07 MAY 2021	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 04 JUN 2021	Jul 13, 2021	Jul 31, 2021	
3	เยอรมนี	German		Phuket	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 11 MAY 2021	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 22 JUN 2021	Jul 13, 2021	Jul 29, 2021	
4	แคนาดา	Canadian		Phuket	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 21 MAY 2021	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 02 JUL 2021	Jul 13, 2021	Aug 9, 2021	
5	สหราชอาณาจักร	British		Phuket	AstraZeneca COVID-19 vaccine (AstraZeneca) 26 MAR 2021	AstraZeneca COVID-19 vaccine (AstraZeneca) 11 JUN 2021	Jul 13, 2021	Aug 5, 2021	
6	สหรัฐอเมริกา	American		Phuket	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 25 FEB 2021	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 18 MAR 2021	Jul 13, 2021	Jul 25, 2021	
7	ฝรั่งเศส	French		บูรี	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 30 APR 2021	Pfizer – BIONTECH COVID-19 vaccine (Pfizer Inc.) 14 JUN 2021	Jul 13, 2021	Jul 27, 2021	

# feedback to applicant in COE



THAILAND PASS

## Check air documents

bierthawabhorn@gmail.com

# Thailand Pass

1

Wait to consider by Staff

0

2

Wait to consider by AI

0

NOT APPROVED 306,425

APPROVED 3,146,062

Dashboard

Check documents by air

Check land documents

Check marine documents

Administrative manager

List of administrators

Set rights

Set up

Set country

Set up province

Set up insurance

Set the vaccine type

Set up airport/checkpoint

Set up AQ Hotel

Set age range

Set up announcements

Registration day

to

Registration date to

Arrival day

to

Arrival day

Type of entry into the country

all

Vaccine

all

Search

Search...

SEARCH

CLEAR FILTER

document	Registration date	passport	First and last name	Country of origin	came to live in the city	flight number	Expected arrival date	Type of travel into	Email
๑๒๓๔๕	16/11/2023 00:09			Brazil	Bangkok	EK0384	17/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:51			Brazil	Bangkok	EK384	21/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:39			Brazil	Bangkok	FD615	16/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:34			Brazil	Bangkok	EK384	21/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:31			Brazil	Bangkok	FD615	16/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:23			Brazil	Bangkok	FD615	16/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:15			Brazil	Bangkok	FD615	16/11/2023	HP	
๑๒๓๔๕	15/11/2023 23:11			Ethiopia	Bangkok	628	16/11/2023	HP	

# 1. Approve by Staff



bierthawabhorn@gmail.com

Check the documents: Mr. regular person ANTHONY VAUGHAN

Current status: **Approved** Type: SB Access Code: 720538

Name of Inspector: Mr. Chulathep Suksaen Date: 27/04/2022

Expected arrival date: 28/04/2022

RETURN TO  
HOME PAGE

DOWNLOAD

NOT  
APPROVED

SEND TP

SEND ACCESS CODE

Upload additional files (if any)

ADD FILE

## Case Transaction

status	time	Inspector's name
APPROVED	27/04/2022 10:05	Mr. Chulathep Suksaen

Note

RECORD



## 2. Auto approve by AI

**2nd vaccine dose**

Vaccine type 2 Pfizer - BioNTech

Date of vaccination 29/07/2021

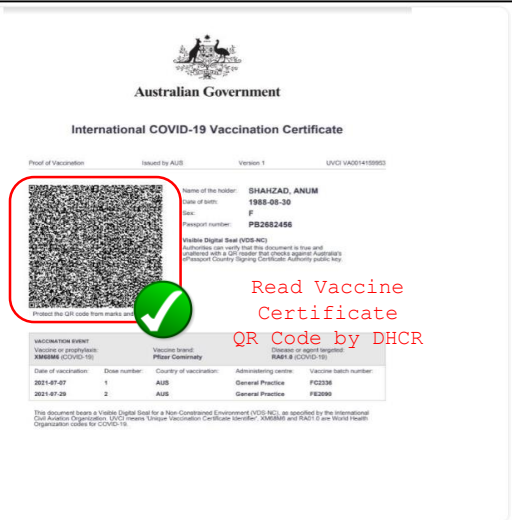
**OCR**

Vaccine name: \*Pfizer - BioNTech

Date of vaccination: 2021-07-29

QR code vaccine

No Uploaded



Read Vaccine Certificate QR Code by DHCR


**Passport**

Passport PB2682456

**OCR**

Name - Surname : SHAHZAD ANUM

Passport number : PB2682456



+

↓

### Case Transaction

สถานะ	เวลา	ชื่อผู้ตรวจ
APPROVED	26/04/2022 09:15	Auto Approve
MANUAL	26/04/2022 08:34	Auto Approve

**Verify docs and data entry at PoE :  
Electronic**



กองด่านควบคุมโรคติดต่อระหว่างประเทศและกักกันโรค  
Division Of International Disease Control Port And Quarantine

DIPQ Digital Information Center,  
Division of International Communicable  
Disease  
Control Port and Quarantine,

Department of Disease Control, Ministry of



# PoE Screening

## 1. Data input

- Direct key passport number
- Scan QR code by mobile app or computer

POE screening

DASHBOARD POE screening

Passport

please insert passport

COE

Thai Health Pass

DDC PASS

The Passport field is required

First name

please insert First name

Surname

please insert surname

flight number

please insert flight number

flight seat

please insert flight seat

Origin Country

Case Type

Conclusion

Entry Thailand

Screen time

☐ Wednesday, November 15, 2023

Symptom Taking

☐ Have symptoms
 ☐ No Symptoms

Disease report

☐ Report
 ☒ Not Report

Submit

Clear

Scan QR code Thai Health Pass

Scan QR code DDC PASS

### Retrieve information from database by passport number

or

Scan Thai Health Pass/DDC PASS QR Code



# PoE Screening

## 2. Screening List

### 2.1 Passenger information

Select Case type

PASSPORT	NAME	CASE TYPE	FLIGHT NO	SEAT NO.	ORIGIN COUNTRY	TIMESTAMP	CONCLUSION	ACTIONS
A	4	Quarantine (AQ) 7 days	KE653	38F	Republic of Korea	01/11/2021 00:33:35		
6		Quarantine (AQ) 14 days	DL7692		United States of America	01/11/2021 00:33:25		
A		Test & Go (EQ)	KE653	39G	Canada	01/11/2021 00:32:58		
4		Test & Go (EQ)	KE653	39A	United States of America	01/11/2021 00:31:57		
A	5	Test & Go (EQ)	KE653		United States of America	01/11/2021 00:30:59		
A	5	Test & Go (EQ)	KE653		United States of America	01/11/2021 00:30:56		
H		Test & Go (EQ)	KE0653	28G	Canada	01/11/2021 00:30:50		
T		Test & Go (EQ)	JL707		Japan	01/11/2021 00:21:37		
T		Test & Go (EQ)	JL707		Japan	01/11/2021 00:21:37		
5		Test & Go (EQ)	JL707	23G	United States of America	01/11/2021 00:21:27		



# PoE Screening

## 2. Screening List

### 2.2 Documents

Print T.8	PRINT UNDER OBSERVATION	QUARANTINE

### Health Declaration Form (T8 Form)

คำถาม  
QUESTIONNAIRE

กรุณากรอกข้อความต่อไปนี้ให้ถูกต้องและใช้ตัวอักษรพิมพ์ใหญ่  
Please fill in the following blanks correctly, in block letters

ประเภทพาหนะ: ☒ เครื่องบิน เที่ยวบินที่ PG712 ☐ เรือ ชื่อเรือ .....

ชนิดของพาหนะ: ☒ เครื่องบิน เที่ยวบินที่ PG712 ☐ เรือ ชื่อเรือ .....

อื่น ๆ (ระบุ) ..... ☐ รถยนต์ ทะเบียนที่ ..... ☐ รถยนต์ หมายเลขทะเบียน .....

จาก null. ถึง ประเทศไทย หมายเลขที่ ..... ☐ car/bus license plate No. ....

From null. to Thailand seat No. ....

วันที่ 15-11-2023 เลขที่หนังสือเดินทาง FX556023  
date 15-11-2023 passport No. FX556023

ชื่อ - นามสกุล : null สัญชาติ : null  
name in full : EDSON FABIO BRAZ DOS SANTOS nationality : null

อายุ ปี เพศ ☐ ชาย ☐ หญิง อาชีพ  
age years sex ☐ male ☐ female Occupation

ที่พักในประเทศไทย / Address in Thailand  
null null null null

อีเมล/โทรศัพท์ (E-mail / Telephone number)  
.....

บุคคลที่สามารถติดต่อได้ (Contact person):  
ชื่อ ..... เบอร์ .....  
Please list the name of the countries where you stayed within two weeks before arrival.  
null.

คุณหรือหมามีอาการหรือมีประวัติการเจ็บป่วยในสองสัปดาห์ก่อนมาประเทศไทย  
Please mark ☒ if you have had any of the following symptoms within two weeks before arrival.

☐ อุจจาระร่วง/ท้องเสีย/diarrhoea ☐ อาเจียน/vomiting ☐ ปวดท้อง/abdominal pain ☐ ไข้/fever ☐ ผื่นตามร่างกาย/rash

☐ ปวดศีรษะ เจ็บคอ/headache, sore throat ☐ หายใจลำบาก/shortness of breath

☐ ไอหรือหายใจขัด/cough or shortness of breath

☐ ต่อมน้ำเหลืองโต/lymph nodes/enlarged lymph glands or tender lumps

☐ อื่น ๆ (ระบุ)/other (specify) .....

ข้อมูลนี้จะใช้เป็นประโยชน์ในการจัดการเหตุการณ์สุขภาพของประชาชน สามารถใช้ในการติดตามผู้โดยสารที่อาจได้รับการสัมผัสโรค  
The information you provide will assist the public health authorities to manage the public health event by enabling them to trace passenger who may have been exposed to communicable diseases. The information is intended to be held by the public health authorities in accordance with the communicable diseases Act (2015) and international Health Regulation (2005) and to be used only for the public health purposes.

Juthamas Ruengkham  
เจ้าหน้าที่ควบคุมโรคติดต่อประจำท่าอากาศยานระหว่างประเทศ  
Port Health Officer / Health Quarantine Officer

ลายมือชื่อ ผู้เดินทาง  
signature (passenger)

### Quarantine order Form

The Order of Communicable Disease Control Officer at Port Health and Quarantine  
Subject: Quarantine of suspected COVID-19

No 617ed0311d2fbc8207bbf4fb /2022 Port of Entry Suvarnabhumi Airport

Date 01 November 2021

According to (Name-Surname) MRS. NICHAKAN WATANABE  
Passport Number AB2274920 Nationality Thai travelled from (city/country) Japan  
suspected COVID-19. Under the Communicable Disease Control Act BE 2558 (AD 2015) by  
Article 40 and/or 42, the communicable disease control officer orders this person to be

☒ Test & Go (EQ) 1 Days and must undergo RT-PCR test on Day 0-1 and self ATK on Day 5 for individuals subjected

at Furama Silom and person will remain under observation in the Kingdom of Thailand  
until completion period upon arrival with the exception of direct instruction and  
permission by the local Communicable Disease Control Officer.

Signature  
( อภิสิทธิ์ ห้วยช่วยชา )  
Communicable Disease Control Officer  
at International Communicable Disease Control Port and Quarantine

### Under observation order Form

The Order of Communicable Disease Control Officer at Port Health and Quarantine  
Subject: Quarantine of suspected COVID-19

No 617ee3511d2fbc8207bc007a /2022 Port of Entry Suvarnabhumi Airport

Date 01 November 2021

According to (Name-Surname) MR. DILBIR SAHNI  
Passport Number Z3285334 Nationality Indian travelled from city India suspected  
COVID-19. Under the Communicable Disease Control Act BE 2558 (AD 2015) by Article 40  
with 42, the communicable disease control officer order this person to be.

☒ Sandbox 7 days and must undergo RT-PCR tests on Day 0-1 and self ATK no Day 5 for individuals subjected.

at Avani Atrium Bangkok Hotel and person will remains under observation in the Kingdom  
of Thailand until completion period upon arrival with the exception of direct instruction  
and permission by the local Communicable Disease Control Officer.

Signature  
( บัณฑิต ทองแป้น )  
Communicable Disease Control Officer  
at International Communicable Disease Control Port and Quarantine





កង្ខំបុគ្គលិកប៉ុន្មានស្រីស្រស់ស្រាយ

## Information about events

# Total Number of Pre-arrival Registration



**System**

**Passenger Number**

**AIR**

**LAND**

**SEA**

**Total**

**COE**

**103,671**

**1,281**

**648**

**105,600**

**Thailand Pass**

**3,350,270**

**202,421**

**—**

**3,552,691**

# Now, Thailand Pass transforms to Thai Health Pass for YF screening



## Thai Health Pass for YF endemic countries

### Health Declaration Form (T.8) of Yellow Fever for Entry to Kingdom of Thailand

Health Declaration Form (T.8) of Yellow Fever for Entry to Kingdom of Thailand

Mr.



#### AIR TRAVEL

Departure from  
**Brazil**

Arrival Date  
**22 December 2022**

Valid For Entry From  
**15 December 2022**

Valid For Entry Until  
**29 December 2022**

YF Vaccination Date  
**30 January 2019**

Health Pass ID  
**639fd3cc55393e542cfea1b8**



**Initiate Sandbox flight to USM and HKT**

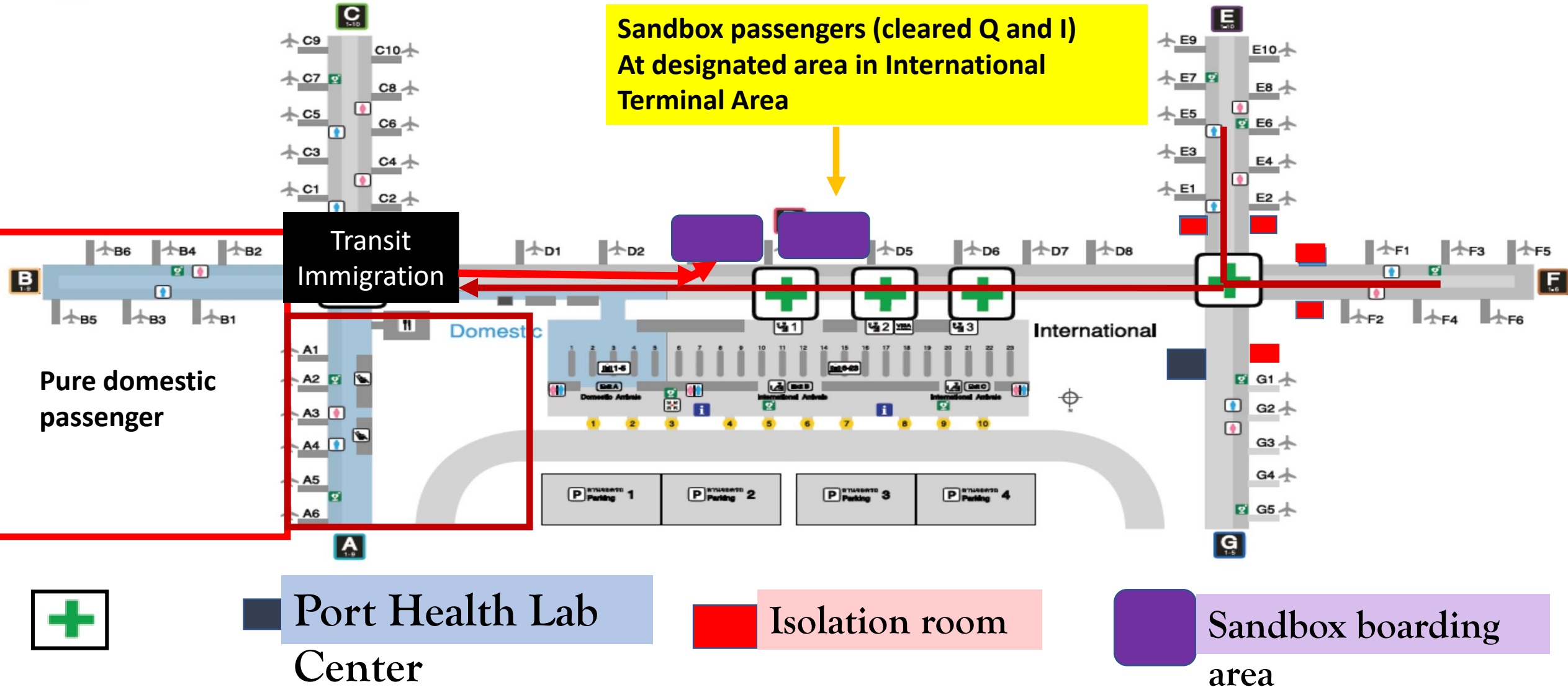


# Transfer Inter-Dom for Sandbox Travelers

- **Port Health Process** upon arrival at **first port**
- **Immigration Formality** at **first port**
- **Custom clearance** at **final port**
- **Characteristics**
  - : domestic passengers can not join with international transfer passenger to USM or HKT
  - : dedicated flight for transfer passenger only (4 digits flight number), not seen in domestic published flight, only connecting with inter flight
  - : waiting departure lounge is on international boarding gate
  - : aircraft for sandbox destination will be parking at international bay (Sandbox gates)
  - : at USM or HKT, all pax will go to international baggage claim



# seal route for international transfer to sandbox



# Departure Gate at International D4 for SandBox





# Xray Security Before Entry Sandbox Gate





# Samui Plus Sandbox Seal Flight

TRAVEL INFO

## Samui Plus Sandbox: Travel to Thailand Without Quarantine



## 2. Book your Flight, COVID 19 Insurance and Samui Extra Plus or SHA+ Hotels

### Book your Flight to Thailand

You can fly to Samui on a direct international flight or international flight via Bangkok and be connected with approved sealed flights as details below.

For the flight via Bangkok, the ticket must be issued on the same booking with an international flight in conjunction with such approved Bangkok-Samui-Bangkok flights. Any flight reservations booked separately will not be allowed.

**Bangkok Airways Flights: PG5125, PG5151 and PG5171**

**Source: [www.thaiembassy.com](http://www.thaiembassy.com)**

# Airport set up as a vaccination center

- ▶ After vaccine against COVID-19 were available, counter check-in area was modified to be vaccination site for staff of airport, airlines and government officers
- ▶ **Approximately 30,000 staff vaccinated at BKK airport**
- ▶ **4 doses of vaccine provided by Port Health, DDC** included
  - 1<sup>st</sup> dose: March 2021** : CoronaVac
  - 2<sup>nd</sup> dose: April 2021** : CoronaVac
  - 3<sup>rd</sup> dose: July 2021** : AstraZeneca
  - 4<sup>th</sup> dose: Jan 2022** : AstraZeneca or Comirnatry







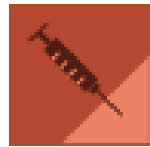
# Volunteers from airport authority (AOT) and airline operators (AOC BKK)

52




**Are you confident the efficacy?**





*Article*

# Homologous or Heterologous COVID-19 Booster Regimens Significantly Impact Sero-Neutralization of SARS-CoV-2 Virus and Its Variants

Rome Buathong <sup>1,†</sup> , Taweewun Hunsawong <sup>2,†</sup>, Supaporn Wacharapluesadee <sup>3</sup>, Suriya Guharat <sup>4</sup>, Ratthapat Jirapipatt <sup>4</sup>, Sasiprapa Ninwattana <sup>3,5</sup>, Nattakarn Thippamom <sup>3</sup>, Anusara Jitsatja <sup>3</sup>, Anthony R. Jones <sup>2</sup>, Kamonthip Rungrojchareonkit <sup>2</sup>, Jindarat Lohachanakul <sup>2</sup>, Rungarun Suthangkornkul <sup>2</sup>, Kedsara Tayong <sup>2</sup>, Chonticha Klungthong <sup>2</sup>, Stefan Fernandez <sup>2</sup> and Opass Putcharoen <sup>3,5,\*</sup>

<sup>1</sup> Department of Disease Control, Ministry of Public Health, Nonthaburi 11000, Thailand

<sup>2</sup> Department of Virology, Armed Force Research Institute of Medical Sciences, Bangkok 10400, Thailand

<sup>3</sup> Thai Red Cross Emerging Infectious Diseases Clinical Center, King Chulalongkorn Memorial Hospital, Bangkok 10330, Thailand

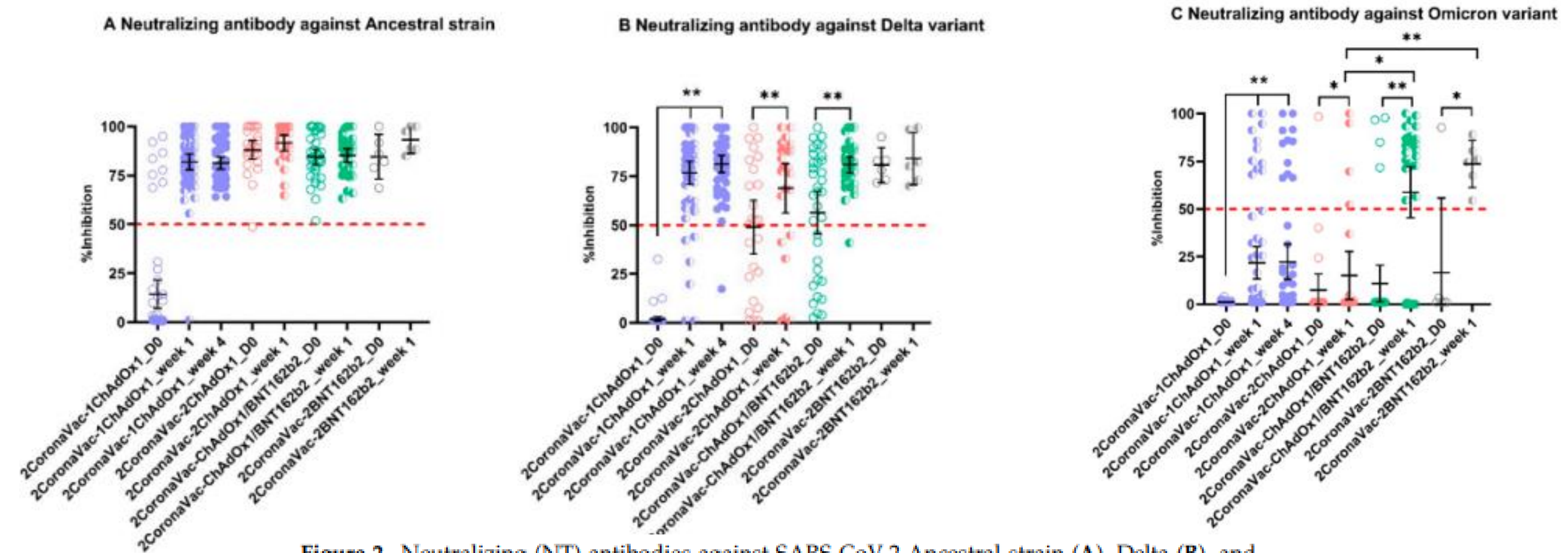
<sup>4</sup> Samut Sakhon Provincial Health Office, Ministry of Public Health, Nonthaburi 11000, Thailand

<sup>5</sup> Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand

\* Correspondence: opass.p@chula.ac.th

† These authors contributed equally to this work.

# Results



**Figure 2.** Neutralizing (NT) antibodies against SARS-CoV-2 Ancestral strain (A), Delta (B), and Omicron (C) VOCs. A “\*” indicates significance of  $p < 0.05$ . A “\*\*\*” indicates significance of  $p < 0.0001$ .

## During the aviation travel resume

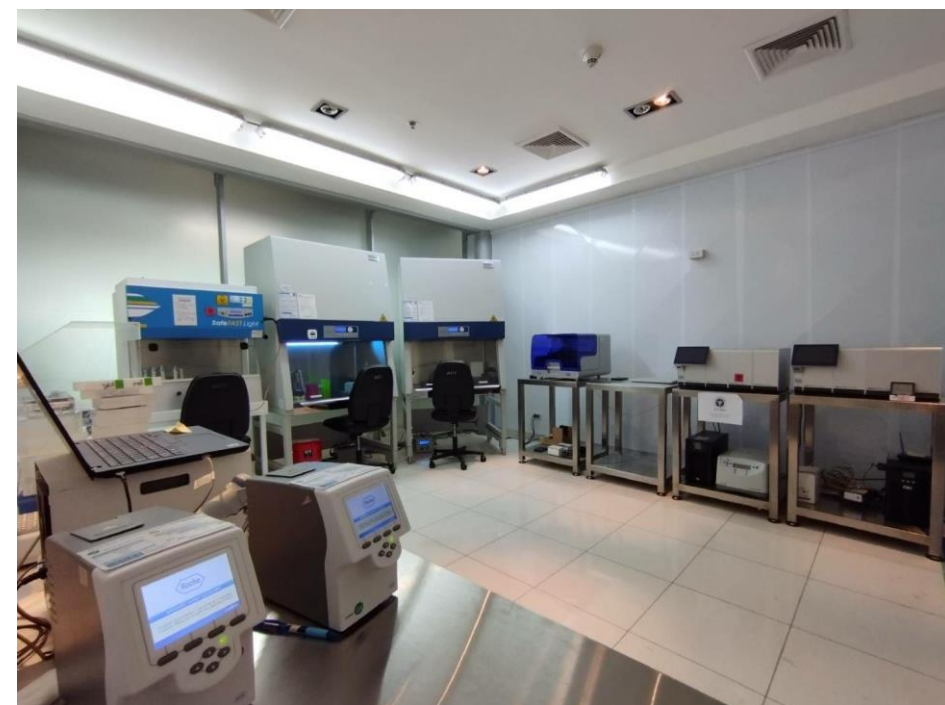
- ▶ Transit/transfer passengers were denied boarding due to no supporting document particularly RT-PCR. They can not pass thru the immigration for testing in the country.
- ▶ Too many ill passengers need refer, shortage of room and transfer staff and vehicle, especially during epidemic in the country.

# During the aviation travel resume

- ▶ Thus, Port Health established arrival lab center at BKK airport since July 2020 with fast, point-of-care RT-PCR for SARS-COV-2 with short turn-around-time.
- ▶ **Aims**
  1. To promote safety travel and unnecessary denied travel for transit/transfer passenger
  2. To reduce the unnecessary refer, only positive case refer to the hospital

# Suvarnabhumi airport laboratory center

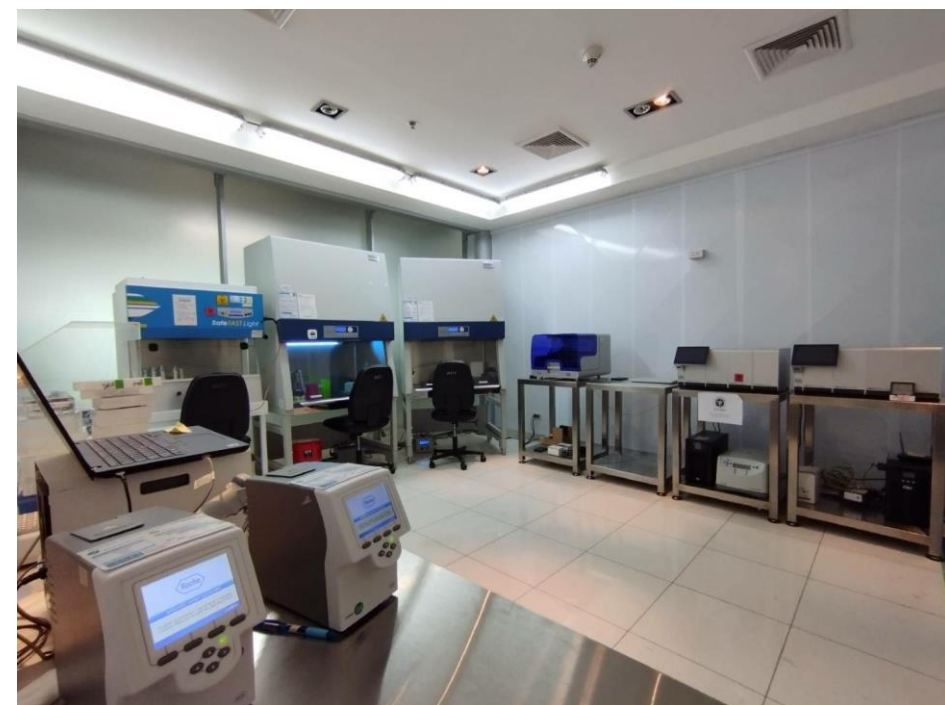
- ▶ Suvarnabhumi airport laboratory was an accredited biosafety and proficiency testing (PT) by the Department of Medical Sciences before operation for SARS-CoV-2 and Monkeypox viruses.
- ▶ Consultant and contributed by DMSc, BIDI and TRC-EID





# Suvarnabhumi airport laboratory center

- ▶ Requires pathogen testing
- ▶ Yellow Fever, West Nile, XDR TB etc...
- ▶ POC or Fast RT-PCR within 2 hours for case management and travel seamless



# Point of Care RT-PCR for SARS-COV-2 KIT at BKK airport

**Liat**-20 min/2 tests



**QIAstat**-70 min/8 tests



**Xpert**- 45 min/4 tests



**QIAprep**-  
70 min/96 tests



**Coyote**-  
30 min/4 tests



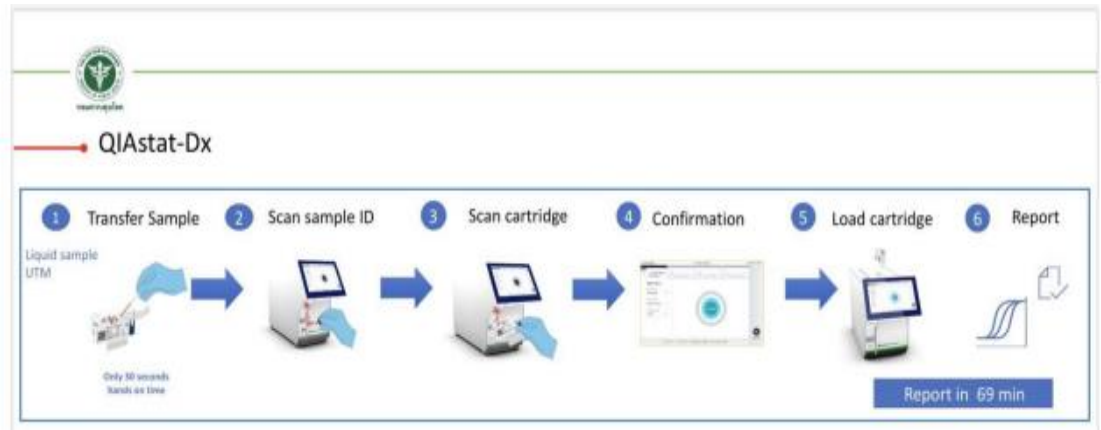
กองด่านควบคุมโรคติดต่อ  
ระหว่างประเทศและกักกันโรค

# Point of care RT-PCR for multiplex RT-PCR at PoE



Liat:

- Turn-around-time **20 minutes**
- Capability for **2 res pathogens**:  
Influenza and COVID-19



QIAstat:

- Turn-around-time **70 minutes**
- Capability for **23 types res pathogens**
- Apply for **MPXV** (diff. reagent)





กองด่านควบคุมโรคติดต่อ  
ระหว่างประเทศและกักกันโรค

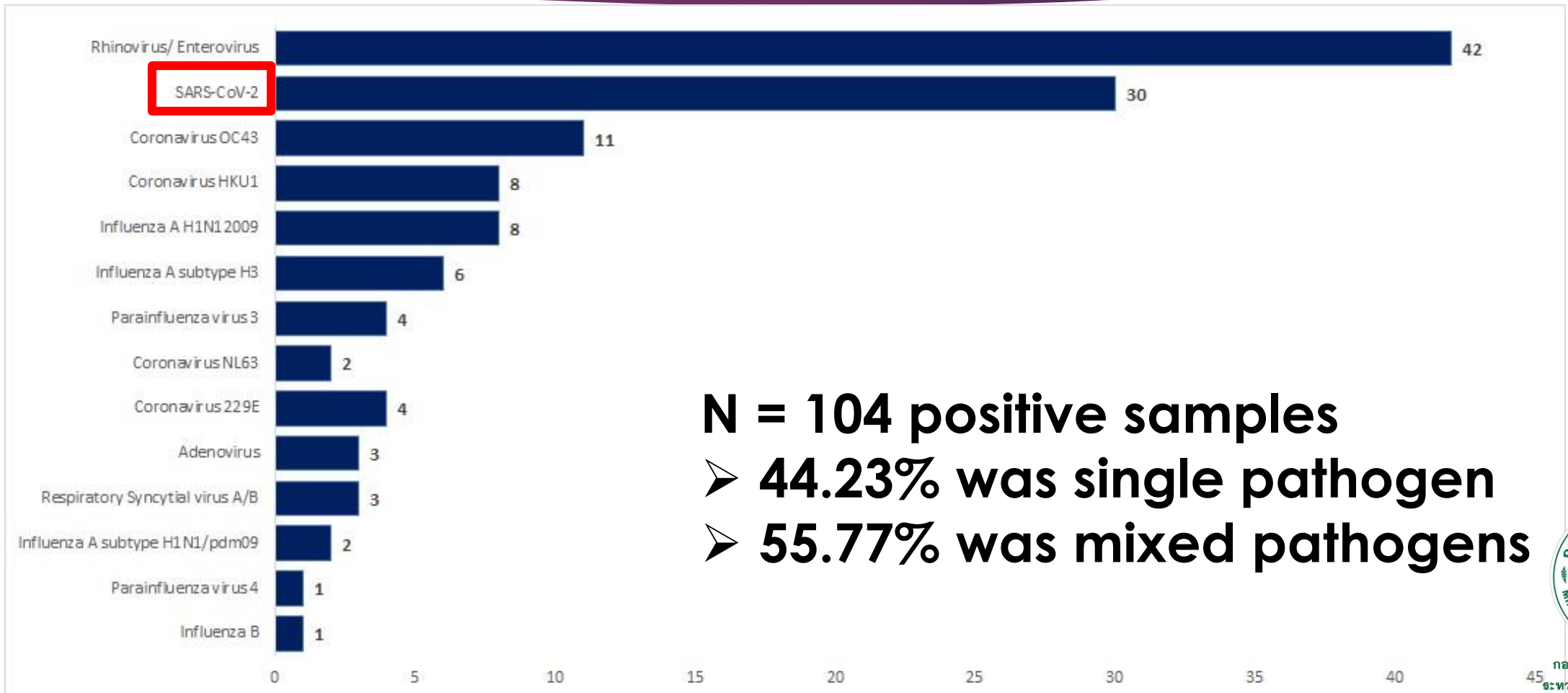
**Not only SARS-CoV-2  
We are also  
monitoring the virus  
circulating among  
travellers.**

Table 1. Pathogens detected by the QIAstat-Dx Respiratory SARS-CoV-2 Panel

Pathogen	Classification (genome type)
Influenza A	Orthomyxovirus (RNA)
Influenza A, subtype H1N1/2009	Orthomyxovirus (RNA)
Influenza A subtype H1	Orthomyxovirus (RNA)
Influenza A subtype H3	Orthomyxovirus (RNA)
Influenza B	Orthomyxovirus (RNA)
Coronavirus 229E	Coronavirus (RNA)
Coronavirus HKU1	Coronavirus (RNA)
Coronavirus NL63	Coronavirus (RNA)
Coronavirus OC43	Coronavirus (RNA)
SARS-CoV-2	Coronavirus (RNA)
Parainfluenza Virus 1	Paramyxovirus (RNA)
Parainfluenza Virus 2	Paramyxovirus (RNA)
Parainfluenza Virus 3	Paramyxovirus (RNA)
Parainfluenza Virus 4	Paramyxovirus (RNA)
Respiratory Syncytial Virus A/B	Paramyxovirus (RNA)
Human Metapneumovirus A/B	Paramyxovirus (RNA)
Adenovirus	Adenovirus (DNA)
Bocavirus	Parvovirus (DNA)
Rhinovirus/Enterovirus	Picornavirus (RNA)
<i>Mycoplasma pneumoniae</i>	Bacterium (DNA)
<i>Legionella pneumophila</i>	Bacterium (DNA)
<i>Bordetella pertussis</i>	Bacterium (DNA)

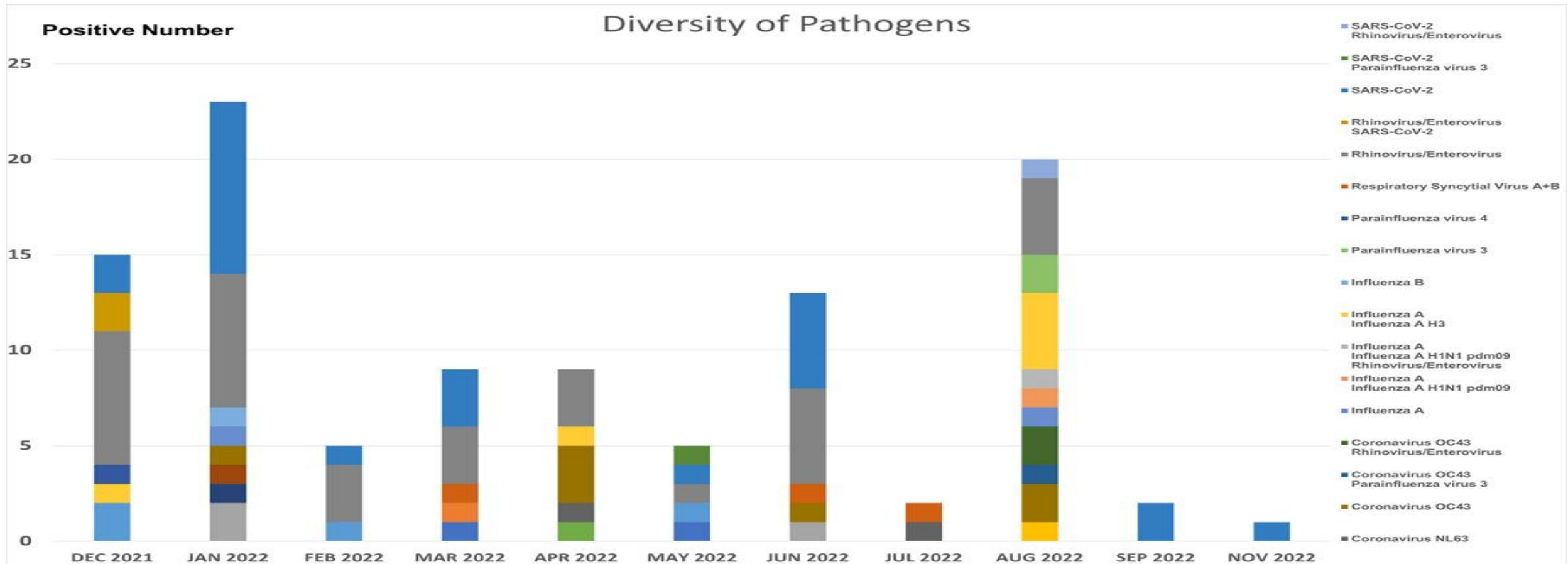
**Note:** Enterovirus and Rhinovirus are both detected, but not differentiated, with the QIAstat-Dx Respiratory SARS-CoV-2 Panel.

# Respiratory pathogens among international travellers arrival at Suvarnabhumi Airport, Thailand, October 2021 – November 2022





# Respiratory pathogens among international travellers arrival at Suvarnabhumi Airport, Thailand, October 2021 – November 2022



# MPOX Passenger Screening

- ▶ **Port Health Screening**  
(Arrival area, Before immigration)
- ▶ **Immigration Screening**  
(Arrival area)
- ▶ **Airport clinic Screening**  
(Departure Terminal)

# Suspected Monkeypox Detection at BKK Suvarnabhumi Airport

No	Sex	Age	Nationality	Detected Date	Place	Lab Result
1	M	35	CHE	18 Jun	Departure	Herpes simplex type 1
2	F	33	IRL	20 July	Arrival	Human herpes type 6
3	F	26	THA from DXB	14 Aug	Arrival	Monkeypox
4	F	25	Thai Immigration	18 Aug	Airport staff	Chickenpox
5	F	33	ISR	16 Oct	Arrival	Enterovirus

## MONKEYPOX SURVEILLANCE AMONG TRAVELERS AT SUVARNABHUMI AIRPORT AND ROLE OF POINT OF CARE RT-PCR FOR MPXV DETECTION, JUNE - AUGUST 2022

- ▶ A suspected case definition of Monkeypox at POE is an inbound international traveller OR airport personnel who has only rash OR fever with 2 symptoms; headache, sore throat, muscle pain, back pain and lymphadenopathy.
- ▶ Laboratory investigation was done by vesicular virus panel by Point-of-Care (POC) RT-PCR including MPXV, HSV-1 and 2, HHV-6, EV and VZV.
- ▶ Samples are skin lesion and oropharyngeal swab in UTM.
- ▶ POC RT-PCR turn-around-time is 70 minutes.
- ▶ The environmental investigation was also conducted by standard RT-PCR at TRC-EIDCC.

# MONKEYPOX SURVEILLANCE AMONG TRAVELERS AT SUVARNABHUMI AIRPORT AND ROLE OF POINT OF CARE RT-PCR FOR MPXV DETECTION, JUNE - AUGUST 2022

## QIAstat-Dx pathogen coverage

### Viral nucleic acids detected and differentiated

- MPXV clade 1
- MPXV clade 2
- Herpes simplex virus 1
- Herpes simplex virus 2
- Human herpesvirus 6
- Enterovirus
- Varicella zoster virus





**Table 1 Summary of suspected cases of Monkeypox identified at Port Health and Quarantine, Suvarnabhumi Airport , Thailand during June – October 2022**

No	Nationality	Age (yrs)	Travel History	Date	Laboratory Result
1	Male Swiss	35	Switzerland	18 JUN 22	Herpes simplex type 1
2	Female Irish	33	Ireland	20 JUL 22	Human herpes type 6
3	Female Thai	26	Dubai, UAE	14 AUG 22	Monkeypox virus Herpes simplex type 1 & Human herpes type 6
4	Female Thai	25	Airport personnel	18 AUG 22	Varicella Zoster virus
5	Female Israeli	33	Vietnam and Sri Lanka	16 OCT 22	Enterovirus; CA6 Human herpes 6

Table 2 Comparison of lab results between skin lesion and oropharyngeal samples

Case No	Sample	Laboratory Result
1	Skin lesion	Herpes simplex type 1
	Oropharyngeal swab	Herpes simplex type 1
2	Skin lesion	Not detected
	Oropharyngeal swab	Human herpes type 6
3	Skin lesion	Monkeypox virus
	Oropharyngeal swab	Monkeypox virus Herpes simplex type 1 Human herpes type 6
4	Skin lesion	Varicella zoster virus
	Oropharyngeal swab	Varicella zoster virus
5	Skin lesion	Enterovirus; Coxsackies A6
	Oropharyngeal swab	Enterovirus; Coxsackies A6 Human herpes type 6

# MPOX Case Isolation at Negative Pressure Room at BKK Airport







# Clinical presentations and lab result of confirmed Monkeypox

## Confirmed Case




**QIAstat-Dx® Viral Vesicular Panel**


  
www.qiagen.com

TEST REPORT

Patient ID

Sample ID

Detected

Monkeypox virus clade 2

User

administrator

Test Status

Completed

Internal Controls

Passed

Skin

RESULT DETAILS

Ct / EP

Viruses	Not detected	Enterovirus	- / -
	Not detected	Herpes simplex virus 1	- / -
	Not detected	Herpes simplex virus 2	- / -
	Not detected	Human herpes virus 6	- / -
	Not detected	Monkeypox virus clade 1	- / -
	<div></div> Detected	Monkeypox virus clade 2	17.2 / 322,166
	Not detected	Varicella zoster virus	- / -
Controls	<div></div> Detected	IC	32.9 / 157,045

TEST DETAILS

Assay VV

Cartridge SN 522110990

SN Operational module 20819017

v1.0

Cartridge LOT 220211

SN Analytical module 10520070

Sample UTM

Expiration Date 01-03-2023

SW Version 1.4.0 build 5

Detected

Herpes simplex virus 1
Human herpes virus 6
Monkeypox virus clade 2

Throat

User

administrator

Test Status

Completed

Internal Controls

Passed

RESULT DETAILS

Ct / EP

Viruses	Not detected	Enterovirus	- / -
	<div></div> Detected	Herpes simplex virus 1	29.6 / 478,155
	Not detected	Herpes simplex virus 2	- / -
	<div></div> Detected	Human herpes virus 6	35.7 / 58,156
	Not detected	Monkeypox virus clade 1	- / -
	<div></div> Detected	Monkeypox virus clade 2	23.3 / 279,011
	Not detected	Varicella zoster virus	- / -
Controls	<div></div> Detected	IC	32.8 / 169,125



## Environmental investigation results by TRC-EIDCC

Sample	RT-PCR Result	Ct
<b>Luggage handle</b>	Detected	35.48
<b>Passport</b>	Detected	34.14
<b>Mobile Phone</b>	Detected	30.81
<b>Table</b>	Detected	31.58
<b>Chairs</b>	Detected	25.51
<b>Rubber band</b>	Detected	31.67

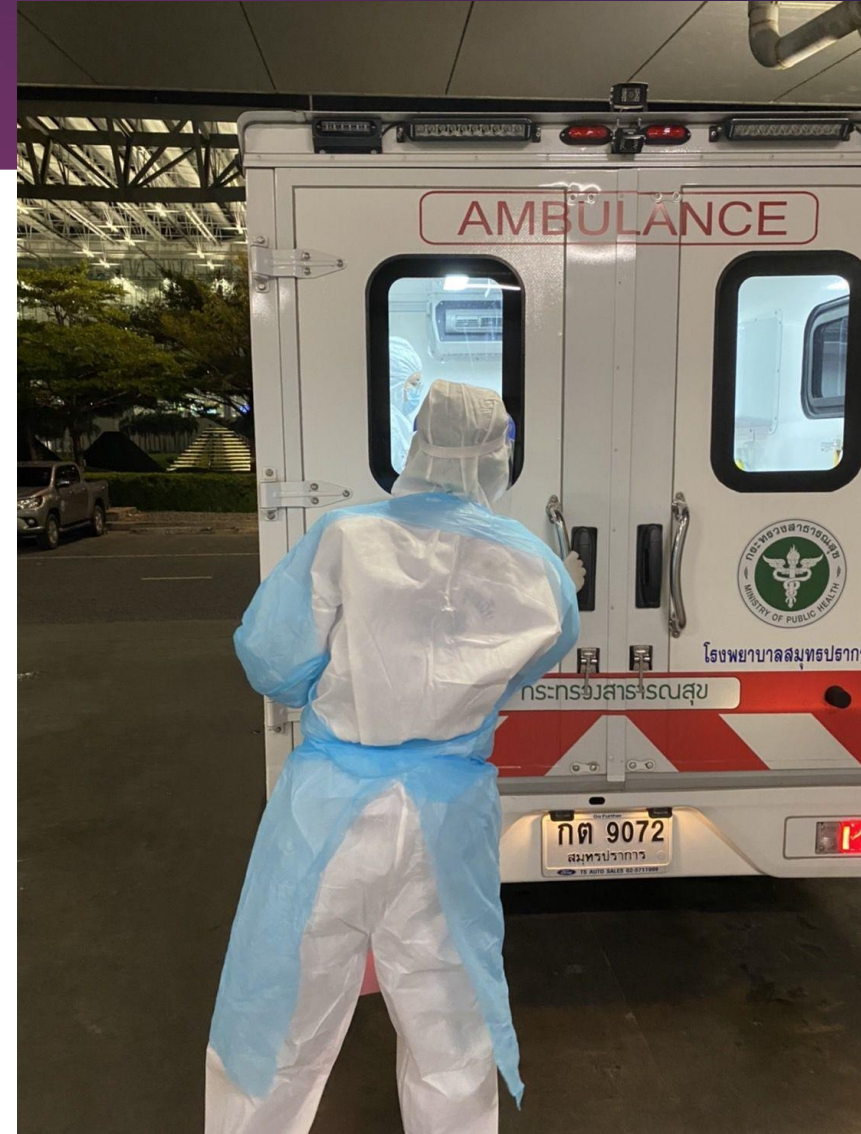
# Disinfection immediately after referral

Disinfection in Isolation Room with 500 ppm Sodium Hypochlorite





# Safety Referral



# Case 1



## QIAstat-Dx® Viral Vesicular Panel



www.qiagen.com

### TEST REPORT

Patient ID

Sample ID

**Detected** ◆ Herpes simplex virus 1

User administrator

Test Status ✔ Completed

Internal Controls ✔ Passed

### RESULT DETAILS

Ct / EP

Viruses	Not detected	Enterovirus	- / -
	<span style="color: red;">◆</span> Detected	Herpes simplex virus 1	16.4 / 490,881
	Not detected	Herpes simplex virus 2	- / -
	Not detected	Human herpes virus 6	- / -
	Not detected	Monkeypox virus clade 1	- / -
	Not detected	Monkeypox virus clade 2	- / -
	Not detected	Varicella zoster virus	- / -
Controls	<span style="color: red;">◆</span> Detected	IC	32.1 / 139,888

### TEST DETAILS

Assay VV

Cartridge SN 522110982

SN Operational module 20819019

v1.0

Cartridge LOT 220211

SN Analytical module 10620009

Sample UTM

Expiration Date 2023-03-01

SW Version 1.4.0 build 5





## QIAstat-Dx® Viral Vesicular Panel



www.qiagen.com

### TEST REPORT

Patient ID

Sample ID

**Detected** ◆ **Varicella zoster virus**

User administrator Test Status ◆ Completed  
Internal Controls ◆ Passed

### RESULT DETAILS

Ct / EP

Viruses	Not detected	Enterovirus	- / -
	Not detected	Herpes simplex virus 1	- / -
	Not detected	Herpes simplex virus 2	- / -
	Not detected	Human herpes virus 6	- / -
	Not detected	Monkeypox virus clade 1	- / -
	Not detected	Monkeypox virus clade 2	- / -
	<span style="color: red;">◆</span> Detected	Varicella zoster virus	18.3 / 703,251
Controls	<span style="color: red;">◆</span> Detected	IC	33.1 / 185,864

### TEST DETAILS

Assay VV

v1.0

Sample UTM

Cartridge SN 522110927

Cartridge LOT 220211

Expiration Date 01-03-2023

SN Operational module 20819017

SN Analytical module 10520006

SW Version 1.4.0 build 5

# Case 4





**Case 5**

QIAstat-Dx® Viral Vesicular Panel

QIAGEN  
www.qiagen.com

TEST REPORT

Patient ID

Sample ID :

→ Coxsackies  
A6  
by TRC-  
EIDCC

Detected

Enterovirus

User

administrator

Test Status



Completed

Internal Controls



Passed

RESULT DETAILS

CI / EP

Viruses	Detected	Enterovirus	22.6 / 593,111
	Not detected	Herpes simplex virus 1	- / -
	Not detected	Herpes simplex virus 2	- / -
	Not detected	Human herpes virus 6	- / -
	Not detected	Monkeypox virus clade 1	- / -
	Not detected	Monkeypox virus clade 2	- / -
	Not detected	Varicella zoster virus	- / -
Controls	Detected	IC	36.5 / 142,120

TEST DETAILS

Assay VV

v1.0

Sample UTM

Cartridge SN 522111011

Cartridge LOT 220211

Expiration Date 01-03-2023

SN Operational module 20819017

SN Analytical module 10520006

SW Version 1.4.0 build 5



# Immigration Officer Detection





# Wastewater-based molecular epidemiology of commercial aircraft lavatory waste testing for MPOX and SARS-CoV-2 viruses at Airports in Thailand, July - October 2022





# Participated Airports

- ▶ Suvarnabhumi Airport
- ▶ Don Mueang Airport
- ▶ Chiang Mai International Airport
- ▶ Mae Fah Luang Chiang Rai International Airport
- ▶ Phuket International Airport
- ▶ Krabi International Airport
- ▶ Hat Yai International Airport
- ▶ Samui International Airport

# Samples

- ▶ Lavatory Waste Water from Aircrafts
- ▶ Toilet Waste Water at Airports
- ▶ Swab in aircraft lavatory toilettes
- ▶ Africa, Asia, Europe and Middle East

**Current Testing Pathogens:**

**SARS-CoV-2, MERS-CoV**

**Future Testing Pathogen: Polio, Influenza viruses etc.**

# Wastewater-based molecular epidemiology of commercial aircraft lavatory waste testing for SARS-CoV-2 variant at Airports in Thailand, July - October 2022

No.	Specimen ID	Specimen type	Name	Collected date	SARS-CoV-2 (Ct) Result <sup>(1)</sup>	SARS-CoV-2 variants suspected <sup>(2)</sup>	Mutation point found	Call Rate	No.	Specimen ID	Specimen type	Name	Collected date	SARS-CoV-2 (Ct) Result <sup>(1)</sup>	SARS-CoV-2 variants suspected <sup>(2)</sup>	Mutation point found	Call Rate
1	ID220049.WW	Lavatory waste water	<p>➤ 56 lavatory waste water samples from 8 FLTS Africa, 22 FLTS EU, 15 FLTS Middle East &amp; 11 FLTS Asia</p> <p>➤ 50/56 lavatory waste water samples SARS-CoV-2 detected</p> <p>➤ <u>All were Omicron BA.5</u> and mixed with few BA.1/BA.2/BA.4</p> <p>➤ 2/14 swab lavatory toilette were detected</p>														
2	ID220050.WW	Lavatory waste water															
3	ID220051.WW	Lavatory waste water															
4	ID220088.WW	Lavatory waste water	Ethiopia)	26-Jul-22	ORF1ab: 31.63 N: -	Omicron BA.5	E484A, F486V, HV6970D	92.31%	9	ID220093.WW	Lavatory waste water	Munich)	31-Jul-22	E: 31.37 ORF1ab: 31.17 N: 30.10	Omicron BA.5	D614G, E484A, F486V, HV6970D	92.31%

# Touchless travel verification

- ▶ New era of touchless begins
- ▶ Face is your passport



# Biometric

Biometric is currently in the process of installing hardware and software.



Counter Check-in



CUSS

**Common Use Self-check in System**



CUBD

**Common Use Bag Drop**



PVS

**Passenger Validation System**



SBG

**Self Boarding Gate**

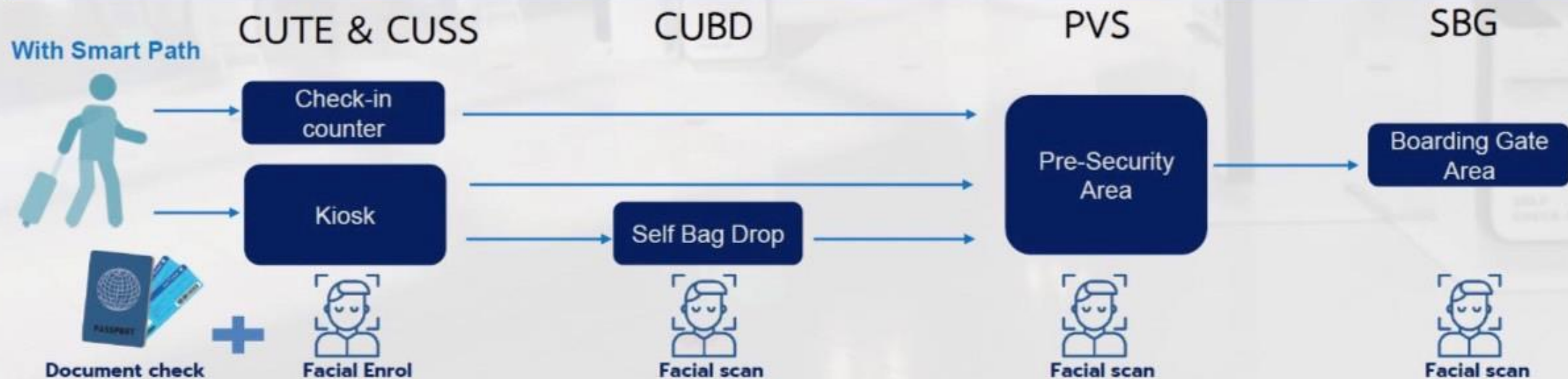


# Biometric Passenger Process Flow

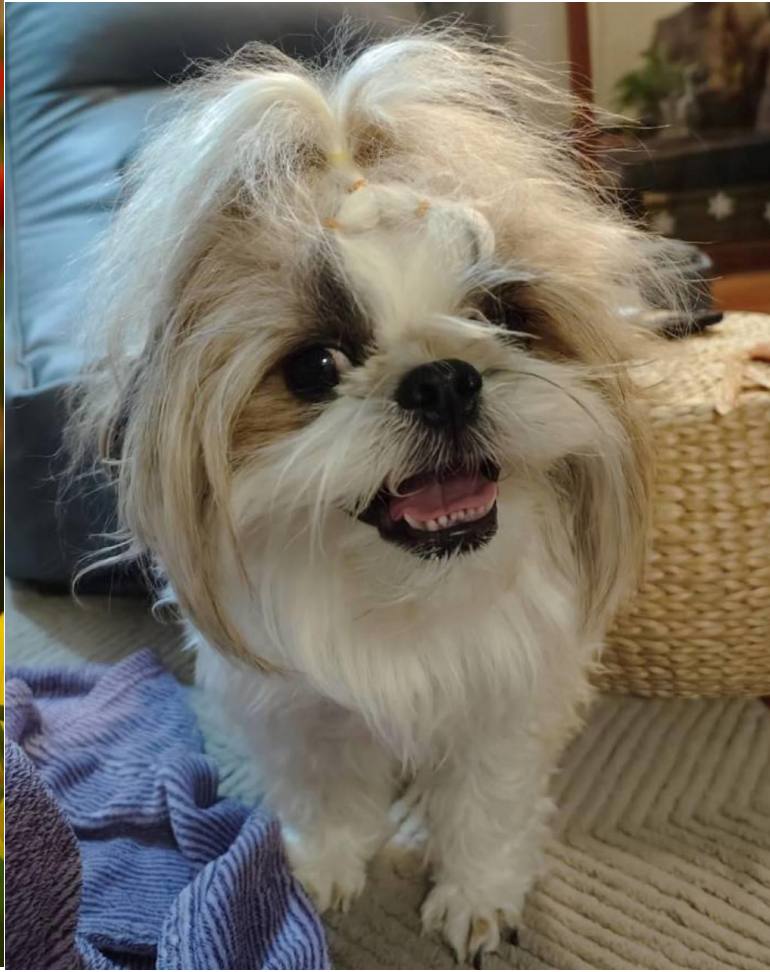
Current



With Smart Path







# Thanks