



# Security Controls in eHRSS

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# Fighting against COVID-19 continue ...



Total Doses Administered

**8,646,366**

\*As of 30 Sep 21

Total Population with 1<sup>st</sup> Vaccine Dose: **4,480,635 (66.5%)**

Total Population with 2<sup>nd</sup> Vaccine Dose: **4,165,731 (61.9%)**

Latest Daily Figure of Doses Administered

**23,574**

1<sup>st</sup> vaccine dose: **7,772**

29,445 (7-day moving average)

2<sup>nd</sup> vaccine dose: **15,802**

More than 6.13 billion vaccine doses have been administered worldwide, equal to 80 doses for every 100 people

Source: Data from local governments via Our World in Data (Last updated on 27 September)

# EHRSS helps combating COVID-19

2019冠狀病毒病疫苗接種紀錄二維碼  
COVID-19 Vaccination Record QR Code



姓名 Name  
CHUK, K\*\*\*\*\*

身份證明文件類別及號碼 Document Type & No.  
香港身份證 HKID Card  
\*\*\*\*600(6)

Save QRCode in eHealth app

Record Details  
01-Apr-2021

Public-Private Partnership

<https://www.ha.org.hk> > FAQs\_Support\_Scheme\_en PDF  
特區政府對居粵之醫管局長期覆診港人特別支援計劃(下稱 ...  
2020年12月1日 — (HKUSZH) to take up follow-up consultation for HA patients with chronic disease ... health records on eHRSS, and authorize HKUSZH to obtain.

<https://www.ha.org.hk> > haho > covid-19 > Appli... PDF  
特區政府對居粵之醫管局長期覆診港人特別支援計劃(下稱支援 ...  
University of Hong Kong – Shenzhen Hospital (HKUSZH) to take up follow-up ... Electronic Health Record Sharing System (eHRSS) and submit a Data Access ...

香港特別行政區政府  
食物及衛生局



地區康健中心  
District Health Centre

# Drastic increase in participation

**參加醫健通  
新冠疫苗紀錄可互通**  
Register with eHealth and  
share COVID-19 vaccination records

自願登記  
Voluntary Registration

公開  
Public

私營  
Private

閱覽快捷安全  
Quick and Safe View

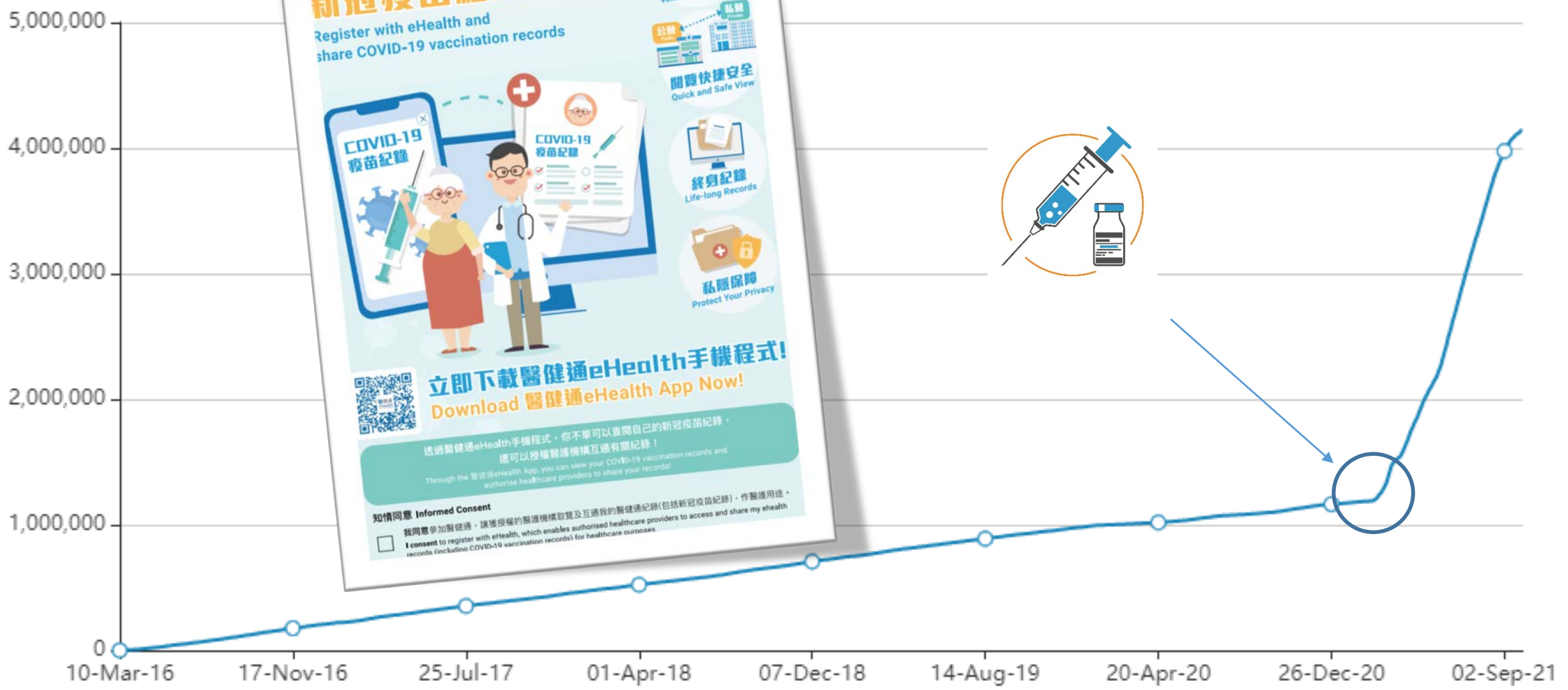
終身紀錄  
Life-long Records

私隱保障  
Protect Your Privacy

立即下載醫健通eHealth手機程式!  
Download 醫健通eHealth App Now!

透過醫健通eHealth手機程式，你不單可以查閱自己的新冠疫苗紀錄，  
還可以授權醫護機構互通有關紀錄！  
Through the eHealth App, you can view your COVID-19 vaccination records and  
authorise healthcare providers to share your records!

**知情同意 Informed Consent**  
 我同意參加醫健通，讓獲授權的醫護機構取閱及互通我的醫健通紀錄(包括新冠疫苗紀錄)，作醫療用途。  
I consent to register with eHealth, which enables authorised healthcare providers to access and share my health  
records (including COVID-19 vaccination records) for healthcare purposes.



# EHRSS Facts Sheet

**2B**  
Health Records  
Shared

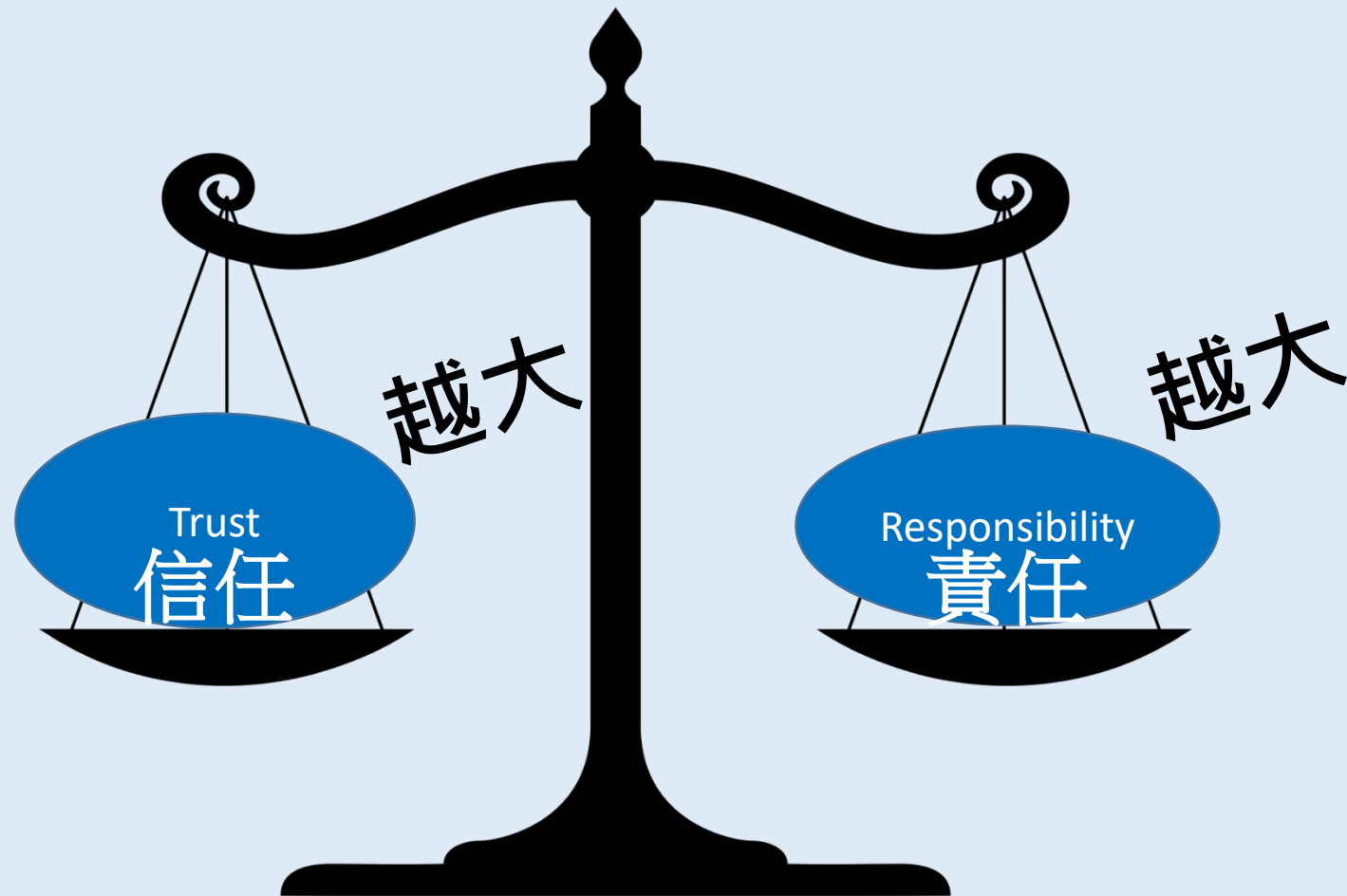
**4.4M**  
Participants

**5M**  
Access per month

**50K**  
Healthcare  
Professionals

**2.3K**  
Healthcare  
Providers

# Trust & Responsibility



# The Hacking Economy

## 71% of Ransomware Attacks Targeted Small Businesses in 2018

Ransomware attacks hit healthcare the hardest last year, with small to medium sized businesses targeted most by hackers due to fewer security resources than their larger counterparts.



## Patient medical records sell for \$1K on dark web

Mackenzie Garrity - Wednesday, February 20th, 2019 Print | Email

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Healthcare data protection company Protenus revealed there were 222 hacking incidents in 2018, up nearly 25 percent from 2017. Of these data breaches, more than 11 million patient records were affected, *CBS News* reports.

Often these patient records can be found on the dark web or black market. Sellers offering patient records promote they have gained access to the medical information through hacking a hospital or payer database.

One seller offered children's health records from a pediatrician. Another dark web post advertised for an entire Georgia hospital database, filled with 397,000 patient records.

Patient records can sell for up to \$1,000 due to the amount of information found in the documents, including date of birth, credit card information, Social Security number, address and email. Social Security numbers can be purchased for as little as \$1, and credit card information sells for up to \$110, according to *CBS News*.

Of the patients who have their medical records compromised, many are left grappling with the effects years later.

Social Security Number : US\$1

Identity Proof : US\$ 30

Credit Card # : US\$ 110

Online Banking : US\$160

Medical Records : US\$ 1000

Attacks on healthcare are expected to increase by

# 400%

in 2020



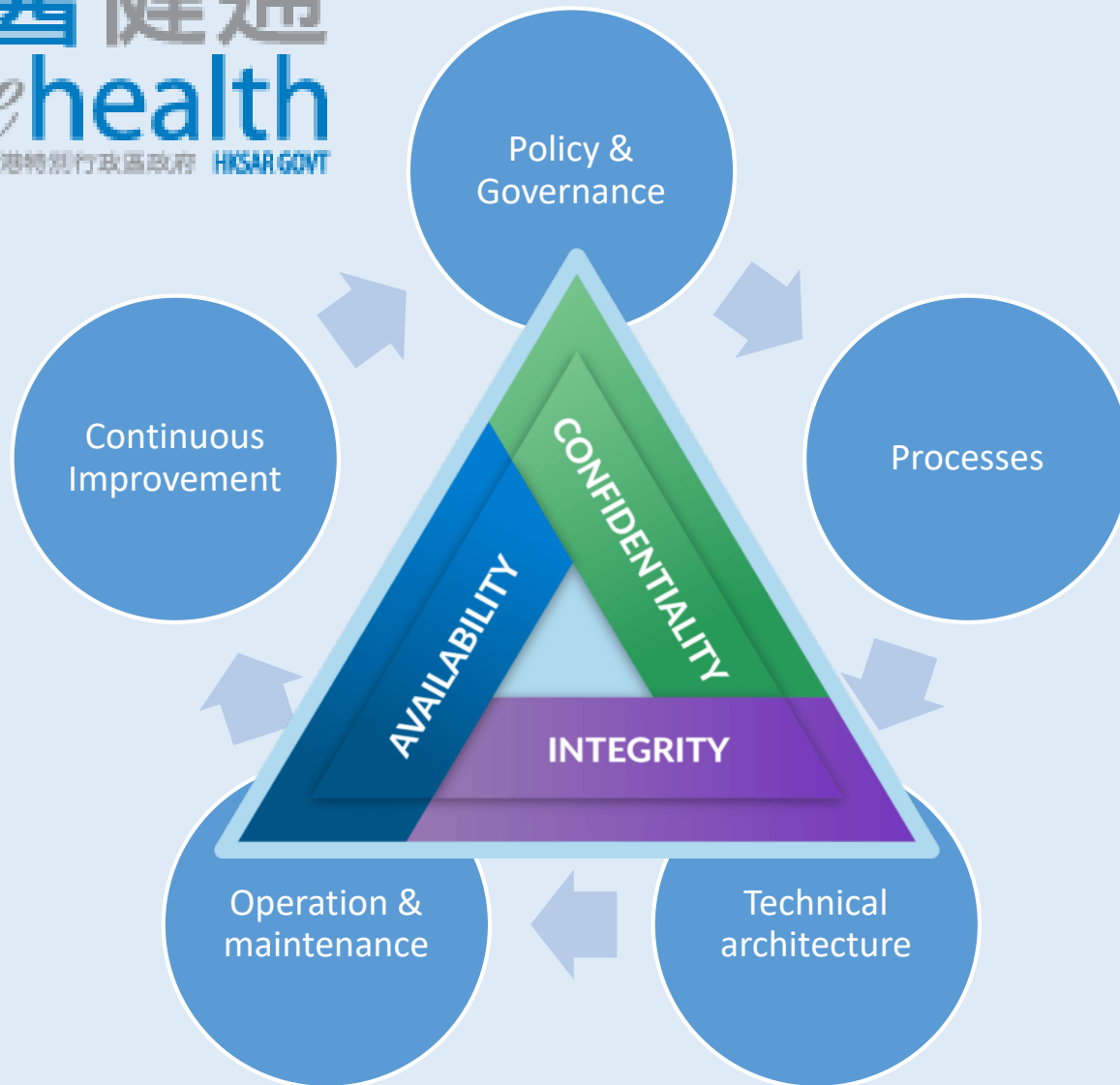
The cost of cyber crime is expected to exceed

# \$6 Trillion

Annually by 2021



# EHRSS Security Objectives



- **Confidentiality** 機密性
  - Ensuring that information is accessible only to those authorised to have access
  - Compliance with eHR Ordinance & PDPO
- **Integrity** 完整性
  - Safeguarding the accuracy and completeness of information and processing methods
- **Availability** 可用性
  - Ensuring that authorised users have access to information and associated assets when required
  - Ensuring the overall system reliability



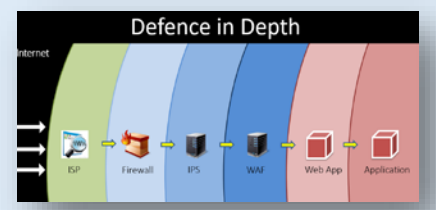
# Security Controls in EHRSS



Data protection & Access Control



Authentication



Defense in depth



Monitoring and audit



Access Notification

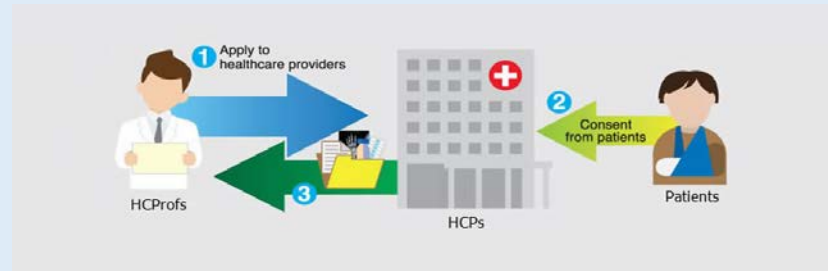
# EHRSS Data Protection

## Legal Support



- Personal Data (Privacy) Ordinance Cap 486
- EHRSS Ordinance Cap 625

## Consent Model



- Healthcare professionals with valid registration status
- Consent must be given by patients
- Healthcare professionals' access is subjected to role-base control

## Role-based Control



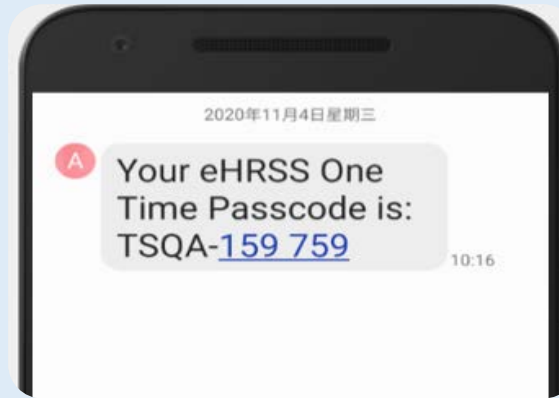
# EHRSS Authentication

## Security Token



- ✓ Secure
- ✓ Convenient
- × \$\$\$
- × Can be shared

## OTP SMS



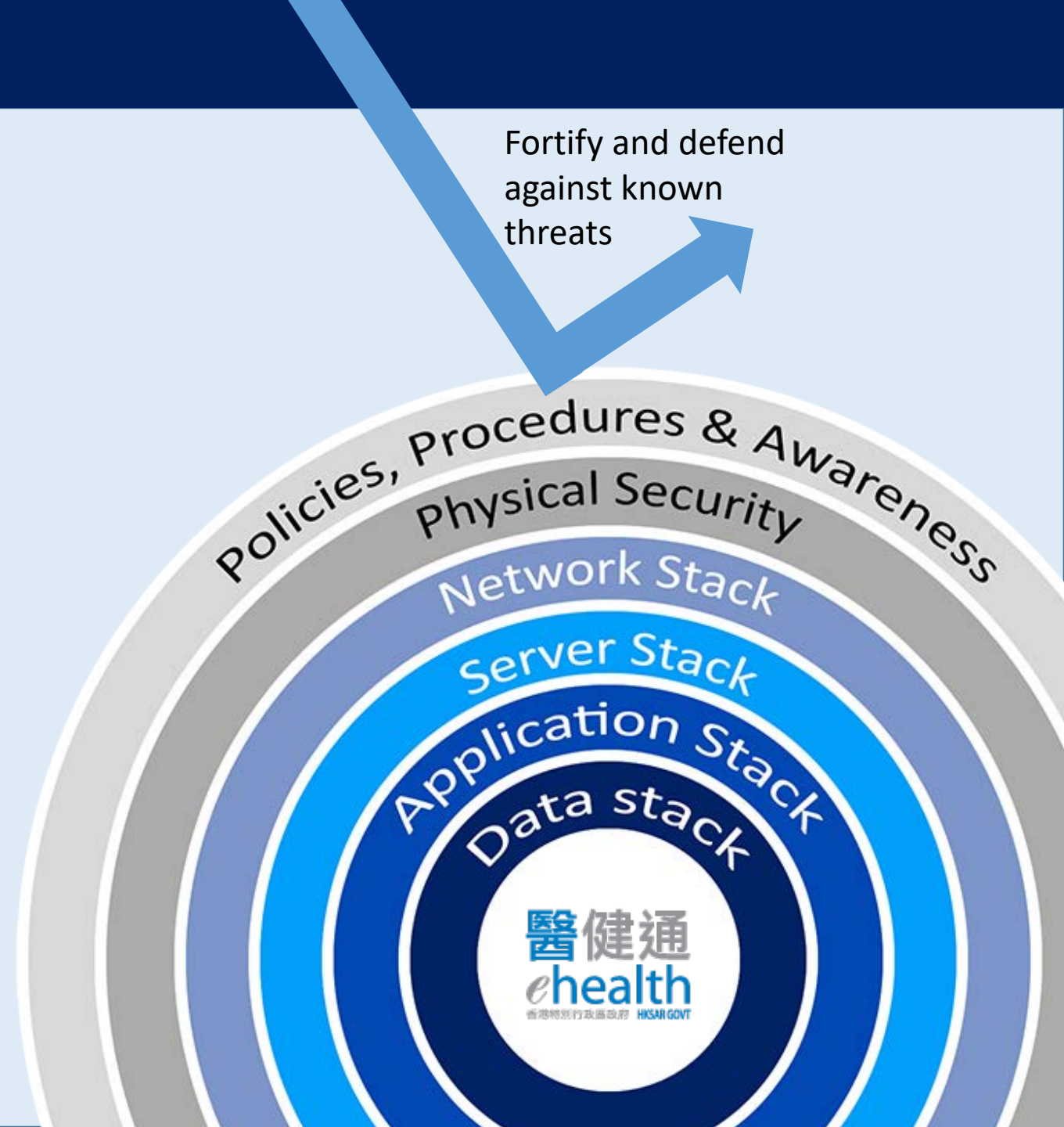
- ✓ Secure
- ✓ Convenient
- ✓ Use personal mobile, more diff to share
- × SMS delay (rare)



- ✓ More Secure
- ✓ Convenient
- ✓ Use personal mobile + biometric
- ✓ Cost effective

# EHRSS Defense-in-Depth

- Security by Design
- Privacy by Default
- Minimize attack surface
  - Special Connection Software
- Zero-trust
- End-to-end Encryption
- Business Continuity
- Monitoring & Audit



# EHRSS Monitoring & Audit



- The operation of eHRSS is ISO 27001 certified
- Advanced monitoring in-place to safeguard every aspect of system activities
- Regular review etc. for new/unknown threat
- Regular drills & awareness training turn discipline into habit
- Full audit trail for user activities
- Heuristic based user behavior detection
- Auto alerts for abnormally (eg. frequent logon, logon after non-office hours.. Etc)
- Exploring AI

# EHRSS Access Notification



Patients will receive notification if :

1. Access to patient's eHR with consent.
2. Access after expiry of patient's consent
3. Emergency use
4. Security concern that may affect patient's eHR

# EHRSS eHealth App



# Stay Connected with Patients via eHealth App



View parts of the users' health records in eHealth (e.g. medications, allergies, vaccine records etc.)



Self-input data or add photos of the vaccine records



Add medical appointments to users' mobile phone calendars and set reminders



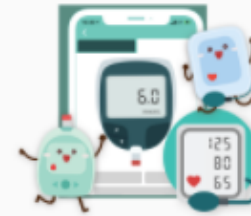
Manage eHealth accounts (e.g. give or change sharing consents to healthcare providers, and update communication means)



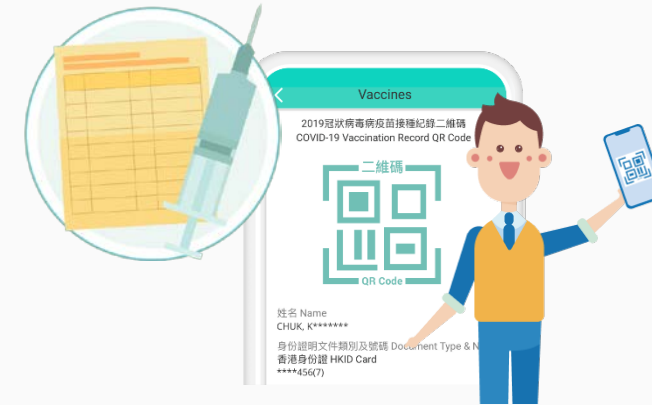
Check health care voucher balance and transaction history, and service quotas of other PPP Programmes



Manage the eHealth accounts of users' children aged under 16 and input child growth and vaccine records



Manage your personal blood pressure, heart rate and blood glucose records



COVID19 Vaccine Records



# EHRSS Cyber Security Tips



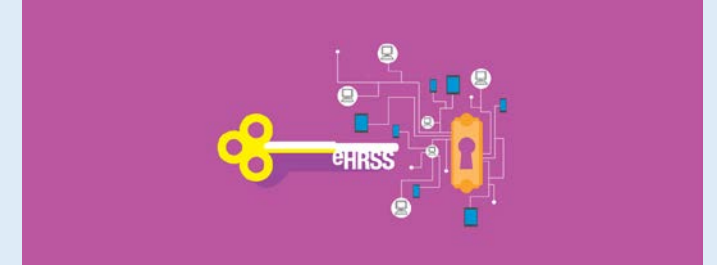
## Immunize your computer asset

- Anti-virus
- Backup and secure your backup



## Protect against ransomware

- Regularly update your software
- Beware of suspicious email / links
- Anti-virus



## Take care of your gadgets

- Enable encryption
- Strong password & multi-factor authentication



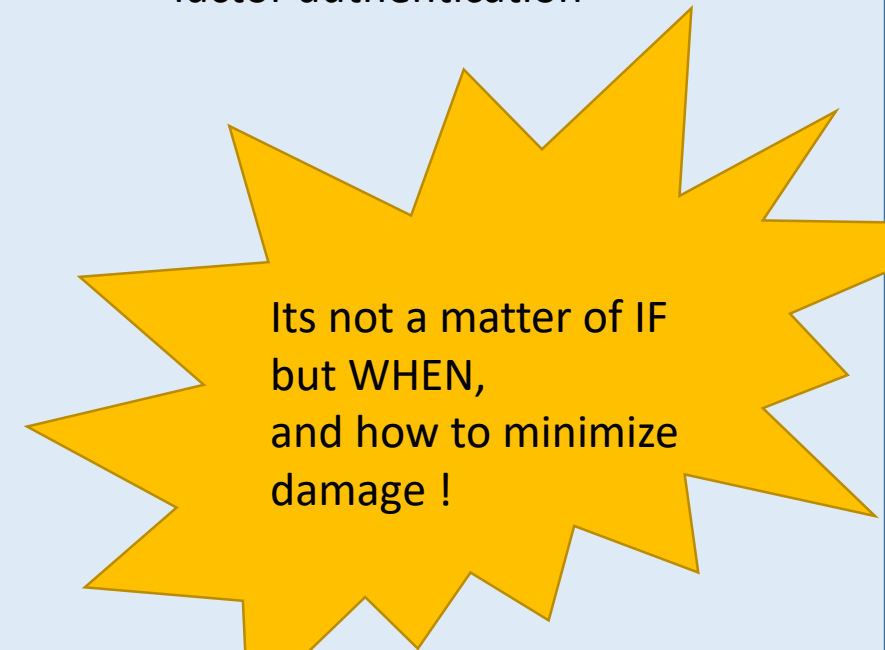
## Incident Respond

- Training &
- Well-defined procedure
- Seek advice from appropriate org



## Password

- Strong password – the longer the better
- Avoid reuse
- Enable multi-factors



Its not a matter of IF but WHEN, and how to minimize damage !

# THANK YOU

Cybersecurity is a shared responsibility



Fighting pandemic is also a shared responsibility

**同心抗疫** *Together,*  
*We Fight the Virus!*

**COVID-19**   
**Vaccine**