FIRST PLENARY: Transforming Healthcare and Leveraging Digital Health for Better Health in Asia Pacific

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Harnessing Digital Health for Benefits – Singapore Experience

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Overview of different healthcare settings…

Varying needs across different healthcare settings…
... call for targeted strategies by Care Sectors

DIGITISE

7,000+ Doctors
22,000+ Nurses

DIGITISE

PUBLIC
PRIVATE

3,000+ Doctors
9,000+ Nurses

CONNECT

NATIONAL COMMON PLATFORMS (2-way exchange)

ANALYSE

NATIONAL ANALYTICS PLATFORM

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Common IT platforms and systems consolidation reduce fragmentation

CONNECT

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Snapshot of Our Common IT Platforms

National IT Platform – National Electronic Health Record (NEHR)

Accessible by authorised healthcare professionals
Healthcare will continue to digitize, connect and analyze

- Increasing needs for population profiling
- Increasing focus on preventive care and predictive measures
- Increasing trends in individualized medicines

Innovation is key in harnessing emerging technologies
National IT Platform – Business Research Analytic’s Insights Network (BRAIN)

1. SOFTWARE AS A SERVICE
   SECURED VIRTUAL WORKSPACE/SANDBOX

2. COMMON ANALYTICS TOOLSET
   Analytic & Data Engineering

3. READILY AVAILABLE LONGITUDINAL POPULATION DATA
   National Electronic Health Records

4. REAL-TIME LINKAGE & HARMONISATION
   Data Linkage

5. COLLABORATION & SHARING
   Standards

Centralised Primary Data
Analysis & Genomic Database

SG10K pilot: 10,000 Singaporeans (Chinese, Malays and Indians). Consent obtained.

Centralised, standardised WGS
in Singapore via commodity sequencing providers

SG10K: Singapore

Research Data Repository of genomic and other –omics research data

Patient record linking to link genomic data to clinical data in BRAIN

Aggregated or individual report output for clinicians and researchers

Analysis of linked data to derive new insights

BRAIN and National Precision Medicine
National IT Platform – Health Hub (Citizen)

Accessible by all Singapore residents

Some examples in Meds Management - OPAS

Outpatient Pharmacy Automation Systems (OPAS)
Combines multi-disciplinary robotic components which handle the pick, pack and labelling of a variety of dosage forms including box/blister/loose pills; a workflow engine to manage orders; an automated assembly and validation intelligence to match collated package to patient; and a guided picking system for non-standard medications.

Enhanced accuracy and workflow efficiency through automating at least 80% of workload

More than 90% traceability of drugs dispensed, from zero previously, in the event of any drug recall activation

 Decrease in patient waiting time by as much as 50%; 95% within 15 minutes at NHG, 50% within 15 minutes at TTSH

Reduction in prescription rework rates range from 30% to 8%-5% at the dispensing end

Enabled up to 50 FTE manpower savings per year; staff redeployed to frontline areas and directly at clinics for better staff-patient interaction

In 2015, OPAS was deployed in KKH, and the collaboration between NUH, TTSH and NHG Pharmacy (progressively).

Over the course of 1 year, 1.70m KKH, NUH, TTSH and NHGP outpatients will benefit.

Furthermore, as NHGP serves all NHG's nine polyclinics, 1.77m NHGPoly outpatients will benefit.

Potential savings arising from PHI's implementation of CLMM range from 38,000 to 95,000 preventable Adverse Drug Events or an equivalent of up to S$8.5m per year.
How Digital Health has benefited our patients and healthcare workers

- **7 mins** for Pharmacists’ Prescription Review, down from 51 mins
- **30 mins** per medication session, 90 mins per inpatient ward nurses time saved daily
- **23 mins** waiting time for urgent cases, 40% faster than before
- **88 mins** average waiting time for overall 95% of A&E patients, 10% faster than before

- **Increased capacity to handle 10,000** OR **150%** more urgent tests at one time
- **Faster turnaround time** 0.5 mins to sort specimens, 45 mins to complete all urgent tests
- **Remote post-discharge care helped reduce readmission rates from 3.5 times to 1.3 times**
- **17 hours saved** everyday
- **Aging-in-Place (AIP)**
- **Multi-dose Medication Management (M3MM)**
- **Laboratory Automation System**
- **HIS Healthcare Cloud (H-Cloud)**
- **Increased resiliency for HIT systems** with maximum downtime of over 30 days, of **21.56 minutes**

**Partnering for research, innovation and value creation is important**

- National Robotics Programme (NRIP) - Partnership in AI SINGAPORE
- LEVERAGE Capabilities
- Co-develop Robotics Middleware - Align with Smart Nation Initiatives - C3 Systems
- RESEARCH Collaboration
- Affordable
- SKILLSfuture
- NATIONAL RESEARCH FOUNDATION

- AI SINGAPORE
- Co-identify collaboration with local SMEs
- Align researchers and industry to healthcare problem statements National HealthTech Challenge
- Align Problem Statements
- EDB Singapore
- SPRING: Singapore's Entrepreneurship Development Board
- MIT Hackathons - Industry Briefing - Startup Briefing
- The Skills MNCs
- AI SINGAPORE
- Co-operative MNCs

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Thank You

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