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AUS-135
WHO
Collaborating
Centre
(eHealth)

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WHO CC on eHealth (AUS-135)

Director: Emeritus Professor Teng Liaw

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Guiding frameworks for the WHO CC global eHealth R&D program

ePBRN
electronic Practice Based Research Network

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1. UN Sustainable Development Goals & Universal Health Coverage

2. Integrated People-Centred Health Services
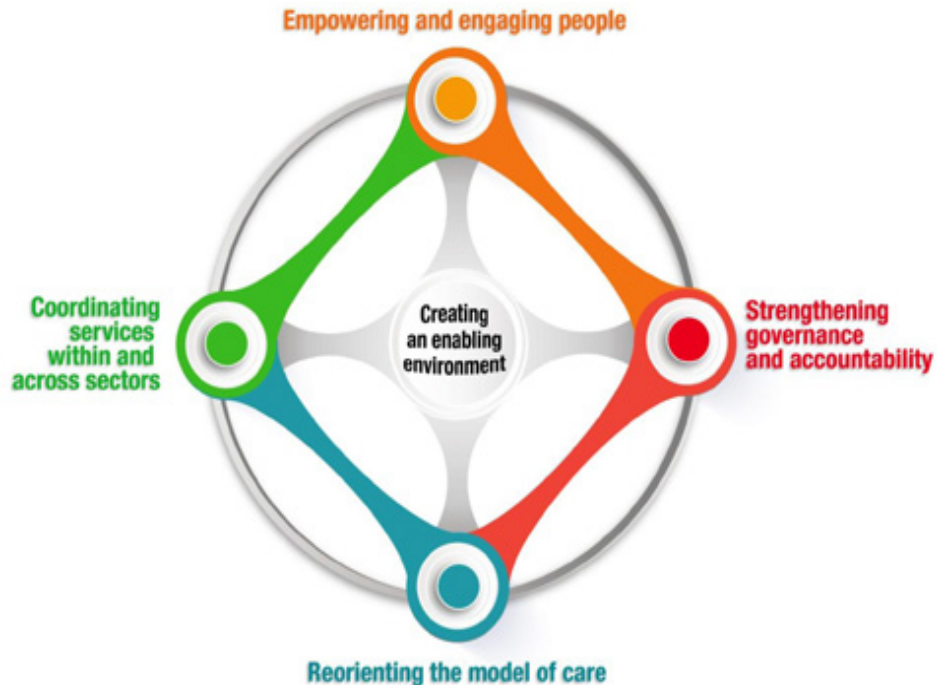
Integrated health services

- *continuum of health promotion, disease prevention, diagnosis, treatment, management, rehabilitation & palliative care;*

- *different levels and sites of care;*

- *throughout the life course*

People-centered care

- *adopts individuals', carers', families' and communities' perspectives as participants in, and beneficiaries of, trusted health systems*

Primary Health Care

Accessible & equitable care

Empowering and engaging people

Coordinating services within and across sectors

Creating an enabling environment

Strengthening governance and accountability

Reorienting the model of care

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3. Chronic Care Model for individuals & populations

Community

Build Healthy Public Policy

Create Supportive Environments

Strengthen Community Action

Health System

Information Systems

Decision Support

Self-Management/ Develop Personal Skills

Delivery System Design/Re-orient Health Services

Activated Community

Informed Activated Patient

Productive Interactions & Relationships

Prepared, Proactive Practice Team

Prepared, Proactive Community (Partners)

Population Health Outcomes/ Functional and Clinical Outcomes

4. Digital Health Maturity Assessment

Essential digital health foundations	Digital Health Maturity Levels (with examples)				
	Level 1: BASIC ✓ Focus: AVOIDING DOWNTIME ✓ Ad-hoc and chaotic ✓ Unstable environment ✓ Unproven, disjointed & uncoordinated processes ✓ Knowledge not shared **UNPREDICTABLE**	**Level 2: CONTROLLED** ✓ Focus on getting control ✓ Coordinated but inconsistent processes ✓ Processes manageable & getting predictable ✓ Knowledge silos exist **REACTIVE & PROBLEM DRIVEN**	**Level 3: STANDARDISED** ✓ Standards and best practice ✓ Centralised/consistent processes ✓ Organisation level knowledge sharing ✓ Proactive & Predictable **REQUEST DRIVEN**	**Level 4: OPTIMISED** ✓ Continuous improvement ✓ Efficiency ✓ Consolidated 'lean' processes ✓ Cross organisation knowledge sharing & collaboration ✓ Proactive & accountable **SERVICE DRIVEN**	**Level 5: INNOVATIVE** ✓ Catalyst for innovation ✓ Pioneers new dynamic process ✓ Industry level knowledge sharing & collaboration ✓ Drives innovation **VALUE DRIVEN**
ICT infrastructure e.g. ICT penetration, affordability, reliability, ICT supply chain	Examples: Accessible (available & affordable) but unreliable Internet and supply chain	Examples: Accessible & somewhat reliable Internet and supply chain	Examples: Support services and ICT hardware (supply chain) mostly accessible	Examples: Fully accessible & timely support services and ICT hardware	Examples: Infrastructure & support services facilitate innovations
Essential tools e.g. unique ID, social media, HIS/eHR/eMR, mHealth, teleHealth	Examples: Local ad hoc adoption & use of digital tools; Telephone = teleHealth	Examples: Regional coordination of adoption & use of digital tools; Asynchronous info sharing	Examples: National benchmarks & standards for digital tools; Synchronous info sharing	Examples: Data analytics & Quality of real-world data; teleHealth integrated with eHR	Examples: Innovations with decision support systems with integrated teleHealth and eHR systems
Readiness for information sharing e.g. standards-based, interoperable, hardware, software & protocols to support security & privacy	Examples: Standalone datasets; No terminology standards	Examples: Ad-hoc sharing of datasets; Local terminology	Examples: Data sets integrated with HIS; National terminology	Examples: Data shared & interoperable; Data-driven policy & practice	Examples: National Common Data Model driving ethical use of linked health data for innovations
Health system adoption e.g. regulations, policy, strategy, governance, capacity building, funding	Examples: No digital health legislation; No training programs; No governance structures	Examples: Digital health privacy/security legislations; Ad-hoc training programs; Ad-hoc governance	Examples: Other digital health legislations; Accredited training programs; Relevant digital health committees	Examples: Artificial Intelligence legislation; National training programs; National digital health agency	Examples: Legislation facilitate innovations; Multisectoral programs; Digital health ministry
Quality Improvement, Measurement, Monitoring, and Evaluation (QIMME) maturity levels					
Quality improvement, measurement, monitoring & evaluation (QIMME)	Examples: Local ad hoc QIMME activities	Examples: QIMME routinely embedded in digital health programs	Examples: QIMME coordinated for CER across programs and regions	Examples: National digital health program with embedded QIMME enabling CER	Examples: Innovating with novel QIMME methods for new models of care

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Digital health maturity assessment

Research and Applications

A digital health profile & maturity assessment toolkit: cocreation and testing in the Pacific Islands

Siaw-Teng Liaw [ID],[1] Rui Zhou,[2] Sameera Ansari,[1] and Jun Gao[2]

[1]WHO Collaborating Centre on eHealth, UNSW Sydney School of Population Health, Sydney, Australia and [2]WHO Western Pacific Region Office, Manila, Philippines

*Corresponding Author: Siaw-Teng Liaw, WHO Collaborating Centre on eHealth, UNSW Sydney School of Population Health, Sydney, Australia; siaw@unsw.edu.au

ABSTRACT

Objectives of WHOCC

1. Evidence-based implementation & evaluation of eHealth, and

2. Capacity-building:

    •   *Scale-up, maintenance and refinement*

    ➢ *co-creation with a sociotechnical approach to digital health maturity*

CONTEXT: eHealth in Western Pacific

- Considerable international variation

- The evidence base is limited but

  - perceptions of the utility of eHealth were generally positive, and

  - positive impacts were found.

➤ *Implementation indicators: RE-AIM*

➤ *Outcomes: safety, quality and cost-effectiveness*

  - *for individual, family and community*

  - *in the facility, district, region and nation*

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Overview of WHOCC global eHealth R&D program

4 focus areas

1. **A common language & data model:**

   - *Data quality & Interoperability standards*

2. **eHealth care of individual**

   - *Smart tools & teleservices*

3. **eHealth care of population & environment**

   - *Smart homes & cities - Internet of Things*

4. **Governance, ethics, access and equity:**

   - *Social enterprise & co-creation*

   - *Addressing the Digital Health Divides*

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Focus 1: Community laboratory to research real world data quality & interoperability

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Real world data from Health Neighbourhoods

- **A Health neighbourhood has disparate actors and information systems.**

- **Need a common language to share, coordinate care and assure quality & safety**

Fairfield Health Neighbourhood

FHN 7 practices
- Patients: 114762
- Consults: 2,328,938
- Scripts:: 1,589,461

Oran Park IPCC

Wollondilly Health Neighbourhood

WHN: 6 practices
- Patients 97382
- Consults: 2,245,876
- Scripts: 1,278,769

Infrastructure to capture RWD:
Internet of Things & CDM-enabled tools

GP n... | Apps | Wearables

Pseudonymisation & ETL
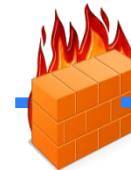
Secure SQL database with GRHANITE™ Linkage

Standardised database (CDM) of linked pseudonymised individuals

Data analytics of data repository

ED, CHCs & Outpatient Clinics | Hospital admissions

Feedback & Data Quality

CDM-enabled tools

Health neighbourhood with Common Data Model (CDM)

OHDSI cohort studies & RCTs

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Standardised real world data to support

1. **Clinical phenotyping and genomics**

2. **Cohort studies: clinical course of NCDs such as**
   - *Atrial fibrillation, CVD, Diabetes, COPD, Mental health and other comorbidities.*

3. **Health services research**
   - *Continuity of care and service use*
   - *Study designs: e.g. Interrupted Time Series & Stepped Wedge Cluster Trials*
   - *Polypharmacy and quality use of medicines*
   - *Injury and violence*

4. **Predictive modelling: machine learning and AI**

Standardised database of linked pseudonymised individuals

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A time & space approach to data management

Practical applications and discussions

An 'integrated health neighbourhood' framework to optimise the use of EHR data

Siaw-Teng Liaw
UNSW Medicine Australia, Sydney, NSW, Australia, and General Practice Unit, South Western Sydney Local Health District and Ingham Institute for Applied Medical Research, NSW, Australia

Simon de Lusignan
University of Surrey, Guildford, UK

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Focus 2. eHealth care of individuals

Telemonitoring of patients with chronic conditions at home.

Emeritus Professor Branko Celler

UNSW Biomedical Research Laboratory

b.celler@unsw.edu.au

Advanced Vital signs monitoring
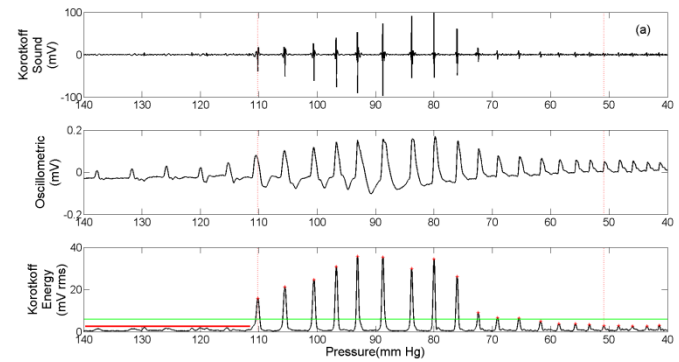
Communication Hubs

Smart home technology
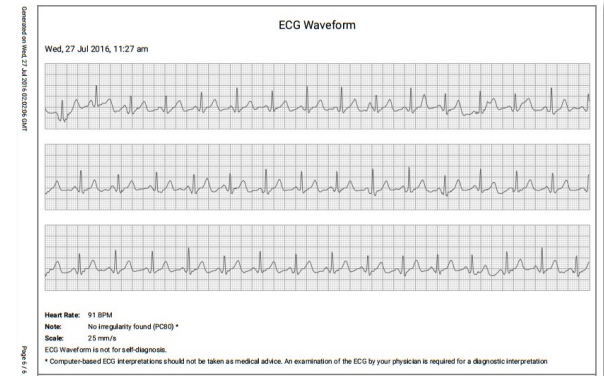
Wearable falls monitoring
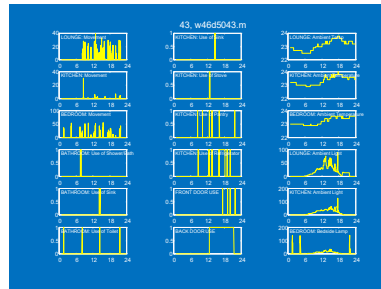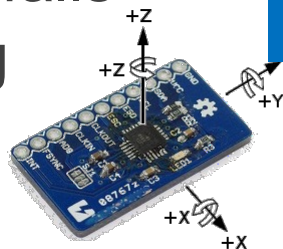
Telerehabilitation
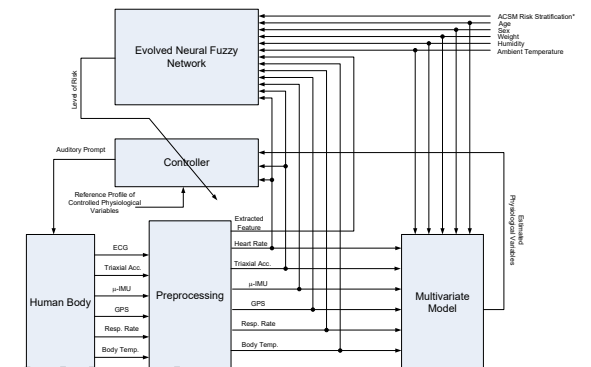
Celler B et al. JMIR Med Inform. 2017;5(3):e29.

The CSIRO National Telehealth Trial

CSIRO NBN Telehealth Trial – 6* Sites

- Townsville
- Penrith
- Nepean Blue Mountains / ARV
- Canberra and ACT
- Ballarat and the Grampians
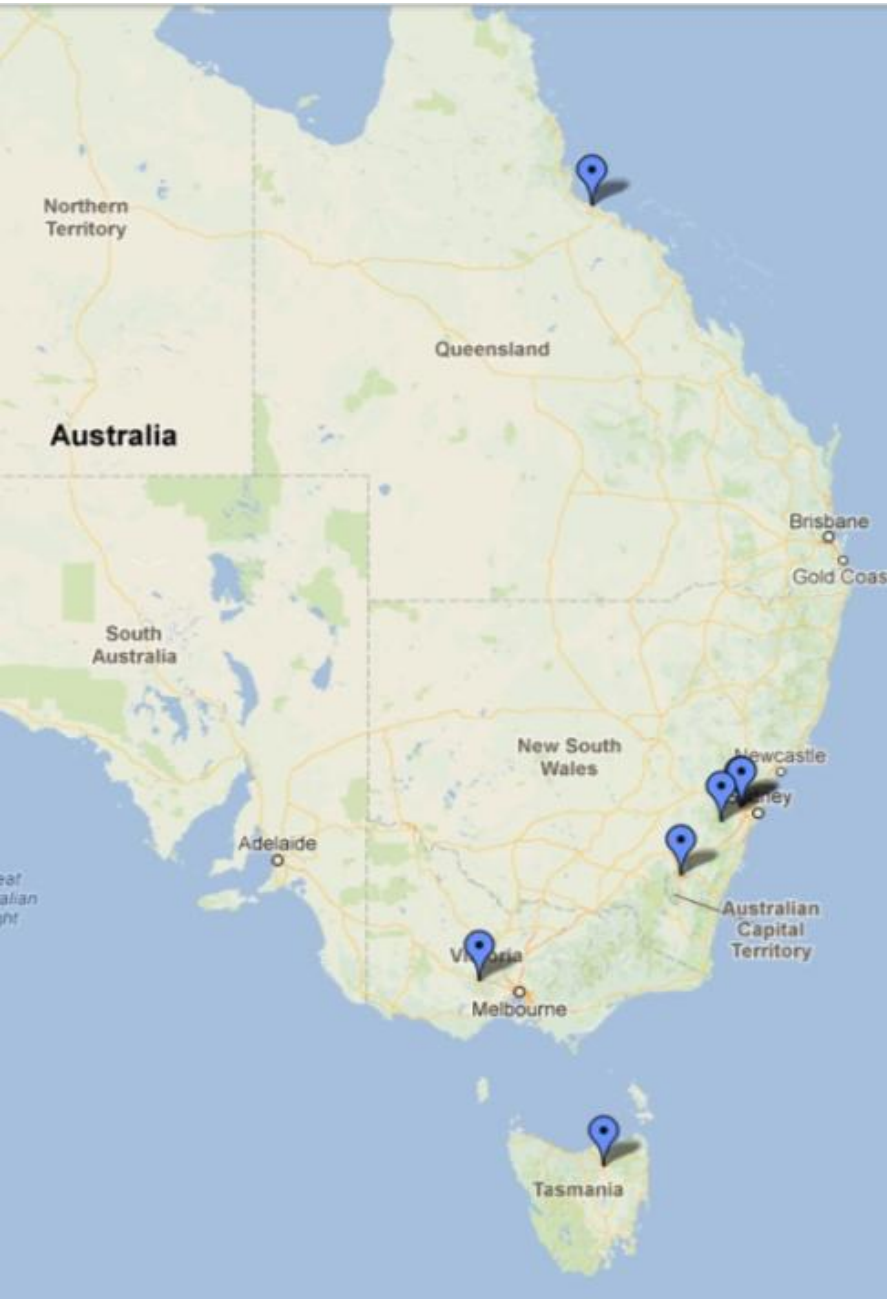- Launceston / Northern Tasmania

Number of patients at each site

- 25 Test Patients
- 50 Control Patients

Total

- 150 Test patients
- 300 Control Patients

Trial Design

- Case Matched controls
- Before-After-Control-Impact (BACI)
-    * One site was decommissioned

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Home telemonitoring reduces costs & admissions

📄 **Original Paper**

Impact of At-Home Telemonitoring on Health Services Expenditure and Hospital Admissions in Patients With Chron Conditions: Before and After Control Intervention Analysis

Branko Celler[1], PhD iD ; Marlien Varnfield[2], PhD iD ; Surya Nepal[3], PhD iD ; Ross Sparks[4], PhD iD ; Jane Li[5], MD, PhD

Rajiv Jayasena[6], PhD iD

[1]Biomedical Systems Research Laboratory, University of New South Wales, Sydney, NSW, Australia

[2]Health and Biosecurity Business Unit, eHealth Research Program, Commonwealth Scientific and Industrial Research Org Herston QLD, Australia

[3]Data 61, Software and Computational Systems Program, Commonwealth Scientific and Industrial Research Organisation NSW, Australia

[4]Health and Biosecurity Business Unit, eHealth Research Program, Commonwealth Scientific and Industrial Research Org North Ryde, NSW, Australia

[5]Health and Biosecurity Business Unit, eHealth Research Unit, Commonwealth Scientific and Industrial Research Organis Marsfield, NSW, Australia
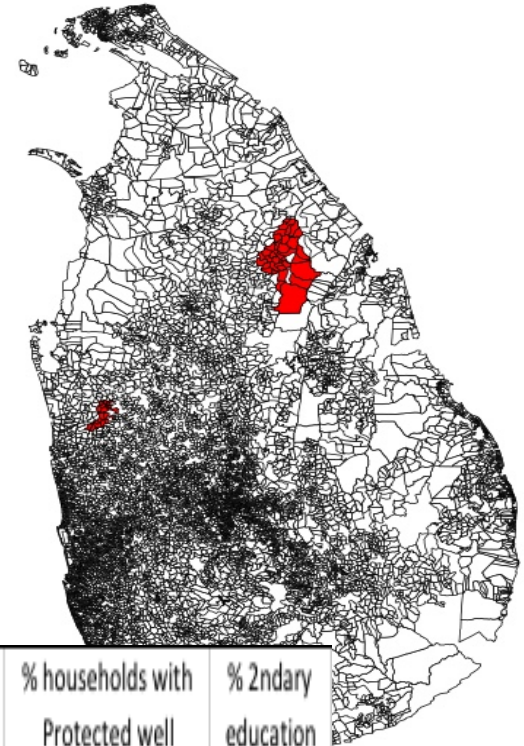
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CKDu in Sri Lanka related to tap use

- Combining Census, Health Survey for CKDu and GIS data

- Map of Sri Lanka with boundaries of 14008 Grama Niladhari administrative areas

- At district level:

- Rasnayakpura   number screened > 15 yrs = 256

- Horowpothana   number screened > 15 yrs = 333

- Embilipitiya   number screened > 15 yrs = 135

|	popn.	% CKDu	% piped water	% male in DSD	% bottled water use	% river water use	% unemployment	% households with Protected well	% 2ndary education
Rasnayakapura	19,800	9.4	3.4	48.8	2.1	0.1	3.0	26.1	44.2
Horowpothana	32,616	16.0	0.77	48.6	23.0	0.83	1.5	36.23	49.2
Embilipitiya	121,529	10.4	34.3	49	0	2.8	4.3	13.7	44.4

PollerGEN: grass pollen species and asthma

- Develop a spatio-temporal grass pollen assessment (concentrations and depositions) to species level using molecular genetics.

- Develop novel pollen bio-aerosol models

- Identify species, or combinations of species that are linked to the most severe public health outcomes of the allergic response (i.e. asthma exacerbations).
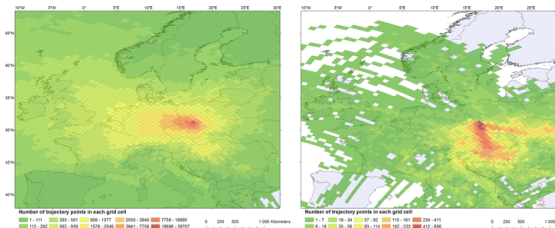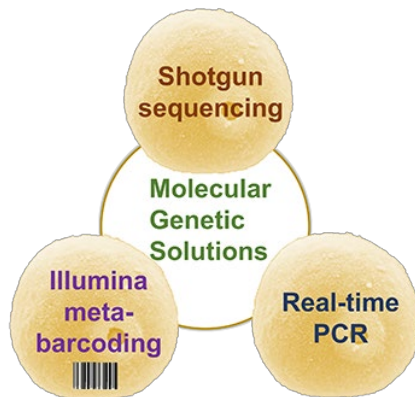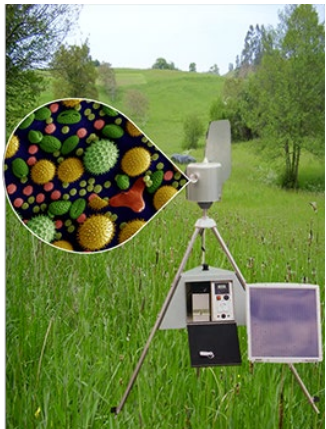
Greenspace and Wellbeing

- Linkages between greenspace and health can be made

- type, quality and context of 'greenspace' should be considered

- Data from satellite on greenspace

- Census level data on health

- Age and sex standardised data adjusted for socio-economic deprivation and rurality

- Level of detail on environment increasing…..tree by tree

- Alternate sources of geolocated data ….social media
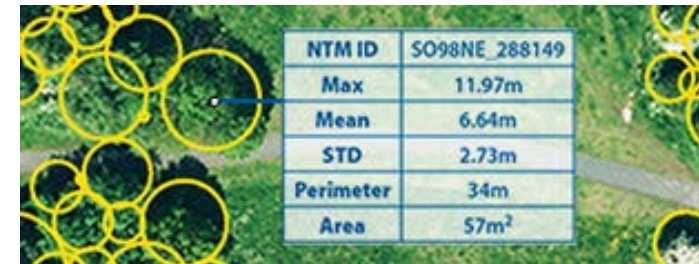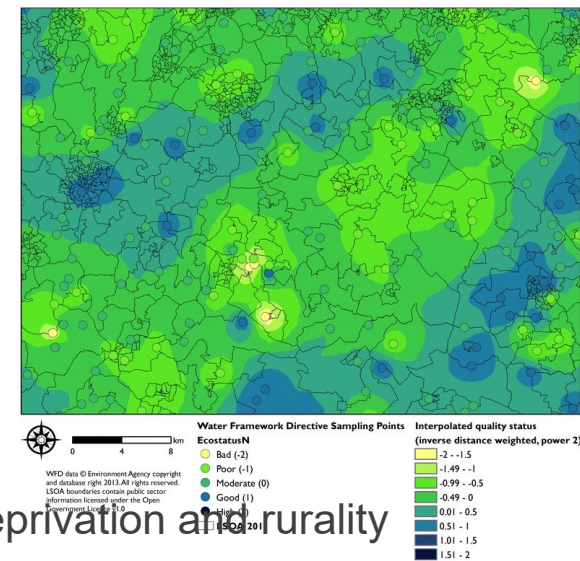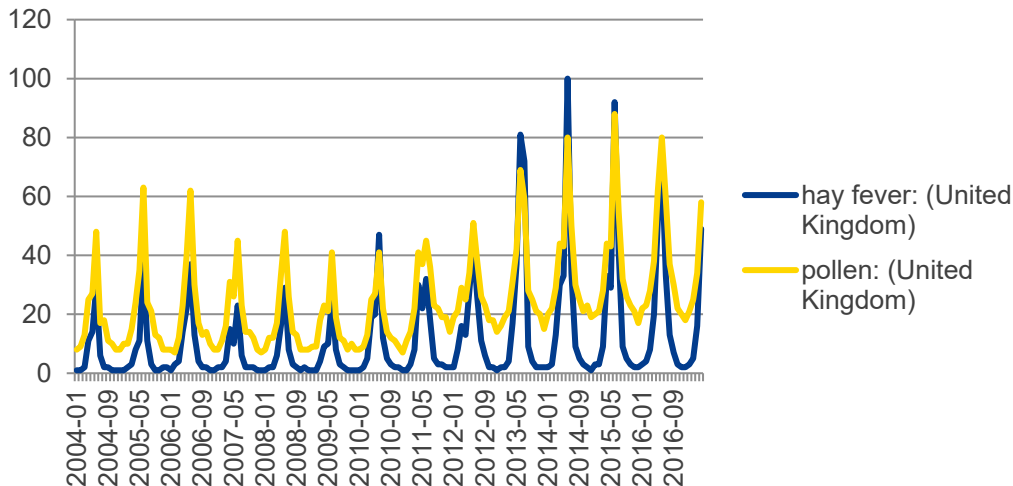
Focus 4. Citizen & community engagement & addressing the Digital Health divides

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Global eHealth, Social Enterprise and Citizen Engagement

CAPITAL

- **Financial**
- **Human**
- **Social**
- **Time**
- **Legal**
- **Environment**

Social Enterprise

eHealth

Citizen Engagement

Integrated Person-centred Health Services (IPCHS)
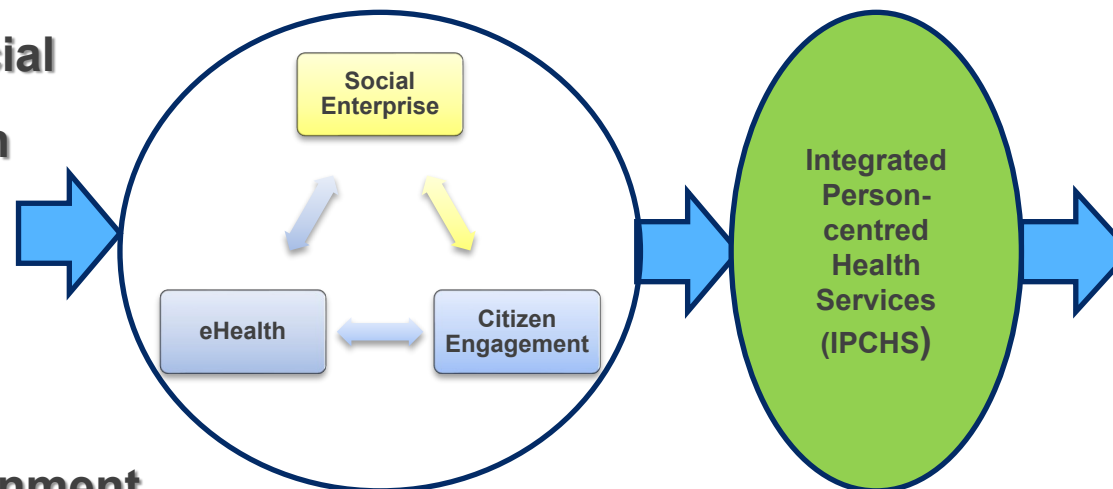
SDG#3: Health;
SDG#8: Work;
SDG#9: Industry and infrastructure;
SDG#10: Income equality
SDG#11: Sustainable cities & communities
SDG#12: Responsible & sustainable consumption and production patterns

Acknowledgment: Dr Myron Godinho, Scientia PhD Scholar

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Community health alliances as social enterprises that digitally engage citizens and integrate services: A case study in Southwestern Sydney (protocol)

Myron Anthony Godinho [iD], Md Mahfuz Ashraf, Padmanesan Narasimhan, Siaw-Teng Liaw

Show less ∧

Article information ∨

Altmetric 4

Abstract

South Western Sydney (SWS) is one of the fastest growing regions in the state of New South Wales (Australia). Much of the population live in local government areas (LGAs) with levels of disadvantage higher than the state average, with a predominance of non-communicable and chronic diseases that are typically associated with age-related and behavioural factors. This necessitates the management of social determinants of health through the integrated provision of primary and social care. The SWS Local Health District and Primary Health Network is exploring the potential of community health alliances (CHAs) as an innovative approach to support the provision of integrated health services. CHAs are a population health approach for addressing health challenges faced by people who share a common area of residence, sociocultural characteristic or health need, and are characterised by a shared mission, shared resource needs and acquiring/developing necessary organisational knowledge and skills. We explore how

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Summary: WHOCC eHealth R&D

https://sphcm.med.unsw.edu.au/who-collaborating-centre-ehealth
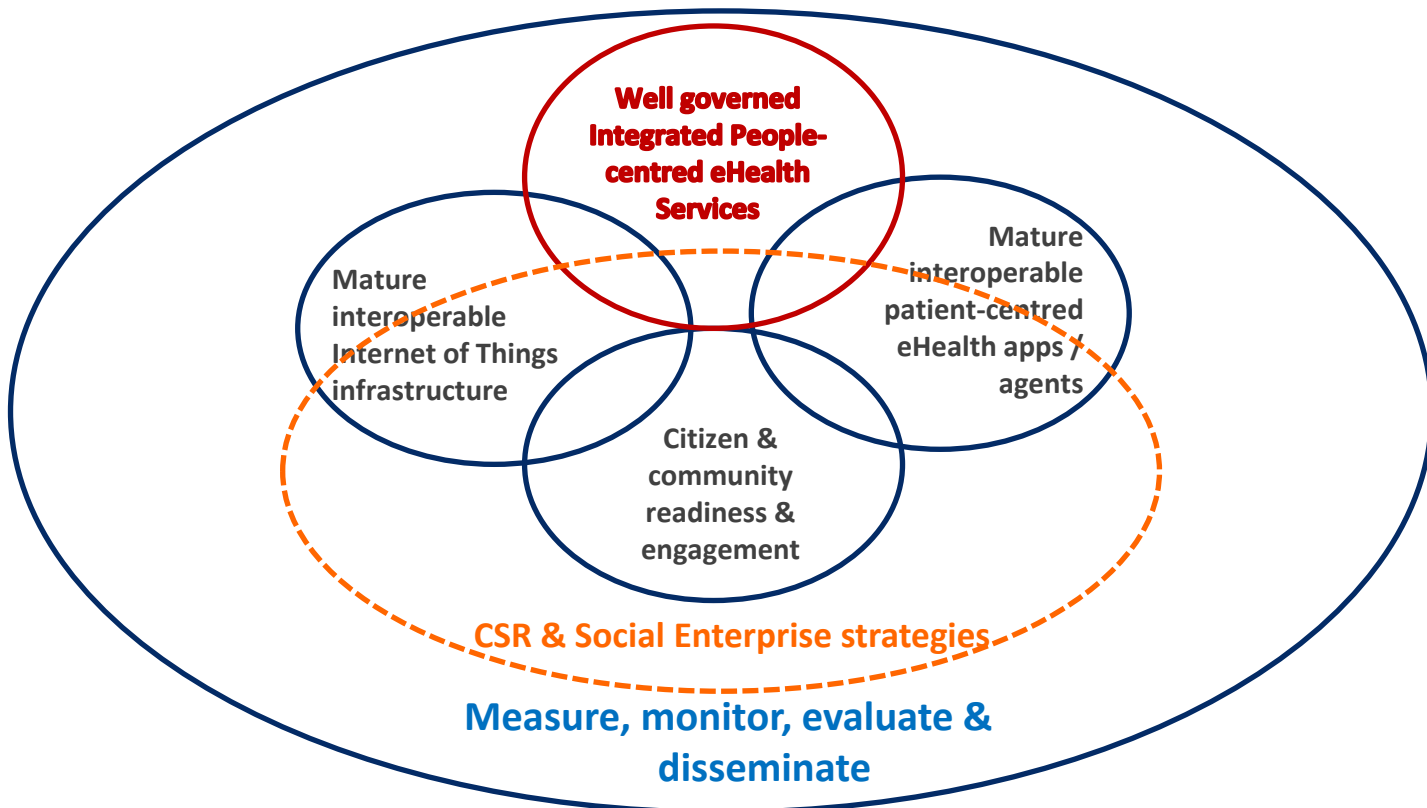
WHO Collaborating Centre for eHealth

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Vision

The WHO Collaborating Centre on eHealth conducts digital health research and development with a focus on the integration of citizen engagement, social enterprise, capability maturity of health organisations to implement and evaluate digital health practice and policy to achieve and sustain integrated person-centred health services that are safe and effective, accessible, equitable and culturally appropriate.

Mission

The WHO Collaborating Centre for eHealth provides academic and technical expertise and knowledge products (e.g. systematic reviews, technical papers) to:

1. inform decision-making on the implementation and evaluation of digital health interventions in health systems, organisations and communities, including providers and consumers of health care; and
2. build capacity for and strengthen digital health principles, clincial practice, management and policy to support learning health organisations.

This will ultimately assist member countries to harness digital health to strengthen their health systems to achieve universal health coverage and contribute to realising the UN Sustainable Development Goals.

📄 The WHO CC Terms of Reference (TOR)can be accessed here

Activities related to TORs

- Systematic review of methodologies for capacity building, implementation and evaluation of personal, professional and organisational policies & strategies in digital health.
- Development of tools and guides for assessment of capability maturity and readiness models for implementation of national digital health strategies.

https://www.youtube.com/watch?v=cK-PAms0IFk&feature=youtu.be

For more details:
siaw@unsw.edu.au