New forms of medical care in community

- Experience from Taiwan -

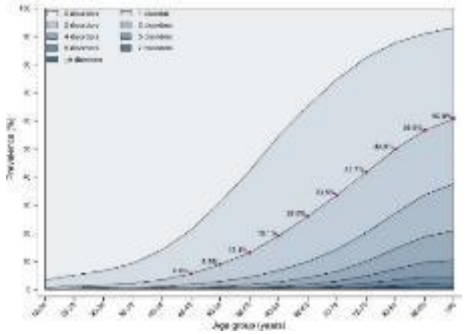
Dr. Ying-Wei Wang,
Director General, Health Promotion Administration, Taiwan
HPH Taiwan Network Representative
2019.5.31

SDG

Globalization

Migration

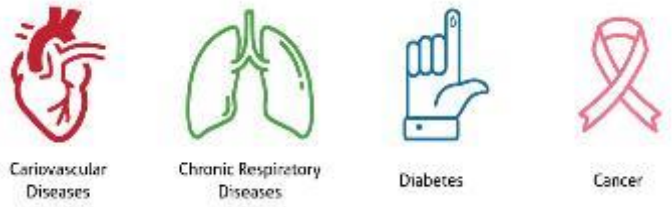
Urbanization



Multimorbidity

Aging

Climate change



NCD

Cost

Technology

Population health promotion 2.0: An eco-social approach to public health in the Anthropocene

Trevor Hancock, MB, BS, MHSc

ABSTRACT

Humanity is both an animal species that evolved within and is dependent upon natural ecosystems and a social animal that exists within the social systems we have created. Our health is dependent upon both these systems – natural and social – functioning well, and indeed upon their interactions. Yet our approach to improving the health of the population over the past few decades has been largely, if not exclusively, focused on the social determinants of health. A recent Canadian Public Health Association (CPHA) Discussion Document and the technical report on which it is based seek to strike a more balanced approach. First, they document the dramatic and rapid global ecological changes that humans have created and argue that they are a significant threat to the health of the population in the 21st century. Second, they identify the underlying social, cultural and economic forces that are driving these changes. Third, they argue that we need to take an eco-social approach in population health promotion, recognizing the interactions between the ecological and social determinants of health. Such an approach could be considered to be 'Population health promotion 2.0', and it has profound implications for the practice of public health.

KEY WORDS: Health promotion; ecosystem; ecological and environmental phenomena; social determinants of health

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2015;106(4):e252–e255
doi: 10.17269/CJPH.106.5161

World Health Organization

UNIVERSAL HEALTH COVERAGE DATA PORTAL

Supporting the Universal Health Coverage Coalition

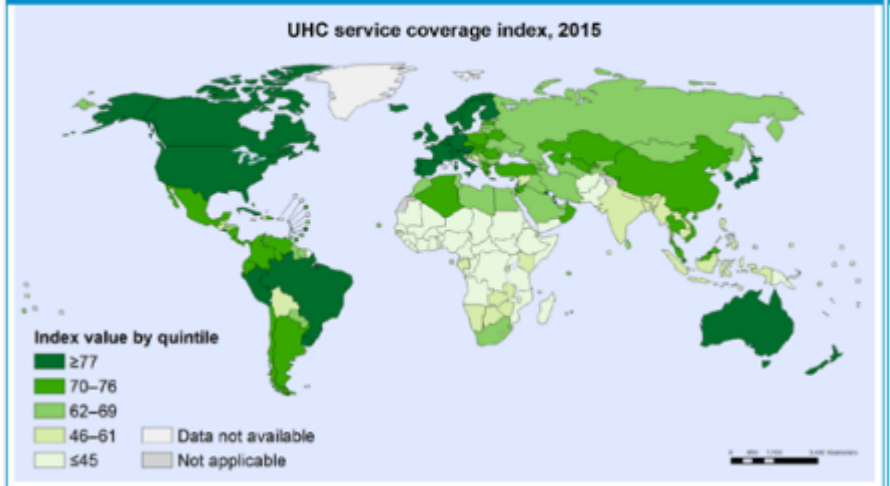
At least half of the world's 7.3 billion people still lack full coverage with essential health services

Coverage of essential health services has increased since 2000, but inequalities persist

Over 800 million people (almost 12 percent of the world's population) spent at least 10 percent of their household budgets in 2010 on out-of-pocket health expenditures

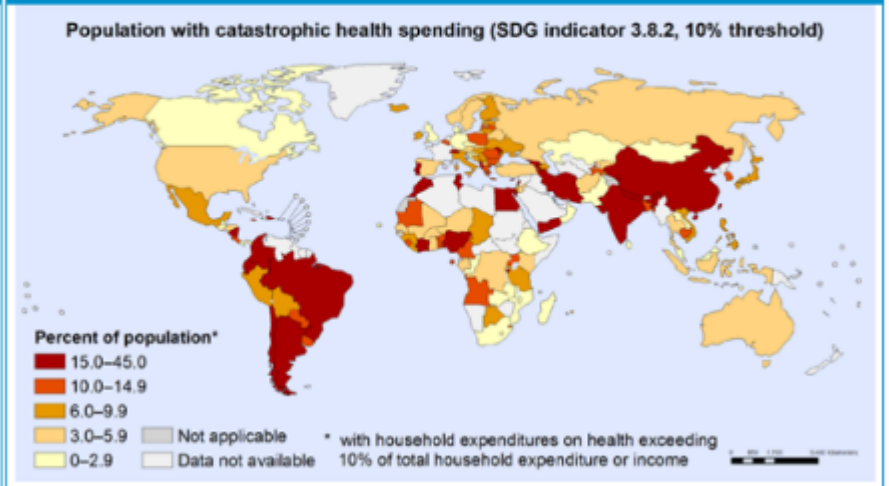
About 100 million people in 2010 fell into extreme poverty (living on $ 1.90 or less a day) because of out-of-pocket health expenditures

SERVICE COVERAGE

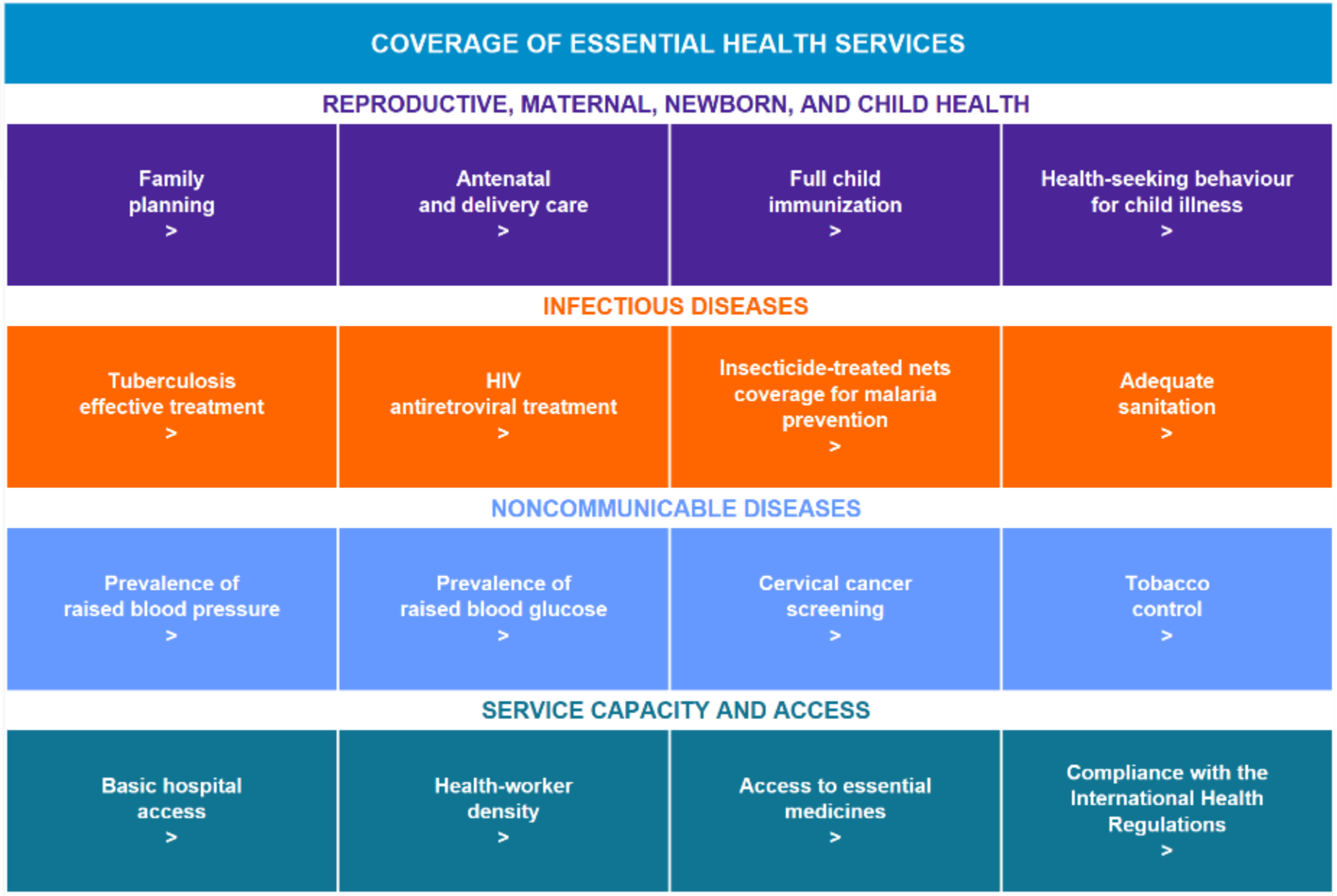


MORE ON SERVICE COVERAGE >

FINANCIAL PROTECTION



MORE ON FINANCIAL PROTECTION >


COVERAGE OF ESSENTIAL HEALTH SERVICES
REPRODUCTIVE, MATERNAL, NEWBORN, AND CHILD HEALTH
Family planning >
Antenatal and delivery care >
Full child immunization >
Health-seeking behaviour for child illness >
INFECTIOUS DISEASES
Tuberculosis effective treatment >
HIV antiretroviral treatment >
Insecticide-treated nets coverage for malaria prevention >
Adequate sanitation >
NONCOMMUNICABLE DISEASES
Prevalence of raised blood pressure >
Prevalence of raised blood glucose >
Cervical cancer screening >
Tobacco control >
SERVICE CAPACITY AND ACCESS
Basic hospital access >
Health-worker density >
Access to essential medicines >
Compliance with the International Health Regulations >

WHO Global NCD Action Plan

A road map with policy options to be implemented from 2013 to 2020 focusing on four modifiable risk behaviors that are linked to four preventable noncommunicable diseases.

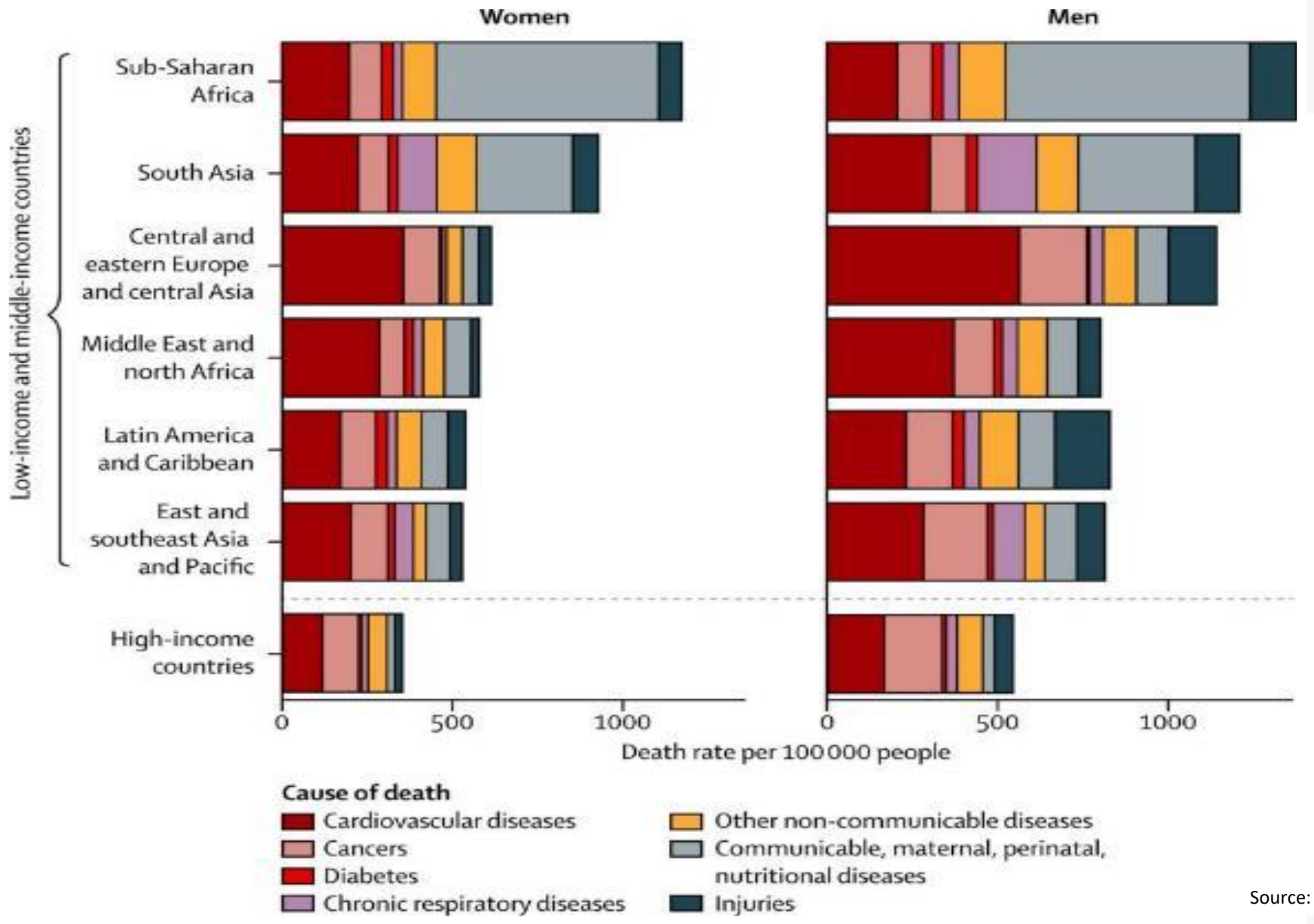
RISK FACTORS

- Tobacco use
- Unhealthy diet
- Physical inactivity
- Harmful use of alcohol

DISEASES

- Cardiovascular diseases
- Cancers
- Diabetes
- Chronic respiratory diseases

NCDs are leading causes of death in virtually every region



Source: Di Cesare et al *Lancet* 2013

Sustainable Development Goals (SDGs): Action on NCDs & Innovation Technology

The 2030 Agenda reaffirms **that NCDs prevention and control and ICTs usage are a priority for sustainable development..**

- 3.4 Reduce by **1/3 NCD** premature mortality.
- 9.c Significantly increase **access to ICTs** and strive to provide universal and affordable access to internet in LDCs by 2020.
- 17.8 Fully operationalize the Technology Bank and STI (Science, Technology and Innovation) capacity building mechanism for LDCs by 2017, and **enhance the use of enabling technologies in particular ICTs**

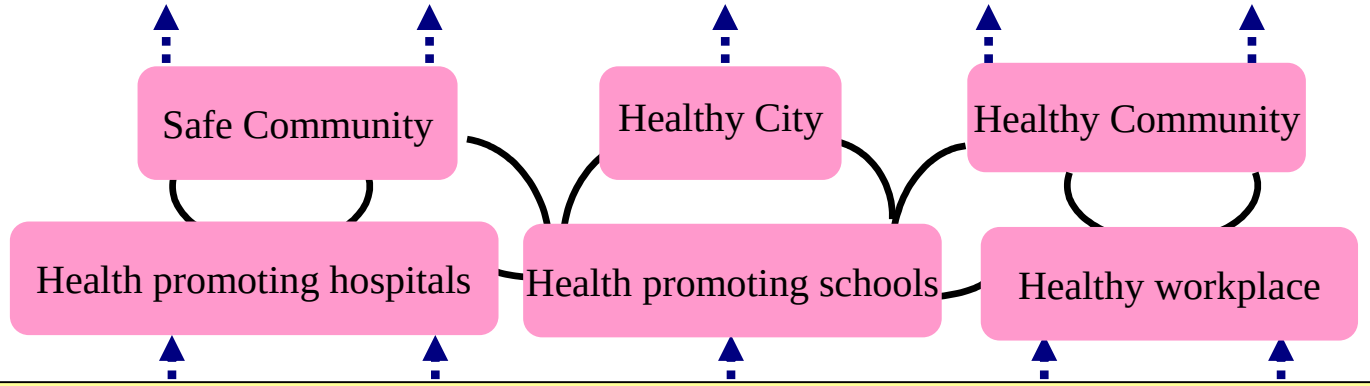
Data source: University of Bergen (http://www.uib.nos)
NCD Alliance (https://ncdalliance.org/)

Development of Health Promotion

Shanghai Charter Health Promotion (2016) Healthy cities and Health Literacy

Helsinki Statement (2013), health in all policies, universal health coverage

The **Bangkok Charter** for Health Promotion in a Globalized World (2005)



- Combined use of the Ottawa Charter strategies are far more effective than single strategy
- Combination can be adapted for use in different settings
- The population should be involved in the action and decision making process
- Learning and communication, granting autonomy to the communities and population.

Jakarta Declaration on Leading Health Promotion into the 21st Century (1997)

Building Healthy Public Policy	Creating Supportive Environment	Strengthening Community Action	Developing Personal Skills	Reorient Health Services

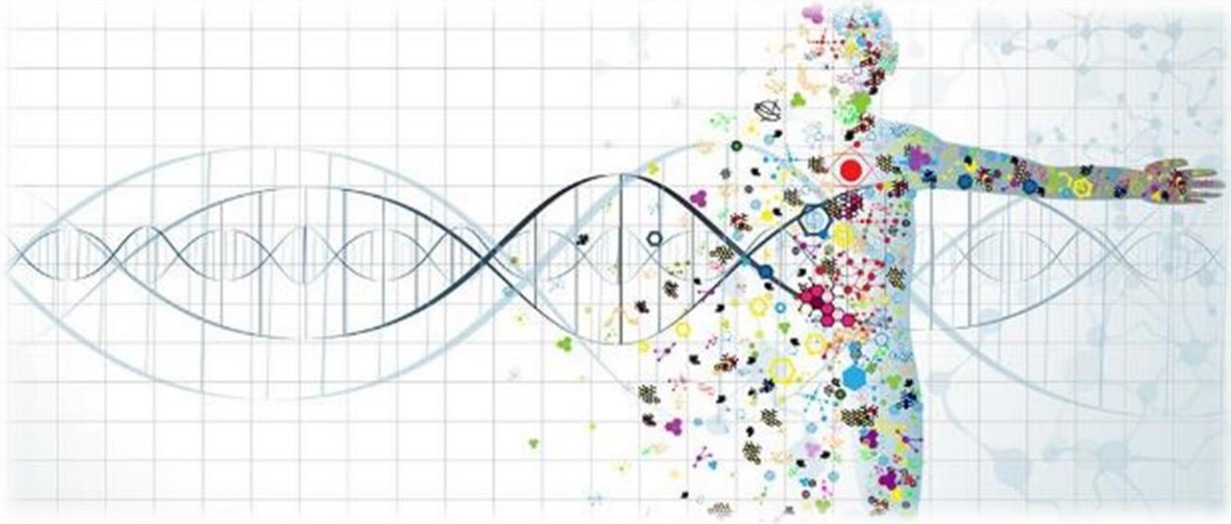
Ottawa Charter for Health Promotion (1986)

9th Global Conference on Health Promotion, Shanghai 2016

- **Health Literacy** is an important factor in improving health outcomes
- Increase knowledge to help people to make healthiest choice and decision for themselves or theirs family to achieve the goal:
  - **Empowering citizens**
  - **Reducing health inequities**

The Evidence-Based Medicine triad

(see D.L. Sackett et al, BMJ 1996; 312: 71-72)



Precision medicine

https://participatorymedicine.org/what-is-participatory-medicine/

About Us

Society for Participatory Medicine

Transforming the Culture of Patient Care

Participatory Medicine? Memberships C

What is Participatory Medicine?

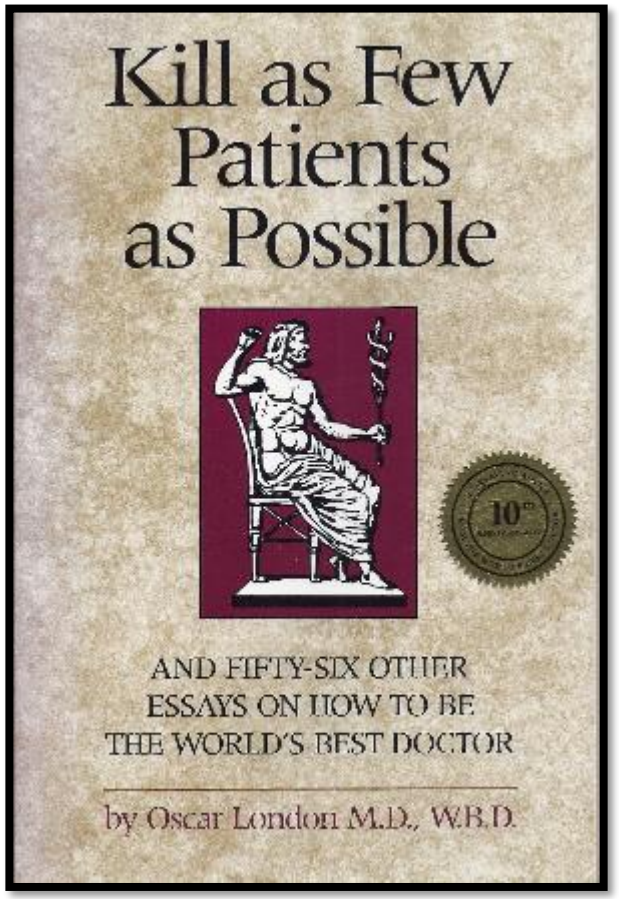
Aging populations, innovation and technology are changing business as usual in healthcare.

- High patient expectations
- Technology-enabled care
- Focus on quality and costs
- Big data use at point of care

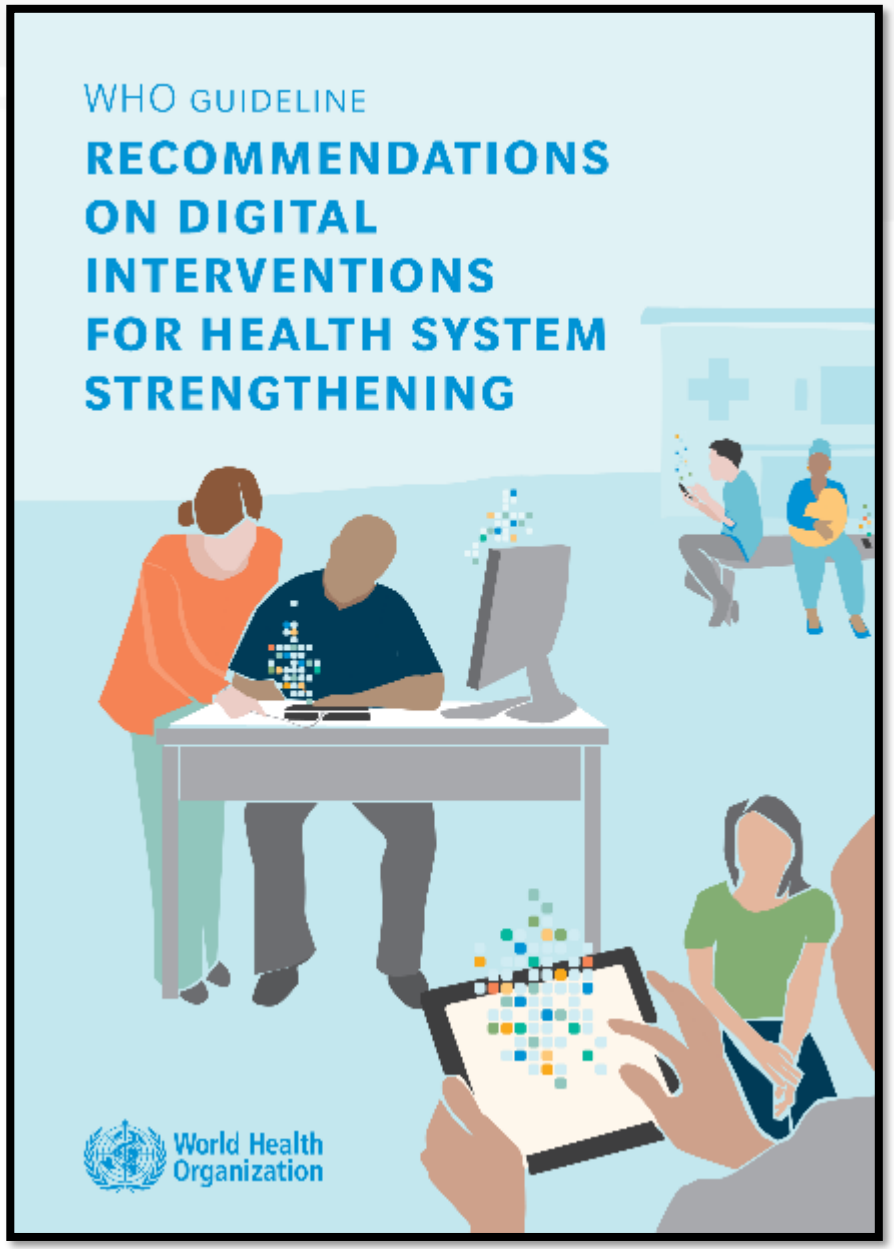
https://participatorymedicine.org/what-is-participatory-medicine/

Minimally Disruptive Medicine (MDM)

- Minimally Disruptive Medicine (MDM) is a theory-based**, patient-centered, and context-sensitive approach** to care that focuses on achieving patient goals for life and health while imposing the **smallest possible treatment burden** on patients' lives. The MDM Care Model is designed to be pragmatically comprehensive, meaning that it aims to address any and all factors that impact the implementation and effectiveness of care for patients with multiple chronic conditions.



Healthcare **2015**, *3*, 50-63



Foreword

Human health has only ever improved because of advances in technology. From the development of modern sanitation to the advent of penicillin, anesthesia, vaccines and magnetic resonance imaging, science, research and technology have always been key drivers of better health.

It's no different today. Advances in technology are continuing to push back the boundaries of disease. Digital technologies enable us to test for diabetes, HIV and malaria on the spot, instead of sending samples off to a laboratory. 3-D printing is revolutionizing the manufacture of medical devices, orthotics and prosthetics. Telemedicine, remote care and mobile health are helping us transform health by delivering care in people's homes and strengthening care in health facilities. Artificial intelligence is being used to give paraplegic patients improved mobility, to manage road traffic and to develop new medicines. Machine learning is helping us to predict outbreaks and optimize health services.

Propelled by the global ubiquity of mobile phones, digital technologies have also changed the way we manage our own health. Today we have more health information – and misinformation – at our fingertips than any generation in history. Before we ever sit down in a doctor's office, most of us have Googled our symptoms and diagnosed ourselves – perhaps inaccurately. Similarly, digital technologies are being used to improve the training and performance of health workers, and to address a diversity of persistent weaknesses in health systems.

Harnessing the power of digital technologies is essential for achieving the Sustainable Development Goals, including universal health coverage and the other "triple billion" targets in WHO's 13th General Programme of Work. Such technologies are no longer a luxury; they are a necessity.

A key challenge is to ensure that all people enjoy the benefits of digital technologies for everyone. We must make sure that innovation and technology helps to reduce the inequities in our world, instead of becoming another reason people are left behind. Countries must be guided by evidence to establish sustainable harmonized digital systems, not seduced by every new gadget.

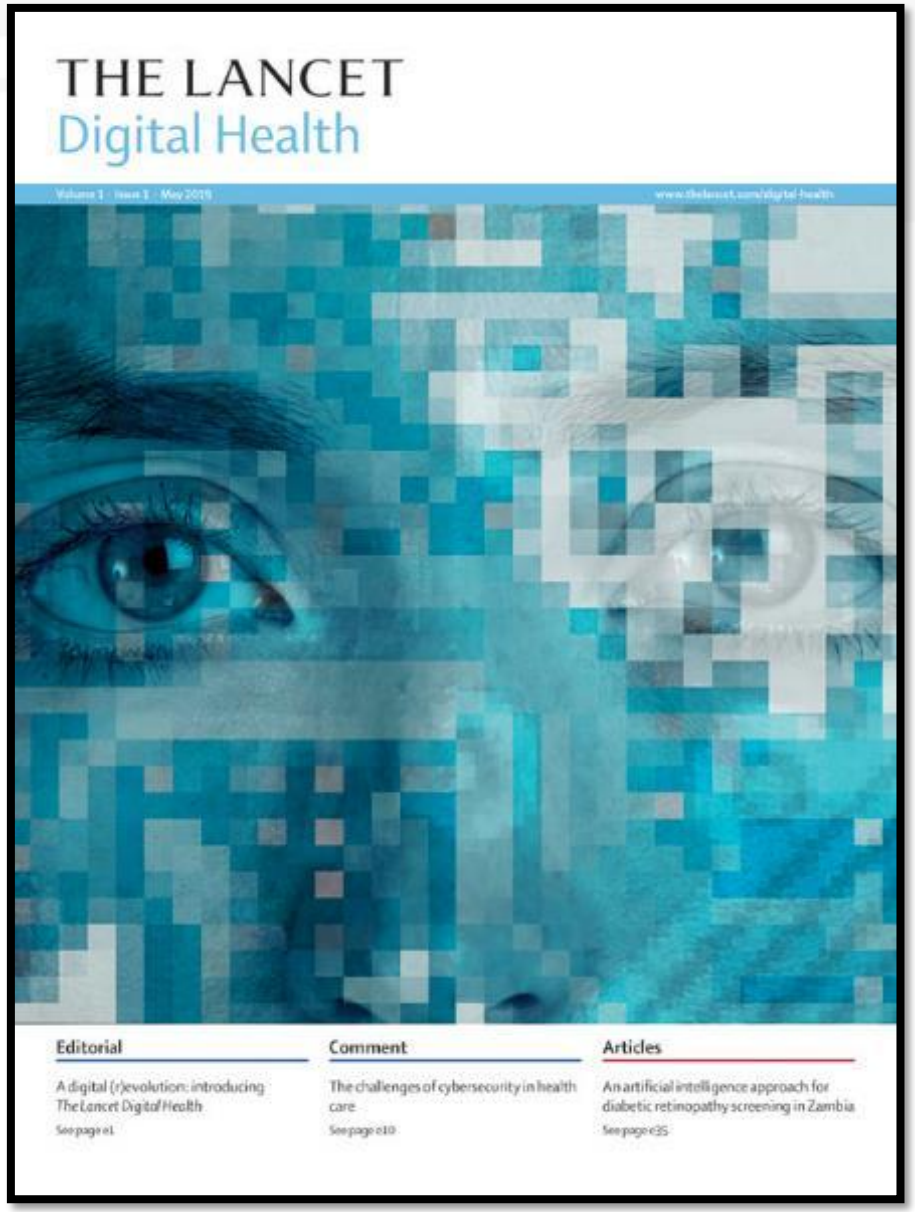
That's what this guideline is all about.

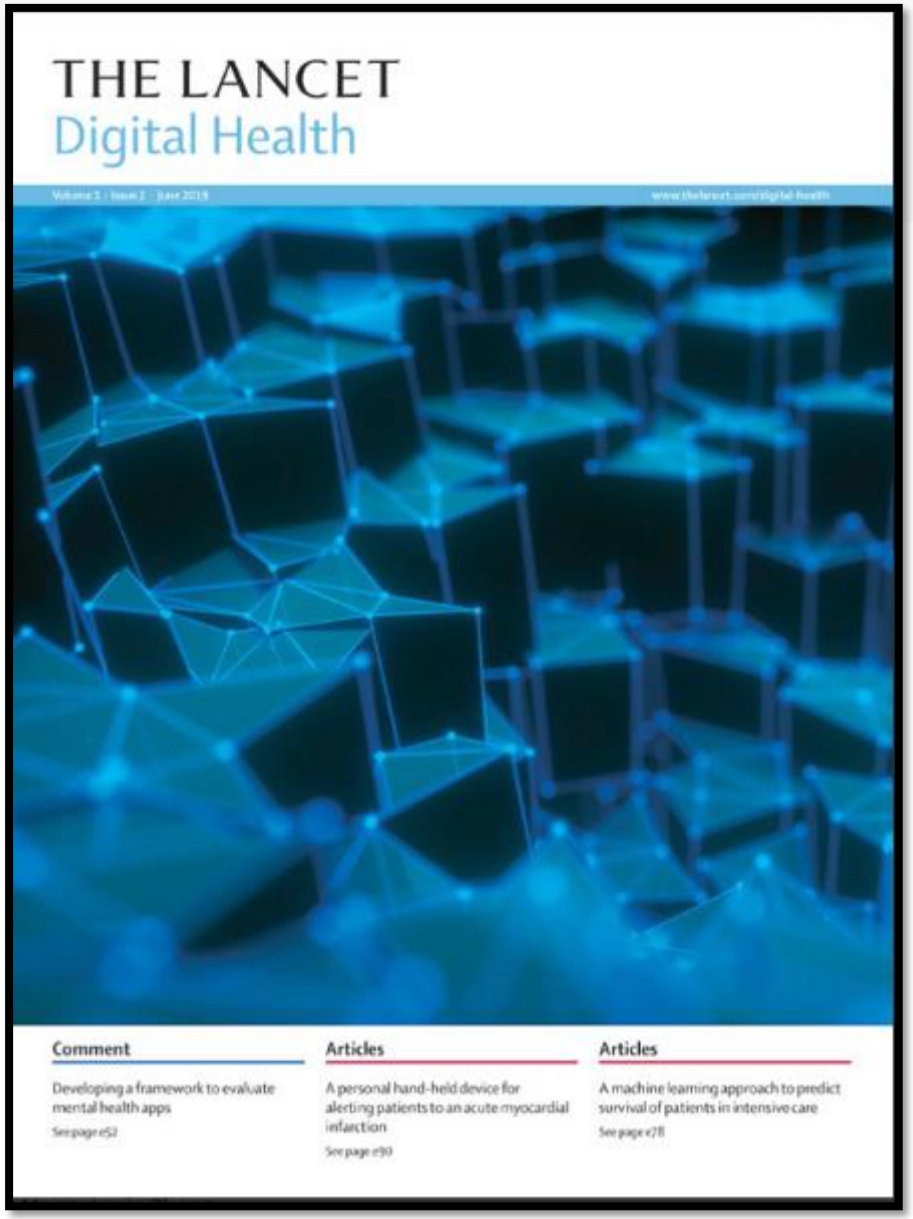
At the Seventy-First World Health Assembly, WHO's Member States asked us to develop a global strategy on digital health. This first WHO guideline establishes recommendations on digital interventions for health system strengthening and synthesizes the evidence for the most important and effective digital technologies.

The nature of digital technologies is that they are evolving rapidly; so will this guideline. As new technologies emerge, new evidence will be used to refine and expand on these recommendations. WHO is significantly enhancing its work in digital health to ensure we provide our Member States with the most up-to-date evidence and advice to enable countries to make the smartest investments and achieve the biggest gains in health. Ultimately, digital technologies are not ends in themselves; they are vital tools to promote health, keep the world safe, and serve the vulnerable.

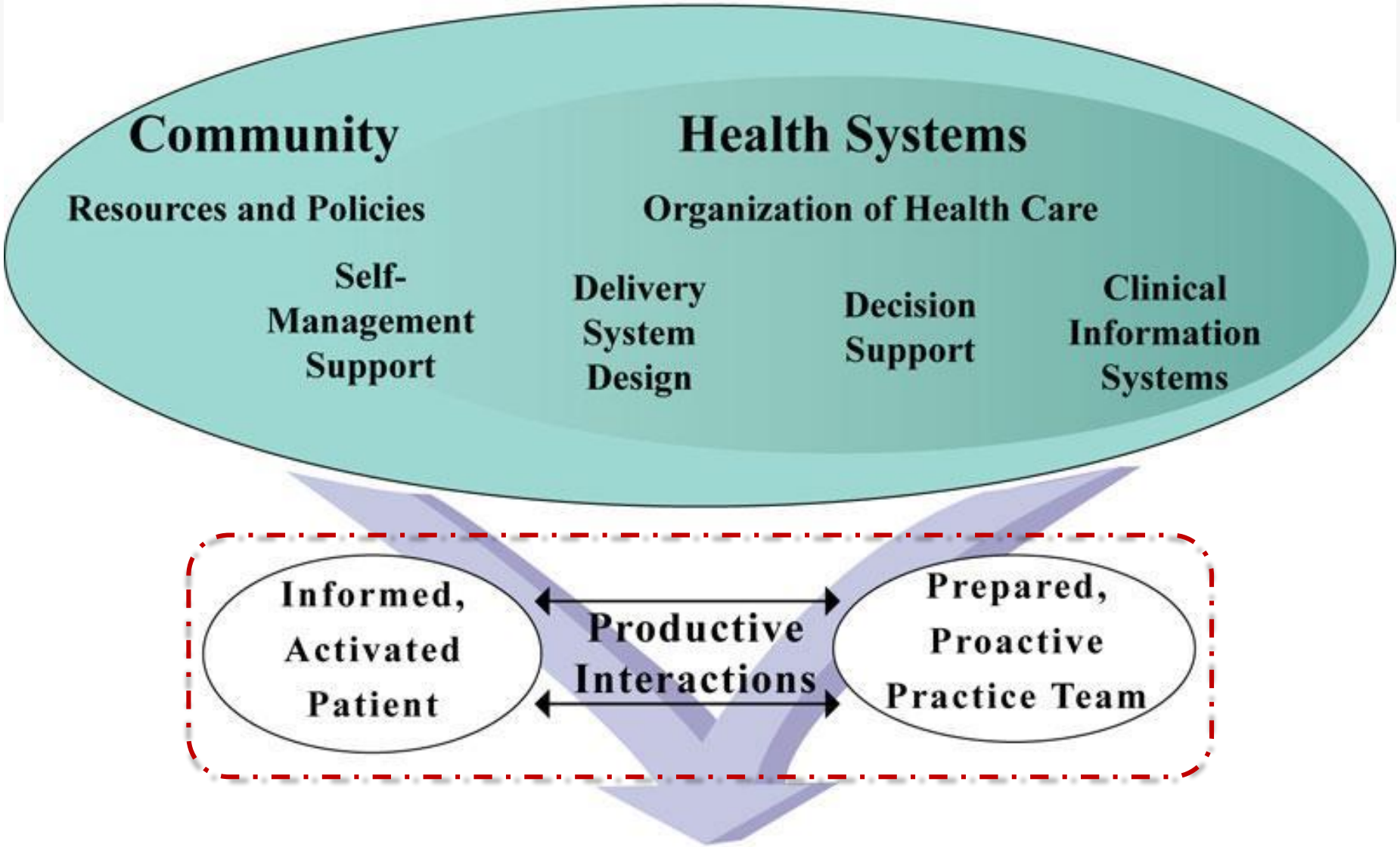
Dr Tedros Adhanom Ghebreyesus
Director-General, World Health Organization

WHO 2019


THE LANCET
Digital Health
Editorial
A digital (r)evolution: introducing The Lancet Digital Health
See page e1
Comment
The challenges of cybersecurity in health care
See page e10
Articles
An artificial intelligence approach for diabetic retinopathy screening in Zambia
See page e35

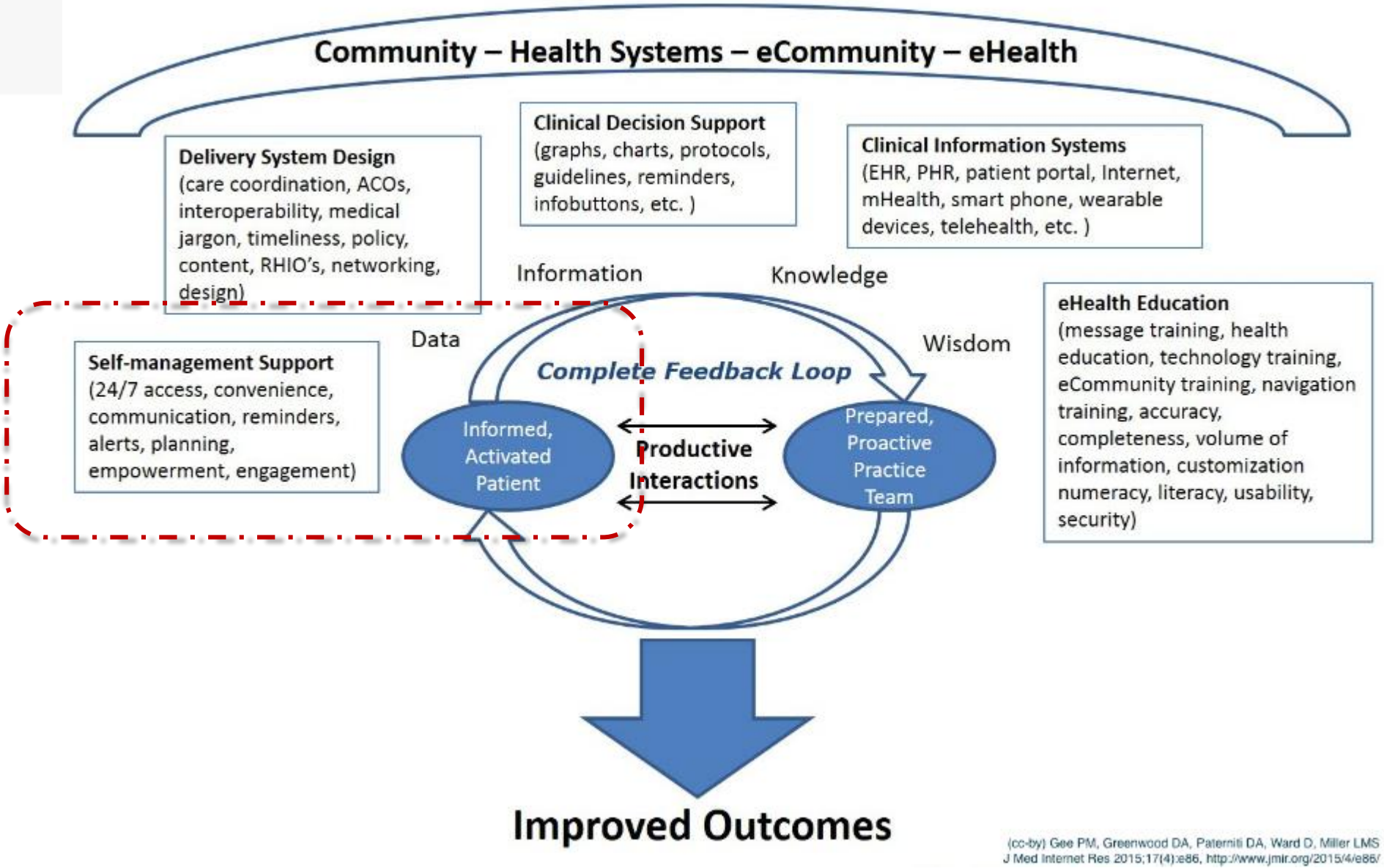

THE LANCET
Digital Health
Comment
Developing a framework to evaluate mental health apps
See page e52
Articles
A personal hand-held device for alerting patients to an acute myocardial infarction
See page e90
Articles
A machine learning approach to predict survival of patients in intensive care
See page e78

The Chronic Care Model

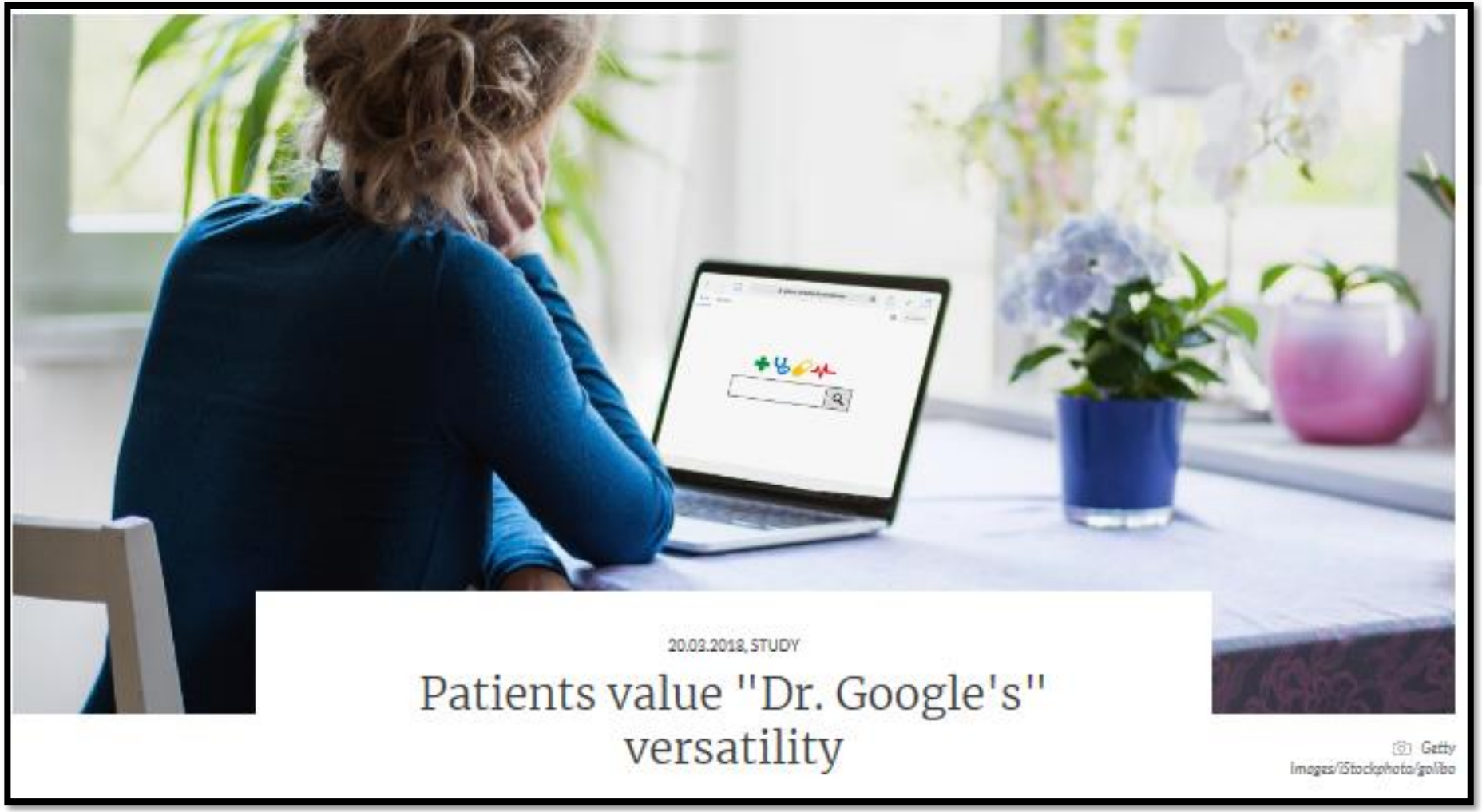


Improved Outcomes

The eHealth Enhanced Chronic Care Model (eCCM)



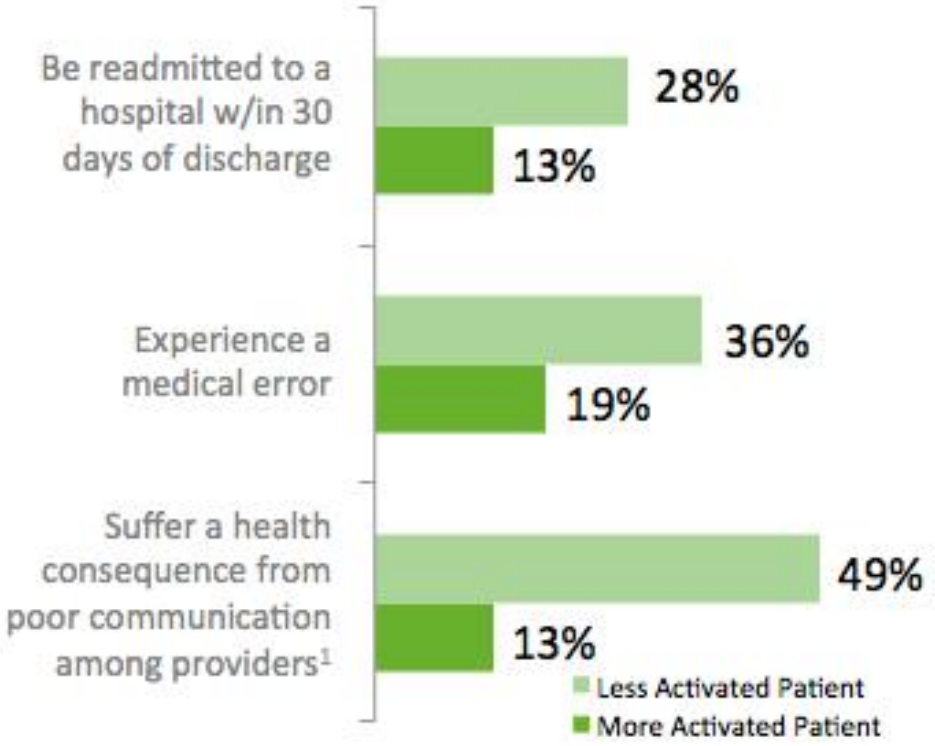
Gee etc. The eHealth enhanced chronic care model: a theory derivation approach. J Med Internet Res. 2015;17:e86t



https://www.bertelsmann-stiftung.de/en/topics/aktuelle-meldungen/2018/januar/patients-value-dr-googles-versatility/

Patient Engagement Improves Outcomes

Higher patient engagement is associated with numerous improvements across various aspects of health delivery

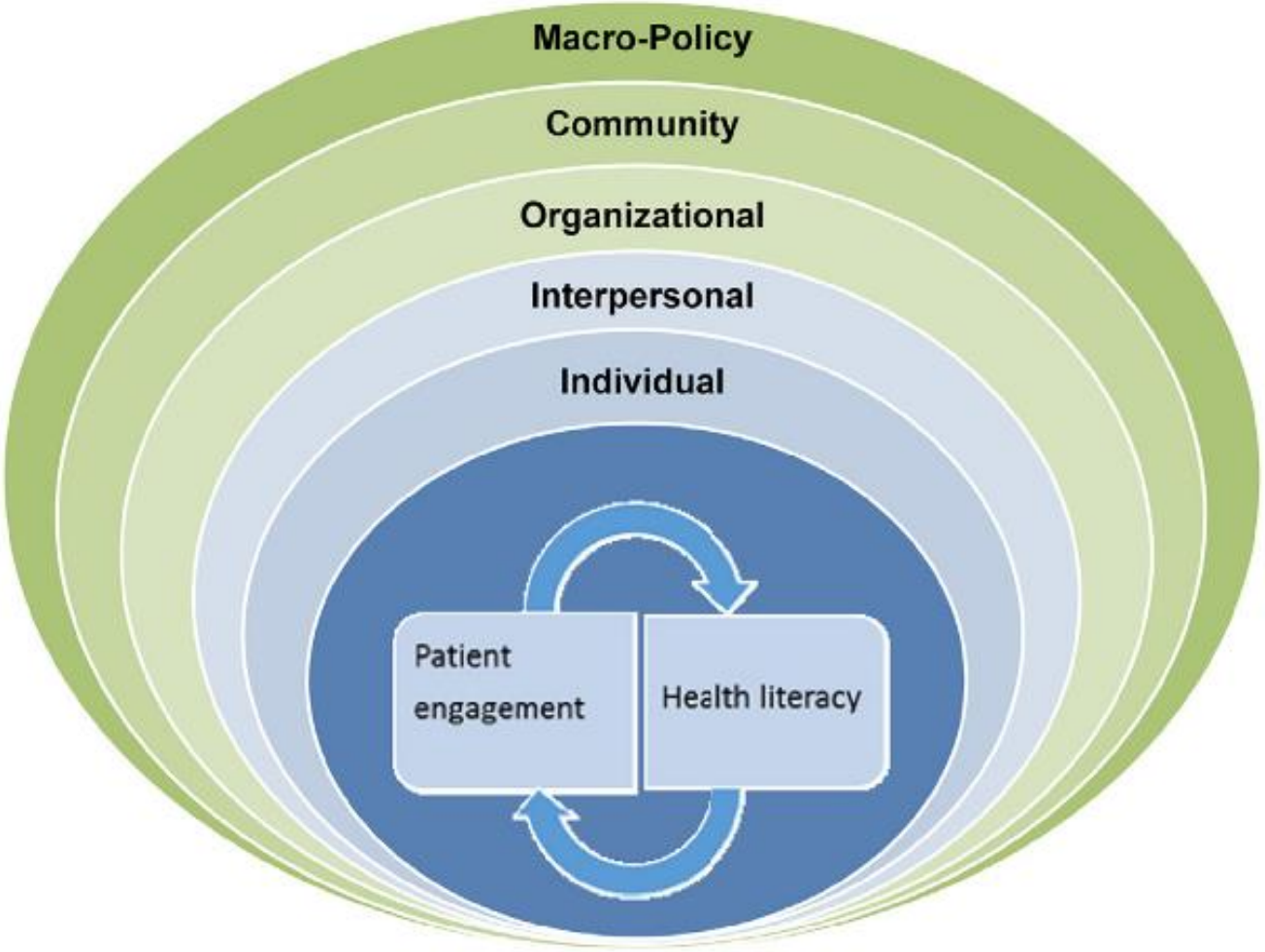


- ↓ Diagnostic testing and expenditures
- ↓ Referrals
- ↓ Elective surgeries
- ↑ Adherence to prescribed medical treatments
- ↑ Functional status and faster recovery
- ↑ Satisfaction
- ↑ Well-informed and engaged patients carry out more health-related behavior changes (e.g., exercise, smoking cessation, dietary modification)[2]

[1]*AARP survey of patients over 50 with 2 or more chronic conditions* [2]*Bipartisan Policy Center Health Information Technology Initiative, December 2012 (internal citations omitted)*

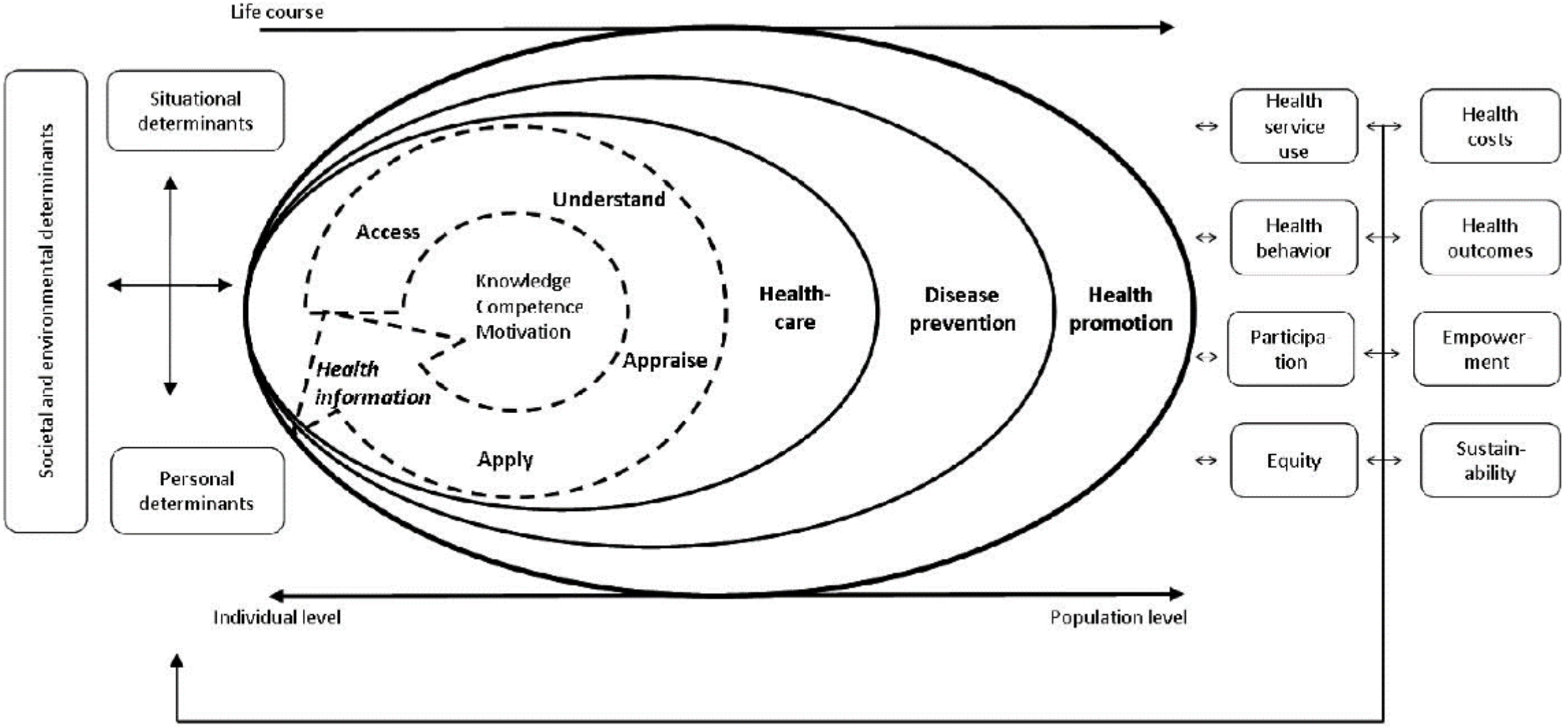
Health literacy social ecological model (HLSEM)

Integrated relationship between health literacy and patient engagement



McCormack, et al., Improving low health literacy and patient engagement: A social ecological approach, Patient Educ Couns 2017 Jan;100(1):8-13

Integrated model of health literacy



Sørensen et al. BMC Public Health 2012, 12:80

“Health literacy friendly materials” reviewing indicators

- This tool includes 6 parts and 19 items.
  1. If the total score is 90 or above: Excellent! You have addressed most items that makes materials easier to understand and use.
  2. It spends about 15-20 minutes to finish the evaluation.

☐A. content 1. The main message is clearly presented on the cover or top of the page 2. Emphasize the implementation of healthy behavior 3. The content has a reasonable scope and closely related to the subject 4. Have a summary or focus on a review 5. Content of the faith	**☐B. Language and style** 6. Daily colloquial language and intonation 7. Explain proper nouns 8. Cultural relevance	**☐C. Organization and editing** 9. Logical coherence 10. Adequate segmentation of learning blocks
☐D. Numerical reading 11. The presentation of the value is easy to understand 12. Avoid calculation	**☐E. visual images** 13. Related to key messages 14. Visual image information is clear and easy to understand	**☐F. layout and design** 15. Use visual cues to read 16. Layout is easy to read 17. The appeal of continuous viewing 18. Visual aesthetics and art editor 19. audio-visual effect is clear

Patient Empowerment

30 seconds CF

Poster & Leaflet

Ask 3 Questions

1. **What are my options?**
2. **What are the pros and cons of each option for me?**
3. **How do I get support to help me make a decision that is right for me?**

Patient Decision Aids

Health 99

共享健康決策

Question Prompt List, QPL

Doctors need your questions

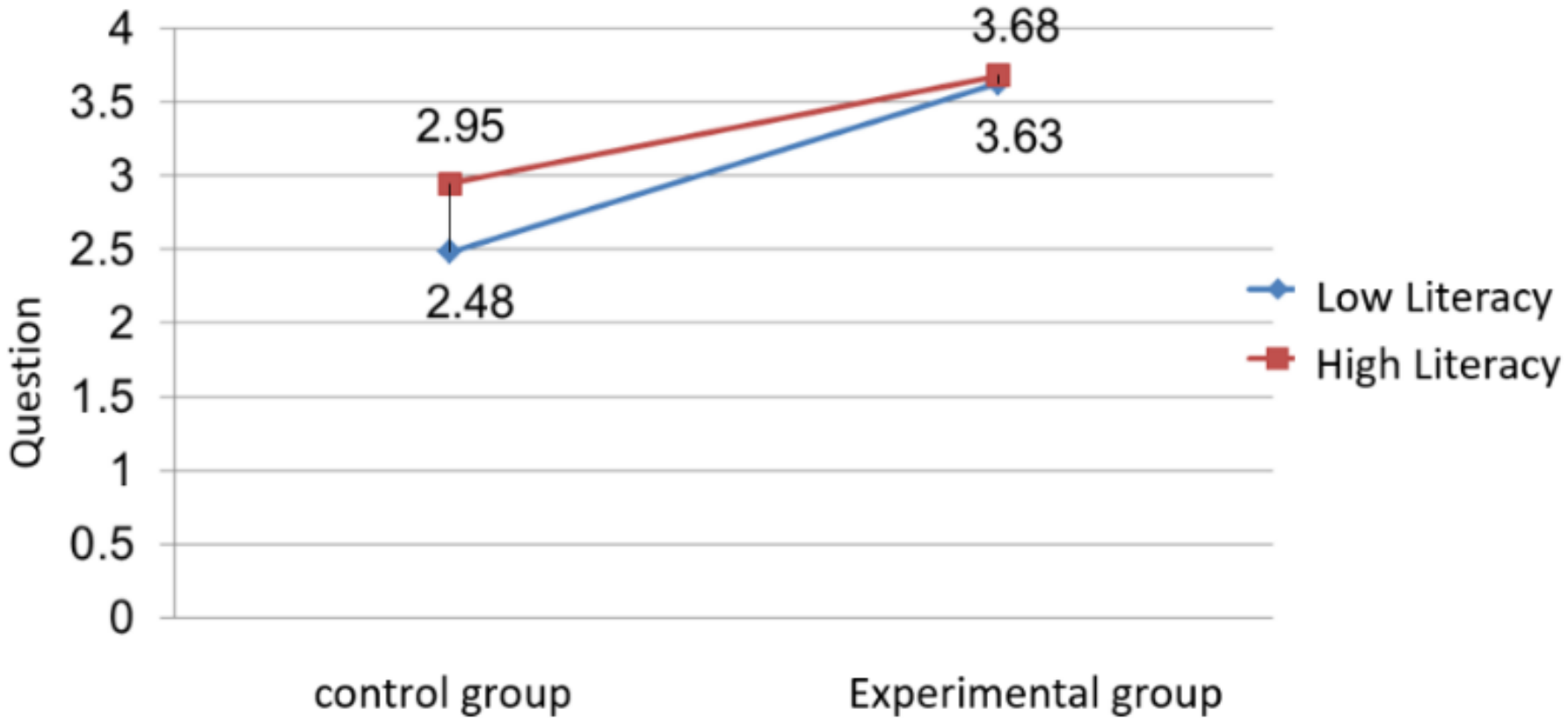
Poster in the waiting area

QPL

Patient asking more questions

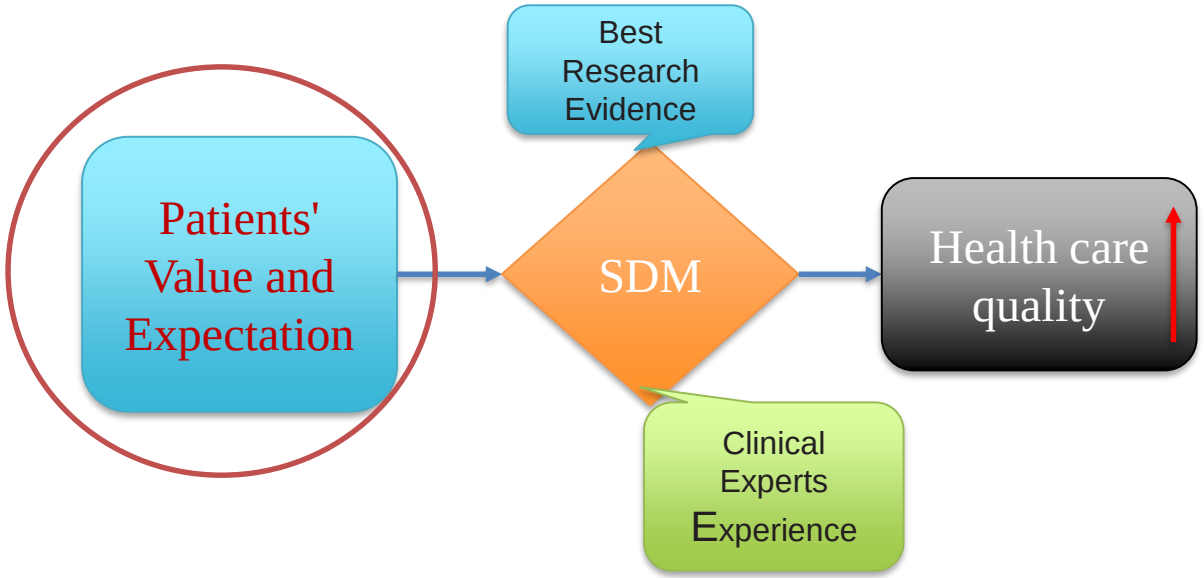
Physician providing more information

Question Prompt Lists are More Helpful for Low Health Literacy Patients



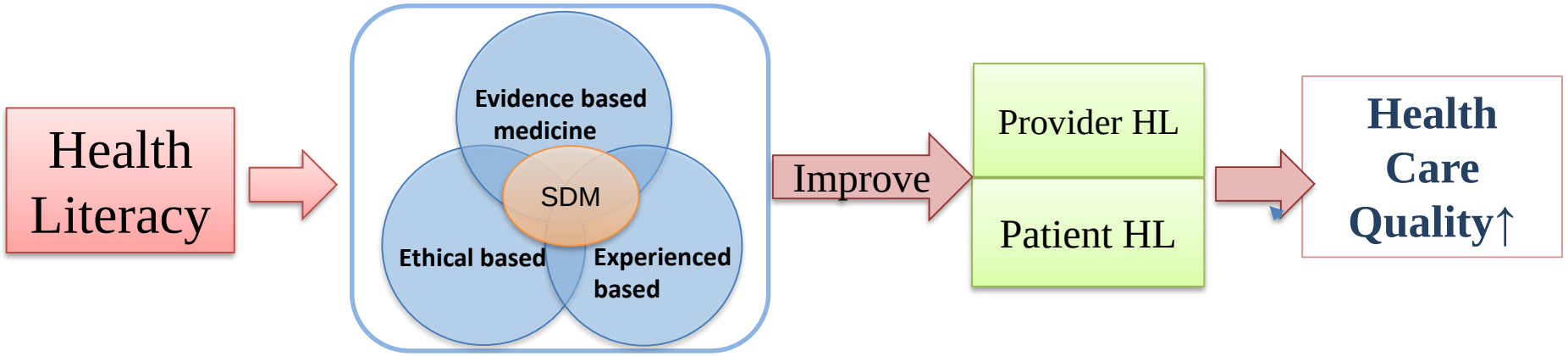
Shared decision making (SDM)

- An approach where **clinicians** and **patients** share the best available **evidence** when faced with the task of making decisions, and where patients are supported to **consider options**, to achieve **informed preferences**



Develop Shared Decision Making for Health Care

- In 2016, 10 hospitals chose chronic diseases as subject to implement SDM model
- Health Promotion Institutions and hospitals passing Cancer Care Quality Accreditation as top priority to wide spread our SDM plan.
- In 2017, HPA and Joint Commission of Taiwan, set up training curriculums for SDM core concept and Coach training

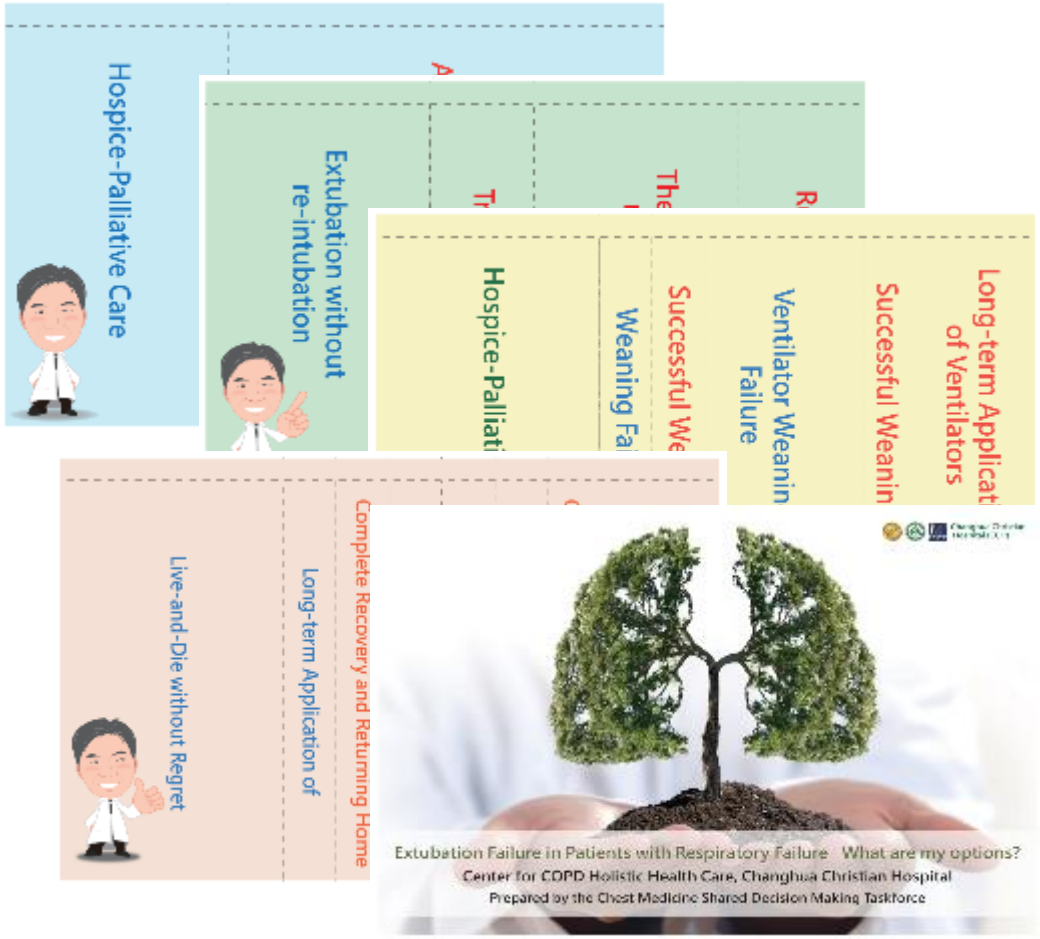


Current Status of SDM Implementation

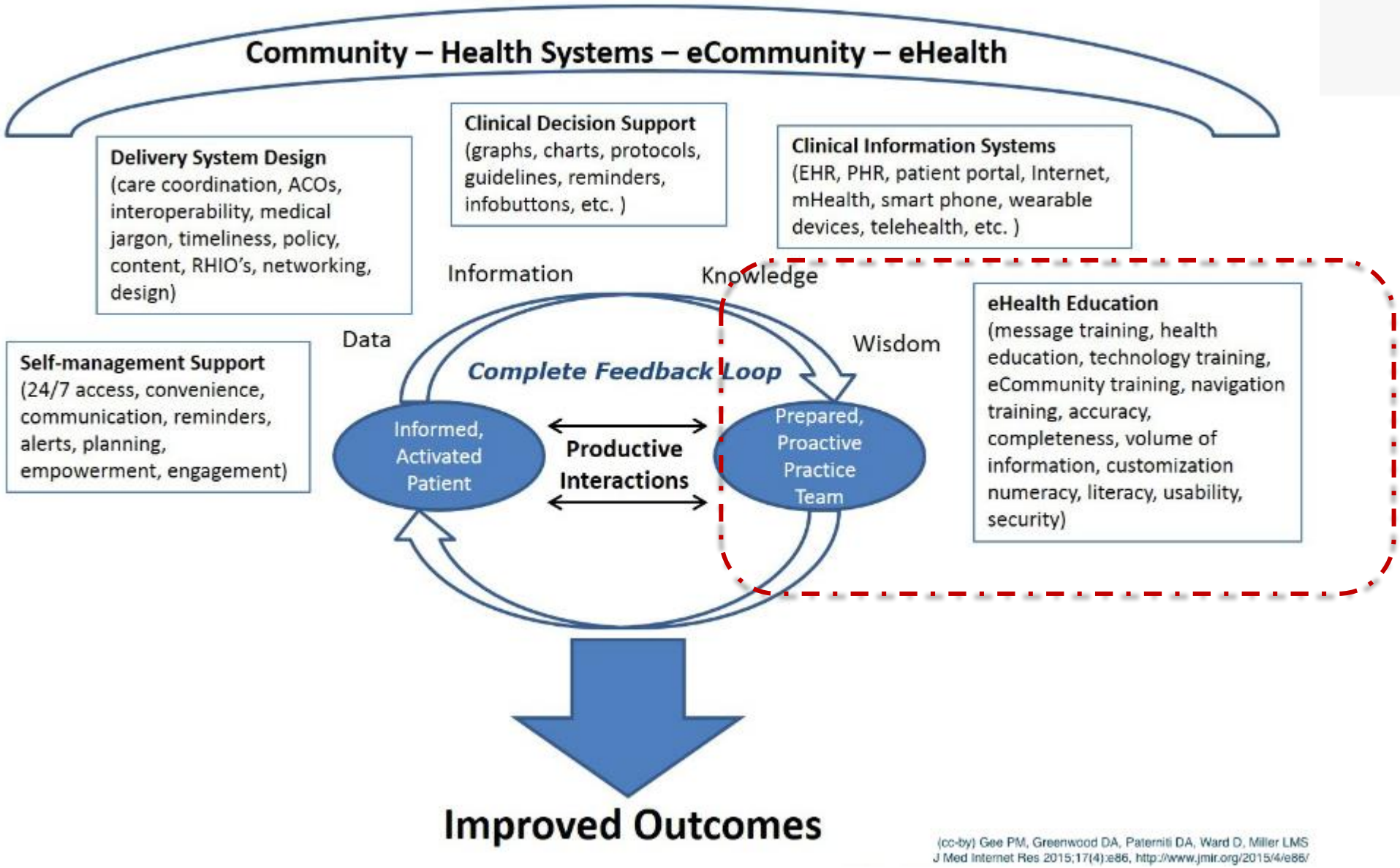
- Preparing 2016-2019 SDM action plan
- 4 pilot PDAs on Hypertension, diabetes, colorectal cancer and breast cancer had been launched in 2016
- 8 Medical institutions implement the SDM pilot program in 2016.
- The advocacy to increase the public awareness: ask 3 questions
- Collaboration with MOHW existing SDM platform(57 PDAs) to establish national shared evidence-informed platform for public application

Develop Patient Decision Aids, PDA

[Extubation Failure in Patients with Respiratory Failure What are my options](#)

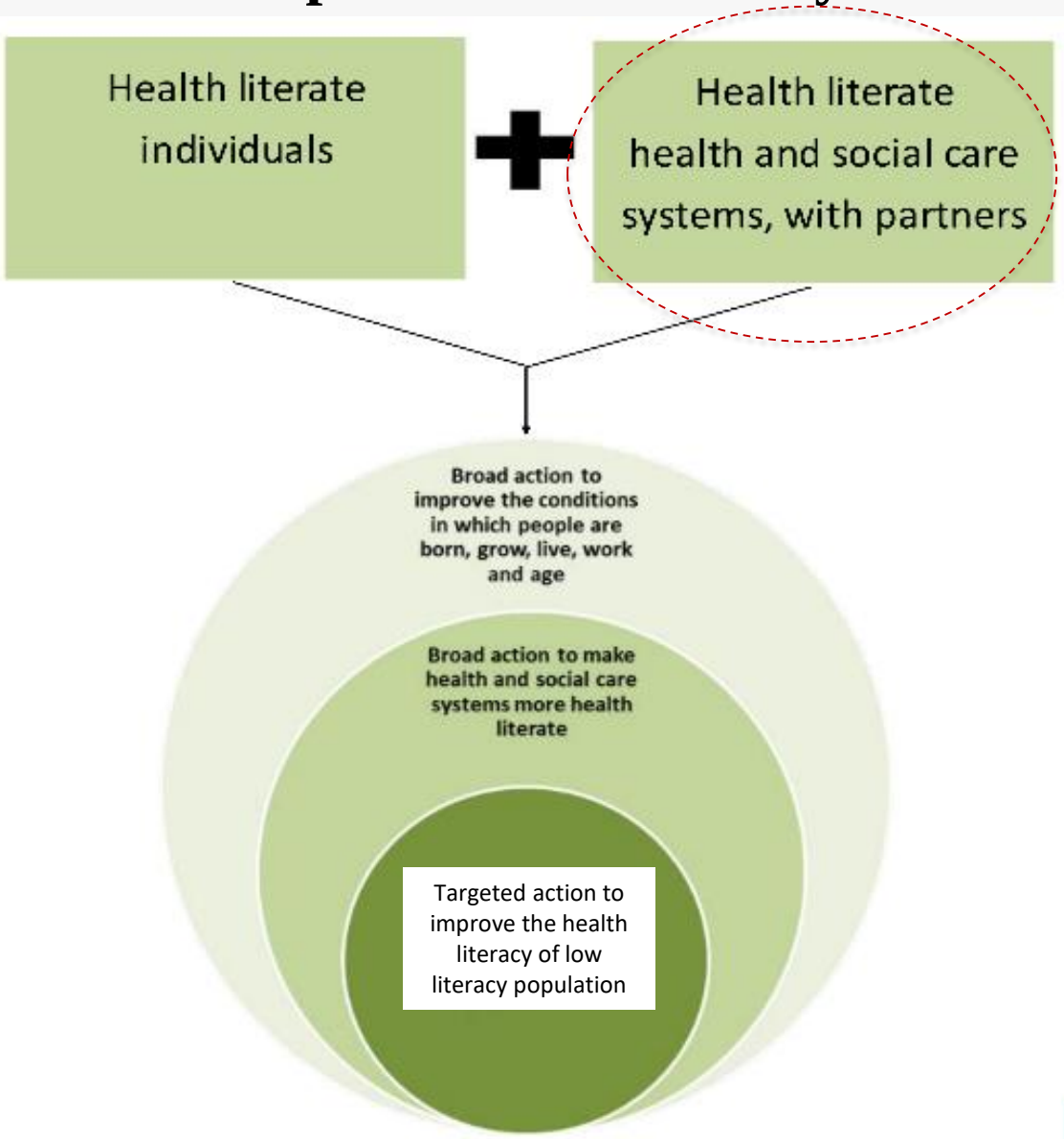


The eHealth Enhanced Chronic Care Model (eCCM)



Gee etc. The eHealth enhanced chronic care model: a theory derivation approach. J Med Internet Res. 2015;17:e86t

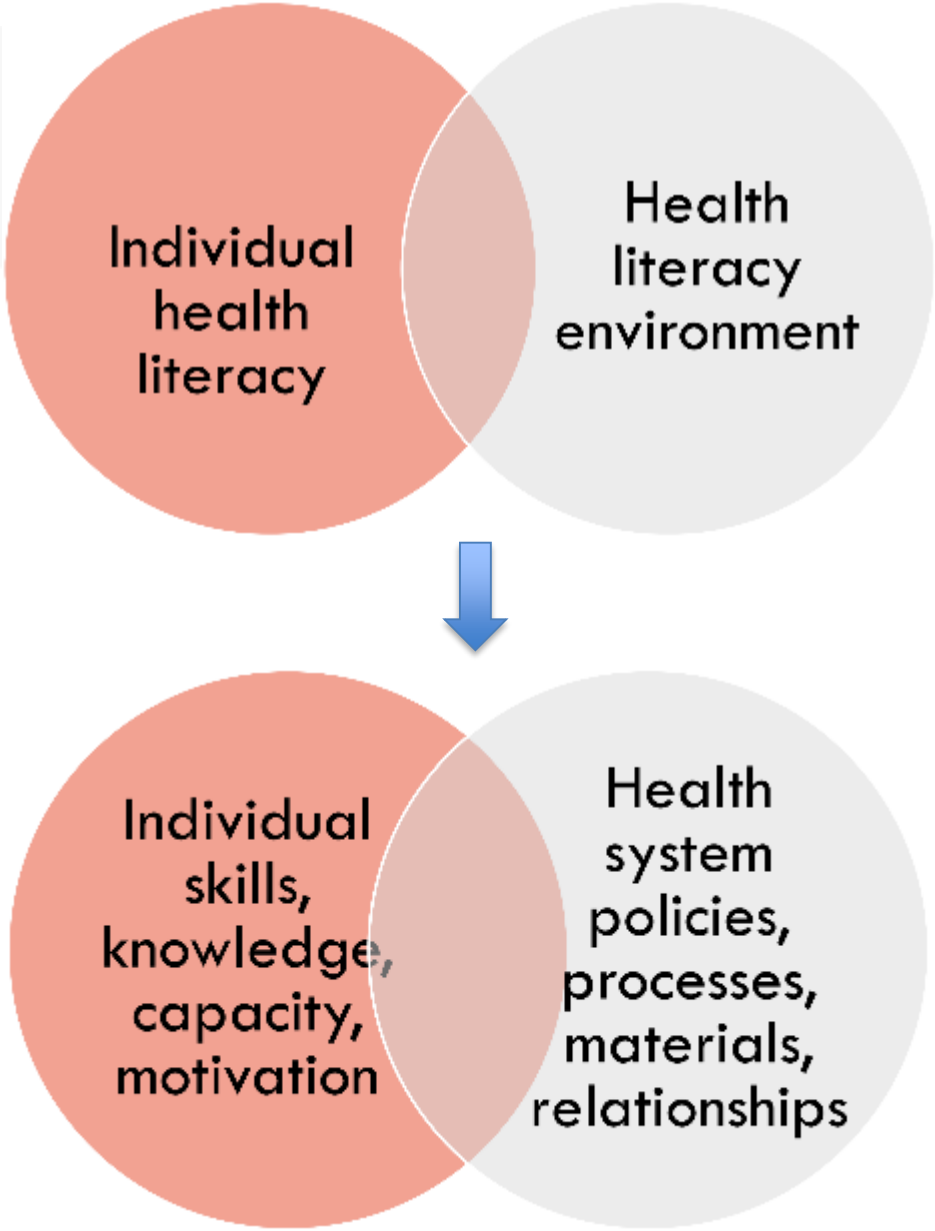
Local action to improve health literacy and reduce health inequalities



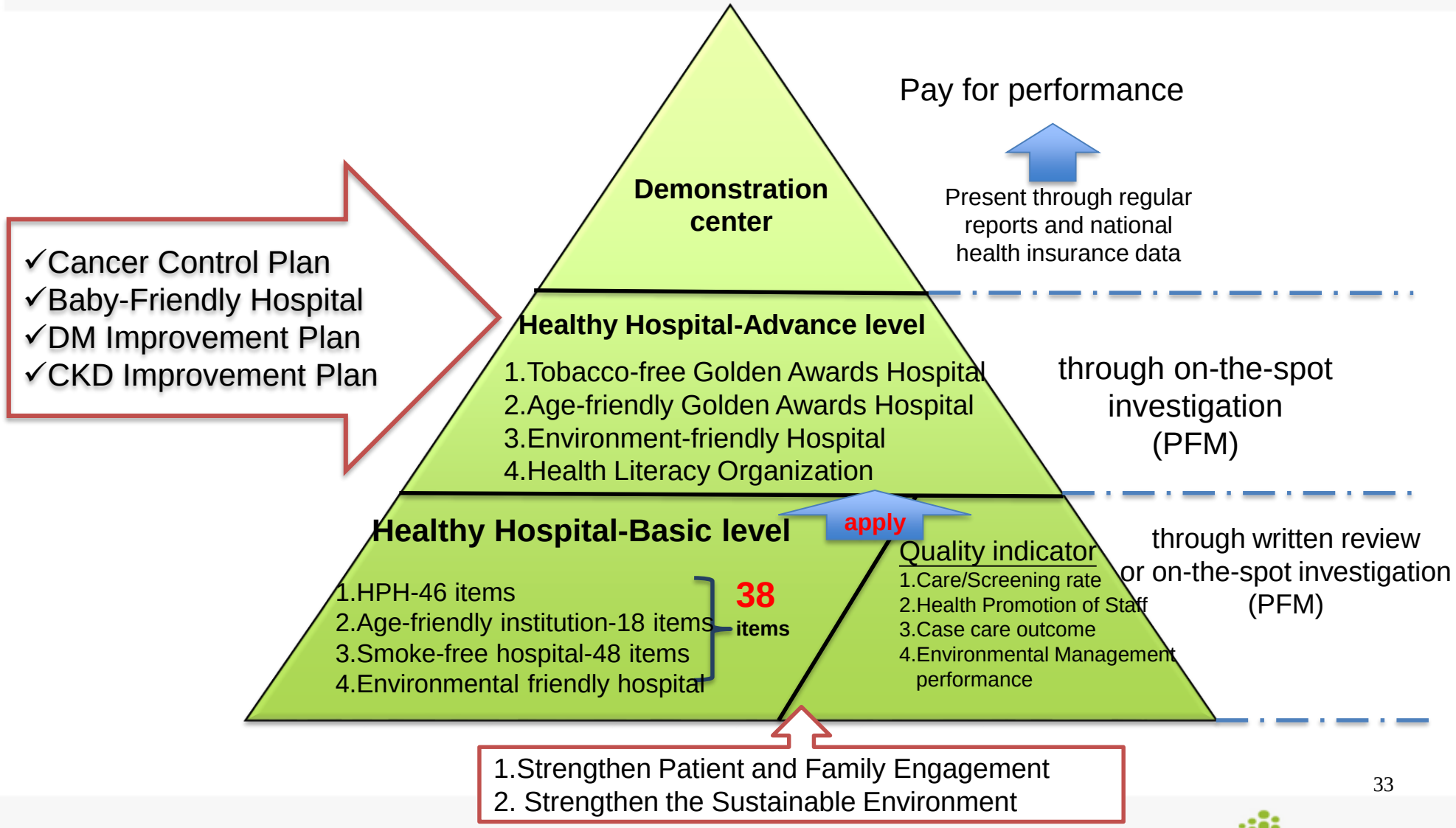
Public Health England

UCL Institute of Health Equity

Health Promotion Administration,


Individual health literacy
Health literacy environment
Individual skills, knowledge, capacity, motivation
Health system policies, processes, materials, relationships

HPH Level and Performance



Five HL-related Scores on Taiwan HH standards

3.2.4 The hospital has a health-literacy promoting plan that aims to help patients obtain, comprehend, and apply information and services to improve their health and the provision of care	
Description	(1 of the following items completed for “Incomplete”; 2-4 for “Partially completed; 5 for “Completed”)
	1. Health literacy training is provided to staff. 2. Information to help others navigate the medical environment is provided. 3. A health information communication framework that conforms with health literacy principles is established, including various channels and information (e.g., oral, graphics, media, and digital information). 4. Activities or measures to improve the health literacy of patients and their family members are provided (e.g., group health education seminars). 5. Activities or measures to improve community health literacy is provided.

Health Literacy in Healthy Hospital

- **Health Literacy**
  - Promotion of HL by hospitals allow patients to easily understand and obtain information and services, which promotes better healthcare and health gains.

- Education training on HL for staff members
- Information about the medical environment
- Communication that adheres to HL, such as information through various formats and channels (oral, graphic, audio-visual, digital), and involves users
- Activities that enhance the HL of patients and their family members (e.g. group education and seminar)
- Community activities that enhance HL

- **SDM**
  - Shared decision making fosters better communication between patients, family members and medical personnel, empowering patients the power to making care-related design

- SDM policies and guidelines by hospital
- Performance monitoring, documentation and discussion
- Involving patients and family members in SDM process

《健康識能機構實務指引》

motion Administration,

Healthcare Providers
Providing Health Literacy Services

- Development of health literacy education training courses
  - Module on health literacy concepts
  - Module on health literacy verbal communication
  - Module on health literacy written communication
  - Module on community health literacy
- Health literacy education training
  - health/medical professionals
  - community health professionals
  - “flipped classroom” strategies
  - e-learning

Flipping classroom with team based learning apply to health literacy training course for community health care providers (2018)

Readiness test

Classroom activities

Promotion program for the health literacy resource integration center (2018-2019)

Teach back method

-Online Training material-

Do you take the medication in a regular based?

Review

Digital Health Professions Education on Diabetes Management: Systematic Review by the Digital Health Education Collaboration

Background: There is a shortage of health care professionals competent in diabetes management worldwide. Digital education is increasingly used in educating health professionals on diabetes. Digital diabetes self-management education for patients has been shown to improve patients' knowledge and outcomes. However, the effectiveness of digital education on diabetes management for health care professionals is still unknown.

Objective: The objective of this study was to assess the effectiveness and economic impact of digital education in improving health care professionals' knowledge, skills, attitudes, satisfaction, and competencies. We also assessed its impact on patient outcomes and health care professionals' behavior.

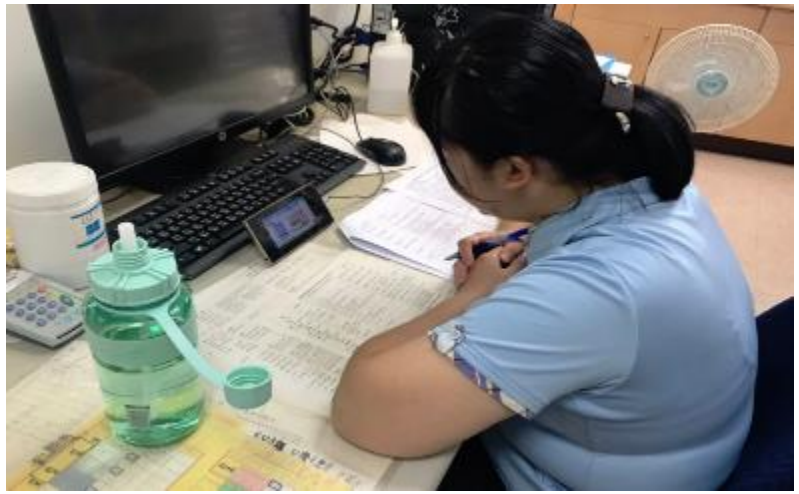
Methods: We included randomized controlled trials evaluating the impact of digitalized diabetes management education for health care professionals pre- and postregistration. Publications from 1990 to 2017 were searched in MEDLINE, EMBASE, Cochrane Library, PsycINFO, CINAHL, ERIC, and Web of Science. Screening, data extraction and risk of bias assessment were conducted independently by 2 authors.

Results: A total of 12 studies met the inclusion criteria. Studies were heterogeneous in terms of digital education modality, comparators, outcome measures, and intervention duration. Most studies comparing digital or blended education to traditional education reported significantly higher knowledge and skills scores in the intervention group. There was little or no between-group difference in patient outcomes or economic impact. Most studies were judged at a high or unclear risk of bias.

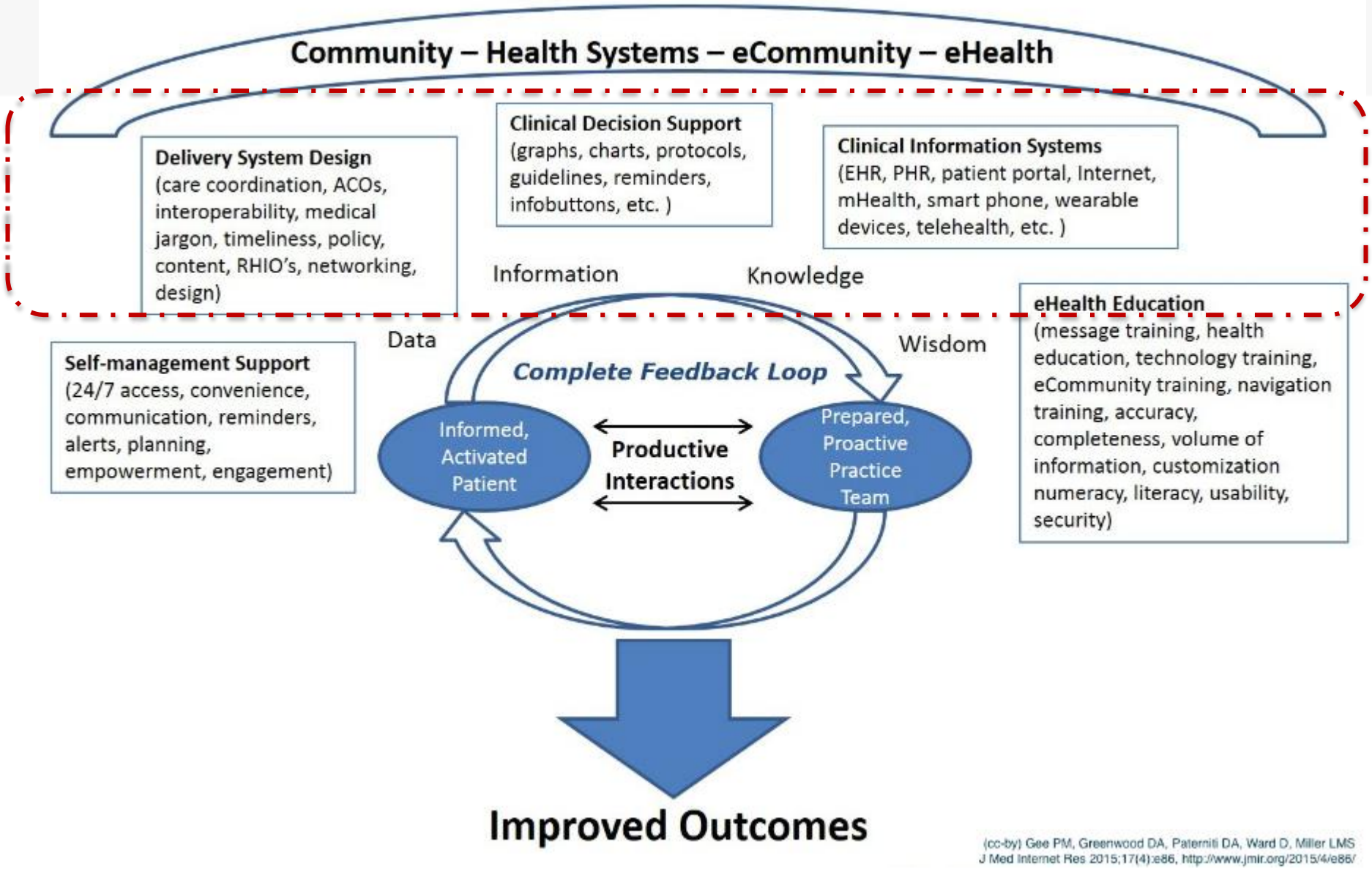
Conclusions: Digital education seems to be more effective than traditional education in improving diabetes management–related knowledge and skills. The paucity and low quality of the available evidence call for urgent and well-designed studies focusing on important outcomes such as health care professionals' behavior, patient outcomes, and cost-effectiveness as well as its impact in diverse settings, including developing countries.

Huang, Z., Semwal, M., Lee, S. Y., Tee, M., Ong, W., Tan, W. S., . . . Tudor Car, L. (2019). Digital Health Professions Education on Diabetes Management: Systematic Review by the Digital Health Education Collaboration. *J Med Internet Res, 21*(2),

Online synchronized small group training for community health worker

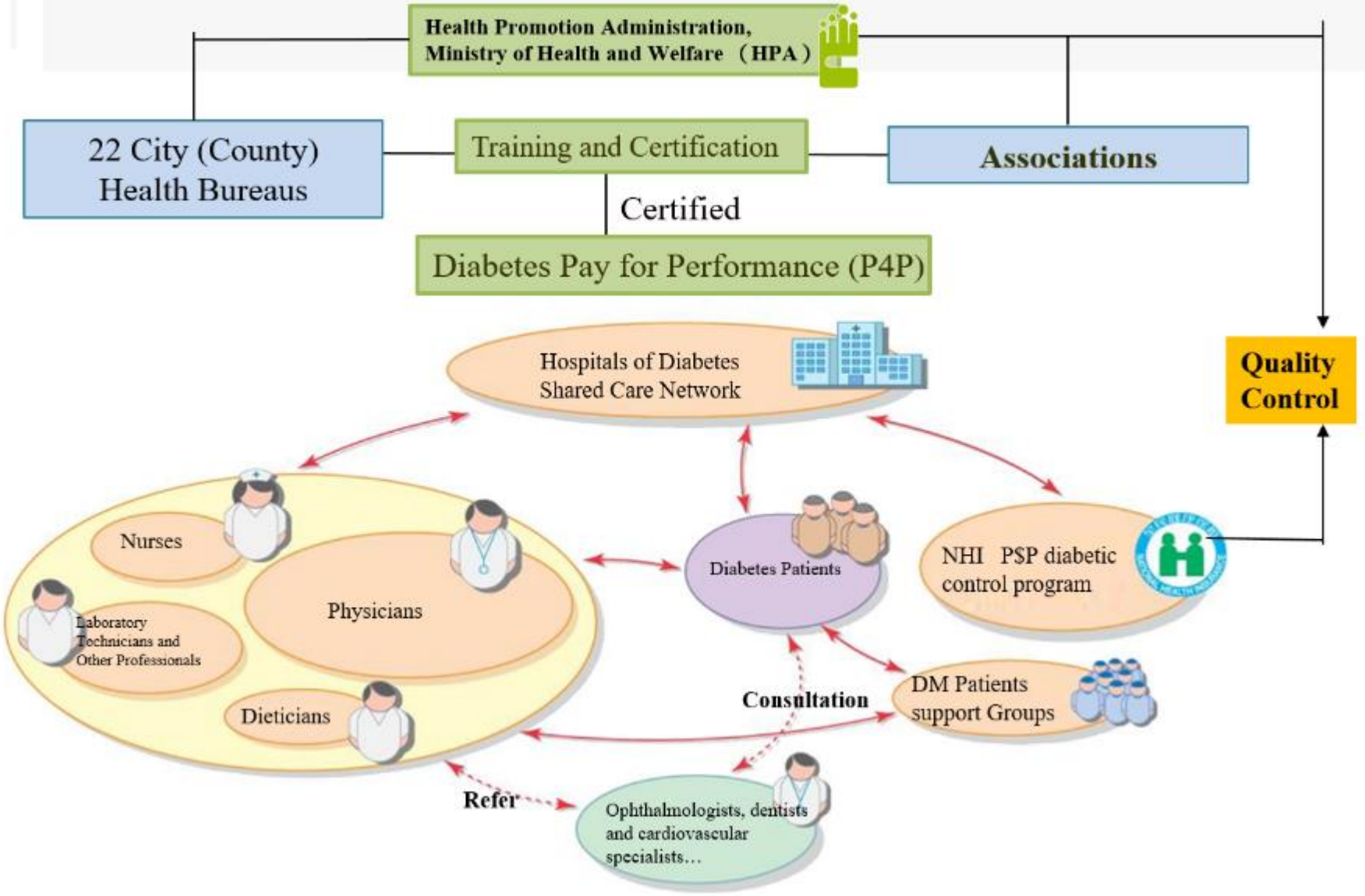


The eHealth Enhanced Chronic Care Model (eCCM)

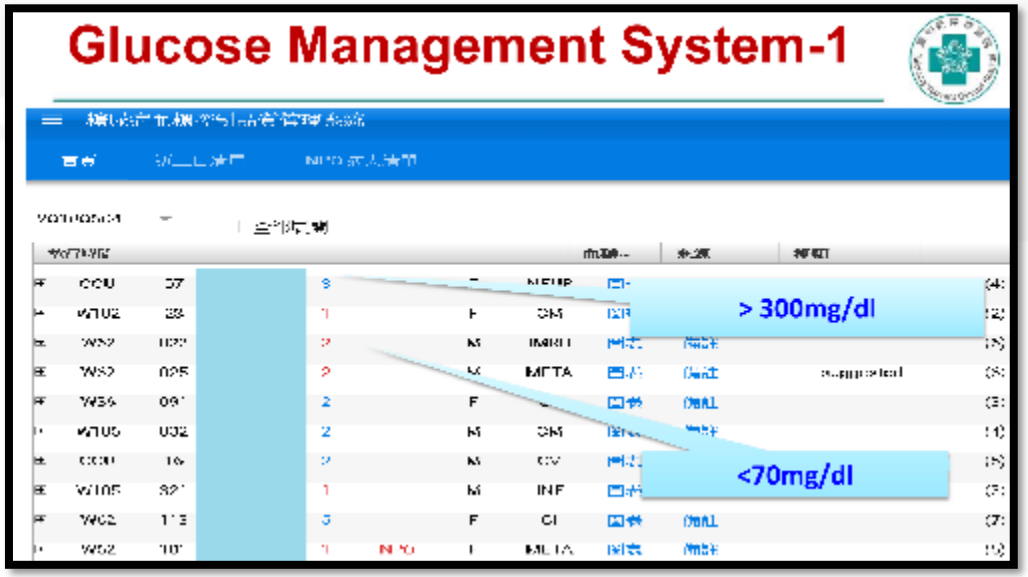


Gee etc. The eHealth enhanced chronic care model: a theory derivation approach. J Med Internet Res. 2015;17:e86t

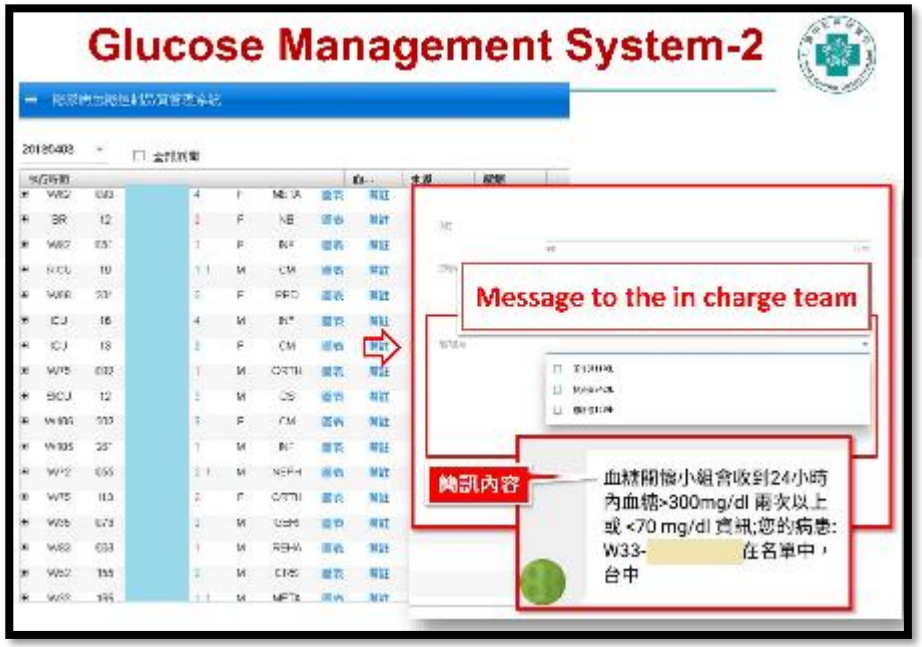
Secondary & Tertiary Prevention: Diabetes Shared Care Program



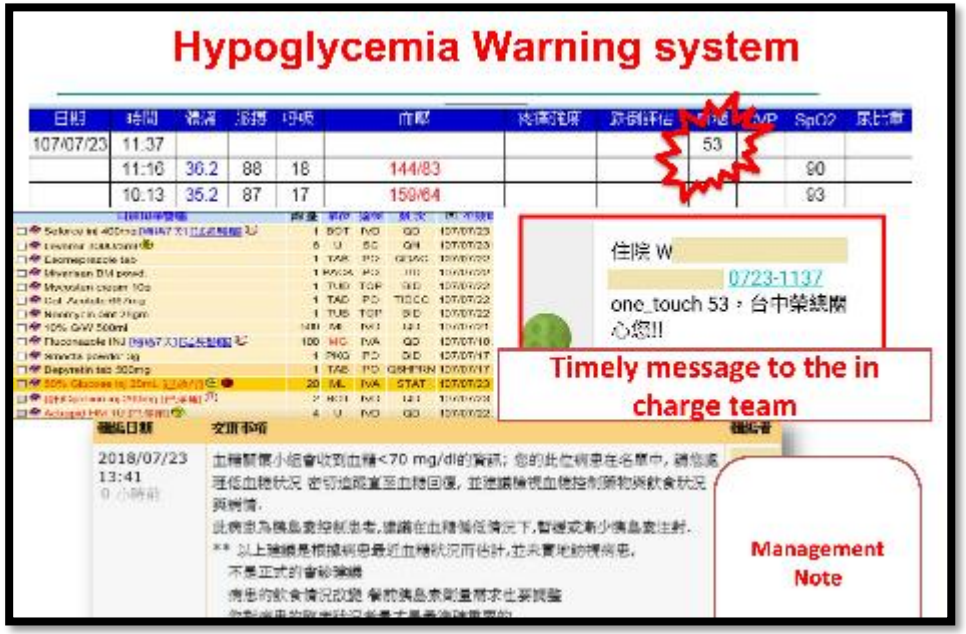
Glucose Management System-1



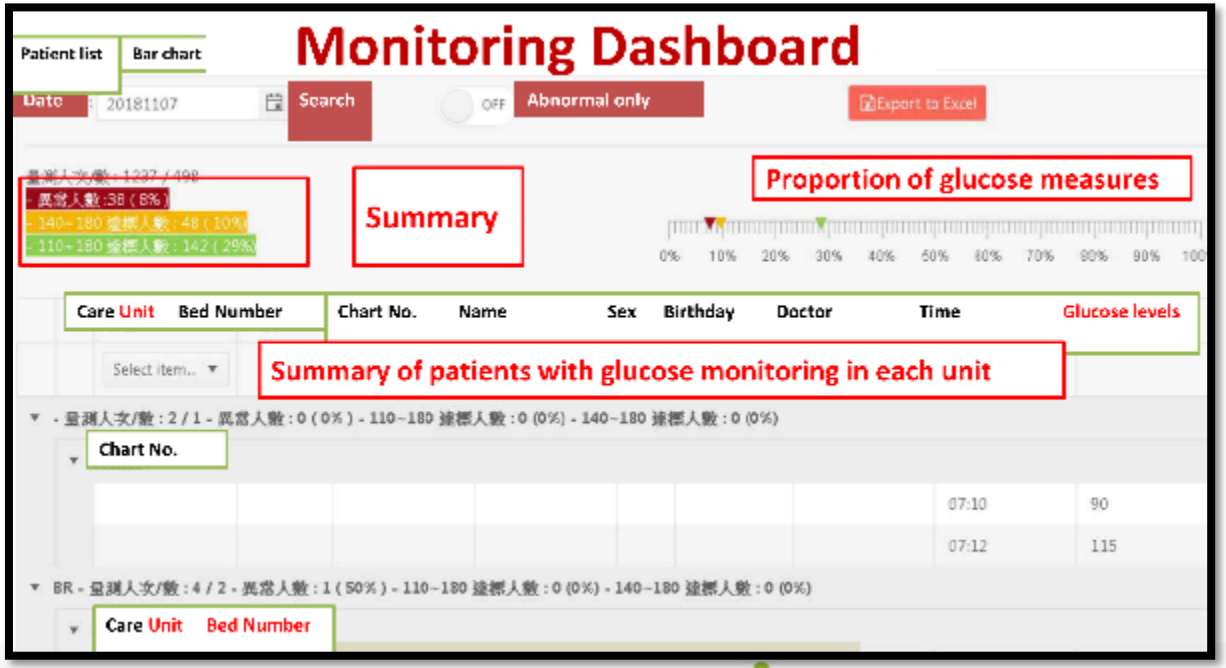
Glucose Management System-2



Hypoglycemia Warning system



Monitoring Dashboard



ICTs Based Smart Healthcare

Patient with diabetes

HCP

Outpatient self-management and healthy lifestyle education

Digital Diabetes Care Solution (APP)

Self data upload

Integration of telecare data platform with hospital's information system

Management and online assistance by case manager

Self management

Global Conference on Primary Health Care

From Alma-Ata towards universal health coverage and the Sustainable Development Goals

Astana, Kazakhstan, 25 and 26 October 2018

We, Heads of State and Government, ministers and representatives of States and Governments[1], participating in the Global Conference on Primary Health Care: From Alma-Ata towards universal health coverage and the Sustainable Development Goals, meeting in Astana on 25 and 26 October 2018, reaffirming the commitments expressed in the ambitious and visionary Declaration of Alma-Ata of 1978 and the 2030 Agenda for Sustainable Development, in pursuit of Health for All, hereby make the following Declaration.

Revisiting Alma-Ata: what is the role of primary health care in achieving the Sustainable Development Goals?

Thomas Hone, James Macinko, Christopher Millett

The Sustainable Development Goals (SDGs) are now steering the global health and development agendas. Notably, the SDGs contain no mention of primary health care, reflecting the disappointing implementation of the Alma-Ata declaration of 1978 over the past four decades. The draft Astana declaration (Alma-Ata 2·0), released in June, 2018, restates the key principles of primary health care and renews these as driving forces for achieving the SDGs, emphasising universal health coverage. We use accumulating evidence to show that countries that reoriente their health systems towards primary care are better placed to achieve the SDGs than those with hospital-focused systems or low investment in health. We then argue that an even bolder approach, which fully embraces the Alma-Ata vision of primary health care, could deliver substantially greater SDG progress, by addressing the wider determinants of health, promoting equity and social justice throughout society, empowering communities, and being a catalyst for advancing and amplifying universal health coverage and synergies among SDGs.

Lancet 2018; 392: 1461–72

Public Health Policy Evaluation Unit, School of Public Health, Imperial College London, London, UK (T Hone PhD, Prof C Millett PhD); Department of Community Health Sciences and Department of Health Policy and Management, UCLA Fielding School of Public Health, Los Angeles, CA, USA (Prof J Macinko PhD); and Center for Epidemiological

The Astana Declaration: time to focus on primary health care

It has been 40 years since the Alma-Ata Declaration enshrined health as a fundamental human right and argued that primary health care was the key to delivering health for all. Although ambitious, the Declaration was just. And yet it failed. Huge health inequities persist and hundreds of millions of people lack access to even the most basic primary health-care services. The Astana Declaration, which in late October reaffirmed a global commitment to primary health care, sets out the only sensible way to ensure health for all. Prioritising primary health care as an issue fundamental to infectious diseases is long overdue.

The Declaration of Astana was issued at the Global Conference on Primary Health Care, organised by WHO, UNICEF, and the Government of Kazakhstan, in Astana, Kazakhstan, Oct 25–26. In it, governments, non-governmental organisations, health practitioners, and researchers recognise that all people are entitled to the highest possible standard of health and wellbeing. The Declaration pledges the development of primary health care systems that are "high quality, safe, comprehensive, integrated, accessible, available, and affordable for everyone and everywhere".

Disease-specific approaches have delivered some huge successes. Gains in HIV control owe much to dedicated institutions such as UNAIDS, PEPFAR, and the Global Fund to Fight AIDS, Tuberculosis and Malaria. Likewise, the near eradication of polio is largely down to focused efforts of governments, backed by institutions such as the Gates Foundation. These organisations will have to square their approaches with the spirit of the Astana Declaration.

Access to good primary health care will aid the proper diagnosis and treatment of common infections, reducing the risk of antimicrobial resistance. Better health promotion and disease prevention, through effective public health measures, vaccination, and education, is sustainable and effective, far more so than testing and treatment. A well integrated and equitable primary health-care system is needed to treat patients coinfected with tuberculosis and HIV.

Strong primary health care also fortifies countries against infectious outbreaks. In this issue, Catherine Bozio and colleagues report an outbreak of *Neisseria meningitis* C infection in Liberia first identified by community health-care workers who then initiated an international response through infrastructure installed after the west African

Sputnik/Science Photo Library

See Articles page 1360

For the **Declaration of Astana** see http://www.who.int/primary-health/conference-phc/declaration

For the **Comment in the *Lancet* by Tedros and colleagues** see *Lancet* 2018; **392**: 1371–72. https://doi.org/10.1016/S0140-6736(18)32556-X

Health Care Reform (With PHC Concept)

Medical model		Primary Health Care
• Treatment	→	• Health promotion
• Illness	→	• Health
• Cure	→	• Prevention, care, cure
• Episodic care	→	• Continuous care
• Specific problems	→	• Comprehensive care
• Individual practitioners	→	• Teams of practitioners
• Health sector alone	→	• Intersectoral collaboration
• Professional dominance	→	• Community participation
• Passive reception	→	• Joint responsibility

Barbara Starfield, Johns Hopkins University

Declaration of Astana

A Vision for primary health care in the 21st century

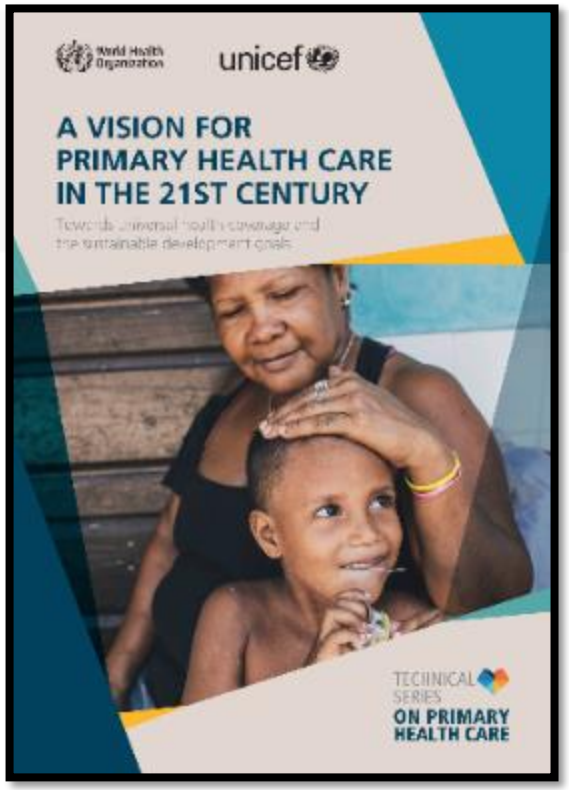
Making the case for PHC

- The economic case
- Health outcomes case
- Responsiveness case

Operational Framework

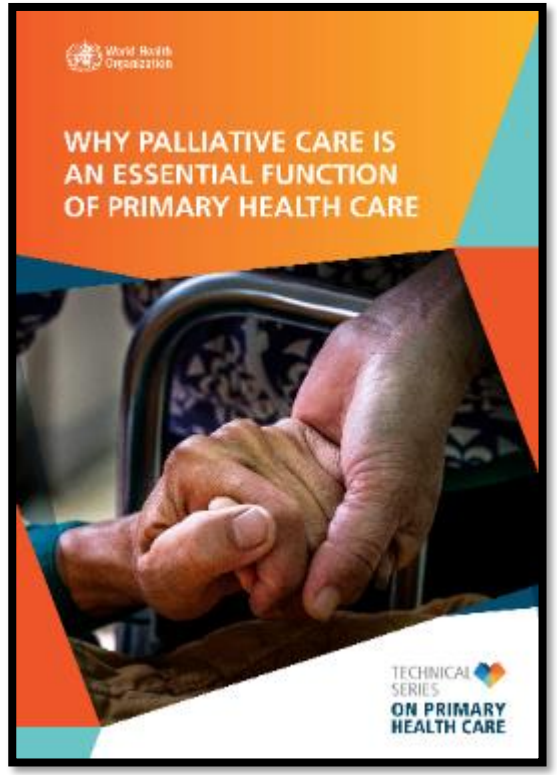
From vision to action

- Health in All Policies / Multisectoral Action
- Empowering individuals, families & communities
- PHC Health workforce
- Strategic purchasing
- The private sector
- Quality in PHC
- Digital technologies
- Integrating health services
- Integrating public health & primary care
- The role of hospitals in PHC
- Antimicrobial resistance
- PHC and health emergencies
- Rural primary care


World Health Organization
unicef
A VISION FOR PRIMARY HEALTH CARE IN THE 21ST CENTURY
TECHNICAL SERIES ON PRIMARY HEALTH CARE


World Health Organization
INTEGRATED CARE FOR OLDER PEOPLE
Realigning primary health care to respond to population ageing
TECHNICAL SERIES ON PRIMARY HEALTH CARE


World Health Organization
Access to rehabilitation in primary health care: an ongoing challenge
Working draft
TECHNICAL SERIES ON PRIMARY HEALTH CARE


World Health Organization
WHY PALLIATIVE CARE IS AN ESSENTIAL FUNCTION OF PRIMARY HEALTH CARE
TECHNICAL SERIES ON PRIMARY HEALTH CARE

Shaping the future of primary health care

Improving the accessibility, affordability and quality of health care is at the heart of primary health care. The three pillars of primary health care are primary care and essential public health functions as the core of integrated health services, multisectoral policy and action, and empowered people and communities (World Health Organization. A vision for primary health care in the 21st century. 2018). Numerous examples of digital technologies, outlined below, attest to their versatility, utility and ubiquity in supporting these pillars in the context of health development (5).

High-quality primary care and essential public health functions

Digital technologies of all kinds have become essential resources in primary care and their uptake is growing (6), with the past decade seeing rapid integration of technology in a range of areas that support primary care and essential public health functions. In this context, common uses of digital technologies include searching medical knowledge resources, facilitating clinical support, monitoring quality of care, and mapping and monitoring the spread of infectious diseases, as well as tracking supplies of drugs and vaccines.

Integrating clinical support tools and referral systems into primary health care can help coordinate care and ensure its continuity across primary, secondary, acute and aged care services. Electronic health records capture information about an individual's health, medical conditions, medications and key events, which can be shared for referrals and timely clinical decision-making. Digital technologies can help improve the patient journey. They can prevent duplication of care processes and enhance communication between providers as well as avoid unplanned hospitalizations and visits for urgent care. Ensuring that the general public has access to timely, expert advice by telephone in health emergencies can save lives.

Primary health care PHC

- Accessible
- Affordable
- Available
- Accountable

- Comprehensive
- Continuous
- Coordinate

- Dignity
- Digital
- Dialogue
- Domestic

- Disease
- Disable
- Dementia
- Dying

- Environment
- Empowerment
- Engagement
- Economic
- Education
- Ecology

- Eating
- Exercise

Rank Order of Office Visits by Diagnosis in Primary Care Clinics

1. Essential hypertension
2. Routine infant or child health check
3. Acute upper respiratory infections, excluding pharyngitis
4. Arthropathies and related disorders
5. Malignant neoplasms
6. Diabetes mellitus
7. Spinal disorders
8. Rheumatism, excluding back
9. General medical examination
10. Follow-up examination
11. Specific procedures and aftercare
12. Normal pregnancy
13. Gynecologic examination
14. Otitis media and eustachian tube disorders
15. Asthma
16. Disorder of lipoid metabolism
17. Chronic sinusitis
18. Heart disease, excluding ischemic
19. Acute pharyngitis
20. Allergic rhinitis

From Cherry DK, Woodwell DA, Rechtsteiner EA. 2005 *Summary: National Ambulatory Medical Care Survey.* National Center for Health Statistics, Advance Data Vital Health Statistics. No 387. Washington, DC, USGovernment Printing Offie; 2007

Applications of ICT for Diabetes Care

- The Use of Telephone Calls for Diabetes Care
- Web-Based Interventions for Diabetes Care
- Videoconferencing for Diabetes Care
- mHealth for Diabetes Care
- Digital Health for Continuous Glucose Monitoring and Insulin Delivery
- Social Media for Diabetes Care
- Serious Games for Diabetes Care
- ...

Fatehi, F., Menon, A., & Bird, D. (2018). Diabetes Care in the Digital Era: a Synoptic Overview. *Curr Diab Rep, 18*(7), 38

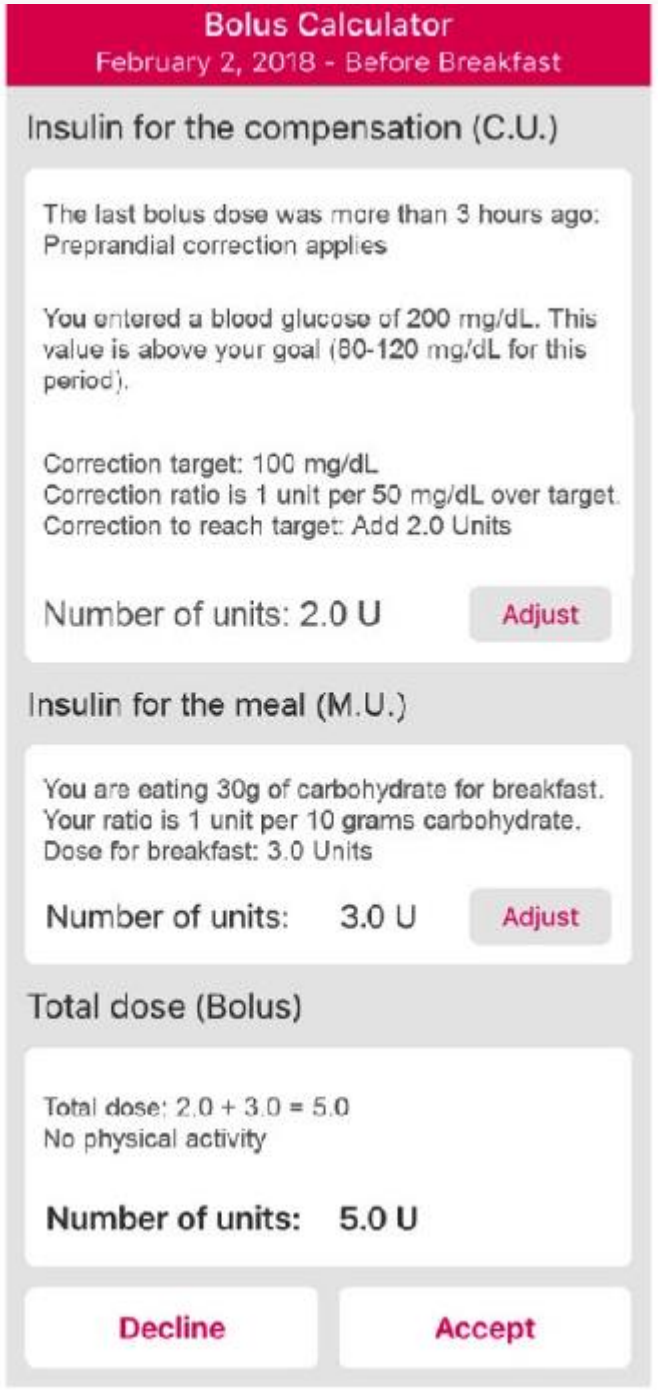
New Models of Diabetes Care

- Electronic health records (EHR)
- Clinical decision support systems (CDSS)
- eHealth Enhanced Chronic Care Model
- cloud-based delivery for insulin dose adjustment
- Wearable devices for continuous blood glucose monitoring and delivery of glucose-lowering agents
- AI-enabled chatbots

Fatehi, F., Menon, A., & Bird, D. (2018). Diabetes Care in the Digital Era: a Synoptic Overview. *Curr Diab Rep, 18*(7), 38

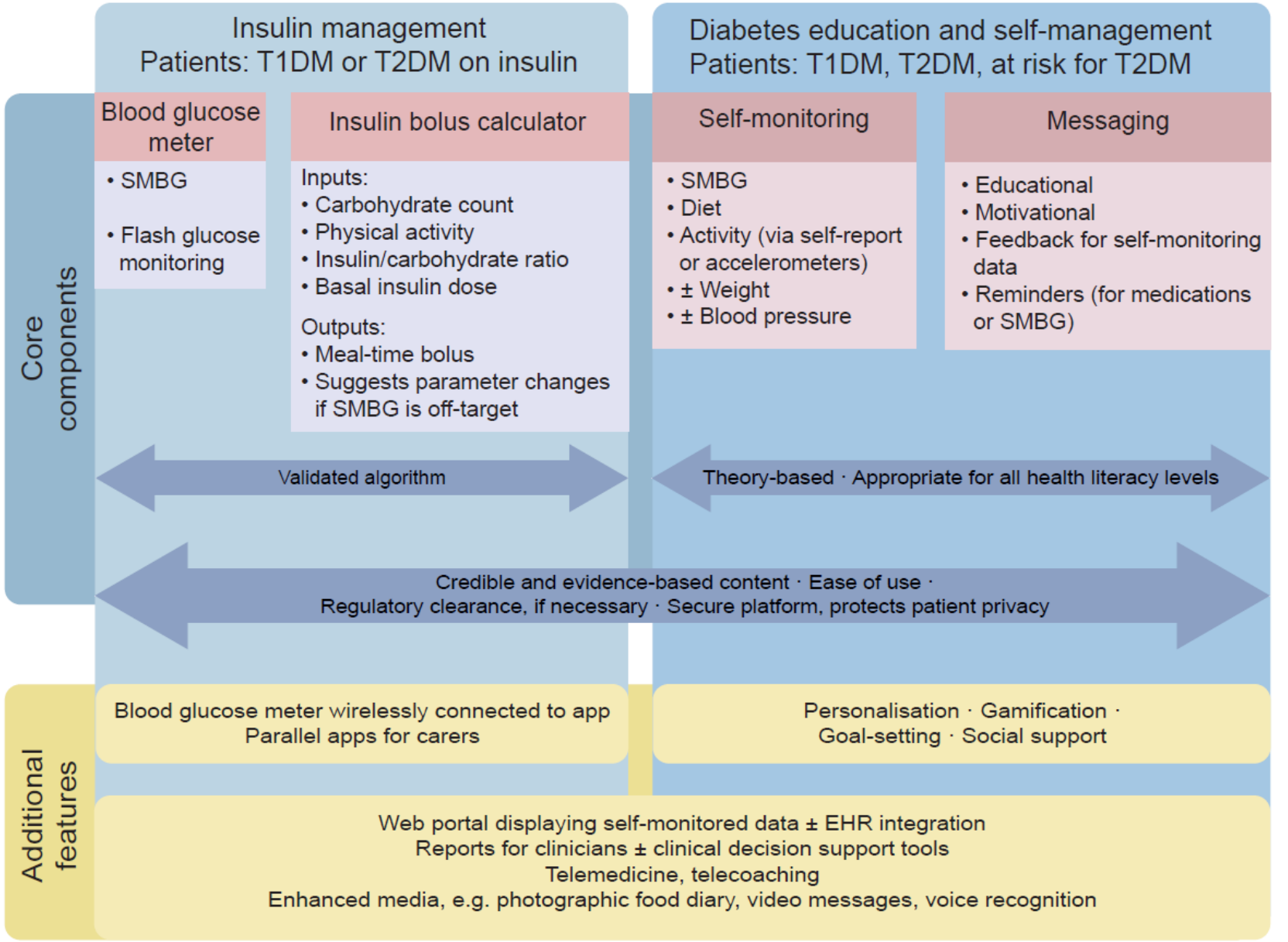
a

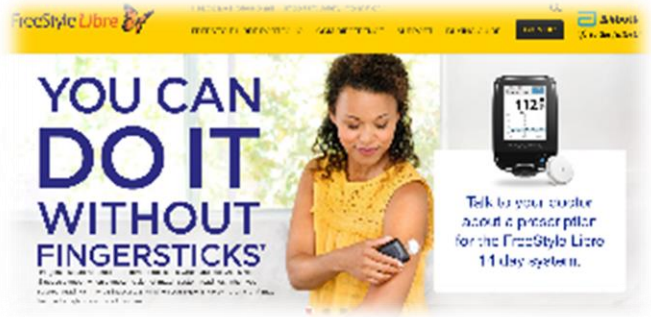
b



Joubert, M., etc. (2019). Remote Monitoring of Diabetes: A Cloud-Connected Digital System for Individu With Diabetes and Their Health Care Providers. *J Diabetes Sci Technol*,

Summary of key components and features of mHealth interventions for diabetes





Shan et al (2019) Diabetologia DOI 10.1007/s00125-019-4864-7

Current Diabetes Reports (2018) 18:38
https://doi.org/10.1007/s11892-018-1013-5

THERAPIES AND NEW TECHNOLOGIES IN THE TREATMENT OF DIABETES (M PIETROPAOLO, SECTION EDITOR)

Diabetes Care in the Digital Era: a Synoptic Overview

Farhad Fatehi[1,2,3] · Anish Menon[1,4] · Dominique Bird[1]

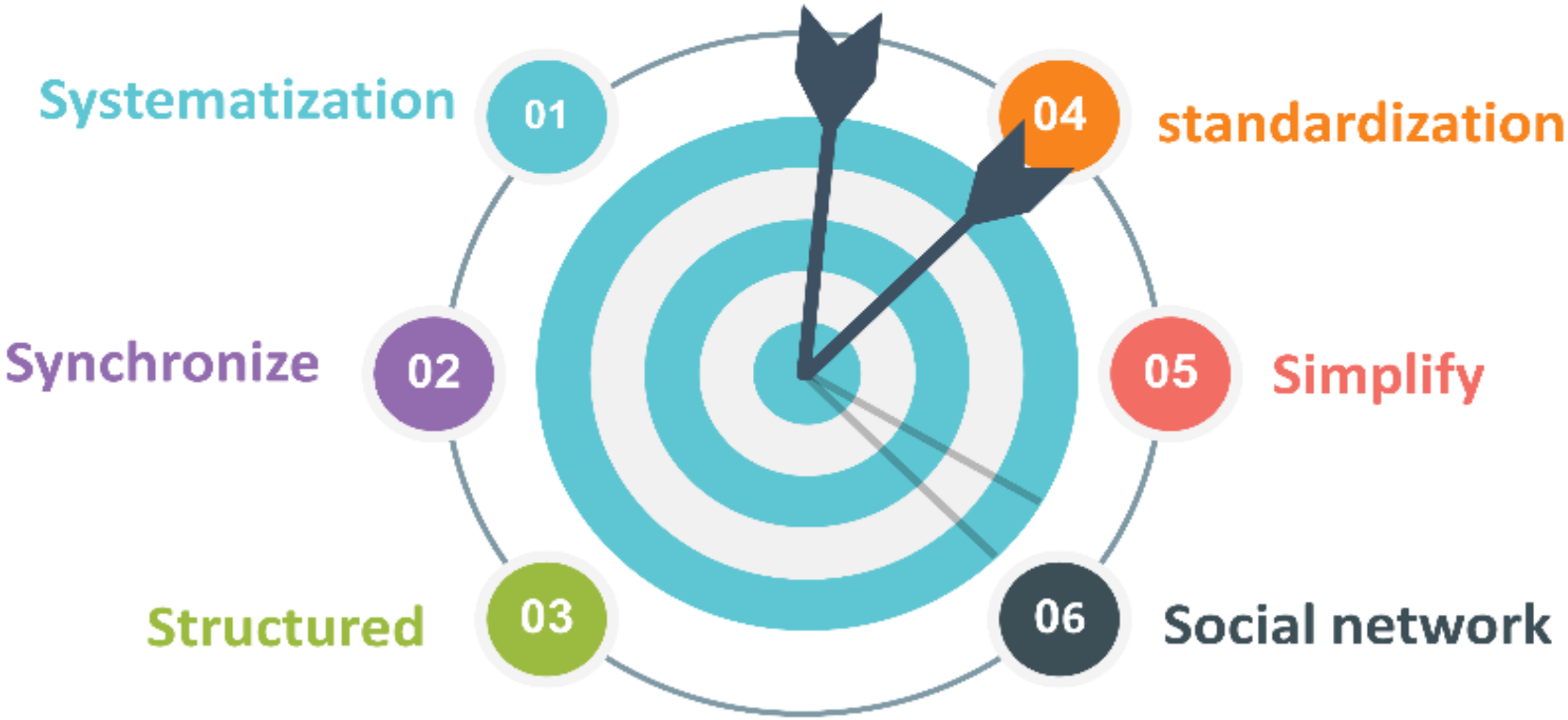
Abstract

Purpose of Review Diabetes care is undergoing a remarkable transformation by the advancements in information and communications technology (ICT). The aim of this review is to provide a general overview of various ICT-based interventions for diabetes care, challenges of their adoption, and consider future directions.

Recent Findings A number of systematic reviews have examined studies on various aspects of telemedicine and eHealth for diabetes care, but they are generally focused on one specific type of technology application for diabetes care.

Summary A wide range of solutions from manual or automated telephone calls, short message services, websites, mobile health apps, remote monitoring devices, and sophisticated artificial intelligence systems has been studied in different settings and scopes with mixed results. However, despite the promising results of research studies, such innovative solutions are not widely adopted by health systems worldwide. Lack of supportive policy and legislation, unsustainable reimbursement, inefficient business models, and concerns regarding the security and privacy of health data are among the most problematic barriers.

Information system support diabetes service capacity and quality



Framework of Integrated NCD Care in Taiwan

Primary Prevention

Control risk factors

- Tobacco, Alcohol and Betel Nut
- Physical inactivity
- obesity

Healthy lifestyles

- Healthy diet
- Regular exercise
- Smoking cessation
- Keeping an ideal waist circumference

Setting approach

- Workplaces
- Healthy schools
- Communities
- Hospital

Secondary & Tertiary Prevention

Adult prevention healthcare and integrated screening

- Risk factors
- Chronic disease

Cancer screening

- Oral cancer
- Colorectal cancer
- Breast cancer
- Cervical cancer

Treatment (UHC by NHI)

- DM、CKD、COPD…share care plane
- Cancer treatment quality certification

Pay for Performance

- Quantity
- Quality
- Cancer & Chronic disease

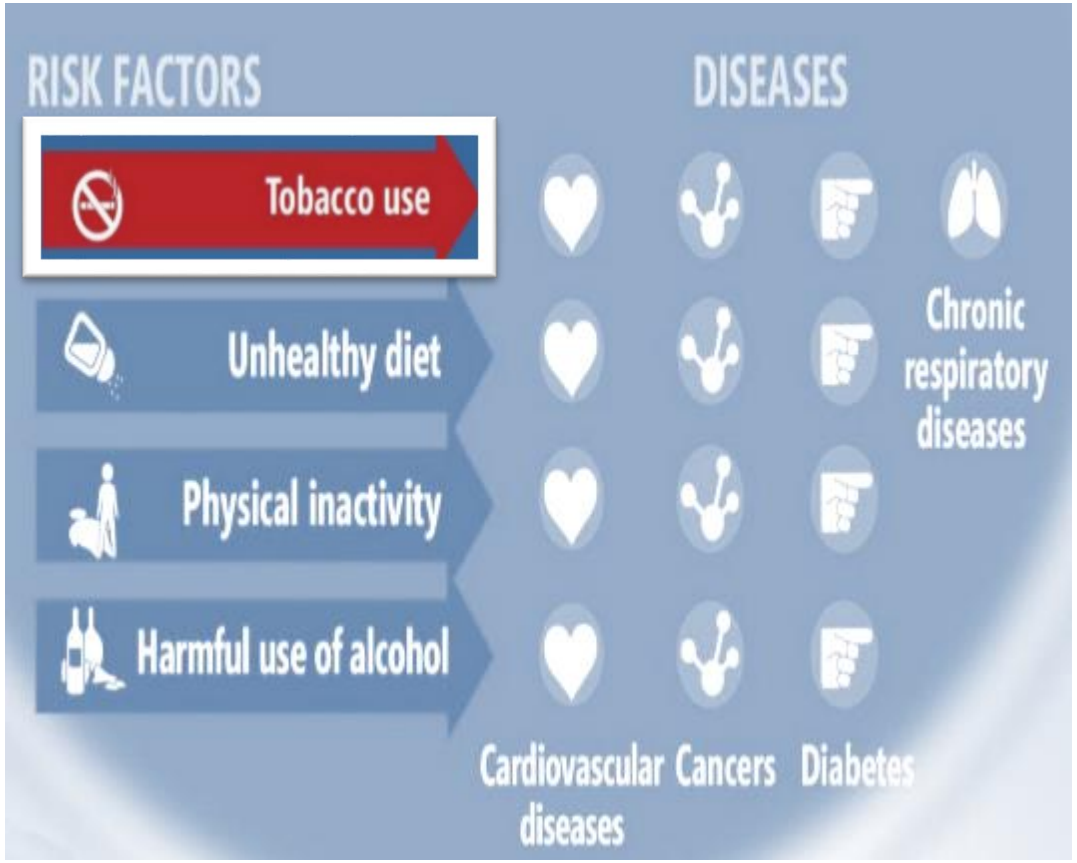
Guideline

- Multidisciplinary team
- Cancer treatment
- Chronic disease control

Prevention of disability

- Intersectoral cooperation
- Limit disability and rehabilitation

Primary Prevention:
ICTs Based for Risk Factors Prevention



Tobacco Control Education Vehicle

Coverage rate : 100%

165
activities
121 activities at school

awareness of third-hands smoke
93%

over 50,000 participants

promotion over 210,000 people

satisfaction
99%

Interactive game for anti-tobacco

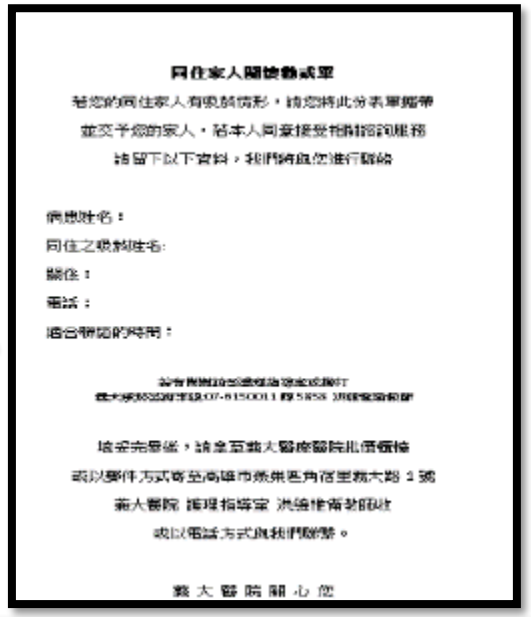
Smoking Cessation Case Management (2)

Identification

Alert for smoking status in HIS

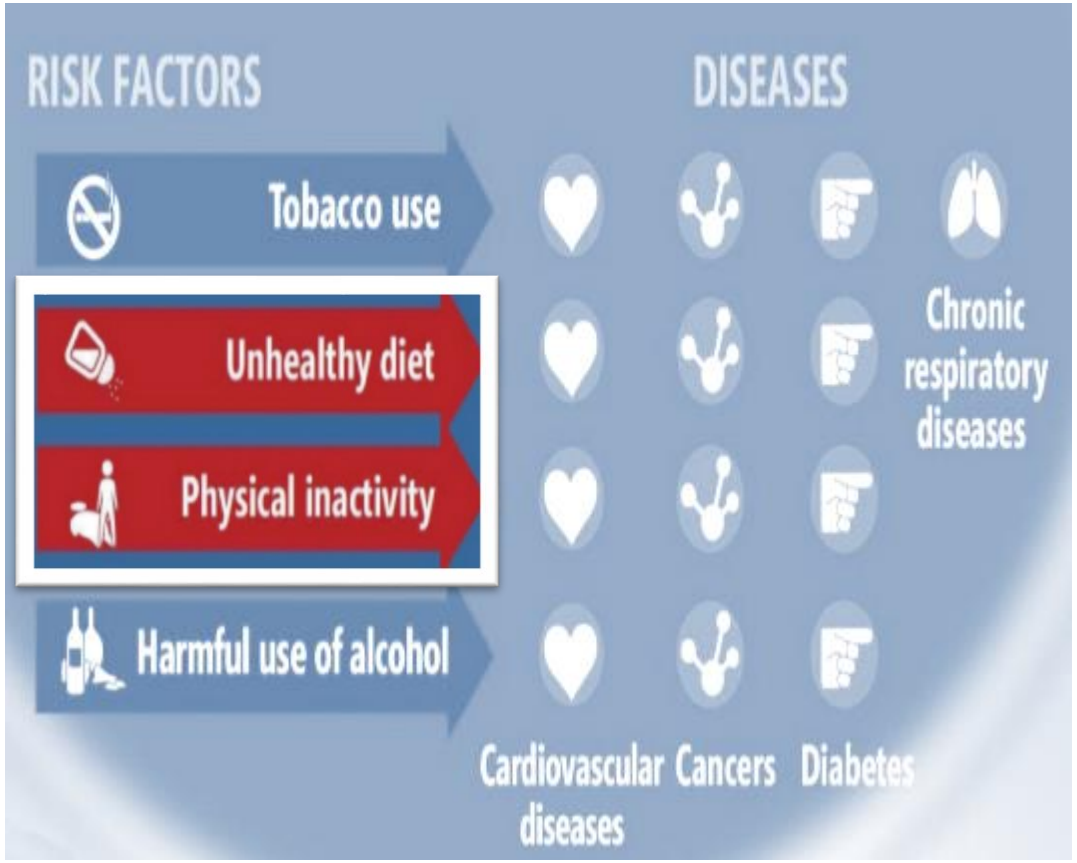
smoker

Non-smoker



Identification rate : 100%

Primary Prevention:
ICTs Based for Risk Factors Prevention



ICTs Based Smart healthcare:

Smart Healthy City Project

Healthy Diet and Exercise

Build smart health promotion model

Healthy body weight management

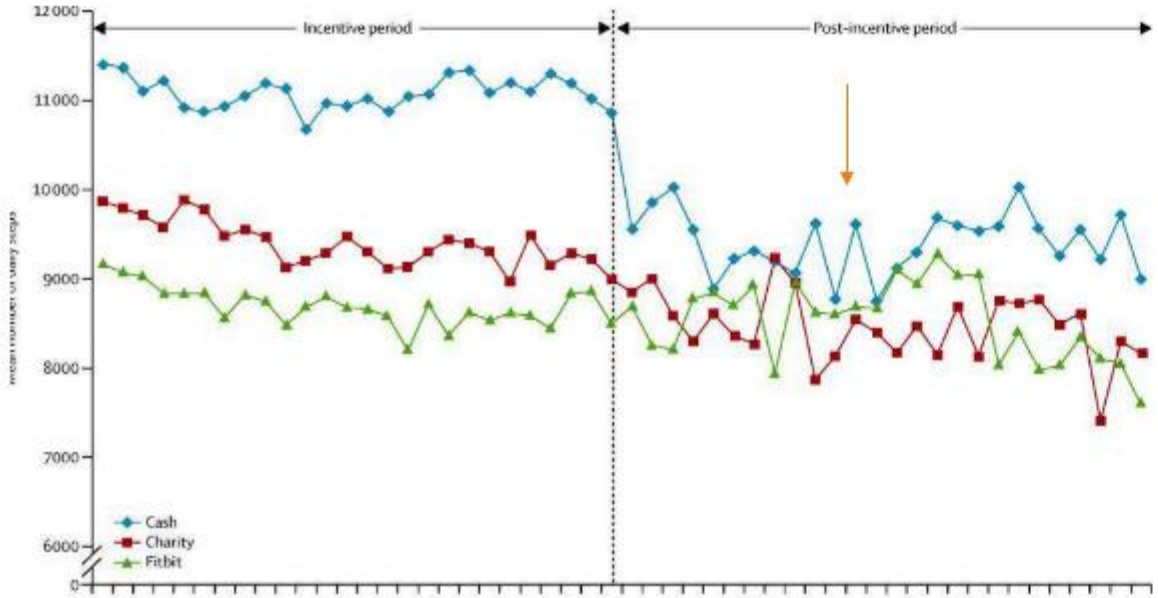
Build the demo site of 2 smart health cities

health examination data and PHR

Healthy Diet and Exercise instructions

Smart health living map

Effectiveness of activity trackers with and without incentives to increase physical activity(TRIPPA): a randomised controlled trial



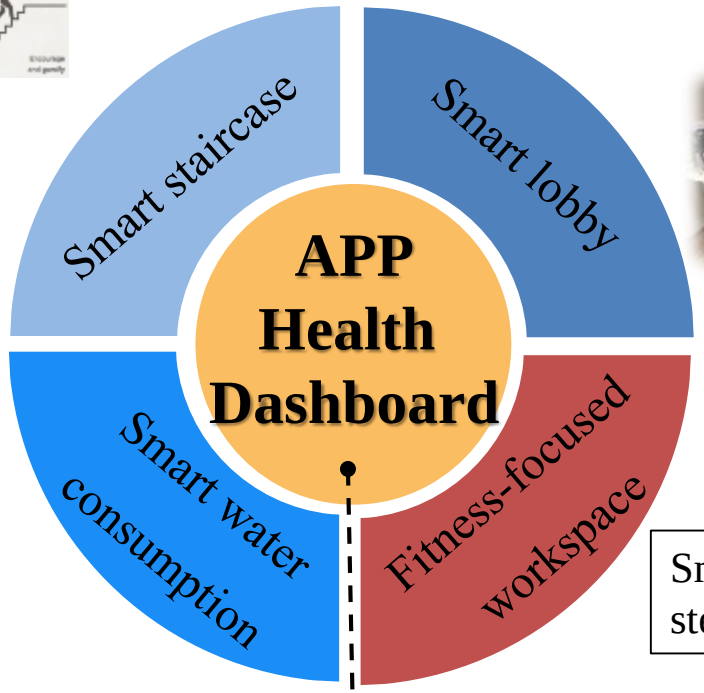
- 800 participants in Singapore
- Control (no tracker or incentives)
- Fitbit Zip only
- Fitbit + cash incentive (blue)
- Fitbit + charity incentive (red)
- Incentives tied to weekly steps
- 6 month incentive and 6 month post-incentive period
- Outcome: Moderate-to-vigorous physical activity (MVPA) by sealed accelerometer at 6 months

Finkelstein et al. Lancet Diabetes Endocrinol. 2016 Dec;4(12):983-995

Smart Healthy Workplace 4 Plus 1 Campaign

Smart device filled staircase renovation projects

Water consumption documentation and smart analysis



Smart workout mats

Health examination

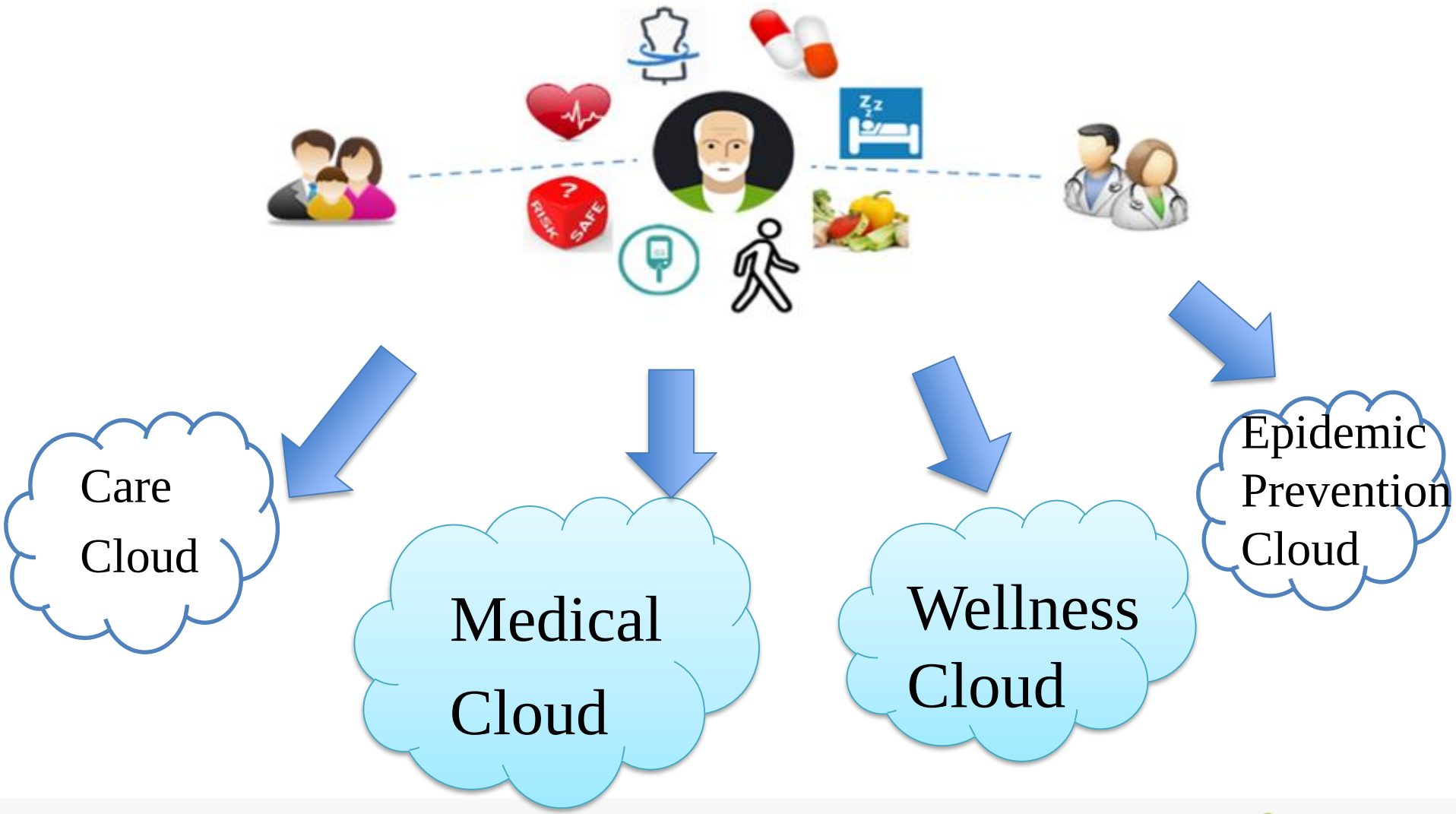
Smart cushion and blue tooth stepper

Adjustable desks

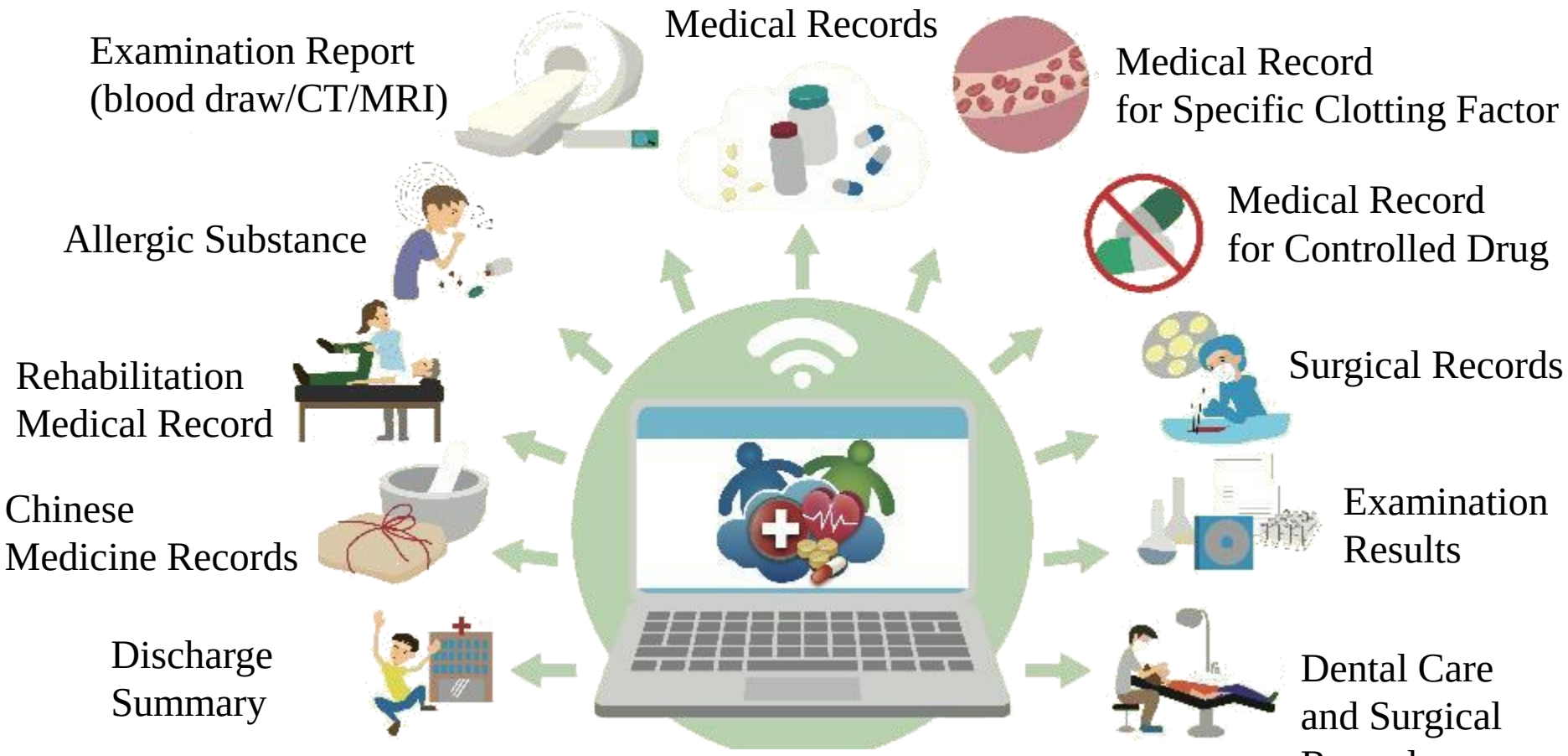
Download APP

- Health management
- Line workplace assistance
- Smart fitness coach
- Real-time health tracker
- Smart healthy diet choice
- Health take-out menu
- Meet-up exercise group
- Exercise social media group

Health Cloud Platform



NHI Medi-Cloud System



My Health Bank

My Health Bank was established in 2014：

- **3 years of medical data**
- **Displayed in the form of diagrams**
- **Simpler access**
- **Certain disease prognosis and evaluation**

Download for Android

Download for iOS

My Health Bank

- **Heightening the awareness of self-care**
- **Reaching self-data anytime anywhere**

健康存摺
My Health Bank

A Tool for Managing Personal Health

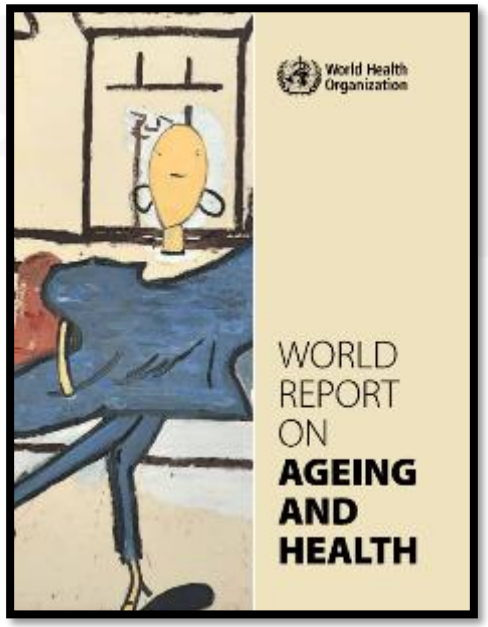
3 years of medical data

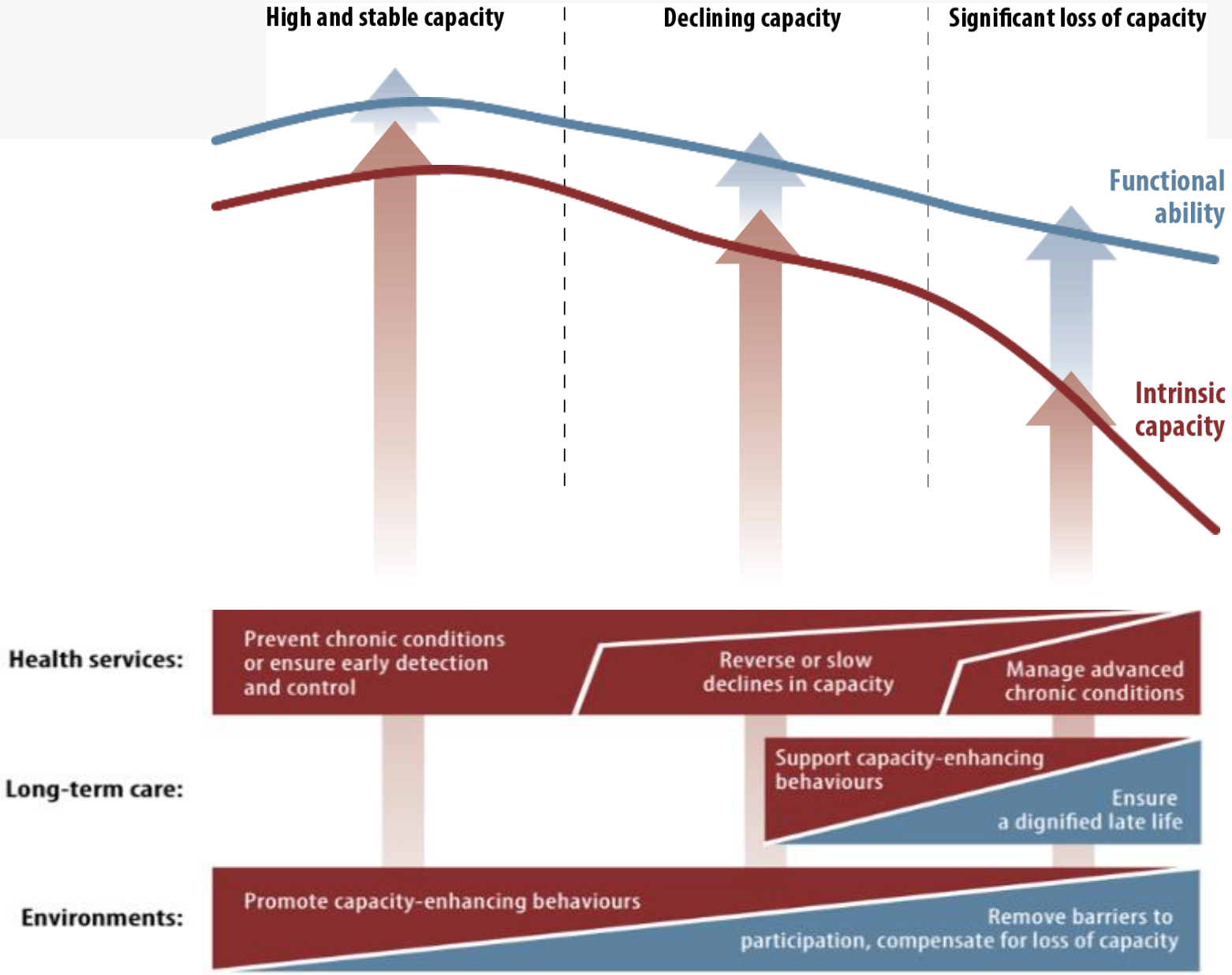
CKD prognosis

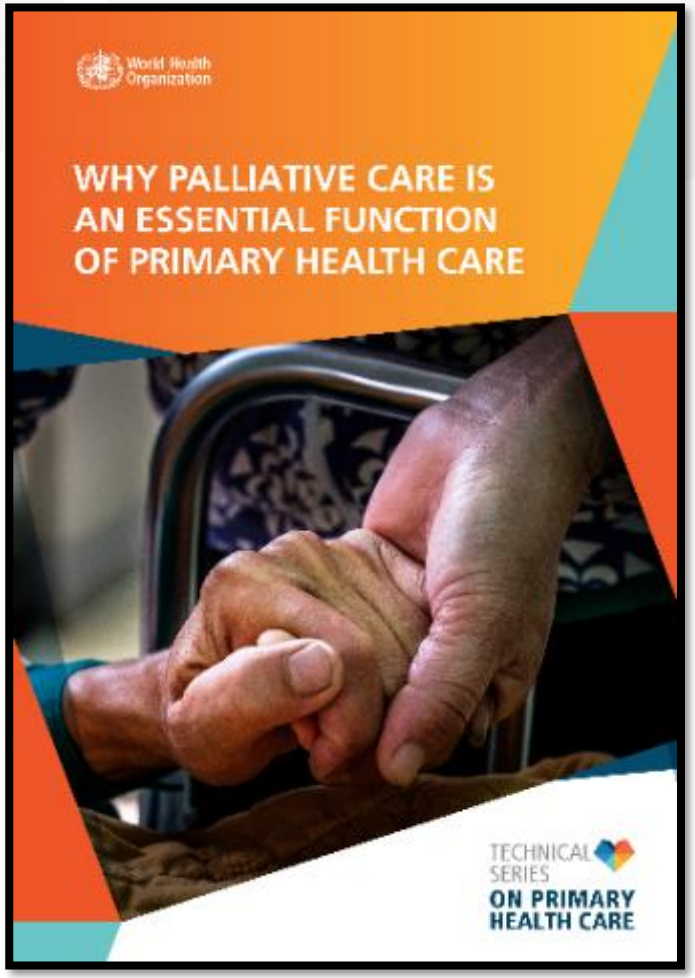
Dental notion illustration

Hyperlink to health education websites

Public Health Framework







New Technology in Community Palliative Care

Palliative home care monitoring

Remote monitor of vital sign of the patient (BP, HR, blood oxygen, heart/breathing sound)

Cellphone automatic alert message

Digital Diabetes Data and Artificial Intelligence: A Time for Humility Not Hubris

Journal of Diabetes Science and Technology
1–5

DOI: 10.1177/1932296818796508
journals.sagepub.com/home/dst
SAGE

David Kerr, MBChB, DM, FRCPE[1], and David C. Klonoff, MD, FACP, FRCPE, Fellow AIMBE[2]

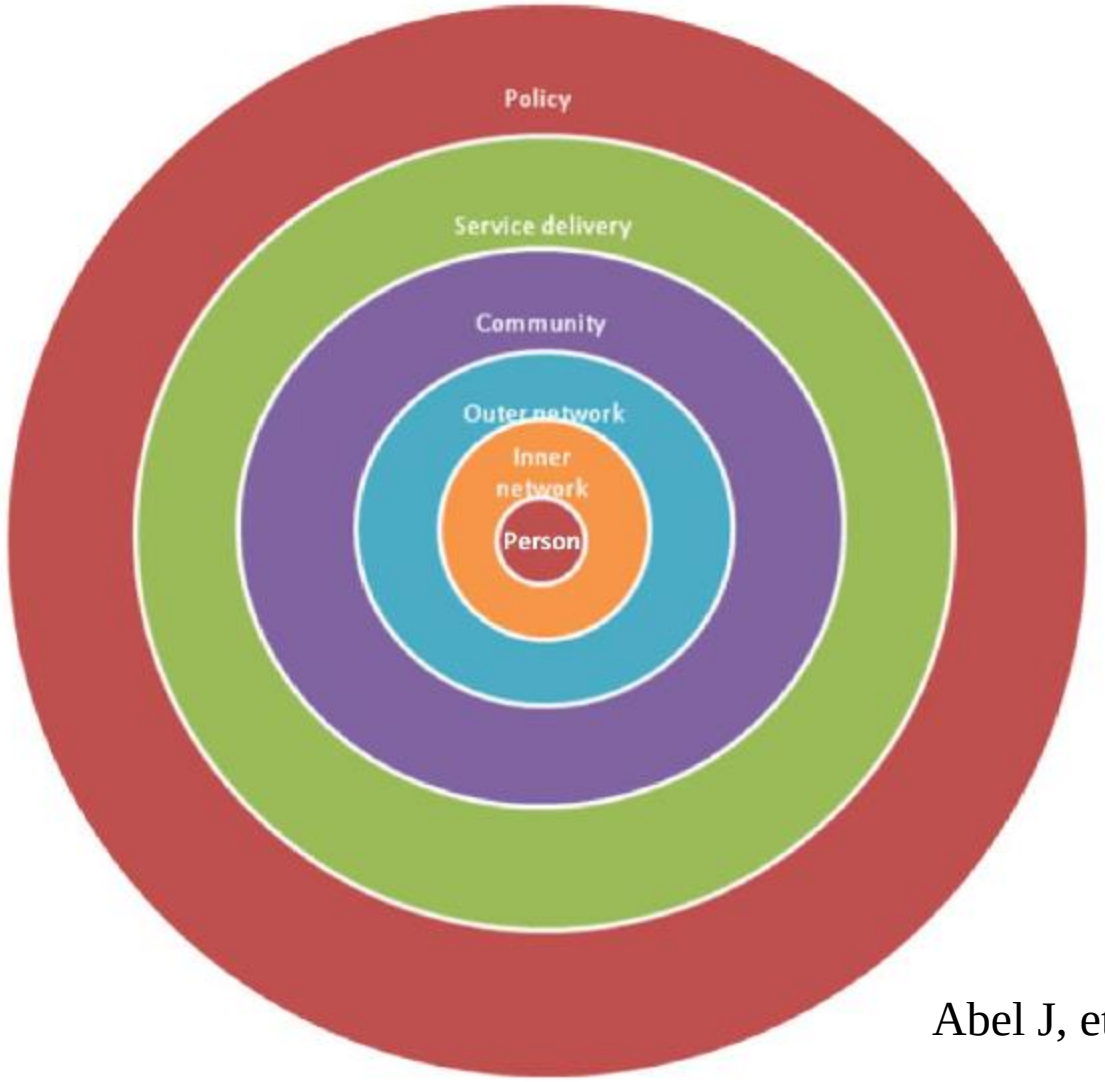
Abstract

In the future artificial intelligence (AI) will have the potential to improve outcomes diabetes care. With the creation of new sensors for physiological monitoring sensors and the introduction of smart insulin pens, novel data relationships based on personal phenotypic and genotypic information will lead to selections of tailored, effective therapies that will transform health care. However, decision-making processes based exclusively on quantitative metrics that ignore qualitative factors could create a quantitative fallacy. Difficult to quantify inputs into AI-based therapeutic decision-making processes include empathy, compassion, experience, and unconscious bias. Failure to consider these "softer" variables could lead to important errors. In other words, that which is not quantified about human health and behavior is still part of the calculus for determining therapeutic interventions.

Kerr, D., & Klonoff, D. C. (2019). Digital Diabetes Data and Artificial Intelligence: A Time for Humility Not Hubris. *J Diabetes Sci Technol, 13*(1), 123-127

Intergenerational Mobile Technology Opportunities Program
IMTOP

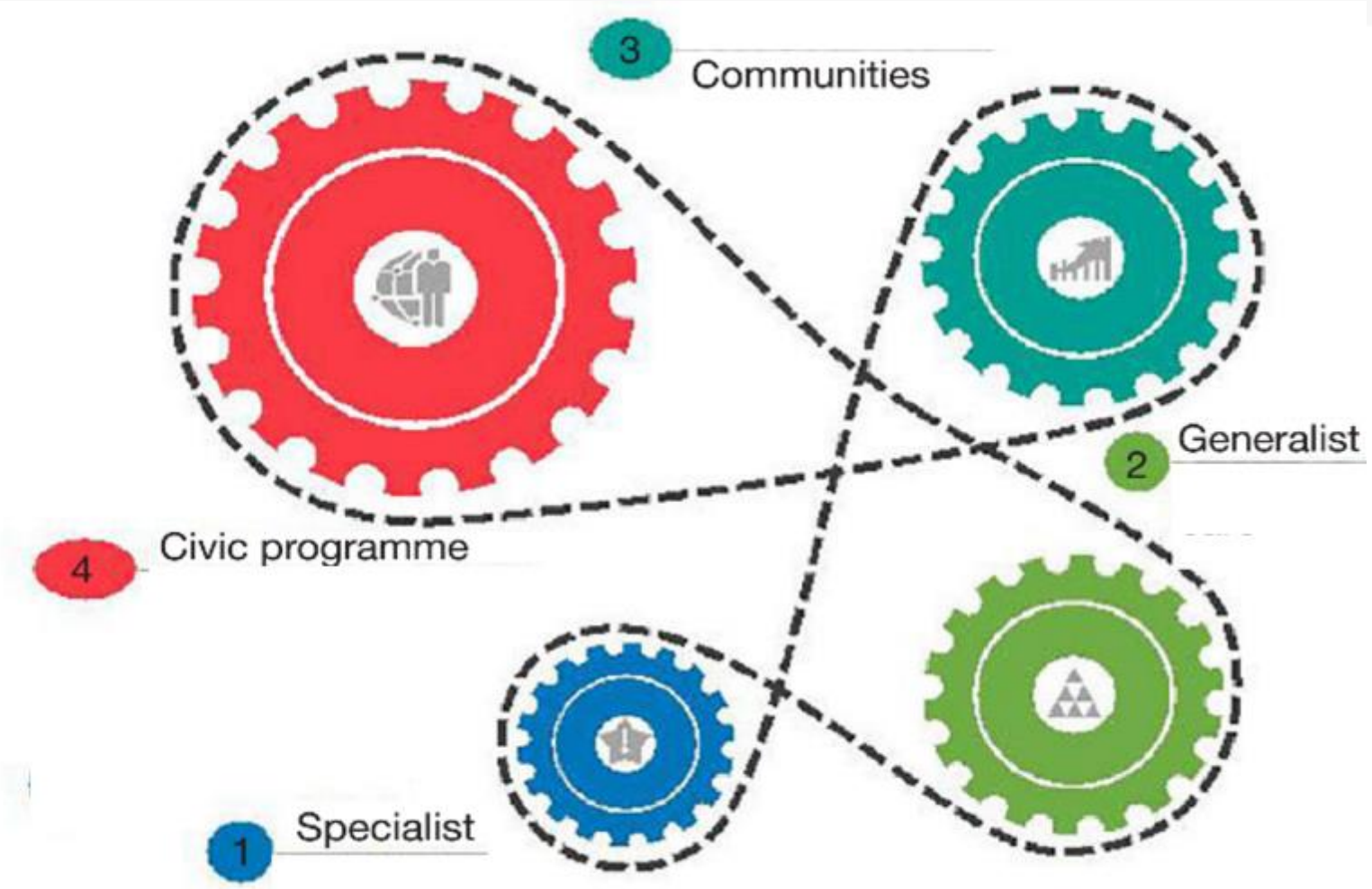
Circle of care



- Person
- Inner network
- Outer network
- Community
- Service delivery
- Policy

Abel J, et al. BMJ Supportive & Palliative Care 2013; 3:383–388

Integrate care—the new essentials model

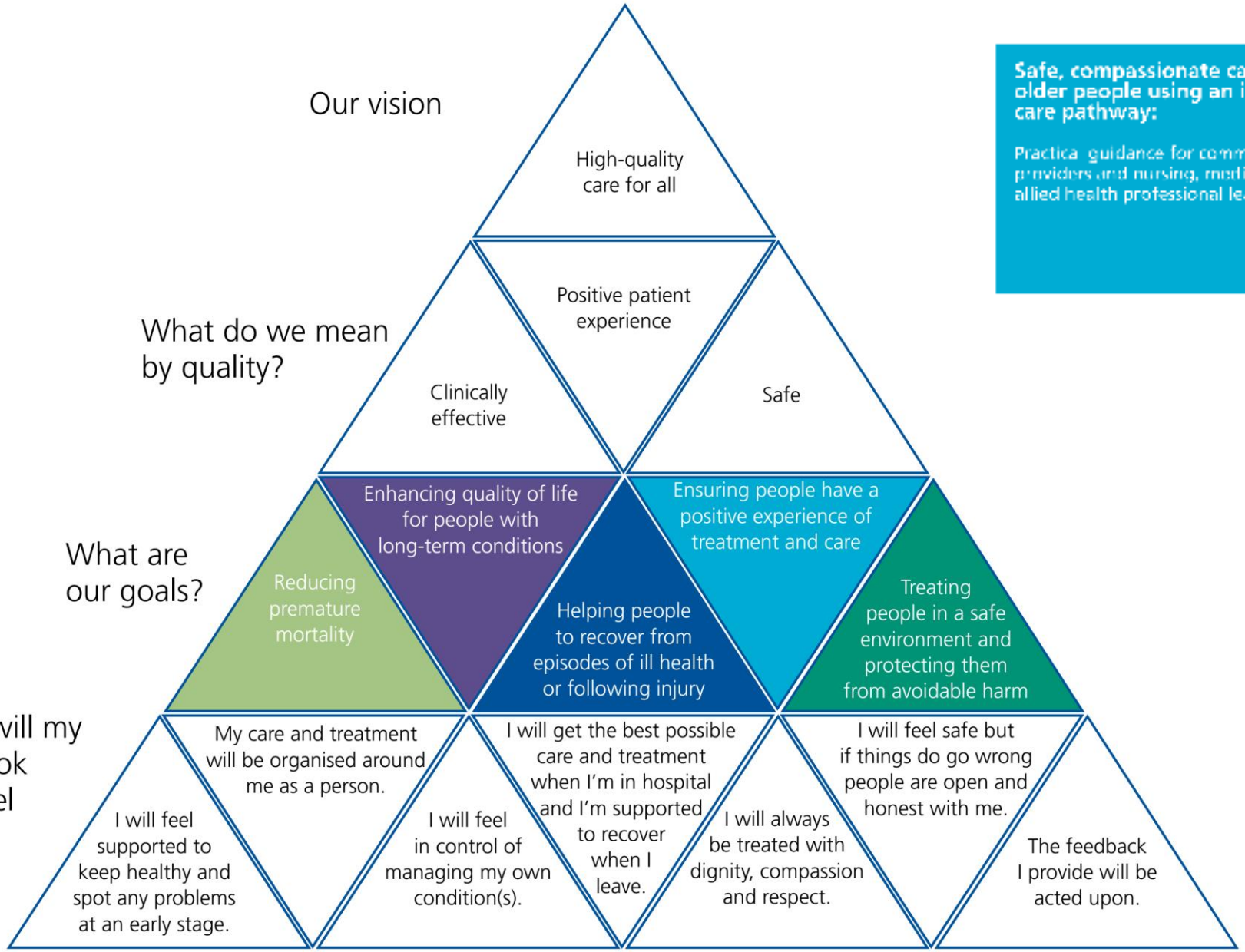


Modified from Ann Palliat Med **2018;7(Suppl 2):S3-S14**

NHS England

Safe, compassionate care for frail older people using an integrated care pathway:

Practical guidance for commissioners, providers and nursing, medical and allied health professional leaders



Promotion,
Prevention,
Protection,
Participation,
Partnership!