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Challenges and Opportunities of Healthcare System in Developing Countries emphasizing the Role of Digital Mobile Technologies

Joshua Sir M.D., Ph.D.

Professor, Graduate School of Public Health, Yonsei University

Director, Center for International Development, YUHS

YONSEI UNIVERSITY
1885

Development of Healthcare System in Korea

Unique Experiences of Korea

- From Aid **Recipient** ('49-'99) to Aid **Donor** Country
- Aid to Korea(1.2 B) was not fully satisfactory nor effective
- Reinvested the Foreign Aid to infrastructure as a stepping stone to development
- Strength in Knowledge (potential) rather than the funding itself (resources for the needs or deficits)

Miracle of Korea

Time to Share Now

Disease Free World

Healthy Global Village

Experiences in Health Sectors

(System Strengthen) Under Strong leadership formation of the effective Governance Structure from central to region and community

(Establishing the Legislation and Administrative Structure) Maternity health Laws & Regulations (1973), Special measure to the rural community(1980) which became basis for the dispatching doctors to the villages

(Training of Human Resources) Dispatch Nursing Practitioner as the key primary health care provider

(Facility Improvement & Service Upgrade) Providing comprehensive Services at Health Centers, Posts, and MCH center to the mother and child both urban and rural

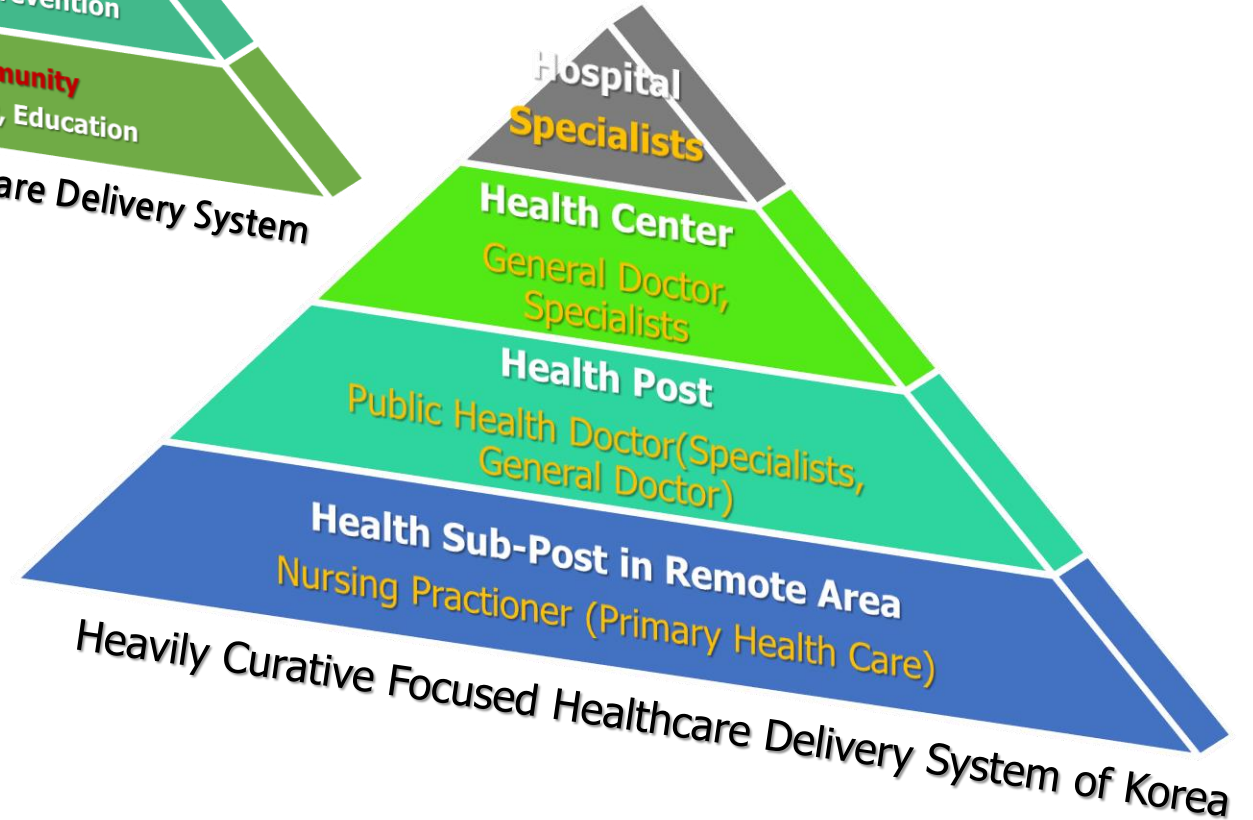**(Data & Statistics Control)** MCH Handbook Distribution, Reports and statistics, HC network

(Community Participation) Promote active participation through New Village Movement, HC Committee and used existing woman's union and creating volunteers group

Establishing Health Center Based Primary Healthcare System in Korea

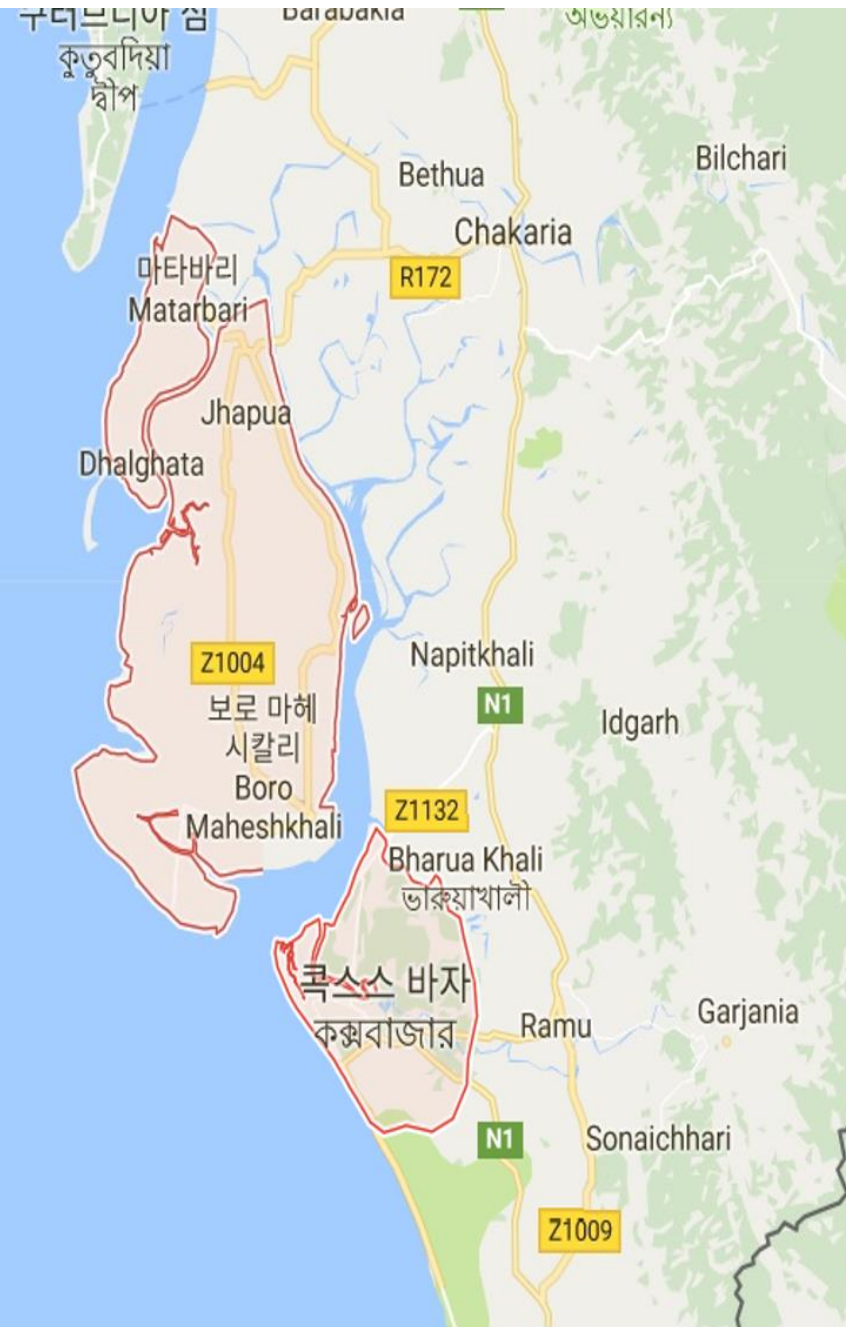**Special Law on "Promoting Health Service in Rural Areas, December 1978**

Healthcare Support for Rural Area

Infrastructure for Agriculture

New Village Movement

Special Law
Dispatch Doctors to Health Post
Dispatch Nursing Practitioner at Sub-Post

Health Center
Doctor, Curative

Health Post
Nurse, Prevention

Community
Volunteer, Education

Ordinary Healthcare Delivery System

Hospital
Specialists

Health Center
General Doctor, Specialists

Health Post
Public Health Doctor(Specialists, General Doctor)

Health Sub-Post in Remote Area
Nursing Practioner (Primary Health Care)

Heavily Curative Focused Healthcare Delivery System of Korea

60'
Family Planning

70'
New Village Movement

80'
Primary Health Care

90'
Health Insurance

Development of Healthcare System of Korea

Strengthen Healthcare Delivery System

Community Clinics

Mohesikhali Upazila Health Complex

Cox' Bazar District Hospital

Higher Hospital in Dakha or Yonsei
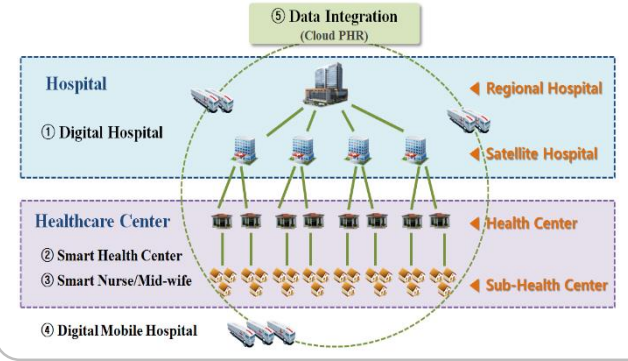
Cloud-based Health Information Exchanger
Health Information
Search/Storage/Transfer/Exchange/Process
Open API

Tele Medicine

Limited Lab. Support

PAD based Smart Home Visiting Service

Stethoscope

Solar Charger

SpO₂

SpO2

Spirometer

Glucose meter

Blood Pressure

Fetal Doppler

Smart Public Healthcare system

⑤ Data Integration
(Cloud PHR)

Hospital

① Digital Hospital

◀ Regional Hospital

◀ Satellite Hospital

Healthcare Center

② Smart Health Center

③ Smart Nurse/Mid-wife

◀ Health Center

◀ Sub-Health Center

④ Digital Mobile Hospital

Financial Protection

Accessibility to Services

Quality of Services
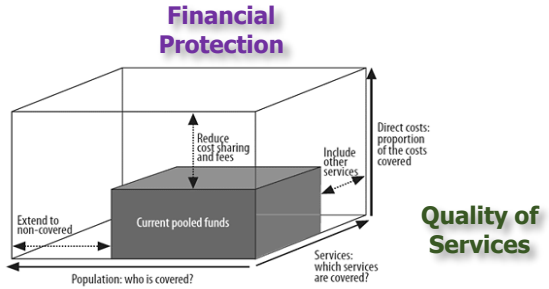
Three dimensions to consider when moving towards universal coverage

Expansion of Accessibility using ICT based Digital Health

"Health Canters Records are Handmade
 – unreliable and unreadable
Takes at least 3 months from Health Canters
to Regional Health Bureau and on…
Impossible to health planning base on Data"
(Annual Planning seminar between Laos & KOFIH
 '14.02.06)

Strengthen Healthcare Delivery System via Digital Health Technology

Community Clinics

Urinalysis, Hand-held Sonography

Mohesikhali Upazila Health Complex

Urinalysis, Hand-held Sonography, Blood Analyzer

Cox' Bazar District Hospital

Urinalysis, Hand-held Sonography, Blood Analyzer

Higher Hospital in Dakha or Yonsei

Related Healthcare Devices

Mobile Urine Analyzer — Yodoc-M & Yodoc-10 Urine Strip

| Product Specifications	
Dimensions	79 x 145.5 x 28.4mm
Screen	4.3inch (touch-screen)
Evaluated Parameters	Occult blood, Bilirubin, Urobilinogen, Ketone body, Protein, Dinitrate, Dextrose, Acidity, Specific gravity, White blood cell

Mobile Blood Diagnostic Device — iChroma 2000 & Strip

Product Specifications	
Dimensions	276 mm (L) x 220 mm (W) x 91 mm (H)
Weight	1.3 kg
Data output	7" touch color LCD
Motor	Stepper Linear Actuator (5V, 0.34A)
Communication ports	USB 4 ports, LAN port, USB OTG port
Operation temperature/ humidity range	15 ~ 35 °C
Storage temperature /humidity range	Temperature -20 ~ 50°C, Humidity Max. 70%
Test result storage	Patient test results (1,000) / System check results (500) Standard material (control) test results (1,000)
Save of ID chip information	500 ID chips (Max. 5 LOTs per each item)
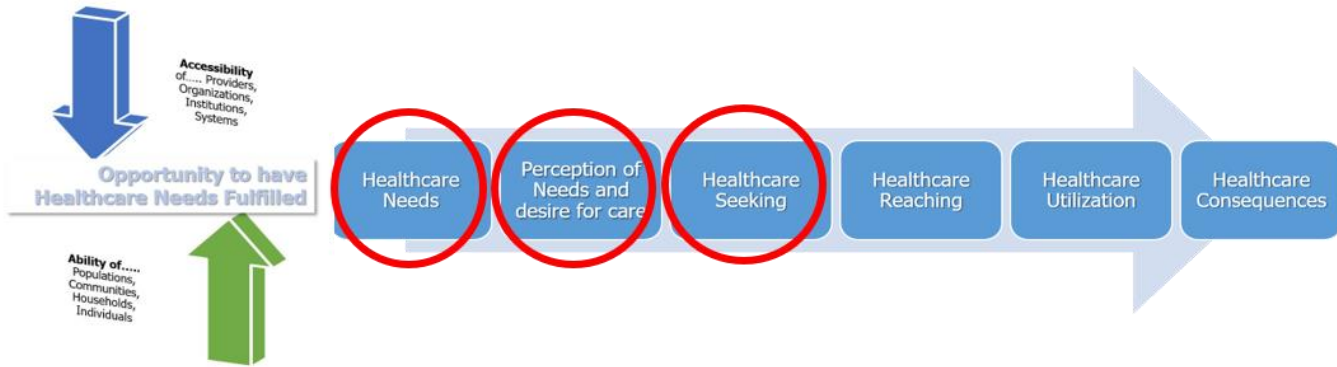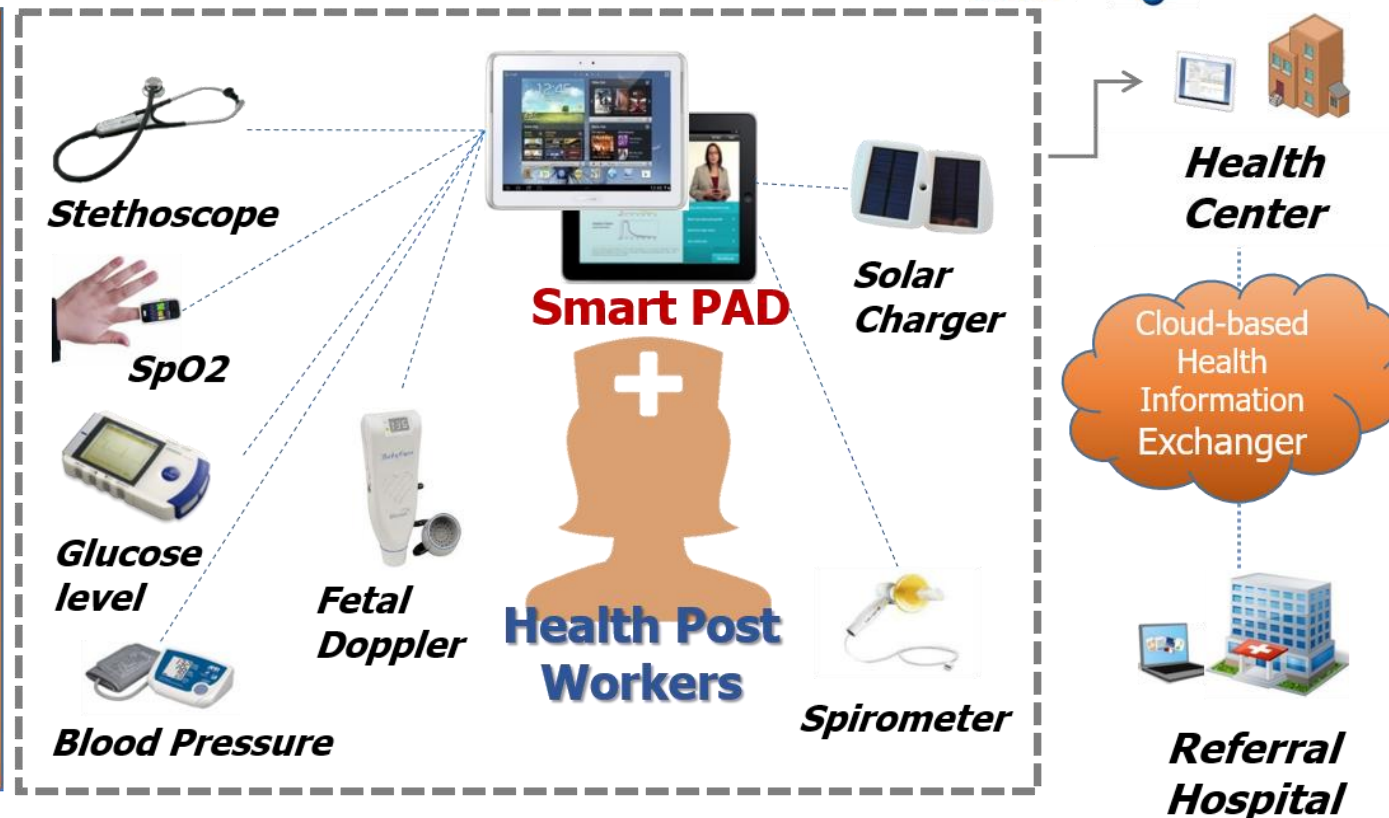
Supporting Health Post with PAD Based Smart Healthcare System

Related Healthcare Devices
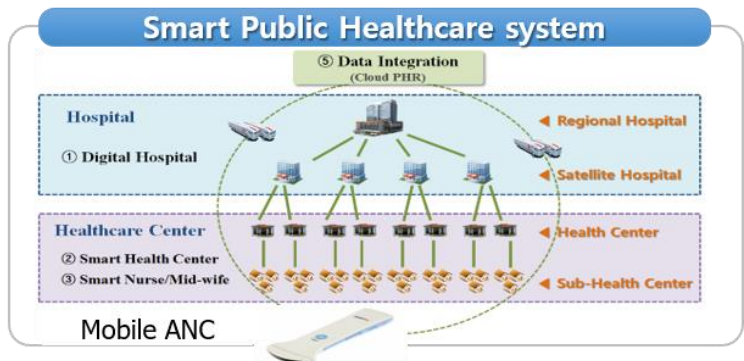
Mobile Ultrasound Device	Sonon 300C & Sonon 300 L

Sonon 300C

Product Specifications	
Frequency	3.5 MHz only
Max. Depth	20cm
Imaging Mode	B Mode
Weight	390g with Battery
Dimensions	78 x 219 x 38mm
Field of View	58.2º

Sonon 300L

Product Specifications	
Frequency	5, 7.5 and 10MHz
Max. Depth	10cm
Imaging Mode	B Mode / Color Mode
Weight	370g with Battery
Dimensions	78 x 229 x 38mm
Field of View	4cm

Smart Public Healthcare system

⑤ Data Integration (Cloud PHR)

Hospital
① Digital Hospital
◄ Regional Hospital
◄ Satellite Hospital

Healthcare Center
② Smart Health Center
③ Smart Nurse/Mid-wife
◄ Health Center
◄ Sub-Health Center

Mobile ANC

Accessibility of...... Providers, Organizations, Institutions, Systems

Opportunity to have Healthcare Needs Fulfilled

Ability of..... Populations, Communities, Households, Individuals

Healthcare Needs — Perception of Needs and desire for care — Healthcare Seeking — Healthcare Reaching — Healthcare Utilization — Healthcare Consequences

Using Non-Expert by Tele-Sonography Technology

Mobile Ante Natal Care

SONON

As Is

Current Scanning

Simultaneous Scan & Diagnosis

- Requiring Radiology Specialists
- Restricted Medical Services

To Be

3D Tele-Sono Scanning

Separate Scan & Diagnosis

- Non Requiring Radiologist at the scene
- Expansion of Benefits to other ares

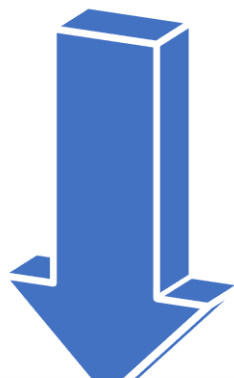1. Non Expert Scan 2. Image Transfer 3. Expert Remote Dx 4. Feedback

Training of Trainers for the Mobile Ultrasonography Examination
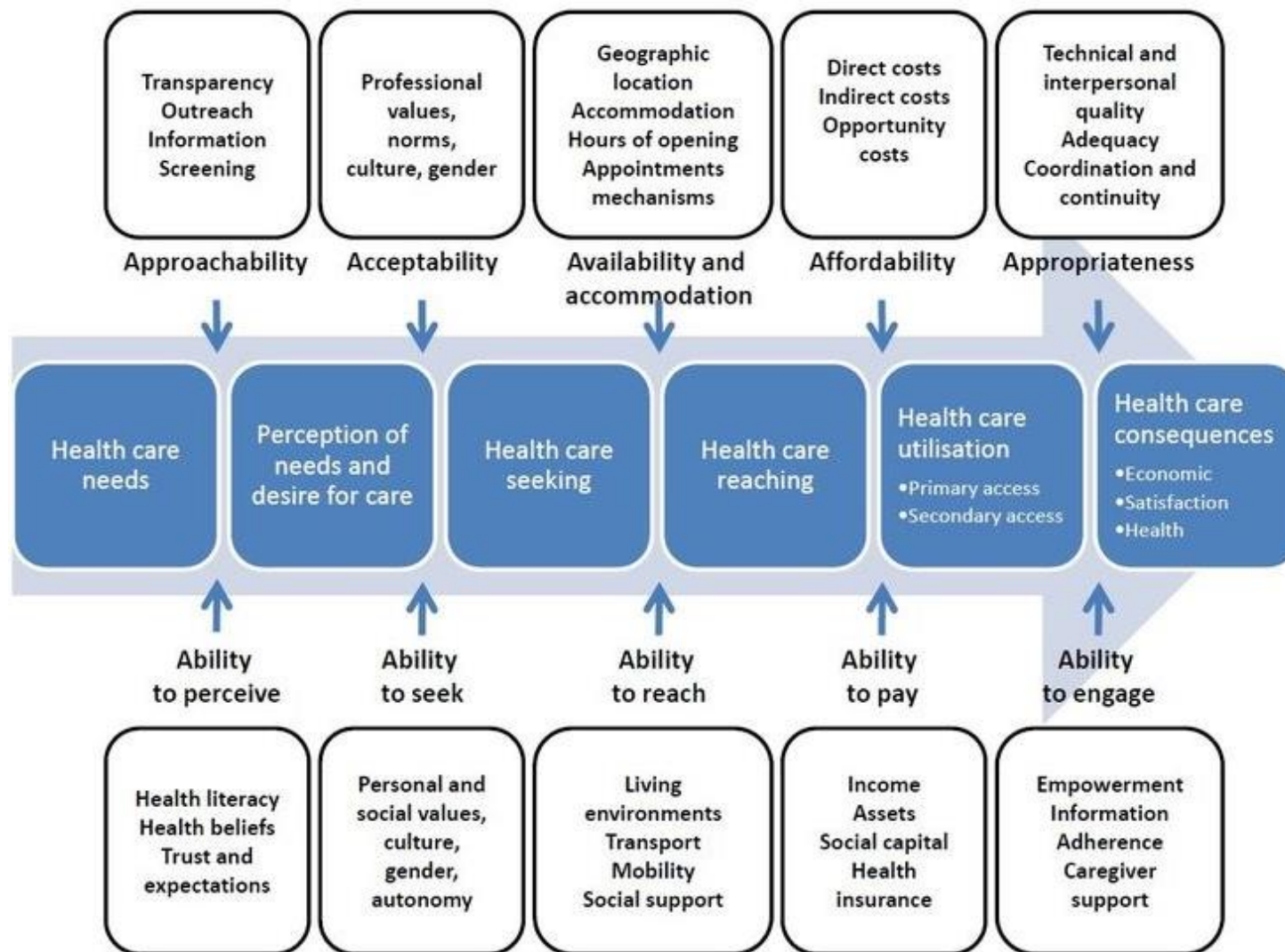January 2018 / Moheshkhali Island, Cox's Bazaar, Bangladesh

Preparation for the launching of **Mobile Ante Natal Care** Project for the Rohingya People Group in Cooperation with Bangladesh Government & International Organization for Migration

Access: Opportunity to have Healthcare Needs Fulfilled

Accessibility of..... Providers, Organizations, Institutions, Systems

Ability of..... Populations, Communities, Households, Individuals

Approachability	Acceptability	Availability and accommodation	Affordability	Appropriateness
Transparency Outreach Information Screening	Professional values, norms, culture, gender	Geographic location Accommodation Hours of opening Appointments mechanisms	Direct costs Indirect costs Opportunity costs	Technical and interpersonal quality Adequacy Coordination and continuity

Health care needs — Perception of needs and desire for care — Health care seeking — Health care reaching — Health care utilisation (Primary access, Secondary access) — Health care consequences (Economic, Satisfaction, Health)

Ability to perceive	Ability to seek	Ability to reach	Ability to pay	Ability to engage
Health literacy Health beliefs Trust and expectations	Personal and social values, culture, gender, autonomy	Living environments Transport Mobility Social support	Income Assets Social capital Health insurance	Empowerment Information Adherence Caregiver support

Current Situation and Needs of Certain CIS Hospitals

- Due to lack of economic development, no major equipment & supplies since the fall of former Soviet Union

- Good number of hospitals, doctors and hospital beds but most of the diagnostic and treatment support rely on human resources mostly.

- Most of the hospitals are governmental and public service is free. So the development of each governmental hospital is almost impossible due to lack of the governmental budget.
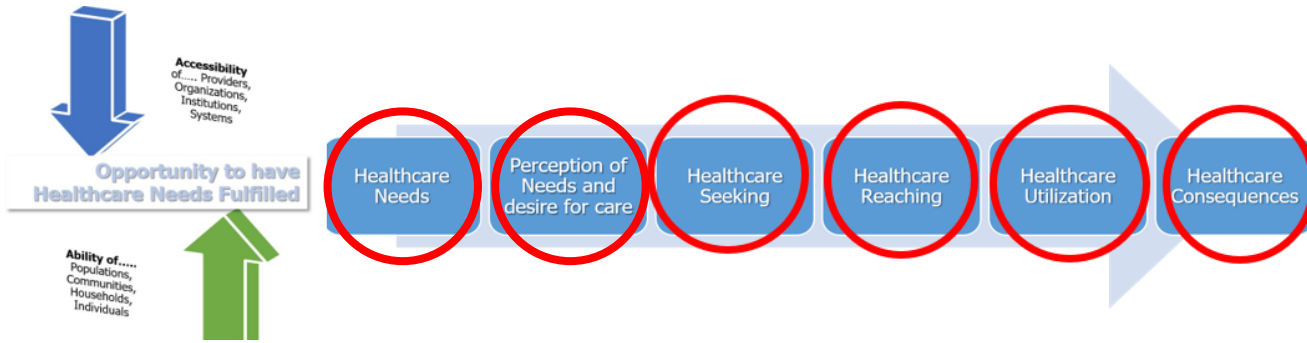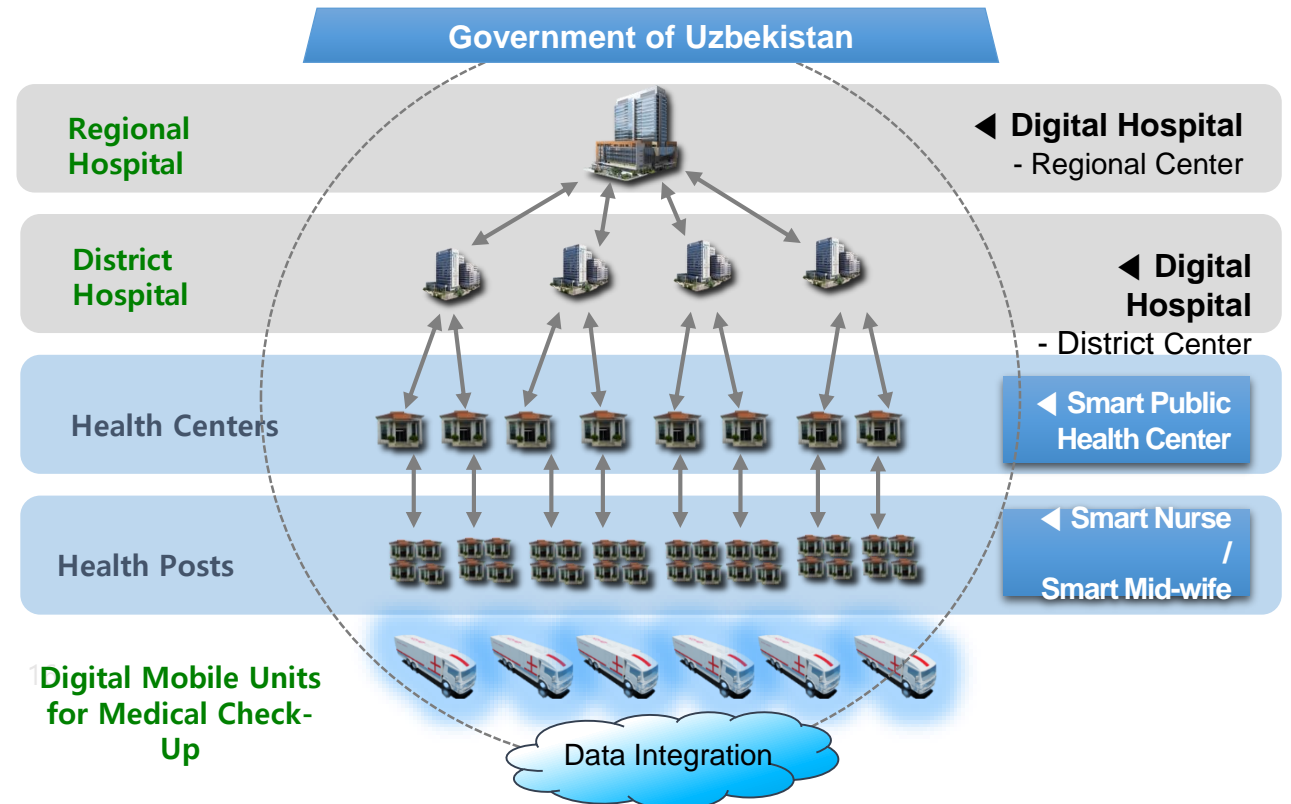
Conceptual Design of Hospitals Required in Central Asia

Accessibility of..... Providers, Organizations, Institutions, Systems

Opportunity to have Healthcare Needs Fulfilled

Ability of..... Populations, Communities, Households, Individuals

- Healthcare Needs
- Perception of Needs and desire for care
- Healthcare Seeking
- Healthcare Reaching
- Healthcare Utilization
- Healthcare Consequences

- Self-Supporting hospital that lead the development of other hospitals in the same city or region not only prosperous independent hospital proper

- Complementary, harmonious and synergistic hospital that share the burden of diseases and needs of patients with other hospitals in the same city or region

- Hospital that is not inward looking but outward, service oriented and identify themselves as an asset of the community

Smart Healthcare System
Digital Hospital Based Open Access Model

Government of Uzbekistan

Regional Hospital — ◄ Digital Hospital - Regional Center

District Hospital — ◄ Digital Hospital - District Center

Health Centers — ◄ Smart Public Health Center

Health Posts — ◄ Smart Nurse / Smart Mid-wife

Digital Mobile Units for Medical Check-Up

Data Integration

Optimal Location for the new hospitals
Medical City where most of the hospitals are
High Accessibility, center 4 Training & Sharing

Nukus Hospital Location
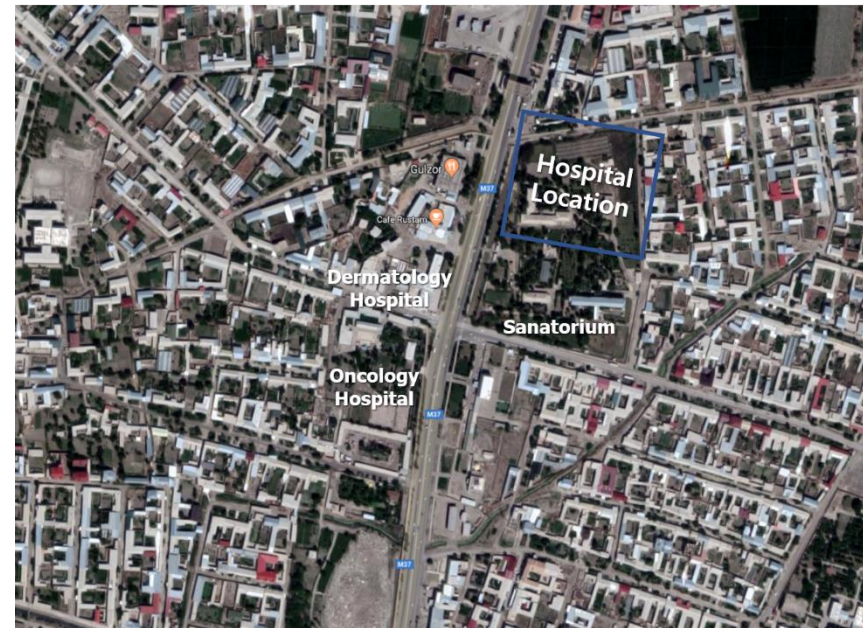
Bukhara Hospital Location

Andijian Hospital Location

Open Hospital with DUR & OCS

- Shares the highest technology of the hospital with other hospital to support doctors prescription
- New hospital can provide Drug Usage Regulation Service and Order Conveying System Service to network hospitals via internet
- DUR automatically check the usage of medicine to prevent potential misuse, abused to create such as Anti-Microbial Resistance
- OCS send the prescription to drug store in and outside of the hospital for the patient to pick up instantly
- SPC might help network hospital to establish drug store inside the hospital and provide continuous drug supplies including SCM.
- Might need to form a membership hospital network & Financial agreement
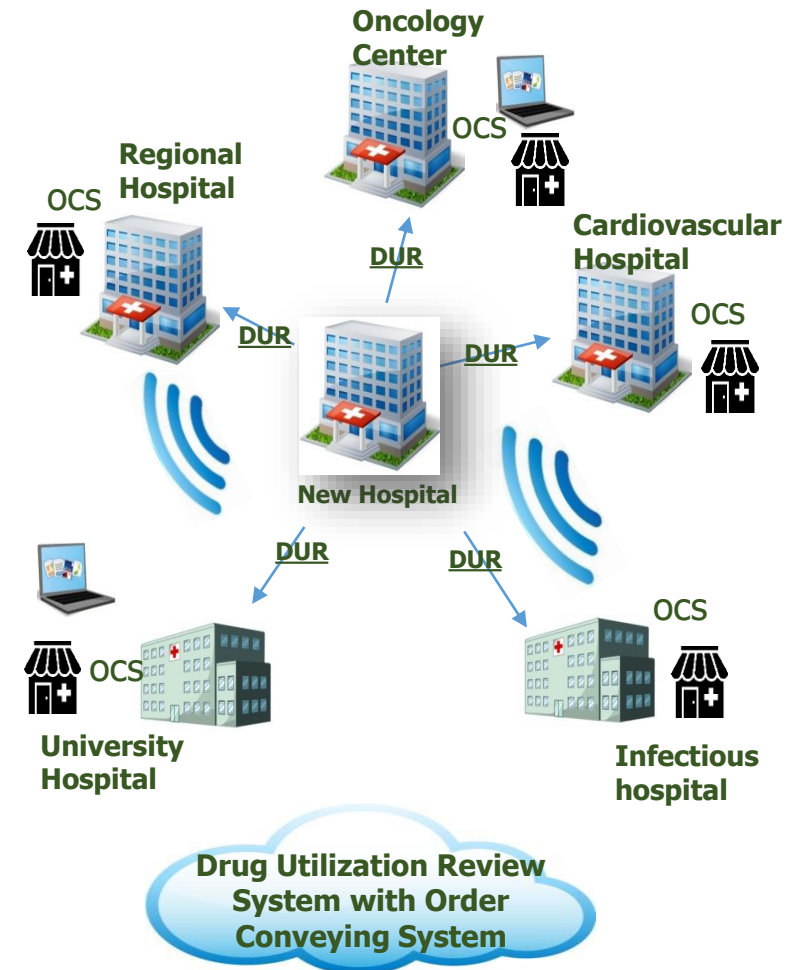
Open Hospital with Collection & LIS

- Shares the laboratory equipment, test and Laboratory Information System with other hospital
- New hospital can provide Laboratory Test List and Specimen Collection service daily with LIS via internet
- Network hospitals don't need to buy the expensive equipment and unnecessary lab tests so the medical service cost could come down
- New hospital can help network hospital to initiate evidence based medicine and training seminar and workshops to improve the knowledge and skills
- SPC might need to establish efficient specimen collection system within city/region
- Might need to form a membership hospital network & Financial agreement
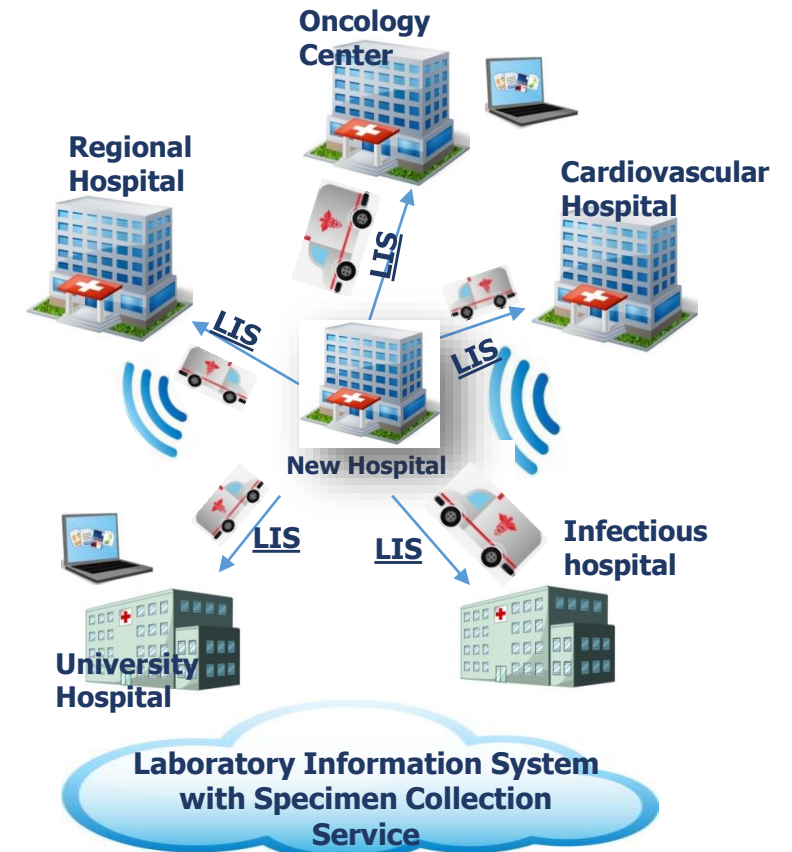
Open Hospital with Facility Sharing

- Shares the key facilities of hospital with web-based facility reservation system

- Sharing Facilities might include imaging diagnostic facilities such as MRI, C-T, PET CT as well as various Endoscopies and Ultrasonographic equipment

- Hospitals could share the hospital beds and ICU beds each other as well as some treatment facility such as Linear Accelerator, and Cardiac Catherization Rooms.

- Network hospitals don't need equip the faculties and buy expensive equipment so the medical service cost could come down

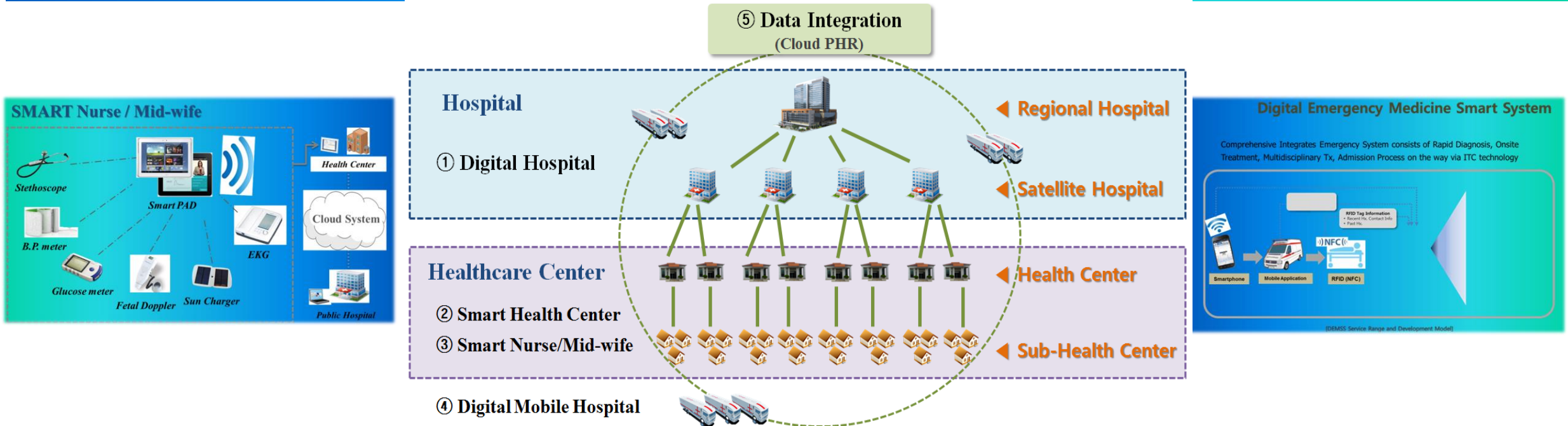- Might need to form a membership hospital network & Financial agreement
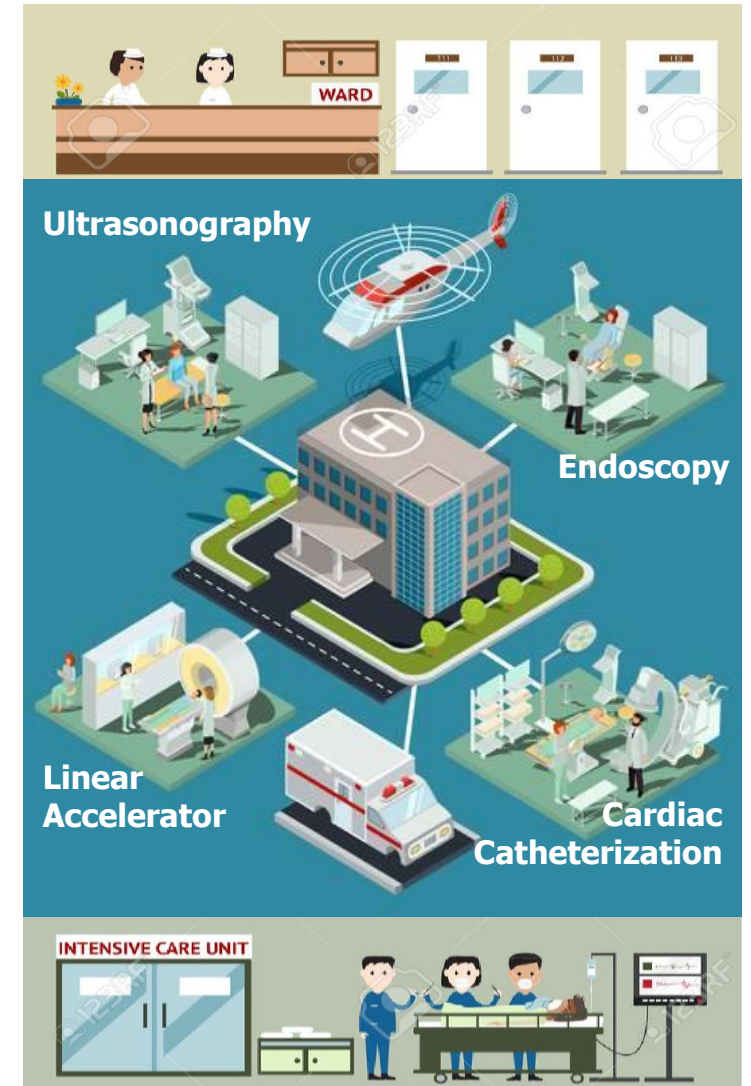
Universal Health Coverage
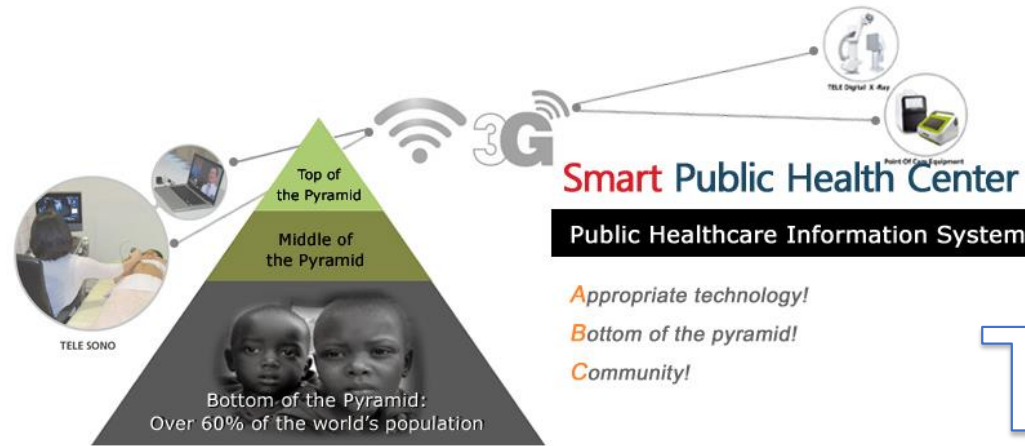
Digital Health Technology

Achieving Universal Health Coverage by Participatory Knowledge Transplantation using ICT based Health technology via Smart Healthcare System Strengthening

Thanks !