Global Healthcare Studies: Portable Health Clinic (PHC)

The Global Healthcare Team, consisting of multi-disciplinary researchers, of Kyushu University works for the development and deployment of advanced technologies to increase access to basic healthcare services for ensuring universal healthcare coverage (SDGs #3) efficiently and affordably (SDGs #9). This also contributes to designing a sustainable social business model to create new employment opportunities in healthcare sector, especially for the rural communities of the developing world (SDGs #1,2,5,8).

Besides, this research team contributes to building partnerships with academia, industry, and government, and organizes and attends various academic conferences and events (SDGs #17).

■ Portable Health Clinic System

The basic technology that has been developed by this team in collaboration with Grameen Communications of Bangladesh is the Portable Health Clinic (PHC). The Portable Health Clinic (PHC) system is a remote healthcare system that uses the functions of both eHealth and telemedicine systems.

It consists of a set of sensors (thermometer, blood tester, urine tester, etc.) in a medical toolbox to measure health status and a client software tool to collect healthcare data and transmit it to the server. A licensed healthcare worker works at the patient end to collect the patient's vital data and transfer them to the remote doctor through the online server. The remote doctor monitors the data and, if needed, makes a video call to the patient for further investigation and prepares an online prescription. Finally, the healthcare worker explains the test results and prescriptions from the doctor to the patient to complete the full circle of the service. Therefore, the PHC system enables a patient to get a health checkup, doctor consultancy and to receive a prescription with detailed explanations from the healthcare workers being at home without going to a clinic or hospital.

	
Hand-Carry Tool Box	Bag-Pack Tool Box

Figure 1: *PHC Healthcare Tool Box*

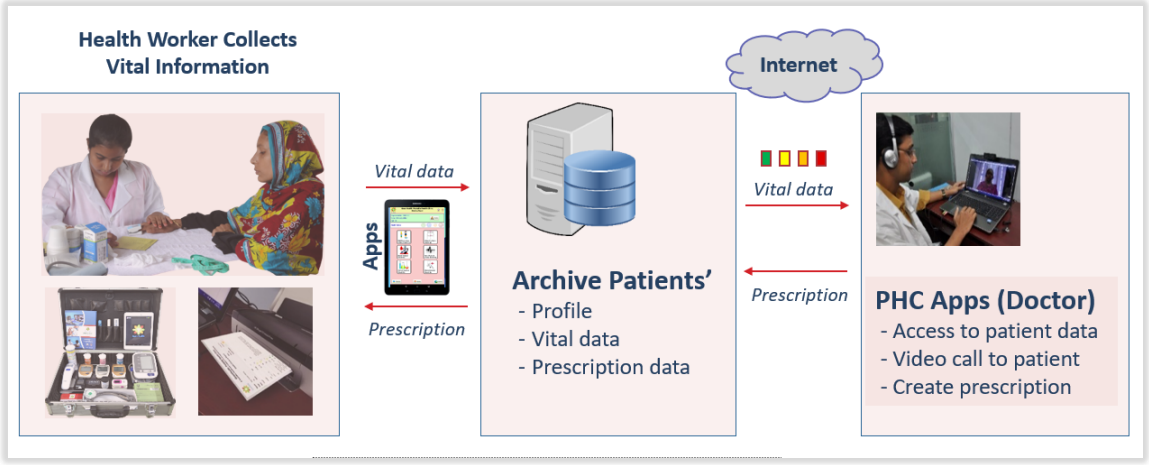


Figure 2: *PHC Service working Flow*

■ Geographical Expansion of the PHC

The implementation of the PHC system has been started in 2010 in Bangladesh. Since then this system has been introduced and piloted in several other countries including Cambodia, China, India, Indonesia, Liberia, Malaysia, Pakistan, and Thailand. Recently, the MCH care service of the PHC system was started in Zambia in August 2023, as the first step to Africa.

■ Modular Expansion of PHC

Initially, the basic PHC system was developed for primary care with a special focus on non-communicable diseases (NCDs), as the major cause of death. However, in many cases, the village patients need secondary or tertiary level treatment that requires additional reports to the remote doctors, otherwise, referral to distant hospitals. Given the need to provide further investigation and better assessment by remote doctors through telemedicine, the demand for pathological support has been noted. Consequently, the PHC system added a new module called “Tele-Pathology”. Additionally, village women have fewer opportunities to see doctors when needed because they mostly stay at home and manage the household. Therefore, PHC services found a huge need for MCH care support in the village and subsequently added another new module for MCH care. Similarly, the “Tele-Eye” care module was added in response to the need for ophthalmic care. Recently, the PHC system has added a COVID-19 module to tackle the pandemic. Thus, the PHC system gradually expands and creates new modules based on the community requirements. One such development work is now underway on “Tele-Dental” care.

■ The specific research areas of this global healthcare research team

1) *Digital Health Platforms and Infrastructure*
2) *Telemedicine and Virtual Healthcare*
3) *Artificial Intelligence in Healthcare*
4) *Medical Informatics and Data Management*
5) *Wearable Technologies and Sensors*
6) *Approach to Healthcare Service Delivery*
7) *Institute of Chronic Disease, Guizhou Provincial CDC*

■ Our Academic research and development partners in other countries

1) *Biyani Group of Colleges, Jaipur, India*
2) *Gadjah Mada University, Indonesia*
3) *University Malaysia Sabah, Malaysia*
4) *Asian Institute of Technologies, Thailand*
5) *Zambia ROCINANTES, Zambia*
6) *Institute of Chronic Disease, Guizhou Provincial CDC*