

Introduction of Regional Health Information Network in Vietnam

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Fujitsu, together with the Fujitsu Research Institute and VNPT-FUJITSU Telecommunication System J.S.C., a Fujitsu group company in Vietnam, recently examined the feasibility of introducing regional health information networks in Vietnam to secure the endorsement of the Japanese Ministry of Economy, Trade and Industry. Vietnam urgently needs to improve regional healthcare services to address the severe shortage of medical resources. The Vietnamese Ministry of Health is greatly interested in deploying a regional health information network to enable medical resources to be deployed more efficiently by sharing data among medical institutions. Vietnamese medical facilities are equipped with an IT infrastructure sufficiently reliable for providing the basis of a regional health information network. This paper describes the need for an information network in Vietnam and presents an overview of the regional health information network and the steps needed for introducing such a network.

1. Introduction

In accordance with the 2014 revision to the Japan revitalization strategy, the Japanese government is preparing a plan for deploying medical infrastructure in emerging Asian countries. In Vietnam, the third most populous member state of the Association of Southeast Asian Nations (ASEAN), one important requirement is improving regional healthcare services, which are seriously lacking resources such as doctors, nurses, and medical equipment. Official Development Assistance (ODA) and other aid is being used to actively support improvements in regional healthcare services.¹⁾ One such improvement is the introduction of a "regional health information network," which makes medical resources more efficient by linking together data from clinics, metropolitan hospitals, and other medical institutions. The Vietnamese Ministry of Health has expressed a strong interest in implementing a regional health information network.

VNPT-FUJITSU Telecommunication System J.S.C. (VFT), a joint venture launched in 1997 by Fujitsu and Vietnam's largest telecommunications company, Vietnam Posts and Telecommunications Group (VNPT), has been actively deploying information and communications technology (ICT) businesses focused on the

needs of the Vietnamese government and industry. In 2013, the Fujitsu Research Institute and VFT examined the feasibility of introducing a health information network in Vietnam with the help of the Japanese Ministry of Economy, Trade and Industry.

In this paper, we first summarize the organizational structure of Vietnamese medical institutions and then explain the requirements for a regional health information network. Finally, we describe the concept of a regional health information network in Vietnam and show how it could be introduced.

2. Overview of Vietnamese medical institutions

2.1 Structure

According to the General Statistics Office of Vietnam, in 2012 there were 12 524 public medical institutions with 27 175 hospital beds and 715 private medical institutions with 3380 hospital beds.²⁾ Although private Vietnamese medical institutions have recently increased in number and begun to compete with public medical institutions, the public medical institutions are still responsible for most of Vietnam's healthcare services. As shown in **Figure 1**, public medical institutions can be classified into four

types in accordance with the government agency that is in charge of them: Vietnam’s Ministry of Health; a Provincial People’s Council; a District People’s Council; and a Commune People’s Council. The quality of a medical institution’s healthcare services is commensurate with the level of the government agency that is in charge of it, with Vietnam’s Ministry of Health at the top followed by the provincial, district and commune councils. Similarly, medical institutions at higher levels provide instruction and training to medical institutions at lower levels. Public medical institutions also run a referral system to coordinate their efforts and provide efficient healthcare services, assigning patients with mild illnesses to regional health stations and patients with severe illnesses to higher-level medical institutions.

2.2 Current issues

The vast majority of public medical institutions are commune health stations. In 2010, there were 10 926 health stations responsible for basic healthcare services in 99% of communes. However, commune

health stations can only provide limited healthcare services: they do not have many highly skilled doctors and nurses, and their use of medicine and medical equipment is restricted. As a result, many patients move past the commune health stations to national hospitals and other high-level medical institutions for examination. This, in turn, has concentrated patients at high-level medical institutions, which have grown crowded. The decrease in healthcare quality caused by long wait times and the increasing responsibilities of doctors and nurses are thought to lead to medical accidents.^{3),4)} On December 14, 2012, Vietnam Breaking News reported that Vietnam’s Ministry of Health was considering two measures to deal with the problem: 1) reduce congestion levels from above 120% to below 100% at extremely crowded hospitals such as the national K Hospital, Bach Mai Hospital, Cho Ray Hospital, and Hue Central Hospital, and 2) reduce the doctors’ patient load to under 50 examinations in 8 hours by 2015 and to under 35 examinations in 8 hours by 2020.

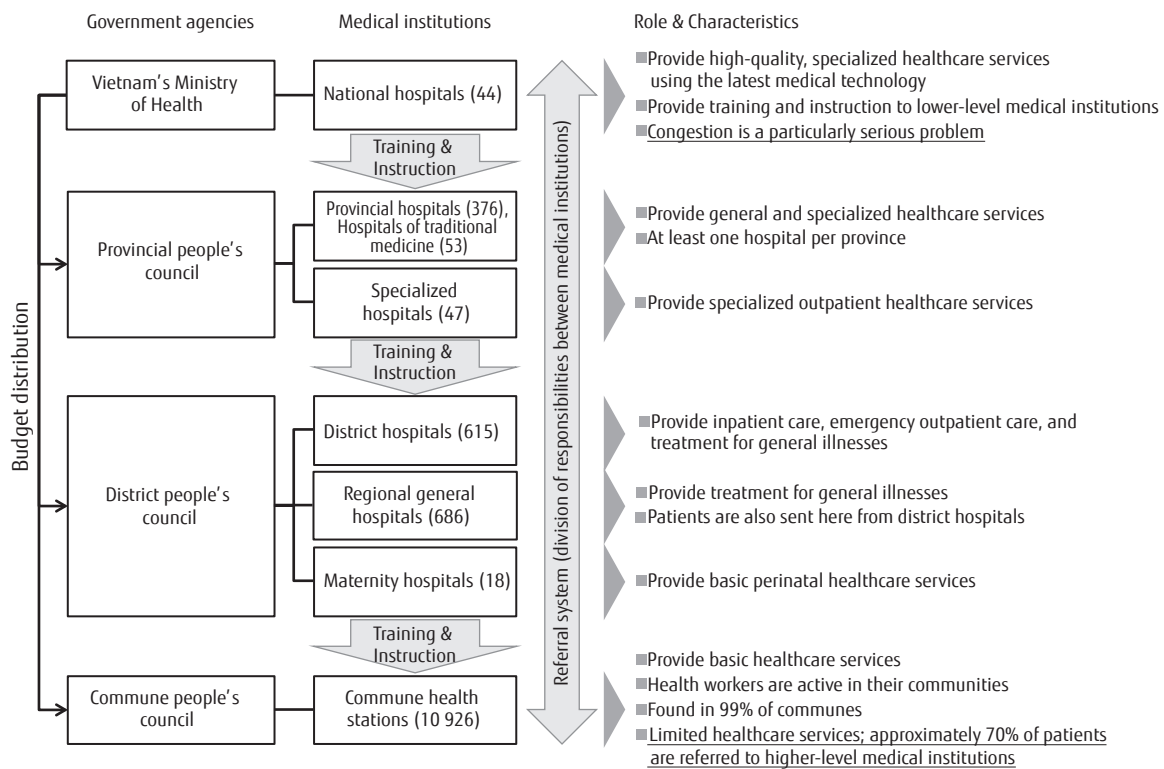


Figure 1
Classification of Vietnam’s medical institutions.

2.3 Requirements for regional health information network

As shown in **Figure 2**, Vietnam’s Ministry of Health is promoting initiatives such as a satellite hospital program, in which national hospitals provide training and instruction to provincial hospitals.⁵⁾ Medical institutions centered on K Hospital as well as those centered on national children’s hospitals are moving forward on adopting a “remote examination system” for exchanging medical imagery and other large amounts of data that are useful for training and instruction provided to lower-level medical institutions. Of the medical institutions currently centered on K Hospital, Bắc Ninh Provincial Hospital would like to start its own regional satellite hospital program to provide training and instruction to lower-level medical institutions and thus improve regional healthcare services.

For both medical institutions centered on K Hospital and those centered on national children’s hospitals, Vietnam’s regional health information network is moving toward the adoption of a remote examination system in which medical imagery and other patient data are shared between national and

provincial hospitals so that physicians can effectively discuss treatments. This system will require fiber to the home (FTTH) or some other high-speed connection to handle the large volume of medical imagery and other data that will be exchanged. Furthermore, for services that connect provincial hospitals, district hospitals, and commune health stations, the introduction of a “patient referral system” for exchanging patient information would be beneficial. Connecting these systems via FTTH or asymmetric digital subscriber lines (ADSL) would enable provincial hospitals to share a patient’s medical information with district hospitals and commune health stations as well as give advice during examinations. This would improve regional healthcare services.

National hospitals, provincial hospitals, and district hospitals should be able to pay the costs associated with running a regional health information network for both medical institutions centered on K Hospital and those centered on national children’s hospitals. While commune health stations, which receive aid from the provincial governments, would not be able to pay for the system, ODA could be used to cover large expenses

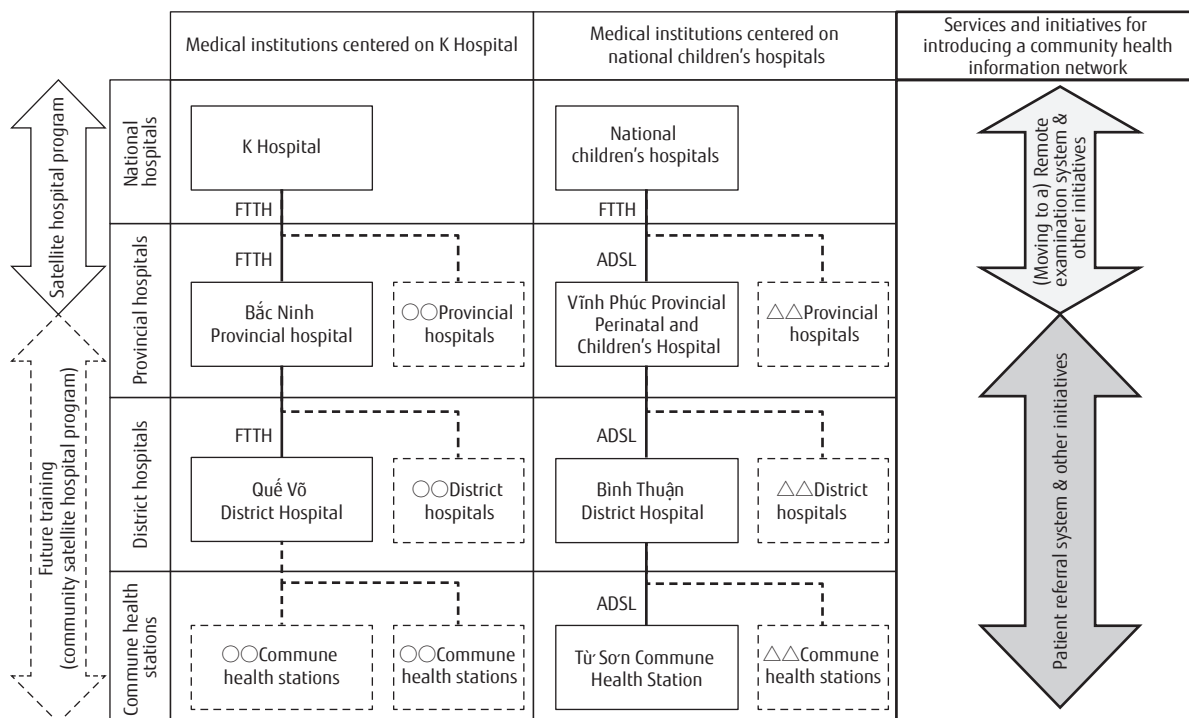


Figure 2
Path to introducing community health information network.

such as ICT system development and infrastructure improvements—including the necessary communication networks, computers, and servers—when a regional health information network is introduced; it would be appropriate for provincial governments to cover the operating expenses of the commune health stations.

3. Overall image of regional health information network

As shown in **Figure 3**, a suitable regional health information network would provide cloud-based services to medical institutions over the Internet using data centers managed by national hospitals and provincial governments. By enabling medical institutions to share data centers, software services, and other ICT resources, this approach would keep initial costs low and would be cheaper than independent installations.

Each individual medical institution would use both its own in-hospital services as well as linked services that promote collaboration between institutions. In-hospital services include an electronic health record system for managing patient information in the course

of providing healthcare services; a pharmaceutical management system for tracking drug inventory and usage; an accounting system for invoicing patients and tracking payments; and an admission management system for keeping track of patients as they are admitted, discharged, and moved between hospital beds. Linked services include the patient referral system and remote examination system mentioned earlier as well as clinical pathways that involve several medical institutions providing healthcare services in accordance with a patient’s condition.

There are several advantages of structuring the regional health information network this way for patients, medical institutions, the central government, and provincial governments.

1) Patients

Patients can continue to receive healthcare services at all targeted medical institutions, where their medical information will be accessible. Patients can even choose the medical institution that is most convenient for them. Using the remote examination system, medical institutions can request medical imagery and

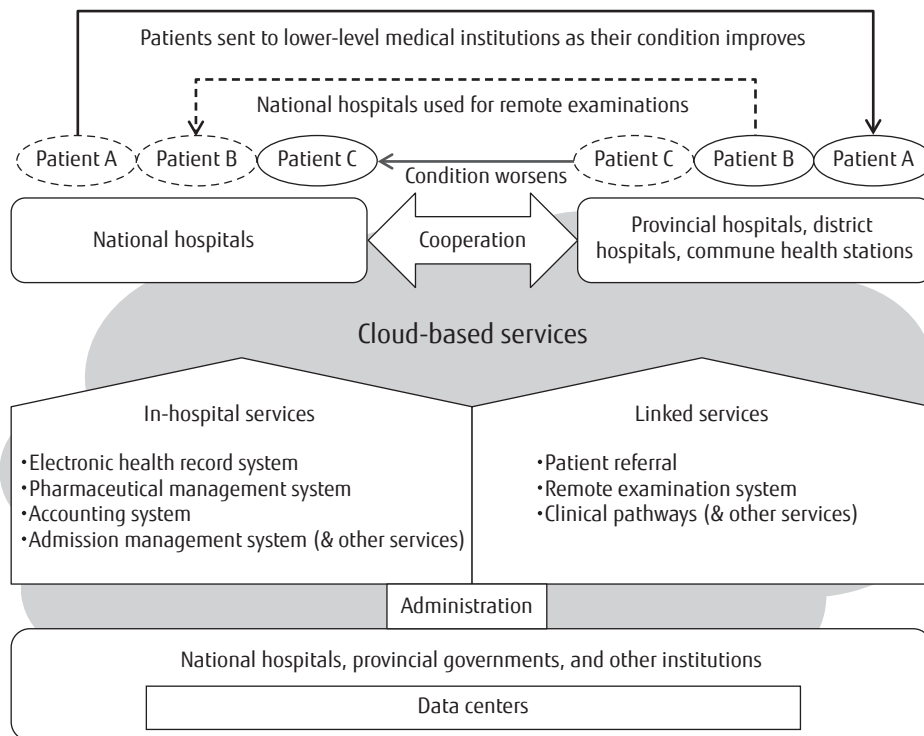


Figure 3
Concept of community health information network in Vietnam.

other data from national hospitals. Effective treatments can also be made possible through coordination with national hospitals; patients can thus receive advanced healthcare services from national hospitals even at the medical institution that is closest to them.

2) Medical institutions

National hospitals, which have a high concentration of patients, can use the patient referral system to refer patients to lower-level medical institutions that are qualified to treat their particular illnesses. This can reduce congestion and enable the national hospitals to focus on providing high-quality healthcare services. Provincial hospitals, district hospitals, and commune health stations can use the remote examination system to share patients' medical imagery with national hospitals, thus learning effective treatments and the skills necessary to provide high-quality healthcare services.

3) Central and provincial governments

By collecting accurate health information and sharing it with government agencies such as Vietnam's Ministry of Health, both central and provincial governments can plan effective healthcare measures based on actual conditions.

4. Feasibility of introducing regional health information network

4.1 Scheme

In Vietnam, it should be possible to use ODA to cover the costs of setting up and running a regional

health information network. In Japan, the cost of setting up such a network is covered by regional health revitalization funds and other public funding provided to municipalities by ministries and other government agencies; the cost of running the network is covered by usage fees collected from subsidiaries. It should thus be appropriate to use ODA to set up a regional health information network in Vietnam and to collect usage fees from medical institutions to cover the network's operating expenses, as shown in **Figure 4**. This would make the medical institutions aware of the value they are receiving from these fees and thus use the services efficiently.

The in-hospital services provided by the regional health information network will continue existing healthcare operations at each medical institution and thus must be applied to existing healthcare systems and conventions. Furthermore, reliable, low-cost telecommunication networks must be secured to ensure that the regional health information network's services can be provided to the targeted medical institutions. An effective strategy for achieving this involves working with VNPT, which is a major telecommunication carrier in Vietnam that also manages hospitals and is knowledgeable about Vietnam's healthcare systems and conventions.

ODA comes in three forms: 1) long-term, low-interest loans denominated in Japanese yen with the funds used to implement power plants, dams,

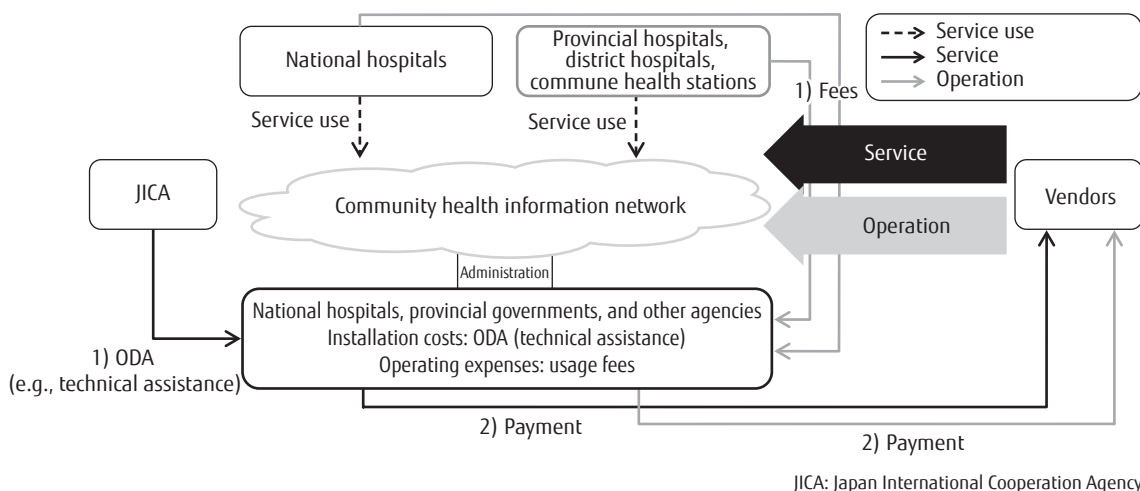


Figure 4 (Proposed) Scheme for introducing community health information network in Vietnam.

roads, bridges, and other hard infrastructure; 2) technical assistance for developing skills to resolve societal problems; and 3) grant assistance for supporting healthcare, hygiene, education, and other basic infrastructure improvements. Of these, both technical assistance and grant assistance do not need to be paid back. It is difficult to consider a regional health information network and other ICT systems to be hard infrastructure projects and thus receive yen-denominated loans for them. Similarly, it is difficult to consider a regional health information network to be basic infrastructure that qualifies for a grant because it represents additional services for improving healthcare. For these reasons, it would be appropriate for technical assistance ODA to cover the installation costs of a regional health information network in Vietnam, with the network considered to be a necessary tool for developing talent through the promotion of cooperation between medical institutions.

4.2 Steps

Fujitsu will take the following steps to bring a regional health information network to Vietnam.

- Step 1

Conduct a survey based on the content of this paper to clarify the demands that must be met by the network.

- Step 2

Conduct experiments to demonstrate the network's effectiveness as well as the costs associated with introducing and operating it. Proposed test sites include medical institutions in Bắc Ninh, Vĩnh Phúc, and other provinces; national hospitals, such as the national children's hospitals; and K Hospital, where a hearing test related to the regional health information network in Vietnam was administered. Fujitsu will need to work together with Vietnam's Ministry of Health and the Japan International Cooperation Agency (JICA) to hold nationwide seminars and other events to widely promote the effectiveness of the network demonstrated in these experiments, thereby raising awareness of the efficacy of a regional health information network.

- Step 3

Propose a technical assistance plan for developing talent through the promotion of cooperation between medical institutions. As explained in the scheme described above, we expect to introduce a regional health

information network with technical assistance ODA. In the implementation process, it is important to consider standardizing patient data security and linking patients with medical information, using Japan's domestic regional health information network for reference.

Given these considerations, we will continue to the actual deployment of a regional health information network (step 4).

5. Conclusion

This paper described the feasibility of Fujitsu helping to introduce a regional health information network in Vietnam on the basis of Japan's policy for helping to deploy medical infrastructure in developing countries. By helping to implement a regional health information network in Vietnam, we expect to gain worldwide recognition of Japan's methods for managing medical information and to make it even easier to deploy Japan's medical technology and expertise in the future.

This paper is the result of a research survey performed for the Japanese Ministry of Economy, Trade and Industry: "2013 Survey on the Feasibility of Deploying Japanese Medical Equipment and Services Internationally."

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