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# Possibility of the Introduction of Telemedicine in Rural Villages in Vietnam - From the Introduction of Medical Information System to the Vertical Integration-Type Medicine Management

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POSSIBILITY OF THE INTRODUCTION OF TELEMEDICINE IN  
RURAL VILLAGES IN VIETNAM  
<FROM THE INTRODUCTION OF MEDICAL INFORMATION  
SYSTEM TO THE VERTICAL INTEGRATION-TYPE MEDICINE  
MANAGEMENT>

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**Abstract**

*We have been implementing the research work in order to achieve the rural clinics that can provide the similar quality of clinic performance as that of urban general hospitals. The research work involves the use of common fund in community, from the financial viewpoint, for the purpose of continuous management of clinics in rural villages of developing countries, and the introduction of telemedicine system from the viewpoint of medical quality improvement. Our research fields have been rural villages near Hanoi, Vietnam1). This report is a result of another research work concerning the telemedicine for the clinics of rural villages, covering from the introduction of the vertical integration-type medicine management pursuing the possibility of quality improvement measures in the healthcare at the Vietnamese rural villages through the field research at the Hanoi, the capital city of Vietnam as well as the hub of the IT technology.*

*Keywords: Medical Information System, Telemedicine Telepathology, Mobile telemedicine van clinic, Vertical Integration-type Medicine Management*

# 1 INTRODUCTION

When you look at healthcare in developing countries, the level of urban general hospitals is similar to the level of advanced countries, but rural clinics have problems of insufficient medical equipments, doctors and nurses. In case of Vietnam, impoverishment of rural clinics caused by economic poverty, particularly in the mountain regions, is increasing the gap between urban areas and rural areas. Therefore, we proposed a financing scheme through the establishment and use of a common fund by the participation of village people. As a result, a virtuous cycle can be expected as the healthcare service quality in rural villages is improved, and the number of medical treatment is increased. The purpose of our research is to be provided the same quality of clinic performance as urban general hospitals. It is covering from the introduction of the telemedicine diagnosis to the vertical integration-type medicine management. This is a possibility of quality improvement measures in the healthcare at the Vietnamese rural villages.

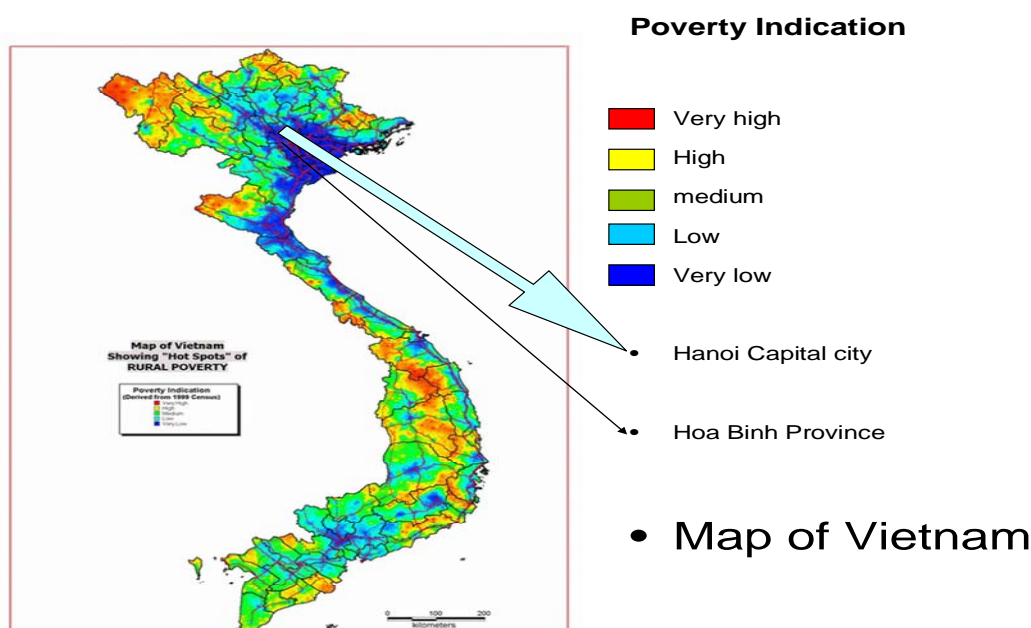


Figure 1. Poverty distribution map of Vietnam  
 (Source: Dr Ngo Quy Chau, "MEDICAL SITUATION IN VIETNAM")<sup>2)</sup>

# 2 FACTS CONCERNING GOVERNMENT HEALTHCARE SYSTEM

Vietnam’s healthcare data shows that many children aged below 5 are suffering from chronic malnutrition, and such infectious diseases as pneumonia and tuberculosis, have higher morbidity rates. According to the World Bank, the poor people live mainly in rural areas, which account for about 90% of the poor family. Poverty rate is high in the North and the Central Highland regions, particularly quite high in the Ethnic Minority region. Regional gap in healthcare data is widening. (Table 1)

Data		Average Life Expectancy (Years)	Infant Mortality per 1,000 Baby (Persons)
Region			
National Average		71.3	26.0
North	Red River Delta	73.3	20.0
	North-East	69.1	30.2
	North-West	66.6	40.5
North Central	North Central-Coast	71.2	30.9

South Central	South Central-Coast	73.6	23.6
	Central-Highland	68.9	30.9
South	South North-East	73.9	18.9
	Mekong Delta	73.0	21.2

(Source) *Annual Report 2002, Ministry of Health of Vietnam*

Table 1. *Vietnam's Major Healthcare Data by Region*

Also, when you look at the Vietnamese Government's healthcare system, measures have been implemented to match their healthcare system to market economic policy such as the liberalization of medical fee charged by hospitals in 1989, raising staff salary to improve quality of the commune health center system in 1994, and improvement in regional medical system in 1997 4)

Meanwhile, compulsory medical insurance system has been implemented as a healthcare policy covering all the people including the poor people, and in 2006, health insurance card for the poor was issued to give easy access to medical consultation at the hospitals and clinics for quality improvement in healthcare.

### 3 QUESTIONS CONCERNING PRESENT HEALTHCARE IN VIETNAM

However, the government insurance system is mostly not working at rural villages. Actually the interviews made by us at the Binh Thai village, Hoa-Binh province in January 2008, showed that the people must pay higher unofficial fee than fair price, to the hospitals to see the doctors even for the holders of health insurance card. The field research work showed that many village people used traditional herbs as an initial treatment at home when they become ill, and if they don't get better, they use medicine they buy at local market and as a final treatment, they go to clinics. The prior research 4) concerning the penetration of health insurance card for the poor mentioned earlier showed that among the users of provincial hospitals, only 13.6% of the hospitalized patients and 1.4% of the outpatients were the holders of health insurance card for the poor people. Also, at rural district hospitals, 38.1% of the hospitalized patients and 19.8% of the outpatients were the holders of health insurance card for the poor people. These research results show relatively low usage rates by the poor people. These results show the same results obtained from our field research. (Table 2, 3)

(a) Consultation Frequency		(b) Frequency of Usage of Health Insurance Card for the Poor People		(c) Usage of Health Insurance Card for the Poor People	
Rural Clinic	34	Health Insurance Card User	12.9	Health Insurance Card for the Poor People	22.3
Healthcare Professional	30	User of the Insurance Card for the Poor People	11.8	Awareness of the Health Insurance Card for the Poor People	21.1
Rural District Hospital	14	Pharmacy User	1.9	Awareness of the Usage of the Health Insurance Card for the Poor People	19.1
Health Worker	11	Medical Expense Deduction User	1.6	Medical Insurance Card User	37.5
Pharmacy	10	Other	71.8		100
Provincial Central Hospital	1		100		
	100				

Table 2. *Interview Results (January 2008) – Usage of Health Insurance Card for the Poor People in Vietnam (%)*

Item	Data (Person)	%
Hoa-Binh Province Population	820,631	
Number of the Holders of the Health Insurance Card for the Poor People in the Province	457,950	55.8
Usage Rate of the Holders of the Health Insurance Card for the Poor People to the Outpatients of the Provincial Hospitals	Holders of the Health Insurance Card for the Poor People:1,788, Total:126,385	1.4
Usage Rate of the Holders of the Health Insurance Card for the Poor People to the Inpatients of the Provincial Hospitals	Holders of the Health Insurance Card for the Poor People:3,036, Total:22,295	13.6
Usage Rate of the Holders of the Health Insurance Card for the Poor People to the Outpatients of the Rural District Hospitals	Holders of the Health Insurance Card for the Poor People:58,299, Total:294,093	19.8
Usage Rate of the Holders of the Health Insurance Card for the Poor People to the Inpatients of the Rural District Hospitals	Holders of the Health Insurance Card for the Poor People:14,215, Total:37,311	38.1

(Source) Hoa-Binh Province Healthcare Department/Rural District Hospitals

Table 3. Usage of the Provincial/Rural District Hospital by the Holders of the Health Insurance Card for the Poor People (2006)

As mentioned above, the penetration of the medical insurance is slow among the low income families in the rural villages in Vietnam instead of percentage of health insurance participation of population are increasing (Figure 2). Also, the medical fee for the children below age 6 is officially free, but the medical fee must be actually paid. Therefore, the “Common Fund System” operated by the common committee participated by the village people is proposed as a way to cover medical fees to make medical consultation at the clinics easier for the local people.

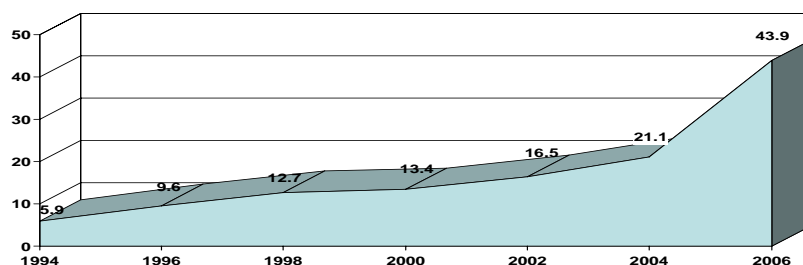


Figure 2. Percentage of health insurance participation of population

(Source: Health statistics yearbook 2006 – Ministry of Health)

## 4 PREVISIONS STUDIES CONCERNING SOLUTION OF THESE QUESTIONS

### 4.1 Introduction of Referral system and Health Information System

Japan International Cooperation Agency “Referral system in Healthcare” (2008) suggested that some very helpful systems of improvement of healthcare were a referral system between Bach Mai Hospital in Hanoi, Hoa Binh Hospital in Hoa Binh province and local clinics in remote areas. Because of the relationship not only between medical facilities but also between the facility and residents, mobile

clinics and periodical home visits were effective for people for whom access to primary medical facilities was difficult 3). Using health information system(HIS) concepts, Kim Anh (2009) proposed that onset of the process of health information system, the success and failure raised the development and implementation of HIS in Vietnam. It is needed to discuss in a critical way in the context of Province and Hanoi capital city. 5)

#### 4.2 Proposals for the Introduction of the Common Fund System Participated by Local People and Telemedicine

As a prototype of such a common fund, we propose “Kou” (social group), a type of project called “Mujin” or “Tanomoshikou” (mutual loan association) in Japan<sup>6</sup>). This system provides financing for payment of medical fees and medicine costs by the person who contributed funds to the common fund, and working fund financing for medical institutions. An approval for financing for the clinics is made by the common committee, and the contribution to the common fund is made at the monthly community meeting. Also, assistance from the donor nations is expected for the initial funds, medical equipments, and medicines at the time of set up of a clinic. In addition, especially in the rural villages, expected medical services are not available due to low quality of and difficult access to medical for prophylactic measure for basic diseases. In order to solve these problems, the rural villages and the urban general hospitals should be linked through the telemedicine system. The system will be a cost-saving system to visit the rural clinics using mobile van equipped with medical equipments, and aimed at the same level of basic diagnosis as the urban general hospitals. (Figure 3)

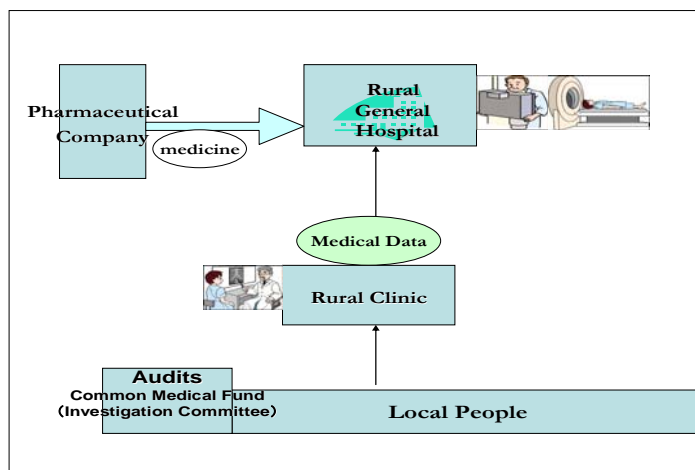


Figure 3. Common Fund System Participated by the Local People, Rural and Rural Clinic (Step1)

## 5 REFERRAL MANAGEMENT SYSTEM IN VIET NAM

### 5.1 Medicine Supply System

The proposed medicine management center prepares the medicine inventory master file in a form classified by each clinic in the province in accordance with the region and disease analysis based on the doctors instructions made based on the telemedicine data from the urban general hospital. Accordingly, the medicine management center purchases medicines. The funds are delivered from the medical fund. As such, this is the establishment of the system data linking the telemedicine diagnosis and the medicine inventory. (Figure 4)

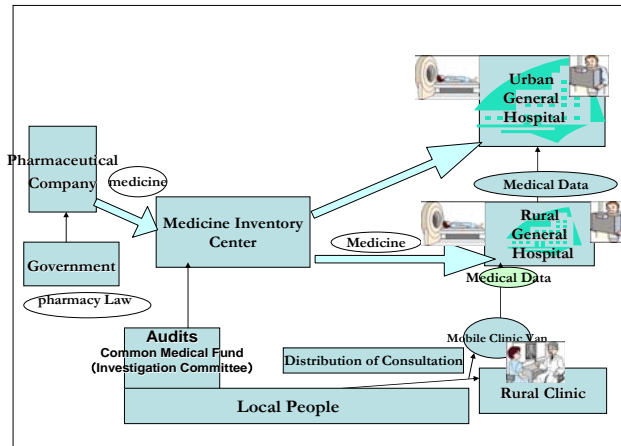


Figure 4. Rural Clinics and Medicine Management System (Step2)

## 5.2 Advantage of the mobile telemedicine van clinic system

For example, the road round to the local clinic from the district general hospital of Hoa-Binh Province, there are some national roads where it runs to the mountains village and has the rural road. Moreover, the river and the lake might run from the national road in the mountains village via the mountain path and it runs in the river and the lake by using a ferry.(Figure 5)



Figure 5. Hoa Binh Province by Google View2010



Figure 6. Rrural village clinic

## **6 BARRIERS TO THE INTRODUCTION OF TELEMEDICINE SYSTEM**

People involved in medical service at Bach Mai Hospital and the private French Hanoi Hospital in Hanoi, capital of Vietnam, argue that there are the following barriers to the introduction of telemedicine system.

(1) Cost burden to provide and maintain medical equipments ,(2)Insufficient knowledge of medical equipment usage by medical staff,(3)Unfamiliar medical equipment operation,(4)Undeveloped laws concerning telemedicine diagnosis

## **7 CONCLUSION**

According to the World Health Organization, the expected roles of the healthcare system are health improvements, provision of healthcare service in accordance with needs, and protection from funding risk7). As stated in the healthcare data, Vietnam's healthcare situation is not satisfactory. Particularly in the rural villages, expected medical service is not provided due to low quality public medical sector, and difficulty in access.

In order to solve the problem, we studied the ways to link the rural villages and urban general hospitals through telemedicine. In this process, the introduction of the "telemedicine diagnosis system" is emerged as a solution.

Also, we studied about the cost of linking the Vietnam rural villages and urban general hospitals through telemedicine. we mentioned that the purchase and maintenance of the telemedicine equipments are possible using the government fiscal budget because the healthcare disbursement from the government that is responsible for healthcare is primarily made to the primary medical institutions. In addition, it is discussed that when the costs are compared between the mobile equipments and the fixed equipments, it is more economical to use mobile-type clinic because it can visit the patients in the clinics scattered in the province, and to cooperate by sending data to the urban general hospitals via the regional hospitals.

Lastly, putting the medicine management into perspective, where the rural villages are linked with the urban general hospitals through the telemedicine system, and the medicine management methods are based on the data linked to the patient's telemedicine diagnosis results. That is to say, the "Mobile Telemedicine Van clinic and Vertical Integration-type Medicine Management System" is proposed, in which medicines are stably provided in accordance with the needs of the patients diagnosed at the clinics scattered in the rural areas, and based on the data accumulated by the management data centers which are established by the medicine inventory centers adjacent to the regional general hospitals in the regional cities. And also we point out a few barrier of introduction of telemedicine, especialy costs.



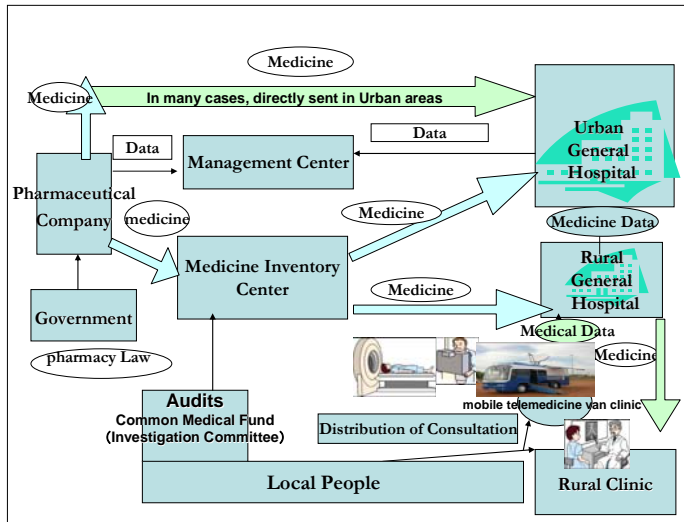


Figure 7. Rural Clinics and Vertical Integration-type Medicine Management System (Final)

Problems	Medical system has downgraded
Questions	Health worker only interested in working in provinces and cities
Findings	<b>Mobile Telemedicine Van clinic and Vertical Integration-type Medicine Management System</b>

Figure 8. Findings from the Studies

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