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MINISTRY OF HEALTH



UNITED NATIONS DEVELOPMENT
PROGRAMME VIETNAM



PROJECT ON GRASSROOTS TELEMEDICINE CONSULTATION USING THE SOFTWARE “DOCTOR FOR EVERYONE”

ASSESSMENT REPORT FOR THE PERIOD
JANUARY TO MAY 2023

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LIST OF ABBREVIATIONS

CHS	Commune Health Station
DHC	District Health Centre
GD	Group discussion
IT	Information Technology
MOH	Viet Nam Ministry of Health
DOH	Department of Health (provincial level)
UNDP	United Nations Development Programme



I. INTRODUCTION

Telehealth (“Y tế từ xa”) means the exchange of information related to an individual’s health between a medical professional and an individual or among medical professionals at different locations through the means of information technology and telecommunications. The COVID-19 pandemic has further demonstrated the need for the development of telehealth to support social distancing measures, in order to reduce the risk of disease transmission, to maintain and enhance the quality of essential medical services, and – indirectly – to improve the quality of people’s treatment and healthcare.

Therefore, the development of telehealth has been prioritized by the Government for investment and initial implementation in the Programme of National Digital Transformation to 2025, with a vision to 2030 (Decision No. 749/QĐ-TTg, dated June 3rd, 2020, on Approving the Programme of National Digital Transformation to 2025, with a vision to 2030). In order to promote the application of information technology in caring for people, on March 8th, 2022 the Prime Minister signed Decision No. 318/QĐ-TTg on the Promulgation of the National Criteria for New Rural Communes and the enhanced National Criteria for Advanced New Rural Communes for the period 2021-2025, which includes criterion no. 14.3 stipulating that the percentage of people participating in and using telemedicine applications is to reach >40% (applicable to both men and women) for advanced new rural communes in all regions of the country.

Accompanying the Ministry of Health in the development of telehealth, from December 2020 the United Nations Development Programme (UNDP) coordinated closely with the Electronic Health Agency (EHA, now the National Health Information Centre) of the Ministry of Health and the Departments of Health (DOH) of Ha Giang, Bac Kan and Lang Son provinces to implement the Project on Telemedicine Consultation at the Grassroots Level using the Software "Doctor for Everyone" (called the Project in this report). The software "Doctor for Everyone" has been developed utilising web and smartphone platforms, with the functions of booking appointments at commune health stations (CHS), conducting consultations or online meetings with video, and allowing multi-point calls. Through the software "Doctor for Everyone", the Project has helped connect health workers in Commune Health Stations (CHS) with higher-level medical units to conduct periodic briefings, professional activities, and remote consultations. At the same time, with the goal of "leaving no one behind", the Project has also helped connect people – especially people in remote and mountainous areas, ethnic minorities, and people with disabilities – with health workers at the CHS for health advice, appointment booking and remote medical examination and treatment. The previous assessment report, for the period 2020-2022, shows that the implementation process in three provinces achieved positive results; moreover, when expanded, provinces could achieve criterion No. 14.3 on advanced new rural communes.

In order to maintain and replicate the effectiveness of the Project on Telemedicine Consultation at the Grassroots Level using the Software "Doctor for Everyone", on August 8th, 2022, UNDP sent an official note to the Viet Nam Ministry of Health (MOH) requesting continued coordination for the next stage of implementation in five provinces, including Thua Thien Hue, Quang Ngai, Binh Dinh, Dak Lak and Ca Mau. To evaluate the implementation results, and find out the shortcomings, difficulties and advantages and lessons learned during implementation in the five abovementioned provinces and the ability to maintain and expand the telehealth programme on a national scale, UNDP in collaboration with the Ministry of Health has implemented this Evaluation of the Project on Telemedicine Consultation at the grassroots Level using the Software "Doctor for Everyone" implemented by UNDP in collaboration with MOH and the five provinces of Thua Thien Hue, Quang Ngai, Binh Dinh, Dak Lak and Ca Mau.



II. OBJECTIVES

1. General objective of the Evaluation

To assess the suitability, effectiveness and feasibility and to find out difficulties and inadequacies in the implementation process, sustainability and replicability of the Project on Telemedicine Consultation at the grassroots Level using the Software "Doctor for Everyone" implemented by UNDP in collaboration with the MOH in five provinces, namely Thua Thien Hue, Quang Ngai, Binh Dinh, Dak Lak and Ca Mau, and thereby to suggest recommendations for nationwide application in the coming time.

2. Specific objectives

- 2.1. Evaluate the implementation process and results, difficulties, advantages and lessons learned from the Project on telemedicine consultation at the grassroots level using the software "Doctor for Everyone".
- 2.2. Describe impacts of the Project in the beneficiary areas.
- 2.3. Propose solutions and recommendations to improve efficiency, ensure sustainability, and expand the implementation of the software at the grassroots level in the coming time.



III. ASSESSMENT METHODOLOGY

1. Design

The assessment used a cross-sectional descriptive study design, combining quantitative and qualitative research methods.

2. Timing and locations

Duration: May – June 2023.

Locations: the five provinces implementing the Project, including Thua Thien Hue, Quang Ngai, Binh Dinh, Dak Lak and Ca Mau. In each province, one district and two communes were selected for the field survey.

3. Data collection methodology and contents

Table 1. Summary of information collection

Method	Subjects	Workload
Collecting qualitative data		
Reports, group discussions and in-depth interviews	At the provincial level: <ul style="list-style-type: none"> Written reports 	
	At the district level: <ul style="list-style-type: none"> Group discussion with leaders and relevant health workers of the district health centre/general hospital (01 discussion/province) 	1 discussion/district x 5 districts = 5 discussions
	At the commune level: <ul style="list-style-type: none"> Group discussion with health workers of the CHS (01 discussion/province) Group discussion of local people (02 discussion/province) 	1 discussion/commune x 5 communes = 5 discussions 1 discussion/commune x 10 communes = 10 discussions
Collecting quantitative data		
Statistics on the activities and results of the Project	<ul style="list-style-type: none"> Data of the Project Statistical report from the software 	
Online survey form	Health workers involved directly in the Project <i>(Sampling: All health workers directly involved and currently working at health facilities of the Project)</i>	1,870 respondents
Collecting and reviewing available documents and data		
Reviewing and analysing the secondary data	<ul style="list-style-type: none"> Legal documents of the Project Periodical data and reports of the Project Available documents and reports of other projects on telemedicine at the grassroots level Health statistics 	



IV. RESULTS

1. Legal basis and economic, social and health context of the Project

1.1. Purpose of the Project

This activity was implemented within the framework of the Project "Support to strengthening vaccine access and health system capacity for Viet Nam's response to Covid-19" carried out by UNDP in collaboration with the MOH with non-refundable aid from the Government of Japan via UNDP. This activity has also helped to provide telemedicine solutions in different contexts in Viet Nam that are heavily impacted by climate change and weather, including coastal areas, the South Central Highlands and the Mekong River Delta in southern Viet Nam, to contribute to digital transformation in the health sector.

1.2. Legal basis of the Project

After finishing the pilot phase in three mountainous provinces in northern Viet Nam with difficult socio-economic conditions, UNDP and the MOH selected five provinces, including Thua Thien Hue, Quang Ngai, Binh Dinh, Dak Lak and Ca Mau, to implement the Project on Telemedicine Consultation at the Grassroots Level using the Software "Doctor for Everyone". The legal basis of the Project included:

- The Project has complemented the Project on Remote Medical Examination and Treatment of the MOH (Decision No. 2628/QD-BYT, dated June 22nd, 2020, approving the Project on Remote Medical Examination and Treatment for the period 2020-2025) to implement the Government's Programme of National Digital Transformation to 2025, with a vision to 2030 (Decision No. 749/QD-TTg, dated June 3rd, 2020, approving the National Digital Transformation Programme for the period of 2025, with a vision to 2030).
- The Project would help localities to achieve Criterion 14.3 of the National Criteria for New Rural Communes in the period 2021-2025 (Decision No. 318/QD-TTg, dated March 8th, 2022, of the Prime Minister on promulgating the National Criteria for New Rural Communes and Newly-Advanced Rural Communes for the period 2021-2025).
- Telemedicine to strengthen the capacity of the grassroots health care level in the five selected provinces was one of the activities under the Project "Support to strengthening vaccine access and health system capacity for Viet Nam's response to Covid-19" carried out by UNDP in collaboration with the MOH with non-refundable aid from the Japan Government via UNDP.
- The official note sent by the UNDP Resident Representative in Viet Nam (dated August 8th, 2022) to the MOH proposing to cooperate in expanding the telemedicine consultation programme and improving the capacity of the grassroots health care level using the software "Doctor for Everyone" in five provinces as the basis for nationwide expansion.

1.3. Socio-economic conditions of the Project provinces

The five provinces supported by the Project are located in remote coastal and island areas, mountainous areas and ethnic minority areas in the Central Highlands, South Central Coast and Mekong River Delta. At the same time, these provinces still face many difficulties in transportation, education levels, economy, etc. Specifically, Quang Ngai and Dak Lak are two provinces with a higher proportion of ethnic minorities than the national rate (Table 2).

Table 2. Social conditions of provinces in the Project

Index	Nation-wide	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau
Population (thousand people)	98,506.2	1,153.8	1,244.1	1,508.3	1,909.0	1,208.8
Population density (person/km ²)	297	233	241	249	146	229
Proportion of women (%)	50.2	50.5	50.6	50.8	49.5	49.3
Proportion of ethnic minorities (%)	14.7	4.7	15.6	2.8	35.7	4.3

Source: Statistical Yearbook 2021

The multidimensional poverty rates of Quang Ngai, Dak Lak and Binh Dinh are higher than the national average. The percentages of poor and near-poor households without health insurance are higher in Quang Ngai and Ca Mau than in the country as a whole. The percentages of poor and near-poor households that do not have access to telecommunications services in Thua Thien Hue, Quang Ngai, and Binh Dinh are higher than that of the country as a whole (Table 3). When the poor do not have access to telecommunications services and do not have the means to access the information, it is also a challenge to ensure equity when implementing the Project Telemedicine Consultation at the Grassroots Level using the Software "Doctor for Everyone".

Table 3. Economic conditions of provinces in the Project

Index	Nation-wide	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau
Multidimensional poverty rate (%)	7.52	6.86	14.16	9.04	18.72	4.27
Ranking by multidimensional poverty rate (from high to low)	-	35	17	25	12	46
Percentage of poor households (%)	4.03	3.56	7.80	4.50	10.94	2.41
Of which:						
Proportion of households without health insurance compared to the total number of poor households (%)	55.65	53.36	35.94	63.49	33.09	67.56
Proportion of households not using telecommunications services compared to the total number of poor households (%)	37.67	73.89	58.05	50.92	21.95	28.62
Proportion of households without the means of accessing the information compared to the total number of poor households (%)	18.55	47.64	29.19	14.26	8.40	9.17
Percentage of near-poor households (%)	3.49	3.30	6.36	4.54	7.77	1.86
Of which:						
Proportion of households without health insurance compared to the total number of near-poor households (%)	57.49	48.89	50.72	69.88	50.95	75.74
Proportion of households not using telecommunications services compared to the total number of near-poor households (%)	15.60	36.93	28.86	23.21	9.70	7.32
Percentage of households without means of access to information compared to the total number of near-poor households (%)	4.96	13.40	4.64	3.74	3.05	1.72

Source: Results of the review of poor and near-poor households in 2022 according to Decision No. 71/QD-LDTBXH dated January 19th, 2023 of the Ministry of Labour, War Invalids and Social Affairs announcing the results of the review of poor and near-poor households in 2022 according to the multidimensional poverty line for the period 2022 – 2025.

Such socio-economic conditions have greatly affected healthcare services delivery in general and primary health care services delivery for people in the community in particular, as well as access and use of high-quality healthcare services. Therefore, it is necessary to have intervention projects such as the Project of telemedicine consultation at the grassroots level using the software "Doctor for Everyone" so that people can get better health care, ensuring equity in health care delivery.

The Project provinces have typical socio-economic conditions for central and southern provinces (Phase 1 had been implemented in three northern provinces), so summarizing the two phases will provide lessons

learned in all three zones for nationwide expansion.

1.4. Health and healthcare conditions in the Project provinces

Table 4. Some basic health and healthcare indicators in the Project provinces

Index	Nation-wide	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau
Health indicators						
Crude birth rate	15.7	17.0	13.6	14.5	15.2	12.8
Crude death rate	6.4	7.5	7.4	7.4	5.2	5.4
Under-1 child mortality rate	13.6	17.4	16.8	14.3	20.0	10.4
Under-5 child mortality rate	20.5	26.2	25.3	21.5	30.2	15.5
Population growth rate	0.95	1.77	0.87	1.36	1.16	1.24
Percentage of undernourished children under 5 years old (Weight for Age)	11.2	10.6	13.2	12.0	18.0	11.3
Percentage of malnourished children under 5 years old (Height for Age)	19.2	21.6	20.9	21.2	28.3	21.0
Percentage of malnourished children under 5 years (Weight for Height)	3.6	5.6	5.8	4.3	7.2	7.0
Percentage of children < 1 year old who are fully vaccinated	87.1	97.3	95.0	97.9	88.4	76.7
Number of deaths from obstetric complications in 2020	3,779	0	1	38	70	128
Percentage of women giving birth receiving antenatal care \geq 3 times in 3 trimesters	74.4	62.6	80.9	82.7	52.9	69.8
Rate of delivery by health workers	92.9	100.0	97.0	99.8	81.8	100.0
Percentage of mothers with postpartum examination	85.4	100.0	92.5	70.8	100.0	99.4
Healthcare indicators						
Percentage of CHS with doctors	87.7	100.0	100.0	100.0	100.0	100.0
Percentage of CHS with medics or midwives	94.5	95.4	100.0	92.5	94.6	100.0
Percentage of CHS meeting the national criteria for Commune Health 2011 – 2020	91.0	97.3	85.0	100.0	98.9	100.0

Source: Statistical Yearbook 2021; Yearbook of Health Statistics 2020.

In all five provinces, the health sector has implemented many solutions to increase access and improve the quality of healthcare services for the people. Therefore, the health indicators were similar or even better than the national indicators; for example, the provinces have ensured that all CHS have at least one doctor and one OB-GYN or midwife. The percentages of CHS meeting the national criteria for Commune Health

were higher than the national average.

However, the environmental conditions affected by climate change and difficult socio-economic conditions have significantly affected the health indicators of people in these provinces. Many health indicators, especially in maternal and child health, were still inferior to the national ones; for example, the crude mortality rate, the under 1-year child mortality rate, the under 5-year child mortality rate, and the under 5-year child malnutrition rate all were higher than the national rates.

If people have timely access to health workers and healthcare services, timely emergency support and regular visits in the community, it can make a significant contribution to improving health outcomes and reducing morbidity and mortality. This further proves the necessity of focused intervention projects for provinces with difficult conditions, prioritising primary health care and capacity building for grassroots health care. The Project therefore contributes to implementing the orientation of "Leaving no one behind" of the State and Government of Viet Nam.

2. Project activities and results

2.1. Project preparation process and results

2.1.1. Project management and administration

2.1.1.1. Baseline evaluation: To prepare for the implementation of the Project, the provincial DOH of the five participating provinces carried out a self-assessment on IT infrastructure readiness according to the guidance of the Viet Nam Administration of Medical Services. Subsequently, from October to November 2022, programme officers of UNDP directly surveyed the preparation process (Table 5). The results of self-assessment by each DOH and the field survey by UNDP experts showed that all five provinces were ready to install the server and implement the Project.

2.1.1.2. Forming a network to implement the Project from central to the local levels: After receiving the official note from UNDP, at the central level, the leaders of the MOH assigned the Viet Nam Administration of Medical Services – the permanent focal point of MOH for directing the Project on Remote Medical Examination and Treatment for the period 2020-2025 – as the focal point for the Project on Telemedicine Consultation at the Grassroots Level using the Software "Doctor for Everyone". The Electronic Health Agency (EHA, now the National Health Information Centre) of MOH was the coordinating unit responsible for IT-related components. Locally, each provincial DOH established a focal point to implement the Project and a focal point for IT support.

2.1.1.3. Project Kick-off Workshop: In order to facilitate the implementation process, UNDP Viet Nam cooperated with MOH to organize the Workshop to introduce the Project with local authorities of all five provinces. Through the workshop, the local governments understood the value of the Project for the health and the satisfaction of the people, improving the capacity of the grassroots healthcare system and contributing to the socio-economic development of the locality. Therefore, during the implementation process, the Project has been well received with the agreement and active participation of the entire local socio-political system, from authorities at all levels to associations, mass organizations and people, not just



within the scope of activities in the health sector.

2.1.1.4. Developing the project implementation plan and guidelines: At the central level, UNDP Viet Nam in collaboration with the Viet Nam Administration of Medical Services has developed a general master plan for the entire Project. On October 19th, 2022, the Viet Nam Administration of Medical Services issued Document No. 1373/KCB-QLCL&CDT to five provincial DOH on the implementation of the Project on Telemedicine Consultation at the Grassroots Level using the Software "Doctor for Everyone" in order to fulfil a number of targets in the National Criteria for Rural Development and the New Rural Construction Programme in the period 2021 – 2025 and Document No. 48/KCB-QLCL&CDT, dated January 12th, 2023, on guiding the implementation of telemedicine consultation at the grassroots level. Locally, all five provinces have prepared province-wide plans and issued official documents to guide lower-level units to implement the Project. Based on the general plan, 100% of the DHC have also developed their own implementation plans in their district.

Table 5. List, time and standard performance results of the Project

Index	Time of implementation	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau
Evaluating the readiness for the Project implementation	Oct – Nov, 2022	Reported	Reported	Reported	Reported	Reported
Forming a network to implement the Project from central to local levels	Jan, 2023	Already available	Already available	Already available	Already available	Already available
Project Kick-off Workshop	8-24th	Completed	Completed	Completed	Completed	Completed
Developing the project implementation plan	20th Jan, 2023	Already available	Already available	Already available	Already available	Already available

Source: Report of provincial DOH

A comparison with the proposed plan showed that the list and outputs of each activity are in line with the requirements (Table 5). However, due to procedural and administrative issues, the progress of project preparation activities was delayed by three-to-four months compared to the set schedule. This has affected the progress as well as the results of the subsequent project implementation phase.

2.1.2. Upgrading the software "Doctor for Everyone" and Preparing the IT infrastructure

2.1.2.1. Upgrading and maintaining the software "Doctor for Everyone"

The software "Doctor for Everyone" was developed by UNDP Viet Nam in coordination with the Electronic Health Agency (EHA, now the National Health Information Centre) of MOH and deployed completely free of charge in all eight provinces in the project. The software has a copyright certificate issued by the Copyright Office of the Viet Nam Ministry of Culture, Sports and Tourism. The software was also posted to the application store of iOS and Android platforms under the development authority (Developer) of the MOH. The software is designed for many target groups with different usage features (Appendix 2). Groups are granted permissions and delegated certain features to use in accordance with their needs and roles. When handing over and putting into use, most of the features have met the needs of the users (Table 6).

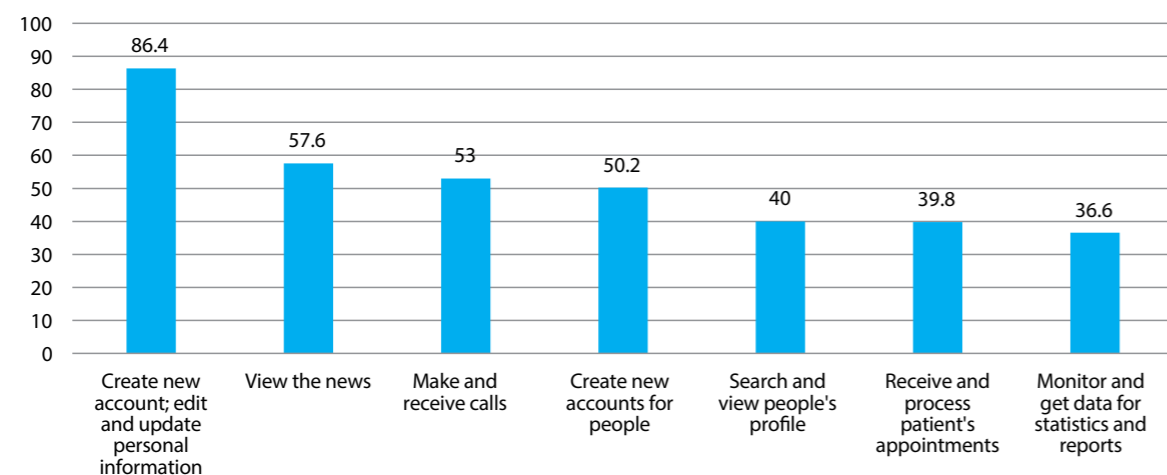
Table 6. Subjects and features used for each target group

Subjects	Designed features	Used features
People	<ul style="list-style-type: none"> Download software Create their own account Make an appointment for health examination Receive information on health communications and the disease situation 	<ul style="list-style-type: none"> Download software Create their own account Make an appointment for health examination Receive the information on health communications and the disease situation
Health workers at grassroots level	<ul style="list-style-type: none"> Create and edit personal accounts Create accounts for people Receive and schedule medical care of patients Create and receive individual calls Create and receive group calls Receive news and notifications View stats and reports 	<ul style="list-style-type: none"> Create and edit personal accounts Create accounts for people Receive and schedule medical care of patients Create and receive individual calls Create and receive group calls Receive news and notifications View stats and reports

Subjects	Designed features	Used features
Health workers at upper-level hospitals/medical centres	<ul style="list-style-type: none"> Make and receive individual calls Create and receive group calls View telemedicine records of lower level units Receive news and notifications View stats and reports 	<ul style="list-style-type: none"> Make and receive individual calls Create and receive group calls View telemedicine records of lower level units Receive news and notifications View stats and reports
Provincial Administration	<ul style="list-style-type: none"> Manage and post the news in the whole province Get the calls and navigation Statistics and analysis of provincial data (people, health workers, appointment schedules, calls) on the Dashboard Notice to users in the province Manage people's accounts according to the hierarchy 	<ul style="list-style-type: none"> Manage and post the news in the whole province Get the calls and navigation Statistics and analysis of provincial data (people, health workers, appointment schedules, calls) on Dashboard Notice to users in the province Manage people's accounts according to the hierarchy
Central line administration	<ul style="list-style-type: none"> Manage the accounts (health facilities, users) throughout the system Navigate calls by province Manage forms and interfaces Store, extract and analyse the information and data of the whole system 	<ul style="list-style-type: none"> Manage the accounts (health facilities, users) throughout the system Navigate calls by province Manage forms and interfaces Store, extract and analyse the information and data of the whole system

Source: Summary report on developing and implementing the software "Doctor for Everyone"

Results of interviewing with health workers showed that health workers have used all features of the software. The features with the highest frequency of use were creating an account, watching news and receiving calls for support / technical briefings (accounting for 50%). Meanwhile, the features of creating accounts and receiving medical appointments of people, although newly implemented, have been used by nearly 40% of health workers (Figure 1).

Figure 1. Features of the software "Doctor for Everyone" used by health workers

Source: Survey on health workers

The functions of medical examination, drug prescription, follow-up examination, and online health consultation for people do not yet have sufficient legal basis, so they are still temporarily locked. According to the survey, the vast majority of health workers did not want to open direct health consultations for people because CHS do not have enough human resources to do so.

At the beginning of the intervention phase in the five provinces, UNDP provided technical support to upgrade the software, including adding new features such as: health workers could create accounts for people through personal accounts, create call groups by themselves, import and export the data of patient records and statistical reports in MS Excel format, create and view frequently asked questions, add a module to redirect video calls to the provincial line, etc.

In the process of using the software, the project had timely remedies for almost all unsuitable features. Some features needed the cooperation of many parties such as: regularly maintaining the Developer account on the Apple and Google application stores, registering the SMS brand name of the MOH, or connecting with other medical software. The Project is working with other parties to set up the plan to address these issues (Table 7).

"All features are used. The feature for people to call directly should not be opened because from COVID until now, the CHS has connected to Zalo and to personal phone, which has been very difficult. I couldn't be on line 24 hours a day. If the connection is not answered, there will be questions. The staff at the station are few, and answering the phone overloads them."

Group discussion at CHS, Thua Thien Hue

"From the date of improving the export function to MS Excel, it's much better. Before that, it took a very long time as it was done by hand. Many times while doing it, you would make a mistake and have to redo it."

Group discussion at CHS, Binh Dinh

Table 7. Unsuitable features and solutions for the software "Doctor for Everyone"

Problems	Unsuitable features	Solutions
Software operating platform	<ul style="list-style-type: none"> iOS mobile device users couldn't download the software from the Apple iOS app store yet Requires updating the software too often 	<ul style="list-style-type: none"> iOS mobile device users installed via a third-party link, but in the long term, MOH needs to renew the Developer account. The new development phase needs updating and improving features; when running stably, it will require less updates.
Create new account	<ul style="list-style-type: none"> There was only one form of authentication via personal email (because the National Centre for Health Information did not have an SMS brand name, so it was not possible to create and send authentication prompts via phone numbers) 	<ul style="list-style-type: none"> Add a feature enabling health workers to create new accounts for people.
24/7 service feature	<ul style="list-style-type: none"> The system automatically signed out, so it did not guarantee continuous 24/7 service. 	<ul style="list-style-type: none"> The software sets up a common logout time to ensure the information security. Upon request, this feature could still be opened on the software.
Connecting feature	<ul style="list-style-type: none"> There is no connection with other health software such as health insurance payment software, hospital management software, CHS management software, and public health record management software. 	<ul style="list-style-type: none"> Working with the National Centre for Health Information to connect with MOH's VTelehealth platform to connect and integrate with other health examination and treatment software.

Source: Group discussions with five provincial DOH and 5 DHC

For IT-related support, the Project has created Zalo groups, including for technical staff of the software design unit, IT staff of provincial DOH and UNDP's project coordinator, so problems related to the software were resolved in a timelier manner. In the new phase, the time to resolve non-conforming features of the category "not subject to software repair" was 12 hours and "must fix software" was 48 hours. IT staff of provincial DOH have also been assigned to assist health workers in solving simple errors such as login errors, errors without images/sounds.

By the end of June 2023, the software was still in the warranty period, meaning the contractor will continue to maintain technical support under the 12-month warranty contract. However, the software still needs to be continuously upgraded in terms of features to meet the new requirements as well as the expansion of implementation.

2.1.2.2. Server system: In the previous stage, UNDP donated two server computers located at the Data Centre of the Electronic Health Agency (EHA, now the National Health Information Centre) of MOH to install and deploy the software "Doctor for Everyone". In order to reduce the load on the servers at MOH, UNDP purchased and installed five servers, including one at each of the five provincial DOH. The servers were all decentralized and assigned clear responsibilities. The server at MOH contains the entire source code of the system, so all features such as appointment booking, reporting, administration, etc. of the software are redirected to MOH's server. In order to reduce the load and increase the quality and stability of the images, the server at each provincial DOH was assigned the conversation function (audio and video calls): Calls made by users in one province are redirected by the MOH server to use the server at the DOH of that province.

2.1.2.3. Infrastructure for server placement: To prepare for the safe installation and operation of the servers, all DOH have prepared the infrastructure of the server room in advance according to the standards required by MOH, including: Standard racks (04U free space, including 02U open, 02U for servers); Internet connection (01 Listedline transmission channel: 100Mbps, 01 IP public); IP address; Cooling and dehumidifying system; Fire prevention and fighting system.

2.1.2.4. Terminal equipment for grassroots health: The project's objective was to provide technical support based on the existing local IT infrastructure. However, to support a number of CHS in difficult areas, UNDP provided the five provinces with 75 sets of desktop computers with microphones, webcams and speakers to conduct telemedicine consultation at the grassroots level using the software "Doctor for Everyone".

"UNDP provided 15 desktop computers to support 15 CHS in each province; fortunately, we received 02 desktop computers for the 02 most difficult communes in our district."

Group discussion at DHC, Binh Dinh

In order to be able to implement telemedicine consultation at the grassroots level using the software "Doctor for Everyone", the DHC and CHS need to have equipment including computers with audio-visual support (webcams, speakers, microphones). According to provincial DOH reports, all units at provincial and district levels and 100% of CHS already have computers and Internet connection lines that meet basic IT conditions for project implementation. However, in the actual implementation process, it was identified that only a handful of CHS had sufficient audio-visual aids (webcams, speakers, microphones) to connect to their computer. According to group discussions, the CHS computer must be used for many tasks such as statistics, reporting, and online health insurance payments, so it is not possible to give complete priority to telemedicine consultations at the grassroots level using the software "Doctor for Everyone". The main means of communication used by medical staff in remote medical examination and treatment were still personal mobile devices, so the image/sound could not guarantee the clarity and confidentiality of information.

According to national data on telecommunications, most households in the Project area have a smartphone or a computer (Table 8). This is a favourable condition for the Project to deploy telemedicine consultations at the grassroots level using the software "Doctor for Everyone" to people as the final target subjects.

Table 8. Some basic telecommunications information indexes of localities

Index	Nationwide	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau
Percentage of households with computers	27.13	30.65	22.23	26.1	23.05	14.25
Percentage of households with smartphones	86.58	83.75	76.99	80.32	84.55	86.19
Percentage of adult population using smartphone	70.91	68.26	59.63	67.34	68.2	66.39
Percentage of households with Internet access (both fixed and mobile broadband)	80.99	77.9	73.42	74.74	78.01	57.5
Percentage of Internet users	74.21	74.25	71.22	71.1	69.4	66.32

Source: National Telecommunications and Information Data, 2021

2.1.2.5. Connection line: When supporting telemedicine consultation at the grassroots level using the software "Doctor for Everyone", and especially when supporting emergency cases, it is always necessary to ensure clear images and continuous connection. In fact, the network connection to the commune level was poor, with frequent disconnections. The regular healthcare budget does not have funds to support the cost of paying 3G and 4G providers for health workers who participate in telemedicine consultation at the grassroots level using the software "Doctor for Everyone".

"The coastal areas are hard to reach directly and have poor internet."

Group discussion at DHC, Ca Mau

Although the rate of people using smartphone is quite high, only two-thirds of households have internet access (including wired and wireless). In the coming time, in order to implement the Project smoothly and to ensure the IT standards of the National Criteria for New Rural Communes and Advanced New Rural Communes, localities also need to have decisive solutions to improve the IT infrastructure index.

2.1.2.6. Information security on network platforms: The confidentiality of patient information and information security on network platforms are important conditions when implementing remote medical examination and treatment activities in general. During this period, MOH and UNDP have added this content to the Project's activities. Before installation, all servers have been tested and the Ministry of Defence has issued a Cybersecurity Certificate. After being upgraded, the software "Doctor for Everyone" was also checked for information security before being installed and used.

2.2. Preparing human resources and training on the use of the software

2.2.1. Selecting personnel and establishing health advisory groups

Before the Project implementation, 100% of DHC and CHS selected and made a list of personnel to participate in the Project. 100% of DHC in the five provinces have established health consultation groups to support the CHS. For better results, provincial general and specialized hospitals also set up health consultation teams and connected them to the system to support DHC and CHS. Due to the task of providing professional support at lower levels, higher-level medical facilities often appoint doctors, especially experienced doctors, to join the Health Advisory Teams.

2.2.2. Training to use the software "Doctor for Everyone"

- *Number of training courses:* In order for health workers to use the software fluently, the Project has implemented 30 training courses for the five provinces. Training duration was half-day, in the form of online training. The training period was from December 8th, 2022 to February 14th, 2023 in accordance with the plan prepared by UNDP and MOH. The time to organize the training was according to the needs and the time proposed by the provincial DOH. To support CHS that could not participate in the training organised by the province, the Project arranged two additional training classes outside the plan for all five provinces (Table 9).

Table 9. Number of training course

Content	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau	Total
Number of training courses	5	6	6	8	5	30+2*

Source: Training report: Implementation of grassroots telehealth using software "Doctor for Everyone". Note: (*) the 02 additional training courses were open to all five provinces.

- *Training coverage for health facilities:* The objective of the Project was that 100% of DHC and CHS through the five provinces would be trained to use the software. According to reports from the five provinces, as of June 2023, the project had trained 689 CHS (accounting for 89.7% of all CHS), 100% of DHC/hospitals and a number of provincial hospitals (Table 10).

Table 10. Number and percentage of health facilities trained to use the software

Content	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau	Total
Number of provincial/district hospitals, DHC	23	22	11	20	14	90
Number of CHS	138	162	133	169	87	689
Compared to total of CHS in province*	89,0	92,6	81,1	89,9	100	89,7

Source: Training report: Implementation of grassroots telehealth using the software "Doctor for Everyone"

* Note: The number of CHS was based on the Health Statistics Yearbook, 2021

- *Training coverage for health workers:* The Project has trained 2,167 health workers from the five provinces to use the software "Doctor for Everyone" (Table 11).

Table 11. Number and percentage of health workers trained to use the software

Content	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau	Total
Number of trained health workers	500	433	295	670	269	2.167

Source: Training report: Implementation of grassroots telehealth using the software "Doctor for Everyone"

According to the report on the evaluation of training activities, all health workers could participate in the training regardless of gender, age and ethnicity. The process of selecting training subjects has ensured gender equity as well as access for ethnic minority health workers (Table 12).

Table 12. Number and percentage of health workers trained to use the software by gender and ethnicity

Content	Provincial and District Levels		Commune Level		Total	
	n	%	n	%	n	%
Number of trained health workers. In which:	858		1,309		2.167	
Female	362	42.2	720	55.0	1,082	49.9
Ethnic minorities	104	12.1	212	16.2	316	14.6

Source: Training report: Implementation of grassroots telehealth using the software "Doctor for Everyone"

Trained subjects at the commune level were mainly doctors, physicians, nurses and midwives who directly provide medical care to people (Table 13). At the provincial and district levels, the percentage of doctors participating in the training was large (>70%). After being trained, these doctors form the core of the Health Advisory Team.

Table 13. Number and percentage of health workers trained to use the software by professional titles and working levels

Content	Provincial level		District level		Commune level		Total	
	n	%	n	%	n	%	n	%
Doctors	115	75,2	536	71,1	537	42,6	1.188	54,8
Physicians, Nurses, Midwives	17	11,1	127	16,8	560	44,4	704	32,5
Pharmacists	0	0	9	1,2	11	0,8	20	0,9
Others	21	13,7	82	10,9	152	12,2	255	11,7
Total	153	100	754	100	1.260	100	2.167	100

Source: Training report: Implementation of grassroots telehealth using the software "Doctor for Everyone"

Although the number of training courses increased compared to the plan, because the training time (December 2022 and January 2023) coincided with many year-end activities and year-end summaries of many activities at the grassroots health level (including military service examination, cross-examination, etc., which had been scheduled in advance), there were still some CHS and assigned staff who could not participate in the training. Some districts proactively provided additional training for relevant health workers prior to implementation.

Given the fact that the software still needs to be adjusted, and human resources of CHS were always fluctuating, it was difficult to ensure 100% training coverage, and localities will need to maintain periodical retraining activities. In addition, maintaining training also helps health workers to be able to use the software more proficiently once the features and software interface are upgraded when participating in remote medical examination and treatment consultations.

- **Content and quality of training:** When evaluating the training programme, over 75% of the trainees were satisfied with the materials, duration, presentation skills and instructions of the lecturers. The contents of the training course (theory, practice and implementation process) were also evaluated as appropriate by the majority of participants. Only about 4% were not satisfied with these training courses. This shows that the development of the content and methods of the training courses on using the Project's software have been relatively suitable with the qualifications and needs of grassroots health workers (Table 14).

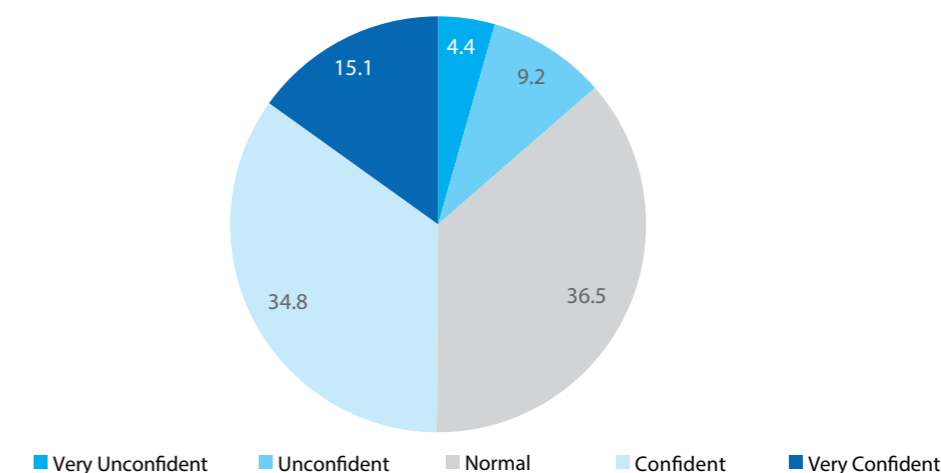
Table 14. Trainees' assessment of the appropriateness of the training programme

Content	Level of Appropriateness (n=2.167)					
	Inappropriate		Normal		Appropriate	
	n	%	n	%	n	%
Training duration	85	3,9	457	21,1	1.625	75,0
Instruction document	76	3,5	418	19,3	1.673	77,2
Lecturer's presentation skills	67	3,1	399	18,4	1.701	78,5
Theoretical guide	69	3,2	402	18,6	1.696	78,2
Practical guide	80	3,7	404	18,6	1.683	77,7
Step-by-step instructions for implementation	73	3,4	451	20,8	1.643	75,8

Source: Evaluation form at the end of the training course using the software "Doctor for Everyone"

After being trained, the confidence level of health workers in using the software from level 3 or higher was 86.4%, while only 9.2% of the trainees were not confident and 4.4% of the trainees were very insecure when using it. However, at the time of assessment (after 3 months), the confidence level of health workers decreased, with only 75% rating their confidence level at level 3 or higher. Up to 25% of staff felt not completely confident when using the software (compared to 13% immediately after training). Since the software "Doctor for Everyone" is newly introduced to medical staff, maintaining regular use combined with refresher training courses on using the software will be necessary to maintain the confidence level of health workers when using the software.

Figure 2. The confidence level of health workers in using the software after the training course



Source: Survey on health workers

2.3. Implementing telemedicine consultations at the grassroots level using the software "Doctor for Everyone"

The implementation of telemedicine consultation was carried out according to the instructions in Document No. 48/KCB-QLCL&CDT, dated January 12th, 2023, of the Viet Nam Administration of Medical Services. Accordingly, the provinces have issued dispatches to deploy the plan to districts and communes, set up a health advisory group, guided people to create accounts, participated in using the software, made medical appointments via mobile applications, and made remote medical consultation calls, briefings, professional exchanges, etc.

2.3.1. Creating accounts for health workers and people

Creating accounts was the first step to get familiar with and using the software. During the period from March 2023 to May 30th, 2023, 3,504 health workers and 513,654 people were granted accounts. Compared to the plan, this was 90.4% of the target of creating accounts for the people and 175% of the target of creating accounts for health workers.

Table 15. Number of accounts and participation rate of health workers in telemedicine consultation

Content	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau	Total
Number of health workers who created an account	739	857	569	861	478	3.504
Number of people who created an account	36.063	95.998	39.805	277.910	63.878	513.654

Creating accounts for health workers: It is common for health workers to create an account by themselves without difficulty because the vast majority of health workers have smartphones, authenticated emails, and basic IT skills.

Creating accounts for people: In the first stage, because the software required people to have an email address to receive an identification number when creating an account, while very few people have an email address, the number of people creating accounts was very small. Through receiving feedback and suggestions from health workers, the Project added the feature that health workers could create accounts for people and import account information in bulk from a list of people in an MS Excel file. This helped to reduce the time to create accounts for people, leading to a significant increase in the number of accounts created. Through group discussion with CHS, it was found that people could set up accounts mainly when going to CHS. In some localities, CHS staffs were more proactive and creative to advise the authorities and mass organizations to join in the implementation of digital transformation in order to achieve the target of New Rural Areas and advanced New Rural Areas. These communes mobilized youth or Community Digital Transformation Teams to go to each village to set up accounts, so the number of people using them was much higher than in other localities. The mobilization of Community Digital Transformation Teams to guide people in installation was an initiative of the grassroots health workers and made a significant contribution to the Project's results.

2.3.2. Consulting and professional support for CHS from higher level units

The project aimed to improve capacity on the spot and continuously for health workers. To achieve this goal, the Project organized briefings, consultations and professional support for CHS from higher-level units through the software "Doctor for Everyone". As a result, after 3 months of implementation, there were about 4,000 calls for remote medical examination and treatment consultations, briefings and professional support requests through the software "Doctor for Everyone". Of these, calls from CHS connecting online with the Health Advisory Team of DHC and even provincial hospitals for professional advice during medical treatment for people were the most frequent (accounting for 67.9% of calls) (Figure 3). When severe cases are treated appropriately at the grassroots level, it not only reduces the costs of people having to go for medical care, but also contributes to improving the capacity of grassroots health workers.



"Old men got more difficult when guiding. All health workers knew how to use it, also have been trained to create account for people. Whoever comes to the CHS, I will guide them and give them an account."

Group discussion at CHS Ca Mau

"When people come for medical examination and treatment, they would be supported by health workers in setting up accounts. Some mobilized youth to go to the area or the village to install it for people."

Group discussion at DHC, Thua Thien-Hue

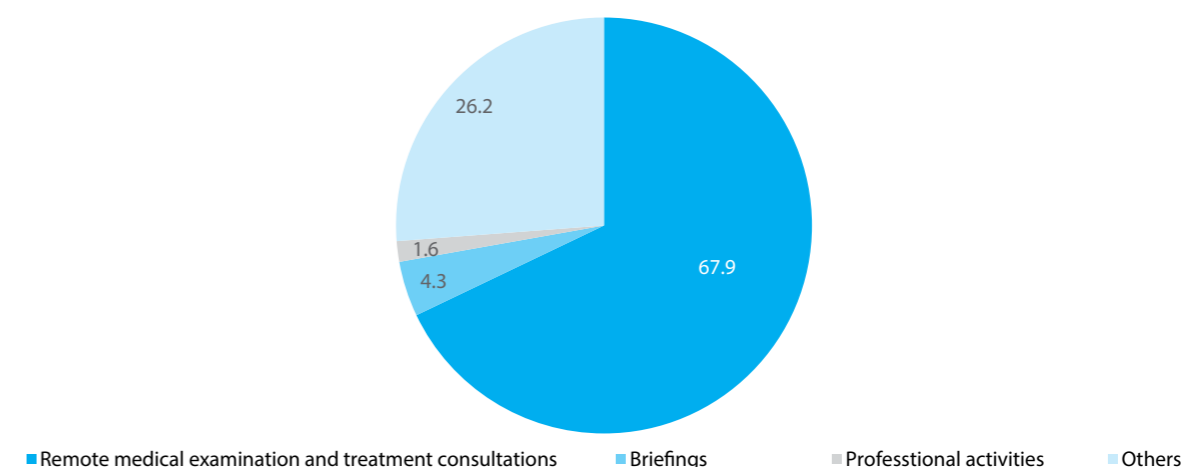
"Community Digital Transformation Team joined to build New Rural Area. This team supported for people to install this software. In other communes, people did it by themselves."

Group discussion at DHC, Binh Dinh

"The commune steering committee has directed commune radio stations. Furthermore, leaflets and posters are also very necessary. In this poster, the brief introduction is very easy to understand, the words are very simple for people to understand."

Group discussion at CHS, Quang Ngai

Figure 3. Results of professional activities using the software "Doctor for Everyone"

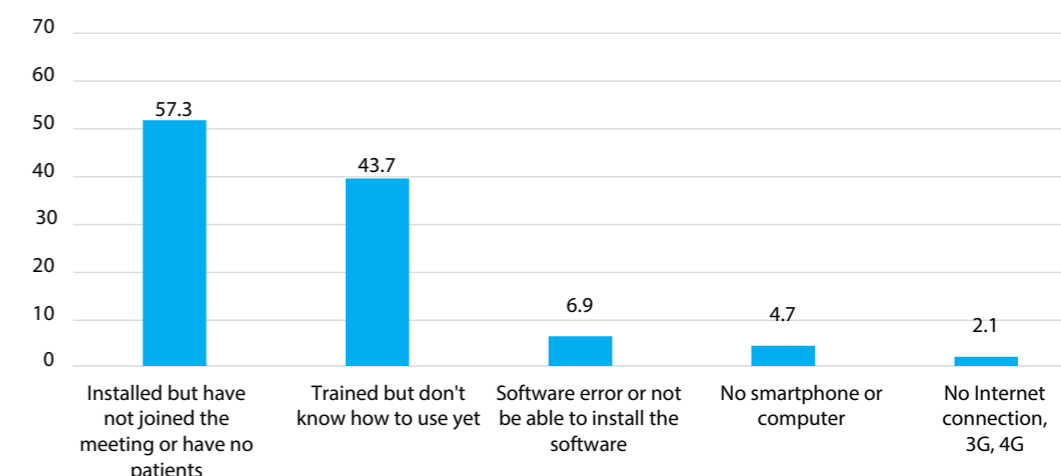


Source: Dashboard on the software "Doctor for Everyone" (Updated May 31st, 2023)

Due to the short implementation time, there were still many health workers who had not yet used the software "Doctor for Everyone" in providing telemedicine consultations at grassroots level.

Among 536 people who have never used the software, the main reasons why health workers have not used their accounts are that they have not attended meetings or have no patients (accounting for 57.3%), or are trained but have not yet used it proficiently (accounting for 43.7%) (Figure 4). Because human resources at the grassroots level are always fluctuating, after being granted accounts, many health workers transferred jobs or were not assigned the task of remote medical examination and treatment consultation. In the coming time, localities need to have solutions to regularly re-train health workers to use the software proficiently. At the same time, it is also necessary to strengthen monitoring of account usage to close unused accounts and remind/support health workers who are tasked with remote medical examination and treatment without using software.

Figure 4. Reasons of health workers not to use the software "Doctor for Everyone"



Source: Survey on health workers

2.3.3. Making appointments for people at CHS through the software

After 3 months of the implementation, nearly 18,000 medical appointments were made through the software (Table 16).

Table 16. Results of scheduling appointments for telemedicine consultation using the software "Doctor for Everyone"

Content	Thua Thien Hue	Quang Ngai	Binh Dinh	Dak Lak	Ca Mau	Total
Total number of appointments	75	13,731	2,740	519	721	17,786
• Number of examinations	53	10,367	2,586	447	545	13,998
Percentage of visits to total number of appointments (%)	70,7	75,5	94,4	86,1	75,6	78,7
• Number waiting for examination	8	3,268	45	13	18	3,352
• Number of new requests	10	63	91	47	141	352
• Number of cancellations	4	33	18	12	17	84

Source: Dashboard on the software "Doctor for Everyone" (Updated May 31st, 2023)

The vast majority of people's medical appointments were handled by the CHS (accounting for 78.7%). Up to the time of the survey, making medical appointment was still done regularly with 352 new and pending requests. The number of cancellation cases accounted for a very low rate (0.5%), which proves that on-time medical care has been well followed by both health workers and people.

According to the local assessment, the scheduling function was still in a simple form, so it could lead to overlapping appointments of many people. According to the local proposal, the software needs

to be adjusted so that when a reservation is made, that time frame is closed and other patients cannot register the same time, or the patient needs to know how many patients are waiting in the time frame they choose so that they can proactively arrange an appointment accordingly.

"People set an appointment at 7 a.m., but if they come here at 7 o'clock, there are four people, how can doctor examine them? So we should improve this appointment. I booked at 7 a.m, now at 8 a.m, I have not been examined, people respond immediately."

Group discussion at DHC, Dak Lak

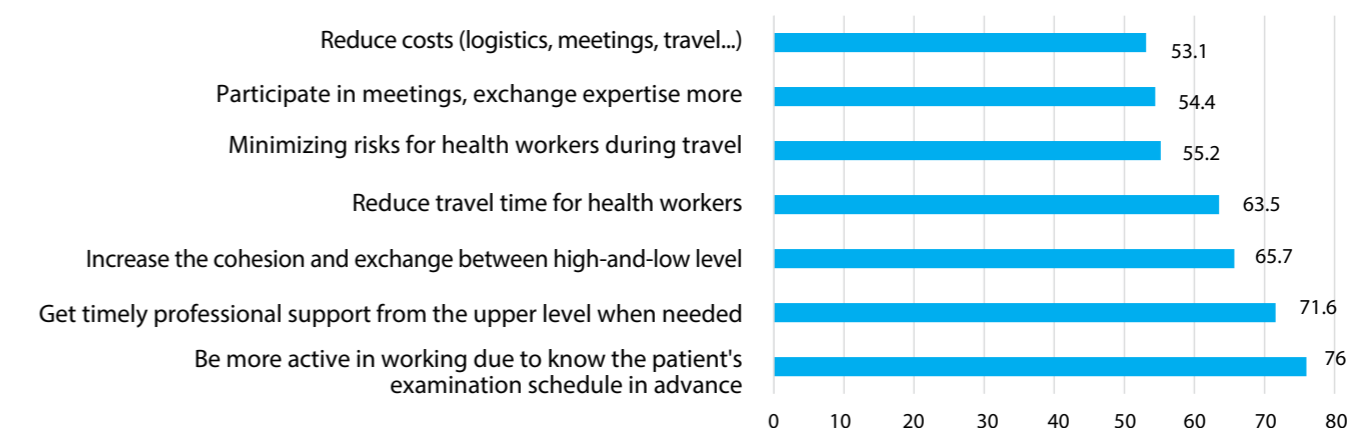
3. Social impacts of the Project on the beneficiary areas

3.1. Impacts on health workers and health facilities at districts and communes

3.1.1. Positive impacts

According to survey on health workers, the project has had many positive impacts on the health workers (Figure 5). Of these, the three most positive impacts on health workers when participating in the Project are: being proactive in their work because they know in advance when patients will come to CHS; receiving timely professional support when needed; and strengthening linkages and exchanges between medical facilities in the area.

Figure 5. Positive impacts on health workers when participating in the Project



Source: Survey on health workers

3.1.2. Difficulties from the perspective of health workers

Difficulties with health workers

People often have a habit of traveling for medical care and have little demand to use healthcare services at CHS. Therefore, it was often difficult for health workers to promote people to use the software "Doctor for Everyone" to schedule an appointment at the CHS.

"We know people's appointments. The CHS also actively serves the people. People also take the initiative in their work, saving the waiting time and reducing fatigue, and we also prepare well."

Group Discussion at CHS, Quang Ngai

"It doesn't cover the fee for 3G. We can still use the Wifi at CHS, but when going down to the area to install the software for people, sometimes we even had to provide the connection for them."

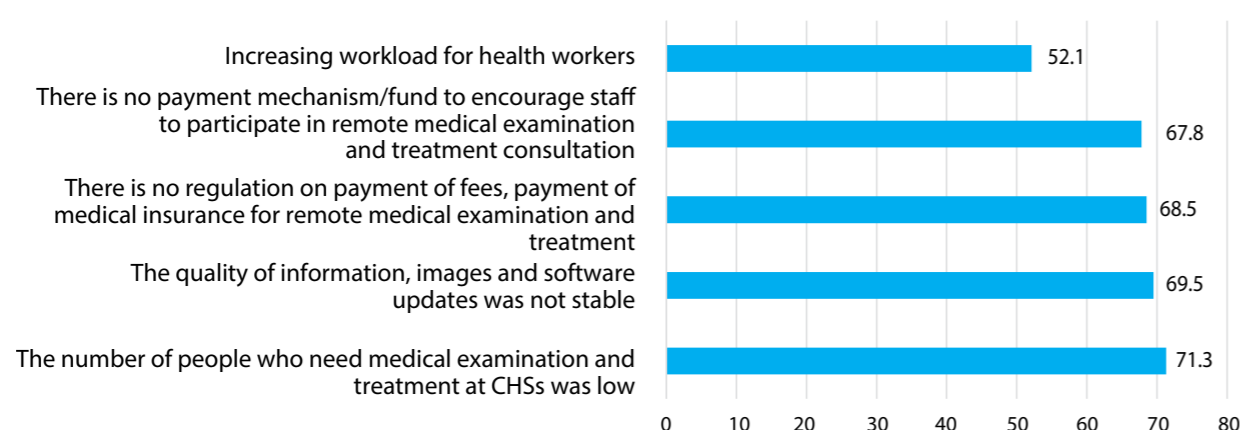
Group Discussion at CHS, Dak Lak

The next difficulty was the unstable quality of IT connection equipment and software. During this period, health workers also had an additional task to support people to install and use the software, but poor quality of equipment, and unstable software are increasing the already overloaded workload at the grassroots level. Up to now, telemedicine services have not been included in the list of health insurance payments, so there is no mechanism to pay for medical examination fees for health workers of CHS and consultation fees for doctors of upper-level hospitals (Figure 6). Through group discussions, it was identified that there was not only the issue of payment for medical examination, but also the payment for the cost of connecting to the network by themselves when using personal phones.

"If something goes wrong, we have to take responsibility. So what comes with that responsibility? Is there any allowance? We don't have any roadmap yet. For example, if every health worker in this group can get an additional 5,000,000 VND per month allowance from the Project, we will definitely do it."

Group Discussion at DHC, Quang Ngai

Figure 6. Difficulties faced by health workers when participating in the Project



Source: Survey on health workers

3.2. Impacts on the local healthcare system

3.2.1. Positive impacts

According to mid-term and final reports of from the five provincial DOH, the Project has had many positive impacts on the local health system, including:

- Connecting grassroots health care with upper-level hospitals contributes to bringing high-quality health care services closer to people, helping to improve quality and equity in health care.
- People's demand and interests to have medical examination and treatment by doctors and nurses of upper-level hospitals are the biggest obstacles in attracting people to the CHS. Connecting online with doctors of upper-level hospitals through the software "Doctor for Everyone" makes people more confident when getting medical care at CHS. This contributes to the flow of patients at different levels, limiting overloading of upper-level hospitals.

- Experimenting with the medical appointment will reform administration and solve the frustrations for people waiting in the medical examination and treatment process.
- Choosing a doctor during appointment making also has a positive impact on improving the quality of health care services and patient satisfaction with grassroots healthcare delivery.
- Being connected for consultations and professional supports will help to strengthen the professional capacity of grassroots health workers.
- The connection and sharing of information will also help to strengthen professional linkages among health facilities at the same level and at other levels in the local health network.
- Helping the locality to fulfil the criteria to meet the standards of New Rural Area and advanced New Rural Areas.

3.2.2. Difficulties

For management, the incomplete system of legal documents created some obstacles to the implementation of the Project, including:

- Lack of regulations on health insurance payment for remote medical examination and treatment services, so there is no legal basis to pay for medical examination fees for CHS, and fees for professional consultations, and on-call services of upper-level hospitals.
- The process of remote medical examination and treatment is also different from face-to-face examination, as health workers have to operate on IT equipment and software, but currently, there are still no professional competencies and IT standards for remote medical examination and treatment practitioners.
- The list of techniques for providing remote medical examination and treatment consultation has been developed by the provincial DOH, but there is not any legal basis because there is not any legal document or guidance from MOH as a basis.

In addition, due to the shortage of human resources at all health facilities, it was not possible to arrange a 24/7 permanent resident to support the lower level regularly. Human resources at the management agencies were also lacking, so the frequency of supportive supervision has not been fully implemented in a timely manner. Moreover, due to the lack of training, the IT qualifications of health workers in both management agencies and service providers were still limited, impacting the installation and use of software for telemedicine consultations.

"Health workers at the CHS often go to meetings. I stopped working in the field or at the market, but I didn't see the doctor and lost my livelihood. For the whole day, I wanted to check gynecological examination. I made an appointment with Ms. T (midwife) on the day that my husband went to get blood pressure medication, I had to see Mr. X... (physician)."

Group discussion with people, Ca Mau

"It is very beneficial to people. Most of them are in difficult economic conditions. When going directly to hospitals and seeing doctors directly, it is expensive and difficult. So, if I ask a doctor, the doctor can advise me and treat me, that's very good."

Group discussion with people, Quang Ngai

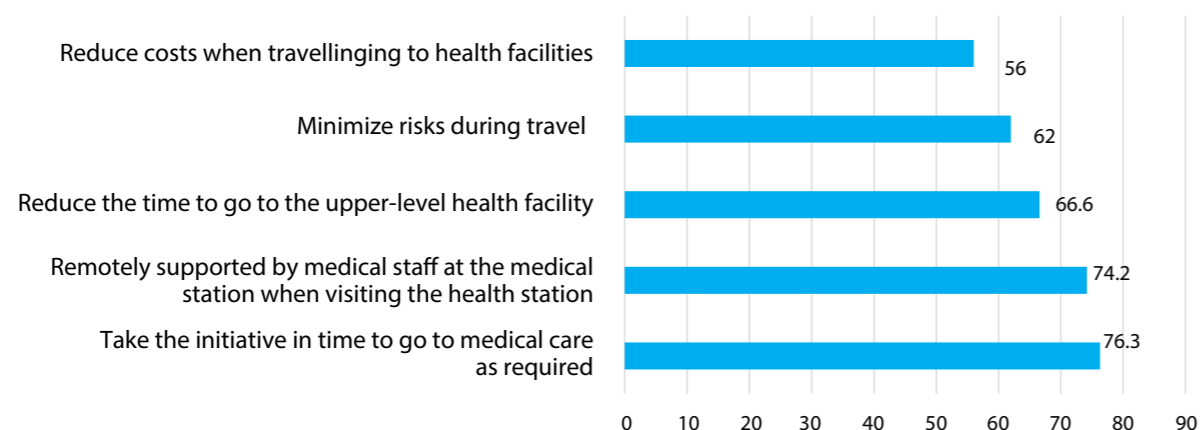
3.3. Impacts on people

3.3.1. Positive impacts

According to people's view, the implementation of the software "Doctor for Everyone" has helped people to choose and schedule medical appointments with the right doctor and at the right time. In the process of medical examination and treatment at the CHS, when they are seriously ill or want to be examined and treated with doctors at higher levels, people were connected online by health workers. The software was also effective for health education and disease prevention. The information on health care, disease prevention, disease prevention notices, etc. will be sent to each citizen's personal account to help them to access official and timely information sources.

Results of the survey on health workers showed that the most positive impacts of the Project on people are: enabling them to take the initiative to seek medical care according to their needs; getting medical examination and advice from a doctor at a higher level without having to go far; not having to go to the upper-level hospital which helps people to save costs, time and risks during travel when going for medical care (Figure 7).

Figure 7. Positive impacts on people when participating in the Project



Source: Survey on health workers

3.3.2. Negative impacts and difficulties

Neither people nor health workers found the Project to have any negative impact on the health and life of people. Although there is no negative impact, health workers and people living in communes with convenient travel conditions said that making appointments with the CHS through the software was not necessary. Therefore, in order to ensure efficiency and maximise the return on investment, during the expansion phase, MOH and localities also need to prioritize implementation in remote and difficult areas.

The perspective of health workers on the difficulties faced by people when participating in the Project

"The commune is also small. It's also near CHS. It's more convenient to go to CHS just a little, so I go directly. If I'm pain, I go to the doctor, but I think that remote communes will be more convenient."

Group discussion at CHS, Thua Thien Hue

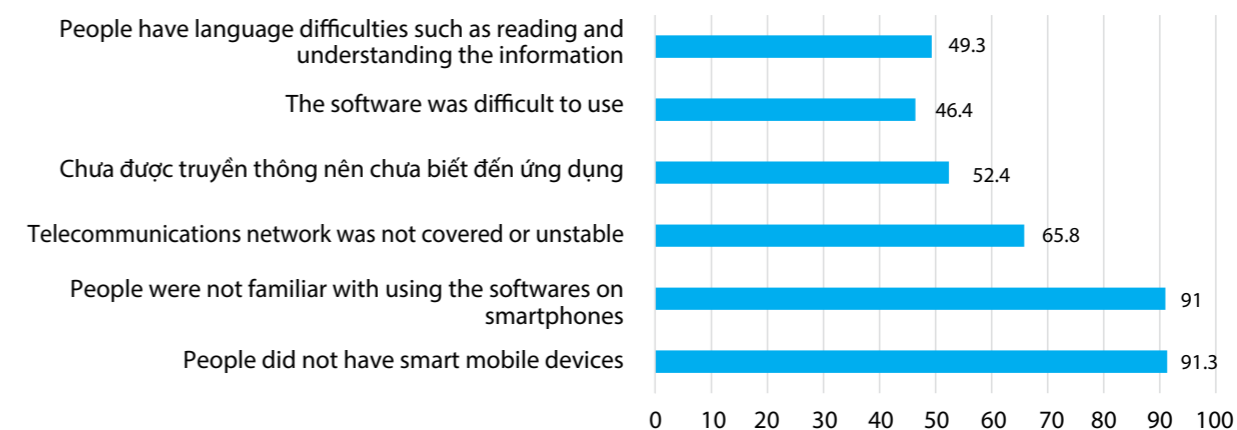
"Vì tụi tôi lớn tuổi, trình độ nó cũng giới hạn, thành thử muốn cài đặt màn hình điện thoại hay gì đó thì tụi tôi thì tại giờ khó, chưa hiểu được. Rồi cái điện thoại của mình cũng cũ, có để mấy đứa nó gọi thôi..."

TLN người dân tại Cà Mau

are summarized in Figure 8. Of these, the biggest obstacles are the lack of adequate smartphones, the low level of use and the lack of a telecommunications network. The above obstacles may be beyond the Project's scope, so the intervention of the local political and social system will be required. In addition, the Project should also consider developing the application on monitoring health, scheduling consultations, and remote health examination by households when implementing the next phase. With these features, just one member of household who knows how to use the software can support others in the family (for example, the elderly, children, and people who do not know how to read...) to easily access to telemedicine consultations.

Because people did not have sufficient information or the software was not suitable for ethnic minority people's education level and languages, some localities had a solution to send youth or to assign Community Digital Transformation Teams to support installation and to guide people on use. This is a lesson learned that should be replicated. Moreover, the software development company needs to improve the software interface to be more simple and easier to use or have the instructions for use in ethnic minority languages.

Figure 8. Difficulties faced by people when participating in the Project, from the perspective of health workers



Source: Survey of health workers



V. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

1.1. Compared with the plan, the Project has fully completed the activities and workload. However, the progress of activity implementation was somewhat slower than planned.

1.2. The main activities and results achieved by the Project, in particular, are:

Activities and results achieved during preparation

- *Baseline evaluation:* Provincial DOH self-assessment and UNDP direct survey in 5 provinces.
- *Forming the network of organizations from central to local levels:* at the central level, the Viet Nam Administration of Medical Services is the focal point, and five Provincial Health Departments assigned focal points to deploy the Project and provide IT support.
- Workshops to Introduce and Kick-Off the Project were held in the five

provinces with the participation of MOH, representatives of Provincial People's Committees and UNDP.

- *Upgrading the software:* UNDP supported the upgrading and addressing inadequacies in the software "Doctor for Everyone" before and during use. Currently, all features of the software have been used by people, health workers and administrators as designed. Inadequacies arising during use have been overcome or have planned solution. The Project has also transferred operation and troubleshooting to the IT support groups of each province to ensure maintenance when the Project ends.
- *Training:* The Project implemented training courses on using the software in the right quantity and time as required by the localities. At the same time, two more training courses were added for the five provinces outside of the plan. Up to now, 100% of DHC and 89.7% of CHS of 5 provinces have participated in training. Health workers have participated in training courses regardless of gender, ethnicity and age. Over 75% of health workers were satisfied with the training courses and 86.4% of health workers were confident in using the software after being trained.

Activities and results achieved during implementation (after 3 months of implementation):

- There have been 3,504 health worker accounts and 513,654 citizen accounts created. Creating and guiding the use of people's accounts in some provinces had the active participation of local authorities and mass organizations.
- Around 4,000 briefing calls and professional support requests were made through the software "Doctor for Everyone". This has great value in reducing people's costs when they need higher-level medical care and also contributes to improving the capacity of grassroots health workers.
- Nearly 18,000 medical appointments were booked through the software "Doctor for Everyone". Up to the time of the survey, localities still maintained new appointments, and cancelled appointments accounted for a very small percentage. Making an appointment has helped people choose the health care provider and time according to their individual needs..

1.3. The project has had many positive impacts on all stakeholders and no negative impacts on the local socio-economic situation. Specifically, it has contributed to:

- Ensuring equity and efficiency in people's healthcare, especially people living in remote and disadvantaged areas.
- Improving professional capacity for grassroots healthcare, strengthening the connection among and between different levels of the medical system, and reducing overload for medical facilities at higher levels.
- Contributing to modernizing health care activities of the health sector;
- Contributing to helping localities to implement state orientations on Rural Development and Digital Transformation.

1.4. Finally, the Project has only a few unsuitable points that need to be further improved and adjusted, specifically:

- *Legal basis for implementation:* the list of eligible diseases for remote medical examination and treatment is not yet legally established due to the lack of any guiding circular from MOH. There is no IT competency standard for practitioners of remote medical examination and treatment, and there is no financial mechanism and norms for remote medical examination and treatment.
- *Upgrading software and ensuring the information technology infrastructure:* IT infrastructure at district and commune levels is limited in terms of equipment and transmission lines, so images and sound are not clear, affecting the quality of remote medical examination and treatment consultations. Although the software has been upgraded, there are still some inappropriate points such as the expired developer account and lack of connection to other software of the health sector.
- *Training on using the software:* There are still a few CHS and health workers who have not been trained. The level of confidence and proficiency of health workers when using the software decreased after an interval of time following the training.
- **Using the software:** The rate of people using accounts was still low, due to the short implementation time of the Project, and limited attention to communication.

2. Recommendations

Based on the evaluation results, the survey team has proposed a number of points that need to be further implemented and improved in the coming time, including:

2.1. For UNDP:

- Continuing to support upgrading and improving features of the software "Doctor for Everyone" (Details in Appendix 3).
- Technical transfer to Project provinces to ensure maintenance and sustainability, for example through: training a provincial core group of trainers so that provinces can self-deploy software training when needed. Transferring management techniques and solving problems when using the software (to the extent possible) to the provincial IT teams.
- Sharing successes and difficulties during the project implementation in the five provinces as lessons in the process of replicating the model nationwide.
- Supporting the technical capacity of MOH if the model of remote medical examination and treatment consultation at the grassroots level using the software "Doctor for Everyone" expands to other localities.
- Supporting MOH to access resources from international governmental and non-governmental organizations to deploy and replicate the model of telemedicine consultations at the grassroots level using the software "Doctor for Everyone".

2.2. For MOH

- Coordinating with UNDP to continue to upgrade and improve the software "Doctor for Everyone". Connecting the software "Doctor for Everyone" with other software for remote medical examination and treatment in the health sector.
- Replicating the model of remote medical examination and treatment consultations at the grassroots level using the software "Doctor for Everyone" in other localities.
- Completing and promulgating legal documents as a legal basis for remote medical examination and treatment consultations.

2.3. For provincial DOH and local authorities

- Continuing to provide health workers with training and refresher training periodically and when upgrading the software on. Training activities need to ensure that all health workers will be able to use the software proficiently once instructed.
- Maintaining periodic professional briefings and supporting remote medical examination and treatment consultation for CHS from higher-level units using the software "Doctor for Everyone".
- Maintaining the medical appointment booking system at CHS for people using the software "Doctor for Everyone".
- Maintaining and implementing synchronously remote medical examination and treatment consultation calls at all CHS.
- Developing a communication plan for people about the effectiveness and use of the CHS appointment booking service using the software "Doctor for Everyone".
- Advocating and advising authorities at all levels to mobilize social forces to participate in guiding people to install and use the software "Doctor for Everyone"; supporting people in the process of using the software, especially in the new deployment phase.
- Integrating and guiding people to use the software and booking medical appointments for local health programmes such as: diabetes, high blood pressure, chronic lung disease, vaccination, mental health, maternal health, etc.
- Replicating the results from successful units to the rest of the province.

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APPENDIX 1: DETAILED DATA OF LOCALS

Table 13. Number and percentage of health workers trained to use the software "Doctor for Everyone" by gender and ethnicity

Content	Thua Thien Hue		Quang Ngai		Binh Dinh		Dak Lak		Ca Mau		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Provincial and district level	228		116		70		321		123		858	
Female	98	43.0	48	41.4	30	42.9	150	46.7	36	29.3	362	42.2
Ethnic minority	17	7.5	17	14.7	1	1.4	68	21.2	1	0.8	104	12.1
Commune level	272		317		225		349		146		1.309	
Female	137	50.4	205	64.7	113	50.2	208	59.6	57	39.0	720	55.0
Ethnic minority	33	12.1	52	16.4	15	6.7	108	30.9	4	2.7	212	16.2
Total	500		433		295		670		269		2.167	
Female	235	47.0	253	58.4	143	48.5	358	53.4	93	34.6	1.082	49.9
Ethnic minority	50	10.0	69	15.9	16	5.4	176	26.3	5	1.9	316	14.6

Source: Training report: Implementation of grassroots telehealth using the software "Doctor for Everyone"

Table 1. Detailed data of Figure 1. Reasons of health workers not to use the software "Doctor for Everyone"

Content	n (N=536)	%
Installed but have not joined the meeting or have no patients	307	57.3
Trained but don't know how to use yet	234	43.7
Software error or not being able to install the software	37	6.9
No smartphone or computer	25	4.7
No Internet connection, 3G, 4G	11	2.1

Source: Survey on health workers

Table 2. Detailed data of Figure 2. Features of the software "Doctor for Everyone" used by health workers

Content	n (N=910)	%
Create an account, edit and update personal information	786	86,4%
Create accounts for people	457	50,2%
Guide people to use the software	444	48,8%
Search and view people's profiles	364	40,0%
Make and receive calls on the software	254	27,9%
View medical news on the software	208	22,9%
Create, receive and process patient appointments	98	10,8%
Monitor and get the data for statistics and programme reports	47	5,2%

Source: Survey on health workers

Table 3. Detailed data of Figure 3. Results of telemedicine consultations at grassroots level using the software "Doctor for Everyone"

Content	Thua Thien Hue		Quang Ngai		Binh Dinh		Dak Lak		Ca Mau		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Remote medical examination and treatment consultation	339	57.0	1.170	69.2	824	78.9	174	52.4	273	47.7	2.780	67.9
Briefings	91	15.3	94	5.6	61	5.8	45	13.6	26	4.5	317	4.3
Professional activities	13	2.2	29	1.7	4	0.4	11	3.3	7	1.2	64	1.6
Others	152	25.5	398	23.5	156	14.9	102	30.7	266	46.5	1.074	26.2
Total	595		1.691		1.045		332		572		4.235	

Source: Dashboard of the software "Doctor for Everyone" (Updated May 31st, 2023)

Table 4. Detailed data of Figure 4. Results of appointment booking through the software "Doctor for Everyone"

Content	Thua Thien Hue		Quang Ngai		Binh Dinh		Dak Lak		Cau Mau		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Total number of appointments In which:	75		13.731		2.740		519		721		17.786	
Number of new requests	10	13.3	63	0.5	91	3.3	47	9.1	141	19.6	352	2.0
Number of cancellations	4	5.3	33	0.2	18	0.7	12	2.3	17	2.4	84	0.5
Number of waiting for examination	8	10.7	3.268	23.8	45	1.6	13	2.5	18	2.5	3.352	18.8
Number of examinations	53	70.7	10.367	75.5	2.586	94.4	447	86.1	545	75.5	13.998	78.7

Source: Dashboard of the software "Doctor for Everyone" (Updated May 31st, 2023)

Table 5. Detailed data of Figure 5. Positive impacts on health workers when participating in the Project

Content	n (N=910)	%
Be more active in working due to know the patient's examination schedule in advance	692	76.0%
Get timely professional support from the upper level when needed	652	71.6%
Increase the cohesion and exchange between high-and-low level	598	65.7%
Participate in meetings, exchange expertise more	495	54.4%
Reduce travel time for health workers	213	23.4%
Minimizing risks for health workers during travel (especially in the rainy season, floods, storms, landslides...)	103	11.3%
Reduce costs (logistics, meetings, travel...)	74	8.1%
Not sure what benefits	23	2.5%

Source: Survey on health workers

Table 6. Detailed data of Figure 6. Negative impacts and Inadequacies for health workers when participating in the Project

Content	n (N=910)	%
The number of people who need medical examination and treatment at CHS was low	648	71.2%
The quality of information, images and software updates was not stable	632	69.5%
There is no regulation on payment of fees, payment of medical insurance for remote medical examination and treatment	623	68.5%
Increasing workload for health workers	474	52.1%
There is no payment mechanism/fund to encourage staff to participate in remote medical examination and treatment consultation	347	38.1%
Không có cơ chế/ kinh phí chi trả khuyến khích cán bộ tham gia tư vấn khám, chữa bệnh từ xa	28	3.1%

Source: Survey on health workers

Table 7. Detailed data of Figure 7. Benefits for people when participating in the Project

Content	n (N=910)	%
Take the initiative in time to go to medical care as required	694	76.3%
Remotely supported by medical staff at the medical station when visiting the health station	675	74.2%
Reduce the time to go to the upper-level health facility	606	66.6%
Minimize risks during travel (especially in the rainy season, flood, storm, landslide...)	564	62.0%
Reduce costs when travelling to health facilities	119	13.1%
Not sure what benefits	22	2.4%

Source: Survey on health workers

Table 8. Detailed data of Figure 8. Negative impacts and inadequacies faced by people when participating in the Project

Content	n (N=910)	%
People did not have smart mobile devices	831	91,3%
People were not familiar with using the software on smartphones	828	91,0%
The software was difficult to use	422	46,4%
People have language difficulties such as reading and understanding the information because the software uses Vietnamese	274	30,1%
Telecommunications network was not covered or unstable	187	24,6%
Not sure what benefits	161	13,7%

Source: Survey on health workers

APPENDIX 2: USER FUNCTIONS

Functions	People	Health workers	Admin	New feature upgrade
MOBILE				
Call				
Make a call		x	x	
Join a call		x	x	
Favourite call		x	x	x
List of call		x	x	
Appointment schedule				
Create an appointment	x	x	x	
List of appointment	x	x	x	
View appointment schedule	x	x	x	
View examination results	x	x	x	x
Appointment processing		x	x	
News				
Hot news	x	x	x	
Watch the news	x	x	x	
Notification				
Notification of incoming call	x	x	x	
Notification of approved appointment	x	x	x	x
Notification of appointment change	x	x	x	x
Notification of appointment cancellation	x	x	x	x
Notification of appointment completion	x	x	x	x
Notification of remind re-examination schedule				x
Notification of updating new features	x	x	x	x
Utilities				
Log in	x	x	x	
Log out	x	x	x	
Forgot password	x	x	x	
Change the password	x	x	x	

Functions	People	Health workers	Admin	New feature upgrade
Sign up for an account	x	x	x	
Update personal information	x	x	x	
Software information	x	x	x	
WEBSITE				
Call				
Make a call		x	x	
Join a call		x	x	
Favourite call		x	x	x
List of call		x	x	
Search a call		x	x	
Export the list of call in MS Excel		x	x	x
Appointment schedule				
Create an appointment		x	x	
List of appointment		x	x	
View appointment schedule		x	x	
View examination results		x	x	
Search an appointment		x	x	
Appointment processing		x	x	
Message the people		x	x	
Export the list of appointment in MS Excel		x	x	x
Enter medical information		x	x	
Enter medical consultation information		x	x	x
Print health records		x	x	x
News				
List of news		x	x	
Watch the news		x	x	
Notification				
Notification of incoming call		x	x	
Notification of updating new features		x	x	x
Utilities				
Log in		x	x	
Log out		x	x	
Change the password		x	x	
Update personal information		x	x	

Functions	People	Health workers	Admin	New feature upgrade
Frequently asked questions		X	X	X
User manual		X	X	X
Statistical report				
Dashboard		X	X	X
Statistics of health workers		X	X	X
Statistics of people		X	X	X
Statistics of appointments		X	X	X
Statistics of calls		X	X	X
Detailed statistics by gender and ethnicity		X	X	X
Administration				
Manage the unit			X	
Manage health workers			X	
Manage people accounts			X	X
Manage the news			X	
Manage Q&A			X	X
Manage user manual			X	X
Manage notifications			X	X
Manage mobile software version			X	X
Call navigation			X	X

APPENDIX 3: PROPOSED SOFTWARE FEATURES TO BE DEVELOPED IN THE NEXT STAGE

Recommended features for further development

Independent features of the software "Doctor for Everyone"

- Synchronously develop the basic features for mobile users and web users.
- Upgrade the appointment booking feature (booking an appointment with DHC, making statistics and displaying the number of patients who have made an appointment by the time frame; notifying to health worker about the request/appointment to be handled).
- Develop a remote consulting feature using AI (ChatBot).
- Develop and build the authentication and digital signature features for the records of health workers.
- Develop more utilities for patients, such as Dashboard to monitor patient's health with some vital indicators (blood pressure, blood sugar, heart rate, temperature), appointment reminder, medication schedule reminder, support monitoring adherence to treatment for some diseases (TB), health monitoring and appointment booking for family members.

Features needed to be shared and integrated with HIS software

- Integrate and synchronize the information with popular local HIS software (VNPT, Viettel HIS) for comprehensive health monitoring and management for people.
- Develop module to introduce patients to higher levels, to book appointments with higher-level hospitals.
- Develop and integrate with HIS about the electronic prescribing feature and integrate with VTelehealth.
- Develop and integrate with HIS about the feature of reporting hospital fees and health insurance for telemedicine consultations.
- Develop a module to store, share, and access imaging results, test results with upper-level hospitals according to MOH's information sharing standards.

UNITED NATIONS DEVELOPMENT PROGRAMME

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