THE SITUATION OF IMPLEMENTATION OF THE NATIONAL IMMUNIZATION INFORMATION MANAGEMENT SYSTEM IN PHU YEN PROVINCE IN 2021

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Abstract: The National Immunization Information Management System is a technological innovation management tool that enhances the performance of managers and health professionals in the evaluation and monitoring of immunization activities. However, until now it still faces challenges regarding its operation and use, impacting on its results**.** To evaluate the current status of implementing the national immunization information management system in Phu Yen in 2021**.** Cross-sectional study**.** Most vaccination facilities have stable electricity and internet (98,3%). However, the number of facilities with barcode scanners is still low (34,2%). 91,7% of the sta - are relatively good at using NIIS. 83,3% of medical facilities input data according to the right process after the vaccination session. There is a need to strengthen monitoring of support and training for health workers as well as proactively control data on their System on a regular basis.

Keywords: National immunization information system, vaccinations, Phu Yen.

1. Introduction

Immunization is the introduction of vaccines into the human body to stimulate the human body to produce antibodies to prevent diseases [1]. In Vietnam, the Ministry of Health has implemented the Expanded Immunization Program (TCMR) since 1981 with the support of the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) [2]. After more than 30 years of implementation, the program has achieved great achievements up to now, contributing to the protection and improvement of the health of Vietnamese people: vaccines for 12 common dangerous infectious diseases to children and pregnant women have been provided for free ; a number of dangerous diseases such as smallpox, polio (in 2000), neonatal tetanus (in 2005) have been eradicated; morbidity and mortality rates from dangerous infectious diseases in children such as diphtheria, pertussis, measles, etc. have decreased several fold [3].

However, the management and monitoring of people's vaccination history have encountered many difficulties due to some facts that the population fluctuates; people change their place of residence; parents do not remember their children's vaccination history; the statistical status of the data is incomplete and obsolete, specifically for the service immunization target group.

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To overcome this situation, the Ministry of Health, in implementing Resolution 36a/NQ-CP, has coordinated with the Vietnam Military Telecommunications Group (Viettel) to build and deploy the National Immunization Information Management System (referred to as the System) piloted in 5 provinces/cities since 2015, and by June 2017 the System has been carried out across the country [4]. This System helps people proactive in their vaccination practices and makes it easy to manage and track their vaccination history. The System also helps medical staff quickly make a monthly injection plan and report the results as soon as the vaccination has been finished, reducing the time of reporting statistics [5].

Since June 2017, Phu Yen province, together with the whole country, has implemented the System at vaccination facilities over the province. However, there have been some difficulties in the implementation process. Therefore, we conducted a study on "The situation of implementation of the National Immunization Information Management System in Phu Yen province in 2021", in order to contribute to providing and supplementing information on the experience of implementing the System. This is also an important first step in enhancing the application quality of this System at vaccination facilities in general and in Phu Yen in particular. The aims of this study were to:

1. Describe the situation of implementation of the National Immunization Information Management System in Phu Yen province in 2021.

2. Assess staff's knowledge and skills on using the National Immunization Information Management System in Phu Yen province in 2021.

2. Methods

2.1. Study design

Cross-sectional descriptive study.

2.2. Location and time of study

Location of study: vaccination facilities in Phu Yen province.

Time of study: from February to December 2021.

2.3. Study subjects

The National Immunization Information Management System at address tiemchung.vncdc.gov.vn.

Staff in charge of vaccination at all levels and staff in charge of data entry at the hospitals with delivery room and vaccination service facilities of Phu Yen province.

Reports/books: personal vaccination books, vaccination result reports, vaccination management books; management books of vaccines, vaccination supplies and vaccines in stock at the facilities selected for the study.

2.4. Sample size, sample selection

Selection of all 120 expanded vaccination facilities eligible to deploy the System according to the regulations of the Ministry of Health in Phu Yen province, including 110 vaccination facilities are at Clinics/Department of Population and Primary Health and 10 Neonatal Hepatitis B vaccination facilities.

Evaluation of staff's knowledge and skills on using the System: a random sample of 12 units was selected due to limited resources.

2.5. Study variables

2.5.1. Variables

Description of the situation of the System implementation in Phu Yen province, including groups of variables:

Equipments: electricity networks, internets, computer number, printers, barcode scanners used for the System.

Human resources: number of staff participating in the System who received training, knowledge and skills to use the System.

Other group of variables: using and management of data, reports.

2.5.2. Assessment standards for knowledge and skills in using the System

Based on the System User Manual [6], the knowledge and skills of using the System on object management, report management, vaccine management of medical staff can be assessed as follows:

+ Pass: answer/perform ≥ 50% of the functions.

+ Failed: answer/perform < 50% of the functions.

2.6. Data collection procedures

Using the available survey toolkit to check the hard copy monthly reports and the System monthly results to compare data.

Directly interviewing combined with observing of medical staff practicing on the System.

Actually checking the subjects to vaccination, comparing personal information and vaccination information on the personal vaccination book and on the System.

Investigators - staff of the Department of Infectious Diseases Prevention - International Health Quarantine: collecting data integrated in injection site monitoring sessions and quarterly checks.

2.7. Data processing and analysis

At the end of the process of entering information into the information collection form, the medical staff and the investigators pressed the "Save and send" button on the Kobotoolbox application. The recordings were automatically saved to the application's memory. The supervisors were responsible to retrieve the records and re-check all the forms, ensuring that the forms were filled out as directed.

Data after extraction on Kobotoolbox application and on the System were cleaned, managed and analyzed using STATA 3.1 software.

Using basic descriptive statistics algorithms: mean, frequency, percentage.

2.8. Study Ethics

This study was based on voluntary participation of the subjects. Subjects had the right to refuse to participate or stop the study when it was not suitable. The study subjects were also clearly explained the purpose and content of the study before conducting the interviews, and emphasized the confidentiality of information so that the subjects

could voluntarily participate and well cooperate in the study process.

All information of the investigation was kept confidential to ensure privacy and used only for study purposes.

3. Results

3.1. General information about information technology (IT) infrastructure of Phu Yen province in 2021

Table 1. General information about IT infrastructure at vaccination facilities

Status of basic IT infrastructure	Result
Number of facilities with stable grid system	118 (98,3%)
Number of facilities with cable/wifi system	118 (98,3%)
Number of facilities with 3G/4G system	1
Percentage of facilities with computers	100%
Percentage of facilities with printers	100%
Percentage of facilities with barcode readers	34,2%
Number of staff participating in vaccination	800
Percentage of staff trained to use	48,75%

Table 1 presented some information about information technology infrastructure at vaccination facilities in Phu Yen province. As of December 2021, there were 118 out of 120 expanded vaccination facilities in Phu Yen with stable grid and cable/wifi systems. At the vaccination facilities at the three levels of province, district and commune, there were computers and printers for vaccination. However, many facilities did not have separate computers for the vaccination program but used in conjunction with other facilities' programs. The number of facilities with barcode readers was low and only facilities at the commune level had barcode readers (accounting for 34.2%), but also being used with the barcode readers of the facilities' medical examination and treatment programs. It was notable that all vaccination participants, according to the instructions, could perform the steps as assigned on the System, but the number of trained staff was less than 50% (390/800 people).

3.2. The situation of implementation of the National Vaccination Information Management System in Phu Yen province in 2021

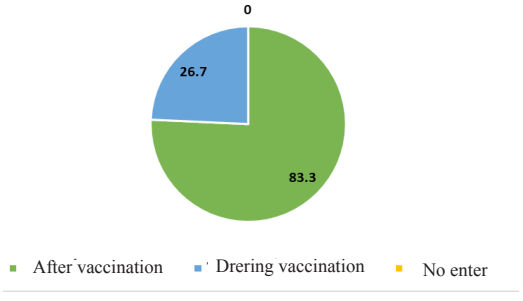

Figure 1. The situation of 4-step injection procedures at facilities

The results of Figure 1 showed that 26.7% of facilities directly imported vaccination data during the vaccination session, most of the facilities imported vaccination data after the vaccination session because of the large number of children and the unstable network. There was no facility that did not enter vaccination

data. In addition, most of the facilities reported vaccination and vaccine data to the System; some facilities, however, still entered the wrong batch numbers or slowly exported used vaccines, so it was unaccurate between the data on the System and the actual data (Figure 2).

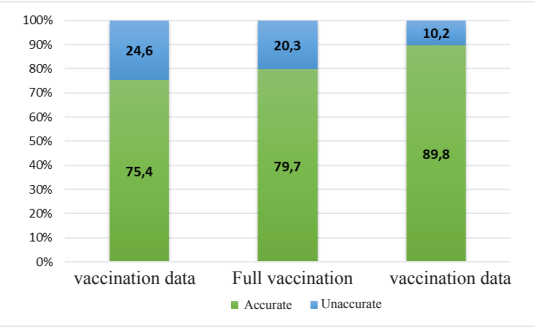

Figure 2. Situation of data reporting on the System

3.3. Assessment of staff's knowledge and skills on using the National Immunization Information Management System in Phu Yen province in 2021

Table 2. Subject management knowledge and skills on the System (n=12)

Functions		Pass		Failed	
		n	%	n	%
Register new subjects	Knowledge	12	100	0	0
	Skills	12	100	0	0
Search subjects	Knowledge	11	91,7	1	8,3
	Skills	10	83,3	2	16,7
Update subject information	Knowledge	10	83,3	2	16,7
	Skills	10	83,3	2	16,7
Implement the 4-step injection procedure	Knowledge	12	100	0	0
	Skills	12	100	0	0
Add children coming in from other places	Knowledge	11	91,7	1	8,3
	Skills	11	91,7	1	8,3
Plan for children's immunization according to vaccines	Knowledge	12	100	0	0
	Skills	12	100	0	0
Filter duplicate subjects	Knowledge	10	83,3	2	16,7
	Skills	10	83,3	2	16,7
Manage subjects	Knowledge	11	91,7	1	8,3
	Skills	11	91,7	1	8,3

In general, over 90% of the subjects directly using the System knew and used basic functions related to the management of vaccinated subjects. However, 8.3% of the subjects were lack of the knowledge and skills in the system's functions using process (Table 2).

Table 3. Vaccine management knowledge and skills on the System (n=12)

Functions		Pass		Failed	
		n	%	n	%
Create a distribution import bill	Knowledge	12	100	0	0
	Skills	12	100	0	0
Create a using export bill	Knowledge	12	100	0	0
	Skills	12	100	0	0
Create a returned export bill	Knowledge	11	91,7	1	8,3
	Skills	11	91,7	1	8,3
		10	83,7	2	16,7
	Skills	10	83,7	2	16,7
Handle incorrect vaccine data	Knowledge	9	75	3	25
	Skills	9	75	3	25
Check inventory	Knowledge	12	100	0	0
	Skills	12	100	0	0
Manage vaccines	Knowledge	11	91,7	1	8,3
	Skills	11	91,7	1	8,3

Table 3 showed that the facilities perform well at creating a distribution import bill (accounting for 100%); the facilities regularly update forms every month, so they were knowledgeable and proficient in manipulation. The handling of incorrect vaccine data was failed in many facilities, they might confuse and not have logical inferences about the errors in the implementation process.

4. Discussion

The National Immunization Information Management System is an application running on a Webside platform, so it is necessary to have computer systems, printers and stable Internet networks. Up to now, all injection facilities in Phu Yen (100%) have computers and printers which are shared with other programs, the facilities do not have computers used only for the Expanded Immunization Program. There is still one commune with unstable Internet network (Song Hinh commune) and one commune without Internet connection, so there is no Internet during working hours making subject management also limited.

In addition, the number of staff participating in vaccination basically meet the requirements of the vaccination session, but the number of staff capable of using the System is still limited (48.75%). Most of the manipulations in the vaccination session are assigned to people in charge, that sometimes puts great pressure on the specialized staff when managing data on papers, books and the System. In addition, although over 90% of staff directly use the System having basic knowledge and skills on subject management on the System, but it is necessary to have professional staff on computers and systems to be able to accurately and quickly search for children coming in from other places in the vaccination sessions at

communes with a large number of children or large population change.

Phu Yen is one of four provinces in the country that will deploy electronic reports on the National Immunization Information Management System, the province will completely use the data on the System, not the data on the paper reports or manually calculated as before. It takes some time to use both paper reports and System reports side by side to compare accurate data. Most of the key staff and staff in charge of vaccination are familiar with the data implementation processes, but more time is needed for the full-time staff to do their work. Most of the staff at clinics are part-time officers of many different programs, so they do not have full capacity for vaccination work.

The system allows viewing and exporting information types and reports required by the vaccination program quickly without having to spend time counting/ checking the management books, so it saves time and increases work productivity. However, as reflected by the staff here, the data on the System are still not completely accurate, especially the vaccination data, complete vaccination number, and vaccine inventory management. The reasons may be that some facilities have not promptly updated injection results to the System, the situation of subject duplication has not been completely resolved, and sometimes also due to System errors (there are differences in the output data reported at different times)[7]. Because the medical staff do not really trust the System and there are many reporting forms for stakeholders, they use data from both on the System and management books/lower levels to compile vaccination reports. Synthetic data from the System only accounts for a low percentage and has not been fully implemented according to the reporting requirements in Circular 34/2018/TT-BYT [8].

5. Conclusion and Recommendation

The National Immunization Information Management System in Phu Yen province has met the basic requirements of the Ministry of Health and received high appreciation from medical staff. However, there were still many financial difficulties during the implementation process, so equipment and human resources were not synchronously invested. All facilities did not have their own computers for vaccination, 1 facilities has barcode printers and none has barcode readers to use for the System (some facilities are using them together with medical examination and treatment). The Provincial Center for Disease Control needs to recommend the Department of Health to propose to the People's Committee of Phu Yen province to support funds for the implementation of the system. That is necessary to emphasize the importance and urgency of the National Immunization Information Management System in improving vaccination quality, contributing to local disease control.

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