CHAPTER III

PROJECT EVALUATION

3.1 Introduction

Planning and administration of any project need a project evaluation because the evaluation plays an important role to judge the value of process or implementation method and the achievement of the implementation. Evaluation makes information system useful to judge the project, and whether it should be extended or terminated. Moreover it is useful for the development of organization, plan, and project.

Micheal Scriven (1967) defined the evaluation as a collection of data, selection of tools for collection, and setting up criteria for evaluation. The main goal of evaluation is to judge the value of a project.

3.2 Purpose

The evaluation of the information system development project of under-5-year old group for comprehensive care of health centers in Dokkamtai district, Phayao province used the evaluation of Scriven with 2 important aims.

1. Formative evaluation, the evaluation during the on-going project to improve it.
2. Summative evaluation, the evaluation after the project has ended for judging the project and finding advantage gained for further application.

3.3 Evaluation Question

Formative Evaluation Question

Was the implementation in accordance with the action plan? What was the result?

1. How was the information system concerning the target group (<5 year-old children) at health center?
2. What were the required data from the target group? How useful?
3. What was the output of each AIC?
4. Was there action plan for information system development? Was it implemented?

Summative Evaluation Question

1. The collected data, was it utilized in planning and responding the comprehensive and continuum care for the target group?
2. Was health center able to report the collected data to the superior in time, completely, and correctly?
3. Was the workload of information reduced? How was the satisfaction of health workers toward the information system?

3.4 Evaluation Design

Table 6: Evaluation design

Evaluation Objective	Parameter	Source of data	Analysis Method
1. To know whether the project has been working continuously or not	- System concerning target group - Data characteristic - Data filing - Information system development plan - Implementation outcome	- Workshop minute - Record form - Supervision record - Action plan - Database on health center's computer - Budget document	- Qualitative, use content and pattern analysis - Quantitative, percentage and descriptive, determining progress of the project
2. To assess the value of developed health information system	- Advantage from information - Time spent for data collection - Response to needs on site and of superior - Satisfaction of data collector	- Health worker's working record - Database of target group on the computer - Supervision record - Meeting minutes - Annual summary	- Qualitative, analysis and conclusion from contents - Quantitative, use percentage and descriptive, showing the outcome of implemented project

3.5 Data Collection Method

The evaluation of information system development in target group of health centers in Dokkamtai District

- Concerning documents made by health worker
- Database of the target group on computer
- Follow up by site observation, interview, and supervision
- Interview health workers and clients

3.6 Data Analysis and Results

Formative evaluation

Was the implementation in accordance with the plan? What was the result?

1. How was the information system concerning the target group (<5 year-old children) at health center?

Process

- Organized a workshop for 20 health workers from health centers analyzing care activities of health centers in Dokkamtai district. The analysis activity concerned the 4 aspects of comprehensive care: promotion, prevention, treatment, and rehabilitation of the target group, which was a duty of each health center.

Output

Table 7: The comprehensive care of the target health centers

Office activity	Field activity
1.Well child clinic (PROMOTION)	-Post delivery follow up
-BW, height, head perimeter	-Follow up weighting in school, kindergarten
-Development test	-Education via media
-Oral health	-Supplementary food demonstration
2.Immunization (PREVENTION)	
-Post delivery BCG, HBV1	-Follow up the missing vaccinating child
-2 months HBV2, DTP1, OPV1	-Follow up the complication of vaccinated
-4 months DTP2, OPV2	child
-6 months HBV3, DTP3, OPV3	-Campaign vaccination in health post, baby
-9 months MMR	care
-1 year 6 months DTP4, OPV4	
-4 years DTP5, OPV5	
3.Treatment	-Home visit in critical case
-Nursing care when sick	-Oral health follow up
-Counseling and referral	
4.Rehabilitation	-Home visit for chronic or disable cases
-Post treatment follow up	
-Disables data collection	
-Palliative support	

2. What were the required data from the target group? How useful?

Process

Organized a meeting of health center official, one from each health center, and official from district health office and concerned persons in order for brain storming and analysis of the data utilization on the 4 aspects of comprehensive care.

Output

Table 8: The analysis on the utilization requirement of information from the comprehensive care to the target group in health center

Service	Objective of information use
1.Health promotion	- Growth assessment - Nutrition assessment - Oral health assessment - Child development assessment - Target follow up
2.Prevention	- Vaccination follow up in target group - Planning for target determination and vaccination dispense - Coverage of vaccination
3.Treatment	- Health and access to care assessment - Treatment planning - Workload analysis of health center
4.Rehabilitation	- Determined target group - Other supports planning

3. What was the process and output of each AIC?

Process

AIC workshop was a meeting among health workers who were involved and who participated in the health center information system development, including chief, official, worker, district and provincial officer, etc. Total number was 25, grouped by zoning of the health center (3 – 4 health centers per group) with a facilitator each. Facilitator regulated, timed, urged participants to write, collected details and agreements of discussion, and then documented a conclusion. Participants, mostly

health workers from health centers, wrote down their opinions in clear handwriting to show on the chart board instead of speaking to other participants. The message should be a short sentence, with only main idea without details. Wrote one opinion on one paper sheet. It was freely expressed from experience, self-performed or observed. All opinions were posted and everyone read them, asked and answered. No judgement whether it was right or wrong was supposed to be done. Grouped the similar opinions together and set aside other's to be further discussed to obtain a common opinion. The AIC processes output were as follow.

APPRECIATION (A)

First, everyone spoke and wrote about the information system of their own health centers. Participants wrote short messages on paper sheets, of 21 x 10 cm. Size. Then posted them to be clearly seen. Everyone discussed. All had encountered similar situation so they understood one another. Then grouped the situations as follows.

Output

Manpower

- Few staff, multiple duties
- Lack of analytical skill of health worker
- Lack of computer skill
- Chief paid little attention to information work

Information system

- Big number of data collection parameters
- Overlapping of data of different items, time-consuming and errors

- Some parameters were too complicated, not time effective
- Data was not useful in health center level
- Frequently asked for data from the superior e.g. provincial, district health office
- Most data collection was to respond temporary requirements, or current situation, it was fragmented without continuity in terms of individual information

Equipment

- Inadequate record form, health center had to self-support
- Some health center had no computer set
- Computer maintenance was costly, difficult to deal with
- Health center had no telephone, difficult to communicate, could not access internet

In the second session, everyone expressed expectations and aims of information system development. They made a common agreement and acceptable conclusion with common purposes as follows.

- To have quality data, responding to public health service and care for target group
- Minimal parameter as necessary, simple to collect and file
- Continuity, lifetime span of target group, integrated context
- Integrate the care and service provision activity, as basic service of health center

From the common agreement on required information system, the group set up parameters for individual target data collection. The parameters were as follow.

- Name and surname
- ID card number
- Address
- Health insurance
- Date of delivery
- Birth weight
- Parity at birth
- Parents' names
- Antenatal care
- Post delivery visit record (2 visits)
- Vaccination
- Child development examination
- Health history and treatment history
- Morbidity, disability

INFLUENCE (I)

It was a brain storming session of all participants to achieve the set up goal (APPRECIATION). Everyone paid attention and shared ideas towards the goal.

Output

Guidelines for information technology for the target group (o – 5 year-old) of Dokkamtai district

- Individual record in detail, and file for further use
- Record both in paper and on computer
- Request support of record form from provincial and district fund
- Request support from concerned sectors both from provincial and district level to obtain a program to record data on computer
- Support a computer set to health center in need
- Manpower development in computer skill, especially MS Access for database
- Enhance participation of village health volunteers, community, and people in collection and recording of data
- Service to target group both at health center and field service, with always target's data recording

CONTROL (C)

It was a workshop to formulate action plan to make expectations realized by setting up roles of concerned sectors, including goals, method, and budget.

Output

Table 9: The action plan including goals, method, and budget.

Activity	Duration	Budget	Source	Responsible by
-Meeting health workers to inform about public health information system development in Dokkamtai	January 2001	1,000 B	DPHO / PPHO	DPHO
-Formulate record forms for target group (0-5 year-old) with required parameter	January 2001	20,000 B	District fund / PPHO	DPHO / Upper north AIDS
-Survey all targets	February 2001	10,000 B	District fund	HC staff/ Health volunteer
-Health workers skill development in computer and database	February 2001	3,600 B	DPHO / PPHO	DPHO / PPHO
-Provide computer set to needy health center	February 2001	175,000 B	Income / Donation	HC / DPHO / Upper north AIDS
-Coordinate with district and provincial authority on database and program	February 2001	-	-	HC / DPHO
-Individual record on computer	March 2001 onward	-	-	HC staff
-Continuum record of target getting care service	April 2001 onward	-	-	HC staff
-Process data for planning for service and incentive		-	-	HC staff / DPHO

DPHO = District Public Health Office

PPHO = Provincial Public Health Office

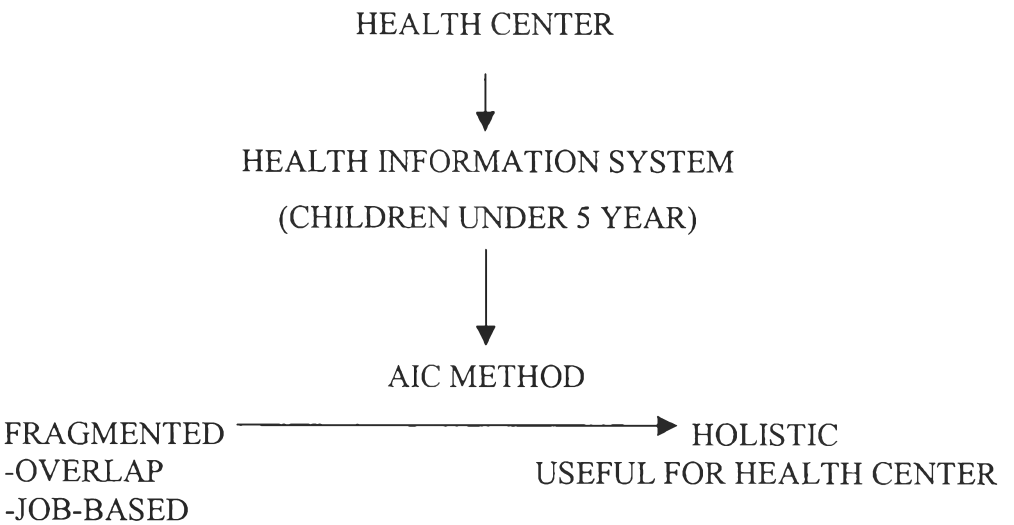
HC = Health Center

4. Was there a development plan for information system? And was it implemented?

According to the AIC, the Dokkamtai action plan was formulated, the information system was developed, starting from the target group of 0 – 5 year-old children to respond to health care and self-health care. It needed continuum information system and service integration, especially covering the core health service. The framework was set to make a simple tool for collection and recording, continuum of life span of the target group, integrating care service the target group should get, family and context. The data would be analyzed and the parameter needed was selected for formulating an individual record with field test and evaluation.

Previously, health center filed the information in sections i.e. Treatment: OPD card, Health promotion: children health record, children weight record, Immunization: vaccination record, rehabilitation, disability record, etc. These records was now transformed into individual-oriented record, covering integrated service including promotion, prevention and control, rehabilitation from birth to present, as shown.

Figure 7: Dokkamtai Public health information system development



4.1 Publishing of the individual record for target group.

At a total number of (referenced from registration database), the individual records publishing were partially supported by Phayao Public Health Office and Dokkamtai district fund.

4.2 Surveyed the target group in each area of each health center.

Initially, the survey was very interested by health volunteers as they surveyed and recorded. Then they handed in all records to leaders, checked and handed to health staff for validity check.

Table 10: Dokkamtai health centers individual record of 0 – 5 year-old

Health center	No. of village in responsibility	No. of target surveyed	Information from registration	% of registration base
Ban Tham	6	197	158	124.68
Nong Lom	8	282	267	105.62
San Kong	6	172	161	106.83
Dokkamtai	10	344	362	105.52
Pasang	9	383	370	103.51
Huay Lan	8	306	318	96.23
Ban Pin	9	338	287	117.77
Ban Jam Kai	6	242	256	94.53
Ban Pang	3	118	124	95.16
Bun Kerd	9	279	283	98.59
Dong Suwan	11	310	317	97.79
Tham Jarernrat	6	209	153	136.60
Khun Lan	8	278	264	105.30
Keu Wiang	6	167	192	86.98
Sawang Arom	8	258	251	102.79
Dokkamtai hospital	9	386	365	105.75
Total	122	4,092	4,269	104.33

*Surveyed data counted only real resident

*Registration dated December 2000

The surveyed data was that of real residents, who live in the responsibility area of each health center, which was in charge of them. The surveyed data was recorded in individual record and filed in the Family Folder, ranked by house number for searching or updating convenience, or when the target individual comes to visit health center. The reason of why number of target individual was bigger than the registration was that

some of the target individuals were delivered outside the district and/or had not officially transferred to local registration. For the hill tribe, whose nationality was not Thai, there were 2 of them (Nong Lom health center responsible area)

4.3 Provision of computer sets with accessories to every health center to record data in electronic forms.

Prior to the start of the project, some health centers had computer set, but some had not. Provision of computer sets was done by many ways e.g. income, annual budget, donation, etc. till all health centers had computer sets.

Table 11: Provision of computer set with accessory to every health center

Health center	No. of computer set	Source of budget
Dokkamtai DPHO	3	Budget, UNFPA, Donation
Ban Tham	1	Income
Nong Lom	1	Donation
San Kong	1	Donation
Dokkamtai	2	Income, Donation
Pasang	2	Income, Donation
Huay Lan	1	Income
Ban Pin	1	Income
Ban Jam Kai	2	Income, Donation
Ban Pang	1	Income
Bun Kerd	1	Donation
Dong Suwan	1	Income
Tham Jaremrat	1	Income
Khun Lan	1	Income
Keu Wiang	1	Income
Sawang Arom	1	Donation
Total	22	

4.4 Manpower development in computer skill for knowledge and skill of computer use.

For data collection, and process for accuracy, fast, and workload reduction, manpower development was as follows.

Table 12: Manpower development in computer skill.

Course / Content	No. of trained staff	Organizer
1.Basic Computer	36	Dokkamtai Technical College
2.Database Management Computer Program	15	Phayao PPHO
3. Database Management Computer Program	20	Phayao PPHO / DPHO
4.Hardware and computer system maintenance	3	Craft and Labor Development Institute, Private sector

4.5 Data collection and updating.

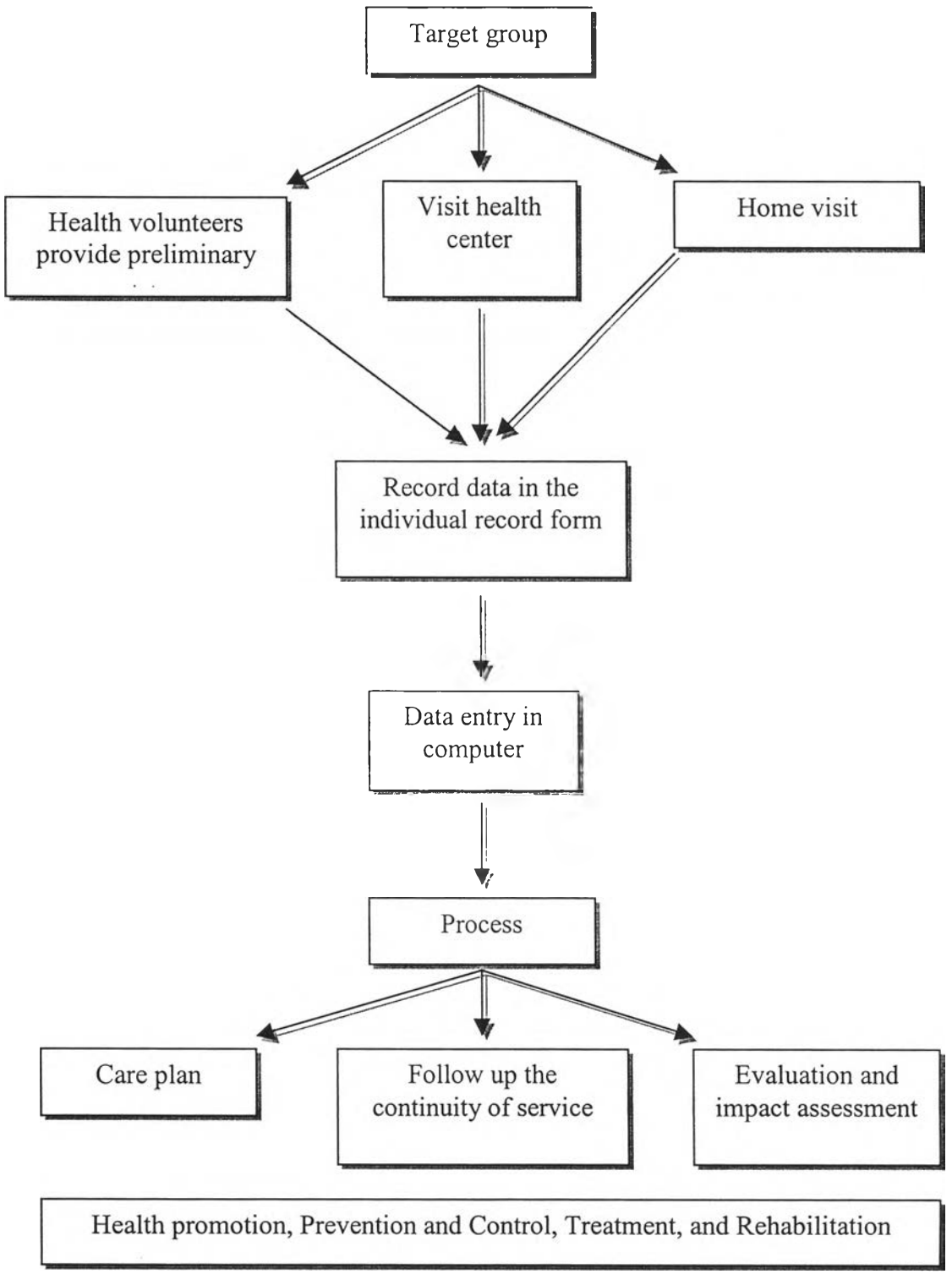
Initially, village health volunteer submitted data to health center then the health worker recorded and filed. When target individual visited health center for service, health worker filled up the individual record, including health promotion, treatment, and rehabilitation work. Then, preliminary problem assessment and inaccessibility of the target individual could be approximated shortly. Such care could then be extended to other family members. This was considered holistic care, leading to family health implementation.

Some health centers filed individual record at the front desk, filing by village and house number. When target individuals visited health center, their parents or guardians would search the files by themselves, which is of advantage that people could participate in self-recheck of the information. That induced the sense of ownership by the people of the information requested and recorded earlier. When some information was found missing, file not found or incorrect, they felt worried and informed the staff to rectify. However, self-searching was controversial as regards privacy and confidentiality of the target group. Possible solution was health worker to record only exposable information, but for those to be concealed, to use computer or health center record book with codes.

Moreover, data recording could be performed in the field by bringing along the record forms. This is a suitable tool well suited for the field service of public health, especially home visits. Health workers could utilize information from individual record for situation assessment and information updating. It could also substitute the existing fragmented records as mentioned (Out patient care, Mother and child, Immunization, etc.) to become individual-oriented record form.

Although, the individual-oriented record form was useful for public health workers to follow up and assess the coverage of core service, solely using such record caused difficulty to process the information as a whole. Because there were plenty of information in the record and needed to be sort out to get the whole picture of activity, it required plenty of efforts. Information technology could be used to solve the problem, using computer. It then reduced time consumption and made it accurate.

Figure 8: Data collection and updating



5. Summative Evaluation

It was the evaluation at the end of the project judging it and finding advantage of the project to apply to similar situations.

The evaluation at the end of the project was the evaluation after it had started for 6 months as a cutout point, where the preparation and preliminary data collection ended. However, there should be continuity of information system development because information concerning living beings is dynamic and it has to be updated for always.

5.1 Advantage of the collected data

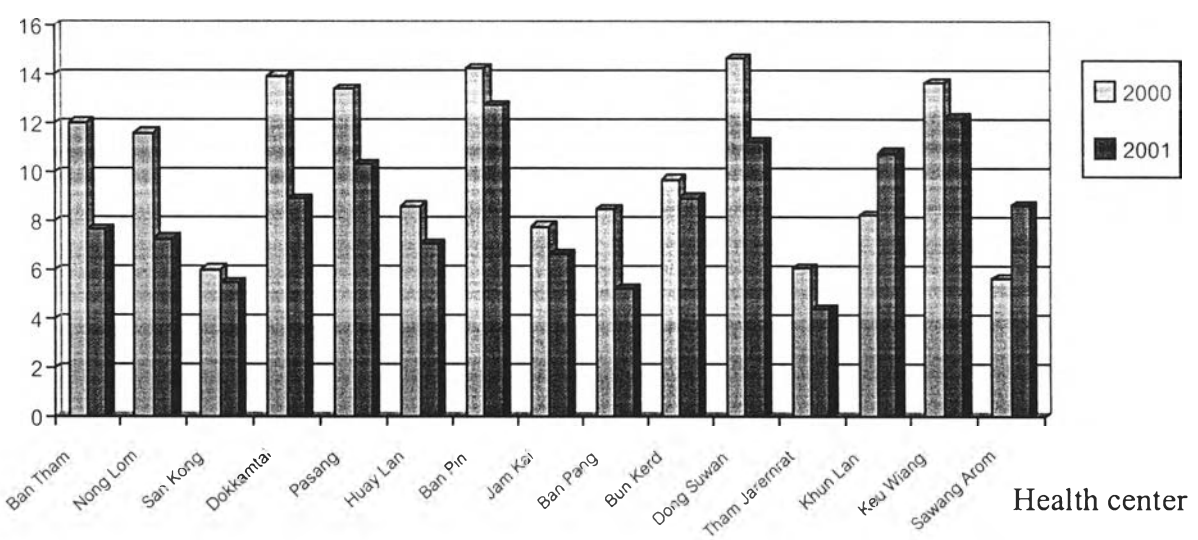
Table 13: Method and advantage of the collected data

Information	Previous		Present	
	Method	Advantage	Method	Advantage
1.Target population -No. Of target group -Birth rate -Baby death rate -Under 5 year children death rate	-Registration -Birth and death certificate	-Target group identification -Problem statement	-Target group registration -Individual record	-Problem statement -Resource allocation to target
2.Public health service -Children health check up -Development check -Immunization -Home visit -Health care -Rehabilitation	-Records at service place	-Workload estimate -Report to superior -Budget allocation	-Individual record -Actively service	-Service planning -Evaluation -Coverage identification -Resource allocation
3.Communicable / Incommunicable disease -Incidence of critical communicable disease -Vertical transmitted disease -Chronic disease	-Records	-Report to superior -Budget allocation -Problem statement -Evaluation	-Home visit -Actively service -Analysis	-Problem statement -Cause identification -Solution /prevention planning -Resource allocation

In general the core of this information system is the continuity of service. The service provider knows current situation of the clients precisely, and knows the cause of discontinuity. For example, vaccination defaulter identification and tracing or home visit. Moreover, the recording of target's information in one health card, including health promotion, prevention, treatment, and rehabilitation, enables children under 5 to get true comprehensive care.

5.2 Duration of data collection

Figure 9: Percentage of time consumption of health workers for recording task, Dokkamtai district, Phayao 2000 and 2001



Source: Time record of health workers in Fiscal year 2000 and 2001

Table 14: Percentage of time consumption of health workers for recording task, Dokkamtai district, Phayao 2000 and 2001

Health Center	Percentage of time consumption	
	2000	2001
Ban Tham	12.03	7.65
Nong Lom	11.61	7.3
San Kong	6.05	5.49
Dokkamtai	13.94	8.93
Pasang	13.42	10.34
Huay Lan	8.61	7.07
Ban Pin	14.23	12.72
Jam Kai	7.79	6.65
Ban Pang	8.52	5.24
Bun Kerd	9.72	8.97
Dong Suwan	14.66	11.22
Tham Jarernrat	6.1	4.41
Khun Lan	8.23	10.78
Keu Wiang	13.67	12.19
Sawang Arom	5.68	8.65

Source: Time record of health workers in Fiscal year 2000 and 2001

According to the chart and the table, the time consumption of health workers for working on records making in Fiscal year 2001 was rather less than that of the previous year (Fiscal year 2000) because the new information system reduced the overlapping task, thus less time consumption. However, some health centers spent more time because those health centers were newly started. They still had no fully organized information system (Swang Arom Health Center). In another case, Khun Lan Health Center, due to the lack of supervision, health workers were not clear and keen on

individual record, and they also lacked computerized system skill. As a whole, in Fiscal year 2000, health workers spent time on records 7.40%, whilst in Fiscal year 2001, it was only 6.54%.

5.3 Fulfillment of information requirement of same and superior level

In line with the public health development to provide public health care and services to the target group, with continuum and comprehensive care covering the core health service, health worker could utilize the collected data as follows.

1. Service planning for target group

   For example, the number of children under 5, both qualitative and quantitative, for vaccination planning and stocking

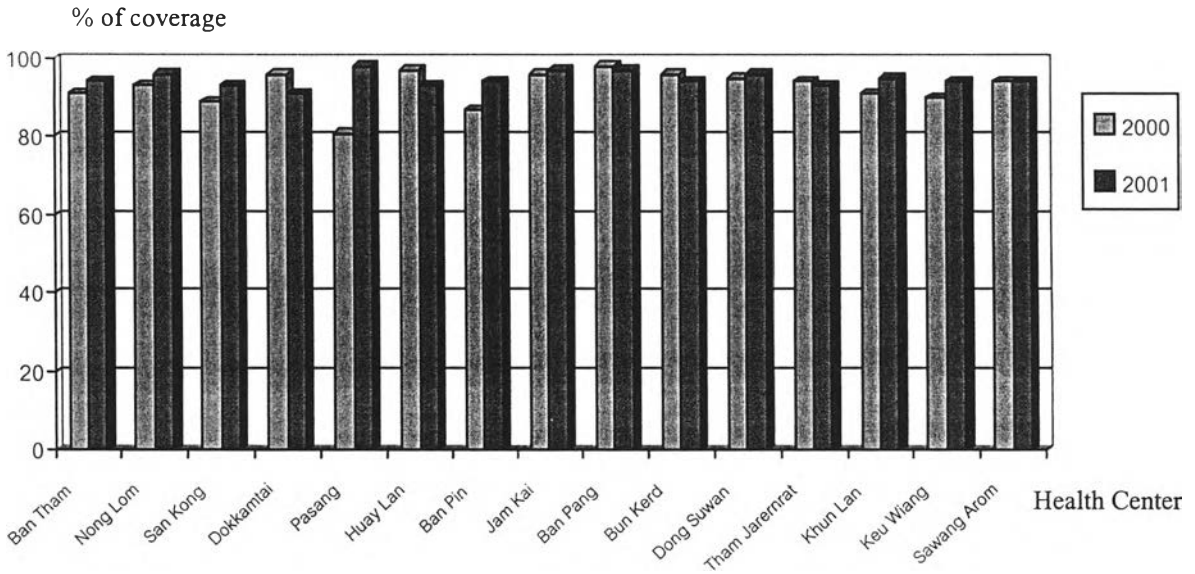
2. Follow up advantage

   Health workers could assess the coverage of care to the target group, such as vaccination, by using the data

3. Evaluation and impact assessment advantage

   Health worker could trace the negative effect of vaccination of each child individually, linking to overall health care, family and context of the target.

Figure 10: Coverage of vaccination for children under 5 in responsible area of Dokkamtai district, fiscal year 2000 – 2001



Source: Coverage report of vaccination, Dokkamtai district health office

Table 15: Coverage of vaccination for children under 5 in responsible area of Dokkamtai district, fiscal year 2000 – 2001

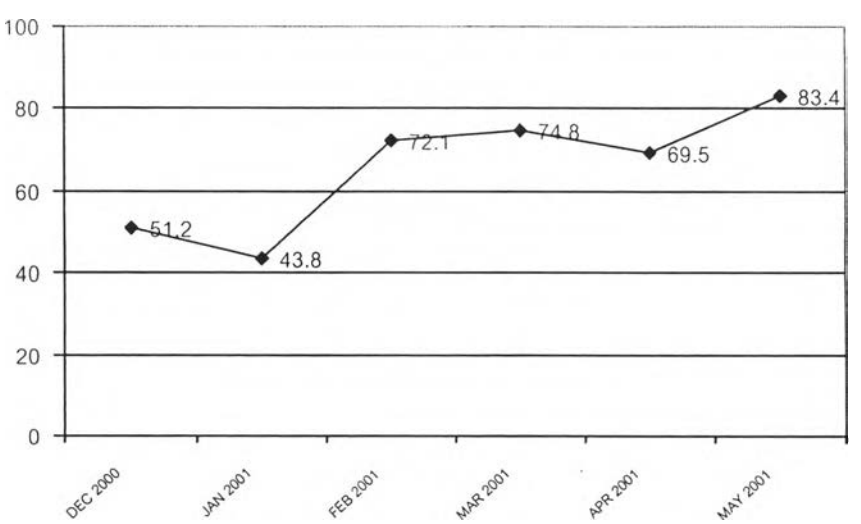
Health Center	Coverage of vaccination (%)	
	2000	2001
Ban Tham	91	94
Nong Lom	93	96
San Kong	89	93
Dokkamtai	96	91
Pasang	81	98
Huay Lan	97	93
Ban Pin	87	94
Jam Kai	96	97
Ban Pang	98	97
Bun Kerd	96	94
Dong Suwan	95	96
Tham Jarernrat	94	93
Khun Lan	91	95
Keu Wiang	90	94
Sawang Arom	94	94

Source: Coverage report of vaccination, Dokkamtai district health office

According to the coverage of vaccination in children under 5 of the target group in responsible area of health centers in Dokkamtai, fiscal year 2001, comparing to the fiscal year 2000, it was found that most of health centers had higher coverage of vaccination in children at almost all health centers. Contributing factors were number of staff, budget and supporting resources, and superior policy. Besides, having accurate individual information at health center helped identify correct target individuals, and facilitate their access to health care. Health workers could therefore tell which child had not received vaccination and why, and health workers could also appropriately plan for good services.

In response to requirements of superior, health workers could summarize the individual records and make a report to district and provincial authority, including monthly and cohort report and as requested.

Figure 11: Percentage of health center, which could submit monthly report in time (by the 5th of the month)

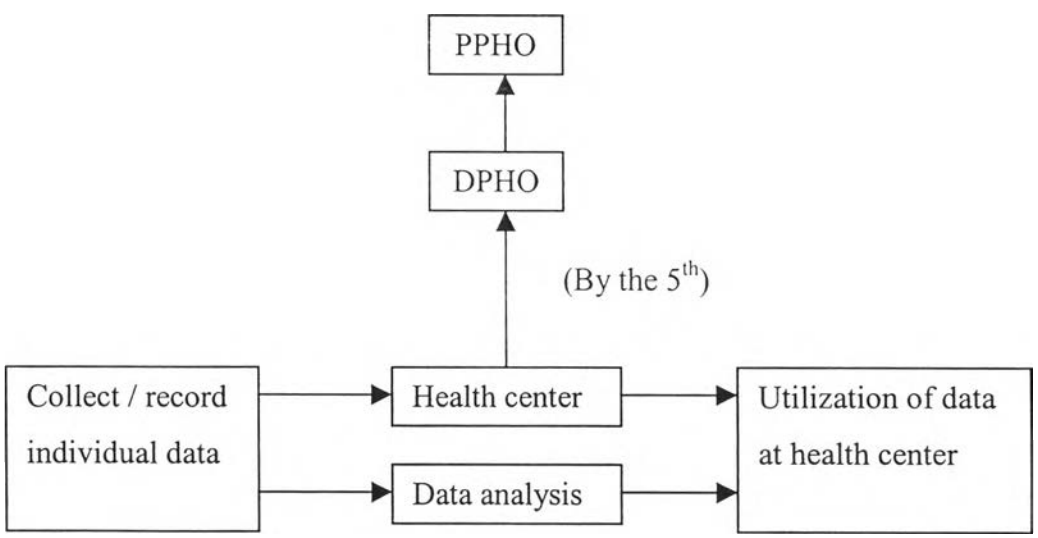


Source: Reporting records of health centers, Dokkamtai district health office

According to the chart, it shows the tendency of improved punctuality of monthly report from health centers to district health office. Before the change of data collection, most health center (around 50%) submitted delayed monthly report (after the 5th of the month). But after the change, most of them became more punctual and submitted it in time (by the 5th of the month) because every health center used computer for data collection and could partially report to district health office in electronic form.

Chart Results of public health information system development for the target group (0-5 year), Dokkamtai, Phayao

Figure 12: Data flow structure of information, Dokkamtai district



Results of public health information system development, and role of various organizations

Health center

- Collect data and verify
- Data analysis
- Utilized data
- Report to district health office

District health office

- Collect data from health centers
- Verify and record data
- Data analysis
- Technical, budget, educational, and equipment supports to health center
- Report to provincial health center

Provincial public health office

- Collect and verify data from district health office
- Analyze and utilize the data submitted
- Technical, budget, educational, and equipment supports to health center, district health office

5.4 Satisfaction of health center staff

According to the supervision of health centers in Dokkamtai district, and the in-depth interview of health workers at health center, who contributed to data collection, recording and processing, and utilizing the data, it was found that at initial stage, health workers mostly felt overloaded with the new system because at the beginning, it was totally data collection. It was difficult, delicate, and requiring a lot of efforts. Moreover, health workers were accustomed to the previous system of filing data by section, and unfamiliar with the new system of individualized information, thus causing confusion.

However, the health workers began to feel responsible and agreed with the change of system. Due to the AIC process previously participated by them, everyone realized the common goal of the improvement of the quality and assurance of the utilization of data. Thus, after data collection at the initial stage, they needed only to update the data. The work during such period was to just record all changes of data of the individual record onto the computer. If the workers were familiar with computer use, it would be more easy. Mostly, there were a certain number of officials at health center, who were capable enough to perform recording, filing and processing the data. Most of health workers were satisfied with the new system because they could utilize the data at any time, for example, children list for vaccination, child client at the health center, coverage of care, etc.

Nonetheless, most of health workers expressed the feeling that there should be an easier method of recording than the current one. The health center with a lot of population in responsible and a lot of clients, the burden of information relevantly increased. Nevertheless, due to some conversations from the supervision and meeting, none of the health workers assumed the data was not utilizable. Most of them agreed that the developed information system was appropriate and could be further improved.