

## **Research on Social Impact Assessment of Using the AorSorMor Online Application in 2023**

### **Background and Significance**

As Thailand has entered the new digital era enabling the rapid sharing of data, it is important that information, especially health data that impacts people's wellness, will be communicated in an accurate and timely manner. This is in alignment with the government's Thailand 4.0 strategy with a focus on adopting innovations and digital technology to enhance work process efficiency, reduce expenses, increase income, and elevate the quality of public health services and people's quality of life.

AorSorMor (Thai Village Health Volunteers) is a form of public engagement in health prevention and promotion for individuals, families, and communities. Having undergone training by health officials, village volunteers perform their civic duties with dedication to their fellow citizens. They play a crucial role in the Thai public healthcare system as change agents in providing health information, giving advice and knowledge, planning, coordinating health activities, screening, and referring patients to hospitals, and also taking care of people's health.

The AorSorMor network was set up by the Ministry of Health in 1977. To date, there have been over 1 million AorSorMor volunteers across the country who have undergone continual development of their potential as well as learning to use digital technology in their work to ensure the health data collected is accurate, quick, timely, and efficient.

For its part, AIS developed an AorSorMor Online application to act as a digital communication tool between sub-district health-promoting hospitals and AorSorMor volunteers, allowing them to integrate the digital technology into their community public health services, to ensure more efficient and pro-active

performance along with upgrading the volunteers' digital literary skills. This effort, which has continued since 2015, is dedicated to contributing to a better quality of life for people and society.

Over the course of time, the AorSorMor Online application has developed multiple features to accommodate community public health efforts and take care of local residents' health and wellness. Chief among them are reports of mental health screening, survey reports of mosquito larvae, reports of incidents (such as surveys of target groups), and health information among others.

To ensure the implementation of the AIS' AorSorMor Online application continues to move in the right direction and to evaluate the development efficiency of the application in facilitating the provision of pro-active health services and in contributing to local residents' quality of life through health-promoting hospitals and AorSorMor volunteers employing the application in caring for local people's health, research ("Social Impact Assessment of Using the AorSorMor Online Application in 2023") was conducted.

## **Objectives**

1. To compare the performances of healthcare staff and AorSorMor volunteers using the AorSorMor Online application in providing pro-active health services and those not using the app.
2. To compare the quality of life of people in areas where healthcare staff and AorSorMor volunteers used the AorSorMor Online application and in areas where the application was not used.
3. To examine the satisfaction levels of healthcare staff and AorSorMor volunteers who use the AorSorMor Online application.

## **Research Hypotheses**

1. In the areas where healthcare staff and AorSorMor volunteers use the AorSorMor Online application, they are likely to have better performance in providing proactive health services than those not using the application.
2. Residents in areas where healthcare staff and AorSorMor volunteers use the application are likely to have a better quality of life than those in areas without the use of the application.
3. Healthcare staff and AorSorMor volunteers using the AorSorMor Online application are likely to have a "Very satisfied" level of satisfaction.

## **Methodology**

This evaluative research used the CIPPI Model of Daniel Stufflebeam as a framework.

1. Evaluating performance in providing pro-active health services based on the Donabedian model for measuring quality of care
2. Evaluating people's quality of life in line with Ragnar Nurkse's concept of the vicious circle of poverty

## **Population and Sample**

The population of this study were 268,946 healthcare staff, AorSorMor volunteers, and local residents in areas where the AorSorMor Online application was or was not used (According to the AorSorMor Online Application Users in 2022 report by Advanced Info Service Public Company).

The sample consisted of 3,081 persons as follows:

- |   |       |
|---|-------|
| 1. Healthcare staffs                                | 140   |
| 2. AorSorMor volunteers                             | 2,505 |
| 3. Local residents under the care of the volunteers | 436   |

## **Research Process Steps**

1. Review the literature and studies related to measuring quality of life, evaluating performance in providing pro-active health services, and other relevant aspects.
2. Design a conceptual framework,
3. Define key terms, components, and indicators in the research.
4. Formulate research questions in alignment with the components and indicators.
5. Evaluate content validity by three subject matter experts.
6. Test reliability of data collection instruments.
7. Collect data from the sample group.
8. Analyze and interpret the data.
9. Conclude data results.

## **Data Analysis**

1. Analyzed general data using descriptive statistics to describe the data e.g., mean, standard variation.
2. Analyzed satisfaction levels of healthcare staff and AorSorMor volunteers use of the AorSorMor Online application using descriptive statistics to describe the data e.g., mean, standard variation.
3. Analyzed performances of healthcare staff and AorSorMor volunteers in areas that use or do not use the AorSorMor Online application using One-way ANOVA and Scheffe pairwise multiple comparison methods.
4. Analyzed the effect size that measures the strength of the relationship between two groups of healthcare staff and AorSorMor volunteers using Cohen's D method.
5. Analyzed people's quality of life using descriptive statistics to describe the data e.g., mean, standard deviation, and compared means of the data in different areas using the independent sample t-test technique.

## **Data Collection Period**

April – May 2023

## Results

### 1. Sample group data

1.1 The sample group consisted of 140 healthcare staffs, 2,505 AorSorMor volunteers, and 436 members of the general public

Type of user	Active users		Former users		Non-users		Total	
	N	%	N	%	N	%	N	%
Healthcare staff	95	67.86%	39	27.86%	6	4.29%	140	100.00
AorSorMor volunteers	2,121	84.67%	309	12.34%	75	2.99%	2,505	100.00
<b>Total</b>	2,216	83.78%	348	13.16%	81	3.06%	2,645	100.00

1.2 437 of the sample group (16.52%) had less than 5 years' experience in performing health services, 573 (21.66%) had 6-10 years' experience, 520 (19.66%) had 11-15 years' experience, 426 (16.11%) had 16-20 years' experience, and 689 (26.05%) had more than 20 years' experience.

1.3 On average, each of the AorSorMor volunteers under the study oversaw 14.52 households for a total 48 residents.

## 2. Performance of healthcare staff and AorSorMor volunteers in providing pro-active health services

2.1 Mean performance of healthcare staff and AorSorMor volunteers in providing pro-active health services broken down by use of the AorSorMor Online application

Aspects	Active users		Former users		Non-users	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
<b>Structural aspects</b>	<b>4.27</b>	<b>0.66</b>	<b>4.17</b>	<b>0.64</b>	<b>4.04</b>	<b>0.79</b>
1. Human resources management	4.30	0.64	4.18	0.65	4.06	0.75
2. Management of equipment and medical devices	4.24	0.67	4.15	0.64	3.84	0.81
<b>Procedural aspects</b>	<b>4.31</b>	<b>0.64</b>	<b>4.23</b>	<b>0.63</b>	<b>4.17</b>	<b>0.75</b>
3. Operating procedure	4.26	0.64	4.15	0.64	4.00	0.74
4. Operating times	4.26	0.66	4.18	0.62	3.98	0.67
5. Communication	4.31	0.64	4.24	0.62	4.09	0.69
6. Providing health information	4.37	0.62	4.29	0.62	4.22	0.67
7. Providing health services	4.34	0.63	4.28	0.63	4.19	0.78
8. Utilizing information	4.33	0.64	4.26	0.62	4.11	0.81
<b>Total</b>	<b>4.30</b>	<b>0.64</b>	<b>4.22</b>	<b>0.63</b>	<b>4.14</b>	<b>0.76</b>

It was found that healthcare staffs and AorSorMor volunteers who were active users of the application exhibited a higher mean performance than former users and non-users in all aspects.

2.2 Performances in providing pro-active health services of healthcare staffs and AorSorMor volunteers in areas with or without the use of the AorSorMor Online application using the One-way ANOVA test to investigate variation

Sources of variation	F	SS	MS	F	P
Between-group variation	2	453.36	226.68	8.196**	.000
Within group variation	2316	64052.14	27.66		
Total	2318	64505.50			

Remark \*\* means significance at 0.01 level.

Overall, the sample mean performance levels in providing pro-active health services were found to be significant at the 0.01 level, suggesting there were significant differences between at least one pair of the sample means. The Scheffe pairwise multiple comparison method was then performed as shown in the table under 2.3.

2.3 Performances in providing pro-active health services of healthcare staffs and AorSorMor volunteers in areas that use or do not use the AorSorMor Online application using the Scheffe pairwise multiple comparison method

Usage	$\bar{x}$	Non-users	Former users	Active users
Absence of usage	4.14	-	-1.595	-2.223*
Discontinued usage	4.22		-	0.629
Active usage	4.30			-

Remark\* means significance at 0.05 level.

The pairwise comparison showed that the mean performance levels in providing pro-active health services of active users and non-users of the AorSorMor Online application were different at 0.05 level of significance with the active users having better performance than the non-users.



2.4 The analysis of the performance in providing pro-active health services of healthcare staff and AorSorMor volunteers in terms of the usage periods of the AorSorMor Online application revealed that the usage periods had a significant effect on mean performance levels. Namely, the longer the usage period, the higher the performance.

Usage periods	$\bar{x}$	0 year	< 1 year	1 year	2 years	3 years	3+ years
0 year	4.06	-	-1.725	-1.742	-2.280*	-2.95*	-3.401*
< 1 year	4.25			-0.018	-0.656	-0.570	-1.676*
1 year	4.23				-0.638	-0.552	-1.659
2 years	4.30				-	0.086	-1.021
3 years	4.28						-1.106
3+ years	4.39						-

Remark\* means significance at 0.05 level.

The results demonstrated that the performances of healthcare staff and AorSorMor volunteers with a usage period of 2, 3, and 3+ years of the AorSorMor Online application were higher than those with 0 year of usage at 0.05 level of significance (Mean differences = 2.380, 2.295, and 3.401 respectively). It was also found that the performances of the group with a 3+ years usage period were higher than the group using the application for less than 1 year at 0.05 significance level (Mean difference = 1.676).

2.5 Effect size of the performances of the group of healthcare staffs and AorSorMor volunteers using the AorSorMor Online application for over three years compared to the group with absence of usage using Cohen and Hedges methods.

<b>Usage Period</b>	<b>Mean</b>	<b>N</b>	<b>S.D.</b>	<b>SDpooled</b>	<b>Cohen's d</b>	<b>Hedges' g</b>	<b>Interpretation</b>
3+ years	39.88	413	5.115	5.231	0.650	0.649	"Medium" effect size
0 year	36.48	87	5.756				

When comparing the difference in performance between the two groups, the healthcare staff and AorSorMor Volunteer group with a 3+ year usage of the AorSorMor Online application, a medium effect size was found.

### 3. People's Quality of Life

3.1 The mean value of people's quality of life in different areas broken down by the use and non-use of the AorSorMor Online application.

Province	Areas that use the application	Areas that do not use the application
Kanchanaburi	64.21	60.43
Chainat	68.07	65.30
Nakhon Si Thammarat	65.62	61.76
Sa Kaew	63.72	58.31
Amnat-Charoen	67.00	62.07
<b>Total</b>	<b>65.72</b>	<b>61.59</b>

It was found that the mean value of people's quality of life in the areas where healthcare staff and AorSorMor volunteers used the AorSorMor Online application was higher than the mean value in their counterpart areas across all the provinces with mean values of 65.72 and 61.59 respectively.

3.2. The quality of life of people in areas that use and don't use the AorSorMor Online application

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	289	65.72	3.96				
Areas that do not use the application	147	61.59	4.03	4.13	266	5.278**	0.000

Remark\*\*means significance at 0.01 level.

The findings showed that the quality of life of people in the areas that use the AorSorMor Online application was statistically higher than that of their counterparts at 0.01 level of significance.

3.3 The use of the AorSorMor Online application had an impact on people's quality of life in different aspects.

### 3.3.1 Health knowledge

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	289	16.58	2.88				
Areas that do not use the application	147	14.59	4.24	1.99	217	5.128**	0.000

Remark\*\*means significance at 0.01 level.

The use of the AorSorMor Online application was found to affect people's quality of life in terms of health knowledge at 0.01 level of significance.

### 3.3.2 Physical health

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	289	7.23	1.53				
Areas that do not use the application	147	6.67	1.73	0.56	264	3.338**	0.001

Remark\*\*means significance at 0.01 level.

The use of the AorSorMor Online application was found to affect people's quality of life in terms of physical health at 0.01 level of significance.

### 3.3.3 Mental health

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	289	15.94	2.45				
Areas that do not use the application	147	15.47	2.69	0.48	434	1.852*	0.032

Remark\*\*means significance at 0.05 level.

The use of the AorSorMor Online application was found to affect people's quality of life with respect to mental health at 0.05 level of significance.

### 3.3.4 Social aspect

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	289	13.08	2.05				
Areas that do not use the application	147	12.43	1.96	0.65	336	3.469**	0.000

Remark \*\*means significance at 0.01 level.

The use of the AorSorMor Online application was found to affect people's quality of life as regards social aspect at 0.01 level of significance.

### 3.3.5 Environmental aspect

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	289	12.89	1.66				
Areas that do not use the application	147	12.44	1.76	0.44	434	2.600**	0.005

Remark \*\*means significance at 0.01 level.

The use of the AorSorMor Online application was found to affect people's quality of life in terms of environmental aspect at 0.01 level of significance.

### 3.3.6 Economic aspect

Usage	N	$\bar{x}$	S.D.	D	df	t	P
Areas that use the application	100	15.29	6.20				
Areas that do not use the application	61	13.98	6.66	1.31	159	1.261	0.052

It was found that the use of the AorSorMor Online application had no effect on people's quality of life with respect to economic aspect at 0.05 significance level.

#### **4. Satisfaction levels of using the AorSorMor Online application.**

Numerical scale

5 is Extremely Satisfied

4 is Very Satisfied

3 is Satisfied

2 is Slightly Satisfied

1 is Least Satisfied

Mean range and descriptive interpretation of the survey respondents are as follows:

4.51 - 5.00	means Extremely Satisfied
3.51 - 4.50	means Very Satisfied
2.51 - 3.50	means Satisfied
1.51 - 2.50	means Slightly Satisfied
1.50 and below	means Least Satisfied

#### 4.1 Overall satisfaction

No.	Satisfaction features	$\bar{x}$	S.D.	Level of satisfaction
1	News	4.32	0.68	Very Satisfied
2	Meeting appointment	4.22	0.75	Very Satisfied
3	Activity reporting	4.29	0.69	Very Satisfied
4	Incident reporting	4.22	0.74	Very Satisfied
5	Monthly reporting	4.39	0.65	Very Satisfied
6	Screening and monitoring COVID-19	4.29	0.70	Very Satisfied
7	Mental health screening	4.30	0.71	Very Satisfied
8	Survey reports of mosquito larvae	4.40	0.65	Very Satisfied
<b>Overall</b>		<b>4.30</b>	<b>0.70</b>	<b>Very Satisfied</b>

Overall, it was found that healthcare staffs and AorSorMor volunteers were "very satisfied" using the AorSorMor Online application. They were also very satisfied with all the features of the application.

## 4.2 Satisfaction levels using the AorSorMor Online application broken down by features

No.	Satisfaction features	Former users			Active users		
		$\bar{x}$	S.D.	Level of satisfaction	$\bar{x}$	S.D.	Level of satisfaction
1	News	4.15	0.75	Very Satisfied	4.35	0.66	Very Satisfied
2	Meeting appointment	4.04	0.87	Very Satisfied	4.25	0.73	Very Satisfied
3	Activity reporting	4.15	0.79	Very Satisfied	4.32	0.66	Very Satisfied
4	Incident reporting	4.06	0.85	Very Satisfied	4.25	0.72	Very Satisfied
5	Monthly reporting	4.23	0.78	Very Satisfied	4.42	0.63	Very Satisfied
6	Screening and monitoring COVID-19	4.12	0.80	Very Satisfied	4.31	0.68	Very Satisfied
7	Mental health screening	4.16	0.76	Very Satisfied	4.32	0.70	Very Satisfied
8	Survey reports of mosquito larvae	4.27	0.78	Very Satisfied	4.42	0.63	Very Satisfied
<b>Overall</b>		<b>4.15</b>	<b>0.80</b>	<b>Very Satisfied</b>	<b>4.33</b>	<b>0.68</b>	<b>Very Satisfied</b>

Both groups of active users and former users were found to be "very satisfied" with the application with a higher mean among the active user group.



### 4.3 Satisfaction levels using the AorSorMor Online application broken down by types of users

No.	Satisfaction features	Healthcare staff			AorSorMor volunteers		
		$\bar{x}$	S.D.	Level of satisfaction	$\bar{x}$	S.D.	Level of satisfaction
1	News	4.29	0.69	Very Satisfied	4.32	0.67	Very Satisfied
2	Meeting appointment	4.12	0.91	Very Satisfied	4.23	0.74	Very Satisfied
3	Activity reporting	4.34	0.76	Very Satisfied	4.29	0.68	Very Satisfied
4	Incident reporting	4.19	0.84	Very Satisfied	4.22	0.73	Very Satisfied
5	Monthly reporting	4.51	0.72	Extremely Satisfied	4.38	0.65	Very Satisfied
6	Screening and monitoring COVID-19	4.13	0.91	Very Satisfied	4.29	0.69	Very Satisfied
7	Mental health screening	4.26	0.82	Very Satisfied	4.30	0.70	Very Satisfied
8	Survey reports of mosquito larvae	4.54	0.61	Extremely Satisfied	4.39	0.65	Very Satisfied
<b>Overall</b>		<b>4.30</b>	<b>0.78</b>	<b>Very Satisfied</b>	<b>4.30</b>	<b>0.69</b>	<b>Very Satisfied</b>

The overall satisfaction level of both healthcare staffs and AorSorMor volunteers was "very satisfied" with the same mean satisfaction. While AorSorMor volunteers were "very satisfied" with all the features, healthcare staff were "extremely satisfied" with two features: monthly reporting and survey reports of mosquito larvae.

## Summary of Findings

1. The study of the performances of healthcare staff and AorSorMor volunteers that use or do not use the AorSorMor Online application found the following:

1.1. The mean performances in providing pre-active health services of healthcare staff and AorSorMor volunteers who are active users of the AorSorMor Online application were higher than those of the former users and non-users in all aspects.

1.2 The performances of healthcare staff and AorSorMor volunteers in areas that use the AorSorMor Online application compared to those in the areas that do not use the application were significantly different at 0.01 level.

1.3 The usage periods of the AorSorMor Online application affected the performances of healthcare staff and AorSorMor volunteers at 0.01 level of Significance.

14. Healthcare staff and AorSorMor volunteers in areas with a usage period of 3+ years exhibited a higher performance at 0.05 significance level. When calculating Cohen's effect size, the result could be interpreted as a medium effect size.

It can be concluded that the use of the AorSorMor Online application showed positive effects on healthcare staff and AorSorMor volunteers' performance in providing community health services. The use of the AorSorMor Online application by healthcare staff and AorSorMor volunteers for 3+ years could contribute to a higher performance in providing community health services at a significant level.

2. The study of people's quality of life in areas where healthcare staff and AorSorMor volunteers use and do not use the AorSorMor Online application found the following:

2.1 The mean value of people's quality of life in areas that use the AorSorMor Online application was higher than the mean value of that in areas that do not use the application at 0.05 level of significance.

2.2 The use of the AorSorMor Online application had an overall effect on people's quality of life at 0.05 level of significance.

2.3 The use of the AorSorMor Online application had an effect on people's quality of life regarding health knowledge, physical health, mental health, social aspect, and environmental aspect except for economic aspect at 0.05 level of significance.

3. The satisfaction levels of healthcare staff and AorSorMor volunteers using the AorSorMor Online application was at the "very satisfied" level both for overall satisfaction and by features.

## Discussions

The use of the AorSorMor Online application can contribute to a better performance of healthcare staff and AorSorMor volunteers in providing pro-active health services because the application has been driven by multiple sectors to be used in performing pro-active health services in line with the Diffusion of Innovations Theory. This is consistent with the study of Somphon Poonping (2011) on "The Application of LINE Program for Job Delegation of Village Health Volunteers" which focused on a sample group of 40 health volunteers in Nong Krot Subdistrict, Muang District, Nakhon Sawan Province. It was found that the use of LINE program allowed for quick assignment or delegation for the village health volunteers and reporting of their performance during rush hours. As for the evaluation of their performance using LINE, it was found that the quick assignment or delegation enabled the volunteers to arrive at areas to perform their duties faster and report the results online from their place of work. This allowed the director and the head of the group to monitor, solve problems, and ask the volunteers to adjust information promptly. Like LINE, which is a kind of mobile application, the AorSorMor Online application is also targeted at AorSorMor volunteers.

The result also aligns with the study of Rundorn Srirrom (2021) on "The Effects of the Use of the AorSorMor Online Application in Combination with Heart-to-Heart Information Management Procedures on the Complete and On-time Submission of Monthly Reports by AorSorMor Volunteers at Kham Duai Health Center". It was found that prior to the use of the application, 38 AorSorMor volunteers, or 45.78%, submitted the reports completely and on time. After the use of the application in combination with Heart-to-Heart Information Management Procedures, the number of volunteers submitting the reports completely and on time rose to 83, or 100%, a sharp increase of 54.22%.

The use of the AorSorMor Online application has been shown to contribute to a better quality of life for people under the care of AorSorMor volunteers. Consequently, it can be assumed that the use of the AorSorMor Online application can contribute to a better quality of life for around 47 people under the care of each AorSorMor volunteer. When factoring in the average number of 268,964 application users per month in 2022, it was found that the use of AorSorMor Online application in 2022 contributed to a better quality of life for 12,640,462 people.

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