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# Causal factors affecting vaccine acceptance behavior of people in Bangkok, Thailand

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**Abstract**---Vaccination does not only reduce the severity of the disease, severe morbidity and mortality rates but it also help building herd immunity. This is why the government is trying to push people to get the COVID-19 vaccine as much and as fast as possible. However, what is interesting is that some people refused or do not accept to be vaccinated. The objective of this research was to study the causal factors affecting vaccine acceptance behavior. This research used the quantitative research method. The sample group was people in Bangkok who received the COVID-19 vaccine at least 1 dose for a total of 380 persons. The data were collected with questionnaires and analyzed with a structural equation modeling. The results revealed that cues to action had the greatest overall effect on vaccine acceptance behaviors, followed by perceived barriers, recognition of benefits of treatment and self-efficacy, respectively. The findings can be applied by Ministry of Health to planning operations or guidelines for communicating and understanding with people through various channels to raise knowledge, understanding, and attitudes that will lead to people's behavior of vaccination acceptance. This is a desirable behavior that is absolutely necessary in the present situation.

**Keywords**---Vaccine, COVID-19, management.

## **Introduction**

### **Background and significance of problem**

The new wave of COVID-19 outbreak in Thailand during December 2020 has once again caused concern among Thai people, both the concern of contracting the disease and the concern over the economic and social consequences. However, the new wave of outbreak differs from the first wave in many respects. The number of infected people are more spread to many provinces. However, the measures to control the outbreak are less stringent both in terms of the number of measures and the size of the control areas. It is expected to relax faster. This can be seen from the government's remedial measures that are considerably smaller than the first wave (Jitsuchon, 2021).

Most people have become accustomed to the new normal way of life after the new wave of COVID-19 which has affected the daily lives of Thai people in many ways. However, adapting to a new way of life may not be a sustainable solution. Due to the number of infected people increasing steadily each day and there is no sign that it will decrease in the near future, getting vaccinated against COVID-19 is the decisive factor in this issue.

The violence, severe morbidity and mortality rates will decrease when the government can control the disease by building herd immunity. This is why the government is trying to push people in the country to get the COVID -19 vaccine as much and as fast as possible. What is interesting is that some people fear getting vaccinated. The same incident happened in the United States causing President Joe Biden to come out and ask people to get vaccinated to reach the specified number (Indraphan, 2021).

Due to the COVID-19 pandemic, many countries around the world have developed vaccines that are effective tools for preventing disease. Scientists around the world are competing to test and produce vaccine against the coronavirus. Previously, among the Americans, there was a trend against the COVID-19 vaccine. Less than half of American adult said they would be vaccinated when it was available. Recently, there is still a trend against the COVID -19 vaccine in Austria. Regarding vaccination in all countries around the world, as of 20<sup>th</sup> July, 2021, there were 3,657 million doses of the COVID-19 vaccine worldwide accounted for 13% of the world's population. The top five countries with the highest number of COVID-19 vaccination are 1) China for 1,457 million doses, 2) India for 404 million doses, 3) USA for 337 million doses, 4) Brazil for 124 million doses, 5) Germany for 85 million doses.

There are 2 types of COVID -19 vaccine available in Thailand in the first phase; 1) COVID-19 Vaccine AstraZeneca given to people aged 18 years and over 2) CoronaVac or Sinovac COVID-19 vaccine is a lethal vaccine which is currently prescribed in people aged 18-59 years (Department of Disease Control, Ministry of Public Health, 2021b).

For Thailand, vaccination started from 28<sup>th</sup> February, 2021, to 19<sup>th</sup> July, 2021, accumulated for 14,547,244 doses. The COVID-19 vaccine were administered and divided into 11,067,518 cases for first-dose vaccine and 3,479,726 cases for

second-dose vaccine. The provinces with the most vaccinations are Bangkok, Phuket, Samut Prakan, Nonthaburi, and Chonburi (Department of Disease Control, Ministry of Public Health, 2021a).

However, the main problem encountered was that people lack proper knowledge and understanding of the epidemic situation, the severity of the disease including the benefits of correct COVID-9 vaccination. In addition, some people also receive false information including side effects from getting the vaccine that may be exaggerated and the cost of accessing vaccines is quite high. This is an important issue that inhibits some people's access to vaccines. Thus, the researchers were interested in studying the Causal Factors Affecting Vaccine Acceptance Behavior of People in Bangkok to guide people to understand the factors involved in vaccine acceptance as well as raising the level of knowledge, understanding, and attitudes that will lead to people's behavior in accepting vaccines. This is a desirable behavior that is absolutely necessary in the present situation.

## **Literature Review**

### **Concepts and theories on vaccine acceptance behavior**

The health belief model shows that the tendency towards health behaviors is an important outcome variable of the study. If considering the situation of COVID-19 pandemic in Thailand, it can be seen that the government has taken various urgent measures to alleviate the ongoing spread situation in the country. Most Thai people are well aware of the importance of protecting themselves from COVID-19 and have behaviors that respond to self-defense according to health belief model. The researchers applied the above behavioral concepts by focusing on the behavior of people accepting vaccines reflected through health protection behaviors, willingness to be vaccinated, and recommendation to others.

Desirable behavior that the government expects from people like vaccine acceptance behavior is rejected. According to the study on the health-promoting behaviors in the past (Bauermeister, Meanley, Pingel, Soler, & Harper, 2013), the factors affecting a person's health behaviors were described through the health belief model. Most people are aware of threats from COVID-19 whether the risk of contracting the disease, the severity of the disease, and other risks possibly occurring such as money spending or loss of social status due to COVID-19 infection. The results of past studies revealed that the individual perception of the threats of illness or health problems would lead to health promotion behaviors to prevent the problem (Chen, Liao, Li, Tian, Yang, He, Tu & Sun 2013; Orji & Mandryk, 2014).

### **Concepts and theories about perceived barriers**

The perceived barriers are important variables that deter individuals from accessing appropriate health care services when needed. Scheer, Kroll, Neri, & Beatty, 2003 argues that barriers to accessing health care can be broken down into two components; environmental barriers and process barriers. The environmental barriers are often related to a personal ability to access health care facilities while the process barriers are associated with providing health care

services, such as lack of expertise by healthcare professionals, having poor attitude, work late, or services that do not meet public health standards.

On the other hand, people will have hesitation or will be restrained from showing healthy behavior if they perceive the barriers to performing that behavior (Bauermeister, et al., 2013; Orji & Mandryk, 2014). The main reason most people hesitate to get the vaccine is caused by the concern about various effects possibly occurring such as side effects from drug allergies as well as other contributing factors such as lack of adequate and appropriate information, potential costs of vaccination such as the cost of travel time or the opportunity cost of taking leave from work to get vaccinated. However, if a person perceives the benefits of treatment, they are more likely to exhibit good health behaviors (Zhao, et al., 2012).

### **Concepts and theories about cues to action**

Action-inducing factors are the variables that influence a person's conformity and exhibited any natural behavior. Individuals tend to be influenced by the media or surrounding people. This includes past experience as a tool to consider when making decisions or expressing any behavior (Blackwell, Minard, & Engel, 2006). Thus, according to the past studies (Stanton & Campbell, 2014; Nieminen, Prattala, 3) Martelin, Harkanen, Hyyppa, Alanen & Koskinen, 2013; McKinley & Wright, 2014), the correlation is often found between behavioral influences, such as media influence or social support with desirable behavior in health care.

### **Concepts and theories about self-efficacy recognition**

The theory of self-efficacy recognition is developed from social learning theory (SCT) which is the theory that has had strong influence on the development of techniques for modifying individual behaviors. This theory was developed by Canadian psychologist, Bandura (1986), studying person's beliefs about their ability to do something on their own (self-efficacy) which is the influence that helps a person to behave in a particular way, based on the self-efficacy concept. This theory believes that the study of human behavior must analyze the conditions and stimuli that will reinforce the conditions to persist. Human behavioral learning is therefore a result of the learning process of many elements, including genetics, social environment, experience, and individual abilities. It is difficult to determine whether the behavior is caused by one particular thing. If a person has self-awareness and expects the outcome of the action, he will show that behavior to achieve a given goal.

### **Concepts and theories about perceived barriers**

The perceived barriers are important variables that deter individuals from accessing appropriate health care services when needed. Scheer, Kroll, Neri, & Beatty, 2003 argues that barriers to accessing health care can be broken down into two components; environmental barriers and process barriers. The environmental barriers are often related to a personal ability to access health care facilities while the process barriers are associated with providing health care

services, such as lack of expertise by healthcare professionals, having poor attitude, work late, or services that do not meet public health standards.

### **Concepts and theories about perceived threats**

Perceived threats are one of the factors affecting public health behaviors in health belief model. Moreover, perceived threats are related to public perceptions of health risks which are often important factors that drive people to prevent health behaviors. The preventive motivation theory (Rogers & Prentice-Dunn, 1997) and the health belief model (Rosenstock, 1974) combine threat perceptions as part of the concept that motivates individuals to engage in preventive behaviors for health protection. When considered in details, it can be found that both health theories agree that perceived threats were positively correlated with intent to induce defensive health behaviors in individuals (Sheeran et al., 2014).

Past studies of the epidemic of diseases such as SARS, swine flu, or MERS found that the perceived threats of these diseases directly influenced monitoring behavior and prevented people's disease (Leppin & Aro, 2009; Kim & Song, 2017). Vacondio, Priolo, Dickert, & Bonini (2021) argued that the perceived threats are complement between perception of possibility to be exposed to disease such as exposure to an infected person and perceived severity such as perception of danger and bad outcomes if being sick with that disease.

### **Concepts and theories about perceived benefits of treatment**

The key indicators of the perceived benefits of treatment are correspondent with the National Health Act B.E.2550 (2007) stating that all four aspects of health must be consistent to create the wellness (Prawet Wasi, 2007). According to the results of past studies, it was found that personal health assessment was strongly related to health and wellness indicators. The researchers therefore applied the definitions from the 2007 National Health Act to measure the perceived benefits of treatment affecting person's health consisting of physical health, mental health and social health. Meanwhile, spirituality or wisdom which refers to knowledge and understanding of health was presented primarily in the self-efficacy factor.

### **Research Methodology**

This research used quantitative research method. The population was people in Bangkok who received the COVID-19 vaccine at least 1 dose for a total of 8,983,063 persons (information as of 29<sup>th</sup> November, 2021) (Bureau of Health, Bangkok, 2021). The size of the sample was determined using the criteria 20 times the observed variable. This research consisted of 19 variables, resulting in a total of 380 samples. The stratified sampling method was used. The data were collected from questionnaires. It passed content validity with IOC values ranging from 0.80-1.00. It was found that regarding the reliability of the measures, Cronbach's alpha of the observed variable measures used in this research was from 0.814 to 0.948 and the entire volume was 0.988. The analysis was conducted with structural equation modeling.

## Research Results

### Causal Factors Influencing Vaccine Acceptance Behavior

The researchers adjusted the model based on the model modification indices to make the model best fit the data. The results revealed that; 1) relative Chi-square = 1.71, 2) RMSEA = 0.041 3) SRMR = 0.042 4) GFI = 0.96 7) = AGFI = 0.92 8) CFI = 0.99 9) PGFI = 0.59 and 10) CN = 299.97, indicating that the indicators entered well with the data and meet the criteria of each index to enter well with the data.

### Direct effect, indirect effect and total effect among the studied variables

Table 1  
Direct effect, indirect effect, and total effect among the studied variables

| Dependent variables | Influence | Independent variables |        |         |      |       | R <sup>2</sup> |
|---------------------|-----------|-----------------------|--------|---------|------|-------|----------------|
|                     |           | SEFF                  | CTAC   | BARR    | THRE | BENE  |                |
| CTAC                | DE        | 0.81**                | -      | -       | -    | -     | 0.66           |
|                     | IE        | -                     | -      | -       | -    | -     |                |
|                     | TE        | 0.81**                | -      | -       | -    | -     |                |
| BARR                | DE        | 0.70**                | -      | -       | -    | -     | 0.49           |
|                     | IE        | -                     | -      | -       | -    | -     |                |
|                     | TE        | 0.70**                | -      | -       | -    | -     |                |
| THRE                | DE        | -                     | 0.71** | -       | -    | -     | 0.51           |
|                     | IE        | 0.58*                 | -      | -       | -    | -     |                |
|                     | TE        | 0.58*                 | 0.71** | -       | -    | -     |                |
| BENE                | DE        | -                     | 0.81** | -       | -    | -     | 0.80           |
|                     | IE        | 0.66*                 | -      | -       | -    | -     |                |
|                     | TE        | 0.66*                 | 0.81** | -       | -    | -     |                |
| VACB                | DE        | 0.14*                 | 0.80*  | -0.23** | -    | 0.18* | 0.88           |
|                     | IE        | -0.16*                | 0.15** | -       | -    | -     |                |
|                     | TE        | -0.02*                | 0.95** | -0.23** | -    | 0.18* |                |

Remark: \* significance at .05 level, \*\* significance at .01 level.

From Table 1, it was found that cues to action had the greatest overall effect on vaccine acceptance behaviors, followed by perceived barriers, perceived benefits of treatment and perceived self-efficacy, respectively. When considering only the direct effect on vaccine acceptance behavior, it was found that cues to action had the most direct effect on vaccine acceptance behavior, followed by perceived barriers, perceived benefits of treatment, and perceived self-efficacy, respectively. Meanwhile, perceived threats had neither direct effect nor indirect influence on vaccine acceptance behavior.

## Discussion of Results

1. The cues to action is the most important variable that has direct and indirect effect on vaccine acceptance behavior because what cues to action is factors that cause a turning point that will start a new behavior to occur. These may be an event, a person, thing, acquaintance's illness, reports from social media, campaign activities, etc. Apart from media influence, a study by Vander Wal

(2012) on the influence of social support on inappropriate weight-control behaviors found that the sample lacked social support groups tend to be more difficult to lose weight than those who are supported by their peers. The social group serves to remind or tell the person to have breakfast or reduce fussy eating at the same time. The study also found that health knowledge person and receive social support will help promoting the potential of health care and weight control (Gillibrand & Stevenson, 2006; Stanton & Campbell, 2014; Nieminen, et al., 2013; McKinley & Wright, 2014).

2. Perceived barriers have the second most direct and overall effect on vaccine acceptance behavior because perceived barriers are important variables that deter a person from accessing appropriate health care services when needed. This is consistent with the idea of Scheer, Kroll, Neri, & Beatty, 2003, who suggested that barriers to accessing health care can be broken down into two components; environmental barriers and process barriers. In addition, there is also the problem of excessive information. Some consumers are also facing the problem of misinformation, information that is fake or false but the person who publicize it believes that it is true (Pitch Pongsawat, 2020).  
The research result of Orji & Mandryk (2014) found that perceived barriers had negative effect on healthy eating behaviors among the subjects. This is consistent with the results of the study of seat-belt-fastening behavior among students in Turkey. The past studies (Han & Kim, 2009; Han & Hyun, 2014; 2015) suggested that the potential cost is an important factor in the consumer decision-making process, especially health care facilities.
3. Perceived benefits of treatment have direct effect on vaccine acceptance behavior because people believe that following disease prevention recommendations can avoid illness or disease. The perceived benefit of treatment is a positive factor in people's health-promoting behaviors according to the health belief model. A study on condom use behavior among prostitutes in China by Zhao et al. (2012) found that most of the samples knew how to use condoms well. However, there are a number of people who are worried about their ability to use condoms safely or not. The research results revealed that prostitutes who perceived their ability to use a condom at a high level also had a higher intention to use it. The same study also found that self-efficacy has negative effect on perceived barriers (in condom use) but had positive effect on the perceived usefulness of the condom. It may be inferred that the sample group perceived their own abilities that can control behaviors to prevent COVID-19 very well. They will be more likely to perceive the benefits of the COVID-19 vaccine more and perceived less barriers to vaccination as well as a tendency to show increasing acceptance behavior.
4. Perceived self-efficacy effect vaccine acceptance behavior. This agrees with the health belief model because it is the belief that they were able to control the desirable behaviors to promote health as well. Self-efficacy variables were therefore significantly correlated with health-enhancing behaviors. For example, a study by Radtke, Kaklamanou, Scholz, Hornung & Armitage (2014) on weight loss intentions among Swiss female consumers and England found that self-efficacy correlated with weight loss intentions of the sample.

## Recommendations

### Policy recommendations

1. The government must communicate and understand the COVID-19 vaccine, especially the adverse events that occurred after getting the COVID-19 vaccine openly and quickly by changing the way people communicate and understand people about the COVID-19 vaccine. The agency or the private sector with expertise in advertising media that is concise, easy to understand should be promoted to present the information. It will help creating interest and an open mind to accept information to the target audience more easily.
2. The government should manage the distribution of the COVID-19 vaccine to improve in a systematic way which is clear and transparent. The focus should be on medical and public health principles without being under political influence or any benefit.

### Administration recommendations

1. The public should be provided with information on the COVID-19 vaccine together with a variety of researches through various media channels that are true from individuals or trusted agencies such as medical personnel who are recognized in the industry of Ministry of Public Health or the government. This will increase the confidence of the people more.
2. The government sector must cooperate with the private sector. This allows vaccines to reach the target audience in the most convenient, easiest, fastest and sufficient way for their needs. Citizens have access to vaccines with minimal hassle. Apart from registering through the application, it should also include registration through various agencies provided with easy access to the COVID-19 vaccine.

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