

## Study of the Determinants Affecting Health Status of Health Care Providers in Thailand\*

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### Abstract

**Background:** Health care providers are one of the important resources of the health service system whereas their health status might be affected by health service system and other determinants related to health. Understanding of the factors/determinants affecting their health status is an important aspect to improve the health service system and the health status of the Thai population. The samples were selected from three hospitals using multi-stage random sampling. The questionnaires included a socio-demographic data form, assessment of internal and external determinants, and a health status assessment during last 4 weeks. Data were collected over a one-month period. Analyses included descriptive statistics, Pearson product moment correlation, and stepwise multiple regression.

**Objective:** The purposes of this research were to study: 1) the external and internal determinants affecting health status of health care providers in Thailand, 2) the relationship between the external and internal determinants and their health status, and 3) the factors that best predict the health status of Thai health care providers.

**Result:** The major findings were the following: 1) trade and investment, and the living and working environment were significantly correlated with the health status of health care providers with correlation coefficients equal to .292 and .303, respectively, and 2) an effective determinant for predicting health status of the health care providers was the living and working environment with prediction power equal to 11.0% ( $R^2$  change = 0.110,  $\beta$  = 0.332), and statistical significance ( $F$  = 7.166,  $p$  = .010).

**Discussion and Conclusion:** The results of this study revealed that the external determinant, the living and working environment most greatly affects health status of health care providers in Thailand. This finding may indicate the need to review and expand the policy planning and strategies for improvement of living and working environment, including safety procedures in the Thai workplaces as well as requiring appropriate personal protective equipments. A further comparative study is recommended to determine whether the living and working environment or other effective determinants could affect the health status of health care providers in the Greater Mekong Sub-region countries.

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**Keywords:** Determinants affecting health status, Health care provider, Thailand

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## Introduction

Adequate health is critical to the development of a country. The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) recognize that adequate healthcare is the major strategic framework for sustainable development in Asia and the Pacific. The government of Thailand realizes the importance of health and has developed a National plan concerning Science, Technology, and Innovation over the next ten years with whose main objectives are to improve the health service system and the health status of the Thai population. These improvements can also assist in improving the economic development of Thailand as health has been shown to significantly affect the productivity and economic capacity of a community and a nation.

It is well known that the health status of a population depends on factors/determinants involving the individual and their environment including health service system. Health care providers are one of the important resources of the health service system because their health status can affect its system. On the contrary, their health status might also be affected by the health service system and other determinants related to health. Better understanding of the factors/determinants affecting health status of health care providers in Thailand is an important aspect to solve problems affecting health service system and also leads to the sustainable development of Thai population. This will also be useful if it has been compared with other countries in the Greater Mekong Sub-region in order to lay out the policy and its strategies together for developing health service system and promote health of population in this region in the future.

In this study, the environmental analyses of healthcare organizations and systems were conducted in terms of Thai society and cultural values, trade and investment, medical information and technology, and living and working environment regarding strengths and weaknesses of the hospitals (Swayne, Duncan, Ginter, 2009). Therefore, the objectives of this research were: 1) to study the external and internal determinants affecting health status of health care providers in Thailand, 2) to examine the relationships between the external and internal determinants and the health status of health care providers, and 3) to find out which factors of the internal and external environment best predict the health status of health care providers in Thailand.

## Materials and Methods

This study investigates one aspect of a larger study that investigates the health service systems and health status among health care providers and people in the Mekong Region. The larger study used a mixed methods approach to look at perceptions of their health status and health service systems of their respective countries.

### Sample

The study recruited samples from hospitals in Thailand by selecting study area in provinces that can compare with other countries in the Greater Mekong Sub-region as followings: Thammasat University hospital, Pathumthani province as the representative of the Central of Thailand; Ang Thong hospital, Ang Thong province as the representative of the lower North; and Sappasitprasong hospital, Ubon Ratchathani province as the representative of the Northeast. Sample size of health care providers was 60 subjects estimated from the table of Kraemer and Thieman (1987) with power analysis of 0.80 and an effect size of .36 at the  $p < .05$  level. The subjects from each hospital were selected by using multi-stage random sampling started with stratified random sampling for selecting study areas including hospitals of which topography were similar to those in other countries in the Greater Mekong Sub-region, and then quota sampling for calculating the proportion of number of health care providers in hospitals. Thus, the subjects were 20, 10, and 30 health care providers from Thammasat University hospital, Ang Thong hospital, and Sappasitprasong hospital, respectively. The subjects included health professions as the following: 1) doctor and dentist, 3) pharmacist, 4) medical technologist and physical therapist, 5) nurse, and 6) assistant nurse and other hospital staff, of which experiences in the hospital were more than one year.

Questionnaires were generated to gather information concerning both dependent and independent variables. The dependent variables related to participants' self-reported health status during the last 4 weeks while the independent variables were developed to examine the internal and external environmental factors which affect health status of health care providers. The assessment of external determinants, internal determinants, and health status was classified into 5 levels ranging from the lowest to the highest represented by percentage of mean of each determinant and health status as the following: percentage of mean greater than or equal to 80 was

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at the highest level, 70%-79% was at high level, 60%-69% was at fair level, 50%-59% was at low level, and less than 50% was at the lowest level. These assessments were to allow a subject to express his or her perspectives on the external and internal determinants affecting health status, and health status. For psychometric testing the instrument, the content validity was proved by five experts with the agreement of 80%. The items were analyzed by the Contrast-group approach having t-test greater than 2.00 (LoBiondo-Wood & Haber, 2003). Reliability was evaluated by Cronbach's alpha coefficient method (LoBiondo-Wood & Haber, 2003; Polit & Hungler, 1999). The reliability of the self-assessments regarding external and internal determinants and health status were 0.92, 0.94, and 0.89, respectively.

Data were collected over a one-month period from April to May in 2011 in the study areas. The data were analyzed using SPSS and included descriptive analyses of the socio-demographic data, the external and internal determinants affecting health status, and health status. Correlation were conducted to examine the relationships between the external/internal determinants and health status and

stepwise multiple regression was used to generate the prediction equations of the health status.

The procedures were approved for human right protection in human subjects by the Ethics Committee of Thammasat University, Thailand.

## Results

### *Socio-demographic data*

The socio-demographic data showed that 26.7% and 73.3% of health care providers were male and female respectively. Fifty percent of the subjects had an age range from 20 to 40 years. Ten percent of subjects were doctors and dentists, 3.3% were pharmacist, 16.7% were medical technicians and physical therapists, 35% were nurses, and 35% were assistant nurses and other hospital staff. Approximately 82% of subjects had level of education in diploma/bachelor degree and higher (65% diploma and bachelor degree, and 16.7% higher). Most of the participants (77.6%) had household-income more than 10,000 Baht per month and 50% had incomes ranging from 10,000 to 30,000 Baht per month as shown in Table 1.

**Table 1** Socio-demographic data from health care providers classified by gender, age, occupation, educational level and household income (n = 60)

Socio-demography	Number of subjects (n)	%
<b>Gender</b>		
Male	16	26.7
Female	44	73.3
<b>Age (years)</b>		
20 – 40	30	50.0
41– 60	29	48.3
Over 60	1	1.7
<b>Occupation</b>		
Doctor and dentist	6	10.0
Nurse	21	35.0
Pharmacist	2	3.3
medical technologist and physical therapist	10	16.7
Assistant nurse and others	21	35.0
<b>Educational Level</b>		
High school	11	18.3
Diploma and Bachelor degree	39	65.0
Master degree or Ph. D.	10	16.7
<b>Household Income per month*</b>		
<10,000 Baht	13	22.4
10,000 – 30,000 Baht	29	50.0
30,001 – 50,000 Baht	8	13.8
> 50,000 Baht	8	13.8

\*n = 58

### *Assessment of External and Internal Determinants and Health Status of Health Care Providers*

According to the 5 levels of the assessment of external determinants, internal determinants, and health status, the levels of the external determinant in terms of Thai society and cultural values, medical information and technology, and living and working environment were high at 71.0% (mean = 21.30,

SD = 2.58), 74.8% (mean = 22.43, SD = 2.04), and 70.3% (mean = 17.58, SD = 3.04) respectively. The levels of the external determinant in terms of trade and investment, and the internal determinant were fair at 68.1% (mean = 17.02, SD = 2.53), and 67.8% (mean = 37.25, SD = 6.68) respectively, whereas the level of health status of subjects was high at 75.8% (mean = 75.77, SD = 8.47) as shown in Table 2.

**Table 2** Score range, mean, standard deviation and level of external and internal determinants affecting health status and health status of health care providers (n = 60)

	Score Range	Score Range of the sample	Mean (%)	SD	Level
<b>External Determinant</b>					
- Socio-culture	6-30	14-26	21.30 (71.0)	2.58	High
- Trade and investment	5-25	10-22	17.02 (68.1)	2.23	Fair
- Medical information and technology	6-30	18-28	22.43 (74.8)	2.04	High
- Living and working environment	5-25	11-21	17.58 (70.3)	3.04	High
<b>Internal Determinant</b>	11-55	24-51	37.25 (67.8)	6.68	Fair
<b>Health Status</b>	20-100	56-99	75.77 (75.8)	8.47	High

### *Correlation between External and Internal Determinants and Health Status of Health Care Providers*

The Pearson product moment correlation revealed that there were statistically significance among the external determinants between Thai society and cultural values, and medical information and technology; and Thai society and cultural values, and living and working environment ( $p < .01$  and  $.05$ ) with the correlation coefficient ranging from moderate to low level equal to .472 and .303, respectively. It was also found that the internal determinants significantly related with the external

determinants in terms of trade and investment, Thai society and cultural values, and living and working environment with the correlation coefficient ranging from low to moderate level equal to .326, .386, and .660 ( $p < .05$  and  $.01$ ), respectively.

The correlation between the external determinants and health status—that is, the trade and investment, and living and working environment significantly related with health status with correlation coefficient at low level equal to .292 and .332, respectively as shown in Table 3. No significant correlation was found between the internal determinant and health status.

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**Table 3** Correlation between external and internal determinants and perception of health status (n = 60)

	External Determinants				Internal Determinants
	Trade and investment	Thai society and cultural values	Information and medical technology	Living and working environment	
<b>External Determinants</b>					
- Trade and investment	1	-	-	-	-
- Thai society and cultural values	.179	1	-	-	-
- Medical information and technology	.181	.472**	1	-	-
- Living and working environment	.238	.303*	.019	1	-
<b>Internal Determinants</b>	.326*	.386**	.023	.660**	1
<b>Health Status</b>	.292*	.234	.165	.332**	.183

\*p&lt;.05, \*\*p&lt;.01

**Prediction of Health Status from the Study Variables**

Stepwise multiple regression analysis for finding the effective determinant indicated that only the determinant living and working environment could predict health status of health care providers at

11% ( $R^2$  change = 0.110,  $\beta$  = 0.332) with statistical significance ( $F$  = 7.166,  $p$  = .01). The equation for health status prediction could be created by calculating regression coefficient of predictor and a constant value as shown in equation A and B in Table 4.

**Table 4** Stepwise multiple regression analysis in health status prediction from the living and working environment as variable (n = 60)

Variable	R	R <sup>2</sup>	R <sup>2</sup> Change	F	B	Beta	t
<b>Living and working environment</b>	.332	.110	.110	7.166*	.992	.332	2.677*
	S.E.est = 8.056				a = 59.548		

Equation of Prediction:

Equation A:  $\hat{Y} = 59.548 + .992 \text{ Living and Working Environment}$ Equation B:  $\hat{Z} = .332 \text{ Living and Working Environment}$ 

\*p &lt; .05

**Discussion**

The study results showed that the health status of health care providers was strongly predicted by those with high education and high income (diploma and bachelor degree or higher and household income

approximately 10,000-30,000 Bath/month). It can be explained that such factors may contribute to knowledge and skills which reflect in good self care and health behaviors. In addition, their professions may allow them to earn high incomes which might enable

them the accessibility to various supplements for better health (Butler, 2001; Badura and Kickbusch, 1991).

For the assessment of external and internal determinants affecting health status, it was indicated that the perspective of the health care providers concerning the external determinant of trade and investment, and the internal determinants of strengths and weaknesses were at fair level, whereas the external determinants in terms of Thai society and cultural values, medical information and technology, and living and working environment were at higher levels. The inter-correlations among the external determinants affecting health status indicated that these determinants were related to each other (Shi and Singh, 1998). However, multicollinearity analyses revealed less than .70, indicating correlation among the independent variables were not an issue.

According to the significant correlations between the external determinants in terms of trade and investment, as well as, living and working environment, and the health status of health care providers, only living and working environment could be an effective variable that had power to predict health status of health care providers at 11% with the multiple correlation coefficient equal to 0.332, and regression coefficient equal to 0.992 as shown in Equation A and B in Table 4. This finding supports that the living and working environment of health care providers in Thailand could affect and predict their health status. It is realized that hospitals are health service organizations in which health hazards toward health care providers can be hidden. These hidden health hazards include: 1) chemical hazard from chemicals used for anesthetization, treatment, killing microorganisms, or laboratory analysis (Hoerauf et al., 1999; Pisaniello et al., 1997;

Sobaszek et al., 1999), 2) physical hazards from instruments or medical equipment or electric machines such as light, radiation, heat, and noise, including repeated movement of physical activities related to their works (ergonomics) (Nelson et al., 2003), 3) biological hazards such as various microbes from patients (Collins and Kennedy, 1987; Engkvist et al., 2000), and 4) psycho-social hazards causing stress during work (Cox and Griffiths, 1996). It can be said that these can affect not only biological functions of healthcare providers' health status but also the change of their health status in terms of psycho-social functions as well. In conclusion, the external determinant in terms of living and working environment is one of the important variables with a power to predict the health status of health care providers in Thailand. This finding may indicate the need to review or expand the policy planning and strategies for improvement of living and working environment, including safety procedures in workplaces as well as appropriate tools for personal protection.

### **Recommendations**

As the study result reflects the scientific advances that have taken place among health providers in Thailand, a further comparative study is recommended to determine the conditions under which if the living and working environment or other effective determinants could affect the health status of health care providers in the Greater Mekong Sub-region countries.

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