

CHAPTER 3

RESEARCH METHODOLOGY

The research on the protective behavior from dust among workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province is the study using the descriptive research and cross-sectional survey research.

3.1 Population

The population in this study are all workers and operators of the lime factories and stone crushing mills in Nakhon Si Thammarat Province. Today, there are about 369 workers from the total of 20 lime factories and stone crushing mills in 6 districts areas (Data from Industry Office, Nakhon Si Thammarat Province, 2002).

3.2 Samples

The samples in this study consist of 2 groups as follows:

1. 198 workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province. The calculation is made as follows.

The number of samples are calculated by using the formula of Taro Yamane's,

$$\text{that is } n = \frac{N}{1 + N(e^2)}$$

When e = the deviation of the random sampling
 n = Size of the samples
 N = Size of population

The deviation of sampling is required to be equal to 5% where about 198 samples are obtained.

Since the samples are from lime factories and stone crushing mills, so the calculation must be made to find the ratio between the samples in the lime factories of 90 workers and in the stone crushing mills of 279 workers respectively, or equivalent to 1:3 which shall be described in details as follows:

- 1.1 The samples of 64 workers were obtained from the lime factories in 4 districts, one factory in Mueang District, 2 factories in Khanom District, 1 factory in Phra Prom District and 8 factories in Ron Phibun District. Each district obtained the samples through the calculation as follows. 7 workers in the lime factories in Mueang District, 12 workers in the lime factories in Khanom District, 3 workers in the lime factories in Phra Prom District and 42 workers in the lime factories in Ron Phibun District, using the simple random sampling as shown in the details in figure 3.

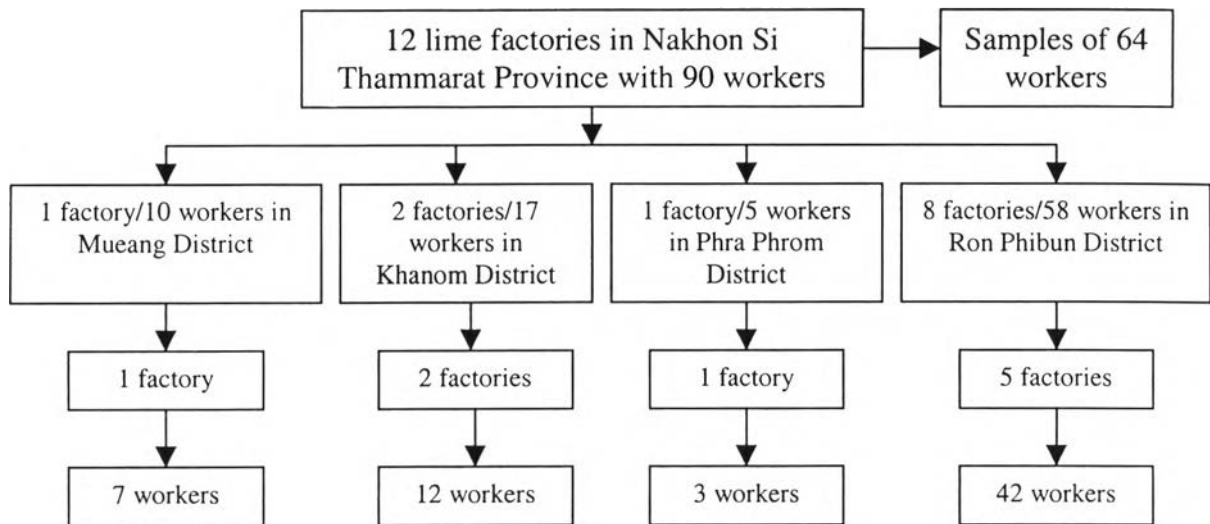


Figure 3: Random sampling of workers in the lime factories in Nakhon Si Thammarat Province

1.2 Samples of 134 workers in the stone crushing mills from 3 districts, they were 1 mill in Chulabhon District, 5 mills in Ron Phibun District, 2 mills in Tung Song District. The calculation was made to find the samples in each district where 10 workers in Chulabhon District stone crushing mill, 113 workers in Ron Phibun District stone crushing mills and 11 workers in Thung Song District stone crushing mills were obtained, using the sample random sampling as shown in details in figure 4.

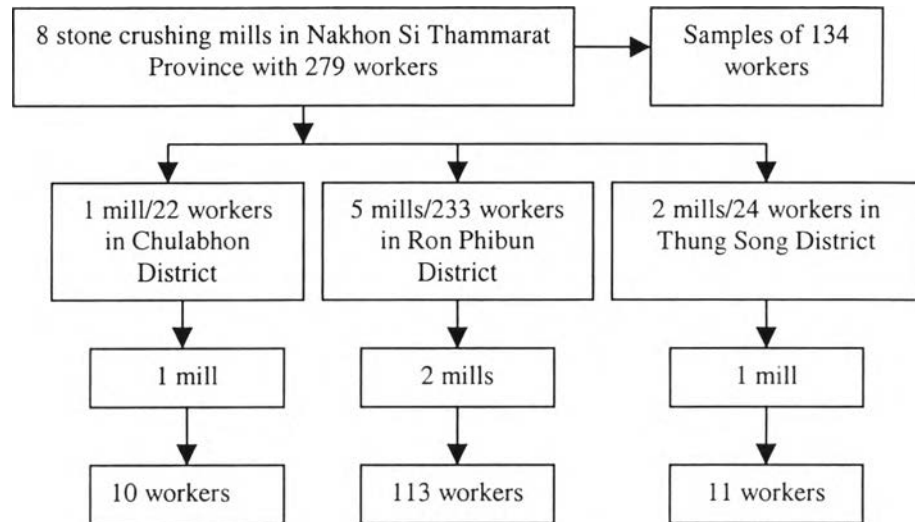


Figure 4: Random sampling of workers in the stone crushing mills in Nakhon Si Thammarat Province

2. 13 samples of owners and operators of the lime factories and stone crushing mills in Nakhon Si Thammarat Province. Locations and names of factories or mills. (Appendix C).

3.3 Instruments in the Research

Data Collection Instruments

The instrument used in this research are made by the researcher from the study of documents and related performances to cover the essence and objectives of the research which consist of 3 parts as follows:

1. **Questionnaires** for the workers in the lime factories and stone crushing mills in Nakhon Si Thammarat Province which are divided into 5 sections as follows:

Section 1 Socio-demographic data such as gender, age, family income, marital status, educational levels, period of time to work, job characteristic, smoking behavior, workers' sickness. The questionnaires is in the form of check list and open ended consisted of 15 questions. (Appendix A). The data analysis is made by using the descriptive statistic to find the percentage value.

Section 2 Protective behavior from dust data such as

- Using of dust protective devices, type of dust protective devices used, distribution of dust protective devices by the factories. The character of the questionnaires is in the form of two choices answers, yes or no, in 4 questions (Appendix A). The data analysis is made by using the descriptive statistic to find the percentage value.
- The level of dust protective behavior, the character of the questionnaires is in the form of two choices answers, yes or no, in 9 questions, yes answer will get 1 point and No answer is zero (0) point for the total of 9 points (Appendix A).

The analysis of points is made by using the educational principle which is divided into 3 levels as follows:

The high level of protective behavior from dust is in between 80-100%.

The medium level of protective behavior from dust is in between 60-79%.

The low level of protective behavior from dust is in between 0-59%.

Section 3 - 4 - 5 Perceived susceptibility , Perceived severity and Perceive benefits and barriers of performing data These evaluation forms contain the negative and positive statements. The questionnaires character is in the form of rating scale with 5 scales in 10 questions (Appendix A).

Point rating scale	Positive statements
5 shall mean	Strongly agreed
4 shall mean	Agreed
3 shall mean	Not sure
2 shall mean	Disagreed
1 shall mean	Strongly disagreed
Point rating scale	Negative statements
1 shall mean	Strongly agreed
2 shall mean	Agreed
3 shall mean	Not sure
4 shall mean	Disagreed
5 shall mean	Strongly disagreed

The data analysis is made by using the criteria according to the standard of scale to find the average mean which is divided into 3 levels as follows:

High level of the awareness shall get the average points in between 3.6-5 points.

Medium level of the awareness shall get the average points in between 2.6-3.5 points.

Low level of the awareness shall get the average points in between 1-2.5 points.

2. Interview the owners and operators of the lime factories and stone crushing mills in Nakhon Si Thammarat Province by dividing into 2 sections as follows:

Section 1: Socio-demographic data such as gender, age, positions, marital status, educational levels, length of factory engagement. The questionnaires character is in the form of the check list and open-ended consisted of 6 questions (Appendix A). The data analysis is made by using the descriptive statistic to find the percentage value.

Section 2: Supportive environmental and health policy data such as the provision of adequate dust protective devices, the provision of monitoring for workers to use the dust protective devices, availability of the annual health examination for workers, the provision of health promotion policy of workers in writing, the

issuance of regulations for the workers to follow on the use of the dust protective devices strictly. The questionnaires character is in the form of the check list and open-ended consisted of 12 questions (Appendix A). The data analysis is made by using the descriptive statistic to find the percentage value.

3. Observation form of protective behavior from dust and environmental conditions in the factories, for examples, the use of dust protective devices among workers while on duty, conditions within the lime factories and stone crushing mills (please refer to the details of questions in the appendix B). The character of the observation form is the check list consisted of 7 questions. The data analysis is made by using the descriptive statistic to find the percentage value.

Instruments production procedures

This research requires the following tools and instruments to be used in collecting data. They are the questionnaires for workers in the lime factories and stone crushing mills, the interviewing forms for the owners and operators of the factories and the observation forms of using the dust protective devices by the workers and the environmental conditions in the factories. The tools and instruments production procedures are as follows:

1. To study the documents and the relating research performances and apply the knowledge for the production of tools and instruments for the data collection.

2. The produced tools and instruments were brought to the three qualified persons for more recommendations. They are Col. Dr. Vichien Chusamuer of the Allied Health Sciences and Public Health Office, Valailuk University, Nakhon Si Thammarat Province, Mr. Wicharn Nungun, Public Health Technical Expert 7, Nakhon Si Thammarat Provincial Public Health Office, Mr. Samart Suwannaphakdi, Public Health Technical Expert 6, Nakhon Si Thammarat Provincial Public Health Office.
3. The improved tools and instruments according to the qualified persons' recommendations were used for the try-out on the samples of 30 workers in Ron Phibun District stone crushing mills and analyzed them to find the confidence in the tools and instruments by using cronbach alpha coefficient formula with the SPSS program for windows. The confidence value of the evaluating form for the awareness of the risk opportunity of having the diseases from the dust was obtained at .68, for the awareness of the disease severity was obtained at .66 and for the awareness of the benefit and obstacle of the prophylaxis practice was obtained at .67 respectively.
4. The true and actual tools and instruments were used in collecting the data in October 2003.

3.4 Data Collection

1. The research instruments were prepared for the research such as 198 sets of questionnaires for the workers, 14 sets of interviewing forms for the owners and operators of the factories and 14 sets of behavioral observation forms of using the dust protective devices and environmental conditions within the factories.
2. Official letters from Maharaj Hospital, Nakhon Si Thammarat Province, were given to the owners and operators of the factories and mills asking for the cooperation for questioning and interviewing and observing the workers and the owners and operators of the lime factories and stone crushing mills in Nakhon Si Thammarat Province, with the cooperation of the two provincial public health officials for collecting the data who had been informed of the essence of the questionnaires, interviewing forms and observation forms until they understood all the statement of purpose. The appointment was made with the factories in advance before entering into the factories for collecting the data.
3. After the data was collected, the accuracy and completion of data.
4. A manual was produced for encoding and the obtained data was transformed according to the prepared manual ready for being recorded in the SPSS program for windows.

3.5 Data Analysis

The encoded and transformed data according to the prepared manual was produced into the data file and recorded in the computer, processed with the SPSS program for windows and the data was analyzed. The analysis of data was divided into 3 parts as follows:

Part 1: The data analysis in part of workers in the lime factories and stone crushing mills by using the descriptive statistic to find the values of frequency, percentage, average mean, standard deviation and using implied statistic to find the Chi-square value. The data analytical result presentation was divided into 4 sections as follows:

Section 1: Socio-demographic data of workers in the lime factories and stone crushing mills.

Section 2: Protective behavior from dust among workers in the lime factories and stone crushing mills.

Section 3: The health belief among workers in the lime factories and stone crushing mills.

Section 4: The relationship analysis between the socio-demographic factor and the factors of the health belief and protective behavior from dust among workers.

Part 2: Data analysis in part of the owners and operators of the lime factories and stone crushing mills, by using the descriptive statistic to find the

value of frequency, percentage, average mean, standard deviation. The data analytical result presentation was divided into 2 sections as follows:

Section 1: The character of socio-demography of owners and operators.

Section 2: The supportive environment to the health provided by factories and the health promotion policy.

Part 3: The observation of the dust protective devices application of workers and the supportive environment to the factories health, analyze data by using the descriptive statistic to find the value of frequency and percentage.

3.6 Ethical Considerations

As this study involved workers and owners in interview, all the participants would have a right to accept or reject to be a subject in this study. All the activities were carried out after getting a verbal consent from the participants. The proposal committee also reviewed the ethical aspect of the study.

3.7 Limitations

This study is a cross-sectional descriptive study, so the study had to be finished within a limited time, therefore the questionnaires, interviewing schedule and observation forms was conducted.