

CHAPTER III

MATERIALS AND METHODS

This chapter provided detail information about research design of the alcohol surveillance system that included the model development process, implementation, and evaluation.

1. Research design

This study is a research and development study that designed to develop and implement an alcohol surveillance system at local level.

2. Setting

The proposed study area was situated at Sumsoong district, about 30 kilometers east of Khon Kaen city center. The proposed area is relatively small and typically rural area in Northeast Thailand.

3. Population and Samples

According to national survey statistics and researches elsewhere, 95 % of the alcohol users are likely to be in the age of 15 and over. Thus, target respondents of this study were anyone who was 15 years old and older living in the District of Sumsoong.

4. Research Methodology

This operational research was divided into 3 phases.

Phase I: Designing a surveillance system

Phase II: Implementing the surveillance system

Phase III: Evaluating the surveillance system

Phase I: Designing surveillance system

There were 6 steps in phase I:

Step 1: Establishing the objective of surveillance system

The objectives of the developed alcohol surveillance system were

1. To determine the magnitude of local alcohol-related problems and provide an early warning for emerging problems;
2. To explore alcohol-related problems pattern at local level;
3. To analyze trend of alcohol-related problems; and
4. To provide information to relevant organizations in preventing and controlling alcohol-related problems as well as evaluating program effectiveness.

Step 2: Developing measurement indicators

Definition of alcohol-related problems for surveillance was divided into 2 groups.

Group 1: Alcohol-related harm

Alcohol-related harm meant specific and defined social or health problems to which alcohol or drinking increased the risk of these problems. Indicators of alcohol-related harm including:

1. Drink/drive traffic crashes

Drink/drive traffic crashes were defined as those in which at least one driver involved in the crashes had been drinking. They were classified into three categories: non-injury crashes, injury accidents and fatal crashes in which at least one person was killed.

2. Alcohol-related assaults

Alcohol-related assaults were defined as an intentional violent event in which one or more persons was harmed sufficiently seriously to require some types of medical attention, and in which at least one person involved in the event had been drinking.

3. Alcohol-related unintentional non-traffic injuries and fatalities

It is known that alcohol is a contributing factor in a significant proportion of unintentional non-traffic injuries; fatal and non-fatal. In this context, injuries were alcohol-related if the person had consumed alcohol prior to the event.

Typical injuries included burns, falls in which related to the alcohol impairment of the individual, drowning in which the person who drowned had consumed alcohol or as the result of a boating accident in which at least one of the boat operators had been drinking.

4. Alcohol-related hospitalization

Hospitalization is often occurs as a result of long term and chronic drinking. There was selectivity by medial personnel to assign alcohol linked ICD codes on hospital admission records.

5. Alcohol-related mortality

This was defining as death caused in part or in full by heavy, usually long-term consumption of alcohol. These conditions were typically defined on death certificates by ICD-10 codes.

Group 2: Alcohol-related risks

Alcohol-related risks were those factors or variables, which, while not specific harms, are themselves often precursors of such harms. That is, these risks in themselves substantially increase the likelihood of alcohol-related harm. For example, drinking to intoxication or heavy (“binge”) drinking may not be a problem for any drinker, but the frequency of such heavy drinking substantially increases the risks of acute trauma including falls, drowning, traffic crashes, violence, etc. Indicators of alcohol-related risks including;

1. Per capita alcohol consumption

It is the volume of alcohol sold in licensed alcohol outlets in each area to representing record of alcohol consumed.

2. Percentage of drinking drivers on the roads

The number of alcohol tested positive drivers on the road is highly related to the number of drink/drive accidents; with risk increasing as the distribution of blood alcohol content (BAC) positive for drivers has been changes to cover more high BAC level (e.g. $BAC > 0.05$).

3. Number and density of alcohol retail outlets

Both the absolute number and the concentration (number of outlets per 100 persons and/or geographical area) of alcohol retail outlets is an indicator of potential risk at the local level. Both on-premises outlets such as bars and restaurants and off-premises outlets such as alcohol to be taken away for consumption elsewhere need to be included.

Step 3: Justify population under surveillance

Respondents of alcohol-related problems surveillance system are general population age 15 years old and over.

Sample size

Estimating sample size in case of known total population and proportion from formula:

$$n = \frac{Z^2 N \pi (1-\pi)}{Z^2 \pi (1-\pi) + N d^2}$$

To replace in formula:

N = Population = 15,340 (people 18 years of age and older)

π = Proportion of alcohol consumption in 30 days of populations in the Northeast
= 35.7% (Kanato, 2003)

d = margin of error 5 % = .05

Z = confidence interval (95% = 1.96)

Sample sizes = 1024

Step 4: Develop data collection tool and source of data

This step was identifying sources of data and preparing data collection tools.

Sources of data include;

1. Existing data: potential sources of data including:
 - 1.1 Hospital admissions and emergency department;
 - 1.2 Primary care unit
 - 1.3 Police station
 - 1.4 Revenue offices
2. Key informant interviews;
3. Focus group discussions

Step 5: Establishing system procedure

The data was collected both quantitatively and qualitatively. Quantitative data consisted of numerical scales that could analyze through the use of statistical techniques. Qualitative data was analyzed using thematic technique or reoccurring issues in the data, summarizes these themes and then interpret the meaning of the themes or data.

The qualitative was analyzed by using the statistics as follows:

1. Descriptive statistics determining frequency, percentage, distribution, mean, and standard deviation, median were performed to describe the general information such as socio-demographic characteristics of the target population.

2. Prevalence of alcohol use and health effect (short-term and long-term consequences). The prevalence of alcohol related co morbidity information was presented in term of number and type of co morbid health effects experienced by respondents with ICD-10 codes. The relationships between alcohol use and health effects was measured by odds-ratio and 95 % confidence intervals. The estimates associated prevalence was presented with standard errors.

3. Correlation between alcohol use and related harm.

4. Apply cluster analysis to identify situation in community.

Step 6: Identify roles and responsibilities

This step was designed to identify the roles and responsibilities of all the stakeholders in each stage of the surveillance system, collection processing, analysis, dissemination and use.

Phase II: Implementing surveillance system

After initial planning was completed and cooperation was assured, the alcohol-related problems surveillance system was implemented soon after. Data collection was done as soon as the procedures and systems were in place. Table 5 showed the summary of indicators, sources of data and data collection techniques.



Table 5 Summary of indicators and sources of data

Indicators	Sources of data	Collection methods
Indicators of alcohol use		
Per capita consumption	General population	Survey by Semi-structured questionnaires
Alcohol treatment admissions	Treatment reporting system,	Data collection form
Hospital admission/discharge diagnoses	Hospital records	Data collection form
Alcohol-related emergencies	Hospital emergency rooms	Data collection form
Alcohol-related deaths	Mortality statistics	Data collection form
Arrest or convictions (1) Drink-driving offences (2) Drunkenness (3) Other alcohol-related offences	Police records, Key informants(arrests or person)	Data collection form and interview guideline
Traffic incidents (1) Accidents (2) Breathalyzer tests	Police records	Data collection form
Non-traffic accidents and injuries	Hospital records Ambulance services	Data collection form
Indicators of alcohol availability		
Alcohol distribution (1) Number of retail outlets (license) (2) Alcohol sales	Municipal statistics Wholesale and retail records, Key informants	Data collection form Data collection form interview guideline

2. Data flow

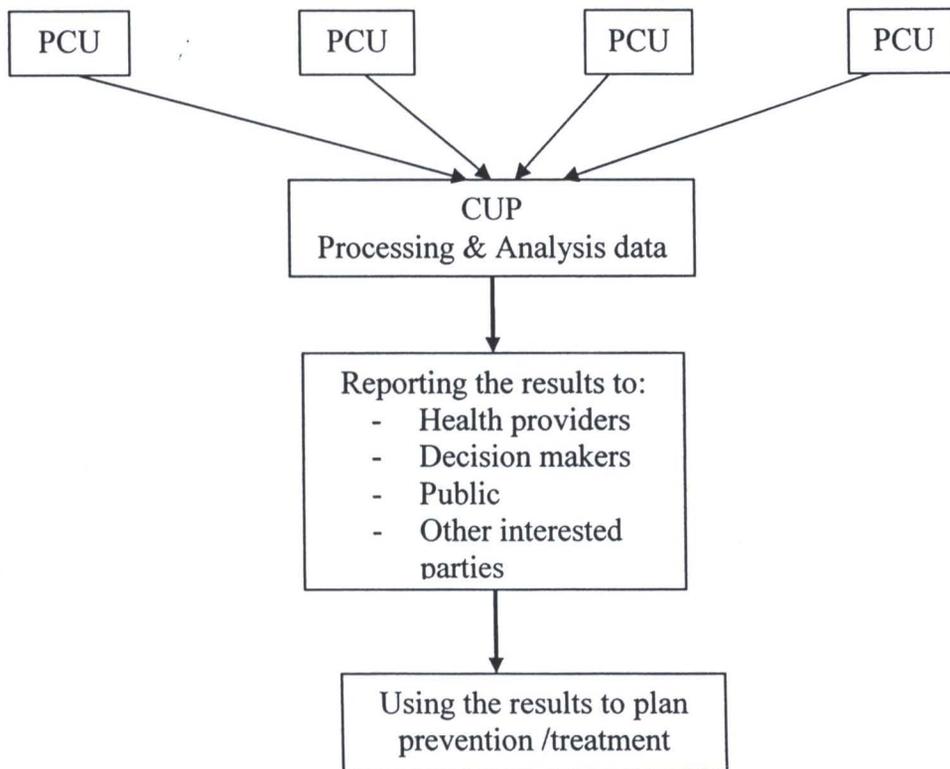


Figure 4 Data flow of alcohol-related problems surveillance system

Phase III: Evaluating surveillance system

Evaluation is essential to ensure the ongoing quality of the system. An evaluation is a less frequent process that brings together various stakeholders to measure the extent to which the alcohol related problems surveillance system is achieving its stated aims and objectives. Steps in evaluating surveillance system in this study include;

Step 1: Engaging stakeholders

The evaluation cycle begins by engaging stakeholders. Groups of stakeholders were;

1. Those involved in surveillance system operations including persons or organizations involved in surveillance system operations such as sponsors, coalition partners, administrators, and staff.
2. Those served or effected by the surveillance system including persons or organizations affected by the surveillance system, both directly such as by receiving services and indirectly such as by benefiting from enhanced community assets.
3. Primary users of the evaluation results included the specific persons who were in the position to do or decide something regarding the surveillance system.

Step 2: Focusing the evaluation design

This step was designing evaluation framework that began with establishing criteria for evaluating quality of the alcohol-related problems surveillance system. Criteria for evaluating quality of alcohol-related problems surveillance system in this study included;

1. Acceptability : The extent to which the data collected reflect the true situation
2. Simplicity: The extent to which the data provide a consistent measure.
3. Flexibility: The extent to which the system is able to detect changes in the services provided as well as monitors trends.
4. Sustainability : The extent of precision of the data
5. Usefulness: The extent to which the routine data gathered are completed

After establishing criteria for evaluating quality of alcohol-related problems surveillance system, qualitative data collection techniques were used to evaluate the developed surveillance system.

Step 3: Data collection and analysis

After designing evaluation, next step was collecting data. It is essential to conduct periodic evaluations of the developed surveillance system every trimester. Before the data collection, the researcher contacted with stakeholders for co-operating.

Step 4: Conclusion and adjustment

After the evaluation was completed, the researcher had draw conclusions for adjustment and proposed for the appropriated model.

5. Standardization of the instruments

1) Content Validity

The questionnaires were checked and suggested by 5 specialists as follows:

- a. Two social and health behavioral experts
- b. One medical clinical nursing expert
- c. One mental health and psychologist in nursing expert
- d. One evaluation and measurement expert

After getting recommendation from the 5 experts, content of the questionnaires was revised and the instruments were accordingly improved.

2) Reliability Analysis

The reliability was tested by using the following process:

- a. The questionnaires were tested in 30 people in Ampur Muang who met the same criteria as the study samples.
- b. Confidence values of the questionnaires was calculated by using the Conbrach alpha coefficient method (Polit and Hungler, 1997:297), the confidence values of reliable questionnaires was 0.8.

6. Ethical consideration

Ethics in the conduct of research and the protection of human subjects from research risks, including data confidentially, anonymity and the effect of the study on participants were:

1. Study subjects were freely consent to participate in research project.
2. Sufficient information was presented to enable person to voluntarily decide whether to participate as a research subject.
3. The study's purpose, benefit, risks, duration, procedures, and alternatives were described to potential subjects in essay to be able to understand.
4. Potential subjects were informed that they had the option of not participating in the study.

5. Information was provided in writing for all subjects and verbal information also provided for non-literature subjects, or where necessary.
6. Written agreement obtained in this manner was referred to as informed consent and conform to the Human Ethical Review of Khon Kaen University.