

Chapter 2

Methodology

This chapter describes the methodology including an overview of the statistical methods for data analysis associated to the statistical models. Graphical and statistical analyses were carried out using R (R Development Core Team, 2010).

This presents statistical model used in the two studies contained in Chapter 3. These methods include logistic regression model, log-linear regression model, Poisson regression model, negative binomial regression model.

2.1 Data sources and data management

The first study, the data include hospital discharge database information routinely reported to the National Health Security Office (NHSO) in the Ministry of Public Health during the 8 fiscal years from October 1999 to September 2007. The focus was on 26 provinces in the whole Central Region, comprising 309 hospitals. We created a secondary data file, kept in MySQL database. Data cleaning was undertaken for correct coding and dealing with missing values by using phpMyAdmin and WebStat. Data were converted to a flat-file format as text file for calculating descriptive statistics and statistical modeling.

The second study used the data on terrorism and violence in Southern Thailand (Pattani, Yala, Narathiwat and four eastern districts of Songkla province) were recorded by the Deep South Coordination Centre (DSCC) from January 1, 2004 for six years, until December 31, 2009. To calculate the incidence rates, using the population were obtained from the 2000 population and housing census of Thailand.

2.2 Study variables

According to the first study, to consider principal diagnosis according to International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10), age, gender, the hospital size and geographic region as predictors for LOS. The diseases were classified into 9 groups: injuries, cerebrovascular disease (CVD), digestive system disease, infectious disease, respiratory disease, genito-urinary disease (GUD), respiratory infection, malignant neoplasms (cancer), and other diseases. Age was divided into three groups: < 60 years, 60-74 years and 75 years or more. Hospital size was classified into three groups (small: 60 or fewer, gender, dividing age into three groups: 0-59 years, 60-74 years and 75 and over. The 26 provinces of Central Thailand were grouped into 6 geographic regions compressing provinces as follows:

- i. North : Nontaburi, Pathumtani, Ayuthaya, Aungthong, Lopburi and Singburi,
- ii. Northwest: Chainat, Kanjanaburi, Suphanburi and Nachornpatom
- iii. Centre: Bangkok
- iv. East: Saraburi, Chachengtrao, Prachinburi, Nachornnayok and Srakao
- v. Southeast: Samutprakarn, Chonburi, Rayong, Chuntaburi and Trad
- vi. Southwest: Rajburi, Samutsakhorn, Samutsongkhram, Pechaburi and Prajubkerekun.

Except for cancer, which had longer LOS, the median LOS in each disease group varied from 2 - 6 days. We classified hospital LOS into binary outcomes: “less than 7 days” and “7 days or more (adverse outcome)”.

In the second study, incidence rates per 100,000 populations for Muslim resident civilian victims of terrorism events set as the outcome of interest. Factors classified by gender,