

Chapter 5

Conclusions and Discussion

5.1 Conclusions

This thesis investigates mortality incidence rates from diabetes and constructs Poisson regression model for mortality from 1996 to 2006 in Southern Thailand, based on diabetes mortality by gender, age group and province provided by the Ministry of Public Health's Bureau of Policy and Strategy.

There were 6572 deaths at age 30 years or more with overall average incidence rates 0.14 and 0.18 per 1000 population for males and females, respectively. The estimated incidence rates from Poisson model increased with age but the rates dropped for the oldest age group. In 2001, 2002 and 2004 the incidence rates were higher than average whereas 1997 and 1998 the incidence rates were lower than average.

The gender difference of diabetes mortality was found. For males the incidence mortality rates were higher than the average in Phuket, Narathiwat, Yala and Pattani whereas they were lower than average in Nakorn Si, Chumporn, Krabi, Satun, Trang and Phattalung. For females the incidence mortality rates were higher than the average in Phuket, Narathiwat, Yala, Pattani, Krabi and Songkla whereas they were lower than average in Nakorn Si, Chumporn, Ranong, Satun, Trang and Phattalung.

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For both gender mortality rates from diabetes increased with age and peak occurred in age 70-74.

5.2 Discussion

It should be noted that our mortality analysis is done by province. It refers to the place where deaths occur, which is not necessarily the place of residence. This could explain the low mortality rates in small provinces such as Ranong. Most hospital deaths occur in big cities. The three hospitals in Songkhla province (Songkhla Hospital, Hat Yai Hospital and Songklanakarin Hospital) are the main hospitals in the south. This could explain the high mortality rate in Songkla.

Compared to the whole of Thailand, the Southern region estimates of males and females diabetes mortality rates for all ages are lower. The crude death rates for males and females were 5.5 and 3.7 respectively, whereas the corresponding rates for the whole country were 7.0 and 4.9 (Rukumnuaykit, 2006). This could be due to hospital deaths in other major cities around the country including the Bangkok metropolis.

Although this study is limited by the quality of the death registration data, the findings provide useful information on the pattern of mortality at the micro level.

Our study agrees with most of previous studies in that there is gender difference in diabetes mellitus mortality (Kumar, 1996). This is possibly due to obesity, hypertension, myocardial infarction that would occur in females more than in males (Kumar, 1996).

For age, it is well known that mortality from diabetes increased with age including our study (Bertoni et al, 2002; Sasaki et al, 1983).

The high mortality incidence rate is in major provinces. The major population resident in Phuket province was Chinese and they preferred fried and oily food. This leads to high blood sugar levels and hypertension which are risk factors of diabetes. The population structure of Phuket also has more urban than rural (Lin and Lee, 1992).

The study of trend in mortality from diabetes in Taiwan compared between city and rural and it was found that people live in the city were more likely to died from diabetes than people in the rural in both gender (Khampitak et al, 2007). Also, the study on comparison of prevalence of diabetes between rural and urban area in Thailand and follow-up patients with diabete, it was appear to be the prevalence of diabetes was much higher in urban than rural. Yala, Pattani and Narathiwat provinces with the majority of population are Muslim, Muslim food are mainly containing oil and sugar, for example rote, spicy Muslim curry which may related to hypertensions and increased blood sugar level which cause of diabetes. Moreover, these three provinces income per head of population is lower than other provinces. The lowest income per head of populations aged 15 to 60 were in Narathiwat, Yala and Pattani. The association between diabetes and socio-economic status was found in Robi et al, (2006). The average education year for Narathiwat is 5.91 years and it is the lowest in Southern Thailand (National Statistics Office, 2002). The mortality was increased among less educated diabetic more than high educated was found in Gnavi et al, (2004).

In 2001, Thai government started project 30 bath treatments all diseases and decreased the cost for diabetes treatment. Diabetes medications cost reduce 11% from 203.30 bath to 180 bath. Patients have easy access to treatment and exercise campaign.

5.3 Limitations

The findings in this thesis are subject to at least three limitations. First, Mortality data in the provincial level has not detailed enough to determine national health policy. Second, from the information for this study we are unable to identify risk factors of diabetes death. Third, the data on death in Thailand is not complete. It is undercounted by as much as 15%, especially for younger age groups (Prasatkul and Vapattanawong, 2006).

5.4 Suggestion for further studies

We can not find an appropriate model to fit with the data for all age group. This suggests that the analysis for type 1 and type 2 diabetes, which is depend on age, should be separated analysis and it need more years of data to investigate trend. Moreover, risks factors for diabetes are also need to specify, using primary data for diabetic patients. Moreover, deaths due to other causes that related to diabetes are also useful to investigate.