

Chapter 3

Preliminary Data Analysis

In this chapter, we describe the study variables and the use of graphical displays to identify road traffic accident mortality patterns. Section 3.1 deals with a description of variables used in this study. Section 3.2 presents number of road traffic accident deaths using mosaic plots and mortality rates using age-specific mortality curves as well as excess deaths and years of life lost (YLL). To facilitate the comparison at different ages, square root scales were used for plotting the curves. The rates were compared to mortality in Japan in 2006 and also to the rates in the rest of Thailand.

3.1 Description of variables

The road traffic accident death data used in this study were recorded by year, province, age, gender and road users. There are 11 years from 1999 to 2006, 14 provinces in Southern Thailand, 17 age groups, and 5 categories of road users as shown in Table 3.1.

Variable	Information
Year	1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006
Province	Nakhon Si Thammarat(80), Krabi(81), Phunga(82), Phuket(83), Surat Thani(84), Ranong(85), Chumporn(86), Songkhla(90), Satun(91), Trang(92), Phattalung(93), Pattani(94), Yala(95), Narathiwat(96)
Age	0, 1-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 56-69, 70-74, 75+
Gender	Male, Female
Road users	1:walk/pedal, 2:motorbike, 3:car, 4:bus/truck and 5:other

Table 3.1: Study variables

3.2 Number of deaths and mortality rates

There were 17580 deaths of road traffic accident in southern Thailand from 1996 to 2006. There were 13803 cases for males and 3777 for females. Figure 3.1 shows the annual number of deaths stratified by gender. There is about three times the number of cases for males compared to females. For males, maximum number of deaths was 1672 cases in 1996 and the minimum was 865 cases in 1998. For females, maximum number of deaths was 421 cases found in 2000 and the minimum was 221 in 1998.

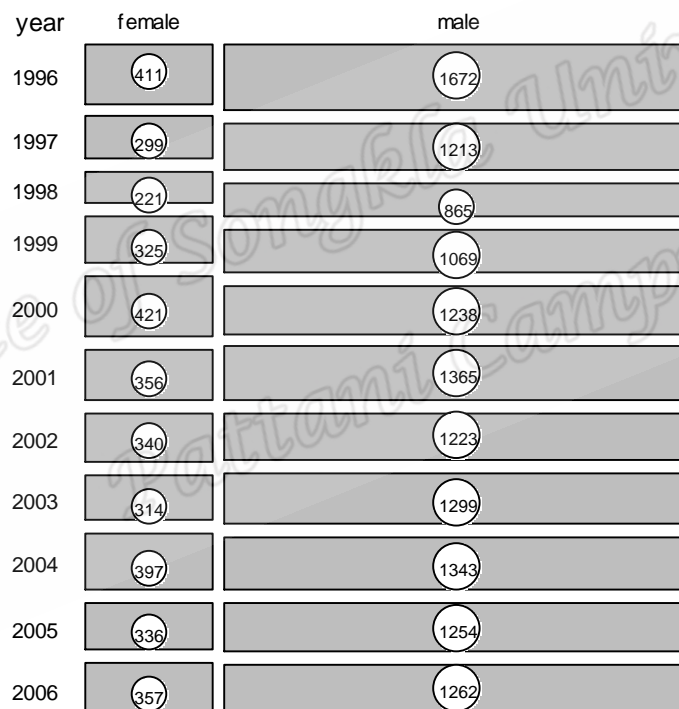


Figure 3.1 Mosaic plot of annual number of deaths by gender

Figure 3.2 shows the number of deaths classified by age group and gender. Higher number of deaths occurred among age group 20-29, followed by age groups 10-19 and 30-39 for both males and females with the number of deaths being 3929, 2833 and 2527, respectively for males. Whereas for females, high numbers of deaths found

in age groups 30-39, 20-29 and 10-19 years with numbers of deaths being 672, 671 and 628, respectively.

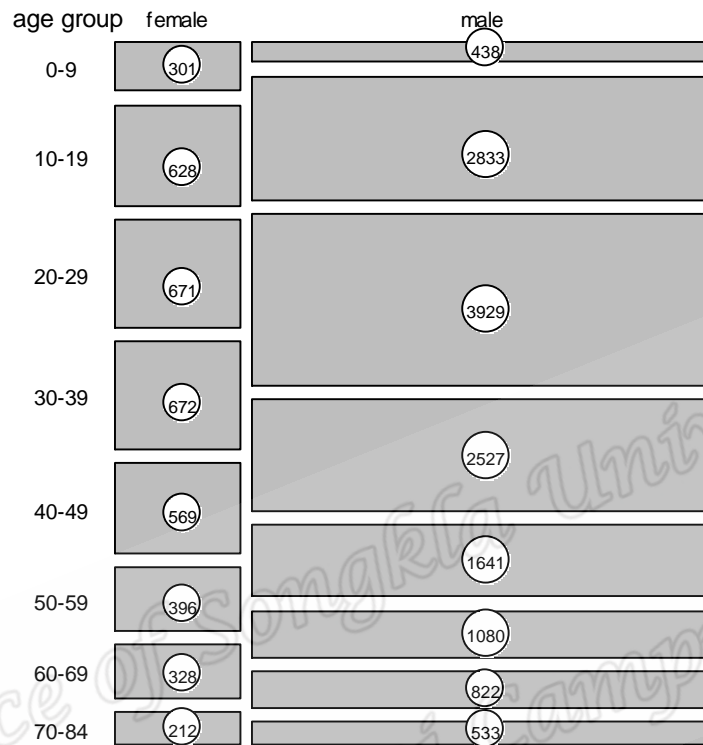


Figure 3.2 Mosaic plot of number of deaths form 1996-2006, classified by age group and gender

Figure 3.3 shows the number of deaths from road traffic accidents by province and gender. There are larger tiles of mosaic plot in Nakhon Si Thammarat, Surat Thani and Songkhla. These three provinces are large in terms of area and population. For males, there were 2557 deaths in Nakhon Si Thammarat, 2427 in Songkla, and 1838 in Surat Thani. For females there were 695 deaths in Nakhon Si Thammarat, 619 occurred in Songkla, and 567 in Surat Thani.

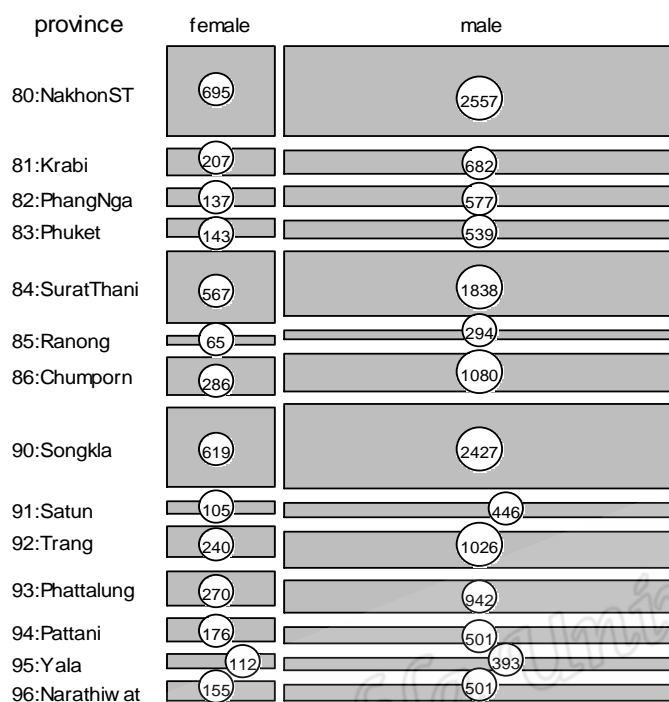


Figure 3.3 Mosaic plot of number of deaths form 1996-2006, classified by province and gender

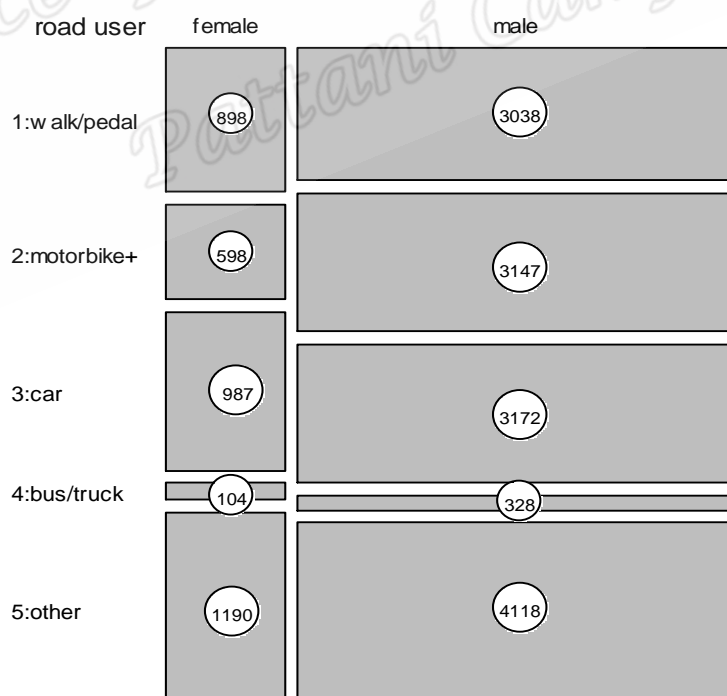


Figure 3.4 Mosaic plot of number of deaths form 1996-2006, classified by road user and gender

Figure 3.4 is a mosaic plot for number of deaths by type of road user and gender. The “other” category means that subjects died using irregular or special vehicles that could not be classified into the other groups. It also included cases where the road user type was not recorded. Apart from the “other” category, for males, death from cars ranked first, followed by motorbike and walk/pedal. For females, the ranking was cars, walk/pedal then motorbike.

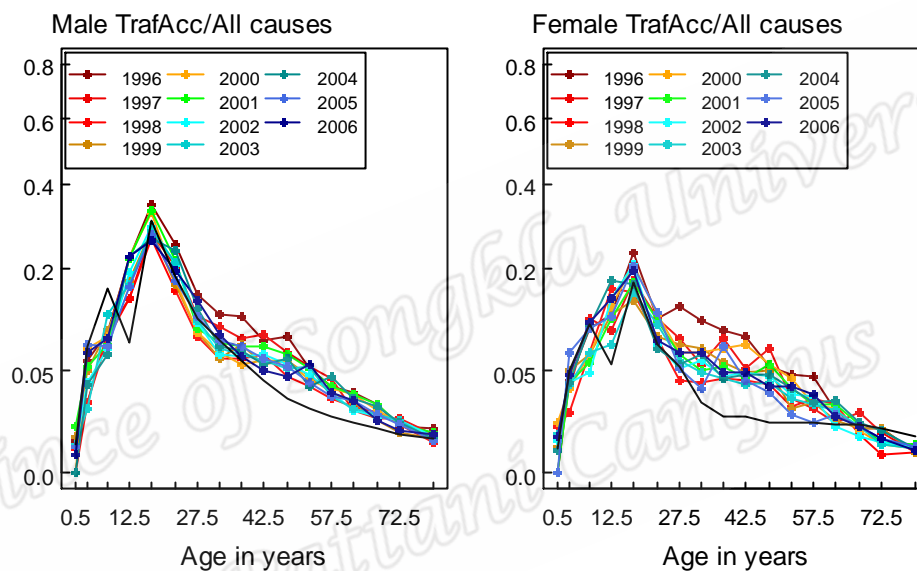


Figure 3.5 Proportion of road traffic accident deaths for “all causes of deaths” in southern Thailand

Figure 3.5 shows proportion of road traffic accident deaths for “all causes of deaths” in southern Thailand. The undotted black lines represent the proportion of road traffic accident deaths for all causes of deaths in Japan in 2006. The proportion of deaths caused by road traffic accidents in southern Thailand had the average of 5.7% and 2.7% for both males and females and Japan had the average of 1.5% and 1.1%. There were high proportions of deaths caused by road traffic accidents among people aged

15 - 19 which represented 29.0% and 18.4% of all causes of death for males and females and Japan was similar with 30.3% and 17.4% in the same age group.

Next we calculated the road traffic accident mortality rates described in Equation (1) in Chapter 2.

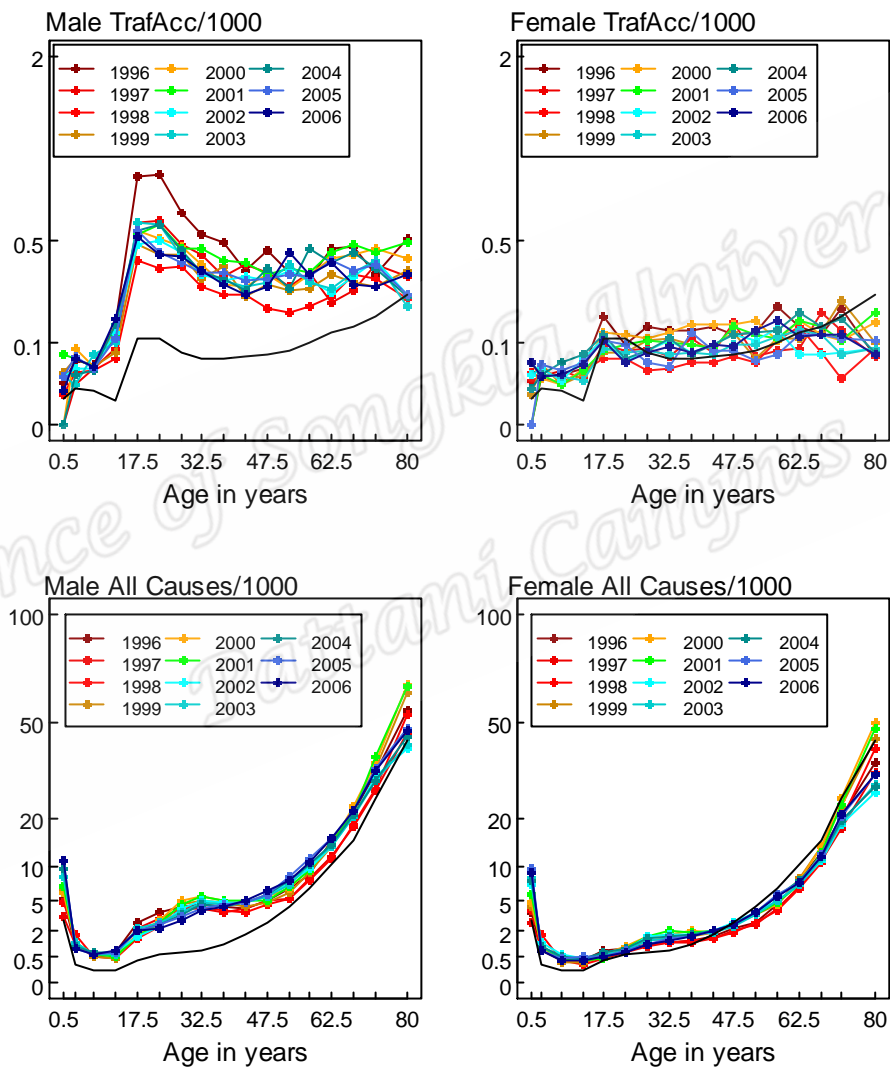


Figure 3.6 Southern Thailand mortality rates per 1000 population

Figures 3.6 shows the mortality rates by age from 1996 to 2006 and compared them with road traffic accident rates from Japan in 2006 using a square root scale. The

Japan rates were plotted as undotted black lines. The top left panel shows the road traffic accident death rates for males and the top right panel shows the rates for females. The bottom left panel shows “all causes of death” rates for males and the bottom right panel shows “all causes of death” rates for females.

The pattern of road traffic accident mortality rates changes with age for males and females in both southern and Japan and the southern Thailand rates were higher overall. The road traffic accident rates for males had a different pattern compared to Japan. Whereas these pattern for females in southern Thailand and Japan were quite similar to each other.

For southern Thailand, in most years, the male rates peaked at about 0.5 per 1000 population at age groups 15-19 and 20-24. The rates were lower for females (about 0.1 per 1000 population) and were more uniform across age. The “all causes of death” rates for males and females both had similar patterns, but with males having a more pronounced increase in the 20-40 year range.

The rates for males and females in youngest age group were 10 per 1000 population and they decrease with age to 0.5 per 1000 at age group 10-14 and thereafter they increase with age.

3.3 Excess deaths

In order to compare southern Thailand mortality with Japan and other regions of Thailand, we calculated excess deaths for southern Thailand over Japan in 2006 and other regions by year.

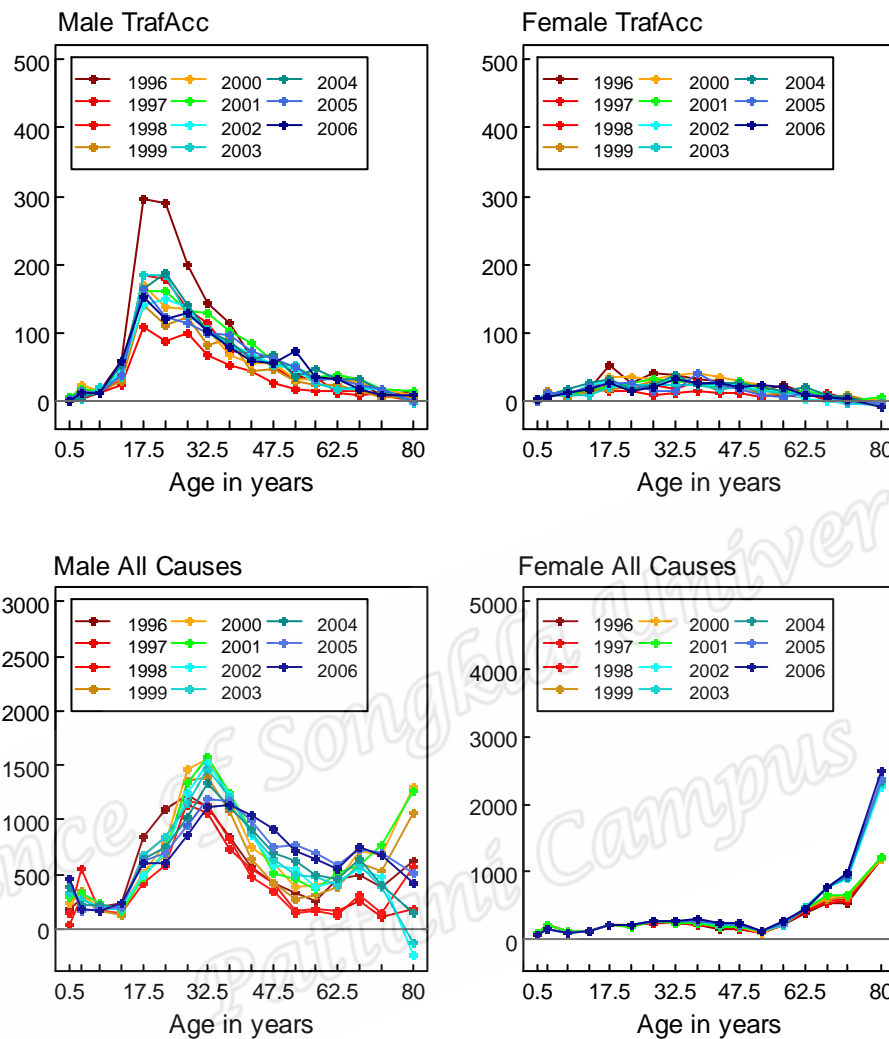


Figure 3.7 Excess deaths in southern Thailand over Japan

Figure 3.7 shows excess deaths in southern Thailand over Japan's 2006 rates. Males and Females in southern Thailand had excess deaths due to road traffic accidents with exception for youngest aged and 80 years or more. Males had larger excess deaths than those of females. Males among age groups 15-24 had largest excess deaths. The maximum excess deaths for this age group found in 1996 with approximately 300 cases.

The “All causes of deaths” in southern Thailand overall males had large excess number of deaths than females. Males were having high excess with peaked at age group 30-34 with more than 1500 cases and the oldest age group. For females the excess number of deaths was quite large for the oldest age group with approximately 1000 cases occurred in 1996 to 2001 and greater than 2000 cases in 2002 to 2006.

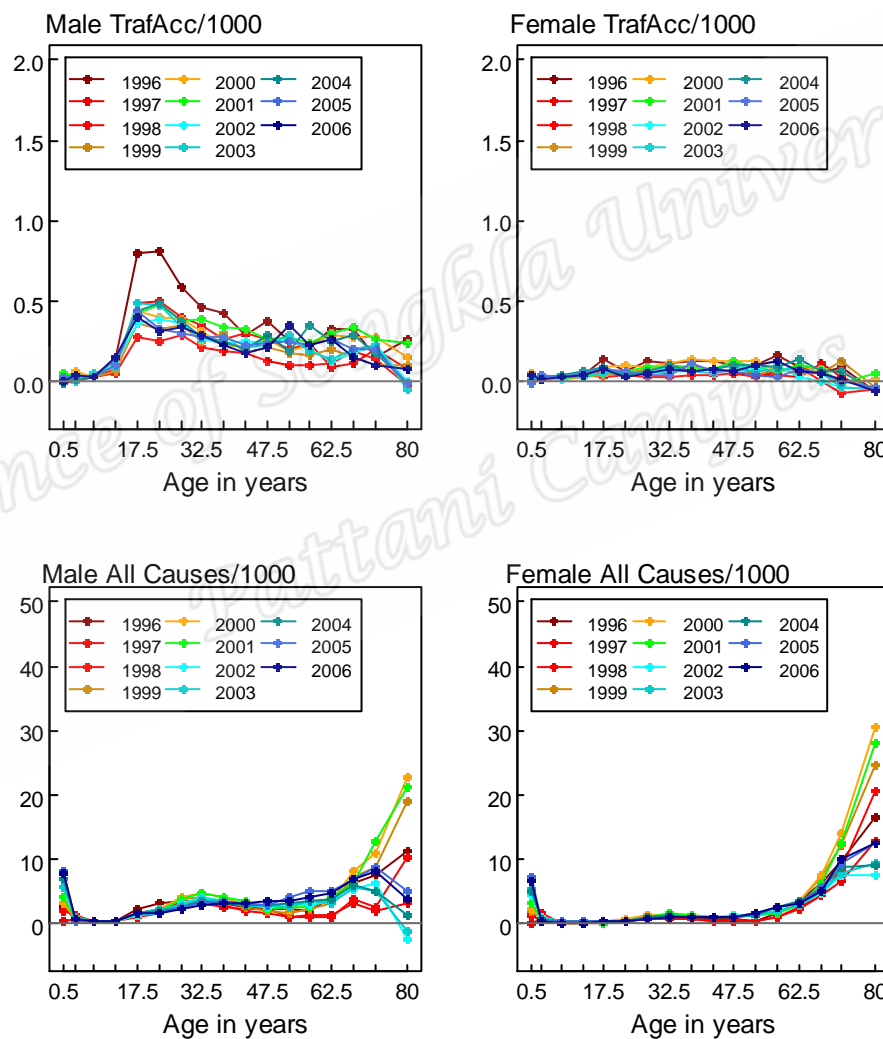


Figure 3.8 Excess mortality rates in southern Thailand over Japan

Figure 3.8 shows excess mortality rates in southern Thailand over Japan's rates in 2006. The patterns of excess mortality rates were similar to excess deaths for road traffic accidents and "all cause of deaths", both of genders.

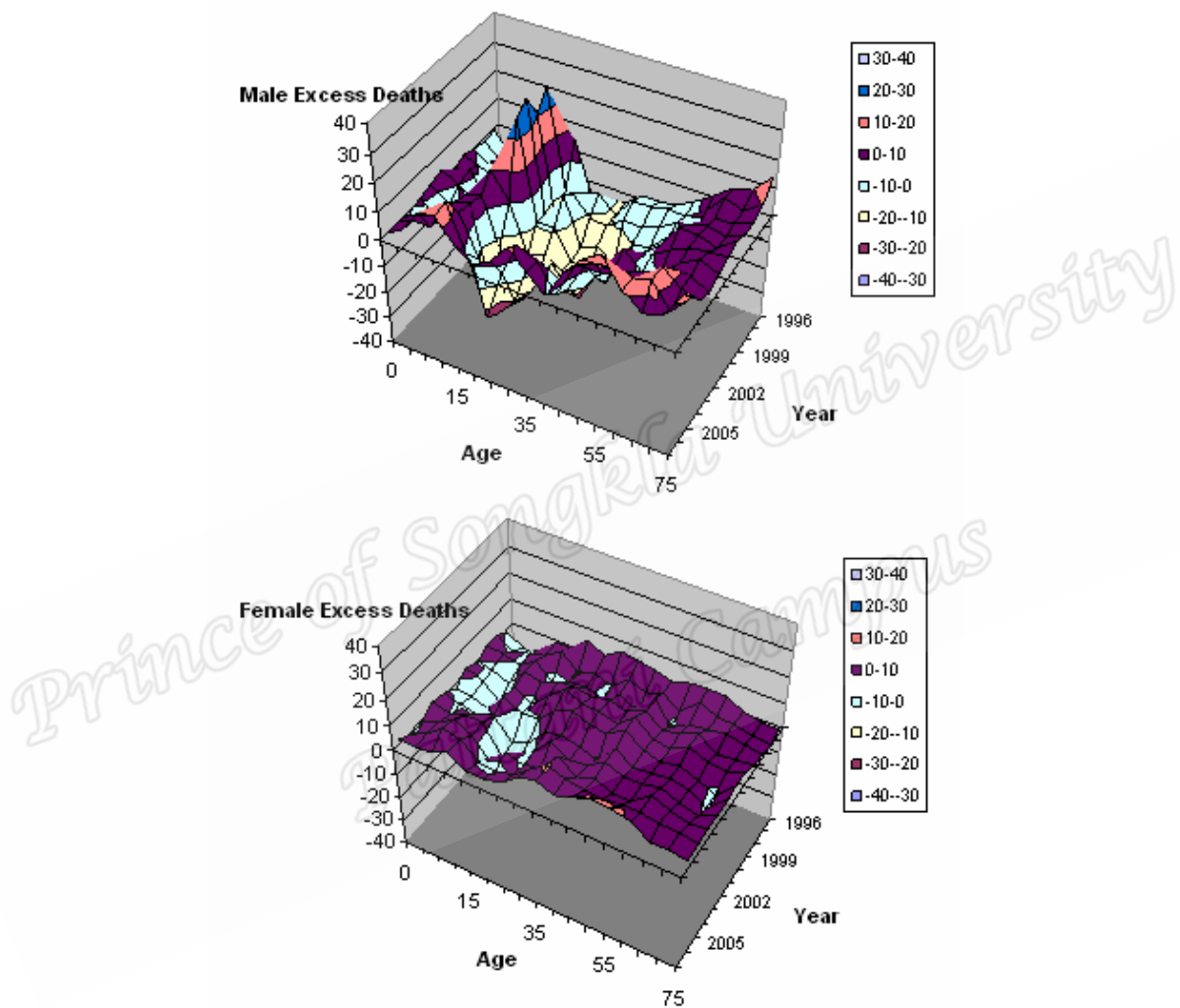


Figure 3.9 Excess deaths in southern over other regions of Thailand by year

Figure 3.9 shows excess deaths in southern Thailand for road traffic accident over other regions of Thailand for both of genders in the perspective 3D view surface where the X-axis is presented age group, Y-axis is excess and Z-axis is year. The surfaces reveal that males had largest excess death among age group 15-19 with an

average of 6 cases per year and a maximum of 30 cases. Age groups older than 55 years also had an excess. Females had an excess deaths among age groups 15 years and older but it was not large.

3.4 Years of life lost (YLL)

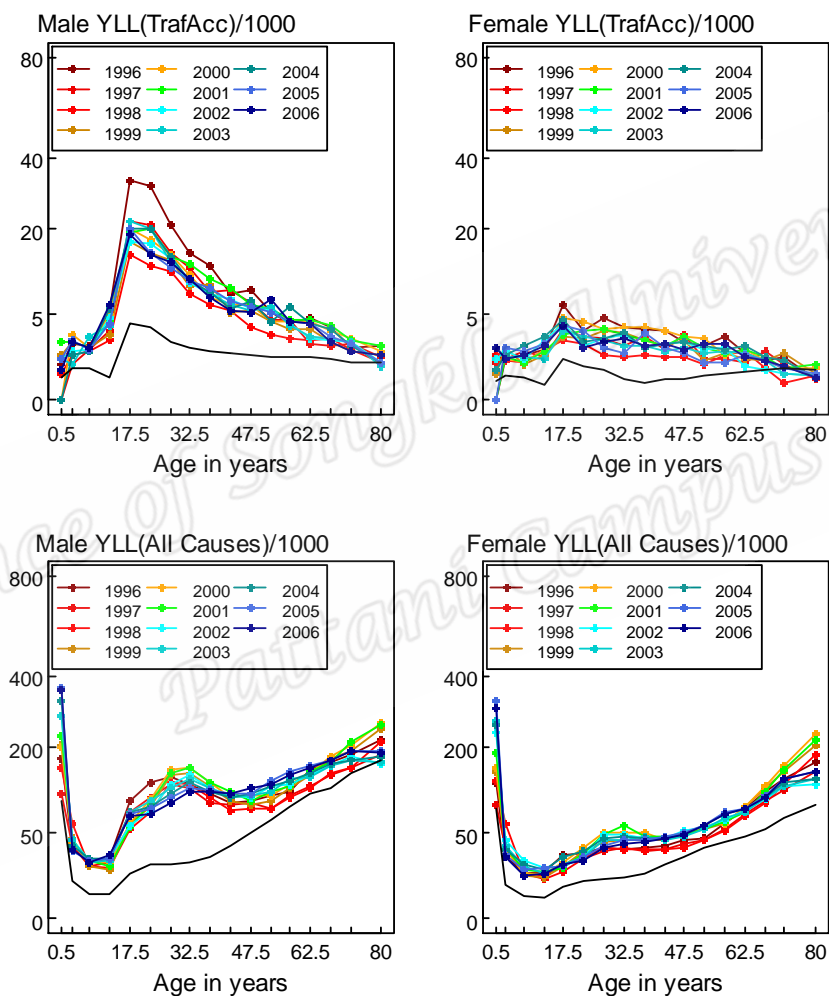


Figure 3.10 Years of life lost (YLL) in southern Thailand per 1000 population

Figure 3.10 shows years of life lost (YLL) in southern Thailand per 1000 population.

The undotted black lines represent years of life lost in Japan in 2006. It is clear that YLL for southern Thailand were higher than those of Japan. Males had the higher

YLL due to road traffic accident deaths than females. Males among age group 15 – 24 were responsible for the highest years of life lost compared to other age groups with an average 19 years lost per 1000 population. Road traffic accident deaths was less contribute YLL for females.

In “all causes of deaths”, there were similar patterns between southern Thailand and Japan, with high YLL in the youngest and oldest groups. However southern Thailand had higher YLL than Japan in both genders and a more pronounced excess of YLL among age groups 15 – 30 years.

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