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Table 5.37Mortality rates of diabetes, heart disease, cancer, paralysis, liver diseases, kidney
diseases, pneumonia, transportation accidents, cerebrovascular disease, and emphysema
among the elderly, 1985-2006

		Mortality rate per 100,000 population among the elderly								
Year	Diabetes	Heart diseases	Cancer	Liver diseases	Kidney diseases	Paralysis	Pneumonia	Transpor– tation accidents	Cere– brovascular diseases	Emphy– sema
1985	28.8	245.0	169.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1986	24.9	259.3	177.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	30.3	304.3	199.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1988	32.4	331.1	209.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1989	37.2	372.3	231.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	39.4	379.2	248.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1991	39.9	386.7	253.9	62.6	38.3	49.5	42.0	16.9	n.a.	n.a.
1992	49.5	400.3	266.8	63.4	48.0	51.5	42.3	20.1	n.a.	n.a.
1993	50.8	389.7	262.9	57.1	45.9	42.4	45.3	19.5	n.a.	n.a.
1994	57.2	412.2	283.9	56.3	47.5	44.9	56.0	24.1	n.a.	n.a.
1995	56.2	440.7	242.1	52.2	55.3	45.5	51.0	26.3	n.a.	n.a.
1996	57.4	407.5	236.2	41.4	38.2	37.4	46.8	22.4	54.9	18.4
1997	48.5	356.1	199.4	33.1	40.5	32.0	33.7	17.1	49.1	13.3
1998	47.7	310.0	213.0	34.4	46.7	31.3	28.9	13.3	38.0	11.0
1999	74.8	257.7	273.7	34.0	56.1	32.3	61.1	18.5	63.8	23.0
2000	82.1	179.9	297.6	34.0	75.5	33.9	59.9	22.6	79.7	29.5
2001	88.4	182.2	218.2	40.6	89.6	34.8	73.0	21.5	110.1	38.8
2002	72.1	149.4	342.6	35.5	87.2	29.2	85.5	18.9	118.7	40.2
2003	66.7	177.1	399.5	38.3	108.0	26.8	107.4	16.7	166.8	54.9
2004	75.8	163.8	393.1	30.7	98.9	32.8	119.2	17.3	166.3	37.7
2005	73.0	172.3	393.6	39.5	100.3	26.6	107.8	16.2	134.3	37.4
2006	71.3	175.3	402.5	39.2	83.0	25.9	110.3	15.2	110.9	35.1

Source: Bureau of Policy and Strategy, Ministry of Public Health.

Note: n.a. = Data not available

3. Conclusions

3.1 Equity in Health Status

3.1.1 Health Status According to Socioeconomic Factors at Individual Level

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Social and economic factors at the individual or family level has some influence on health as they affect people's accessibility to factors required for livelihood and to services, particulary essential health care.

The 1996 health examination survey revealed a comparison of equalities in health status of the elderly with different economic status backgrounds, classified by family's financial conditions: unneedy, occasionally needy, somewhat needy, and very needy. It was found that the financially needy condition was significantly associated with disability; 22% of unneedy elders were disabled, and as high as 35% of very needy elders were disabled compared to the unneedy (Table 5.38).

 Table 5.38
 Disabilities of elders by level of financial neediness

Financial status	Long-tern	n disability	total disability		
r manciai status	Percent	Odds ratio	Percent	Odds ratio	
Very needy (n =188)	25.5	1.63-3.4	34.6	1.59-3.09	
Somewhat needy (n =591)	20.8	1.12-1.83	28.9	1.22-1.88	
Occasionally needy (n =1,056)	19.6	1.08-1.61	27.0	1.15-1.65	
Unneedy (n =2,213)	17.7	1.0	22.2	1.0	

Source: Sutthichai Jitapunkul et al. 1999.

According to the 2004 Health and Welfare Survey, examining the proportion of sick people with and without hospitalized care and their income level, the lowest-income group had the highest proportion of illness (26%) while the highest-income group had an illness proportion of only 15% (Table 5.39). If the illness proportion was equal for all five income groups, the proportion should be 20%.



 Table 5.39 Proportion (percentage) of people with illness (as outpatients and inpatients) by income level

	Proportion of people with illness					
Income level	Requiring non-	Requiring				
	hospitalization care	hospitalization care				
	(outpatient)	(inpatient)				
Lowest	26.4	25.6				
Low	21.0	21.1				
Medium	20.4	19.3				
High	17.2	19.0				
Highest	15.0	15.0				
Total	100	100				

Source: Suphon Limwattananon et al. 2005.

So it can be said that the socioeconomic status of individuals or families mostly tends to be associated with illness conditions which are self-reported, including disabilities resulting from a lack of suitable care.

3.1.2 Health Status According to Socioeconomic Status at the Locality Level

An analysis of the relationship between the socioeconomic status of locality and mortality in 926 districts across the country (including Bangkok), categorized into five quintiles using socioeconomic indicators of districts derived from five socioeconomic variables from the population and housing census data, comparing standardized mortality ratio (SMR) in groups of districts, reveals that SMRs are different among groups of districts. The differences are found in the aspects of overall mortality, mortality by sex, and mortality by disease. For overall mortality in males, accidents and suicide are the top leading causes of death in the district groups with medium and high socioeconomic levels (quintile 4); a lower proportion is noted in poorer district groups (quintiles 1 and 2) as they are located in the Northeast with a higher prevalence of bile duct cancer, compared with other regions. As for lung cancer, diabetes, ischemic heart disease and cerebrovascular disease, the highest death proportions are found in the rich group of districts (quintile 5), while the death proportions of leukemia and accidental drowning have no difference among district groups (Figures 5.63–5.66).

Figure 5.63 Standardized mortality ratios (overall and by sex) in groups of districts with various socioeconomic levels

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Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.



Figure 5.64 Standardized mortality ratios of three cancers in groups of districts with various socioeconomic levels



Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.

Figure 5.65 Standardized mortality ratios of three chronic diseases in groups of districts with various Socioeconomic Levels

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Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.



Figure 5.66 Standardized mortality ratios of accidents and suicide in groups of districts with various socioeconomic levels



Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.

Another explanation of the differences in morbidity and mortality rates in districts with different socioeconomic status is that they have different risk factors. For example, in municipal and non-municipal areas, according to the 1996-1997 and national health examination survey, the proportion municipal residents with a high cholesterol level (>200 mg/dl%) is 18% higher than that for non-municipal residents (Table 5.40).

	Population with cholesterol >200 mg/dl%							
Residential area	Bangkok	Central	North	Northeast	South	Total		
Cholesterol >200 mg/dl%	56.1	48.4	36.1	15.7	41.7	35.8		
Municipal areas		43.2	43.3	42.6	50.4	51.5		
Non-municipal areas		49.3	35.5	13.9	40.3	33.9		

Source: Second National Health Examination Survey.

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The 1996-97 survey also shows that municipal residents are 1.2 times more likely to have hypertension than non-municipal people. Besides, differences are noted for risks for such illnesses as heart diseases, cerebrovacular diseases, etc, which are major causes of morbidity and mortality.

Moreover, the infant mortality rate is an indicator of health status disparities in various population groups. In non-municipal areas, the infant mortality rate is 1.56 times higher than that in municipal areas. Even though it has declined significantly during the part 30 years, the disparities between municipal and non-municipal areas are steadily on the rise (Table 5.41).

	IMR (per 1,000 live births)					
Survey	Total	Municipal areas	Non municipal	NM to M rates		
			areas			
SPC 1 (1964-1965)	84.3	67.6	85.5	1.26		
SPC 2 (1974-1976)	51.8	39.6	58.7	1.48		
SPC 3 (1985-1986)	40.7	27.6	42.6	1.54		
SPC 4 (1989)	38.8	23.6	41.4	1.75		
SPC 5 (1991)	34.5	21.0	37.0	1.76		
SPC 6 (1995-1996)	26.05	15.24	28.23	1.85		
SPC 7 (2005-2006)	11.26	7.92	12.39	1.56		

Table 5.41 Infant morbidity rates in municipal and non-municipal areas, 1964-2006

Source: National Statistical Office.

Note: SPC = Survey of Population Changes.

3.2 Relationship Between Risk Factors and Health Problems

An analysis of the relationship between risk factors and health problems reveals that smoking and alcohol drinking as are significant co-risk factors for major disease burden in males. Alcohol abuse is the major cause of road traffic accidents, alcoholic dependence, liver cancer, depression and cirrhosis, while smoking is the major risk factor for cerebrovascular disease, liver cancer, ischaemic heart disease, and chronic obstructive pulmonary disease for instance (Figure 5.67).

Among females, the risk factors for major disease burdens are, for example, overweight being a co-risk factor for cerebrovascular disease, depression, ischaemic heart disease, and knee-joint degeneration (Figure 5.68).



Figure 5.67 Diseases and risk factors among Thai males, 2004

				DALYs			
Rank	Risk factors	Rank	Males	(x 100,000)	%		
1	Alcohol	1	HIV/AIDS	6.5	12		
2	Unsafe Sex	2	Traffic accidents	6.0	11		
3	Tobacco	1-3	Alcohol dependence/harmful use	3.3	6		
4	Non-Helmet	→4	Stroke	3.1	6		
5	Blood pressure	▶5	Liver and bile duct cancer	2.9	5		
6	Obesity	6	Depression	2.6	5		
7	Cholesterol	7	Ischaemic heart disease	1.8	3		
8	Fruit & Vegetable	>8	COPD	1.8	3		
9	Illicit Drugs	>9	Diabetes	1.7	3		
10	Air Pollution	10	Cirrhosis	1.3	2		
11	Physical Inactivity						
12	WSH /						
13	Non-Seatbelt use						
14	Malnutrition-International						
15	Malnutrition-Thai						

Source: Working Group on Burden of Disease and Risk Factors in Thailand, International Health Policy Programme, 2006.

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Figure 5.68 Diseases and risk factors among Thai females, 2006

Source: Working Group in Burden of Disease and Risk Factors in Thailand, International Health Policy Programme, 2006.

3.3 Risk Factors and Disease Occurrence

In addition to risk factors that are behaviour related, factors at the individual level tend to result in getting chronic or non-communicable diseases such as obesity, hereditary diseases (family history), and high blood-chemical contents (such as cholesterol and sugar levels).

A cohort study on employees of the Electricity Generating Authority of Thailand (EGAT, 1985-1997) reveals that there are several factors that determine the chances of developing an illness such as age, sex, body mass index, waistline, hypertension, family history with diabetes, impaired glucose tolerance, triglyceride level, and HDL-cholesterol level. The study also indicates that a BMI level between 23 and 27.5 increases the chance of having diabetes 1.7 times, and a BMI of 27.5 or over increases such a chance 2.9 times, compared with a BMI under 23. The waistline greater than the maximum allowable limit (90 cm in males and 80 cm in females) increases the chance of developing diabetes 1.7 times; hypertension increases such a chance 1.7 times, and a family history increases it 2.7 times (Table 5.42). It is noteworthy that such risk factors clearly determine the chance of developing illnesses in the future; some of the risk factors can be controlled or modified.

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Variable	Odds ratio (95% CI)		
Age 35-39	1		
40-44	0.86 (0.60, 1.25)		
45-49	1.06 (0.72, 1.57)		
<u>></u> 50	1.43 (0.81, 2.49)		
Sex (male =1, female = 0)	1.64 (1.09, 2.47)		
BMI (kg/m^2) 23 - \leq 27.5	1.73 (1.26, 2.47)		
<u>></u> 27.5	2.93 (1.59, 5.54)		
Waistline: ≥90 cm in males, ≥ 80 cm in females	1.69 (1.12, 2.57)		
Hypertension	1.67 (1.18, 2.35)		
Diabetic history: father or mother or brother/sister	2.72 (2.03, 3.66)		
Impaired Glucose tolerance	4.10 (2.97, 5.64)		
Triglyceride ≥ 200	1.57 (1.11, 2.23)		
HDL-C <40 in males, < 50 in females	1.30 (0.85, 1.98)		

Table 5.42 Odds ratios of various variables contributable to the occurrence of diabetes

Source: Wichai Ekpalakorn, 2005.