

## Chapter 7

# Analysis of the data obtained in general health examination

### 7.1 Introduction

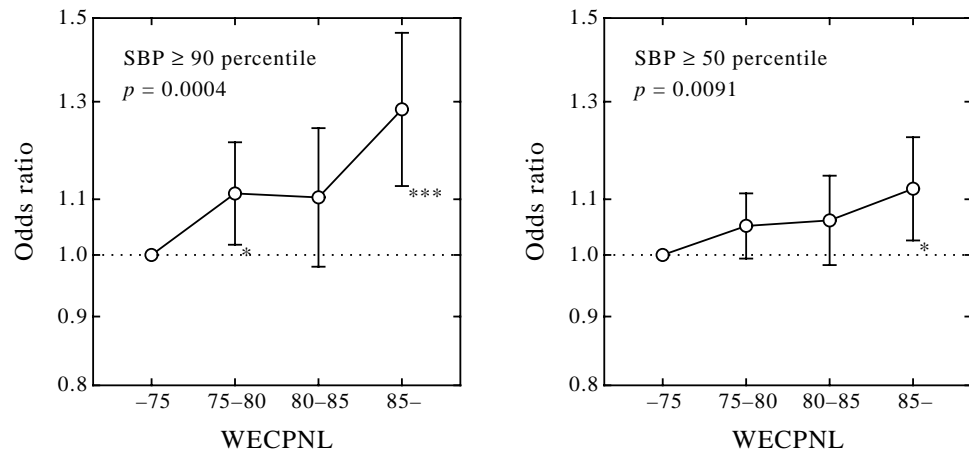
Citizens over 40 years are suggested by the government to receive health examination on the basis of Health and Medical Service Act for the Elderly. The data obtained from the health examination conducted by the local authorities for the years of 1994 and 1995 were analysed with respect to systolic blood pressure and diastolic blood pressure, the numbers of red and white blood cells and the concentration of serum uric acid. Logistic regression analysis was applied to analyse the data acquired.

### 7.2 Effect on systolic and diastolic blood pressure

Sample size of the subjects concerning systolic and diastolic blood pressure stratified in the ranks of WECPNL is shown in Table 7.1. In order to adjust various confounding factors possibly influencing the blood pressure,

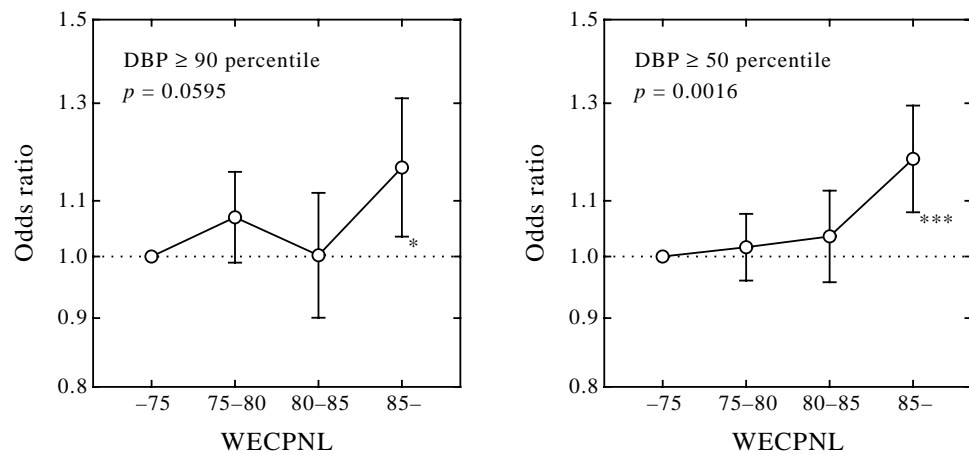
**Table 7.1** Sample size of systolic and diastolic blood pressure

Year	Municipality	WECPNL						Total
		-75	75-80	80-85	85-90	90-95	95-	
1994	Okinawa City	2,938	4,337	1,006	189			8,470
	Kadena Town				1,556	155		1,711
	Chatan Town		441	923	437	15	93	1,909
	Kitanakagusuku Village	1,190	2					1,192
1995	Ishikawa City	338	905	642	101			1,986
	Gushikawa City	2,066	1,627	247	213			4,153
	Ginowan City	2,140	1,750	1,061				4,951
	Okinawa City	80	85	1				166
	Yomitan Village		4,021	222				4,243
Total		8,752	13,168	4,102	2,496	170	93	28,781



**Figure 7.1** Odds ratio *vs.* WECPNL on higher systolic pressure.

\*: $p < 0.05$ , \*\*:  $p < 0.01$ , \*\*\*:  $p < 0.001$



**Figure 7.2** Odds ratio *vs.* WECPNL on diastolic blood pressure.

\*: $p < 0.05$ , \*\*:  $p < 0.01$ , \*\*\*:  $p < 0.001$

multiple logistic regression analysis was applied. Since there is close correlation between blood pressure and age, the rates of those with systolic blood pressure and diastolic blood pressure exceeding 90 percentile or 50 percentile for age groups stratified in the bands of 10-years were taken as the dependent variable. Noise exposure in WECPNL, age (20–79 years, 6 categories), sex, Body Mass Index (5 categories) and the interaction of age and sex were applied as the independent variables.

Relation between odds ratios and WECPNL on systolic and diastolic blood pressures are shown in Figure 7.1 and Figure 7.2 with 95% confidence

**Table 7.2** Sample size of the concentration of serum uric acid

Year	Municipality	WECPNL				Total
		-75	75-80	80-85	85-90	
1994	Okinawa City	2,934	4,321	1,005	189	8,449

intervals. On systolic blood pressure, the odds ratio of 90 percentile of those of the noise exposed group with WECPNL over 85 was 1.3 reference to that of the control. This implies the number of persons with the blood pressure exceeding the threshold increases by about 30 % in the noise exposed group. The increase of odds ratio was also found in the noise exposed group with WECPNL from 75 to 80 compared with the control. The results of the trend test tell that the trend of increase of odds ratio with the increase of WECPNL are significant with the significance probability,  $p = 0.0004$ , as shown in the figure, which suggests that significant dose-response relation is very likely to exist between the rate of the higher blood pressure and the noise exposure.

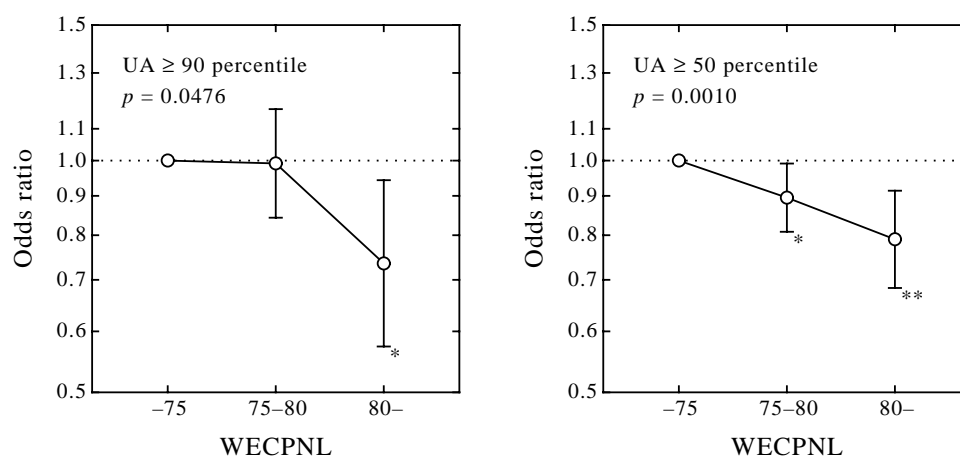
### 7.3 Effect on the numbers of white blood cells and red blood cells

Sample size of the subjects concerning white blood cells is 28,692, and that of white blood cells is 13,404. No significant dose-response relationship was found as to the numbers of white blood cells and red blood cells.

### 7.4 Effect on the concentration of serum uric acid

Sample size of the subjects concerning serum uric acid stratified in the ranks of WECPNL is shown in Table 7.2. Since there is close correlation between uric acid and sex, the rate of those with the concentration of uric acid exceeding 90 percentile or 50 percentile for male and female groups was taken as the dependent variable. Noise exposure in WECPNL, age (20-79 years, 6 categories), sex, Body Mass Index (5 categories), the concentration of creatinine (5 categories) and the interaction of age and sex were applied as the independent variables.

Relation between odds ratios and WECPNL on uric acid is shown in Figure 7.3 with 95% confidence intervals. The odds ratio of those exceeding the threshold corresponding 50 percentile of the population is 0.8 in the noise exposed group with WECPNL over 80. The results of the trend test tell that the trend of decrease of odds ratio with the increase of WECPNL is significant



**Figure 7.3** Odds ratio *vs.* WECPNL on the concentration of serum uric acid.

\*: $p < 0.05$ , \*\*: $p < 0.01$ , \*\*\*: $p < 0.001$

with the significance probability,  $p = 0.0010$ , as shown in the figure, which suggests that significant dose-response relation is likely to exist between the rate of the lower concentration of serum uric acid and the noise exposure.