

# A STUDY ON AIRCRAFT NOISE, ANNOYANCE AND HEALTH AROUND AN AIRPORT

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**Introduction** Health assessment for inhabitants is one of the major concerns around airports where some fears arose concerning adverse health effects such as cardiovascular disease since occupational noise exposure had been supposed to be a potential cause of hypertension. The present study is showing an association between aircraft noise, annoyance and health check data around an airport.

**Subjects and Methods** General health check data and annoyance reactions to road-traffic, railway and aircraft noise were collected around Fukuoka airport. The reaction was measured with Japanese modifiers that were extracted from word pool to compose a linear scale (Yano et al.2002). Questionnaires including that scale were mailed and withdrawn at community health services around the airport. Subjects with these data were divided into three groups according to the zoning of governmental countermeasures against aircraft noise. Group I and II were the subjects from areas over 75 and 90 respectively of WECPNL in early 70's when the countermeasure was established. Group 0 was the control set of data from outer area of class I zone where the estimated WECPNL in 70's was about 70. The order of relative noise levels in these three have been remained through decades though each level decreased remarkably. Data from 894 subjects were analyzed in this study. Multiple liner regression analysis was used to determine simultaneously magnitude and the effects of aircraft noise and other confounding variables. Systolic or diastolic blood pressure was a dependent variable in the models. Package programs for statistics, SPSS and HALWIN, were used for analysis.

**Results** Table 1 shows the result from multiple regression analysis. Estimated WECPNL for three groups and the degrees of annoyance from aircraft noise did not associate with systolic or diastolic blood pressure data significantly. The factors that found to be available to the model were age, sex, and the degree of annoyance from road-traffic noise.

**Discussion** Personal factors such as age, food or drinking habit are known to affect ones blood pressure. Controlling these confounding variables is inevitable to evaluate the effects of environmental noise, even if the lifestyle change itself was partly a result of noise exposure. With the control in statistical analysis our study showed that systolic and diastolic blood pressure associated not with annoyance from aircraft noise but with that from road traffic noise. There should be more data to analyze these causal relationships.

Table 1. Multiple regression analysis of systolic and diastolic blood pressure with control factors and aircraft noise level.

	Systolic BP	Diastolic BP	TG	TCHO
Factor	beta <sup>1</sup> (p-vale)	beta (p-vale)	beta (p-vale)	beta (p-vale)
Age	0.335(0.0000)	0.224(0.0000)	0.170(0.0000)	0.234(0.0000)
WECPNL	0.039(0.2090)	0.043(0.1750)	-0.022(0.4876)	-0.005(0.8737)
Annoyance by road-traffic noise	0.083(0.0194)	0.076(0.0370)	-0.013(0.7252)	0.049(0.1870)
Annoyance by Railway noise	-0.071(0.0309)	-0.002(0.9620)	0.015(0.6585)	0.011(0.7426)
Annoyance by Aircraft noise	-0.025(0.4749)	-0.043(0.2238)	-0.035(0.3330)	-0.025(0.4856)
Sex	(0.0005)	(0.0000)	(0.0000)	(0.0159)
Male	0.124	0.189	0.163	-0.089
Smoking	(0.0580)	(0.0032)	(0.0260)	(0.2852)
Current smoker	-0.064	-0.103	0.079	-0.038
Drinking	(0.4475)	(0.2198)	(0.2410)	(0.5957)
Current drinker	0.025	0.042	-0.041	-0.019
Adj. R-Square	0.153(0.0000)	0.104(0.0000)	0.065(0.0000)	0.063(0.0000)

<sup>1</sup> beta: standardized partial regression coefficient

**Keywords:** blood pressure, aircraft noise, annoyance

## References

- T.Yano et al. International joint study on the measurement of community response to noise: Construction of noise annoyance scale in Japanese, Jap.J.Acoustic.58(2), 101-110, 2002
- T.Yano et al. International joint study on the measurement of community response to noise: The variety of noise annoyance modifiers and question wording in Japanese. Jap.J.Acoustic.58(3),165-172,2002