

COMPLAINING ABOUT AIRCRAFT NOISE

STATE-OF-THE-ART AROUND AMSTERDAM AIRPORT SCHIPHOL

C.M.A.G. van Wiechen, D. Houthuijs, S.H. Heisterkamp
National Institute for Public Health and the Environment, The Netherlands

Introduction Like at other major airports, aircraft movements at Schiphol airport have been increasing over the last decades. During the same period, there has also been an enormous increase in numbers of complainants about aircraft noise, registered at the Environment Advisory Committee Schiphol (EACS). Since 1999, these numbers seem to stabilise at approximately 10,000 yearly complainants (Figure 1). A spatial expansion of complainants has been taking place as well. In 1992 complaints came from 64 municipalities; at the beginning of this century the number of municipalities have doubled, the majority lying in an area with a radius of 30 kilometres around the airport. We explored the possible exposure-response relation between aircraft noise exposure and the prevalence of complainants. In addition, we wanted to get insight into the role of sound insulation of houses as exposure modifier, and into possible determinants of complaint behaviour, like personal characteristics and aspects of health.¹

Method Two sources of data were used: (1) the EACS complaints registration of several years. An aircraft noise exposure level (L_{den}) was assigned to each complainant, using a GIS (Arc/Info). With data of 1998 and 1999 we calculated the period prevalence rate in areas with 1 dB(A) noise level intervals. In addition, we carried out spatial smoothing techniques with complainants data of 1998-2000, making use of small area health statistics. Prevalence rates were estimated in 4-digit postal code areas. The Bayesian mapping was based on spatio-temporal modelling with exposure co-variables, using Markov Chain Monte Carlo (MCMC) techniques. Competing models were compared using the Expected Predicted Deviance (EPD); (2) the HIAS (Health Impact Assessment Schiphol) questionnaire survey, carried out in 1996.² This data was used to analyse sound insulation of houses in relation to aircraft noise exposure at the individual level, and to compare personal characteristics and aspects of health of complainants with those who do not complain.

Results In 1998 and 1999, 12,549 and 10,257 complainants respectively were registered. The prevalence of complainants increased, from less than 1% at 50 dB(A) (L_{den}) to about 7% at 62 dB(A) (Figure 2). An increase in the percentage of sound insulated houses with increasing noise levels was observed, rising markedly above 60 dB(A) (from 24% to almost 90%). Results of the spatial smoothing analyses also showed a clear relation with aircraft noise. The maps show that the 4-digit postal code areas with above average standard rates of complainants are mainly situated within the 50 dB(A) noise zone (L_{den}) and along flight routes. When we compared people who complained with those who did not complain about aircraft noise, complainants reported more noise annoyance, sleep disturbance, concern about health, and fear for an aircraft crash. When we compared 'highly annoyed' complainants with 'highly annoyed' non-complainants, the former group was still more often highly disturbed in the sleep (OR=2.7 95%CI=2.1-3.4) and reported more concern about health (OR=2.7 95%CI=2.1-3.4) and fear for an aircraft crash (OR=1.6 95%CI=1.3-2.0). The difference in noise sensitivity disappeared (OR=0.8 95%CI=0.6-1.1).

Discussion Results indicate that there is an exposure-response relation between aircraft noise exposure and the prevalence of complainants, possibly influenced by sound insulation of houses. This relation will be further explored. Important determinants of complaint behaviour apart from noise level are noise annoyance, sleep disturbance, concern about health, and fear for an aircraft crash. Although complainants do not seem to be representative for the total population, and do not reflect the full extent of noise annoyance, their prevalence does reflect the regional distribution of aircraft noise annoyance in a noise polluted area. Therefore, the complainants data can be a useful tool in health–monitoring activities.

Keywords aircraft noise, complaint behaviour, complainants, annoyance, sleep disturbance, sound insulation, GIS

References

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Figure 1 Trend in aircraft movements, complaints, and complainants at Schiphol since 1986

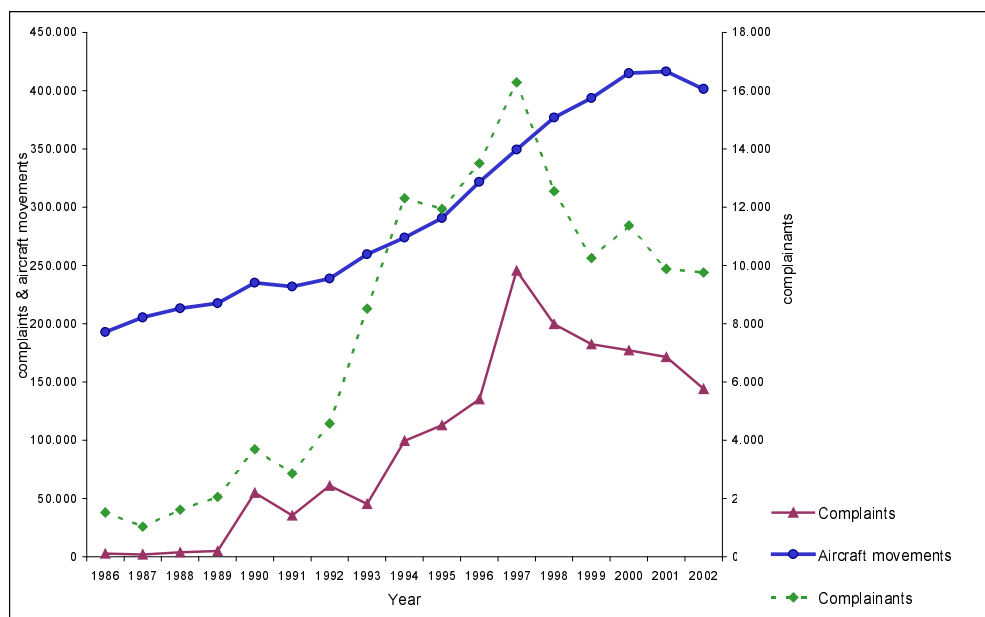


Figure 2 Prevalence of complainants per area with 1 dB(A) noise level interval (L_{den}), with 95%CI (printed one-sided), for 1998 (continuous line) and 1999 (discontinuous line)

