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R. van Poll | O. Breugelmans | L. Dreijerink

Geilenkirchen Air Base Perception Survey

Perceptions of residents in the Netherlands

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R. van Poll (Project Manager), RIVM (National Institute for Public Health and the Environment)
O. Breugelmans (researcher), RIVM
L. Dreijerink (researcher), RIVM

Contact:
R. van Poll
Centre for Environmental Health Research
ric.van.poll@rivm.nl

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This survey was carried out for the Ministry of Housing, Spatial Planning and the Environment as part of the Geilenkirchen Air Base Perception Survey

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Abstract

Geilenkirchen Air Base Perception Survey
Perceptions of residents in the Netherlands

About 20% of the residents (an estimated 41,000) of the area of the Netherlands around the Geilenkirchen NATO air base experience serious noise annoyance from military air traffic (AWACS). On top of this, a lot of people are concerned about potential health and safety risks from this traffic. There are major differences in perception in the area, with the highest percentage of annoyed and concerned people in the municipalities of Onderbanken, Brunssum and Schinnen. People also experience serious noise annoyance in municipalities further away from the base, however. The perceived annoyance is not explained entirely by noise levels; non-acoustic variables (e.g. negative expectations regarding the future noise situation and concern) are also a factor. Residents also say they suffer from sleep disturbance, again particularly in the municipalities of Onderbanken, Brunssum and Schinnen. Residential satisfaction is comparable to that in the Dutch population as a whole. The proportion of residents who perceive their health as good (67%) is lower than in the Dutch population (80%). There is a great demand for information, especially on flight schedules and the Dutch government's position on the air base. 60% of the population are in favour of compensation to offset the disadvantages of the base.

These are the main findings of a perception survey of 2,500 residents of the area of the Netherlands around the Geilenkirchen air base. The RIVM sent out 5,000 questionnaires in August and September 2007 asking residents of the municipalities of Onderbanken, Brunssum, Schinnen, Heerlen, Kerkrade, Landgraaf, Nuth, Simpelveld and Voerendaal about such things as the annoyance they experienced from noise, odour and vibration from AWACS aircraft, their perceived health, residential satisfaction, concern about health and safety risks from AWACS, and the demand for information on the air base.

The main recommendations are to reduce the exposure to noise and improve the relationship between government and residents. This could best be done by stepping up policy on replacing the current AWACS engines and insulating homes; to improve the relationship with residents the government could provide better information, take residents seriously and fulfil its undertakings.

Key words:
perception survey, military air traffic, annoyance, concern, trust, demand for information, compensation

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Rapport in het kort

Belevingsonderzoek vliegbasis Geilenkirchen

Ongeveer 20% (naar schatting 41.000) van de inwoners in de Nederlandse regio rond de NAVO-vliegbasis Geilenkirchen ervaart ernstig geluidshinder van militair vliegverkeer (AWACS). Bovendien zijn veel mensen bezorgd over mogelijke gezondheids- en veiligheidsrisico's van het militaire vliegverkeer. De verschillen in de regio zijn groot, met het grootste aandeel gehinderden en bezorgden in de gemeenten Onderbanken, Brunssum en Schinnen. Echter, ook in de gemeenten die verder van de vliegbasis afliggen blijken mensen ernstige geluidshinder te ervaren. De ervaren hinder wordt (niet uitsluitend) door de geluidsniveaus verklaard maar ook niet-akoestische factoren spelen een rol zoals een negatieve verwachting van de geluidssituatie in de toekomst en bezorgdheid. De inwoners geven ook aan last te hebben van slaapverstoring. Ook hier springen de gemeente Onderbanken, Brunssum en Schinnen in het oog. De woontevredenheid onder de inwoners is vergelijkbaar met die van de Nederlandse bevolking. Het aandeel inwoners met een goede ervaren gezondheid (67%) is lager dan in de totale Nederlandse bevolking (80%). Er is grote behoefte aan informatie, vooral over vliegtijden en standpunten van de Nederlandse overheid met betrekking tot de vliegbasis. Bij 60% van de bevolking bestaat draagvlak voor compensatie van de nadelen van de basis.

Dit zijn de belangrijkste resultaten uit een belevingsonderzoek gehouden onder 2500 inwoners in de Nederlandse regio rond de vliegbasis Geilenkirchen. In augustus en september 2007 verstuurde het RIVM 5000 vragenlijsten waarin inwoners van de gemeenten Onderbanken, Brunssum, Schinnen, Heerlen, Kerkrade, Landgraaf, Nuth, Simpelveld en Voerendaal werd gevraagd naar onder andere hun ervaren hinder door geluid, geur en trillingen van de AWACS-vliegtuigen, hun ervaren gezondheid, de woontevredenheid, hun bezorgdheid over gezondheids- en veiligheidsrisico's door AWACS en hun behoefte aan informatie over de vliegbasis.
De belangrijkste aanbevelingen zijn beperking van de blootstelling aan geluid en het verbeteren van de relatie tussen overheid en inwoners. Aangrijpingspunten hiervoor zijn het intensiveren van ingezet beleid ten behoeve van vervanging van de huidige AWACS-motoren en het isoleren van woningen. Voor het verbeteren van de relatie met de inwoners zijn verbeteren van de informatievoorziening, de inwoners serieus nemen en het nakomen van afspraken door de overheid belangrijke aangrijpingspunten.

Trefwoorden:
belevingsonderzoek, militair vliegverkeer, hinder, bezorgdheid, vertrouwen, informatiebehoefte, compensatie

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Preface

This survey was commissioned by the Local Environmental Quality Directorate (LOK) of the Ministry of Housing, Spatial Planning and the Environment (VROM). It was carried out by the Centre for Environmental Health Research (MGO) of the National Institute for Public Health and the Environment (RIVM). The report is in response to the following request for information from the Directorate:

> Provide insight into the perceived health, residential satisfaction and perceived environmental quality of residents around the Geilenkirchen air base.

Final responsibility for the compilation of the report rests with Dr Ric van Poll, Oscar Breugelmans and Lieke Dreijerink (all of the MGO). The project team also comprised Jutta Köhler, Wim Swart, Dr Vivianne Visschers and Danny Houthuijs (again, all of the MGO).

Information gathering (field work) for the questionnaire survey was carried out by Veldkamp Marktonderzoek B.V., Amsterdam, under the responsibility of Maud Adriaansen and Dieter Verhue.

The noise data used in the survey were calculated by the National Aerospace Laboratory (NLR), under the responsibility of Henk Lania.

This report is a translation of the RIVM report 'Belevingsonderzoek vliegbasis Geilenkirchen. Percepties van inwoners van Nederland' (Report No. 630310001). It has been translated by Taalcentrum-VU, Amsterdam.

An advisory committee and a scientific advisory committee, both appointed by the RIVM, were consulted at certain points during the survey. They advised the project team on the design and conduct of the survey and the report. The advisory committee was made up of people who have an understanding of the problems with the air base by virtue of their post, role or background. Its members were: Sandra Akkermans and Ester Wolters, Limburg Environmental Federation; Dick Cremers, ex-alderman of the Municipality of Onderbanken; Sven Evertz and Cindy Gielkens, South Limburg Municipal Health Service; Jac Fijnaut, Stop AWACS association; Hans Hermans, South Limburg doctors' working group; Huub Kockelkoren, Municipality of Brunssum; Diana Metsemakers, Municipality of Onderbanken; Peter Simons, Province of Limburg and Jelle Zijlstra and Henk Richel, Geilenkirchen air base. The scientific advisory committee comprised Dr Wim Passchier, Professor of Risk Analysis and Dr Ree Meertens, Senior Lecturer, Health Information and Education staff group, University of Maastricht.

Many people were involved in the writing of this report, but final responsibility for the content rests with the RIVM.

The authors would like to thank all those mentioned above for their efforts and their input to the survey. Special thanks is due to those who participated in the survey, i.e. those who took part in the individual and focus group interviews and all the residents of the area around the air base who took the trouble to fill in the questionnaire.

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Glossary of terms, acronyms and abbreviations

ACN	Address Coordinates (Netherlands) database
AWACS	Airborne Warning and Control System
95% CI	Confidence Interval: indicates the area (interval) within which the actual value in the survey population lies. '95%' means that if we were to repeat the survey, 95 out of 100 repetitions would yield results within that interval. The confidence interval says something about the accuracy of the calculated values.
CBS	Statistics Netherlands (Centraal Bureau voor de Statistiek)
MPRD	Municipal Personal Records Database
Geilenkirchen	Municipality in the German Land of North-Rhine Westphalia
L_{den}	A measure of noise load due to environmental noise (Level day-evening-night)
LOK	Local Environmental Quality Directorate of VROM
MGO	Centre for Environmental Health Research, RIVM
NATO	North Atlantic Treaty Organization
NIMBY	Acronym standing for 'Not In My Back Yard'
NLR	National Aerospace Laboratory
Prevalence	Used here in the sense of incidences of something at a particular time per 100 respondents
RIVM	National Institute for Public Health and the Environment
4DPA	Four-digit postcode area
VROM	Ministry of Housing, Spatial Planning and the Environment
VWS	Ministry of Health, Welfare and Sport

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Summary

In October 2006 the Ministry of Housing, Spatial Planning and the Environment (VROM) asked the National Institute for Public Health and the Environment (RIVM) to investigate how residents of the area of the Netherlands around the Geilenkirchen (Germany) NATO air base perceived their health and residential situation. This was in response to concern expressed by the Onderbanken Municipal Executive to the Housing (VROM) and Health (VWS) ministers about their residents' health as a result of the activities at the air base and the AWACS aircraft. The purpose of the perception survey was to provide insight into the perceived health, residential satisfaction and perceived environmental quality of residents around the Geilenkirchen air base.

More negative perception of health and environmental quality among residents around Geilenkirchen
The survey revealed that residents of the area of the Netherlands around the Geilenkirchen air base had a more negative perception of their health and residential situation than the total Dutch population. They experience more annoyance and sleep disturbance as a result of military air traffic and perceive themselves to be less healthy. On top of this, a large proportion of them are concerned about their safety. As regards noise annoyance and concern, the base's sphere of influence covers at least the entire survey area; it is not confined to the municipalities of Schinnen, Onderbanken and Brunssum, though the effects found were most common in these municipalities.

The survey was in two parts. First, key figures and residents from the area were interviewed, then a questionnaire was compiled based on these interviews. This was sent out during the August-September 2007 period to 5,000 of the 222,000 or so adults in the survey area, a representative sample of the population of the municipalities concerned. Residents were asked about their perceptions of annoyance due to noise, odour and vibration from AWACS; their perceived health; residential satisfaction; concern about health and safety risks from AWACS; their attitude to the air base; and demand for information on the base. In the end some 2,500 residents completed the questionnaire.

Perceived annoyance and concern above the Dutch average
About 20% of respondents experience serious noise annoyance from military air traffic (AWACS), as against 6% in the Netherlands as a whole. Residents also say they suffer from sleep disturbance owing to military air traffic (6%; Netherlands 1%), and a lot of people are concerned about potential health and safety risks from this traffic. The differences in the area are large, with the highest percentage of annoyed and concerned people in the municipalities of Onderbanken, Brunssum and Schinnen. Noise levels do not provide the sole explanation for the annoyance people experience: non-acoustic factors (e.g. negative expectations regarding the future noise situation and concern) also contribute to perceived annoyance. Residential satisfaction is comparable to that in the Dutch population as a whole. The proportion of residents who perceive their health as good (67%), on the other hand, is lower than in the Dutch population (80%).

Residents want more and better information on the air base
There is a great demand for information among residents, especially on flight schedules and the Dutch government's position. At the same time, the majority of residents (at least 60%) do not trust, or have a neutral attitude to, information from the authorities concerning the base. 60% of residents are in favour of compensation in the form of modifications to homes or financial compensation. 40%, however, are not in favour of compensation: a lot of residents consider that it would not solve the problem.

Reducing exposure and improving the relationship with residents

Possible solutions put forward by respondents themselves are quieter engines for the military aircraft (73.2%) and improving the relationship between government and residents. To achieve this the government could step up its policy on replacing the current AWACS engines; another possibility, however, would be to insulate homes. To improve the relationship with residents the government could provide better information, take residents seriously and fulfil its undertakings.

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1 Introduction

1.1 Reason for the survey

June 2005: the Onderbanken Municipal Executive sent a letter on behalf of the Municipal Council to the ministers of Health, Welfare and Sport (VWS) and Housing, Spatial Planning and the Environment (VROM) expressing its concern about the health of Onderbanken residents as a result of exposure to activities at the Geilenkirchen air base and military air traffic at the base, in particular the AWACS aircraft.[1] Based on the results of a survey by South Limburg Municipal Health Service (Gielkens-Sijstermans et al., 2005), which found that environmental annoyance had increased, particularly due to noise, odour and dust from air traffic, but also from other sources (e.g. road traffic and industrial activity), the Municipal Executive asked the two ministers to carry out or commission a health survey. The Municipal Health Service concluded that the noise annoyance in Onderbanken and Brunssum was extreme and that action needed to be taken to reduce it, as it could affect residents' health.

In response to this request from the municipality of Onderbanken, the then State Secretary for Environmental Management asked the RIVM to advise him. In its report (Tweede Kamer, 2005a) the RIVM estimated the incidence of certain effects as a result of exposure to air traffic noise in the Municipality of Onderbanken. It advised the State Secretary not to have a separate health survey carried out among Onderbanken residents, but noted that a 'perception survey' among them was a possibility. The State Secretary asked for further elucidation, which the RIVM provided in the form of a research proposal (Tweede Kamer, 2005b). In administrative consultations in February 2006 the State Secretary, the Province of Limburg and the Municipality of Onderbanken agreed, among other things, to commission the perception survey that had been announced. The survey was to begin at the end of 2006, and the RIVM was commissioned to carry it out in October 2006.

1.2 Geilenkirchen (Germany) air base: background

The British Royal Air Force began building the airfield in 1951, siting it four kilometres away from the German Municipality of Geilenkirchen and about two kilometres from the Municipality of

[1] The acronym 'AWACS' is used for both the radar system and the aircraft carrying it. The aircraft at Geilenkirchen air base are Boeing E-3A Sentries, modified Boeing 707s.

Onderbanken. It was opened two years later. The RAF stopped using it in 1968, when it was taken over by the German air force.

Ten years later the German government made it available to NATO, which decided to station AWACS aircraft there. Geilenkirchen NATO Air Base became operational in 1982, and it has been operating to date with 17 AWACS, three Trainer Cargo Aircraft and two air tankers.

The number of daytime aircraft movements (on weekdays from 8.00 am to 10.00 pm) averages 13.5 per day, or about 3,400-3,600 per year. The number of night and weekend flights has been calculated at about 30 per year (Ministerie van Defensie, 1981; VROM, 2005). From 2006 the number of aircraft movements was temporarily reduced to 2,800 per year during the daytime and 15 evening/night flights.

To start with, (in the 1980s) the function of the aircraft was mainly to patrol the airspace in the light of the current East-West relationship in Europe (the Cold War). During the next two decades aircraft movements increased, with operations being conducted in connection with the conflicts in the former Yugoslavia, Afghanistan and Iraq. After the terrorist attacks on New York on 11 September 2001 the AWACS were also deployed to protect various events such as the Olympic Games, the European and World football cups and the Pope's visit to Germany.

A survey of air pollution and health effects in the border area was carried out in 1994/95 (Einbrodt et al., 1995), to ascertain whether road and air traffic from the Geilenkirchen air base were affecting the health of the population in the German-Dutch border area. 364 schoolchildren in four municipalities participated in the survey. The results did not suggest there was any link with road or air traffic.

In 1999 an air tanker crashed on German territory near Schinveld (Municipality of Onderbanken). A survey conducted by South Limburg Municipal Health Service did not indicate that the accident had had any effect on perceived physical and mental health (Hajema et al., 2000; Hoebe et al., 2001), though the researchers did note a serious increase in environmental annoyance. In various studies the Municipal Health Service found that residents in the area experienced a lot of environmental annoyance as a result of air traffic (Gezondheidsenquête Limburg 1999, 2004; Gielkens-Sijstermans et al., 2005).

There have been protests from the population and the municipal authorities during the entire period that the aircraft have been stationed there, in particular regarding noise annoyance and air pollution. Local residents are demanding, among other things, that the present engines be replaced with less noisy modern ones, but NATO has deferred a decision on the matter several times. The campaign reached its high point when the NATO base applied to the Ministry of Defence to clear six hectares of woodland and fell a limited number of trees in an adjacent area of 14 hectares in the Schinveld woods. The aim

was to remove some of the trees in the base's 'obstacle-free' zone, which were too high to meet NATO safety standards for an obstacle-free 'flight funnel' for aircraft taking off and landing. In 2005 the then Housing Minister initiated a 'NIMBY procedure.'[2] In spite of vehement protests by local residents and environmental organizations this resulted in the clearing of six hectares of trees in the Schinveld woods at the beginning of January 2006. In July 2007 the Council of State ruled (Raad van State, 2007) that the then Housing Minister was not authorized to apply the NIMBY procedure to a 13-hectare area of the total of 20 hectares because 'the need to fell trees in this area in the short term has not been substantiated'. The Spatial Planning Act lays down the criterion of urgency as a precondition for applying a NIMBY procedure, and this condition was not met in the case of the 13-hectare area. The Council considered that the requirements of the Act had been met in the case of the other seven hectares but took the view that the Minister's decision had not been carefully prepared and adequate reasons had not been given for it. The Council suspended the decision on the remaining hectare of woodland (Raad van State, 2007). There is no appeal against the decision.

It is against this background that the perception survey in the area of the Netherlands around the Geilenkirchen air base was carried out just after the summer of 2007.

1.3 Purpose of the survey

The perception survey looks at residents' experience in relation to living and working in the vicinity of the Geilenkirchen air base. For the purpose of the survey, perception is defined as 'the entirety of beliefs, attitudes, opinions and feelings, also social and cultural values, held by people in relation to the Geilenkirchen air base and military air traffic'.

The general aim of the perception survey was:

> *To provide insight into the perceived health, residential satisfaction and perceived environmental quality of residents around the Geilenkirchen air base.*

The research questions were as follows:

[2] A NIMBY procedure (NIMBY stands for 'Not in My Back Yard') enables central government to compel a provincial or municipal authority to amend a local plan. This can only be done in the case of schemes of national importance. The statutory basis for it is the Spatial Planning Act (WRO).

1. How much annoyance, sleep disturbance and concern do residents of the area around the Geilenkirchen air base experience, how do they perceive their health, how satisfied are they with their residential environment, and what determinants affect their perception of the base?
2. What is communication like between the various stakeholders, and what would people like to see done in future?
3. Is there any support for particular types of compensation to residents living around the air base, and if so, what types of compensation would people prefer?
4. How much trust do the population have in the authorities involved in making decisions on the Geilenkirchen air base, and what factors affect this trust?

To answer these questions, the survey was divided into two parts. The first part was a qualitative survey to identify the main issues relating to perception of the air base. This entailed interviewing key figures in the area and holding three focus groups with residents. The results of the qualitative survey were used to design the second part, the quantitative survey. This was a cross-sectional survey of residents aged 18 or over, based on a questionnaire.

The survey was conducted among residents on Dutch territory, not German territory. On the German side, the *Gesundheitsamt* in Heinsberg did not feel the need for a perception survey at the time when the questionnaire survey was being organized. Also, the survey was confined to certain aspects of perception; it did not consider health in the strict sense (e.g. use of medicinal drugs or cardiovascular disease).

1.4 Organization of the report

The report is organized as follows. Chapter 2 is for readers wanting a quick overview of the survey and the results, containing a summary of the design of the survey, the main results and the conclusions and recommendations. Chapters 3, 4 and 5 are for readers wanting to study the results and findings in more detail. Chapter 3 is a more detailed discussion of the results of the qualitative survey (the individual and focus group interviews). Chapter 4 deals with the quantitative survey (the questionnaire survey) in detail. Chapter 5 sets out the answers to the research questions and the recommendations. Chapter 6, lastly, is for readers wishing to study the survey method, discussing the design and conduct of the two surveys in more depth.

2 Summary of perceptions

The subject of the survey was the perceptions of residents of the area of the Netherlands around the Geilenkirchen (Germany) air base as regards the activities at the base and military air traffic there, in particular the AWACS aircraft. The survey was conducted by the RIVM for the Ministry of Housing, Spatial Planning and the Environment. Below is a summary of the results; they are discussed in more detail in Chapter 3 (Interviews) and Chapter 4 (Questionnaire).

2.1 Interviews

For the perception survey three focus group interviews were held with 18 residents of Onderbanken, Brunssum and Schinnen. Five interviews also took place with a total of seven key figures (i.e. people from the area who know about feelings in the community from their voluntary or paid work). The purpose of these interviews was to gain insight into important additional topics for the second part of the survey, the questionnaire survey of local residents' perceptions of the Geilenkirchen air base. 'Known' topics were annoyance, residential satisfaction, perceived health and sleep disturbance. The following additional topics emerged from the interviews: concern about the effects of noise and the possibility of aircraft accidents; trust in the authorities; information on the base and air traffic; residents' attitudes to the base; and the solutions residents would like to see. The results of the interviews are not representative of all the residents of the area, but they are indicative of the issues that residents feel to be important.

2.2 Questionnaire survey

The topics that emerged from the interviews were included in a questionnaire, which was sent out during the August-September 2007 period to 5,000 of the 222,000 or so adults in the survey area around the base. This was a representative sample. The questionnaire was sent to residents of the municipalities of Onderbanken, Brunssum, Schinnen, Heerlen, Kerkrade, Landgraaf, Nuth, Simpelveld and Voerendaal. More questionnaires were issued in the municipalities of Onderbanken, Brunssum and Schinnen, where about 200 were sent out to each four-digit postcode area (a total of 16). In the other municipalities between 240 and 325 questionnaires were sent out to each municipality. About 2,500 people filled in the questionnaire, i.e. a response rate of about 50%. The results are presented by topic.

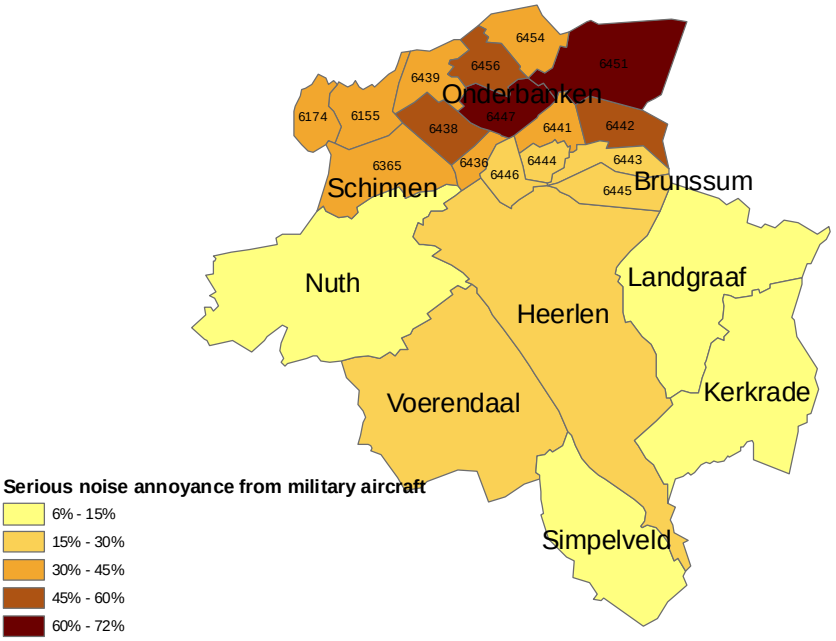
In the year prior to the survey (August 2006–July 2007) there were 2,724 aircraft movements, including 10 night or weekend flights.

ANNOYANCE
Annoyance is subjective. It can be due to a variety of factors (e.g. noise or odour) and come from a variety of sources (e.g. traffic or neighbours). The main annoyance in the survey area is from noise, odour and vibration due to military air traffic and ground activities at the Geilenkirchen air base. Annoyance is not solely a matter of exposure to noise, odour or vibration, however; other factors such as personal characteristics, sensitivity to noise and perceived control over the noise source are also involved.

Noise annoyance

Apart from road traffic, military air traffic is by far the main source of perceived serious noise annoyance in the area (18.6%). Military air traffic is particularly predominant in Brunssum, Schinnen and Onderbanken (see Figuur 1). The proportion of the population who experience serious annoyance from it ranges from 6.2% in Landgraaf to 71.9% in Schinveld (Onderbanken). By way of comparison, in the Netherlands as a whole 6% of the population say they experience serious annoyance from military air traffic. Ground activities at the base also cause a lot of serious noise annoyance, especially in Schinveld (Onderbanken) and North East Brunssum. The number of people in the survey area experiencing serious annoyance from military air traffic noise is estimated at about 41,000. The geographical distribution of this 'highly annoyed' population over the survey area is shown in Figuur 1. Other sources of noise annoyance (mopeds, road traffic, neighbours and building work) in the area account for a percentage of highly annoyed people comparable to that found for the Netherlands as a whole in previous studies.

The degree of perceived noise annoyance from military air traffic is explained by a number of factors. First, exposure to noise affects the degree of annoyance: residents who are exposed to more noise say they experience more annoyance. Residents who expect there to be more noise in future also experience more annoyance than those who do not, however. The feelings people have when thinking about AWACS and their sensitivity to noise also affect the degree of perceived annoyance. People who are concerned about the effects of military aircraft on their health say they experience more annoyance. Lastly, the degree of annoyance is influenced by hearing aircraft noise during day-to-day activities: people who hear noise when engaged in these, experience more annoyance.



Figuur 1 Proportion of residents experiencing serious noise annoyance from military air traffic, by municipality and postcode area

Sleep disturbance

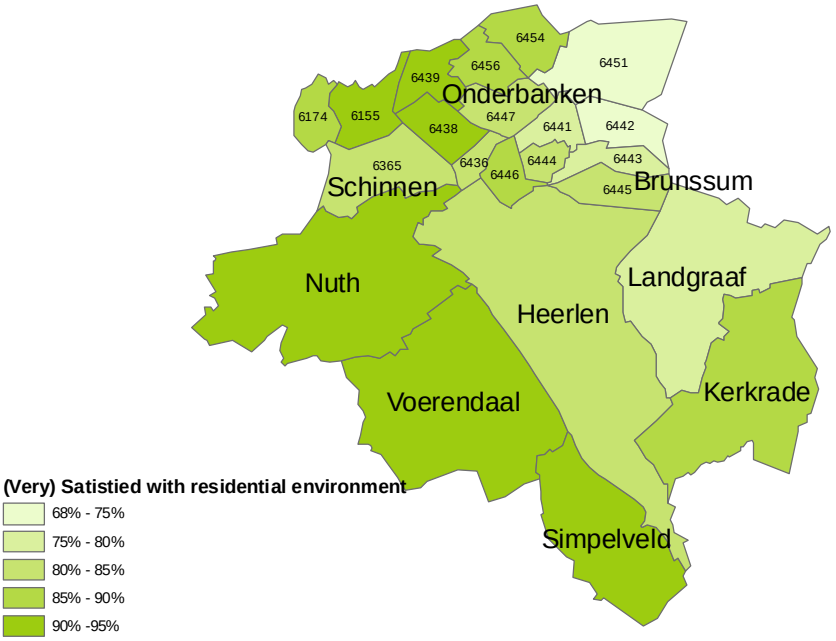
Military air traffic is the main source of serious sleep disturbance in the area (5.7%), especially among residents of Onderbanken, Brunssum and Schinnen. The proportion of residents reporting serious sleep

disturbance ranges from 1.6% in Landgraaf to 34.3% in Schinveld. The number of highly sleep disturbed people due to military air traffic in the area is estimated at about 12,500. Part of this group comprises people who sleep during the daytime. In parts of the survey area it may be that sleep disturbance due to civil air traffic is being wrongly attributed to military air traffic. Other known sources of sleep disturbance, in particular road traffic and neighbours, result in slightly less sleep disturbance than nationwide. In the Netherlands as a whole, military aviation causes serious sleep disturbance in 1% of the population.

Odour annoyance
Road traffic is the main source of serious odour annoyance (7.2%). The proportion of residents experiencing serious odour annoyance from military aircraft is 5.2%. The proportion is particularly high in Brunssum, Onderbanken and Schinnen; in the rest of the area it is below 5%. Serious odour annoyance is lowest in Simpelveld (1.2%) and highest in Schinveld (45.4%). An estimated total of about 11,500 residents experience serious odour annoyance from military aircraft. The figure for serious odour annoyance from civil aviation in the Netherlands as a whole is 1%.

Vibration annoyance
In the survey area 7.2% of the population experience serious vibration annoyance from military air traffic, which is in fact the main source of such annoyance. Vibration from aircraft is related to the noise they produce: it is the low-frequency part of the noise spectrum in particular that produces vibration that can cause annoyance. Serious vibration annoyance is reported particularly in Schinveld, Merkelbeek and the north side of Brunssum. Vibration annoyance ranges from 1.1% in Landgraaf to 49.8% in Schinveld. The number of residents experiencing serious annoyance from vibration is estimated at 16,000. In the Netherlands as a whole, 3% of the population experience serious vibration annoyance from air traffic. Residents experience serious vibration annoyance from ground activities at the base particularly in the areas of Schinveld (22.9%) and North Brunssum (13.4%).

RESIDENTIAL SATISFACTION
Just under 90% of residents are satisfied or very satisfied with their home. This is in line with the national figures. Also high, but slightly lower, is the proportion who are satisfied with the residential environment (84%), again comparable to the national figures; unlike in the case of satisfaction with the home, however, there are large differences between municipalities here (see Figuur 2), with 67.6% satisfied in Schinveld and 93% in Nuth. Satisfaction with noise in the residential environment also varies widely, from 30.7% in Onderbanken to 75.5% in Nuth. In both cases satisfaction is strongly correlated to exposure to military air traffic noise and annoyance from road traffic.



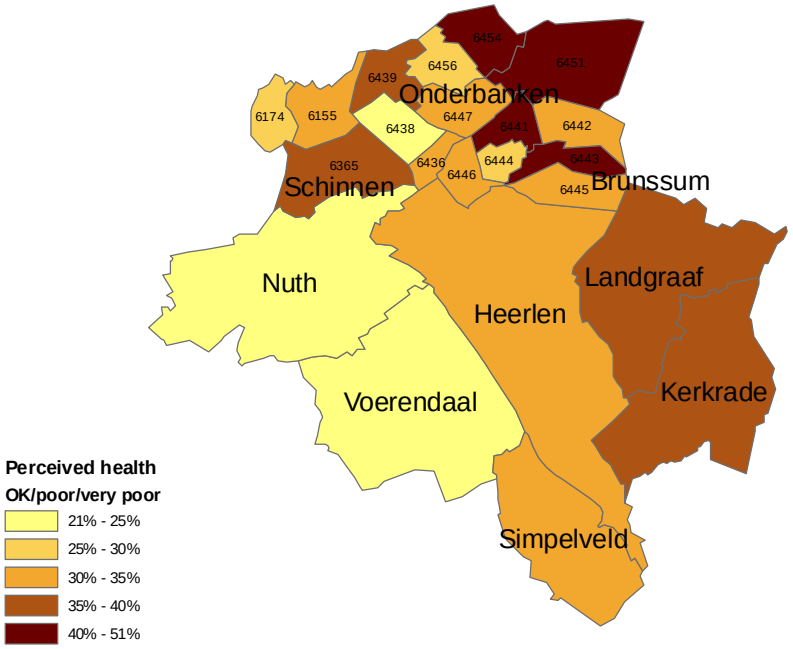
Figuur 2 **Proportion of residents satisfied/very satisfied with the residential environment, by municipality and postcode area**

SELF-REPORTED HEALTH

Self-reported health is the rating that people give for their own health, i.e. perceived health.

Perceived health

Whereas in the Netherlands as a whole about 80% of people perceive their health as good or very good, in the area around the air base the figure is 66.8%. Previous research shows that perceived health in Eastern South Limburg (75% good or very good) is lower than in the rest of the country, indeed, it is the lowest of all the Municipal Health Service areas in the Netherlands. This survey shows that perceived health is lower than we would expect in some municipalities in the survey area. It is lowest in Schinveld (48.7%) and highest in Nuth (79.0%: see Figuur 3).

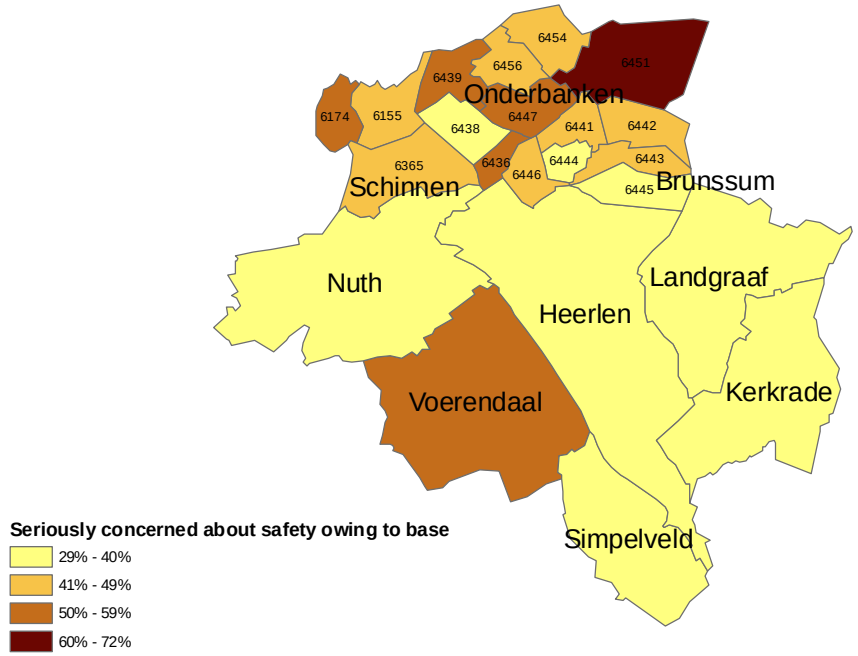


Figuur 3 Proportion of residents who perceive their health as less good ('OK/poor/very poor'), by municipality and postcode area

CONCERN

Concern about the residential situation

Over one-third of residents (an estimated 77,000) say they live under an aircraft approach path, and of these, 47% are highly concerned about this. The figure for serious concern about living under an approach path to a major airfield in the Netherlands as a whole is 24%. Again, over one-third of residents (an estimated 82,000) say they live near a military air base, and of these, 42% are highly concerned about this (see Figuur 4), as against 19% in the Netherlands as a whole. About 16% of residents say they are highly concerned about living near a military air base.



Figuur 4 **Proportion of residents highly concerned about the safety of living near the air base (of those who say they live near it), by municipality and postcode area**

Feelings about AWACS

About 16% of residents have strong or very strong negative feelings when thinking about AWACS. About 3% of residents say they have strong or very strong positive feelings when thinking about AWACS.

Concern about exhaust emissions, noise and accidents

Residents' concerns are mainly about exhaust and noise emissions from aircraft and the possibility of an aircraft accident. Most people are concerned about an accident involving a military aircraft (51.6%). Among the municipalities, residents of Nuth are least concerned (38.8%) and those of Schinveld most concerned (82.4%). Just under half (48.5%) are concerned about health problems due to noise (lowest 29.2%, highest 86.7%). Lastly, 38.3% are concerned about health problems due to exhaust emissions (lowest 24,0%, highest 73.6%).

Concern about the three risks (exhaust emissions, noise and accidents) is explained by a number of factors. First, the risks are predicted by perception of the risk: residents who perceive the risk to be higher (greater probability, large number of people exposed, low personal controllability, serious consequences, few measures taken, short-term effects, more scary) are more concerned than those who perceive it to be lower. We also found that people who have negative feelings when thinking about AWACS are more concerned about the three risks. Lastly, we find that age is a factor: older residents are more concerned than younger ones.

TRUST AND ATTITUDE

Trust

Various authorities are involved in providing information on the Geilenkirchen air base: the municipal authorities, the provincial authority, central government, the base/NATO, the Municipal Health Service and the German government. The survey looked at trust in the authorities as regards the information

they provide about the base. The majority of residents (at least 60%) do not trust, or have a neutral attitude to, these authorities when it comes to the base. The Municipal Health Service enjoys the most trust (39.8%). The degree of trust in information from the municipality, the base, the Housing Ministry and the Defence Ministry depends on a number of factors. We found that the more honest people rate an authority to be, the more trust they have in it, and that people place more trust in information from an authority that is sympathetic.

Attitude
Most people have a neutral attitude to the base (52.1%). About a quarter have a positive attitude, and one-fifth a negative attitude. More people have a negative attitude in Schinnen, Brunssum and Onderbanken.

COMPENSATION AND POSSIBLE SOLUTIONS
Compensation
Compensation is something positive – money or goods – to offset negative effects, in this case of the air base. Over 60% of residents are open to the possibility of some kind of compensation. Here again there are large differences between municipalities: the proportion is lower, about 50%, in Schinnen, Onderbanken and Voerendaal. For those who are open to the possibility, the most suitable types of compensation are sound insulation (74.9%) and municipal tax rebate (69.2%); the solution mentioned least is a relocation scheme (21.9%). Almost 40% of residents, then, are not open to the possibility of compensation, considering that it would not solve the problem (62.7%) or that health cannot be bought (46.2%). Some regard compensation as bribery (40.3%).

Possible solutions
The solution most commonly mentioned is quieter engines for the military aircraft (73.2%). Other solutions mentioned have to do with the relationship between government and the public: government should take residents seriously (48.5%) and keep its promises (35.4%). About one in nine residents (11.8%) say the base should be closed; 5.7% say nothing needs to be done.

INFORMATION
About 70% of residents would like to receive information about the base. Various sources are mentioned, the main one being the provincial authority (50%), but people would also like to receive information from the municipal authority, pressure groups, the Municipal Health Service, a representative or the ministries. Most residents (52.0%) receive information on the base through the 'media' (free sheets, newspapers, radio and television). About one-third of residents are satisfied with the information they receive from various sources, though there are large differences between municipalities. Most residents want to receive information from free sheets (54%). Information meetings are apparently a less suitable way of conveying information. The information they would like is: notifications of busy flying periods (48.2%), the Dutch government's position on the air base (44.4%), and information on the level of aircraft noise (from permanent monitoring 44.2%).

EXPECTATIONS
Future expectations about the residential environment to some extent determine the amount of perceived annoyance from military air traffic and satisfaction with the residential environment. Most residents' future expectations of the residential environment are neutral (between 55% and 80%). The remainder are predominantly negative, expecting it to deteriorate. Expectations about the value of the home are an exception: more people are positive than negative about this. People are generally negative as regards future road traffic noise and air quality (dust/soot/smoke). People are most pessimistic about aircraft noise in Schinveld, Brunssum and Onderbanken ('get worse' 32.8%-50.9%) and air quality ('get worse' 24.4%- 35.0%).

2.3 Conclusions and Recommendations

We draw the following conclusions from the results of the perception survey:

- About 20% of residents of the area of the Netherlands around the Geilenkirchen air base say they experience serious noise annoyance from military air traffic, an estimated 41,000. In the Netherlands as a whole, 6% of people experience serious annoyance from military air traffic.
- In addition to noise exposure (in L_{den}), serious annoyance is determined by other 'non-acoustic' factors. Negative expectations about the future noise situation, negative and positive feelings when thinking about AWACS, sensitivity to noise and concern all affect the degree of annoyance perceived by residents. Some of these factors (expectations, sensitivity to noise and concern) are also involved in the relationship between aircraft noise and annoyance around Schiphol Airport.
- About 16% of the population say they are highly concerned about living near a military air base.
- Annoyance and concern are highest in the municipalities of Onderbanken (proportion of residents experiencing serious annoyance from the noise of military air traffic 64%, proportion highly concerned 58%), Brunssum (29% and 32% respectively) and Schinnen (39% and 25% respectively), but they were clearly found in the other municipalities in the survey area as well.
- Odour and vibration also cause serious annoyance: people say they experience this particularly in Onderbanken (36% and 41% respectively), Brunssum (10% and 17% respectively) and Schinnen (9% and 18% respectively).
- The proportion of residents who perceive their health as good (67%) is lower than in the total Dutch population (80%). In the Eastern South Limburg Municipal Health Service area as a whole 75% of people perceive their health as good, the lowest score in the whole of the Netherlands.
- About 6% of residents say they experience serious sleep disturbance from military air traffic. Some of this occurs during the daytime, as this is when some people sleep. In parts of the survey area it may be that sleep disturbance due to civil aviation is being wrongly attributed to military air traffic. In the Netherlands as a whole, 1% of the population say they experience serious sleep disturbance from military air traffic.
- There is a great demand for information among residents, in particular information from the base on e.g. busy flying periods. There is also a demand for information from the Dutch government on its position on the base and military air traffic.
- There is support for compensation: about 60% of residents say they are open to this possibility. Support is lower in some postcode areas, however. In these areas just under half of residents are open to the possibility of compensation.
- About 40% say they are not open to the possibility of compensation because it would not solve the problem, health cannot be bought or it feels like bribery.
- Possible solutions put forward by residents include both technical measures (quieter engines and insulation) and relational measures (keeping promises, taking residents seriously).
- About 20% of residents have some trust or a lot of trust in central government as a source of information on the base. This is in line with the degree of trust in information from central government on specific topics.
- Honesty and empathy are the two main factors that determine residents' trust in government.

Lastly, we put forward a number of policy recommendations based on the conclusions of the perception survey.

Noise, odour and vibration

Reduce exposure to emissions from the base and the military aircraft.

There is a clear correlation between exposure to aircraft noise and the degree of perceived annoyance. Perceived annoyance is based on exposure to noise, odour and vibration as a result of ground activities

at the base and as a result of military air traffic. While exposure (to noise) only partly explains the perceived annoyance, this would lessen if exposure were to be reduced. One way of doing this would be to step up policy on replacing the current engines. For many residents, replacing the current engines on the AWACS aircraft would be a major solution. Another way of tackling the problem would be to reduce emissions due to ground activities at the base. A third way would be to provide sound insulation for homes. A fourth way would be to reduce the number of training (and other) flights. A fifth way would be to change flight paths and/or schedules, which could have a mitigating effect.

The relationship with local residents

Improve information to residents

There is a great demand for information, and the suggestions are concrete. Some residents would like notifications of busy flying periods. Residents would also like information on the Dutch government's position on the base, on changes to the base and on aircraft noise from permanent monitoring. The government began permanent monitoring in December 2007. People would also like feedback on undertakings and up-to-date information on flight schedules.

Make it clear what residents can expect in future

Residents expect to be taken seriously and promises to be kept. For example, what can they expect, and what can they not expect, on the basis of the results of this survey?

Concern

Make noise levels more predictable

The extent to which people think they can do something about the annoyance affects the concern they feel. An individual cannot eliminate the annoyance, but predictability, or a regular pattern, can make it more controllable. If they have information on e.g. how often and when the military aircraft will be flying (so and so many today at such and such a time), residents know what to expect and can plan their activities accordingly.

Trust

Regain the trust of the population

Trust, in particular in government and the base, is low. A large proportion of residents have little or no trust in these authorities. There are a number of factors that can influence trust. Honesty and empathy are factors that play a role for residents in the survey area as regards trust in the authorities. Trust might be regained by being honest about what is going on and sympathizing with residents' perceptions.

Monitor perceptions on a permanent basis

By monitoring perceptions, the authorities can keep their finger on the pulse, thus providing an indication of whether policy on reducing exposure and annoyance is having the desired effect or whether it needs to be revised.

Balancing out the pros and cons

Investigate the possibility of appropriate compensation

There is support for compensation among part of the population, but it is not clear as yet what form it should take and what the magnitude or duration should be. Before a compensation scheme is introduced it needs to be examined how people should be compensated, who should be compensated and for how long.

Consider providing sound insulation as a compensation measure

Sound insulation was mentioned as one of the possible solutions, but also as a possible form of compensation.

3 Results of individual and focus group interviews

To gain an initial impression of the perceptions of residents on the Dutch side of the Geilenkirchen air base a qualitative survey was carried out at the beginning of 2007, involving focus group and individual interviews. Three focus group interviews were held with residents of the municipalities of Brunssum, Schinnen and Onderbanken (Schinveld and Merkelbeek), in which a total of eighteen persons participated. In addition, five interviews were held with a total of seven 'key figures' from the area who, from their volunteer or paid work, have knowledge of how local residents perceive the influence of the base. The results of the interviews are not so much representative of the population of the area as indicative of the issues that are felt to be important. A detailed description of the method employed is given in 6.2, Qualitative survey.

The results of the individual and focus group interviews provided an indication of the issues that concern the population regarding the Geilenkirchen air base and AWACS. These were then used as topics when compiling the questionnaire. The next section summarizes the results of the interviews; a more detailed account can be found in Appendix 7.4.

3.1 Findings

Important topics that emerged from the interviews were: annoyance, concern about health and safety risks, lack of trust in the authorities, attitudes to NATO and government, and lack of communication. Residents of Brunssum, Schinnen and Onderbanken said they were satisfied with their residential environment, but at the same time they said they experienced annoyance from AWACS and other aircraft from the Geilenkirchen air base and ground activities at the base (by 'annoyance' they meant noise, smell, soot and vibration). Residents also said they had the idea that aviation fuel was sometimes being jettisoned. They were also concerned about potential damage to health and accidents involving an AWACS or other aircraft over an inhabited area. Residents did not report any health problems, or they did not associate them with the base. According to the key figures, many residents reported non-specific symptoms such as headache, shortness of breath and loss of concentration.

As well as annoyance and anxiety, lack of trust on the part of the residents in the responsible authorities was noted as influencing their attitudes to the base. Lack of trust was due e.g. to these authorities not keeping their promises. Also, NATO's objective is different from that of residents, i.e. international as opposed to regional security. Residents said they felt powerless against these authorities (ministries, NATO), and moreover they had the impression that they were not being taken seriously. Most residents did not see the presence of the air base in their area as having much in the way of benefits. Communication was also a major factor: residents said they did not receive information about the base from NATO, central government or their municipality, which is something they would appreciate. The municipality was seen as playing an important role here.

Lastly, possible solutions to the problem were solicited. Residents are under the impression that closing the base is impossible or unlikely. Quieter engines or reducing the number of flights were mentioned as options. The participants in the focus group and individual interviews showed little or no interest in financial (or other) compensation for the presence of the base.

3.2 Conclusions

Based on the interviews, the following topics were included in the questionnaire:

- Concern about the adverse effects of air traffic (noise, smell, exhaust emissions) and aircraft accidents
- Factors that influence trust in the municipality, central government and NATO
- Information that residents would like to receive about the base and how they would like to be informed (communication)
- Perception of potential health and safety risks; trust in the authorities; information on the base and air traffic; residents' attitudes to the base; and the solutions residents would like to see

4 Results of questionnaire survey

This chapter sets out the results of the questionnaire survey. Perceptions of residents of the area of the Netherlands around the Geilenkirchen air base were surveyed in relation to a number of topics, which were taken from previous perception surveys (Franssen et al., 2004; Houthuijs et al., 2006) and the focus group and individual interviews (chapter 3). The topics were dealt with in the following order: annoyance (noise, sleep disturbance, odour and vibration); residential satisfaction (satisfaction with the home, the residential environment and environmental noise); self-reported health (perceived health, general health perception, mental health and physical symptoms); concern; trust in information from the authorities; compensation; information; and expectations. The results were expressed in terms of prevalence, i.e. the incidence of a particular characteristic in the population. The sections below set out only the most important prevalences, in particular those relating to perceptions of the base and the AWACS; more detailed results are given in the tables section (see Appendix 5).

4.1 Method

Before discussing the results of the questionnaire survey we shall briefly explain how it was approached and conducted. A full description of the survey method is given in chapter 6, Description of survey method.

The questionnaire (see Appendix 1) was sent out during the August-September 2007 period to 5,000 of the 222,000 or so adults in the survey area around the base (see Figuur 5), i.e. to residents of the municipalities of Onderbanken, Brunssum, Schinnen, Heerlen, Kerkrade, Landgraaf, Nuth, Simpelveld and Voerendaal. More questionnaires were issued in the municipalities of Onderbanken, Brunssum and Schinnen than the other municipalities: in these three municipalities about 200 questionnaires were sent out to each four-digit postcode area, a total of 820 in Onderbanken, 1324 in Brunssum and 1262 in Schinnen. In the other six municipalities between 240 and 325 questionnaires were sent out to each municipality. The questionnaire was completed by just under 2,500 residents, i.e. an average response rate of 50% (minimum 42%, maximum 58%).

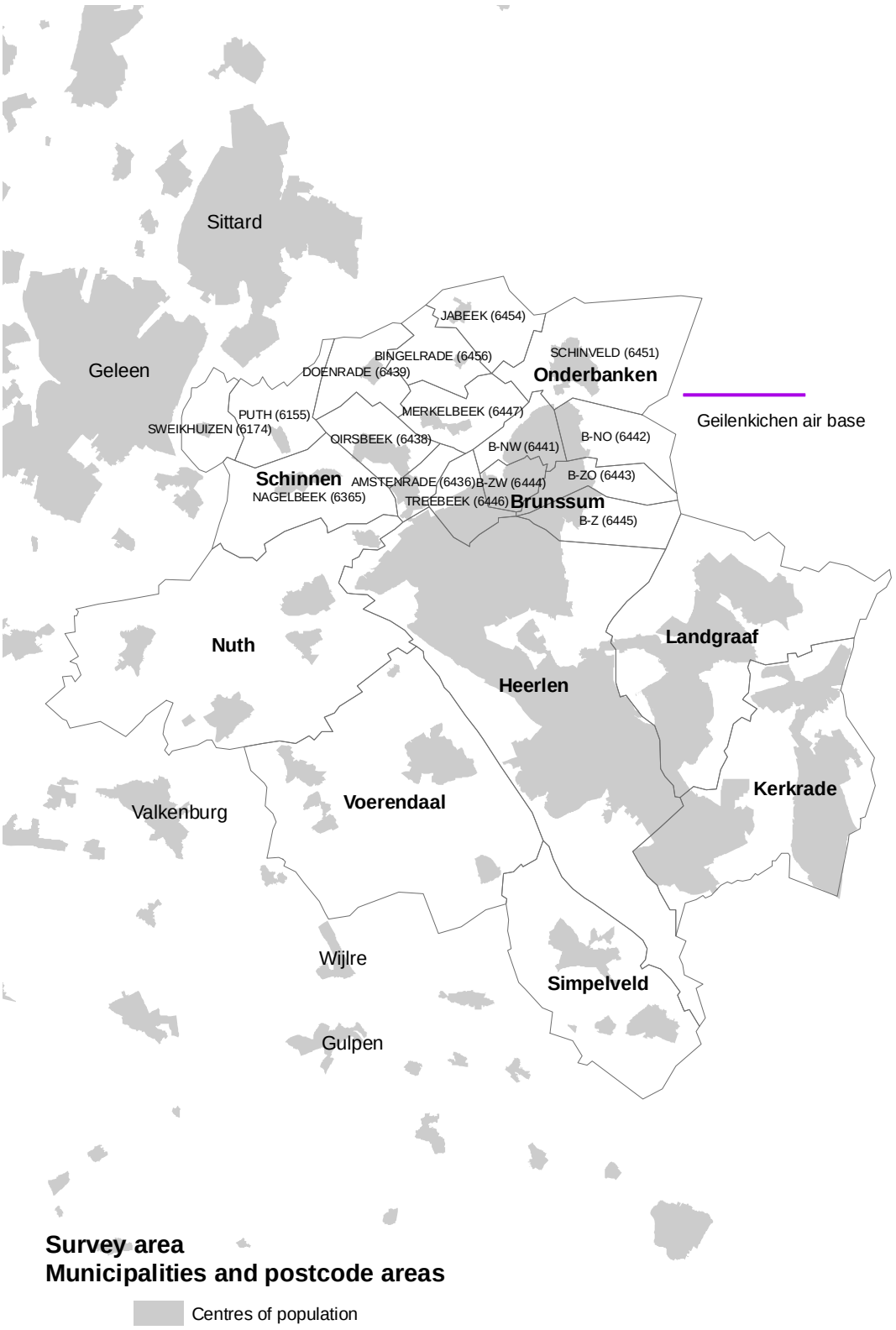
The questionnaire survey was followed up with a non-response survey (see section 6.3.6 and Appendix 2: Non-response questionnaire). The results showed that the non-response was selective: in other words, the composition of the non-respondents group (people who were unwilling or unable to take part in the survey) was different from that of the respondents group, and they might have reacted differently to the topics in the questionnaire. Weighting models were used to minimize potential distortion, so that the figures presented can be regarded as estimates for all adult residents in the survey area.

In the year prior to the survey (August 2006–July 2007) there were 2,724 aircraft movements, including 10 night or weekend flights (Commissie AWACS Limburg, 2007).

The results are presented at various levels of geographical scale: first for the survey area as a whole, referred to as ‘total’, then at the level of municipalities (9) and lastly at the level of the sub-areas (22, the total of the 16 four-digit postcode areas in Onderbanken, Brunssum and Schinnen and the 6 other municipalities). The tables section (Appendix 5) gives the results for all these levels in the form of prevalences with associated confidence intervals. Reference is made to the tables section under the various topics in this chapter. This chapter also presents another level of scale, the inner and outer

areas. The inner area comprises the municipalities of Onderbanken, Brunssum and Schinnen, those closest to the base. The outer area comprises the remaining municipalities.

The prevalences (%) were calculated based on the reactions of the just under 2,500 respondents in the survey and the over 200 respondents in the non-response survey. The text presents these prevalences as estimates for the adult population in the survey area. In the tables section (Appendix 5) the accuracy of the estimates is indicated by a confidence interval (95%): the smaller the confidence interval, the more accurate the estimate of prevalence for the adult population in the survey area is.



Figuur 5 Survey area of the Netherlands around the Geilenkirchen air base (municipalities and four-digit postcode areas)

4.2 Annoyance and sleep disturbance

The activities at and around the Geilenkirchen air base create noise, odour and vibration. Local residents are affected by these and may experience annoyance as a result. Annoyance is subjective and is used as a measure of perception; it is *not* a measure of exposure to noise, such as CU or L_{den}, or to odour, such as odour unit. The most common type of annoyance around airports is noise annoyance. Research shows that about 10-30% of individual perception of annoyance is determined by actual exposure to noise (Job, 1988; Guski, 1999). Also, personal characteristics and a person's social and cultural setting play a major role in perception of annoyance: these are referred to as the 'non-acoustic' factors. They include individual sensitivity to noise, fears for safety and of aircraft crashing, concern about the health effects of noise, attitudes to air traffic, perceived control over the situation, and perceived social or economic benefits of air traffic.

The wide variation in individual perception of annoyance at different noise levels makes it difficult to be precise about the annoyance an individual can be expected to perceive (at a particular noise level). It is possible, however, to ascertain what proportion of the population may experience serious annoyance from environmental noise. The percentage of 'highly annoyed' people is a measure of the annoyance perceived by the population over a lengthy period as a result of exposure to environmental noise. It does not provide any insight into acute perceived annoyance due to short-term variations in noise levels from overflights. How annoyance is determined in this survey and how the percentage of annoyed/highly annoyed people is calculated is set out in Appendix 3: Additional information on topics.

In addition to annoyance, local residents were asked whether their sleep was disturbed by environmental noise. Nocturnal noise can have an effect on sleep (Gezondheidsraad, 2004), reflected in changes in falling asleep, staying asleep, mobility during sleep, structure of sleep, physiological factors and effects on the post-sleep period. According to the Health Council (Gezondheidsraad, 2004) there is sufficient evidence that nocturnal noise has an adverse effect on sleep quality and general well-being, which can result in an increased heart rate, motor disturbance, diminished sleep quality, insomnia or the use of sleeping pills. These effects are not easy to measure with a questionnaire. The questions on sleep disturbance due to various sources are mainly an indication of the nocturnal annoyance perceived by local residents.

Odour penetrates our environment from various sources. Excessive odour is often described as 'smell' and can cause annoyance. Odour annoyance is a major annoyance factor in the environment. The national Annoyance Survey by the RIVM/TNO (Franssen et al., 2004) indicates that drains (13%), agriculture and manure transport (4%), road traffic (6%) and industry (6%) are the main sources of serious odour annoyance in the Netherlands.

The main source of annoyance due to vibration is road traffic (5%), followed by building work (3%) and aeroplanes/helicopters (3%: Franssen et al., 2004). Vibration from aircraft is related to the noise they produce: it is the low-frequency part of the noise spectrum in particular that produces vibration that can cause annoyance.

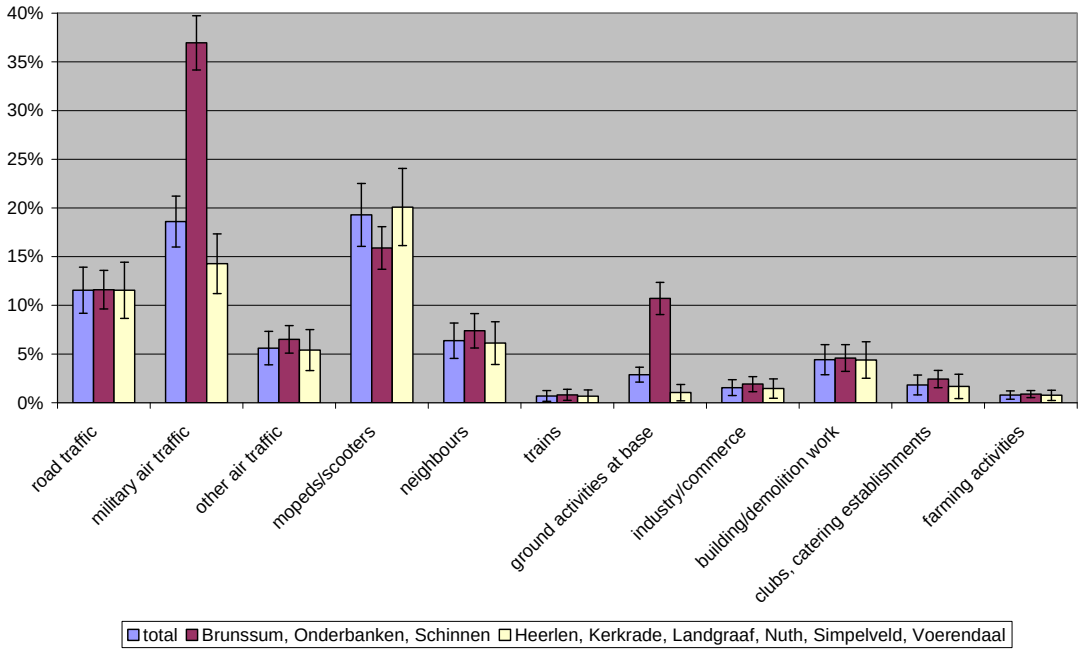
All the questions on annoyance in the questionnaire used a standard formulation (ISO, 2003).

4.2.1 Noise annoyance

Three questions were put to the participants on the extent to which air traffic noise had caused them disturbance or annoyance during the past twelve months. A distinction was made between noise from

military air traffic (e.g. AWACS), other air traffic (e.g. from Beek airfield) and total noise annoyance from air traffic. As the main emphasis of the survey is annoyance caused by the Geilenkirchen air base, this section looks at noise annoyance from military air traffic.

As well as air traffic, the survey participants were asked to rate other sources of noise as to their annoyance value. This enables us to compare the perceived noise annoyance from the Geilenkirchen air base with that from other noise sources in the area. The results are shown in Figuur 6. Table X1 (Appendix 5: Tables Section) shows all the annoyance percentages. A total of 18.6% of residents say they experience serious annoyance from the noise of military air traffic. Military air traffic is by far the main source of serious noise annoyance in the municipalities of Brunssum, Schinnen and Onderbanken. Also, many Schinveld and North East Brunssum residents experience serious noise annoyance from ground activities at the base, 36.7% and 21.8% respectively.



Figuur 6 Proportion of the population experiencing serious annoyance due to noise from various sources (percentage, with 95% confidence interval)

The proportion of people in the survey area experiencing serious annoyance from the various noise sources corresponds reasonably well to the national data from the Annoyance Survey (Franssen et al., 2004). Interestingly, the amount of noise annoyance caused by mopeds and scooters (19.3%) is comparable in the survey area as a whole to the level of noise annoyance from military air traffic. Serious annoyance from mopeds in the survey area is in line with the Annoyance Survey, which shows that Dutch residents experience most noise annoyance from road traffic and neighbours. Among the road traffic sources, mopeds and scooters cause the most serious annoyance (19%).

The proportion of people in the survey area experiencing serious annoyance from the noise of military air traffic is 18.6% (Table 1). The differences in the area are large, with the highest percentage of highly annoyed people in the municipalities closest to the base (Onderbanken, Brunssum and Schinnen). The latest Annoyance Survey (Franssen et al., 2004) indicates that the proportion of highly annoyed people due to air traffic noise in the Netherlands as a whole is 12%, as against 6% for military

air traffic. The present survey shows that in the other municipalities too the proportion of residents experiencing serious annoyance is higher than we would expect from the national data. The municipalities of Heerlen and Brunssum have the largest *numbers* of highly annoyed people within their boundaries because of their larger populations.

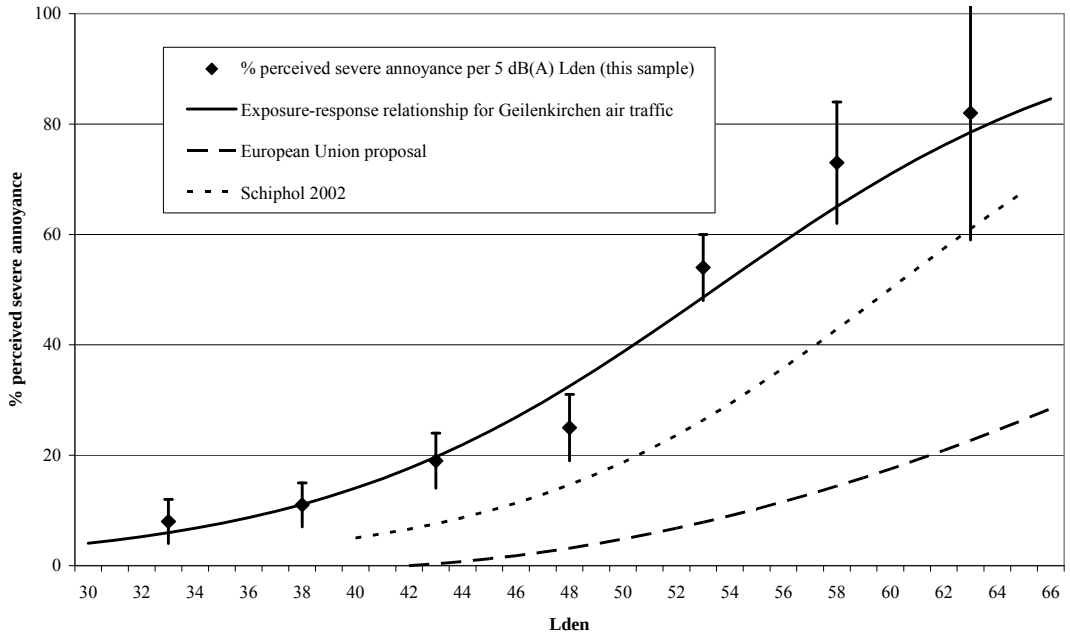
Table 1 Serious annoyance due to military air traffic noise, by municipality in the survey area: percentage of highly annoyed people and estimated numbers of such people, with 95% confidence interval (CI)

Municipality	Percentage of highly annoyed people (CI)		Number of highly annoyed people (CI)	
Brunssum	28.9	(25.1-32.7)	6970	(6050-7880)
Onderbanken	63.9	(57.8-70.1)	4260	(3850-4670)
Schinnen	39.4	(35.0-43.8)	4230	(3750-4700)
Heerlen	17.7	(11.4-23.9)	13260	(8540-17900)
Kerkrade	13.5	(7.5-19.4)	5540	(3080-7970)
Landgraaf	6.2	(2.5-9.8)	1980	(800-3130)
Nuth	10.6	(5.8-15.4)	1370	(750-1990)
Simpelveld	11.6	(6.0-17.3)	1070	(550-1590)
Voerendaal	24.3	(16.4-32.1)	2520	(1700-3330)
Total	**18.6**	**(16.0-21.1)**	**41200**	**(35500-46800)**

Within the municipalities of Brunssum, Onderbanken and Schinnen there are large differences in the percentages of highly annoyed people from one postcode area to another. In Schinveld (postcode 6451) 71.9% of the population experience serious annoyance due to military aircraft noise, whereas the proportion in the more northerly Jabeek (6454) is 35.4%. In North East Brunssum (6442) the proportion of highly annoyed people is 51.5%, as against 18.0% in South Brunssum (6445). The differences within the Municipality of Schinnen are smaller: in Oirsbeek (6438) the proportion of highly annoyed people is 47.8%, as against 31.7% in Nagelbeek (6365).

Correlation between military air traffic noise and percentage experiencing serious annoyance
For the purpose of the survey it is important to establish how far annoyance from the Geilenkirchen air base is related to the aircraft noise to which local residents are exposed and how far it is caused by other factors. The link between exposure to military air traffic noise and the proportion of the population experiencing serious annoyance as a result can be stated as an exposure-response relationship. This indicates what proportion of the population will experience serious annoyance at each noise level in the survey area. We opted for L_{den} as the noise indicator (see also section 6.3.8, Noise exposure).

In the questionnaire the participants were asked to indicate the extent to which noise from military air traffic (e.g. AWACS) had caused them annoyance, disturbance or annoyance *during the past twelve months*. As this relates to perceived annoyance over a period of a year, it was decided to use L_{den} as the noise indicator. This also enables us to compare the annoyance value of military air traffic noise with the situation around other airports such as Schiphol. The National Aerospace Laboratory (NLR) calculated the annual average exposure to military air traffic noise at the homes of the survey participants for the year 2006. This did not include noise from ground activities at the base (e.g. taxiing, warming up engines). Noise exposure is divided into 5dB(A) categories (30-35, 35-40 etc. up to 60-66). The average noise exposure among all the survey participants was about 46dB(A) L_{den}.



Figuur 7 Correlation between exposure to noise (by 5dB(A) noise category) from military air traffic and the proportion of highly annoyed people (percentage by noise category ● with confidence interval |). The continuous line (curve) indicates the estimated percentage of highly annoyed people in the survey at a particular exposure to military air traffic noise as a continuous variable. (..... 'Schiphol' curve, - - - - 'EU' curve (proposal))

The exposure-response curve (continuous line) shows a strong link between the proportion of the population experiencing serious annoyance and noise from aircraft flying to and from the Geilenkirchen air base. The exposure-response relationship enables us to say something about the proportion of the *population* experiencing serious annoyance when exposed to a particular noise level, but not to what extent an *individual* will experience annoyance, as other non-acoustic factors play a major role in individual perception of annoyance (see section 4.2.2).

Figuur 7 also shows the exposure-response relationships found around Schiphol (Breugelmans, 2004) and proposed for use in the European Union (European Communities, 2002). The noise situation around Schiphol differs substantially from that in the survey area. In the survey area overflights are few (an average of fewer than 14 per day) with high noise levels, whereas in the area around Schiphol they are numerous with a lower noise level for each overflight. In both cases there is a strong link between the annoyance perceived by the population and the noise level in L_{den}. A striking feature compared with the other curves is that the proportion of annoyed people in the survey area is higher at the same noise levels. This shows that the particular noise situation in the survey cannot be described adequately using the exposure-response relationships that apply around civil airports or those proposed for use in the European Union.

4.2.2 Determinants of annoyance

As pointed out in 4.2.1, noise annoyance is not determined solely by the degree of exposure to noise; other non-acoustic factors are involved. The survey therefore looked at which of these non-acoustic factors affect the degree of noise annoyance perceived by residents on the Dutch side of the Geilenkirchen air base. To ascertain this a linear regression model (see section 6.3.11) was fitted to

explain perceived noise annoyance from military air traffic, using expectations, concern, trust, feelings, attitude and sensitivity to noise as explanatory variables (predictors). The influence of age, sex, education, degree of urbanization of the residential environment, exposure to noise (L_{den}) and exposure during day-to-day activities was also investigated. The definitions of the various predictors are given in Appendix 3: Additional Information on Topics.

Table 2 Correlation between perceived noise annoyance from military air traffic and various explanatory variables, based on a regression analysis

Predictor	Coefficient	Standard error	t-value	Pr > |t|
Intercept	-4.64	0.47	-9.87	<.0001
Exposure (L_{den})	0.13	0.01	13.12	<.0001
Expectation that noise will get worse	2.14	0.21	10.37	<.0001
Negative feelings	1.08	0.10	10.82	<.0001
Noise sensitivity	0.23	0.02	9.73	<.0001
General concern	0.50	0.06	8.20	<.0001
Positive feelings	-0.52	0.07	-7.48	<.0001
Noise during activities	0.90	0.13	7.12	<.0001
Sex	-0.52	0.11	-4.87	<.0001
Negative feelings * Expectation that noise will get worse	-0.59	0.12	-5.12	<.0001
		R^2	F-value	Pr > F
Model		0.59	388.58	<.0001

'Coefficient' indicates the increase in ‘annoyance’ when a predictor increases by one unit.

The predictors in the model explain 59% (R^2) of the variation in perceived noise annoyance, so the score for perceived annoyance can be predicted reasonably well using the chosen predictors. First, the amount of noise to which people are exposed (L_{den}) was found to be a significant predictor of perceived annoyance. If exposure to noise increases by one unit, annoyance from military air traffic increases by 0.13 (on a scale of 0 to 10). In other words, for each additional decibel of noise residents experience slightly more annoyance.

In addition to exposure to noise, non-acoustic factors were found to be involved. People expecting aircraft noise to get worse in the coming year, for instance, experience more annoyance than those who expect it to remain the same or decrease. Furthermore, residents whose negative feelings are intensified by thinking about AWACS experience more annoyance from military air traffic, whereas those who have positive feelings when thinking about AWACS have a lower annoyance score. Positive feelings have a lesser effect than negative ones, however. Greater sensitivity to noise also results in more perceived annoyance.

People who are more concerned about the effects of military aircraft on their health, moreover, experience more annoyance. Also, residents who hear noise during their day-to-day activities experience more annoyance than those who say they do not hear any noise. 75% of residents said they heard noise during their day-to-day activities. Men are somewhat more annoyed than women, rating perceived annoyance half a point higher on average. This is unusual, as women usually experience more noise annoyance than men. Lastly, interaction between negative feelings and expectations was found to explain some of the annoyance.

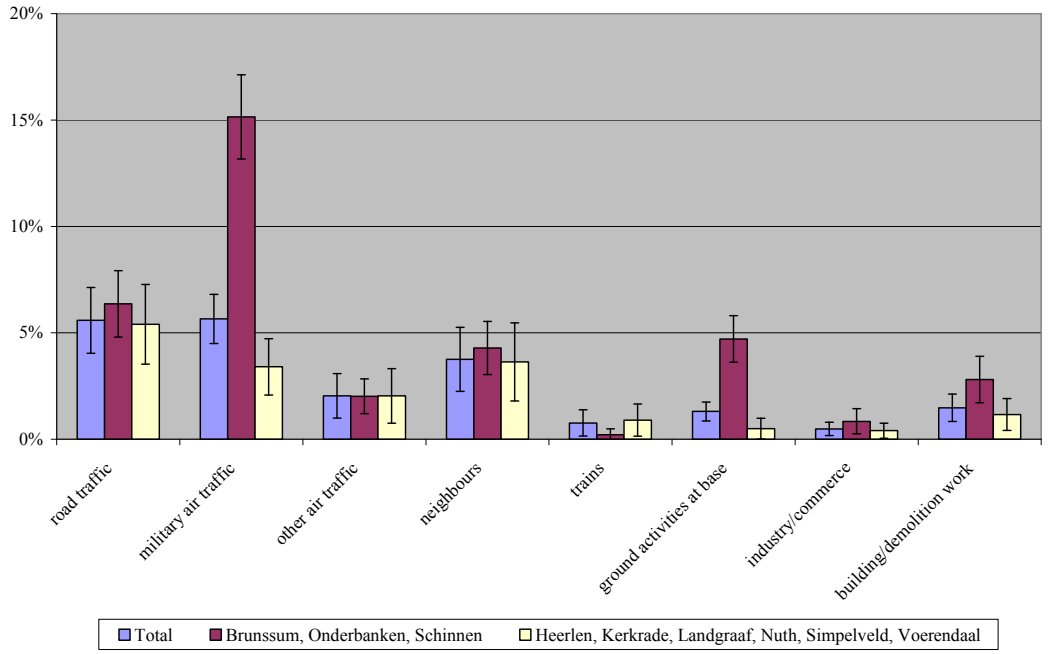
Not all the predictors measured are significant predictors of annoyance: people's education, their attitude to the base, their trust in information from various authorities, the degree of urbanization of the residential environment and age were found not to explain any of the variation.

4.2.3 Sleep disturbance due to noise

The proportion of the population who say they experienced serious sleep disturbance from noise during the past twelve months is shown in Figuur 8. The main source of sleep disturbance mentioned is military air traffic (total 5.7%), with the municipalities of Onderbanken (28.6%), Brunssum (12.7%) and Schinnen (12.6%) most prominent. Interestingly, a large proportion (10.2%) experience serious sleep disturbance in the Municipality of Voerendaal, which is further away from the base. A possible explanation could lie in the fact that Voerendaal lies particularly close to the flight paths of a number of airfields (Geilenkirchen air base, Maastricht Aachen Airport and Liège Airport), and it is difficult for the respondents to distinguish between traffic from the various airfields. It may be that some of the sleep disturbance due to civil aviation is being wrongly attributed to military air traffic.

There are large differences within the municipalities of Brunssum and Onderbanken. In Onderbanken the proportion experiencing serious sleep disturbance ranges from 8.1% in Jabeek (postcode 6454) to 34.3% in Schinveld (6451). In Brunssum the proportion ranges from 3.7% in South Treebeek (6446) to 25.0% in North East Brunssum (6442: Table 4).

The total number of night and weekend flights in the year prior to the survey (August 2006 to July 2007) was 10 (Commissie AWACS Limburg, 2007). This raises the question of whether this number of night flights could be causing the proportion of serious sleep disturbance found. Night flights are defined as those occurring between 10.00 pm and 8.00 am (the 'night flight period': Commissie AWACS Limburg, 2007). Sleep disturbance can also occur than at 'night', i.e. during the daytime. The questionnaire asked whether people slept during the daytime. About 30% of residents said that they sometimes needed to sleep during the daytime. Of these, 11% said that they suffered from serious sleep disturbance, as against 4% of those who did not need to sleep during the daytime. The proportion of residents experiencing sleep disturbance, then, is not caused by aircraft noise solely during the night but also during the daytime. The questionnaire did not ask why people slept during the daytime. 'Daytime sleep' was found to be distributed fairly evenly among men and women and the various age groups.



Figuur 8 Proportion of the population who say they experience serious sleep disturbance from various noise sources

Ground activities (total 1.3%) at the base are mentioned as causing serious sleep disturbance particularly in Schinveld (18.8%) and North East Brunssum (10.7%). Of the other sources of sleep disturbance, road traffic (5.6%) and neighbours (3.8%) are most commonly mentioned. These are also the main sources of sleep disturbance/serious sleep disturbance nationwide, although the percentages found here are lower than the national average (Franssen et al., 2004).

4.2.4 Odour and vibration annoyance

Odour and vibration annoyance experienced from military aircraft flying overhead is 5.2% and 7.6% respectively and is confined mainly to the municipalities of Brunssum, Onderbanken and Schinnen (Table 3). The proportion experiencing serious annoyance from odour is highest in the Schinveld (45.4%) and Merkelbeek (29.9%) postcode areas; in the remaining municipalities in the survey area the proportion of highly annoyed people as a result of odour is below 5% (Table X2). The number of adults in the survey area experiencing serious annoyance from odour caused by military aircraft is estimated at 11,500.

The proportion of highly annoyed people as a result of vibration caused by military aircraft flying overhead is higher than for odour annoyance (Table 3). The vibration is related to the noise that aircraft produce: it is the low-frequency part of the noise spectrum in particular that produces vibration that can cause annoyance. The worst areas are in Schinveld and Merkelbeek and the north side of the Municipality of Brunssum. The number of adults in the survey area experiencing serious annoyance from vibration due to military aircraft is estimated at 16,900. Perceived serious annoyance from vibration due to ground activities at the Geilenkirchen air base is centred on the areas of Schinveld (22.9%) and North East Brunssum (13.4%: Appendix 5: Tables Section, Table X3).

Table 3 Serious odour and vibration annoyance due to military air traffic and ground activities at Geilenkirchen air base

Area (postcode)	Serious odour annoyance from military aircraft (%)	Serious vibration annoyance from military aircraft (%)	Serious vibration annoyance from ground activities at the base (%)
Puth (6155)	12.4	20.3	1.6
Sweikhuizen (6174)	6.0	12.3	0.0
Nagelbeek (6365)	1.6	6.6	0.8
Amstenrade (6436)	9.6	18.2	1.7
Oirsbeek (6438)	11.1	24.3	2.1
Groot-Doenrade (6439)	15.9	20.7	3.3
Brunssum-NW (6441)	15.2	28.0	7.1
NE Brunssum (6442)	18.6	36.9	13.4
SE Brunssum (6443)	11.2	9.3	8.5
SW Brunssum (6444)	6.6	10.5	2.8
South Brunssum (6445)	3.1	8.1	3.3
South Treebeek (6446)	4.2	8.1	1.2
Merkelbeek (6447)	29.9	39.2	6.8
Schinveld (6451)	45.4	49.8	22.9
Jabeek (6454)	13.5	20.0	2.7
Bingelrade (6456)	18.7	20.4	7.8

Of the other sources of odour and vibration annoyance, road traffic is most commonly mentioned. The proportion of highly annoyed people in the survey area as a whole is 7.2% due to odour and 6.7% due to vibration from road traffic. The annoyance is distributed fairly uniformly over the survey area and is comparable with the findings from the national Annoyance Survey (Franssen et al., 2004).

4.3 Residential satisfaction

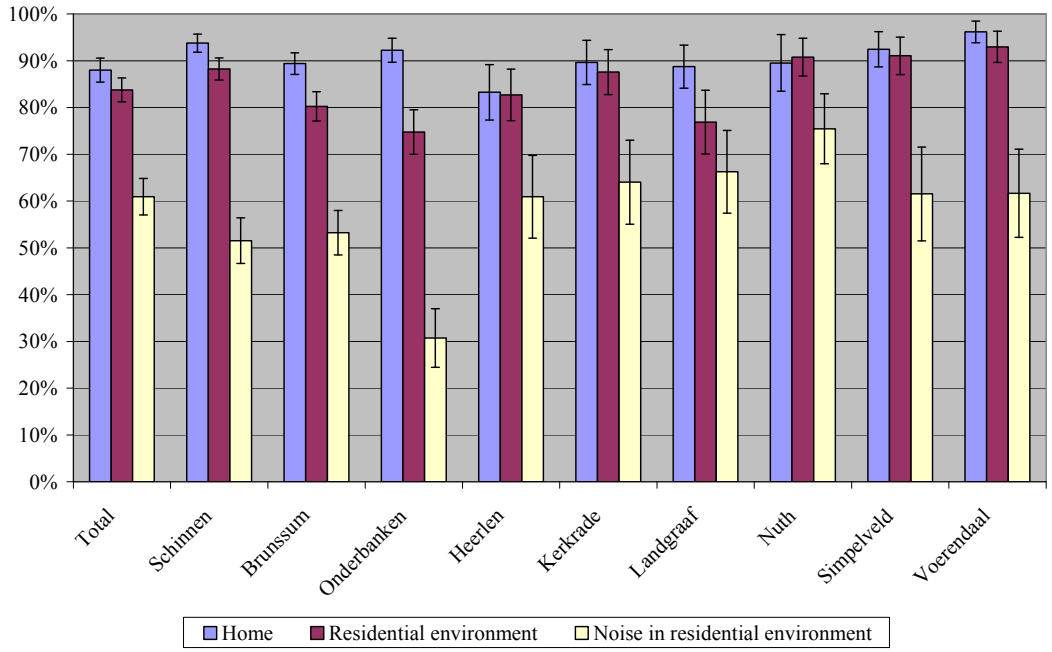
Satisfaction with life can be regarded as the sum of satisfaction with various areas of life, including the home and the residential environment (Campbell et al., 1976; Leidelmeijer and Van Kamp, 2003). Satisfaction with the home and the residential environment is in turn determined by a whole host of factors, including physical characteristics of the home (e.g. size and quality); physical, social and spatial characteristics of the residential environment (e.g. noise and odour annoyance, crime, population mix, presence and quality of amenities: Van Poll, 1997; Bonaiuto et al., 1999 and 2003; Connerly and Marans, 1988; Ellaway and Mcintyre, 2001). Taken together, ratings for these factual characteristics produce an overall rating for the residential environment, i.e. residential satisfaction. Personal characteristics such as age, level of education and type of household influence the way in which the factual situation is perceived. Indeed, personal characteristics not only affect how that perception contributes to satisfaction, they also have a direct effect on satisfaction itself: in other words, some people are more satisfied than others.

Residential satisfaction is high in the Netherlands: about 90% of people say they are satisfied or very satisfied with their residential environment (Buys et al., 2007; VROM, 2007). Satisfaction varies according to the degree of urbanization. The more urbanized an area is, the lower the residential satisfaction. Residential satisfaction in urban areas is about 80%, as against about 90% in rural areas (VROM, 2007).

The questionnaire asked about such things as satisfaction with the home, the residential environment and noise in the residential environment.

4.3.1 Residential satisfaction: results

88% of adult residents in the survey area are satisfied or very satisfied with their current home (Figuur 9). This figure is close to the national average of 90% (VROM, 2007). The differences between the municipalities are small. The proportion of people satisfied or very satisfied with the residential environment (84%) is also not very different from the national average of 86% (Buys et al., 2007). There are large differences between the municipalities in the survey area, however: 67.6% are satisfied with the residential environment in Schinveld, as against 93% in the Municipality of Nuth. There are also large differences between municipalities in the proportion of people who are satisfied or very satisfied with noise in the residential environment, ranging from 75.5% in the Municipality of Nuth to 30.7% in the Municipality of Onderbanken (Table X5).



Figuur 9 Proportion of the population satisfied/very satisfied with the home, the residential environment and noise in the residential environment, by municipality

4.3.2 Determinants of residential satisfaction

The degree of satisfaction with the home, the residential environment and noise in the residential environment was analysed using linear regression analysis. Three separate regression models were fitted to investigate how satisfaction is explained by various predictors (Table 4). In addition to military air traffic noise, predictors were included in the model that were expected a priori to be correlated to residential satisfaction.

Table 4 Correlation between satisfaction with the home, the residential environment and noise in the residential environment and a number of explanatory variables: results of a regression model

	Home		Residential environment		Noise in the residential environment	
Predictor	Coefficient	SE	Coefficient	SE	Coefficient	SE
L_{den} for military air traffic	0.001	0.002	-0.003	0.002	-0.031***	0.003
Urbanization	0.026*	0.014	0.050***	0.014	-0.003	0.017
Annoyance due to road traffic noise	-0.004	0.005	-0.027***	0.006	-0.098***	0.008
Feeling safe in the residential environment	0.064***	0.008	0.092***	0.010	0.055***	0.011
Perceived health	-0.089***	0.023	-0.118***	0.023	-0.164***	0.028
Tenant or owner-occupier	0.315***	0.037	0.131***	0.035	0.030	0.046
Expectation that value of home will go down	-0.250***	0.047	-0.259***	0.053	-0.272***	0.067
Expectation that road traffic noise will get worse	-0.062*	0.037	-0.091**	0.036	-0.074	0.047
Expectation that air traffic noise will get worse	0.025	0.033	-0.061*	0.034	-0.440***	0.045
Explained variation R^2	0.14		0.19		0.33	

'Coefficient' indicates how much 'satisfaction' changes when a predictor changes by 1 unit. Significance: * <0.1, ** <0.05, *** <0.01. SE = standard error

Together the predictors in the models were found to predict 14%-33% of the variation in satisfaction (with home, the environment, noise). These low values indicate that the variation found in the answers to the questions on residential satisfaction are only explained to a small extent by the variables used in the model. As indicated at the start of this section, satisfaction with the home and the residential environment is determined by a whole host of different factors, some but not all of which were included in the survey.

Satisfaction with the home is explained to a limited extent (14%) by the various predictors. Significant predictors of satisfaction with the home were found to be feeling of safety and personal health perception, whether the person is a tenant or an owner-occupier, and whether or not the value of the home is expected to go down. In other words, if people feel safe they are more satisfied with their home, and if they rate their health better they are more satisfied. People who own their own homes are also more satisfied than those in rented homes. People who expect the value of their home to go down in the coming year are less satisfied than those who do not expect this to happen. Satisfaction with the home does not show any correlation with exposure to aircraft noise.

Satisfaction with the residential environment is also explained to a limited extent (19%) by the chosen predictors. Degree of urbanization was found to be a significant predictor: the lower the degree of urbanization, the more satisfied residents are. Also, people who are more annoyed by road traffic noise are less satisfied with their residential environment. On the other hand, if they feel safe in their environment and perceive their health as good, they are more satisfied. If they own their own home and do not expect its value to go down, they are also more satisfied. Again, satisfaction with the residential environment does not show any correlation with exposure to aircraft noise.

The degree of satisfaction with noise in the residential environment does show a clear correlation with exposure to noise from military air traffic. These results indicate that the people who are exposed to the highest noise levels in the survey area rate almost a whole point lower on average on the five-point satisfaction scale than those who are exposed to the lowest noise levels. Annoyance from road traffic noise is a major predictor of the degree of satisfaction with noise in the residential environment: the more annoyance people experience from road traffic, the less satisfied they are. Future expectations of exposure to military aircraft noise are also a factor.

4.4 Self-reported health

Self-reported health, also referred to as subjective health or health perception, is the rating a person gives for his or her health. It is a summary measure of various health factors that are relevant to a person. The underlying health factors vary from one person to another, but they often relate to both physical and mental health, examples being illnesses, physical impairments and disabilities, fitness, fatigue and feelings of depression. Lifestyle factors such as nutrition, smoking and physical activity can also help to determine people's ratings of their health (Hoeymans et al., 2005).

The correlation between exposure to air traffic noise and poor perceived health, as in indicator of quality of life, has been studied to a limited extent (Gezondheidsraad, 1994; WHO, 1999; Van Kempen et al., 2005). Research in the 1980s into the situation around military airfields and motorways did not find any direct link between exposure to noise from road and air traffic and perceived physical health. An indirect link was however observed via annoyance, in particular stress reactions due to exposure to noise (Van Kamp, 1990). A recent study (Jabaaij, 2005) also established a link between perceived health and the degree of noise annoyance. Precisely what is cause and what is effect is impossible to say, given the cross-sectional nature of the study.

Mental health is a generic term for the state of emotional and mental well-being that enables a person to function in society and cope with the demands of day-to-day life. To date, research into the effect of environmental noise on mental health has been scanty. Results of recent international population studies suggest that long-term exposure to high noise levels is associated with mental health characteristics such as depression and fear but does not affect mental function. Noise is probably not associated with serious impairment of mental health or clinically defined psychiatric disorders, but it does affect stress responses and mental well-being (Stansfeld et al., 2000; Stansfeld and Lercher, 2003). Smith et al. (2001) found a statistically significant correlation between exposure to noise and depression and cognitive errors, but the results of various other studies into the incidence of mental disorders are inconsistent (Stansfeld and Lercher, 2003).

Self-reported health was measured by four different measures in the questionnaire. First 'perceived health' was measured by one general question and based on the 'general health perception' (2) and 'mental health' (3) components of the RAND-36 questionnaire (Van der Zee et al., 1993). RAND-36 comprises eight components, and the reliability of the individual components is rated as good (Evers et al., 2000). As a fourth measure, physical symptoms were measured using the 'somatization' component of the Four-Dimensional Symptom Questionnaire (4DSQ, Terluin and Duijsens, 2006). For more details of these measures see Appendix 3: Additional information on topics.

4.4.1 Self-reported health: results

(1) Perceived health

About 80% of the Dutch population perceive their health as good or very good (Mac Gillavry et al., 2007). The percentage is lower in the survey area (total 66.8%, Table 5). Now the proportion of people who perceive their health as less good in the former Eastern South Limburg Municipal Health Service area, which includes the survey area, is already higher (about 25%) than the national average (19.3%): indeed, it is the highest of all the former Municipal Health Service areas in the Netherlands (Mac Gillavry et al., 2007). Thus the proportion of residents in the survey area with lower perceived health is even lower than in the Municipal Health Service area. Perceived health is highest in Nuth (79% good or very good) and lowest in Onderbanken (55.9%), particularly Schinveld (6451) and Jabeek (6454). Perceived health is also relatively low in Kerkrade and Brunssum (62.5% and 62.8% respectively). In Brunssum this is particularly the case in NW Brunssum (6441) and SE Brunssum (6443: Appendix 5: Tables Section, Table 6).

(2) RAND-36, 'general health perception' component

General health is perceived as less good on average in the survey area (65.4) than in the total Dutch population (70.7). General health status is slightly diminished in the municipalities of Brunssum, Onderbanken, Kerkrade and Landgraaf. In Schinveld the proportion of residents perceiving their health as good or very good is significantly lower than the average for the area as a whole (average = 58.5; CI 54.0-63.0; Table X6).

(3) RAND-36, 'mental health' component

Mental health in the survey area, averaging 73.0 (CI 71.5-74.6), is below the national average (76.8). It is slightly diminished in the municipalities of Brunssum, Onderbanken, Heerlen and Landgraaf. In Schinveld mental health is moreover significantly lower than in the rest of the area (average = 67.1; CI 63.2-71.0: Table X6).

(4) 4DSQ, 'physical symptoms' subscale

The results show that the average score for physical symptoms is low (M=7.0; CI 6.4-7.6). In other words, people generally display normal reactions to their day-to-day trials and tribulations. Compared with a reference population in Terluin et al. (2006) the average score is about the same (average = 7.0). Although the scores in the municipalities of Brunssum and Onderbanken are somewhat elevated (see Table 5), on average they are still normal. Schinveld has a significantly higher score for physical symptoms (somatization: average = 9.6; CI = 8.1-11.0). The score is on the borderline between low and moderately elevated. As 5% of people have a moderately elevated score (>11), Schinveld thus displays somewhat more physical symptoms than the rest of the survey area (Table X6).

Table 5 Percentage (%) and average scores (avg.) for four self-reported health measures, with 95% confidence interval (CI)

	(1) Perceived health		(2) General health perception (scale 0-100)		(3) Mental health perception (scale 0-100)		(4) Physical symptoms	
Municipality:	%	95% CI	avg.	95% CI	avg.	95% CI	avg.	95% CI
Schinnen	69,4	64,6-73,9	66,4	64,4-68,4	73,6	72,0-75,2	6,5	6,0-7,1
Brunssum	62,8	58,1-67,3	64,5	62,5-66,5	71,2	69,3-73,0	8,1	7,5-8,7
Onderbanken	55,9	49,7-61,9	61,2	58,4-64,0	70,2	67,7-72,6	8,6	7,7-9,5
Heerlen	69,8	60,8-77,6	65,8	61,7-69,9	72,2	68,4-76,0	6,9	5,4-8,4
Kerkrade	62,5	52,5-71,6	63,1	59,4-66,9	74,6	71,5-77,7	7,2	6,0-8,5
Landgraaf	59,8	49,3-69,6	64,9	62,0-67,9	72,0	68,4-75,5	7,0	5,8-8,2
Nuth	79,0	69,2-86,3	69,2	65,0-73,4	77,0	73,6-80,4	5,4	4,2-6,6
Simpelveld	69,6	58,6-78,8	67,4	62,9-71,8	76,4	72,6-80,2	6,8	5,4-8,1
Voerendaal	77,6	67,9-85,0	69,4	65,6-73,3	74,4	70,6-78,3	6,2	5,0-7,3
Total	66,8	63,1-70,3	65,4	63,8-67,0	73,0	71,5-74,6	7,0	6,4-7,6
Reference population	75,0[+]		70,7[*]		76,8[*]		8,35 [#]	

+ South Limburg Municipal Health Service area (Mac Gillavry et al., 2007).
* Aaronson et al. (1998), reference population for the Netherlands. SF-36.
[#] Terluin et al. (2002), reference population of GP patients (n=2127).

4.4.2 Determinants of general health perception

A regression model was used to predict general health perception from a number of different predictors (Table 6). Together the predictors in the model explain 42% of the variation in general perceived health.

First, satisfaction with the residential environment was found to be a significant predictor of general perceived health. In other words, residents who are satisfied or very satisfied with their residential environment rate their general health as better than those who give a neutral rating or are dissatisfied with their residential environment. Also, the better residents rate their mental health, the better they perceive their general health too. People who experience more physical symptoms, on the other hand, rate their general health as less good.

Women rate their health higher than men. Age is also an important predictor of perceived health: the older people are, the less good they rate their general health. Exposure to noise from military air traffic noise (in L_{den}) was not found to be an explanatory factor for general perceived health (Table 6). In other words, the degree to which people are exposed to noise from military air traffic does not display any correlation with how healthy they feel.

Table 6 Correlation between general health and a number of explanatory variables

Predictor	Coefficient	Standard error	t-value	Pr > |t|
Intercept	64.24	3.97	16.16	<.0001
Satisfaction with residential environment	4.11	0.90	4.55	<.0001
Mental health	0.24	0.03	9.14	<.0001
Physical symptoms	-1.31	0.08	-15.92	<.0001
Sex	3.36	0.76	4.45	<.0001
Age	-0.23	0.03	-9.16	<.0001
Exposure (L_{den}) to military air traffic noise	-0.08	0.06	-1.34	.1789*
Model		Adj. R^2	F-value	Pr > F
		0.42	176.66	<.0001

'Coefficient' indicates the increase in 'general health perception' when the predictor increases by one unit.* Not significant at p values below 0.001.

4.5 Concern and feelings

A high-risk activity can cause people to worry or have disquieting thoughts: we refer to this as 'concern'. A high-risk activity can also arouse feelings (affect): these are generally negative, although some high-risk activities can evoke positive feelings, especially if we choose them ourselves. Concern and the negative feelings that the activities at and around the base arouse were found to be important topics in the focus group and individual interviews. The focus groups were asked whether people were concerned about their health or safety because of the military air base, and it emerged that residents were concerned mainly about the negative effects of odour and exhaust emissions from military aircraft, noise and the possibility of an aircraft accident. These different sources of concern were therefore dealt with separately in the questionnaire. Another finding from the focus group interviews was that respondents associate particular feelings directly with AWACS and the base, e.g. powerlessness, frustration, anger and fear.

Two common ways of investigating concern about risks are asking direct questions about the degree of concern regarding a high-risk activity and rating an activity for underlying risk factors. Direct questions about concern were posed in a similar way to those about annoyance, and here again the answers were on a scale of 0 to 10. The proportion of highly concerned people was calculated in the same way as that of people highly annoyed by noise, odour or vibration (Appendix 3: Additional Information on Topics). Concern about a risk can also be measured by asking about qualitative characteristics of the risk, e.g. whether it is taken voluntarily and whether there is the possibility of a single event causing a large number of casualties (cf. Fischhoff et al., 1978; Slovic, 1987; Vlek and Stallen, 1981: see Appendix 3 for more information). Based on the interviews and the literature, a number of these characteristics were selected for military air traffic: probability (of unpleasant consequences), personal controllability, number of people exposed, health effects, measures taken, how long it takes for effects to be felt, and how scary the risk is (Fast, 2004; Franssen, 2002; Gezondheidsraad, 1999; RIVM/TNO, 1998; Staples, 1999). The higher the probability of unpleasant consequences is rated, the lower the controllability, the larger the number of people exposed, the more serious the health effects, the more inadequate the measures taken, the more immediately the effects are felt, and the more scary the risk, the more concern it arouses.

The feelings aroused by the AWACS were also found to be important during the interviews. Various scales have been developed in previous studies into the relationship between feelings and risk perception (e.g. Goldberg et al., 1999; Lerner and Keltner, 2001). A set of questions about feelings was included based on the theory and previously used scales (Goldberg et al., 1999; Lerner and Keltner, 2001).

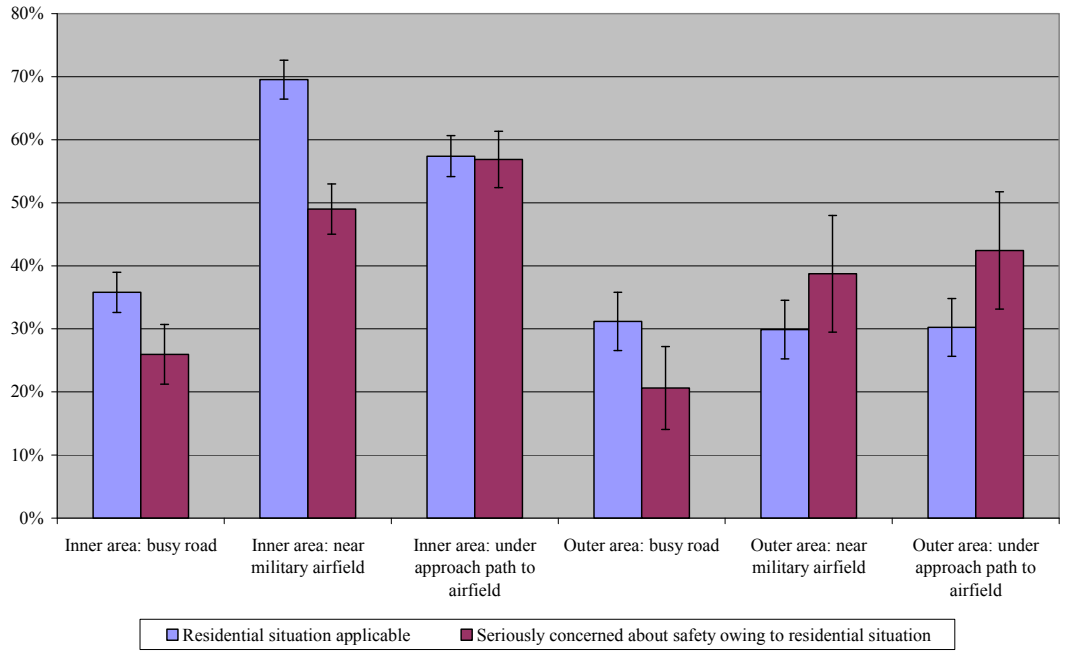
Thus the questionnaire included questions on the degree of concern about a number of risks in the environment. Specific questions on concern about health (and other) risks of exhaust emissions, noise and accidents relating to the base were included. Questions were also asked about these risks in terms of the underlying risk factors mentioned above, along with a question on the feelings that the base and AWACS arouse among residents.

4.5.1 Concern and feelings: results

For a number of environmental risks, respondents were asked how concerned they were about the particular risk if they considered that the situation applied to their residential environment. Not all situations applied to everyone: data are given on the three most important ones (Figuur 10), since in the case of the other risks the 'Applicable' proportion was so small that estimates of the proportion of people highly concerned about them would be unreliable.

The most important situations were: living near a military airfield, living under an approach path to an airfield and living along a busy road (Figuur 10). A total of 32.1% said they lived on a busy road. In Schinnen and Brunssum the proportion was higher (37.7% and 36.4% respectively): in Schinnen the number was particularly high in Amstenrade (6365, 63.7%) and in Brunssum in South East Brunssum (6443, 41.9%). 37.5% of the population in the survey area said they lived near a military air base. As expected, this percentage is strongly correlated with distance from the base, ranging from 10% in the Municipality of Simpelveld to 90% in the Municipality of Onderbanken. 35.4% of the population in the survey area said they lived under an approach path to an airfield, ranging from 20% in the Municipality of Kerkrade to 80% in the Municipality of Onderbanken.

Those who indicated that a situation applied to them were polled about concern about living near the base and living under an approach path. Concern about living under the approach path was particularly high in Schinnen and Onderbanken (56.8% and 67.6% respectively): in Schinnen this was particularly the case in Amstenrade and Groot-Doenrade, in Onderbanken particularly in Schinveld. The proportion of people highly concerned about living near the base was 42.4%: large numbers were found in Onderbanken (64.7%) and particularly in Schinveld (71.7%) and Voerendaal (59.1%: Table X7).



Figuur 10 Proportion of residents indicating that a risk situation applies to them and proportion highly concerned about safety, in the inner area (Onderbanken, Schinnen and Brunssum) and the outer area

4.5.2 Concern about exhaust emissions, noise and accidents

It emerged from the focus group and individual interviews that concern about military air traffic relates mainly to exhaust emissions and noise from aircraft and the possibility of an aircraft accident (Table X8). People are most concerned about the possibility of an accident involving a military aircraft (total 51.6 %): residents are particularly concerned about accidents in Onderbanken (80%; Schinveld 82.4%, Schinnen 61.9%, Groot-Doenrade 81.9%) and Brunssum (64%; NW Brunssum 72.7%, NE Brunssum 75.1%). Just under half of residents are concerned about health problems due to military aircraft noise (total 48.5%). Again, the proportion of people concerned was highest in Onderbanken, Brunssum and Schinnen. About four in ten residents are concerned about health problems due to exhaust emissions (38.3%). The proportion of people concerned about all three situations is highest, then, in Schinnen, Brunssum and Onderbanken. The proportion of highly concerned residents in Onderbanken is highest (between 68% and 80%) in Schinveld, where concern about noise is even greater than concern about the possibility of an accident involving a military aircraft.

4.5.3 Determinants of concern

As outlined above, concern about a risk is based on various qualitative factors. It was found that the scores for the qualitative factors – probability; number of people exposed; controllability; seriousness of consequences; measures taken; how long it takes for effects to be felt; and how scary the three risks (exhaust emissions, noise, accidents) are – could be combined into a single risk perception scale (see Appendix 3). A higher score on this scale means that the risk is perceived as being higher. In addition to cognitive assessment of a risk, feelings affect the degree of concern, so a set of questions about feelings was drawn up which yielded the factors ‘positive/negative feelings when thinking about AWACS’. Linear regression models (see section 6.3.11) were fitted to investigate the influence of cognitive assessments and feelings on concern about the three potential risks. The risk perception scale

and positive and negative feelings were used as predictors (Table 7), and the influences of age, sex and exposure were examined.

Table 7 Correlation between concern about exhaust emissions, noise and accidents and a number of explanatory variables

Risk	Effect	Coefficient	Standard error	t-value	Pr > |t|
Exhaust	Intercept	-0.12	0.20	-0.58	.5645*
R^2=.50	Risk perception scale	0.86	0.03	25.48	<.0001
	Positive feelings	-0.05	0.03	-1.86	.0631*
	Negative feelings	0.16	0.02	6.81	<.0001
	Age	0.004	0.001	3.53	.0004
	Exposure (L_{den})	0.01	0.003	2.75	.0060*
	Sex	0.01	0.04	0.22	.8239*
Noise	Intercept	-0.14	0.21	-0.67	.5058*
R^2=.48	Risk perception scale	0.73	0.04	20.57	<.0001
	Positive feelings	-0.08	0.03	-3.07	.0022*
	Negative feelings	0.31	0.03	11.71	<.0001
	Age	0.01	0.001	5.66	<.0001
	Exposure (L_{den})	0.01	0.004	1.63	.1024*
	Sex	-0.02	0.04	-0.40	.6876*
Accident	Intercept	-0.02	0.23	-0.07	.9408*
R^2=.45	Risk perception scale	0.81	0.03	24.27	<.0001
	Positive feelings	-0.06	0.03	-2.08	.0377*
	Negative feelings	0.24	0.02	10.04	<.0001
	Age	0.01	0.002	4.63	<.0001
	Exposure (L_{den})	0.002	0.004	0.96	.3390*
	Sex	-0.002	0.046	-0.05	.9623*

'Coefficient' indicates the increase in 'concern' when a predictor increases by one unit.* Not significant at p values below 0.001.

The principal predictor of concern about potential health problems due to exhaust emissions from military air traffic is perception of the risk. Residents who perceive the risk from exhaust emissions to be higher (greater probability, large number of people exposed, low personal controllability, serious consequences, few measures taken, short-term effects, more scary) are more concerned than those who perceive it to be lower. We also found that people who have negative feelings when thinking about AWACS are more concerned about exhaust emissions. Lastly, age was found to be a significant predictor: the older residents are, the more concerned they are. The predictors perception, negative feelings and age were also found to explain concern in the models of concern about potential health problems from military air traffic noise and concern about the possibility of an accident involving a military aircraft. Positive feelings, exposure to noise (L_{den}) and sex were not found to be significant predictors of concern about the three risks.

4.6 Trust and attitude

Trust appears to be an important factor in how people assess a risk. Also, attitudes and values determine whether someone trusts e.g. a risk manager (Cvetkovich et al., 2002). Trust in a source or stakeholder is determined by four factors: competence and expertise, honesty, dedication, and lastly empathy and compassion (Covello, 1992, 1993; Gezondheidsraad, 2001; Peters et al., 1997).

(1) The perceived competence and expertise of the source is important, and here knowledge, intelligence and experience of the source are factors.
(2) Honesty is important in gaining trust: it is better, for example, to say that there are no environmental data for a particular area than to try to disguise this or 'beat about the bush' (Miller and Solomon, 2003). People are quite capable of understanding that estimates of the magnitude or probability of an environmental problem include a certain margin of error (Johnson, 2003; Johnson and Slovic, 1995, 1998).
(3) Dedication is important. This is determined by the extent to which someone devotes himself to the cause, is able to identify with the problem and feels involved with it.
(4) Trust in the message is created by displaying empathy and compassion for those affected (Miller et al., 2003; Peters et al., 1997), i.e. by taking residents' feelings into account and acknowledging their concern.

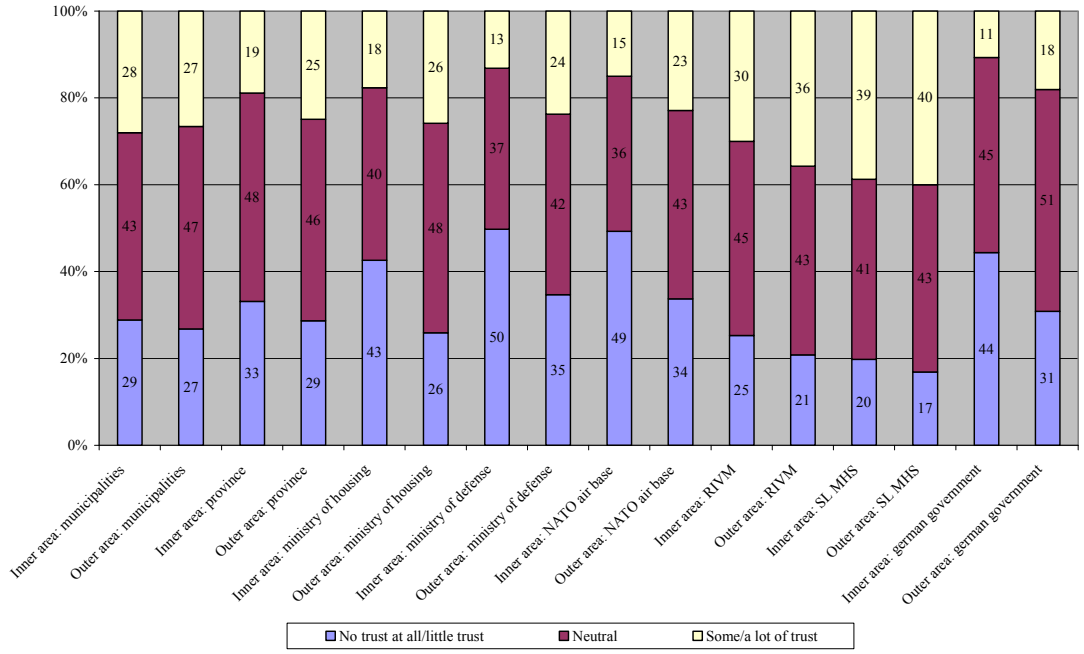
'Attitude' refers to the totality of how we think, what we feel and how we behave in relation to a particular matter, in this case the Geilenkirchen air base. An attitude is acquired over time and remains fairly consistent, i.e. it does not easily change. If we want to ascertain someone's attitude to a matter we generally ask how positive or negative they feel about it (Oostveen and Grumbow, 1988; De Vries, 1988).

The questionnaire survey investigated trust in a number of authorities based on four factors. A direct question was asked about attitude to the Geilenkirchen air base.

4.6.1 Trust: results

We examined how much trust people in the survey area have in the authorities involved with decisions on the air base. Specifically, the questionnaire asked about trust in information on the base from these authorities, i.e. the municipality, the Province of Limburg, the Housing Ministry, the Defence Ministry, the Geilenkirchen NATO air base, the RIVM, South Limburg Municipal Health Service and the German government.

The majority of residents (over 60%) do not trust, or have a neutral attitude to, the authorities involved with the base. The proportion of residents with little or no trust in the authorities is higher in the inner area than the outer area (Figuur 11).



Figuur 11 Trust in information on the air base from various authorities in the inner and outer areas (proportion of no trust, little trust, neutral, some trust, a lot of trust)

Trust is lower in the inner area, in particular trust in the Defence Ministry, NATO, the German government and the Housing Ministry. Trust in the various authorities varies among the various municipalities (Table X9). Trust in the municipal authority (total 26.9%) is relatively high in Onderbanken and Nuth and relatively low in Simpelveld, Kerkrade and Brunssum. Trust in the provincial authority (total 23.8) is relatively high in Landgraaf and Nuth but lower in Onderbanken, Brunssum, Kerkrade and Simpelveld. Trust in government (the Housing and Defence Ministries, total 24.3% and 21.7% respectively) is relatively low in Brunssum, Onderbanken and Simpelveld, but relatively high in Heerlen. The air base (total 21.4%) enjoys a relatively large amount of trust in Heerlen and Nuth, but less in Schinnen, Brunssum, Onderbanken and Simpelveld. Lastly, the German government (total 16.7%) enjoys a relatively large amount of trust in Nuth, but less again in Schinnen, Brunssum, Onderbanken and Simpelveld. Residents' trust is highest in the Municipal Health Service (total 39.8% – slightly less in Simpelveld) and the RIVM (34.6% – but slightly less in Onderbanken).

The proportion of residents who have trust in government is reasonably in line with results of other studies into trust in authorities as regards *specific* information, in this case environmental information. If people are asked about trust in authorities as sources of information (*in general*), the proportion who have trust in an authority is generally higher (Dekker, 2001).

4.6.2 Determinants of trust

We then investigated what factors influence trust in information from these authorities. For this purpose four regression models (Table 8) were fitted. The factors dedication, competence, honesty and empathy were used as predictors. The municipality, the Geilenkirchen air base and central government were expected to be the authorities that residents came into contact with most. As regards central government, a distinction was made between the Housing Ministry and the Defence Ministry.

For the four authorities, the four predictors explained 20-30% of the variation in trust in information.

- Trust in information from the *municipality* is explained first by honesty: the more honest people rate the municipality to be, the more trust they have in the information. The degree of empathy also influences trust: the more sympathetic the municipality is to its residents, the more trust they place in the information it provides. Lastly, if the municipality does little to abate the annoyance, people have less trust in the information.
- Trust in information from the *base* is predicted by the predictors honesty, empathy and dedication: the more honest, more sympathetic and dedicated the base is thought to be, the more trust people have in the information.
- Trust in information from the *Housing Ministry* is least well predicted by the four predictors (21%). Honesty and empathy are significant predictors. In other words, the more honest and mindful of the well-being of residents living around the base government is thought to be, the more trust there is in the information.
- Trust in information from the *Defence Ministry* is predicted by honesty, empathy and dedication: the higher the Ministry is rated on these factors, the more trust there is in the information.

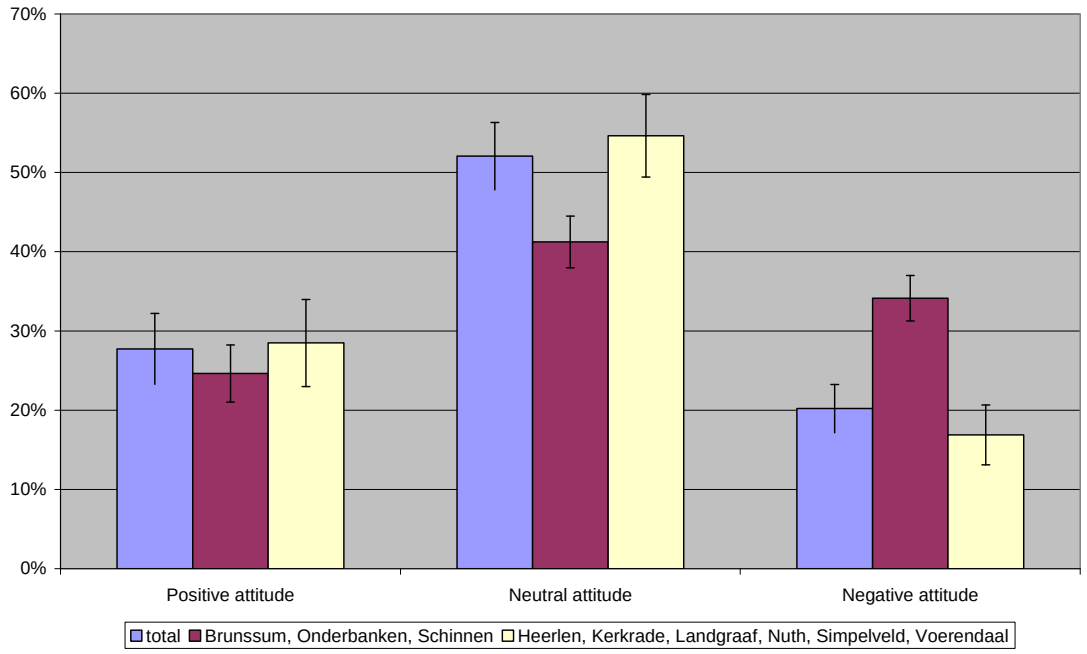
Table 8 Correlation between trust and four trust factors for four authorities

Authority	Predictor	Coefficient	Standard error	t-value	Pr > |t|
Municipality	Intercept	1,40	0,07	19,49	<,0001
R^2=,27	Honesty	0,36	0,04	9,73	<,0001
	Empathy	0,16	0,03	4,97	<,0001
	Competence	0,07	0,02	3,33	,0009
	Dedication	-0,06	0,03	-2,17	,0303*
Air base	Intercept	0,79	0,08	10,07	<,0001
R^2=,31	Honesty	0,30	0,03	9,67	<,0001
	Empathy	0,20	0,02	8,22	<,0001
	Dedication	0,19	0,03	6,42	<,0001
	Competence	-0,03	0,02	-1,83	,0676*
Housing Ministry	Intercept	1,36	0,07	18,89	<,0001
R^2=,21	Honesty	0,30	0,03	10,15	<,0001
	Empathy	0,12	0,02	5,61	<,0001
	Dedication	0,08	0,03	3,26	,0011*
	Competence	0,02	0,02	0,88	,3797*
Defence Ministry	Intercept	0,81	0,07	11,59	<,0001
R^2=,29	Honesty	0,34	0,03	10,94	<,0001
	Empathy	0,15	0,02	6,72	<,0001
	Dedication	0,13	0,03	4,71	<,0001
	Competence	0,05	0,02	2,57	,0101*

'Coefficient' indicates how much 'trust' changes when a predictor changes by 1 unit. * Not significant at p values below 001.

4.6.3 Attitude: results

Most people have a neutral attitude to the base (total 52.1%: Figuur 12). About a quarter have a fairly positive (19.6%) or positive (8.2%) attitude, and one in five have a fairly negative (11.4%) or very negative (8.8%) attitude to the base.



Figuur 12 Proportion of the population with a negative, neutral or positive attitude to the Geilenkirchen air base

Residents' attitudes are more pronounced in Schinnen, Brunssum and Onderbanken (the 'neutral' proportion is less than for the totality of municipalities): Brunssum has more people with both a positive attitude and a negative one, and Schinnen has more people with a negative attitude. In Onderbanken over half of residents have a negative attitude to the base, particularly in Merkelbeek (Table X20).

4.7 Compensation and possible solutions

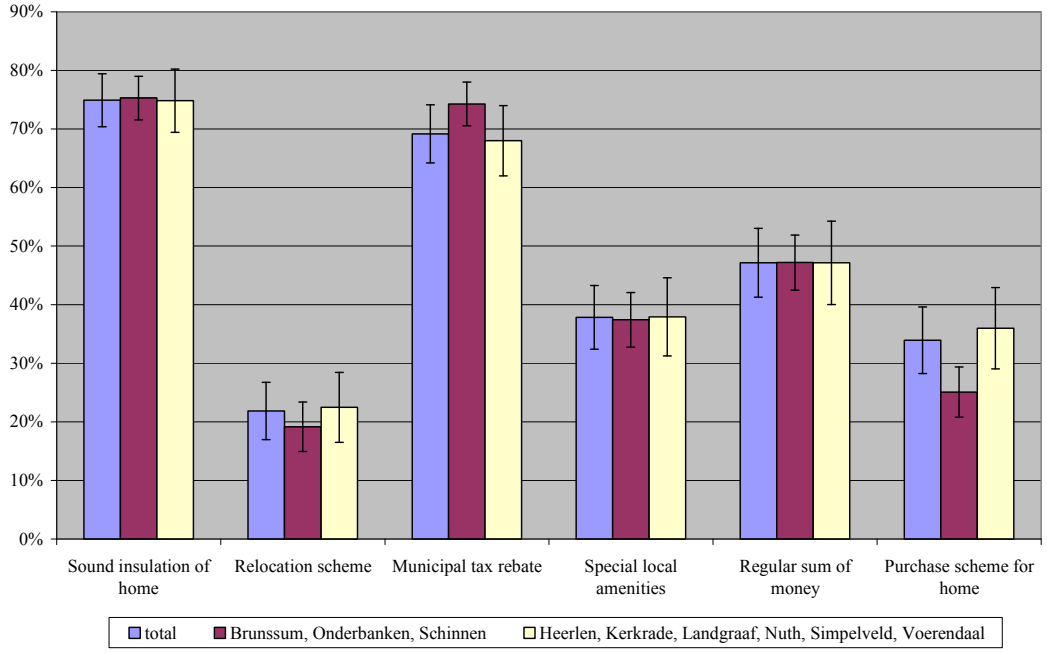
Compensation literally means 'remedying, topping up or replacing something that is deficient or absent', and it can take a tangible or intangible form. Tangible compensation takes the form of material goods, e.g. providing special amenities for homes or in the residential environment. Another type of compensation is financial: here a sum of money is provided to offset the disadvantages of an activity or situation. There are methods for expressing the adverse effects of an activity or something whose price is not determined by a market mechanism in monetary terms (monetarizing it). What also sometimes happens is that annoyance from one environmental factor is compensated for by reducing exposure to another environmental factor.

The questionnaire survey investigated the support there was for compensation, considering potential forms of compensation suggested e.g. during the qualitative survey. Respondents were also asked about the solutions they would like to see to reduce or avoid the adverse effects of the base.

4.7.1 Compensation: results

Over half of the population are open to the possibility of some kind of compensation to offset the disadvantages of the base (total 61.7%). Although the percentage was significantly lower in Schinnen,

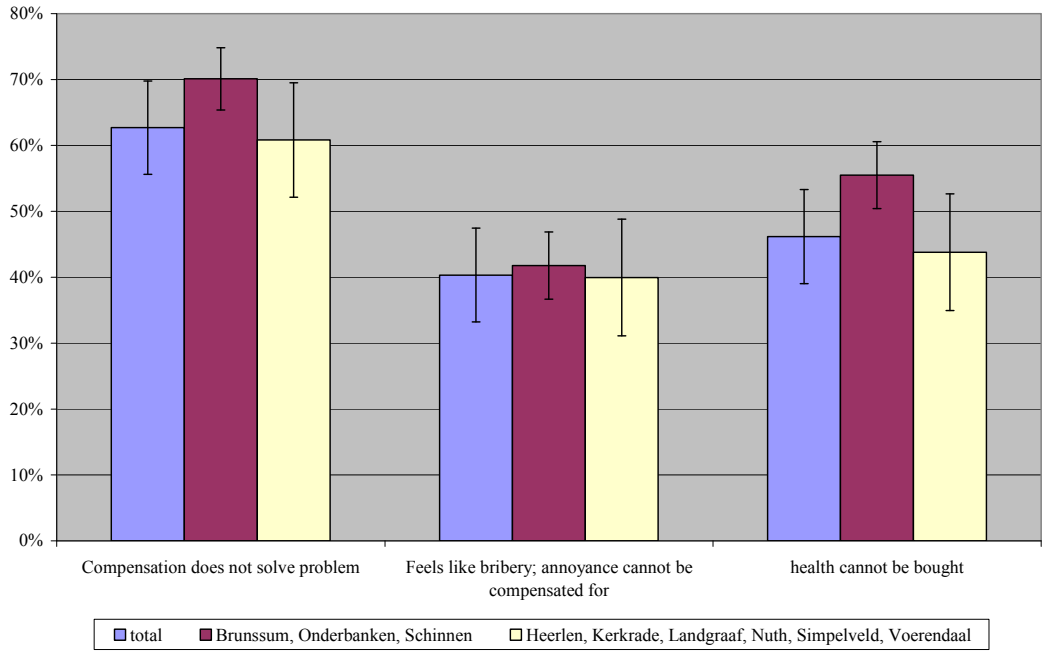
Onderbanken and Voerendaal, over half of residents said they were open to the possibility of compensation. This was not the case in Amstenrade and Bingelrade, however, where just under half of residents are open to the possibility of compensation (Table X15). Of those who are open to the possibility of compensation, 74.9% regard sound insulation as the most suitable type, followed by municipal tax rebate (69.2%). Slightly less than half of residents (47.1%) regard a regular sum of money for local residents as a suitable type of compensation. The least suitable type, relatively speaking, is a relocation scheme whereby government arranges a replacement home: about one in five (21.9%) selected this option (Table 13).



Figuur 13 Types of compensation regarded as suitable/very suitable by those local residents who are open to the possibility of compensation

Others types of compensation mentioned (n= 128; 5.1%) were quieter engines, closing or moving the base, rebate on medical expenses and reducing the number of aircraft movements.

A total of 38.3% of residents are not open to the possibility of compensation (inner area 42.6%, outer area 37.3%: Table 14). In Onderbanken, Schinnen and Voerendaal a higher than average proportion of residents are against compensation (Table X16). They consider above all that it would not solve the problem (62.7%); this was particularly the case with residents of Schinnen and Onderbanken. About half take the view that health cannot be bought (46.2%), in particular in Onderbanken, Landgraaf and Nuth. For a large proportion of this group compensation feels like bribery (annoyance cannot be compensated for (40.3%)), particularly in Schinnen, Brunssum, Onderbanken and Nuth.

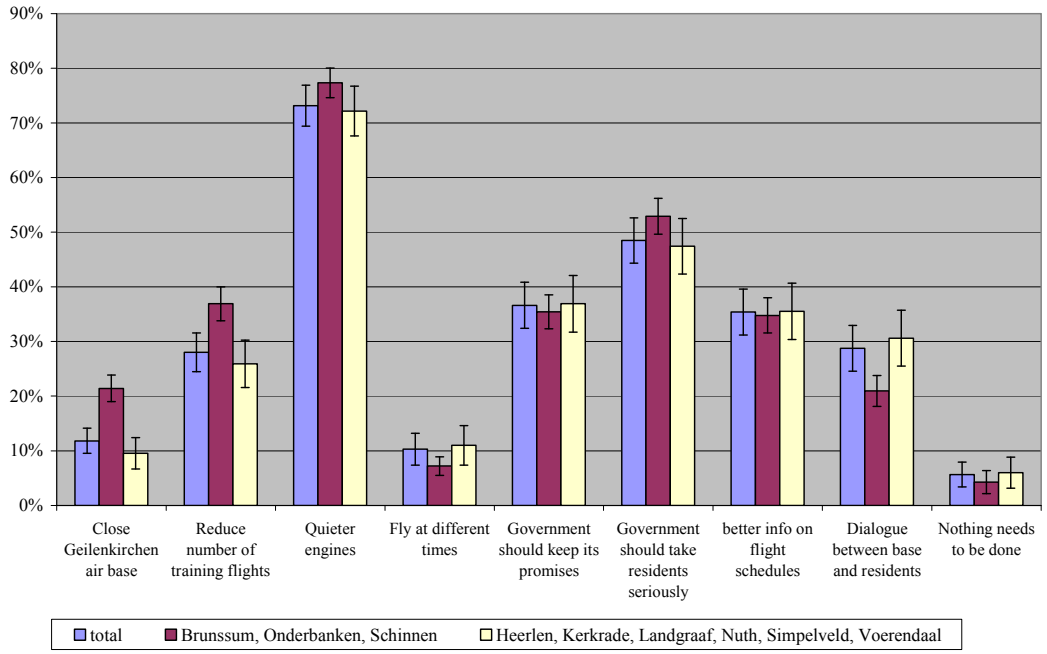


Figuur 14 Reasons for not being open to the possibility of government compensation to make the disadvantages of the Geilenkirchen air base more acceptable

Other reasons mentioned (n=82, 3.3%) were that people did not experience any disadvantages, or they did not consider compensation to be necessary.

4.7.2 Possible solutions: results

The possible solution most commonly mentioned was equipping the aircraft with quieter engines (73.2%: Figuur 15). Other frequently mentioned solutions have to do with the relationship between government and the public: government should take residents seriously (48.5%) and it should keep its promises (35.4%). Improving the information provided was also frequently mentioned as a possible solution (38.8%). About one in nine residents (11.8%) say the base should be closed. Here there are large differences between municipalities: in the inner area over 20% of residents would like to see the base closed. 5.7% of the population say nothing needs to be done (Table X19).



Figuur 15 Ways of resolving the disadvantages experienced by residents as a result of Geilenkirchen air base and the aircraft (AWACS; more than one answer allowed)

4.8 Information

Information is one of the topics that emerged from the qualitative survey: people said in particular that they would like more information on the base than hitherto. Information is part of risk communication, which is 'the process of communicating risk factors related to industrial technology, natural hazards and human activities' (Leiss, 2004). Unlike risk communication, which revolves around the exchange of information between the various stakeholders (NRC, 1989; Leiss, 2004), information is one-way traffic, from the authorities (e.g. government) to residents (Brug et al., 2000). *Postbus 51* (public information service) television commercials are an example. Information can increase or change people's knowledge; it can also increase people's trust and make them more articulate (Gurabardhi et al., 2005; Payne-Sturges et al., 2004). A simple model that illustrates the information process is the Sender-Message-Receiver model (SMR model: Shannon and Weaver, 1947). This indicates what elements are involved in information transfer: source, sender, channel, message and receiver.

The questionnaire survey looked into these links in the information chain.

4.8.1 Information: results

Demand for information
Just under one in three residents (total 31.0%) did not want any information (Table X10).

Source
Residents who did want information (total 69.0%) would prefer to receive it from the province (50.0%) but also from e.g. municipalities, pressure groups, the Municipal Health Service, a representative or a Ministry (Housing, Defence: Table X12).

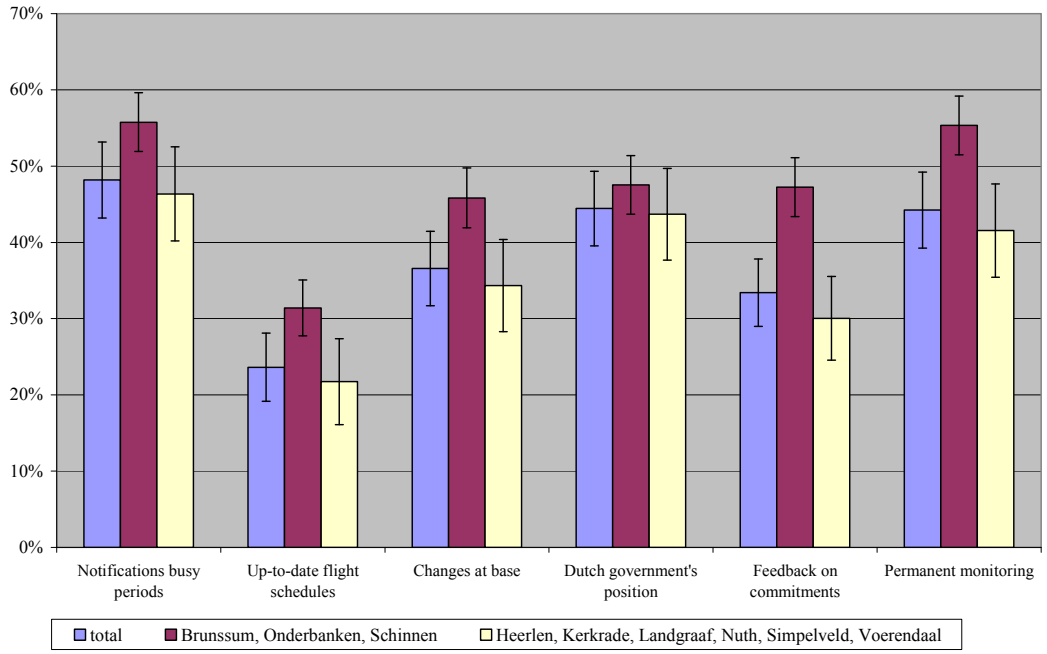
Sender
Most residents (total 52.0%) receive information on the Geilenkirchen air base through the 'media' (free sheets, newspapers, radio and television: Table X10), so the media are the most important 'sender'. 'Pressure groups' (Stop AWACS and environmental organizations:16.9%) and the 'municipality' (10.3%) are also important senders, albeit to a lesser extent. The Municipality of Onderbanken was an exception here: besides the media the municipality and pressure groups were also important senders. The other senders played only a small role (less than 6%).

Channel
Most residents want to receive information from free sheets (54.0%) and local media (newspapers, radio, television: 47.6%), followed by regional media (31.9%: Table X14). Information meetings organized by the municipality (5.9%) or the base (7.2%) are apparently a less suitable way of conveying information.

Type of information (message)
People want various types of information (Figuur 16). Just under half of residents would like notifications of busy flying periods (48.2%). A large proportion of the population would also like information on the Dutch government's position on the base (44.4%) and on the level of aircraft noise from permanent monitoring[3] (44.2%). About one in three residents would like information on changes at the base (36.6%) and feedback on undertakings (33.4%). About a quarter of the population would like up-to-date information on flight schedules (Table X13).

Satisfaction with information (receiver)
About one-third of residents are satisfied with the information they receive from sources such as the municipality, the province, the media or pressure groups (Table X11). Satisfaction does vary by municipality/four-digit postcode area and source, however. A relatively large number of residents in Onderbanken were satisfied with the various sources. In Nuth and Simpelveld very few people were satisfied with the information, especially from the province.

[3] The noise monitoring network has been operational since 3 December 2007.



Figuur 16 Type of information desired (more than one answer allowed)

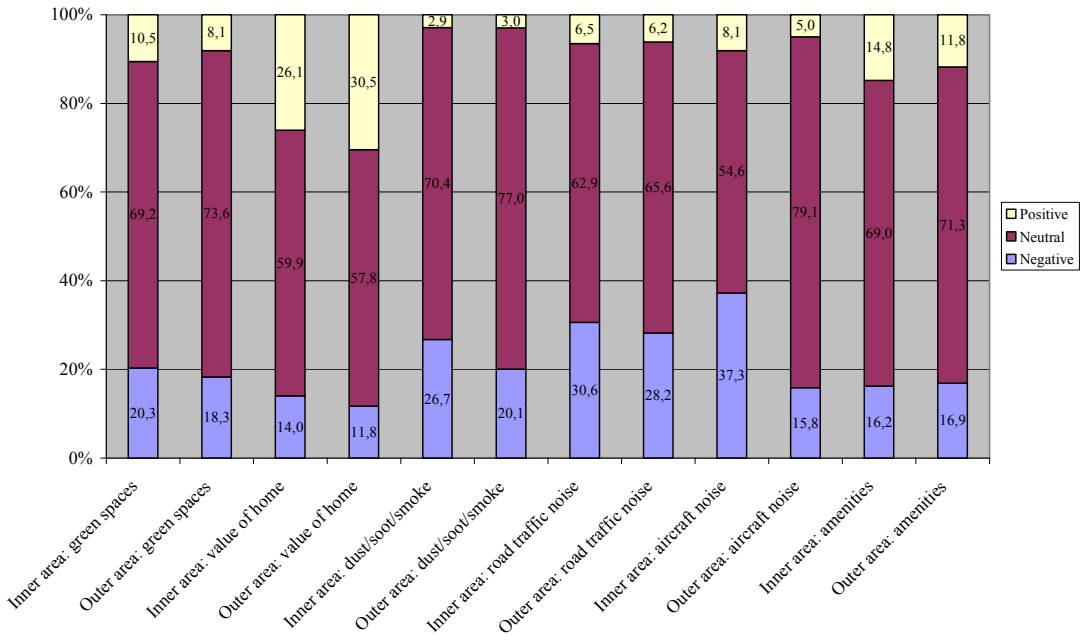
4.9 Expectations

Expectations as to how the residential environment will change were one of the perception aspects that – along with e.g. satisfaction with the home – strongly determine satisfaction with the residential environment (Houthuijs and Van Wiechen, 2006). In 2003 74% of the Dutch population thought that their residential environment would remain unchanged in future, 12% that it would get better and 14% that it would get worse. Various aspects of the residential environment are generally looked at, including aircraft noise. About 81% of people in the Netherlands think that aircraft noise in their neighbourhood will not change in the near future; about 3% think it will get better, and about 10% that it will get worse (Franssen et al., 2004).

The questionnaire survey asked about the future expectations people had for certain aspects: green spaces, value of the home, air quality, road and air traffic noise and amenities.

4.9.1 Expectations: results

The majority of residents in the area around the base had neutral expectations regarding the future of the environment (between 55% and 80%: Figuur 17). Of those who are not neutral about the future of the environment, the majority are negative, expecting it to get worse. Expectations about the value of the home are an exception: more people are positive than negative about this. Expectations were particularly negative as regards road traffic noise and air quality (dust/soot/smoke). People are most pessimistic about aircraft noise in Schinveld, Brunssum and Onderbanken (get worse 32.8%-50.9%) and air quality (get worse 24.4%- 35.0%). There are also people who are optimistic about aircraft noise, the highest proportion being in Onderbanken (11.7%: Table X17).



Figuur 17 Expectations for various aspects of the residential environment in the inner area (Brunssum, Schinnen and Onderbanken) and the outer area (Heerlen, Kerkrade, Landgraaf, Nuth, Simpelveld and Voerendaal)

5 Discussion, conclusions and recommendations

This chapter discusses the results of the survey. Based on the research questions it draws conclusions and makes recommendations on how to apply the findings to policy.

5.1 Answers to research questions and conclusions

1. How much annoyance, sleep disturbance and concern do residents of the area around the Geilenkirchen air base experience, how do they perceive their health, how satisfied are they with their residential environment, and what determinants affect their perception of the base?

Annoyance
The proportion of the population experiencing serious annoyance from the noise of military air traffic in the survey area is 18.6%, corresponding to about 41,000 of the 220,000 adult residents there. The worst areas for noise annoyance are the municipalities of Onderbanken (63.9%), Brunssum (28.9%) and Schinnen (39.4%). The most recent Annoyance Survey shows that nationwide 6% of the population say they experience annoyance from military air traffic. Comparing this percentage with the other municipalities in the survey area we see that here too the annoyance rates are higher than the national average. This indicates that the base's sphere of influence as regards noise from military air traffic is not confined to the municipalities of Onderbanken, Brunssum and Schinnen but extends at least to the other municipalities included in the survey. Serious annoyance experienced as a result of ground activities at the base, such as sleep disturbance and noise, odour and vibration annoyance, is concentrated mainly in the inner area, i.e. the municipalities of Onderbanken, Schinnen and Brunssum.

Three questions were put to the survey participants on the extent to which air traffic noise had caused them annoyance, disturbance or annoyance during the past twelve months. A distinction was made between noise from military air traffic (e.g. AWACS), other air traffic (e.g. from Maastricht-Aachen Airport) and total noise annoyance from air traffic. We would expect the proportion of serious annoyance from total air traffic to be higher than that from military or other air traffic, but this is not the case. The proportion of people highly annoyed by military air traffic is generally higher than that for total air traffic. This indicates that the respondents' reactions to a question on annoyance experienced from military air traffic (e.g. AWACS) produce higher scores (more perceived annoyance). It may be that the question on total air traffic produces some kind of average: respondents experience annoyance from military air traffic but less from other air traffic in the area, so they give a lower (i.e. average) annoyance score in answer to the question on total air traffic. Another possibility is that the specific source (AWACS) produces a stronger reaction (a higher perceived annoyance score) to the question about annoyance from military air traffic. Lastly, the specific nature of the exposure – peaks of elderly, noisy aircraft flying overhead at intervals – could produce a stronger reaction (more annoyance). This finding is also reflected in the exposure-response relationship (Figuur 7), which shows the correlation between noise from military air traffic (in L_{den}) and the proportion of the population experiencing serious annoyance (in percent). There is a strong correlation between the level of noise to which people are exposed and the degree of annoyance they experience. A conspicuous feature of the exposure-response relationship is that the proportion of annoyed people in the survey area is higher than we might expect from existing exposure ratios. This shows that the particular noise situation in the survey area cannot be described adequately using the exposure-response relationships that apply around civil airports or those proposed for use in the European Union.

The reported annoyance from noise, odour and vibration appears to be an accurate reflection of perceived annoyance. Comparability with an external reference, e.g. questions not directly related to the survey remit, provides an indication of any distortion of the survey results, as there is always the possibility in a survey looking at a specific problem that respondents will exaggerate the perceived problem because they realize what the aim of the survey is. The reported perceived annoyance from sources other than the air base (e.g. traffic and neighbours) in this survey is in line with the national figures from the Annoyance Survey. The high reported noise and odour annoyance (from military air traffic) is also in line with the findings of the Netherlands Housing Survey (WoON: see Deuning, 2007). This shows that noise and odour annoyance in some parts of the survey area (in particular Onderbanken and Heerlen) is much more common than nationwide.

Over the years perceived noise annoyance from military air traffic in the area has increased, and it has been at the current level for some years now (Table 9). The various results are not entirely comparable, however, because of differences in survey methods and definitions of annoyance, but the orders of magnitude are comparable. The increase in annoyance after 1998 was noted after the inquiry into the consequences of the air tanker accident in 1999 (Hajema et al., 2000; Hoebe et al., 2001). The continuing elevated level of annoyance was noted in 2003 (Gielkens-Sijstermans et al., 2005). The present survey also shows that the amount of perceived annoyance is in the same order of magnitude. At the time the increase was attributed to the impact of the aircraft accident. Whether this explains the similar level found in the present survey is unclear.

Table 9 Serious perceived noise annoyance from military air traffic over the years (% highly annoyed)

Municipality	2007	2003	1998
Onderbanken	63.9	60.3	39.8
Brunssum	28.9	31.1	19.0
Schinnen	39.4	35.3	21.4
Heerlen	17.7	11.2	6.4
Kerkrade	13.5	10.2	4.5
Landgraaf	6.2	5.7	4.4
Nuth	10.6	11.8	12.3
Simpelveld	11.6	6.0	4.4
Voerendaal	24.3	16.5	9.8
Total	18.6	15.0	9.4

The noise annoyance figures from 1998 and 2003 are TNO-standardized figures based on data from the Limburg Health Survey (Gezondheidsenquête Limburg. 1999) and Gielkens-Sijstermans et al. (2005).

Looking at the variables that explain annoyance, we find that so-called 'non-acoustic' factors play a major role in addition to noise exposure (L_{den}, computed). Negative expectations about the future noise situation, positive and negative feelings when thinking about AWACS, sensitivity to noise, general concern and noise annoyance while engaged in activities are all found to be variables that contribute to perceived annoyance. Some of these factors (expectations, sensitivity to noise and concern) are also involved in the relationship between aircraft noise and annoyance around Schiphol (Houthuijs and Van Wiechen, 2006). How effective measures to reduce perceived annoyance by influencing these factors are is not known. Apart from noise exposure, it would seem that government can only influence some of these explanatory factors through indirect mechanisms, of which displaying empathy (positive and negative feelings) and gaining trust (concern) would seem to be the most promising. The only way to eliminate the annoyance entirely is to eliminate the source of the noise. The essential point is that perceived annoyance is influenced not only by the noise load from military aircraft but also by other – non-acoustic – factors.

Sleep disturbance
About 6% of residents experience serious sleep disturbance from military air traffic, the highest proportion being in Onderbanken, Brunssum and Schinnen. Some of the sleep disturbance occurs during the daytime: about 30% of residents said that they sometimes needed to sleep during the day. Of these, 11% said that they suffered from serious sleep disturbance, as against 4% of those who did not need to sleep during the daytime. Also, in part of the survey area it may be that some of the sleep disturbance due to civil aviation is being wrongly attributed to military air traffic.

Self-reported health
Self-reported health was measured by various questions in the questionnaire. The various measures of health obtained from the answers to these display the same pattern: self-reported health in the survey area is less good than we might expect from reference populations. 'Perceived health' and health perception, as measured by the RAND scales of general health and mental health, are both lower in the survey area than nationwide, except for physical symptoms, which display a comparable pattern to that in the reference population.

The 'perceived health' ratings determined by Statistics Netherlands for all the Municipal Health Service areas in the Netherlands (Mac Gillavry et al., 2007) show that perceived health in the Eastern South Limburg area is lower than in the rest of the country: indeed, it is the lowest of all the former Municipal Health Service areas. The same negative deviation is found in the present survey, although 66% of the population in the survey area say that they perceive their health as good or very good. Thus the perceived health of residents of the survey area is 14% below the national figure and 9% below the figure for the Eastern South Limburg Municipal Health Service area. The latter area is larger, however, than the survey area.

We examined what factors influence health perception (RAND general health) in the survey area. The analysis revealed that greater satisfaction with the residential environment, better mental health status, age and fewer physical symptoms influence health perception. The model included exposure (in L_{den}) to noise from military aircraft, but no correlation was found between this and health perception.

Concern
About 16% of the population say they are highly concerned about living near a military air base. Many people said that they live near the base (an estimated 82,000) or under the aircraft approach path (an estimated 77,000): of these, 47% are highly concerned about living under an approach path (about 36,000 residents) and 42% are concerned about living near the base (about 35,000). Interestingly, while concern in the municipalities of Onderbanken, Schinnen and Brunssum is higher, many residents of the other municipalities are also highly concerned about the risks of military air traffic. The questionnaire asked about a number of specific risks: the health effects of aircraft noise, exhaust emissions from aircraft and the possibility of an aircraft accident. Concern among the population is highest about the possibility of an accident involving a military aircraft, with over half of residents worried about this.

We examined what factors influence the degree of concern about a particular risk. The analysis produced the same results for concern about health effects, exhaust emissions and aircraft accidents. People who have negative perceptions of the air base, negative feelings when thinking about AWACS and higher age in particular feel more concern.

Residential satisfaction
Satisfaction with the home is high and appears to be in line with the national data. Satisfaction with the residential environment is also high, but there are large differences between municipalities. Some of

these can be attributed to the degree of urbanization: higher urbanization results in lower satisfaction with the residential environment, as found in other surveys (e.g. WoON, 2006). This reasoning does not work in the case of Onderbanken: this is a municipality with a relatively low degree of urbanization and low satisfaction with the residential environment, which do not tally. There are large differences in satisfaction with noise in the environment, as we would expect: satisfaction with noise is particularly low in the municipalities of Onderbanken, Schinnen and Brunssum.

Residential satisfaction is not correlated to the noise load from military air traffic; the variables that determine it are: positive perceptions of the home and the residential environment, e.g. how safe people feel there; a low degree of urbanization; being an owner-occupier; personal health perception; and expectations regarding the value of the home.

Conclusions:

- About 20% of residents of the area of the Netherlands around the Geilenkirchen air base say they experience serious noise annoyance from military air traffic, an estimated 41,000. In the Netherlands as a whole, 6% of people experience serious annoyance from military air traffic.
- In addition to noise exposure (in L_{den}), serious annoyance is determined by other 'non-acoustic' factors. Negative expectations about the future noise situation, negative and positive feelings when thinking about AWACS, sensitivity to noise and concern all affect the degree of annoyance perceived by residents. Some of these factors (expectations, sensitivity to noise and concern) are also involved in the relationship between aircraft noise and annoyance around Schiphol Airport.
- The exposure-response relationship found (L_{den} vis-à-vis percentage of people highly annoyed by noise: Figuur 7) shows a strong correlation, but it differs from the situation around civil airports. This shows that the particular noise situation in the survey area cannot be described adequately using the exposure-response relationships that apply around civil airports or those proposed for use in the European Union.
- About 16% of the population say they are highly concerned about living near a military air base.
- Annoyance and concern are highest in the municipalities of Onderbanken (proportion of residents experiencing serious annoyance from the noise of military air traffic: 64%, proportion highly concerned 58%), Brunssum (29% and 32% respectively) and Schinnen (39% and 25% respectively), but they were clearly found in the other municipalities in the survey area as well.
- Odour and vibration also cause serious annoyance: people say they experience this particularly in Onderbanken (36% and 41% respectively), Brunssum (10% and 17% respectively) and Schinnen (9% and 18% respectively).
- The proportion of residents who perceive their health as good (67%) is lower than in the total Dutch population (80%). In the Eastern South Limburg Municipal Health Service area as a whole 75% of people perceive their health as good, the lowest score in the whole of the Netherlands.
- About 6% of residents say they experience serious sleep disturbance from military air traffic. Some of this occurs during the daytime, as this is when some people sleep. In parts of the survey area it may be that sleep disturbance due to civil aviation is being wrongly attributed to military air traffic. In the Netherlands as a whole, 1% of the population say they experience serious sleep disturbance from military air traffic.

2. What is communication like between the various stakeholders, and what would people like to see done in future?

The question about communication is confined mainly to the information provided by a number of authorities involved. There is a great demand for information among residents. One in three residents are satisfied with the information they receive, although there are large differences in satisfaction

between residents of particular municipalities. The information residents receive comes largely through various media (free sheets, newspapers, radio and television), pressure groups or the municipality. Only a limited amount of information is provided directly by e.g. the province, central government, the air base or the Municipal Health Service (under 6%).

Over two-thirds (69%) of residents would like to receive information about the base. They would like information in particular from the Province of Limburg, as well as the municipality and central government. Different types of information are desired: just under half of residents would like information on busy flying periods; people would also like information on the Dutch government's position, on noise levels, on changes to the base or feedback on undertakings. Residents would prefer to receive this information from free sheets and local media (newspapers, radio, television). Information meetings are a less suitable way of conveying information.

Conclusions:
- There is a great demand for information among residents.
- They would particularly like information from the base on e.g. busy flying periods. There is also a demand for information from the Dutch government on its position on the base and military air traffic.

3. Is there any support for particular types of compensation to residents living around the air base, and if so, what types of compensation would people prefer?

The survey shows that the majority of the population are open to the possibility of some kind of compensation (61.7%) to offset the annoyance caused by the presence of the air base. In some postcode areas of Schinveld and Amstenrade, especially those nearer the base, about half of the population are open to the possibility of compensation, however. There is a good deal of support for sound insulation for homes, somewhat less for municipal tax rebate or a regular sum of money. The survey did not look at the size of any rebate or regular sum of money. There are various methods and techniques for monetarizing such things as health or environmental quality, but expressing loss of health, well-being or environmental quality in monetary terms is not without its pitfalls (Dusseldorp et al., 2001; Lebret et al., 2005). The survey also did not look at how compensation should be applied (e.g. a one-off or regular payment, only for current residents or also for future ones) or the extent to which it would reduce the perceived annoyance or concern.

As against the majority who are open to the possibility of compensation, a proportion of residents (38.3%) are not in favour, saying that it would not solve the problem, which is of course true: compensation does not eliminate the annoyance, it merely aims to provide something positive to offset the negative effects of the base.

Possible solutions include technical measures (quieter engines) and a better relationship between government and residents (taking them seriously, keeping promises). Interestingly, high scores were given not only for technical but also for 'relational' solutions: residents want government to take them seriously, and government needs to keep its promises. This is a challenge for the authorities.

Another interesting point is that a relatively small proportion of residents (about 11%) mention closing the base as a solution. We would expect this option to be chosen more often. Although the proportion in favour of closure is higher nearer the base (maximum 40%), this is still remarkable. A possible explanation is that while this is the most desirable solution for local residents it is also the least realistic (so why choose it?). Another explanation could be that a lot of residents had the idea that quieter engines would be introduced, as the government has undertaken on several occasions to keep up

pressure on NATO to fit the AWACS with quieter engines. Lastly, it could be that what people are against is not so much NATO activities in their backyard (NIMBY) as the way the activities are conducted and communicated. The high proportion of residents who give quieter engines as a possible solution would seem to support this argument.

Conclusions:
- There is support for compensation: about 60% of residents say they are open to this possibility. Support is lower in some postcode areas, however, where just under half of residents are open to the possibility of compensation.
- About 40% say they are not open to the possibility of compensation because it would not solve the problem, health cannot be bought or it feels like bribery.
- Possible solutions put forward by residents include both technical measures (quieter engines and insulation) and relational measures (keeping promises, taking residents seriously).

4. How much trust do the population have in the authorities involved in making decisions on the Geilenkirchen air base, and what factors affect this trust?

The survey looked specifically at trust in the authorities, asking whether residents trusted the information from each particular authority on the Geilenkirchen air base. This measures not trust in the authority as a whole but specifically in the information provided by that authority on the base, as people's trust in the authorities on other matters might be different. With this in mind, we can say the following about trust in the authorities.

Trust varies from 16.7% in information from the German government to 39.8% in information from the South Limburg Municipal Health Service. Trust in information from the municipality, the province, ministries and the base is between 20% and 25%. This is in line with the degree of trust in central government as regards information on other specific topics such as the environment (Dekker, 2001). Trust in the information provided by the various authorities varies considerably among the municipalities in the survey area.

Residents' trust in the various authorities is determined mainly by the degree of an authority's perceived 'honesty' and 'empathy', slightly less by 'dedication' and very little by its 'competence'.

Conclusions:
- About 20% of residents have some trust or a lot of trust in central government as a source of information on the base. This is in line with the degree of trust in information from central government on specific topics.
- Honesty and empathy are the two main factors that determine residents' trust in government.

5.2 Recommendations

Lastly, we put forward a number of policy recommendations based on the findings of the perception survey.

Noise, odour and vibration
Reduce exposure to emissions from the base and the military aircraft.
There is a clear correlation between exposure to aircraft noise and the degree of perceived annoyance. Perceived annoyance is based on exposure to noise, odour and vibration as a result of ground activities

at the base and military air traffic. While exposure (to noise) only partly explains the perceived annoyance, this would lessen if exposure were to be reduced. One way of doing this would be to step up policy on replacing the current engines. For many residents, replacing the current engines on the AWACS aircraft would be a major solution. Another way of tackling the problem would be to reduce emissions due to ground activities at the base. A third way would be to provide sound insulation for homes. A fourth way would be to reduce the number of training (and other) flights. A fifth way would be to change flight paths and/or schedules, which could have a mitigating effect.

The relationship with local residents

Improve information to residents

There is a great demand for information, and the suggestions are concrete. Some residents would like notifications of busy flying periods. Residents would also like information on the Dutch government's position on the base, on changes to the base and on aircraft noise from permanent monitoring. The government began permanent monitoring in December 2007. People would also like feedback on undertakings and up-to-date information on flight schedules.

Make it clear what residents can expect in future

Residents expect to be taken seriously and promises to be kept. For example, what can they expect, and what can they not expect, on the basis of the results of this survey?

Concern

Make noise levels more predictable

The extent to which people think they can do something about the annoyance affects the concern they feel. An individual cannot eliminate the annoyance, but predictability, or a regular pattern, can make it more controllable. If they have information on e.g. how often and when the military aircraft will be flying (so and so many today at such and such a time), residents know what to expect and can plan their activities accordingly.

Trust

Regain the trust of the population

Trust, in particular in government and the base, is low. A large proportion of residents have little or no trust in these authorities. There are a number of factors that can influence trust. Honesty and empathy are factors that play a role for residents in the survey area as regards trust in the authorities. Trust might be regained by being honest about what is going on and sympathizing with residents' perceptions.

Monitor perceptions on a permanent basis

By monitoring perceptions, the authorities can keep their finger on the pulse, thus providing an indication of whether policy on reducing exposure and annoyance is having the desired effect or whether it needs to be revised.

Balancing out the pros and cons

Investigate the possibility of appropriate compensation

There is support for compensation among part of the population, but it is not clear as yet what form it should take and what the magnitude or duration should be. Before a compensation scheme is introduced it needs to be examined how people should be compensated, who should be compensated and for how long.

Consider providing sound insulation as a compensation measure

Sound insulation was mentioned as one of the possible solutions, but also as a possible form of compensation.

6 Description of survey method

The perception survey in the area around the Geilenkirchen air base comprised an exploratory qualitative survey and a quantitative survey based on the qualitative survey. The qualitative survey entailed holding focus group interviews with residents of Brunssum, Schinnen and Onderbanken (Schinveld and Merkelbeek) and interviews with 'key figures' from the area. The purpose of the interviews was to canvas the opinions, preferences and perceptions of residents on the Dutch side of the Geilenkirchen air base. The topics that emerged from the interviews were used as input to a questionnaire on the perceptions of local residents. The results of this exploratory survey are not representative of the residents in the survey area; they provided an indication of the issues that concern the population regarding the base and AWACS. The quantitative survey comprised a cross-sectional survey based on a written questionnaire containing questions on both perceptions and health aspects and possible determinants of these. The survey was conducted among the adult population (aged 18 or over).

6.1 Survey area

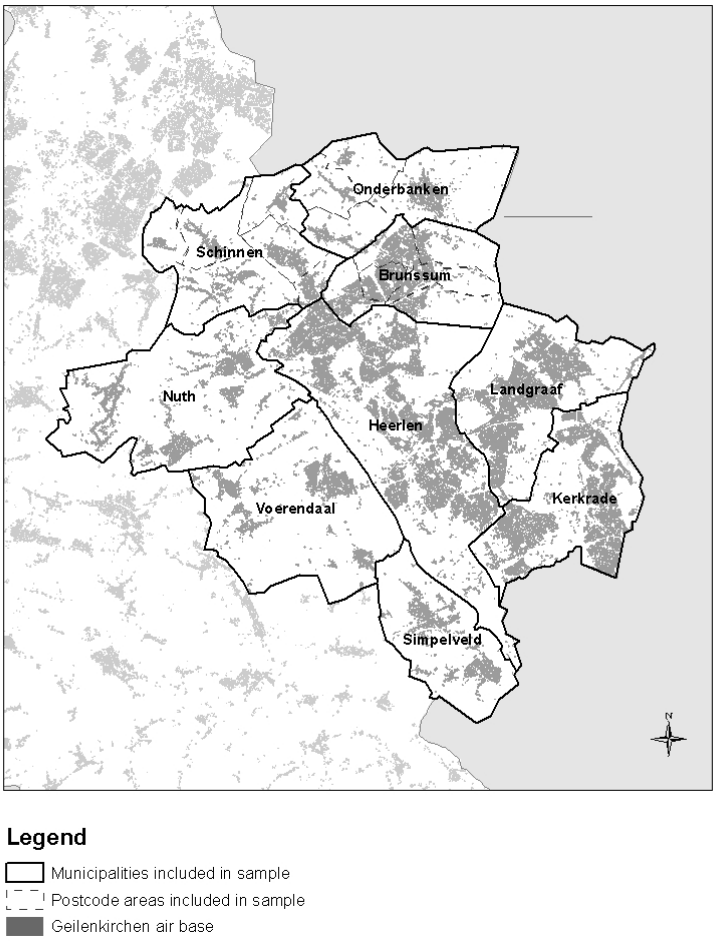
The survey area was selected as being the base's expected sphere of influence. Within the area there had to be sufficient contrast in exposure to noise, odour, vibration etc. to examine the influence of the base. The boundaries of the area were based on four-digit postcode areas (4DPAs) and municipal boundaries. Statistics Netherlands (CBS) records a lot of general population characteristics by 4DPA which were available for use in the analyses. A number of environmental characteristics were surveyed using a Geographical Information System (GIS), taking into account exposure to aircraft noise, numbers of complainants in each 4DPA, locations of take-off and landing routes, the possibility of aviation fuel being dumped, municipal boundaries and the results of monitoring surveys by the South Limburg Municipal Health Service.

The records of the Limburg AWACS Committee (Commissie AWACS Limburg, 2007) show that the majority of complainants live in the municipalities of Onderbanken, Brunssum and Schinnen. Complainants are also recorded to the south of that area, however, owing to the take-off and landing routes, which skirt round the Municipality of Brunssum and Hoensbroek (Municipality of Heerlen).

Following consultation with the client, the advisory committee and the scientific advisory committee it was decided to focus particularly on the municipalities in the immediate sphere of influence of the Geilenkirchen air base, where residents' perceptions would be surveyed at a low level of aggregation (4DPA). The survey area extends to the Dutch municipalities within or intersected by a 10-kilometre radius from the base and those municipalities where residents are likely to be living within the base's sphere of influence because of the take-off and approach paths. The area is thus split into two parts, as follows:

1. The base's immediate sphere of influence (the 'inner area')
The base's immediate sphere of influence contains the municipalities of Onderbanken, Brunssum and Schinnen. These are the municipalities with the highest noise loads (Lania, 2006) and the largest numbers of complainants immediately under the take-off and approach paths to the airfield. Health aspects and perceptions were surveyed at four-digit postcode level in these municipalities.
2. The area around the base (the 'outer area')

The area around the base comprises the municipalities of Landgraaf, Heerlen, Nuth, Simpelveld, Voerendaal and Kerkrade. The Municipality of Simpelveld is outside the 10-kilometre radius of the base, and only tiny parts of the municipalities of Voerendaal and Nuth lie within it. These municipalities were included following a conversation with someone from the National Aerospace Laboratory (NLR), who pointed out the possible influence there of the take-off routes. Health aspects and perceptions were surveyed at municipal level in these municipalities.



Figuur 18 Residential areas in the municipalities and postcode areas in the survey area in relation to the Geilenkirchen air base (thin grey line)

6.2 Qualitative survey

6.2.1 Selection of areas and contacting of respondents

The focus groups were held in the area that lies in the base's immediate sphere of influence, as it is the residents there that are most affected by the base. Three focus groups were held, in Brunssum, Schinnen and Schinveld. The aim was to form a group of ten residents for each location, so 150 residents per location were sent written invitations. Their addresses were selected at random from the

Netherlands Address Coordinates (ACN) database of the Land Registry, within the postcode areas 6441, 6442 and 6444 (North and East Brunssum), 6451 and 6447 (Schinveld and Merkelbeek) and 6365 (Schinnen). The focus groups took place in community centres in Brunssum, Schinnen and Schinveld in February 2007.

The key figures were selected on the basis of their involvement with the problem and their knowledge of how residents perceive the presence of the base. An RIVM researcher personally invited them to be interviewed. The participants in the focus groups were sent letters asking them to sign up by telephone or e-mail for an interview on a weekday evening in their locality. The date and time were stated, but not the location. Those who signed up were sent a letter of confirmation stating the precise location.

6.2.2 Response rate and characterization of participants

All the key figures contacted were willing to be interviewed. From the 450 addresses to which letters were sent, a total of 18 residents participated in the three focus groups, i.e. a 4% response rate. It should be noted that the ACN database includes postcodes of businesses, shops, etc., but the response rate was still not very high.

Because of this a number of residents (53 in total) from the sample of the three municipalities were contacted by telephone and asked if they would like to participate: this produced two acceptances. Residents were also asked why they did not want to take part. The telephone conversations revealed that a large number of those invited were not interested in the focus groups because they did not feel annoyed, they were not interested or they did not see any point in the whole survey. Other reasons given for not taking part were illness, old age or ‘don’t have time’.

The key figures interviewed individually were an alderman from the Municipality of Onderbanken, an alderman from the Municipality of Brunssum, two members of the Stop AWACS association, a Municipal Health Service official and two general practitioners. The two members of the Stop AWACS association were interviewed together, as were the two general practitioners.

Four residents took part in the focus group in Brunssum; there were five participants in Schinnen and nine in Schinveld. A total of sixteen men and two women participated in the focus groups, with ages ranging from 32 to 66. The length of time the participants had been living in their present home ranged from 1.5 to 44 years, with an average of 25 years.

6.2.3 Design of interviews

The interviews with the key figures were conducted by an RIVM researcher. All five interviews took place in January and February 2007, and each one lasted about an hour and a quarter. The focus groups were chaired by two RIVM researchers: these interviews took place in February 2007 and each one lasted about one-and-a-half hours. The interviews were recorded on tape. At the start of both the individual and the focus group interviews the purpose of the interview was explained and the perception survey as a whole was described. It was also emphasized that the RIVM’s role was to conduct the survey, the RIVM had no influence on policy and any follow-up action would be taken by the Housing Ministry. The participants were also told in general terms what the interview would involve.

The topics that could potentially be raised in the interviews were: residential satisfaction, annoyance, risk perception, perceived health, trust in various authorities, information, possible compensation, desired solutions, benefits of the air base, and actions that the participants were taking against the base. These were based on previous experience of the Schiphol Airport Health Impact Assessment

(RIVM/RIGO, 2005), which looked at such things as residential satisfaction, perceived health, annoyance and concern. The topics of possible compensation and trust were added from the survey remit.

6.3 Quantitative survey

6.3.1 Sample

The sample was a random stratified sample of all residents aged 18 or over in the survey area, based on name and address data from the Municipal Personal Records Database (MPRD) supplied by the participating municipalities. In the municipalities of Onderbanken, Brunssum and Schinnen the sample was stratified by four-digit postcode area (4DPA). In the other municipalities it was stratified by municipality, taking into account the distribution of residents among the 4DPAs in each municipality. This produced 22 strata (6 municipalities and 16 4DPAs). In each stratum 228 persons were selected so as to arrive at a net sample of 114 persons per stratum, given an expected response rate of 50%. The number of residents in each postcode area varies considerably in the survey area. In order to enable equally valid conclusions to be drawn on postcode areas with differing population sizes the sample was redistributed using a finite population correction, which measures how much higher the precision is the closer the sample fraction comes to the total population. This resulted in the sample structure shown in Table 10.

Table 10 Size of sample by stratum (after rounding)

Municipality	Postcode	Total population[1]	Population aged 18 or over	Sample	Weighting factor
Brunssum	6441	8105	6855	224	0.0327
	6442	2850	2240	216	0.0964
	6443	4200	3510	220	0.0627
	6444	6905	5505	224	0.0407
	6445	2985	2345	218	0.0930
	6446	4585	3655	222	0.0607
Onderbanken	6447	1735	1350	210	0.1556
	6451	4995	4005	222	0.0554
	6454	745	600	192	0.3200
	6456	885	705	196	0.2780
Schinnen	6155	2030	1615	212	0.1313
	6174	800	640	194	0.3031
	6365	2855	2325	218	0.0938
	6436	2560	2095	216	0.1031
	6438	4025	3130	220	0.0703
	6439	1165	925	202	0.2184
Heerlen	--	91500	74900	324	0.0043
Kerkrade	--	49300	41100	280	0.0068
Landgraaf	--	39200	31900	270	0.0085
Nuth	--	15900	12900	242	0.0188
Simpelveld	--	11300	9200	238	0.0259
Voerendaal	--	13000	10400	240	0.0231
Total		271625	221900	5000	

[1] Source Statistics Netherlands Statline, 1 January 2006

6.3.2 Questionnaire

The questionnaire was based on the questions posed by the client and the relevant topics brought up in the qualitative survey. To answer these questions, standardized questions from the Dutch and international literature were used as far as possible, as well as questions that have proved useful in previous RIVM research, including the Schiphol Airport Health Impact Assessment. The questions were organized under nine headings:

- Housing
- Health
- Noise, odour and vibration
- Safety
- Information
- Trust
- Geilenkirchen air base
- Compensation
- Personal characteristics

The full text of the questionnaire comprised 16 pages and is reproduced in Appendix 1. How the various questions and scales were operationalized is set out in Appendix 3: Additional Information on Topics.

6.3.3 Pilot

The draft version of the questionnaire was tested on a number of people from the survey population to find out whether anything in it was unclear. At the focus groups in February 2007 the participants were asked whether they were willing to take part in a pilot, and seventeen of the eighteen said they were willing to test it.

These seventeen people were sent the questionnaire by post at the beginning of May along with a reply envelope. Fifteen people returned the questionnaire with their comments and were sent a small gift for taking part. The amount of comments given varied: some people gave a lot, others none. The project team discussed all the comments, and the questionnaire was revised in response to some of them.

6.3.4 Field work and response rate

The field work was carried out by Veldkamp Marktonderzoek BV. Prior to this a press release was sent out and published in ‘De Trompetter’ (a regional weekly) on 8 August 2007. The questionnaire was sent out with a covering letter from the RIVM and notes from Veldkamp, along with a postage-paid envelope. Respondents could either return it by post or answer the questions in an Internet version of the questionnaire. They could indicate in the questionnaire whether they would like a small gift or whether the money for it should be donated to a charity.

The respondents were contacted in four waves so as to avoid distortion due to any unusual flight patterns as far as possible. The respondents were distributed among the waves at random. The first wave of questionnaires was sent out on 13 August 2007. The waves were sent out at approximately one-week intervals. The field work ended on 5 October 2007. Reminders were sent to non-respondents two weeks and four weeks after the questionnaires were initially sent out. N=5,000 people were invited to take part in the survey, of whom n=2,509 participated, i.e. a 50% response rate. The majority of the questionnaires were completed on paper (n=2,147, i.e. 86% of the total), and a smaller proportion on the web (n=362, i.e. 14% of the total). Table 11 shows the gross sample and the response rate for each wave.

Table 11 Response rates by wave

	Gross n	Net n	Response rate (%)
Wave 1 (13 August)	1250	647	52
Wave 2 (17 August)	1250	647	52
Wave 3 (24 August)	1250	613	49
Wave 4 (31 August)	1250	602	48
Total	5000	2509	50

The response rate to the first two waves was slightly higher than to the last two. The waves were sent out at weekly intervals, so the fourth wave went out three weeks after the first one. The field work for all four, however, ended at the same time, so the field work on the first waves in effect lasted somewhat longer than on the last one, which is why the response rate for the first two is slightly higher (52%) than for the last two (49% and 48%). Table 12 shows the gross sample and the response rate by municipality. The rate was highest in the Municipality of Onderbanken (58%) and lowest in the Municipality of Heerlen (42%). The final survey database contained data from 2489 respondents, as 20 questionnaires were found unsuitable for processing.

Table 12 Response rates by municipality

Municipality	Gross n	Net n	Response rate (%)
Brunssum	1324	655	49
Heerlen	325	138	42
Kerkrade	281	119	42
Landgraaf	270	120	44
Nuth	241	110	46
Onderbanken	820	479	58
Schinnen	1262	659	52
Simpelveld	237	109	46
Voerendaal	240	120	50
Total	5000	2509	50

6.3.5 General characteristics of the sample

It is well known that older people are often more willing to take part in research of this kind and also easier to contact. This was yet another survey where persons aged 45 or over were over-represented compared with the age distribution of residents aged 18-45 in the survey area (Table 13). The ratio of men and women, however, is very balanced in the survey population. Single-person households and one-parent families were under-represented in the sample because of the way the participants were selected: as each resident aged 18 or over in the survey area had the same probability of being selected, households with more than one person aged 18 or over had a higher probability of being included in the sample. The proportion of respondents with higher education was comparable with the average for the Netherlands, but the other education categories are unfortunately not directly comparable with the Statistics Netherlands figures.

Table 13 General characteristics of the sample

Variable	Category	Survey participants (%)	Reference number %
Age	18-44	29.4	41.3[1]
	45-64	44.2	36.9[1]
	65	26.5	21.8[1]
Sex	Male	49.2	48.9[1]
	Female	50.8	51.1[1]
Composition Household	Family without children	38.3	29[2]
	Family with children	37.3	29[2]
	One-parent family	3.7	6[2]
	Single-person household	15.1	35[2]
	Living with parents	5.6	--
Level of education	Primary	8.5	--
	Secondary phase 1	33.7	--
	Secondary phase 2	31.9	--
	Higher	26.0	25[3]
Length of occupancy of home	Under 5 years	18.8	--
	5 years or over	81.2	--
Tenure of home	Tenant	23.2	39.4[2]
	Owner-occupier	76.8	60.6[2]

[1] Calculated from four-digit postcode data from the participating municipalities (Statistics Netherlands Statline, population as of 1/1/2006)
[2] Figures from the Netherlands Housing Survey (VROM, 2007) for the Province of Limburg
[3] Onderwijs in cijfers (Education in Figures) yearbook, Statistics Netherlands, 2008

The proportion of owner-occupiers among the respondents was higher (76.8%) than might have been expected from the Netherlands Housing Survey for the Province of Limburg (60.6%).

6.3.6 Non-response survey

A non-response survey was carried out among the non-respondents, the aim being to find out to what extent this group differed from the respondents in terms of background characteristics and some important questions in the main survey, in other words to ascertain whether the non-response was selective. For the purpose of this survey eight questions were selected from the main survey questionnaire which were expected a priori to be possibly connected with local residents' reasons for taking part or not taking part in the survey (see Appendix 2: Non-Response Questionnaire). The questions related to: aircraft noise, satisfaction with the residential environment, trust in various authorities, concern, age, sex, level of education, and attitude to the Geilenkirchen air base. The non-respondents were also asked why they had not responded. The non-response survey was conducted in the period from 24 September to 5 October 2007. It was based on a random sample of 531 persons from the group of non-respondents. To maximize the number of participants in the non-response survey various data collection techniques were employed. Non-respondents whose telephone numbers were known were contacted by telephone and asked to answer the questions; those whose telephone numbers were not known were visited door-to-door by local interviewers with a questionnaire.

A total of n=531 persons were asked to take part in the non-response survey. Initially n=401 persons were selected at random, then the data on them was enriched with telephone numbers (this was

successful in about 65% of cases). Those for whom no telephone numbers could be ascertained were visited door-to-door by interviewers. Those whose telephone numbers could be ascertained were contacted by telephone. Willingness to take part in the non-response survey was much lower in the case of those contacted by telephone than in the face-to-face poll. Given the short time available it was decided to increase the number of participants in the survey by taking an additional telephone poll sample of n=150 persons (on top of the 241 who had already been contacted by telephone). In the end n=212 persons took part in the survey, i.e. a 40% response rate.

Table 14 Response rates for the non-response survey

	Gross n	Net n	Response rate (%)
Telephone	391	117	30
Face-to-face	140	95	68
Total	531	212	40

Participants in the non-response survey were asked why they had not completed the main survey questionnaire. The main reason was that they didn't have time or didn't want to. Another reason for not cooperating was that they did not experience any annoyance.

Table 15 Reasons for not completing the questionnaire

N=235[1]	Absolute	%
I didn't receive the questionnaire.	6	3
The person the questionnaire was addressed to doesn't live here.	23	10
I didn't have time.	50	21
I didn't want to.	17	7
I don't experience any annoyance.	20	9
I am living/was living elsewhere at the time.	2	1
My Dutch is not good.	1	0
I'm not interested in the subject.	10	4
I don't see any point in participating in the survey.	6	3
Other reason	124	53

[1] N=235 here instead of n=212 because this includes respondents who answered 'The person the questionnaire was addressed to doesn't live here.'

Over half of respondents gave 'Other reason': these were often personal reasons, such as being too old, illness or having moved house. Another reason frequently given was being asked to take part in too many surveys, and some people thought the questionnaire was too long. Interestingly, in 10% of cases the addressee did not live at the address stated: this was mainly the case with respondents contacted by telephone (there was only one case in the face-to-face poll). It is highly likely that many of these cases involved more than one dwelling at the same address, with the telephone number of e.g. the downstairs neighbours listed for that address.

6.3.7 Comparison between respondents and non-respondents

The distribution of respondents and non-respondents by age and sex is shown in Table 16. This shows that men under 45 were under-represented among the respondents. For the sake of comparison Table 16 shows the Statistics Netherlands data for the survey area: here again, we see that older participants (particularly men) were over-represented in the survey.

Table 16 Distribution by age and sex of respondents and participants in the non-response survey compared with reference figures from Statistics Netherlands

Sex	Age	Respondents	Non-response survey participants	Statistics Netherlands[1]
Male	18-44	13.3	21.8	21.0
	45-64	23.4	18.9	18.7
	65+	12.5	6.8	9.1
Female	18-44	16.0	16.5	20.3
	45-64	20.8	20.4	18.2
	65+	14.0	15.5	12.6

[1] Population data on the survey area from Statistics Netherlands Statline as of 1 January 2006

The skewed demographic structure of participants in the main survey was overcome by adding a post-stratification weighting factor for the analyses.

Table 17 compares the respondents with the participants in the non-response survey. These are straight counts with no weighting. The table shows striking differences between the two groups on all the points raised in the non-response survey.

Table 17 Comparison between respondents and participants in the non-response survey

Variable	Respondents	Non-respondents
Number of persons	2489	210
Satisfied/very satisfied with the residential environment	78.2%	91.9%
Very/fairly concerned about health problems	58.7%	31.9%
Very/fairly concerned about aircraft accidents	65.8%	43.3%
Little or no annoyance from aircraft noise	23.3%	36.7%
Moderate annoyance from aircraft noise	31.9%	49.1%
Serious annoyance from aircraft noise	44.7%	14.3%
Positive attitude to Geilenkirchen air base	15.4%	38.1%
Neutral attitude to Geilenkirchen air base	44.8%	43.8%
Negative attitude to Geilenkirchen air base	39.7%	18.1%
Primary	8.5%	10.5%
Lower secondary education (VBO/MAVO)	33.7%	39.1%
Higher secondary education (HAVO/VWO/MBO)	31.9%	33.3%
Higher education	26.0%	17.1%

In both groups the vast majority were satisfied or very satisfied with the residential environment. The percentage was almost 14% higher among participants in the non-response survey, who also mainly said they were very satisfied with their residential environment, whereas the respondents merely said they were satisfied. The participants in the main survey displayed greater concern about the possibility of an aircraft accident and the incidence of health problems due to aircraft noise in the vicinity of their home. The difference between the two groups is over 20%. The percentage of highly annoyed people is about 30% higher in the respondents group. Also, a larger proportion of the respondents have a more negative attitude to the Geilenkirchen air base. Another point is that the proportion of respondents having completed higher education is about 10% higher than among participants in the non-response survey.

It was concluded from these results that the non-response was selective. To remove the distortion from the results caused by the differences found between the respondents and the non-respondents as far as possible the results were corrected using a weighting factor for selective non-response.

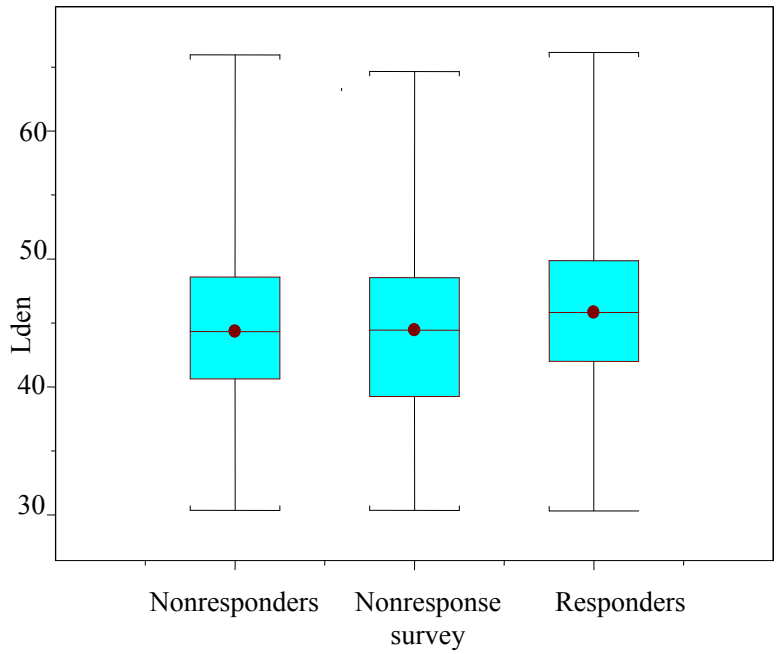
6.3.8 Noise exposure

There are a number of indicators available for measuring exposure to noise. Those most commonly used to describe a single overflight are LA_{max} and SEL. LA_{max} is the maximum noise level during the overflight, in other words the highest number of decibels observed. SEL (Sound Exposure Level) provides an indication of the amount of sound energy measured during the full overflight, i.e. the average sound energy during the overflight. In themselves LA_{max} and SEL do not take account of the *number* of overflights during a particular period.

To measure the noise situation over a lengthy period (e.g. a year) there are average noise indicators available: these take account not only of the amount of noise produced by an overflight but also the number of overflights during the period. The average noise indicator most commonly used is LA_{eq}, the average noise level of all overflights during a particular period. LA_{eq} is computed from the SEL values of all the individual overflights during the period. L_{den} is a variant of LA_{eq} and is an indicator of the influence of environmental noise. Calculations of L_{den} take into account the fact that noise in the evening and at night is perceived as more annoying than daytime noise. Europe agreed in 2004 to use L_{den} to describe annoyance due to environmental noise (EU, 2004). European studies into the effect of environmental noise increasingly use L_{den} as a noise indicator.

For the purpose of the survey it is important to establish how far annoyance from the Geilenkirchen air base is correlated to the aircraft noise to which local residents are exposed and how far it is caused by other factors. At the start of the survey there were data available on the 35 CU noise contour around the base. The noise unit CU stands for Cost Unit, the measure of noise which was formerly in general use in the Netherlands but is now only used around regional and small airports and military airfields. The legislation provides for a changeover to the European dose measure L_{den} (see below) for regional and small airports, while military airfields will continue to use CU as the noise unit for the time being. Geilenkirchen air base is required by law to establish the 35 CU noise contour. This does not provide any information on the survey participants' individual exposure to noise, nor any indication of exposure to noise outside the contour.

Following consultation with the Ministry of Defence and the National Aerospace Laboratory we were able – using model computations – to ascertain the noise exposure in L_{den} at the addresses in the survey. The National Aerospace Laboratory (NLR) calculated the annual average noise exposure (L_{den}) at each home in the sample for the year 2006. This was ascertained using a model that took account of such things as the number of aircraft passing overhead, the flight paths and the noise produced by the various types of aircraft (Van der Wal et al., 2001a and 2001b). The data were anonymized by unlinking the address coordinates from the database.



Figuur 19 Boxplot of exposure to aircraft noise (L_{den}) of respondents, non-respondents and participants in the non-response survey

As the boxplot in Figuur 19 shows, the differences in the distribution of noise exposure between respondents, non-respondents and participants in the non-response survey are small. The respondents' average exposure was 45.7 dB(A) L_{den} (range 30.3-66.1), as against 44.4 dB(A) (range 30.4-66.0) in the case of the non-respondents. A slight tendency towards greater willingness to participate in the survey was found among those who were exposed to higher noise levels. The weighting factor for selective non-response takes this difference into account.

6.3.9 Weighting factors

To arrive at reliable estimates of the prevalence of the health and perception indicators in the questionnaire survey the sample needed to be weighted back to the target population (everyone aged 18 or over) in the survey area. Each respondent in the study was therefore assigned a weighting factor reflecting how many members of the target population each respondent represents. Weighting factors are needed to estimate population parameters without distortion. The weighting factor used in the analyses takes five possible sources of distortion into account:

1. Selection probability or sampling fraction. This is the probability each person aged 18 or over in the survey area has of being included in the sample, stratified by the various postcode areas and municipalities in the survey area. The weighting factor is calculated by dividing the number of persons in a stratum of the sample by the number of persons aged 18 or over living in that stratum.

2. Non-response unit. This is the complete absence of questionnaire information on a person. Some of the persons included in the sample will fail to return the questionnaire for various reasons (refusal, house move, language problems, etc.). The weighting factor is calculated by dividing the number of persons per stratum of the sample by the number of persons per stratum who actually took part in the survey.

3. Non-response item. This is where a respondent fails to answer questions (items) in the questionnaire, or answer them correctly, with the result that the respondent's data cannot be used in an analysis. The weighting factor is calculated by, for each analysis, dividing the number of persons per stratum who took part in the survey by the number of persons per stratum who actually answered the particular question.

4. Selective response/non-response. Whether a person does or does not return the questionnaire can be influenced by factors directly connected with the subject under consideration. It could be, for example, that people who experience a lot of annoyance from aircraft noise are more inclined to respond than those who do not find it a annoyance. Because of the resulting selective response the respondents are not entirely representative of the sample as a whole, producing distortion in the final results. To find out whether this was the case, a group of non-respondents was polled. The weighting factor for selective non-response was based on the variables on which information is available for both respondents and non-respondents, assuming that the participants in the non-response survey were representative of the group of non-respondents as a whole. The two groups were compared using logistic regression with 'response' as the outcome variable (1=respondent, 0=non-respondent). The questions posed in the non-response survey were included in the model as explanatory variables. It was decided to include all the variables (see Table 17) which were expected a priori to be a possible influence on response/non-response in the logistic regression analysis. The results of the logistic regression were used to calculate the probability of each respondent being a respondent based on the explanatory variables used.

Table 18 Weighting factor for selective response/non-response: distribution of weights among the population of non-respondents

Average	1.0
Minimum	0.54
25% quartile	0.66
50% median	0.82
75% quartile	1.21
Maximum	3.50

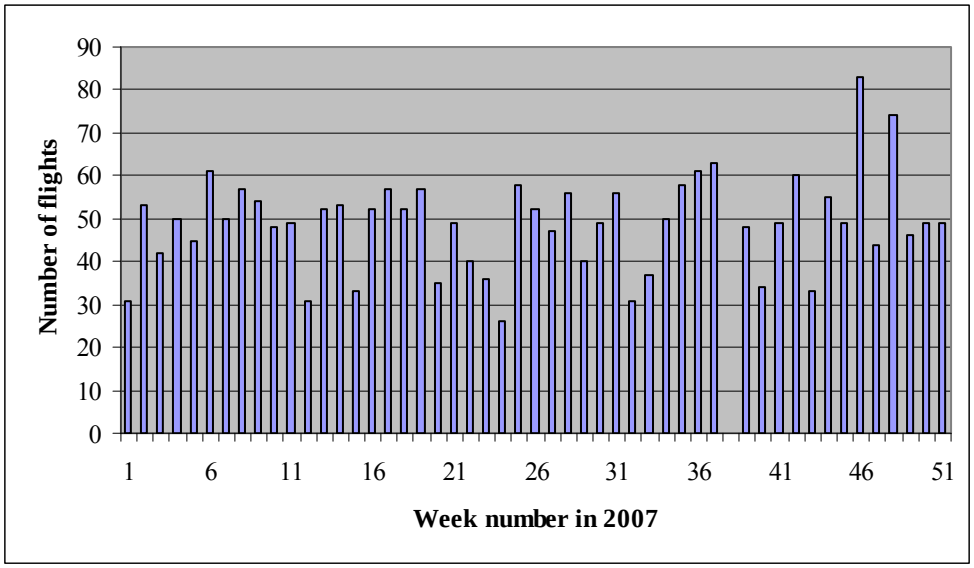
5. Post-stratification. The sampling method can cause the demographic structure of the sample to differ from that of the total population in the survey area. It is virtually impossible to take a sample that takes full account of the age and sex structure of the population. This can be corrected for by comparing the demographic structure of the respondents (in terms of age and sex) with external demographic data on the total population, in this case from Statistics Netherlands.

How the weighting factors were calculated has already been described in detail in Appendix G to RIVM Report 630100001 (Breugelmans et al., 2004).

6.3.10 Numbers of flights to and from the base in 2007

Below is an overview of the number of flights to and from the base in 2007. This was compiled in order to ascertain how representative the number of flights (per week) during the survey period was of the number of flights during the year. In 2007 the number of flights to and from the base by Boeing 707s (AWACS, B707-300 training flights, K35 tanker) was 2444, or about 90% of the total air traffic at the base. The average number of flights per week was 48 (SD 12.9). The average number of flights per day (weekday) in 2007 was 9.6 (SD 3.3). An overview of the number of flights per week in 2007 is given in Figuur 20.

The survey period ran from week 33 to week 40 (13 August–5 October). The average number of flights per week during that period was 44 (SD 19.4). The average number of flights per day during the survey period was 8.8 (SD 7.1). The runway was closed for maintenance in week 38 and there were no flights that week. There were somewhat fewer flights during the survey period compared with the year as a whole, owing mainly to week 38. If we do not count that week (which is also at the end of the survey period, when most of the questionnaires had already been returned) the average number of flights is somewhat higher: 50 per week, 10 per day, which is reasonably in line with the annual average. Nevertheless, the survey period is not entirely representative of 2007, particularly as a result of week 38, the only week in 2007 when there were no flights at Geilenkirchen. This is unlikely, however, to have influenced the way in which the respondents answered the questionnaire.



Figuur 20 Number of flights per week to and from the base by Boeing 707s (90% of all flights)

6.3.11 Analytical methods

This section briefly describes the software and analytical methods used. For the statistical analyses we used SAS (version 9.1) and SUDAAN (version 9.0).

Linear regression

Multiple linear regression techniques were used to explain the degree of trust in information from authorities, concern about three risks and annoyance due to military air traffic noise. Multiple regression looks at how scores for a criterion variable – the variables being trust, concern and annoyance in this survey – relate to scores for various predictors, taking the interrelationships between the predictors into account. The mathematical equation for a linear model with p predictors is:

$$Y = b_0 + b_1X_1 + b_2X_2 + ... + b_pX_p$$

where Y is the dependent or criterion variable, the Xs and p are predictors and the b's the regression coefficients. As the sample is stratified – with a weight attached to each observation – the SAS SURVEYREG procedure was used, assuming that the regression coefficients are the same in the various strata. An important hypothesis that must obtain for this procedure is that the predictors are not too strongly correlated. To gain an idea of any correlations between the predictors, factor analyses were carried out, among other things. The models were fitted manually using backward selection.

Exploratory factor analysis

When fitting the various models and determining the appropriate predictors we expected there to be correlations between the predictors, but there was no clear expectation as to precisely what factors the predictors would summarize. The exploratory type of factor analysis was therefore used: this produces factors that can be derived from the original predictors and can be regarded as the 'best summarizers' of those predictors. Orthogonal (varimax) rotation was then used to organize the summarized information more clearly among the factors. If predictors were found to have a high loading on a particular factor, a factor that summarized a number of predictors was constructed. Appendix 3: Additional Information on Topics describes which predictors were summarized and how in various models.

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Appendix 1 Questionnaire

PERCEPTION SURVEY RESIDENTIAL ENVIRONMENT

QUESTIONNAIRE

NOTES

Please read the instructions below carefully before completing the questionnaire.

• Try to answer all the questions yourself (without assistance from e.g. your partner, children or other housemates). If this is not possible, for example because you have poor eyesight or do not understand the questions, you can ask someone to help you fill in the questionnaire, but you must provide the answers yourself.

• It is important to answer all the questions. There are no 'right' or 'wrong' answers; we want to know about your personal experience. Select the answer that best fits you in each case.

• Most of the questions can be answered by checking the circle beside your selected answer. Instructions for completion are printed in bold type. Some questions are in the form of a table: here you should check an answer in each row.

EXAMPLE:

Question 1 Here are some statements about television. State to what extent you agree or disagree.

Check one answer in each row.

	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
I like watching television	o	●	o	o	o
I have plenty of time to watch television	o	o	o	o	●

• More than one answer can be given to some questions: if so, this is stated separately.

• Answer the questions in the order in the questionnaire, unless it is stated at a particular answer that you can continue to a subsequent question, in which case you can skip the questions in between.

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EXAMPLE:
Question 2 How many days a week do you watch television?

- o 1-2 days → **CONTINUE WITH QUESTION 5**
- o 3-4 days
- o 5 days or more

Suppose you have checked the answer '1-2 days', then you can go straight to Question 5. If you have checked '3-4 days' or '5 days or more' you should continue with the question following Question 2.

• If you want to change an answer, you can cross out the first answer and circle or check the right answer. You can point to it with an arrow if you wish.

• We estimate that the questionnaire takes about half an hour to complete. If you need more time, just put it to one side and continue with it at a convenient time.

• Please complete the questionnaire and return it to us as soon as possible using the enclosed postage-paid reply envelope.

Thank you very much for your cooperation.

HOUSING

The following questions are about your home and the environment where you live.

1 How satisfied are you with your present home?

- o Very satisfied
- o Satisfied
- o Neither satisfied nor dissatisfied
- o Dissatisfied
- o Very dissatisfied

2 How satisfied are you with your present residential environment?

- o Very satisfied
- o Satisfied
- o Neither satisfied nor dissatisfied..
- o Dissatisfied
- o Very dissatisfied

3 How satisfied are you with the noise level in your residential environment?

- o Very satisfied
- o Satisfied
- o Neither satisfied nor dissatisfied
- o Dissatisfied
- o Very dissatisfied

4 Have any special measures been taken to insulate your home against external noise?

- o Yes
- o No
- o Don't know

5 How satisfied are you with the present insulation of your home against external noise?

- o Very satisfied
- o Satisfied
- o Neither satisfied nor dissatisfied
- o Dissatisfied
- o Very dissatisfied

6 State which aspects of your neighbourhood you expect to get better or worse during the coming year.
Check one answer in each row.

	Get better	Get worse	Remain the same
Green spaces in the neighbourhood	o	o	o
Value of home	o	o	o
Dust/soot/smoke	o	o	o
Road traffic noise	o	o	o
Aircraft noise	o	o	o
Amenities	o	o	o

HEALTH

Here are some questions about your health.

7 How would you say your health is, generally speaking?

- o Very good
- o Good
- o OK
- o Poor
- o Very poor

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8 Check the answer that best indicates how **true** or **untrue** you think each of the following statements is in your ca
Check one answer in each row.

	Absolutely true	Mostly true	Don't know	Mostly untrue	Absolutely untrue
I seem to fall ill more easily than other people.	o	o	o	o	o
I am just as healthy as other people I know.	o	o	o	o	o
I expect my health to get worse.	o	o	o	o	o
I am in excellent health.	o	o	o	o	o

9 Have you suffered during the past week from:

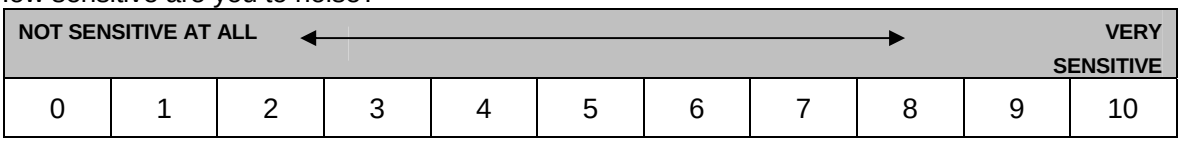
	No	Occasionally	Regularly	Often	Very often
Dizziness or light-headedness	o	o	o	o	o
Painful muscles	o	o	o	o	o
Fainting	o	o	o	o	o
Neck pain	o	o	o	o	o
Back pain	o	o	o	o	o
Excessive perspiration	o	o	o	o	o
Palpitations	o	o	o	o	o
Headache	o	o	o	o	o
Flatulence	o	o	o	o	o
Blurred vision or spots in front of your eyes	o	o	o	o	o
Shortness of breath	o	o	o	o	o
Nausea or upset stomach	o	o	o	o	o
Pain in the stomach or abdomen	o	o	o	o	o
Pins and needles in your fingers	o	o	o	o	o
A feeling of pressure or tightness in the chest	o	o	o	o	o
Chest pain	o	o	o	o	o

10 The next questions are about how you feel and how you have been during the past four weeks. Please select the answer that comes closest to how you often you have felt as follows:
Check one answer for each question.

	Constantly	Usually	Often	Occasionally	Rarely	Never
How often have you felt particularly nervous during the past four weeks?	o	o	o	o	o	o
How often have you felt so down during the past four weeks that there was nothing that would cheer you up?	o	o	o	o	o	o
How often have you felt calm and tranquil during the past four weeks?	o	o	o	o	o	o
How often have you had lots of energy during the past four weeks?	o	o	o	o	o	o
How often have you felt gloomy and depressed during the past four weeks?	o	o	o	o	o	o
How often have you felt happy during the past four weeks?	o	o	o	o	o	o
How often have your physical health or emotional problems got in the way of your social activities (e.g. visiting friends or family) during the past four weeks?	o	o	o	o	o	o

NOISE, ODOUR AND VIBRATION

11 How sensitive are you to noise?



12 Below is a scale from 0 to 10 on which you can indicate how much of a nuisance, disturbance or annoyance you find **noise** when you are at home. If you do not find it annoying at all, select 0; if you find it extremely annoying, select 10. If you are somewhere in between, select a number between 0 and 10.

If a particular type of noise is not audible in your home you can select NOT APPLICABLE in the last column.

Thinking back over the past twelve months, which number from 0 to 10 best indicates how much of a nuisance, disturbance or annoyance you find noise from the following sources when you are at home?

Circle one answer in each row.

Annoyance due to noise from …….	NOT ANNOYING AT ALL										EXTREMELY ANNOYING	NOT APPLICABLE
Road traffic (cars, buses, lorries)	0	1	2	3	4	5	6	7	8	9	10	o
Total air traffic	0	1	2	3	4	5	6	7	8	9	10	o
Military air traffic (e.g. AWACS)	0	1	2	3	4	5	6	7	8	9	10	o
Other air traffic (e.g. from Beek airfield)	0	1	2	3	4	5	6	7	8	9	10	o
Mopeds/scooters	0	1	2	3	4	5	6	7	8	9	10	o
Neighbours	0	1	2	3	4	5	6	7	8	9	10	o
Trains	0	1	2	3	4	5	6	7	8	9	10	o
Geilenkirchen air base (taxiing/testing engines/other ground activities)	0	1	2	3	4	5	6	7	8	9	10	o
Industry/commerce	0	1	2	3	4	5	6	7	8	9	10	o
Building/demolition work (inc. renovation)	0	1	2	3	4	5	6	7	8	9	10	o
Clubs, associations, catering establishments	0	1	2	3	4	5	6	7	8	9	10	o
Farming activities	0	1	2	3	4	5	6	7	8	9	10	o

13 Please answer the same question regarding the amount of annoyance due to **smells**, thinking back over the past twelve months. **Circle one answer in each row.**

Annoyance due to smells from …….	NOT ANNOYING AT ALL										EXTREMELY ANNOYING	NOT SMELT
Road traffic (cars, buses, lorries)	0	1	2	3	4	5	6	7	8	9	10	o
Total air traffic	0	1	2	3	4	5	6	7	8	9	10	o
Military air traffic (e.g. AWACS)	0	1	2	3	4	5	6	7	8	9	10	o
Other air traffic (e.g. from Beek airfield)	0	1	2	3	4	5	6	7	8	9	10	o
Industry/commerce	0	1	2	3	4	5	6	7	8	9	10	o
Farming activities	0	1	2	3	4	5	6	7	8	9	10	o

14 Please answer the same question regarding the amount of annoyance due to **vibration**, thinking back over the past twelve months. **Circle one answer in each row.**

Annoyance due to vibration from ……	NOT ANNOYING AT ALL										EXTREMELY ANNOYING	NOT FELT
Road traffic (cars, buses, lorries)	0	1	2	3	4	5	6	7	8	9	10	o 88
Total air traffic	0	1	2	3	4	5	6	7	8	9	10	o
Military air traffic (e.g. AWACS)	0	1	2	3	4	5	6	7	8	9	10	o 88
Other air traffic (e.g. from Beek airfield)	0	1	2	3	4	5	6	7	8	9	10	o 88
Trains	0	1	2	3	4	5	6	7	8	9	10	o 88
Geilenkirchen air base (taxiing/testing engines/other ground activities)	0	1	2	3	4	5	6	7	8	9	10	o 88
Farming activities	0	1	2	3	4	5	6	7	8	9	10	o

15 How much is your sleep disturbed by noise from the following sources, thinking back over the past twelve months?

Circle one answer in each row.

	NOT DISTURBED AT ALL										VERY DISTURBED	NOT AUDIBLE
Road traffic (cars, buses, lorries)	0	1	2	3	4	5	6	7	8	9	10	o
Other air traffic	0	1	2	3	4	5	6	7	8	9	10	o
Military air traffic (e.g. AWACS)	0	1	2	3	4	5	6	7	8	9	10	o
Other air traffic (e.g. from Beek airfield)	0	1	2	3	4	5	6	7	8	9	10	o
Neighbours	0	1	2	3	4	5	6	7	8	9	10	o
Trains	0	1	2	3	4	5	6	7	8	9	10	o
Geilenkirchen air base (taxiing/testing engines/other ground activities)	0	1	2	3	4	5	6	7	8	9	10	o
Industry/commerce	0	1	2	3	4	5	6	7	8	9	10	o
Building/demolition work (inc. renovation)	0	1	2	3	4	5	6	7	8	9	10	o

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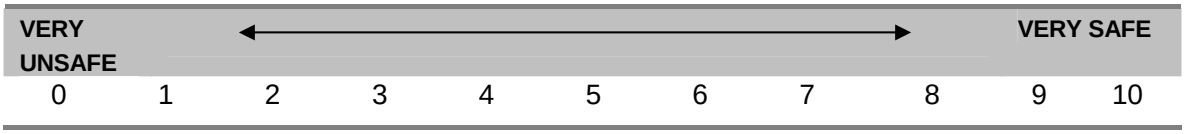
CONCERN

16 How safe do you feel in your residential environment?



17 Below is a list of residential situations. We should like to know how concerned you are about your safety in these situations. If a situation applies to you, indicate how concerned you are about it. If a situation does not apply to you, indicate how concerned you would be if it did.

Please indicate this by circling the number that corresponds to your degree of concern: 0 means you are not concerned at all, and 10 means you are very concerned.

Circle one answer in each row.	**IN THIS SITUATION I AM ... ABOUT MY SAFETY**										
	NOT CONCERNED AT ALL										**VERY CONCERNED**
Living in a busy road	0	1	2	3	4	5	6	7	8	9	10
Living near industry	0	1	2	3	4	5	6	7	8	9	10
Living near a civil airfield	0	1	2	3	4	5	6	7	8	9	10
Living near a military air base	0	1	2	3	4	5	6	7	8	9	10
Living under an approach path to an airfield	0	1	2	3	4	5	6	7	8	9	10
Living in an agricultural/horticultural area	0	1	2	3	4	5	6	7	8	9	10
Living near high-voltage lines	0	1	2	3	4	5	6	7	8	9	10
Living near radio or television transmission masts or mobile telephone masts (GSM base stations)	0	1	2	3	4	5	6	7	8	9	10

18 Below is a list of feelings you might have when thinking about AWACS. We should like to know how strongly you sometimes feel or have felt them.
Don't think too long before answering this question, just indicate your first impression, as that is often the best.

Check one answer in each row.

	Not at all	**Somewhat**	**Moderately**	**Strongly**	**Very strongly**
Cheerfulness/pleasure	o	o	o	o	o
Unpleasant/uncomfortable feeling	o	o	o	o	o
Fearful/sinking feeling	o	o	o	o	o
Safety	o	o	o	o	o
Disgust	o	o	o	o	o
Frustration	o	o	o	o	o
Painful feeling	o	o	o	o	o
Concern	o	o	o	o	o
Pride	o	o	o	o	o
Anger	o	o	o	o	o
Sadness/gloom	o	o	o	o	o
Hopelessness/powerlessness	o	o	o	o	o
Pleasant feeling	o	o	o	o	o
Nervousness	o	o	o	o	o
Surprise	o	o	o	o	o
Anger/rage	o	o	o	o	o

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19 Below are some statements about concern. We should like to know how far you agree or disagree with them.

	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
I am concerned that the exhaust emissions from military aircraft that occur in the vicinity of my home could cause health problems.	o	o	o	o	o
I am concerned that the noise from military aircraft that occurs in the vicinity of my home could cause health problems.	o	o	o	o	o
I am concerned about the possibility of an accident involving a military aircraft near my home.	o	o	o	o	o

20 Below are some statements about the risk of exhaust emissions (dust, soot, smoke, aviation fuel) from military a traffic.
How far do you agree or disagree with them?

Risk from military air traffic exhaust emissions	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
The risk of problems from military air traffic exhaust emissions is small.	o	o	o	o	o
There is very little I can do myself to limit/reduce military air traffic exhaust emissions.	o	o	o	o	o
Lots of people are exposed to military air traffic exhaust emissions.	o	o	o	o	o
Military air traffic exhaust emissions have serious effects on health.	o	o	o	o	o
Adequate measures are being taken to reduce military air traffic exhaust emissions.	o	o	o	o	o
The harmful effects of military air traffic exhaust emissions are felt in the short term.	o	o	o	o	o
Military air traffic exhaust emissions are scary.	o	o	o	o	o

21 Below are some statements about the risk of noise from military air traffic.
How far do you agree or disagree with them?

Risk from military air traffic noise	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
The risk of problems from military air traffic noise is small.	o	o	o	o	o
There is very little I can do myself to limit/reduce military air traffic noise.	o	o	o	o	o
Lots of people are exposed to military air traffic noise.	o	o	o	o	o
Military air traffic noise has serious effects on health.	o	o	o	o	o
Adequate measures are being taken to reduce military air traffic noise.	o	o	o	o	o
The harmful effects of military air traffic noise are felt in the short term.	o	o	o	o	o
Military air traffic noise is scary.	o	o	o	o	o

22 Below are some statements about the risk of an accident involving a military aircraft.
How far do you agree or disagree with them?

Accident involving a military aircraft	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
The risk of an accident involving a military aircraft is small.	o	o	o	o	o
There is very little I can do myself to prevent an accident involving a military aircraft.	o	o	o	o	o
Lots of people are exposed to an accident involving a military aircraft.	o	o	o	o	o
The consequences of an accident involving a military aircraft are serious.	o	o	o	o	o
Adequate measures are being taken to reduce the risk of accidents involving military aircraft.	o	o	o	o	o
An accident involving a military aircraft is scary.	o	o	o	o	o

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INFORMATION

The questions below are about the information you receive on the Geilenkirchen air base.

23 From which of the authorities below do you receive information on the Geilenkirchen air base? Please indicate how satisfied you are with the information from those particular authorities. Do you receive information on the Geilenkirchen air base from the following?

	NO	YES		Very dissatisfied	Fairly dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Very satisfied
Municipality	NO	YES	→	o	o	o	o	o
Province of Limburg	NO	YES	→	o	o	o	o	o
Municipal Health Service	NO	YES	→	o	o	o	o	o
Ministry of Housing, Spatial Planning and the Environment (VROM)	NO	YES	→	o	o	o	o	o
Ministry of Defence	NO	YES	→	o	o	o	o	o
Media (free sheets, newspapers, radio and television)	NO	YES	→	o	o	o	o	o
Pressure groups (e.g. Stop AWACS, environmental organizations)	NO	YES	→	o	o	o	o	o
Geilenkirchen air base	NO	YES	→	o	o	o	o	o
German authorities (e.g. the German government)	NO	YES	→	o	o	o	o	o
Other, as follows: …… ……	NO	YES	→	o	o	o	o	o

24 From whom would you like to receive information on the Geilenkirchen air base?
You can check more than one answer.

- o I do not want any information. → **CONTINUE WITH QUESTION 27**
- o Municipality
- o Province of Limburg
- o Municipal Health Service
- o Ministry of Housing, Spatial Planning and the Environment (VROM)
- o Ministry of Defence
- o A representative
- o Media (newspapers, radio and television)
- o Pressure groups (e.g. Stop AWACS, environmental organizations)
- o Geilenkirchen air base
- o Other, as follows: ……

25 Supposing the types of information below were to be available, which would you like to receive?
You can check more than one answer.

- o Notifications of busy periods
- o Up-to-date flight schedules
- o Changes at the base
- o The Dutch government's position
- o Feedback on commitments: what is being done about them?
- o New policy
- o Aircraft noise, e.g. results of permanent monitoring
- o Other, as follows:
  ……

26 How would you like to receive the information?
You can check more than one answer.

- o In a free sheet
- o At an information evening/meeting organized by the municipality
- o At an information evening/meeting organized by Geilenkirchen air base
- o Through the local media (newspapers, radio and television)
- o Through the regional/provincial media (newspapers, radio and television)
- o Through the national media (newspapers, radio and television)
- o Through pressure groups (e.g. Stop AWACS, environmental organizations)
- o From a government web site, e.g. www.awacsinlimburg.nl
- o Other, as follows: …….

TRUST

27 This question is about trust. Please indicate how much trust you have in the following authorities as regards the Geilenkirchen air base and AWACS.

	No trust at all	No trust	Neutral	Some trust	A lot of trust
Municipality					
Province					
Ministry of Housing, Spatial Planning and the Environment (VROM)					
Ministry of Defence					
Geilenkirchen air base/NATO					
National Institute for Public Health and the Environment (RIVM)					
South Limburg Municipal Health Service					
German government					

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28 Please state to what extent you agree or disagree with the statements below relating to dealings with the Geilenkirchen air base.

	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
The Dutch government endeavours to minimize noise annoyance.	o	o	o	o	o
The Dutch government is perfectly capable of minimizing noise annoyance.	o	o	o	o	o
The Dutch government is honest about what happens with Geilenkirchen air base.	o	o	o	o	o
The Dutch government does not think enough about the well-being of residents living around the base.	o	o	o	o	o
Geilenkirchen air base knows about residents' feelings.	o	o	o	o	o
Geilenkirchen air base has an open-minded attitude to residents.	o	o	o	o	o
Geilenkirchen air base takes account of local residents.	o	o	o	o	o
Geilenkirchen air base does everything it can to meet local residents' wishes.	o	o	o	o	o
My municipal authority actively works to get the noise reduced.	o	o	o	o	o
My municipal authority honestly says what is going on.	o	o	o	o	o
My municipal authority shows sympathy with residents.	o	o	o	o	o
My municipal authority does everything in its power to limit annoyance.	o	o	o	o	o
The Dutch government takes complaints about noise seriously.	o	o	o	o	o
Military air traffic has benefits for man.	o	o	o	o	o
My opinion is taken seriously by Geilenkirchen air base.	o	o	o	o	o

GEILENKIRCHEN AIR BASE

29 What is your attitude to Geilenkirchen air base?

o Very positive
o Fairly positive
o Neutral
o Fairly negative
o Very negative

30 Please give your opinion on the following statements by checking the answer on each line that best matches your opinion.

Check one answer in each row.

	Agree completely	**Agree mostly**	**Neither agree nor disagree**	**Disagree mostly**	**Disagree completely**
The area can be proud of the fact that NATO has an air base at Geilenkirchen.	o	o	o	o	o
Geilenkirchen air base has an open-minded attitude to residents.	o	o	o	o	o
Geilenkirchen air base is valuable to the area.	o	o	o	o	o
The presence of Geilenkirchen air base brings security to the area.	o	o	o	o	o
I don't know what to expect of Geilenkirchen air base.	o	o	o	o	o
There are better alternatives to using the current type of aircraft.	o	o	o	o	o
The negative effects of Geilenkirchen air base are not distributed fairly among the population.	o	o	o	o	o
NATO does useful work.	o	o	o	o	o
I know about Geilenkirchen air base's plans for the future.	o	o	o	o	o

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31 Have you ever taken any of the following steps to combat annoyance from Geilenkirchen air base? If so, how many times during the past twelve months?

	NO	YES		How many times during the past twelve months?
Lodged a complaint with the Air Traffic Complaints Information Centre (KICL)	o	o		
Signed a petition	o	o		
Attended a public meeting or demonstration	o	o		
Joined a pressure group against aircraft noise	o	o		N/A
Sent a letter to a newspaper	o	o		
Complained to an official body	o	o		
COMPENSATION				

Below we set out a number of measures that could serve as compensation to make the disadvantages faced by people living around an air base such as Geilenkirchen more acceptable. ***The measures listed are examples.***

32 Would you be open to the possibility of government compensation to make the disadvantages of the Geilenkirchen air base more acceptable?

o Yes

o No → **CONTINUE WITH QUESTION 34**

33 What kinds of compensation do you regard as more and less suitable?

	Very unsuitable	Unsuitable	Neutral	Suitable	Very suitable
Government-funded insulation of your home against external noise	o	o	o	o	o
A relocation scheme whereby the government arranges an alternative home	o	o	o	o	o
Municipal tax rebate	o	o	o	o	o
Additional local amenities such as a new park or recreational facilities	o	o	o	o	o
A regular sum of money for people living near Geilenkirchen air base	o	o	o	o	o
A purchase scheme whereby the government buys your house for a reasonable price	o	o	o	o	o
Other types of compensation, as follows: ……	o	o	o	o	o

→ **CONTINUE WITH QUESTION 35**

34 If you would not be open to the possibility of compensation, please state why.
You can check more than one answer.

- o Compensation would not solve the problem.
- o Compensation feels like bribery.
- o Annoyance cannot be compensated for.
- o Health cannot be bought.
- o Other, as follows: ……

35 What do you think needs to be done to resolve the disadvantages experienced by residents as a result of Geilenkirchen air base and the aircraft (AWACS)? **Select a <u>maximum</u> of four answers.**

- o Geilenkirchen air base should be closed.
- o The number of training flights should be reduced.
- o The aircraft should be fitted with quieter engines.
- o The aircraft should fly at different times.
- o The government should keep its promises.
- o The Dutch government should take residents seriously.
- o Residents should be provided with better information on flight schedules.
- o There should be dialogue between Geilenkirchen air base and the residents.
- o Nothing needs to be done.
- o Other, as follows:
  ……

PERSONAL CHARACTERISTICS

36 Are you male or female?

- o Male
- o Female

37 What is your year of birth?

1	9			**(state year)**

38 What type of household do you live in?

- o Married or cohabiting without children
- o Married or cohabiting with one or more children
- o One-parent family with one or more children
- o Single
- o Living with parents
- o Other, as follows: ……

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39 What is the highest level of education you have completed?

- o Did not complete primary school
- o Primary school
- o LBO/VBO (junior secondary vocational/pre-vocational), e.g. LTS, LHNO, LEAO, LAO, technical school, house-keeping school, elementary agricultural and horticultural school, elementary retail school
- o Advanced elementary (MULO, ULO, MAVO, VMBO)
- o Senior general secondary (MMS, HAVO)
- o Senior secondary vocational (MBO), e.g. MTS, MEAO, MHNO, MSPO, MAO, commercial school, secondary agricultural school, home care training, nursery school teacher training
- o Pre-university/grammar school (HBS, VWO, Gymnasium, Atheneum)
- o Higher professional (HBO), e.g. HTS, HEAO, Social Work College, Primary Teacher Training College, Art School, Conservatory, teacher training (MO-A, NLO)
- o University (prior to 1986 also Technical College and Agricultural College)
- o Other, as follows: .....

40 How many years have you been living at this address?
IF LESS THAN ONE YEAR, ENTER '0'.

[ ] Years **(state number)**

41 How many years have you been living in this neighbourhood?
IF LESS THAN ONE YEAR, ENTER '0'.

[ ] Years **(state number)**

42 Are you the tenant or owner-occupier of your present home?

- o Tenant
- o Owner-occupier

43 Which of the situations below apply to your residential environment?

	Applicable	Not applicable
I live in a busy road.	o	o
I live near industry.	o	o
I live near a civil airfield.	o	o
I live near a military air base.	o	o
I live under an approach path to an airfield.	o	o
I live in an agricultural/horticultural area.	o	o
I live near high-voltage lines.	o	o
I live near radio or television transmission masts or mobile telephone masts (GSM base stations).	o	o

44 How many hours between 7 am and 11 pm do you spend in or around the home on an average weekday?

[ ] Hours **(state number)**

45 Do you hear military aircraft (e.g. AWACS) during your day-to-day activities (e.g. at work)?

o Yes
o No

46 Do you sometimes need to sleep during the daytime?

o Yes
o No

47 Does your work or that of your housemates have anything to do with Geilenkirchen air base, NATO or the Defence Ministry?

o Yes
o No

48 What is your postcode?

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LASTLY

- Date completed:

Day:		Month:		Year:			
				2	0	0	7

- If you return the completed questionnaire you will be sent a small gift as a sign of our gratitude. If you do not wish to receive it, or would like to donate the money to Médecins sans Frontières, please indicate below.
  - o I should like the gift.
  - o I do not want the gift.
  - o I should like to donate my gift to Médecins sans Frontières.

- If you would like us to send you a summary of the results once the survey is complete, please enter your name and address below.

Surname and initials: .....

Street and house number: .....

Postcode and town: .....

- Would you mind us contacting you again for a written interview on your health and your opinion of your residential environment? The answer you give now does not commit you to future participation.
  - o Yes, you may contact me in due course, but I am not committed to
  - o No

N.B.

Please check whether you have answered all the questions that apply to you.

If you have any comments you would like to make on the questionnaire or the survey or if you would like to supply additional information, please do so here:

Appendix 2 Non-response questionnaire

Perception of the Residential Environment Questionnaire

Introduction

In August/September, in association with the RIVM (National Institute for Public Health and the Environment), we asked you to cooperate with a survey on such things as perception of your residential environment, the environment and health and your attitude to Geilenkirchen air base. For the survey we asked you to complete a questionnaire, which was intended for the person in your household who was 18 or over and first to have a birthday at the time of receiving the questionnaire. Unfortunately we have not received the questionnaire back from you/that person.

To make our picture as reliable as possible we should nevertheless like to ask you/that person a few questions. Answering them will only take a few minutes and is very important to our survey. This is a condensed version of the standard questionnaire, containing seven brief questions. Would you mind answering them, please? The interviewer will make an appointment with you to collect the questionnaire, or you can send it back using the postage-paid reply envelope.

Thank you very much for your cooperation.

---

1 Please say why you did not take part in the survey.
You can check more than one answer.

- o I didn't receive the questionnaire.
- o The person the questionnaire was addressed to doesn't live here.
- o I didn't have time.
- o I didn't want to.
- o I don't experience any annoyance.
- o I am living/was living elsewhere at the time (e.g. in a nursing home, abroad).
- o My Dutch is not good.
- o I'm not interested in the subject.
- o I don't see any point in participating in the survey.
- o Other reason, as follows: ……..…….

2 How satisfied are you with your present residential environment?

- o Very satisfied
- o Satisfied
- o Neither satisfied nor dissatisfied.....
- o Dissatisfied
- o Very dissatisfied

3 How much of a nuisance, disturbance or annoyance is noise when you are at home, thinking back over the past twelve months? Answer by checking a number from 0 to 10. If you do not find it a annoyance at all, select 0; if you find it an extreme annoyance, select 10. If you are somewhere in between, select a number between 0 and 10. If a particular type of noise is not audible in your home you can select NOT APPLICABLE in the last column.

Annoyance due to noise from …….	NOT ANNOYING AT ALL ← → EXTREMELY ANNOYING											NOT APPLICABLE
Military air traffic (e.g. AWACS)	0	1	2	3	4	5	6	7	8	9	10	o

4 What is your attitude to Geilenkirchen air base?

- o Very positive
- o Fairly positive
- o Neutral
- o Fairly negative
- o Very negative

5 Below are some statements about concern. We should like to know how far you agree or disagree with them.

	Agree completely	Agree mostly	Neither agree nor disagree	Disagree mostly	Disagree completely
I am concerned that the noise from military aircraft that occurs in the vicinity of my home could cause health problems.	o	o	o	o	o
I am concerned about the possibility of an accident involving a military aircraft near my home.	o	o	o	o	o

6 This question is about *trust*. Please indicate how much trust you have in the following authorities as regards the Geilenkirchen air base and AWACS.

	No trust at all	No trust	Neutral	Some trust	A lot of trust
Municipality	o	o	o	o	o
Central government	o	o	o	o	o
Geilenkirchen air base/NATO	o	o	o	o	o

7 What is the highest level of education you have completed?

- o Did not complete primary school
- o Primary school
- o LBO/VBO (junior secondary vocational/pre-vocational)
  e.g. LTS, LHNO, LEAO, LAO, technical school, house-keeping school, elementary agricultural and horticultural school, elementary retail school
- o Advanced elementary (MULO, ULO, MAVO, VMBO)
- o Senior general secondary (MMS, HAVO)
- o Senior secondary vocational (MBO) e.g. MTS, MEAO, MHNO, MSPO, MAO, commercial school, secondary agricultural school, home care training, nursery school teacher training
- o Pre-university/grammar school (HBS, VWO, Gymnasium, Atheneum)
- o Higher professional (HBO), e.g. HTS, HEAO, Social Work College, Primary Teacher Training College, Art School, Conservatory, teacher training (MO-A, NLO)
- o University (prior to 1986 also Technical College and Agricultural College)
- o Other, as follows: ……..

THANK YOU VERY MUCH FOR YOUR COOPERATION!

Appendix 3 Additional information on topics

Annoyance and sleep disturbance
To determine percentages of annoyed people in a standardized manner the ends of the scale on which the annoyance was measured were set at 0 and 100 respectively. The higher the category of annoyance selected by a respondent, the higher the value on the scale from 0 to 100. There is a growing international convention to refer to the percentage of respondents whose annoyance on the scale is above 72 as the percentage of 'highly annoyed' (Miedema and Oudshoorn, 2001). In Dutch we have translated this as the percentage of 'ernstig gehinderd' or 'erg gehinderd' (the two terms are used interchangeably). If we take 50 as the dividing line, we call the result the percentage of '(at least) annoyed', and taking 28 we call the result the percentage of '(at least) slightly annoyed'. Although 'at least' is in brackets it is essential, as every 'lower' category of annoyance includes all the 'higher' ones: i.e. the percentage of '(at least) annoyed' includes the 'highly annoyed' category. The following example illustrates how annoyance is calculated. The scale used in this survey is from 0 to 10, so it has 11 response categories. The percentage of highly annoyed people is calculated from the scores given by the individual respondents. A respondent's score is calculated as follows: the cut-off score of 72 is in the eighth response category (N.B. this is category '7', as there is a category '0'), since 7/11 x 100=63.64 and 8/11 x 100 = 72.73. All the respondents in categories 0-6 score 0, and respondents in categories 8, 9 and 10 score 100 for the variable 'highly annoyed'. Respondents in category 7 score ((72.73-72)/(72.73-63.64)) x 100 = 8 for this variable. For the sake of completeness it should be noted that respondents who answered 'not applicable' to a annoyance category are regarded as not annoyed. The percentage of highly sleep disturbed people was calculated in the same way.

Noise annoyance from various sources was measured. As already noted, it was decided to use annoyance due to military air traffic as a dependent variable because of the link between total air traffic and military air traffic. The correlation between these two questions is high (r=0.78). The annoyance model used a continuous scale.

Noise sensitivity
People differ in how sensitive they are to noise: some are more resistant to it than others. Sensitivity to noise is best defined as a state of an individual that causes a heightened reaction to noise. This can be due to biological, psychological or lifestyle-related factors (RIVM and RIGO, 2005). To begin with, sensitivity to noise and noise annoyance were not found to be correlated in such a way that they measure the same construct ($r \leq .40$). Also, the factor analysis carried out when fitting the annoyance model made it clear that sensitivity to noise is not correlated to a single factor. The variable was therefore included in the model as a separate predictor.

Self-reported health
Self-reported health was measured by four different measures: (1) one question on 'perceived health', (2) the 'general health perception' components, and (3) 'mental health' on the RAND-36 scale (Van der Zee and Sanderman, 1993). RAND-36 comprises eight components. The reliability of the individual components is rated as good (Evers et al., 2000). As a fourth measure, physical symptoms were measured using the somatization scale in the Four-Dimensional Symptom Questionnaire (Terluin and Duijsens, 2006).

General health perception
The RAND-36 scale of general health perception measures a person's rating of his or her general health status, for example 'How would you say your health is, generally speaking?'. A person who scores low on the scale rates his or her personal health as poor and thinks it is probably likely to get even worse; a

person who scores high rates his or her health as excellent. The score was transformed so as to make the standard scores run from 0 to 100. The reliability of the scale was found to be adequate (Cronbach's alpha=.81) and was well in line with the alpha of 0.81 for general health measured by Van der Zee and Sanderman (1993).

Mental health
The RAND-36 mental health scale contains questions on feelings of depression and nervousness, for example 'How often have you felt gloomy and depressed during the past four weeks?'. People who score low on the scale have suffered from nervousness and depression all the time during the past four weeks, whereas those who score high have felt peaceful, calm and happy. Here again the score was transformed so as to make the standard scores run from 0 to 100. The reliability of the RAND-36 mental health subscale was adequate: alpha=0.87. The value was moreover well in line with the alpha of 0.85 for mental health measured by Van der Zee and Sanderman (1993).

Physical symptoms: the 4DSQ – somatization
The somatization scale in the Four-Dimensional Symptom Questionnaire (Terluin and Duijsens, 2006) is concerned with physical symptoms. A low score for somatization (0-10) can be regarded as normal (Terluin and Duijsens, 2006): this often corresponds to a normal reaction to the stresses and strains of everyday life. A score of 0 is rare (under 10%). A moderately elevated score (11-20) usually points to stress problems: while moderate somatization can of course be an impediment to social functioning, the person is not really demoralized. A highly elevated score (21-32) points to a serious process of somatic fixation, whereby the person becomes trapped in a vicious circle of physical symptoms, concern about his or her physical health, heightened awareness of physical symptoms and a lowered perception threshold for physical sensation. The 4DSQ somatization sub-scale was also found to be reliable, with an alpha of 0.89, comparable to the reliability of α=.83 previously found among a group of GPs' patients (Terluin and Duijsens, 2006).

Risk perception
Two common ways of investigating concern about risks are asking direct questions about the degree of concern regarding a high-risk activity and rating an activity for underlying risk factors. Direct questions about risk were posed in a similar way to those about annoyance, and here again the answers were on a scale of 0 to 10. The proportion of highly concerned people was calculated in the same way as that of people highly annoyed by noise, odour or vibration. Respondents were also asked to rate various qualitative aspects of the three risks, and these were found to be interrelated to such an extent that they could be combined into a single perception scale for each risk. The reliability of the perception scale for risk due to exhaust emissions from military air traffic was adequate (Cronbach's α=.80), as was the case with the risk due to noise (α=.79) and the risk of an accident (α=.74).

The factor analysis of the predictors in the annoyance model showed that the three types of concern had high loadings for one factor, so a composite variable for general concern was created and included in the model as a predictor.

Feelings about AWACS
The focus group interviews showed that respondents associated particular emotions directly with AWACS and the base, e.g. powerlessness, frustration, anger and fear. Various scales have been developed in previous studies into the relationship between emotions and risk perception (e.g. Goldberg et al., 1999; Lerner and Keltner, 2001). The study by Lerner et al. (2001) distinguished between fear and anger, based on their theory that emotions with the same value differ in terms of the various assessment dimensions: for example, anger and fear – both negative emotions – differ in the degree of security and control. Fear is defined by a feeling of situational control and insecurity, and anger by a feeling of

individual control and insecurity. The study showed that fear and anger have different effects on the degree of concern: people whose predominant emotion is fear were found to be more concerned, whereas those whose principal emotion was anger were less concerned. Based on the theory and previously used scales, a set of questions about emotions was included (Goldberg et al., 1999; Lerner et al., 2001). We expected to find a distinction between the anger factor and the fear factor.

A factor analysis, however, did not find the expected anger and fear factors. The fact that the expected correlation is absent shows that respondents do not make a clear distinction between anger and fear as posited in the questionnaire. Because of this confusion it was decided not to distinguish between fear and anger. The factor analysis revealed three factors, one measuring positive feelings (Cronbach's α=.81), one measuring negative feelings (α=.95) and one for the item 'security'. The first two factors were used in the subsequent analyses.

Trust in information

We then examined what factors influence trust in information from various authorities. The factors dedication, competence, honesty and empathy were included as possibly explaining trust in various authorities. Each factor was measured with one question. The municipality, the air base and central government would seem to be the authorities that residents came into contact with most. Questions were asked about the four explanatory factors for trust in the information provided by these authorities.

To ascertain what influence the four factors have on the degree of trust a model was fitted. The dependent variable was trust in information from either the municipality, the base or central government (the Housing Ministry and Defence Ministry). The predictors, as defined above, were dedication, honesty, empathy and competence. A total of four models were tested.

The degree of trust as a predictor of noise annoyance was also examined. An exploratory factor analysis of trust in information from the authorities reveals a difference between the authorities at national level (the Housing Ministry, Defence Ministry, NATO base, German government) and those operating at local level (municipality, province, South Limburg Municipal Health Service). A 'trust in national authorities' factor was therefore created to cover the Housing and Defence Ministries and the NATO base. The qualitative survey showed that the municipality is assigned a separate role: because of the separate status it was expected to have it was included as a separate predictor. In the end this did not turn out to be a significant predictor of noise annoyance, and given the possibility that the variation was shared with trust in national authorities it was not included in the final annoyance model.

Attitude

People's attitudes to the NATO air base were examined. A previous survey of the area around Schiphol indicated that the more negative people's attitudes to the airport and government were, the more likely they were to be highly annoyed, experience serious disturbance and lodge complaints (RIVM/RIGO, 2005).

As pointed out above, the factor analysis of all the selected predictors in the annoyance model revealed a kind of negative reaction to military air traffic and the base: this factor covers not only attitudes to the base but also the variables expected deterioration, negative feelings, overall concern and overall trust (-0.61). Given the interrelationship between these variables, including them as separate predictors would cause problems, and it would diminish their value as predictors. In view of the underlying factor we looked at possible interaction effects, and found an effect above all between negative feelings and negative expectations regarding noise in the coming year. The effects between the other predictors were not so pronounced and they did not stand up as separate predictors. The interaction effect between feelings and expectations was included in the model as a predictor.

The interaction effect between negative expectations regarding noise and negative feelings when thinking about AWACS is explained mainly by the fact that the majority of people who do not have negative expectations (68% of 1430) do not have negative feelings either. Also, the majority of people who have few or no negative feelings do not have negative expectations (76.9% of 1265). In the case of people who have a reasonable or high degree of negative feelings or expectations there does not appear to be a correlation. The fact that there is an interaction effect shows that the weights for the predictors negative expectations and negative feelings only represent part of the effect on the dependent variable annoyance, as the two predictors also have an effect by way of the interaction effect.

Expectations
Whether people expected improvement or deterioration during the coming year was coded in two dummy variables, one for expected improvement and one for expected deterioration. Improvement and deterioration in noise from air traffic were examined as predictors of noise annoyance. The factor analysis of all the predictors for the annoyance model revealed an improvement and deterioration factor with a reasonable loading of the exposure variable (L_{den}). As only a small group in relation to the total had positive expectations (n=209), it was decided to include only negative expectations in the model.

Sound insulation
The expectation was that people would experience less noise annoyance if they had fitted their home with sound insulation. 983 respondents (40%) said that they had installed sound insulation. The descriptive analyses showed that the majority of them (70%) were satisfied or very satisfied with the measures. Insulation has not been found to be a significant predictor of annoyance, however, and this includes exploratory univariate analyses.

Being an owner-occupier
As the literature shows, being or not being an owner-occupier influences the degree of annoyance: owner-occupiers say they experience more annoyance than non-owner-occupiers. 77% of the respondents (n=1857) were owner-occupiers. This predictor was not found to be significant, however, so in the end it was not included in the model.

Aircraft noise during day-to-day activities
75% of respondents (n=1801) said they heard AWACS during their day-to-day activities. The variable 'hearing military aircraft during day-to-day activities' was found to be a significant predictor of annoyance, which also did not have a high loading on one of the factors.

Education
The survey of the area around Schiphol showed that people on the panel with higher education were more likely e.g. to be highly annoyed and to lodge complaints (RIVM/RIGO, 2005). An education variable was therefore included in this survey. To ascertain what influence education has we used the Statistics Netherlands classification into three categories. Only the 'higher education' category turned out to be a significant predictor in the exploratory analyses. As it is a dummy variable, it distinguishes between 'higher education' and 'no higher education'. There is some correlation (approx. $r=-0.41$; $p<0.001$) between the three categories, so the other two were not included in the model.

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Appendix 4 Individual/focus group interviews

Impressions from the focus groups with residents and interviews with key figures

Introduction
Focus group interviews were held with 18 residents of Brunssum, Schinnen and Onderbanken (Schinveld and Merkelbeek) at the beginning of 2007, along with five interviews with 'key figures' from the area. The purpose of the interviews was to canvas the opinions, preferences and perceptions of residents on the Dutch side of the air base. The topics that emerged from the interviews were used as input to a questionnaire on the perceptions of local residents. The results of this survey are not representative of all the residents in the survey area; they provide an indication of the issues that concern the population regarding the base and AWACS. This appendix sets out the findings for each topic in more detail.

Residential satisfaction
All the interviews indicated that people are generally satisfied with their residential environment and enjoy living in the area. Hardly anyone, therefore, wanted to move (this question was asked at the end of the focus group interviews). Some residents, however, associate their residential environment directly with noise annoyance and concern about AWACS and other aircraft from the NATO base.

Annoyance
Noise annoyance is the main type of annoyance from AWACS and other aircraft from the Geilenkirchen air base: this was said by both the key figures and the members of the focus groups. Three reasons can be given for noise being experienced as annoyance:
- The noise of AWACS is harsh, and different from that of e.g. freighters flying to and from Geilenkirchen.
- The timing of the flights: they can pass over at any time during the day (sometimes even at night), the flights are often unpredictable and take place at inconvenient times, e.g. when the weather is nice and people want to sit in the garden for a while or at night.
- There is nothing you can do about the noise: insulation does not help and you have to stop talking until it is over.

The sources of noise annoyance mentioned were:
- The low-flying aircraft
- The 'laps round the houses' (training flights)
- The activities at the base itself, i.e. testing, warming up engines and de-icing aircraft (especially when there is an easterly wind)

Apart from the noise, residents said they experienced annoyance from the exhaust emissions from the aircraft (soot, air pollution) and vibration from very low-flying aircraft ('feeling your gut vibrate'). Residents also have the idea that fuel is sometimes jettisoned, as they regularly smelt kerosene. They found the dirtying of windows, window frames and gardens by soot and fuel a nuisance.

Health
A few residents said in the focus groups that they had experienced health problems as a result of the base. Most of the respondents in the focus groups did not report any health problems, or they did not associate them with the base. According to the key figures, many residents reported non-specific symptoms such as headache, shortness of breath and loss of concentration: they had the impression that residents often attributed health problems to the AWACS. According to a few respondents in the focus

groups there was a relationship between health problems and AWACS or the base. Residents were also concerned because they thought that fuel and soot were ending up around their homes and in their gardens: they thought it could be unhealthy for pets and could contaminate their home-grown vegetables.

Concern/risk perception
There was a lot of concern among residents about the AWACS, who wondered what effects the noise, the soot emissions and the jettisoned fuel ('the smell') could have on health. Far more people were concerned about an accident involving an AWACS or other aircraft near or over an inhabited area, often referring to the tanker crash in 1999. If an accident were to happen involving an aircraft from the base in an inhabited area, there could be a lot of casualties, as this is a densely populated area.

The following causes of concern were identified:
- Low-flying, which was related to the possibility of an aircraft accident
- The impression that AWACS sometimes jettison fuel
- The condition of the AWACS (their age) and their cargo (which could be ammunition)

As regards the first two points, it was often pointed out that since the trees had been felled the AWACS seemed to be flying lower, so they could carry more fuel. A few focus group members pointed out that the presence of the base had given them a feeling of security during the Cold War, but nowadays there was no raison d'être for it here. Other members noted that the base could attract terrorists, thus reducing security.

Trust
Residents have little trust in the authorities (NATO, central government, municipalities). Key figures said that people had particularly little trust in NATO and central government. People thought there was not much that municipalities could do about the AWACS problem, as they often did not have the latest news about the base. On the one hand, residents realize that the Dutch government is only a small player in NATO, so it cannot do very much; on the other, many of them are disappointed in the government because it has promised all sorts of things over the years as regards the base and has never kept these promises. Residents take the view that NATO can do what it likes because it is such a big organization, e.g. it can exceed the noise limits, apply different safety rules from those in civil aviation and not keep its promises. A few focus group members suggested that this was due to considerations of economy and that NATO regards international security as being far more important than regional security. A few residents had a positive attitude to NATO as an institution: countries need to work together, so it is a good thing that we have an organization such as NATO. In short, these authorities arouse a lot of indignation, distrust and hopelessness among residents, even if a few of them saw benefits as well.

Information and the demand for it
At present, residents are not informed about the air base by NATO, the Dutch government or the municipalities. Any information they do receive (from time to time) comes from the media (newspapers and television), and then only when something happens. People would like to receive regular information from a local source, e.g. the municipality. The focus group members said they would also like to have objective reports on noise levels and air pollution from AWACS and other aircraft. The respondents realized that not all the information could be made public, or certainly NATO sees it that way. The kinds of information people would like are:
- When more aircraft (especially low-flying) and night flights can be expected, so that these do not take people by surprise so much, and why unexpected flights take place.
- Why the old AWACS are still allowed to fly here and why they have still not been fitted with new engines.

- Why the base is still in this area, as there is no need for it now. South Limburg is very densely populated; there are so many thinly populated areas in Europe and the world that would be more suitable.

More open and honest communication by government would be appreciated: the government makes a lot of concessions as regards the air base and it could own up to this. Lastly, residents would like NATO to listen to them and take them seriously.

Complaints/campaigns
A few focus group members had lodged complaints at one time or another. The general impression, however, was that it did no good, as NATO was too big to take action against.

Compensation
Everyone interviewed indicated more or less unanimously that there was no interest in financial (or other) compensation for the presence of the base. Residents did not regard this as a solution to the problem, often referring to it as a 'sweetener'. A few key figures said that this was not the right time to propose a compensation scheme for residents; their trust in government and NATO needed to be regained first.

Solutions
People generally realize that closing the base is impossible and unlikely. Some of the focus group members thought it would have an adverse economic effect on the area and the people who work there. The following changes were mentioned as potentially resulting in less annoyance and less danger:

- Quieter and cleaner engines or aircraft
- Reducing the number of AWACS
- Reducing the number of training flights, or moving them from this area towards the east, the more thinly populated German side
- Dialogue with the base or NATO: residents want to be listened to and taken seriously.
- The same kind of environmental regime as that around Schiphol: a temporary ban on flights if the annoyance quota is full.

Benefits
According to the residents and key figures the area experiences few if any economic benefits from the presence of the base, as only a few Dutch people work there and NATO personnel do not buy from local traders. The only potential benefits are to the housing market, as NATO rents homes for its personnel.

Unfairness/injustice/powerlessness
There is a strong feeling of unfairness and injustice among residents. They are under the impression that the base can do and does do anything it likes because NATO is so big, whereas other authorities or 'ordinary people' cannot. This gives them the feeling that there is no point in taking action. Residents feel powerless because they have been promised all sorts of things over the years but the Dutch government has never kept those promises. In short, they feel that NATO and the Dutch government are not listening to them.

Low response to focus groups
In all the focus groups people were amazed, and sometimes indignant, at the low response to the focus groups among residents of Brunssum, Schinveld and Schinnen. They thought that the 'man in the street' did feel annoyed, and explained it by the lax mentality and wait-and-see attitude of Limburgers.

About the specific locations

The focus group members from Schinnen were very happy to be involved in the survey, as they had often been ignored hitherto and they certainly did experience annoyance.

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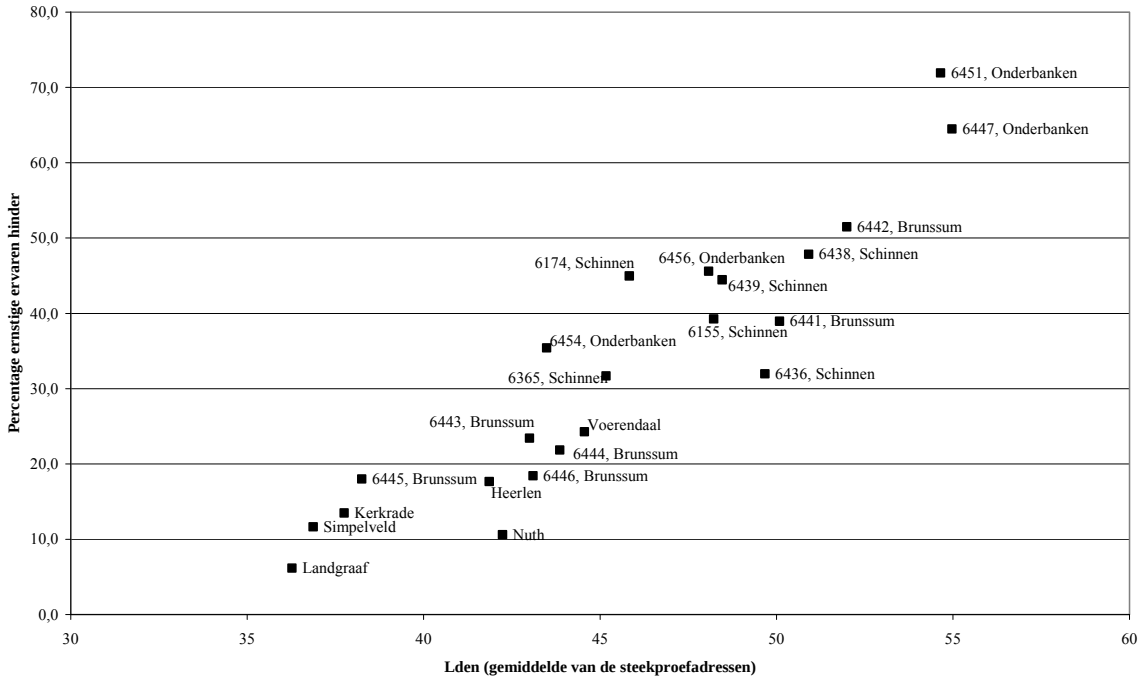
Appendix 5 Tables section

This section sets out the results of the questionnaire survey in detail. The data are given from the survey as a whole (total), each municipality and each four-digit postcode area (4DPA). The figures are prevalences (percentages) for each geographical level (total, municipality, 4DPA) with the associated 95% confidence intervals. The 4DPAs are referred to by the numerical part of the postcode. The table below shows the postcode numbers and associated postcode areas, also the number of residents aged 18 or over in the total area, each municipality and each 4DPA.

Four-digit postcode	Four-digit postcode area	Number of residents aged 18 or over
	Schinnen	Total 10730
6155	Puth	1615
6174	Sweikhuizen	640
6365	Nagelbeek	2325
6436	Amstenrade	2095
6438	Oirsbeek	3130
6439	Groot-Doenrade	925
	Brunssum	Total 24110
6441	NW Brunssum	6855
6442	NE Brunssum	2240
6443	SE Brunssum	3510
6444	SW Brunssum	5505
6445	South Brunssum	2345
6446	South Treebeek	3655
	Onderbanken	Total 6655
6447	Merkelbeek	1350
6451	Schinveld	4005
6454	Jabeek	600
6456	Bingelrade	705
-	**Heerlen**	74900
-	**Kerkrade**	41100
-	**Landgraaf**	31900
-	**Nuth**	12900
-	**Simpelveld**	9200
-	**Voerendaal**	10400
	Total	**221900**



Figuur 21 Correlation between average exposure (L_{den}) to military air traffic and serious perceived noise annoyance from military air traffic (Table X1), for each survey sub-area (i.e. the 16 4DPAs in Onderbanken, Brunssum and Schinnen plus the six other municipalities)

Table X1 Percentage of the population saying they have experienced serious noise annoyance during the past twelve months (by municipality)

Percentage highly annoyed (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Road traffic	11.6	10.1	13.2	7.9	11.9	10.1	11.8	15.4	10.7	9.6
	9.2-13.9	7.6-12.6	10.1-16.3	4.9-11.0	6.5-17.3	4.9-15.4	5.5-18.2	7.7-23.2	4.7-16.6	3.9-15.4
Total air traffic	11.3	22.0	19.8	44.3	8.4	10.2	6.2	6.5	6.2	10.1
	9.4-13.3	18.5-25.6	16.4-22.3	38.2-50.4	4.1-12.7	5.1-15.4	1.9-10.5	2.8-10.3	2.3-10.1	5.3-15.0
Military air traffic (e.g. AWACS)	18.6	39.4	28.9	63.9	17.7	13.5	6.2	10.6	11.6	24.3
	16.0-21.1	35.0-43.8	25.1-32.7	57.8-70.1	11.4-23.9	7.5-19.4	2.5-9.8	5.8-15.4	6.0-17.3	16.4-32.1
Other air traffic (e.g. from Beek airfield)	5.6	8.1	5.7	7.1	6.7	3.8	4.2	5.7	5.8	5.0
	3.9-7.3	5.9-10.2	3.6-7.8	4.2-10.0	2.6-10.8	0.6-7.0	0.0-9.3	0.9-10.5	1.9-9.7	1.5-8.4
Mopeds/scooters	19.3	12.8	18.5	11.1	15.6	25.2	25.1	18.9	16.2	23.4
	16.1-22.5	9.7-15.9	15.1-21.9	7.5-14.6	9.2-22.1	16.0-34.4	15.6-34.6	9.6-28.1	8.6-23.8	13.9-33.0
Neighbours	6.4	5.9	8.5	5.6	6.2	6.5	7.7	4.0	5.7	2.2
	4.5-8.2	3.7-8.0	5.8-11.3	3.0-8.2	2.1-10.3	1.8-11.3	2.8-12.5	0.8-7.2	1.3-10.0	0.0-4.5
Trains	0.7	0.8	0.7	1.0	0.0	1.4	1.1	0.0	1.6	1.4
	0.1-1.2	0.1-1.6	0.0-1.6	0.0-1.9	0.0-0.0	0.0-4.0	0.0-2.8	0.0-0.0	0.0-3.5	0.0-3.1
Ground activities at Geilenkirchen air base	2.9	3.9	9.9	25.5	0.7	1.8	1.1	0.1	1.3	1.4
	2.1-3.6	2.3-5.4	7.6-12.2	20.2-30.8	0.0-2.0	0.0-4.0	0.0-3.0	0.0-0.2	0.0-3.2	0.0-3.9
Industry/commerce	1.5	2.9	1.5	1.7	1.3	0.3	2.9	0.0	3.9	2.0
	0.7-2.4	0.8-4.9	0.7-2.4	0.0-3.5	0.0-2.9	0.0-0.8	0.0-2.9	0.0-0.0	0.0-9.1	0.0-4.9
Building/demolition work	4.4	4.8	5.4	1.3	5.4	1.1	8.2	1.7	2.5	2.2
	2.9-6.0	2.8-6.8	3.2-7.5	0.0-2.3	1.6-9.1	0.0-2.6	3.2-13.2	0.0-3.6	0.0-5.5	0.0-4.7
Clubs. associations. catering establishments	1.8	2.4	2.8	1.1	2.2	1.3	1.0	2.6	1.2	0.4
	0.8-2.8	1.1-3.8	1.4-4.2	0.2-2.1	0.0-4.9	0.0-3.0	0.0-2.4	0.0-5.4	0.0-3.0	0.0-1.1
Farming activities	0.8	1.5	0.1	2.7	0.5	0.0	0.1	2.9	4.0	2.1
	0.3-1.2	0.6-2.5	0.0-0.3	1.3-4.2	0.0-1.5	0.0-0.0	0.0-0.2	0.2-6.0	0.3-7.7	0.2-4.5

Table X1 continued Percentage of the population saying they have experienced serious noise annoyance during the past twelve months (by postcode area)

Percentage highly annoyed (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Road traffic	11.7	9.2	13.8	10.3	4.9	16.0	15.3	10.4	15.3	9.7	12.9	14.5	8.4	8.8	7.0	3.5
	4.2-19.1	3.0-15.5	7.2-20.5	5.0-15.7	1.7-8.1	7.1-24.9	8.1-22.5	4.9-15.9	7.5-23.1	3.6-15.7	5.8-20.0	6.6-22.5	4.0-12.8	3.8-13.7	1.7-12.4	0.9-6.2
Total air traffic	22.1	25.4	18.7	22.9	23.7	19.9	30.1	32.6	11.1	11.9	13.5	17.1	43.8	50.3	23.2	32.0
	14.2-29.9	15.5-35.3	11.4-25.9	14.5-31.3	15.9-31.6	12.1-27.7	20.8-39.3	22.6-42.6	5.1-17.1	6.4-17.4	6.5-20.6	8.5-25.7	33.9-53.6	40.7-59.9	14.2-32.3	21.9-42.0
Military air traffic (e.g. AWACS)	39.2	44.9	31.7	32.0	47.8	44.5	38.9	51.5	23.4	21.8	18.0	18.4	64.5	71.9	35.4	45.6
	29.2-49.3	32.3-57.6	22.2-41.2	22.6-41.4	38.1-57.6	33.9-55.0	28.9-49	40.2-62.8	15.1-31.7	14.6-29.1	10.4-25.6	12.2-24.7	53.9-75.0	62.4-81.5	24.9-45.9	34.6-56.6
Other air traffic (e.g. from Beek airfield)	9.3	7.7	8.9	7.0	8.0	6.8	8.4	4.3	2.5	3.4	4.9	8.2	8.5	7.0	5.6	5.8
	4.0-14.5	2.3-13.1	3.8-14.0	2.2-11.7	3.7-12.3	2.2-11.4	3.2-13.7	0.4-8.2	0.0-4.9	0.7-6.1	0.5-9.3	0.9-15.6	3.8-13.1	2.4-11.6	1.2-9.9	1.7-10.0
Mopeds/scooters	10.1	7.7	17.2	16.3	8.5	16.9	20.0	23.3	17.2	16.4	14.7	19.5	12.6	11.2	10.6	7.7
	4.0-16.2	2.1-13.4	7.8-26.7	9.3-23.3	4.1-12.8	8.7-25.0	12.3-27.7	14.5-32.1	9.8-24.7	9.3-23.6	7.6-21.8	11.2-27.8	7.0-18.2	5.6-16.8	4.2-17.1	3.1-12.3
Neighbours	7.1	9.4	5.9	9.7	2.6	2.8	12.2	4.1	8.5	8.2	9.2	4.5	8.1	5.1	0.8	7.4
	2.9-11.3	2.1-16.6	0.1-11.7	3.6-15.8	0.0-5.3	0.0-8.2	4.9-19.6	0.3-8.0	2.5-14.6	2.5-14.0	2.5-15.8	1.4-7.7	3.1-13.0	1.2-9.0	0.0-2.4	0.4-14.4
Trains	0.2	1.1	3.5	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	1.3	1.4	1.0	1.4	0.0
	0.0-0.6	0.0-2.8	0.2-6.7	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-9.1	0.0-0.0	0.0-0.0	0.0-3.1	0.0-3.4	0.0-2.3	0.0-4.1	0.0-0.0
Ground activities at Geilenkirchen air base	3.8	2.7	1.1	5.4	5.0	4.5	12.3	21.8	13.2	6.4	7.1	1.9	8.7	36.7	7.7	13.7
	0.7-6.9	0.0-5.8	0.0-3.2	1.3-9.5	1.2-8.7	0.5-8.5	6.3-18.4	13.7-29.9	6.8-19.6	2.3-10.5	2.6-11.7	0.0-4.1	4.1-13.2	27.8-45.5	2.9-12.4	6.9-20.4
Industry/commerce	1.0	0.9	9.3	1.0	0.7	2.9	0.5	1.1	3.9	0.2	3.1	2.5	1.2	2.2	0.0	1.0
	0.0-2.4	0.0-2.5	0.9-17.6	0.0-2.5	0.0-1.9	0.0-8.4	0.0-1.2	0.0-2.8	0.0-8.1	0.0-0.5	0.0-6.3	0.1-4.8	0.0-3.0	0.0-5.2	0.0-0.0	0.0-2.7
Building/demolition work	9.3	2.3	4.2	8.6	1.4	2.8	10.2	3.3	5.4	0.9	5.4	4.2	3.1	0.9	0.1	0.9
	1.4-17.1	0.0-4.7	0.7-7.7	2.6-14.6	0.0-3.1	0.0-8.2	3.7-16.7	0.3-6.2	0.0-10.9	0.0-2.1	0.9-10.0	0.9-7.4	0.1-6.0	0.0-2.2	0.0-0.3	0.7-2.5
Clubs. associations. catering establishments	1.3	1.2	1.9	5.8	1.2	3.2	2.0	2.2	2.9	2.3	7.4	2.4	1.5	0.7	2.1	1.6
	0.0-3.5	0.0-3.5	0.0-4.5	1.0-10.6	0.0-3.0	0.0-6.6	0.0-4.7	0.0-4.6	0.0-6.0	0.0-6.1	1.9-12.9	0.0-4.7	0.0-3.6	0.0-2.1	0.0-4.5	0.0-3.5
Farming activities	3.2	0.1	0.2	2.7	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.7	5.0	0.7	7.3	5.4
	0.2-6.2	0.0-0.2	0.0-0.5	0.0-5.8	0.0-2.8	0.0-3.4	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-2.2	1.5-8.5	0.0-2.1	0.1-14.6	0.0-11.1

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Table X2 Percentage of the population saying they have experienced serious odour annoyance during the past twelve months (by municipality and postcode area)

Percentage highly annoyed (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Road traffic	7.2	5.6	7.6	4.3	8.2	7.6	6.9	3.5	7.3	5.6
	5.2-9.1	3.3-7.9	5.1-10.1	2.2-6.4	3.9-12.5	2.5-12.7	1.5-12.3	0.6-6.3	2.7-12.0	2.2-9.1
Total air traffic	3.1	4.6	4.7	21.0	2.2	2.6	2.3	1.6	1.2	1.1
	2.0-4.2	3.0-6.2	3.2-6.3	15.8-26.2	0.0-4.6	0.1-5.2	0.0-5.4	0.0-3.4	0.0-2.9	0.0-2.7
Military air traffic (e.g. AWACS)	5.2	9.0	10.1	36.2	3.2	2.4	3.9	2.3	1.2	5.3
	3.9-6.4	6.7-11.2	7.8-12.5	30.3-42.1	0.4-6.1	0.3-4.4	0.0-7.8	0.1-4.6	0.0-2.8	1.2-9.4
Other air traffic (e.g. from Beek airfield)	1.4	1.9	1.2	2.9	1.2	1.3	2.3	1.1	0.7	0.0
	0.6-2.2	0.9-2.9	0.4-1.9	0.8-5.0	0.0-2.8	0.0-3.1	0.0-5.6	0.0-2.6	0.0-2.0	0.0-0.0
Industry/commerce	3.8	4.1	2.7	2.1	7.2	1.6	2.4	1.0	1.1	1.2
	1.7-6.0	1.7-6.4	1.4-4.0	0.2-4.1	1.2-13.1	0.1-3.1	0.0-5.3	0.0-2.1	0.0-2.6	0.0-2.9
Farming activities	2.5	4.2	1.3	5.7	1.3	0.6	5.3	2.4	4.5	8.4
	1.5-3.6	2.6-5.9	0.2-2.4	3.6-7.8	0.0-2.7	0.0-1.7	0.0-10.6	0.0-5.1	0.0-9.8	1.3-15.5

Percentage highly annoyed (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Road traffic	6.4	2.9	9.2	5.7	2.3	7.7	9.7	9.9	10.1	4.7	2.6	7.0	4.2	4.2	5.3	3.9
	0.9-11.9	0.0-5.9	1.8-16.7	0.4-11.0	0.0-4.5	1.2-14.1	3.4-16.1	4.1-15.7	3.4-16.8	0.4-9.0	0.2-5.0	2.3-11.7	1.2-7.1	1.0-7.5	0.9-9.8	0.0-9.3
Total air traffic	6.7	1.4	1.8	5.4	4.6	8.3	7.7	9.1	5.7	2.7	1.9	0.3	18.3	27.5	2.7	7.0
	2.5-10.9	0.0-4.2	0.0-3.8	1.2-9.6	1.1-8.1	3.1-13.4	3.4-12.0	3.7-14.5	1.4-10.0	0.4-5.0	0.0-4.4	0.1-0.6	11.3-25.3	19.1-36.0	0.2-5.2	2.3-11.7
Military air traffic (e.g. AWACS)	12.4	6.0	1.6	9.6	11.1	15.9	15.2	18.6	11.2	6.6	3.1	4.2	29.9	45.4	13.5	18.7
	6.4-18.3	0.9-11.2	0.0-3.2	4.3-14.9	5.7-16.5	8.5-23.3	8.8-21.6	11.1-26.1	5.1-17.2	2.6-10.5	0.0-6.3	1.1-7.3	21.4-38.4	36.0-54.8	3.4-23.7	10.9-26.6
Other air traffic (e.g. from Beek airfield)	3.0	1.5	0.9	1.5	2.5	2.0	2.2	0.1	1.4	0.5	1.1	0.6	3.4	3.6	0.1	0.6
	0.3-5.8	0.0-4.5	0.0-2.2	0.0-3.5	0.0-5.0	0.0-4.8	0.0-4.5	0.0-0.2	0.0-3.3	0.0-1.4	0.0-3.3	0.0-1.7	0.2-6.6	0.3-6.9	0.0-0.2	0.0-1.7
Industry/commerce	4.2	0.9	12.4	1.9	0.8	0.8	3.0	2.7	4.7	1.0	1.9	3.0	1.8	2.6	0.0	2.2
	0.7-7.6	0.0-2.6	2.9-22.0	0.0-4.9	0.0-1.9	0.0-2.3	0.0-6.0	0.0-5.3	0.2-9.2	0.0-2.7	0.0-4.4	0.0-6.2	0.0-4.2	0.0-5.7	0.0-0.0	0.0-5.4
Farming activities	6.8	2.5	1.1	7.4	3.5	3.4	0.9	0.7	0.7	2.8	0.2	1.7	8.6	2.5	19.9	5.5
	2.6-11.0	0.0-5.9	0.0-2.5	1.7-13.2	0.5-6.6	0.3-6.4	0.0-2.4	0.0-2.0	0.0-2.1	0.0-6.9	0.0-0.4	0.0-3.7	4.0-13.2	0.0-4.9	9.0-30.8	1.4-9.6

Table X3 Percentage of the population saying they have experienced serious vibration annoyance during the past twelve months (by municipality)

Percentage highly annoyed (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Road traffic	6.7	8.6	8.6	6.3	4.1	9.5	6.3	7.4	6.3	9.3
	5.1-8.3	6.1-11.2	6.1-11.2	3.4-9.1	1.2-7.0	3.9-15.2	2.4-10.3	1.9-12.8	1.5-11.1	3.3-15.3
Total air traffic	5.2	8.0	9.0	25.5	3.6	6.3	3.9	1.3	0.9	1.8
	3.8-6.7	5.8-10.2	6.8-11.3	19.9-31.1	0.8-6.3	1.1-11.5	0.3-7.4	0.0-2.8	0.0-2.3	0.0-3.7
Military air traffic (e.g. AWACS)	7.6	17.6	17.2	41.6	3.9	7.7	1.1	2.5	3.2	11.0
	6.2-9.1	14.4-20.7	14.2-20.2	35.6-47.5	1.2-6.7	2.3-13.1	0.0-2.8	0.2-4.8	0.0-6.7	5.5-16.4
Other air traffic (e.g. from Beek airfield)	1.4	2.2	1.6	3.7	0.6	3.4	0.2	0.9	0.7	0.8
	0.6-2.1	1.2-3.3	0.6-2.7	1.1-6.3	0.0-1.8	0.0-6.7	0.0-0.5	0.0-2.3	0.0-2.1	0.0-2.0
Trains	1.2	0.4	0.0	1.1	0.7	3.2	1.7	0.0	0.9	1.4
	0.3-2.1	0.0-1.1	0.0-0.0	0.0-2.6	0.0-2.1	0.0-7.0	0.0-4.0	0.0-0.0	0.0-2.8	0.0-3.0
Ground activities at Geilenkirchen air base	1.7	1.6	5.7	15.9	0.6	1.5	0.0	0.0	0.7	0.0
	1.1-2.3	0.7-2.6	3.9-7.5	11.5-20.4	0.0-1.9	0.0-3.7	0.0-0.0	0.0-0.0	0.0-2.0	0.0-0.0
Farming activities	0.8	2.0	0.4	2.3	0.0	0.0	0.6	0.8	6.0	5.1
	0.5-1.2	0.9-3.0	0.0-1.0	1.3-3.3	0.0-0.0	0.0-0.0	0.0-1.9	0.0-2.2	1.3-10.8	0.9-9.2

rivm

Table X3 continued Percentage of the population saying they have experienced serious vibration annoyance during the past twelve months (by postcode area)

Percentage highly annoyed (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Road traffic	13.2	3.3	15.9	7.3	4.1	3.6	12.3	7.6	4.2	7.1	9.5	8.6	7.7	6.2	5.4	5.0
	5.6-20.8	0.0-6.5	7.8-24.0	2.6-11.9	1.1-7.1	0.0-7.2	5.6-19.0	3.0-12.3	0.7-7.7	1.3-12.9	3.3-15.6	3.4-13.7	3.5-11.9	1.7-10.6	1.0-9.9	0.0-10.4
Total air traffic	7.3	4.4	6.6	8.6	10.1	7.3	13.7	21.3	6.8	3.7	6.6	4.6	25.1	31.6	6.0	10.3
	3.0-11.6	0.2-8.7	2.1-11.0	3.5-13.7	4.9-15.2	2.5-12.1	7.3-20.0	13.0-29.7	2.5-11.1	0.7-6.7	1.4-11.8	1.4-7.8	17.2-33.0	22.7-40.6	0.7-11.4	4.8-15.9
Military air traffic (e.g. AWACS)	20.3	12.3	6.6	18.2	24.3	20.7	28.0	36.9	9.3	10.5	8.1	8.1	39.2	49.8	20.0	20.4
	12.6-28.0	5.0-19.6	2.1-11.1	10.9-25.4	16.6-32.0	12.9-28.6	19.4-36.6	26.6-47.1	4.4-14.3	5.4-15.7	2.7-13.4	3.1-13.1	30.1-48.3	40.4-59.3	11.7-28.4	12.3-28.5
Other air traffic (e.g. from Beek airfield)	2.5	3.1	1.2	1.2	3.4	2.3	3.7	1.5	0.2	0.5	1.8	0.9	5.1	4.1	1.0	1.8
	0.1-4.9	0.0-6.8	0.0-2.9	0.0-2.9	0.6-6.3	0.0-4.9	0.3-7.0	0.0-3.8	0.0-0.5	0.0-1.5	0.0-4.4	0.0-2.3	1.4-8.8	0.0-8.3	0.0-2.6	0.0-4.0
Trains	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.2	1.0	0.0
	0.0-0.1	0.0-0.0	0.0-5.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.1	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-3.5	0.0-3.7	0.0-2.9	0.0-0.0
Ground activities at Geilenkirchen air base	1.6	0.0	0.8	1.7	2.1	3.3	7.1	13.4	8.5	2.8	3.3	1.2	6.8	22.9	2.7	7.8
	0.0-3.7	0.0-0.0	0.0-2.4	0.0-4.0	0.0-4.3	0.0-6.5	2.3-11.9	6.9-20.0	3.4-13.6	0.1-5.4	0.5-6.1	0.0-2.9	2.6-10.9	15.5-30.3	0.2-5.2	2.4-13.1
Farming activities	4.9	0.1	0.3	1.7	2.3	2.0	1.2	0.0	0.0	0.0	0.0	0.0	6.5	0.1	5.3	3.9
	1.1-8.6	0.0-0.4	0.0-0.7	0.0-4.2	0.0-4.8	0.0-4.7	0.0-3.3	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.1	2.6-10.4	0.0-0.2	1.1-9.5	0.2-7.5

Table X4 Percentage of the population saying they have experienced serious sleep disturbance during the past twelve months (by municipality)

Percentage highly annoyed (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Road traffic	5.6	4.8	7.7	4.0	4.5	5.6	8.7	4.1	3.5	4.3
	4.0-7.1	3.0-6.6	5.2-10.2	1.8-6.2	1.6-7.4	1.6-9.7	3.0-14.4	0.3-7.9	0.5-6.6	0.8-7.8
Total air traffic	3.5	4.4	5.6	16.6	2.3	3.7	2.2	1.7	2.1	4.9
	2.5-4.6	2.8-6.0	3.8-7.3	12.0-21.3	0.2-4.5	0.6-6.8	0.0-5.0	0.0-3.5	0.0-4.4	1.6-8.2
Military air traffic (e.g. AWACS)	5.7	12.6	12.7	28.6	1.9	6.8	1.6	2.6	1.7	10.2
	4.5-6.8	9.7-15.5	10.1-15.4	23.1-34.0	0.0-3.8	2.6-11.0	0.0-3.5	0.3-4.9	0.0-3.9	4.9-15.5
Other air traffic (e.g. from Beek airfield)	2.0	2.4	1.7	2.7	2.7	2.3	0.1	2.4	0.7	2.5
	1.0-3.1	1.2-3.6	0.5-2.9	0.9-4.4	0.1-5.4	0.0-5.0	0.0-0.4	0.2-4.6	0.0-2.1	0.2-4.8
Neighbours	3.8	3.2	4.7	4.6	2.5	8.1	2.6	2.1	2.7	1.4
	2.3-5.3	1.6-4.8	2.8-6.6	2.1-7.1	0.0-5.0	1.9-14.3	0.0-5.5	0.0-4.3	0.0-5.4	0.0-3.0
Trains	0.8	0.1	0.2	0.3	0.2	2.1	0.9	0.0	1.0	3.0
	0.2-1.4	0.0-0.2	0.0-0.7	0.0-0.7	0.0-0.4	0.0-5.2	0.0-2.5	0.0-0.0	0.0-2.9	0.2-5.8
Ground activities at Geilenkirchen air base	1.3	2.0	4.0	12.1	0.0	1.1	0.8	0.0	0.7	1.3
	0.9-1.7	0.8-3.2	2.6-5.4	8.1-16.2	0.0-0.0	0.0-2.8	0.0-2.3	0.0-0.0	0.0-2.0	0.0-3.7
Industry/commerce	0.5	1.2	0.8	0.3	0.3	0.0	0.8	1.0	0.0	1.4
	0.2-0.8	0.0-2.6	0.0-1.6	0.0-0.8	0.0-0.8	0.0-0.0	0.0-1.9	0.0-2.9	0.0-0.0	0.0-3.8
Building/demolition work	1.5	3.8	2.6	1.8	0.1	1.0	3.6	1.4	1.6	0.9
	0.8-2.1	1.8-5.8	1.1-4.2	0.2-3.4	0.0-0.4	0.0-2.6	0.1-7.2	0.0-3.2	0.0-3.8	0.0-2.1

Table X4 continued Percentage of the population saying they have experienced serious sleep disturbance during the past twelve months (by postcode area)

Percentage highly annoyed (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Road traffic	8.4	2.9	5.4	4.4	2.9	5.5	9.0	4.7	5.5	8.8	9.1	6.8	4.9	4.4	3.7	0.3
	1.4-15.3	0.0-6.2	1.2-9.6	0.9-7.9	0.3-5.4	0.0-11.7	3.1-15.0	1.0-8.4	1.0-10.0	2.6-14.9	3.0-15.1	2.2-11.4	1.8-8.0	0.9-7.9	0.0-8.4	0.0-0.8
Total air traffic	2.9	2.4	3.7	5.9	4.9	4.9	9.3	7.5	5.0	3.0	4.7	2.3	14.6	21.3	4.4	6.0
	0.1-5.7	0.0-5.7	0.9-6.5	1.6-10.2	1.3-8.5	1.0-8.7	4.5-14.2	3.0-12.0	1.0-9.0	0.5-5.6	0.2-9.3	0.2-4.4	8.3-20.9	13.8-28.9	0.5-8.4	1.8-10.3
Military air traffic (e.g. AWACS)	8.3	8.4	9.5	13.4	16.4	17.3	24.0	25.0	6.3	7.0	5.6	3.7	28.1	34.3	8.1	15.6
	3.5-13.0	0.0-18.6	4.3-14.7	6.8-20.0	9.7-23.2	8.6-26.1	15.8-32.2	16.5-33.5	2.2-10.3	3.0-10.9	1.5-9.7	0.9-6.4	20.1-36.2	25.6-43.0	2.9-13.4	8.5-22.7
Other air traffic (e.g. from Beek airfield)	0.4	7.9	1.4	2.3	2.9	3.0	3.3	1.6	0.9	1.5	1.1	0.2	4.2	2.4	1.8	2.0
	0.0-0.9	0.0-18.4	0.0-3.1	0.0-4.6	0.3-5.6	0.0-6.3	0.0-6.9	0.0-4.2	0.0-2.2	0.0-3.7	0.0-3.2	0.0-0.3	0.9-7.6	0.0-5.1	0.0-4.2	0.0-4.5
Neighbours	2.8	9.9	1.6	5.7	1.5	3.0	6.7	1.2	4.3	5.9	1.3	3.7	3.6	5.9	0.1	3.3
	0.1-5.5	0.0-20.6	0.0-4.9	0.8-10.6	0.0-3.5	0.0-8.2	2.0-11.3	0.0-3.3	0.5-8.2	0.9-11.0	0.0-2.8	0.7-6.8	0.5-6.6	1.9-9.9	0.0-0.2	0.0-7.3
Trains	0.0	0.0	0.5	0.0	0.0	0.0	0.8	0.0	0.0	0.1	0.0	0.0	0.9	0.0	0.9	0.0
	0.0-0.0	0.0-0.0	0.0-1.1	0.0-0.1	0.0-0.0	0.0-0.0	0.0-2.4	0.0-0.0	0.0-0.0	0.0-0.2	0.0-0.0	0.0-0.0	0.0-2.7	0.0-0.0	0.0-2.6	0.0-0.0
Ground activities at Geilenkirchen air base	1.5	5.7	0.9	1.7	2.2	3.2	5.8	10.7	4.2	1.2	1.8	1.7	4.2	18.8	0.7	1.3
	0.0-3.5	0.0-15.2	0.0-2.5	0.0-4.1	0.0-4.8	0.0-6.4	1.8-9.8	4.9-16.6	0.9-7.4	0.0-2.6	0.0-3.8	0.0-3.6	0.9-7.5	11.9-25.7	0.0-2.0	0.0-3.4
Industry/commerce	0.7	0.1	4.1	0.0	0.6	0.2	1.6	1.0	0.3	0.2	0.9	0.6	1.6	0.0	0.0	0.0
	0.0-2.1	0.0-0.2	0.0-10.0	0.0-0.1	0.0-1.6	0.0-0.7	0.0-4.2	0.0-2.6	0.0-0.7	0.0-0.5	0.0-2.5	0.0-1.8	0.0-3.9	0.0-0.0	0.0-0.0	0.0-0.0
Building/demolition work	9.9	0.2	1.6	8.0	0.2	2.7	4.4	2.6	5.8	0.1	1.1	0.9	1.5	2.3	1.4	0.1
	1.3-18.5	0.0-0.5	0.0-4.2	1.8-14.3	0.0-0.5	0.0-8.0	0.9-7.9	0.0-5.7	0.0-13.2	0.0-0.3	0.0-3.1	0.0-2.4	0.0-3.6	0.0-4.8	0.0-4.0	0.0-0.3

Table X5 Satisfaction with the home and the residential environment and safety in the residential environment (by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
(very) satisfied with the home	88.0	93.8	89.4	92.2	83.3	89.6	88.8	89.5	92.5	96.2
	84.9-90.6	91.1-95.7	86.6-91.7	88.5-94.8	75.0-89.2	81.8-94.4	81.6-93.4	77.2-95.6	85.5-96.2	90.5-98.5
(very) satisfied with the residential environment	83.8	88.2	80.3	74.8	82.7	87.6	76.9	90.8	91.1	93.0
	80.9-86.3	85.4-90.6	76.7-83.4	69.3-79.5	75.3-88.2	80.3-92.4	68.3-83.7	84.1-94.8	84.4-95.1	87.0-96.3
(very) satisfied with noise in the residential environment	60.9	51.5	53.2	30.7	60.9	64.0	66.3	75.5	61.5	61.7
	56.9-64.8	46.7-56.4	48.4-58.0	25.1-37.0	51.3-69.8	54.0-73.0	56.1-75.1	66.1-82.9	50.4-71.6	51.3-71.1
(very) satisfied with sound insulation of home	64.2	59.5	58.2	40.8	62.3	66.5	70.1	71.8	75.0	65.4
	60.0-68.1	54.7-64.2	53.3-62.9	34.9-47.0	52.7-71.0	56.2-75.4	59.6-78.8	61.4-80.4	64.9-83.0	54.9-74.6
Home has sound insulation	41.7	36.0	44.7	36.2	43.5	52.8	32.7	28.1	40.5	36.4
	37.7-45.9	31.4-40.8	40.0-49.5	30.6-42.3	34.2-53.3	42.4-62.9	23.9-42.9	19.0-39.5	30.1-51.9	26.7-47.5
Feeling very safe in the residential environment	59.6	63.2	49.3	52.7	55.1	62.8	61.5	76.1	72.7	67.3
	55.5-63.6	58.7-67.8	44.4-54.1	46.7-58.7	45.6-64.7	52.8-72.8	51.8-71.2	66.4-85.8	63.0-82.3	57.9-76.8

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
(very) satisfied with the home	91.7	92.7	94.5	94.9	95.0	89.6	88.1	86.3	88.0	93.4	89.8	89.0	91.9	91.1	95.6	96.2
	85.6-95.4	81.9-97.3	81.9-98.5	88.3-97.8	89.6-97.6	81.1-94.6	80.8-92.8	78.0-91.8	79.1-93.5	87.8-96.5	81.6-94.6	80.7-94.0	85.3-95.7	84.8-94.9	88.6-98.4	90.6-98.5
(very) satisfied with the residential environment	90.0	87.5	82.0	82.3	95.3	92.3	76.1	74.3	78.0	85.1	81.7	85.8	81.8	67.6	86.3	89.2
	83.5-94.1	76.5-93.7	73.5-88.3	73.4-88.6	90.8-97.6	85.8-95.9	67.1-83.3	64.8-82.0	68.3-85.3	77.2-90.5	72.6-88.2	78.5-90.9	74.0-87.6	58.8-75.4	78.4-91.6	82.0-93.7
(very) satisfied with noise in the residential environment	57.8	50.5	52.4	50.7	49.3	48.2	50.1	33.6	39.2	67.3	55.5	62.8	31.0	25.3	51.3	41.6
	47.2-67.7	37.4-63.6	40.8-63.7	39.7-61.6	39.4-59.2	37.6-59.0	39.1-61.0	23.3-45.9	28.5-51.1	57.2-76.1	44.1-66.4	52.3-72.2	21.9-41.7	17.3-35.4	39.3-63.2	30.3-53.8
(very) satisfied with sound insulation of home	65.1	57.9	46.8	60.2	65.7	60.5	48.8	42.1	64.3	64.4	68.1	64.1	45.7	32.3	58.5	61.3
	54.8-74.2	43.6-70.9	35.4-58.5	49.3-70.1	56.3-74.0	49.6-70.4	37.7-60.0	31.3-53.7	52.5-74.6	53.5-73.9	57.1-77.4	53.2-73.7	35.9-55.9	23.7-42.3	46.3-69.8	50.0-71.6
Home has special sound insulation	33.7	26.9	31.4	41.7	39.1	34.0	34.1	49.5	56.4	40.5	61.5	46.1	33.9	39.6	29.2	29.1
	24.0-45.1	17.5-38.9	22.0-42.7	31.2-52.9	29.7-49.3	24.5-45.0	24.9-44.7	38.6-60.5	44.7-67.5	30.7-51.2	49.9-71.8	35.6-57.0	24.7-44.6	30.9-48.9	19.8-40.9	20.0-40.3
Feeling very safe in the residential environment	66.0	61.9	54.4	60.0	70.9	63.7	46.7	40.8	47.9	53.8	59.2	47.8	63.7	44.8	61.4	65.7
	56.1-75.9	48.2-75.5	43.1-65.6	49.4-70.7	62.2-79.5	53.4-73.9	35.7-57.7	30.1-51.5	36.3-59.4	43.2-64.4	47.9-70.4	37.0-58.5	54.4-72.9	35.5-54.1	49.7-73.1	55.4-76.0

Table X6 Self-reported health status of the population (by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Perceived health (good/very good)	66.8 63.1-70.3	69.4 64.6-73.9	62.8 58.1-67.3	55.9 49.7-61.9	69.8 60.8-77.6	62.5 52.5-71.6	59.8 49.3-69.6	79.0 69.2-86.3	69.6 58.6-78.8	77.6 67.9-85.0
Perceived health (OK to very poor)	33.2 29.7-36.9	30.6 26.1-35.4	37.2 32.7-41.9	44.1 38.1-50.3	30.2 22.4-39.2	37.5 28.4-47.5	40.2 30.4-50.7	21.0 13.7-30.8	30.4 21.2-41.4	22.4 15.0-32.1
General health status (scale 0-100) [1]	65.4 63.8-67.0	66.4 64.4-68.4	64.5 62.5-66.5	61.2 58.4-64.0	65.8 61.7-69.9	63.1 59.4-66.9	64.9 62.0-67.9	69.2 65.0-73.4	67.4 62.9-71.8	69.4 65.6-73.3
Mental health status (scale 0-100) [1]	73.0 71.5-74.6	73.6 72.0-75.2	71.2 69.3-73.0	70.2 67.7-72.6	72.2 68.4-76.0	74.6 71.5-77.7	72.0 68.4-75.5	77.0 73.6-80.4	76.4 72.6-80.2	74.4 70.6-78.3
Physical symptoms (average score) [1]	7.0 6.4-7.6	6.5 6.0-7.1	8.1 7.5-8.7	8.6 7.7-9.5	6.9 5.4-8.4	7.2 6.0-8.5	7.0 5.8-8.2	5.4 4.2-6.6	6.8 5.4-8.1	6.2 5.0-7.3

[1] For an explanation of the RAND and 4DSQ scales see Appendix 3.

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Perceived health (good/very good)	68.0 57.5-76.9	74.5 62.0-83.9	62.5 50.1-73.5	68.6 57.8-77.8	76.4 67.2-83.6	64.2 53.3-73.8	53.2 42.2-63.9	69.1 58.7-77.8	58.8 47.3-69.3	71.7 61.7-80.0	64.6 52.6-75.0	66.7 56.3-75.8	66.3 56.8-74.7	48.7 39.4-58.1	58.9 46.3-70.5	71.5 60.6-80.4
Perceived health (OK to very poor)	32.0 23.1-42.5	25.5 16.1-38.0	37.5 26.5-49.9	31.4 22.2-42.2	23.6 16.4-32.8	35.8 26.2-46.7	46.8 36.1-57.8	30.9 22.2-41.3	41.2 30.7-52.7	28.3 20.0-38.3	35.4 25.0-47.4	33.3 24.2-43.7	33.7 25.3-43.2	51.3 41.9-60.6	41.1 29.5-53.7	28.5 19.6-39.4
General health status (scale 0-100) [1]	68.2 64.5-71.9	67.5 63.4-71.6	65.1 59.5-70.7	66.2 61.7-70.7	67.9 64.8-70.9	61.1 56.1-66.2	62.7 57.8-67.7	65.4 61.2-69.5	62.6 57.5-67.6	66.6 62.7-70.5	65.4 61.7-69.2	65.6 61.5-69.7	64.9 61.7-68.1	58.5 54.0-63.0	62.1 55.6-68.5	68.1 64.5-71.7
Mental health status (scale 0-100) [1]	74.2 70.8-77.5	72.6 68.6-76.6	73.7 68.9-78.6	69.4 65.4-73.4	77.1 74.7-79.5	70.6 67.0-74.2	68.5 64.3-72.7	72.3 68.6-76.1	70.5 65.5-75.6	73.3 69.6-77.0	75.1 71.1-79.1	70.6 66.6-74.5	74.1 70.6-77.6	67.1 63.2-71.0	70.9 66.7-75.1	78.0 75.0-81.0
Physical symptoms (average score) [1]	6.1 5.0-7.2	5.0 3.7-6.3	6.7 5.0-8.3	7.2 6.0-8.4	6.0 5.1-6.9	8.3 6.9-9.7	8.2 6.8-9.6	7.9 6.7-9.1	8.8 7.1-10.5	7.8 6.6-9.1	7.9 6.6-9.1	7.9 6.5-9.4	7.3 5.9-8.6	9.6 8.1-11.0	8.9 7.2-10.6	5.5 4.3-6.7

[1] For an explanation of the RAND and 3DSQ scales see Appendix 3.

Table X7 Percentage of the population saying they are seriously concerned about their safety as a result of a particular residential situation (by municipality)

Concerned about safety (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Percentage considering that a risk situation applies to them...										
Living in a busy road	32.1	37.7	36.4	30.4	29.2	35.4	30.7	35.1	27.7	29.4
	28.3-36.1	32.9-42.7	31.7-41.4	24.9-36.5	21.2-38.7	25.8-46.3	21.8-41.3	24.9-46.9	18.7-39.0	20.2-40.6
Living near a military air base	37.5	55.3	70.6	90.1	31.1	23.9	48.0	21.0	9.6	17.1
	33.5-41.6	50.1-60.3	65.9-74.8	86.4-92.8	22.9-40.7	15.4-35.2	37.4-58.7	13.1-31.9	5.3-16.9	10.3-27.2
Living under an approach path to an airfield	35.4	65.5	47.8	80.1	33.3	20.1	28.2	42.8	26.1	41.6
	31.5-39.5	60.4-70.2	43.0-52.6	74.0-85.0	24.7-43.2	13.2-29.5	19.5-38.8	31.6-54.8	17.5-37.1	30.8-53.4
... and seriously concerned about it.										
Living in a busy road	21.8	27.3	25.9	23.3	9.7	22.2	35.3	26.6	27.6	29.3
	16.5-27.1	20.1-34.4	18.9-32.9	14.7-32.0	1.1-18.3	8.4-35.9	16.8-53.9	8.3-45.0	8.6-46.7	11.4-47.2
Living near a military air base	42.4	45.6	45.0	64.7	40.2	38.1	36.2	29.2	37.6	59.1
	36.2-48.6	39.2-51.9	39.3-50.8	58.2-71.2	24.6-55.9	12.9-63.4	22.2-50.1	10.6-47.8	8.9-66.2	33.3-84.9
Living under an approach path to an airfield	47.0	56.8	52.3	67.6	42.7	46.9	47.0	28.1	39.6	44.4
	40.3-53.6	50.7-63.0	44.7-59.9	61.1-74.0	26.3-59.1	23.5-70.3	26.7-67.3	13.0-43.2	19.6-59.6	27.0-61.8

rivm

Table X7 continued Percentage of the population saying they are seriously concerned about their safety as a result of a particular residential situation (by postcode area)

Concerned about safety (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Percentage considering that a risk situation applies to them...																
Living in a busy road	33.8	29.2	63.7	29.9	26.7	37.9	33.5	37.3	41.9	33.3	36.4	40.1	28.0	33.4	17.8	30.2
	24.0-45.2	19.1-41.7	52.1-73.9	20.7-41.2	18.4-37.0	27.6-49.5	23.7-45.0	26.8-49.2	30.5-54.4	23.8-44.4	25.6-48.8	29.8-51.4	20.4-37.0	25.0-43.0	10.8-27.8	20.1-42.7
Living near a military air base	57.6	36.8	47.5	53.8	59.6	73.7	81.6	93.2	82.2	60.9	65.1	42.3	81.1	96.6	75.3	85.4
	45.9-68.6	25.6-49.7	36.0-59.3	42.2-65.0	48.8-69.6	62.1-82.7	69.4-89.7	85.5-97.0	72.4-89.0	49.9-70.9	52.5-75.9	31.9-53.5	71.2-88.2	90.4-98.8	61.3-85.4	75.3-91.8
Living under an approach path to an airfield	64.4	48.9	51.8	70.4	73.9	76.1	72.0	65.8	36.7	31.4	30.1	37.5	87.5	81.2	55.0	81.3
	52.6-74.8	35.3-62.6	39.7-63.8	58.4-80.0	63.1-82.4	65.1-84.5	60.6-81.2	53.4-76.3	25.9-49.0	22.1-42.6	20.6-41.7	27.6-48.6	77.3-93.5	71.1-88.3	42.1-67.3	68.6-89.6
... and seriously concerned about it.																
Living in a busy road	21.8	47.0	30.6	21.1	25.3	27.2	30.3	16.7	14.7	31.4	22.1	31.9	35.0	20.6	39.3	10.3
	8.4-35.2	25.3-68.7	16.4-44.7	5.3-36.9	9.7-40.9	11.6-42.8	13.2-47.4	2.4-31.1	3.8-25.7	13.1-49.8	7.7-36.6	15.8-47.9	19.5-50.4	8.6-32.7	15.9-62.7	0.1-20.5
Living near a military air base	44.6	52.9	46.8	51.8	38.1	52.5	48.0	45.9	46.5	39.3	37.8	49.4	59.0	71.6	45.6	47.9
	30.6-58.5	34.8-71.0	30.6-62.9	36.0-67.5	26.3-49.9	40.0-65.1	36.0-60.0	34.4-57.5	32.7-60.2	26.5-52.2	25.0-50.7	33.0-65.7	47.2-70.8	62.3-80.9	32.4-58.9	34.8-61.0
Living under an approach path to an airfield	46.9	40.4	55.7	63.0	58.2	64.6	50.8	59.1	59.9	54.8	43.8	44.2	61.4	74.1	58.5	50.9
	33.3-60.6	23.8-57.0	38.1-73.2	49.7-76.3	46.8-69.6	52.0-77.1	37.3-64.2	45.8-72.3	39.8-79.9	34.0-75.6	24.1-63.5	28.0-60.3	50.0-72.8	64.7-83.4	42.1-74.8	38.0-63.8

Table X8 Percentage of the population concerned that exhaust emissions or noise from military air traffic in the vicinity of the home could cause health problems and concerned about the possibility of an accident involving a military aircraft (highly/fairly concerned; by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Concerned about health problems due to exhaust emissions from military aircraft	38.3	48.9	45.2	68.8	38.7	39.9	30.5	24.0	27.4	34.5
	34.5-42.3	44.0-53.9	40.4-50.0	62.4-74.5	30.2-47.9	30.4-50.2	22.1-40.3	16.6-33.5	19.3-37.4	25.7-44.5
Concerned about health problems due to noise from military aircraft	48.5	54.0	64.0	78.1	45.9	47.4	50.7	29.2	29.7	44.4
	44.4-52.7	49.0-58.9	58.7-68.9	72.6-82.7	36.7-55.4	37.1-58.0	40.2-61.1	20.8-39.5	21.1-39.9	34.2-55.1
Concerned about the possibility of an accident involving a military aircraft	51.6	61.9	64.6	80.0	54.3	45.3	44.1	38.8	43.2	42.4
	47.3-55.9	56.6-66.9	59.4-69.4	73.8-85.0	44.3-63.9	35.2-55.8	34.1-54.6	28.6-49.9	32.7-54.3	32.4-53.0

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Concerned about health problems due to exhaust emissions from military aircraft	45.0	55.2	43.7	45.0	52.2	64.5	51.4	57.1	50.2	36.1	44.5	35.3	65.4	73.6	61.6	55.9
	34.5-55.8	41.3-68.3	33.0-55.0	34.4-56.0	42.0-62.3	52.9-74.7	40.0-62.6	45.4-68.1	38.5-62.0	26.9-46.5	33.5-56.0	26.3-45.4	54.2-75.2	63.4-81.7	47.8-73.8	43.7-67.4
Concerned about health problems due to noise from military aircraft	48.7	44.4	40.5	57.5	61.6	72.4	67.2	71.5	66.3	58.1	68.0	57.3	65.2	86.7	63.4	69.6
	37.7-59.7	32.0-57.6	30.3-51.6	45.9-68.4	51.0-71.1	61.0-81.5	54.4-77.9	58.7-81.6	53.9-76.8	46.7-68.8	55.4-78.4	45.9-68.0	54.4-74.7	78.0-92.4	49.5-75.5	56.7-80.1
Concerned about the possibility of an accident involving a military aircraft	54.9	59.1	58.0	62.4	63.3	81.9	72.7	75.1	63.5	57.0	60.6	57.9	79.1	82.4	76.8	71.3
	43.3-65.9	44.5-72.3	45.8-69.3	50.3-73.1	52.2-73.2	70.2-89.6	60.3-82.3	62.3-84.6	50.7-74.7	45.5-67.7	48.1-71.8	46.6-68.4	67.3-87.5	72.4-89.3	63.0-86.5	58.3-81.5

rivm

Table X9 Percentage of the population that has trust in the information from the authorities involved with Geilenkirchen air base and AWACS (the remaining part of the population has no trust or is neutral; by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Municipality	26.9	28.7	22.1	49.8	30.4	18.4	27.8	31.9	17.3	26.4
	23.1-30.9	24.3-33.5	18.2-26.6	43.7-55.9	22.0-40.5	11.7-27.7	19.1-38.7	21.7-44.3	10.6-26.8	17.6-37.6
Province	23.8	22.3	18.5	14.1	27.7	18.6	28.0	28.3	15.7	23.1
	20.1-27.9	18.3-26.9	14.8-22.9	10.3-18.9	19.5-37.7	11.7-28.4	19.0-39.1	18.5-40.7	9.5-24.7	14.8-34.2
Housing Ministry	24.3	21.1	18.5	8.5	30.4	21.9	22.5	28.3	14.0	25.4
	20.6-28.4	17.1-25.8	14.7-22.9	5.3-13.3	22.0-40.4	13.9-32.7	14.6-33.0	18.5-40.8	8.1-23.1	16.3-37.3
Defence Ministry	21.7	12.7	14.8	7.7	28.1	22.8	16.7	25.7	17.4	19.9
	18.1-25.8	9.5-16.8	11.3-19.0	4.7-12.5	20.0-37.9	14.6-33.8	9.9-26.6	16.1-38.4	10.0-28.5	11.8-31.7
Geilenkirchen air base/NATO	21.4	14.0	17.3	7.6	26.2	18.6	21.4	27.4	15.2	21.0
	17.8-25.4	10.7-18.1	13.4-22.1	4.5-12.4	18.4-35.8	11.1-29.3	13.5-32.1	17.5-40.2	8.4-26.0	12.1-33.8
National Institute for Public Health and the Environment	34.6	32.3	30.3	24.9	40.4	32.0	32.1	35.8	26.3	34.6
	30.6-38.9	27.7-37.2	25.7-35.3	19.8-30.8	31.1-50.4	22.7-43.1	22.7-43.2	25.3-47.9	17.6-37.3	24.7-45.9
South Limburg Municipal Health Service	39.8	40.4	38.3	37.5	43.2	35.5	39.6	41.1	30.4	41.4
	35.7-44.0	35.6-45.4	33.5-43.4	31.6-43.8	33.9-53.0	25.8-46.6	29.6-50.6	30.2-53.0	21.2-41.5	30.9-52.8
German government	16.7	10.5	11.6	7.4	19.5	14.5	20.0	24.5	11.0	14.2
	13.6-20.3	7.7-14.2	8.4-15.8	4.7-11.4	12.7-28.7	8.4-23.7	12.4-30.7	15.1-37.2	5.6-20.5	7.6-24.8

Table X9 continued Percentage of the population that has trust in the information from the authorities involved with Geilenkirchen air base and AWACS (the remaining part of the population has no trust or is neutral; by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Municipality	27.0	29.9	28.5	31.9	29.3	21.3	25.5	23.3	18.1	19.4	25.4	21.0	50.9	54.2	31.6	39.8
	17.7-38.8	17.8-45.5	18.7-41.0	22.1-43.6	21.4-38.6	13.7-31.6	16.4-37.3	15.7-33.3	11.0-28.5	12.5-28.9	17.0-36.3	13.0-32.0	41.0-60.7	44.7-63.5	22.0-43.0	29.4-51.3
Province	19.0	26.2	24.1	22.0	23.5	17.4	17.9	19.2	13.4	19.6	22.7	20.5	20.6	12.0	7.4	18.0
	11.1-30.8	14.7-42.2	14.9-36.7	13.8-33.2	16.4-32.4	10.7-27.0	10.3-29.2	11.9-29.5	7.2-23.5	12.0-30.4	14.6-33.4	12.5-31.6	13.2-30.7	7.1-19.8	3.6-14.6	10.7-28.6
Housing Ministry	23.2	25.5	24.0	21.7	17.9	16.7	15.3	17.9	20.1	18.7	18.6	22.6	12.0	6.5	8.5	12.3
	14.0-35.8	13.9-41.9	14.6-36.9	13.2-33.4	11.8-26.3	9.9-26.8	8.3-26.5	11.1-27.6	11.3-33.1	11.7-28.5	11.5-28.6	13.8-34.8	6.4-21.4	2.5-15.7	4.3-16.1	6.6-21.8
Defence Ministry	17.2	18.1	5.7	17.2	10.8	14.7	10.2	15.7	16.6	14.7	16.1	20.3	11.3	4.9	9.0	14.6
	9.1-29.9	7.8-36.4	1.8-17.2	9.2-29.8	6.1-18.3	8.3-24.7	4.6-21.0	8.9-26.0	8.4-30.1	8.4-24.4	8.6-28.2	11.7-32.7	5.5-21.7	1.5-14.7	4.5-16.9	7.8-25.5
Geilenkirchen air base/NATO	22.4	21.9	9.7	16.9	8.6	15.5	13.2	13.6	23.6	16.8	20.5	20.1	13.6	3.6	12.6	12.7
	13.2-35.3	10.5-40.0	4.3-20.4	9.1-29.2	4.6-15.5	8.8-25.8	6.3-25.5	7.3-23.9	13.9-37.0	9.7-27.4	11.9-33.0	11.3-33.1	6.5-26.1	0.8-14.0	5.8-25.3	6.4-23.5
National Institute for Public Health and the Environment	27.1	39.8	34.8	35.5	29.6	31.3	26.3	31.2	36.6	30.0	34.4	29.0	28.3	25.0	21.0	21.1
	17.7-39.1	26.7-54.7	24.2-47.1	25.2-47.4	21.7-38.9	21.9-42.5	17.0-38.5	22.1-41.9	25.1-49.7	21.2-40.5	24.1-46.3	19.5-40.8	19.3-39.4	17.6-34.3	13.7-30.9	13.1-32.2
South Limburg Municipal Health Service	39.1	45.8	40.7	41.1	38.7	42.5	34.1	37.0	40.5	42.1	44.8	35.5	41.3	38.9	27.8	31.1
	28.6-50.6	32.6-59.7	29.6-52.9	30.4-52.8	29.7-48.6	32.1-53.6	24.0-45.9	27.4-47.8	28.8-53.4	31.6-53.2	33.3-56.8	25.4-47.0	31.6-51.8	29.9-48.7	19.3-38.4	21.6-42.5
German government	13.0	9.2	13.7	10.4	7.8	9.1	9.7	10.9	8.3	18.1	9.8	10.4	15.1	4.6	7.6	7.4
	6.0-25.7	3.3-23.1	7.3-24.3	5.0-20.3	4.0-14.7	4.4-18.0	4.1-21.4	5.4-20.9	3.4-18.8	10.6-29.3	5.1-18.0	4.4-22.4	7.7-27.3	1.8-10.8	3.6-15.0	3.2-16.1

Table X10 Information on Geilenkirchen air base Percentage of the population that receives information from the following authorities (by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Municipality	10.3	18.2	23.6	64.0	7.7	3.6	5.4	2.7	3.8	9.7
	8.4-12.4	14.6-22.5	19.9-27.8	58.2-69.4	4.1-14.0	1.2-10.2	2.5-11.3	0.7-10.2	1.0-13.0	4.7-19.2
Province of Limburg	6.0	10.7	9.2	12.5	5.1	3.2	6.6	4.8	3.8	7.3
	4.4-8.0	7.7-14.5	6.8-12.3	8.8-17.4	2.2-11.1	1.2-8.3	2.9-14.3	1.9-11.8	1.1-12.0	3.9-13.4
Municipal Health Service	2.6	4.1	3.6	10.0	3.7	0.3	0.0	0.8	2.9	4.8
	1.7-4.1	2.4-7.1	2.2-5.8	6.8-14.5	1.5-8.6	0.0-2.4	0.0-0.0	0.2-4.3	0.6-12.1	1.9-11.6
Housing Ministry	3.5	4.5	5.8	7.1	4.6	1.7	1.5	1.2	1.8	2.8
	2.3-5.1	2.7-7.3	3.8-8.6	4.5-11.2	2.1-9.8	0.4-7.6	0.3-6.6	0.4-4.1	0.4-6.9	1.1-7.4
Defence Ministry	3.3	3.2	5.2	9.6	1.7	1.9	5.7	2.0	1.6	7.4
	2.3-4.7	2.0-5.2	3.5-7.7	6.4-14.1	0.5-5.3	0.5-6.7	2.2-13.7	0.5-7.9	0.4-5.4	3.3-15.6
Media (free sheets. newspapers. radio and television)	52.0	60.2	63.9	74.7	47.4	47.1	53.8	51.4	44.5	53.6
	47.8-56.1	55.4-64.8	58.9-68.5	69.3-79.5	38.2-56.7	37.0-57.5	43.3-63.9	40.0-62.6	34.0-55.6	42.6-64.2
Pressure groups (e.g. Stop AWACS. environmental organizations)	16.9	23.6	32.2	56.8	15.5	7.0	15.7	11.3	5.3	16.1
	14.3-20.0	19.7-27.9	28.0-36.7	50.8-62.7	9.8-23.8	3.5-13.6	9.8-24.2	6.4-19.2	2.4-11.2	9.9-25.2
Geilenkirchen air base	2.0	2.3	4.3	6.5	2.1	0.3	0.5	1.2	1.9	4.0
	1.2-3.3	1.2-4.1	2.4-7.6	3.9-10.5	0.6-7.1	0.0-2.4	0.1-3.4	0.2-8.3	0.6-6.2	1.6-9.6
German authorities (e.g. the German government)	0.6	0.9	1.4	2.6	0.0	1.0	0.5	0.0	0.7	0.7
	0.3-1.0	0.3-2.4	0.7-2.8	1.2-5.7	0.0-0.0	0.2-4.3	0.1-3.4	0.0-0.0	0.1-5.0	0.1-4.7

Table X10 continued Information on Geilenkirchen air base Percentage of the population that receives information from the following authorities (by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Municipality	12.3	7.5	18.1	20.7	21.6	20.0	17.3	26.3	26.2	32.8	31.3	12.8	57.2	69.6	52.4	57.4
	6.9-20.9	3.3-16.3	10.2-29.8	12.8-31.7	14.5-30.8	12.8-29.8	11.0-26.2	18.1-36.6	16.7-38.6	23.7-43.5	21.6-42.9	7.3-21.5	47.4-66.5	60.7-77.2	40.1-64.4	45.5-68.6
Province of Limburg	3.2	8.9	9.4	11.6	15.4	10.4	9.4	9.0	8.0	11.5	10.8	5.6	11.5	14.6	7.6	7.3
	1.3-7.4	2.5-26.8	3.9-20.8	5.9-21.6	9.1-24.9	5.4-19.1	4.5-18.6	4.6-16.6	3.5-17.5	6.7-19.1	5.9-19.1	2.7-11.3	5.8-21.5	9.2-22.5	4.0-14.1	2.8-17.9
Municipal Health Service	1.0	2.8	1.2	4.3	8.8	2.0	2.6	2.5	3.6	5.5	5.9	1.9	3.6	14.1	4.7	5.4
	0.2-4.5	0.6-11.2	0.2-5.9	1.6-11.5	4.0-18.3	0.4-9.7	0.7-9.1	0.9-6.9	1.1-11.0	2.1-13.4	2.5-13.6	0.5-6.9	1.5-8.6	8.9-21.6	2.2-9.9	2.4-11.7
Housing Ministry	0.2	4.4	4.4	1.1	7.9	9.5	4.4	2.9	9.4	6.1	7.6	5.0	1.8	9.3	2.7	9.4
	0.0-1.7	1.3-14.0	1.3-13.5	0.3-4.2	3.5-16.7	4.6-18.7	1.6-11.1	1.0-8.2	4.4-19.1	2.0-16.8	3.3-16.6	2.0-11.8	0.5-6.3	5.1-16.3	1.0-7.1	4.9-17.4
Defence Ministry	1.0	2.0	2.5	2.0	4.3	9.5	3.3	4.3	8.4	3.9	9.1	5.5	4.6	12.9	3.9	6.3
	0.2-4.5	0.3-12.9	0.7-8.9	0.5-7.2	1.7-10.3	4.6-18.7	1.0-10.7	1.5-11.9	3.6-18.1	1.5-10.0	4.4-17.8	2.1-13.5	2.1-9.9	7.8-20.6	1.7-8.9	2.5-15.2
Media (free sheets. newspapers. radio and television)	46.7	55.0	61.3	62.4	66.6	58.8	56.8	62.9	67.5	72.0	64.2	61.8	70.4	77.9	65.0	74.3
	36.0-57.6	41.6-67.7	49.9-71.6	51.0-72.5	56.6-75.3	47.9-68.9	45.4-67.6	51.2-73.3	56.2-77.1	61.0-80.9	52.3-74.6	50.9-71.6	59.7-79.2	69.7-84.4	51.2-76.8	62.5-83.4
Pressure groups (e.g. Stop AWACS. environmental organizations)	21.6	9.9	21.6	21.7	29.0	28.0	33.2	47.0	30.6	31.3	33.6	23.5	45.5	65.1	41.1	48.4
	13.9-32.0	5.1-18.5	14.0-31.9	13.6-32.7	20.9-38.6	19.4-38.5	24.3-43.5	36.4-57.9	20.8-42.6	22.4-41.8	23.6-45.4	16.0-33.1	35.9-55.4	55.7-73.4	30.0-53.3	37.1-60.0
Geilenkirchen air base	0.0	3.4	1.4	4.8	1.9	3.0	9.3	2.0	2.0	1.8	3.5	2.7	6.2	6.9	5.6	5.5
	0.0-0.0	1.0-11.2	0.3-6.1	1.7-12.7	0.4-7.7	1.1-8.1	3.9-20.6	0.6-7.0	0.5-7.7	0.4-8.9	1.0-11.5	0.9-7.7	2.4-15.1	3.4-13.5	1.5-18.5	1.6-17.1
German authorities (e.g. the German government)	0.0	1.8	1.0	1.5	0.8	1.0	0.0	0.3	3.2	1.8	1.4	1.9	3.5	2.2	0.0	5.2
	0.0-0.0	0.2-11.9	0.1-6.6	0.2-10.0	0.1-5.3	0.1-7.0	0.0-0.0	0.0-1.9	1.1-9.1	0.4-8.9	0.2-9.6	0.5-6.9	0.8-13.8	0.6-7.6	0.0-0.0	1.4-17.2

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Table X11 Percentage of the population fairly or very satisfied with the information received from the various authorities (this could only be calculated in the case of authorities from which enough people said they received information; by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Information from the municipality	37.9	35.8	30.3	47.3	44.7	39.4	6.8	56.4	45.7	39.1
	26.4-50.9	23.4-50.3	19.1-44.5	36.0-58.8	22.1-69.7	8.3-82.5	0.7-41.7	2.5-98.5	3.5-95.1	7.6-83.3
Information from the province	35.0	23.3	30.0	38.2	52.1	22.9	43.6	0.0	2.0	28.4
	24.5-47.1	10.2-44.7	14.1-52.6	20.3-60.0	22.4-80.4	4.1-67.2	15.2-77.0	0.0-0.0	0.1-22.3	6.5-69.4
Information from free sheets. newspapers. radio and television	33.5	29.4	36.3	42.2	32.0	29.3	45.2	16.2	30.4	40.4
	27.9-39.7	23.5-36.1	30.5-42.6	34.9-49.8	20.8-45.8	16.2-47.1	30.5-60.7	7.7-31.0	17.2-47.8	26.6-55.9
Information from pressure groups (e.g. Stop AWACS. environmental organizations)	31.2	39.3	46.5	54.1	36.5	9.8	14.1	44.3	3.2	40.2
	21.7-42.5	29.2-50.4	37.5-55.7	44.9-63.0	17.1-61.6	2.2-34.3	4.3-37.4	18.1-74.0	0.3-25.2	17.7-67.7

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Information from the municipality	26.2	24.8	45.8	46.9	23.9	56.1	34.0	4.7	46.1	31.6	11.2	22.1	52.0	47.7	33.5	44.6
	7.0-62.4	3.6-74.4	18.7-75.7	18.4-77.6	9.1-49.6	27.8-80.9	11.7-66.7	1.4-14.5	21.3-73.1	12.8-59.2	2.3-40.1	2.9-72.5	36.6-67.0	32.0-63.9	17.2-55.0	26.5-64.2
Information from the province	0.0	68.4	33.9	59.4	2.4	2.4	57.4	0.0	9.5	18.3	24.3	18.8	10.7	45.0	56.9	53.4
	0.0-0.0	11.6-97.3	4.6-84.5	22.4-88.1	0.2-22.8	0.2-20.1	18.0-89.2	0.0-0.0	0.7-59.5	4.3-53.1	4.9-66.8	2.4-68.6	1.6-47.4	18.6-74.6	17.5-89.1	10.3-92.0
Information from free sheets. newspapers. radio and television	23.8	29.6	29.9	36.7	27.5	26.5	34.2	34.1	42.9	35.4	31.6	38.7	31.1	45.6	49.2	38.4
	12.8-40.0	15.3-49.6	16.6-47.9	23.5-52.2	17.8-40.0	16.2-40.2	22.1-48.8	22.8-47.4	28.6-58.4	24.1-48.7	19.7-46.4	25.2-54.3	21.3-42.8	34.6-57.0	35.6-62.9	26.0-52.5
Information from pressure groups (e.g. Stop AWACS. environmental organizations)	44.2	66.3	28.9	45.7	32.4	46.9	45.7	42.8	56.2	38.1	49.3	53.0	39.1	61.0	46.5	51.9
	20.9-70.3	25.7-91.8	11.6-55.8	21.0-72.7	17.9-51.3	25.4-69.5	28.6-63.8	27.9-59.0	29.9-79.5	21.6-57.8	29.9-69.0	28.5-76.2	25.3-54.9	46.9-73.4	26.2-68.1	33.8-69.5

Table X12 Percentage of the population that would like to receive information from one of the following authorities (respondents could check more than one answer; by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Don't want any information.	31.0	25.9	27.9	19.0	27.7	32.1	31.3	41.4	52.3	39.4
	27.4-35.0	21.6-30.6	23.8-32.5	14.6-24.4	20.0-37.1	23.1-42.6	22.4-42.0	30.7-53.0	41.4-62.9	28.9-51.1
Municipality	39.5	37.5	42.9	46.5	35.1	34.5	55.1	46.1	33.8	27.9
	34.8-44.4	32.3-42.9	37.0-49.1	39.9-53.1	25.0-46.8	23.3-47.7	42.8-66.8	31.5-61.3	21.1-49.3	17.4-41.5
Province of Limburg	50.0	64.3	66.2	75.9	44.3	41.5	57.4	40.4	39.0	50.5
	45.1-54.9	58.9-69.3	60.3-71.6	69.9-81.0	33.7-55.3	29.5-54.5	44.8-69.1	26.9-55.6	26.0-53.8	38.0-63.0
Municipal Health Service	31.1	36.8	31.6	35.8	22.9	35.1	31.7	39.7	39.7	47.4
	27.0-35.6	31.8-42.2	26.5-37.2	29.9-42.3	15.6-32.3	24.4-47.5	21.1-44.5	26.1-55.2	26.4-54.8	35.0-60.2
Housing Ministry	27.2	35.0	39.4	52.1	21.5	23.0	25.4	27.1	32.4	33.2
	23.4-31.4	30.0-40.3	33.9-45.1	45.5-58.6	14.3-30.9	14.3-34.8	16.6-36.9	16.2-41.9	20.1-47.7	22.5-45.9
Defence Ministry	22.8	27.2	25.0	40.3	26.0	14.4	21.7	18.2	25.1	17.2
	19.2-26.9	22.5-32.5	20.5-30.1	34.1-46.9	18.0-36.0	8.3-23.9	13.1-33.9	9.5-32.2	14.3-40.3	9.6-28.9
A representative	26.5	24.7	29.2	37.7	29.4	20.4	23.1	28.8	29.8	21.7
	22.4-31.2	20.2-29.7	24.2-34.8	31.5-44.4	20.4-40.5	11.6-33.4	13.7-36.0	16.5-45.3	18.4-44.5	12.7-34.5
Media (newspapers. radio and television)	5.4	6.6	8.9	12.8	4.3	5.8	4.5	1.9	6.2	4.8
	3.8-7.7	4.5-9.7	6.2-12.7	8.8-18.1	1.6-11.1	2.3-13.8	1.6-11.8	0.3-9.3	2.4-15.1	1.4-15.6
Pressure groups (e.g. Stop AWACS. environmental organizations)	37.0	34.9	39.7	43.1	38.5	38.6	32.7	34.7	26.3	35.8
	32.2-42.0	29.9-40.1	34.2-45.4	36.7-49.8	28.3-49.9	27.0-51.6	22.7-44.6	22.4-49.4	15.2-41.5	24.3-49.2
Geilenkirchen air base	15.3	21.8	22.3	40.6	12.0	17.0	11.4	8.1	10.6	17.7
	12.5-18.6	17.8-26.5	18.4-26.9	34.4-47.1	6.8-20.3	9.9-27.7	6.2-20.0	3.6-17.3	5.0-21.4	10.5-28.3

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Table X12 continued Percentage of the population that would like to receive information from one of the following authorities (respondents could check more than one answer; by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Don't want any information.	33.7	19.8	21.4	32.6	21.1	27.3	20.2	31.4	25.0	35.1	29.0	31.7	25.6	13.2	26.0	31.0
	23.6-45.6	10.2-34.9	13.2-32.8	22.5-44.6	13.6-31.4	18.6-38.3	12.9-30.2	21.5-43.3	16.4-36.2	25.5-46.1	19.2-41.3	22.2-42.9	16.9-36.7	7.6-22.1	16.8-37.8	21.1-43.1
Municipality	38.9	42.0	42.7	34.8	31.2	46.8	45.1	41.5	46.5	39.6	43.5	41.0	39.7	50.7	43.0	39.8
	27.0-52.3	29.4-55.7	30.2-56.2	23.7-47.8	22.6-41.4	34.8-59.1	32.5-58.3	29.7-54.4	32.6-61.0	27.2-53.6	30.6-57.3	28.8-54.4	30.0-50.2	40.8-60.6	29.2-58.0	27.2-54.0
Province of Limburg	59.7	66.7	60.4	63.8	71.0	58.4	62.9	67.8	59.9	68.3	70.5	71.5	75.6	76.2	66.8	82.9
	46.5-71.7	53.4-77.7	47.1-72.3	50.9-75.0	61.0-79.3	45.7-70.1	49.6-74.6	54.1-79.0	45.8-72.6	55.1-79.1	55.7-82.0	57.6-82.2	65.8-83.3	66.9-83.5	50.1-80.2	69.0-91.4
Municipal Health Service	31.6	44.4	36.1	34.3	41.0	34.6	33.5	36.0	28.4	25.3	39.8	33.5	39.3	34.3	33.1	39.8
	21.4-44.1	31.3-58.3	24.5-49.6	23.5-47.0	31.1-51.7	24.1-46.8	22.5-46.6	25.1-48.6	17.8-42.1	15.9-37.9	27.5-53.6	22.1-47.1	29.3-50.3	25.7-44.1	21.2-47.6	27.2-53.8
Housing Ministry	38.6	38.6	33.7	33.3	33.5	38.2	43.1	39.9	33.5	36.4	45.1	39.1	45.2	53.9	56.5	52.0
	27.3-51.4	26.3-52.7	22.7-46.9	22.4-46.3	24.4-44.1	27.2-50.6	31.2-55.8	28.7-52.3	21.3-48.3	24.7-49.9	32.3-58.5	27.7-51.9	35.0-55.9	43.8-63.6	41.8-70.1	38.3-65.5
Defence Ministry	21.6	30.4	33.7	30.3	23.2	24.8	19.9	35.7	21.9	27.5	25.1	27.2	22.0	50.6	36.7	23.8
	12.5-34.9	20.0-43.2	21.9-47.9	20.1-43.0	15.6-33.2	16.3-35.9	12.6-30.0	25.1-47.9	12.6-35.4	16.9-41.6	16.0-37.0	17.5-39.7	14.9-31.2	40.7-60.5	23.3-52.5	15.0-35.7
A representative	26.7	24.6	26.6	29.6	18.2	27.0	22.4	35.2	37.2	29.6	31.3	28.7	27.1	46.2	25.6	23.2
	16.1-40.7	15.2-37.2	16.5-39.8	19.0-43.0	11.7-27.2	17.6-39.2	14.6-32.7	24.7-47.5	23.7-53.0	18.5-43.8	20.0-45.4	18.4-41.8	18.1-38.4	36.5-56.2	14.1-42.0	14.3-35.3
Media (newspapers. radio and television)	5.5	6.1	5.6	3.3	9.8	9.0	12.5	5.9	9.0	4.2	14.1	8.2	6.5	17.9	1.9	6.5
	2.4-12.2	2.3-15.2	1.7-17.5	0.8-13.1	5.5-16.8	4.2-18.0	6.2-23.5	2.4-13.6	3.0-23.7	1.5-10.9	6.6-27.6	3.8-16.8	3.1-13.3	11.6-26.8	0.5-7.6	2.9-14.2
Pressure groups (e.g. Stop AWACS. environmental organizations)	32.5	43.5	30.6	40.5	31.1	44.7	39.9	48.2	35.1	38.6	38.1	41.2	39.4	45.4	33.8	45.9
	21.6-45.5	30.7-57.2	20.2-43.5	28.7-53.4	22.4-41.3	33.0-57.1	28.6-52.3	35.8-60.8	22.8-49.8	26.9-51.8	26.1-51.7	29.0-54.5	29.5-50.3	35.8-55.4	20.8-49.9	32.5-59.9
Geilenkirchen air base	19.8	27.8	11.1	19.6	30.0	26.3	23.5	28.9	20.9	21.0	24.5	18.6	23.4	50.1	29.3	32.3
	12.0-31.0	17.9-40.7	5.2-22.0	11.7-30.9	21.1-40.8	17.6-37.4	15.6-33.7	19.3-41.0	11.8-34.3	13.0-32.0	15.0-37.3	11.6-28.6	16.1-32.8	40.2-60.0	17.8-44.4	21.4-45.7

Table X13 What information would you like to receive if it were available (respondents could check more than one answer; by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Notifications of busy periods	48.2	58.0	53.9	59.3	49.9	42.1	47.5	36.3	49.6	42.4
	43.2-53.2	52.4-63.3	48.0-59.7	52.5-65.7	39.0-60.9	30.4-54.8	35.4-59.9	23.0-52.1	35.4-63.9	30.5-55.3
Up-to-date flight schedules	23.6	32.5	29.5	36.8	19.5	27.4	21.8	14.9	13.8	31.6
	19.7-28.1	27.5-38.0	24.5-35.0	30.7-43.4	11.9-30.3	17.1-40.9	12.7-34.8	7.9-26.5	7.4-24.3	20.5-45.4
Changes at the base	36.6	37.7	47.2	54.4	32.1	33.3	39.0	42.0	26.3	37.5
	31.9-41.5	32.5-43.1	41.4-53.1	47.8-60.9	22.4-43.5	22.8-45.7	27.8-51.5	27.9-57.5	15.5-40.9	25.6-51.1
The Dutch government's position	44.4	48.7	45.2	54.4	49.2	47.9	34.9	29.3	35.7	39.0
	39.7-49.3	43.3-54.2	39.6-51.0	47.8-60.8	38.4-60.0	35.5-60.5	24.6-46.8	18.5-43.2	23.7-49.7	27.8-51.5
Feedback on commitments	33.4	45.3	43.9	63.6	30.6	24.0	33.3	34.6	27.5	34.7
	29.3-37.8	39.9-50.8	38.3-49.7	57.2-69.6	21.9-41.0	14.6-36.8	22.8-45.8	22.2-49.5	16.3-42.5	23.7-47.6
Aircraft noise. e.g. results of permanent monitoring	44.2	59.2	50.5	67.6	47.4	37.0	34.6	41.5	30.6	46.1
	39.4-49.2	53.7-64.5	44.7-56.4	61.2-73.5	36.8-58.3	26.2-49.3	24.5-46.4	27.6-56.9	19.0-45.4	33.9-58.7

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Notifications of busy periods	56.4	52.6	53.1	59.0	60.2	67.3	52.4	65.2	51.8	48.8	47.5	63.3	65.4	56.8	55.2	64.4
	43.2-68.7	39.0-65.9	40.0-65.7	46.0-70.9	49.2-70.3	55.2-77.5	39.5-64.9	51.7-76.6	37.8-65.4	35.8-61.9	34.3-61.0	49.9-74.9	54.9-74.5	46.6-66.4	40.5-69.1	50.1-76.5
Up-to-date flight schedules	27.5	30.3	32.5	27.4	37.5	38.8	30.6	36.0	27.2	31.4	25.6	25.6	39.6	34.9	34.6	43.6
	18.0-39.7	19.3-44.2	21.4-46.0	17.5-40.3	27.5-48.6	27.3-51.6	20.5-43.0	25.2-48.5	16.3-41.6	20.3-45.2	15.7-38.9	15.9-38.5	29.5-50.8	26.2-44.7	22.2-49.5	30.4-57.7
Changes at the base	32.8	45.7	35.9	33.6	38.5	53.1	51.3	45.2	47.0	50.4	52.3	33.8	43.9	59.3	46.6	55.5
	21.9-46.0	32.6-59.4	24.4-49.3	22.9-46.3	28.6-49.5	40.7-65.1	38.7-63.8	33.1-57.9	33.4-61.0	37.3-63.4	38.8-65.4	22.3-47.7	33.6-54.7	49.1-68.8	32.7-60.9	41.4-68.8
The Dutch government's position	45.7	56.4	53.6	34.8	54.5	50.0	52.7	56.1	44.9	37.2	45.1	38.0	46.1	62.0	41.1	40.9
	33.3-58.5	42.9-69.0	40.6-66.1	24.1-47.4	43.7-64.9	37.8-62.1	40.0-65.1	43.0-68.3	31.6-58.9	25.5-50.6	32.3-58.6	26.5-51.0	35.9-56.6	51.8-71.3	28.2-55.4	28.6-54.5
Feedback on commitments	38.3	53.0	43.7	40.2	49.1	57.0	41.7	57.4	35.1	53.6	54.9	28.7	62.5	69.6	53.2	42.5
	27.3-50.5	39.3-66.2	31.6-56.5	28.4-53.1	38.4-59.8	44.2-69.0	29.7-54.6	44.1-69.6	23.5-48.7	40.3-66.4	41.1-67.9	19.0-40.9	51.8-72.1	59.8-77.8	38.4-67.5	29.9-56.1
Aircraft noise. e.g. results of permanent monitoring	56.2	57.6	50.3	49.7	74.6	57.8	53.5	66.5	40.9	52.4	48.7	43.9	71.2	70.8	55.8	53.8
	42.9-68.7	43.4-70.7	37.6-63.1	37.1-62.4	64.0-82.9	45.2-69.4	40.5-66.0	52.8-77.9	28.5-54.6	39.1-65.3	35.5-62.0	31.8-56.7	60.6-79.9	60.8-79.1	40.9-69.8	39.8-67.2

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Table X14 How would you like to receive the information? (respondents could check more than one answer; by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Free sheet	54.0	66.1	64.2	66.9	50.4	56.0	52.3	46.3	43.9	48.6
	49.1-58.8	60.7-71.0	58.5-69.6	60.6-72.8	39.7-61.1	42.9-68.3	40.0-64.3	32.0-61.2	30.2-58.5	36.1-61.2
Information meeting organized by the municipality	5.9	10.9	6.3	18.0	2.8	9.0	6.6	2.8	3.9	6.2
	4.3-8.1	7.9-14.9	4.4-9.0	13.6-23.4	0.9-8.4	4.4-17.6	2.3-17.2	1.1-7.3	0.9-16.3	2.8-13.2
Information meeting organized by Geilenkirchen air base	7.2	8.2	4.0	12.2	6.4	5.2	16.6	3.5	0.0	5.7
	4.9-10.4	5.4-12.3	2.4-6.7	8.2-17.7	2.5-15.4	1.9-13.7	9.0-28.6	1.2-10.1	0.0-0.0	2.1-14.6
Local media (newspapers. radio and television)	47.6	47.8	55.9	55.7	48.0	50.9	41.9	41.5	34.1	42.5
	42.7-52.6	42.4-53.3	50.1-61.6	49.0-62.2	37.3-59.0	38.2-63.4	30.6-54.0	27.8-56.6	22.1-48.7	30.4-55.5
Regional/provincial media (newspapers. radio and television)	31.9	31.3	35.0	37.4	35.8	27.5	22.0	34.5	30.0	37.9
	27.6-36.6	26.5-36.6	29.7-40.8	31.4-44.0	26.1-46.9	18.0-39.5	14.2-32.7	21.4-50.5	18.1-45.5	26.7-50.5
National media (newspapers. radio and television)	17.7	17.0	19.5	22.4	17.5	18.2	11.7	22.8	20.8	20.4
	14.5-21.5	13.4-21.4	15.5-24.3	17.3-28.5	11.1-26.4	10.7-29.2	6.6-19.9	12.5-37.9	11.2-35.4	11.6-33.2
Pressure groups (e.g. Stop AWACS. environmental organizations)	14.6	15.8	20.2	35.4	15.2	14.1	10.6	6.1	7.9	10.8
	11.7-18.0	12.4-19.9	16.5-24.5	29.4-41.8	9.3-24.1	8.0-23.6	5.7-19.1	2.8-12.9	3.1-19.1	5.4-20.4
Government web site	21.9	27.1	27.0	33.8	13.4	23.3	30.6	27.6	18.8	21.3
	18.5-25.7	22.4-32.4	22.1-32.4	27.6-40.7	8.0-21.6	13.9-36.3	20.4-43.1	15.4-44.3	10.4-31.7	12.3-34.5

Table X14 continued How would you like to receive the information? (respondents could check more than one answer; by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Free sheet	71.5	64.9	74.0	46.9	67.6	77.5	64.2	71.0	57.2	65.4	65.5	64.7	72.1	65.1	60.2	72.7
	58.1-82.0	51.7-76.1	62.1-83.2	34.5-59.6	56.8-76.8	65.6-86.1	51.5-75.2	57.8-81.4	42.9-70.4	51.9-76.8	51.3-77.3	51.2-76.1	62.2-80.3	55.3-73.7	44.1-74.4	59.0-83.1
Information meeting organized by the municipality	7.0	5.8	14.0	9.6	13.6	7.4	6.2	16.4	1.2	5.1	8.6	6.0	23.0	18.8	6.7	13.2
	3.2-14.8	2.2-14.3	7.4-24.8	4.5-19.4	7.4-23.7	3.4-15.2	2.9-12.6	9.4-27.1	0.2-8.5	1.6-15.5	3.9-17.9	2.7-12.6	14.9-33.8	12.6-27.2	3.0-14.4	6.8-24.0
Information meeting organized by Geilenkirchen air base	8.2	2.6	7.9	9.9	8.6	7.0	5.0	11.6	1.2	4.0	1.6	2.0	9.9	13.7	9.2	10.6
	3.0-20.3	0.6-10.4	2.4-23.0	4.3-21.2	4.2-16.9	3.0-15.3	1.9-12.7	5.4-23.1	0.2-5.7	1.0-14.9	0.2-10.8	0.6-6.9	5.5-17.2	7.9-22.9	2.8-26.2	4.4-23.2
Local media (newspapers. radio and television)	51.0	50.2	47.0	45.2	46.5	53.6	60.1	67.3	53.3	50.1	55.5	53.4	66.0	54.2	41.2	56.2
	38.2-63.6	36.8-63.6	34.4-60.0	33.0-58.0	36.1-57.2	41.2-65.5	47.3-71.7	53.8-78.4	39.3-66.7	36.9-63.3	42.0-68.3	40.3-66.0	55.7-74.9	44.1-64.0	28.1-55.7	42.2-69.2
Regional/provincial media (newspapers. radio and television)	26.4	32.6	26.2	33.9	34.7	35.1	41.0	38.1	42.3	26.0	36.3	28.3	33.0	38.1	35.7	44.5
	17.2-38.3	21.5-46.0	15.8-40.3	23.0-46.9	25.4-45.4	24.5-47.5	29.2-53.9	27.0-50.6	29.3-56.4	15.5-40.1	24.6-49.9	18.3-41.0	24.1-43.2	29.0-48.1	22.6-51.4	31.4-58.3
National media (newspapers. radio and television)	16.0	15.2	14.7	15.8	18.6	24.1	22.2	23.2	24.6	16.7	23.9	9.6	14.7	29.0	15.5	7.6
	9.2-26.6	7.6-27.9	7.6-26.5	8.3-27.8	11.8-28.1	15.3-35.9	13.8-33.6	14.8-34.3	14.2-39.0	9.3-28.3	14.2-37.2	4.1-20.6	8.0-25.5	21.0-38.6	8.0-28.2	3.8-14.7
Pressure groups (e.g. Stop AWACS. environmental organizations)	15.7	19.4	9.6	8.6	23.4	20.6	23.1	33.0	19.7	16.2	19.4	14.6	17.5	46.4	18.7	25.3
	9.2-25.5	11.1-31.7	4.1-20.8	4.4-16.2	15.6-33.6	12.9-31.2	15.4-33.3	22.8-45.1	11.7-31.1	9.8-25.7	11.2-31.5	8.6-23.7	11.3-26.2	36.7-56.3	9.7-33.1	16.0-37.7
Government web site	27.4	29.5	34.1	29.5	18.4	31.3	23.7	32.9	24.1	30.8	34.0	22.4	34.8	35.8	20.3	33.0
	16.7-41.6	18.9-43.0	22.7-47.8	19.1-42.6	11.7-27.7	20.8-44.1	15.6-34.4	22.2-45.8	14.0-38.1	19.4-45.3	22.6-47.7	12.9-36.2	25.0-46.1	26.7-46.1	12.3-31.7	20.6-48.3

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Table X15 Percentage of the population open to the possibility of government compensation to make the disadvantages of the Geilenkirchen air base more acceptable. and the suitability of the various compensation options (by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Yes. I am open to the possibility of compensation.	61.7	54.7	59.9	52.6	64.4	60.0	63.4	65.4	63.4	54.8
	57.4-65.8	49.6-59.6	55.0-64.7	46.2-58.9	54.4-73.4	49.5-69.6	52.6-72.9	54.1-75.2	52.3-73.3	43.6-65.6
What kind of compensation would you regard as suitable/very suitable? (more than one answer allowed)										
Insulation of your home against external noise	74.9	74.2	74.7	79.7	79.4	61.1	81.3	77.1	74.0	73.1
	69.8-79.4	67.6-79.9	68.4-80.0	72.1-85.6	67.6-87.7	46.3-74.1	67.8-90.0	62.4-87.2	59.1-84.8	58.3-84.1
A relocation scheme whereby the government arranges an alternative home	21.9	11.4	23.6	14.8	29.5	13.9	16.2	27.9	26.3	14.2
	17.6-26.8	7.7-16.5	18.1-30.2	9.8-21.9	19.6-41.7	7.1-25.5	8.4-29.0	16.9-42.3	14.8-42.3	6.9-26.8
Municipal tax rebate	69.2	71.3	74.6	78.1	69.3	67.8	69.1	67.5	56.3	66.7
	63.7-74.1	64.7-77.2	68.5-79.9	70.2-84.4	56.8-79.6	52.5-80.0	54.8-80.5	52.6-79.6	41.2-70.3	51.0-79.4
Special local amenities	37.8	36.8	39.6	29.5	39.4	40.5	38.9	23.1	32.6	36.4
	32.7-43.3	30.2-44.0	33.2-46.5	21.9-38.4	28.0-52.0	27.1-55.4	26.5-53.0	12.4-38.7	19.8-48.6	22.7-52.9
A regular sum of money for local residents	47.1	40.8	50.6	45.0	51.2	49.5	35.1	48.6	44.9	45.7
	41.3-53.0	34.2-47.7	43.7-57.4	36.1-54.3	38.4-63.9	35.3-63.8	23.0-49.5	34.1-63.2	30.7-60.0	30.8-61.4
A purchase scheme to buy up your home	33.9	18.8	28.2	23.4	38.2	33.3	35.3	32.4	43.0	30.2
	28.7-39.6	14.2-24.4	22.4-34.9	16.9-31.3	27.0-50.9	20.9-48.6	23.2-49.7	20.6-47.0	28.6-58.8	18.0-45.9

Table X15 continued Percentage of the population open to the possibility of government compensation to make the disadvantages of the Geilenkirchen air base more acceptable. and the suitability of the various compensation options (by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Yes. I am open to the possibility of compensation.	56.2	51.8	57.9	48.6	56.0	55.4	56.9	60.9	65.3	55.3	59.1	66.7	52.3	51.8	62.9	48.3
	45.1-66.8	38.2-65.1	45.8-69.2	37.4-60.0	45.8-65.8	44.2-66.0	45.6-67.6	49.3-71.4	52.9-75.9	44.5-65.6	47.2-70.0	56.1-75.9	42.3-62.2	42.1-61.4	51.4-73.1	36.9-60.0
What kind of compensation would you regard as suitable/very suitable?																
Insulation of your home against external noise	68.6	61.7	77.0	76.4	77.4	70.6	79.9	78.9	73.7	68.3	71.2	74.0	78.3	82.8	74.0	71.5
	50.6-82.3	39.3-80.0	61.1-87.7	59.2-87.9	64.2-86.7	55.2-82.4	66.2-88.9	63.3-89.0	58.2-84.9	51.6-81.4	52.9-84.4	59.6-84.6	65.2-87.4	70.1-90.8	57.5-85.7	54.6-84.0
A relocation scheme A replacement home	1.2	19.8	19.3	21.3	2.8	10.9	32.0	11.8	20.0	21.2	25.2	21.6	15.1	16.1	17.6	6.3
	0.2-8.3	6.9-45.2	9.0-36.5	11.1-37.0	0.7-10.8	3.3-30.8	18.7-49.1	5.1-24.9	11.3-32.9	11.0-36.8	14.6-39.9	12.6-34.4	7.8-27.1	8.6-28.0	9.1-31.4	1.9-19.0
Municipal tax rebate	70.3	57.9	70.8	66.7	75.7	80.8	78.9	70.4	65.9	75.2	71.4	78.9	75.1	79.3	74.6	80.4
	54.3-82.5	37.2-76.2	54.4-83.1	49.7-80.3	62.2-85.6	67.1-89.6	64.4-88.5	53.6-83.1	49.7-79.0	60.2-85.9	56.1-83.0	65.3-88.1	59.8-86.0	66.8-87.9	57.3-86.5	61.4-91.4
Special local amenities	49.3	31.3	32.3	46.7	30.0	31.6	32.3	39.0	38.5	47.0	51.8	37.3	26.4	32.6	28.9	20.4
	33.3-65.4	15.1-53.8	18.9-49.4	30.8-63.3	18.5-44.8	19.1-47.5	19.1-49.2	25.0-55.1	25.8-53.0	32.0-62.6	36.2-67.0	25.5-50.7	16.2-40.1	21.0-46.8	17.0-44.6	9.2-39.2
A regular sum of money for local residents	53.5	52.5	32.6	28.9	45.5	39.2	47.9	56.3	44.7	50.5	43.9	61.7	45.2	44.5	63.6	32.8
	37.4-68.8	32.8-71.5	20.3-47.9	16.6-45.4	32.2-59.5	25.7-54.6	32.5-63.7	41.0-70.4	30.8-59.5	35.2-65.6	29.2-59.8	47.9-73.8	31.2-59.9	31.1-58.8	45.8-78.3	19.0-50.4
A purchase scheme to buy up your home	16.0	28.0	30.1	11.2	15.5	17.0	30.1	14.1	31.4	22.5	33.7	35.5	22.0	22.3	33.0	23.3
	6.8-33.0	13.7-48.7	18.1-45.6	5.0-23.3	8.1-27.6	7.3-34.9	17.2-47.0	6.9-26.6	19.1-47.0	12.2-37.9	20.5-50.1	23.8-49.2	12.9-34.9	13.1-35.3	19.0-50.9	12.0-40.2

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Table X16 Percentage of the population not open to the possibility of government compensation to make the disadvantages of the Geilenkirchen air base more acceptable (by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
No. I am not open to the possibility of compensation.	38.3	45.3	40.1	47.4	35.6	40.0	36.6	34.6	36.6	45.2
	34.2-42.6	40.4-50.4	35.3-45.0	41.1-53.8	26.6-45.6	30.4-50.5	27.1-47.4	24.8-45.9	26.7-47.7	34.4-56.4
Why are you not open to the possibility of compensation? (more than one answer allowed)										
Compensation would not solve the problem.	62.7	76.5	65.6	75.5	60.4	63.9	57.7	61.4	60.9	62.3
	55.0-69.8	69.2-82.4	57.8-72.7	66.1-83.1	42.2-76.1	48.2-77.1	40.0-73.7	41.8-77.9	42.8-76.4	44.1-77.5
It is bribery, annoyance cannot be compensated for.	40.3	40.6	39.7	51.3	34.7	35.5	54.1	54.0	32.5	40.6
	33.6-47.4	33.8-47.9	32.3-47.5	41.9-60.6	21.1-51.5	22.4-51.2	36.8-70.4	35.6-71.4	18.3-50.7	24.9-58.6
Health cannot be bought.	46.2	55.4	53.6	62.5	32.1	58.6	48.6	56.8	47.3	47.6
	39.2-53.3	47.9-62.6	45.7-61.3	53.1-71.1	18.9-49.0	42.4-73.0	31.6-65.9	38.1-73.7	30.2-65.0	30.8-65.0

Percentage	Schinnen						Brunssum						Onderbanken			
(95% confidence interval)	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
No. I am not open to the possibility of compensation.	43.8	48.2	42.1	51.4	44.0	44.6	43.1	39.1	34.7	44.7	40.9	33.3	47.7	48.2	37.1	51.7
	33.2-54.9	34.9-61.8	30.8-54.2	40.0-62.6	34.2-54.2	34.0-55.8	32.4-54.4	28.6-50.7	24.1-47.1	34.4-55.5	30.0-52.8	24.1-43.9	37.8-57.7	38.6-57.9	26.9-48.6	40.0-63.1
Why are you not open to the possibility of compensation? (more than one answer allowed)																
Compensation would not solve the problem.	70.9	81.3	82.0	68.1	80.0	78.1	64.4	82.6	59.7	70.8	70.3	52.7	68.4	78.2	80.7	70.8
	52.1-84.4	59.6-92.7	64.7-91.9	50.4-81.8	64.0-90.0	60.7-89.2	47.3-78.5	62.5-93.1	37.2-78.7	54.7-83.0	51.8-83.9	34.5-70.2	51.4-81.6	63.0-88.4	65.0-90.4	52.0-84.4
It is bribery, annoyance cannot be compensated for.	52.4	62.9	34.7	43.5	33.9	35.0	41.5	31.9	59.3	38.7	34.3	25.4	61.1	52.4	43.8	31.1
	36.5-67.7	44.4-78.2	19.9-53.1	28.4-59.8	21.4-49.3	21.2-51.8	26.7-58.0	18.2-49.7	37.2-78.2	25.0-54.4	18.8-54.0	12.6-44.6	45.9-74.4	38.0-66.5	28.3-60.5	18.1-47.9
Health cannot be bought.	68.9	60.6	46.8	60.3	42.5	79.6	50.9	51.5	66.8	45.5	61.8	54.3	66.6	65.8	56.4	41.1
	53.3-81.1	42.0-76.5	29.4-65.0	43.2-75.2	28.8-57.5	63.5-89.7	35.0-66.6	33.5-69.2	44.3-83.6	30.5-61.3	40.9-79.1	35.9-71.7	52.3-78.5	50.6-78.3	39.8-71.6	26.9-57.0

Table X17 Expectations regarding aspects of the neighbourhood for the coming year (by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Improvement in green spaces	8.6	5.1	13.3	9.4	7.2	9.9	7.1	10.8	7.6	8.6
	6.5-11.3	3.4-7.6	9.8-17.8	6.2-13.9	3.4-14.7	5.1-18.3	3.5-13.8	5.3-20.9	3.5-16.0	4.3-16.5
Improvement in value of home	29.6	22.9	29.2	19.3	28.1	30.3	37.3	31.9	38.7	18.1
	26.1-33.4	18.9-27.4	24.8-34.1	15.0-24.5	20.3-37.4	21.1-41.3	27.5-48.2	21.7-44.2	28.3-50.2	10.7-28.9
Improvement in dust/soot/smoke	3.0	1.7	3.0	4.7	4.1	0.4	3.0	2.4	2.2	5.5
	1.9-4.5	0.7-4.1	1.9-4.5	2.7-8.1	1.8-8.9	0.1-2.6	1.0-9.0	0.8-7.3	0.6-7.9	2.6-11.4
Improvement in road traffic noise	6.2	4.9	6.7	8.6	3.8	5.5	12.2	2.3	8.4	10.2
	4.7-8.2	3.2-7.4	4.8-9.4	5.6-13.1	1.6-8.6	2.7-10.7	6.6-21.4	0.7-7.1	3.7-17.9	5.8-17.3
Improvement in aircraft noise	5.6	7.8	7.3	11.7	3.8	4.9	6.4	4.2	5.0	11.6
	4.2-7.5	5.6-10.7	5.4-9.9	8.3-16.3	1.6-8.5	1.9-12.2	2.8-14.3	1.9-9.1	2.1-11.4	6.3-20.3
Improvement in amenities	12.4	21.4	14.2	5.9	14.2	7.3	8.2	13.3	18.4	14.2
	10.0-15.2	17.5-25.8	11.0-18.0	3.1-10.7	9.0-21.8	3.3-15.2	4.2-15.4	7.4-22.6	11.0-29.2	8.6-22.7
Deterioration in green spaces	18.7	20.0	20.8	19.0	15.1	18.9	25.6	14.5	19.9	19.9
	15.8-22.0	16.1-24.5	17.1-24.9	14.5-24.4	10.0-22.3	12.0-28.3	17.1-36.6	8.2-24.4	12.9-29.4	12.0-31.0
Deterioration in value of home	12.2	11.8	13.2	21.0	14.9	14.1	6.0	8.6	5.7	7.6
	9.7-15.2	8.7-15.9	10.1-17.0	16.2-26.8	9.6-22.4	7.9-23.9	2.9-12.1	4.1-17.2	2.2-13.7	3.4-16.1
Deterioration in dust/soot/smoke	21.3	27.0	24.4	35.0	23.7	19.1	12.6	17.9	20.2	22.4
	18.1-25.0	23.0-31.5	20.5-28.8	29.4-41.1	16.6-32.7	11.9-29.3	7.8-19.6	10.8-28.2	12.8-30.5	14.5-33.0
Deterioration in road traffic noise	28.7	33.1	31.5	23.1	29.9	25.9	26.1	30.1	23.4	33.2
	25.1-32.6	28.6-37.8	27.1-36.2	18.4-28.4	22.1-39.1	17.5-36.6	18.0-36.2	21.1-41.0	15.7-33.3	23.7-44.3
Deterioration in aircraft noise	19.9	39.2	32.8	50.9	18.0	12.4	9.5	21.5	14.0	27.3
	17.3-22.9	34.7-44.0	28.7-37.3	44.7-57.0	12.5-25.3	7.3-20.4	5.5-15.9	13.9-31.6	8.4-22.3	19.3-37.1
Deterioration in amenities	16.7	12.3	14.7	28.9	13.6	23.6	14.6	8.3	26.9	24.4
	13.8-20.2	9.7-15.4	11.6-18.5	23.7-34.6	7.7-22.8	16.3-32.9	8.4-24.1	3.9-16.7	18.6-37.3	16.3-34.8

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Table X17 continued Expectations regarding aspects of the neighbourhood for the coming year (by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Improvement in green spaces	0.8	14.7	5.8	5.1	5.5	2.3	19.8	5.6	9.3	11.2	7.1	16.5	11.4	8.8	12.8	5.5
	0.2-3.7	7.8-25.9	2.8-11.8	1.7-14.8	2.3-12.5	0.5-9.4	11.5-32.0	2.1-14.1	4.2-19.1	5.2-22.5	3.2-15.1	9.8-26.6	5.1-23.4	4.8-15.8	6.6-23.5	2.5-11.7
Improvement in value of home	21.2	28.7	20.7	14.5	30.9	19.4	19.8	22.1	28.6	37.2	41.8	32.8	21.9	14.6	24.0	35.3
	13.1-32.4	18.2-42.0	13.2-31.1	8.5-23.7	22.0-41.5	11.8-30.3	11.7-31.6	14.2-32.6	18.9-40.7	27.4-48.1	30.2-54.3	22.8-44.7	13.9-32.8	9.0-22.7	15.7-34.9	24.6-47.6
Improvement in dust/soot/smoke	0.0	1.9	6.7	0.0	0.4	0.0	0.0	1.8	7.0	5.2	2.5	2.2	3.6	5.3	5.4	2.8
	0.0-0.0	0.3-12.3	2.4-17.1	0.0-0.0	0.1-3.2	0.0-0.0	0.0-0.0	0.4-7.1	3.2-14.4	2.5-10.3	0.6-9.8	0.7-6.3	1.5-8.2	2.4-11.4	2.1-13.2	0.5-15.1
Improvement in road traffic noise	7.0	6.1	11.4	1.4	0.6	6.2	2.8	5.9	13.4	8.0	3.9	7.7	5.5	10.0	14.2	2.8
	3.1-15.1	2.3-15.1	5.7-21.6	0.4-5.4	0.1-2.8	2.4-15.2	0.6-12.1	2.3-14.0	7.5-22.8	3.9-16.0	1.5-9.7	4.0-14.3	2.6-11.1	5.5-17.6	6.8-27.4	0.5-15.1
Improvement in aircraft noise	7.2	7.8	7.0	4.7	11.1	7.0	4.4	5.5	10.0	9.1	4.7	9.9	10.6	12.2	11.8	11.5
	2.6-18.5	3.4-17.0	3.5-13.2	2.0-10.7	6.2-18.9	3.5-13.7	2.1-9.0	2.2-13.0	5.5-17.7	4.7-16.9	1.5-13.7	4.9-18.9	6.1-17.9	7.3-19.7	5.9-22.0	5.4-22.9
Improvement in amenities	8.6	10.2	58.5	6.3	18.0	2.6	11.4	9.2	19.5	12.0	11.7	21.6	1.4	7.3	3.5	8.9
	4.0-17.6	4.7-20.6	46.7-69.4	2.5-15.1	10.9-28.2	0.6-10.4	5.9-20.9	4.1-19.6	11.1-32.0	6.8-20.4	6.5-20.3	13.7-32.2	0.3-5.7	3.2-15.5	0.5-21.0	3.4-21.6
Deterioration in green spaces	22.8	6.7	17.8	35.7	15.2	8.4	21.0	20.0	25.7	15.6	30.7	17.5	23.0	19.6	16.5	9.9
	14.5-33.9	2.7-15.7	9.6-30.5	25.4-47.5	9.2-24.0	4.0-16.7	13.1-31.9	12.9-29.8	16.9-37.1	10.0-23.6	21.2-42.1	10.7-27.3	16.0-31.9	13.0-28.6	9.9-26.1	5.0-19.0
Deterioration in value of home	12.7	7.4	16.2	15.7	5.4	14.7	23.0	18.4	9.0	6.2	9.1	8.5	14.7	28.3	7.0	6.5
	6.4-23.9	3.0-16.9	8.0-30.2	8.7-26.7	2.6-11.1	8.6-23.9	14.6-34.2	12.0-27.2	4.9-16.1	2.8-13.2	4.8-16.5	4.7-14.9	9.2-22.7	20.5-37.7	3.5-13.7	3.0-13.4
Deterioration in dust/soot/smoke	26.9	18.7	23.9	34.0	24.1	35.1	29.2	34.1	16.9	23.7	18.3	22.1	31.5	39.4	27.0	25.4
	18.5-37.4	9.6-33.4	15.6-34.8	23.8-45.9	17.1-32.7	25.5-46.1	20.3-40.0	24.6-45.0	10.2-26.7	15.8-34.0	11.2-28.7	14.5-32.2	22.9-41.5	30.7-48.9	18.2-38.2	16.9-36.2
Deterioration in road traffic noise	20.9	30.3	53.2	38.4	23.8	24.1	41.0	26.7	25.2	25.8	32.6	30.4	26.9	21.4	21.2	26.5
	14.4-29.4	18.4-45.6	41.4-64.6	27.9-50.1	16.7-32.7	16.0-34.5	30.5-52.3	18.7-36.6	16.9-35.7	17.6-36.1	23.0-44.0	21.8-40.6	19.0-36.5	14.7-29.9	13.9-30.9	18.0-37.2
Deterioration in aircraft noise	36.0	45.3	37.0	37.5	40.8	45.5	41.8	49.1	25.2	22.6	31.6	29.6	50.3	56.1	33.9	38.7
	27.0-46.2	32.3-58.9	26.5-48.8	27.9-48.2	31.7-50.6	35.1-56.4	31.6-52.6	38.1-60.2	16.7-36.3	15.5-31.6	22.4-42.6	20.9-40.0	40.3-60.3	46.4-65.3	24.3-45.2	28.5-50.0
Deterioration in amenities	27.6	33.2	12.9	2.9	3.5	21.1	15.3	13.5	19.3	11.6	20.8	10.9	40.1	23.4	35.7	30.5
	18.6-39.0	20.9-48.3	7.5-21.4	0.8-9.7	1.3-8.9	13.4-31.7	8.7-25.5	7.8-22.3	11.6-30.5	6.2-20.6	13.4-30.9	6.4-18.0	31.0-50.0	16.1-32.7	25.7-47.2	21.6-41.2

Table X18 Percentage of the population that has taken action against annoyance from Geilenkirchen air base (by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Complained to the KICL	2.6	5.2	4.8	12.1	2.0	1.5	1.5	0.9	1.1	3.6
	1.8-3.6	3.7-7.2	3.3-7.1	8.8-16.5	0.7-5.3	0.3-6.4	0.4-5.3	0.2-3.8	0.2-5.5	1.7-7.7
Signed a petition	5.5	10.2	12.4	24.4	4.0	1.9	5.3	3.2	0.3	5.1
	4.3-7.1	7.7-13.5	9.9-15.3	19.5-30.1	1.8-8.9	0.5-6.4	2.4-10.9	1.4-7.4	0.0-2.3	2.5-10.3
Attended a public meeting or demonstration	2.9	4.3	6.6	32.8	0.8	1.1	1.5	1.5	0.2	3.1
	2.2-3.7	2.6-7.1	5.0-8.8	27.3-38.9	0.2-4.1	0.3-3.9	0.3-6.2	0.4-5.0	0.0-1.3	1.2-7.9
Joined a pressure group against aircraft noise	1.3	1.4	1.9	5.4	1.9	0.2	0.0	1.0	0.0	1.5
	0.6-2.6	0.8-2.7	1.1-3.1	3.2-9.0	0.5-7.4	0.0-1.7	0.0-0.0	0.2-4.4	0.0-0.0	0.4-6.1
Sent a letter to a newspaper	0.6	0.4	0.5	2.1	1.2	0.0	0.6	0.0	0.0	0.0
	0.2-2.2	0.1-1.5	0.2-1.4	0.9-4.9	0.2-7.6	0.0-0.0	0.1-2.9	0.0-0.0	0.0-0.0	0.0-0.0
Complained to an official body	1.9	4.5	3.1	12.0	1.2	0.2	1.4	1.9	0.2	4.6
	1.2-3.0	3.1-6.5	2.0-4.9	8.5-16.7	0.2-7.8	0.0-1.6	0.3-6.2	0.6-5.4	0.0-1.3	2.2-9.5

Table X18 continued Percentage of the population that has taken action against annoyance from Geilenkirchen air base (by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Complained to the KICL	6.5	6.1	1.4	4.1	7.5	6.7	8.4	9.5	5.8	2.8	0.0	0.4	14.3	13.4	4.2	7.8
	3.2-12.4	2.7-13.2	0.3-5.6	1.8-9.2	4.1-13.2	3.1-13.9	4.7-14.7	5.3-16.6	1.8-16.6	1.0-7.4	0.0-0.0	0.1-1.5	9.3-21.3	8.5-20.7	1.6-10.4	4.0-14.7
Signed a petition	7.9	5.0	7.0	8.9	15.8	10.6	12.7	19.7	17.9	13.0	3.2	6.3	16.5	32.0	7.6	13.8
	4.2-14.3	1.9-12.4	3.4-13.7	4.5-16.8	9.6-24.7	5.4-19.6	7.8-20.0	13.1-28.5	11.1-27.5	7.9-20.6	1.2-8.3	3.4-11.3	10.7-24.4	23.9-41.2	3.5-15.5	8.4-22.0
Attended a public meeting or demonstration	3.4	0.3	5.6	2.3	6.2	2.9	5.6	13.3	6.2	5.3	6.0	7.4	13.5	47.6	8.9	12.0
	1.2-9.3	0.0-2.2	2.0-14.6	0.6-8.4	2.5-14.5	1.0-8.1	2.9-10.5	7.8-21.7	2.8-13.1	2.6-10.7	2.7-12.6	3.8-14.1	8.5-20.8	38.1-57.3	4.7-16.2	6.7-20.5
Joined a pressure group against aircraft noise	0.0	0.0	0.7	0.2	3.9	1.5	1.8	7.0	1.7	1.2	0.0	1.3	1.7	8.0	0.6	2.6
	0.0-0.0	0.0-0.0	0.1-5.1	0.0-1.5	1.8-8.1	0.4-5.7	0.5-5.8	3.4-13.7	0.4-6.6	0.3-4.5	0.0-0.0	0.3-5.3	0.4-6.5	4.4-14.1	0.1-4.4	0.8-7.8
Sent a letter to a newspaper	0.0	0.0	0.7	0.0	0.8	0.0	0.5	0.0	0.0	1.5	0.0	0.0	1.2	2.6	0.6	2.4
	0.0-0.0	0.0-0.0	0.1-5.0	0.0-0.0	0.1-5.4	0.0-0.0	0.1-2.3	0.0-0.0	0.0-0.0	0.4-5.8	0.0-0.0	0.0-0.0	0.2-5.7	0.8-7.9	0.1-4.1	0.7-7.7
Complained to an official body	4.1	3.5	2.5	3.6	6.3	7.4	4.1	8.4	4.6	1.9	0.0	0.2	3.8	17.8	2.1	5.6
	1.8-9.0	1.3-9.2	0.8-7.8	1.2-10.2	3.3-11.6	3.6-14.6	1.8-9.2	4.3-15.9	1.5-13.1	0.6-5.8	0.0-0.0	0.0-1.2	1.7-8.2	11.9-25.7	0.8-6.0	2.5-12.1

Table X19 What do you think needs to be done to resolve the disadvantages experienced by residents as a result of Geilenkirchen air base and the aircraft (AWACS)? (a maximum of four options could be selected; by municipality)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Geilenkirchen air base should be closed.	11.8	22.4	17.3	35.3	9.9	11.0	4.9	8.6	9.7	17.0
	9.9-14.1	19.1-26.2	14.3-20.8	29.8-41.1	6.0-15.9	6.3-18.4	2.5-9.4	4.8-14.9	5.3-17.1	11.4-24.5
Reduce the number of training flights.	28.0	38.8	34.6	42.6	25.3	33.9	19.0	21.5	19.0	33.5
	24.7-31.6	34.2-43.5	30.2-39.2	36.7-48.8	18.6-33.5	25.0-44.2	12.7-27.4	14.4-30.7	12.2-28.3	24.4-44.1
The aircraft should be fitted with quieter engines.	73.2	77.9	76.4	79.7	71.0	72.8	78.3	64.3	67.9	72.2
	69.0-76.9	73.6-81.7	71.9-80.5	74.3-84.2	61.2-79.2	62.6-81.1	68.8-85.5	52.4-74.6	56.6-77.4	60.2-81.7
The aircraft should fly at different times.	10.3	7.2	7.7	5.4	11.3	14.0	10.5	3.1	8.8	11.1
	8.0-13.2	5.1-10.0	5.7-10.3	3.3-8.6	6.6-18.9	8.3-22.5	5.7-18.4	1.0-8.9	3.9-18.7	6.1-19.2
The government should keep its promises.	36.6	31.1	35.9	41.1	38.8	33.4	45.2	23.9	33.0	30.0
	32.6-40.8	26.7-36.0	31.5-40.5	35.2-47.2	29.8-48.6	24.5-43.6	35.1-55.8	16.0-34.1	23.7-43.7	20.9-40.9
The government should take residents seriously.	48.5	47.0	54.6	56.8	48.7	41.6	49.4	44.4	55.4	49.9
	44.4-52.6	42.1-51.9	49.6-59.5	50.7-62.8	39.3-58.2	31.8-52.0	39.2-59.7	33.7-55.7	44.2-66.0	39.1-60.7
Better information on flight schedules	35.4	37.0	36.4	24.8	38.8	34.3	33.2	30.0	29.3	36.2
	31.4-39.6	32.3-41.8	31.8-41.3	20.0-30.4	29.8-48.6	24.9-45.0	24.4-43.4	20.8-41.1	20.5-40.1	26.1-47.7
Dialogue between the air base and the residents	28.8	21.3	22.3	15.3	32.3	29.0	29.5	31.6	27.6	28.8
	24.9-32.9	17.5-25.7	18.5-26.6	11.4-20.2	23.7-42.3	20.6-39.2	20.9-39.9	22.2-42.8	18.8-38.4	19.7-40.1
Nothing needs to be done.	5.7	0.6	6.3	2.8	2.9	10.9	5.9	8.9	7.7	5.6
	4.0-7.9	0.2-1.5	4.0-9.8	1.1-7.3	1.0-8.1	5.6-20.2	2.4-14.0	3.7-20.0	2.9-19.0	1.8-16.3

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Table X19 continued What do you think needs to be done to resolve the disadvantages experienced by residents as a result of Geilenkirchen air base and the aircraft (AWACS)? (a maximum of four options could be selected; by postcode area)

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Geilenkirchen air base should be closed.	16.0	20.2	19.1	22.6	27.2	28.2	22.5	17.7	16.4	18.4	14.7	8.7	26.9	40.2	25.4	33.4
	10.5-23.7	11.7-32.6	12.7-27.6	15.4-31.8	19.9-36.0	20.1-38.0	15.5-31.6	11.5-26.2	10.2-25.2	12.0-27.2	8.9-23.3	5.1-14.4	19.7-35.6	31.6-49.5	17.2-35.9	24.1-44.1
Reduce the number of training flights.	34.2	36.1	41.1	30.7	45.3	40.0	40.5	42.1	31.0	33.4	31.9	26.2	44.9	42.8	38.5	40.8
	25.0-44.7	24.7-49.2	30.5-52.5	21.9-41.2	35.6-55.3	30.1-50.8	30.5-51.3	31.8-53.1	21.7-42.2	24.2-44.0	22.6-42.9	18.1-36.2	35.5-54.7	33.8-52.3	28.0-50.2	30.1-52.6
The aircraft should be fitted with quieter engines.	66.3	70.9	81.8	78.0	81.3	83.1	74.2	78.0	75.8	78.9	78.4	75.4	83.6	77.8	76.9	84.4
	54.4-76.4	56.3-82.2	71.9-88.7	67.2-85.9	72.3-87.8	74.0-89.5	62.6-83.2	66.7-86.2	65.0-84.1	68.9-86.4	67.0-86.7	65.0-83.6	74.6-89.8	69.2-84.6	65.1-85.6	73.6-91.3
The aircraft should fly at different times.	10.8	6.6	3.2	3.7	10.5	8.4	5.9	11.3	9.7	4.7	9.0	10.3	10.1	3.9	2.0	7.1
	4.9-22.3	2.8-14.8	1.1-8.6	1.3-10.1	6.0-17.7	4.1-16.4	2.6-12.9	6.0-20.1	4.8-18.5	1.8-11.7	4.7-16.8	5.6-18.1	5.3-18.5	1.6-9.2	0.6-6.8	2.8-16.8
The government should keep its promises.	42.9	30.8	22.9	32.6	27.7	39.8	28.8	36.3	36.3	32.4	50.7	44.4	35.5	43.1	45.6	37.5
	32.2-54.2	20.4-43.7	14.6-34.2	23.0-44.0	19.2-38.3	29.8-50.8	20.5-38.7	26.4-47.5	25.9-48.1	23.4-42.8	39.1-62.1	34.0-55.2	26.8-45.3	34.2-52.5	33.9-57.8	27.0-49.2
The government should take residents seriously.	44.4	45.7	39.2	48.7	50.5	57.1	55.1	42.4	56.8	51.9	62.3	58.1	47.5	62.2	56.4	46.4
	33.9-55.4	33.0-58.9	28.8-50.7	37.8-59.8	40.6-60.3	46.4-67.3	43.8-65.9	32.3-53.3	44.9-67.9	41.1-62.5	50.3-72.8	46.9-68.5	37.9-57.2	52.6-71.0	43.7-68.3	35.2-57.9
Better information on flight schedules	38.8	42.8	44.9	24.1	36.4	42.0	42.5	25.7	32.1	33.3	35.0	41.1	25.8	23.5	33.0	23.0
	28.2-50.5	30.3-56.3	33.7-56.5	15.9-34.8	27.4-46.6	31.8-53.0	31.9-53.8	17.6-36.0	22.1-44.1	24.0-44.1	24.9-46.7	31.1-52.0	17.9-35.6	16.6-32.2	22.0-46.3	14.4-34.7
Dialogue between the air base and the residents	22.1	22.0	22.7	21.4	19.4	22.4	17.4	12.7	27.9	28.1	25.1	21.3	13.4	14.7	26.8	11.9
	13.8-33.5	13.4-34.0	14.6-33.6	13.6-32.0	12.5-28.8	14.5-32.8	10.6-27.3	7.0-22.1	17.8-40.8	19.6-38.5	16.0-37.0	14.0-31.1	7.8-22.1	9.2-22.7	16.7-40.1	6.3-21.6
Nothing needs to be done.	1.7	0.5	0.9	0.3	0.0	0.5	6.4	8.5	6.1	6.8	1.1	7.2	1.2	3.6	0.7	3.6
	0.4-7.3	0.1-3.4	0.1-6.3	0.0-2.0	0.0-0.0	0.1-3.5	2.2-17.7	3.2-20.8	2.3-15.1	2.6-16.7	0.3-4.6	3.1-15.8	0.3-4.7	1.0-11.7	0.1-5.0	0.5-21.7

Table X20 Attitude to Geilenkirchen air base (by municipality and postcode area)

Percentage (95% confidence interval)	Total	Schinnen	Brunssum	Onderbanken	Heerlen	Kerkrade	Landgraaf	Nuth	Simpelveld	Voerendaal
Very positive	8.2	4.8	10.0	4.7	5.6	9.2	8.8	16.8	8.4	11.8
	6.0-11.0	2.6-8.8	6.8-14.5	2.2-9.7	2.4-12.7	4.0-19.8	4.2-17.7	8.7-30.0	3.5-18.8	5.2-24.5
Fairly positive	19.6	15.9	18.9	10.4	18.8	16.2	30.1	21.5	16.2	16.4
	15.9-23.8	11.8-21.0	14.8-23.8	7.4-14.5	11.3-29.7	9.2-27.1	20.6-41.8	13.0-33.5	8.8-28.0	8.7-28.9
Neutral	52.1	45.9	41.9	30.5	56.3	55.3	50.7	48.5	65.2	49.6
	47.8-56.3	41.0-50.9	37.2-46.8	24.9-36.7	46.3-65.8	44.6-65.7	40.2-61.2	37.3-59.8	53.6-75.3	38.7-60.6
Fairly negative	11.4	19.7	16.1	23.2	11.2	9.3	6.6	9.3	7.3	13.1
	9.3-13.8	16.3-23.5	13.3-19.4	18.7-28.4	7.0-17.6	5.0-16.8	3.5-12.2	5.2-16.2	4.0-12.9	8.1-20.5
Very negative	8.8	13.8	13.1	31.1	8.0	9.9	3.7	3.8	2.9	9.1
	7.1-11.0	11.2-16.9	10.5-16.1	25.8-37.0	4.6-13.6	5.4-17.5	1.6-8.3	1.7-8.5	1.1-7.7	5.3-15.1

Percentage (95% confidence interval)	Schinnen						Brunssum						Onderbanken			
	6155	6174	6365	6436	6438	6439	6441	6442	6443	6444	6445	6446	6447	6451	6454	6456
Very positive	8.8	4.9	9.9	3.0	0.0	5.0	10.6	8.3	10.0	8.5	5.7	14.7	3.3	4.5	14.0	0.6
	2.9-23.8	0.7-27.7	3.5-25.1	0.6-13.8	0.0-0.0	1.5-15.2	4.2-24.3	3.1-20.5	4.7-20.1	3.4-19.7	1.7-18.0	7.3-27.5	0.8-12.8	1.3-14.1	5.6-30.7	0.1-3.9
Fairly positive	6.1	18.6	18.9	22.0	16.3	7.0	14.9	15.0	23.7	19.8	22.7	20.2	19.6	4.1	15.3	22.4
	2.0-17.2	8.7-35.6	10.4-32.0	12.8-35.0	8.8-28.3	2.5-17.8	7.7-26.7	7.7-27.3	13.5-38.2	11.6-31.7	13.4-35.9	12.2-31.6	11.5-31.3	1.7-9.7	7.6-28.3	12.7-36.2
Neutral	55.3	41.7	41.2	46.2	44.3	49.2	42.8	33.5	33.1	44.0	47.2	48.1	31.9	29.1	27.6	37.8
	44.0-66.0	29.7-54.9	30.6-52.6	35.3-57.5	34.4-54.6	38.4-60.0	32.3-53.9	24.1-44.3	23.5-44.4	33.8-54.7	35.8-58.8	37.5-58.9	23.5-41.6	20.8-39.0	18.6-38.8	27.3-49.6
Fairly negative	20.1	21.8	17.4	14.8	23.5	21.9	11.2	25.8	20.1	19.5	14.8	11.4	19.7	25.1	27.2	16.8
	13.5-28.7	13.5-33.4	11.2-25.9	8.8-23.8	16.3-32.8	14.7-31.4	6.8-17.9	18.0-35.5	12.9-29.8	12.8-28.5	8.7-24.0	6.8-18.5	13.5-27.8	18.2-33.5	18.8-37.5	10.4-26.1
Very negative	9.9	12.9	12.6	14.1	15.9	16.9	20.6	17.4	13.2	8.2	9.6	5.6	25.6	37.3	15.9	22.5
	5.7-16.5	7.2-22.0	7.7-20.1	8.9-21.5	10.4-23.5	11.0-25.1	13.9-29.4	11.0-26.5	7.8-21.2	4.7-14.0	5.0-17.6	3.0-10.3	18.7-34.0	28.8-46.6	9.3-25.8	15.3-31.8

Erratum: RIVM-report 630311 001,

Page 32, section 4.2, 1st paragraph: CU should be KE

Page 76, section 6.3.8, 3rd paragraph should be replaced by:

For the purpose of the survey it is important to establish how far annoyance from the Geilenkirchen air base is correlated to the aircraft noise to which local residents are exposed and how far it is caused by other factors. At the start of the survey there were data available on the 35 KE noise contour around the base. The noise unit 'KE' (Kosten Eenheden) stands for Kosten Unit, the measure of noise which was formerly in general use in the Netherlands but is now only used around regional and small airports and military airfields. The legislation provides for a changeover to the European dose measure L_{den} (see below) for regional and small airports, while military airfields will continue to use KE as the noise unit for the time being. Geilenkirchen air base is required by law to establish the 35 KE noise contour. This does not provide any information on the survey participants' individual exposure to noise, nor any indication of exposure to noise outside the contour.

RIVM

National Institute
for Public Health
and the Environment

P.O. Box 1
3720 BA Bilthoven
The Netherlands
www.rivm.com