Public health impact of large airports: Evaluation
Public health impact of large airports: Evaluation

HJ Albering, University of Maastricht, Department of Health Risk Analysis and Toxycology, POBox 616, 6200 MD Maastricht

WF Passchier, Health Council of the Netherlands, POBox 16052, 2500 BB The Hague

The Hague, 11 september 2000
Contents

1 Introduction 7
  1.1 Background 7
  1.2 Objective 8
  1.3 Structure of the report 8

2 The project 9
  2.1 International and preparatory committee 9
  2.2 Staff 9
  2.3 Workshop 10

3 Methodology 13

4 Results 15
  4.1 Project organisation and design 15
  4.2 Output 20
  4.3 Impact 21

5 Conclusions and lessons learned 25
  5.1 Project design 25
  5.2 Integrated assessment 26
Annex 29

A Questionnaire sent to the committee 31
Chapter 1

Introduction

1.1 Background

In September 1999 the Health Council of the Netherlands published the report ‘Public health impact of large airports’. This report responds to a request of the Ministers of Health, of Transport and of the Environment of the Netherlands Government. An international committee of experts that met in a three-day workshop in March 1999 in Rolduc Abbey, Kerkrade, prepared the report. In its report the committee focused on the public health impact of local changes in environmental factors and approached the subject of health impacts of large airports in an integral manner.

The committee introduced the airport operations system as a framework for discussing the public health effects of large airports. Public health encompassed the concepts of health and quality of life. In its report the committee reviewed exposure and effect data for major environmental factors associated with airport operations such as air pollution, noise and accident risk. The impact of environmental factors was characterised by assessing the evidence for a causal relationship between the exposure to an environmental factor and a public health effect, the severity of the effect and the number of people affected. The report ended with an attempt to integrate the findings and presented recommendations for controlling environmental and public health risk associated with major airports.
1.2 Objective

The present internal evaluation study aims to assess the process that led to the report and the degree to which the report contains an integrative view on the health impacts of the airport operations system. The main objective of this study is to generate lessons for future designs, both in a methodological sense and with respect to the feasibility of integral assessment.

1.3 Structure of the report

The present report is structured as follows: In Chapter 2 the project is summarised. In Chapter 3 the methodology is outlined. An overview of the results is presented in Chapter 4. Chapter 5 draws conclusions and sets out some general lines for future projects in the field of environment and health.
Chapter 2

The project

2.1 International and preparatory committee

The Health Council Presidency asked scientists from Dutch universities and research institutes and a few others to take part in a preparatory committee (11 members). This committee provided guidance for the work of the staff in preparing the Rolduc workshop and identified committee members from outside the Netherlands. The preparatory committee met 5 times, 4 times before the workshop and once after the workshop was held. The staff interviewed the international committee members (10 in total) and their comments were used in drafting the working papers for the Rolduc workshop. The committee that was responsible for the report consisted of the members of the preparatory committee and foreign experts.

Furthermore, other scientists were invited to take part in the workshop to provide additional views and insights.

2.2 Staff

The Health Council staff (4 members) started work on this project at the end of summer 1998. Its first tasks were compiling the relevant scientific literature and initiating a selection process for international committee members. The staff collected recent review papers and reports on the public health effects of environmental factors.
associated with airport operations. Also literature was provided by members of the preparatory committee and by committee members. Additional literature was retrieved on specific subjects using recent review papers. The staff used the literature collected to prepare the working papers for the Rolduc workshop and for the subsequent drafting of the committee’s report. The working papers dealt with:

- Environment and health
- Airport operations system
- Safety
- Noise
- Air quality
- Perception of the living environment
- Soil and water pollution
- Airport malaria

The staff carried out three case studies to provide the committee with background material on the way public health plays a role in airport development. The cases selected were London Heathrow, Munich International Airport Franz Josef Strauss and Berlin Brandenburg International.

The Health Council had put an announcement in the Dutch Official Gazette on 23 October 1998 outlining the design of the project and calling upon interested parties to provide data and views that might be helpful in preparing a scientific assessment of the public health impact of large airports. The reactions received were reviewed by the preparatory committee and taken into account in preparing the report. In July 1999 all the individuals and organisations that had responded were approached again with a draft version of the first three chapters of the report (general introduction) and an outline of the contents of the other chapters. All parties were given the opportunity to present additional information to the committee. The comments received were used by the staff to clarify the views put forward in the first three chapters and were considered in the final editing of the full report.

2.3 Workshop

The (international) committee of experts met in a three-day workshop in March 24-27, 1999 in Rolduc Abbey, Kerkrade to prepare the report. In total 30 experts participated in the meeting.

The first day started with a general introduction about the programme and the objectives of the workshop. During the second day (first full day) plenary discussions
on environment and health, airport systems and cumulation and perception were held. In working groups the papers on noise, air quality (including odour), and safety were discussed. At the end of the second day the outcome of the working groups was presented in a plenary session. The last day of the workshop was devoted to a plenary discussion on the central topic of the meeting: ‘large airports and public health’. Furthermore, conclusions and recommendations to be put in the committee’s report were discussed. After the workshop the committee finalised the report by commenting on draft texts posted to them.
Chapter 3

Methodology

The internal evaluation of the project focused on:

- **Project organisation and design**
  - Task preparatory committee
  - Selection international committee members
  - Topic selection working papers
  - Review literature
  - ‘State of the art’ of the working papers
  - Design of the workshop
  - Degree of participation of committee members during the workshop
  - Effectiveness of the workshop
  - Time schedule

- **Output**
  - Appropriateness of an integrated assessment approach
  - Success of providing an integrated assessment
  - Scientific quality of the report

- **Impact**
  - In what way and to what extent do relevant policy makers expect the outcome to be used?
A questionnaire was sent to all committee members by (e-)mail. In total 17 (out of 21) members responded. The questionnaire is listed in Annex A. One of us (HA) interviewed the Dutch committee members (i.e. the members of the preparatory committee) and also representatives of the relevant government departments in person. The response to the questionnaire was used as guidance for the discussion during the interviews. Ten (out of 11) Dutch committee members were interviewed.

The responses to the questionnaire and the interviews were compiled and evaluated in a qualitative way.
Results

4.1 Project organisation and design

Preparatory Committee

In the course of the preparation of the Rolduc workshop the task of the preparatory committee was changed. Initially the preparatory committee acted as a sounding board for the staff. It provided guidance for the work of the staff in preparing the workshop and identified committee members from outside the Netherlands. At the outset the Health Council Vice-president proposed that an international committee with only a few Dutch members should be responsible for the report requested. However, it appeared that the preparatory committee’s work and responsibility could not be separated from the work and responsibility of the international committee. Therefore, all members of the preparatory committee were included in the advisory committee and take responsibility for the report.

The preparatory committee met 4 times in the period before the workshop. The pre-conference process was commented upon by some members of the preparatory committee. The arguments were as follows:

According to the rules of procedure of the Health Council either the Health Council President, or one of the Vice-presidents is responsible for a project. This implies that he has the authority to select committee members and establish the advisory committee, and to transmit the committee’s report to the relevant Cabinet ministers.
On average 6-8 (50 –75%) of the members were present at the meetings

Important issues related to public health impact of large airports were not discussed in depth:
- the request for advice from a policy point of view
- the approach of an integrative assessment
- the importance of appearance of the environment

Too much attention was paid to the concept of health.

High pressure of time surrounding the project. No time for reflection of the process.

## Committee

The preparatory committee and the staff proposed committee members from outside the Netherlands. Particularly in the field of safety it appeared very difficult to recruit experts. This was probably due to a safety conference in Geneva at the same time as the Rolduc workshop.

The majority of the members agreed or strongly agreed that the composition of the committee was balanced. There was a wide range of expertise covering the broad topic of public health impact of large airports. One member stated that the domains of safety and occupational health were poorly represented. Another member argued that the expertise on consultation and compensation was limited. The same was the case for the living environment, according to one committee member.

More than 90% of the committee members agreed that the international composition of the committee enhanced the quality of the committee’s report. The acceptance of the report will be better if it is supported by an international panel. Some members stipulated that there is a high degree of expertise and experience in the Netherlands. A few committee members debated that some Dutch experts are closely associated with studies related to the expansion of Amsterdam Schiphol Airport. Most agreed that an international committee would enhance the legitimacy of the conclusions with respect to their applicability for Amsterdam Airport Schiphol.

## Working papers

The staff collected review papers and reports on the public health effects of environmental factors associated with airport operations. The literature obtained was used to prepare the working papers for the conference.
In general the committee considered this approach as appropriate. Several committee members stated that:

- Too much reliance on original papers might cover a rather narrow spectrum and would probably have been more confusing than clarifying.
- There was less need to review the original literature because the subject of health impacts of large airports was approached in an integral manner.
- Time for preparation of the working papers was rather short. It was not feasible to summarise the original literature.

However, two members considered this approach as too restricted. They stated that recently published reviews in a given research area miss about 1-2 years of worth of findings. Experts invited to the workshop can help to fill in these data gaps but they may not ensure adequate representation of differences of opinion in the interpretation of research data. To guarantee that the review of the literature summarised the state of the art, one member suggested that an expert should have been assigned to this task.

The working papers were distributed about one week prior to the workshop. One third of the committee members indicated that they did not have enough time to read the papers before the workshop, however this did not affect their participation in the workshop negatively.

In general, the working papers were adequate in outlining the relevant issues to be addressed in the report. All scientific issues were mentioned. The papers were a good starting point and anchor for discussions. Comments made included:

- Naturally it took some time before the relevant issues in the working papers were clearly outlined.
- Approach was perhaps broader than strictly needed.
- Not all issues were treated with a similar depth, but this was not a big problem (final report is what matters, and it was fine).
- Methods for quantitatively assessing the public health effects of environmental factors were not developed/discussed/agreed upon separately.
- Paper on air quality and case studies were well done.
- Occupational health was not adequately addressed.
- Too little attention was paid to perception, consultation with stakeholders and compensation of the affected population.
- Lack of consistency between the working papers, due to pressure of time surrounding the project. The working paper on environment and health provided
the framework for discussing public health impact of large airports, but some of the other papers were not coherent with this paper.

- Working paper: Environment and Health
  - At the beginning it was not entirely clear what public health effects were meant to be discussed; some committee members stated that this was partly due to different opinions about the concept of health by members of the Health Council
  - The in depth treatment of the social science approach to environment and health was slightly too philosophical
  - Too complete
  - More attention might have been paid to quality of life issues

- Working paper: Safety
  - Too little concern with control. Just presenting problems and effects

- Working paper: Perception of the living environment
  - The input on visual and recreational impacts of large airports could have been handled better.
  - Is the recreational and visual impact of large airports related to an airport operation system an important issue to be dealt with?

- No specific remarks were made about the papers on air quality and noise.

---

**Workshop**

**Design**

Most committee members were satisfied with the programme of the workshop. They found the meeting well structured and balanced. Within the constraints of time there was adequate participation. However, a number of shortcomings were mentioned. Some committee members stated that there were too many participants to enable effective individual participation. Furthermore, some members found that more time should have been devoted to discussions in working groups. A few members criticised the working group and plenary meetings. They could have been more structured and more productive. Three suggestions for improvement were made:

- Appointing moderators with different expertise. One with professional expertise related to the topic and a ‘neutral’ moderator with leadership ability. The neutral moderator or panel chair should guard the total process of the project.

- In plenary sessions the issue on environment and health, airport systems and cumulation and perception were discussed. In working group sessions the papers on noise, air quality (odour) and systems and safety were discussed. One member
proposed not to discuss the separate issues in topical working groups, but to
discuss the impact of large airports on health in small but broad expertise groups.
- The staff had assigned members to working groups on the basis of their expertise.
  One member suggested to let the experts chose by themselves in which working
group they want to participate.

Effectiveness

40% of the committee members did not make any special remarks and agreed that at
the workshop the relevant scientific issues related to public health impact of large
airports were sufficiently addressed and discussed. 50% of the committee members was
of the opinion that the workshop was balanced. The following issues were not
sufficiently addressed:
- Occupational health
- Odour
- Control (safety issue)
- Consultation and compensation
- Quantification of health effects of airport exposure
- Appearance of the environment. This appeared to be an important issue. However,
the evidence that was available was limited. More attention should have been paid
to this issue.

According to 3 committee members the discussions about the concept of health (quality
of life) during the plenary sessions were not very productive and took too much time.
Some committee members stated that this was partly due to different opinions about the
concept of health by members of the Health Council. Some committee members were
of the opinion that the staff had too big an influence on the workshop.

One member considered the issue on cumulation and perception less useful and
the reflection part not very effective because of too many advocacies.

One member thought the effectiveness of the workshop to be limited in relation to the
scope of the project (to approach the subject of health impacts of large airports in an
integral manner). He suggested using a court like construction, where a small senior
expert committee examine specialists. The task of this committee should be to
approach the subject in an integral manner.

Finally, one committee member considered the workshop balanced and useful for
a description of the state of the art. A new meeting (with fewer participants) should

19 Results
have been scheduled to highlight the conclusions, discussions and recommendations of the final report.

4.2 Output

After the workshop the committee finalised its report by commenting on draft texts by (e-) mail. The majority of the committee members were satisfied with this procedure. There was enough time to respond and comments were taken care off.

In the final report the committee focused on the public health impact of local changes in environmental factors and approached the subject of health impacts of large airports in an integral manner. The airport operation system was introduced as a framework for discussing the public health effects of large airports.

The majority of the committee considered this integrated approach appropriate for the subject. One member suggested that the chosen approach might even be considered a model both for other countries and for other problems of comparable complexity and impact.

A few members argued that there is no common methodology to address cumulative exposure and the impact on public health.

In determining the impact of environmental factors the committee used classification schemes for the evidence of a causal relationship between the exposure to an environmental factor and a public health effect, the severity of an effect and the number of people affected. According to some members the chosen ‘star’ system was very suitable. One member was of a different opinion and was not sure that the chosen approach contributes to integration.

The majority of the committee broadly agreed that the project was successful in providing an integrated assessment of the public health impact of large airports. One member stated that it was in many ways a landmark document that will be very valuable internationally. According to two members the project succeeded in presenting the complex nature of public health impact of large airports of the relatively well-documented effects and about the plausible but less studied effects.

However also critical comments were made. The final report was insufficient on:
- In its final conclusion (‘the way ahead’) and in recommendations on interactions between stakeholders, in particular with the people affected.
- Giving priority and weighting
- Quantification of effects of airport exposure
- Quality of life issues
- Discussing the conclusions and recommendations
One member brought up that the integrative approach followed by the committee did not succeed in successful integration.

According to some members formal meta-analysis techniques and mathematical models could have provided additional input without replacing integral assessment as such. Expert rating following the Delphi-method, was mentioned as another method to aggregate the data on the impact on public health, although this committee member stated that the integral approach followed by this project was superior because the evaluation process was transparent and conclusions were traceable.

The project design provided the possibility to interested parties to supply data and views that might be helpful in preparing the report. One member argued that stakeholders might have participated in the entire process. Two members suggested carrying out additional sessions or exercises, to get real input from local stakeholders.

### 4.3 Impact

To facilitate the decision process on the future of the Dutch aviation infrastructure, and specifically the development of Amsterdam Schiphol Airport, the Cabinet ministers responsible for health, for the environment and transportation requested the Health Council of the Netherlands to evaluate the state of knowledge with respect to the health impacts associated with large airports.

The President of the Health Council received this request, dated on 14 February 1998, from the Minister of Health, Welfare and Sport, also on behalf of her colleagues of environment and transportation. Originally, the Minister requested a short report dealing with the current state of knowledge regarding the health effects of major airports. This report should be finalised before December 1998. However, this was not feasible and the Minister and the President of the Health Council agreed to aim a report in spring 1999.

On 18 December 1998 the Cabinet decided to work out the Future Aviation Strategic Policy Choice. One year later, in December 1999, the Cabinet took further decisions regarding the national airport development in the medium to long term.

On 2 September 1999, the report public health impact of large airports was submitted to the Minister of Health, Welfare and Sport, to the Minister of Housing, Spatial Planning and the Environment and to the Minister of Transport, Public Works and Water Management.

In the present evaluation study representatives of the relevant government departments were interviewed. In retrospect the representatives of the departments of the
environment and of transportation thought the health impact assessment study at Amsterdam Airport Schiphol being co-ordinated by RIVM to be sufficient. The report describing the current state of knowledge regarding the health effects of major airports might be useful to develop a health monitoring system around Amsterdam Airport Schiphol.

The policy makers of the three relevant Government departments were of the opinion that the direct impact of the report was modest. The strategic decisions related to Amsterdam Schiphol Airport were made in December 1998 and December 1999. They argued that the conclusions and recommendations were not contrary to the established policies. The conclusions are such that direct actions are not necessary. Furthermore, the report supported the health impact assessment study around Schiphol Airport. The report has played a role in drawing up a proposal for a new system of environmental safety standards and it will be used as input to develop a health monitoring system around Amsterdam Airport Schiphol.

In its report the committee focused on the public health impact of local changes in environmental factors and approached the subject of health impacts of large airports in an integral manner. The committee introduced the airport operations system as a framework for discussing the public health effects of large airports. According to the representative of the Ministry of Health, Welfare and Sport the chosen method was very useful.

The representative of the Ministry of the Environment indicated that there is a need to work out the monitoring programme around Schiphol Airport. The committee recommended that a comprehensive, efficient monitoring programme should follow a public health impact assessment. However, the monitoring programme was not specified in the report. He also indicated that health issues hardly play a role in the political discussion around Schiphol Airport. Within the department of environment the interest in health and health issues is on the increase.

According to the representative of the Ministry of Transport there was one error in the report. With respect to controlling air pollution the committee noted that in most industrialised nations industrial and road traffic sources of air pollution are subject to regulatory control contrary to aircraft emissions. However, the International Civil Aviation Organisation (ICAO) sets standards to the emission of aircraft engines of NO\textsubscript{x}, CO, HC and smoke number. He supported the integrative approach but was of the opinion that too little attention was paid to the positive effects on health of large airports. From the policy point of view the question has to be answered what degree of integration is required too make the decision making process with respect to Schiphol Airport effective.
On April 10, 2000 the official reaction of the Netherlands Government to the report was sent to Parliament. The reason why the reaction took so long (Ministers should react to Health Council reports within 3 months time) is related to the necessary consultations between the various government departments. The reaction hardly addressed the public health evaluation in the report as such. According to the representative of the Ministry of Environment this was not feasible within the consultation process between the various government departments.
5 Conclusions and lessons learned

5.1 Project design

We conclude that generally the committee members were satisfied with the project. The comments received also indicate possibilities for improvement:

1. The role of the preparatory committee should be clearly defined from the outset. In the present project the role of the preparatory committee members during the actual compilation of the report was unclear. It is generally to be advised that members of the preparatory committee are included in the committee responsible for the Health Council report.

2. For a very broad topic as the health impact of large airports, the project design allotted very limited time for reflection and interaction between committee members. This problem might be resolved by either intensifying the consultations of individual committee members (e.g. using a Delphi type of procedure) before the meeting of the full committee, or by organizing two meetings. In either case the duration of the project would probably increase by half a year.
The question of consistency between working papers needs further thought. Too much consistency might introduce a bias in the meeting. This matter might possibly be resolved by working out alternative options and do so consequently.

The committee meeting should end more clearly with a discussion of proposed conclusions and recommendations. In the present case the final plenary session of the Rolduc workshop was of too general a nature. A possible improvement might be appointing moderators with different expertise. One with professional expertise related to the topic and a ‘neutral’ moderator with leadership ability. The neutral moderator or panel chair might guard the total process of the project.

### 5.2 Integrated assessment

We interpret the comments received as support for the final report being a comprehensive compilation of knowledge and issues related to the impact of airport operations on health. However, committee members feel that there is still a way to go from such a compilation to operational recommendations.

A first step on this road is specifying the concept of health. One needs to be aware of different values or differing schools of thoughts about the concept of health.

Another step on this road is studying more quantitative methods for expressing both the negative and positive impact of the airport operations on health. Quantitative methods that have been mentioned in the course of the airports project are: variation in house prices, expressing health impact in disability adjusted life years and the multi-attribute aggregation method proposed by RIVM in its study on a comprehensive set of indicators for valuing the local environment (leefomgevingsbalans).

Integrated assessment implies integrating knowledge from different research domains. This implies sufficient time, both in preparatory consultations as in committee meetings for mutual learning (in the present project this applied to the issue of the ‘visual appearance of the environment’).

Integrated assessments gain in impact if operationalizations are provided. As mentioned in the airports report, recommendations depend on political, social and cultural boundary conditions. This implies that before such recommendations can...
be developed consultations with policymakers (and possibly other stakeholders) are required. For the airports study this relates to the actual monitoring of the impacts and to the governing structure of future developments.

9 A Health Council report is by definition an expert assessment. The impact of the assessment will also be depend on the way the report addresses the issues that are relevant in the societal debate. This requires and analysis of this debate and consultations with policymakers and other stakeholders.

10 The project design provided the possibility to interested parties to supply data and views that might be helpful in preparing the report. Views held by stakeholders and the public at large about the output of the report should be evaluated in an additional questionnaire.
Annex

A Questionnaire sent to the committee
Annex A

Questionnaire sent to the committee

Committee

- Are you of the opinion that the committee (Dutch and foreign members) encompassed the range of expertise relevant and required for the project?
- Do you think that the international composition of the committee did enhance the quality of the committee’s report?

Literature

- In retrospect, do you consider this approach as too restricted or as appropriate?
- Were the working papers adequate in outlining the relevant issues to be addressed in the report?
- Are you of the opinion that all relevant scientific issues were mentioned in the working papers (e.g. state of the art, in depth, width)? Which issues were not addressed in sufficient depth?
- The working papers were sent about a week prior to the workshop. Did you have enough time to read the papers before the workshop? If not, did that negatively affect your participation in the workshop?
Rolduc Workshop

- Were you satisfied with the programme of the workshop (duration, plenary meetings and group meetings)?
- Do you think that every workshop participants could participate fully in the plenary sessions and in the working group sessions? Or do you think that either yourself or other participants had insufficient opportunity to put forward concerns and to influence the conclusions and recommendations.
- Do you think that at the workshop the relevant scientific issues related to public health impact of large airports were addressed? Were these issues sufficiently discussed? Please specify where the discussions were not as effective and efficient as you would have liked.
- Are their issues or specific viewpoints that have been overstressed during the plenary and the working group sessions? If so, did this have an adverse influence on the conclusions and recommendations?

The report

- After the workshop the committee finalised the report by commenting on draft texts by (e-) mail. Are you satisfied with the procedure followed (e.g. time schedule, number of drafts)?
- Were you satisfied with the way your comments were taken into account by the staff?
- Do you think that in retrospect the integrated assessment approach was appropriate for the project?
- Do you think that the project succeeded in providing an integrated assessment of the public health impact of a large airport? If so, to which extent?
- Are you aware of other methods to aggregate the data on the impact on public health, which could have been used in our report?

Only for policy makers

- Can you describe the impact of the report on the decision-making process (e.g. policy documents).
- If you have further remarks about the process, the workshop, or the report, please let us know.