COVERAGE OF IMPACTS ON HUMAN HEALTH IN UK ENVIRONMENTAL IMPACT STATEMENTS: A REVIEW

By

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Abstract

With occurrences of environmental deterioration, human health issues are increasingly being addressed on the agenda, incorporation of health considerations into Environmental Impact Assessment is an attempt to broaden the scope of human health issues.

Previous study had found a poor coverage of health considerations within Environmental Impact Statements (British Medical Association, 1998). After years of endeavor, this study attempts to assess whether the ‘poor coverage’ label attached to health impacts remains valid in the recent UK EISs.

This dissertation first reviews the legislative requirements for human health issues in different policy and projects, and then utilizes a criteria checklist to examine the health considerations within selected EIS.

The overall conclusion is that though health considerations are more likely to be addressed within recent UK EISs, however, the quality of any form of health assessment remains unsatisfactory; besides, there existing differences among different sector of project types.

Recommendations were provided that future works should emphasize the public impacts of environmental problems and promote the incorporation of health aspects into environmental and sectoral policies.
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1 Introduction, Objective and Aims

1.1 Introduction

This study aims to review the treatment of health impacts in recent UK EIS, and compare wherever possible with those from an earlier British Medical Association (BMA) study (BMA report, 1998).

Nowadays, human health issues are increasingly being addressed on the agenda, Health Impact Assessment (HIA) as one form of health assessments, is being built more explicitly into the machinery of development to aid making policy decisions (BMA report, 1998). A number of guidance and legislative requirements enable the incorporation of health considerations within Environmental Impacts Assessment (EIA). Previous study had highlighted the inadequate coverage of health consideration in Environmental Impact Statement (EIS) in the UK (BMA report, 1998). However, after years of endeavour, it is appropriate to examine whether the coverage of human health consideration in EIS improve or not.

This dissertation will also extend this topic further, to evaluate the health considerations in different sectors of EIS, as well as give some recommendations on how to enhance health considerations in public policies especially in relation to environment.
1.2 Objective

The overall objective of the study is to assess whether the ‘poor coverage’ label attached to health impacts remains valid in the UK EIA practice after the a similar study conducted by BMA in 1998 and identify if there is a need to improve the documentation of health considerations in EIS.

1.3 Aims

In order to fulfill this objective, primary aims have been formulated in order to maintain focus and achieve the project goal. Therefore, the primary aims of this dissertation are as follows:

(1) Identify the policy and statutory requirements for health issues within UK and EU.

(2) Established the extent and depth of human health considerations in EIA.

(3) Assess whether there is sectoral differences in magnitude and severity of the potential impacts on human beings and their health coverage in selected EISs and if so, point out the main difference and explain that.

(4) Provide recommendations on improving the health consideration within EIA.
Management of the environment to safeguard human health

This chapter introduced the concept ‘environmental health’ to explain the relationship between human health and the environment as well as the importance of concerning environmental health.

2.1 Human Health and the Environment

Over recent decades, many countries have experienced rapid economic growth, but adequate measures to safeguard health and the environment have not always accompanied the benefits of increased overall prosperity (WHO, 1996).

The United Nation Conference on Environment and Development declared that ‘human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature’.

Many impacts on human health are mediated through, or influenced by, the biophysical environment. Sustainable development places the human being at the centre of all development; it is highly coherent with the health determinants approach of public health. The health determinants of ecosystem health, economic equity and social development become the overall objective of development. ‘The traditional efforts of public health in favour of intersectoral action for health are transformed into collective efforts of all government agencies, non-government organizations (NGO’s) and the private sector towards sustainable development of social, economic and environmental capital’ [(Goodland, 1994; Health Canada, 1997), from Cragg et al., 1999].
2.2 Environmental Health

The UK government defines environmental health as

‘those aspects of human health, including quality of life, that are determined by physical, biological, social and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations’.

(Department of the Environment and the Department of Health, 1996)

However, the UN Environment and Development Committee for the UK has pointed out that the 1994 strategy document failed to address major issues concerning the relationship between environment and health (BMA report, 1994).

2.3 Reasons for Concerning Environmental Health

With occurrences of environmental deterioration, poor environment contributes to 25-33% of global ill health (WHO Regional Office for Europe, 2004), thus concern over unforeseen environmental consequences of large engineering projects became widespread which lead projects funders to require a thorough examination of how proposals would affect flora, fauna, and the physical environment as well as the massive disruption of human communities.

The health of a population is largely determined by the factors outside the jurisdiction of health ministries and health services, thus it is becoming increasingly clear that one requirement for the promotion of health is that policies in ‘non-health’ areas should take health criteria into account.
Policies, programs and projects of almost all public and private sectors have impacts on health, prior planning can avoid direct or indirect adverse effects on vulnerable. Health expertise was bound to the realization that health impacts are often overlooked during the planning stages of development projects.

Health Impact Assessment (HIA), in recent years, has created interest as one way of putting inter-sectoral action for health into practice by working in partnership with other sector.
3 Rationales for Health Impact Assessment

This chapter utilizes different definitions of Health Impact Assessment, analyzes the positivistic and relativistic bases for predictions in HIA, and illustrates future works of developing tool for HIA that should be done.

3.1 Social-economic model of health

Before assessing impacts on health, we must clearly define what we mean by health. The model of health used has implications for the type of information to be collected and for the indicators that will ultimately be employed (Health Scotland Glasgow Office, 2000). The Socio-ecological model of health, which was developed by the WHO, defines health as

’a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’ (WHO, 1948).

Frequently, the term ‘health’ is considered as the absence of disease and a great deal of ‘health’ policy is concerned with the provision of health services for those with disease as well as the prevention of disease through measures such as immunization, health education, and provision of safe food and water. If the overarching aim of public policy is to improve the health and well being of the population, then an appropriate model of health, which reflects this aim, should be used when the health impacts of policies are being assessed. We could argue that when conducting a health impact assessment it is therefore necessary to define health in its broadest sense, and to consider the impact of policies on the broader determinants of health. However, the social-economic model of health is criticized as hopelessly (Siracci, 1997) and so boundless as to be meaningless (Seedhouse, 1997).
3.2 Definition of Health Impact Assessment (HIA)

There are various definitions of Health Impact Assessment (as listed in Table 3.1), but the two essential characteristics are that it seeks to predict the future consequences for health of possible decisions as well as seeks to inform decision-making (Kemm, 2003).

**Table 3.1 Definitions of Health Impact Assessment (HIA)**

<table>
<thead>
<tr>
<th>Definition</th>
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<tbody>
<tr>
<td>Health Impact Assessment (has been succinctly described ‘as any combination of procedures or methods by which a proposed policy or program may be judged as to the effects it may have on the health of population’ (Ratner et al., 1997).</td>
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<tr>
<td>Health Impact Assessment (HIA) is’ a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population and the distribution of those effects within the population’ (WHO European Centre for Health Policy, 1999).</td>
</tr>
<tr>
<td>Health impact assessment is ‘a methodology which enables the identification, prediction and evaluation of the likely changes in health risk, both, positive and negative, (single or collective), of a policy, program plan or develop action on a defined population; These changes may be direct and immediate or indirect and delayed’ (BMA Board of Science and Education, 1998).</td>
</tr>
<tr>
<td>‘Health impact assessment is the estimation of the effects of a specified action on the health of a defined population’ (Scott Samuel, 1998).</td>
</tr>
<tr>
<td>‘Health impact assessment is a method of evaluating the likely effects of policies, initiatives and activities on health at a population level and helping to develop recommendations to maximize health gain and minimize health risks. It offers a framework within which to consider, and influence the broad determinants of health’ (Scottish Office, 1999).</td>
</tr>
</tbody>
</table>
Health impact assessment is ‘a combination of procedures or methods which enable a judgment to be made on the effect(s)----positive or negative of policies, programs or other developments on the health of a population or no parts of the population where health are concerned’ (National Assembly for Wales, 1999).

Source: Adopt from Kemm and Parry, 2004

3.3 Positivistic and relativistic bases for predictions in HIA

Health impact assessment intended to influence decision making so that policies, projects, and programs in all areas lead to improve population health or at least do not damage population health (Kemm and Parry, 2004).

Ideally, a satisfactory health assessment should involve the impact on all aspects of physical, mental, and social well-being including objectively assessed states, subjective feelings, sense of well-being, and quality of life considering both positive and negative aspects of health (Kemm and Parry, 2004). This kind of research is based on natural science disciplines such as epidemiology and toxicology assess the consequence of people exposed to particular levels of toxic and the frequency of ill health in people exposed to these levels (dose-response curve). In theory, this approach is expected to extend to all determinants of health. Unfortunately, relevant sciences which could contribute to health impact, are currently limited in their ability to explore outcomes other than death or frequency of objectively assessed disease.

Nevertheless, considerable progress has been achieved in developing new measures. For example, complex models to predict the potential impacts on health have been developed, which took into account changing levels of exposure and delays between exposure and outcome. Another example is that, the EuroQol Group, which aiming at
developing a standardized, non-disease-specific instrument for describing and valuing health states, intended to complement quality-of-life measures and to facilitate the collection of a common data set for reference purposes (EuroQol Group, 1990).
4 The development of environmental health

This chapter covers the situation and policy with regards to human health and the environment from the WHO to UK.

4.1 The World Health Organization (WHO) and the development of health

Members of the World Health Organization (WHO) in the European region have been working together for a number of years to improve health across the region. Environmental and Health Action Plan for Europe (WHO/EURO, 1994) is their health strategy, set out objectives relating to ‘institutional structures, environmental health management tools, specific environmental hazards, living and working environments, economic sectors and international action’.

The development of National Environmental Health Action Plans (NEHAPs) across Europe which were government document that addressed environmental health problems in a comprehensive, holistic and inter-sectoral ways, were first agreed in Helsinki in 1994, following by the publication of the Environmental Health Action Plan for Europe.

The WHO Regional Office for Europe, in its strategy Health 21, called for all member states to implement HIA in its target 14.2: By 2020, member states should have established mechanisms for health impact assessment and ensured that all sectors become accountable for the effects of their policies and action on health (WHO, 1999).

The main body of work on HIA was carried out by WHO’s European Centre for Health Policy (ECHP). Governments across Europe recognized the need to take a more integrated approach to health and socio-economic development: this has put HIA on the policy agenda. ECHP gathers information, develops models and
methodology, and shares experience with HIA. Using the Gothenburg consensus paper as a starting point, it uses meetings, workshops and an international e-mail network to develop and evaluate practical tools for policy-making (ECHP, 1999).

4.2 The WHO/EURO Environment and Health process—four conferences

4.2.1 Introduction

The World Health Organization Regional Office for Europe environment and health process, started at the end of the 1980s, aimed to build bridges between the health and environment sectors, to deal with the effects of environmental problems on human health at national and international levels.

Four ministerial conferences have so far marked the milestones of this environment and health process.

4.2.2 First Conference Frankfurt, 1989

It was the first time that ministers of health and ministers of environment met in common forum. The major policy outcomes of this conference were the European Charter on Environment and Health, in which ministers agreed on the basic principles, mechanisms and priorities for environment and health program; established the WHO European Centre for Environment and Health; and the agreement at the follow-up conference in five years. The Environment and Health process in Europe had been initiated.

4.2.3 Second Conference in Helsinki, 1994

The second conference was held in Helsinki in 1994. Ministers of health and of the environment reviewed a comprehensive assessment of the situation in Europe called
Concern for Europe's Tomorrow’. Based on this assessment, the ministers:

· adopted the Declaration for Action on Environment and Health in Europe, which initiated the Environmental Health Action Plan for Europe;

· committed countries to develop National Environment and Health Action Plans (NEHAPs);

· established the first European Environment and Health Committee (EEHC); and

· agreed on a follow-up conference in five being.

This was also a successful initiative—the Environment and Health Action Plan for Europe (EHAPE) has stimulated the development of national action plans in 43 out of the 52 Member States in WHO’s European Region (Ivanov et al., 2004).

4.2.4 Third Conference in London, 1999

The third ministerial conference addressed environment and health issues in a strategic way, launching action in partnership as a means of implementation. The major outcomes of this conference were: a legally binding Protocol on Water and Health, and the European Charter on Transport, Environment and Health. The conference also endorsed actions in the areas of NEHAPs, local processed, public information and participation, climate change, children’s environment and health, economic tools for environmental health decision-making, workplace health and environmental health research.

4.2.5 Fourth Conference in Budapest, Hungary, 2004

The fourth ministerial conference further defined the partnerships initiated in London. The major policy outcome of this conference was endorsement of a Children’s Environment and Health Action Plan for Europe (CEHAPE), which called for regional as well as national action to better address future of our children by ensuring sustainable development and, in so doing, also called for involvement of collaboration
with a new set of stakeholders.

4.3 European Community Policy

There is also international recognition of the need of HIA. The Commission of the Europe Union stated that article 129 of the European Union Treaty ‘requires the Commission to check that proposals for policies, and implementing measures and instruments, do not have an adverse impact on health, or create conditions which undermine the promotion of health’ (Commission of the European Communities, 1995).

Article 152 of the Amsterdam Treaty stated that’ A high level of human health protection shall be ensured in the definition and implementation of all community policies and activities’ (European Communities, 1997).

4.4 The Health Policy of the United Kingdom

At present, there is no legal obligation to conduct health impact assessment in UK, other than the requirement for EU policies [(Commission of the European Communities, 1995), from Mindell and Joffe, 2003] to consider health, nor are there any legal definitions regarding what constitutes an adequate health impact assessment. Meanwhile in Europe and particularly in the United Kingdom development of HIA was encouraged by a series of supra-national and national government statements.

HIA was hailed in the UK as an idea ‘whose time has come’ and is considered to be a convenient point to start discussion of the recent development of health impact assessment (Scott-Samuel, 1996).

It was soon followed by the green paper ‘ Our healthier nation: A contract for the nation’ which stated ‘the Government will apply health impact assessments to its
relevant key policies, so that when they are being developed and implemented, the consequences of those policies for our health is considered’ (Department of Health, 1998).

The commitment was renewed in the subsequent white paper ‘saving lives: our healthier nation’ which pledged that ‘…the Government will apply health impact assessments to its relevant key policies, so that when they are being developed and implemented, the consequence of those policies for our health are considered’ (Department of Health, 1999).

In relation to health inequalities, the Acheson report required that all policies should be subjected to some forms of health impact assessment. Recommendation 1 of the report states that ‘as part of health impact assessment all policies likely to have direct or indirect effect on health should be evaluated in terms of their impact on health inequalities’ (Acheson D., 1998).

Similarly, the other 3 government consultative documents on public health strategy have referred to the requirement for HIA of both national and local policies and projects. Governments in Scotland, Wales, and Northern Ireland made similar commitments (Secretary of State for Scotland, Wales and Northern Ireland, 1999).

In England the Department of Health published a discussion of how health aspects of policy could be appraised though the discussion was theoretical and heavily biased toward economic outcomes. The Greater London Assembly has developed a system for assessing the health impacts of all its strategies (Van de Mheen et al., 1999).
5 Ways to conduct Health Impact Assessment (HIA)

This chapter discusses the flexibility and drawback of incorporation of HIA into Environmental Impact Assessment as well as the promotion of health public policy, and later, point out the current routes and situation of incorporation of HIA into EIA.

5.1 Introduction

Despite many advances in the field of HIA over the last decade, in comparison with other impact assessment processes such as EIA and Strategy Environmental Assessment (SEA), HIA is still at a relatively early stage of development. There is a need, therefore, to strengthen the role of health in various impact assessment processes, as well as to encourage the development of HIA as a policy tool of importance in its own right (Shademani and Schirnding, 2001). Although Health Impact Assessments may be undertaken separately, in most cases health issues should be integrated into the full impact assessment (Vanclay and Bronstein, 1996).

Health Impact Assessment shares certain concepts and methods with risk assessment, environmental impact assessment, strategic environmental assessment, social impact assessment, and economic assessments. It draws on a wide range of disciplines however the two main conceptual roots lie in:

* The EIA-based strand promotes the incorporation of health within project EIA;

* Policy appraisal and the promotion of healthy public policy (HPP)
5.2 Incorporate in project EIA

5.2.1 Introduction

Environmental Impact Assessment (EIA) was first been required in the USA since the National Environmental Policy Act (NEPA) of 1969 and then introduced to Europe for certain large projects by EU Directive 85/337/EEC; it was incorporated into UK law in 1988 Town and Planning Act (Joffe and Sutcliffe, 1997). By 1997, more than 100 countries used environmental impact assessment (Joffe and Mindell, 2003). The new UK Environmental Impact Assessment Regulations, which became law in 1999, increased the number and types of developments requiring this (Chapman, 2001).

5.2.2 Argument for integration of HIA within EIA

There are different opinions on the necessity and desirability of including health considerations within EIA and the resulting EIS.

There are 5 main reasons for integrating HIA into EIA

· address public concerns;
· minimizing the need for separate health and EIA;
· demonstrating cost effectiveness;
· minimizing the adverse and maximizing the beneficial effect on health;
· supporting the concept of sustainable development;

Environmental Impact Assessment (EIA) was encouraged by increasing awareness of environmental damages and is now become steadily broader and embedded in a legislative framework in many countries. Birley proposed that Health Impact Assessment should not be a separate procedure but should be incorporate within Environmental Impact Assessment (EIA) to avoid duplication of procedures. (Birley, 1992). ‘The procedural stages are similar for EIA and HIA, and can be considered
inherent to good management practice’ (Birley, from Shademani and Schirnding, 2001).

Existing legislation for EIA provides scopes for controlling the effects of proposed new developments on human health. Furthermore, new strategies and policies are being adopted which recognize the need for integrated evaluation of proposals and decision-making. Since the planning machinery for environmental impact assessment is already in place and it would be inappropriate to duplicate or replace it, Health Impact Assessment should thus be considered a component of EIA (BMA report, 1998).

The International Study of the Effectiveness of Environmental Assessment concluded that a key area requiring more work was ‘the closer integration of environmental, with social, health and other impacts’ (Sadler, 1996). On the other hand, many suggest that extension of environmental impact assessment so that health issues were properly covered would be a logical way to develop HIA (Joffe and Sutcliffe, 1997).

5.2.3 Argument against integration of HIA within EIA

However, the UK’s Environment and Health Action Plan failed to explicitly address the objective (Russell and Gallagher, 1997), which did include in the European plan, suggested that ‘mechanisms such as EIA should be used to help achieve the health improvement targets’. Thus, it would appear that the use of EIA to improve the level of information on the health consequences of development projects to decision-makers should be encouraged.

Although EIAs should take a holistic approach, including human health, the focus is primarily confined to the physical, chemical and biological environment, while human health is only referred to, if at all, indirectly.

Furthermore, the complexity of many environmental hazards demands cross-sectoral
approaches to safeguard health. One of the main difficulties in incorporating human health more directly in environmental impact assessments, however, has been a lack of an adequate dialogue between those in the health care professions and those concerned with environmental regulation.

There are now many organizations with an interest in health and environmental issues and it is not easy to identify precisely where responsibilities for environmental health lie. There is no single government department, which is responsible for the whole environmental health function, and there is no clear framework for addressing many of the more complex environmental health issues, particularly those of a cumulative or trans-boundary nature. Even though the process of developing a health impact assessment can be similar to those of and EIA, there are some important difference between these two (Conway et al., 1999).

Firstly, HIA is concerned with the impact of the environment on people whereas EIA is concerned with the impact of people on the environment. For example, there are some health elements within EIA, but these tend to focus on health hazards such as pollution and communicable diseases, which does not allow for the assessment of health in its broadest sense.

Secondly, EIA predominantly seeks to reduce negative environmental impacts of specific developments or projects while HIA seeks to identify and maximize health gain. Even EIA of broader policies is being attempted (SEA), but this still tends to focus on mitigation of negative impacts.

Thirdly, EIA is mandatory and there is specific guidance on how and when it should be done. However, there is no statutory requirement to undertake HIA.

Therefore, simply integration of health issues within an existing EIA procedure can lead to a number of problems, thus ‘integration of HIA within EIA should be
presented in terms of feasibility rather than as a recommendation’ (Bond, 2004).

5.3 Policy appraisal

Despite integrate Health Impact Assessment within project EIA may give a clear mandate for health assessments, there are dangers in this approach. First and foremost, EIAs are dealt with by decision makers who have no real competence of dealing with health, and that health professionals may be marginalized in the decision-making process (Bond, 2004), and there was evidence that this does happen in the United Kingdom (Russell and Gallagher, 1997). Furthermore, it may limit HIA to projects with implication for the physical environment; limit impacts identified to those that are bio-physical determinants; and focus on mitigating adverse impacts, not enhancing positive impacts. In addition, it has also been unclear that to which extent the current EIA practice conforms to these guidelines, as well as what has to be done to improve such conformity (Conway, 1999).

According to the limitations of integration HIA within project EIA, some suggest that conducting a health impact assessment on a specific project is too late to influence the choice of possible options to achieve a given objective. It should be undertaken at the level of a policy plan or program (Joffe and Sutcliffe, 1997). Health impact assessment could also be seen as a specialized form of policy appraisal. In 1992, the UK government published guidance on policy appraisal and the environment (DoE, 1992) which set objectives of SEA to involve health consideration. The European Commission is required to check that proposals do not have adverse impacts on health (Commission of the EC, 1995). However, until recently discussion of health consequences was largely limited to policies concerned with the provision of medical facilities (Kemm and Parry, 2004) therefore more work should be done to extend the applications of policy appraisal to health consequences.
5.4 How to incorporate health considerations into EIA

5.4.1 Common routes

At the 22nd Annual conference of IAIA, Cherp summarize various routes already tested on incorporation of health considerations into EIA, the main results were list below: (from Cherp, 2002)

* Comparative analysis of legal and procedural requirements (e.g. Wood 1995)

* Analysis of individual case-studies (e.g. Lee and George 2000) or routine practice (Cherp 1999), focused on one or more of the following aspects:
  · Conformity with procedural requirements
  · Reflection of the best practice approaches (including the quality of documents and scientific soundness (as explained in Leknes 2002))
  · Performance or effectiveness (e.g. to which extent the EIA was able to influence the decision-making process or project design)

* Capacity needs assessment (e.g. EIA Centre 1995)

* Supplemented by ... more system-and process-oriented studies, with a focus on policy-making and policy implementation processes (Cherp 2002)

Analyze legal requirements and individual case studies are widely accepted and applied to the current relative studies.

5.4.2 Challenges facing the integration of HIA and EIA (Russell and Gallagher, 1997)

5.4.2.1 Regulatory limitations

Although the government guidance forming legislative basis for EIA contain a number of requirements for consideration of the effects of development projects on human health, the implementation of such requirements has so far been weak. An explicit and clear legal and policy framework that forms the basis for the
implementation of HIA is still lacking in UK.

There are very limited criteria or thresholds on different types and locations of projects that help identify the needs for a full EIA or the potential risk to human health caused by a project. Additionally, guidelines or checklist that inform decision makers in the EIA process about health hazards associated with different project categories and health sensitive project locations are lacking. A limitation also mentioned by Birley et al. (1995).

5.4.2.2 Institutional limitations

Institutional challenges relate to limitations in institutional capacity of Environmental Affairs and lack of institutional co-operation and co-ordination. Limitations in institutional capacity of Environmental Affairs result mainly from the insufficient numbers of personnel suitably qualified in Environmental Health Impact Assessment (EHIA). This has been found to hinder the prediction and measurement of health risks arising from development projects.
6 Literature Review

This chapter displays a brief review of the previous studies on analyzing health considerations within Environmental Impact Statement, illustrates the poor situation of health concern, and highlights the necessity of this study.

6.1 Health considerations in EIS under EIA regulations

UK government guidance on the preparation of EIS and on EIA more generally has paid little explicit attention to the issue of socio-economic impacts. The initial guidance on EIA procedures (DoE/Welsh Office, 1989), published shortly after the implementation of the original EIA directive, mentioned the following as matters which might be considered for inclusion in an EIS: 'purpose and physical characteristics of the project, including details of the numbers to be employed and where they will come from’ (p. 37) (to be included as part of the project description); ‘[the existing] population----proximity [to be site] and numbers’ (p. 38) (to be included as part of the information describing the site and its environment); and ‘change in population arising from the development, and consequential environmental effects’ (p. 39) (as part of the assessment of effects in the ES).

The later, more detailed, best practice guidance on the preparation of EISs (DoE, 1995) includes a more comprehensive list of health issues, which might be address in an EIS…. Reference is again made to project employment levels as matters to be considered in drafting the project description, for both construction and operational phases. A detailed appendix covering ‘impacts on human beings’ implies that the EIS should consider potential effects on human health and well being, and also provides guidance on the assessment of effects on population, housing and services.

It is recommended that, in situations where an EIS is being prepared, health impacts need to be included, otherwise, in situations where an EIS is not appropriate, an
analogous process could be carried out with the aim of improving the health outcome ([Joffe, 1993), from Joffe and Sutcliffe, 1997].

6.2 Coverage of Health Considerations in UK EIS

Although environmental impact assessment must ‘identify, describe and assess...the direct and indirect effects of a project on...human beings’, considerations of potential impacts on human health were seldom performed (Birley, 1995; Joffe and Sutcliffe, 1997; BMA report 1998 and Fehr, 1999), particularly for road transport [(Walter and Machtolf, 1999), from Mindell and Joffe, 2003].

A review of 39 EISs covering a variety of development sectors conducted by British Medical Association (BMA) indicated that 72 per cent of the EIS did not list in their tables of contents sections or chapters dealing with human health. Forty-nine per cent of the EISs sample made no specific references to human health at all, and six-seven per cent did not refer to the size of receiving population likely to be affected (BMA report, 1998). This study referred primarily to existing EU and UK legislation together with some UK examples and cases study taken from earlier BMA policy documents, and suggests ways in which HIA could be incorporated more explicitly into the existing UK EIA procedures.

Poor coverage of health in the UK EISs was found (Russell and Gallagher, 1997), and poor coverage was also identified in US EISs (Canter, 1990; Arquiaga and Canter, 1994) as well as in Europe (Cherp 2002; Alenius 2001).

A possible limitation of this approach is that health effects tend more often to be related to broader aspects of the environment, such as the volume of traffic in a geographical area, than to specific projects such as a new runway or power station.
6.3 Reasons for poor coverage of health considerations in UK EIS

The most accountable reason for poor health consideration is that legislation fails to make human health impact assessment an explicit requirement. The amended EIA Directive of the European Union (97/11/EC, 1997) which requiring an assessment of potential impacts on human beings is just referring to ‘demographic changes rather than socio-economic or health effect’ (Carroll and Turpin, 2002). In addition, human health impact assessment is complex and there is no clear procedures or methodologies for assessing the health implications of new developments (BMA report, 1998). Furthermore, Birley also suggested that the EIA and HIA stakeholders did not agree on words, procedures, and on what it meant to include health in EIA (from Conway, 1999).

Nevertheless, considerable efforts have been undertaken on an international scale, for example, Quebec has been relatively successful contributes public health sections to the instructions for this EIS and appraises the health aspects of the statement (Conway, 1999).
7 Methodology

This chapter outlines the development of the research methodology use within the dissertation project to examine the health considerations within recent UK EISs.

7.1 Sample choice

This research involved 39 EISs, which were selected in the EIS collection held by the School of Environmental Science, University of East Anglia. The sample was selected randomly, concerning different project type and geographic region of the EIS so that the sample can reflect the overall situation of the UK.

It was decided to choose a sample size of 39 EISs from the collection; this was the same number as sampled in the earlier study by BMA report 1998 in order to thoroughly assess whether the ‘poor relation’ label attached to health considerations remain valid in UK EIA practice and was significant enough to permit some disaggregated analyses by broad project type.

Since the requirement for EIA in the UK stemmed from a European Commission directive, originally dated from 1985 (Directive 85/337/EC) and revised 12 years later (Directive 97/11/EC) coming into force in member state in March 1999. Therefore, there were only a few minor amendments during 1985 to 1999 when new regulations were brought in to meet the obligations of the updated EIA Directive. Aiming at examining the coverage of health issues in recent days, it is therefore suitable to choose EIS sample after 1999.

Apart from the main EIS reports, other relevant documents were examined, which included the non-technical summary, supplementary reports and planning statements as attaching to the EISs selected. The reason for examining documents other than just the EIS was to get a better picture of the EIA process as a whole, rather than just what
was reported in the EIS. The aims of the review, therefore, were to investigate the extent that health issues were considered in EIAs, rather than simply the quality of the EIS themselves.

**Table 7.1** Chronological listing of Environmental Impact Statements Reviewed in this Study

<table>
<thead>
<tr>
<th>EIS</th>
<th>Date</th>
<th>Title of EIS</th>
<th>Agency/Organization</th>
<th>Geological location</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Feb. 1999</td>
<td>Chapel Ascot Farm, Ladbroke, Warwickshire: Expansion of the High Health Status Pig Unit</td>
<td>CPM</td>
<td>Warwickshire</td>
<td>S 2/1/c</td>
</tr>
<tr>
<td>4</td>
<td>1999</td>
<td>Coldham Windcluster - Environmental Statement Non-Technical Summary</td>
<td>Eastern Generation</td>
<td>Suffolk</td>
<td>S 2/3/i</td>
</tr>
<tr>
<td>6</td>
<td>Jun. 2000</td>
<td>M6 Junction 1, Rugby : Direct Access Motorway Service Area – EIA</td>
<td>Swayfields Ltd.</td>
<td>Warwickshire</td>
<td>S 2/10/p</td>
</tr>
<tr>
<td>7</td>
<td>Jun. 2000</td>
<td>Proposed Gauging Station River Leam Kites Hardwich</td>
<td>EA</td>
<td>Warwickshire</td>
<td>Non-statutory</td>
</tr>
<tr>
<td>8</td>
<td>Nov. 2000</td>
<td>Goodwood, Chichester: Project Rolls Royce (manufacturing plant) - ES</td>
<td>Terence O'Rourke plc</td>
<td>West Sussex</td>
<td>S 2/10/a</td>
</tr>
<tr>
<td>9</td>
<td>2000</td>
<td>Eye Biomass Energy Plant, Suffolk—Environmental Review</td>
<td>Terence O'Rourke plc</td>
<td>Suffolk</td>
<td>Non-statutory</td>
</tr>
<tr>
<td>11</td>
<td>Nov. 2001</td>
<td>Ness Point, Lowestoft: Proposed wind turbine - Planning Application, EIS,</td>
<td>SLP Energy</td>
<td>Suffolk</td>
<td>S 2/3/i</td>
</tr>
<tr>
<td>13</td>
<td>Jul. 2002</td>
<td>Rainton Bridge South Business Park</td>
<td>Environment Dept, City of Sunderland</td>
<td>Sunderland</td>
<td>S 2/10/a</td>
</tr>
<tr>
<td>No.</td>
<td>Date</td>
<td>Description</td>
<td>Consultant/Agency</td>
<td>Location</td>
<td>Reference</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>16</td>
<td>Oct. 2002</td>
<td>Baltic Business Park, Gateshead, plus Transport Asst, Geo-technical &amp; Ground Contamination Interpretative Report, Masterplan and various maps</td>
<td>Terrace Hill Ltd/WYG</td>
<td>Newcastle</td>
<td>S 2/10/b</td>
</tr>
<tr>
<td>17</td>
<td>Oct. 2002</td>
<td>Path Head Quarry Landfill Site</td>
<td>SITA</td>
<td>Gateshead, Durham</td>
<td>S 2/11/b/ii</td>
</tr>
<tr>
<td>18</td>
<td>Dec. 2002</td>
<td>A4103 Roman Road, Hereford / C1095 Tillington Road to A480; Proposed road improvement - EIS, Planning Statement</td>
<td>Halcrow</td>
<td>Herefordshire</td>
<td>S 2/10/f</td>
</tr>
<tr>
<td>19</td>
<td>Dec. 2002</td>
<td>Lower Queen to Kings Coughton Proposed Gas Pipeline - EIS</td>
<td>Montgomery Watson Harza</td>
<td>Warwickshire</td>
<td>SI 1999 No. 1672</td>
</tr>
<tr>
<td>20</td>
<td>2002</td>
<td>Breme Park, Bromsgrove: Residential Development and Technology Park</td>
<td>RPS</td>
<td>Bromsgrove</td>
<td>S 2/10/b</td>
</tr>
<tr>
<td>21</td>
<td>2002/3</td>
<td>Maiden’s Hall Proposed Surface Mining Scheme</td>
<td>UK COAL</td>
<td>Northumberland</td>
<td>S 1/19</td>
</tr>
<tr>
<td>22</td>
<td>Feb. 2003</td>
<td>Farmington Stone Quarry, proposed extension, plus NTS and Supporting Statement</td>
<td>Farmington Natural Stone Ltd</td>
<td>Gloucestershire</td>
<td>S 1/19</td>
</tr>
<tr>
<td>23</td>
<td>Feb. 2003</td>
<td>Larden Grange, Much Wenlock, Shropshire: Extension of Existing Poultry Unit</td>
<td>ADAS</td>
<td>Shropshire</td>
<td>S 2/1/c</td>
</tr>
<tr>
<td>24</td>
<td>May 2003</td>
<td>Sand and Gravel Workings Review of Old Minerals Permissions Land at Bleak Hill, Somerley</td>
<td>RMC</td>
<td>Hampshire</td>
<td>S 1/19</td>
</tr>
<tr>
<td>25</td>
<td>May 2003</td>
<td>Shortwood Quarry Restoration by Landfill</td>
<td>Cory Environmental</td>
<td>Gloucestershire</td>
<td>S 1/19</td>
</tr>
<tr>
<td>26</td>
<td>May 2003</td>
<td>Whittern Farms, Lyonshall, Kington, Herefordshire: Construction of Poultry Houses - NTS, EIS</td>
<td>Whittern Farms Ltd</td>
<td>Herefordshire</td>
<td>S 2/1/c</td>
</tr>
<tr>
<td>28</td>
<td>Oct. 2003</td>
<td>Wootton Farm, Kings Pyon, Herefordshire: Erection of Poultry Houses</td>
<td>J&amp;D Bevan &amp; Son</td>
<td>Herefordshire</td>
<td>S 2/1/c</td>
</tr>
<tr>
<td>29</td>
<td>Nov. 2003</td>
<td>A1056 Northern Gateway at Sandy Lane - Stage 2 – ES</td>
<td>Scott Wilson (Scotland) Ltd</td>
<td>Newcastle</td>
<td>S 2/10/f</td>
</tr>
<tr>
<td>31</td>
<td>2003</td>
<td>A688 West Auckland Bypass, 2 Volumes</td>
<td>WSP/Durham CC</td>
<td>Durham</td>
<td>S 2/10/f</td>
</tr>
<tr>
<td>32</td>
<td>2003</td>
<td>Cresswell, Northumbria Leisure (Holiday park); EIA plus appendices</td>
<td>Nathaniel Litchfield and Partners</td>
<td>Northumberland</td>
<td>S 2/12/e</td>
</tr>
<tr>
<td>33</td>
<td>2003</td>
<td>Foxcovert Planning Application— Proposed Mineral Extraction</td>
<td>The Bank Group</td>
<td>Newcastle</td>
<td>S 1/19</td>
</tr>
<tr>
<td>34</td>
<td>2003</td>
<td>Tall Trees Hotel, Yarm, EIS, Transport Asst, Ecological Asst.</td>
<td>Maher Developments</td>
<td>Yarm</td>
<td>S 2/10/b</td>
</tr>
<tr>
<td>35</td>
<td>2003</td>
<td>Throckmorton Foot and Mouth Burial Site NOPD and ES</td>
<td>Halcrow Group Ltd</td>
<td>Throckmorton</td>
<td>Non-statutory</td>
</tr>
</tbody>
</table>
7.2 Sample analysis

7.2.1 Geographic locations

The 39 EISs were located in the Northern (3), North-East (8), East Midlands (1), West Midlands (13), East Countries (9), South-East (2) and South-West (3). Figure 7.1 showed a breakdown of the EISs by regional location.
In terms of geographical distribution, the number of EIS submitted from North-East, West Midlands and East Anglia was obviously higher than those of East Midlands, South England and Northern England. This was due to the limitation of the EIS collection that was available in the library mentioned above.

In the case of the EIS centre mentioned above, most of the EISs submitted by West Midlands, East and North East regions are sent to University of East Anglia EIS centre, while other regions do not; Those in Wales are held centrally by the Welsh Assembly and the University of Wales Aberystwyth gets all their spare copies. Scotland and Northern Ireland have different EIA Regulations, so there are none of the EISs submitted by these two regions.

7.2.2 Project types

The 39 EISs included different types of project, of which 7 fell within Schedule 1 to the Town and Country Planning (Environmental Impact Assessment) (England and
Wales) Regulations 1999, 25 within Schedule 2, as well as 4 in other regulations as mentioned as notes attaching to table 7.1, and 3 non-statutory in addition. They included proposals for quarries and open-cast mining, landfill sites, roads improvements and bypasses, sewage treatment works, infrastructures, energy generation and agriculture units as shown in table 7.2.

Table 7.2 Variations in EISs by project type

<table>
<thead>
<tr>
<th>Project description</th>
<th>No. of EISs considering health impacts</th>
<th>% of EISs considering health impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste disposal</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>Extraction</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>Agriculture</td>
<td>4</td>
<td>10.3</td>
</tr>
<tr>
<td>Energy</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Wind farm</td>
<td>4</td>
<td>10.3</td>
</tr>
<tr>
<td>Urban development</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>Roads</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>Waste water treatment</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Gas pipeline and gas field development</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Industry estate</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Total: all EISs</td>
<td>39</td>
<td>100</td>
</tr>
</tbody>
</table>

7.2.3 Limitations of the sample

Since the composition of EIS sample in this study and those in the BMA report was different (most of EISs in BMA report fell within Schedule 1 including clinical waste incinerator, power station airports etc., while majority of those in this study belong to Schedule 2 which represented urban development, wind farm, project planning etc.), the compare results between these two studies therefore probably will be affected by the project’s sectoral differences.

Concerning the limitation of the EIS collection of the EIS centre, any conclusions
7.3 Description of review process of EIS

The review process was focused on the thoroughness of the analysis and the documentation of the health considerations. The EISs were each reviewed based on the criteria questions listed in table 7.3. The criteria checklist was developed based on issues identified in published literature. The results from the analysis will be presented from two perspectives: the overall results from the 39 EISs, and a more detailed review of how health impacts were actually addressed in the selected EISs sample.

The design of this review criteria checklist was based on various studies of the literature relating to the similar aims of studies. For example, to determine: the coverage of health impacts in EIA (Russell and Gallagher, 1997; BMA, 1998), the level of coverage of cumulative effects in EIA (Burris and Canter, 1997; Cooper and Sheate, 2002); the coverage of socio-economic impacts in EIA (Chadwick, 2002); and the potential effects of EIA on UK Local Planning Authority (LPA) decisions (Wood and Jones, 1997).

Table 7.3 Criteria Questions Regarding the Documentation and Analysis of Health considerations

<table>
<thead>
<tr>
<th>Criteria question</th>
<th>Rationale for inclusion in this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Are human health issues in the table of contents, or introduction section (Burris and Canter, 1997; Samuel et al., 2000)?</td>
<td>Referral to human health issues in the table of contents, index, or introduction informs the reader that health issues was a part of the overall impact analysis and where this analysis is located in the EIA (Burris and Canter, 1997).</td>
</tr>
<tr>
<td>2 Are human health issues addressed in the scoping section (Burris and Canter, 1997; Bond et al., 2004)?</td>
<td>When human health issues are mentioned as part of the scoping section, this indicates that health was considered early in the process along with other impact concerns. In this study,</td>
</tr>
</tbody>
</table>
3 Are human health issues listed in environmental impacts section (Russell and Gallagher, 1997)?

The environmental impacts section of proposed action and alternative is the mandated part.

4 Does the EIS contain an identifiable section (or subsection) dealing specially with health impacts, or with a similar title (Chadwick, 2001)?

Place health impact section visibly, can reflect the importance of health considerations in the EIS.

5 Are human health issues listed in a separate individual section, for example, appendices, etc. (Cooper and Canter, 1997)?

The importance of the health considerations is highlighted and easier to find in the EIA when health considerations are presented in an individual section.


When human health issues were addressed in the non-technical summary part within the EIA, a quick reference is provided to the projected EISs. The inclusion it along with direct or indirect impacts, in a separate table, or in a narrative form, would aid the overall incorporation of health considerations and accessible to the general public (Burris and Canter, 1997).

Assessed impacts on human health (BMA, 1998);

Main body of incorporation health considerations into EIA which reflect the magnitude and severity of health issues coverage.

1 Are health impact assessment quantitatively or qualitatively described (Burris and Canter, 1997; Cooper and Canter, 1997)?

This question inventoried the type of analysis applied in the EIA. The generality of the question directed attention to statements in the EIAs that simply said no HIA were identified, to more detailed HIA (Burris and Canter, 1997).

2 Are specific guidelines/methodologies described for the HIA (Burris and Canter, 1997)?

When specific guidelines or methodologies are documented for the HIA, the reader should be more informed on how health significance was determined.

3 Are there any prediction and/or evaluation of impact magnitudes (Cooper and Sheate, 2002)?

Evaluate and predict the potential impacts of propose project on human health can inform the reader further information in order to conduct mitigations.

4 Are there any mitigation, monitoring and management advice of effects (Cooper and Sheate, 2002)?

Indicate the level of environmental health management.

Included a characterization of the ‘receiving population’ (BMA, 1998).

Without characterizing the ‘receiving population’, it is impossible to predict the actual health impacts on any proposal.

1 Is there any description of the population that is affected by the project? (Alenius, 2001)

Analysis of the size, age, gender distribution, sensitive groups of the ‘receiving population’ inform more detail and can help to conduct mitigation.

2 Is there any explanation on why this ‘receiving population’ being considered? (Alenius, 2001)

Categorized affected populations according to their likely vulnerability to potential adverse impacts on health.
3 What methods are used in describing how the health of population is affected? (Alenius, 2001)  
Made the predicted impacts more reliable, (e.g.: comparison with guidance and threshold limit; dose-response analysis; comparison with exposure to effects of similar projects)

| Referred to the relevance of health considerations in site selection and project design (BMA, 1998). | Referral to human health issues in site selection, indicated health issues was concerned in the early stage of EIA process and played important role on affected the proposed project. |
| Referred to consultation on health issues, particularly with health professional (Wood and Jones, 1997; BMA, 1998). | Most participants of the EIA process are developers or other stakeholders, who have limit knowledge of EIA, consultation with expert hence can involve professional advices. |

The review process for each EIS was conducted in a ten-step procedure as shown in figure 7.2

**Figure 7.2** Ten-step EIS review process

<table>
<thead>
<tr>
<th>STEP 1</th>
<th>Record name of proposed project.</th>
<th>STEP 5</th>
<th>Review table of contents, for health impacts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 2</td>
<td>Record name of agency/organization responsible for EIS.</td>
<td>STEP 6</td>
<td>Briefly scan the ‘introduction’, ‘alternatives’, and ‘methodology’ section for health impacts.</td>
</tr>
<tr>
<td>STEP 3</td>
<td>Record location of project.</td>
<td>STEP 7</td>
<td>Review ‘environmental impact’ section for health impacts</td>
</tr>
<tr>
<td>STEP 4</td>
<td>Record project type and briefly describe.</td>
<td>STEP 8</td>
<td>Review ‘mitigation’ and ‘scoping’ section for health impacts.</td>
</tr>
<tr>
<td>STEP 9</td>
<td></td>
<td></td>
<td>Briefly scan all other sections of EIS for health impacts.</td>
</tr>
<tr>
<td>STEP 10</td>
<td></td>
<td></td>
<td>A brief summaries documented.</td>
</tr>
</tbody>
</table>

*Source: Modified from Cooper and Canter (1997)*
In addition, though based on transparent criteria, the concept of ‘health considerations/issues’ was ambiguous in BMA report 1998, therefore, it is difficult to compare the results thoroughly between BMA report and this study.
8 Results and Discussion

This chapter will present the results of the dissertation and discuss the implications of the results with regards to the health considerations within recent UK EISs.

8.1 Foreword

The issue of when an environmental hazard becomes a health issue is difficult to define. The range of consequences for human health may cover an individual whose quality of life has been compromised by the development of the proposal. For example, in a new road construction project in a rural area, the dispersal of air-borne particles can lead to acute and/or chronic illness amongst some members of the general public.

As the definition of ‘health consideration/issue’ is ambiguous in BMA report, thus the criteria checklist below was listed in order to make the results comparable. Though based on transparent criteria, the categorization of EISs is therefore clearly subjective.

1. Those health considerations in noise/odour/air assessment, which at least, certain methodologies (e.g.: compare levels to guidelines; assess model etc.) were adopted, and possible impacts were predicted on human being in any depth, were categorized in ‘concern health issues’;

2. Those of which concern human being and/or local community, anything concern human mental/physical aspects (e.g. traveler stress) is kind of human health, public right of pedestrians & cyclists, population change is not included.
### 8.2 Results

The research results of the checklist were shown below in table 8.1.

#### Table 8.1 Number and percentage of EIS meeting the criteria

<table>
<thead>
<tr>
<th>Criteria question</th>
<th>No. of ‘yes’</th>
<th>% of ‘yes’</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contained specific sections on issues of human health</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Are human health issues in the table of contents or introduction?</td>
<td>12</td>
<td>31%</td>
</tr>
<tr>
<td>· Are human health issues addressed in the scoping section?</td>
<td>7</td>
<td>18%</td>
</tr>
<tr>
<td>· Are human health issues listed in environmental impacts section?</td>
<td>24</td>
<td>62%</td>
</tr>
<tr>
<td>· Does the EIS contain an identifiable section (or subsection) dealing specially with health impacts?</td>
<td>8</td>
<td>21%</td>
</tr>
<tr>
<td>· Are human health issues listed in their own section (Appendices, etc.)?</td>
<td>12</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Referred to impacts on human health in non-technical summaries</strong></td>
<td>11</td>
<td>28%</td>
</tr>
<tr>
<td><strong>Assessed impacts on human health</strong></td>
<td>18</td>
<td>46%</td>
</tr>
<tr>
<td>· Is health impact assessment quantitatively or qualitatively described?</td>
<td>11+7</td>
<td>46%</td>
</tr>
<tr>
<td>· Are specific guidelines/methodologies described for the HIA?</td>
<td>15</td>
<td>38%</td>
</tr>
<tr>
<td>· Are there any prediction and/or evaluation of impact magnitudes</td>
<td>15</td>
<td>38%</td>
</tr>
<tr>
<td>· Are there any mitigation, monitoring and management advice of effects?</td>
<td>9</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Included a characterization of the ‘receiving population’:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Is there any description of the population that is affected by the project?</td>
<td>7</td>
<td>18%</td>
</tr>
<tr>
<td>· Is there any explanation on why this ‘receiving population’ being considered?</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>· What methods are used in describing how the health of population is affected?</td>
<td>10</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Referred to the relevance of health considerations in site selection and project design.</strong></td>
<td>12</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Referred to consultation on health issues, particularly with health professional.</strong></td>
<td>13</td>
<td>34%</td>
</tr>
</tbody>
</table>
8.2.1 Inclusion of specific section on human health issues

36% of the 39 EISs did not list any relevant sections or chapters that explicitly discussed human health or related issues. That meant 25 EISs (64%), therefore, listed sections directly relevant to the assessment of impacts on human being and their health compare to 28% in the BMA report. Within the 25 EISs, 18 of them contained different kinds of health assessment within noise assessment/odour assessment/air quality assessment. The rest, 7 EISs just listed sections concerning with ‘impacts on human beings and/or local communities’ which were not specifically related to health.

31% of the EISs displayed in their table of contents and/or introduction sections, directly or indirectly discussed human health or related issues. 18% addressed health considerations in the scoping section. Again, 31% of the 39 EISs contained any depth of health issues in a separate individual section such as appendix. For example, one included a copy of the company’s health and safety and environmental policy. The second example included a Health Impact Assessment (HIA) in a separate report, which aimed to assess whether human populations were likely to be exposure to any material harmful to human health. The rest of them were studies of noise disturbance and copies of the European Commission and WHO Air Quality Standards and Guidelines.

Only 8 EISs (21%) contained relatively specific sections or subsections and entitled explicitly associate with health issues such as ‘the potential health impacts of pollutions’ or ‘potential health effects from exposure to landfill gas’ etc.

8.2.2 Reference to impacts on human health in non-technical summaries

As the inclusion of a non-technical summary (NTS) in an EIS was a specific requirement of the Town and Country Planning (Assessment of Environmental Effects) Regulations 1999 which intended to make the technical environmental impact
statement (EIS) accessible to general public. Compare to the poor inclusion of NTS within the EISs sample chosen in the BMA report 1998, great efforts had been made (only 26% included a NTS in BMA report, while 100% included those in the sample of this study) to increase the inclusion of NTS. As a result, the number of EISs making direct reference to issues of human health or safety gradually increase which indicated that 3 EISs (8%) in BMA report, 11 EISs (28%) in this study respectively).

8.2.3 Assessment of impacts on human health

As the inclusion of specific sections on human health issues gradually increase, the magnitude and severity of health considerations as a consequence, slightly improved.

Generally, in relation to public health and safety, 18 EISs (46%) analyzed potential impacts in any depth, compare to 45% in the BMA report. Of which 11 of those used qualitative assessment while 7 of those utilized quantitative assessment; 38% contained specific methodology /guidelines when assessing the human health impacts, for example, one case in air quality assessment, use the AEROME dispersion model (from USEPA) to predict the air-born particles concentration, and compared them to the threshold limits of the UK Air Quality Strategy (UKAQS) and other air quality standards and guidelines; In terms of prediction and/or evaluation of impacts on human health, 38% make specific description of the potential impacts such as lead to respiratory disease, disturbance of sleep etc. 23% give some mitigation, monitoring and management advices on human health.

Only 5 EISs (15%) of this study included detailed assessment of potential impacts on public health (5% in BMA report), 2 of them utilized the previous heath reports of similar study to evaluate the potential health impacts on human beings; another 2 contained expert reports in a health risk assessment study; and the other 1 included a public perception questionnaire of site selection.
In order to make these 2 studies more comparable, in broader terms, an additional scenario which assumed any indirect assessments that contained any information about human being or their health was defined to be kind of human health considerations was established. The result was presented in table 8.2.

Table 8.2 Percentage of EISs discussing 5 types of health impacts

<table>
<thead>
<tr>
<th>Environmental Aspects</th>
<th>Predicted Impacts</th>
<th>% of EISs including the impact (BMA)</th>
<th>% of EISs including the impact (this study)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Physical damage; Disturbance of sleep; Annoyance</td>
<td>62</td>
<td>64</td>
</tr>
<tr>
<td>Air pollution</td>
<td>Respiratory and/or cardiac disease</td>
<td>59</td>
<td>64</td>
</tr>
<tr>
<td>Odour</td>
<td>Loss appetite; annoyance; raise nuisance</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Traffic</td>
<td>Traveler stress; public rights of pedestrians &amp; cyclists; traffic safety</td>
<td>44</td>
<td>18</td>
</tr>
<tr>
<td>Human being</td>
<td>Employment; population change; public perception</td>
<td>----</td>
<td>10</td>
</tr>
</tbody>
</table>

From the above analysis, little improvement had been made on the noise and air pollution assessment, whereas, in cases which within odour assessment, the coverage of human health issues was boost double.

However, the number of EIS, which involve health issues in traffic assessment dropped dramatically. This would be mainly because of different definitions of ‘health issues/considerations’ especially in traffic assessment (always qualitative rather than quantitative, and the discussion of health issues were inexplicit). That is to say, the inconsistency definition of ‘health considerations’ between this study and BMA report would affect the results of analysis.

While all these environmental aspects such as: noise, odour, traffic etc. could have implications for health, this was rarely made explicit in this sample of EISs. The
potential impact on public health of the predicted levels of noise or air pollution again, were not further discussed or analyzed. In those cases in which level of noise was assessed, the discussion was in terms of volume in particular locations rather than in terms of the likely effects on people, such as their preferences or tolerances of such disturbance, or likely disruption of patterns of sleep. This situation also indicated in the BMA report.

In general, the majority of the EISs tended to merely focus on the issue of compliance with environmental quality standards or emission limits. The problem with that approach as discussed in the BMA report is that cumulative effects may be neglected, because compliance with standards or limits does not take account of long-term exposure to pollutant.

8.2.4 Characterization of receiving population

A slight decrease of the sample EIS within which included no information about the likely affected population (56% in this study, 67% in BMA) had been found. Only 44% of the EISs, therefore, give any estimations of population likely to be affected by the potential impacts of the proposed projects. 18% attempted to estimate the size and/or gender of the receiving population; only 15% of the EISs explained why the given population being considered, the typical reasons were, for example: people live in vicinity or people who are vulnerability such as school children, patients etc.; in describing how the health of population is affected 10 EISs (26%) mentioned some information about this, some of them were compared with guidance and threshold limits (4 EISs), some of them were by evaluating exposure effects of similar projects (4 EISs), only 2 included dose-response analysis.

6 EISs categorized affected population according to their likely vulnerability to potential adverse impacts on health while none did this in the BMA report. For example, in one case, the receiving population was divided into 6 groups by different
distances to the proposal site so as to predict the noise impacts on different receptors; others mainly concerned the vulnerability of population such as old people, school children, hospital patients etc.

8.2.5 Role of health consideration in site selection and project design

In terms of mentioning health or public safety as having influenced site selection or project design, 31% of the 39 EISs briefly discussed the health factors while only 18% of those described in the BMA report. In most of those cases, it was just describe briefly as: proximity to housing/residential. Only one case included a ‘site selection questionnaire’ to concern about the public perception on the adverse effects.

8.2.6 Consultation

All of the 39 EISs indicated that developers had consulted with statutory consultees concerning their proposals in any depth. However, majority of them provide no evidence of any consultation in terms of human health issues. Only 34% of the EISs reported consulting with local Environmental Health Departments, Health and Safety Executive or WHO etc. while 38% provided any evidence of any consultation in relation to human health in the BMA report. Even though in the BMA report, the results of health consultation were presented in terms of different consultees respectively (as mentioned above, local Environmental Health Department, WHO etc.), a consistent level of the health consultation was maintained which indicated insufficient consultation with health professionals, environmental health departments and the Health and Safety Executive were remained challenges against the quality and reliability of the EISs in relation to health impact sections.

As displayed in table 8.3, the result indicated that the overall situation of health considerations in EISs was improved. There were much more EISs which contained specific sections directly relevant to the assessment of impacts on human being and
their health (64% in this study whereas 28% in BMA report). Besides, the inclusion of health issues in the EISs was more explicit, for example, the human health issues were addressed in the Non-technical summary from 8% in the BMA to 28% in this study; in addition, health factors were concerned more in the site selection and project design stage, which revealed that health issues were concerned in earlier stage. In terms of the quality of health assessment, there was little improvement on the specific process of the health impact assessment as well as the consultation with health professionals; furthermore, description of receiving population slightly improved (33% in BMA report and 44% in this study respectively). The three indicators reflected that, the quality of health assessment didn’t make any actual progress, unfortunately.

Table 8.3 Comparison of the health considerations between the BMA report and this study

<table>
<thead>
<tr>
<th>Criteria</th>
<th>% of EISs in BMA report</th>
<th>% of EISs in this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contain sections directly relevant to the assessment of impacts on human being and their health.</td>
<td>28</td>
<td>64</td>
</tr>
<tr>
<td>Reference to impacts on human health in non-technical summaries.</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>Analyze potential health impacts and/or public safety in any depth.</td>
<td>45</td>
<td>46</td>
</tr>
<tr>
<td>Displayed any information of the likely affected population.</td>
<td>33</td>
<td>44</td>
</tr>
<tr>
<td>Health consideration in site selection and project design.</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>Consultation with health professionals or health organizations.</td>
<td>38</td>
<td>34</td>
</tr>
</tbody>
</table>

8.2.7 Sectoral differences among selected project types

The composition of the sample, in terms of the representation of broad project types, is summarized in figure 8.2. It was decided to categorize the sample EIS into 8 groups (Quarries, Agriculture, Energy, Waste disposal and waste water treatment, Urban
development, Roads and other transport, gas field development and others), because they were the top number of project types of EIS submitted in UK during 1993-1998 period (Wood, 2000) under the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1985. It is believed that the sample composition is very similar to that for all UK EIS submitted, and therefore, highly representative of all EIS.

**Figure 8.2** EIS sample composition by broad project types

![Pie chart showing project types with percentages](image)

*Quarries* 13%  
*Agriculture* 15%  
*Energy* 10%  
*Waste disposal and waste water treatment* 13%  
*Urban development* 13%  
*Roads and other transport* 13%  
*Gas field development* 15%  
*Others* 8%

*Note: Composition of all EIS submissions is taken from Wood (2000)*

According to the table 8.4, the percentage of those which meet the criteria questions was much higher in ‘waste disposal/water treatment’ and ‘urban development’ sector than other sectors. One of the reasons may be that, these two types of project are more likely to facilitate greater public awareness. Therefore, stakeholders are more willing to pay attention to the public health/safety area during the EIA process, and document the health considerations in EIS as well.
It seemed that EIS in the ‘roads and other transport’ sector were more likely to contain specific sections on health issues and assess the health impacts in any form and any depth; however, in terms of ‘receiving population’, the EISs in this sector only mentioned the ‘receiving population’ apparently, rather than further focused on the nature of the receptors and explain why and how the population being concerned. Since the likely receptors within roads and other transport constructions must be drivers, pedestrians or cyclists, little had been done to explain why this population was concern; in addition, it is difficult to analyze the size and gender of the population, since the flexibility of the receptors.

The health considerations in selected EISs of energy sector and offshore petroleum & pipeline works development sector were clearly much poorer than the average level. Because, the majority cases within the energy sector were wind farm planning applications which was believed to impose less adverse environmental impacts especially health impacts; In terms of gas field development cases in this study, all of them were under different regulations other than Town and Country Planning (England and Wales) Regulations 1999. Basically, the offshore petroleum and pipeline works are of public consensus that it imposes high risk of impacts on environment and health. However, the health considerations being concerned in current EIS, as mentioned above, were as part of noise assessment, odor assessment, air quality assessment etc. Whereas, projects in offshore petroleum and pipeline works sector, doesn’t impose direct impact on the public, as a result, health issues were neglected.

Last but not least, the percentage of meeting the criteria questions within quarries and agriculture sector is similar to the average level.
Table 8.4 Percentage of EIS answering ‘yes’ according to the criteria questions within 8 groups of project

<table>
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<td>33</td>
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<td>31</td>
</tr>
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<td>6.</td>
<td>33</td>
<td>25</td>
<td>60</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>40</td>
<td>23</td>
</tr>
</tbody>
</table>

Note: the number in this table is percentage of answering ‘yes’ according to the criteria questions.
9 Summaries and Conclusion

9.1 Summary

While in Europe and particularly in the United Kingdom development of HIA was encouraged by a series of supra-national and national government statements (Kemm and Parry, 2004). However, there is no legal obligation to conduct health impact assessments in the UK currently, other than the requirements for EU policies to consider health impact assessment.

The health considerations in Environmental Impact Statements had been improved compare to the result presented in the BMA report 1998. There were more EISs which contained specific sections directly relevant to the assessment of impacts on human being and their health; the health issues in the EIS were addressed more explicitly and in earlier stage. Nevertheless, in terms of the quality of health assessment, the inclusion of receiving population in EIS sample was still poor though slightly increased compare to BMA report; besides, the health professional consultation was even worse than the BMA report; in the specific health assessment process, the majority of the EIS tended to merely focus on the issues of compliance with environmental quality standards or limits than in terms of the likely effects on people. Therefore, we can draw the conclusion that: the documentation of health assessment in Environmental Impact Statement was increased due to the legislation requirement, unfortunately, there are no actual progress in terms of magnitude and severity of health considerations with EIS.

According to the 8 broad project types categorized in this study, the human health issues inclusion in Waste disposal & waste water treatment sector and Urban Development sector were the best two sectors, while it is weak in the energy and offshore petroleum and pipeline works development sector. This indicated that, the quality of human health considerations within environmental impact assessment
arrange differently from sector to sector due to the nature of the projects.

9.2 Recommendation

There is a need to heighten public health policy-maker awareness of the linkages between health and the environment and to strengthen the role of the health sector in national events, emphasizing the protection of human health from environmental risk factors.

Since there no legal obligation to conduct health impact assessment in the UK, in order to enhance the status of health aspects in environmental issues, government and organizations can provide evidence and arguments for, and promote greater understanding and harmonization of, the approaches for developing legislative measures to protect human health from environmental risks.

Systematic methodologies of health impacts should be developed with which health impact assessment can be conducted; comprehensive checklist should then be produced to guide developers and planning authorities.

Although there is clearly potential for integration HIA within EIA, and even some progress had been made, this approach will not be more effective unless great deal efforts have contribute to get various organizations/departments working together; in addition, health impacts were also recommended to be involved in other forms of impact assessments so as to support a sustainable development.

Thus, the future works should emphasize the public impacts of environmental problems and promote the incorporation of health aspects into environmental and sectoral policies.
9.3 Conclusion

This study scanned the policy and statutory requirements for human health within UK and WHO/EURO, and found that there were increasing awareness of inclusion of health considerations into different policy and projects, however, legal requirements were still inadequate.

When assessed the coverage of health issues in the selected sample and compare to the BMA report, it was indicated that situations was slightly improved but still far from satisfactory. However, because the definition of health consideration was ambiguous in BMA report, though based on transparent criteria, which try to make these two studies comparable, the result was therefore subjective and only indicative rather than conclusive. In terms of sectoral difference analysis, this study only mentioned 8 groups of project type which were the top number of EISs submitted in the UK; in addition, due to the limitation of EIS collection held by the University of East Anglia EIS center, the EIS sample is therefore, not broadly representative but instructive.

Basic recommendations were provided to indicate the future works that health agencies and organizations should be pursued.

(11,504 words)
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