# DEALING WITH ASSERTIONS OF HUMAN HEALTH RISKS OR EFFECTS FROM ENVIRONMENTAL EXPOSURES: A SYSTEMATIC APPROACH

## A GUIDANCE DOCUMENT FOR SCOTLAND

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# MEMBERSHIP OF GROUP

**This document has been prepared by a group representing the principal organisations involved in addressing public and media concerns over the human health effects or potential effects of environmental exposures in Scotland.**

## Members of the Group:

| | |
|---|---|
| G. Morris | Scottish Centre for Infection and Environmental Health (Chair) |
| T. Bell | Royal Environmental Health Institute of Scotland |
| R. Black | Information and Statistics Division, Common Services Agency |
| A. Brown | Department of Environmental Services, Glasgow City Council |
| C. Clark | University of Strathclyde representing the National Society for Clean Air |
| T. MacDonald | Department of Environmental Services, Glasgow City Council representing the National Society for Clean Air |
| C. Ramsay | Scottish Centre for Infection and Environmental Health |
| M. Vinson | Consultants in Public Health Medicine (CD &EH) Working Group |
| P. Woolgar | Scottish Environment Protection Agency |

## Administrative Support

| | |
|---|---|
| S. Brownlie | Scottish Centre for Infection and Environmental Health |
| S. Wadd | Scottish Centre for Infection and Environmental Health |

# CONTENTS

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# INTRODUCTION

Public concern about health effects which might be associated with exposure to environmental agents frequently generates enquiries to departments of public health, local authorities, environment agencies and others. These approaches may be direct or indirect and are often prompted by media interest. Approaches often involve demands that investigations are exhaustive and that results are communicated in a transparent and accessible manner. While the agencies concerned should not have any difficulty in conducting and reporting their work openly, the demand for exhaustive investigation would soon deplete the limited resources available if every assertion of an environmental health problem was followed up in this comprehensive way. Agencies require a strategy of escalating the intensity of an investigation if the initial evidence supports the view that a problem does indeed exist. Clearly, in some instances it will prove difficult to justify to the complainant that a limited investigation is required rather than a detailed and thorough epidemiological investigation, particularly in instances where there is intense public pressure. In many cases, scientific evidence or other circumstances will demand positive action by the agencies involved. It is important that a systematic approach is adopted when responding to and investigating assertions of health effects.

This document sets out a structured approach to dealing with assertions of health effects associated with environmental exposures. It is intended that this should assist public service bodies in determining an appropriate response and in subsequently defending any decisions taken. A staged approach is recommended with the fulfillment of stated criteria being desirable before progressing to a subsequent stage. The agencies typically involved are local authorities (and in particular the environmental health departments), the public health departments of local health boards, the Scottish Environment Protection Agency (SEPA) and frequently, though perhaps indirectly, the Scottish Centre for Infection and Environmental Health (SCIEH) and the NHS Information and Statistics Division (ISD) both of which are divisions of the Common Services Agency of the National Health Service in Scotland. Depending on the nature of the problem the relevant water authority, the Food Standards Agency, the Meteorological Office, the Royal Environmental Health Institute of Scotland (REHIS) or the National Society for Clean Air (NSCA) may also be involved.

Local authorities or public health authorities and other agencies may become involved in a range of situations and we consider here three scenarios:

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|---|---|
| *Scenario 1a* | ***A belief that ill health exists in the community and that this is linked to exposure to an environmental agent(s) and the potential source of exposure is identified (e.g. from a specific factory or installation).*** |
| *Scenario 1b* | ***As in 1a except no specific environmental source is under suspicion.*** |
| *Scenario 2* | ***No ill health is evident yet there may be a local source of environmental exposure which members of the community believe has the potential to cause ill health even though there is no actual assertion that it is currently doing so.*** |

# INTRODUCTION (continued)

This document sets out possible strategies for addressing public concern. The emphasis is on principles to apply in formulating a response rather than health outcomes or risks from specific agents or types of exposure. The guidance is not intended to address concern over proposed developments as these are catered for under the planning process.

The definition of an environmental exposure used in this guidance is inclusive and could be fulfilled by proximity to a fixed industry, site, plant or installation; by intermittent exposures such as might relate to rail, road or air transport; by seasonal exposures such as might be associated with agricultural practices; by exposures to energy and waste related activities, whether conducted at a defined site such as an incinerator, landfill site or power station or by proximity to power conductors such as overhead cables.

With the emergence of "Health Impact Assessment" as a public health tool, it is perhaps appropriate to observe that assessment of the health effects of contaminants in the environment are as much health impact assessments as assessments of proposed policies and there is inevitably some overlap in methodology.

# COMMUNICATION

## 2. COMMUNICATION BETWEEN OTHER AGENCIES AND THE PUBLIC

Good communication between local agencies is fundamental to dealing successfully with complaints or assertions from the community. Existing relationships between health boards, local authorities and other relevant agencies should ensure that lines of communication are well established. Although, it is for the agency receiving the initial complaint to determine at which point to inform other agencies, it is often helpful to liaise at an early stage given that community groups and individuals often approach several agencies simultaneously. This early, and to an extent informal, review might be termed the " Initial Assessment Phase". A decision to call a meeting of relevant parties e.g. local authorities, SEPA, water authority etc. would normally be taken by the Director of Public Health following initial informal discussions between the agencies. In practice, responsibility in these matters normally devolves to the Consultant in Public Health Medicine with designated responsibility for communicable diseases and environmental health. the CPHM (CD & EH). For convenience, the core group of investigators called together by the CPHM (CD & EH), if it is considered necessary following initial assessment, could be termed an Environmental Hazard Investigation Team (EHIT) and would be analogous to an Outbreak Control Group for an infectious disease outbreak.

It is likely that each of the agencies involved will routinely maintain a minimum dataset on all complaints made to them. This information together with the minutes of all EHIT meetings including decisions taken and the reasons for them is essential to the efficient management of the problem and to the subsequent audit process. Good record keeping is imperative as those involved may ultimately be required to defend decisions taken in what are likely to be changing circumstances.

The importance of having a meaningful dialogue with the community and its representatives cannot be overstated. If investigation is based on what the authorities perceive to be the community's concerns but this does not fully address the true concerns of the complainants, then the outcome will be unsatisfactory for all those involved. There should be no ambiguity over the questions any investigation sets out to address and communication strategies should be adopted to ensure this.

An EHIT should give early consideration to planning how the progress and results of an investigation will be communicated to the local community and relevant others. Some guidance on the principles of good communication is contained in Appendix 1.

# SCENARIOS

## 3. WHERE ILL-HEALTH IS ALLEGED TO BE LINKED TO ENVIRONMENTAL EXPOSURE (SCENARIO TYPE 1)

The approach adopted by local agencies should be essentially the same whether alleged ill health in the community is putatively linked to an identified local exposure (Scenario Type 1a) or an unidentified environmental source is suspected (Scenario Type 1b).

Early discussions between the public service bodies during the Initial Assessment Phase may indicate that no further action is appropriate in these situations. If this is the case, the decision and the reasoning behind it should be communicated without delay to the complainants. Frequently however, the information presented will imply that some, perhaps quite limited, investigation is appropriate. In essence the same phased approach is adopted for Scenario Type 1a and 1b. At the end of each stage (see Figure 1) there are two options: either no further action is required and reasons should be communicated; or further action is required and the next stage of investigation is appropriate.

### 3.1 Literature review, construction of symptom profile and review of existing epidemiological data (Stage 1)

If the decision is to proceed to investigation, this initial investigation step may, for convenience, be termed Stage 1 and comprises two parallel activities (i) a literature review with the primary purpose of appraising biological plausibility, and (ii) the assembly of descriptive epidemiological data.

The purpose of a literature review is to establish whether exposure to agents of the type under suspicion could give rise to health effects and particularly those being alleged by the complainant. Sources within the literature may also give information on what emissions or discharges are associated with a particular industry or activity. As such, a literature review is useful for appraising the 'biological plausibility' of any hypothesised association between an exposure and an alleged health outcome. It is suggested that the literature review proceed in parallel with an initial limited exercise to assemble descriptive epidemiological data.

Descriptive epidemiological data may be obtained either from established health data sources (see Box 1) or may be accomplished by simply collating information from existing complaints. In some circumstances a structured *ad hoc* approach might be adopted by using a questionnaire to elicit information on symptoms and details of symptoms when these occurred. Inevitably *ad hoc* health surveys, even using simple questionnaires will consume further resources and raise the profile of the issue within the community. This approach is only advised following careful consideration by the EHIT. Information on whether complainants contacted a General Practitioner or other medical services and any positive clinical findings may provide a crude indicator of the severity of symptoms and may also be elicited by questionnaire.

# SCENARIOS

The principal purpose of Stage 1 is to determine whether the available evidence supports a decision to proceed to Stage 2 and, if this is considered appropriate, to give a steer to the subsequent investigations. With co-operation between relevant parties, Stage 1 can be accomplished with limited resources and at a local level. The outcome of Stage 1 can then be appraised during a review.

### *Points to consider at Stage 1*

The review stage is an important opportunity for the EHIT to examine, hopefully on the basis of relevant evidence, the credibility which may be attached to the complaints or enquiries. Some of the more important considerations for the EHIT at this stage are:-

*Is there consistency between individuals in terms of the type of symptoms?*

Consistency in the type of symptoms reported might tend to suggest that reported symptoms are likely to be related to an environmental exposure.

The symptoms recorded might include respiratory irritation, nausea, headache etc. Once a symptom profile has been created it should be appraised for consistency and biological plausibility. Biological plausibility, where established, is an important criterion, particularly when dealing with Scenario Type 1a. Lack of consistency in the symptoms reported might cast doubt on any assertion that exposure to a single exposure source is the cause. A measure of severity of symptoms might be derived by asking whether the respondents have contacted their General Practitioner. The type of symptoms reported may give some clue as to the type of chemicals to which the population are being exposed, for example, where nausea is frequently reported this may be a response to a persistent or recurrent odour problem (e.g. compounds containing sulphur groups) whereas irritation of the eyes and nose may imply a different type of chemical exposure.

*Is there any temporal pattern in the reporting of symptoms?*

A temporal pattern may be consistent with the release of a pollutant to the environment linked to the hours of operation of a plant or to the sequence of operations within a plant such as cleaning, delivery of materials etc. For example, health effects in communities have been caused by emissions associated with unloading a ship in a nearby dock.

*Is there evidence to associate symptoms with prevailing climatic conditions?*

Consideration of the spatial and temporal distribution of complaints may be especially valuable when allied to a knowledge of climatic conditions. Wind strength and direction and the presence or absence of rainfall will inevitably influence exposure to any airborne pollutant but may also be relevant where pollutants are present in water.

*Does the spatial distribution of complainants' homes, place of work etc. relate in any way to the geographical location of any putative source?*

Any observed pattern in spatial distribution is an important observation particularly when this can be related to a putative source. Where there is no hypothesised environmental source, spatial plotting may provide some clues as to any possible local pollutant source.

Although collection and collation of symptoms may lead to a conclusion that further investigation is not warranted, some additional measures may be desirable for the purposes of public reassurance. A decision not to proceed beyond this stage must be communicated without delay to the complainants together with a clear explanation of why the decision was made.

### 3.2 Review of existing data on local pollution sources (Stage 2)

The decision to progress to Stage 2 will normally be taken only where there is good evidence that health effects are present which cannot otherwise be satisfactorily explained. Stage 2 should comprise a desktop review of local sources of environmental exposures and, as discussed above, will be informed by a knowledge of the health effects reported. The principal agencies involved in providing information to an EHIT for a Stage 2 investigation are likely to be the Local Authority(ies) and relevant industry representatives, transport operators etc. SEPA and the water authority. Industrial processes are required to monitor emissions if they undertake prescribed processes authorised by SEPA. Local authorities hold local air quality data. Thus, data on emissions may be obtainable which can be reviewed alongside the pattern of complaints of health effects. Emissions from industrial plant can be influenced by a range of factors including design, feedstock, production rate and state of repair. Experienced officers within the relevant agencies, perhaps in consultation with plant operators, may be able to provide an insight into the extent to which these influences may be operating in the case under consideration.

Even where complaints are seen to match changes in the nature and pattern of emissions, this is not necessarily indicative of a causal link. Non-industrial sources such as transport, energy or waste related activities may need to be identified and reviewed separately. The use of detailed Ordnance Survey Maps supported by local knowledge of the type which is normally available within council environmental health departments is central to this process.

A potential complicating factor in all exposure assessment relates to the possibility that any specific pollutant may be contributed from different sources. For example particulate matter <10 microns in size ($PM_{10}$) from an industrial source may be superimposed on an existing, perhaps elevated background level, such as might be contributed by traffic. Thus the effect may be additive. In other cases different pollutants may act synergistically or antagonistically.

If there is little consistency in the complaints received, or if existing evidence suggests that environmental exposure levels are satisfactory then progressing to Stage 3 is unlikely to be warranted. At this point it would be essential to communicate this decision to the principal complainants or their representatives. It will be necessary to provide information on the reasons for arriving at the decision to take no further action. Positive efforts to provide reassurance will be vital.

***Points to consider at Stage 2***

*What environmental data are available without requiring further monitoring or modelling?*

Environmental monitoring and modeling is costly. Information on emissions or prevailing environmental conditions may already exist which can inform the investigative process. In particular, information may be held by SEPA and/or the Local Authority concerning changes to processes or emissions. Much valuable information may be accessed with the co-operation of local companies. Variations in emissions or hypothesised sources may be more important than absolute levels.

Meteorological conditions may significantly affect the behaviour of environmental contaminants in the environment and hence human exposure. This is particularly true for pollutants in water and air. Historical meteorological data in Scotland may be obtained from the head office of the Meteorological Office in Bracknell, Berkshire. In some case local data may have been gathered and held by local authorities.

## 3.3 Ad hoc collection and analysis of health data (Stage 3)

The decision to progress to Stage 3 is likely to be taken on the basis of finding that a health effect exists which cannot otherwise be explained (Stage 1) and where existing evidence implies an unacceptable or changed exposure to environmental source in question (Stage 2). The principal agency involved at this stage of the operation will be the local health board and specifically the Consultant in Public Health Medicine (normally the individual with designated responsibility for environmental health. An important aspect of this stage is to establish whether there is evidence that the health status of those in the area under investigation differs from the residents of comparable areas elsewhere. A particular concern would be to explore whether any observed differences in health status can be explained by the socio-economic circumstances (levels of deprivation) of the area. Health data come in various forms and are not normally gathered with the intention that they

should be related to any environmental exposure (see Box 1). Thus the only useable spatial reference may be the postcode of residence which, in some circumstances, e.g. where the hypothesised exposure is thought to take place when people are at school or work, may be misleading. Whilst the address of complainants will in most situations be available, issues of confidentiality must always be considered where health data are concerned.

## BOX 1

**Brief account of existing health data with sources of spatial distribution.**

Any set of aggregate or individual health records which are geographically referenced (e.g. by parliamentary constituency, postcode sector or Health Board area) is capable of being linked with exposure data which are coded to the same geographical entities. In epidemiological studies of chronic diseases it is usually necessary to estimate the person-years at risk from population estimates or census data for these areas.

In Scotland, postcode units have formed the basis of the geography of the censuses of 1971, 1981, 1991 and (soon) 2001. The smallest census area for which population counts are published is the enumeration district (1971, 1981) and the census output area (1991). This means a health record which includes a postcode can be linked to a population at risk in small geographical areas, and the latter can be aggregated to form larger groups for analysis of analysis (e.g. populations living near particular industrial sites).

Historically, the main sources of health data used in this way have been the cancer registration system (SMR6) and mortality records although any postcoded health data such as hospital discharges (SMR1) could also be linked with populations at risk and, potentially, exposure data for quite small geographical areas. Details of the methodology involved and practical examples can be found in Elliot P, Cuzick J, English D and Stern R (eds). *Geographical and Environmental Epidemiology: Methods for Small Area Studies*. Oxford: OUP, 1992.

### *Points to consider during Stage 3*

*Is there evidence that health as measured by any of the above parameters is worse in the area under consideration than comparable areas locally or the national picture?*

The absence of any detectable difference in the health of the population in the area under investigation, compared to residents in similar areas, or the health of the national population, may be used to justify a decision to abandon the investigation at this stage.

*Where a local environmental exposure is thought to be linked to the health effects, do changes in health parameters correlate with changes in the levels of a suspect environmental agent?*

Changes in the health of the population which can be associated with changes in emissions, whether measured or modelled, from the hypothesised source are likely to indicate that this may be a significant factor.

*Is there any indication of changes in the level or pattern of activity amongst affected individuals which might result in changes in exposure to an agent?*

Such information will not necessarily be volunteered and may only be elicited by careful questioning or perhaps as part of a questionnaire survey. Examples might be changes in employment status, re-routing of transport, changes in leisure activities which may, for example, result in more time being spent outdoors.

## 3.4 Environmental monitoring/modelling (Stage 4)

The decision to progress to Stage 4 should only be taken where there is the strongest possible indication that a health effect is taking place. Stage 4 aims to provide more robust indicators of exposure for use in epidemiological analysis.

Such further investigation is likely to be costly and probably time consuming. Initially, all routinely collected data must be carefully collated and examined as described in Stage 2. Such information should reside with the public authorities which have statutory responsibility for environmental control, e.g. local councils, water authorities and the Scottish Environment Protection Agency and, in specific circumstances, the Health and Safety Executive. Environmental data of this sort are normally gathered for statutory purposes and may not be an appropriate indicator of population exposure.

In compliance with their statutory duties in relation to local air quality management, local authorities will have assessed local levels of nitrogen dioxide, sulphur dioxide, particulate matter, benzene, lead, carbon monoxide and 1,3-butadiene. Some local authorities also hold data on ozone levels.

Local air quality management requires local authorities to carry out a three stage exercise commencing with a desktop review of emission sources including traffic followed by the application of screening models and monitoring, culminating in a final comprehensive review and assessment of pollutants where there is likely to be an exceedence of the nationally prescribed air quality objectives.

Environmental monitoring is an expensive and often complex activity, particularly if the results are intended to be representative of exposure, and is unlikely to be useful without a target agent(s). Where a target agent can be identified it is generally because it is known to be emitted or potentially emitted from a local source. Similarly environmental modelling has little value in the absence of a target agent for which physical and chemical characteristics are known.

Monitoring and or modelling should ideally be conducted not only in the area where concerns exist but in a comparison area elsewhere. This requirement for a comparison area should only be relaxed where robust information is available on typical levels of exposure to the same agent elsewhere.

Environmental monitoring or modelling must be subject to rigorous quality control particularly if results are to be compared to work conducted elsewhere.

Where there is a significant number of potential sources, monitoring and modelling costs can escalate rapidly but, for practical purposes, these must be contained. Whilst the same agent (for example lead) may be transmitted by different environmental carriers, generally the evidence will suggest that an agent will present a risk through ingestion, inhalation or skin contact, thus limiting the investigation to one environmental carrier (e.g. water or air). Further targeting of monitoring and modelling may be achieved by dealing only with those compounds which could give rise to the effects complained of. For example, respiratory or eye irritation is commonly associated with aldehydes. Thus, if there are local sources of formaldehyde or acrolein then these sources should be the focus of investigation. Where neurological problems are being reported, a large number of chemicals might be implicated (e.g. heavy metals or pesticides). Environmental monitoring in such circumstances is likely to be worthwhile only where knowledge of local sources has suggested a clear hypothesis as to the chemicals involved.

### 3.5 Analytical epidemiology (Stage 5)

Medical studies based on routinely collected information such as death certificates and cancer registrations are sometimes described as *descriptive epidemiology*. These generally do not include any information on exogenous risk factors such as occupational exposures. In contrast, *analytical epidemiology* usually involves field work to obtain data on exposures of some kind (for example from employment records or questionnaires about lifestyle factors). There are two main types of analytical epidemiological studies:

### *Cohort (or follow-up) studies*

These involve identifying cohorts of individuals in whom an exposure of interest can be assessed. It is very unusual for exposures to be measured exactly: investigators are usually restricted to proxy indicators of exposure such as duration of employment in a particular part of a factory. The study groups or cohorts are then 'followed-up' by linking their identifying characteristics (name, date of birth etc) with disease and mortality registers. In Scotland, there are well established means of doing this type of work through the National Health Service Central Register or by direct probability matching with ISD databases. The strength and nature of the association between the exposure and the disease of interest can be assessed by comparing incidence or mortality in groups defined by exposure level. The main disadvantages of the cohort study approach are that they tend to be expensive to conduct, since large numbers of individuals have to be followed-up in studying even common diseases, and the delay between initiating research and obtaining results can be substantial if the study is conducted prospectively. Of course, the same study design can be applied retrospectively if good quality historical exposure records are available, for example occupational radiation exposure data.

### *Case-control studies*

A more commonly used approach is the case-control study. This involves obtaining exposure information retrospectively in a group of individuals who already have a disease (cases) and comparing this with similarly collected information from a group who do not have the disease (controls). As before, exposure assessment can be by personal interview or from historical records. The main advantage of this approach is that fewer subjects are required to investigate the relationship between exposure and outcome. However, case control studies always involve retrospective exposure assessment, which can introduce bias (for example, recall bias in lifestyle questionnaires).

A very useful recent publication provides an introduction and examples of the application of these concepts: dos Santos Silva I. *Cancer epidemiology: principles and methods*. IARC Scientific Publications. Lyon: International Agency for Research on Cancer, 1999.

The Scottish Cancer Intelligence Unit of ISD Scotland maintains a small Epidemiological Studies Group based on external funding for commissioned research. This group has expertise in designing and conducting field research using standard epidemiological tools such as structured questionnaires as well as specialised equipment such as household radon monitors.

Because of the expense of conducting detailed epidemiological research, the NHSiS is not capable of investigating in detail every assertion of adverse health consequences of putative environmental hazards reported to health boards, local councils and the Scottish Executive. Therefore the onus is on investigators to exploit existing resources in carrying out *descriptive epidemiology* (e.g.

geographical incidence studies and correlation studies of geographically referenced exposure and health outcome data) to determine the magnitude, if any, of the alleged effect and to begin to assess evidence for causation. The field work required for *analytical epidemiological* investigations should only be contemplated if strong evidence of a potential hazard remains when all options using routinely collected data have been exhausted. Good examples of this sequence of escalation are found in the investigations of the clusters of childhood leukaemia observed in populations living near the two nuclear reprocessing facilities in the UK at Sellafield and Dounreay. These are summarised in Little J. Epidemiology of childhood cancer. IARC Scientific Publications. Lyon, International Agency for Research on Cancer, 1999.

The procedure for dealing with Scenario Type 1 is summarised in Figure 1 on page 32.

# SCENARIOS

## 4.0 WHERE NO ILL-HEALTH IS EVIDENT BUT EXPOSURE TO A SOURCE IS THOUGHT TO BE A POTENTIAL RISK TO HEALTH (SCENARIO TYPE 2)

In some cases there may be a high level of suspicion in a community that a known local industry, plant or installation presents an undefined hazard. Even if no symptoms are being experienced, there may be concerns that health will be affected in the medium or long term due to continued exposure. Particular problems can be experienced when addressing this type of concern.

One possible response by the agencies would be to examine health data to ascertain whether anything out of the ordinary is occurring. Insofar as it relates to looking for any unusual health effects within a specific geographical area, such an exercise is unlikely to yield benefit and might be construed as a fishing expedition unless the exercise focuses on a specific, biologically plausible outcome. Health status, measured by whatever parameter, is rarely uniform across the population and even if it were practicable to review all sources of health data, the presence of a disease cluster might simply be the product of chance and unrelated to any hypothesised environmental exposure. Scenario Type 2 commences with an appraisal of biological plausibility followed by investigation of exposure, if appropriate.

As in Scenario Type 1, the decision to convene an Environmental Hazard Investigation Team (EHIT) normally lies with the CPHM (CD& EH) following informal discussion with the relevant agencies. This procedure is summarised in Figure 2.

### 4.1 Literature review, desktop review of sources of environmental agents and putative health effects

The first action of the EHIT should be to assess biological plausibility by reviewing relevant literature. If biological plausibility exists, any existing information on emissions from the alleged source should be reviewed. As described above, those likely to hold data on emissions on industrial or energy related sources, are SEPA, the local authority or the company itself.

The EHIT may then consider emissions data, and specifically the levels recorded, in the context of existing scientific and epidemiological knowledge about the health effects of the agents or industry involved and also the levels in relation to any statutory or other published standards available. SCIEH can provide this information if requested and may be represented on an EHIT if local agencies consider this to be appropriate.

### *Points to consider during Stage 1*

*What environmental data are available without requiring further monitoring or modelling?*

Environmental monitoring and modelling is costly and information on emissions or prevailing environmental conditions may already exist which can inform the investigative process. In particular, information may be held by SEPA concerning changes to processes or emissions. Much valuable information may be accessed with the co-operation of local companies. Changes to emissions or hypothesised sources may be more important than absolute levels. To be useful, the time period to which it refers must be accurately known.

*What scientific evidence shows that exposure to agents in the quantities known to be or potentially present can produce acute or chronic health effects?*

Where particular agents have been monitored, these are normally chosen because there is scientific evidence of their capacity to damage health or the environment. In many cases permissible maximum standards are enforced through 'consents' under the environmental and planning legislation.

*What epidemiological evidence exists to support a link between the exposures recorded and health effects?*

Epidemiology can be used to explore the existence and strength of any association between an environmental exposure and a health outcome. Accordingly, it is possible that epidemiological evidence from the literature (or from other sources) may show that proximity to a particular industry or exposure to a particular agent at a stated level, has been associated with health effects. Such observations may be the origins of local concern and, provided that the studies are methodologically robust, this external evidence may be an important consideration for the EHIT. It would be expected too, that any statistical relationship will have been explored in terms of accepted criteria of causality. Even in the absence of biological plausibility a causal relationship may exist and those claiming such a relationship between a particular exposure and health effects will inevitably be open to challenge where this criterion cannot be fulfilled. Comments above regarding the dangers of making biological plausibility an absolute criterion apply here also. Both SCIEH and ISD have skills in the critical appraisal of epidemiological evidence which could be used to support the work of an EHIT. The criteria of causality proposed by Bradford Hill (1965) are set out in Box 2 on page 16.

If, following consideration of the evidence assembled during Stage 1, the EHIT consider that there is no evidence that emissions of the type and at the level recorded (or at levels which may be reasonably predicted) are capable of presenting a health risk to the exposed population, progression to Stage 2 is unwarranted. This decision must be communicated without delay to the complainants together with a full explanation as to why the decision was taken. Where emissions are considered

to exceed safe levels, measures should be recommended to reduce these by the application of statutory controls.

## 4.2 Environmental monitoring/modelling (Stage 2)

The decision to progress to Stage 2 should only be taken where the EHIT cannot be satisfied that the alleged threat does not exist. This could be due, perhaps, to inadequate information on emissions or from other information.

Environmental monitoring is an expensive activity particularly if it is to be representative of exposure and is unlikely to be useful without a specific target agent(s). Similarly, environmental modelling has little value in the absence of a target agent whose physical and chemical characteristics are known.

Where a particular industry or other environmental source has been identified by the complainants it is possible to identify target substances which may be monitored, thus providing a focus for the investigation which will greatly reduce cost and increase the effectiveness of the exercise.

### *Points to consider during Stage 2*

*What specific environmental agents should be the subject of monitoring?*

The choice of agents to be monitored cannot, in this instance, be informed by any health information. No symptoms have been alleged. Accordingly, such limitations as may be applied to monitoring must be done through a knowledge of the type of emissions which might emanate from a particular source if statutory and other controls were breached. Such information may be accessed through regulators, the owners and from relevant literature.

*Can knowledge of climatic factors inform the selection of sampling sites and permit the maximum value to be extracted from the exercise?*

Where airborne pollutants are alleged to be hazardous or present a risk, monitoring efforts can be enhanced through a knowledge of wind strength and direction although it may be necessary, for public reassurance, to monitor under a range of climatic conditions and at more than one sampling point. As intimated above, meteorological data is available from the headquarters of the Meteorological Office in Bracknell, Berkshire although, normally, this service will carry a charge

*Is it possible to engage the co-operation of the owner or operator of any site which is a suspected source?*

A knowledge of processes conducted on the suspect site can inform monitoring. It is often possible

to secure the full co-operation of site operators who may regard the allegation as wholly unjustified and be willing to provide information to the EHIT.

### 4.3 Review of health information (Stage 3)

The review of health information may be based on existing data sources (see Box 1 in Section 3 above) or may require the application of a specially produced questionnaire.

The procedure for dealing with Scenario Type 2 is summarised in Figure 2 on page 32.

## BOX 2

**Differentiating between Causality v Association**

Even where there is an established statistical association between an environmental exposure and a health outcome, a decision is required on whether the link is actually causal. Familiarity with a topic permits researchers to dismiss spurious correlations with reasonable certainty. If causal inference is to be drawn in less familiar territory further tests must be applied to the association. The criteria of causality proposed by Bradford Hill retain relevance (Hill, 1965) and set out factors which should be considered when reviewing a statistical association to decide whether a relationship is indeed causal.

**Consistency**

Consistency in an association between an exposure and a health outcome is demonstrated where the relationship is repeatedly illustrated in different populations at different times.

**Strength of Association**

From the perspective of a statistician and epidemiologist the appropriate measure of strength is the difference in the incidence (or prevalence) of disease in the exposed and the unexposed population.

**Specificity**

Suspicion should be attached to a possible causal relationship where the exposure produced one health effect in one situation and quite a different health effect in another. Hill was keen that this criterion should not be over emphasised on the basis that a wide range of diseases could be associated with any given factor. Nonetheless, in reviewing the quality of epidemiological evidence, specificity, if present, provides useful additional evidence.

**Temporality**

A positive temporal relationship is one where cause (exposure) should precede effect (health outcome).

Establishing a causal relationship presents greater difficulty with diseases which develop slowly such as the chronic effects which might derive, say from living in cold/damp housing. For practical purposes, many studies in environment and health use snap-shot measurements of environmental conditions as proxies for exposure while also acknowledging their methodological shortcomings. Yet the chronic diseases or symptoms which they record might plausibly be associated with long periods of adverse exposure. If a prospective cohort study design is not chosen researchers will have to rely on one off snap-shot measurements of environment as it is now using techniques of varying sophistication or will need to establish exposure histories through interview.

Many epidemiological studies fail to meet the criterion of temporality. An important question concerning health is perhaps: "If the symptoms are a succession of separate, yet everyday symptoms, does this equate to a single disease entity with an onset date which can be related to a known exposure history?"

**Dose-Response**

The alternative term "biological gradient" is used by Hill to describe this observation which is amongst the most important criteria for causality.

The logic underpinning the desire to see a dose-response relationship is founded on the simple premise that greater exposure to an adverse environment will, intuitively, result in more severe, or a greater number of symptoms.

Statistical techniques and in particular correlation coefficients can be used to show whether a dose-response relationship exists. The obvious problem in this regard is that of obtaining the satisfactory quantitative measure of dose to justify subsequent statistical analysis.

**Biological Plausibility**

Biological plausibility is often proposed as the most important criterion for causality. It is certainly amongst the most widely debated. Biologically plausibility is determined by the prevailing scientific knowledge which may itself be constrained by contemporary paradigms concerning the causes of illness. Hill proposed a refinement in addition to biological plausibility, namely that of coherence which essentially requires that a proposed cause and effect relation-

ship should not seriously conflict with current understanding regarding the natural history and biology of the disease. The extent to which assessment of biological plausibility is influenced by prevailing knowledge has been an occasional criticism of Hill's criteria (see for example Charlton, 1996) yet a belief in the biological plausibility of an association creates the bridge which enables a linkage of human epidemiological evidence with biological evidence derived from the laboratory etc (Weed, 1997).

It is perhaps inevitable that the development of biomedical knowledge and the accumulation of epidemiological evidence will not proceed at the same pace. There are many examples in medicine where epidemiology has highlighted a relationship between a health outcome and an exposure in the absence of a clear biomedical hypothesis.

**Experimental Evidence**

Evidence from all the laboratory, clinical and other research which might lead to a conclusion of biological plausibility might be cited in satisfying this criterion. However, the experimental evidence implied here has generally been interpreted as evidence from what might be termed "challenge and avoidance" studies. This effectively means an occurrence of a disease, or increase in the incidence or severity of symptoms, corresponding to deliberate exposure to the environment and *vice versa.*

Despite this, challenge and avoidance studies present amongst the strongest evidence of a causal association.

**Analogous Explanation**

In some circumstances, Hill believed that an association revealed by statistical analysis might be strengthened by the existence of analogous causal explanations elsewhere. The example cited was that there would be greater enthusiasm to relate a drug prescribed during pregnancy with a birth defect, in the knowledge that other drugs produced such outcomes. The example quoted was that of Thalidomide.

Charlton, B.G. (1996) Attribution of causation in epidemiology : chain or mosaic? *Journal of Clinical Epidemiology*, **49**, 105-107.

Hill, A.B. (1965) The environment and disease: association or causation? Presidential address to the Royal Society of Medicine. Proceedings of the Royal Society of Medicine.

Weed, D. (1997) On the use of causal criteria. *International Journal of Epidemiology*, **26**, No.6, 1137-1141.

# CONCLUSIONS

## 5. CONCLUSIONS

Summarising Table

Classification of possible scenarios relating to health risks or effects from environmental exposures

| Scenario | Classification |
|---|---|
| Alleged ill-health exists which is perceived to be linked to environmental exposure | 1 |
| Potential source of exposure identified | 1a |
| Potential source of exposure not identified | 1b |
| No ill-health evident but exposure to a known source perceived to be a potential risk to health | 2 |

These guidelines are produced with the intention that they should assist relevant professionals in developing a logical and structured approach in situations where individuals or communities claim their health is being affected by an environmental exposure or harbour concerns that an exposure may present a potential health threat. Departures from the protocols set out in the document may be dictated by the particular circumstances surrounding a complaint but the drafting committee believe the above constitutes a good basis for operation.

In all but the most unusual circumstances a responsible approach demands close co-operation between the agencies concerned. Decisions to follow a particular course in investigation or indeed not to investigate must have the strongest evidential basis. A second key observation relates to communication not just between agencies but also between the agencies and the public and agencies and the media. The information disseminated must be comprehensive, timely and accurate. It should also be clear and consistent, qualities which are best ensured when the EHIT is the only vehicle for communication and its output derives from consensus within the team.

# PRINCIPAL AGENCIES

## 6. THE ROLE AND STATUS OF THE PRINCIPAL AGENCIES

### 6.1 Health Boards

***Aims and objectives***

The role of Health Boards is to fulfil specific statutory obligations in terms of providing health care and to ensure the maintenance of public health for their local population.

***Organisation***

There are 15 Health Boards in Scotland. Health Boards are accountable to the Scottish Minister for Health through the Scottish Health Service Management Executive.

***Health remit***

Each Health Board is responsible for organising the provision of healthcare services for its population. The public health protection role of a Health Board is the responsibility of the Director of Public Health (DPH). The DPH (except in Island Health Boards) normally delegates specific responsibilities for the surveillance, investigation, control and prevention of communicable disease and environmental hazards to a Consultant in Public Health Medicine for Communicable Disease and Environmental Health (CPHM (CDEH)).

The CPHM (CDEH) works closely with a variety of other professional disciplines within the Health Service and with a wide range of disciplines in outside agencies. In particular, the CPHM (CDEH) acts in a statutory capacity as a designated medical officer to the local authorities within the Health Board area. Health Boards and local authorities have a statutory duty to co-operate with each other in maintaining public health. CPHMs would therefore normally have a close working relationship with colleagues in environmental health employed by the local authorities.

***Information Held***

Health Boards have access to health data in the form of Hospital Case Discharge Data (Scottish Morbidity Record (SMR)) and related systems. This information on cases of illness treated in hospital is shared with the NHS Information and Statistics Division (ISD) of the Common Services Agency (CSA). Health Boards also hold demographic data on all patients living in their area who are registered with a General Practitioner, on the Community Health Index (CHI) System. A variety of other computerised database systems (e.g. child health surveillance and community screening) also use the CHI System as a patient identifier.

Most Health Boards will also have access to other morbidity registers or useful data:

- Death, births and still-birth registrations for local population
- Hospital Waiting List Data
- Cancer Registrations
- Lifestyle Information (including *ad hoc* surveys)
- Continuous Morbidity Recording

Health Boards also hold basic demographic data on their local populations in terms of age and sex, and are able to link patients' areas of residence to indices for assessing relative socio-economic deprivation.

## 6.2 Local Authorities

### *Aims and objectives*

There are 32 unitary Local Authorities in Scotland who have statutory responsibility for providing local services and enforcing legislation set by the UK and Scottish Parliaments. The range of services provided include education, social work, housing, roads and transportation, leisure and recreation, and cleansing. In addition, local authorities also have wide ranging enforcement powers in terms of environmental health and these cover such areas as food safety, occupational health and safety, licensing, protection of public health, and environmental control.

### *Organisation*

Most councils have a corporate strategy which sets out the overall aims of the council within a set period (usually around 3 years). Each service department within the council generally has a development service plan which interfaces with the corporate strategy and is reviewed annually to take account of budget and resource availability. Performance of councils is monitored by the Accounts Commission who report annually on the objectives achieved and any deficiencies identified.

### *Health Remit*

Local councils, generally through their Environmental Health Departments, have responsibility to protect and enhance the health of local communities. This is achieved through:

- promoting public health initiatives in terms of partnerships with health boards in response to the White Paper "Towards a Healthier Scotland".
- setting out and establishing local Agenda 21 strategies within local communities.
- monitoring local air quality in terms of Part I of the Environmental Protection Act 1990.
- providing effective refuse collection, waste management and street cleansing services.
- administering the contaminated land provisions of Part IIa of the Environmental Protection Act 1990.
- enforcing licensing and registration provisions in terms of food safety, animal welfare, civic government legislation etc.

- through enforcement policies, ensure effective enforcement action is taken to maintain satisfactory standards in terms of food safety, occupational health and safety, noise control and general public health.

***Information Held***

Local councils have access to and hold a wide range of data in the form of inspection records and reports, records of enforcement action, pollution and monitoring data and sampling data relating to food, water, land and air. In addition, certain legislation such as the Food Safety Act 1990 and the Civic Government (Scotland) Act 1982 require public registers to be maintained.

Requests for information held by local councils should be made in the first instance to the Head of Environmental Health.

## 6.3 Scottish Environment Protection Agency (SEPA)

***Main aim and objectives***

The Scottish Environment Protection Agency (SEPA) was established under the Environment Act 1995 as a Non-Departmental Public Body with responsibility for environmental protection in Scotland. It became fully operational on 1 April 1996. SEPA's main aim is:-

To provide an efficient and integrated environmental protection system for Scotland which will improve the environment and contribute to the Government's goal of sustainable development.

To fulfil this main aim, SEPA must operate as an integrated business in its approach to regulatory matters and in undertaking its wider duty to deliver environmental quality improvements.

The main elements of legislation which SEPA must apply relate to the control of:

- emissions to atmosphere and the aquatic environment;
- the management and disposal of controlled wastes; and
- radioactive substances.

Additional powers and duties continue to be given to SEPA, stemming from the Environment Act 1995 and through regulations implementing a range of new EC Directives. A list of SEPA's principal duties and functions is given in its Corporate Plan.

***Organisation***

SEPA operates within a framework agreed with the Scottish Ministers, who also appoint the Main Board. The Main Board comprises a Chairman, a Deputy Chairman and 10 members, including the Chief Executive and has ultimate responsibility for the organisation. The day-to-day running and

management of SEPA is the responsibility of the Chief Executive, supported by the Management Team. SEPA also has three Regional Boards, each chaired by a member of the Main Board.

***Health remit***

SEPA is concerned with the protection of Scotland's environment and for improving its quality and therefore tends to be indirectly involved with the protection of public health. However a number of SEPA's statutory powers and duties do make specific reference to health protection, for example:-

- through the waste management licensing system, SEPA ensures that waste is not treated, transported, kept or disposed of in a manner likely to cause pollution of the environment or harm to human health.
- SEPA has an objective to protect human health and environmental quality through the regulation of the safe keeping, use and disposal of radioactive sources and radioactive waste.
- the contaminated land provisions of Part IIA of the Environmental Protection Act 1990 require that land be remediated where it is designated as contaminated on the basis of pollution of controlled waters, or harm to human health, ecological systems or property. SEPA has a duty to secure the remediation of special sites.
- The Pollution Prevention and Control (Scotland) Regulations 2000, which progressively replace Part I of the Environmental Protection Act 1990, defines a permitting regime regulated by SEPA to control all emissions which, "may have significant negative effects on human beings or the environment".

***Information held***

In the course of undertaking its duties, SEPA collects and holds a variety of information on the release of substances into the environment. The information tends to be collected through submission of applications for consents, licences, authorisations etc., issue of consents, licences, authorisations etc., emissions monitoring and information obtained through background monitoring programmes. A summary of the types of information held is listed below:

*Public Registers*

The Public Registers contain basic information required by statute on applications, licences, emissions monitoring, convictions etc. relating to the following provisions:

- The Groundwater Regulations 1998 - applications and authorisations of disposal of listed substances to land including variations, revocations and monitoring information. Notices to prevent or control indirect discharges of listed substances arising from various activities.

- The Waste Management Licensing Regulations 1994 - information relating to the storage, treatment or disposal of waste including landfill site licences, exemptions to licences, applications, working plans, inspection reports, monitoring information, modifications, revocations, suspensions, appeals, surrenders, convictions.
- Part I Environmental Protection Act 1990 - applications, authorisations, variations, appeals, restrictions, monitoring records, enforcement and prohibition notices, revocations, convictions/ appeals etc. related to Part A (IPC) and B processes from 1 April 1996 onwards.
- Control of Pollution Act 1974 - discharge consents, applications, decisions/appeals, revocations, monitoring records, reviews.
- The Control of Major Accident Hazards Regulations 1999 - Regulation 6 and 16 notifications, safety reports.
- The Pollution Prevention and Control (Scotland) Regulations 2000 - site reports, applications for permits and for surrender of permits.
- Radioactive Substances Register - information relating to the use, accumulation and disposal of radioactive materials.
- Special Waste Notifications - consignment notes, disposal and location records (non-commercially confidential), summaries of Special Waste

It should be noted that certain information may be withheld from the public register on the grounds of commercial confidentiality or national security.

*General Information*

A variety of data are held by SEPA as a result of background monitoring programmes undertaken by SEPA. The extent of availability, the format, and how the information can be accessed, varies but typically comprises of chemical and biological indicators of water quality data which is used to classify the quality of watercourses.

## 6.4 Information and Statistics Division (ISD)

***Aims and objectives***

The Information and Statistics Division (ISD Scotland) is part of the Common Services Agency for the NHSiS.

# PRINCIPAL AGENCIES

ISD Scotland has four principal functions:

To collect, collate and maintain a wide range of National Health Service data sets.
To provide information, statistical and IT services to the NHSiS, other public sector organisations, members of the public and commercial organisations.
To complement these services with interpretation and/or statistical advice on health data.
To further the overall aims of the NHSiS through the best use of IT.

***Organisation***

ISD Scotland consists of a number of Units covering data input, output and analysis. For management purposes the Units are arranged into homogenous clusters as follows:-

- Standards, Input and Development
- Workforce, Hospital & Outcomes
- Cancer and Record Linkage
- Customer Services
- General Practice Administration System for Scotland
- Information Systems Support Group
- Primary Care Output
- Personnel and Finance

***Health Remit***

Historically, ISD has been the principal source of comparative health service data and provides information and statistical services to the NHSiS, other public sector organisations, members of the public and commercial organisations.

The Division's main output remains the provision of comparative information relating to hospital, family practitioner and community activity and performance, the incidence of particular types of morbidity, programmes to monitor and screen particular sections of the population, and information on manpower and finance in the whole NHSiS to account to Parliament, and hence the public, for NHS spending.

This is achieved through the following broad groupings of services to the Department:-

- establishing the corporate database for the National Health Service in Scotland and maintaining it to agreed quality standards **(Data Services)**

- analysing the data to provide routine products and services **(Information Services)**

- providing a comprehensive and cost-effective source of statistical advice and analytical support to customers on all aspects of health statistics **(Statistical Intelligence Services).**

*Main users of ISD data and information services*

The main users of ISD Services are:

- The SEHD Management Executive.
- Secondary/acute health services, Primary Care Trusts and (LHCCs).
- Health Boards
- General Medical Practitioners, Pharmacists & General Dental Practitioners
- Scottish Dental Practice Board
- Local Authorities
- Universities
- Members of the public

## 6.5 The National Society for Clean Air and Environmental Protection

***Main aim and objectives***

The National Society for Clean Air and Environmental Protection (NSCA) is a non-governmental organisation and a registered charity. It was founded as the Coal Smoke Abatement Society in 1899, but today it has widened its interests and the scope of its activities and influence.

The Scottish Division is run by an Executive Committee. A part-time Administration and Support Manager is based in Glasgow. The Scottish Division run at least three seminars per year as well as an AGM. Funding is derived from a variety of sources including a grant from the Scottish Executive.

NSCA is a member of the International Union of Air Pollution Prevention and European Environmental Bureau.

NSCA's objectives are to secure environmental improvement through the reduction of air pollution, water and land pollution, noise and other contaminants, while having due regard for other aspects of the environment. The Society examines questions of environmental policy from an air quality perspective and aims to place them in a broader social and economic context.

The Society is recognised nationally and internationally for its balanced arguments, response to issues, integrity and promotion of public education. Policy discussion and formulation is initiated by NSCA Divisions and at the annual conference as well as within the Council of the Society. Policy details are evolved by the appropriate committees and working groups.

# PRINCIPAL AGENCIES

***Organisation***

The elected Board of Trustees is the Society's governing body. An elected Council, supported by specialist committees and working groups, considers overall policy and specific issues. The Society is divided into geographical divisions that organise meetings and activities at a regional level. An administrative staff headed by the Secretary General is employed and based in Brighton.

NSCA membership is largely made up of organisations with a direct involvement in environmental protection. Membership is also available to private individuals with a particular interest in its activities.

***Health remit***

NSCA makes representations to Government, other authorities, agencies and industry on all matters relating to air pollution, noise, contaminated land, waste and other environmental issues. This includes the drafting of legislation and standards, technical matters and local and national issues.

NSCA organises conferences, seminars and workshops, produces a wide range of information including educational publications, promotional material, technical papers and regular briefings on current issues. An annual Pollution Handbook and bi-monthly journal Clean Air are also published.

The Society's library and information department, which is part funded by the Department of the Environment, Transport and the Regions, provides a service both to members and the public.

The core activities of NSCA - Scotland are

- Air Quality Management
- Industrial Regulation and IPPC
- Fuel Quality and Vehicle Standards
- Noise
- Sustainable Development and Local Environment Management
- Climate Change
- Waste and Water Quality
- Acidification
- Contaminated Land
- Radiation
- Health Promotion

## 6.6 Royal Environmental Health Institute of Scotland (REHIS)

### *Aim and objectives*

The Royal Environmental Health Institute of Scotland was formed in 1983 following an amalgamation of the Royal Sanitary Association of Scotland (founded in 1875) and the Scottish Institute of Environmental Health (founded in 1891).

The Institute's main objectives are to:

- promote the advancement of health, hygiene and safety
- take cognisance of health, safety and environmental legislation
- stimulate general interest in all questions connected with public health and safety
- promote and maintain high standards of professional practice and conduct on the part of Environmental Health Officers, Red Meat Inspectors, White Meat Inspectors and Food Safety Officers in Scotland.

### *Organisation*

REHIS is governed by the Executive Council. The role of the Council is to:-

- meet to despatch the business of the Institute
- promote the advancement of health and hygiene, to take cognisance of legislation, to stimulate general interest in health and hygiene, and to disseminate such knowledge for the benefit of the community at large.
- convene and hold general meetings of the Institute.
- delegate powers or duties to sub-committees.
- make bye-laws for conducting the proceedings of the Institute.
- promote legislation and to petition, for or against, any legislative measures.
- draw up and adopt and from time to time alter or amend a Code of Professional Practice applicable to Environmental Health Officers in Scotland.

## 6.7 Scottish Centre for Infection and Environmental Health (SCIEH)

### *Aim and objectives*

SCIEH's principal aim is to improve the health of the Scottish population by providing the best possible information and expert support to practitioners, policy-makers and others on infectious and environmental hazards. SCIEH seeks to achieve this through a range of activities including its 24 hour on-call advice and operational support facility, by the conduct of surveillance, by education

and training of relevant professionals and by engaging in research into infectious and environmental hazards.

***Organisation***

Based in Glasgow but with a Scotland-wide remit, SCIEH is a Division of the Common Services Agency (CSA) of the Scottish Health Service. It was created in 1993 following the amalgamation of the Communicable Diseases (Scotland) Unit and the Environmental Health (Scotland) Unit. The organisation has a staff of approximately 85, representing a wide range of skills including environmental health, public health medicine and epidemiology, veterinary science, microbiology, environmental chemistry, occupational health and information technology.

***Health Remit***

The Centre is responsible for the national surveillance of the communicable diseases in Scotland and collates and interprets data from statutory notifications of the infectious disease, laboratory isolates of selected pathogens and data from spotter practices. SCIEH is currently developing and piloting environmental health surveillance for Scotland, which, if adopted nationally, will ultimately provide an accessible national source of temporally and spatially defined environmental exposure data. Drawing on experience supported by biomedical, toxicological and epidemiological evidence, staff offer advice and operational support to health boards, local authorities and others on the health effects of environmental exposure and the conduct of epidemiological studies. Regular education and training on environmental and infectious hazards is offered to key public health professionals in Scotland. Staff of the organisation have significant involvement in research including studies to elucidate the links between environmental exposures and human health.

***Information held***

SCIEH's principal datasets relate to the incidence of infectious disease and laboratory isolates within Scotland. Through its partnership with the Information and Statistics Division, a sister Division within the CSA, SCIEH may be a vehicle for access to surveillance data relating to diseases of non-infectious aetiology. SCIEH disseminates the products of its surveillance activity with informed commentary and other health related information through its Weekly Report and otherwise through occasional publications.

# APPENDIX 1

## COMMUNICATING WITH COMPLAINANTS

The Environmental Health Incident Team (EHIT) must give priority to creating and maintaining clear lines of communication with complainants or their representatives. In the context of this document the demands relate to communicating risk in absolute and relative terms and to conveying the decisions of the EHIT in an appropriate manner. For example, in some cases it may be necessary to state that no further investigative action is warranted when such a message may run contrary to the wishes of complainants. It has been said that while debates about health risks are seldom only about communication, poor communication is very often a factor. To be seen to listen and respond appropriately provides credibility to the communicator. Clearly not all situations or complainants are the same and it is not possible to be prescriptive regarding the strategies adopted. Many factors influence individual or community perceptions of risk and it is wise to make some attempt to understand what these may be in any case. Only through this process are the challenges of communication likely to emerge. However, despite the widely varying circumstances certain general principles of good communication are likely to apply in most cases. The Department of Health has recently produced guidance aimed at assisting those involved in undertaking such a task the general principles of which are set out below for reference purposes.

### *Planning a communication strategy*

- Identify aims
- Identify key stakeholders (some of these may be represented on the EHIT but the team should make every effort to identify those who may be affected by the perceived threat or by the decisions of the EHIT)
- Identify how the risk(s) or decisions may be perceived by different stakeholders
- Identify any apparent inconsistencies with previous messages or other actions
- Where the problem is likely to be ongoing, e.g. if an investigation is undertaken, put mechanisms in place for keeping all the above under review
- Consider when to communicate, who to communicate with, what to communicate and how to communicate.

### *The process of communication*

- Identify anyone outside the EHIT who may require to be involved at each stage of message preparation and release;
- Identify what other actions are being taken to deal with the risk.

# APPENDIX 1

*It is important that the mechanisms employed for involving other key stakeholders are clear and decisions taken are on a consistent and defensible basis.*

***The content of communication***

- Ensure statements issued address the likely concerns of the audience (i.e. perceived fairness, or a need to vent anger) as well as providing factual information;
- Acknowledge uncertainties in scientific assessments where these exist
- In statements giving information about relative risks
  - if relative risks are cited that the baseline risk is made clear;
  - any risk comparisons should be relevant to actual choices.
- Acknowledge benefits as well as risks.

***Monitor decisions and outcomes***

- Set up procedures to monitor actions and results
- Review the strategy and outcomes
- Disseminate lessons for future practice

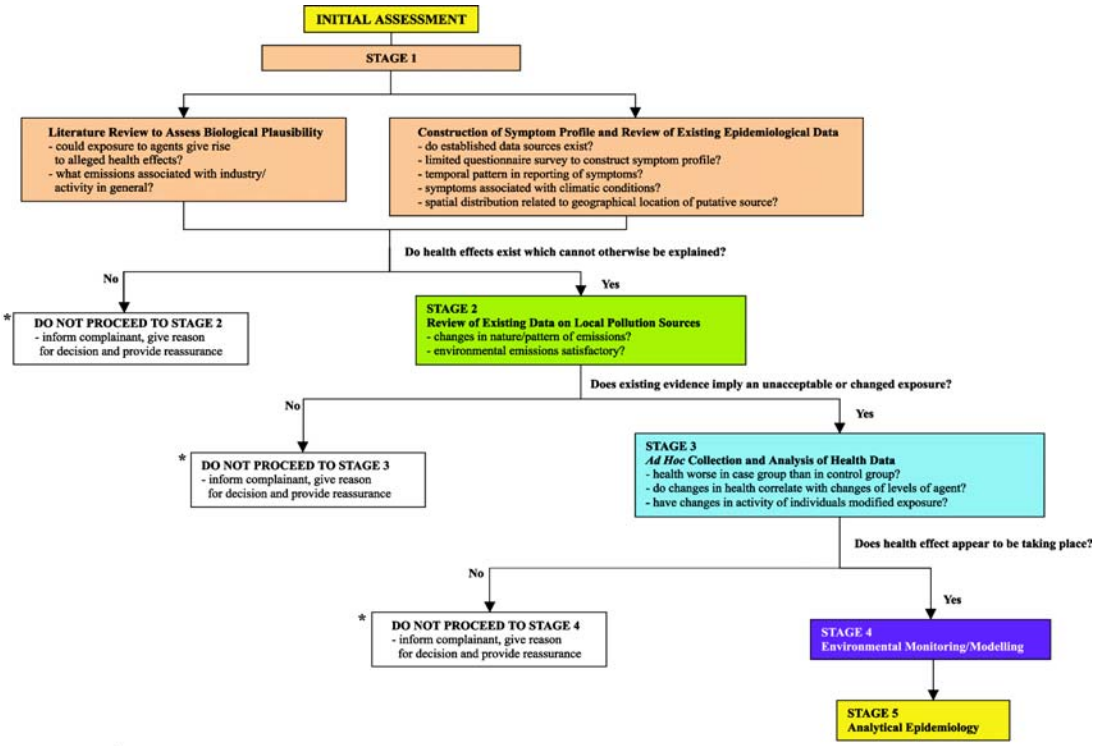
*The communication of risks should be recognised as an essential skill, acquired through training and experience. Useful sources of information for the non-expert include:*

ILGRA (1998). Risk Assessment and Risk Management: Improving Policy and Practice within Government Departments. Available from the Health and Safety Executive.

Bennet (1998). Communication About Risks to Public Health: Pointers to Good Practice. Available from the Department of Health.

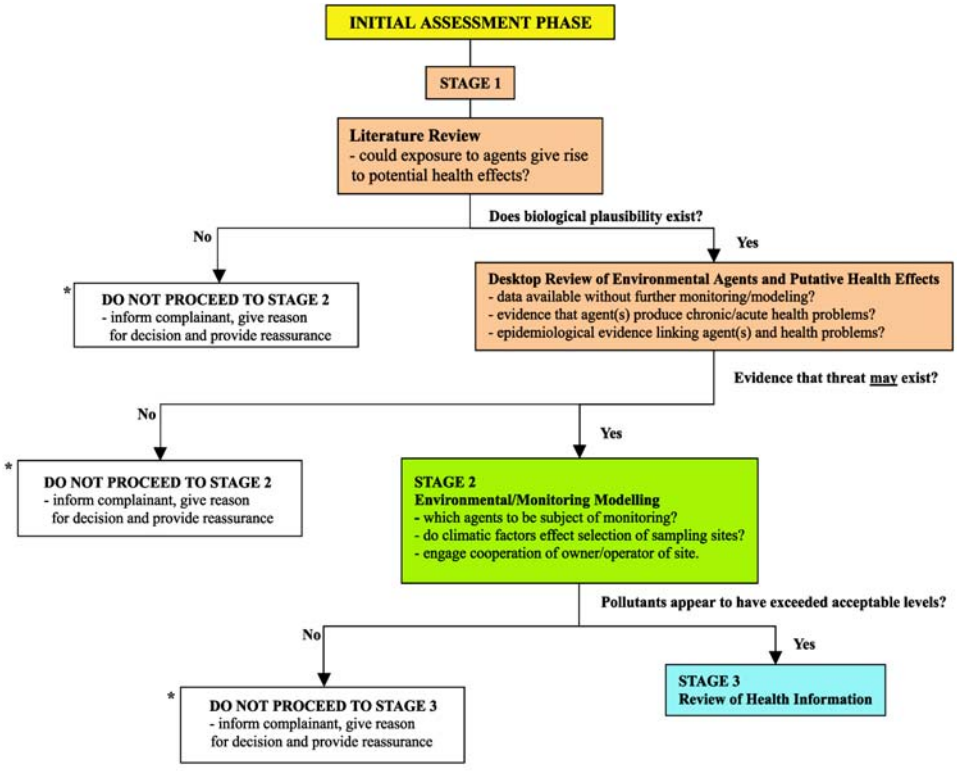
SNIFFER (1999). Communicating Understanding of Contaminated Land Risks. Available from the Foundation for Water Research.

## FIGURE 1 - ILL-HEALTH IS ALLEGED TO BE LINKED TO ENVIRONMENTAL EXPOSURE (SCENARIO TYPE 1a and 1b)




*Open and frank communication with complainant (s) is essential at all stages to ensure concerns are addressed.

## FIGURE 2 - NO ILL-HEALTH EVIDENT BUT EXPOSURE TO SOURCE THOUGHT TO BE POTENTIAL RISK TO HEALTH (SCENARIO TYPE 2)




*Open and frank communication with complainant (s) is essential at all stages to ensure concerns are addressed.