Developing policies for a healthy environment

MICHAEL JOFFE
Department of Epidemiology and Public Health, Imperial College School of Medicine at St Mary’s, London, UK

JILL SUTCLIFFE
Imperial College Centre for Environmental Technology, London, UK

SUMMARY
The health of a population is largely determined by factors outside the jurisdiction of health ministries and health services. Although it is widely recognised that policies in ‘non-health’ areas need to take health into account, it is unclear how this should best be achieved. The analogous problem, of taking environmental criteria into account in general policy implementation, is addressed by preparing an Environmental Impact Statement (EIS) on projects such as the building of a new power station or a motorway. This is a legal requirement in most countries, at least for major projects. Although health is mentioned in most of the legislation, in practice health impacts are rarely systematically included. It is suggested that, in future, EISs should include health impacts, and that in other situations where an EIS is not appropriate, an analogous process should be carried out to examine health effects. This would be more appropriate if carried out at a higher level than specific projects, and at an earlier stage, in the formulation of policies, programmes or plans. Quantitative health risk assessment is a necessary part of the process. The starting point should be a list of possible options for addressing an identified health need: a multidisciplinary statement should be prepared, that includes economic and social impacts, ecological analysis, and issues of public information and consultation, as well as technical and scientific issues.

Key words: environmental impact assessment; environmental impact statement; health audit; health protection

BACKGROUND
Many of the major determinants of health, disease and death are environmental risk factors, in the sense that they are not individually chosen aspects of lifestyle. They may be directly harmful, as in the examples of exposure to occupational chemicals or to domestic radon; they may be natural, as in the latter case, or generated by human activity, as in the former. They may also alter people’s susceptibility to disease, for example the availability of sufficient food. In addition, they may operate by making unhealthy choices more likely, for example the availability and affordability of illegal drugs or tobacco, and also the advertisement of the latter.

Typically, these factors lie outside the jurisdiction of health services and health ministries. 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.

The crucial importance of the environment is well established in relation to the unprecedented improvement in health that occurred in Britain in the late nineteenth and early twentieth centuries, before the availability of effective medical interventions such as immunisation (apart from vaccination against smallpox) and antibiotics (McKeown, 1979). The major improvements
were in the availability of food, purified water
and sewage disposal, clean milk and food
hygiene, and improved working conditions, in
approximately that order both temporally and
in terms of their importance; together with a
voluntary decline in the birth rate. A similar
dependence has occurred elsewhere, and the
potential now exists for this to be generalised
even to the poorest parts of the world, if appro-
appropriate policies are adopted.

For most of this century, health policy has
neglected the environmental aspects, concentrat-
ing on personal health services (including preven-
tive measures such as screening and immuni-
sation), together with an individualistic
view of health education. More recently, there
has been increasing recognition of the need not
only to link health and environment, but also to
extend their consideration into other policy areas,
both officially [Department of the Environment,
1990; World Health Organization (WHO), 1992;
Commission of the European Communities,
1993] and by the medical profession (Draper,
1991; Godlee and Walker, 1992; Chivian et al.,
1993; McMichael, 1993; Lancet, 1994).

The need for policy in non-health areas to take
account of health has long been emphasised by
the WHO: the need for ‘intersectoral’ action is a
key component of its ‘Health for All’ strategy
(WHO Regional Office for Europe, 1985). The
European Union (EU) has explicitly recognised
this more recently, and potentially more effect-
ively given its politico-legal powers and greater
budget. Article 129, the section of the Maastricht
Treaty that gives the EU a general health com-
petence for the first time, includes the statement,
‘Health protection requirements shall form a
constituent part of the Community’s other poli-
cies’ (Commission of the European Commu-
nities, 1992). This sentence is derived from a
similar but earlier European competence in the
area of environmental protection in other (non-
environment) policy areas, such as energy and
transport.

However, it is less clear how to achieve these
aims in practice. For example, there is currently
considerable public and official concern over
possible health effects of ambient air pollution,
especially that generated directly or indirectly by
motor vehicles. It is an area in which official
bodies have been active for many years, and in
which policy has been largely driven by health
considerations: the response has been to set
guidelines (WHO), limit values (EU) and air
quality bands (UK Department of the Environ-
ment). Yet it remains difficult to use this infor-
mation to develop effective policy: in the acute
situation, when the threshold is exceeded, it is
unclear what action is appropriate, in the absence
of clearly effective interventions to protect health.
For longer-term policy development on, for ex-
ample, traffic emission standards, inspection and
maintenance, traffic reduction, improvements in
fuel quality, or support for development of clea-
ner technologies, it is unclear what health benefits
can be expected to follow each of the possible
policy options.

There is a need for a process that considers
each option, and documents not only the poten-
tial for health gain, but also the other aspects,
both positive and negative. This would be inter-
disciplinary, requiring integration of several dis-

tinct types of information: (a) bio-medical
science, to explain what needs to be changed,
and why, together with (b) technical data, to
investigate how it can be done; (c) social and
economic information is essential, not only to
estimate costs, but also to analyse which groups
stand to gain or lose, as equity is an important
consideration; (d) finally, an ecological analysis is
needed, to examine the wider ramifications. The
process also involves different types of input,
including professional advocacy, the media and
the private sector. Good public information and
public consultation are essential.

In general, a number of different policy options
need to be considered, and each will involve
trade-offs, not only between health-motivated
and economic considerations, but also within
the health/environment area: for example, diesel
globes produce less carbon dioxide, owing to
greater efficiency, but they also emit the particu-
late matter that is currently giving rise to concern
on health grounds.

Detailed consideration of the available types of
policy measure is beyond the scope of this paper.
In brief, these include regulation, economic (e.g.
fiscal) measures, construction (e.g. traffic cal-
ming), and provision of information. In all cases,
there should be transparency of the policy pro-
cess, together with public consultation at the

crucial stages. They can be positive inducements
or negative sanctions (e.g. subsidies or taxation,
respectively). In general, a mixture of carrot and
stick is likely to be the most effective; for ex-
ample, provision of better public transport plus a
steep increase in parking charges (Royal Com-
mmission on Environmental Pollution, 1994).
A MODEL TO CONSIDER: ENVIRONMENTAL IMPACT ASSESSMENT

The connection between health and environment can fruitfully be explored for another reason: environmental protection is a useful analogy for health policy, having many of the same requirements but in many ways being further advanced. It is therefore useful to examine what can be learnt from the methods that have been developed in the environmental policy area.

Concerns about environmental damage on a widespread basis emerged during the 1960s. That is not to say that environmental damage, or concern over it, started then, but the scope and consequences of that damage began to be identified on a larger scale than before. The scale shifted from local (e.g. a pollution incident) to national (e.g. provision of water supply) to regional (e.g. the link between burning fossil fuels and acid rain) to global (e.g. climate change). Individual areas of pollution abatement had already entered the legislative framework in a piecemeal manner (Alkali Act 1863; Clean Water Act 1865; Rivers Pollution Prevention Act 1876; Clean Air Acts 1956 and 1968) but the need to safeguard the interlinked web of life had not.

Environmental Impact Assessment (EIA, called EA in the UK), is one of the strongest tools for ensuring that the environment is taken into account when projects are undertaken within policy areas such as energy and transport. It is a method by which the environmental impacts of proposed developments are examined and considered in advance of a decision being taken. For large developments such as power stations, airports and motorways, this is a legal requirement, while for other projects an assessment is discretionary, for example, windfarms or marinas.

The results of the assessment are presented in an environmental impact statement (EIS, called ES in the UK) and include the following.

- A description of the site and the development proposed.
- Baseline information.
- Likely effects deemed to be significant and the method by which that has been determined. Impacts to be examined include: 'direct and indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the project' (Department of the Environment, 1989).
- The means by which such impacts can be avoided, reduced, minimised or remedied.
- A non-technical summary so that members of the public can understand the implications.

According to the Department of the Environment, ‘A good EIS should enable readers to form their own judgement on the significance of the environmental issues raised by the project’ (Department of the Environment, 1989).

The original legislation appeared in the United States in 1969. The enactment of the National Environmental Policy Act in 1969 (cited in Yost and Rubin, 1993) followed pressure by ecologists keen to have the concerns of their discipline taken into account by planners and decision-makers. In California, a ‘project’ was defined as an activity directly undertaken, supported or approved by a public agency—almost any conceivable action taken by a public agency thus fell within it (Webb and Segal, 1992).

The impact of the legislation itself was far greater than could have been predicted. Over 100 countries now have some type of EIA approach, ranging from sponsor-related assessments, through guidelines and regulations, to legislation. The EU adopted its Directive on Environmental Assessment in 1985 (Commission of the European Communities, 1985) and gave member states 3 years to adopt it. In July 1988, the UK enacted this Directive via its Town and Country Planning Act (UK Government, 1988) and has some 20 sets of regulations.

Health was included in the original EIA legislation and in many acts that followed. However, while the legislation specifies that health should be included, surveys of EIS in the USA (Canter, 1990), the UK (Sutcliffe, 1995), and in Germany (Kobusch et al., 1994) have shown that it is not being translated into practice.

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 a specific project such as a new runway or power station. Although it is perfectly possible to envisage a proposed bypass, say, being evaluated from a health viewpoint, it would probably be more effective to examine the whole context.

This links with a question that has already emerged in the EIA literature: that the focus on projects is already too late in the decision-making process, so that it excludes consideration of alternatives and fails to consider synergistic/
cumulative impacts. The suggestion is that environmental assessment should be carried out at the level of a policy (the ways in which government seeks to achieve the objectives which it sets itself in a particular area), or of a programme or plan (sets of related activities which give effect to policy); in this perspective, projects are discrete activities usually at specific locations (Department of the Environment, 1991). Although this ‘strategic environmental assessment’ (SEA) was provided for in the original US legislation, it is only recently that it has started to be developed within environmental practice, for example in Canada and New Zealand.

The recommendation of an SEA approach to health protection arises from a perception that the situation requires it, not from the existence of an established body of knowledge and experience. SEA involves a rather different way of thinking from established EIA practice. The techniques have not yet been fully developed, and anxiety is sometimes expressed that its broader focus makes it less precise. However, health impacts on large populations tend to be easier to quantify than those at the local project level, therefore the broader perspective may well be more manageable rather than less, for the purpose of assessing health effects. It will be necessary to build up experience by using case studies, to develop the necessary methodology.

There are two principal ways in which health policy could benefit from the existence of EIA. First, in situations where an EIS is being prepared, health impacts need to be included. Secondly, in situations where an EIS is not appropriate, an analogous process could be carried out with the aim of improving the health outcome—an idea which has gained some currency under the term ‘health audit’ (Joffe, 1993). This may occur because environmental effects, apart from an impact on human health, are not likely to occur. Examples include radon, which is thought to be responsible for an increased risk of lung cancer in certain geographical areas, and the ‘nutritional environment’—the ready availability of healthy food choices at affordable prices. In both types of case, ways need to be found to develop the technical means of doing this, and to overcome the institutional barriers that stand in the way.

THE ROLE OF RISK ASSESSMENT

In determining risk, a key issue is the role of risk assessment (RA). This is a method for estimating the health impact of a particular risk factor, such as a chemical agent. It is a quantitative technique which is quite narrow and specialised, in contrast to EIA which has a broad scope.

It seems reasonable to think of RA and EIA as complementary—especially in a health context where RA is necessary to quantify the health risk. While RA has been seen as a part of EIA in the USA, the two have developed separately in Europe: EIA within statutory authorities, from administrative reform and public accountability; and RA as a management technique in the hands of experts, largely in the non-governmental sector, for example in the chemical and insurance industries. In European legislation, the Seveso Directive covers RA and is considered separately from EIA. However, there is growing recognition that convergence of the two approaches would have some advantages, not least that this may lessen the shortcomings of either when used alone.

Risk assessment has four components: (a) hazard identification—establishing whether there is any effect on health; (b) dose–response assessment—description of the relationship between the concentration of the agent and its health effect (e.g. the presence of a threshold); (c) exposure assessment—documenting the distribution of the actual concentrations that are likely to occur; and (d) risk characterisation—combining these three types of information to derive an estimate of the likely health impact attributable to that risk factor. The disciplines that contribute to RA are toxicology, epidemiology, exposure assessment and modelling.

In carrying out an RA, attention needs to be given to possible impacts on sensitive sub-groups of the population, defined, for example, in terms of age or clinical condition.

Uncertainty is an inherent part of RA. Animal experiments often provide the basis for estimates that are then extrapolated to humans, with appropriate safety factors. Whenever possible, it is preferable to use data derived from humans. Effects at low doses tend to be inferred from results obtained at high doses, as the former may be so uncommon that their demonstration may not be practicable. While statistical analysis requires large numbers, this is not always achievable. The effects of mixtures are difficult to
discern, especially where synergistic and other interactive effects are concerned. The accuracy and completeness of the data are likely to be problematic. Modelling can be used, but is fallible: there is the possibility of leaving out a potential exposure pathway, and models may well not reflect reality accurately.

CONCLUSION

Health policy development would benefit from the introduction of a type of process similar to an EIA, either within such an assessment where appropriate, or as a separate but analogous exercise. In each case, this would start by identifying a health need, together with a list of possible interventions. For each of these, it would then be necessary to establish its effectiveness in terms of the associated health gain, as well as its feasibility, time-scale and cost (including opportunity cost), and other effects, including the positive and negative impacts on specific groups, and what are the environmental/ecological effects and other wider considerations. The most appropriate level would be higher than individual projects, either programmes/plans, or in actual policy formulation.

ACKNOWLEDGEMENTS

The authors would like to thank Professor Nigel Bell for helpful comments on an earlier draft of this paper.

Address for correspondence:
Michael Joffe
Department of Epidemiology and Public Health
Imperial College School of Medicine at St Mary’s Norfolk Place
London W2 1PG
UK

REFERENCES


Department of the Environment (1990) This Common Inheritance, Britain’s Environmental Strategy. HMSO, London.


Kobusch, A.-B., Fehr, R. et al. (1994) Development of health impact assessment in EIA in Germany. Presentation at 14th IAIA conference, Quebec.


