HSE CONTRACT RESEARCH REPORT No. 55/1993

ATTITUDES TOWARDS NOISE AS AN OCCUPATIONAL HAZARD

VOLUME THREE: LITERATURE SURVEY AND REVIEW OF PUBLIC AWARENESS CAMPAIGNS

Thomson-MTS and Building Use Studies
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This study investigated attitudes to noise as an occupational hazard among the workforce and management in a variety of industries. The objectives are to understand the individual and organisational factors operating in the workplace which affect attitudes towards noise-induced hearing loss and to determine the standards of hearing conservation achieved in the United Kingdom. It involved a national survey of 48 organisations and a more detailed examination of ten of these as case studies, using desk research, objective audits of hearing conservation programmes, a questionnaire for members of the workforce and interviews with management, health and safety personnel and shop floor workers. There are three main findings. Firstly, individual psychological factors are less important in achieving a high level of hearing protector wearing among the workforce than management rules and peer norms. Secondly, workforces accept management rules about wearing hearing protectors provided these are reinforced by training and by an obvious management commitment to hearing conservation. Thirdly, an effective hearing conservation programme requires three management attributes: senior management commitment, the ability of middle management (particularly in production and engineering) to put hearing conservation measures into practice, and specialist technical knowledge of noise and of the legislation.

This report and the work it describes were funded by the Health and Safety Executive. Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.
ATTITUDES TOWARDS NOISE AS AN OCCUPATIONAL HAZARD

VOLUME THREE: LITERATURE SURVEY AND REVIEW OF PUBLIC AWARENESS CAMPAIGNS

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CHAPTER ONE: CONTEXT AND AIMS

1.1 INTRODUCTION

In 1989, the HSE invited proposals for a study of the influences of perceptions and attitudes towards noise as an occupational hazard. The aim of the study was to assist the HSE in understanding the current awareness of the problem of noise as an occupational hazard, the current level of implementation of noise protection measures in the workplace in the United Kingdom, the perceptions and attitudes of the management and workforce involved in hearing conservation and the main influences on their perceptions and attitudes. The purpose of this was to help guide HSE strategy in raising awareness of the problem and in achieving better compliance with the Noise at Work Regulations.

The study used a mixture of field research and desk research in order to:

• ascertain the level of awareness of the problem of noise as an occupational hazard and the level of noise-reduction and hearing protection measures already taken by organisations, as a gauge of the effectiveness of previous HSE noise awareness campaigns;

• investigate the factors involved in reducing occupational noise exposure;

• develop an understanding of why many individuals and organisations fail to take steps to minimise the risk of occupational noise-induced hearing loss;

• examine the motivations of, and influences on, managers, the workforce and others regarding noise-reduction and hearing protection measures;

• investigate the forms of campaign which are most likely to be effective with the relevant groups in the light of the findings of the study.

The study is described in three volumes.

• Volume One, the Summary Study Report, contains an overview of the entire study. It is designed to be read as a stand-alone document for people who want rapid access to the main findings, conclusions and recommendations of the study.

• Volume Two, the Detailed Report of the Study, is a comprehensive description of the study and its findings, including conclusions and recommendations. A detailed description of the aims of the study is included in Volume Two.

• Volume Three, the Literature Survey and Review of Public Awareness Campaigns, contains a brief review of the literature on noise induced hearing loss and on attitudes in the context of work and of risks to health. It also contains a description of a number of public awareness campaigns.
1.2 PURPOSE AND STRUCTURE OF THIS VOLUME

This volume, Volume Three, contains the literature survey and case studies of public awareness campaigns. The aim of this volume is to provide background information for anyone coming to the study without a detailed knowledge of the topics involved. Chapter One reviews the literature on noise induced hearing loss to ascertain the fundamental nature and scale of the problem. Chapter Two summarises the psychological literature on attitudes and behaviour change to provide an overview of the theoretical issues involved; this covers a number of areas including risk, health and safety in the workplace, and attitudinal factors in the wearing of hearing protectors. Chapter Three is a review of other public campaigns aimed at changing attitudes and behaviour, to determine what lessons can be learnt from these.

This literature review has been prepared as a working tool for the research. Its aim, therefore, is to give a general survey of the field, with more detailed examination of those parts which appear likely to contribute to the empirical work such as the development of the questionnaire.\(^1\) It might, in future, form the basis of a briefing document for use by agencies not primarily engaged in noise-related work, but who may come to play a role in the HSE's efforts to achieve changes in attitude and behaviour.

\(^1\) Thus, it does not include a critical analysis of the literature, since this would have required a narrower focus and much more detailed appraisal than was appropriate within the context of the whole study.
CHAPTER TWO: NOISE INDUCED HEARING LOSS

2.1 AN INTRODUCTION TO NOISE INDUCED HEARING LOSS

This chapter outlines the nature of noise induced hearing loss and the development of noise control legislation in the United Kingdom. This is followed by a discussion of practical hearing conservation programmes that are used in industry and an examination of the use of hearing protectors. Hearing protectors are discussed in detail because it is at this level that the attitudes of individuals make an impact on hearing conservation.

2.1.1 Sound and noise

Noise is a large and increasing problem in the industrialised nations. The World Health Organisation claims that "10-20% of the European populations are exposed to sound well above acceptable levels" and it forecasts a 30% increase in community noise levels in Europe by the year 2000. Noise is also widely recognised as a major, and underestimated, industrial hazard.

Noise is technically defined as unwanted sound: a definition which emphasises that the distinction between sound and noise is a matter of psychological judgement and does not involve a physical difference. Commonly, this distinction is ignored and the terms 'sound' and 'noise' are used interchangeably. This paper will follow this convention.

Sound is assessed by means of a measure of sound pressure called a decibel; in nearly all cases, this is adjusted to take greater account of frequencies in the range of human hearing, giving the A-weighted decibel or dB(A). The decibel measure is used on a logarithmic scale, so that an increase of 10 dB represents a tenfold increase in intensity, and an increase of 3 dB represents approximately a doubling of sound intensity. The scale runs from 0 dB, which is the threshold of hearing at a frequency of 1000 Hertz, to above 150 dB, when instantaneous damage to hearing occurs. Some typical sound levels are shown below.

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3 Pearce (1985); TUC (1986).
4 Taken from CBI (1983) p.15.
Figure 2.1 Typical sound levels

<table>
<thead>
<tr>
<th>Sound Level (dB(A))</th>
<th>Description</th>
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<tr>
<td>0</td>
<td>Threshold of hearing.</td>
</tr>
<tr>
<td>30</td>
<td>Subdued speech.</td>
</tr>
<tr>
<td>50</td>
<td>Normal conversation.</td>
</tr>
<tr>
<td>60</td>
<td>A typical office.</td>
</tr>
<tr>
<td>80</td>
<td>Vehicular road traffic.</td>
</tr>
<tr>
<td>90</td>
<td>Typical lathes.</td>
</tr>
<tr>
<td>100</td>
<td>Pneumatic drill; weaving shed; metal working shop.</td>
</tr>
<tr>
<td>110</td>
<td>Woodworking shop; diesel hammer at 10m.</td>
</tr>
<tr>
<td>120</td>
<td>Boiler shop; diesel engine room; jet aircraft at 150m.</td>
</tr>
<tr>
<td>130</td>
<td>Jet engine; riveting; threshold of pain.</td>
</tr>
<tr>
<td>150</td>
<td>Instantaneous damage to hearing.</td>
</tr>
</tbody>
</table>

The effects of noise on people are related to the total amount of sound energy received over time, rather than the loudness alone, so that a noise of 90 dB(A) for eight hours is as damaging as a noise of 96 dB(A) for two hours. For this reason, noise in industry is assessed in terms of the equivalent continuous sound level on an equal energy basis, or dB LAeq, usually over a period of 8 hours (giving dB LAeq,8hr). The amount of sound energy received by a person over a given time period is termed the “dosage”.

2.1.2 The effects of noise on hearing

People differ from one another in their hearing ability. In addition to minor, natural differences between individuals, hearing may be defective, either because of a physiological or neurological problem present at birth or because of some acquired hearing loss. Acquired hearing loss can be caused by certain illnesses, by temporary or permanent physical damage to the ear, by ageing (presbycusis) and by exposure to noise, whether social or work-related.

There are three possible effects of noise on hearing.

1. Temporary Threshold Shift (TTS) is a rise in the threshold of hearing as a result of exposure to loud noise. sufferers become temporarily unable to hear quiet sounds. This change wears off over a period which last up to 16 hours. A number of factors affect the degree of TTS experienced, including the nature of the noise, the base state of a person’s hearing, and their attitudes towards the noise. A link between TTS and long term damage to hearing has not been established, although it is widely believed that exposure to conditions noisy enough to produce TTS will, over a period of about 10 years, lead to a permanent hearing loss.

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6 MRC Institute of Hearing Research (1985).
2. Permanent Threshold Shift (PTS) is a permanent change in the threshold of hearing as a result of exposure to loud noise. This is generally due to damage to the hair cells and nerves in the inner ear; this type of hearing loss is termed sensori-neural hearing loss.\textsuperscript{8} It involves not just a loss of sensitivity in hearing, but a distortion of what is heard: high frequencies, in the 2000 to 6000 Hz range, become less well heard, making the consonants in speech difficult to hear.\textsuperscript{9}

3. Tinnitus - a ringing or other noise in the ear is also caused by exposure to loud noise. Approximately 20\% of people who suffer noise induced hearing loss will also suffer tinnitus,\textsuperscript{10} although some studies put the prevalence of tinnitus in people with noise induced hearing loss as high as 1 in 3 or 1 in 2.\textsuperscript{11} Although tinnitus can have other causes than previous exposure to loud noise, such exposure increases the likelihood of tinnitus: one study\textsuperscript{12} found that, for all age groups, the percentage of the population who suffer from tinnitus and who have a history of noise exposure is approximately one and three quarter times greater than the percentage of the population who have tinnitus and who have not suffered from noise exposure.

The exact relationship between hearing loss, the loudness of a noise, the length of exposure and other processes such as ageing is not completely understood. A recent review of research suggests that PTS is rapid over the first ten years of sustained exposure to high noise levels, but then further damage occurs increasingly slowly. This threshold shift does not simply add to the progressive hearing loss due to ageing but rather, combines with it in such a way that the effect of one is reduced in proportion to the potential magnitude of the other.\textsuperscript{13}

This means that there is no theoretical foundation for the model that, over long-term exposures, the noise-induced component of a PTS is a monotonic function of the total sound energy impinging on the ear.\textsuperscript{14} However, a linear relationship between total sound energy received at the ear and threshold shift is still recommended as a model for short term (i.e. within a day) exposures.\textsuperscript{15}

\begin{itemize}
\item TUC (1986) p.18.
\item The other type, conductive hearing loss, is due to problems with conduction of the sound through the ear canal, eardrum or the ossicles (bones) of the middle ear. Conductive hearing loss involves only a loss of intensity of sound, rather than the additional distortion which is associated with sensorineural hearing loss.
\item TUC (1986) p.19.
\item Waugh (1986).
\item Merluzzi et al. (1983).
\item Robinson (1987).
\item As is assumed in BS5330:1976 "Estimating the risk of hearing handicap due to noise exposure".
\item Robinson (1987).
\end{itemize}
There is a continuing debate about how to measure hearing handicap, and several formulae are in use. They produce very different figures for the number of people affected. The most widely used method of measurement in Britain is to measure hearing loss in decibels for three pure tones at frequencies of 1, 2 and 3 kilohertz. The three figures are then averaged. These frequencies are considered the most important in hearing speech, though they may not fully account for the hearing of consonants, which register at around 4 kilohertz. British Standard 5330:1976 says that, at these frequencies, handicap begins at 30 dB. The government pays out compensation in its industrial injuries scheme above 50 dB.

Hearing aids can help ameliorate PTS to some extent, but they cannot completely correct the distortions of sound which occurs. Furthermore, they can help only certain types of hearing loss and in particular contexts. For example, they tend to be most effective in conversational situations with little background noise; they are much less helpful in noisy backgrounds and over greater distances.\(^\text{16}\)

### 2.1.3 The effects of hearing loss

Hearing loss can affect a person's work, private and social life. At work, it may impair a person's ability to use the telephone, and it could, in the worst case, lead to accidents due to failure to hear warning signals or to notice noises coming from faulty structures or equipment.

Socially and personally, there are a number of potential consequences of hearing loss, including the following:\(^\text{17}\)

- deterioration in speech, since it is through hearing that the pitch and volume of speech is monitored and controlled;\(^\text{18}\)
- loss of enjoyment of music and other aesthetic auditory experiences (e.g. birdsong);
- loss of enjoyment of social situations such as parties and pubs where there is a high level of background noise;
- social problems of isolation and loneliness;
- psychological problems such as pathological anxiety and depression;
- changes in a person's role, for example, within the family and the wider society;
- becoming a burden to friends and family who may have difficulties in coping with the new situation.

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\(^\text{16}\) The failure of hearing aids completely to solve the problem of hearing loss is indicated by the fact that only 21% of the hearing-impaired elderly own a hearing aid (Gilholme Herbst 1983).

\(^\text{17}\) The list is derived from Gilholme Herbst (1983) and Cowan (1983), except where otherwise indicated.

\(^\text{18}\) Cowan (1983).
Overall, the major personal and social effects have been summarised as: 
"impoverished sensory experience, impaired contact with the auditory world, 
communication difficulties and impairment of interpersonal relationships .... very real 
degradation of quality of life." 19

In addition, there is a stigma attached to deafness. People often try to hide deafness, 
and those around them see it as a disability. This is discussed further in the section 
on attitudes to deafness, but one consequence of these attitudes is that deaf people 
often experience social rebuffs in their everyday encounters with others. 20

2.1.4 Who is at risk from noise-induced hearing loss

Noise induced hearing loss is the most common industrial disease after backache. 21 
Martin (1990) estimates that 1.7 million workers are exposed to noise over 85 dB(A) 
and 630,000 to over 90 dB(A). These figures are supported by other organisations: 
the Health and Safety Executive estimate that 700,000 are exposed to 90 dB(A) or 
over, 22 the Lancet cite a figure of two million at risk, 23 and the Trades Union 
Congress similarly claim that up to two million workers are suffering noise levels of 84 
DB(A) and above.

Hearing loss, like all medical conditions, is affected by individual differences. Thus, it 
is impossible to predict how much hearing loss an individual will suffer as a result of 
exposure to excessive noise, or even what a particular hearing loss will mean in 
terms of hearing difficulty. However, figures based on the spread of effects over a 
normal population can be given. For example, for people suffering a 30 dB(A) 
hearing loss, half of them will experience difficulty in perceiving speech correctly to 
the same or greater degree as the bottom 2% of a young, otoologically normal 
population. 24 This is considered to be the "low fence" of hearing disability in the 
British Standard on hearing handicap due to noise. 25 People working in some 
industries are at greater risk of noise induced hearing loss than others. Mining, 
construction, printing, bottling halls, metal working, steel industry, woodworking, 
taming, the paper and board industry, offshore installations, potteries and the textile 
industry are all generally acknowledged to generate excessively noisy working 
environments. For example, in 1980 the Textile Research Council acknowledged that 
textile machines were getting faster and noisier. Noise from farm equipment such as 
chainsaws can give out 105 dB and mixing units for animal feeds, 100dB; in the 
construction industry, rock drills and pneumatic breakers can produce 113dB. 26

19 Waugh (1986).
21 Charity (1989).
22 Pearce (1985).
25 British Standard BS5330:1976 "Estimating the risk of hearing handicap due to noise exposure".
It must not be overlooked that the high levels of leisure and non-work related noise, which many people experience nowadays, will add to the total noise burden experienced by noise-exposed workers. Sources include music, personal stereos, shooting, some vehicles (particularly racing cars and motorbikes from the point of view of the spectator) and the use of equipment with a noisy motor such as lawnmowers and some do-it-yourself tools. Some noise levels reported suggest that noise emission levels in some leisure activities may even be equivalent to occupational noise exposure of 85-90 dB(Aeq,8hr), although other studies suggest a lower level of 80 dB(Aeq,8hr). However, non-occupational noise is only likely to be a significant part of the overall noise exposure experienced by workers if their noise exposure at work is substantially less than 90 dB(Aeq,8hr) daily exposure.

Regarding the amount of noise induced hearing loss which will occur as a result of particular exposures, one estimate is that 8% of workers exposed to 85 dB(A) for 30 years could experience a 25 dB hearing loss in speech frequencies (0.5, 1 + 2 KHz) whilst 18% of workers exposed to 90 dB(A) for 30 years could experience a similar 25 dB hearing loss in speech frequencies. When the effects of aging are taken into account, it is estimated that 48% of people exposed to noise levels at work of 90 dB(A) for 40 years will suffer a 30 dB(A) hearing loss, compared with 31% of people exposed to 85 dB(A) noise, and 26% of people not exposed to high noise levels at work.

The most thorough study of the relationship between noise and deafness in Britain was conducted by Burns and Robinson between 1961 and 1968. They claim that, at age 65 and after 40 years' work in a noise of 90 dB(A), 11% of otologically normal people would suffer a clear handicap (30 dB hearing loss).

Because the population does not comprise solely "otologically normal" people, about 40% of the general population exposed to such a noise can, in practice, expect to suffer a hearing handicap, with roughly half being able to attribute their loss to industrial noise.

Kryter concludes that at around 75 dB(A), the damage to hearing due to industrial noise during a lifetime's work will roughly double the damage done by everyday noise in industrialised societies. Noise induced hearing loss begins to be measurable in people exposed to 70 dB(A) throughout a lifetime's work. Impairment at this stage is

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26 Pearce (1985).
27 MRC Institute of Hearing Research (1985).
29 Pelemar & Pike (1982).
31 Most of the material in this paragraph is derived from Pearce (1985).
mainly around the 4 kHz frequency, at which consonants sound in normal speech. Above 83 dB, deafness is measurable in the other, lower frequencies of speech at which vowels sound. Exposure to this level of noise would cause an extra three out of 20 people to develop a handicap above 40 dB, which is equivalent to a “20% loss of intelligibility of speech communications.”

2.1.5 Numbers of people with hearing difficulties

Of the adult population, 17% have a clinically significant hearing loss; 33 amongst the elderly, the percentage increases to between 30% and 40%. 34 Some studies have found higher levels than the current official statistics. 35 It is, furthermore, extremely difficult to try to apportion the cause of deafness between the natural loss of hearing due to aging (presbycusis), medical or clinical causes, damage arising from societal and leisure noise and damage from industrial noise. However, the HSE estimate that one quarter of people exposed to noise levels at or above 90 dB(A) for the majority of their working lives will suffer some degree of noise-induced hearing loss. 36

Tinnitus is an even greater problem: one study found that 39% of the population suffer some degree of tinnitus 37 and nearly 8%, or approximately 4 million people, suffer tinnitus severely enough to cause loss of sleep. 38 In a sample of men engaged in a noisy industry, those exposed to “fairly high” noise levels experienced as much tinnitus as those exposed to “high” noise levels. 39 Another study puts the prevalence of tinnitus in people with noise induced hearing loss as between one third and one half. 40

2.1.6 Other effects of noise

Although this research is primarily concerned with the hearing loss caused by exposure to noise, it is also worthwhile noting the other negative effects of working in a noisy environment. These include annoyance, increased stress, interference with communications, reduced pro-social behaviours such as generosity and helping people, 41 lowered performance on work tasks 42 and reduced group cohesion on work tasks. 43 Noise may also aggravate an existing predisposition to mental stress. 44

33 Martin (1990).
34 Gilholme Herbst (1983).
36 Pearce (1985).
37 MRC Institute of Hearing Research (1985).
38 Martin (1990).
39 Merluzzi et al. (1983).
40 MRC Institute of Hearing Research (1985).
41 Matthew & Canon (1975) and Sauser et al. (1978).
42 See, for example, Carpenter (1958) or Broadbent & Little (1960).
44 Council of Europe (1965) p.12.
2.2 THE DEVELOPMENT OF NOISE CONTROL LEGISLATION\textsuperscript{45}

2.2.1 Early recognition of noise induced hearing loss

The connection between exposure to noise and hearing loss has been known since the times of the Greeks. Somewhat more recently, Bernadino Ramazzini described occupational deafness in coppersmiths in Venice in his "De Morbis Artificium" of 1713. However, the nature of the connection between noise and hearing loss was not systematically investigated until 1886, when Thomas Barr of Glasgow published his paper on "The Effects of Loud Noise on the Hearing of Boiler Makers and Others Working in Noisy Surroundings". Barr discovered that people first lose the ability to hear at higher frequencies which leads to mis-hearing of consonants. He also found that most of the damage is done within the first 10 years of exposure to noise.

The annual report of the Factory Inspectorate in 1908 stated that "it is generally known that men employed in certain trades are liable to have their sense of hearing seriously impaired, if not entirely destroyed" and yet "men are apt to regard the deafness as inevitable". In 1927, the Inspectors' report referred to a study of 1000 textile weavers of whom a quarter had some degree of deafness. The Government's Industrial Health Review Board then reported in 1933 to the Medical Research Council on "The Effects of Noise on the Performance of Weavers", stating that "excessive noise is definitely harmful".

In spite of the growing awareness of noise induced hearing loss, in the first half of the twentieth century successive British Governments undertook no research into the subject. Even by 1953, a Government White Paper claimed that Britain did "not consider it practicable to legislate in the present state of knowledge".

In 1963, case law established that it was the responsibility of employers to know that high noise levels could damage hearing and that they should take steps to avoid damaging the hearing of their workforces. However, it was 1968 before Factory Inspectors were issued with instruments to measure noise levels.

The breakthrough in developing an official response to noise induced hearing loss began in 1972 with the publication of the Robens Report which reviewed all aspects of Health and Safety in the United Kingdom. This formed the basis of most modern Health and Safety Legislation.

\textsuperscript{45} Most of the material in this section is derived from Pearce (1985) and Harrison (1978).
2.2.2 The arrival of modern noise control legislation

The 1972 Robens Report recommended that legislation to control noise at work be introduced, and a Code of Practice was produced later the same year. Entitled the "Code of Practice for Reducing the Exposure of Employed Persons to Noise", this set a recommended limit of 90 $\text{dB}_{\text{Aeq},8\text{hr}}$ for the amount of noise to which workers should be exposed.\(^{46}\)

The Code advised that noise levels reaching workers should be brought down as low as is reasonably practical. If after this, levels still exceed 90$\text{dB}_{\text{Aeq},8\text{hr}}$, then appropriate hearing protection must be provided or other effective methods of hearing conservation adopted. However, the Code explicitly states that "ear protectors should not be used as a substitute for effective noise control" but "should rather be regarded as an interim measure while control of noise exposure by other means is being perfected".

The Robens Report also lead to the 1974 Health and Safety at Work Act (HSW Act), which is the legislation under which the recommendations of the Code are implemented. The HSW Act places a general duty on employers to ensure, so far as is reasonably practical, that the health, safety and welfare of their employees is not threatened whilst at work (Section 2). This is deemed to include avoiding exposing them to a noise environment which might be damaging. Employees have a duty to cooperate with their employers to enable them to meet their obligations under the Act, and to take reasonable care for their own safety (Section 7). Section 6 of the Act also requires manufacturers, suppliers and importers of plant and machinery to ensure, so far as is reasonably practical, that their products do not pose risks to workers' health and safety.

The HSW Act was innovative because, as Dawson et al point out, the legislation attempts to "use statute as a basis for fostering a particular attitude to the improvement of safety at work". This attitude involves two components: self-regulation and workforce involvement in health and safety.\(^{47}\)

Self-regulation is based on the "Robens philosophy" that the government should be predominantly concerned with creating a framework for better health and safety organisation, whilst industry takes the responsibility for policies and methods of control. Self-regulation was seen to promote workforce involvement, because it was intended to help staff see where control for setting standard actually lies. The fact

\(^{46}\) The 90 $\text{dB}(A)$ standard was later incorporated into legislation for specific industries such as the Woodworking Machines Regulations and the Tractor Cabs Regulations.

\(^{47}\) Dawson et al. (1988) p3; they contrast this with the lack of workforce involvement under the Factories Acts.
that systems and rules are devised at the local, rather than governmental level, should increase the motivation of the workforce because they will perceive their contribution may make a difference. This begins to overcome the problem described by Robens that “the existence of a mass of (governmental) law has an unfortunate and all pervading psychological effect”. 48

The criteria for compensation for Occupational Deafness were first set in 1974 with the legislation coming into effect in 1975. The criteria included working for at least 20 years in one of three specified types of work. Claims had to be made whilst the claimant was still working in the place where they had been exposed or within one year of leaving it. 49 Only 3000 workers benefited from compensation under these rules between 1975 and 1979.

In 1979, the criteria were relaxed somewhat: the definition of deafness became less restrictive, but the 20 years’ service rule remained. As a result 150,000 people with impaired hearing (compared to 20,000 under the 1974 regulations) became eligible for compensation. 50

2.2.3 Continuing pressure for developments in noise control legislation

In the view of one author, “sufficient legislation was already in place by 1985 to bring the noisiest industries to heel”. 51 However, HSE Inspectors, like their predecessors, the Factory Inspectors, see their role more as educators and publicists than enforcers and prosecutors. 52 Partly as a result, prosecutions were few in the initial years of the new law: between 1975 and 1980 there were only 42 notices issued on noise under the 1974 HSW Act. 53 Pearce 54 nevertheless concludes that “neither the law nor the technology (was) being applied with anything like the vigour needed to save the hearing of the nation’s workforce”.

Pressure has continued to be applied to update and improve the noise control in the United Kingdom. Pressure has come both from overseas trends and from lobbies within the United Kingdom.

49 Cowan (1983).
51 Pearce (1985).
53 Cowan (1983) There is evidence that a single prosecution can have a beneficial effect on a whole industry. Thus, the only prosecution for excessive noise by 1985 was of a spinning company which refused to give its workers hearing protection, but this has led to over 85% of textile trade operatives using hearing protectors (See Pearce, 1985).
54 Pearce (1985).
PRESSURE FROM OVERSEAS

The World Health Organisation has set the goal for the European Region of protecting its people effectively against work-related health risks by 1995.\textsuperscript{55} This specifically includes noise: "noise levels can have a disturbing effect on workers and result in severe physical impairment."

During the 1980s, the position within the EEC has varied from country to country. The standards (recommended or legally required) which applied in 1986 in a number of countries are given below.\textsuperscript{56}

Figure 2.2 Noise exposure limits in EEC countries in 1986

<table>
<thead>
<tr>
<th>Country</th>
<th>&quot;Eight hour&quot; limit</th>
<th>Absolute maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Britain</td>
<td>90</td>
<td>135</td>
</tr>
<tr>
<td>Italy</td>
<td>90</td>
<td>115</td>
</tr>
<tr>
<td>West Germany</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>85</td>
<td>115</td>
</tr>
<tr>
<td>Belgium</td>
<td>85</td>
<td>110</td>
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<tr>
<td>France</td>
<td>85</td>
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<tr>
<td>Belgium</td>
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<td></td>
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<tr>
<td>Sweden</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

Since the latter part of the 1980s, the EEC has been developing Directives on the protection of workers from noise. One is already in effect: the Council of European Communities Directive: "The Protection of Workers from the Risks Related to Exposure to Noise at Work", issued May 12 1986 (ref. 86/188/EEC). The main difference between it and previous British Standards on noise is that the limit for assessments of noise in the workplace, the marking of noisy areas and the provision of hearing protectors should occur at 85 dB(A) rather than 90 dB(A). It also stipulates a greater role for audiometry.\textsuperscript{57}

The situation in Australia has been reviewed in a report commissioned by the Commonwealth Department of Health. This found the following:

\textsuperscript{55} World Health Organisation (1985).
\textsuperscript{56} Source: TUC (1986) p.32.
\textsuperscript{57} Ritson (1987).
• the current approach is piecemeal and not fully effective;
• many workers (especially those employed by the Commonwealth) are still not covered by specific hearing conservation regulations;
• Inspectorates are far too small to police the regulations that do exist;
• workers generally are poorly informed of noise hazards and risks. There is a lack of worker-oriented educational programs and materials;
• education programs are sporadic and uncoordinated;
• there is no systematic surveillance of the progress of existing hearing conservation efforts, especially at the national level;
• there is a significant problem with small and medium sized industry
• there is little community awareness of the magnitude of the problem;
• it is widely believed that noise control is usually expensive or technically impossible;
• few people are educated about noise control techniques (for new equipment and processes and for existing noise problems);
• there are no systems to ensure the speedy and efficient transfer of noise control technology throughout industry;
• non-compliance with the hearing conservation regulations appears to be commonplace.\textsuperscript{58}

In response to these problems, the report puts forward a set of proposals for tackling the problem of noise induced hearing loss in Australian industry; these proposals are reproduced in Appendix A.

PRESSURE FROM WITHIN THE UNITED KINGDOM

In 1974, an HSE Industrial Health Advisory Sub-Committee report entitled “Framing Noise Legislation” recommended that legislation be introduced to control noise, based on six fundamental provisions:

1. surveys of noise levels in workplaces;
2. the taking of all reasonably practical steps to reduce noise exposure below the 90dB\textsubscript{L\text{Aeq,8hr}} limit;
3. the marking of all areas where the Leq exceeds 90 dB(A);
4. the supply of hearing protectors in such areas in order to bring the noise levels within the limit;
5. the obligation of workers to wear hearing protectors, where necessary;
6. the duty of manufacturers to provide a warning to purchasers if their machinery is noisy.

Partly as a result of this report, an HSE working party on noise was set up in 1976, comprising members from the Trades Union Congress (TUC), the Confederation for British Industry (CBI), from HSE and scientific experts. Its aim was to review reaction

\textsuperscript{58} Waugh (1986).
to the report, assist in the preparation of draft noise regulations and guidance literature for submission to the Health and Safety Commission, and to consider draft advisory documents on audiometry and machine noise. This produced a Consultative Document in 1981 which followed the principles of the 1972 Code but extended certain areas, such as imposing a duty to conduct audiometric tests on workers exposed to 105 dB(A) or above.

Since the HSE working party, both the CBI and the Trade Unions have continued to develop their position on noise.

THE CBI
The CBI set up their own Noise Working Party which produced the report "Protecting Hearing at Work" in 1983. This states that, whilst it accepts the risk to hearing posed by high noise levels and the merits of regulations, such regulations "should be reasonable in their expectations of employers and they should hold out the prospect of real benefits to employees. The CBI therefore would like to see regulations reflecting a balance between the weight and cost of obligations on employers and the benefits of improvements in working conditions to employees."59 They also want the government to fund research into more acceptable designs of hearing protectors.60

In terms of noise limits, the CBI says that it would cost £55 million to meet a 90 dB(A) limit for noise throughout the steel industry alone.61 They stated in 1983 that since, at the time of writing, no EEC countries had legislation which requires the reduction of sound levels by technical or organisational means below 90 dB(A), and since there was no evidence that workers exposed daily to noise levels of between 85 and 90 dB(A) had incurred any damage, then there was no justification for an EEC-wide limit of 85 dB(A). 62

THE TRADE UNIONS
The TUC held a conference on the control of noise in April 1980, and as a result of this, set up a working party which produced the TUC handbook on noise at work (TUC 1986).

The TUC position63 is that the primary method of dealing with noise should be reduction at source rather than personal hearing protection, which they recommend should be adopted only where noise reduction is not "reasonably practical". This position has been endorsed in the documentation of individual trade unions.64

60 Pearce (1985).
63 Taken from TUC (1986).
64 ASTMS (1981).
Regarding noise limits, the TUC consider that noise levels in industry above 80 dB(A) should be defined as harmful to hearing. However, in their 1986 handbook on noise, they proposed an intermediate target of 85dBA_{eq,8hr}, with the ultimate goal of reducing noise levels "to the lowest level possible in every particular set of circumstances".

2.2.4 The new Noise at Work Regulations, 1989

In response to a growing recognition that noise control legislation needed to be developed further, and in particular, to fall in line with the European Community's Directive on noise, the HSE prepared the new Noise at Work Regulations 1989, which came into force on 1 January 1990.

The Regulations embody the concept of self-assessment whereby all employers covered by the HSW Act must assess noise if it is likely that employees are exposed to defined "action levels". Under Regulation 6 it is stated that employers shall reduce the risk of hearing damage to the lowest level reasonably practicable, even if it does not exceed any of the action levels.

There are three action levels:

FIRST ACTION LEVEL - a daily personal noise exposure ($L_{EP,d}$) of 85 dB(A)

If the daily dosage exceeds this level employers must provide ear protectors to all employees who ask for them and ensure that these and other equipment provided under the regulations are maintained and repaired. They must also provide employees with adequate information, instruction and training about noise risks, hearing protection, and the employees’ own responsibilities. The employees’ duties are to use noise control measures such as machine enclosures and to report any defects.

SECOND ACTION LEVEL - a daily personal noise exposure ($L_{EP,d}$) of 90 dB(A)

If the daily dosage exceeds this level employers have additional duties to those outlined under Action Level 1. They must reduce noise exposure as far as is reasonably practicable by means other than ear protectors. They must provide ear protectors to all those exposed to this Action Level and ensure, so far as is reasonably practicable that they are used. All areas where the level is exceeded must be marked as ear protection zones with notices. It is a duty of employees to use ear protectors if this Action Level is exceeded.

PEAK ACTION LEVEL - a peak sound pressure of 200 pascals (140dB re 20\mu Pa)

Duties as outlined under Action Level 2.
Under Regulation 12 machine manufacturers and suppliers must provide information on the noise generated by equipment if it is likely to exceed Action Level 1.

The implementation of all HSE legislation is assisted by the actions of Industry Advisory Committees (IACs) and National Interest Groups (NIGs) and their role is briefly outlined here. The IACs comprise representatives of employers, Trade Unions and the HSE. Their purpose is to provide a link between these groups within particular industries, such as construction or transport.

NIGs work in parallel with IACs. These are internal to the HSE and they collect and distribute information about a particular industry to inspectors and to the industry itself. They also try to ensure more uniform standards of enforcement.
2.3 HEARING CONSERVATION PROGRAMMES

2.3.1 Introduction

The aim of a hearing conservation programme is to reduce the likelihood of noise induced hearing loss in the workplace.\textsuperscript{65}

Hearing conservation programmes comprise a number of elements.\textsuperscript{66}

a) noise measurement;
b) noise reduction;
c) hearing protection;
d) health education;
e) monitoring of the programme;
f) audiometry;
g) management involvement.

These are discussed further below.

2.3.2 Contents of hearing conservation programmes

NOISE MEASUREMENT
The measurement of noise is a complex issue and is not discussed here. For the purposes of compliance with the Noise at Work Regulations, 1989 detailed information on the assessment of noise is contained in "Noise Guide No 3: Equipment and Procedures for Noise Surveys"\textsuperscript{67}.

NOISE REDUCTION
The most fundamental approach to reducing noise at source is to alter processes and use quieter equipment. This has not always been easy in the United Kingdom since, as noted in 1985 "industrial machinery made in Britain is now almost always noisier than its German, Scandinavian or Japanese counterparts".\textsuperscript{68} This is in spite of Section 6 of the Health and Safety at Work Act (1974) which requires manufacturers of machinery to design plant that is safe to work.

Noise reduction may also be achieved by making existing machinery quieter. Many books give guidance on how noise reduction may be achieved,\textsuperscript{69} and at least one

\textsuperscript{65} Gasaway (1985); Feldman & Grimes (1985); Lipscomb (1988).
\textsuperscript{66} This list is adapted from one given in Pelmeur & Pike (1982).
\textsuperscript{67} HSE HS(G) Series (1990), "Noise at Work Noise Assessment, Information and Control" ISBN 0 11 885430 5
\textsuperscript{68} Pearce (1985).
\textsuperscript{69} See, for example, TUC (1986).
company has found that "the investment in noise control by modifications to the machines themselves has provided a long term solution to many of the noise problems encountered." Noise reduction is achieved by the following measures:

- replacement or modification of noisy parts of machinery (for example, replacing metal gears by plastic ones);
- good maintenance of machinery;
- the isolation and damping of noisy equipment using, for instance, anti-vibration mountings, sound-attenuating ducts and flexible piping.

The engineering and design professions object when noise is attributed entirely to machinery. They point out the importance of the environment where the machine operates. For example, variations in the building and layout can account for a difference of plus or minus 3 dB(A) in the noise level. Environmental measures may include improvements in:

- attenuation, by means of sound-absorbing materials;
- insulation, by means of enclosures for the machines, machine mounted shields and free standing barriers;
- fixing, to reduce vibration, by means of level floors and machinery which is secured to walls.

The HSE's "Noise Guide No 4: Engineering Control of Noise" contains further advisory information.

HEARING PROTECTION
This is achieved by the construction of soundproof booths for operators or by the wearing of hearing protectors over the ears. Hearing conservation programmes must include provisions for cleaning, maintenance and issue of replacement protection equipment otherwise its effectiveness may be impaired.

A successful hearing conservation programme will often combine noise reduction and hearing protection measures. However, some organisations rely more on hearing protection than on noise reduction because it may seem easier to implement this type of measure.

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69 Personal communication from Prof. M.R. Russell, Institute of Sound and Vibration Research, University of Southampton.
70 It is reported that in one case, a noise reduction of 10 dB(A) was achieved merely through improved maintenance (TUC (1986) p.44).
71 See, for example, Smith (1987).
72 HSE HS(G) Series (1990), "Noise at Work Noise Assessment, Information and Control" ISBN 0 11 885430 5
HEALTH EDUCATION
Health education is often ignored in hearing conservation programmes, although, according to a number of authors, it is fundamental to their success. They argue that it is crucial to "raise consciousness" about hearing conservation and to retain interest by means of continuing education. A list of the kinds of training which one author considers appropriate for different levels of staff is given in Appendix B. Training should be in two phases:

- initial training of employees, either when the scheme is introduced or when new staff are recruited;
- refresher training to maintain motivation and knowledge about the correct use of hearing protectors.

MONITORING
An integral part of any hearing conservation programme should be its monitoring, particularly regarding the use and maintenance of hearing protectors, and the effectiveness of the training element. In safety training in general, it is claimed that "remarkably few studies have evaluated the effectiveness" of training programmes.

AUDIOMETRY
The use of audiometry as part of a hearing conservation package is controversial. The CBI in its 1983 publication Protecting Hearing at Work gave three reasons why audiometry should have only a minor role in a hearing conservation programme. These were the imprecision of audiometry, its inability to reveal the cause of a hearing loss, and the greater importance of and hence the need to concentrate on measures to control the noise. The Association of Scientific, Technical and Managerial Staffs (ASTMS) also argued in 1981 against routine audiometry on the basis that it offers no benefits to the members being screened, it focuses on the "frailty" of the workforce rather than the responsibility of the employer, and its results could be used against the employer at a later date. The benefits of audiometry have been demonstrated by Karmy & Martin. They investigated whether attitudes towards the wearing of hearing protectors changed more following audiometric testing or exposure to an educational package which

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74 For example, Pelmea & Pike (1982); Alberti et al. (1982); Else (1982). Riko & Alberti (1982); Lofgren, Holm & Tengling (1982).
75 Pelmea & Pike (1982); Alberti et al. (1982); Lancet (1979).
77 CBI (1983).
78 The report (ASTMS 1981) suggests in particular that audiometric tests used to establish the "reference" audiogram at the beginning of a person's employment is often taken after they have been exposed to the noise for a few hours, so that they are experiencing a temporary threshold shift which makes their hearing appear less acute than it actually is.
79 Karmy & Martin (1982).
involved posters and a videotape. They found that audiometric testing can be more effective than education in raising awareness of the danger of noise in the workplace. They also make clear that education has an important role in imparting information rather than changing attitudes.

Audiometry may be necessary for the purposes of compensation, and the model "Hearing Protection Agreement" developed by ASTMS\(^{80}\) includes negotiating for the introduction of medical hearing checks if this is wanted by the workforce and if the Trade Union as well as the workplace Health and Safety Officer is kept informed of the results.

**MANAGEMENT INVOLVEMENT**

The commitment of management to the success of a hearing conservation programme is very important.\(^{81}\) Indicators of such a commitment (or lack of it) include:\(^{82}\)

- the status within the organisational hierarchy of the person responsible for the hearing protection programme;
- the salience of the programme within the company;
- whether noise emission is taken into account in the purchase of new machines;
- whether engineering changes have been implemented to reduce noise;
- whether management wear hearing protectors when appropriate;
- whether employees and supervisors are encouraged to wear hearing protectors and sanctioned if they do not;
- whether there is an ongoing programme of education and monitoring within the programme;
- whether there are good channels of communication between the management and workforce.\(^{83}\)

The most widely discussed and, according to the literature, one of the most problematic aspects of hearing conservation programmes is the use of personal hearing protectors. The main points raised in the literature about the use of hearing protectors are given in the section which follows.

\(^{80}\) ASTMS (1981).
\(^{81}\) Pelmea & Pike (1982); Royster & Holder (1982).
\(^{82}\) List compiled from (inter alia) Else (1982).
\(^{83}\) Royster & Holder (1982).
2.4 HEARING PROTECTORS

Hearing protectors come in a number of different types, including disposable earplugs, re-usable earplugs (universal or custom-moulded), canal caps mounted on a head band and earmuffs.

2.4.1 The performance of hearing protectors

The rating of most hearing protectors is between 15 and 30 dB(A). No hearing protector can offer more than 50 dB(A) of attenuation since bone conduction allows the transmission of noise energy.

Reports suggest that the actual attenuation of earplugs in the workplace may be as little as one third of the laboratory attenuation\(^8^4\) and furthermore, the attenuation values in the workplace showed much greater variability than those measured in the laboratory. As an example: compressible foam earplugs have been shown to have a practical attenuation of some 10-15 dB less than its officially accepted figure.\(^8^5\) Howie\(^8^6\) concludes that the laboratory ratings should be reduced by 50 or 60% to obtain a realistic attenuation figure for earplugs in the workplace; Feldman & Grimes\(^8^7\) suggest de-rating the protective device by 10 dB.

For earmuffs, the reduction in attenuation was lower - typically 3 to 10 dB(A) less than that obtained in the laboratory, but again, the variation in attenuation was greater in the workplace.\(^8^8\)

Hearing protectors tend to give considerably greater attenuation during laboratory testing because of either protector factors, such as faulty seals, absent liners or inappropriate spring pressures in earmuffs, or to fitting factors, such as wearing the wrong size, faulty fitting\(^8^9\), an unusually shaped head or ear, or the interference of other safety equipment such as safety glasses (whose temple bars may prevent a proper seal forming between the head and muff).\(^9^0\)

\(^8^4\) Howie (1989) cites a number of studies.
\(^8^5\) Pearce (1985).
\(^8^6\) Howie (1989).
\(^8^7\) Field and Grimes (1985).
\(^8^8\) Howie (1989) citing a number of studies.
\(^8^9\) Martin (1982).
\(^9^0\) Sutton (1982); Abel, Albert & Riko (1982).
2.4.2 The use of hearing protectors

Else\textsuperscript{91} has observed the use of hearing protectors and identified a set of contexts where use is high or low. A high level of hearing protector use is likely when:

- noise levels are high;
- exposure is in short periods;
- work is basically stationary;
- the workforce is predominantly young or new to the work;
- there is little need for verbal communication;
- there are few workplace hazards other than noise.

Hearing protectors are less likely to be used when the above conditions are reversed and, in addition, when:

- the workforce is highly skilled;
- the environment is hot;
- it is necessary to wear other protective equipment.

To explain Else's contextual findings it is necessary to look at the more detailed factors which have a direct impact on the use of hearing protectors by individuals and organisations. These include:

1. comfort;
2. correct fitting;
3. hygiene;
4. suitability for noise encountered;
5. maintenance and replacement;
6. ability to hear speech and warning signals;
7. the dangers of removing hearing protectors;
8. workforce attitudes.

Each of these is discussed further below.

1. COMFORT

Hearing protectors may make workers feel uncomfortable and those which offer greater attenuation are felt to be less comfortable.\textsuperscript{92} The discomfort is experienced in terms of headaches, disorientation and skin irritation.\textsuperscript{93} The cause of the discomfort varies, and several factors are involved:

\textsuperscript{91} Else (1982).
\textsuperscript{92} Alberti (1981).
\textsuperscript{93} Pearce (1985).
Attitudes to Noise as an Occupational Hazard

- weight - with ear muffs this varies from about 150gm to 335gm, even though 200gm is accepted as the maximum weight for comfort;
- pressure - canal caps attached to a headband can be extremely uncomfortable if worn for any length of time, although they are useful for brief exposures to noise. The force of the spring on ear muffs can vary by a factor of two;
- operator sensitivity - some individuals have more tender skin than others;
- degree of adjustability - earmuffs are more comfortable and more effective if they are adjustable and if the cups can rotate on a pivot point;
- temperature - earmuffs, for example, are very uncomfortable in a hot environment and operator sensitivity is increased by perspiration;
- use of other safety equipment - many designs of earmuffs are uncomfortable if safety glasses are also being worn.

In general, sites which use earplugs tend to have more complaints about discomfort than sites using muffs.

Comfort is not a static condition, individuals show various degrees of adaptability. It takes time for them to become accustomed to wearing hearing protectors. Since the disadvantages of wearing hearing protectors are immediate, hearing conservation programmes must find a means of encouraging use, at least until the medium term benefits of reduced stress, fatigue and irritability are appreciated.

Discomfort not only reduces use of protectors but workers' efforts to increase comfort can reduce effectiveness. For example, perforating earmuffs to make them cooler, bending the steel headbands to reduce the pressure, or cutting earplugs to make them a more comfortable shape all reduce performance.

Personal differences must also be allowed for, individuals vary in their experience of the same hearing protection equipment. The idea that people differ in the degree to which they feel comfortable is enshrined in the Noise at Work Regulations, 1989 which state that users must be given personal choice in the selection of protectors.

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94 TUC (1986).
95 Savich (1982).
96 Savich (1982).
100 Gasaway (1985) p.165.
2. FITTING

The HSE's "Guidance on Regulations" identifies "fit to the wearer" as a key factor in the selection of a protector. In the past workers have not always been sure which is the correct type or size of hearing defender for them and there is a need for training to overcome this. One study found that most users had forgotten or had never been taught how to fit their hearing protector. Many did not realise that for earmuffs, the pinna (upper part of ear) must be inside the muff rather than under the seal.

The study also found some people wearing their ear muffs sideways or upside down, dividing disposable mineral down ("acoustic wool") earplugs in half to provide a piece for each ear, or choosing the wrong size of pre-moulded plugs on basis of comfort rather than attenuation; they had not been taught that the plugs should feel tight. This tendency to choose earplugs which are too small to attenuate effectively was also evident in another study, where 68% of un instructed subjects chose an earplug which was too small.

Getting a good fit for earplugs is difficult because the size of ear canals varies widely from person to person (from about 3mm to 14mm) and, worse still, a person's right and their left ear canals may be different sizes. Since earplugs are usually provided in matching pairs, such people will suffer in one ear. Expandable foam plugs overcome this difficulty and maintain a good seal. This is sometimes not the case with more rigid forms of ear protectors which work loose with head and jaw movements.

A different problem may arise with custom-moulded earplugs if the wearer has not previously worn earplugs: the surface tissues lining the ear canal may "pad down" over time, rendering the earplugs a looser fit than when first worn. First time users may therefore need to be refitted after wearing the plugs for a short while.

The fitting of earplugs also may require higher levels of dexterity for some workers. Similarly, the standard instructions for the insertion of many earplugs, which usually involve pulling up the top of one ear using the opposite hand with the arm extended over the top of the head, are impossible to perform if wearing a hard hat and this may be sufficient to prevent use when people are moving from quiet to noisy areas on a dangerous site. Special earmuffs attached to hard hats are available, but care must be taken to make these satisfactory.

102 Riko & Alberti (1982).
106 For example, the tension of the springs must be set and maintained properly, and Sutton (1982) gives a list of other factors to consider.
3. HYGIENE

Earplugs may cause hygiene problems, especially if they are re-usable or become contaminated in a dirty working environment. Disposable ear plugs which need to be moulded into shape by the wearer are also a hygiene risk in dirty working environments. Further problems may be caused by workers misshaping their hearing protectors whilst cleaning them or damaging them by the use of unsuitable cleaning products such as bleach.

The hygiene risk is manifested mainly in terms of increased ear infections,\(^{107}\) also some protectors leave fluff behind in the ear,\(^{108}\) which may be dangerous in the presence of toxic chemicals.\(^{109}\)

The HSE’s “Noise at Work: Guidance on Regulations”\(^{110}\) on the Noise at Work Regulations states that “Proper provision should be made for the clean storage of re-usable protectors”.

4. SUITABILITY

Certain types of hearing protectors work best in particular types of noise. For example, good quality liquid seal ear muffs give good attenuation of mid-frequency noise, but are poor at protecting against low frequencies,\(^{111}\) whereas earplugs perform better at low frequencies. The spectrum frequency of noise must be considered when selecting hearing protectors\(^{112}\) a factor which is again acknowledged in the HSE’s “Noise at Work: Guidance on Regulations”\(^{113}\) . Advice is available in “Noise Guide No 5: Types and selection of personal ear protectors”\(^{114}\).

5. MAINTENANCE AND REPLACEMENT

There is little evidence of maintenance programmes for hearing protectors, though this subject has now been given high priority under Regulation 10 of the Noise at Work Regulations. Research\(^{115}\) has found pre-moulded plugs flattened, cracked or shrunk because of cold temperatures, plastic plugs damaged by ozone, custom-moulded plugs broken or worn or misshapen by cleaning procedures, ear muffs with poor seals, missing foam liners, or poor head band tension.\(^{116}\)

\(^{107}\) Pearce (1985).
\(^{108}\) Pearce (1985).
\(^{109}\) Royster & Holder (1982).
\(^{111}\) ASTMS (1981).
\(^{112}\) Pearce (1985).
\(^{115}\) Pearce (1985).
\(^{116}\) Riko & Alberti (1982).
Earmuffs need replacing regularly: a study found that a typical earmuff after three months' use down a mine provides only a quarter of the protection of a new muff.\textsuperscript{117} One research study suggested that replacement was needed as often as every four weeks,\textsuperscript{118} although little further deterioration was found over a year after the first six weeks.\textsuperscript{119}

6. ABILITY TO HEAR SPEECH AND WARNING SIGNALS

Hearing protectors, especially ear muffs, tend to interfere with people's directional hearing\textsuperscript{120} and workers frequently complain that they cannot understand speech in the conditions of the factory\textsuperscript{121}. The HSE's guidance on the Noise at Work Regulations notes that "some people have a tendency to speak quietly when they are wearing hearing protectors" and suggests that users are advised to "speak up when wearing protectors".

These can be serious problems for those whose hearing is already impaired,\textsuperscript{122} particularly if they have a loss in the high-frequency range.\textsuperscript{123} Even for those with good hearing these effects can be isolating for the person involved, a condition which some find undesirable. Where verbal communication is essential, earmuffs with a built-in intercom are available.

These effects mean that people's ability to hear warning signals at work may be reduced. Wilkins & Martin, claim that signals 15 dB(A) above the masked threshold level are not heard reliably. In one survey, half the workers felt that hearing protectors make it more difficult to hear warning sounds.\textsuperscript{124}

There are two categories of warning: intentional warning signals, such as sirens, alarms and people's shouts, and incidental warning signals, such as the sound of an approaching vehicle, the change in tone of machinery, the loosening of a die key in drop forging ("the ringing of the keys") or the noise before a roof fall in a coal mine ("roof talk").

Incidental warning signals, which may be little louder than the background noise, are much less likely to be heard when wearing a hearing protector though most intentional warning signals are 15 dB(A) above the masked threshold level. Indeed, since the signal to noise ratio is unchanged (because the hearing protector reduces

\textsuperscript{117} This study, conducted by the Institute of Occupational Medicine, was reported in Pearce (1985).
\textsuperscript{118} Howie (1989), based on a study by Rawlinson & Wheller (1987).
\textsuperscript{120} Wilkins & Martin (1979); Savich (1982); and studies cited by Lipscomb (1988) p.185.
\textsuperscript{121} Alberti et al. (1982).
\textsuperscript{122} Abel, Alberti, Haythornthwaite & Riko (1982).
\textsuperscript{123} Alberti et al. (1982).
\textsuperscript{124} Wilkins & Martin (1982).
the level of both the noise and the warning signal by the same amount), and since the minimum signal to noise ratio is positively related to the noise level, the warning signal might actually be slightly easier to detect when wearing hearing protectors.\textsuperscript{125} Examples have been found where the introduction of hearing protectors have reduced rather than increased industrial accidents.\textsuperscript{126}

Problems may arise if the attenuation level of the hearing protectors is excessive or if the maximum attenuation occurs in the same frequency range as the warning signal. Protectors should therefore offer the minimum attenuation level appropriate for the type of noise, and the warning signal should be of a frequency different to that maximally attenuated (high frequencies, in general) by the protectors\textsuperscript{127}. It may also be the case that, in the workplace, people are sufficiently distracted by their work task that they fail to perceive signals when wearing hearing protectors, even though, in a laboratory simulation of the noise levels, they detected the warning signals without difficulty.\textsuperscript{128}

There is, additionally, a problem for people already suffering from noise-induced hearing loss, whose perception of sound in noise when wearing protectors is governed by their doubly elevated absolute hearing thresholds rather than by the masked threshold of normal-hearing people, making hearing warning signals difficult.\textsuperscript{129}

7. THE DANGERS OF REMOVING HEARING PROTECTORS
When noise is intermittent but unpredictable, workers may tend not to bother wearing their hearing protectors consistently. The dangers of this are not generally understood. Here are some facts:

- it takes only 16 minutes in a noise of 115 dB(A) for a person to receive the same noise dosage as staying in a 95 dB(A) environment for five hours;\textsuperscript{130}
- a worker in a jet engine room producing 117 dB(A) would receive their daily dose in only one minute without hearing protection;\textsuperscript{131}
- if an earmuff which gives an overall protection of 20 dB(A) is removed for only 30 seconds every hour, the effective protection is reduced to 15 dB(A);\textsuperscript{132}
- even if a hearing protector gave infinite protection, if it were worn for 75% of the exposed time, it would offer only 6 dB(A) protection.

\textsuperscript{125} Sutton (1982).
\textsuperscript{127} Sutton (1982).
\textsuperscript{129} Wilkins & Martin (1978).
\textsuperscript{130} Tengling & Lundin (1982).
\textsuperscript{131} ASTMS (1981).
\textsuperscript{132} ASTMS (1981).
The HSE's "Guidance on Regulations" states that the problems of workers with variable exposure to noise must be taken into account when complying with the Regulations. This is not, necessarily, a simple matter. Higher attenuation muffs tend to be more uncomfortable and so are removed more often. This may explain anomalous findings where workers supplied with high attenuation protectors (earmuffs fitted to helmets) suffer more hearing impairment than those using more comfortable earplugs with 10-15 dB less nominal attenuation. The former wear the protectors for less of the time. This is a further reason (in addition to the need to hear safety warnings and verbal communications) why it is frequently recommended that hearing protectors of only the minimum attenuation necessary are purchased. In addition, many writers stress the importance of workers in noisy environments having frequent breaks during which they can remove their hearing protectors.

8. WORKFORCE ATTITUDES
The issue of workforce attitudes is treated separately in the literature review.

From the above discussion it can be seen that the majority of factors which influence the use of hearing protectors are recognised in the HSE's Guidance on Regulations on the Noise at Work Regulations. The task ahead then, is to ensure that the Regulations are effectively implemented.

Finally, it must be remembered that the reliance on hearing protectors as the main plank of a hearing conservation programme is unsatisfactory. The Noise at Work Regulations state this explicitly for exposure to noises which exceed Action Level 2. In the past writers and lobbyists have argued that reliance on hearing protectors tends to push the responsibility for avoiding hearing damage onto the employee. Howie writes, "given the unreliability of hearing protector performance, it is critical that most effort be concentrated in reducing personal noise exposures by means other than by the use of ear protectors."

134 Study of Swedish shipyard workers reported by Tengling & Lundin (1982).
CHAPTER THREE: ATTITUDES, BEHAVIOUR AND THE WORKPLACE:
THEORETICAL AND EMPIRICAL WORK

3.1 INTRODUCTION

There are three general approaches to the reduction of workplace risks, including noise, which are outlined by Lee.136

1. Limiting exposure compulsorily; this prevents risky actions from being carried out.

2. "Legislating" for safer exposure, which usually involves physical modifications to the environment. This alters the balance of costs and benefits of risk actions.

3. Changing attitudes towards a hazard so that exposure is voluntarily reduced, safer ways of engaging in the activity are cultivated or optional environmental changes are accepted.

Lee argues the first two options are difficult because they involve dealing with "complex and multi-layered power structures" involving a number of different, and perhaps conflicting, needs, values and beliefs. Changing attitudes, and hence altering the level of risk which people deem acceptable, is therefore an important part of the policy mix.

This chapter looks at attitudes, their development, and how they are linked to behaviour in the context of noise control. The review concentrates on those areas of this broad span of literature which may contribute to an understanding of the attitudinal and behavioural factors involved in noise induced hearing loss. It introduces the key ideas, and provides a basis of relevant theory and knowledge; it is not intended to offer direct guidance to the HSE on policy formation.

In summary, this chapter contains:

- a description of some psychological approaches to the topic of attitudes and the ways attitudes influence behaviour;
- a summary of theories of attitude change;
- the subject of risk - how we think about it and how we act regarding it;
- attitudes and behaviour towards health and safety in the workplace;
- an examination of a number of attitudinal fields relevant to the problem of workplace noise. These are:
  - attitudes and beliefs towards health, in general;
  - empirical work on attitudes towards deafness;
  - attitudinal factors involved in the wearing of hearing protectors.

136 Lee (1987)
3.2 ATTITUDES AND BEHAVIOUR

Attitudes which are fundamental to the issue of noise induced hearing loss include:

- the attitudes of management and of workers towards reducing noise levels and minimising their personal risk;
- the attitudes of machinery manufacturers when they design or modify equipment;
- the attitudes of equipment buyers as they make purchasing decisions;
- the attitudes of trade unions and insurance companies towards the different ways of reducing the risk;
- the attitudes of family and friends in terms of encouraging individuals to take the risk of hearing loss seriously.

To understand the nature of attitudes and how they influence behaviour, the main theoretical ideas developed within psychology are explored below.

3.2.1 Defining ‘attitude’

Psychologists define an attitude as a relatively permanent tendency for a person to respond positively or negatively towards a particular object or concept. Attitudes pervade our interactions with the world. They profoundly affect our lives as social beings, helping to shape how we respond to and interact with people, objects and situations. Being so widespread, attitudes have been extensively studied by psychologists and a number of theoretical strands can be discerned.

3.2.2 Components of attitudes

Traditionally, attitudes are said to have three components: beliefs, emotions and intentions to act\(^{137}\) (more technically, cognitive, affective and conative aspects). For a time, it was thought that a person’s beliefs about an object determined his or her emotional response to that object, and that this, in turn, determined how the person would act with regard to the object. Thus, if a manager knew about the damage to hearing which high noise levels can cause, he or she would develop negative feelings about high noise levels, and take steps to reduce noise levels in the workplace.

\(^{137}\) The concept "intention to act", rather than the more straightforward idea of action, is used to allow for the intervention of extraneous factors (i.e. factors other than the individual’s attitude) in determining whether or not the person carries out some action.
However, it soon became evident that this simple model of:

knowledge determining attitudes which result in action

\[\text{(beliefs which produce feelings creating intentions to act)}\]

was inadequate. Firstly, beliefs do not necessarily determine a person's emotional response to something. One has only to think of the irrational fears that people have to realize the problem here. Thus, simply giving somebody information, even assuming that they think about and accept the information so that it becomes part of their belief system, is not sufficient to alter their feelings. Indeed, the reverse process may take place: we may seek out and adopt particular beliefs in order to justify our attitudes. For example, people usually read newspapers whose political outlook coincides with theirs, in order to furnish them with a selective view of the "facts" which supports their position. Hence, information which does not accord with our pre-existing feelings, rather than changing those feelings, may simply be ignored.

Secondly, our feelings are not necessarily reflected in what we do. For example, a prejudiced person may be discouraged from exhibiting that prejudice by social norms which inhibit overt statements of prejudice. As well as social norms, which are a very powerful constraint on our behaviour, other factors affect what we do and the degree to which a particular attitude is manifest in behaviour.

Take the example of a union shop steward considering whether to campaign about noise levels in their workplace. He or she may be influenced by:

- judgements of the relative importance of noise in relation to other campaigns he or she could mount (competing motives);

- how successful the shop steward judges their previous campaigns to have been (considerations of the likely outcome);

- how tired the shop steward feels (the person's inherent abilities).

It is therefore incorrect to assume that our beliefs, feelings and intentions to act are necessarily consistent with each other, or, that our attitudes relate directly to our behaviour.
3.2.3 Theory of reasoned action

Psychologists have developed theories which take account of the complex relationship between attitudes and behaviour. The theory of "reasoned action" formulated by Fishbein and Ajzen asserts that there is consistency between attitudes and behaviour, but that this consistency can only be understood at a much more detailed level of analysis.

A person's intention to perform a particular act, such as organising a noise control campaign, is not directly related to the individual's attitude towards the general subject of "noise in the workplace". It is rather a function of their attitude towards that particular act which combines the personal, social, and motivational factors mentioned above.

By being so much more specific about the attitude than earlier theories, Fishbein and Ajzen claim that a much better understanding of likely behaviour can be achieved. A further degree of predictability of behaviour can be achieved if account is taken of the internal or external constraints on behaviour which the person perceives. For example, if workers believe themselves to be insufficiently articulate to express their concerns convincingly to their supervisor, or if a purchasing director believes that there are no quiet versions of the machine to be purchased, then these perceived constraints on behaviour will intervene between the individual's attitude and their actions.

3.2.4 Usefulness of the theory of reasoned action

The theory has been criticised for relying too much on identifying and quantifying the constraints on behaviour at an individual level. It is said that the theory is of little use in dealing with the attitudes of groups such as managers in a company. Whilst this is true, the theory creates a valuable framework for considering the range of factors at work in explaining the attitude-behaviour link.

A second criticism is that the theory assumes that we are like computers, summing and weighting the different factors involved in a precise, mathematical way. In reality, the various factors involved are often not dealt with in a rational way but are resolved intuitively.

The emphasis within the theory is on information as a key factor in attitudes and behaviour. The theory suggests that giving information about an intended action, including information about the norms of people important to the individual in question, will be enough to change his or her attitude and hence, behaviour. It is clear from the evidence on attitude change, discussed in Section 3.3 below, that this is not the case.
3.2.5 The importance of the social context

In addition to Fishbein and Ajzen's analysis, other recent theories have argued that attitudes are not something we hold as isolated individuals but are produced by the various social systems of which we are a part and from which we learn. These social systems vary in size, from national and even international communities down to neighbourhoods and families.

Attitudes towards noise induced hearing loss should be considered in terms of the professional bodies, unions, company ethos, formal and informal work groups, friendships, families, economic climate and so on, of which the individuals concerned are a part. This has important implications for any attempt to change attitudes, as will be discussed in the next section.

3.2.6 Our perception of other peoples' attitudes

People draw conclusions about the attitudes of other significant individuals in a shared situation, and this will shape their own attitudes and behaviour. Our perception of other people is necessarily based on incomplete information. We have to make inferences about their attitudes on the basis of their words and actions but our conclusions about their motivations may be wrong. To explore how this process works, attribution theory has been developed within psychology. This explains that people tend to consider the outcome of other people's actions to have been intended, whereas, in explaining their own actions, people recognize much more the force of external circumstances.

3.2.7 The co-orientation model

The co-orientation model combines these last two ideas - the importance of social groups in attitude formation, and the process of attributing intention to another person's behaviour. Co-orientation is not a theory but rather, an approach to understanding a social situation which focuses on the views which each group in a social situation has of other groups' motives and intentions. It emphasises that our beliefs about other groups may be incorrect, but, nevertheless, those beliefs will have a real effect on our attitudes and behaviour.

Co-orientation is important to the topic of noise induced hearing loss because managements, unions, workers, manufacturers and even the HSE Inspectors may all have their particular beliefs about the attitudes of the other groups which not only may be incorrect, but may affect how they behave towards the other group. An obvious, if over-simplified, example is if management erroneously consider that unions do not really want to tackle the issue of noise in the workplace but merely intend to disrupt production, or if unions wrongly believe that management just want to exploit the workforce with little concern for their well-being, then cooperation between these two groups is unlikely to be successful.
3.3 ATTITUDE CHANGE

3.3.1 Introduction

A number of useful "rules of thumb" have been developed with regard to attitude change and these are discussed below. Needless to say, there is no single theory which satisfactorily explains all aspects of attitude change and which can be used to derive unequivocal guidelines for practical use.

This section will first of all look at some of the guidelines suggested by early attitude change research. It then describes some theories about the processes underlying attitude change and goes on to discuss how, in spite of theoretical gaps, practical attempts to change attitudes can be approached.

3.3.2 Attitude change research

Attitude change research dating back to the 1950s suggests that the topic can fruitfully be considered from the perspective of:

who says what, to whom, via what channel and with what effect?

Hovland, Janis and their colleagues at Yale\textsuperscript{138} carried out experimental research into each of these factors, trying to establish the basic laws of attitude change. The principal findings of this research are summarised below.

WHO
It is helpful if the source of the message intended to change attitudes is perceived to be:
• powerful or prestigious but not self-interested;
• credible and relevant to the recipient;
• a role model for the recipient, that is, a person "like me".

WHAT
It is generally concluded that for an intelligent audience a two-sided presentation of an argument is more persuasive; otherwise, a one-sided presentation is more effective. McGuire (1969) discovered that the effect of a persuasive communication can be weakened if the audience has encountered some of the arguments now being used, in a previous communication which was mainly opposing the position now advocated. This is termed the inoculation effect.

\footnotetext{138}{See for example, Hovland, Janis and Kelley (1953)}
Another aspect of the content of persuasive messages is the extent to which they appeal to the emotions, particularly fear, or simply present facts. In a study of a skin cancer prevention campaign in Australia, it was found when comparing the effects of an emotional and a factual video, that the emotional video was more effective in producing long term behavioural change.\textsuperscript{139}

Janis argues that fear should be used with caution. Messages which are too frightening can be counter-productive because they encourage people to "switch off" and ignore or dismiss the message. This view is endorsed by the planners of the latest drink-driving campaign which is discussed in Part 3 of this literature review.

Regarding health related behaviours, studies suggest that case-history information may be more effective in changing attitudes and intentions than abstract information.\textsuperscript{141} The enhanced persuasiveness of case-history information may result from the recipient feeling emotionally involved in the material being presented.

A number of studies have shown that self-attributional messages are more effective in producing behaviour change than other kinds of motivational messages. It is suggested, therefore, that greater use of hearing protectors will be achieved by encouraging people to make the self-attribution that they are "the kind of people who look after their hearing" than by exhortations to wear hearing protectors.\textsuperscript{142}

TO WHOM
The characteristics of the audience must be taken into account when designing a persuasive message. Material must interest them and be relevant, otherwise, they will not pay attention; and the level of difficulty of the message must correspond to their abilities.

A study investigating the debate about nuclear energy found that pro-nuclear and anti-nuclear energy adherents "talk past each other."\textsuperscript{143} They are blinkered and are selective with the information they receive. It is therefore important that any persuasive communication addresses the issues of importance to the target audience, not just the issues deemed important by those already persuaded.

\textsuperscript{139} Cody and Lee (1990)
\textsuperscript{140} The emotional video contained interviews with cancer patients, but also presented a resumee of the facts used in the factual video.
\textsuperscript{141} For example, a study by Rook (1987) of intentions towards the prevention of osteoporosis, cited by Cody & Lee (1990).
\textsuperscript{142} See Gasaway (1985) p.95-96 for a description of such studies and their applicability to hearing conservation.
\textsuperscript{143} Royal Society (1983)
CHANNEL
Face to face communication is best; if not, the message should be personalised as far as possible, and care must be taken that the channel actually reaches the target audience.

WITH WHAT EFFECT?
As noted in the Section 3.2, it is the attitude towards a specific act rather than general attitudes which best predict behaviour. Account must always be taken of other factors, both internal and external, which contribute to the actions which a person carries out.

3.3.3 Theories about attitude and behaviour change

COGNITIVE CONSISTENCY
As noted in Section 3.2, peoples' behaviour does not always follow from their attitudes. However, there is a theory that people strive for consistency, and achieve this, if necessary, by realigning their attitudes to match their behaviour. When a person acts in a way which is inconsistent with their attitudes, they will experience some sort of psychological discomfort, sometimes termed cognitive dissonance, which impels the person to change.

This theory suggests for example that, if people take part in a strike for quieter working conditions, they will develop a stronger negative attitude towards noise in the workplace than they held initially. Conversely, if for any reason a worker fails to take action to protect their hearing, the theory suggests that they will tend to dismiss the threat of noise induced hearing loss. A related idea is that if people make a public commitment to something, they will tend to act in accordance with that commitment.¹⁴⁴

The idea of cognitive consistency also explains the finding (discussed above) that a person who is respected or prestigious is more persuasive than a neutral person in that, if someone feels positively towards an individual, they will tend to feel positively towards any ideas this individual espouses.

¹⁴⁴ The situation here is more complicated, since real or imagined peer pressure may contribute to attitude change, alongside the need for cognitive consistency.
DIFFUSION OF INNOVATION

A theory which concentrates more on behaviour change than on attitudes, and which takes into account some of the social processes involved, is termed "diffusion of innovation", and was developed by Rogers & Shoemaker. They found that, rather than innovations spreading slowly and evenly throughout a social group, there are key members of the group who informally act as "gatekeepers" regarding the dissemination of novel ideas.

The implication is that, if these key individuals can be identified and persuaded to adopt an idea, it will quickly diffuse throughout the rest of the group. This has been tried out, particularly in the third world, where key individuals from the indigenous community have been introduced to improved farming methods or trained in simple techniques of hygiene and health care; they have then successfully encouraged their communities to adopt these new practices. The diffusion of innovation/gatekeeper model suggests that persuasive communications need not necessarily be targeted at the entire audience, and that effort may be better spent focussing on key individuals.

This idea is seen as oversimplified by some theorists. Jaspars (1978), for example, cites work in the USA on voting behaviour. Opinion leaders in the community do appear to be important as a source of "influence flow" but the mass media still seem to have an important role as a source of "information flow". Thus, it may be important to distinguish information from opinion formation in explaining the social processes involved in influencing behaviour.

3.3.4 Discussion and summary

Attitudes are clearly important to the problem of noise induced hearing loss. However, attitudes, whilst relatively enduring, are by no means fixed or simply formed. The fact that attitudes are developed in a complex manner means that they must be understood in depth, and key influencing factors and relevant groups identified, for it is only then that the total context of attitude development will be addressed. This section has dismissed the notion of attitudes as isolated, robust mental concepts which can readily be manipulated.

This is a vitally important point because legislators and policy makers often turn to psychologists when all else has failed in the belief that addressing attitudes will solve their problem. The complexity of attitudes in their social context precludes simple interventionist approaches and so policy makers looking for an "attitudinal fix" often experience disappointment and lose faith in the possibility of an attitude change approach helping them. Attitudes cannot be changed by a one-off campaign; rather, an understanding of attitudinal issues must be part of the continuing process of...

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145 Rogers (1983)
management and policy formation. In this way, psychological approaches do not replace traditional management and policy techniques but should shape and inform their development.

By way of summary, leading writers have developed the following advice on the development of attitude change campaigns. Lee suggests the strategy\(^{146}\) below:

1. dismantle the attitude: reveal its components and what drives it;
2. design and transmit messages that address, in a focused way, the particular target group and its critical characteristics and beliefs;
3. test out the campaign experimentally to see if it works, before investing in it.

Glendon & Hale\(^ {147}\) make the following points about campaigns to improve health and safety:

- it is changes in behaviour, not attitudes, which are the ultimate goal;
- attempts to change attitudes are often overambitious and avoid analysing the underlying factors which are responsible for the problem;
- behaviour is a function of the work culture and the social and economic structure of the employment, rather than of individuals' attitudes;
- exhortations are of little use;
- the audience must be identified precisely;
- the audience should be primed by other techniques; publicity is likely to be effective only in combinations with other factors;
- the role of management is crucial;
- safer working environments usually involve change in the structure of the organisation, in addition to campaigns;
- questions which need to be asked in any campaign include:
  - who has examined the problem?
  - who has defined what the desired change should be?
  - is the message reaching its intended audience?
  - how is the change to be assessed?
  - is the message having the desired effect?

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146 In Lee (1987)
147 Glendon & Hale (1984)
3.4 RISK PERCEPTION AND RESPONSE

Before any action can be taken to avoid risks in the workplace, the risk first must be recognised and judgements made about its seriousness. This is termed risk perception. Psychologists usually use the term “perception” in a restricted, technical sense, to refer to one very specific part of the process of awareness. In relation to ‘risk’, however, it is being used in its more colloquial sense as denoting the entire process of knowing, thinking and feeling about a risk. As a result, risk perception work draws heavily on the main theoretical ideas of attitudes and behaviour research.

There has been an enormous amount of research by psychologists on risk perception and human responses to risky situations. Most of this has focused on large scale, potentially catastrophic risks such as attitudes to the siting of nuclear power stations or chemical plants, or responses to living in areas where natural hazards (earthquakes, droughts, flooding, and so on) pose a threat. The risk of occupational deafness is different from these: it is non-catastrophic, non-life threatening, and affects people on an individual scale; the danger is slow and invisible and the damage is permanent. The research on these risks is, therefore, not reviewed here, but the general findings about the nature of risk perception are drawn upon.

3.4.1 Risks are subjective

Risk is a subjective phenomenon. Something which one person or organisation perceives as risky may be considered unproblematic by others.

3.4.2 The multi-dimensional nature of risk perception

Risk is not a unitary concept. Different risks - physical, emotional, financial or political - are not judged in the same way. They cannot reasonably be described in terms of a single scale of severity running from “no risk” to “extremely risky”. There is something different about the nature, and not just the scale, of the risks associated with, say, parachute jumping as compared with living near a nuclear power station. Lee claims that it is “myopic” of scientists to assume that risk can be scaled on a single dimension of severity: “We need to break down the unitary concept of risk assessment.”148 A number of dimensions of risk have been identified. For example, Slovic et al (1980)149, have found that people judge risks according to the extent to which they:

148 Lee (1987)
149 In Lee (1987)
1. are immediate in their impact - have long term impact;
2. affect future generations - do not affect future generations;
3. cause individual injuries - are globally catastrophic;
4. are controllable - are uncontrollable;
5. are observable and familiar - are unobservable and unfamiliar;
6. affect few people - affect many people.

Prima facie, noise would seem to fit on these dimensions as having long term impact/not affecting future generations/causing individual injury/being controllable/being observable and familiar.

In a recent report\(^{150}\) reviewing the implementation of the new Noise at Work Regulations (1989), it was argued that noise is often ignored as a problem in the workplace because it is a long term risk which people are able to dismiss for much of their working life.

3.4.3 The context-dependent nature of risk perception

A list of factors has been established which influence public acceptability of risk.\(^{151}\) These factors include:

- whether the individual would benefit from the risk activity;
- whether the hazard is familiar or unfamiliar;
- whether the risk exposure is voluntary;
- whether they or others would have to pay to reduce the risk;
- whether the risk was concentrated or diffuse;
- whether the risk was immediate or deferred.

Risk perception, like attitudes in general, is affected by many other factors which interact with riskiness, such as social norms, how one comes to be exposed to the risk, and one’s motives for taking the risky action.\(^{152}\)

3.4.4 Individual biases in risk perception

Psychologists have identified a number of perceptual biases which people exhibit when assessing risk. In judging risks of different causes of death or illness, for example, there is a tendency for people to overestimate the rarer causes and to underestimate the more common causes; the risk of being murdered is judged as higher than that of suffering a stroke, the risk of floods is judged as higher than that of suffering asthma, and the risk of cancer is judged as higher than that of heart

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\(^{150}\) Kyriakides (1990)

\(^{151}\) Cited in Royal Society (1983) p. 111-2

\(^{152}\) In Lee (1987)
disease.\textsuperscript{153} Related to this is the tendency for people to overestimate the frequency of events that are dramatic, sensational or more recently experienced or heard about. In addition, people frequently seem to underestimate their personal risk: they feel a sense of personal immunity - "it won't happen to me".

3.4.5 Group related biases in risk perception

Researchers have identified a number of tendencies in the way in which groups deal with risk. Groups frequently produce increased polarisation: group decisions are more extreme than the average decision of the group members individually. Thus, if members of a group tend to be cautious regarding a particular issue, decisions on that issue made by the group will tend to be even more cautious; if the members are individually inclined to take risks, the group's decisions will tend to be more risky.\textsuperscript{154}

Irving Janis, in his book "Victims of Groupthink"\textsuperscript{155}, describes other errors and biases in thinking which occurred amongst groups of decision makers in real-life political situations, including the USA invasion of Cuba at the Bay of Pigs, and Chamberlain's policy of appeasement before the Second World War. He defines "groupthink" as "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action".\textsuperscript{156} This typically leads to a reduction in the expression of minority views and an avoidance of certain sources of information.

3.4.6 The social dimension of risk perception

Lee\textsuperscript{157} considers that we lack a clearly structured analysis of the way in which different cultural and particularly different power groups vary in their understanding of hazards (for example, the medical profession, parliamentarians, and so on). He suggests that we should consider the social representations\textsuperscript{158} of risks held by dominant and subordinate groups, in order to understand the social processes involved in individuals' responses to risk.

\textsuperscript{153} Royal Society (1983)
\textsuperscript{154} This work was carried out by a number of researchers, including Moscovici, Doise and Fraser. It is discussed in Tajfel (1978).
\textsuperscript{155} Janis (1972)
\textsuperscript{156} Janis (1972) p9
\textsuperscript{157} Lee (1987)
\textsuperscript{158} A "social representation" is a set of ideas, images and beliefs about something in society which is shared by and transmitted by members of the society.
3.4.7 Risk homeostasis

Adams\textsuperscript{159} has put forward the idea that, if environments are made safer, people actually behave in a less careful way. When, for example, people wear seat belts while driving they tend to take more risks and so the accident rate is unchanged. He terms this phenomenon “risk homeostasis”.

There is little evidence as to whether or not risk homeostasis occurs in industry: Adams would suggest that it does; but Dawson et al claim that, when money is not spent and actions are not taken to make plant more safe, workers appear to observe safety procedures less.\textsuperscript{160} The theory of risk homeostasis suggests that workers would be more vigilant in a risky environment. However, the intervening variable of company attitudes and norms towards safety may be producing a greater and opposite effect to the risk homeostasis effect; further research would be necessary to uncover this.

3.4.8 Individual responses to risk

People’s response to risk occur at a number of different levels. Emotional and cognitive responses may include anxiety, worry, concern and fear. A number of writers have explored the difference between these, and their relation to attitudes.\textsuperscript{161} Taking the three component view of attitudes (cognitive, affective and conative), concern implies cognitive involvement, whereas anxiety is more behavioural and worry is affective - that is, worry is a feeling, whilst fear also has both cognitive and affective components. Fear is generally accompanied by worry, but worry can occur without fear.

Another response is to deny that the risk exists, thus avoiding experiencing any of the unpleasant psychological effects described in the previous paragraph. However, the risk may be so obvious that it cannot be denied; then it may be dealt with by rationalisation - for example, smokers often justify the risks they run by stating that “you’ve got to die of something”.

Having perceived the risk, though, there are still a number of possible responses.

- People may do nothing.
  They may do this because they do not recognise the risk, because they deny the reality or the priority of the risk, or because they feel unable to influence the risk. A theory called the ‘locus of control theory’ (which claims that people are consistent in feeling either in control of situations or under the control of external forces or people), and the concept of learned helplessness (which suggests that when people find themselves unable to influence a negative situation, they become passive and apathetic) may be useful concepts for thinking about this response of

\textsuperscript{159} Adams (1988)
\textsuperscript{160} Dawson et al. (1988) p.88
\textsuperscript{161} Van der Pligt et al., Levy and Guttman, and Prescott-Clarke, all cited in Brown (1983)
doing nothing. Since locus of control theory recognises the importance of situational factors, it may be possible to alter the attribution of control if the environment can be changed.

- People may continue with the risky activity.
  This may be in order to fulfill needs such as survival or earning enough money, to increase knowledge, or to demonstrate personal skill or ability.

- People may avoid the risk.

- People may attempt to change the nature of the danger.
  They may do this by lessening its possible effects, by personal intervention, or by long term political action.

All four types of actions are likely to be found concerning the risks associated with noise in the workplace.

In looking at how people come to make decisions in risky situations, it is important not to overlook the size and likelihood of any benefits which the risky behaviour may offer for the person. Any action is the outcome of a complex set of often competing motivations; thus, to improve "safety behaviour" involves changing the relative values of safety vis a vis other motivations.

3.4.9 Organisational responses to risk

At the organisational level, Rayner concluded from his study of risk-taking in hospitals that the structure of an organisation can have a marked effect on the risk taking of individuals within it. For example, in organisations which are strongly bureaucratic, risks are routinised as far as possible and emphasis is placed on careful adherence to established procedures. This engenders a number of unsafe attitudes: people rely unthinkingly on safety standards and believe that, provided the rules are adhered to, they run no risk (this is especially problematic with incremental risks such as exposure to hazardous substances); and blind spots are common because the bureaucracy tries to cover up inconsistencies. A bureaucratic organisation may thus encourage over-confidence in dealing with potential hazards.

Rayner claims that organisations which are very hierarchical in structure will tend to incorporate a wide variety of attitudes towards risk in their members, whereas organisations with little hierarchical stratification and a high sense of team membership are more likely to have members with a consistent and balanced attitude towards risk.

There is an extensive literature on the assessment of risk in industry, looking mainly at the project management processes involved and at techniques of quantitative evaluation of risk. Hayes et al (1986) and Shiliito (1990) are useful references.
3.5 ATTITUDES AND BEHAVIOUR TOWARDS HEALTH AND SAFETY IN THE WORKPLACE

A major problem concerning health and safety in the workplace is getting people and organisations to recognize the danger: many occupational health hazards such as noise and radiation are not immediately obvious, and people find it difficult to see their own experience in terms of statistical probability. Whilst the previous section examined some of the psychological issues involved in risk perception, this section concentrates more on empirical work.

These studies are relevant to this document because they indicate the relative importance which employees attribute to different aspects of their working life. It is important to know which risks concern workers and where deafness fits in; and also, to understand how important risk is to workers within the context of other factors such as pay, job satisfaction, secure employment and so on.

Below is a summary of the findings of a number of reports looking at attitudes to workplace risks. These include a survey sponsored by the Social and Community Planning Research in 1982\(^\text{163}\) which looked at public attitudes towards industrial, work-related and other risks; a Canadian study of workers' awareness of health risks in the workplace; work by Philip Leather on safety in the construction industry; and a study of attitudes of staff at different levels in a hospital hierarchy towards radiation risks.

3.5.1 Awareness of risks to health and safety in the workplace

People are aware of risks in the workplace. The SCPR study found that 37 percent of respondents felt that they were at risk in their present job; 12 percent of respondents believed that there was a chance of incurring serious health damage at work. Similarly, the Canadian study\(^\text{164}\) found that workers were conscious of risks to health at work, but they lacked:

- quantitative knowledge of the degree of their exposure,\(^\text{165}\) and
- information about what they could do, practically and legally, to remedy the situation.

\(^{163}\) Prescott-Clarke (1982) and Renshaw et al. (1984). This will subsequently be referenced in the text as "the SCPR study".

\(^{164}\) Walters & Haines (1988)

\(^{165}\) For example, of workers who were aware that noise levels were measured in their work area, 65 percent did not know the results of these measurements; and of workers tested for the effects of exposure to noise, 25 percent did not know the outcome of these tests.
The tendency was for only those respondents who were already aware of their legal rights to seek information about risks or to persist in getting their concerns remedied.\(^{166}\)

Although safety procedures exist, people do not adhere to them. In the SCPR study, for example, of the people supposed to wear protective clothing, about 25 percent never or rarely did so. Furthermore, whilst those in more dangerous jobs were more likely to know of safety procedures or of the need to wear protective clothing, whether or not they actually wore protective clothing was independent of whether they believed that they could be killed or suffer serious health damage at work. This indicates that knowledge and beliefs about the severity of a risk do not necessarily relate to taking action to avoid the risk. This idea is supported by data from a study of radiation risks in hospitals by Rayner (1986).\(^{167}\)

### 3.5.2 Attribution of blame for harm suffered in the workplace

People appear to make what is termed the “fundamental attribution error” when explaining how accidents and harm in the workplace occur: that is, they blame the person involved for any harm which befalls that person, but they blame accidents or harm which may happen to themselves on external circumstances. Thus, in the SCPR study, respondents overwhelmingly tended to blame human error or carelessness for accidents to other people, rather than factors such as the inadequacy of safety precautions. In contrast, when it came to their own risks, about a quarter of those who felt there was a chance of incurring serious health damage at work believed that there was “nothing or not much” that they could do to control their risk.

Similarly, in a survey in the construction industry,\(^{168}\) a majority of the private-sector managers and foremen interviewed regarded individual skill and experience to be capable of overcoming all but the severest risks and dangers,\(^{169}\) even though a different study\(^{170}\) found that the worker was primarily to blame in only 20 percent of fatal accidents in the construction industry.

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\(^{166}\) Walters and Haines (1988) suggest that workers’ pursuit of their health and safety concerns might be facilitated if they had better access to information about their legal rights and mechanisms for dealing with hazards in the workplace. However, this assumes that knowledge will lead to action, an assumption which needs investigating in the context of workplace noise.

\(^{167}\) This study is discussed in more detail in the section on organisational factors, below.

\(^{168}\) Leather (1984)

\(^{169}\) It is interesting to note in contrast that in public sector construction organisations surveyed in the same study, it was structural factors such as bonus targets, rather than risk-taking by individuals, which were blamed for risky behaviour.

\(^{170}\) HSE (1978).
Leather (1987) criticises what he sees as an overriding acceptance of a single factor explanation of industrial accidents, namely, individual carelessness. Single factor analyses do not take satisfactory account of the social, psychological, cultural and economic context; they also ignore the impact of the organisation and the work environment on the individual (including physical constraints, such as poor job design and work organisation, which can lead to reduced safeness of work behaviour).

In support of this, one study found that factors influencing attitudes towards workplace risk included: the person’s work group, the physical working conditions, the work format, other management representatives and the perceived status of safety as an organisational goal. Leather (1987) suggests that we should adopt a cognitive model of the individual in order to allow these multiple, interacting factors to be taken into account, as in Fishbein & Ajzen’s model of attitudes, for example (discussed in Section 3.2.3 above).

### 3.5.3 Perceived conflicts about health and safety interests

The SCPR study found that people think there may be a conflict between maintaining health and safety in the workplace and factors such as productivity, profit, and therefore pay. Furthermore, they recognise a “pay-off” in their own work decisions between safety and money. In a hypothetical game involving different levels of job risk and different rates of pay in the SCPR study, two thirds of respondents opted for the safest job, which had the lowest pay, and only one tenth were willing to take the most risky but highest paid job. However, two fifths of respondents said they would be willing to choose one of the more risky jobs for more money.

### 3.5.4 Organisational factors in workplace health and safety

Organisational factors are crucial in relation to health and safety in the workplace in a number of ways.

THE ECONOMIC AND INDUSTRIAL STRUCTURE

Zohar (1980b) claims that market pressures, government legislation and the general socio-economic conditions can all affect companies’ actions regarding health and safety. Leather (1988) found that public and private construction companies differ in their attribution of responsibility for safety, with private sector operatives tending to put more blame on the individual whereas public sector employees place more blame.

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171 The impact of the organisation on the individual’s attitudes and behaviour towards health and safety issues is discussed further in the section on organisational factors.


174 It is, of course, questionable to what degree decisions in such games reflect what would occur in a real-life situation.
on the external situation. Another factor is the relationship of management and workforce and, in particular, the role of the unions in the organisation, and their level of concern about health and safety. A multi-national study\textsuperscript{175} has shown how differences in the strength of labour movements are associated with substantial and important differences in health policy between countries. The greater the strength of the unions, the more likely it appears to be that health problems will be recognised, that policies will be implemented and that accident rates will be reduced.

THE TYPE OF ORGANISATION AND MANAGEMENT STYLE

It appears in general that a company's approach to industrial relations and to health and safety are likely to be related.\textsuperscript{176} Size of organisation is another important factor. Many small industrial firms do not register with the Factory Inspectorate or local authority,\textsuperscript{177} and the smaller construction firms have in the past accounted for far more of the fatal accidents than large ones.\textsuperscript{178} This is perhaps because management in these smaller firms was more casual, with no formal control of health and safety and no safety department.\textsuperscript{179}

Another size-related difference between companies is that larger firms tend to rely more on internal sources of information for health and safety programmes, whereas smaller firms rely more on outside sources.\textsuperscript{180} For this reason, public health educators may need to provide information of varying levels of scope, detail and sophistication to firms of different sizes. Also, larger companies often underestimate the extent to which health and safety programmes are in place in other firms\textsuperscript{181} and may as a result tend to be less likely to support their own programme.

CONFLICTS OF INTERESTS FOR THE ORGANISATION

Overall, the stress which a company lays on health and safety issues is a result of a number of conflicting demands (productivity, competitiveness, other employee concerns, and so on). On an economic level, incentive payments such as bonuses for early completion of construction projects can mitigate against safer working practices.\textsuperscript{182} Furthermore, safety measures themselves may cost money, and there are often conflicts over the costs and benefits of steps taken to improve health and safety.\textsuperscript{183}

\textsuperscript{176} Dawson et al. (1988) p.56
\textsuperscript{178} HSE (1979) p.7; cited in Dawson et al. (1988) p.101; another example is the positive relationship between construction site size and the wearing of hard hats (Dawson et al. (1988) p.127).
\textsuperscript{179} Dawson et al. (1988) p.113
\textsuperscript{180} Bulow-Hube & Morisky (1987)
\textsuperscript{181} Bulow-Hube & Morisky (1987)
\textsuperscript{183} Dawson et al. (1988) p.47
MANAGEMENT RESPONSIBILITY FOR HEALTH AND SAFETY

Concern for health and safety issues is effective only when it originates from within the management hierarchy.\textsuperscript{184} Dawson et al (1988) cite cases where safety performance was not included at all in line managers' job descriptions, in spite of the company safety policy document stating that safety was the managers' responsibility.\textsuperscript{185} Clearly, this could fundamentally affect the credibility of the safety policy in such an organisation.

In addition, even when health and safety is explicitly seen as part of a line manager's job, there is "enormous variation" in the emphasis on and support given to this function by senior management,\textsuperscript{186} yet such commitment is crucial. Leather (1984) found that supervisors frequently judged workplace hazards to be someone else's responsibility even when they themselves officially had ultimate responsibility for safety.

COMPANY CULTURE

Management responsibility for health and safety is, though, only one manifestation of the "company culture". The salience of health and safety in the company culture is just as important as explicit managerial responsibility for safety issues. Zohar (1980b) suggests that the two dimensions of highest importance in determining an organisation's overall safety climate are:

1. workers' perceptions of management attitudes about safety;
2. workers' perceptions regarding the relevance of safety in the general production process.

Employee attitudes to safety are in part inseparable from the prevailing norms and values in their organisation and the wider industrial sub-culture. Thus, as Leather (1987) puts it, "the 'safe working environment' which management is required to provide as a result of the Health and Safety at Work Act (1974) needs to be seen as comprising both that which is materially necessary to perform a job safely and that which is psychologically necessary to convince lower organisational members that safety really counts as a primary organisation goal". It should perhaps be added that safety is better considered as a value affecting how organisations try to achieve their goals, rather than a goal in itself. An organisation's values are usually set at the highest level of management, and a variety of people within the organisation are then influential in maintaining these values, including co-workers, supervisors, management, safety officers and representatives.

\textsuperscript{184} Dawson et al. (1988) p. 89
\textsuperscript{185} Dawson et al. (1988) p. 76
\textsuperscript{186} Dawson et al. (1988) p. 76
HOW COMPANY CULTURE CAN EXPRESS CONCERN FOR HEALTH AND
SAFETY
There are a number of ways in which a concern for health and safety might be
manifested; these include\(^{187}\):

- the degree of status, power and influence wielded by the organisation's safety
  officers; Leather (1987) complains that companies often do not realise the
  implications of this for staff attitudes towards health and safety issues;
- the frequency and extent of senior management's active and visible involvement in
daily site-safety matters;
- the emphasis placed on safety training;
- the extent to which safety is treated as an ad hoc or an a priori management
  function;
- the relationship of the payment system to safety;
- whether the workforce has a safety representative.\(^ {188}\) Leather (1988) found that
  less than one third of private-sector construction sites which he visited had a safety
  representative.

More generally, Leather (1987) advises that managerial and supervisory personnel at
all levels must be aware of the variety of ways in which they communicate their
values on safety to those beneath them. Managers represent the organisation to their
workforce; they therefore have a very broad responsibility concerning health and
safety. Zohar (1980b) sums this up by stressing the importance of managers
demonstrating “a continuous and visible demonstration of safety as a major
organisational concern”. However, many managers believe that having provided
safety equipment and materials, the responsibility for ensuring safety then lies with
the operative\(^ {189}\) - a further example of the “fundamental attribution error”, described
earlier in this section.

STAFF INVOLVEMENT AND ORGANISATIONAL COMMUNICATION
Zohar (1980b) claims that the structure of an organisation is relevant to its policies
and actions on health and safety in a number of ways; he recommends:

- regular reviews of existing policies and the inclusion of lower organisational
  personnel in policy making;
- a full utilisation of the significance of group and interpersonal processes (e.g.
  conducting group safety training sessions, encouraging group discussion of safety);

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\(^{187}\) This list is compiled mainly from Leather (1987) and Zohar (1980b).

\(^{188}\) The term “safety representative” refers to a member of the workforce appointed by them to deal
with health and safety issues, acting as a representative of the trade union; a “safety officer” is a
management role within the organisation which has overall responsibility for safety within the
plant or site.

\(^{189}\) Leather (1987)
• group cooperation rather than competition;
• frequent and open communications between workers and management on safety issues. This ensures that management have accurate knowledge of workers' concerns on which to base safety decisions, which will help to overcome any misperceptions between the two groups. It will also encourage the involvement of workers in the decision making process, making it more likely that they will conform to organisational decisions.

DIFFERENCES IN ATTITUDE DUE TO ROLE WITHIN ORGANISATION
A study of attitudes towards radiation risks incurred in the course of hospital work found that these differed widely in different strata within the organisation. The professionals at the top of the hierarchy, such as surgeons, were the group who expressed least concern about health risks posed by their occupation and who most often flouted safety procedures. The research suggests that competitive pressures and the individualism fostered by the professional culture encouraged them to adopt a cavalier attitude towards hazards. In contrast, the bureaucrats in the hospital strongly emphasised rules and formal procedures. Those who felt the most misgivings about the risks they were exposed to at work were the people low down in the hierarchy, such as caretakers and maintenance workers. They frequently doubted the assurances of experts that activities which they undertook were safe.

Thus, it seems that socialisation into a role within an organisation is an important determinant of a person's perceptions of the risks they face in their work. Brown makes the related suggestion that people at different positions within an organisation may flout rules for different reasons. It is important therefore not to seek just one single cause of, say, failure to take precautions against industrial noise.

CASE STUDY: THE IMPORTANCE OF MANAGEMENT IN THE WEARING OF HARD HATS IN CONSTRUCTION
In a study of the wearing of hard hats (Hickling 1984), the primary conclusion was that "organisational factors emerged in the survey as very important in influencing the wear and use of current protective equipment and associated accessories". These factors are also relevant to the wearing of hearing protectors, and they include:

• insufficient provision of safety equipment for the number of workers present;
• poor level of education of workers about accessories and equipment ensembles;
• the widespread but incorrect supposition that different items of safety equipment can successfully be worn together;
• the relationship of site operator and sub-contractors regarding responsibility for the provision of safety equipment;
• the failure to take the wearing of safety helmets into account when equipment and workplaces are designed.

190 Rayner (1986)
191 It may be also that their status encourages a belief that they are above the rules, although the study does not suggest this.
192 personal communication
SUMMARY OF ORGANISATIONAL FACTORS IN WORKPLACE HEALTH AND SAFETY
Organisational factors will determine a number of important aspects of the safety culture within an organisation; these include:

- the industrial and economic context;
- the overall culture of the organisation;
- the definitions of responsibility for safety;
- the degree of positive commitment to safety at all levels of the organisation;
- the monitoring and accountability procedures;¹⁹³
- the degree of role differentiation and the corresponding difference in representation of health and safety issues between different groups;
- the extent of team membership within the organisation;
- management of the provision of safety equipment;
- the degree of health and safety education provided for workers;
- the clarity of definitions of responsibility for the provision of safety equipment and the enforcement of safety procedures at the level of the workplace;
- the degree to which safety and safety equipment is taken into account when equipment and workplaces are designed.

As Leather (1987) points out, factors such as these will interact with individual attitudes and ways of behaving regarding safety¹⁹⁴ to produce the overall behaviour within the organisation regarding health and safety.

¹⁹³ Dawson et al. (1988) p.160
¹⁹⁴ That is, the one will not simply cause or be caused by the other, but individual and organisational factors will mutually shape the health and safety behaviour of both the organisation and the individual worker.
3.6 OTHER RELEVANT ATTITUDES

This section focuses on three specific areas of attitude and behaviour where previous work may be helpful in trying to understand the psychological issues in noise induced hearing loss. These three sections are:

- attitudes and beliefs about health;
- attitudes to deafness;
- attitudinal factors in hearing protection.

3.6.1 Attitudes and beliefs about health

Awareness about health issues is increasing: one paper refers to evidence of "an overflowing health consciousness". In the light of this, psychologists have developed a number of theories in order to understand how we come to act in the way we do regarding our health. Clearly, taking action to protect one's hearing is a health-related action and so these theories may help develop a better understanding of how individuals behave regarding noise induced hearing loss.

THE HEALTH BELIEF MODEL

One such theory is the Health Belief Model (HBM). This was developed in the early 1950s by social psychologists in the US Public Health Services in order to understand the widespread failure by the public to adopt preventive or screening measures for diseases. According to the Health Belief Model, a person's health actions are guided by four perceptions:

1. **Perceived susceptibility** - feelings of personal vulnerability to a health threat;
2. **Perceived severity** - feelings concerning the severity of contracting a condition or illness, or the seriousness of leaving it untreated, including both clinical and social consequences;
3. **Perceived benefits** of action - the perception that the advocated health measures will be effective in reducing the risk, plus the potential positive aspects of a health action;
4. **Perceived barriers** to action - the perception of physical and psychological barriers to the recommended action.

There may also be a need for a cue or trigger in order to "tip the scales in favour of taking the desired action"; this may be either internal such as symptoms) or external (for example, the mass media).

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195 Walters & Haines (1988), referring to a number of other papers.
The factors involved in the Health Belief Model are illustrated in the diagram below.

**Figure 3.1 Factors involved in the Health Belief Model**

The health belief model, like the Fishbein and Ajzen approach to attitudes, suggests that behaviour can only be predicted if account is taken of the person's beliefs about the outcome of the possible courses of action, plus their evaluations of those outcomes. Not all of the HBM components have proven useful in practice; for example, perceived severity does not always appear to affect intentions regarding health behaviour.

Attempts to change health-related behaviour usually concentrate on providing information about the condition: that is, they addresses perceived susceptibility, perceived severity and the perceived benefits of the health action. The model suggests that health education also needs to address and reduce the perceived barriers to health protection behaviours. These will often relate to non-health variables, such as discomfort or appearing "sissy". It may also be valuable to focus on more positive non-health consequences of preventive health behaviour. Perceived physical attractiveness may play an important role here - the wearing of hard hats has become almost a fashion symbol in New York. Psychological barriers may be reduced by using modelling - well known, popular role models can be used to show that the health behaviour can be attractive and socially acceptable.
PROTECTION-MOTIVATION THEORY

A more recent idea is Protection-Motivation Theory (Prentice-Dunn & Rogers 1986). It can be seen as a development of the Health Belief Model and, like that model, it focuses on people's expectations of various outcomes and their evaluation of these. It differs from the Health Belief Model in that it categorises the processes involved into "threat appraisal" and "coping appraisal", the latter including the factor of personal mastery or effectiveness which is omitted from the Health Belief Model. Thus, knowing that a less "health-threatening" option exists is not sufficient to change behaviour; the person must also believe himself or herself capable of carrying out the better behaviour. Thus, the model indicates that values such as self-esteem can be instrumental in persuading people to pursue good health, and also that it is important to give people practical suggestions for actions they can take.

MESSAGE FRAMING

One practical aspect of the development of psychological approaches to understanding people's health behaviour is that attention is now being paid to the content of health messages. According to models such as those described above, long term health behaviour changes require alteration of processes such as increasing an individual's motivation to comply. One approach to achieving this has been to manipulate the wording, or "framing", of recommendations. A number of studies have found that a message presented in a "loss frame" - that is, emphasising the negative impact of a course of action, has a greater impact on behaviour change than a message presented in a "gain frame" focussing on the benefits of an alternative course of action.

3.6.2 Attitudes to Deafness

A number of people working in the field of noise induced hearing loss emphasise that the key barrier to getting people to take the threat to their hearing seriously is the long-term nature of the threat. However, it may also be that deafness is not perceived as a particularly severe disability, and that people underestimate the impact partial deafness will have on their lives. This section briefly reviews two studies which have looked at the attitudes which the general public have towards deafness.

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199 NB. Prentice-Dunn & Rogers (1986) point out that an individual's sense of self-efficacy is conceptually independent of the 'barriers' referred to in the Health Belief Model.

200 Hale (1984) cites a number of studies.

201 Work by Kahneman and Tversky, reported in Wilson, Purdon & Wallston (1988)

202 Kyriakides (1990)

203 Martin, personal communication.
POSITIVE AND NEGATIVE ATTITUDES TOWARDS DEAF PEOPLE
The Office of Population Censuses and Surveys (OPCS) commissioned a study of attitudes of the public towards deafness in 1981.\textsuperscript{204} The survey covered a number of areas. It found that the majority of people interviewed were generally sympathetic towards deafness, with over three quarters of them seeing total deafness as a severe or very severe handicap on a par with being confined to a wheelchair, although less severe than blindness. No common stereotype emerged from the interviews, and a large proportion of respondents rejected discriminatory statements about deaf people (although this does not necessarily indicate that no stereotype exists). Sixteen percent of respondents felt that deaf people seem less intelligent than hearing people and 27 percent that they frequently seem to behave rather oddly. Furthermore, 50 percent thought that some or all deaf people would have different kinds of jobs from hearing people, and 65 percent thought that their prospects for promotion would be worse.

There is also a tendency for people to believe that deaf people sometimes “use” their affliction to ignore things they do not want to hear. Furthermore, “not hearing” can be seen as a form of nonconformity which others may resent or want to control.\textsuperscript{205} Goffman’s (1968) analysis of stigma, in which stigmatised people attempt to appear normal, can usefully be applied to deafness: deaf people appear to be normal (in Goffman’s term, “non-stigmatised”) until they are “discredited” by their failure to hear something correctly. The reluctance to wear hearing aids can therefore be understood, since wearing an aid would “give oneself away” as being deaf.

The OPCS study also found that a majority of people recognised that deaf people face difficulties in their everyday life; a majority also believed that deaf people are more isolated and socialise less than hearing people.

A study by Gilholme Herbst (1983) found four dimensions of attitudes towards the deaf current in our society, which are more negative than the attitudes uncovered in the OPCS study. These are described below.

1. The deaf are considered to be submissive, passive, insecure and to lack self-confidence.
2. They are seen as reclusive and introverted.
3. They are thought to be emotionally labile, depressed and anxious.
4. They are seen as hypersensitive, egocentric and paranoid.

\textsuperscript{204} Bunting (1981)
\textsuperscript{205} The ideas in this paragraph were drawn from Gilholme Herbst (1983)
PERSONAL KNOWLEDGE OF DEAF PEOPLE
Forty four percent of the OPCS sample had fairly frequent contact with deaf people; 35 percent had contact only rarely or not at all. This contact was more with the partially deaf than with the totally deaf; and the deaf people known to respondents were overwhelmingly elderly or middle aged.

BELIEFS ABOUT CAUSES OF DEAFNESS
In the OPCS study, the most commonly cited causes of deafness were congenital deafness and noise of machinery (cited by 42 percent and 39 percent of respondents respectively); 31 percent also mentioned other noises as possible causes. This widespread awareness of the damage to hearing which can be caused by noise is supported by the findings of a study of Canadian workers by Watters & Haines (1988), where respondents believed, almost without exception, that noise could impair health. Seventy six percent of their sample reported exposure to noise and, of these, 36 percent claimed that this had already affected their health.

BELIEFS ABOUT HEARING AIDS
The limitations of hearing aids were recognised by some, but by no means all, of the OPCS respondents. Thirty two percent believed that all deaf people could be helped by a hearing aid; whereas 62 percent believed that only some people could be helped. Seventy one percent recognised that a hearing aid will not restore a deaf person's hearing to normal, but 17 percent thought that it would, and 45 percent thought that a hearing aid is useful in all situations whereas only 40 percent recognised that there are situations in which a hearing aid is unhelpful. Hearing aids still appear to have a negative image socially.

THE SERIOUSNESS WITH WHICH PEOPLE VIEW DEAFNESS
Martin (1990) suggests some possible reasons why workers do not appear to value their hearing in the same way as their sight or limbs. These include:

- damage to a person's hearing is invisible,
- the effect is individual and situation-specific,
- prior to the loss, hearing is "always there" and so is taken for granted.

In addition, it is probable that people fail to take the risk of hearing loss seriously because the damage takes so long to become evident.

Martin (1990) suggests that one way in which the effect of noise induced hearing loss might be conveyed is to play to workers a simulation of hearing loss, including spectral blurring to simulate the distortion which occurs (rather than simply using low pass filtering).
SUMMARY
It appears from the research that:

- people are aware that noise poses a serious threat to hearing;
- people generally have sympathetic attitudes towards the deaf;
- there are, though, widely held beliefs about deaf people's lack of emotional and social well-being, and their appearance of lack of intelligence;
- the deaf people whom respondents encounter tend to be elderly;
- hearing aids are viewed negatively;
- a number of people wrongly believe that hearing aids can help all people in all situations.

3.6.3 Attitudinal factors in hearing protection

There is widespread resistance to wearing hearing protectors; some of the reasons for this are discussed in Part 1 of this literature review. Others, however, are more psychological in nature.

Martin (1990) has pointed out that the "attitude problem is a major reason for ensuring that noise is controlled at source rather than relying on people to protect themselves against it". Although there is not a great deal of empirical research on the psychological aspects of wearing hearing protectors, certain factors have emerged as important.

INDIVIDUAL PSYCHOLOGICAL FACTORS
People may not perceive the risk to their hearing as real; unlike wearing hard hats or safety goggles, the danger of not using hearing protectors is by no means apparent and the negative effects of noise exposure may not be noticeable for some years. Staff may be concerned about their appearance when wearing hearing protectors; this may be a serious problem since self-esteem will affect both their feelings of well-being and their job satisfaction.

THE NATURE OF THE WORKPLACE GROUP
Younger workforces, or those which are new to the task, tend to be more willing to use hearing protectors. Older workforces, or those which have long experience of unprotected exposure to noise, tend to resist the adoption of hearing protectors.

Whilst it is important not to put the responsibility for any failure of hearing conservation programmes largely on the shoulders of the workforce, it is important, that such social psychological factors are taken into account and addressed in the design of a hearing conservation programme.

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206 Lofgren et al. (1982)
207 Royster & Holder (1982)
208 Else (1982)
THE VALUE OF INFORMATION ABOUT PERSONAL RISK - THE COGNITIVE APPROACH

A study by Zohar et al. (1980) examined whether hearing protector usage might be increased by giving individual feedback to workers about the degree of temporary loss of hearing acuity (temporary threshold shift) which each one of them had suffered during the course of one day’s work, whether with or without hearing protectors. Using two groups of workers in different sections of the same factory, they initially monitored the wearing of the hearing protectors provided, to give baseline data, and then gave both groups a programme of lectures on the subject of hearing conservation and noise induced hearing loss. One group, the experimental group, were then given audiometric testing on at least two days over a month-long period of audiometry (the treatment period). This testing compared each person’s audiograms at the start and end of their shift. The audiograms were both given to the worker in question and hung on a notice board, and the research team explained to the workers how to interpret the audiograms. Note that staff were encouraged to wear hearing protectors on only one of the two days on which they were monitored, so that they could see the effect of protectors on their own hearing. The other group of workers, the control group, did not undergo any audiometric testing.

Monitoring of the wearing of hearing protectors in both groups continued for five months. Zohar and his colleagues found that the percentage of workers using hearing protectors rose over the treatment month and the subsequent five months from 30–40 percent to about 85–90 percent in the experimental group. Hearing protector use in the control group, although slightly increased during the period of the educational lectures, quickly dropped back to a low level of usage. This was despite management introducing a programme of enforced wearing of hearing protectors for this group during this period, with a penalty for non-compliance of temporary suspension without pay for several hours of the shift. This latter strategy proved totally ineffectual; the researchers surmise that the workforce realised that the threat of suspension would not be carried out because of the effect this would have on production targets.

The scheme was very successful in increasing hearing protector usage and, unlike purely educational programmes (such as the one which the control group in this study underwent), appears to have a sustained effect after the end of the active intervention. Furthermore, the authors claim that new workers who had not undergone audiometry nevertheless adopted the new norms of their colleagues and showed a high rate of hearing protector usage. The authors attribute the powerful effect of the programme to two processes:

1. the feedback gave sufficient motivation to the individual worker to overcome resistance to wearing hearing protectors;
2. this led to the formation of new norms about wearing hearing protectors within the work group.
The authors point out a number of difficulties with a feedback programme:

- intensive monitoring of hearing protector usage is necessary to keep track of the progress of the programme;
- the room in which the audiometry is carried out must be close to the place of work and yet be relatively quiet;
- the audiograms must be interpreted for the workers, and this may need to be done a number of times;
- management must recognise that the time needed for the audiometric testing is a good investment;
- management fears about workers using the results of their audiograms against the company must be overcome.

Given these provisos, providing workers with feedback about their temporary threshold shift over a working day appears to be an effective way of encouraging the wearing of hearing protectors.

REWARDS FOR WEARING HEARING PROTECTORS - THE BEHAVIOUR MODIFICATION APPROACH

To motivate staff to use hearing protectors, one company ran a lottery,\(^\text{209}\) whereby workers who, on random checks, were found to be wearing the protectors correctly were given a lottery ticket, and prizes were awarded. This increased the wearing of hearing protectors from 6 percent to 71 percent of the exposed workforce, and even four years after the end of the scheme, about 60 percent of workers used them regularly. Thus, the effect of the lottery seems to have been to help motivate people during the initial first few weeks of using the protectors; once people became used to wearing them, little further motivation was needed.

Another study found that a reward system of the “token economy” type led to sustained improvement in rates of wearing.\(^\text{210}\) This may be because the reward system helps people to overcome their resistance to wearing them, to get past the initial discomfort, and to realise the short term, extra-auditory benefits of wearing hearing protectors; an alternative hypothesis is that a new group norm is established during the token regime which is maintained after the regime is terminated.\(^\text{211}\)

Motivation to wear earmuffs is also provided when staff with repetitive work are supplied with muffs which have a built-in headset over which music is transmitted.\(^\text{212}\)

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\(^{209}\) Lofgren et al. (1982)


\(^{211}\) These explanations are discussed in Feldman & Grimes (1985).

\(^{212}\) Harrison (1978). Obviously, this may reduce the likelihood of warning and danger signals being noticed, and this must be taken into account before installing such a system; some, though, also have workplace information relayed through the headset.
PUNISHMENT FOR NOT WEARING HEARING PROTECTORS

Another approach is to punish the failure to wear hearing protectors. One study, using a technique which was essentially punitive, found only temporary gains in the percentage of wearers of hearing protectors.213

"LEGISLATION" VERSUS CHOICE

In contradiction of the usual assumption within psychology that it is better to allow an individual to choose a particular behaviour than to force them to comply, Hager et al.214 found the opposite: that the mandatory wearing of hearing protectors on a site was more successful, as measured by mean hearing thresholds (standardised for a particular number of years of employment), than a voluntary wearing policy. As mentioned elsewhere, though, rules will only be effective if adherence to them is supported by management at the level of the workplace.

SUMMARY OF THE PSYCHOLOGICAL ASPECTS OF HEARING PROTECTORS

- People may not perceive the risk to their hearing as real.
- The danger of not using hearing protectors is by no means apparent.
- The negative effects of noise exposure may not be noticeable for some years.
- Staff may be concerned about how they look when wearing hearing protectors.
- Younger workforces, or those which are new to the task, tend to be more willing to use hearing protectors than older workforces, or those which have long experience of unprotected exposure to noise.
- Rewards to motivate people to use hearing protectors may be useful initially, before their wearing becomes habitual.
- Staff carrying out repetitive work may be motivated to wear earmuffs if these have a built-in headset over which music is transmitted.
- Giving information to staff about their own particular risk (as measured by temporary threshold shift at the end of the working day) appears to be effective in encouraging the wearing of hearing protectors.
- Threats of penalties for not wearing hearing protectors have been found not to be effective in at least two studies, although a mandatory site policy of hearing protector usage was successful in another study.
- The aim should be to get the wearing of hearing protectors to be the norm in the workplace, so that factors such as peer pressure and conformity to norms can influence the workforce.

CHAPTER FOUR: CASE STUDIES OF PUBLIC INFORMATION CAMPAIGNS

4.1 INTRODUCTION

Legislation is already in place to control the exposure of workers to noise. The HSE wish to develop a strategy to ensure greater compliance with the new regulations. Some kind of publicity campaign may well form part of such a strategy, and so the purpose of this third part of the literature review is to present case studies of a number of public information campaigns, in order to help the HSE understand how other organisations approach this task.

Each case study campaign is intended to change the behaviour of the public in some way, but each has a different format and approach and so lessons can be learnt by comparing the campaigns.

This part of the review is structured as follows:

- the remainder of this introduction presents general points about the role of public information campaigns and their planning;
- there follows a section which reviews the Health Education Authority's (HEA) experience of running health-related, public information campaigns;
- this is followed by the case studies which are presented in two sections: those which relate to the workplace or have a strong workplace component, and others which do not relate to the workplace but have other features which are of interest.

Each campaign is described in terms of:

- the problem it addresses;
- its aims;
- the actions which have been carried out within the campaign;
- any evaluation which has been conducted of the success of the campaign;
- possible lessons for a noise campaign.

4.1.1 Public Information and legislation

Changing public behaviour can be achieved through public information campaigns or through legislation (or through a combination of the two). It is perhaps worth considering how these approaches relate.
Public information is often used in combination with legislation, for example, to publicise new laws and to support laws which are difficult to enforce. Legislation can be made very effective when supported by public information in this way. A good example is the introduction of compulsory seat belt wearing in 1983.

Prior to the seat belt regulations there were a number of public information campaigns to encourage seat belt wearing. Surveys\textsuperscript{215} found that during the period the campaigns were run, seat belt wearing rates were increasing from about 30% in the mid-1970s to almost 40% in 1982. However, soon after the introduction of regulations making the wearing of front seat belts compulsory, wearing rates reached 95% and have been maintained at this level since. Little public information has been needed since the introduction of the regulations, but it seems likely that the extensive campaigns prior to the new law “primed” people towards conforming with the law once it was introduced.

Legislation is rarely as effective as this and often needs the support of continued public information. Examples are included in the case studies in this review: drink/driving is illegal and yet remains a persistent problem; similarly there is ignorance of the new COSHH regulations and a failure to implement them in certain circumstances. It is as a result of this failure of legislation that public information campaigns take on an important role.

4.1.2 Planning a public information campaign\textsuperscript{216}

Each case study discussed in the report has produced a set of lessons to be learnt. To a great extent these must be considered as specific to each campaign since the campaigns were designed and tailored to meet specific sets of circumstances. However, some general principles of campaign planning do exist.

Good campaign planning requires answers to the following questions.

WHERE ARE WE NOW?
Carry out a baseline survey or collate epidemiological data; these data must be broken down by socio-economic, spatial and other categories.

WHERE DO WE WANT TO GO TO?
Targets must be set. Where possible a long term view must be taken (for example, a five year plan).

Targets can be set in relation to a global problem or by identifying local “hot spots”.

\textsuperscript{215} Broughton (1989)
\textsuperscript{216} These conclusions are drawn from the research carried out by Building Use Studies and from interviews with senior campaign planners at the Health Education Authority.
HOW WILL WE GET THERE?

1. **Strategy**
   Consider a "middle-out approach". This means targeting professionals who act as agents for the campaign and for the behaviour change it is designed to produce. A "top-down" approach can generate a lot of high status support quickly, but it may not be carried through into the lower levels of the organisation. Even if it is, it may then prove difficult to resource a response adequately: you create a 'monster you cannot support'. The key, whether the "middle-out" or "top-down" approach is chosen, is to achieve a company culture which actively supports the campaign and into which the aims of the campaign can be integrated.

   A "bottom-up" approach presents a very diverse target audience and, again, it can be difficult to resource such a campaign unless the target audience is restricted in some way. Within the workplace, a campaign taking a "bottom-up" approach will not necessarily gain the support of senior management since communication channels from workforce to management are often inadequate, since the workforce have little control over resources, and since managers in some companies do not respond to workforce priorities.

2. **Timing**
   Plan the campaign and the media elements to avoid obvious clashes with competing events and also to take advantage of complementary events.

3. **Launch**
   Have a high profile media launch; this gets maximum immediate attention, but the team must be prepared for following-up a good response. A high profile launch is politically popular in that ministers like to feel that "things are happening" and they may be willing to give the launch specific ministerial support. The launch should also be supported by a consensus statement from highly authoritative sources, particularly organisations.

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217 See details of 'Look after your Heart' programme.
4. **Tactics**

Hire a public relations firm for below-the-line activity\(^{218}\). Publicity must continue at low cost during the life of the campaign. The following tactics can help achieve this:

- have an identifiable logo and/or by-line which links and reinforces different elements of the campaign;
- publicise “the 1000th worker to ...”;
- run competitions;
- publicise shocking or notable case histories (‘dead bodies’, in advertising jargon). Before the campaign begins, prepare a stock of case-histories which can be released at strategic moments;
- use any opportunity to get editorial coverage in magazines and newspapers, as this is free publicity;
- carry out small surveys: the results always attract media attention.

**HOW WILL WE KNOW WHEN WE GET THERE?**

Evaluate the campaign with tracking surveys of media impact and more strategic research and evaluations. The Health Education Authority spent five million pounds on four mass media campaigns in 1988/9, of which one million pounds was spent on research and evaluation.

Budget for evaluation at the outset of the campaign; otherwise, it is easy to decide that it cannot be afforded. Evaluation enables the lessons to be recalled long after the event. It also enables long term campaigns to be justified and reoriented: “it provides the navigation for a campaign”.

Set milestones so that there is early warning if the campaign is off-target.

Evaluation research must produce results on a timescale which is suitable for the results to be acted upon.

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\(^{218}\) 'Below the line' activity is the variety of campaigning activities which do not involve purchased advertising. The latter is termed 'above the line' activity.
4.2 THE EXPERIENCE OF THE HEALTH EDUCATION AUTHORITY

The Health Education Authority (HEA) has responsibility for running a number of important campaigns related to public health and so have wide experience of running and evaluating public information campaigns. Some of the people in the HEA who were interviewed during the preparation of the case studies offered some general comments on designing and running public information campaigns.

It should be noted that the information described here was collected in 1989; some of it may therefore be out of date, but to the best of the authors' knowledge, it was accurate at that time.

4.2.1 The use of mass media in health education

The HEA has a remit to provide direct public education. Mass media are powerful sources of influence upon public knowledge, attitudes and awareness of certain health issues. They have the potential to reach a large number of people quickly and simultaneously, including "hard to reach" audiences. Mass media are therefore a useful channel of communication for conducting direct public education.

Intervention strategies, which aim to change important aspects of people's behaviour, require large resources, need a considerable period of time to be set up and also take a long time before the benefits start being visible.

When planning the use of mass media communications in health education, the following criteria should be considered:

- development of the programme and appropriateness of using mass media to achieve specific objectives;

- an assessment of the social climate in relation to the kind of message being delivered;

- the extent to which professionals concerned with local health promotion (statutory and voluntary) are prepared (with skills and resources) to provide partially informed and newly motivated groups and individuals with the necessary support for behaviour change;

- availability of tools and resources for research and evaluation;

- ensuring HEA delivery systems are primed with appropriate resources, including collaboration with the Press Office.
All HEA mass media initiatives are routinely monitored and evaluated through tracking studies. Impact and effectiveness can also be monitored through requests for packs/leaflets, calls to helplines, product sales, uptake of services and media auditing.

4.2.2 Examples of success

The HEA through mass media communications has achieved demonstrable success in a number of areas.

1 Many HEA media campaigns have achieved high levels of awareness, e.g. the most recent Teenage Smoking TV advertisements obtained 93% prompted recall (source: MORI Teenage Smoking Campaign: First Tracking Survey, May-June 1990). The HEA has also achieved industry recognition for its AIDS “Talking Heads” campaign. The advertisements came seventh in the top 50 brands obtaining the highest prompted recall in Marketing’s “Adwatch of the Year” 1989-90, and fourth when prompted recall was related to level of spend (i.e. value for money).

2 During the AIDS “Talking Heads” campaign, weekly calls to the National AIDS Helpline almost doubled from 11,800 to 21,400 for several weeks.

3 Similarly, calls to the Smokers’ Quitline increased substantially during the period before and after National No-Smoking Day (NNSD) 1990.

4 An immunisation campaign in mid 1989-early 1990 achieved 63% awareness of a newly launched vaccine, MMR, with public knowledge of this vaccine surpassing all other childhood vaccines. Furthermore, 45% of children had received the new vaccine at the time of the study (source: MORI/HEA MMR Campaign evaluation, May 1990).

5 The current HEA/Department of Health immunisation campaign, June 1990, has been devised as a result of developmental research and following the evaluation of a pilot campaign which ran in the Granada region. The research identified the appropriate target, the relevant concerns to be addressed, and the most appropriate message for greatest impact (see HEA/DoH Professional Information Pack on Immunisation, June 1990, for further details).

6 HEA excellence in the use of mass media was acknowledged in a major review of public service advertising by the National Audit Office which concluded that the Spring 1988 AIDS publicity was “an extremely well planned and well-managed campaign” (source: Publicity Services for Government Departments, National Audit Office, HMSO Dec. 1989).
7 National No-Smoking Day, of which the HEA is one of the major sponsors, provides an excellent example of a one day event which utilises both local and national publicity, involving up to 9,000 local organisers holding community events, with considerable results. Evaluation of NNSD indicates that 72,000 smokers continue to give up smoking three months after participating in the event (source: NOP Market Research for the NNSD Committee, Evaluation of the 1989 No Smoking Day Campaign).

8 The "Look After Your Heart" (LAYH) programme (1990/91) utilises a mix of marketing and communication approaches to promote year round coverage of the LAYH messages. These include press and TV advertising, editorial coverage, heartbeat award schemes for healthy eating places, a range of publications, advice and assistance to TV/radio programmes, and commercial co-promotions such as "Food for the Heart". This latter is an annual month-long co-venture with all the leading supermarket chains plus a number of other relevant organisations.

4.2.3 Enhancement of the effectiveness of mass media campaigns

Mass media campaigns are most effective when they are guided by research and evaluation. This includes:

- knowledge of the target audience;
- knowledge of the latest behavioural and/or epidemiological data;
- concept and pre-testing to ensure the message is appropriate for the target audience and to assess their receptivity and understanding;
- reviews and development of new initiatives.

The effectiveness of mass media is also increased when it is complemented by local health promotion activities. Research suggests that mass media is most effective for agenda-setting (shifting local norms), reinforcing, reminding or confirming knowledge about healthy behaviour, prompting people to get further information (for example, to call helplines); and it may influence one-time behaviour such as encouraging parents to have children immunised. The role of mass media is therefore mostly concerned with short-term, clearly defined objectives.

For maximum impact and effectiveness, local health educators in schools and youth settings, primary health care, communities and workplaces need to be adequately resourced in terms of staffing, training and development, and appropriate materials to carry out activities which enable motivated groups and individuals to acquire healthier lifestyles.

219 Pasick & Wallack (1988-89)
Although inconclusive, pointers to the importance of local education can be inferred from the evaluation of Drinkwise Day 1990, whereby the two NHS Regions (North West and South West) with established local education programmes out-performed all other regions in terms of awareness of units and correct knowledge of upper limits.

It is also supported by recent research in Australia which indicates that significant changes in health-related behaviour occur when mass media is used in conjunction with community initiatives (compared with mass media alone).  

The effectiveness of mass media advertising is enhanced when part of a ‘marketing mix’ including other forms of mass contact with the public. For example, in the HEA context, the work of the Publishing, Commercial and Press Departments are all creating an environment in which advertising messages are more readily received and understood because the same messages have been reinforced from other mass media routes. (The converse is, of course, also true - that, for example, advertising can set the scene for editorial messages). The premise that different types of mass communications reinforce each other is, of course, difficult to prove because of the problems of isolating the impact of advertising from messages received from other routes. However, there seems little doubt, for example, that the impact of the HEA’s AIDS advertising campaign is related to public concern generated by editorial coverage.

4.2.4 Health education and health promotion in the workplace

Health education must be distinguished from health promotion. Health education enables people to develop the knowledge and skills required for healthy living, but tends to put the blame on to the individual for not looking after their own health, ignoring the social constraints which inhibit behavioural change.

Health promotion encompasses both the need to develop personal skills for healthy living and also the need to create health promoting policies and social and physical environments supportive of health.

Health promotion schemes in the workplace must:

- have the support of top management;
- identify and then be formulated around “agents” of health education and promotion within the organisation;
- be built on the principles of participation, collaboration, consultation and equity.

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220 Redman, Spencer & Sanson-Fisher (1990)
221 This material is drawn from Curtis (1990).
Critical practical elements of success include having good communication channels and planning and timing the campaign carefully.

In order to be convincing to management, the material given to them regarding health promotion in their workplace must tell them what the managers and organisation are expected to do, what the benefits will be for the organisation, when these benefits will be realised, and which other organisations are participating. It is thus very important that the results of the campaign in each organisation are monitored, so that feedback is available.

To be useful, the scheme should be structured into a "step by step" approach, and people should be either provided with the resources they need for their next step, or told where they can obtain such resources.

Campaigns may fail because:

- we may just tell people what is "good" for them;
- we may appear to be challenging their freedom of choice;
- we may appear to be interfering with people's standards of living or personal preferences;
- we may give people information which does not seem relevant to their personal situation.
4.3 CASE STUDIES

4.3.1 Workplace case studies

A WEARING OF HARD HATS AND THE "SITE - SAFE '83" CAMPAIGN

A1 Problem

The construction industry is known to be a high risk industry where improvement in health and safety is always needed. The construction industry "covets and promotes an image of toughness, individuality and independence. Bravado and the running of risks are seen as natural expressions of this culture." 222

The Construction Industry Advisory Committee (CONIAC) recommendations on hard hat wearing resulted in an agreement in 1981 between construction industry unions and employers that the wearing of hard hats should become one of the National Rules throughout the industry.

A CONIAC attitudes working party developed the idea of a campaign to improve safety in the construction industry which they called “Site Safe '83”.

A2 Aims

“Site Safe '83” attempted to produce a permanent change in attitudes towards safety by raising awareness of hazards and showing how they can be avoided. It was aimed specifically at smaller firms and the self-employed.

The implementation of a National Rule on hard hat wearing was intended to make the wearing of hard hats compulsory. Thus one scheme examined here takes a "campaign" approach whilst the other takes a "legislative" approach.

A3 Actions

“Site Safe” had four themes, three of which concentrated on specific causes of accidents, and the fourth, on the planning and provision of expert advice. The overall aim was to change attitudes to safety permanently by raising awareness of hazards and possible precautions and emphasising the fact the problem is everyone’s responsibility.

“Site Safe '83” involved leaflets, newsletters, promotional materials, “Site Safe” packs describing the problem and precautions, seminars, talks, discussions and exhibitions. Groups such as trade unions, industry federations, insurance and professional organisations were all involved. “Site Safe News” has continued to be produced twice yearly.

222 Dawson et al. (1988) p. 127
A4 Evaluation

"SITE SAFE '83"
An evaluation of "Site Safe '83" found that five months into the campaign, the message was still not getting through to small firms nor on to the sites of larger firms, even where their senior management was committed to improving safety.223

Overall, the campaign has been judged by some writers as failing to increase safety.224 Some of the reasons for this may be particular to the construction industry, such as the constantly changing nature of the work undertaken, the temporary nature of the workplace and work team, the high level of subcontracting or self-employment, low union membership, lack of close supervision, time pressures and the complex time sequencing of a construction project, time-related bonus incentives and the lack of obligation to register work sites for jobs lasting under six weeks.

Other authors have criticised the organisation and operation of the "Site Safe" campaign because of its concentration on changing workforce attitudes and its underemphasis of the role of management and the existence of structural barriers to safer working practices.225

THE WORKING RULE ON HARD HATS
A study in 1984226 found that only 29% of construction workers were wearing hard hats. Most construction workers expressed the view that they would wear the helmets more if they were more strongly urged or even ordered to do so by their management. In only one seventh of the sites studied did the person responsible for safety on the site consider that the wearing of helmets was dictated by the workers' supervisor or the company operating the site. Thus, the "working rule" appeared to be largely ineffectual because it was not sufficiently enforced on site.

A5 Lessons to be learnt

• Legislation needs to be reinforced at a local level - the commitment of all levels of management to the regulation is crucial to this.
• It is difficult to reach small firms, at least, in the construction sector.
• Campaigns must take account of structural factors in industries which may make the adoption of safer working practices difficult.

223 HSE (1983)
224 Dawson et al. (1988) p.xviii
225 Glendon & Hale (1984)
226 Hickling (1984)
B1  THE CAMPAIGN TO PUBLICISE COSHH

Problem

The COSHH regulations came into force on 1st October 1989, and they required action by employers, in the form of a workplace assessment, by 2nd January 1990. The official campaign to publicise the COSHH regulations began ten months before they came into force, in December 1988. This review is based on an interview with Phil Gifford and Ian Chapman, senior members of the COSHH implementation team.

Prior to the campaign, there existed a relatively broad level of awareness of and interest in the regulations since the ideas behind them had been under discussion for almost ten years. A large consultation exercise, involving about 700 respondents, had been carried out as early as 1984. In addition, the regulations were somewhat controversial, and so generated media interest. This meant that by October 1989, there was a reasonable degree of awareness of the new regulations: a telephone survey of 2000 companies\(^\text{227}\) found that 38% of its sample overall had heard of COSHH. Awareness of the regulations differed according to the size of the company: all large companies were aware of the regulations; in contrast, 53% of companies employing 25 to 49 people and 31% of companies employing one or two people were aware of the regulations. It was calculated that 80% of employees worked for companies which were aware of COSHH (this reflected the high degree of awareness amongst the large employers.)

The HSE recognised that this existing awareness was not wholly beneficial in terms of action: people were very concerned about COSHH, and this tended to produce a denial or avoidance response.

The situation two years after the introduction of the regulations was that awareness had increased to 73% of companies employing 25 to 49 people and to 48% of companies employing one or two people.

B2  Alims

The aims of the publicity were twofold:

1. to increase awareness of the COSHH regulations;
2. to provide guidance and support in order to help industry carry out their obligations under the legislation.

\(^{227}\) Carried out by an independent survey organisation under contract to DIAS.
The HSE and DTI wanted to target resources towards small companies; these were seen as the key target group because they are more difficult to contact and lack specialist staff. It was felt that bigger companies were already more aware, and could thus “look after themselves” as far as adhering to the COSHH regulations. All companies, though, clearly needed some extra information: one survey of high risk industries found that, prior to the introduction of the regulations, there was a considerable amount of activity concerning hazards which were to be included in COSHH, but this activity was not of a high quality.

B3 Action

The campaign was launched with a press conference attended by the Secretary of State. It comprised a number of initiatives which were put into effect at two levels:

NATIONAL LEVEL
The activities of the HSE’s policy division included the production of publicity material, mailings and national advertising.

LOCAL LEVEL
Publicity was developed at a local level through the local press and radio; lectures were also arranged. In addition, the National Interest Groups and Special Responsibility Groups were used to publicise COSHH. The National Interest Groups provided an effective mechanism for identifying problems in a particular business area as quickly as possible. Another initiative was the setting up of links, via the Department of Trade and Industry, with small firms’ counsellors, services and local enterprise agencies. These links included running informational seminars for people working with small firms. This link is now being extended to cover commercial consultancies; one region has already held an HSE-run seminar for consultants, who are now seen as a key target group, and who themselves recognise the importance of keeping up to date with COSHH.

The tactics adopted included the following:

- the provision of basic information in the form of leaflets which would be requested by individual organisations, trade associations, and HSE Area Offices; this was seen as a “demand-led” information resource i.e. the leaflets are given out on request. These leaflets also contained details of other COSHH publications and advice on how to get further information;
- putting forward a staged set of messages about COSHH over the period before the regulations came into effect;
- to provide an enquiry service: this was done at two levels - three national HSE enquiry points, and a COSHH Policy Enquiry Team providing more detailed guidance:
• offering low cost, in-depth but easily comprehensible publications on the
  assessment duty of employers; this includes the Approved Code of Practice and a
  step-by-step guide to self-assessment oriented towards small businesses who will
  not have their own health and safety staff;
• the production of introductory videos about the regulations;
• the development of an open learning course which could be used for helping large-
  scale employers train their health and safety staff;
• encouraging the National Interest Groups and Special Responsibility Groups to
  work closely with industry and trade associations in explaining the regulations;
• carrying out mailings to organisations dealing with small businesses and also to
  chambers of commerce and trade associations;
• producing material oriented specifically at particular industries;
• running a small scale advertising campaign (based on the image of "three wise
  monkeys") in national newspapers and in trade association journals;
• working with National Interest Groups to tailor information to specific industry
  needs, and to uncover problems encountered by particular industries.

During the period from October 1989 (when the regulations came into effect) to
January 1990 (the date by which companies had to have completed a COSHH
assessment), there was a great deal of publicity in the media. Since January, the
direction of the campaign has been shifting. No further funds are being made
available for HSE-produced publicity of a general nature but the campaign is
continuing by taking advantage of press and media interest in the regulations. Since,
though, the level of interest is high, this appears to be relatively successful.

Further interest can be generated by the publication of survey results, new
publications, and by events connected with the anniversary of the introduction of the
regulations. The HSE give interviews to trade magazines about COSHH, and they
have co-sponsored a special issue of "Works Management" devoted entirely to
COSHH. These activities are a relatively inexpensive way of obtaining good
coverage of a specialist target audience. For example, the European Year of Health
and Safety has "clean air" as one of its themes, which is clearly a COSHH objective.
"Works Management" are again looking at COSHH from this angle.

Other activities designed to "keep the pot boiling" include attendance at exhibitions,
the publication of new advice or amendments, and issuing details of prosecutions and
of specific problems encountered. Furthermore, since many companies have a
commercial interest in COSHH, they will help to maintain awareness of and interest in
the Regulations.

It is intended to improve the assessment booklet, making it more practical by giving
examples and solutions to particular problems. This is seen as an important
development.
B4 Evaluation

No quantified targets were set against which changes in levels of awareness and activity as a result of the publicity could be measured. The following assessment is therefore largely anecdotal in nature. Very early on, the HSE developed plans to ensure that the impact of COSH on industry was monitored and assessed effectively. Above line evaluation was carried out before COSH came into force and this is being followed up by an evaluation which will be reported in September 1992.

Demand for the leaflets was high; over 5 million of them have been distributed. 100,000 copies of the Approved Code of Practice have been sold. The advisory material has been judged as attractive and clearly written<sup>228</sup>. Responses from chambers of commerce and trade associations were very variable. The advertising campaign, which had a budget of £250,000, was aimed at small businesses; the highest number of responses were to the advertisements placed in "The Mail on Sunday".

It has been found that knowledge of COSH regulations is much higher amongst organisations which are members of a strong trading association or similar. For example, a DTI report found that over 90% of dry cleaning companies surveyed were aware of the COSH regulations which related to their business, whereas awareness amongst companies without such a strong association was lower. The role of suppliers was also a significant factor.

Continuing DIAS telephone surveys show that there is still a problem of small companies not taking sufficient action, but that companies employing 20-50 staff are improving quickly.

One problem which has been identified so far is the tendency for some organisations, having carried out their COSH assessment, not to act on it. However, the presence of the warning notices on hazardous substances sometimes acts as a trigger to employees, reinforcing COSH awareness amongst the workforce.

The aim of the video, which the COSH team produced, was to introduce the regulations and to allay some of the anxiety which surrounded them. According to the HSE campaign team, it appears not to have been very successful. Since commercial companies concerned with COSH often produce and market their own sales videos, it seems more efficient to let them develop video publicity material.

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<sup>228</sup> Safety Practitioner February 1989
A review of COSHH in Building magazine 229 said there are problems of ignorance and compliance within the construction sector. Particular problem areas are that:

- sub-contractors are ignorant of COSHH even when main contractors are in compliance;
- architects are ignorant of COSHH yet clients treat them as a knowledge resource;
- suppliers of materials are not giving adequate information, which makes assessment difficult;
- implementation is costly.

At the individual level, the main problem is that workers cannot easily think of substances which they have handled for many years as being hazardous. In terms of the use of protective equipment, goggles and masks are reported to need improvement “if anyone is going to wear them”.

B5 Lessons to be learnt

- Fear and ignorance of new regulations inhibits compliance. Publicity material must provide organisations with a practical way forward.
- Generate free publicity through editorial copy and correspondence.
- Particular target audiences can usefully be addressed through trade literature and regional or locally based initiatives.
- Develop and exploit links with relevant bodies such as trade unions and consultants who have a continuing interest in the field.
- The field effort needed to launch COSHH was large, which has made heavy demands on HSE resources, particularly those of Policy, of Inspectors, of specialists and of DlaS. This has implications for the other regulations launched at the same time as COSHH: the Noise at Work Regulations and the Electricity at Work Regulations. It would be helpful if new regulations could be launched on a planned timescale, so that they can mutually benefit from the reinforcement of each others’ messages, rather than confusing the target audience and dissipating effort and resources. However, this is not feasible now that regulations are being made as a result of EC Directives so that there is less UK control over the timing of them.
- With regard to monitoring, telephone surveys which are simple in scope but with a reasonably large sample size may be a valuable complement to data collected by the Inspectorate. An externally run telephone study avoids making further demands on inspectors and can furnish useful and up-to-date data about the successes and failures of campaigns. The experience of more lengthy and detailed surveys is that the methods of collection and the non-random selection of the sample means that it is difficult to generalize from them, and any delays in the collection and analysis of the data make it difficult to act on the information.

229 Building (12.10.90)
C A PUBLIC NOISE AWARENESS CAMPAIGN IN THE NETHERLANDS

C1 Problem

On 1st August 1987 the Dutch government introduced new regulations to control noise in the workplace. They conducted a public awareness campaign to support the introduction of the new law.

C2 Aims

The aims of the campaign were:

- to create awareness of the statutory provisions among a range of relevant groups such as employers, manufacturers, suppliers, importers, arbitration bodies, employees and training institutes;
- to create awareness among employees of the dangers of chronic exposure to noise.

The campaign did not aim to change attitudes, as this was held to be a more long term objective.

C3 Action

The campaign had three phases:

FIRST PHASE
This simply comprised a press release, which was issued as new legislation came into effect. There was a limited response from the media: this was felt to be due to the fact that it was issued during the peak holiday period and because of the generally low priority of the issue.

SECOND PHASE
Three months after the press release, a series of brochures, stickers, posters and fact sheets were mailed to the bodies, listed above, which needed to be aware of the new law. For each sector of the target groups, specific material was prepared.

In total 91,000 information packs were sent out and 250,000 brochures were ordered as a result of the mailing. It was therefore concluded that a large part of the target group had been reached. On a more disappointing note, the mailing has not, though, led to firms contracting the institution running the campaign.
THIRD PHASE
In February and March 1988 a publicity campaign aimed at making the public aware of the risk of harmful noise was undertaken. This used the following techniques:

- television information slot ("Postbus 51 slot");
- brochures in post offices and libraries;
- advertisements in newspapers;
- an independent telephone help-line.

There has been no research into the effectiveness of this, but 560,000 brochures have been distributed and interest has been generated in press and radio. Daily advertisements in the press had an intriguing format (no details given) and did not specify who was publishing the advertisement. These newspaper advertisements were more effective in publicising the help line than a television advertisement.

From the reaction of people who called, it was concluded that the telephone help line was highly valued. It was apparent that they wanted to raise the problem of noise because they were unable to express their anxieties at work.

COSTS
The total cost of the campaign was £169,000. Of this, £54,000 was required for Phase 2 and £115,000 for Phase 3.

C4 Evaluation
The scheme was judged to have been successful in its stated aim of making people aware of noise as an occupational hazard. It was suggested that the combination of media and techniques used in the campaign accounted for this success. One disappointing note, however, was that requests for information from notoriously noisy industries were remarkably few.

The campaign lacked up-to-date mailing lists which inhibited its effectiveness as information was sent to incorrect addresses.

C5 Lessons to be learnt

- A telephone help-line was found to be valuable.
- Press releases must be timed to avoid obviously conflicting demands for public attention.
- Up-to-date databases are essential to avoid wasting resources.
- Very noisy industries are difficult to access with such public information campaigns.
D THE "LOOK AFTER YOUR HEART" PROGRAMME

It should be noted that the information described here was collected in 1989; some of it may therefore be out of date, but to the best of the authors' knowledge, it was accurate at that time.

D1 Problem

Approximately 180,000 deaths per year result from coronary heart disease in the United Kingdom; this represented 27% of all deaths in 1986. The financial costs include £500,000,000 on treating patients, 35,000,000 working days lost and £250,000,000 in sickness benefits (1984/5 figures), as well as the cost of lost productivity through sickness and premature death.

The United Kingdom has not matched the large reductions in coronary heart disease achieved in other countries and was criticised by the World Health Organisation (WHO) in the early 1980's.

D2 Aim

Lowering the incidence of heart disease in response to the WHO criticism became an important issue on the political agenda in the UK during the 1980s. Funding from the Department of Health and the then Health Education Council was made available for a campaign to reduce heart disease.

D3 Action

The campaign was first piloted in Wales. There then followed campaigns in England and Scotland. This description covers all three but focuses primarily on the English campaign.

THE WELSH PILOT CAMPAIGN

The Health Education Council, in conjunction with the Welsh Office, set up the pilot scheme in Wales in 1985. Entitled "Heartbeat Wales", it built upon an approach recommended by the World Health Organisation, in that it:

- had measurable goals; for example, by 1990, the proportion of the population between ages of 18 and 64 who smoke cigarettes should be reduced by 5%;
- was based on the lifestyles and risk factors of the Welsh population;
- had a structured plan of action for the achievement of each target (although priorities between these factors were not set initially);
- it established links with outside agencies (such as the meat industry, supermarkets, educational bodies).
COSTS
The approximate annual costs were £700,000 in 1987/8, representing 25p per person; "Heartbeat Wales" had a staff of 25. The scheme was endorsed by a number of important organisations such as the Trades Union Congress and the Confederation of British Industry.

THE SCOTTISH CAMPAIGN
"Heartbeat Wales" was largely a community-based scheme. The Scottish Health Education Group took a different approach in the "Be All You Can Be" campaign, which was very broad-based, concentrating on people's entire lifestyle and emphasising overall health rather than particular illnesses, although specific risk factors associated with a variety of illnesses were included in the campaign. One reason for this approach was that adults in Scotland had been shown to take a negative view of exhortations to avoid poor health.

The cost of the campaign was about £700,000 per annum (1987-88) or 14 pence per capita, but this cannot be directly compared with the Welsh and English schemes since the Scottish scheme covered a broad spectrum of health behaviours. No quantified targets were set for the scheme; it was left to individual health boards to determine their own approaches on the basis of local circumstances.

THE ENGLISH SCHEME
The English scheme is called "Look After Your Heart" (LAYH). It was planned by the Department of Health and by the Health Education Council (as it was then), and it was launched in April 1987 at a cost of 3.5 million pounds. It has three elements:

- a community based element;
- a public information campaign;
- a workplace-based scheme.

The programme was launched before the Welsh pilot study was complete. "Heartbeat Wales" was considered to be of limited value as a model for England for two reasons:

1. "Heartbeat Wales" had a much higher per capita funding than the English programme (approximately double);

2. "Heartbeat Wales" was strongly based on Welsh culture and identity and targeted on a small population (about four million people) for whom this shared identity is important. The English campaign, in contrast, has a target audience of 47 million people in 14 regions with no strong common identity.
THE COMMUNITY BASED ELEMENT
The community approach was intended to gain the involvement of District Health Authorities, who would initiate schemes locally. Funds were available for this, both in the form of small, pump-priming grants and as more substantial budgets. However, the Health Authorities initially failed to take up the scheme to any substantial degree. One reason for this was that there were management problems with goal-setting and with the financial aspects of the scheme.

These shortcomings are now being overcome by means of community-based committees which combine the community and workplace approaches (see below).

THE PUBLIC INFORMATION CAMPAIGN
This comprised an initial advertising campaign, and new and existing HEA reports, repackaged using the campaign logo, and a high quality introductory booklet containing case studies and other information. The public information campaign was a relatively minor component of the overall LAYH programme.

THE WORKPLACE SCHEME
The workplace scheme is administered by staff at the Health Education Authority. It has formed the main thrust of the LAYH programme to date, although there is currently an additional build-up of effort into community schemes which are taking over local workplace schemes, although large national companies are still supported by the HEA itself.

HEA staff lobby organisations to encourage them to take part in the scheme. They have a detailed, high quality information pack to promote participation.

The workplace scheme is built around a set of ten criteria and recommendations to create a healthier lifestyle. Organisations which sign up to the scheme are asked to implement at least three of the ten criteria. These are:

1. use offices and other premises to put across the basic messages of the campaign;
2. provide information to staff about healthy living by distributing campaign material;
3. publish advice on all aspects of healthy living in the house newspaper or magazine;
4. provide more smoke-free areas in offices and factories;
5. provide healthy choices of food and publicity about them in staff canteens and public eating places;
6. introduce programmes for employees in exercise, nutrition and stress management to encourage healthy living;
7. provide more opportunities for staff to take exercise;
8. arrange for staff to have fitness testing and blood pressure screening;
9. explore opportunities for commercial collaboration through advertising, promotions and publicity;
10. adopt practical, company-wide policies on smoking, nutrition, exercise, alcohol and stress management, in order to provide staff with an environment conducive to good health.
Organisations which become involved in the scheme are given guidelines which include the following:

- a named contact must be nominated, both for day-to-day matters and future long term involvement;

- a budget must be made available;

- a LAYH Steering Group should be established internally, to identify objectives and to plan and supervise the development and implementation of the initiatives required. The objectives must include short and medium term aims, links to existing activities, and targets such as depth of coverage for each topic and numbers of staff to be reached in a given time period;

- accurate information should be disseminated about coronary heart disease;

- a rolling plan of events must be devised.

Workplace campaigns need to take into account the culture of the organisations involved. For example, in the civil service, people are often appraised annually on the progress of schemes under their budgetary control. Since future budgets are allocated on the basis of this appraisal, campaigns must be planned to take account of this system.

The Director of Workplace Projects at the HEA stresses the importance of getting commitment from the managers in organisations who are going to be directly involved. In this respect the HEA has adopted a “middle out” approach to getting the scheme adopted rather than the more conventional “top down” or “bottom up” methods. This approach has been successful, resulting in a waiting list for companies wishing to join the scheme. Commitment is first sought from two groups: the chief medical officers or others responsible for occupational medicine; and the personnel managers, who control the budgets for health promotion. It is then hoped that these groups can obtain the commitment of senior management; and gain the cooperation and involvement of the workforce at large.

These groups have been contacted through their professional bodies, the Faculty of Occupational Medicine and the Institute of Personnel Managers (IPM). Staff from the HEA have held workshops, developed handouts and made presentations at annual conferences. By attending professional conferences, the LAYH campaign has gained the commitment of IPM tutors to its work and has encouraged them to develop the appropriate tools for training. In order to be effective, information must be integrated into the main body of the training and related to other aspects of personnel management rather than being “tacked on” as a separate module solely about heart disease.
DECENTRALISATION OF THE CAMPAIGN; RE-EMPHASISING THE COMMUNITY ASPECT

The LAYH campaign is now being decentralised following criticism (see evaluation section). There is resistance in the provinces to campaigns which are based in London and which are felt to be imposed on the rest of England. Furthermore, since there are geographical variations in the risk factors, different approaches in different regions are justified, at least until it is clear which ones work and which do not.

A number of regional coordinators have been appointed, of whom it is hoped 22 will be in place by late 1990. The aim is to establish “partnerships” or groups comprising major local employers, Family Practitioner Committees, local authorities and Regional and District Health Authorities. These will be able to give the campaign a local flavour, such as the “Yorkshire Heartbeat” scheme. It is intended that the regional coordinators will act to prevent the potential duplication of activities and facilitate the sharing of resources.

As with a national scheme, it is important that local initiatives are monitored. The National Audit Office found that there are different degrees of local planning and local implementation, but little local monitoring.

EDUCATION

The LAYH campaign, as part of its community initiatives, is seeking to use formal and semi-formal educational routes to promote healthy behaviour. Material on coronary heart disease is being included in the new national curriculum, particularly in science subjects. The topic can be raised in a variety of subjects, for example, from biology (regarding the circulatory system) to mathematics (dealing with statistics of incidence).

The second aspect is the less formal education of mothers through pre-school playgroups, health and welfare services. The aim is to train mothers to instill sensible eating habits into their children from an early age. Women are very influential in shaping the behaviour of other family members but currently their potential with regard to health promotion is not being realised. For example, women tend to believe that coronary heart disease is a male problem which they can ignore. This is in spite of the fact that women exhibit many of the risk factors, including their higher incidence of smoking, use of the contraceptive pill, lack of exercise and their tendency to eat badly through “starvation diets”.

Evaluation

Trends in mortality levels are only discernible in the long term: therefore, it is necessary to use trends in the levels of risk factors, such as diet and smoking, as indicators of effectiveness of prevention work.
The achievements of the Welsh pilot scheme and the Scottish and English campaigns have been evaluated by local management and national audit organisations.

WELSH PILOT, "HEARTBEAT WALES"
The Committee of Public Accounts\(^{230}\) noted the "vigorous and businesslike approach of the Welsh office .... whose campaign has begun to show a worthwhile return on the investment made". "Heartbeat Wales" was further commended for having measurable goals, objectives and outcome targets.

A review by the National Audit Office\(^{231}\) has praised the scheme for being well structured and for showing early signs of having an impact on people's behaviour and lifestyles.

SCOTLAND, "BE ALL YOU CAN BE"
There are periodic "tracking surveys" of the campaign to ascertain the level of public awareness of the programmes. These have found a "substantial" increase in awareness of the principal risk factors in heart disease since 1984 together with a modest reduction in overall mortality rates for men. However, a 1988 report by the Scottish Health Education Co-ordinating Committee also found increased incidence of coronary heart disease in social classes C2, D and E compared with classes A and B. The report commented on the existence of "striking" local variations in mortality rates. It was therefore decided to introduce a national programme directed specifically towards the prevention of heart disease. Results from this will not be evident for some time.

ENGLAND, "LOOK AFTER YOUR HEART"
At the end of the first year of the campaign, the HEA found that the campaign had been highly successful in the workplace and 74 major employers covering two million employees had been recruited.

The National Audit Office report,\(^{232}\) however, criticised the campaign for its lack of quantified targets and estimates of the resources and funding needed to meet its objectives. Their report also discussed the importance of inter-departmental coordination within government to address the problem of coronary heart disease. In particular, school curriculum content, school meals and the failure of the Treasury to raise tobacco duty in line with inflation were all areas in which government departments were failing to support policy on heart disease prevention.

\(^{230}\) Committee of Public Accounts (1989)
\(^{231}\) National Audit Office (1989)
\(^{232}\) National Audit Office (1989)
Other findings in the report included:

- there is no single body with responsibility for minimising the risk of differences between departments’ policies;
- the three UK health departments have adopted separate approaches, believing that geographical differences preclude greater consistency;
- national strategies have not included guidance on how health authorities can develop specific preventative programmes;
- comprehensive data on the scale of the problem is lacking;
- at the level of health authorities, the approach is uneven;
- information from the health authority regions is insufficient for valid assessment of the extent of local initiatives and how integrated these are with the national campaign;
- government departments and the NHS, as employers, have given little support to the programme, and locally-funded activity within the NHS is not well-integrated with the national programme.

Specific criticisms of the content of the campaign included the fact that the initial advertising campaign had not resulted in a sustained increase in awareness about heart disease, and that both awareness and media coverage were lower than for cheaper single-event campaigns such as the National No-Smoking Day. To address these points, a long-term strategy was needed with clearer objectives, quantified targets and priorities. Staffing also needed to be increased, management arrangements improved and there needed to be more advertising.

D5 Lessons to be learnt

- Set measurable goals.
- Base the campaign on the lifestyles and particular risk factors of the target population.
- Establish links with outside agencies.
- If campaigns are too broad in scope, there is a risk that they may fail to communicate a clear message.
- For workplace schemes, get some commitment to ongoing action by the organisation; offer a range of actions from which organisations can choose those most suitable for them.
- Workplace schemes must be the responsibility of a named individual and a budget must be allocated for the scheme.
- Workplace schemes should take the culture of different organisations into account; for example, staff assessment procedures may have implications for how managers run the scheme.
- A “middle-out” approach to getting a scheme adopted within a company may be more successful than either a “top-down” or “bottom-up” approach.
- Community based action schemes will not automatically be pursued by local organisation and official bodies - they are not a panacea.
- There are a number of advantages to decentralising campaigns, including
  i) the possibility of targeting specific regional audiences,
  ii) the possibility of addressing area-related problems and
  iii) the greater acceptability of a local initiative as opposed to a remote national scheme.
- Professional bodies of middle ranking managers, such as the IPM and the FOM are useful routes to bringing the scheme to managers' attention. The scheme can also be publicised at conferences.
- The health issue should be included in the education programmes of the relevant professional bodies.
- Full advantage should be taken of the opportunities to include health issues in formal and informal education and public health programmes.
- Clear quantified objectives are crucial in assessing the success of the scheme.
E  ALCOHOL AWARENESS IN THE WORKPLACE

It should be noted that the information described here was collected in 1989; some of it may therefore be out of date, but to the best of the authors' knowledge, it was accurate at that time.

E1  Problem

It is recognised that “inappropriate drinking” is costing organisations a considerable amount of money in terms of lost productivity, poor decision making, accidents, increased absenteeism and difficulties in inter-personal relations.

Developing a targeted and fully evaluated campaign is problematic because of the sensitive nature of alcohol misuse: individuals deny the problem and so its scale is difficult to measure.

The “alcohol awareness at work” campaign is a relatively new scheme launched in March 1990 by the Health Education Authority. It grew out of previous alcohol campaigns, in particular an “alcohol caravan” which toured different workplaces.

E2  Aims

The overall aim is to reduce alcohol consumption among working people. The strategy decided upon included:

CLEAR AND POSITIVE IMAGE
A logo was developed for the launch conference and is being used on all the material relating to the campaign, thus giving it a coherent and easily recognisable image. Presentation is seen to be very important in this campaign - for example, the conference material was handed out in an attractive cardboard case embellished with the logo.

A CREDIBLE MESSAGE FOR MANAGEMENT
The message focuses on the costs of alcohol in the workplace since this relates clearly to managers’ chief concerns. Similarly, the campaign is about “good and effective practice”, which appeals to managers.

NO SINGLE GOAL
The campaign does not concentrate on a single goal such as getting workplaces to draw up their own policy on alcohol. Policies can easily become a substitute for action, left unread on a shelf. The campaign is about making decisions and taking action rather than simply making policies.
FOCUS AWAY FROM “PROBLEM DRINKING”
The scheme is about normal, everyday drinking and the implications of this for companies; not about “problem drinking”. It is explicitly aimed at everybody, so that it is less threatening to those who may drink too much. Some senior executives do have “drink problems” and a campaign stressing this aspect of alcohol use may well be rejected. The theme of “working together” on the issue is important in generating motivation and overcoming individual resistance. Thus, the campaign is not “anti-alcohol”; it is about promoting the sensible use of alcohol.

RESEARCH
Research is seen as essential to the scheme in order to maintain the right direction and to assess progress.

Initial research was carried out whose objective was to explore:

- the present state of awareness amongst top managers of the potential costs of “inappropriate drinking”;
- the range of responses which managers might make to this problem.

PR COMPANY INVOLVEMENT
Following the research phase, a public relations company was commissioned to design some aspects of a workplace alcohol awareness programme, based on the research findings. The programme aims to make further use of other campaigns by, for example, exploiting and reinforcing the alcohol-related components of the “Look After Your Heart” and healthy eating schemes.

TARGET AUDIENCE
The target audience for early publicity was senior executives (corporate affairs directors, personnel directors, or similar) in large private companies, representatives from government departments and other civil service bodies, trades union delegates, representatives from management institutions such as the CBI and the Institute of Directors, the media and other interested bodies such as “Alcohol Concern” and the HSE.

IN VolvEMENT OF RELATED ORGANISATIONS
The campaign has succeeded in its aim of involving brewers and distillers such as Guinness, Bass, International Distillers and Vintners and Scottish & Newcastle Breweries in the campaign. The Brewers Society have been working closely with the HEA team on the project.
E3 Action

The first step taken by the campaign managers at the HEA was to set up an advisory committee with experience in alcohol management to develop a strategy for the campaign. They recommended the initial research, already described, and the appointment of the public relations company.

The programme was launched by means of a high-publicity national conference for the target audience. The conference comprised a number of speakers talking about their companies’ experiences with alcohol awareness followed by addresses by a union general secretary, and by representatives from the CBI, the Institute of Directors and the HEA, discussing the implications for management and the way the issue could be taken forward. Questions were taken by the Undersecretary of State at the Department of Employment. It was thus a top level and high profile conference.

As a result of this conference, the campaign now has a mailing list of 800 organisations who wish to be kept in touch; this was developed both from the original invitation list and from people who have heard about the campaign through the subsequent media publicity. Each company will receive:

- a briefing paper which reports on the conference;
- a newsletter which looks at case studies, contains interviews, and so on;
- details of the annual “drinkwise day” (a separate scheme).

In the next phase of the campaign, the focus will switch to employees. Further research is also planned. In addition, a consultancy service is being developed for companies seeking help.

The HEA have run training seminars to help identify and deal with problem drinking in the workplace. The target audience is the people who act as the first point of referral for alcohol problems, including line management, trades union representatives and occupational health and welfare staff. A training pack is being produced.

COST

The annual budget for the scheme is modest: £200,000 excluding staff costs and office overheads. Of this, £60,000 goes on education, training and dissemination of information; and £60,000 goes on research. The costs of the tendering process for the research and the public relations tasks are included in the budget.
E4 Evaluation

Having only recently been launched, no formal evaluation of the campaign is available. However, early responses from participating companies are positive and the campaign managers have stressed that using a professional PR firm is a very important factor in the scheme’s success so far.

A separate alcohol awareness campaign run by the Post Office has been reviewed. This involved a roadshow comprising a short video about the nature and effects of alcohol, group discussions, a booklet and a computer game. The review suggests that if management training is to achieve its desired results, it should be governed by certain basic principles:

- collaboration of management and trade unions;
- it should be approached as a co-operative venture involving local management, medical and welfare staff;
- workforce participation;
- it must encourage participants to take positive action. They should be informed of the procedure to be followed in referring a problem drinker for help, and they should be encouraged to consider what measures could be taken to prevent such problems and to promote a sensible approach to alcohol among staff;
- evaluation must be an integral part of the scheme.

At a more general level, the Post Office campaign indicated that one particular difficulty of alcohol education is that those people for whom drinking presents no problem tend to see education as irrelevant, while those with problems are loath to admit this by participating. This difficulty can be compounded at the workplace by employees’ suspicions that health education represents just another method of management ‘interfering’. A more promising approach is offered by the inclusion of alcohol within a broader spectrum, covering a number of health areas.

E5 Lessons to be learnt

- Try to develop a clear and positive image for the campaign and a message which appeals to management’s interests.
- Research can form an important foundation for a campaign.
- The involvement of a PR company in arranging the public launch and other aspects of the scheme has proven valuable.
- The top-down approach adopted by this scheme appears to have been successful so far, although it is too early to gauge whether commitment by senior management results in effective policy and behaviour change at the power levels of the organisation.
- Cooperation between management, workforce and company health professionals should be encouraged.

F  ACTION ON SMOKING AND HEALTH (ASH)

F1  Problem

Smoking is a major health risk and the threat to non-smokers of airborne cigarette smoke ("passive smoking") has recently been discovered; there is thus a need to persuade people not to smoke.

F2  Aims

ASH sees its job as being "to create a climate of pressure for change". It does not run campaigns as such; rather, it acts as an ongoing pressure group and a source of information. It receives some funding from the Department of Health but it also has links with the departments of Employment and Environment; all three pass details on to ASH.

ASH has a fundamental belief about changing smoking behaviour: giving information is not enough; the solution only begins when clear guidelines are given and when there are easily accessible sources of information which offer practical help.

New evidence on the dangers of passive smoking has led to increasing demand amongst workers for protection from tobacco smoke; however, many workers believe that the responsibility for action lies not with themselves, but with their employers. ASH has therefore turned its attention to the workplace.

One of the functions of ASH's workplace campaign is to raise the profile of the issue of smoking in the workplace. A further objective is to alert employees to their rights: they would like to see a test case for the Health and Safety at Work Act taken to the courts.

F3  Actions

Prior to the workplace campaign, ASH concentrated on lobbying and on providing information, seeing its role as ensuring that information on the health risks of smoking was accurate and widely available. ASH has been successful in working through the media, but it has also worked through health and local authorities via environmental health officers; additionally, it has cooperated with the HEA on, for example, "National No Smoking Day".

SMOKING POLICIES IN THE WORKPLACE

In 1987, ASH collaborated with the HEA on the production of a large booklet "Smoking Policies at Work." However, employers wanted more. They wanted to
draw on experience rather than simply reading guideline booklets. ASH considered that the key problem for workplace no-smoking policies was that there were no clear implementation guidelines. What was needed was an A-Z, step-by-step guide to setting up and maintaining such a policy. As a result, ASH produced the “Smoking Policy Manual”. This gave policy guidelines rather than just discussion points; and it identifies individuals who must be involved, suggests strategies and timetables and provides agendas and questionnaires. The handbook is marketed through the media and is mentioned in the Employer Information Packs which are produced and distributed by ASH.

ASH WORKPLACE SERVICES
More recently, ASH has decided to concentrate on and formalise its experience of setting up smoking policies in the workplace by establishing a consultancy called “ASH Workplace Services”. ASH sees this as its most important and innovative service, offering on-site consultancy through a team of specially trained consultants who assess the existing situation, provide some on-the-spot advice, and write a full report containing specific and detailed policy recommendations and guidance for further action.

The minimum visit lasts for two hours with a question and answer session leading to the production of a proposal for implementing a no-smoking policy. The other options are half day or full day sessions which involve a site audit, a presentation and suggestions on how the organisation can develop their policy. The consultancy also runs smoking policy implementation seminars.

ASH has run one small, paid-for advertising campaigns in a personnel publication. In general, thought, the most common route through which employers hear about ASH is through reports in the media. Interest is generated following the publication of new research findings or in connection with other campaigns such as the National No-Smoking Day, where ASH is often mentioned in subsequent articles. ASH also write articles for magazines or give interviews, for example, in occupational health magazines. Recently, they have set up a telephone hotline for employers, answering initial enquiries and enabling them to give further details of their services. ASH have also produced an Employee Pack, an Employer ‘Info’ Pack and two videos to support their consultancy work.

ASH Workplace Services was launched in 1989. It now has a full time director and operates as a separate company within ASH. Income from its consultancy is used to support the other work of ASH. The next stage will be the professional marketing of the services it provides to employers by means of a number of methods including the unpaid media, ‘cold call’ mailing and working with health promotion and public health departments.
F4 Evaluation

The workload of ASH has recently expanded. Three or four years ago, ASH received 20 - 30 enquiries a month; now they receive approximately 200 enquiries, more than 100 of these coming from employers.

There has been no formal evaluation of ASH Workplace Services as it is an ongoing consultancy service whose value can only be assessed in the long term. However, ASH report that the service seems very popular with employers. It seems, though, that these employers want more help: for example, they frequently request site visits and some want a “quick fix” such as the distribution of 1,000 information packages to employees. Such an approach is unlikely to prove successful, and ASH recognises the need to educate its client in such situations.

ASH has learnt that it is important to take into account the structure of different organisations. For example, in some government departments, circulars about no-smoking policies are sent out by senior management, but the end result may be simply “paper policies”. The problem is often that responsibility for implementing no-smoking policies tends to be shifted from senior management personnel to low-grade health promotion staff, with the consequence that the policies are ineffective. Similarly, in industry, occupational health staff implement the policies but often little action is taken until senior personnel become involved.

ASH has recognised that it is important to offer a very professional service if their type of consultancy is to be successful in the long term. Through ASH Workplace Services, it now concentrates its advice on a professional, paid-for service in order to provide employers with up to date, impartial advice.

The income to ASH from the service sold to employers means that work in this area can continue to expand. The service ensures that even in the absence of legislation, smoking policies develop at an increasing pace. The development of smoking policies has been taken out of the campaigning sector and largely put into the corporate personnel sector.

ASH emphasises the importance of follow-up to ensure that any new smoking policy is maintained. It suggests that, in the future, 'enforcement' may take the form of a consultant paid for by the employer rather than being seen in terms of formal surveillance.
F5 Lessons to be learnt

• The marketing of guidance for employers such as the ASH Manual must be carried out within an overall marketing strategy for the campaign.

• Recent thinking in ASH is that employer consultancy is likely to be a more effective tool than the Manual or seminars alone, information from which can simply be put on a shelf and forgotten. However, it is crucial that such a service is professional and responsive to employers' needs.

• There is a need for good marketing of such a consultancy service.

• There should be follow-up after policies are adopted to ensure that they are maintained.

• It is important to take into account the structure of organisations in order to avoid "paper policies".
3.2 Non-workplace case studies

G DRINK/DRIVING CAMPAIGN

The Department of Transport's most recent advertising campaign\(^{234}\) had the overall theme of "drinking and driving wrecks lives". It began in 1987 and was conducted by the advertising agency Waldron, Allen, Henry & Thompson. It is discussed in this report because it is one of the few public awareness campaigns to be backed by television advertising and evaluated by market research rather than academic techniques. Drink-driving is a problem similar to occupational deafness in that there is a legal framework to control behaviour, yet this is frequently ignored.

G1 Problem

Drinking and driving contributes significantly to accidents and road deaths in the United Kingdom. It is a persistent problem and therefore the Department of Transport decided to run a long term campaign, and not just respond to the Christmas peak in drinking and driving. A budget of two million pounds was allocated to the campaign.

Research showed that the risk of being caught by the police or involved in an accident is perceived to be low. Individual drivers also believe that:

"I... am not a drunken driver,
... am not a menace to society,
... do not drive over the limit,
... can hold my drink,
... am in control of my car.

In other words the problem is not associated with "me" - it is always a problem of "someone else".

G2 Aims

The twin aims of the campaign strategy were to:

- make drinking and driving socially unacceptable;
- make NOT drinking and driving socially acceptable.

The agency decided that the advertising had to put across the idea that "drinking anything at all is not worth the risk to lives ...because the consequences are disastrous for other people".

\(^{234}\) This was written in 1990.
The agency defined the creative task as:

"To implicate the viewer firmly in the act of drinking and driving."

TARGET AUDIENCE
The main target group was young male drivers. However, the advertising had to reach non-target groups so that they would act as "agents" to spread the message. Obvious targeting, it was felt, would lead to alienation, with the target group becoming defensive and other groups saying "this problem is not to do with me".

G3 Action

The following creative methods were dismissed as a means of achieving this strategy:

- statistics, because they were not involving;
- blood and gore images, because people have "seen it all before";
- the previous line of "you're a menace to society", because people do not accept personal responsibility in this way.

The films to be used on television had to have an emotional impact. The agency wanted to recreate the intensity of news interviews with survivors and rescuers in major disasters such as Zeebrugge. They also wanted to create a feeling of guilt, not by telling people that it was wrong to drink and drive but by showing the consequences of a drink-related fatality and allowing the viewer to 'think their way into the tragedy of the situation'.

The films therefore included a mock interview with a fireman who had just pulled a dead body out of crash wreckage. A second film focussed on the grief of a family at the funeral of a relative who had been killed by a drunk driver.

OTHER ELEMENTS OF THE CAMPAIGN
The campaign was launched with a ministerial press conference which attracted initial media attention. Posters were produced which presented a positive alternative to drinking and driving such as "take a taxi tonight".

The agency also approached brewers and asked them to help make NOT drinking socially acceptable. Brewers responded with the development of non-alcohol drinks. One of the aims of the campaign was to emphasize the idea of a "virtuous circle" whereby if you drink low or no-alcohol drinks you can win at pool or darts and have no hangover. "Wheelwatch" flags were displayed in pubs to show the availability of non-alcoholic drinks.
Local authorities were offered campaign material such as posters three months in advance of the launch. They could use it in any way they chose but were encouraged to use the slogan “drinking and driving wrecks lives”.

Each year, new films have been made to keep the message fresh, although each time the same slogan has been used at the end of all advertisements for consistency.

### G4 Evaluation

Market research was carried out at various points during the campaign and the following results reveal a positive change in attitudes about drinking and driving throughout the campaign.

**Figure 4.1 Attitude change over the period of the drink/driving campaign**

<table>
<thead>
<tr>
<th>Attitude statement about drinking and driving</th>
<th>Percentage agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer 1987</td>
</tr>
<tr>
<td>&quot;I never do it under any circumstances&quot;.</td>
<td>All men</td>
</tr>
<tr>
<td></td>
<td>PTG</td>
</tr>
<tr>
<td>&quot;It is difficult to avoid drinking and driving if you are going to have any kind of social life&quot;.</td>
<td>All men</td>
</tr>
<tr>
<td></td>
<td>PTG</td>
</tr>
<tr>
<td>&quot;I try not to do it, but once in a while you cannot help it&quot;.</td>
<td>All men</td>
</tr>
<tr>
<td></td>
<td>PTG</td>
</tr>
<tr>
<td>&quot;People I know seem to criticise drinking drivers more these days&quot;.</td>
<td>All men</td>
</tr>
<tr>
<td></td>
<td>PTG</td>
</tr>
</tbody>
</table>

---

235 PTG means primary target group.
Research on behavioural change showed the following results over the period of the campaign (in 1989, advertisements were also shown during the summer).

Figure 4.2 Reported behaviour change over the period of the drink/driving campaign

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage who had driven after drinking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre Post</td>
</tr>
<tr>
<td>All men</td>
<td>35 35</td>
</tr>
<tr>
<td>PTG</td>
<td>36 38</td>
</tr>
</tbody>
</table>

These results indicate that less men were drinking and driving over the campaign period. Among the PTG, the percentage of drink-drivers fell by almost a third from 36% to 26%. It is clear that the improvement was not immediate for the primary target group and that there was a relapse in behaviour during the summer for the “all men” group. However, the overall conclusion is that a coordinated and well resourced campaign appears to have been effective.

G5 Lessons to be learnt

- This campaign benefited from a thoroughly researched brief and experience of the types of creative solutions which had failed to make an impact on the primary target group in the past. However, the success of the campaign seemed to rely heavily on the creative solution of the advertising agency, which is an element of the campaign that is uncontrollable other than through the selection of the advertising agency.

- The campaign also illustrates the length of time required to achieve attitudinal and behavioural change.
NEIGHBOURHOOD WATCH SCHEMES

Research on Neighbourhood Watch schemes has been examined in this report because the approach to behaviour change adopted in Neighbourhood Watch is different from that of many public information campaigns in that it utilises the social structure of groups.

Problem

The problem addressed by Neighbourhood Watch schemes is the increasing volume of local crime (such as burglary and vandalism). The police cannot be on patrol in all areas, and so it is hoped that increased public vigilance may help crime prevention.

Aims

Neighbourhood Watch schemes aim to encourage residents to take action to protect their own and their neighbours' property by means of casual surveillance. The schemes aim to get people involved in local Neighbourhood Watch groups led by a volunteer coordinator; the police offer help and advice, particularly during the set-up of the scheme, but the idea is that the groups are initiated and maintained locally.

Action

Local Neighbourhood Watch groups hold meetings to raise awareness about crime, produce newsletters which report local crime and encourage neighbours to "keep an eye open" for anything unusual. They also promote the marking of property, the prompt reporting of suspicious activities and improvements in home security.

Neighbourhood Watch schemes have been formally evaluated by the Home Office and the findings below are taken from their report236.

Evaluation

FORMATION

Nineteen per cent of Neighbourhood Watch schemes were formed around existing organisations such as residents' groups or ratepayers' associations. A number of other schemes were initiated by one individual and such schemes tend to remain narrowly based, frequently relying on the one person to run the scheme.

236 Husain S. 1988
RISK, ATTITUDES AND BEHAVIOUR
The study categorised households according to the level of crime risk to which they were exposed (based on data from the second British Crime Survey). A sample of residents were then asked to state their personal level of concern about crime. It was found that concern about crime increased as the risk increased.

The study then found that involvement in Neighbourhood Watch schemes did not correlate with the levels risk or concern. For example, in some council estates where risk was medium to high, there were low levels of involvement in Neighbourhood Watch.

LONG TERM PROGRESS OF SCHEMES
A majority of scheme coordinators felt that the schemes were effective in providing reassurance and improving community relationships. Nevertheless, a significant proportion of households within most scheme areas failed to carry out basic actions as encouraged by the scheme.

The long term success of the schemes relied to a significant extent on the involvement of the police. Among residents, the initial high level of interest and enthusiasm was difficult to sustain after the novelty of the scheme had worn off. Successful schemes appear, ironically, to be partly dependent on the pre-existence of conditions which they are intended to create: good relationships within the community and with the police.

IDEAS FOR IMPROVING SCHEMES
The study suggested two major areas to improve the initiation and maintenance of schemes. In high crime risk areas the police must play a greater role in initiating the schemes and more financial assistance from outside of the community may bring benefits.

More guidance and better training was identified as a need for scheme coordinators. This should be directed at their role as motivators and the current emphasis on simple administration should be reduced.

H5 Lessons for noise campaigns

- Workplace campaigns may be easier to set up if they can utilise the framework of an existing group with well-established communication channels linking everyone in the group.
- Although there may be early enthusiasm for workplace activities within the campaign, it may be found that this dwindles and people lose motivation to make the scheme a success.
- It seems likely that goodwill between the work force and the management is as crucial to the success of hearing conservation schemes as is goodwill amongst the local community and the police to the success of neighbourhood watch.
- The tentative finding of little relationship between involvement in the scheme and the person’s level of either risk or concern suggests that the conclusion with regard to noise is that it must not be assumed that workers in high risk environments will initiate action, even where they express concern about noise levels.\textsuperscript{237}
BRITISH ASSOCIATION FOR THE HARD OF HEARING

Problem

It is believed that people do not take the problem of noise induced hearing loss seriously.

Aims

The primary aim of the campaign was to change behaviour so that people would not expose themselves to noise likely to damage their hearing.

The material was distributed via community nurses, companies, colleges and schools, the latter target being based on a philosophy of "getting them young".

Action

The campaign was sponsored by British Telecom. It lasted six months, ending May/June 1989 and comprised information packs with posters and leaflets. The packs included a poster with the image of a glass breaking with the text "If noise can shatter glass imagine what it can do to your hearing". A second poster focused on a personal history of a noise induced hearing loss sufferer saying "I wish I'd known about noise when I was young...".

Packs were sent out on demand rather than spontaneously.

Evaluation

There were no targets set for the campaign other than creating a greater public awareness; this was not quantified and there was no monitoring of success. However, the organisers report that packs were taken up "vigorously" by schools and colleges, where the information was often incorporated into environmental studies courses.

Lessons to be learnt

- Campaigns need formal evaluation; otherwise, the benefits are unknown and it is difficult for the promoting agency and others to ascertain how valuable the campaign was and what lessons can be learnt.
APPENDIX A

Suggested Actions to Improve Hearing Conservation in Australian Industry

Set up a special task force, responsible to the National Occupational Health and Safety Commission (to ensure tripartite oversight), to plan and co-ordinate a systematic attack on all aspects of excessive noise exposure. Give the task force a limited life span of ten years and the resources to achieve the above goals within that time limit.

The key elements of the task force's programme are envisaged to be as follows:

1. Mount a concerted noise reduction campaign throughout industry:
   (a) Existing machinery, plant and equipment
       Prepare simple multi-lingual printed and audio-visual educational materials showing how the main methods of noise control can be economically applied to common workplace noise problems. Seek to involve the Factory Inspectorates in the collection and dissemination of this information, adding a positive aspect to their role.
   (b) New machinery, plant and equipment
       Encourage the inclusion of maximum noise level requirements in purchase specifications. Prepare purchasing guidelines for engineers and purchasing officers, illustrated with model specifications for common classes of equipment, explaining the meaning and importance of noise level specification. Require justification of the purchase of noisy machinery, so that someone takes responsibility for it. Promote low-noise design by ensuring that all relevant technical and professional curricula contain segments on the effects of noise and noise reduction design principles and techniques; prepare model curricula for this purpose. Foster incentives such as special design awards.

2. Prepare and make available through Australian Government Bookshops a clear and concise multi-lingual Australian Hearing Conservation Manual, bringing together relevant basic information about legal liability, standards and regulations, noise measurement, exposure evaluation, noise control, personal hearing protection, audiometry, compensation, sources of information, how to determine whether consultants are needed, how to locate and evaluate consultants.
3. Undertake a series of surveys to:
   - document the present extent of compliance with the law;
   - identify problems experienced by managers in understanding and complying with hearing conservation regulations;
   - determine employee and employer perceptions of and prejudices about noise hazards in order to target educational campaigns accurately;
   - identify successes and failures experienced by employees with noise control measures, especially those involving the use of personal hearing protection, as a guide to improving design.

4. Mount a comprehensive education programme:
   Use the public media to increase public awareness and understanding of noise induced hearing loss, promote self-defence attitudes towards noise hazards, focus attention on high risk occupations and activities and catalyse the effects of specific workplace educational programmes. Ensure that relevant trade, technical, professional and managerial training includes segments on noise hazards, legal requirements and approaches to prevention. Promote the inclusion of education about noise dangers in school health education curricula. Seek the co-operation of union and employer organisations in all aspects of the education campaign.

5. Encourage the formation of workplace noise hazard committees (workplace health and safety committees are already required by law in some states) and prepare a multi-lingual action kit for their use, covering, from the workers' point of view, the same ground as that covered in the proposed Hearing Conservation Manual, pointing out steps workers can take to reduce noise risks.

6. Make use of modern electro-acoustic technology to design hearing protectors that do not impair the ability to localise sound. Promote the development of more comfortable earmuffs, with particular emphasis on thermal comfort.²³⁸

7. Require that hearing protectors sold commercially meet a minimum standard of performance reliability.

8. Ensure that retail stores selling noisy equipment such as motor mowers, chain saws, power tools etc, stock and display a range of good quality hearing protectors as a matter of course.

9. Prepare updated Model Hearing Conservation Regulations, paying particular attention to scope, permissible noise exposure, realism of expectations imposed on employers and employees (especially in small organisations), penalties, relative emphases placed on environmental control and personal protection.

10. Provide adequate research resource to support implementation of the strategy.

²³⁸ Waugh (1981)
Monitoring Progress

An early part of the proposed campaign would be a thorough survey to objectively document the present state of hearing conservation in industry. As well as identifying high risk occupations for precise targeting of subsequent educational programmes, the survey would provide a baseline from which to measure the future development of industrial hearing conservation programmes.

The 1978 ABS survey referred to above provides an historical reference point documenting the prevalence of perceived noise induced hearing loss in the community at large. A similar survey conducted in the future should reveal a marked reduction in prevalence, particularly in the younger age groups.

Both the Victorian and Western Australian hearing conservation regulations require regular hearing tests on noise exposed employees and notification of cases of impairment to the health authorities. The notification records will provide an indication of progress in these States.

The audiometric records of organisations conducting hearing conservation programmes provide a further source of hearing loss incidence data.

A suggested establishment for the proposed task force is:

- two behavioural scientists
- two engineers/physical scientists
- one communications/media personnel
- three graduate project officers
- two technical officers
- one clerical officer
- one secretary.
APPENDIX B

Training Requirements for a Typical Hearing Conservation Programme
The following list of training requirements is adapted from Else D. "Hearing Protector Programme Establishment" in Alberti (1982).

**The individual responsible for the hearing protection scheme:**
this person should receive training on: all aspects of noise (including exposure limits and measurement); hearing protector selection; all information for other levels of staff.

**Management responsible for purchase and maintenance of noise-emitting machinery:**
these people should receive training on: noise (including exposure limits); engineering methods of noise reduction; the disadvantages of hearing protectors; the company hearing protection scheme.

**Users of hearing protectors:**
these people should receive training on: the functioning of the ear; deafness; how to choose and fit hearing protectors suitable for them and their work; where and when hearing protectors must be worn in their workplace; probable loss in directional hearing; how to check hearing protectors for wear or damage; people to whom problems associated with the hearing conservation programme should be reported.

**Store personnel:**
these people should receive training on: how to select the appropriate type of hearing protector for different circumstances.

**Maintenance and cleaning staff:**
these people should receive training on: how to clean and maintain the equipment, including checking for damage and wear.

**Supervision and management:**
these people should receive training on: the functioning of the ear; deafness; details of the company hearing conservation programme; where and when hearing protectors must be worn in their workplace; probable loss in directional hearing; the need to have and demonstrate management commitment to the hearing conservation programme.
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