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Reducing the Costs of Alcohol in the Workplace : The Case for Employer Policies

by

Melanie Powell

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REDUCING THE COSTS OF ALCOHOL IN THE WORKPLACE:
THE CASE FOR EMPLOYER POLICIES

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ABSTRACT:

More than 90 percent of the UK workforce drink alcohol and as many as 30 percent of male employees and 23 percent of female employees could be consuming quantities above 'safe limits'. Survey results also indicate that the vast majority of dependent drinkers are in employment. Current evidence suggests that alcohol consumption, in or out of work time, can result in lower productivity, increased absenteeism and sickness absence, and increased accident rates. The annual value of industrial days lost through alcohol consumption in the UK in 1987 is estimated to be over £1.7 billion, excluding the value of lost productivity, accidents and injury.

Alcohol acts as a depressant, impairing reasoning, memory, perception, balance and co-ordination skills even at very moderate levels of consumption. Physical and intellectual ability decline as more alcohol is consumed either at work or at leisure. In the longer run, continued consumption can lead to disease, emotional and social problems, chronic illness and even premature death. Because the majority of drinkers are in employment, these effects will have an impact in the workplace.

Some adverse consequences at work are related to excessive alcohol misuse by a minority of employees, but most are associated with the moderate but inappropriate drinking behaviour of the majority. Existing evidence implies that alcohol is involved in at least 1/5th of all UK industrial accidents. The probability of an accident increases six fold for the average man

who has consumed two pints of beer, and risk-taking behaviour increases and decision-making skills decrease even with low levels of consumption. One in 10 men and one in 20 women report feeling the effects of a hangover at work and in one UK study, a quarter of all the men interviewed reported regular lunchtime drinking.

Up to 60 percent of USA corporations have introduced formal workplace policies of different types in order to reduce employment costs associated with alcohol consumption. However, less than 20% of UK firms have taken similar action. Workplace policies are designed to identify problem drinkers at an early stage and to provide treatment, avoiding the need for disciplinary procedures. Although many USA studies have shown workplace policies to be cost-effective, some studies report conflicting results using different definitions of successful outcome and policy goals. Many studies suffer from statistical defects and the poor definition of appropriate policy goals.

The economic case for increasing the number and type of workplace policies in the UK cannot be confirmed without a consistent framework for evaluating cost-efficiency. Evidence of employment costs associated with alcohol consumption are examined in this paper and the need for further information identified. A framework for evaluating costs and benefits is outlined as a basis for future policy discussion, and the economic evaluation of alcohol workplace policies in the UK.

1. ALCOHOL PROBLEMS IN THE WORKPLACE

1.1 Introduction

Alcohol acts as a depressant on the central nervous system, impairing reasoning, memory, perception, balance and co-ordination skills even at fairly moderate levels of consumption. Alcohol consumption impairs the judgement of drivers and increases the risk of accident and injury on the road, in the home, and at work. Both physical and intellectual ability decline as the amount of alcohol consumed increases at any time. Over longer periods, continued alcohol consumption is also associated with disease and chronic illness. In the workplace, therefore, the adverse consequences of alcohol consumption could arise whether employees are moderate or heavy drinkers, drinking in or out of work time.

Current evidence suggests that alcohol consumption can result in lower productivity, and increased absenteeism, sickness absence and accident rates. Some of these effects are related to excessive alcohol misuse by a minority of employees, but many are associated with the moderate but inappropriate drinking behaviour of the majority. Surveys show that the vast majority of dependent drinkers are in employment and that up to 10 percent of all drinking males may experience alcohol problems at work (Crawford et al. 1985; Braine 1977). Costs to the employer arise through responsibility for safety, potential health care costs, loss of competitiveness and eventually, through lower profitability.

One method of reducing employer costs associated with alcohol is through prevention. Workplace alcohol policies could potentially reduce costs in two ways: through primary prevention by providing information, education and reducing the availability of alcoholic drinks at the workplace, and through secondary prevention involving the early identification and treatment of problem drinkers at work.

Under the terms of the Health and Safety at Work Act (1974), a workplace alcohol policy would fulfil UK employers' duties in primary prevention through the provision of information, instruction and training to ensure health and safety at work. If effective, a policy could diminish any employee claim of negligence regarding health and safety following an alcohol related accident or injury at work (Howard 1990). Secondary alcohol prevention, in the form of the early identification and treatment of problem drinkers at work, was formally approved in a joint publication by the Health and Safety Executive, Health Departments and the Department of Employment in 1981 (HSE 1981) and has been identified as an important area for further research by the Government's Ministerial Group on Alcohol. A labour management approach to industrial alcohol problems through workplace policies is also recommended by the International Labour Organisation (ILO 1987) and the TUC (1986).

1.2 Alcohol and Workplace Problems

Alcohol and Industrial Accidents

The relationship between alcohol and accidental death or

injury has been widely documented particularly in respect of driving, drowning and accidental falls. (Alcohol World 1985; Howland & Hingson 1988; Hingson & Howland 1987). Alcohol consumption increases the risk of accidents by impairing co-ordination, vision, reaction and judgement. For example, the Department of Transport estimate that 25 percent of drivers and pedestrians killed in road traffic accidents in the UK have blood alcohol levels above the legal limit, (Harrison 1987). Alcohol has also been associated with industrial accident and injury rates, the results of which are considered below.

No simple causal relationship between alcohol consumption and accidental injury has been identified, but the presence of alcohol in the blood has been shown to raise the probability of an accident occurring (Alcohol World 1985). The results of a study of drivers in Grand Rapids, USA, showed that at the 60 mg/100 ml blood alcohol level (2 pints drunk consecutively for the average man), the probability of an accident occurring doubled. At the 100 mg/100 ml (3-3 1/2 pints), just above the legal limit of 80 mg/100 ml, the likelihood rose to six fold. At the 150 mg/100 ml level (5 pints), the probability of an accident occurring was 25 times higher than when no alcohol was present (Denney 1986). Other laboratory experiments have shown that industrial safety is also affected at relatively low levels of alcohol consumption (25-50 mg/100 ml), as risk taking increases and perceptual and decision making skills decrease with consumption (Argyopoulos-Grisanos and Hawkins 1980). However, motor skills and hence physical productivity are not greatly

affected at these low levels (Mongrain and Standing 1989).

From early studies, the National Council on Alcoholism estimated that excessive drinkers were three times more likely to have an accident at work than other workers (Braine 1977). Evidence from more recent studies suggests that alcohol is involved in at least 1/5 of all industrial accidents (Emery 1986), and similar associations have been reported from studies in other European countries (WHO 1989). Autopsy analysis of blood alcohol concentrations (BACs) carried out after fatal industrial accidents in the UK and the USA indicate that between 9 percent and 20 percent of fatalities have BACs above the legal limit (Allsop Beaumont 1983; Lewis and Cooper 1989). Studies of attenders at accident and emergency departments also show that between 20 percent and 25 percent of non-fatal accidents occur at work and many may be alcohol related. (Yates et al. 1987). Allsop and Beaumont (1983) reported that 20 percent of accident victims in one UK plant (excluding those already under the company alcohol policy) had admitted drinking prior to the accident.

Alcohol is eliminated from the bloodstream at the approximate rate of 10 mg or one unit per hour¹. It is therefore possible to start work on the morning after a binge drinking session with a positive BAC level, possibly above the legal limit. The Allsop and Beaumont study (1983) showed that 76

¹. One unit is approximately equal to one centilitre of pure alcohol consumed as a typical half pint of beer, a glass of wine or one shot of spirits.

percent of alcohol related accidents occurred in the three hours 9am to 11am and 1pm to 2pm as opposed to 19 percent of non-alcohol related accidents. High early morning accident rates, therefore, may be related to raised BAC levels and hangover effects and high mid-day rates to lunch-time drinking by moderate drinkers.

Alcohol and Industrial Absenteeism

Estimates of the extent of alcohol related sickness absence in England and Wales range from 8.8 to 14.8 million days per annum (Holtermann and Burchell 1981). These total figures are generated from sample measures of the amount of excess sickness absence taken by heavy drinkers above that of light or moderate drinkers. They do not include, therefore, the sickness absence caused by hangover effects suffered by light or moderate drinkers. Sickness absence amongst excessive drinkers is thought to be up to five times greater than amongst other drinkers (Braine 1977; Wilson 1980). Studies of UK dependent drinkers show that more than 90 percent of dependent drinkers admit to absenteeism due to drinking habits, with the majority admitting to being late to work (Edwards et al. 1967; Saad and Madden 1976). From the study respondents, Saad and Madden (1976) found an average yearly loss of 121.7 days per dependent drinker, of which 81.1 days were due to sickness absence and 35.6 days to unemployment.

Holtermann and Burchell (1981) used the results of Saad and Madden's study to estimate the excess rate of sickness absence

generated by problem drinkers in England and Wales in 1977. They found that dependent drinkers took four times more days sickness than the average employee and less severe problem drinkers took twice the average rate. Hyman and Beaumont (1984) found that 30 percent of identified problem drinkers took 10 or more certified spells of sickness absence between 1978 and 1983 compared to 20 percent by other employees. Problem drinkers took 117 days absence on average over the five years, 41 percent more than other workers.

The limited statistical validity of many UK studies makes it impossible to draw firm conclusions about the association between problem drinking and excess rates of sickness absence in the UK. However, some of the more statistically valid American studies have shown that problem drinking employees in the USA use health care services at a significantly higher rate than other employees (Holder 1986). Given that higher rates of hospitalisation for problem drinking employees necessarily involve higher rates of sickness absence, the American results lend support to the findings of UK studies.

Alcohol and Other Employment Problems

There are three other types of alcohol workplace problems; lower on-the-job productivity, higher employee replacement costs, and adverse interactions between alcohol and chemical compounds handled in the workplace. Less is known about the extent of these problems than those previously discussed. Reduced efficiency in production skills has been investigated in a number

of American studies (Moskowitz 1985; Mongrain & Standing 1989). The ability to perform simple manual skills appears not to be impaired by alcohol to the same extent as mental decision making skills and visual perception. However, people tend to underestimate the extent of their own impairment. The costs associated with lower productivity from alcohol consumption by managers and white-collar workers, therefore, may be greater than for manual workers, even though safety may be a more important risk for manual workers.

Little is known about employer costs of dismissal, search and replacement of skills resulting from alcohol misuse. The adverse effects of alcohol consumption before and after exposure to some chemical agents used in the work place, however, is known but not widely recognised. Nausea, dizziness, face flushing, decreased blood pressure and breathing difficulties are typical of the interactive effects of alcohol with solvents such as trichloroethylene, those used in the manufacture of insecticides and synthetic rubber and the industrial explosive, nitroglycerol (Podolsky and Richards 1985).

1.3 Estimated Costs to UK Industry

All estimates of the cost to industry of alcohol misuse are based on a measure of the value of production lost through alcohol consumption. This measure is usually calculated as the total value of output associated with the estimated days lost in any year. The most recent annual estimate in England and Wales placed the value of industrial employment loss at £1.7 bn, about

half of which was due to sickness absence (Maynard 1989). Estimates will vary over time as prices change but also between studies according to the methodology adopted. A summary of UK estimates and their sources is presented in Table 1. The figure of £1.7 bn is an update of two earlier annual estimates by McDonnell and Maynard (1985a) and Holtermann and Burchell (1981). Estimates of the costs of reduced efficiency at work and industrial accidents and injury are excluded due to the absence of data. Instead, the value of the annual excess days lost due to unemployment and premature death are added as evidence suggests dependent drinkers tend to suffer higher rates of unemployment and mortality (Berry et al. 1977).

The values of sickness absence and unemployment included in Table 1 are prevalence estimates. The value of output lost for each day excess sickness or unemployment is equated to the amount employers are willing to pay for labour (ie daily wages together with employers' on-costs). For this figure to represent industrial rather than personal costs to the individual, it must be assumed that the potential increase in employment could and would be taken up. The results are also very sensitive to the definition of problem drinkers. For example, McDonnell and Maynard (1985b) show, using OPCS data, that the estimate of excess unemployment alone could range between £2 bn and £5 bn depending on the category of drinkers compared.

Godfrey et al. (1989) estimated that about 160,000 avoidable working life years were lost due to alcohol in 1986 using OPCS

Table 1

Estimates of the Value of Lost Output
to U.K. Industry from Alcohol Consumption

£ millions

Authors	Year	Region	Sickness Absence		Unemployment		Premature Death		Total Value	
			low	high	low	high	low	high	low	high
1. Holterman ⁽¹⁾ & Burchell (1981)	1977/ 1978	England/ Wales	157.2	259.5	32.4	54.1	138.2	219.8	327.8	533.4
2. McDonnell ⁽²⁾ & Maynard (1985)	1983	England/ Wales	(641.5)		(144.7)		(567.7)		(1,354.0)	
3. McDonnell ⁽³⁾ & Maynard (1985)	1983	England/ Wales	176.1	404.4	2,154.5	5,386.3	(567.7)		2,898.3	6,357.8
4. Maynard ⁽⁴⁾ (1989)	1987	England/ Wales	(779.3)		(179.6)		(703.7)		(1,662.3)	
5. National Council on Alcoholism (Braine) 1977	1977	G.B.	-		-		-		(350.0)	
6. Scottish Council on Alcoholism		G.B.	-		-		-		350.0	500.0
7. Walsh (1980)		Scotland Ireland	-		-		-		50.0	100.0
									(30.0)	

(1) Low and high estimates of prevalence of alcoholism in economically active population of 358,700 and 600,000.

(2) One estimate of prevalence at 750,000.

(3) Low estimate assumes 40% of excess days sickness absence and unemployment (calculated from OPCS survey data) is alcohol related, and 100% of excess is the high value.

(4) Simple revaluation of estimate (2).

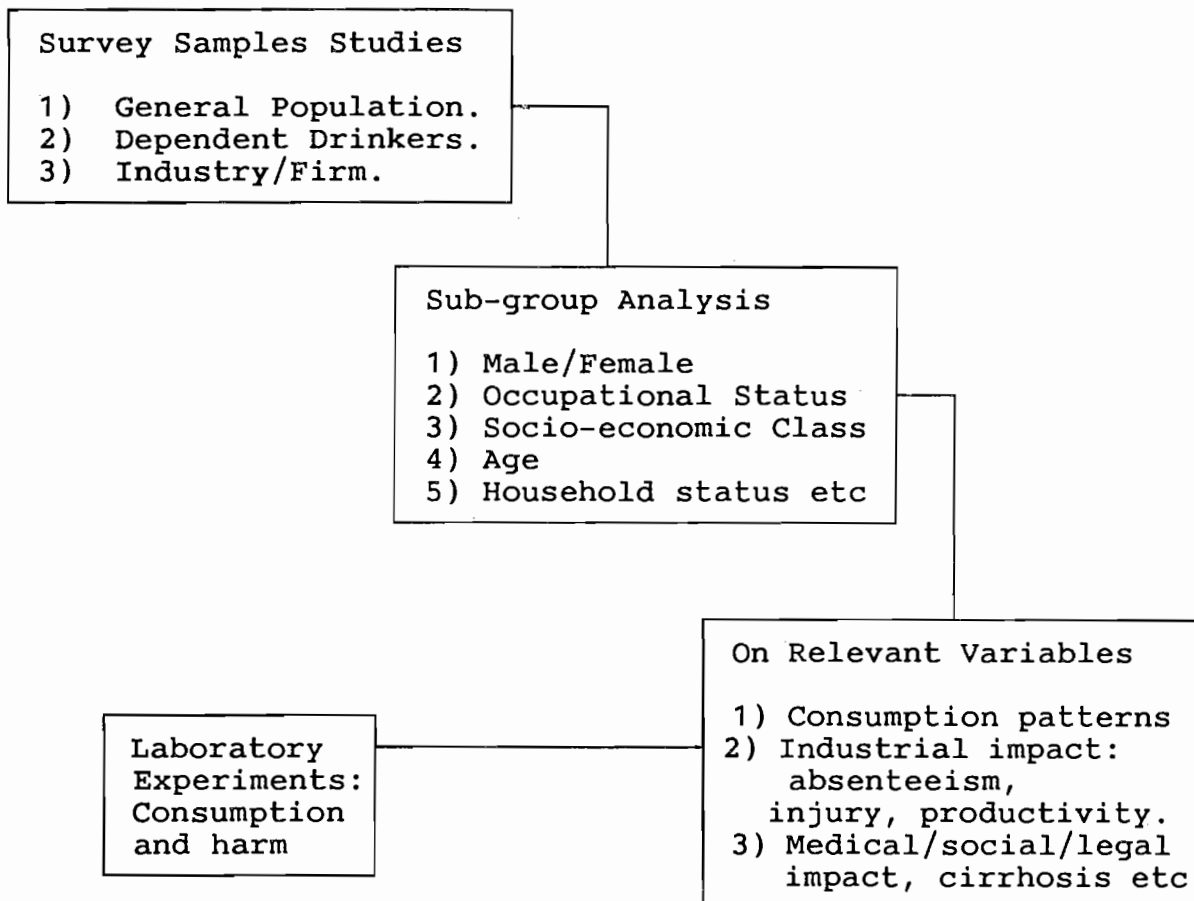
data and estimates of mortality risk. However, the value of premature death in total cost calculations is not a prevalence figure, but the value (discounted to the present) of the future stream of earnings lost through premature death in the year under investigation. A prevalence estimate should value the lost output in the year in question from previous premature deaths. (Godfrey and Powell, 1987). It is not clear, therefore, that the value of working days lost in the future falls directly as a cost to industry rather than on society generally or on the individual and family in a less than full employment economy.

Total cost figures should not be interpreted as potential savings for industry in the absence of the consumption associated with the costs. A reduction in alcohol costs following a reduction in consumption need not imply a reduction in total industrial costs. If the reduction results from a policy, the policy itself would involve increased industrial expenditure on set-up and running costs. Total cost figures should therefore be treated with caution.

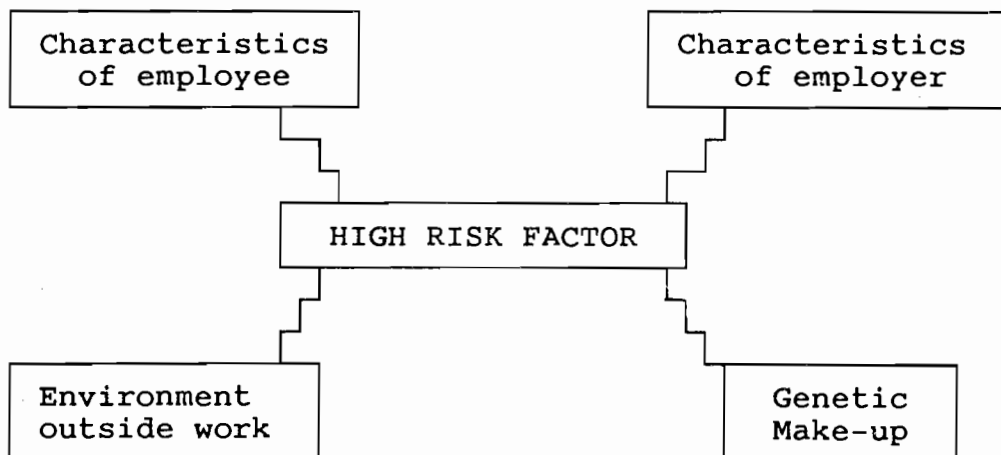
All estimates of the total costs to industry associated with alcohol are based on assessments of the probability that employees will be drinkers of a certain type, and that different drinking patterns will lead to a variety of workplace problems and costs under different conditions. The information needed to estimate these probabilities or 'risk factors' has been derived from a mixture of laboratory experiments and sample surveys of the general population, surveys of dependent drinkers and

Figure 1 Identifying Risk Factors

i) **Methodology for identifying industrial costs and generating risk factors:**



ii) **Reported as:**



specific employee groups. Risk factors could be used to identify workers at highest risk. The extent of available evidence is examined in the following section.

1.4 Identifying Workers at High Risk

The method by which risk factors are generated is shown in Figure 1. The results of surveys and experiments are reported as a set of characteristics which can be grouped into those which are associated with the highest risk of workplace problems and costs. For example, some studies (discussed below) show that younger male employees in workplaces where alcohol is available are at higher risk of associated industrial problems than similar workers in sites where alcohol is not available. Other studies show that employees are more likely to develop alcohol problems if their work is perceived to be boring or stressful, and/or they are experiencing a stressful life event such as divorce. Both work and non-work factors can individually or in some combination raise the risk that alcohol problems will arise at work. As a result, some occupations and industries may be found to be at higher risk than others, but all employees potentially face some risk. Each characteristic is considered below.

Characteristics of Employees

According to an OPCS survey of drinking habits in England and Wales in 1980, 27 percent of men and 13 percent of women drink above the low risk levels of 21 units for men and 14 units for women identified by the Royal College of Physicians (1987). A 1987 study of staff working in a London based multi-national

company also showed that 30 percent of men and 23 percent of women consumed more than the Royal College limit, and about 10 percent of both men and women drank more than the higher guideline of 21 units for women and 35 units for men set by the Health Education Authority in 1987 (Robert et al. 1988). It was also found that both male and female employee consumption increased linearly from Monday to Saturday and that the highest levels of consumption occurred amongst the youngest employees. Compared to the earlier study, (Wilson 1980), a far smaller percentage (who were not teetotal) reported drinking nothing in the week before and a far larger percentage reported drinking between 10 and 35 units of alcohol in the previous week. Rising levels of consumption for women have also been identified in other studies (Breeze 1985). These trends and the increased level of participation by women in the workforce may indicate that alcohol problems in employment are no longer a male phenomenon.

Wilson (1980) reported that of those in full time employment, one in 10 men and one in 20 women reported feeling the effects of a hangover at work or during housework. However, heavy drinkers were more than twice as likely as light or moderate drinkers to go to work with a hangover or to work after excessive lunchtime drinking. In a study of five UK industries, Davies (1981) found that at least a quarter of all the men interviewed reported lunchtime drinking in the previous week. The figures for women were much lower or negligible. More than half the men in vehicle manufacture and over 70 percent in the

brewery reported drinking at lunchtime. About 10 percent of the men who drank at lunchtime in these two industries exceeded 50 units per week at lunchtime alone. This is the equivalent of 5 pints of beer every day and a post 1 hour lunch break blood alcohol level of 124 mg/100 ml. These findings provide additional evidence that low level lunchtime drinking and heavy social drinking may be an important risk factor in industrial accidents.

Characteristics of Employers

Although problem drinkers and inappropriate drinking may arise in any form of employment, some occupations have been associated with much higher rates of alcohol problems than others. Evidence of the existence of high risk occupations can be obtained from differential rates of liver cirrhosis mortality between occupations. Liver cirrhosis is assumed to be an adequate indicator of most alcohol problems. The highest mortality ratios, standardised for the age composition of occupational groups, between 1961 and 1982 are presented in Table 2. 1982 data are the most recent available as OPCS occupational mortality data are only produced every ten years. The average mortality ratio is 100. Although the rates are not strictly comparable, there have been noticeable changes in relative risks and some groups have retained a consistently high rating. For example, the mortality rates for publicans, deck/engine workers room and ships pilots, bar staff, hotel managers and electrical engineers, are more than double the average rates.

From Table 2, it can be seen that the risk relative to the average increased between 1962 and 1972 in most occupational groups, but subsequently decreased. The average mortality rate across all individuals, however, has been rising. In England and Wales the mortality rate per 100,000 persons from chronic liver disease and liver cirrhosis rose from 3.0 in 1962 to 3.4 in 1972 and to 4.4 in 1982. It is therefore difficult to interpret changes in occupational rates over time. For example, between 1972 and 1982, the standardised mortality rates for qualified medical practitioners fell from more than three times the average

Table 2 Liver Cirrhosis Mortality By Occupation
(1962-1982 England and Wales)

Occupation	1962	1970-72	1982
Publicans) 773) 158	1017
Innkeepers)) 315	
Ship Ratings/Boatmen	400	628	873
Barstaff	200	633	612
Ship Officers/Pilots	467	781	417
Electrical Engineers	300	319	387
Hotel Managers	450	506	342
Fisherman	-	595	296
Cooks	460	354	265
Restaurateurs	282	375	263
Authors/Journalists	-	314	261
Drivers Mates	-	377	225
Winders/Reelers	-	319	202
Domestic	200	281	141
Garage Proprietors	233	294	140
Medical Practitioners	350	311	115

Source: OPCS; Plant; (1981); (1986).

risk to a level just above average. This effect may indicate an increased awareness, coupled with lower levels of consumption amongst GPs, but also a raised rate across other occupations relative to the rate for medical practitioners.

By comparing standardised mortality rates for liver cirrhosis with alcohol related admission rates to psychiatric hospitals, Slattery et al. (1986) devised a 'tolerance rate' for occupational groups. Given that mortality rates measure the prevalence of alcohol problems, and admission rates measure the degree of occupational response, the ratio of the two will indicate the degree of cirrhosis not matched by treatment and hence the degree of occupational tolerance to alcohol problems. The occupations found to have the highest significant tolerance rates were those described as managerial or commercial, where alcohol consumption was socially acceptable, eg. clergy, accountants and managers. Plant (1981) summarised high risk industries characteristics using eight common factors:

1. Availability of alcohol at work, eg. drinks trade.
2. Social pressure to drink at work, eg. mining, journalism and sales/ management.
3. Occupations which lead to separation of the worker from normal social and sexual relations for lengthy periods of time, e.g. seamen, commercial traveller.
4. Freedom from supervision at work eg. professional workers, white collar workers and directors.
5. Very high or very low relative incomes.
6. A tradition of collusion by colleagues.
7. Occupations which involve high levels of stress, or hazard, eg. mining, offshore rig personnel.
8. Occupations with reputations for heavy drinking attracting existing heavy drinkers, eg., drinks trade.

The evidence which has been collected on occupational risk often lacks statistical rigour. Most of the studies are conducted without controls and utilise data which were not collected for the study. In the case of clinical studies, the subjects are limited to severe cases which may involve an occupational bias. However, results of occupational studies also

support the medical evidence on occupational risk. Slattery et al. (1986) found 22 occupations in the UK with significantly high rates of admission to psychiatric hospitals for alcohol problems relative to the average. Eight of the high risk occupations were associated with the food, drink and entertainment industry, four with building and construction and three with the health services. The others were mainly connected with shipping, transport, and the arts. Whitehead and Simpkins (1983) also looked for predictive factors of high risk occupation, finding eight employer characteristics significantly related to indicators of alcohol problems, confirming earlier criteria. The two most important factors were inexpensive access to alcohol at work and social pressure to drink at work. These broad conclusions are also supported by studies in other European countries (WHO 1989).

Environment Outside Work and Genetic Characteristics

Several studies have shown that social and cultural factors may influence the onset of alcohol problems and their subsequent development. Factors such as leisure interests, family ties and religious interests are largely outside the control of the employer, but may affect the risk of alcohol problems at work (Janes and Ames 1989). Gorman (1988) examined the impact of stressful life events outside work on the development of alcohol problems in relation to the type of occupational characteristics of workers. Stressful life events are more likely to lead to alcohol problems in conjunction with availability, social pressure to drink, freedom from supervision and collusion by

colleagues at work. Genetic factors have also been identified. The children of alcoholics are at higher risk of developing alcohol problems and are more likely to develop alcohol problems at an earlier age than in the general population (Svikis & Pickens 1989; Blane 1988).

1.5 Summary

It is apparent from the evidence discussed in this section that detail is lacking on the nature and extent of alcohol related workplace problems. The variation in cost figures partly reflect inadequacies in the data. Despite these limitations, workplace studies have identified a substantial adverse effect of alcohol on safety, sickness absence and productivity at the workplace.

2. TYPES OF WORKPLACE POLICIES

Industrial initiatives require planning, co-operation and staffing, involving capital and current expenditures by firms. Different types of potential policy responses in the workplace are now examined together with a summary of the current policies operating in the UK. Alcohol workplace policies have three characteristics:

Specificity: Whether the alcohol policy is separate from or integrated with other health and support policies provided by the employer.

Incentives: Whether the incentives are based on self-referral, supervisor confrontation, or company wide bonus schemes.

Services: Whether the treatment and support services are provided within the company, contracted in or based on voluntary and public services.

2.1 Specificity and Services

Most European policies follow the disciplinary structure of the USA Employee Assistance Programme (EAP) model, developed in the 1970s. EAPs are formal written policies with agreed procedures, designed to help employees with a range of problems which affect performance at work, but the alcohol policy is usually the central component. They arose from early alcohol specific policies run by members of Alcoholics Anonymous who persuaded former employers of the cost efficiency of rehabilitating alcoholic employees. USA state funding and rising health care costs led to a rapid increase in the number of EAPs from 500 in 1973 to 10,000 by 1986 (Harig 1989). American surveys indicate that up to 50-60 percent of major corporations have alcohol programmes and that the likelihood that a company will have a policy is positively related to size (Bernstein & Mahoney 1989). More than 50 percent of USA worksites surveyed with more than 750 employees had policies, compared to only 15 percent of worksites employing between 50 to 99 employees (ODPHP 1987).

Roman (1988) identifies four types of EAP. Internal programmes are favoured by large corporations and are staffed by company employees who carry out assessment after a self-referral or referral by a supervisor. Counselling and treatment are then provided by external services. External programmes rely on

contracting assessment services from the private sector. Most UK policies rely on identification within the workforce, but on professional assessment and treatment within the NHS. Trades unions tend to rely on peer referral while professional groups rely on censure from the licensing body.

Most UK policies are formal and alcohol specific but some cover substance abuse, and a few are based on the broad brush approach to health prevention. The majority are found in large corporations, often a USA subsidiary, a company with strong public sector connections, or within the public sector itself.

No reliable data are available on the number of policies operating or the proportion of the working population covered. Evidence from surveys and known policies suggests that about 20 percent of the workforce are covered by formal policies. Examples of large corporations with alcohol policies are British Telecom, the Post Office, Marks and Spencers, Rolls Royce, Shell UK, IBM and the drinks industry. Alcohol policies have also been agreed in the Civil Service, in the NHS and in many local authorities. The content of some of these policies are summarised by Tether and Robinson (1986); Tether (1984); IAS (1983).

2.2 Objectives and Incentives

The general stated objective of most formal workplace policies is secondary prevention; to provide a route towards counselling and treatment for dependent workers with a view to rehabilitation. A further objective of prevention may be to

educate the workforce about the nature of alcohol and the impact of drinking on work activities, and to train supervisors about the sensitivity of the issue.

The main incentive in nearly all formal workplace policies is 'constructive confrontation' (Roman, 1988) where existing workplace supervisors confront any employee whose productivity has deteriorated. Any employee whose productivity fails to improve is then referred to a professional for evaluation. If the employee is found to be a dependent drinker, they are offered treatment and time off in place of disciplinary procedures. Although the dependent drinker is defined in the policy as being in need of medical help, alcohol problems at the workplace are identified only as a change in productivity. If the employee undertakes treatment but fails to improve productivity on return, the final sanction is dismissal.

Figure 2 contains a flow chart identifying the main characteristics of a workplace alcohol policy. Alcohol problems which do not affect productivity will only be considered if the employee asks for assistance through self-referral. The criterion for active intervention is therefore short run deterioration in work performance, usually measured by absenteeism, drinking at work and poor time-keeping and safety records. However, alcohol problems which are not associated with dependency, eg. single incidents of intoxication, remain simple disciplinary matters, where the final sanction is also dismissal.

3. ECONOMIC JUSTIFICATIONS FOR WORKPLACE POLICIES

To date, UK firms have either been unaware of the potential costs of industrial alcohol problems or have been slow to make the investment in an alcohol policy. In addition, attempts to measure the success of workplace policies in the USA have provided conflicting results. To explain the slow reaction by employers in the UK and to explore the potential for increasing the number of UK policies, it is useful to examine the nature of efficient choice by employers.

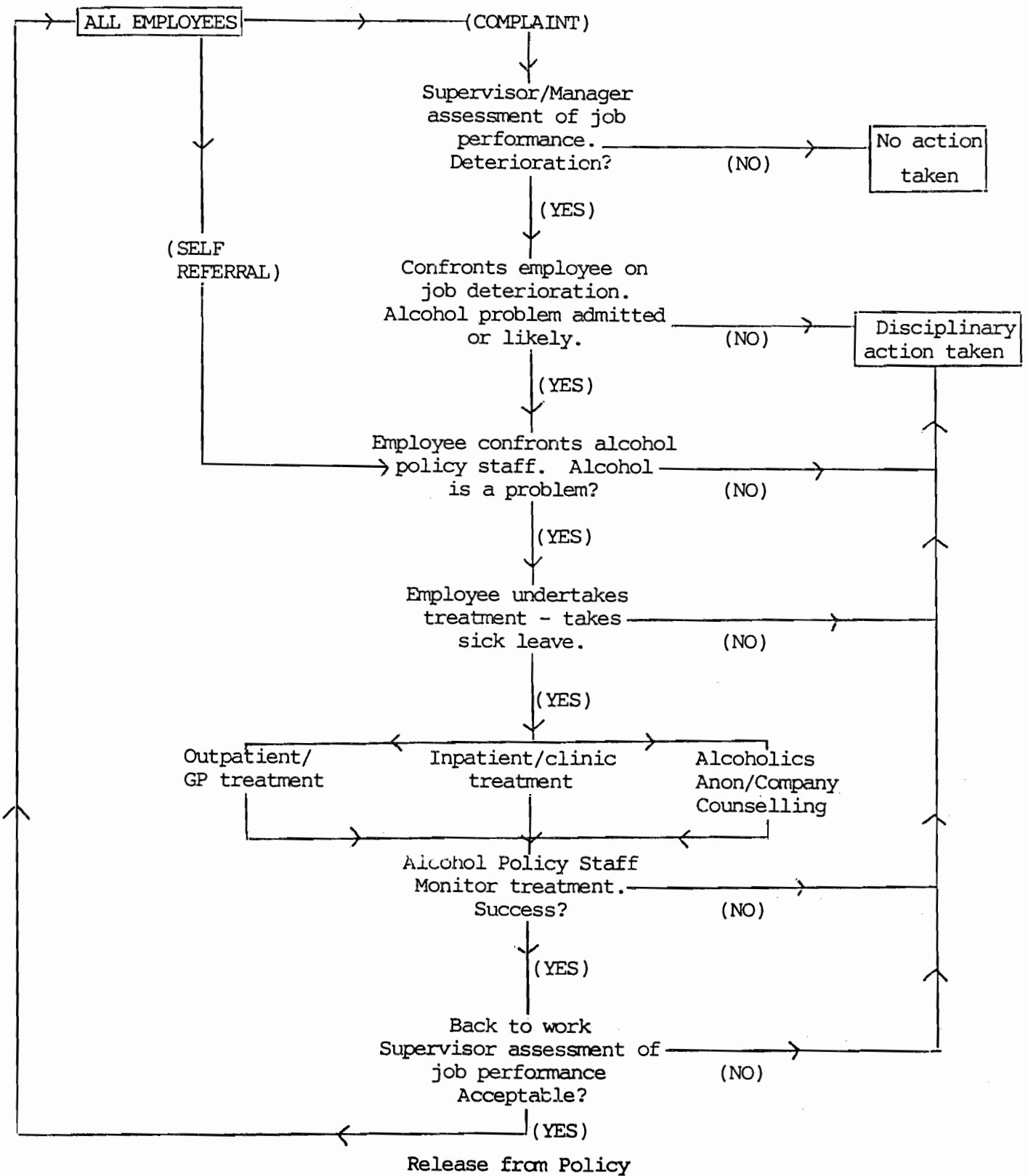
Business decisions can be divided into current and capital expenditure decisions. Current decisions are based on short run costs, and capital decisions on the need for investment to produce longer run returns. When combined, these decisions are intended to improve company performance over time as measured by profits. The maximum level of profits, measured by sales revenue net of production costs, arises when the increase in revenue generated by a decision just equals the cost of implementing the action.

Introducing an alcohol policy in the workplace involves additional current and capital expenditure by firms on personnel, training, information, co-ordination, and administration, all of which raise total costs. Any increase in costs not matched by an increase in revenue will reduce profitability and in the long run, the market value of the firm. Companies will not set up alcohol policies unless the benefits are perceived to outweigh

Figure 2

STRUCTURE OF WORKPLACE ALCOHOL

POLICIES



Source:
From: Walsh (1982).

the costs. The main route through which workplace policies increase profitability is through reductions in the employment costs in terms of wages and productivity.

Ideally employers will want to pay employees according to productivity and at most at a level equal to the value that they add to output. However, in reality, employees may be paid more or less than this amount because it would be impossible to monitor the actions of every employee at all times. For example, the alcohol dependent employee may receive a salary for months before a reduction in productivity is noticed. The four models outlined below show how, under these circumstances, alcohol policies within the workplace could lower employment costs, providing benefits to raise profitability in the long run.

3.1 Human Capital Approach

A firm can be thought of as investing in what has been called 'human' capital when it decides to implement an alcohol programme (Schramm 1980). The difference between 'human' and 'physical' capital is that 'human' capital is rented rather than sold and that employees know more about the productivity of their human capital than their employers. Human capital can usually be increased through education and training, which will improve performance over the life cycle. Under some circumstances, it may be more cost-efficient to improve the performance of existing employees rather than hire new staff. As with all investment decisions, the expected net return is the deciding factor. This approach is particularly relevant for firms who have already

invested in the training of personnel.

Staff training usually involves the cost of providing educational facilities and time off work, but can also take the form of below average productivity while learning a job. This is costly for the firm in the short term because the benefits of training are realised after investment. However, if it is assumed that employee productivity will rise after training for the period of employment, it can be profitable to invest in training over the longer run. During initial training, the employee is paid at a loss as they receive more than the value of their addition to output, but subsequent improvements in productivity relative to the wage lead to a net benefit for the employer. Training will be profitable if the value of performance generated over the expected employment period is greater than the costs of training. However, the productivity of an employee who develops an alcohol problem after training will decline. This can result in a reduced return on training if not a net loss. If the company provides an alcohol policy and employees respond, a higher level of productivity may be restored. However, to raise profitability, the gain in productivity after treatment must exceed the cost of treatment.

Schramm (1980) argues that the firm has a choice of four actions when it discovers employees with alcohol problems affecting productivity; dismissal, time off for medical/social intervention, postponement of action or toleration of productivity loss. Dismissal is the most likely response when

the employee is unskilled because the costs of hiring and firing and the level of prior investment in training may be relatively low. It may also be more likely in periods of high unemployment because replacement costs are lower. Toleration or postponement of action is more likely to arise when employee productivity is thought to be higher than the wage, even when productivity is obviously declining. The replacement of skill in this case may be costly but the degree of toleration will depend upon the length of service remaining. Alcohol problems amongst senior management may be tolerated for these reasons. The decision to give time off for treatment may only appear viable, therefore, for staff who receive costly but intensive in-service training and who are expected to remain with the company for a long period.

The human capital approach provides one explanation as to why some companies may not introduce formal company wide alcohol policies. If the mix of employees is such that the typical response to alcohol problems is dismissal or postponement and toleration, an alcohol policy covering the entire workforce is unlikely to improve company performance. The set up costs may be high, involving trade union consultation, staff training or the hiring of new personnel staff, and the dissemination of information. These costs are more clearly identifiable and more easily calculated than the benefits of workplace intervention. Some companies may therefore prefer informal and minimal policies.

3.2 Performance Monitoring Approach

Loosely specified employment contracts may be widely used by employers because they reduce the costs of generating individual employee contracts and increase the benefits of flexible job specifications. However, the cost of adopting this type of contract over long periods is that the employer must pay according to an average level of expected addition to the value of output which may encourage employees to reduce their productivity. Monitoring is therefore necessary, with or without training, because employees know more about their own productivity than their employers. Employers must rely on observing indicators such as absenteeism, late arrival and accident records which may not identify a safety hazard or low productivity levels resulting from alcohol use until the effects are severe. The firm must then bear the burden of the cost of dismissal, rehiring and a prolonged period of low productivity.

Managers could improve productivity by using inter-employee monitoring, encouraged by group productivity incentives. This applies to all factors affecting employee performance in addition to alcohol abuse. The purpose is to identify a downward turn in productivity before crisis levels are reached and to reverse the trend for each employee where possible. In terms of alcohol policies, the firm has a choice of three types of action. It can ban alcohol consumption on the premises, provide economic incentives to all employees to alter drinking behaviour or introduce formal intervention policies for problem drinkers. As separate policies, they reflect the strategies of coercion,

co-operation and constructive confrontation (Roman 1988).

A ban on workplace drinking might effectively reduce alcohol related accidents but have little impact on absenteeism or long run deterioration in productivity. If workplace drinking is part of an established culture, enforcement may require stringent penalties and increased monitoring costs. Evidence from other European countries suggests that on-site consumption is a major factor affecting workplace problems (WHO 1989). Although American studies show that monetary incentives can alter employees behaviour in health promotion (Warner and Murt 1984), there is no evidence that the productivity of participating employees is higher than that of non-participating employees. The most common response is the introduction of formal intervention policies to encourage staff monitoring while minimising the costs of dismissal and non-workplace consumption.

3.3 Labour Market Signalling Approach

If labour markets worked efficiently, wages would provide all the information that employees need to know about firms when searching for a job. However, the problems of limited information and monitoring suggest that the wages offered by employers will often reflect the average wages and average quality of employment in the industry, giving little indication of the nature of employment in a specific firm. Potential employees may look for additional signals about management skill and the performance of prospective employers other than the wage. Workplace alcohol policies could act as a signal of a firm's

commitment to its employees, of its use of long run planning, and of high workplace morale. Employees who place a high value on the quality of employment will look for these signals, which can in turn signal information about the prospective employee to the employer. Signals of this type reduce the costs of search and of making an incorrect decision for both the employer and the employee, raising the level of expected net benefits from the employment decision. Employers operating in highly competitive labour markets, therefore, may be more likely to adopt workplace policies.

3.4 Fringe Benefits Approach

Fringe benefits constitute compensation for employment not paid currently as money. A firm can pay fringe benefits to individual employees or to the whole workforce by providing services like an alcohol workplace policy. The provision of fringe benefits must involve a direct cost to the employer on behalf of employees. A firm will pay fringe benefits rather than money compensation, if non-money payments are the least cost form of compensation. Economies in the provision of services to employees are an incentive for employees to accept fringe benefits. Companies may be able to obtain more favourable terms on the purchase of insurance and health advice, for example, because administrative charges are lower than for the individual employee. This factor has been a particularly important element in the provision of alcohol policies in the USA where employers often carry the cost of insurance for employee health care.

The payment of fringe benefits rather than wages always restricts the choice of employees' spending. Employers may be attracted to use this system of payment to alter employee behaviour in relation to productivity. A further motive is potential reductions in tax contributions. If employees accept the workplace alcohol policy as a fringe benefit, reduced tax contributions can raise profitability by lowering current costs. The implication is that alcohol policies must act as signals of quality in addition to reducing employer costs. American surveys suggest that both employers and employees view workplace health promotion programmes as desirable benefits, particularly in relation to morale and corporate image (Clement and Gibbs 1983). However, alcohol policies are less likely to emerge as part of a package of fringe benefits in smaller companies and in countries like the UK where firms do not bear the direct cost of providing health care cover. Companies with strong unions may also be less likely to adopt company wide fringe benefit packages.

4. HOW SUCCESSFUL ARE WORKPLACE POLICIES?

4.1 Identifying the appropriate goal

The economic models outlined above provide several justifications for the introduction of workplace policies. However, they are all based on the rationale that the policy will raise short run productivity and potential long run profitability. There is no suggestion that the motive for introduction should be a commitment to the social goal of

improved health and welfare. An employer may target health and social welfare, but this behaviour is only predicted where it acts as a competitive signal, lowers internal organisation costs, aids employment policies and reduces associated expenditure. However, if it is argued that workplace policies should be used as part of a population wide health policy, there will be two distinct criteria on which to judge the success of workplace alcohol policies: the industrial goal of improvements in productivity, and the wider social goal of successful identification and rehabilitation of problem drinkers. These two goals can easily be confused in evaluation studies.

Workplace policies may be the most effective method of identifying and rehabilitating dependent drinkers compared with other treatment systems. Employers not only maintain a regular appraisal of individual behaviour on a day to day basis, but evidence suggests the most accurate predictor of long-term outcome of treatment is compliance with treatment by individuals who are forced to do so in order to retain employment (Wright 1989; Allsop and Beaumont 1984). However, the emphasis on job performance and self-referral as the criterion for intervention, is likely to result in many dependent drinkers being overlooked. Managers and all female employees are less likely to be identified as problem drinkers, and younger workers with limited service records are less likely to return to satisfactory job performance. Male employees and unskilled workers with alcohol problems are less likely to be self-referrals (Reichman et al. 1988; Macdonald et al. 1989; Walker and Shain 1983).

A conflict between the medical justification for intervention and the disciplinary incentive for compliance can be found in the design of formal written alcohol policies based on the EAP model. The medical criterion for intervention is based on a definition of loss of individual control, whereas the incentive to comply depends on the existence of individual control. Even if the employee co-operates or volunteers, the criterion for monitoring remains improved job performance. Productivity improvements may or may not occur whatever the outcome of treatment in terms of drinking behaviour. It is unlikely therefore, given the structure of EAP based policies, that both goals can be efficiently achieved by workplace intervention.

4.2 Measuring Success

Economic evaluations of workplace policies have generally measured net returns as the benefits of improvements in work performance (reductions in absenteeism, productivity, and sickness absence, etc) rather than improvements in health status, net of the monetary cost of implementing and running a policy. It has been estimated that the annual net return for USA firms on every dollar invested in alcohol workplace policies is between two and seven to one (Shahandeh 1985). The net return calculated in short period costing studies is the value of the annual per capita policy benefits over the annual per capita policy costs.

Table 3

Net Present Value Method

Policy Benefits

Policy Costs

Averted costs (k)
for every
individual (i) using the
policy in year t

Expenditures (k) for
for every
individual (i) using the
policy in year t

- C1. Premature replacement costs after dismissal or death.
- C2. Costs of excess absenteeism
- C3. Costs of lower productivity due to inefficiency
- C4. Costs of sickness absence and medical care
- C5. Costs of disability payments or insurance cover

- E1. = Direct Expenditures
- E2. = Indirect Expenditures

Individual policy benefit

$$PB_i = \sum_{k=1-5} C_{ki}$$

Individual policy cost

$$PC_i = \sum_{k=1-2} E_{ki}$$

Annual individual benefit

$$PB_t = \sum_{k=1-5} \sum_{i=1-n} C_{ki}$$

Annual individual cost

$$PC_t = \sum_{k=1-2} \sum_{i=1-n} E_{ki}$$

Present value of
total policy benefit

$$PB^* = \sum_{t=1-m} \frac{PB_t}{(1+r)^t}$$

Present value of
total policy cost

$$PC^* = \sum_{t=1-m} \frac{PC_t}{(1+r)^t}$$

Net Return = $PB^* - PC^*$

A more sophisticated model for evaluating the return on industrial investment in alcohol policies would involve estimating the long run net return. Swint et al. (1978) devised a cost-benefits model that could be used for retrospective or

prospective evaluation of workplace policies. The present discounted value (where 'r' is the interest rate) of the costs and benefits in each period are calculated to determine the net impact on profitability in the long run. In this way, the introduction of a workplace alcohol policy could be compared with any alternative investment proposal. Costs are defined as direct expenditure on the alcohol policy and indirect costs of work-time lost following the policy, discounted for the years in operation (m). Benefits, as shown in Table 3, are the discounted value of averted costs derived from the policy for each individual (i).

The cost side of the calculation is probably the most simple to quantify retrospectively from company records, or to project as future expenditures. The benefit side requires information on the rate of excess absenteeism, inefficiency, mortality, unemployment and sickness absence amongst policy users. Data on risk factors in the UK are limited, where available specific company records are often incomplete, and there is no clear methodology for evaluating these benefits as shown in the discussion on total costs to industry. However, evidence from American company studies shows that workplace policies are often cost-effective. Unfortunately, studies are rarely comparable and suffer from a variety of methodological defects (Babor et al. 1986; Kurtz et al. 1984). The most common defects are lack of experimental controls, lack of objective measures of success and the inappropriate use of short follow-up periods.

Some American studies have found negative or low level of returns from investment in workplace alcohol policies. (Walker and Shain 1983). One interpretation of these results is that earlier studies overestimated the benefits of improved productivity. However, it is more likely that the rate of uptake of assistance at the workplace slows down as the original pool of dependent employees in need of help declines. As the effects on productivity and medical costs decline over time, the less tangible benefits of improved employee morale, work relations and company image may increase. In addition, the value of continuing education and knowledge of alcohol problems is not included. These non-monetary or intangible benefits are particularly difficult to value.

Other intangible benefits have also been excluded. Sapolsky et al. (1981) found that employers used workplace programmes to recruit and retain employees because they enhanced employee morale and corporate image. The rising importance of these intangible benefits in the USA, and potentially in the UK, may be due to increased competition in labour and product markets resulting in wider use of fringe benefits and signalling devices.

The potential for an increase in the number of workplace policies in the UK depends upon the extent to which employers are informed about the costs of alcohol and the extent to which longer run intangible benefits become more important than short run investment cost factors in the investment decision of UK firms. The emphasis on intangible benefits will be greater when

there is little slack in the labour market, the level of organisation of labour is limited, health care costs are an important consideration to employees and where the responsibility for health care costs in employment rests mainly on the employer. In the American market, health care costs are borne by many employers, turnover costs in employment are high, union power is limited, and the costs of legal redress are high. The issue of property rights for employers to insist on compulsory alcohol and drugs testing is still being contested. In the light of these factors, the emphasis on longer run medical intervention instead of short run profitability may be limited in the UK.

Table 4 Benefits of Alcohol Workplace Policies and the Major Recipient in the UK

	Tangible & Intangible Benefits	The Employer	The Employee	Other People or Employers
1	Improved productivity:			
	Training/turnover	+		+
	Absenteeism	+		+
	Efficiency	+		+
	Accidents	+	+	+
	Goodwill/morale	+		
2	Premature mortality avoided		+	+
3	Reduced health costs		+	+
4	Reduced disability/ Welfare payments			+
5	Reduced domestic problems		+	+
6	Reduced RTA's/ Other accidents		+	+
7	Reduced crime			+
8	Unemployment		+	+

A final factor affecting the outcome of any economic evaluation of workplace policies is the inclusion of 'spillover' effects in the calculation. Spillover effects are the costs and benefits generated for other people and firms by the workplace policy which are not valued by the company. For example, workers in companies with policies may be more aware of alcohol problems and potentially more productive. If these employees leave for jobs in companies without policies, some of the benefits of the investment will be available for other firms who do not have to pay for them.

In the UK, the benefits of reductions in health care costs for the NHS are spread across many taxpayers but are not included in the firm's investment evaluation. The extent of private cover for alcohol dependency is also limited. In the USA, most States enforce mandatory partial company insurance reimbursement for alcohol dependency treatment, so that firms pay most of the cost. The typical benefits to the employer for inclusion in an evaluation of a UK company alcohol policy are identified in Table 4. These benefits are defined on the basis of the goal of improvements in long run profitability rather than health outcomes.

Premature mortality is a factor often included as a direct effect on employers in total cost studies. The human capital approach is valid only when there is no unemployment and when the value of foregone earnings reflects the social value of the life

lost. Individual employers are unlikely to include benefits of longevity in investment decisions as these will largely accrue to future employers. In addition, chronically ill employees are likely to have left the payroll before their death, in which case the employer is concerned with minimising turnover costs. If the value of premature death is not included in the evaluation of industrial costs of alcohol abuse in the UK, total costs measured by industry would be reduced by more than 40 percent. (See figures in Point 4 of Table 1).

Any evaluation of the cost-effectiveness of preventive health policy based on workplace policies should, however, include the spillover benefits. It has been argued that European workplace alcohol policies have failed in terms of the health goals of reduced consumption because they lack primary prevention, particularly steps to reduce alcohol consumption at work and provide health education (WHO 1989). From the productivity goal of the firm, however, it would be inefficient to introduce these aspects if most of the benefits fall to other firms and individuals, making the net return negative. In the light of the conflict between medical and productivity goals in the workplace policy, it is important to identify clearly the goal of the policy before attempting an economic evaluation.

5. SUMMARY

Alcohol consumption at moderate or excessive levels can generate costs which will be borne by the employer. These costs may arise not only through employee alcohol consumption at or

during work time, but also through inappropriate consumption away from work. The costs are mainly those of lost productivity created by reduced efficiency, increased sickness absence and absenteeism, reduced returns on training, and increased rates of accidents and injury for which the employer may be held responsible. A recent estimate of the value of UK output associated with days lost alone in 1987 was in excess of £1.7 billion.

Survey results show that the majority of employees drink and that even moderate drinking patterns are associated with increased risk of accidents and injury, with poor decision-making and with reduced efficiency after lunchtime drinking or hangovers. About one in 10 male employees are thought to be problem drinkers taking up to 40 percent more sickness absence than other employees. The majority of dependent drinkers are employed and it has been estimated that about 160,000 working life years were lost in the UK in 1986 because of premature mortality due to problem drinking, the equivalent of the full-time working lives of 2,500 people.

Non-work factors such as divorce and other family problems have been shown to influence the onset of alcohol problems for any employee. All employees, therefore, could potentially bring alcohol related problems to work. However, the characteristics of some employees and employers may generate higher than average risk of experiencing alcohol related problems at work. Younger male workers, workers in occupations or jobs where alcohol is

available at work, managerial and commercial employees in occupations where alcohol consumption is socially acceptable, workers who are free from supervision or in an environment of traditional collusion, and employees who consider their work to be monotonous or stressful, are at higher risk.

The costs of alcohol to employers in the USA are particularly high because of the statutory requirements in most States to provide medical cover for alcohol related illness. About 60 per cent of USA corporations have introduced formal alcohol policies in an attempt to reduce employer costs. Only 20 percent of UK companies are thought to have similar policies. Workplace policies are designed to identify the problem drinker at an early stage and to provide treatment and counselling without loss of job status. The employee is usually confronted initially by a supervisor or manager only if their productivity has begun to decline. If alcohol problems are diagnosed by a qualified professional, treatment is offered. Disciplinary procedures are only started if the employee fails to comply or if productivity continues to decline.

The economic case for workplace alcohol policies can be made on the basis of the cost-efficiency of improvements in productivity alone. Employers are interested in maximising profits and productivity in the long run. Although introducing a policy involves additional current and capital costs, the net return may be positive in the long run. The benefits of specialised training can be recouped, the costs of dismissal and

hiring avoided, policies may act as fringe benefits and cost-effective signals of efficient management, attracting employees in short supply.

The cost-effectiveness of alcohol workplace policies, however, can only be determined through empirical evaluation. Some USA study results show a net return of seven to one for every dollar invested in alcohol workplace policies. However, other studies have shown conflicting results. Part of the explanation lies in the statistical defects of some economic studies, and part in the way that the goals of workplace policies and hence the measures of successful outcomes are defined. It has been argued that alcohol workplace policies may be effective and cost-efficient health prevention policies. Because the successful outcome of an alcohol health policy is controlled drinking rather than increased productivity, different benefits enter the economic evaluation and a clear distinction has not always been made. Benefits generated for the employee, family and society would be included in an evaluation of a health policy but not in an evaluation of the net returns to the firm introducing a policy to increase productivity.

In order to assess the cost-effectiveness of increasing the number of alcohol workplace policies in the UK, careful evaluation is essential. Future company studies should follow the criteria for economic evaluation under appropriately and explicitly stated goals, using robust statistical techniques. Such studies cannot be undertaken without more precise company

data on the impact of policies on absenteeism, productivity and other indicators of workplace costs. On a more general basis, better quality data on the number and type of policies existing in the UK, and on company reasons for implementing policies are a necessary base for any further analysis.

Bibliography

Alcohol (Health & Research) World, (1985), Vol.9 (4), Summer.

Allsop, S. & Beaumont, P. (1983), 'Dismissal for alcohol offenses', *Employee Relations*, 5.2 and 5.5.

Argyropoulous-Grisanous, M. & Hawkins, P. (1980), *Alcohol and Industrial Accidents*, Christian Economic and Social Research Foundation, London.

Babor, T., Ritson, E., & Hodgson, R. (1986), 'Alcohol-related problems in the primary health care setting: A review of early intervention strategies', *British Journal of Addiction*, 81, pp 23-46.

Bernstein, M. & Mahoney, J. (1989), 'Management perspectives on alcoholism: The employer's stake in alcoholism treatment', *Occupational Medicine: State of the Art Reviews*, 4,(2), pp 223-232.

Berry, R., Boland, J., Smart, C., Kanak, J. (1977), *The Economic Costs of Alcohol Abuse and Alcoholism - 1975*, National Institute of Alcohol Abuse and Alcoholism, Rockville, USA.

Blane, H. (1988) 'Prevention issues with children of alcoholics', *British Journal of Addiction*, 83, pp793-798.

Braine, B. (1977), *Report of the Working Party on Alcohol and Work*, National Council on Alcoholism, London.

Breeze, E. (1985), *Drinking in England and Wales*, OPCS, HMSO, London.

Clement, J. & Gibbs, D (1983), 'Employer considerations of health promotion programs: Financial variables' *Journal of Public Health Policy*, 4, pp. 45-55.

Crawford, A., Plant, M., Kreitman, N. & Latcham, R. (1985), 'Self-reported alcohol consumption and adverse consequences of drinking in three areas of Britain: General population studies', *British Journal of Addiction*, 80, pp 421-428.

Davies, J.B. (1981), 'Drinking and alcohol-related problems in five industries', in Hore, B. & Plant, M. (eds) *Alcohol Problems in Employment*, Croom Helm, London.

Denney, R. (1986), *Alcohol and Accidents*, Sigma Press, Cheshire.

Dritschel, B. & Pettinati, H. (1989), 'The role of female occupation in severity of alcohol related problems', *American Journal of Drug and Alcohol Abuse*, 15 (1), pp 61-72.

Edwards, G., Kelley-Fisher, M., Hawker, A. and Hensaman, C. (1967), 'Clients of Alcoholism Information Centres', *British Medical Journal*, 4, pp 356-349.

- Emery, M. (1986), 'Alcohol and Safety in Industry', *Journal of Social and Occupational Medicine*, 36, pp 18-23.
- Godfrey, C., Hardman, G., & Maynard, A., (1989), 'Priorities for Health Promotion', Centre for Health Economics Discussion Paper 59, University of York.
- Godfrey, C. & Powell, M. (1987), 'Making sense of studies of alcohol and tobacco', in *The Costs of Alcohol, Drugs and Tobacco to Society*, Institute of Prevention and Social Psychiatry, Erasmus University, Rotterdam.
- Gorman, D. (1988), 'Employment, stressful life events and the development of alcohol dependence', *Drug and Alcohol Dependence*, 22, (1-2), pp 151-159.
- Harig, P. (1989), 'Alcoholism in the Workplace', *Occupational Medicine: State of the Art Reviews*, 4 (2), pp 213-221.
- Harrison, L. (1987), 'Data Note 7 - Drinking and Driving in Great Britain', *British Journal of Addiction*, 82, pp 203-208.
- HSE (1981), *The Problem Drinker at Work*, HMSO, London.
- Hingson, R. & Howland, J. (1987), 'Alcohol as a risk factor for injury or death resulting from accidental falls', *Journal of Studies on Alcohol*, 48, pp 212-219.
- Holder, H. (1986), 'Alcoholism treatment and total health care utilisation and costs: A four-year longitudinal analysis of federal employees', *JAMA*, 256, pp 1456-1460.
- Holtermann, S. & Burchell, A. (1981), 'The Costs of Alcohol Misuse', *Government Economic Service Working Paper*, No. 37, DHSS, London.
- Howard, G. (1990), 'Alcoholism and drug abuse-some legal issues for employers', *British Journal of Addiction*, 85, pp 593-603.
- Howland, J. & Hingson, R. (1988), 'Alcohol as a risk factor for drownings: A review of the literature', *Accident Analysis and Prevention*, 20 (1), pp 19-25.
- Hyman, J. & Beaumont, P. (1984), 'Identifying the problem drinker', *Occupational Safety and Health*, 14, pp 26-29.
- IAS (1983) *Alcohol Problems in Employment - Information Pack*, Institute of Alcohol Studies, London.
- ILO (1987), 'Drugs and Alcohol, Programmes of Assistance for Workers', *Conditions of Work Digest*, 6 (1), International Labour Office, Geneva.
- Janes, C. & Ames, G. (1989), 'Men, blue collar work and drinking: alcohol use in an industrial sub-culture', *Culture, Medicine and Psychiatry*, 13, pp 245-274.

Kurtz, N., Goggins, B., & Howard, W. (1984), 'Measuring the success of occupational alcoholism programs', *Journal of Studies on Alcohol*, 45, pp 33-45.

Lewis, R.J. & Cooper, S.P. (1989), 'Alcohol, other drugs, and fatal work-related injuries', *Journal of Occupational Medicine*, 31 (1), pp 23-28.

Macdonald, S., Albert, W., Maynard, M., & French, P., (1989), 'Survival analysis to explore the characteristics of EAP referrals that remain employed', *International Journal of Addictions*, 24 (2), pp 133-122.

McDonnell, R. & Maynard, A. (1985a), 'The Cost of Alcohol Misuse', *British Journal of Addiction*, 80, pp 27-33.

McDonnell, R. & Maynard, A. (1985b), 'Estimation of Life Years Lost from Alcohol Related Premature Death', *Alcohol and Alcoholism*, 20, pp435-443.

Maynard, A. (1989), 'The costs of addiction and the costs of control', in Robinson, D., Maynard, A. and Chester, R. (eds), *Controlling Legal Addictions*, Macmillan, Basingstoke.

Mongrain, S. & Standing, L. (1989), 'Impairment of cognition risk taking and self perception by alcohol', *Perceptual Motor Skills*, 69, pp 199-210.

Moskowitz, H. (1985), 'Adverse effects of alcohol and other drugs on human performance', *Alcohol Health & Research World*, 9, pp 8-39.

ODPHP (1987), 'National Survey of Worksite Health Promotion Activities: A Summary', Monograph Series, Office of Disease Prevention and Health Promotion, National Health Information Centre, Silver Spring, MD. USA.

Plant, M. (1981), 'Risk factors in employment' in B. Hore and M. Plant (eds), *Alcohol Problems in Employment*,

Plant, M. (1986), *Drugs in Perspective*, (Teach Yourself Books), Hodder and Stoughton, Sevenoaks.

Podolsky, D. & Richards, D. (1985), 'Investigating the role of substance abuse in occupational injuries', *Alcohol Health and Research World*, 9 (4).

Reichman, W., Young, D., & Gracin, L. (1988), 'Identification of alcoholics in the workplace', in M. Galanter (ed), *Recent Developments in Alcoholism*, Vol. 6, Plenum, New York.

Robert, R., Cyster, R. & McEwan, J. (1988), 'Alcohol consumption and the workplace: Prospect for change', *Public Health*, 102 (5), pp 463-469.

- Roman, P. (1988), 'Growth and transformation in workplace alcoholism programming', in Galanter, M. (ed) *Recent Developments in Alcoholism, Vol. 6*, Plenum, New York.
- Royal College of Physicians (1987), *The Medical Consequences of Alcohol Abuse: A Great and Growing Evil*, Tavistock, London.
- Saad, E. & Madden J. (1976), 'Certificated incapacity and unemployment in alcoholics', *British Journal of Psychiatry*, 128, pp 340-345.
- Salposky, H., Altman, D., Greene, R., Moore, J. (1981), 'Corporate attitudes towards health care costs', *Milbank Memorial Fund Quarterly*, 59, pp. 561-585.
- Schramm, C. (1980), 'Evaluating Industrial Alcoholism Programs - A Human Capital Approach', *Journal of Studies on Alcohol*, 41 (7), pp 702-713.
- Shahandeh, B. (1985), 'Drug and Alcohol Abuse in the workplace: Consequences and counter measures', *International Labour Review*, 12 (2), pp 207-223.
- Slattery, M., Alderson, M., and Bryant, J., (1986), 'The occupational risk of alcoholism', *The International Journal of Addiction*, 21 (8), pp 929-936.
- Svikis, D. & Pickens, R. (1989), 'Children of alcoholics: a target for prevention efforts', *Occupational Medicine: State of the Art Reviews*, 4 (2), pp 301-310.
- Swint, M., Decker, M., and Lairson, D. (1978), 'The economic returns to employment-based Alcoholism programs: A methodology', *Journal of Alcohol Studies*, 39 (9), pp 1633-1639.
- Tether, P. (1984) 'The Workplace and the Prevention of Alcohol Related Problems', Working Paper, Institute of Health Studies, Addiction Research Centre, University of Hull.
- Tether, P. & Robinson, D. (1986), *Preventing Alcohol Problems: A Guide to Local Action*, Tavistock, London.
- TUC (1986), 'Problem drinking - TUC guidelines for a workplace policy', TUC.
- Walker, K. and Shain, M. (1983), 'Employee assistance programming: In search of effective interventions for the problem drinking employee', *British Journal of Addiction*, 78, pp 291-303.
- Walsh, D. (1982), 'Employee Assistance Programs', *Milbank Memorial Fund Quarterly, Health and Society*, 60 (3), pp 492-517.
- Warner, K. & Murt, H. (1984), 'Economic Incentives for health', *Annual Review of Public Health*, 5, pp 107-133.

WHO (1989), Papers and Proceedings of the World Health Organisation Regional Office for Europe 'Consultation on the drinking practices of specific categories of employees' held in Cologne, 20-24th November, 1989, WHO, Geneva.

Wilson, P. (1980), *Drinking in England and Wales*, OPCS, HMSO, London.

Whitehead, P. & Simpkins, J. (1983), 'Occupational factors in alcoholism' in B. Kissin & H. Begleiter (eds), *The Pathogenesis of Alcoholism: Psychosocial Factors*, Plenum Press, New York.

Wright, C. (1989), 'Occupational Chemical Dependency Programs: The Business of Alcohol and Drug Dependencies' in *Occupational Medicine: State of the Art Reviews*, 4 (2), pp 195-212.

Yates, D., Hadfield, J., & Peters, K. (1987), 'Alcohol consumption of patients attending two accident and emergency departments in North West England', *Journal of the Royal Society of Medicine*, 80, pp 486-489.