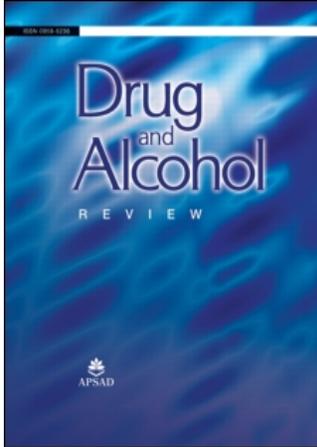


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### A scientific perspective on harm reduction

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## EDITORIAL

# A scientific perspective on harm reduction

### Introduction

Recent Editorials [1,2] have discussed the theme of harm reduction, and the role which *Drug and Alcohol Review* can play in covering and evaluating this topic. Definitions of harm will of course vary, including criminological, social and medical aspects, and all these are likely to be addressed by authors of differing backgrounds. Over the years, most of the papers in *Drug and Alcohol Review* have been in areas other than biological and medical sciences.

Although many of the proposed and implemented harm reduction measures may be educational, social or political there are also scientific aspects to harm, and harm reduction policies, which I would like to emphasize.

### Evidence-based approaches

It seems to be agreed that prohibition is not a practical or complete answer to the problems resulting from drug use, and that where addictive substances are going to be used there is a need to minimize the harm which results. Nevertheless, it must be acknowledged that prohibition policies can avoid some forms of harm. The introduction and subsequent repeal of prohibition of alcohol sales in the United States, and reductions in alcohol consumption in France during the Second World War, had a substantial effect on rates of liver cirrhosis (see, for example, [3]). One major challenge will be to evaluate the consequences of harm reduction policies when the harm prevented is of a different kind, or affects different people, from the harm which may be caused or not mitigated by a tolerant or permissive approach. What 'exchange rate' should be used in comparing the costs and benefits?

Questions of evidence and evaluation and the basing of policies and clinical practice on evidence are topical and they provide one area where biomed-

ical research and statistical analysis have resulted in techniques and concepts which can help to set policies [4]. Reviews have traditionally been subjective and presented in a non-quantitative way, but a combination of explicit criteria for inclusion of primary studies with the statistical techniques of meta-analysis are producing a new methodology [5].

### Biological and medical aspects

In many ways, an approach based on harm reduction requires more knowledge of biology, medicine and pathology than one based on abstinence or prohibition. This is because the link between use and harm involves a person; an organism which is damaged by the drug or by conditions associated with its use in ways which may or may not be understood. Effective intervention, aimed at harm reduction even if use is not reduced, requires an understanding of the mechanisms of harm.

Although these mechanisms may be very obvious and even crude—such as violence or accidents resulting from intoxication—there are many scientific issues to be explored. With accidents, how is performance or judgement affected? With infections, do host factors play a role? With pharmacotherapy or substitution of other drugs, what are the mechanisms and side-effects? With harm from tobacco and alcohol use, how do the medical complications arise and are there ways the link could be broken?

Examination of the interface between use and harm should provide a base on which to develop new preventive measures, interventions and treatments. Without trying to predict how research in these areas will turn out, or to review those where useful results have been obtained, it is worth considering some of the areas which could be examined by *Drug and Alcohol Review* and by its readers.

*Addiction* is, almost by definition, a common feature of all abused drugs. Some mixture of social, psychological and biological factors leads to a situation where a person continues to use the drug despite the knowledge that it is causing them harm, and despite their expressed wish to stop. It is known that for alcohol and tobacco at least, there are genetic factors which make some people more likely to use these substances and/or become dependent on them. Despite a great deal of work on experimental animals and an increasing amount with humans, addiction is not well understood.

*Intoxication* is also a feature of many drugs. The impairment of judgement and co-ordination which occurs after use may provide part of the reward for use, but certainly leads to many kinds of harm—physical and social. Again, we could benefit from increased understanding in this area.

*Infection*, usually from poor hygiene with injected drugs, is well understood and has been the focus for many harm reduction measures. In the case of alcohol, there is also an element of immunosuppression caused by the drug itself, leading to increased susceptibility to infection.

*Carcinogenesis* is a prominent complication of smoking—not only in the lungs—and is probably also enhanced by alcohol in some organs. The fundamentals of tumour biology are beginning to be understood, and the local and remote aspects of exposure are now being established through epidemiological studies of adequate size. Molecular biology promises understanding and may lead to novel treatments, but it will be even more effective if it can lead to preventive measures.

*Other lung diseases* related to smoking can be explained in only a few individuals. For example, a genetic deficiency of a protective protein ( $\alpha$ 1-protease inhibitor deficiency) interacts with cigarette smoking to produce lung damage.

*Atherosclerosis and peripheral vascular disease* are strongly influenced by smoking but the mechanisms are not well understood. The protective effects of low-dose alcohol against heart disease—the subject of a recent meta-analysis [6]—are perhaps 50% understood. However, there is strong resistance to the idea of preventing harm by using alcohol; an interesting contrast to other aspects of harm reduction philosophy.

*Brain damage* from drug use is mainly from alcohol, and at present is not well understood.

Part of the problem may be due to thiamine deficiency associated with poor diet and/or increased requirements. The rational response to this is addition of thiamine supplements to food-stuffs such as bread, or to beer, and this requires an understanding of requirements and bio-availability and rigorous evaluation of the effectiveness of such measures.

*Cirrhosis* is the best-known physical consequence of excessive alcohol use. While there are data on the dose-response relationship and evidence for greater vulnerability in women and in some racial groups, there are only preliminary ideas of how alcohol causes cirrhosis and why some people get it while other equally heavy drinkers do not. Given this poor understanding of even the most well-known and long-established type of drug-induced harm, there is still much to be done before harm reduction can have a major impact.

*Foetal effects* of smoking and alcohol are recognized but again poorly understood, and the only practical measures to prevent these problems are educational messages to reduce alcohol use and smoking during pregnancy. Some animal experiments suggest that this may be too late, and even that male exposure to these agents can have harmful effects on the offspring.

Opportunities for *screening and intervention* may depend on being able to pick out people who are at greatest risk from their drug use; this may (if effective screening methods are available) be more cost-effective than intervening to prevent harm in all subjects/patients/clients.

Given all these forms of harm, and the paucity of detailed knowledge about many of them, there is plenty of scope for biomedical approaches to harm reduction. Decriminalizing drug use and giving out clean needles may reduce some kinds of harm, but the prevention of infection is only a part of the answer. On the positive side, a great deal of research is being done world-wide on the topics I have listed and more; there must be a place for a journal such as *Drug and Alcohol Review* to report on these projects and on their implications over the coming years.

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