



Drug harms in the UK: a multicriteria decision analysis

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Summary

Lancet 2010; 376: 1558–65

Published Online

November 1, 2010

DOI:10.1016/S0140-

6736(10)61462-6

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Background Proper assessment of the harms caused by the misuse of drugs can inform policy makers in health, policing, and social care. We aimed to apply multicriteria decision analysis (MCDA) modelling to a range of drug harms in the UK.

Method Members of the Independent Scientific Committee on Drugs, including two invited specialists, met in a 1-day interactive workshop to score 20 drugs on 16 criteria: nine related to the harms that a drug produces in the individual and seven to the harms to others. Drugs were scored out of 100 points, and the criteria were weighted to indicate their relative importance.

Findings MCDA modelling showed that heroin, crack cocaine, and metamfetamine were the most harmful drugs to individuals (part scores 34, 37, and 32, respectively), whereas alcohol, heroin, and crack cocaine were the most harmful to others (46, 21, and 17, respectively). Overall, alcohol was the most harmful drug (overall harm score 72), with heroin (55) and crack cocaine (54) in second and third places.

Interpretation These findings lend support to previous work assessing drug harms, and show how the improved scoring and weighting approach of MCDA increases the differentiation between the most and least harmful drugs. However, the findings correlate poorly with present UK drug classification, which is not based simply on considerations of harm.

Funding Centre for Crime and Justice Studies (UK).

Introduction

Drugs including alcohol and tobacco products are a major cause of harms to individuals and society. For this reason, some drugs are scheduled under the United Nations 1961 Single Convention on Narcotic Drugs and the 1971 Convention on Psychotropic Substances. These controls are represented in UK domestic legislation by the 1971 Misuse of Drugs Act (as amended). Other drugs, notably alcohol and tobacco, are regulated by taxation, sales, and restrictions on the age of purchase. Newly available drugs such as mephedrone (4-methylmethcathinone) have recently been made illegal in the UK on the basis of concerns about their harms, and the law on other drugs, particularly cannabis, has been toughened because of similar concerns.

To provide better guidance to policy makers in health, policing, and social care, the harms that drugs cause need to be properly assessed. This task is not easy because of the wide range of ways in which drugs can cause harm. An attempt to do this assessment engaged experts to score each drug according to nine criteria of harm, ranging from the intrinsic harms of the drugs to social and health-care costs.¹ This analysis provoked major interest and public debate, although it raised concerns about the choice of the nine criteria and the absence of any differential weighting of them.²

To rectify these drawbacks we undertook a review of drug harms with the multicriteria decision analysis (MCDA) approach.³ This technology has been used successfully to lend support to decision makers facing complex issues characterised by many, conflicting objectives—eg, appraisal of policies for disposal of

nuclear waste.⁴ In June, 2010, we developed the multicriteria model during a decision conference,⁵ which is a facilitated workshop attended by key players, experts, and specialists who work together to create the model and provide the data and judgment inputs.

Methods

Study design

The analysis was undertaken in a two-stage process. The choice of harm criteria was made during a special meeting in 2009 of the UK Advisory Council on the Misuse of Drugs (ACMD), which was convened for this purpose. At this meeting, from first principles and with the MCDA approach, members identified 16 harm criteria (figure 1). Nine relate to the harms that a drug produces in the individual and seven to the harms to others both in the UK and overseas. These harms are clustered into five subgroups representing physical, psychological, and social harms. The extent of individual harm is shown by the criteria listed as to users, whereas most criteria listed as to others take account indirectly of the numbers of users. An ACMD report explains the process of developing this model.⁶

In June, 2010, a meeting under the auspices of the Independent Scientific Committee on Drugs (ISCD)—a new organisation of drug experts independent of government interference—was convened to develop the MCDA model and assess scores for 20 representative drugs that are relevant to the UK and which span the range of potential harms and extent of use. The expert group was formed from the ISCD expert committee plus two external experts with specialist knowledge of

legal highs (webappendix). Their experience was extensive, spanning both personal and social aspects of drug harm, and many had substantial research expertise in addiction. All provided independent advice and no conflicts of interest were declared. The meeting's facilitator was an independent specialist in decision analysis modelling. He applied methods and techniques that enable groups to work effectively as a team, enhancing their capability to perform,⁷ thereby improving the accuracy of individual judgments. The group scored each drug on each harm criterion in an open discussion and then assessed the relative importance of the criteria within each cluster and across clusters. They also reviewed the criteria and the definitions developed by the ACMD. This method resulted in a common unit of harm across all the criteria, from which a new analysis of relative drugs harms was achieved. Very slight revisions of the definitions were adopted, and panel 1 shows the final version.

Scoring of the drugs on the criteria

Drugs were scored with points out of 100, with 100 assigned to the most harmful drug on a specific criterion. Zero indicated no harm. Weighting subsequently compares the drugs that scored 100 across all the criteria, thereby expressing the judgment that some drugs scoring 100 are more harmful than others.

In scaling of the drugs, care is needed to ensure that each successive point on the scale represents equal increments of harm. Thus, if a drug is scored at 50, then it should be half as harmful as the drug that scored 100. Because zero represents no harm, this scale can be regarded as a ratio scale, which helps with interpretation of weighted averages of several scales. The group scored the drugs on all the criteria during the decision conference.

Consistency checking is an essential part of proper scoring, since it helps to minimise bias in the scores and encourages realism in scoring. Even more important is the discussion of the group, since scores are often changed from those originally suggested as participants share their different experiences and revise their views. Both during scoring and after all drugs have been scored on a criterion, it is important to look at the relativities of the scores to see whether there are any obvious discrepancies.

Weighting of the criteria

Some criteria are more important expressions of harm than are others. More precision is needed, within the context of MCDA, to enable the assessment of weights on the criteria. To ensure that assessed weights are meaningful, the concept of swing weighting is applied. The purpose of weighting in MCDA is to ensure that the units of harm on the different preference scales are equivalent, thus enabling weighted scores to be compared and combined across the criteria. Weights are, essentially, scale factors.

MCDA distinguishes between facts and value judgments about the facts. On the one hand, harm

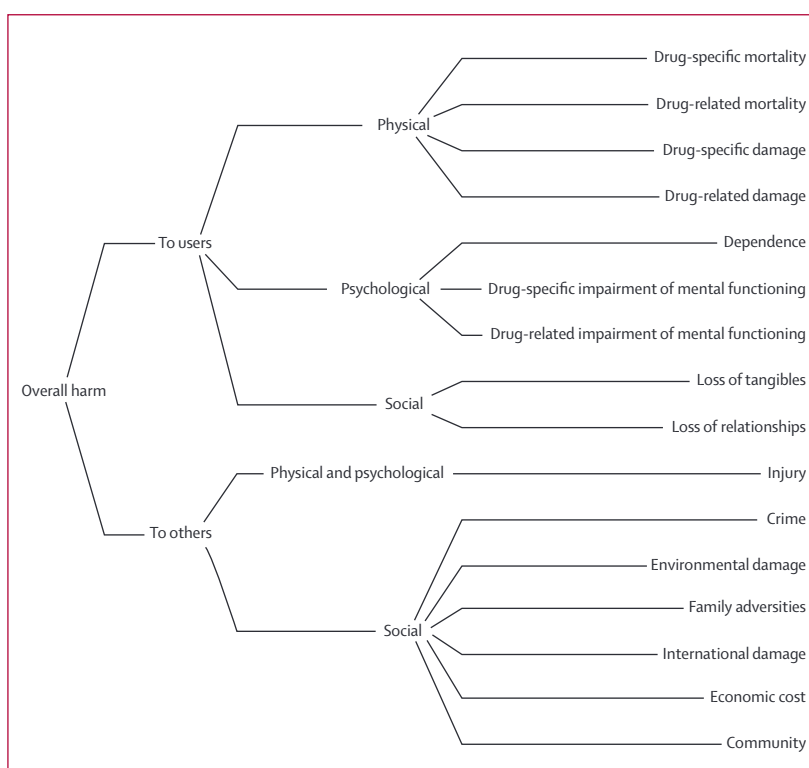


Figure 1: Evaluation criteria organised by harms to users and harms to others, and clustered under physical, psychological, and social effects

expresses a level of damage. Value, on the other hand, indicates how much that level of damage matters in a particular context. Because context can affect assessments of value, one set of criterion weights for a particular context might not be satisfactory for decision making in another context. It follows then, that two stages have to be considered. First, the added harm going from no harm to the level of harm represented by a score of 100 should be considered—ie, a straightforward assessment of a difference in harm. The next step is to think about how much that difference in harm matters in a specific context. The question posed to the group in comparing the swing in harm from 0 to 100 on one scale with the swing from 0 to 100 on another scale was: “How big is the difference in harm and how much do you care about that difference?”

See Online for webappendix

During the decision conference participants assessed weights within each cluster of criteria. The criterion within a cluster judged to be associated with the largest swing weight was assigned an arbitrary score of 100. Then, each swing on the remaining criteria in the cluster was judged by the group compared with the 100 score, in terms of a ratio. For example, in the cluster of four criteria under the category physical harm to users, the swing weight for drug-related mortality was judged to be the largest difference of the four, so it was given a weight of 100. The group judged the next largest swing in harm to be in drug-specific