drugscience

INDEPENDENT SCIENTIFIC COMMITTEE ON DRUGS

Multi-criteria Decision Analysis:

A new approach to evaluating the harm caused by nicotine delivery products.

"I tried using an e-cigarette instead of smoking..but I worried that it might be harmful so I gave it up."
Tammy, a smoker

All nicotine products have the potential to cause harm, but the quotation above demonstrates just one situation in which an accurate evaluation of *relative* harmfulness is invaluable for making rational choices. Nicotine users, clinicians and policymakers all have critical decisions to make about nicotine-delivery products: which to use, which to recommend, which to warn against, which to regulate, which to ban. Millions of Europeans suffer illness and die from the indirect consequences of consuming nicotine, whilst millions more have been able to avoid such harm due to successful cessation and effective public health policy.

A firm scientific basis for making personal or political decisions to reduce or avoid harm depends on reliable evidence. The **Independent Scientific Committee on Drugs** (ISCD) assembled in July 2013 an international group of leading nicotine and tobacco experts who collaborated in a novel process for establishing the relative harms (to users and to others) of 12 nicotine delivery products. The experts used available evidence supplemented by their knowledge and experience to deliberate the inputs to a *multicriteria decision analysis* (MCDA) model , a state-of-the-art method for combining all relevant information into a relative ordering of the products from most to least harmful. The group's findings are currently being prepared for peer-reviewed publication. Prior to full publication of the work, this briefing summarises the project and reports some of its key conclusions.

The Rationale

The results of this project provide a relative ordering of the nicotine delivery products for their relative harm. It was not the intention to provide 'correct answers' for individuals like Tammy or policymakers like the European Parliament—that is not the task of scientists. Instead, the results *support* optimal decision-making at every level, so that the relative harmfulness of different products can be compared, and balanced against subjective benefits and freedoms.

How MCDA Works

Evaluation of a product's harmfulness depends on empirical evidence, but that is not always enough. For example, if there is less published evidence of one product's harmfulness than another one, this may reflect a lower propensity to harm or merely that it is newer, less prevalent or has received less scientific scrutiny. Therefore, the ISCD's expert group discussed and shared knowledge of the evidence base along with their reasoning and opinions based on years of professional experience. Under the direction of Dr Larry Phillips, Emeritus Professor of Decision Sciences at the London School

of Economics, they reached a shared consensus on the relative harmfulness of each delivery product. They considered 14 sorts of harm: 7 types of **harm to the user** (e.g. product-related death) and 7 types of **harm to others** (e.g. economic cost). Next, the experts came to a consensus on the relative importance of each type of harm in order to appropriately weight them, so that, for example, deaths associated with nicotine-delivery products would matter more than the littering associated with the products. This process provides reliable and replicable results.

The Results

Full results are to be published in a forthcoming paper. This section provides some key findings of the evaluation of 12 representative nicotine delivery products.

Harm to Others

Cigarettes cause around 100 times as much harm to *other people* as the next most harmful products. These harms to others consist chiefly of gross economic costs (net economic costs when taxation is considered, will be lower) and the health damage to others caused by passive smoking. This striking result is due partly to factors intrinsic to the product (e.g. exposes others to smoke) and partly due to their high prevalence. Liberal democracies tend to consider 'harm to others' as greater justification for political intervention than harm to the individual, reflecting Mill's Harm Principle.

Harm to Users

The following graph shows the relative harmfulness of 4 products. Whilst these scores are composites of 7 different types of harm (from immediate toxicity to damage to relationships, weighted in accordance with their relative importance), **the gulf between the harmfulness of cigarettes and other products is largely due to the vastly greater capacity of cigarettes to cause damage and promote disease in the long-term, often leading to death**.