A Multi Criteria Decision Analysis (MCDA) for evaluating and appraising government policy responses to non-medical heroin use

This is a discussion paper prepared for the 2017 ISSDP conference by Steve Rolles[1] and Fiona Measham[2]. The research project being discussed is based on a collaboration between DrugScience (Professor David Nutt is founder and Chair) and the Ragnar Frisch Centre for Economic Research (Ole Rogeberg is the lead researcher), with funding from the Norwegian Research Council. Steve Rolles and Fiona Measham were project participants and this discussion paper reflects their views, not necessarily those of other project participants.
A paper is being prepared for publication that will incorporate input from other project participants (Ole Rogeberg, Lawrence Phillips, David Nutt, Niamh Eastwood, Anne Schlag, Polly Taylor, and Rhys Ponton) on this discussion paper, as well as feedback at the ISSDP conference. This will be a companion paper to an already completed paper from the project, currently being submitted for publication; Rogeberg, O., et al. (forthcoming) 'A new approach to formulating and appraising drug policy A multi-criterion decision analysis applied to alcohol and cannabis regulation' (the appendices from which have been duplicated here).

Introduction

Heroin occupies a unique space in the drug policy debate as perhaps the most feared and demonized of all drugs. Yet its powerful cultural associations with addiction, depravity and death to a significant extent belie its pharmacology. It can be powerfully addictive, and its narrow therapeutic index creates a high overdose risk, but when used in controlled medical environments it is very safe, hence its enduring place as a pain control medication in the legal pharmacopeia of many jurisdictions; widely used in post-operative and palliative care, in childbirth, as well as veterinary medicine.

All non-medical opioid use has been subject to long standing prohibitions. Indeed it was a desire to control opium and its various derivatives that fueled the emergence of the first international drug controls early in the last century. These policy models went on to shape the wider global drug prohibition regime under the 1961 UN Single Convention on Drugs. Policy responses to illicit non-medical heroin markets have subsequently varied from militarized eradication of the opium poppy and harsh punitive user-level enforcement, through to more tolerant harm reduction approaches with decriminalized possession and use, and provision pharmaceutical heroin available via medical prescription for supervised consumption as part of a treatment programme. As yet no jurisdiction has adopted a legal regulated retail or free market model.

Given the significant social and health harms associated with illicit non-medical heroin use, and substantial public resources expended in attempting to address

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them, a comparative evaluation of how such different policy models –existing and speculative –might impact on key policy criteria is of great interest to the ongoing policy debate.

Drug policy, however, has impacts that can affect a range of policy domains. Different policy approaches can deliver positively, or negatively, on different indicators – which may sometimes be in conflict or have tradeoffs with each other. For example, increasing the taxation on cigarettes and alcohol may generate more government revenues and dissuade some users by increasing prices, but may also fuel criminality in the form of increased smuggling, grey market sales and counterfeiting. Similarly, the legalization of cannabis may reduce criminal justice costs and disproportionate criminalization of individuals but could also lead to an increase in use and associated health harms, particularly if a more laissez-faire free market model is adopted[3].

This, in turn, raises the question of how different interest groups and stakeholders may prioritize different outcomes – and how such prioritization may then impact on policy development. For example; the police may prioritise crime reduction; the finance ministry may prioritize reducing expenditure and maximising tax revenue; parents may prioritize child protection; health professionals may prioritise reducing addiction and overdose death, and so on. Even when deliberately attempting to be objective about how policy may impact on different areas of concern, the intrinsic complexity of thinking about impacts on multiple, often conflicting sets of indicators and attempting to balance their relative importance, combined within intrinsic cognitive biases of individuals or groups, means rational decision making can be extremely challenging.

In an attempt to address these policy decision dilemmas regarding non-medical heroin use (specifically cognitive bias, and multi-outcome complexity), a Multi Criteria Decision Analysis (MCDA) was undertaken to approach the decision making process in a structured and transparent manner.

Methods

The development of an MCDA for appraising different policy models centres on a 'decision conference' of invited experts, facilitated by an impartial specialist in group processes and decision analysis. In this case a diverse group of experts on drug-related harms, addiction, criminology, and drug policy was assembled *(see appendix 1)*, facilitated by MCDA expert Professor Lawrence Phillips[4].

Over two, two-day meetings, the participants first collectively defined the four policy options to be assessed. These were, in broad terms; absolute **prohibition**; **decriminalisation** (prohibition of supply with decriminalisation of personal possession and use e.g. Portugal); legal supply via strict **state control** and regulation, and legal supply via a commercial/**free market** *(for more detail -see*

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3 Caulkins, J. P., et al. (2016). Considering Marijuana Legalization Insights for Vermont and Other Jurisdictions. *Rand* corporation http://www.rand.org/pubs/research_reports/RR864.html

[4]See: www.lse.ac.uk/researchAndExpertise/Experts/profile.aspx?KeyValue=l.phillips%40lse.ac.uk

appendix 2). Participants then identified and defined twenty-seven key outcome criteria reflecting the range of ethical and normative concerns, organised within seven broad thematic policy-impact clusters *(see appendix 3).*

Each of the four policy options was then evaluated on each of the twenty-seven criterion and weighted to provide summary scores for comparing different policy regimes. The outcome criteria were then weighted against each other to reflect their relative importance. The weightings represented both how important the particular issue was and how much variation existed between the best and worst options (ranked at 0 and 100 respectively for each). This was a two-stage process; firstly criteria were weighted against each other within thematic clusters, and then the thematic clusters were weighted against each other.

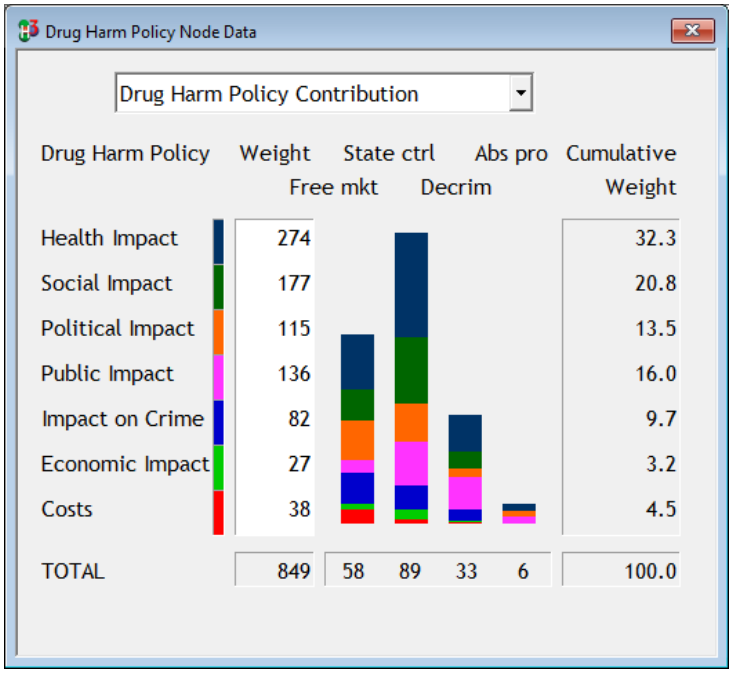
A sensitivity analysis was also undertaken to see how much variation in any one criteria would be needed to swing the balance in favour of one policy option from another – this also allowed for differences of opinion on rankings or weightings within the decision conference to be noted and then tested to see what impact they would have on the final scores.

A more detailed account of this process is provided in the forthcoming companion paper

Results

The graphic below (produced by the MCDA software) represents the cumulative totals for each of the four policy options – showing a colour-coded breakdown of how each scored on each of the 7 thematic areas. The column on the left is the free market option, then moving right; state control, decriminalisation, and absolute prohibition.

State Control is clearly the model that delivers the best overall outcomes, although not on every thematic area; the free market model for example (which came second overall) scores better on political impacts and impact on crime (specifically because of the negative impacts of the remaining illicit trade under the State Control model). The Free Market model scored better than decriminalisation, with absolute prohibition scoring worst on every criteria. *(A more detailed breakdown will be made available with the published paper)*



Discussion

The thinking behind this MCDA exercise emerged in response to the Nutt *et al.* 2010 Lancet paper[5] which used an MCDA approach to rank harms of 20 drugs, itself a development of work in an earlier 2007 Lancet paper[6]. In a 2011 critique[7], Rolles and Measham noted how the comparative harm ranking model in Nutt *et al* 2010 was unable to fully capture and express how drug related social and health harms are significantly shaped by the legal/policy environment (for example, it somewhat inconsistently ranked illicit street heroin against pharmaceutical prescribed methadone). They further noted that heroin provided perhaps the starkest example of the need to disaggregate harms related to pharmacology, and wider harms related to the legal/policy environment:

"Consider, for example, two injecting heroin users; the first is committing high volumes of crime to fund their illicit habit, using 'street' heroin (of unknown strength and purity) with dirty, possibly shared needles in unsupervised and unsanitary environments. Their supplies are purchased from a criminal dealing/trafficking infrastructure that can be traced back to illicit production in Afghanistan. They have HIV, Hepatitis C and a long, and growing, criminal record. The second uses legally manufactured and prescribed pharmaceutical diamorphine of known strength and purity in a supervised, clinical setting, with clean injecting paraphernalia. There is no link to failing drug producer states; no criminality,

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[5]Nutt, D., King, L., & Phillips, L. (2010). Drug harms in the UK: A multicriteria decision analysis. *The Lancet,* 376(9752), 1558–1565

[6]Nutt, D., King, L. A., Salusbury, W., & Blakemore, C. (2007).Development of a rational scale to assess the harm of drugs of potential misuse.*The Lancet,* 369(9566), 1047–1053.

[7]Rolles, S., Measham, F. (2011). Questioning the method and utility of ranking drug harms in drug policy. *International Journal of Drug Policy* (2011), doi: 10.1016/j.drugpo.2011.04.004http://www.tdpf.org.uk/sites/default/files/Utility-drug-harms-Measham-Rolles.pdf

profiteering or violence involved at any stage of the drug's production, supply or use; no blood borne disease transmission risk; a near zero risk of overdose death; and no offending to fund use."

This new MCDA exercise attempts to address this shortcoming by considering outcomes for individual drugs within the four different policy models. Time limitations meant that only three drugs were considered; alcohol, cannabis, and heroin *(Note: only the latter is discussed here, alcohol and cannabis are considered in a separate paper, and potential future discussions will explore the results between the three in more detail)*. Clearly this exercise could usefully be extended to other drugs, and participants noted a particular utility in undertaking a similar process for at least one widely used stimulant drug (possibly MDMA/ecstasy) and a psychedelic drug (LSD or magic mushrooms).

This exercise also reflected an evolutionary process regarding the detail and sophistication of the outcome criteria, of which there are now 27, compared to 16 in the Nutt *et al* 2010 paper, and 9 in the earlier Nutt *et al* 2007 paper. One of the notable developments is the specific inclusion of potential benefits of drug use and drug markets, in terms of, for example, personal and community well-being, and the economic and tax revenue benefits of drug markets. The analysis of benefits alongside costs/harms is a vital element of any comprehensive policy analysis but has often been considered taboo in the debate on currently illicit drugs (even if less so for alcohol and tobacco). This has arguably led to historically skewed policy making that only considers one side of the cost/benefit analysis.

The MCDA is a useful but imperfect tool and its limitations (as well as the limits of the decision conference expertise) need to be acknowledged when considering the results. There is inevitably more complexity and nuance to policy making decision making than the MCDA model can incorporate – and it is important to be clear about the generalisations implicit in both the chosen policy models and the outcome criteria, and note how these generalizations may overlook some important questions (many of these points were noted during the four day conference itself). Different drug policies operate within wider health and social policy environments that have profound impacts on drug using behaviours, drug markets, our responses to them, and their impacts.

Variables relating to social deprivation, unemployment, inequality, as well as the quality of mental health and social care systems for vulnerable and marginalized populations all significantly impact on drug use and related harms. Effective responses to these wider challenges are crucial to addressing drug related harms in the longer term. More directly, the extent of investment in targeted, evidence based drug prevention, treatment, and harm reduction will also be an important variable under any legal regime, as will be the nature of enforcement and sentencing responses to illicit markets and use. Whilst these more granular questions are not tackled directly, and they could lead to considerable variation within any one of the four proposed policy models, they are at least implicit in the MCDA model's outcome criteria, in so far as the criteria broadly ask which policy models are likely to facilitate better or worse outcomes in areas such as

treatment access, social and family cohesion, and international security and development.

The precise nature of the State Control policy model for heroin was also a focus of considerable debate amongst the decision conference participants. Thinking on this first of the two legal supply policy options was significantly shaped by the experience of Heroin Assisted Therapy (HAT) in multiple jurisdictions, notably Switzerland[8]. While it was acknowledged that HAT represents a form of state-regulated supply of heroin, the fact that it takes place within a medical treatment model with strict access criteria (long term users who have failed in other forms of treatment) marks it out as distinct from the forms of existing state controlled supply considered for the parallel exercises regarding alcohol and cannabis. Because HAT is categorized as a medical intervention (permitted under domestic and international laws that only prohibit non-medical drug use and markets) also means it has often existed outside the wider legalization debate, even if for the individual user moving from illicit to prescribed supply their supply and use has effectively been 'legalised'. It has been estimated that if 10% of the heaviest problematic users could be supplied via HAT this could account for 50% of total heroin consumption[9] – so it is not difficult to envisage a scenario in which a majority of the market could be legally regulated under this model.

There has only been one limited experiment with lower threshold access to medicallyprescribed heroin[10] so there is less analysis to inform speculation on this front. Other models of prescribing heroin in safer non-injectable forms to facilitate so-called 'route transitions' – such as powder for smoking or snorting, oral pill forms, or smokeble heroin 'reefers' (or maybe vapourisers for the modern age?), have been mooted but, in a political environment that more often discourages bolder innovation, have barely been considered, even if all warrant further exploration.

Transform Drug Policy Foundation's 2007 'Blueprint for Regulation'[11] envisages a system in which HAT could exist in parallel with more strictly regulated licensed retailing of other lower risk opiates. These could potentially include rationed licensed sales of certain slow release oral pill form opioids, and a modern form of the 'opium den'; licensed, membership-based premises in which opium could be consumed. The concept here is that if the non-medical demand for the effects of heroin and other opioids can be met via lower threshold access to safer products, consumed in safer ways, in safer environments – consumption can progressively be shifted away from high riskheroin injection, and overall health and social harms reduced. Prohibition more commonly pushes in the

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[8]Csete, J, (2013) 'From the Mountaintops: What the World Can Learn from Drug Policy Change in Switzerland' , Open Society Foundations

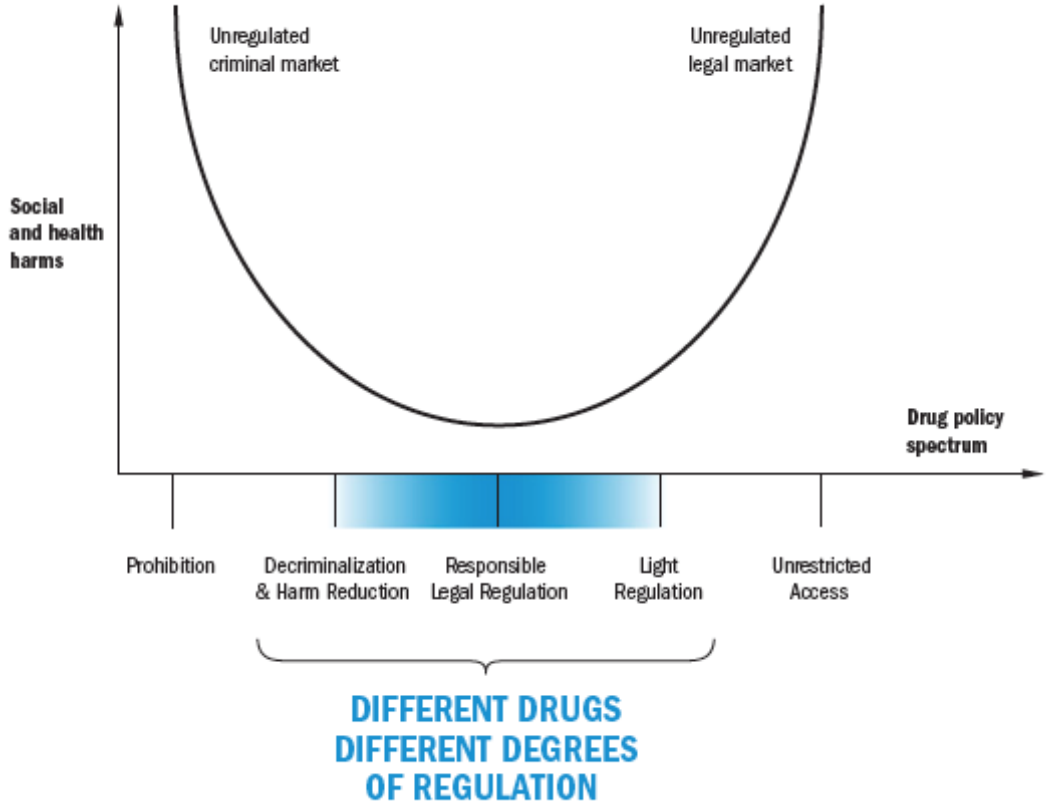
[9]Killias, M. and Aebi, M. (2000) 'The impact of heroin prescription on heroin markets in Switzerland', Crime Prevention Studies, vol. 11, pp. 83-99.

[10]Haasen, C., Verthein, U., Eiroa-Orosa, F.J., et al. (2010) 'Is heroin-assisted treatment effective for patients with no previous maintenance treatment? Results from a German randomised controlled trial', European Addiction Research, vol. 16, pp. 124-130.

[11]Rolles, S., (2007). After the War on Drugs; Blueprint for Regulation. *Transform Drug Policy Foundation*

opposite direction – making unsafe injecting of variable purity products more likely (as users seek to maximize 'bangs for bucks' from a scarce commodity) and limiting market access to the most profitable, potent and risky preparations; the emergence of the highly potent synthetic fentanyls into non-medical opioid use being an obvious recent manifestation of this dynamic. This MCDA attempts to capture some of these dynamics, the 'More harmful substances' criteria for example; *('Decreases consumption of more harmful substances or increases consumption of less harmful substances (e.g., cannabis prohibition leading to synthetic cannabinoids)'*). But the potential for policy models to more substantially re-shape risk behaviours over time, and the possibilities of a tiered market of opioids with different levels of risk and corresponding regulatory models are beyond its current scope. However, the result of the exercise - strongly favouring the State Control model – suggests that greater attention be focused on such possibilities and their implications in the short, medium and long term.

The overall findings for heroin are similar to those for the parallel processes undertaken for cannabis and alcohol[12], all of which favoured state regulation. Heroin prohibition scored particularly badly, due to the profoundly increased risks of illicit heroin injection (relative to supervised legal use), and the acute harms associated with the international illicit opium/heroin market (relative to the legal one).



[12] See forthcoming paper…

All three final graphs echo the 'paradox of prohibition' graphic (albeit inverted) originally devised by John Marks, adapted by Transform Drug Policy Foundation[13], then subsequently utilised by, amongst others, the European Union ALICERAP project[14], The Global Commission on Drug Policy[15]*(pictured)*, and the Canadian Government Task Force on cannabis regulation[16]. The graphic attempted to capture the broad reform narrative; that unregulated markets – whether criminal controlled under prohibition or corporate controlled under a free market model – are associated with avoidable health and social harms; and that optimum outcomes are achieved at some point between these two extremes where responsible government agencies can intervene in and regulate drug use and drug markets in the public interest. The MCDA process has arguably provided some empirical support for the core idea the graphic represents – albeit from a delphic process by experts, rather than specifically data driven – and therefore naturally supports the broader reform narrative. Importantly this narrative can be applied equally to un-regulated illicit drug markets, or over commercialized under-regulated legal markets for alcohol and tobacco. The results stress the need to move beyond the polarized 'should we? shouldn't we?' legalization debate, and refocus on the nature of the legal regulatory model that is adopted, specifically the risks of adopting and inadequately regulated commercial model where business interests are prioritised over the wider interests of individual and social health and well being.

This analysis potentially leaves the work open to the criticism that it is a reflection of the experiences, political persuasions, and policy orientations and experiences of the group – which could fairly be assumed to be nearer the centrist position than either the free market or prohibitionist ends of the policy spectrum. Every effort was made to remain objective on both rankings and weightings, but it was noted in the discussion that it would be of value to run a similar exercise with different groups – potentially with a wider spectrum of views, or focusing on specific political leanings, and comparing outcomes. Participants did, however, frequently note how the exercise was forcing them to challenge many of their own views, often expressing a disconnect between the more rationally derived conclusions and their 'gut' or 'instinctual' leanings. Indeed, the way in which the structured MCDA process can challenge such instinctive biases is arguably one of its great strengths. It suggests this or similar MCDA processes could usefully be deployed to inform, moderate or shift more entrenched or polarized positions amongst policy makers and opinion formers.

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[13]Rolles, S., Murkin, G. (2013) How to Regulate Cannabis: A Practical Guide .*Transform Drug Policy Foundation*www.tdpf.org.uk/resources/publications/how-regulate-cannabis-practical-guide

[14]Apfel, F., (2014). Cannabis – From Prohibition to Regulation. *European Union ALICE RAP*www.alicerap.eu/resources/documents/cat_view/1-alice-rap-project-documents/19-policy-paper-series.html

[15] Global Commission on Drugs (2014). Taking Control; Pathways to drug policies that work. www.globalcommissionondrugs.org/reports/taking-control-pathways-to-drug-policies-that-work/

[16]The Canadian Task Force on Cannabis Legalization and Regulation. (2016). A Framework for the Legalization and Regulation of Cannabis in Canada. *Health Canada*http://healthycanadians.gc.ca/task-force-marijuana-groupe-etude/framework-cadre/index-eng.php

Appendices

Appendix 1: Participants

DimaAbdulrahim	Addiction and Offender Care Directorate, Central and Northwest London NHS Foundation Trust
Jan van Amsterdam	Amsterdam Institute for Addiction Research
Roland Archer	Analytical Laboratory, Guernsey (first conference only)
Daniel Bergsvik	SIRUS - Norwegian Institute for Alcohol and Drug Research
Eric Carlin	Scottish Health Action on Alcohol (first conference only)
Niamh Eastwood	Executive Director, Release
Graeme Henderson	Professor of Pharmacology, Bristol University
Tom Lloyd	Independent drugs policy advisor, former Cambridgeshire chief police constable
Michael Lynsky	Professor of Addictions, National Addictions Centre, King's College London
Fiona Measham	Professor of Criminology, Durham University, and Director of The Loop (drug and alcohol not-for-profit social enterprise)
David Nutt	Professor of Neuropsychopharmacology, Imperial College
Ole Rogeberg	Ragnar Frisch Centre for Economic Research, Oslo, Norway
Steve Rolles	Senior Policy Analysts, Transform Drug Policy Foundation
Jeremy Sare	Director for Government Affairs and Communications, Angelus Foundation (first conference only)
Anne Schlag	Senior Researcher, King's Centre for Risk Management (first conference only)
Janie Sheridan	Associate Professor & Director, Centre for Addiction Research
Polly Taylor	Independent consultant in Veterinary Anaesthesia
Tim Williams	Consultant addiction psychiatrist, NHS
Rhys Ponton	Independent specialist pharmacist, in drug misuse(second decision conference only)

Appendix 2: Policy Models

Absolute prohibition: Production, distribution, possession and use are illegal under criminal law, and the laws are actively enforced. Policies within this class may differ as to the strictness of penalties, the relative emphasis of enforcement efforts, as well as the type of police procedures used in investigation (e.g., entrapment, surveillance, interception of personal communications, requirements for "probable cause" before demanding house searches or drug tests).

Decriminalisation: Production and distribution remain illegal. Use and possession are a civil offence, but may be subject to fines, or result in recommendations to voluntarily enter treatment (without threat of criminal sanctions for non-compliance). E.g. Portugal. Policies within this class may differ as to the strictness and enforcement of remaining penalties, in the degree of enforcement of supply-side control efforts, or in the particular groups targeted by enforcement (e.g., adolescents, minorities).
'Decriminalisation' is not a strictly defined legal term, but its common usage in drug policy (and the definition used here) refers to the removal of criminal sanctions for possession of small quantities of currently illegal drugs for personal use, with optional use of civil or administrative sanctions. Under this definition of 'decriminalisation', possession of drugs remains unlawful and a punishable offence (albeit not one that results in a criminal record).

State control: There are legal options available for users to access the substance, possess and use it, but a variety of regulatory interventions may be applied to structure the market and shape the levels and type of use: Age limits, state controlled production and sales, legal non-commercial home production, regulations on where, when and by whom consumption is legal, taxation, advertising and marketing restrictions, etc. Policies within this class may differ as to which regulatory instruments they employ and in what way, but a substantial share of users are able to access and use the substance without involving either themselves or others in illegal activity.

Free market: Production, distribution, possession and use are not subject to any specific regulatory policies beyond those that apply in general to consumer goods within a modern market economy (e.g., accurate content declarations, absence of fraud, payment of taxes). No additional taxes or restrictions apply beyond those that apply to all goods (e.g., VAT) beyond age limits.

Appendix 3: Outcome criterion

Cluster	Criterion	Definition
Health	Harm to user	Prevents medical harms to a user resulting from consumption of intended substance; includes blood-borne viruses (BBV)
	Harm to others	Prevents health harms (including BBVs) to third parties due to either indirect exposure (e.g., second hand smoking) and behavioural responses to consumption (e.g., injury due to alcohol induced violence)
	More harmful substances	Decreases consumption of more harmful substances or increases consumption of less harmful substances (e.g., cannabis prohibition leading to synthetic cannabinoids)
	Encourages treatment	Encourages treatment of substance-use problems
	Product quality	Assures the quality of products due to mislabelled or counterfeit/adulterated product, unknown dose/purity
Social	Education	Improves education about drugs
	Medical use	Policy does not impede medical use
	Research	Policy does not impede research
	Human rights	Policy does not interfere with human rights as distinct from the individual's right to use.
	Individual liberty	Policy does not interfere with individual liberty (individual's right to use)
	Community cohesion	Policy does not undermine social cohesion in communities
	Family cohesion	Policy does not undermine family cohesion
Political	International development & security	Policy does not undermine international development and security
	Industry influence on governments	Impedes drug industry influence on governments (less lobbying is preferable)
Public	Promotes well-being	Promotes social and personal well-being
	Children and young	Protects children and young people
	Protects vulnerable	Protects vulnerable groups other than children and young people
	Religious/cultural value	Respects religious or cultural values
Crime	Criminalises users	Does not criminalise users
	Reduces acquisitive crime	Reduces acquisitive crime to finance use
	Reduces violent crime	Reduces violent crime due to illegal markets

	Prevents corporate crime	Prevents corporate crime, e.g. money-laundering, tax evasion
	Prevents criminal industry	Extent to which the policy discourages illegal market activity
Economic	Generates state revenue	Generates state revenue
	Reduces economic costs	Reduces public financial costs not directly related to the enforcement policy (e.g., spillover effects on health policy budgets)
Cost	Introduction	Financial costs of introducing the policy
	Maintenance	Financial costs of enforcing the policy