

The New Zealand Drug Harms Study: Use of multi criteria decision analysis to consider social and individual harms from illegal drugs

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(and husband, father of two, singer and wine enjoyer)

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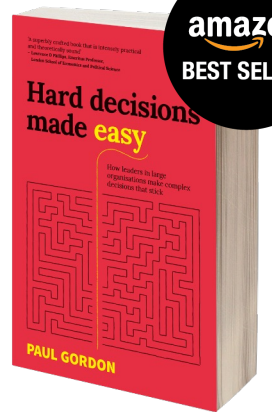
Almost 20 years putting best-practice decision science into the real world by helping large organisations – public and private – make hard decisions with ease.

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President, SDP Australasian Chapter



Why Drug Harms Research and why MCDA?

- Prof David Nutt – convinced there was a better way to consider UK drug policy, using evidence-based harm indices
 - Former Chair of the UK Advisory Committee on the Misuse of Drugs (ACMD)
 - Used a delphic process to rate drugs on 9 parameters
 - Resistance to academic publishing

- Prof Larry Philips got in touch
 - Emeritus Professor of Decision Science at the London School of Economics and Political Sciences
 - “Good start, David, but you could do better using the MCDA approach”



Nutt, D. J., King, L. A., Phillips, L. D., & on behalf of the Independent Scientific Committee on Drugs. (2010). Drug harms in the UK: a multicriteria decision analysis. *The Lancet*, 376(1558-65).

Articles

Drug harms in the UK: a multicriteria decision analysis



David J Nutt, Leslie A King, Lawrence D Phillips, on behalf of the Independent Scientific Committee on Drugs

Summary

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.

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What happened next?

David set up DrugScience.org and then several other publications using MCDA

1. Replication of the original MCDA by a group of European experts (funded by DG Justice)
 - Spearman correl of 0.95 with the UK results
2. Comparison of different nicotine products
 - E-cigs (vapes) about 40 x less harmful than cigarettes
3. Different opioid preparations – illegal and prescription
4. Different policy models – Norwegian Research Council
5. South African nicotine products analysis in 2017 – with Patrick Sharry
6. **Australian drug harms ranking study in 2019**
7. **New Zealand drug harms ranking study: A multi-criteria decision analysis in 2022**

Why is this hard and Why MCDA?

- Poor and incomplete data
- Range of different perspectives and opinions
- Strong 'status quo' bias
- Range of very tangible and very intangible harms

New Zealand Drug Harms Ranking Study

- Led by Dr Rose Crossin, University of Otago, Christchurch, New Zealand
- (Consistent with the original UK study and Australia study)
 - Plus Māori worldview-specific criteria, youth-specific evaluation (12-17 years old)
- Convened a multi-disciplinary panel of 23 experts
 - Diverse experience from across the spectrum of drug use and harms
 - Medical professionals, law enforcement, justice, social services, policy, psychopharmacology
- 17 harm criteria
 - Harm to users
 - Harm to others
- 23 drugs
- Three day externally facilitated 'Decision Conference'
 - Two days 'whole of NZ'
 - One day 'Youth-specific'



The 23 drugs



Illicit non-presc opioids
(e.g. Heroin)

Nitrite-based inhalants Cocaine

Alcohol

Tobacco

Amphetamine-type
substances

Synthetic cathinones

Presc opioids

Benzodiazepines

ENDs / vapes

PIEDs

MDMA (inc Ecstasy)

Ketamine

Hallucinogens (inc
LSD)

Cannabis

Methylamphetamine

Kava

Solvents & Fuels

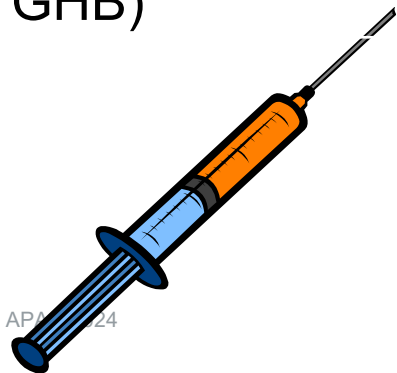
Synthetic cannabinoids

Illicit fentanyl

Fantasy-type substances
(e.g. GHB)

Nitrous oxide

Opioid subs therapies
(e.g. Methadone)



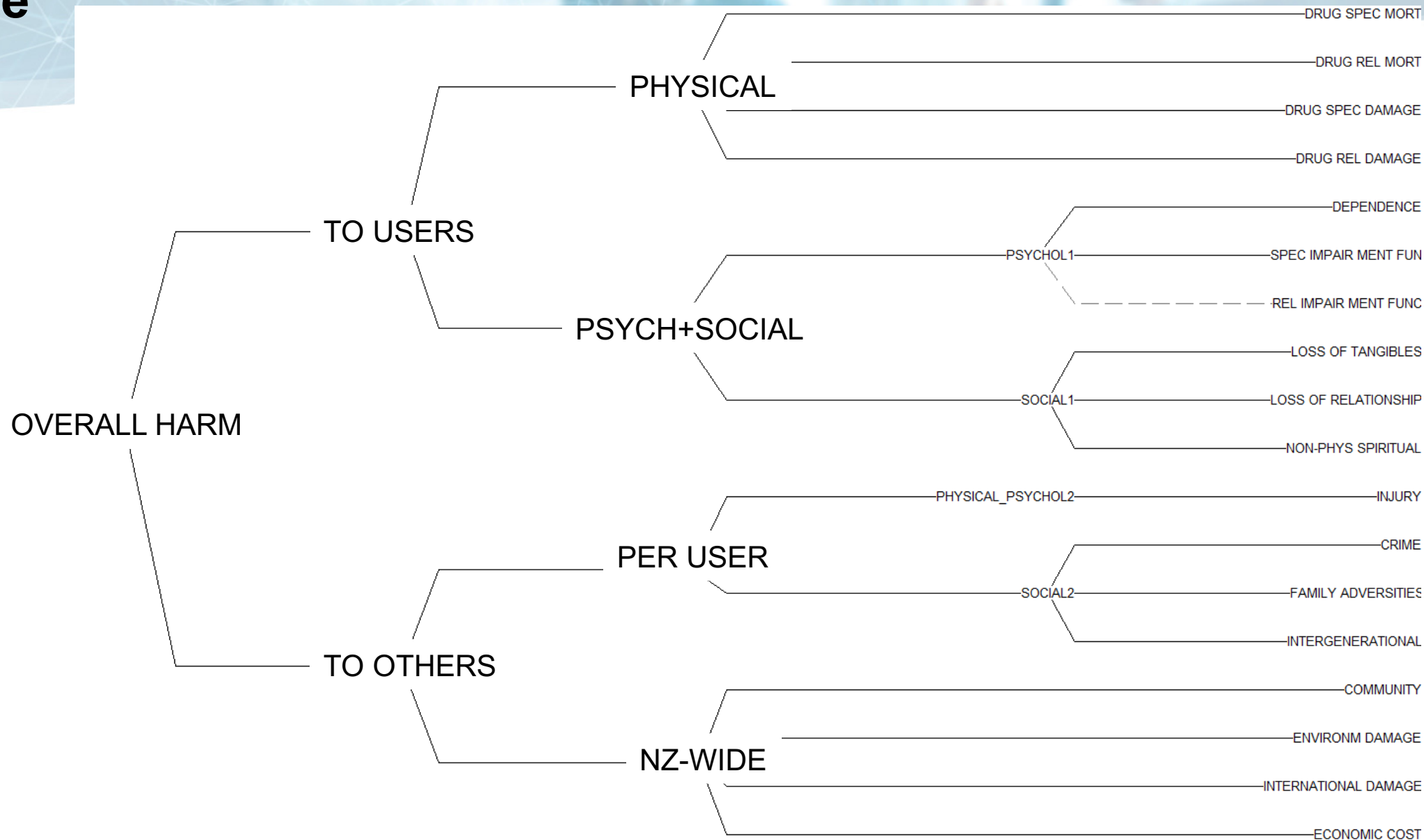
Drugs (1 of 2)

No.	Drug name	Definition and other names
1	Alcohol	All alcohol for drinking (commercially prepared and 'homebrew')
2	Meth	Crystalline methamphetamine, also called 'ice'
3	Illicit non-prescription opioids	Includes heroin, morphine, 'homebake' that are not obtained by prescription
4	Illicit Fentanyl	Fentanyl-based substances and fentanyl analogues (e.g. fentanyl, carfentanil, acetyl fentanyl, furanyl fentanyl)
5	Tobacco products	Includes cigarettes and other products containing tobacco, which may be smoked or chewed
6	Opioid substitution therapies	Use of OST products (e.g. methadone or buprenorphine) without a prescription or outside of prescribed use
7	Prescription opioids	Use of prescription opioids such as morphine, oxycodone, codeine without a prescription or outside of prescribed use
8	Solvents and fuels	Fuel and solvent inhalation including chroming
9	Synthetic cannabinoids	Synthetic cannabinoid receptor agonists e.g. spice, AMB-FUBINACA
10	Amphetamine-type substances	Amphetamine, other than crystalline (including tablets, powder, base/paste, liquid, and amphetamine sulphate/speed).
11	Cocaine	Predominantly inhaled, though also includes administration via injection, but excludes crack cocaine (as this is very limited in New Zealand).
12	Cannabis	Limited to psychoactive forms (i.e. not CBD oil). Includes illegal cannabis consumed for medicinal reasons, but excludes prescribed medicinal cannabis. Includes oil and resin.

Drugs (2 of 2)

No.	Drug name	Definition and other names
13	Benzodiazepines	Use of prescription benzodiazepines such as diazepam or lorazepam without a prescription or outside of prescribed use. May also be known as downers or xannies.
14	Fantasy-type Substances (FTS inc GHB and GBL)	Gamma hydroxybutyrate and gamma butyrolactone (may also be known as fantasy, liquid ecstasy or G)
15	PIEDs	Performance and Image Enhancing Drugs (including anabolic steroids and growth hormones)
16	Ketamine	Excludes use of ketamine in medical contexts
17	MDMA (inc Ecstasy)	Primarily MDMA but may contain other psychostimulants
18	Hallucinogens	Lysergic acid diethylamide (LSD) and natural psychedelic products (includes salvia, mushrooms, cactus, etc)
19	ENDs / vapes	Electronic Nicotine Delivery Systems (e-cigarettes containing nicotine).
20	Kava	Piper methysticum, typically prepared as a drink
21	Synthetic cathinones	Bath salts, includes mephedrone
22	Nitrous oxide	Inhaled nitrous oxide products e.g. whippets and nangs
23	Nitrite-based inhalants	Inhaled nitrite-based inhalants e.g. amyl nitrite, isobutyl nitrite, isopentyl nitrite

Value Tree



Criteria (1 of 2)

Drug harm criteria	Definition
Harms to users	
Drug-specific mortality	Intrinsic lethality of the drug expressed as ratio of lethal dose and standard dose (for adults). Does not include consideration of how difficult it might be to measure the dose.
Drug-related mortality	The extent to which life is shortened by the use of the drug (excludes drug-specific mortality) - e.g. road traffic accidents, lung cancers, HIV, suicide
Drug-specific damage	Drug-specific damage to physical health – e.g. cirrhosis, seizures, strokes, cardiomyopathy, stomach ulcers (taking into account differences in help-seeking behaviour and existing health inequalities). Includes the impacts from withdrawal.
Drug-related damage	Drug-related damage to physical health, including consequences of, for example, sexual unwanted activities and self-harm / self-injury, blood-borne viruses, emphysema, and damage from cutting agents
Dependence	The extent to which a drug creates a propensity to continue to use despite adverse consequences (ICD 10 or DSM 5). Includes consideration of how quick it is to become dependent compared to how hard it is to stop once dependent.
Drug-specific and drug-related impairment of mental functioning	Drug-specific and drug-related impairment of mental functioning e.g. amphetamine-induced psychosis, ketamine intoxication, including mood disorders, depression, anxiety. Not including the intended intoxicating effect of the drug.
Loss of tangibles	Extent of loss of tangible things (e.g. income, housing, job or employment position, educational achievements or training opportunities, criminal record, imprisonment)
Loss of relationships	Extent of loss of relationship or connections with family / whānau, friends, social or community groups
Non-physical / spiritual damage	Extent to which the use of a drug negatively impacts on mana, wehi, tapu, ihi, mauri, wairua, ahua/aura; lowers ihi rangaranga (energetic vibration) and increases vulnerability to wairua poke (negative entities/demons). Also includes impacts on reputation, identity, potential (e.g., through imprisonment or criminal conviction, reduced ability to fulfil cultural obligations)

Criteria (2 of 2)

Drug harm criteria	Definition
Harms to others	
(Harms per user)	
Injury	Extent to which the use of a drug increases the chance of injuries to others both directly and indirectly – e.g. violence (including family violence), traffic accident, foetal harm, drug waste, secondary transmission of blood-borne viruses, injury associated with criminal activity related to supply. The ‘proximal’ harm.
Crime	Extent to which the use of a drug involves or leads to an increase in volume of crime (beyond the use-of-drug act) or organised criminal activity directly or indirectly (at the population level, not the individual level). This excludes violence in general (covered under ‘Injury’) but does include sexual exploitation and violence
Family adversities	Extent to which the use of a drug causes negatively impacts on family / whānau wellbeing – e.g. family / whānau breakdown, economic wellbeing, emotional or spiritual wellbeing, future prospects of children, child neglect or maltreatment
Intergenerational	Extent to which the use of a drug, directly or indirectly impacts on future generations (e.g., mana of the whānau, transmission of addictive behaviours, loss of knowledge and connection to whakapapa, tikanga and culture)
(Total harms to NZ)	
Community	Extent to which the use of a drug creates decline in social cohesion, decline in the productiveness and wellbeing of the community, and decline in the reputation of the community, increases associated stigma and whakamā, or distorts the tikanga and/or narratives of hapū/iwi or marae. Includes impacts on community from advertising.
Environmental damage	Extent to which the use and production of a drug causes environmental damage locally and disregard for kaitiakitanga – e.g. toxic waste from amphetamine factories, discarded needles
International damage	Extent to which the use of a drug in Aotearoa New Zealand contributes to damage internationally e.g. deforestation, destabilisation of countries, international crime, new markets
Economic cost	Extent to which the use of a drug causes direct costs to Aotearoa New Zealand (e.g. health care, police, prisons, social services, customs, insurance, crime) and indirect costs (e.g. loss of productivity, absenteeism)

The 'Decision Conference'

- Facilitated by independent MCDA experts (not drug experts!)
- All drugs collaboratively scored by panel
 - Using 0-100 point 'scales of relative preference'
 - 0 represents 'least harm'
 - 100 represents 'most harm'
 - Scores captured live in MCDA model
- All criteria collaboratively weighted
 - Using a 'swing weighting' process
- Results reviewed at end of the Decision Conference for initial validity check
- During scoring and weighting
 - Occasional 'sensitivity analyses' were captured
 - Assumptions were captured to clarify any specific judgements or scores / weights

Underlying Assumptions

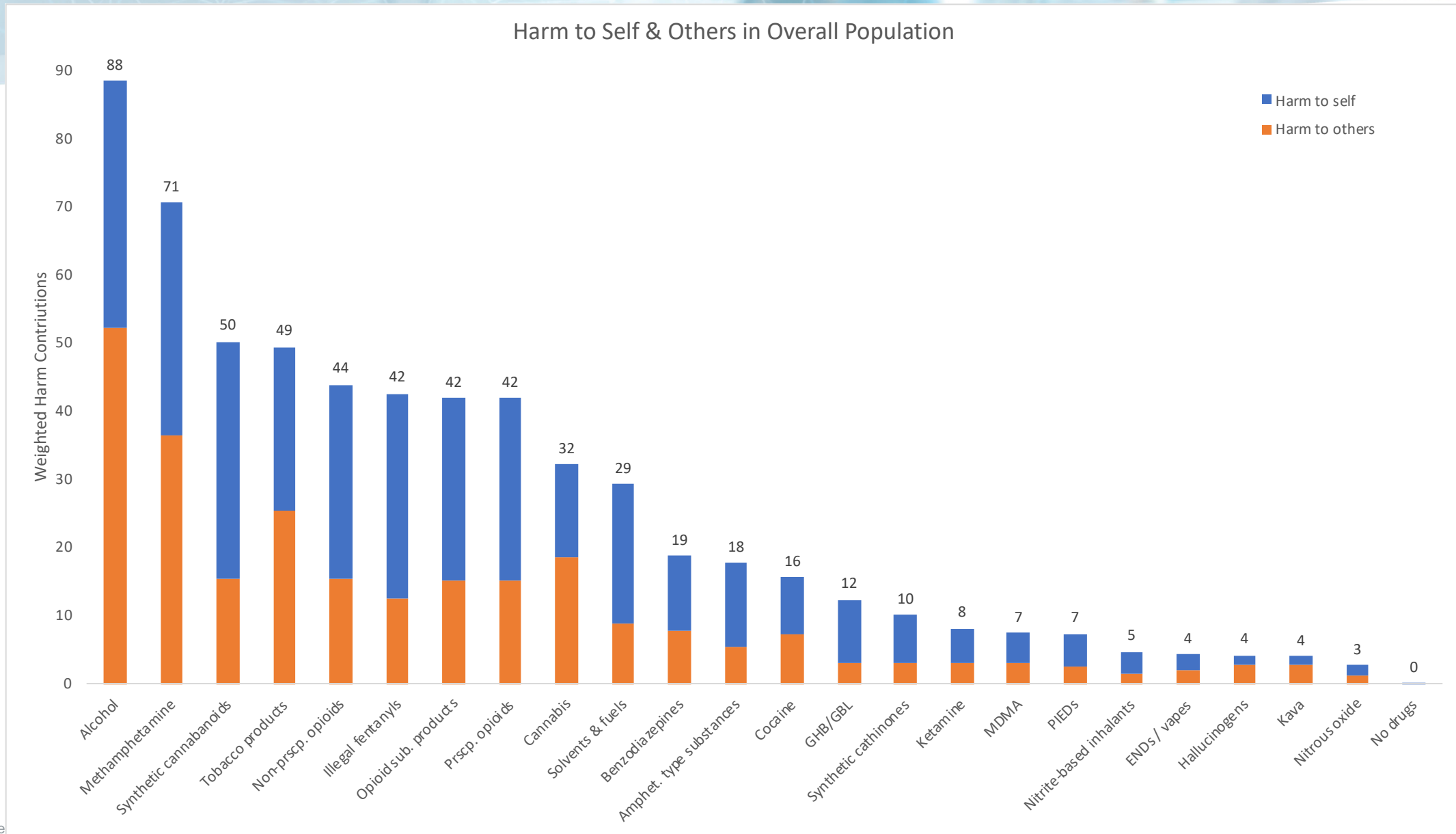
- Harm to Users – the effect of misuse of that drug on the ‘typical’ user, considering the harm on a single user (i.e. not taking prevalence into account) using in a ‘typical’ way;
- Harm to Others – the effect of misuse of that drug on people other than the drug user themselves (such as their family, community, etc.). These criteria consider the total harm to others in Australia
- Use of any drug has the potential to harm, but not all drug use results in harm
- Harms may be acute or chronic, and may affect the individual or others
- Consider a ‘realistic middle ground’ and what harms are most relevant for the majority of people who use a drug in New Zealand
 - not the worst-case scenario - every unfavourable context
 - not the best-case - no harm despite unfavourable context
- Consider the harms associated with each drug separately
 - Irrespective of any cutting agents
 - Assuming the drug was actually the specific drug
- Considering harm in the context of the most common route of administration
- Assess harms associated with drug use, without balancing that harm against perceived benefits or motivations for use
- Assess harms in the current policy context

What did we learn?



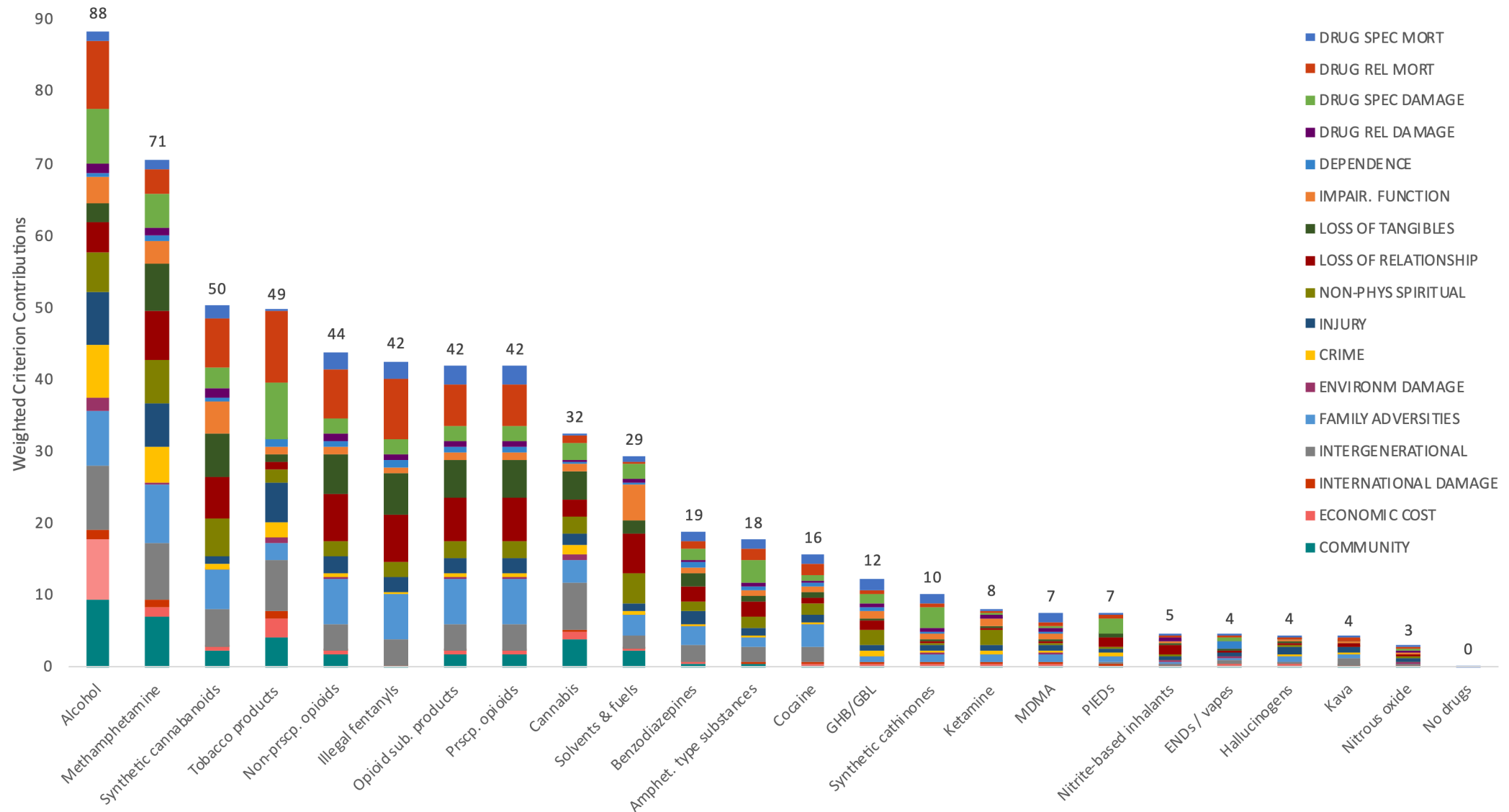
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Harm to Self and Others (Overall Population)

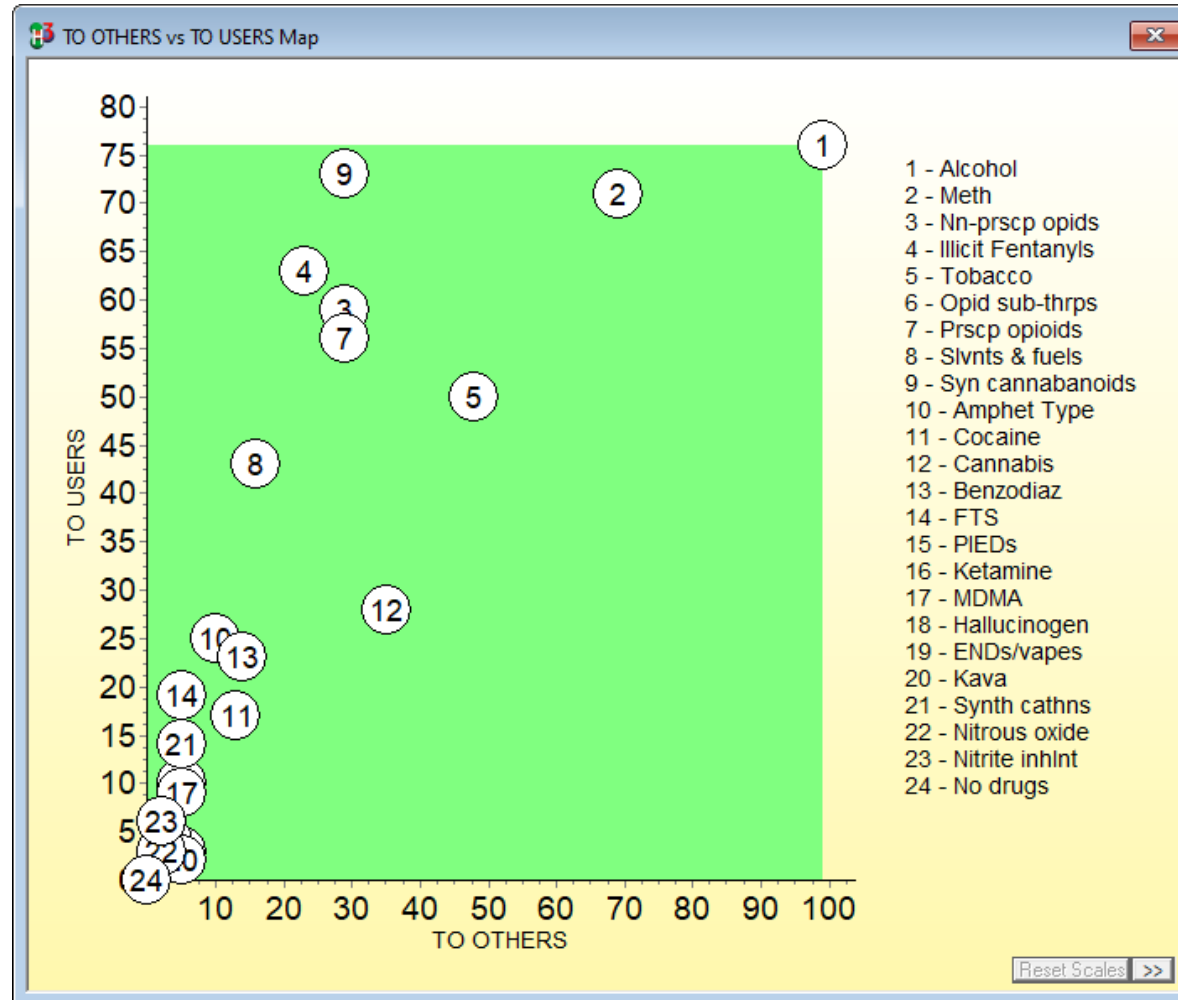


Criterion Contribution (Overall Population)

Criterion Contributions for Overall Population



Overall results – full NZ population



Drug comparisons – full NZ population

Sorts

Compare Alcohol minus Meth

	Model Order	Cum Wt	Diff	Wtd Diff	Sum	
NZ-WIDE	ECONOMIC COST	8.4	86	7.2	7.2	█
PHYSICAL1	DRUG REL MORT	9.9	60	5.9	13.2	█
PHYSICAL1	DRUG SPEC DAMAGE	7.9	35	2.8	15.9	█
NZ-WIDE	COMMUNITY	9.4	25	2.3	18.3	█
SOCIAL2	CRIME	7.1	30	2.1	20.4	█
NZ-WIDE	ENVIRONM DAMAGE	1.9	85	1.6	22.0	█
PHYSICAL_PSYCHOL2	INJURY	7.5	20	1.5	23.5	█
SOCIAL2	INTERGENERATIONAL	8.9	10	0.9	24.4	█
PSYCHOL1	SPEC IMPAIR MENT FUN	5.1	10	0.5	24.9	█
PHYSICAL1	DRUG REL DAMAGE	1.5	30	0.4	25.3	█
NZ-WIDE	INTERNATIONAL DAMAGE	1.4	25	0.3	25.7	█
PHYSICAL1	DRUG SPEC MORT	2.5	5	0.1	25.8	█
PSYCHOL1	REL IMPAIR MENT FUNC	0.0	0	0.0	25.8	█
PSYCHOL1	DEPENDENCE	1.0	-25	-0.2	25.6	█
SOCIAL2	FAMILY ADVERSITIES	8.0	-5	-0.4	25.2	█
SOCIAL1	NON-PHYS SPIRITUAL	6.1	-10	-0.6	24.6	█
SOCIAL1	LOSS OF RELATIONSHIP	6.9	-40	-2.8	21.8	█
SOCIAL1	LOSS OF TANGIBLES	6.5	-60	-3.9	17.9	█
		100.0		17.9		

Most harmful (Alcohol) vs
2nd most harmful (Meth)

Sorts

Compare Syn cannabinoids minus Tobacco

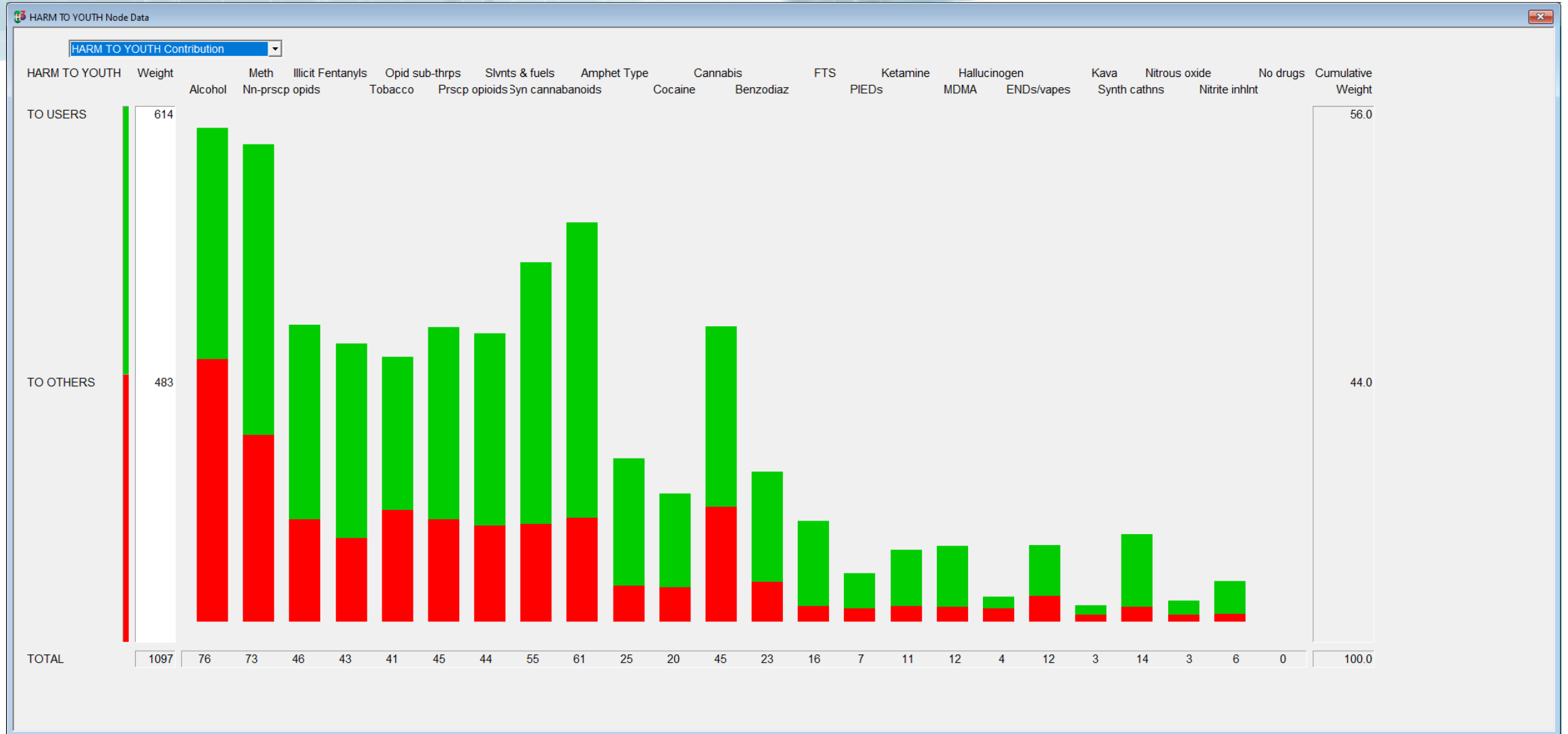
	Model Order	Cum Wt	Diff	Wtd Diff	Sum	
SOCIAL1	LOSS OF RELATIONSHIP	6.9	70	4.8	4.8	█
SOCIAL1	LOSS OF TANGIBLES	6.5	70	4.6	9.4	█
PSYCHOL1	SPEC IMPAIR MENT FUN	5.1	73	3.8	13.2	█
SOCIAL1	NON-PHYS SPIRITUAL	6.1	55	3.4	16.5	█
SOCIAL2	FAMILY ADVERSITIES	8.0	40	3.2	19.7	█
PHYSICAL1	DRUG SPEC MORT	2.5	69	1.7	21.4	█
PHYSICAL1	DRUG REL DAMAGE	1.5	81	1.2	22.6	█
PSYCHOL1	REL IMPAIR MENT FUNC	0.0	0	0.0	22.6	█
PSYCHOL1	DEPENDENCE	1.0	-40	-0.4	22.2	█
NZ-WIDE	ENVIRONM DAMAGE	1.9	-38	-0.7	21.5	█
NZ-WIDE	INTERNATIONAL DAMAGE	1.4	-79	-1.1	20.4	█
SOCIAL2	CRIME	7.1	-22	-1.6	18.9	█
SOCIAL2	INTERGENERATIONAL	8.9	-20	-1.8	17.1	█
NZ-WIDE	COMMUNITY	9.4	-20	-1.9	15.2	█
NZ-WIDE	ECONOMIC COST	8.4	-26	-2.2	13.0	█
PHYSICAL1	DRUG REL MORT	9.9	-30	-3.0	10.1	█
PHYSICAL_PSYCHOL2	INJURY	7.5	-55	-4.1	5.9	█
PHYSICAL1	DRUG SPEC DAMAGE	7.9	-65	-5.1	0.8	█
		100.0		0.8		

3rd Most harmful (Synthetic cannabinoids)
vs 4th most harmful (Tobacco)

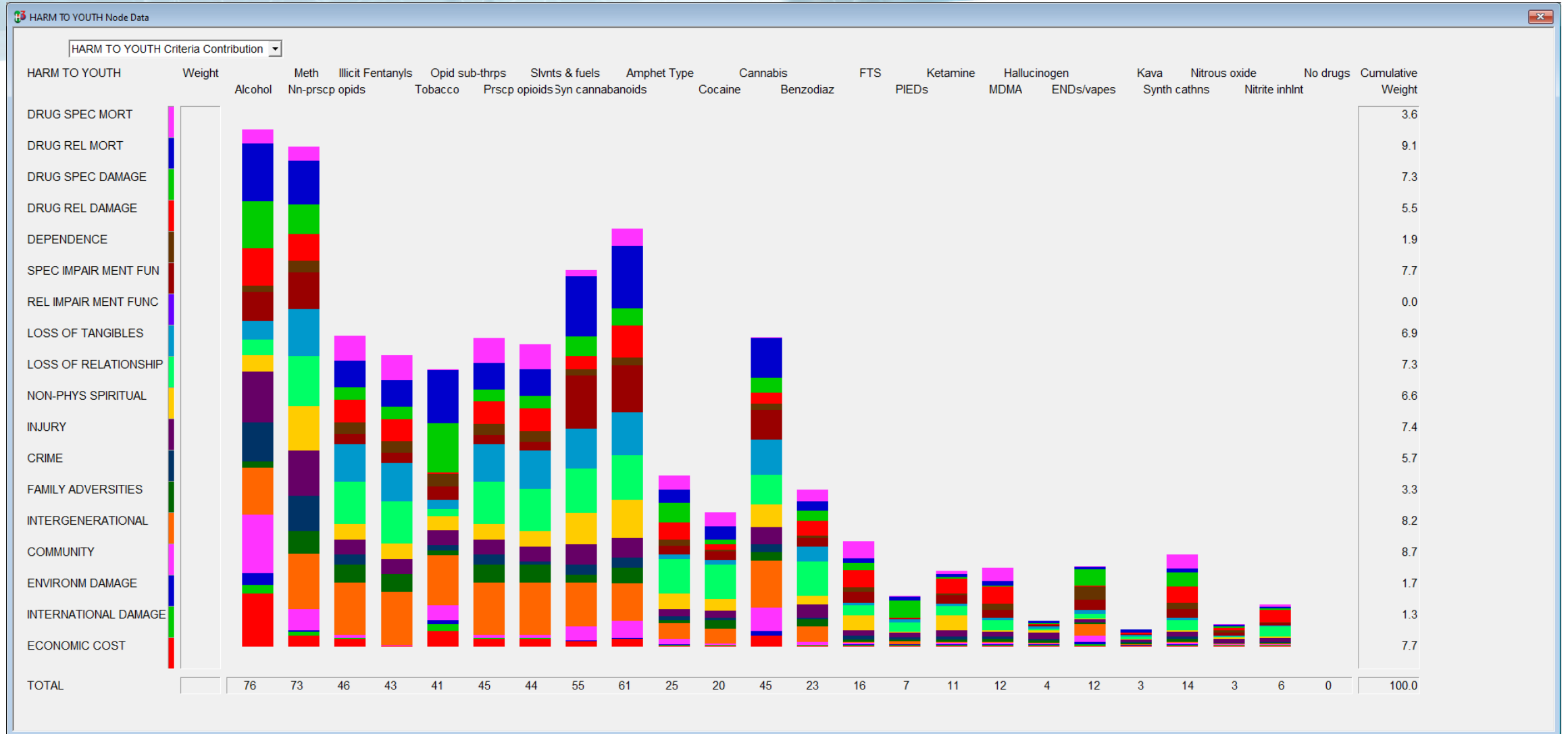
Observations – full NZ population

- Alcohol is the most harmful drug overall (88 points) and Nitrous oxide is the least harmful (3) points
 - Noting that this does not take prevalence into account except for the last 4 ‘harms to others’ criteria
 - There are more harms to others from alcohol than harms to users
- Meth is the second most harmful drug
 - There are more harms to users from meth than harms to others
- When considering only Harms to users, alcohol is still the most harmful, but synthetic cannabinoids is a close second
- When considering only Harms to others, alcohol is still the most harmful, but tobacco is third behind meth
- Synthetic cannabinoids, tobacco and all the opioid variants are quite close in terms of total harm
 - But this is different when considering only harms to users

Overall results – Youth only



Overall results – Youth only



Comparisons of orders of most harm

	Full NZ population			Youth (12-18 years old)		
	Overall harm			Overall harm		
Order	ID	Drug	Value	ID	Drug	Value
1	1	Alcohol	88	1	Alcohol	76
2	2	Meth	70	2	Meth	73
3	9	Syn cannabinoids	50	9	Syn cannabinoids	61
4	5	Tobacco	49	8	Slvnts & fuels	55
5	3	Nn-prscp opids	44	3	Nn-prscp opids	46
6	4	Illicit Fentanyl	42	6	Opid sub-thrps	45
7	6	Opid sub-thrps	42	7	Cannabis	45
8	7	Prscp opioids	42	12	Prscp opioids	44
9	12	Cannabis	32	4	Illicit Fentanyl	43
10	8	Slvnts & fuels	29	5	Tobacco	41
11	13	Benzodiaz	19	10	Amphet Type	25
12	10	Amphet Type	18	13	Benzodiaz	23
13	11	Cocaine	16	11	Cocaine	20
14	14	FTS	12	14	FTS	15
15	21	Synth cathns	10	21	Synth cathns	13
16	16	Ketamine	8	16	MDMA	12
17	15	PIEDs	7	17	ENDS/vapes	12
18	17	MDMA	7	19	Ketamine	11
19	23	Nitrite inhInt	5	15	PIEDs	7
20	18	Hallucinogen	4	23	Nitrite inhInt	6
21	19	ENDS/vapes	4	18	Hallucinogen	4
22	20	Kava	4	20	Nitrous oxide	3
23	22	Nitrous oxide	3	22	Kava	2
24	24	No drugs	0	24	No drugs	0

Observations – youth population only

NOTE: it is not meaningful to compare absolute weighted scores (i.e. a number of points) between the NZ population and the Youth only results. All weighted scores should only be considered compared to the other drugs for that population group.

- Alcohol is still the most harmful drug overall (77 points) and Nitrous oxide is still the least harmful (3) points
 - But Meth is a much closer second (75 points)
 - Solvents and fuels are much more harmful to youth than overall
- Synthetic cannabinoids is the most harmful drug to youth when considering only the harms to users
- Tobacco is significantly less harmful to youth (relative to other drugs) than to the whole NZ population
- Cannabis is significantly more harmful to youth (relative to other drugs) than to the whole NZ population

The New Zealand drug harms ranking study: A multi-criteria decision analysis

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Abstract

Aims: The harms arising from psychoactive drug use are complex, and harm reduction strategies should be informed by a detailed understanding of the extent and nature of that harm. Drug harm is also context specific, and so any comprehensive assessment of drug harm should be relevant to the characteristics of the population in question. This study aimed to evaluate and rank drug harms within Aotearoa New Zealand using a multi-criteria decision analysis (MCDA) framework, and to separately consider harm within the total population, and among youth.

Methods: Two facilitated workshops involved the separate ranking of harm for the total population, and then for youth aged 12–17, by two expert panels. In the total population workshop, 23 drugs were scored against 17 harm criteria, and those criteria were then evaluated using a swing weighting process. Scoring and weighting were subsequently updated during the youth-specific workshop. All results were recorded and analysed using specialised MCDA software.

Results: When considering overall harm, the MCDA modelling results indicated that alcohol, methamphetamine and synthetic cannabinoids were the most harmful to both the overall population and the youth, followed by tobacco in the total population. Alcohol remained the most harmful drug for the total population when separately considering harm to those who use it, and harm to others.

Conclusions: The results provide detailed and context-specific insight into the harm associated with psychoactive drugs use within Aotearoa New Zealand. The findings also demonstrate the value of separately considering harm for different countries, and for different population subgroups.



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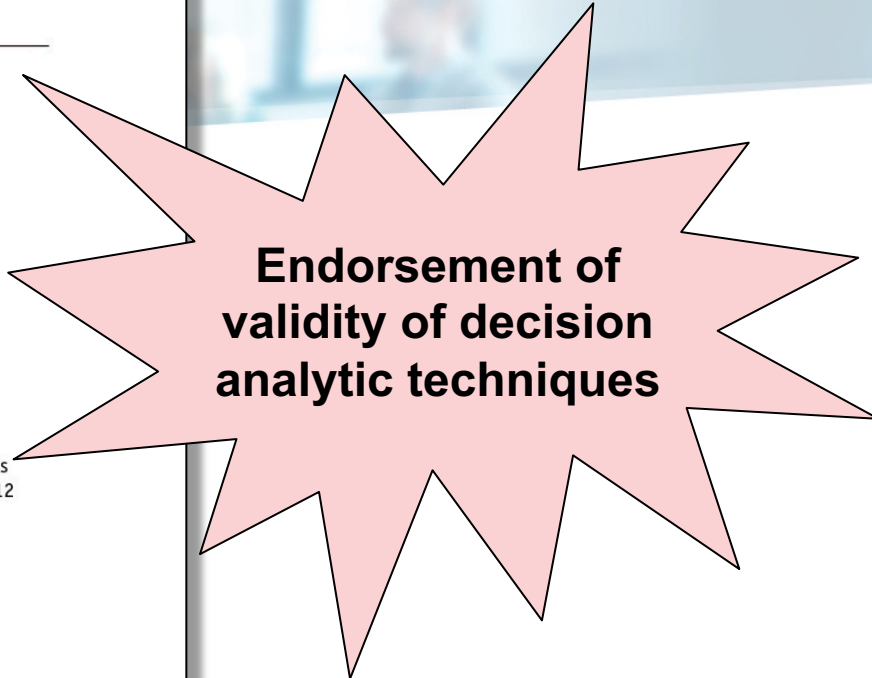


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Endorsement of
validity of decision
analytic techniques



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Research suggests alcohol is the most harmful drug in New Zealand

ON AIR EARLY EDITION

Newstalk ZB, Wed, 28 Jun 2023, 7:14AM

iHeart

Dr Rose Crossin: Researcher on findings that alcohol is the most harmful drug in N...

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HEALTH | 1NEWS

Most harmful drugs in New Zealand ranked

By Christina Huang, 1News Producer | June 28, 2023



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What did we learn? Keys to success

Lessons

- It is possible to come to a shared view of harms across a wide stakeholder group
- Context is critical in decision analysis
 - Whole of NZ vs Youth
 - NZ vs Australia
- It's not necessarily the 'obvious' harms that drive the results

What about non-illicit drugs?

- Methodology and approach would be very applicable – especially comparative approach and diverse stakeholder participation
- Include beneficial as well as harmful outcomes
- Define clear context (population, methods of use, etc.)

Keys

Early stakeholder engagement
Active stakeholder participation
Good social process
Time spent in process design, framing and context setting
Clear and tested criteria covering ALL aspects of harms

ANY QUESTIONS?