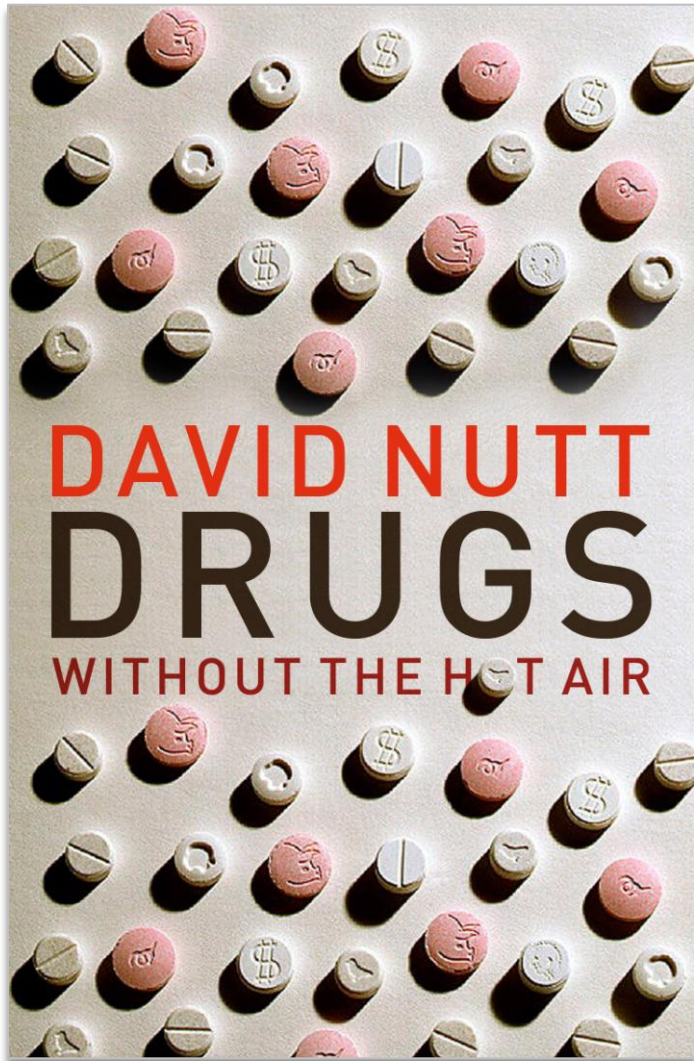


Further reading



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Independent Scientific Committee on Drugs**

Assessing the harms of alcohol and other drugs and developing new ways to minimise them

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[profdavidnutt@twitter.com](https://twitter.com/profdavidnutt)

The science of drugs

What is a drug?

And who says?

The science of drugs

What is a drug?

The Pharmacologist

“something that when given to a rat results in a scientific paper”

What is a drug?

“something a politician once used but now regrets”

Jaqui Smith

“I smoked but didn't enjoy”

David Cameron

“I did things when young that I I shouldn't have – we all did”

etc etc



Release

6



Boris Johnson

Mayor of London, UK 2008 –



**This an outrageous slur –
of course I have taken
drugs!**



9

**Some
make a
joke
about
it**

Drugs are controlled because ...

They are harmful

They might be harmful

The media wants it

... as do the majority of politicians

... and some of the public

So getting the best estimate of harms is vital

But difficult

- Poor data on existing controlled drugs because illegality → covert use
- And less for new entrants to the field, “legal highs”

4 key issues

1. Relative harms of drugs

- and comparisons with alcohol and tobacco

2. Comparative harms –v- other risky activities

1. Proportionality of penalties cf health harms

2. Benefit-harm equation of the law?

How the UK drug laws (MDAct1971) work

Schedules	Class A	Class B	Class C
2-3-4 Medicines	Opioids Metamphetamine i.v. amphetamine	Amphetamines Barbiturates	Benzodiazepines Ketamine GHB Buprenorphine Steroids Growth Hormone
1. Not currently medically recognised	Cocaine MDMA	Cannabis	Clenbuterol
1. Never medical	Crack cocaine LSD Psilocybin (mushrooms)	Mephedrone Naphyrone	Benzylpiperazine

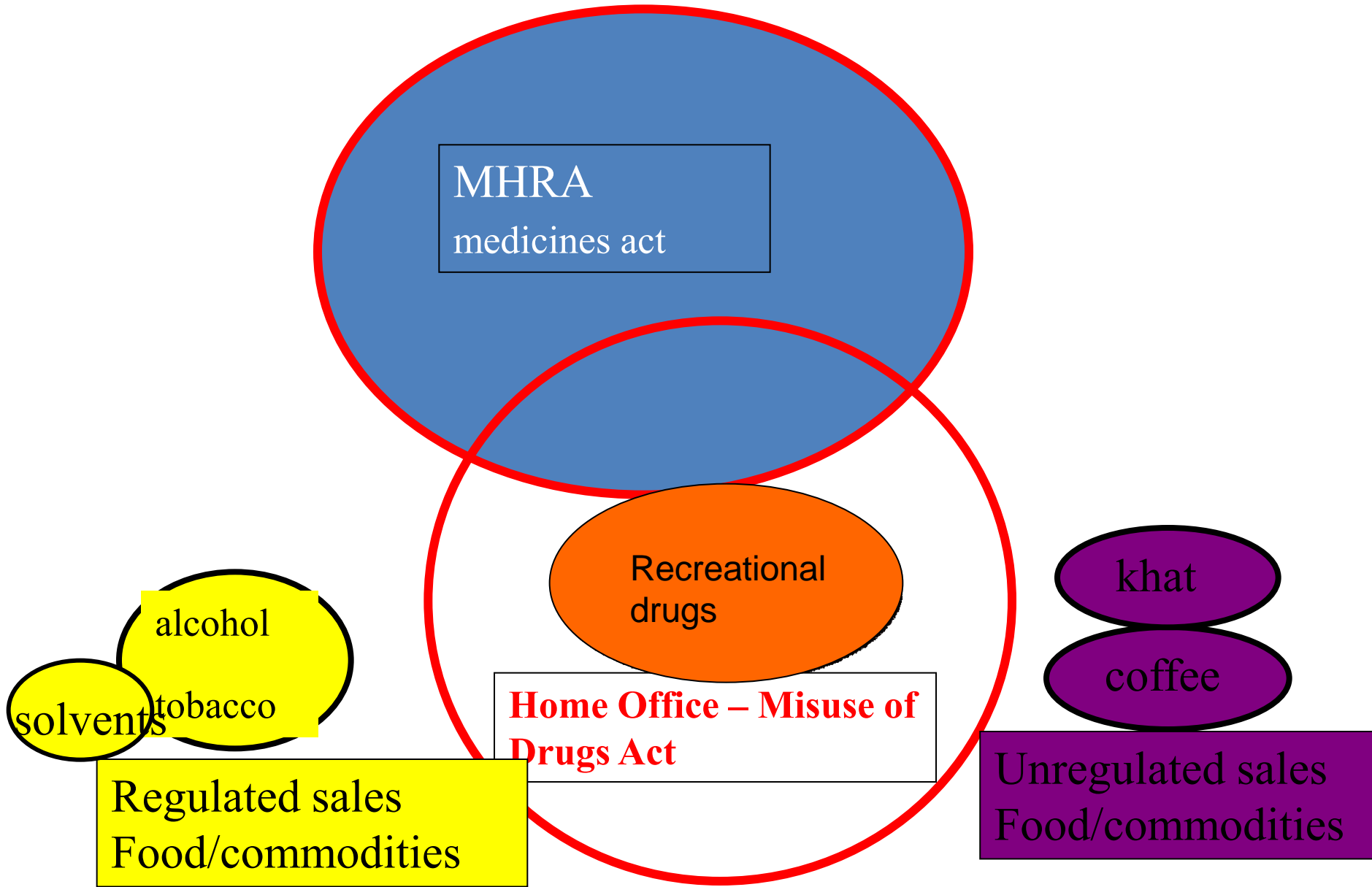
Penalties under the UK MDA Act

Classes determine penalties

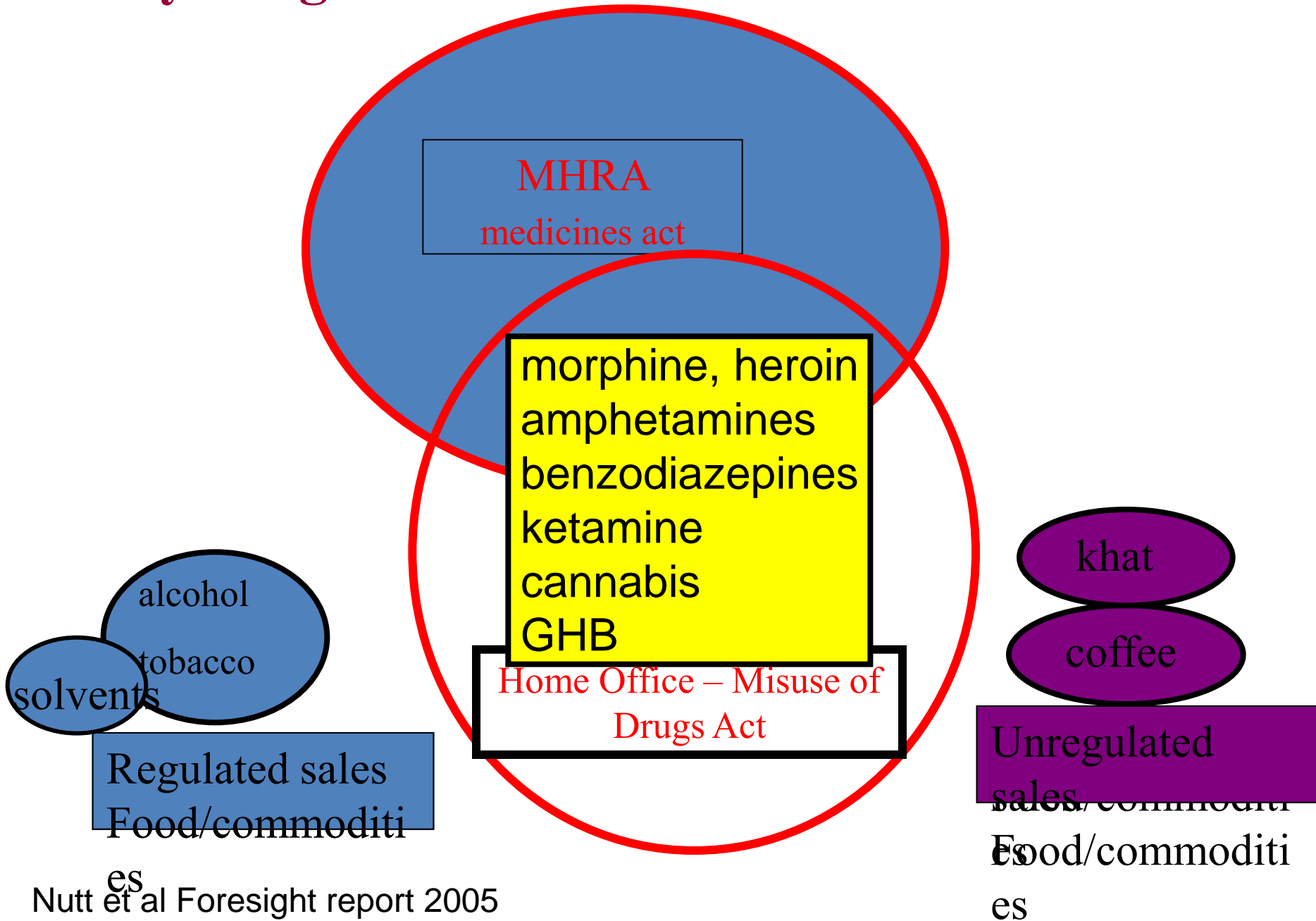
	<u>A</u>	<u>B</u>	<u>C</u>	
possession	7	5	2	yrs
supply etc	life	14	14	yrs

So getting class wrong may have profound consequences particularly for users caught in possession

The present framework of drug control



Many drugs are controlled under both Acts



A short history of what we have done

2000 Runciman report – I develop the 9 point harm assessment scale

2001-2006 – Home Office ACMD group systematically reviews a range of drugs using this scale →

Nutt, DJ; King, LA; Saulsbury, W; Blakemore, C [2007] Developing a rational scale for assessing the risks of drugs of potential misuse Lancet 369:1047-1053 PMID: 17382831

The drugs considered

Alcohol and tobacco included to give “anchor points”

	Class in Misuse of Drugs Act	Comments
Ecstasy	A	Essentially 3,4-methylenedioxy-N-methylamphetamine (MDMA)
4-MTA	A	4-methylthioamphetamine
LSD	A	Lysergic acid diethylamide
Cocaine	A	Includes crack cocaine
Heroin	A	Crude diamorphine
Street methadone	A	Diverted prescribed methadone
Amphetamine	B	..
Methylphenidate	B	eg, ritalin (methylphenidate)
Barbiturates	B	eg, seco (secobarbital [Au: ok?]) and amobarbital
Buprenorphine	C	eg, temgesic, Subutex
Benzodiazepines	C	eg, valium (diazepam), Librium (chlordiazepoxide)
GHB	C	Gamma 4-hydroxybutyric acid
Anabolic steroids	C	..
Cannabis	C	..
Alcohol	..	Not controlled if over 18 years in UK
Alkyl nitrites	..	Not controlled
Ketamine	..	Not controlled at the time of assessment; controlled as class C since January, 2007
Khat	..	Not controlled
Solvents	..	Not controlled; sales restricted
Tobacco	..	Not controlled if over 16 years in UK

Table 2: The 20 substances assessed, showing their current status under the Misuse of Drugs Act

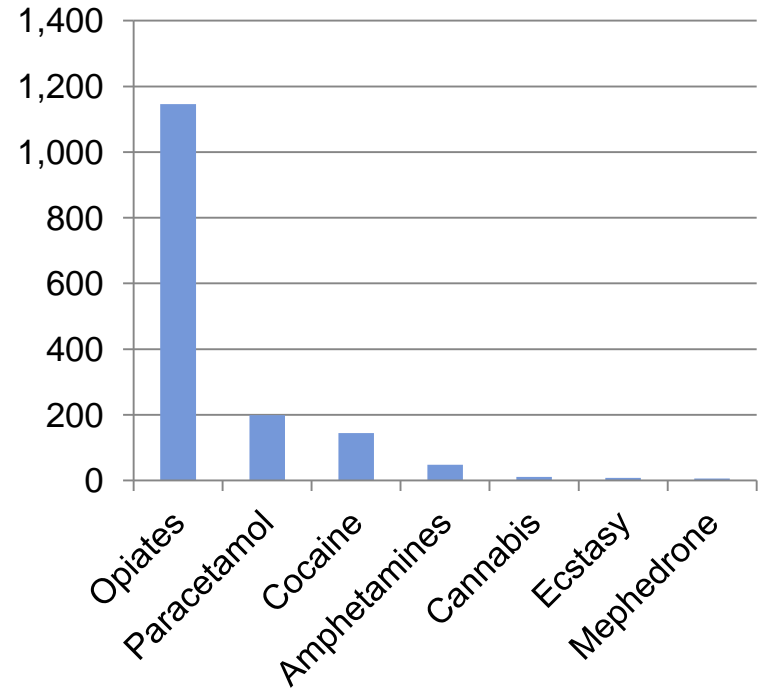
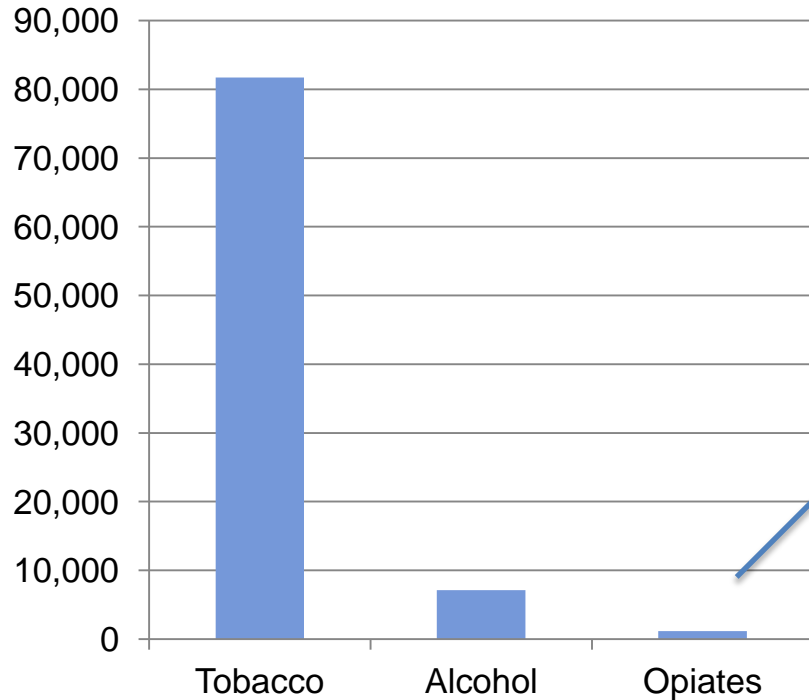
The nine parameters of harm

	Parameter	
Physical harm	One	Acute
	Two	Chronic
	Three	Intravenous harm
Dependence	Four	Intensity of pleasure
	Five	Psychological dependence
	Six	Physical dependence
Social harms	Seven	Intoxication
	Eight	Other social harms
	Nine	Health-care costs

Table 1: Assessment parameters

Assessment made by Delphic process

Drug related deaths



Source: Smoking and drinking among adults, 2009. Office for National Statistics
Drug Misuse Declared: Findings from the 2010/11 British Crime Survey England and Wales. Home Office
Estimates of the Prevalence of Opiate Use and/or Crack Cocaine Use, 2009/10: Sweep 6 report. The Centre for Drug Misuse Research

Tobacco and Health

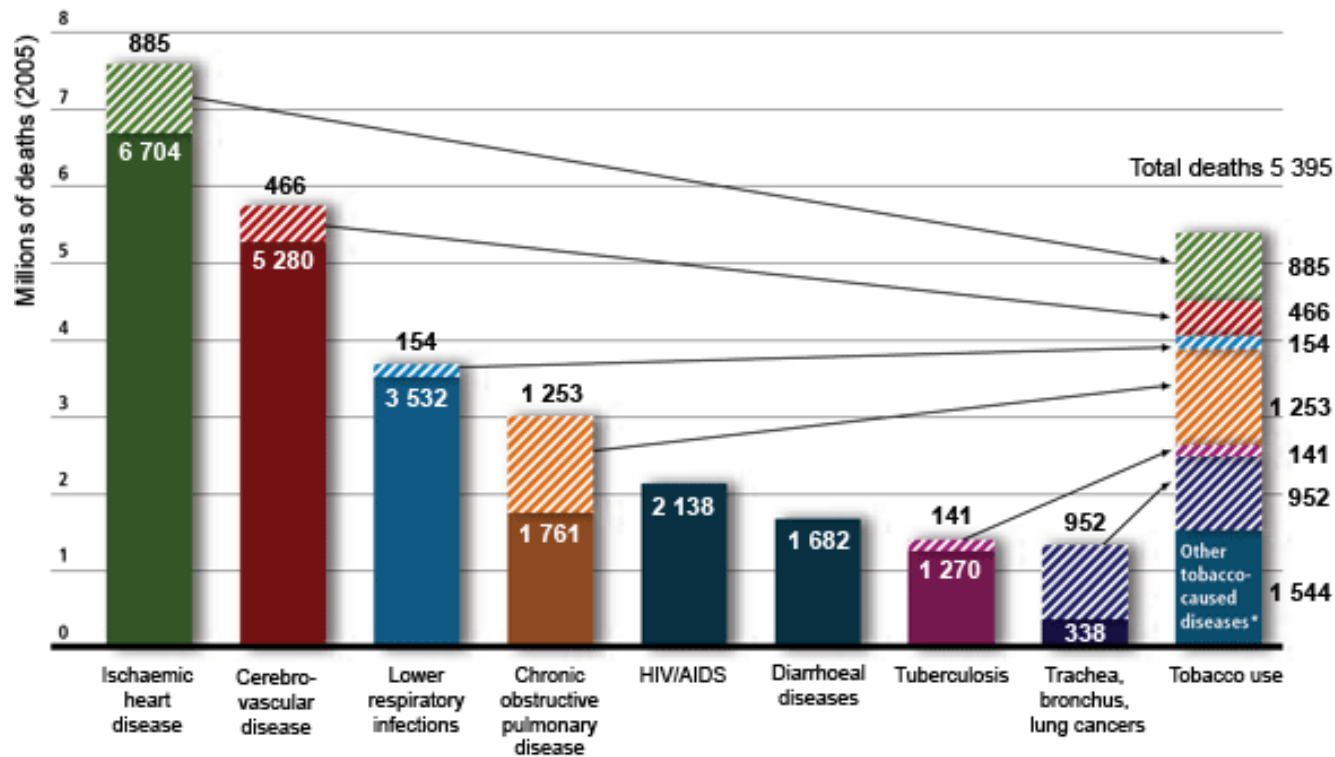
TOBACCO KILLS UP TO ONE IN EVERY TWO USERS

Of the more than 1 billion smokers alive today, around 500 million will be killed by tobacco



Tobacco and premature death

TOBACCO USE IS A RISK FACTOR FOR SIX OF THE EIGHT LEADING CAUSES OF DEATH IN THE WORLD



Tobacco: $>$ 5million premature deaths per year

Relative harms

Index of toxicity = deaths per million users

heroin >>>cocaine > amph - MDMA - Cannabis
20,000 - 170 - 70 - 50 - 5

1 in 50 heroin users die of drug

Concordance between psychiatric drug specialists and the expert group

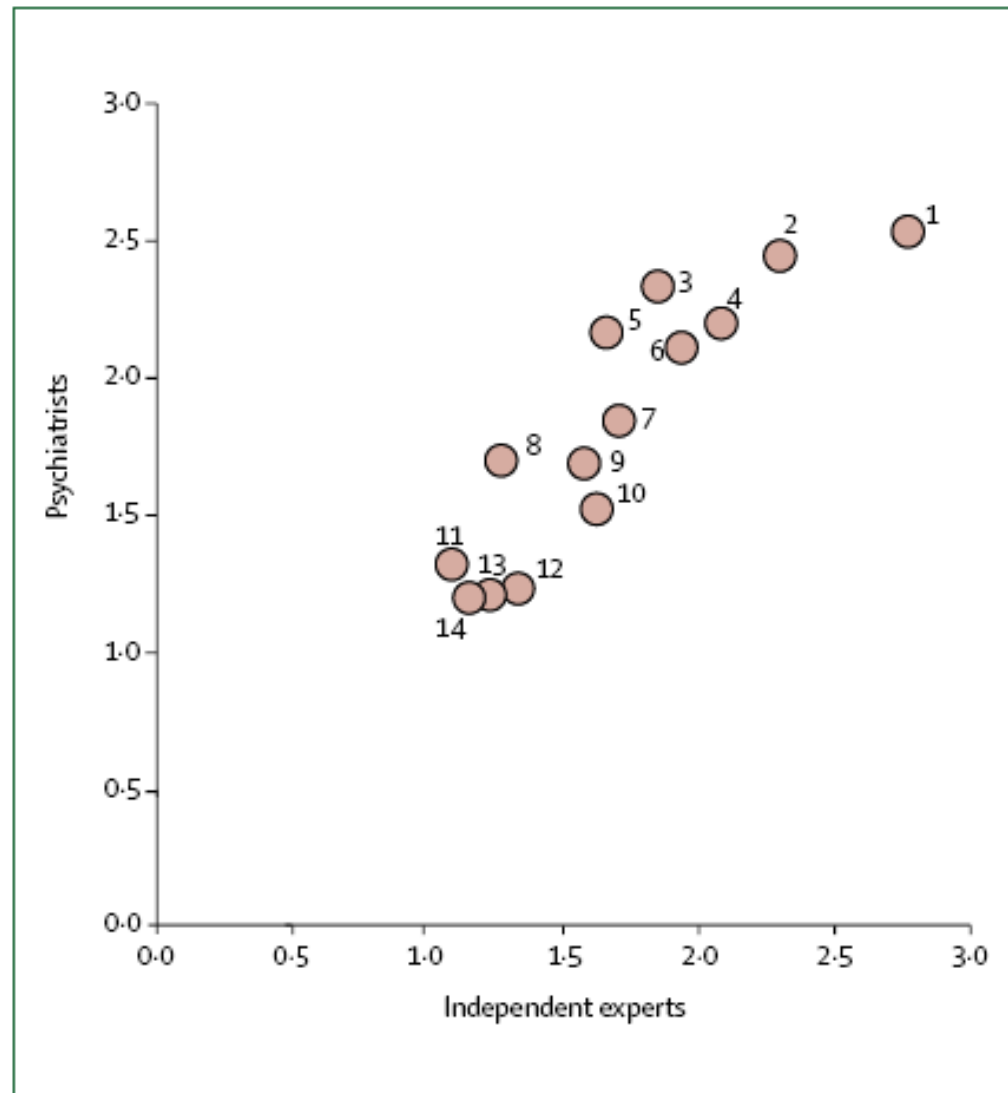


Figure 2: Correlation between mean scores from the independent experts and the psychiatrists

1=heroin. 2=cocaine. 3=alcohol. 4=barbiturates. 5=amphetamine.

6=methadone. 7=benzodiazepines. 8=solvents. 9=buprenorphine. 10=tobacco.

11=ecstasy. 12=cannabis. 13=LSD. 14=steroids.

Drug harm ranking

no relation to UK MDAct

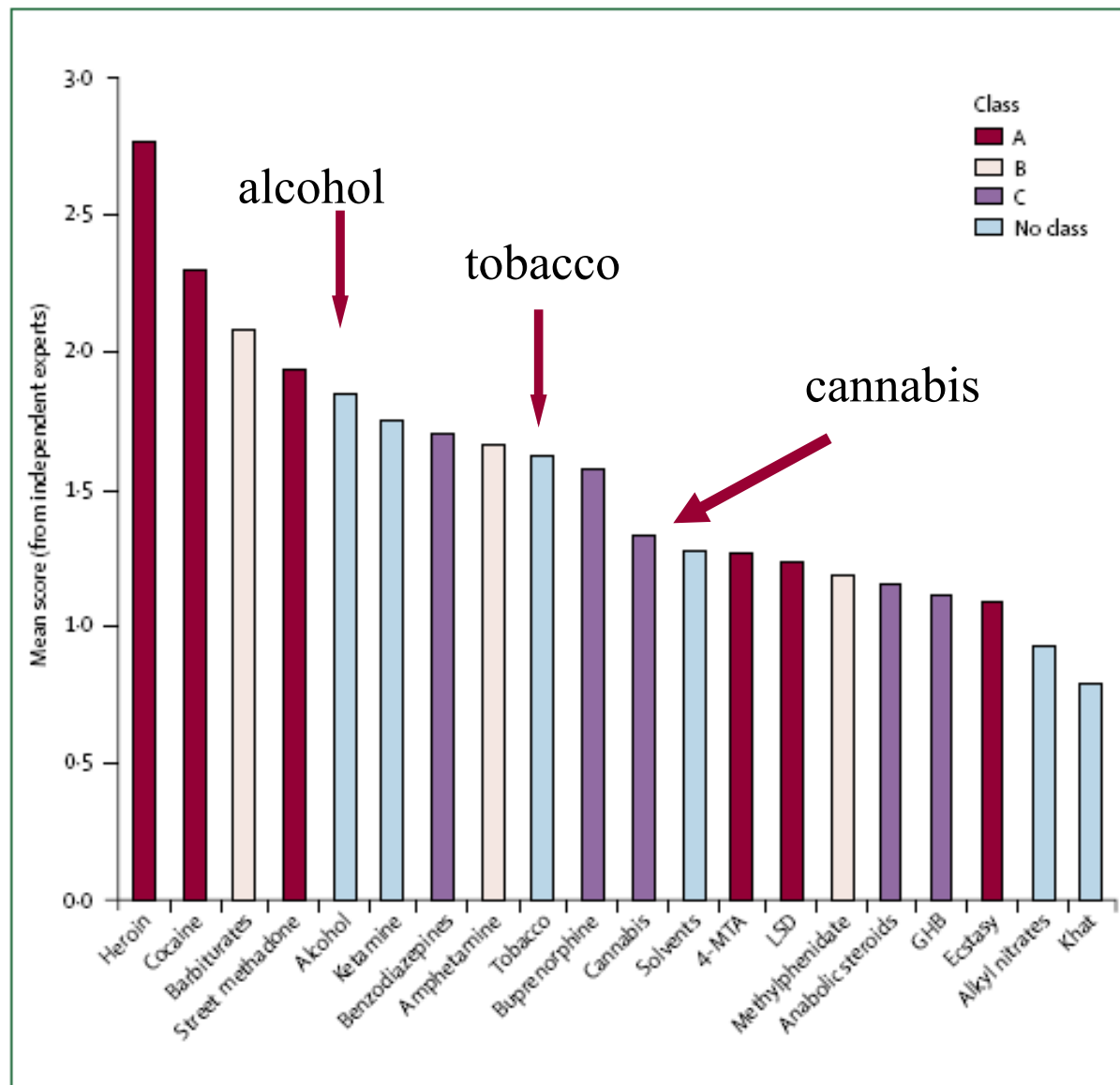
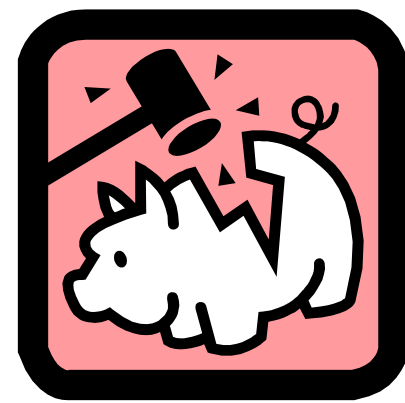


Figure 1: Mean harm scores for 20 substances

The respective classification under the Misuse of Drugs Act, where appropriate, is shown above each bar. Class A drugs are indicated by black bars, B by dark grey, and C by light grey. Unclassified substances are shown as unfilled bars.

But....

- Each parameter of harm weighted equally
- And were these the right harms to assess?



March & June 2009

- Medical Research Council and Home Office co-sponsor research project
- Advisory Council on the Misuse of Drugs, (ACMD), David Nutt as Chair, meets to develop an MCDA model and to test its potential for evaluating drug harms

July 2010

- ACMD publishes the MCDA framework developed in 2009
- <http://www.homeoffice.gov.uk/publications/drugs/acmd1/ACMD-multi-criteria-report>

The 16 criteria of harm

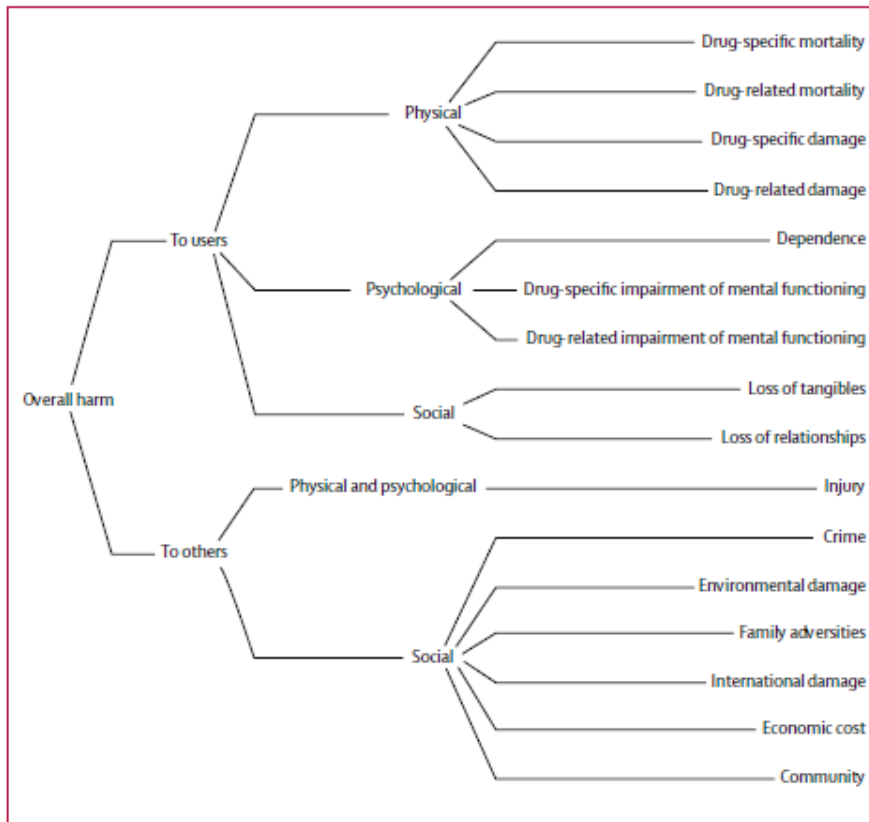
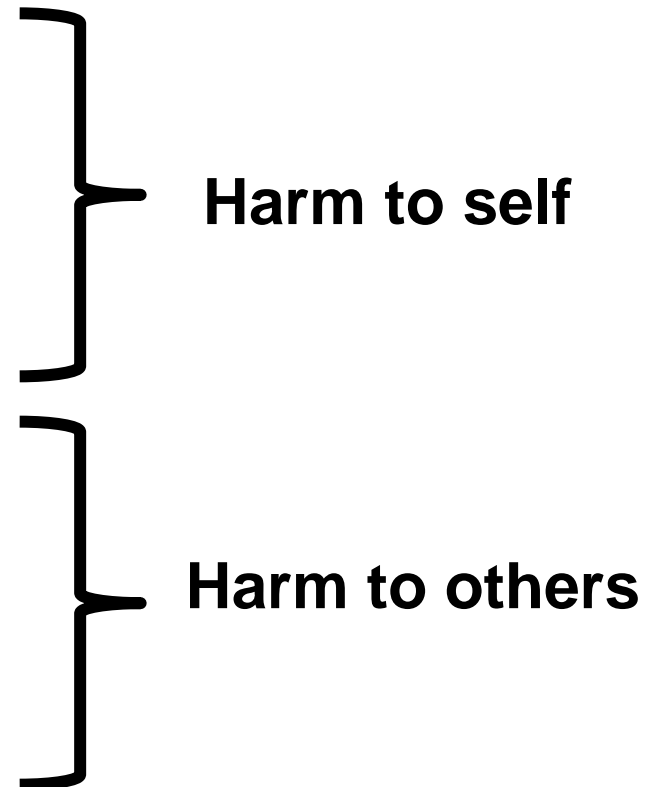
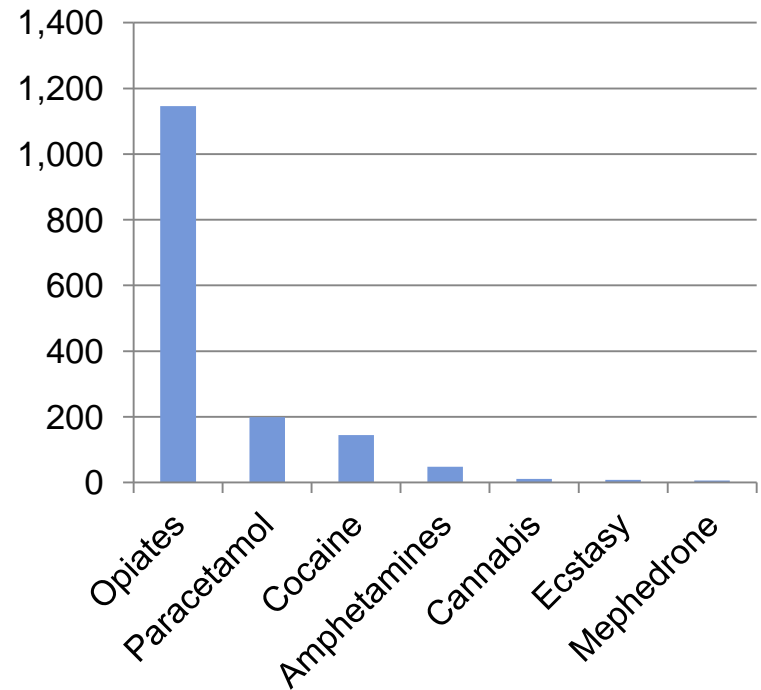
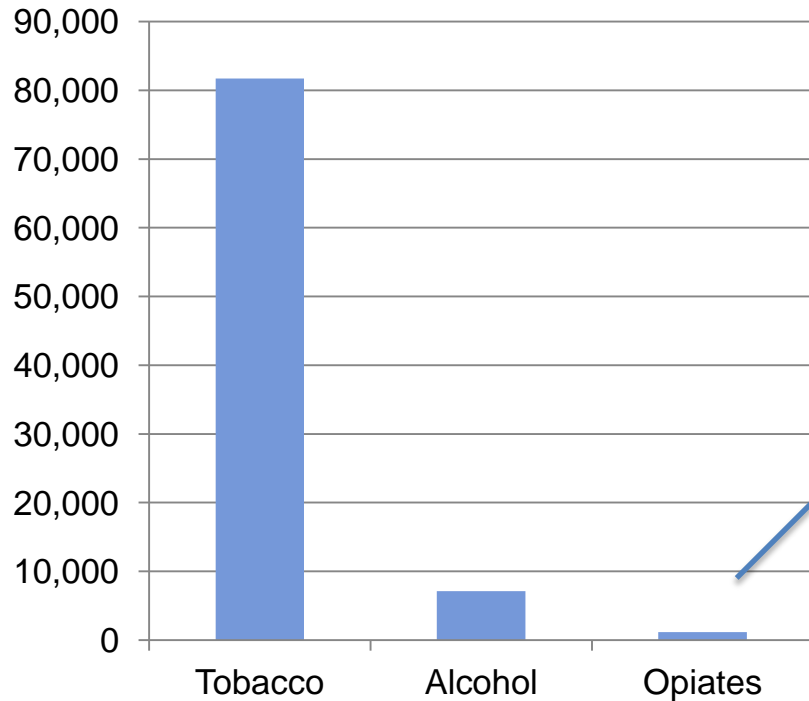


Figure 1: Evaluation criteria organised by harms to users and harms to others, and clustered under physical, psychological, and social effects



Alcohol and tobacco are the big killers



Source: Smoking and drinking among adults, 2009. Office for National Statistics
Drug Misuse Declared: Findings from the 2010/11 British Crime Survey England and Wales. Home Office
Estimates of the Prevalence of Opiate Use and/or Crack Cocaine Use, 2009/10: Sweep 6 report. The Centre for Drug Misuse Research

Amy Winehouse's death due to acute alcohol poisoning



Blood alcohol 450mg/%
= 5.5 x legal driving
limit



+ Imperial College
student last year

More than 20% of all male deaths 16-44 yrs due to alcohol

Male deaths from alcohol by age band

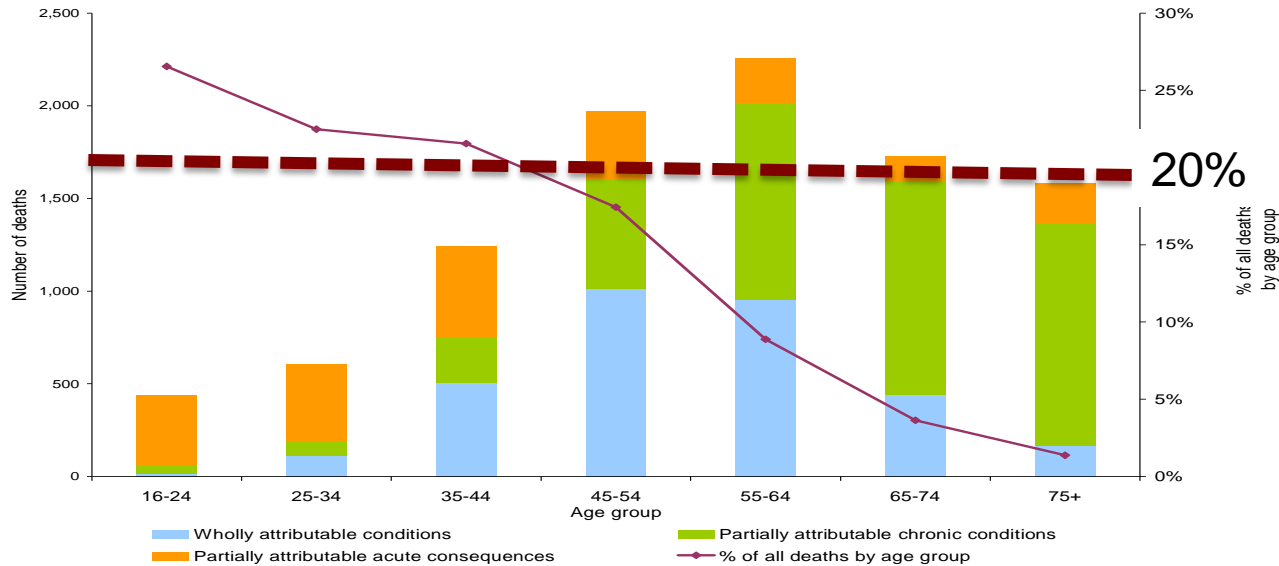
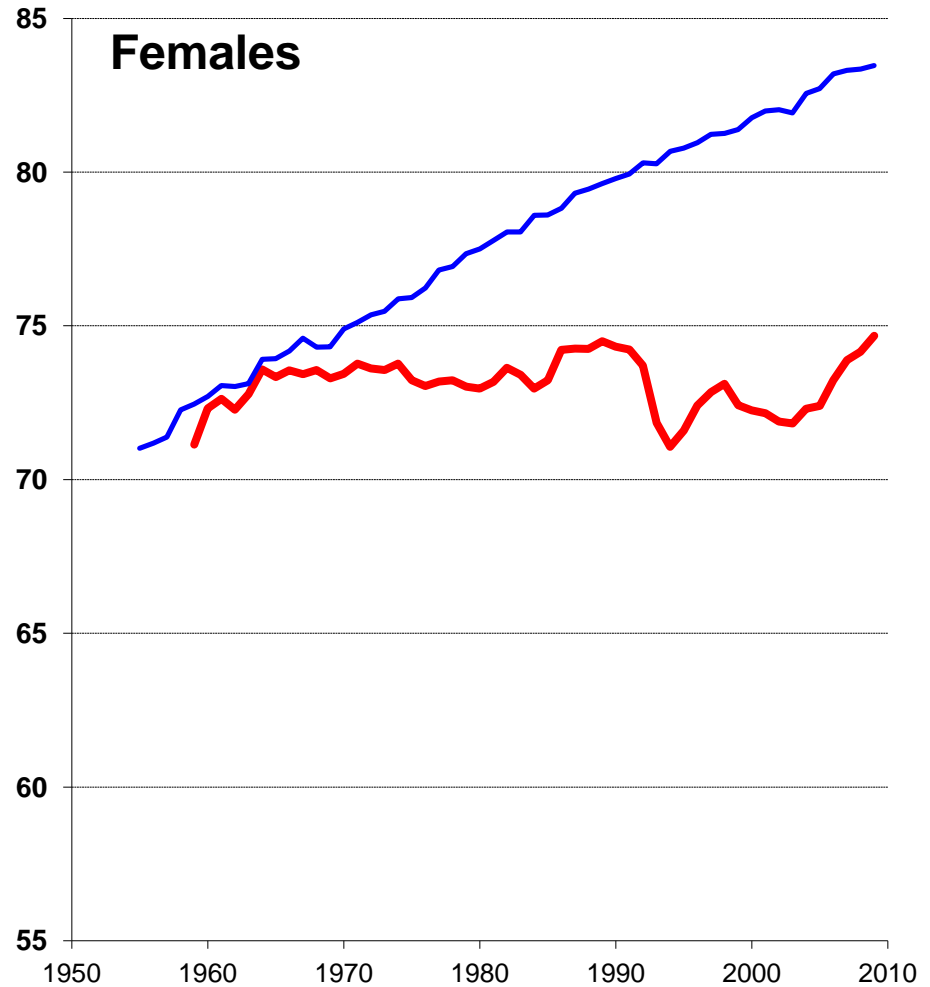
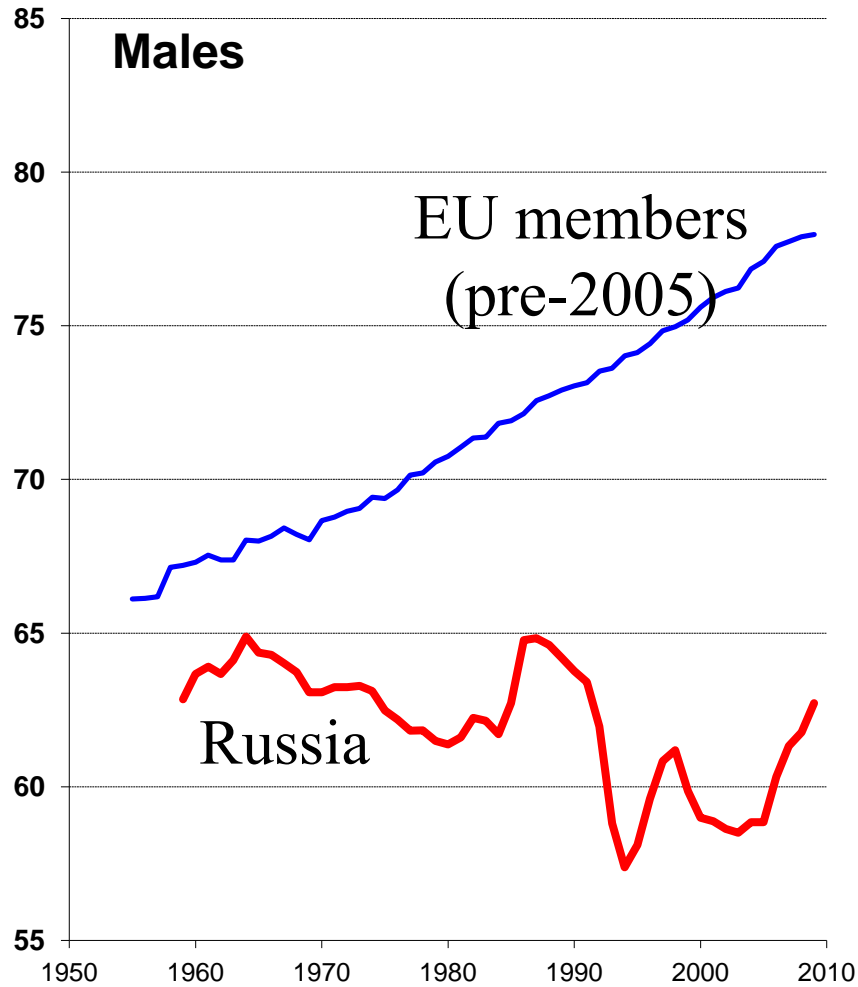


Figure 1. Number (% of all deaths in each age group) of male deaths attributable to alcohol consumption by age and type of condition (2005)

Alcohol the most common reason for death in men under 50

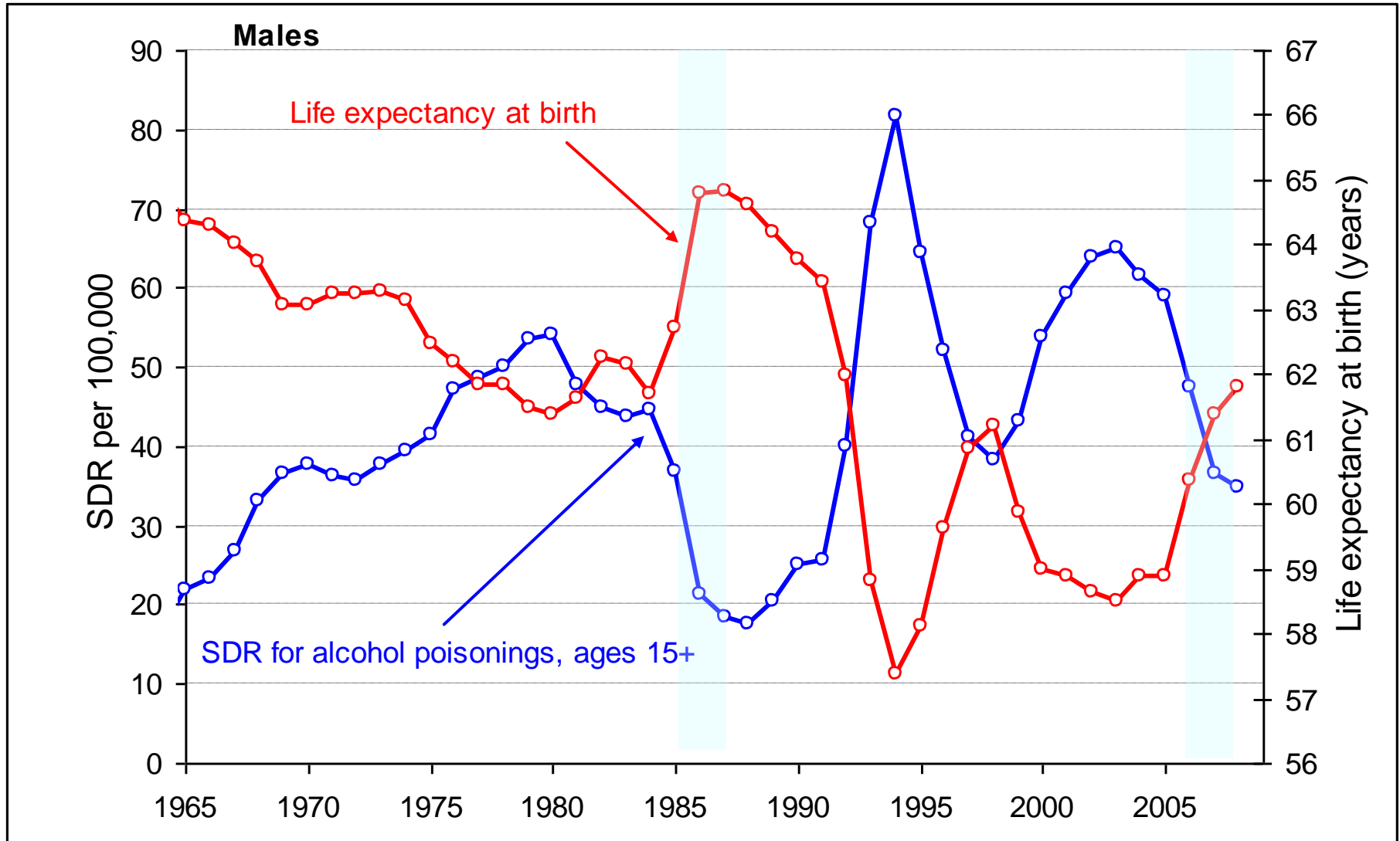
<http://www.nwph.net/nwpho/publications/alcoholattributablefractions.pdf>

Life expectancy at birth 1955 -2009 by country



Source : Shkolnikov & Andreev

Strong evidence that alcohol drives fluctuations in male life expectancy in Russia 1965 -2008



Alcohol main cause of global disability in 15-24 yr olds



Global burden of disease in young people aged 10–24 years: a systematic analysis



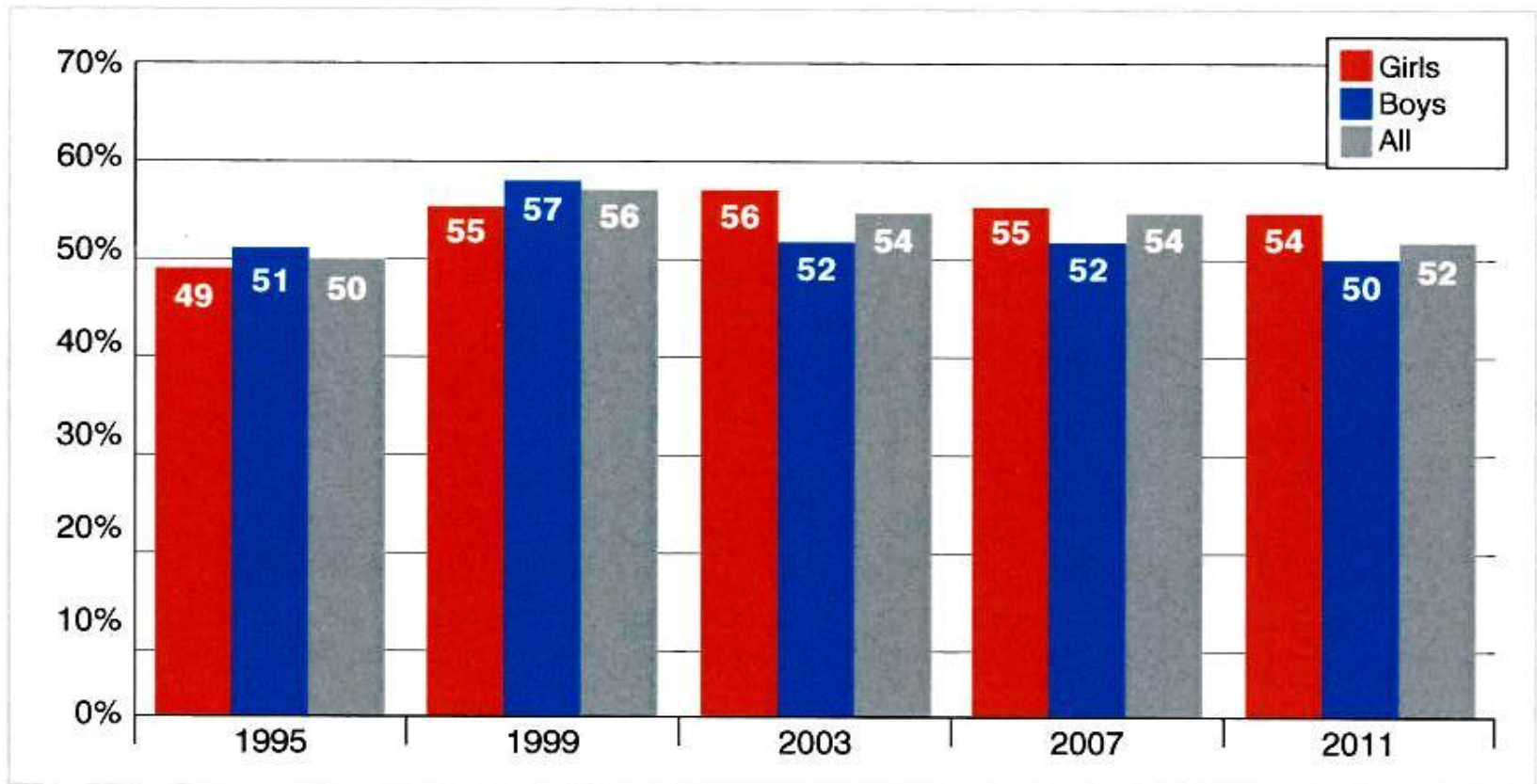
Fiona M Gore, Paul J N Bloem, George C Patton, Jane Ferguson, Véronique Joseph, Carolyn Coffey, Susan M Sawyer, Colin D Mathers

Summary

Background Young people aged 10–24 years represent 27% of the world's population. Although important health *Lancet 2011; 377: 2093–102*

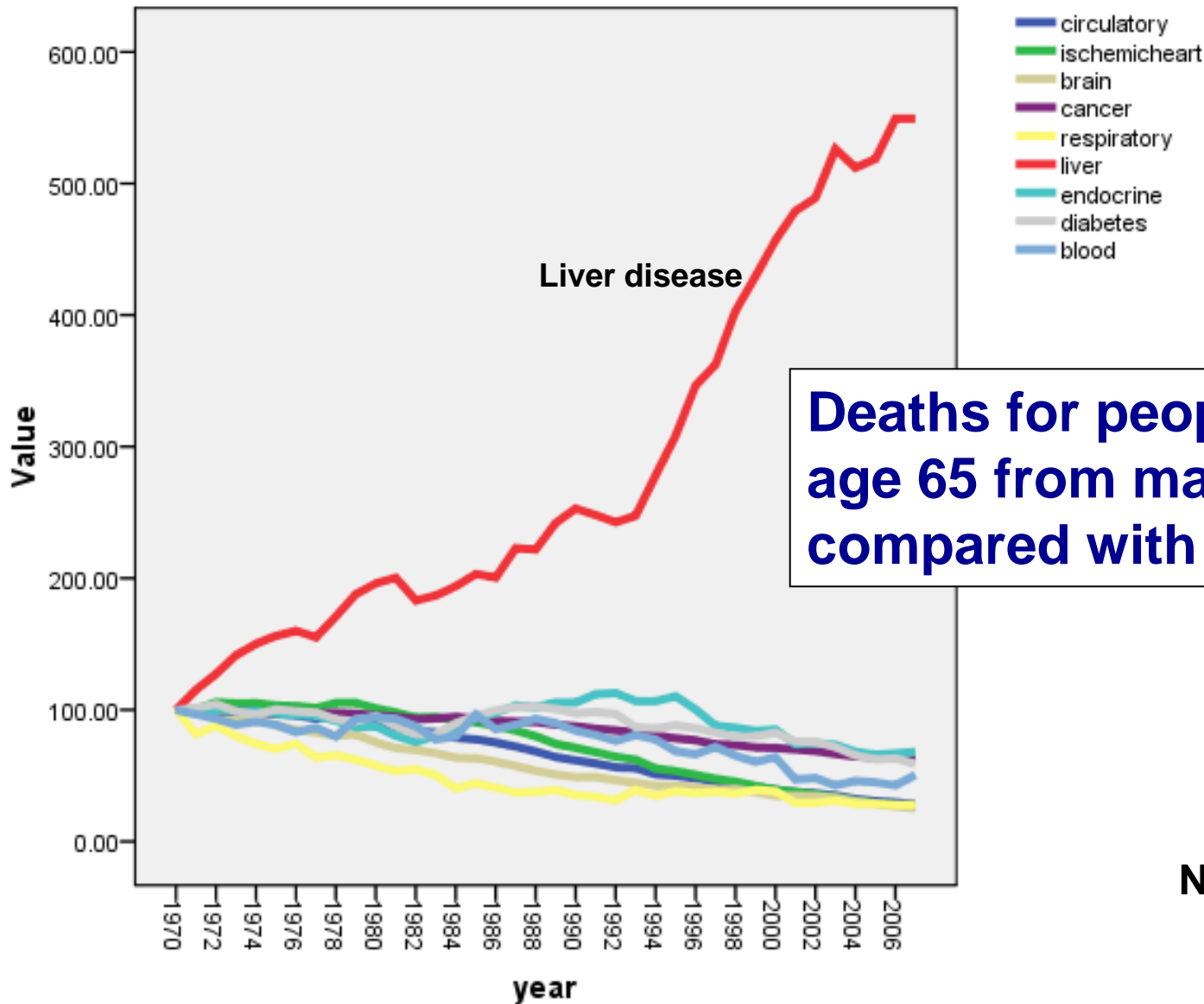
Half of all 15-16 years olds are drunk once a month

Graph 5: Consuming more than five alcoholic drinks on one occasion in the last 30 d



Liver deaths in the UK

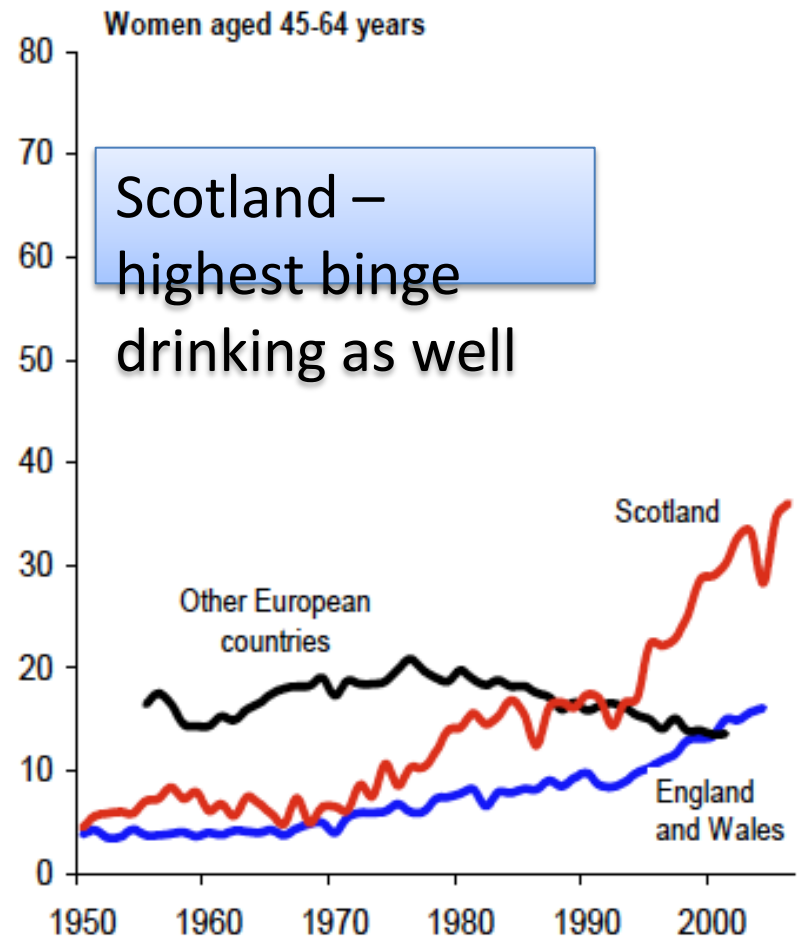
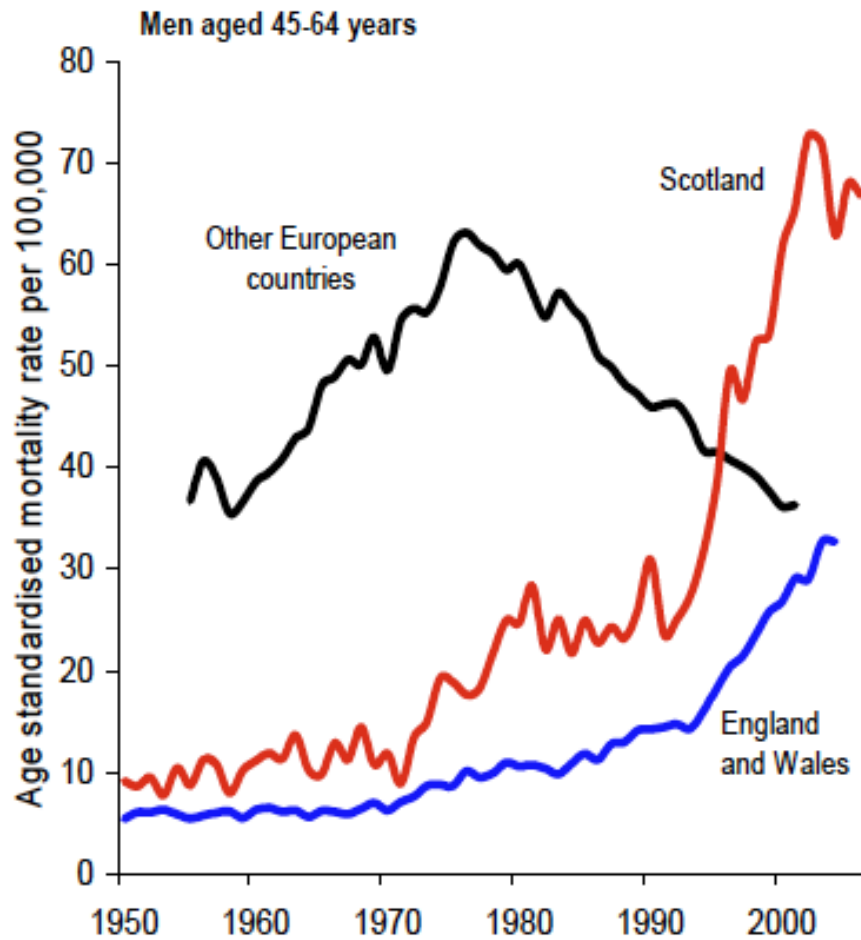
country: UK



Nick Sheron

Massive increase in alcohol health harms

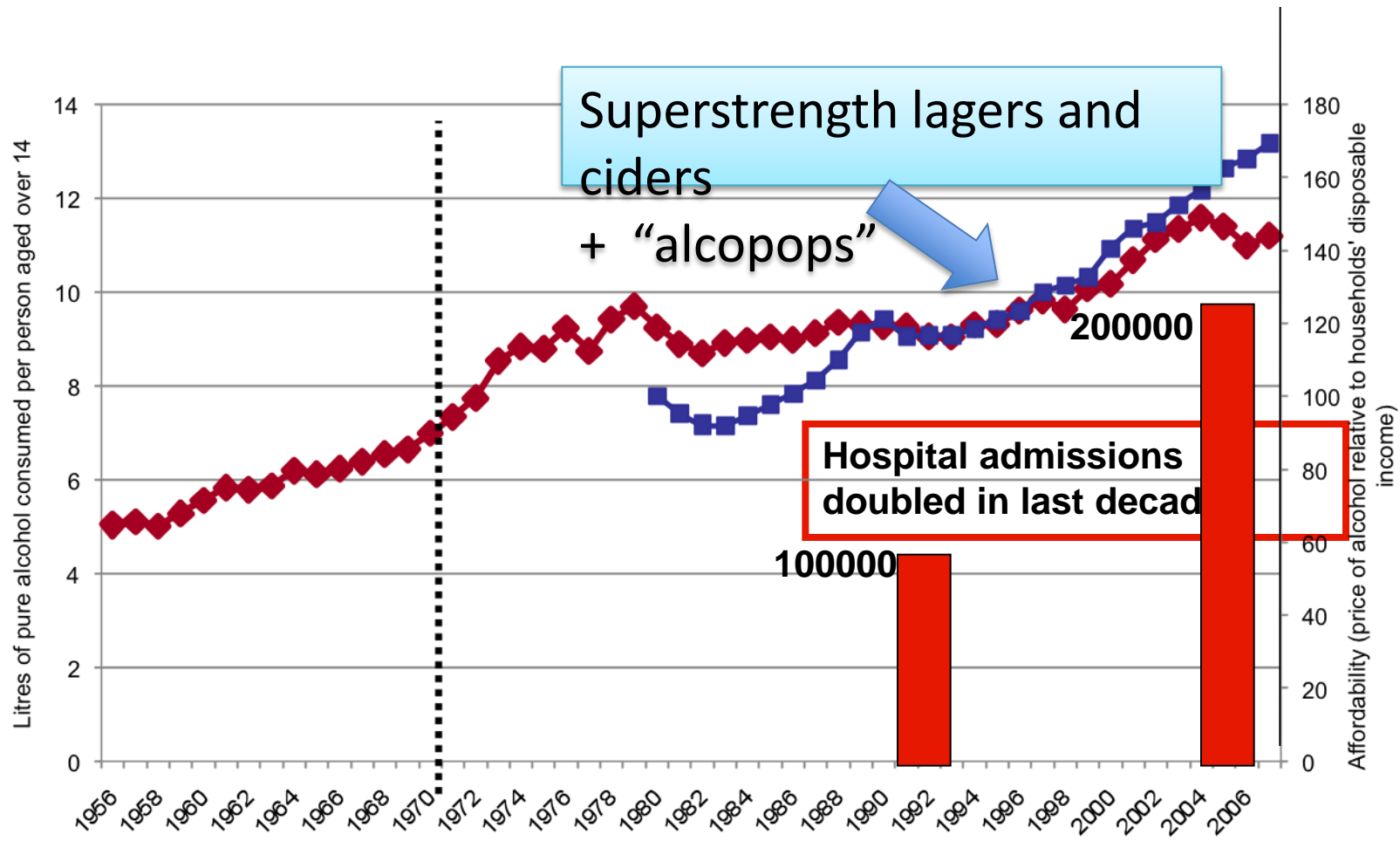
Chronic liver disease and cirrhosis mortality rates per 100,000 population, 1950-2006



Scotland –
highest binge
drinking as well

Leon & MacCambridge, Lancet 2006

In the last 40 years alcohol consumption has doubled - as the real cost has halved



◆ Estimated consumption ■ Affordability

Sources: BBPA Statistical Handbook 2008; Institute of Alcohol Studies Factsheet 'Trends in the affordability of alcohol in the UK'

Social damage from alcohol

Exxon Valdez = largest environmental disaster before the Gulf Spill - 1989

Captain
drunk



Political destruction

In UK many MPs
careers ruined
including
George Brown
and
Charles Kennedy

'Drunk' general was in jet crash cockpit

RUSSIA: The plane crash which killed Polish president Lech Kaczynski (pictured) and 95 members of his country's political and military elite in April 2010 was the fault of the Polish pilots, pressured to land by air force commander Gen Andrzej Blasik – who was in the cockpit and had been drinking, Russian investigators claimed yesterday.



Another political casualty



**MP arrested after
brawl in commons bar**

22/Feb/2012

**Labour member
For Falkirk
Ed Joyce**

Alcohol induced violence

Even Ascot not immune



Royal Ascot June 16th 2011

Metro

The myth of health benefits from alcohol risks v benefits – men in UK

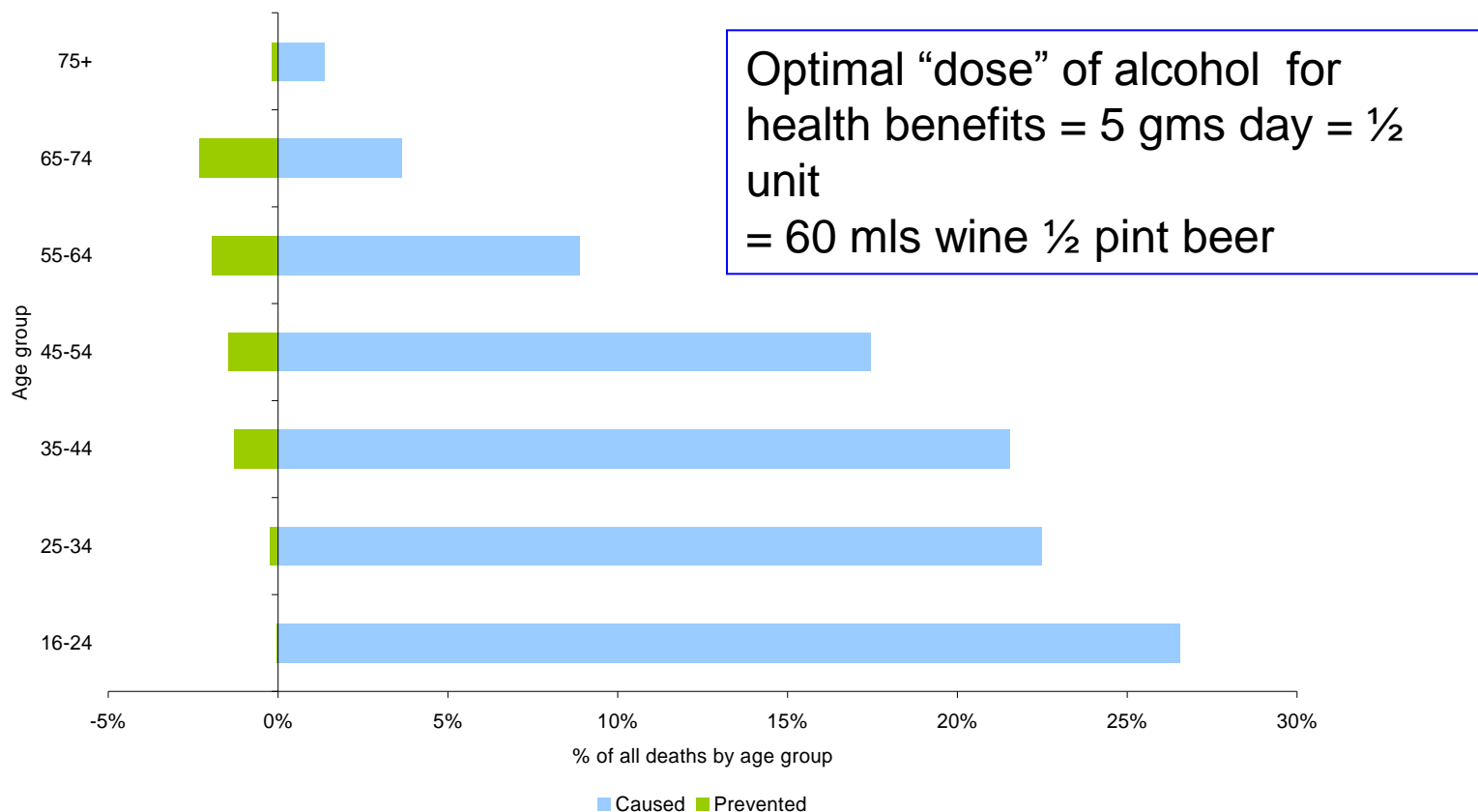


Figure 13. Percentage of male deaths attributable to alcohol consumption by age (2005)

THE ISCD DRUG HARMS MODEL

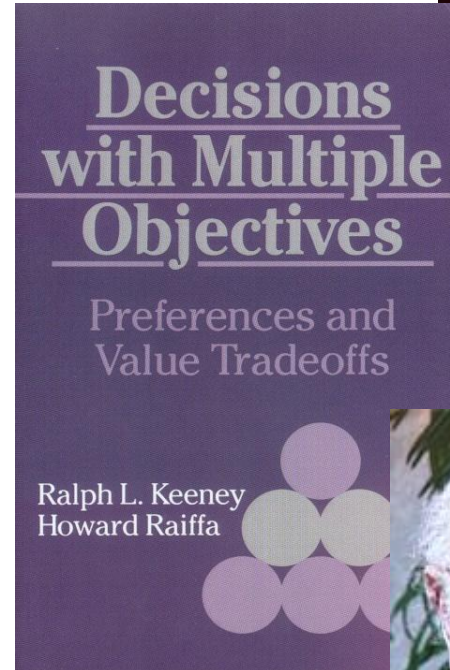
(Independent scientific committee on drugs)

Nutt DJ King LA Phillips LD (2010) Drug harms in the UK: a multicriteria decision analysis Lancet 376: 1558-66 DOI: [10.1016/S0140-6736\(10\)61462-6](https://doi.org/10.1016/S0140-6736(10)61462-6)

Decision conference + MCDA

Multi Criteria Decision Analysis

- A methodology for a group of key players to appraise options on multiple criteria, and combine them into one overall appraisal
- MCDA converts all input evaluations of decision outcomes into the common currency of *value added*





MCDA provides a way to compare apples and oranges, provided there is a context that establishes added value.

For the ISCD, it was negative value: physical, psychological and social harm

The 20 drugs



Heroin

Crack

Cocaine

Alcohol

Tobacco

Amphetamine

Mephedrone

Buprenorphine

Benzodiazepines

Cannabis

Anabolic Steroids

Ecstasy

Ketamine

LSD

Mushrooms

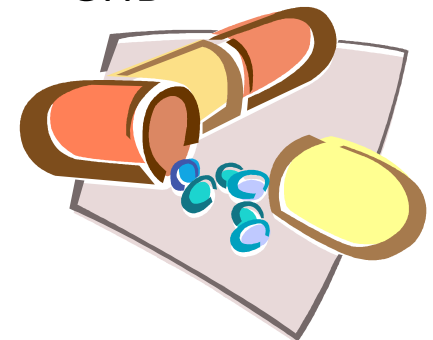
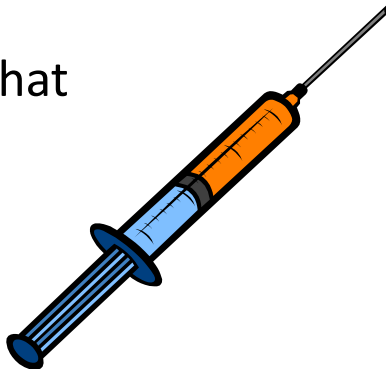
Methylamphet-
amine

Khat

Butane

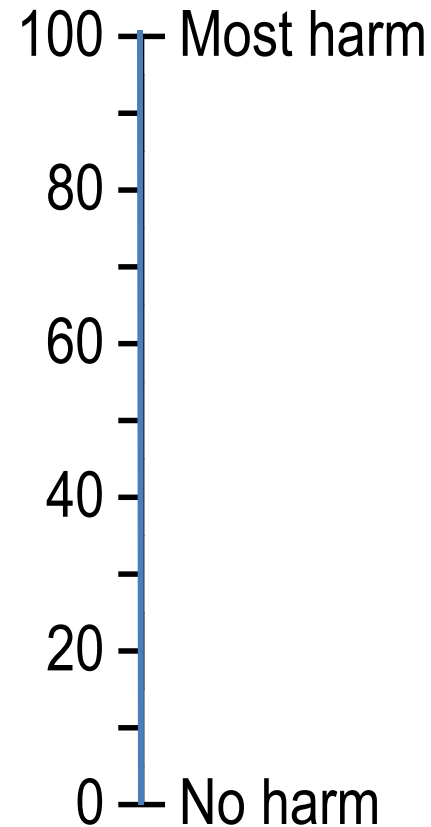
Methadone

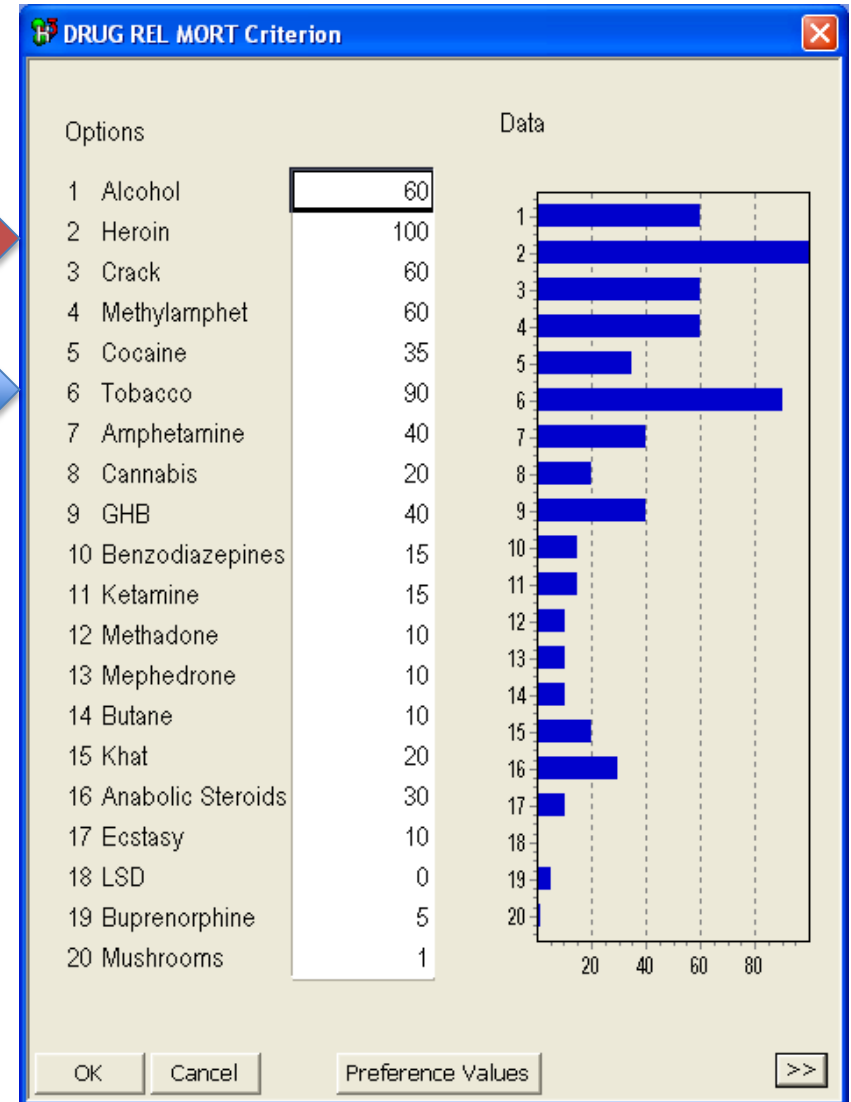
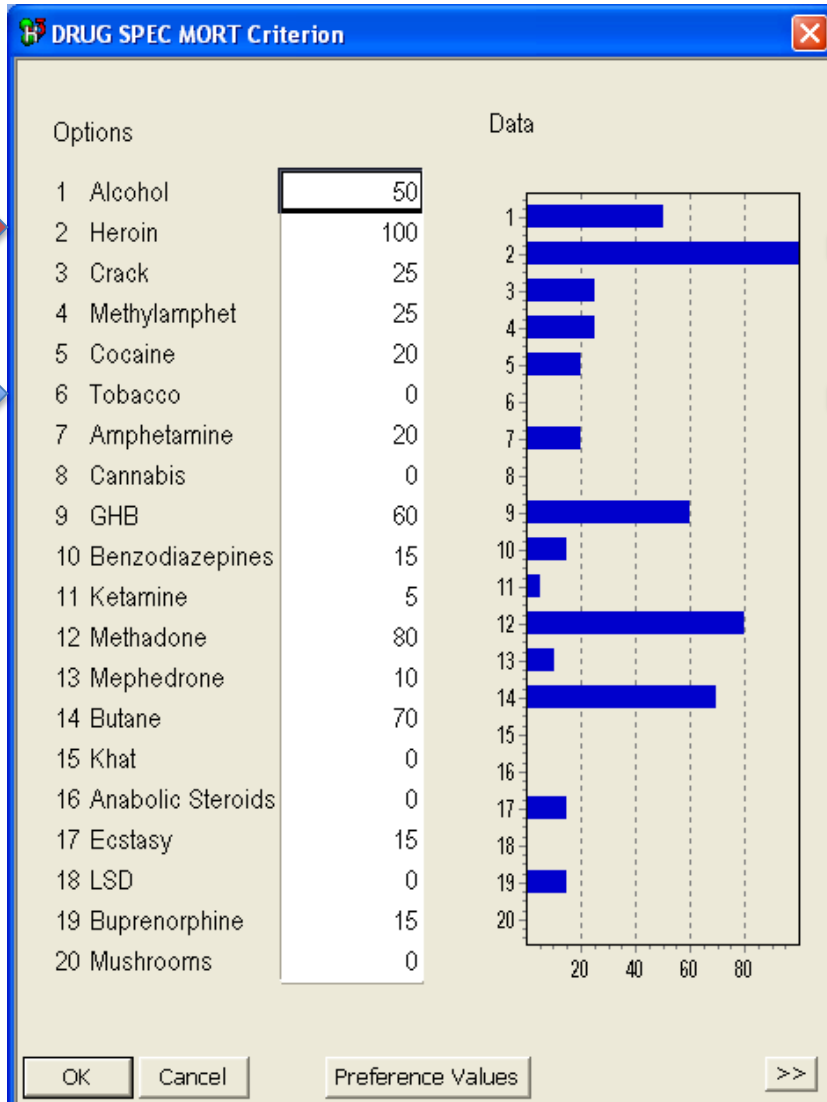
GHB



Scoring the drugs

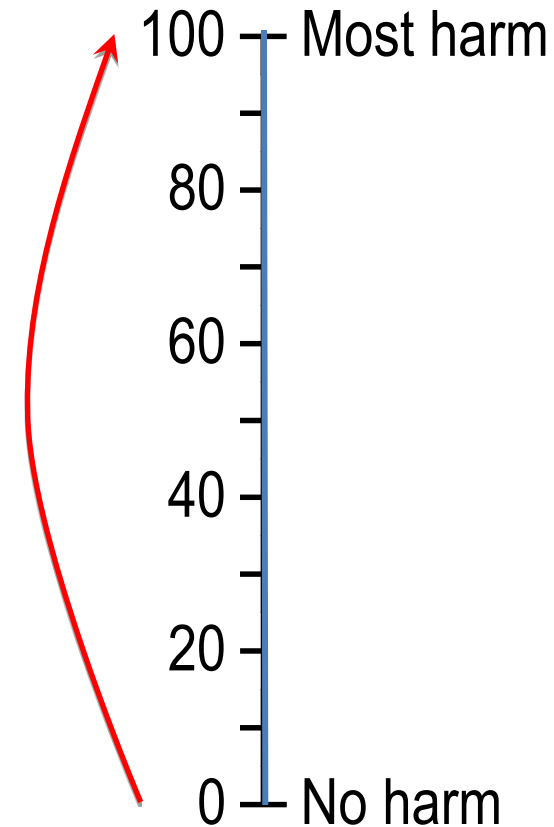
- The most harmful drug on each criterion was scored at 100.
- All other drugs were scored relative to that drug.
- E.g., a drug considered half as harmful was given a score of 50.
- This creates a unique ratio scale for each criterion.





Weighting the criteria

- Some criteria represent more harm than others.
- Swing-weights equate the units of harm on all the criteria: the swing in harm from the 'no harm' drug on a criterion to the 'most harmful'.
- The group considered this question to compare the levels of 'most harm' on the criteria:
 - “How big is the difference in harm and how much do you care about that difference?”






Weighting Harms to Others

Weight Criteria Swings Below Selected Node

Options	ENVIRONM DAMAGE		INTERNATIONAL DAMAGE		COMMUNITY	
	CRIME	FAMILY ADVERSITIES	ECONOMIC COST			
1 - Alcohol						
2 - Heroin						
3 - Crack						
4 - Methylamphet	Heroin	Alcohol	Alcohol	Crack	Alcohol	Alcohol
5 - Cocaine						
6 - Tobacco						
7 - Amphetamine						
8 - Cannabis						
9 - GHB						
10 - Benzodiazep						
11 - Ketamine						
12 - Methadone						
13 - Mephedrone						
14 - Butane						
15 - Khat						
16 - Anabolic Ster						
17 - Ecstasy						
18 - LSD						
19 - Buprenorphin						
20 - Mushrooms						
Input Values	80	30	70	30	100	25

OK Cancel

The resulting criteria weights

	Model Order	Cum Wt	Diff	Wtd Diff	Sum	
SOCIAL2	ECONOMIC COST	12.8	0	0.0	12.8	
PHYSICAL_PSYCHOL2	INJURY	11.5	0	0.0	24.2	
SOCIAL2	CRIME	10.2	0	0.0	34.4	
SOCIAL2	FAMILY ADVERSITIES	8.9	0	0.0	43.4	
PHYSICAL1	DRUG REL MORT	6.4	0	0.0	49.7	
PSYCHOL1	DEPENDENCE	5.7	0	0.0	55.5	
PSYCHOL1	SPEC IMPAIR MENT FUN	5.7	0	0.0	61.2	
PSYCHOL1	REL IMPAIR MENT FUNC	5.7	0	0.0	67.0	
PHYSICAL1	DRUG SPEC MORT	5.1	0	0.0	72.1	
SOCIAL1	LOSS OF TANGIBLES	4.5	0	0.0	76.5	
SOCIAL1	LOSS OF RELAT	4.5	0	0.0	81.0	
PHYSICAL1	DRUG SPEC DAMAGE	4.1	0	0.0	85.1	
PHYSICAL1	DRUG REL DAMAGE	4.1	0	0.0	89.2	
SOCIAL2	ENVIRONM DAMAGE	3.8	0	0.0	93.0	
SOCIAL2	INTERNATIONAL DAMAGE	3.8	0	0.0	96.8	
SOCIAL2	COMMUNITY	3.2	0	0.0	100.0	
		100.0		0.0		

Drugs ranked according to total harm

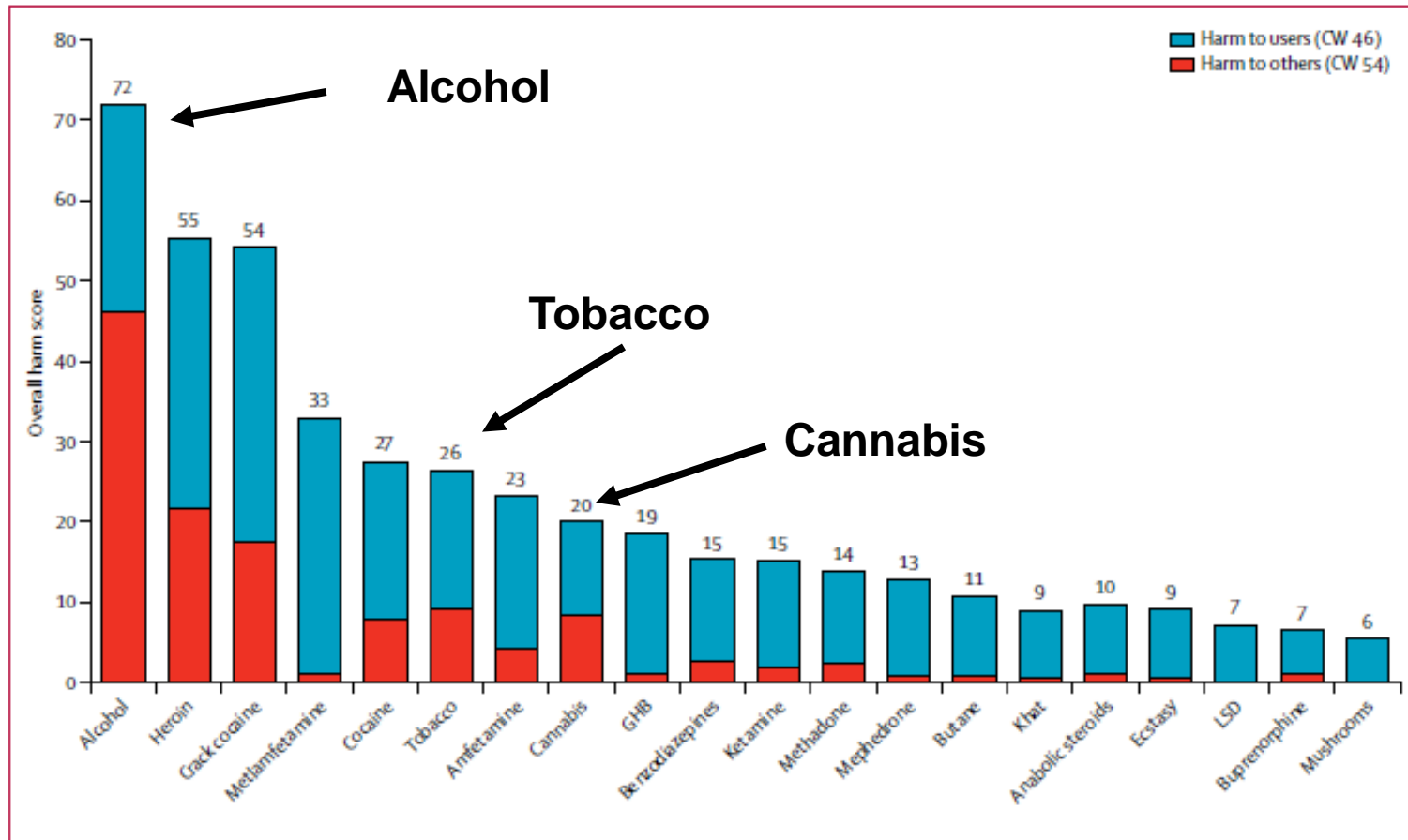
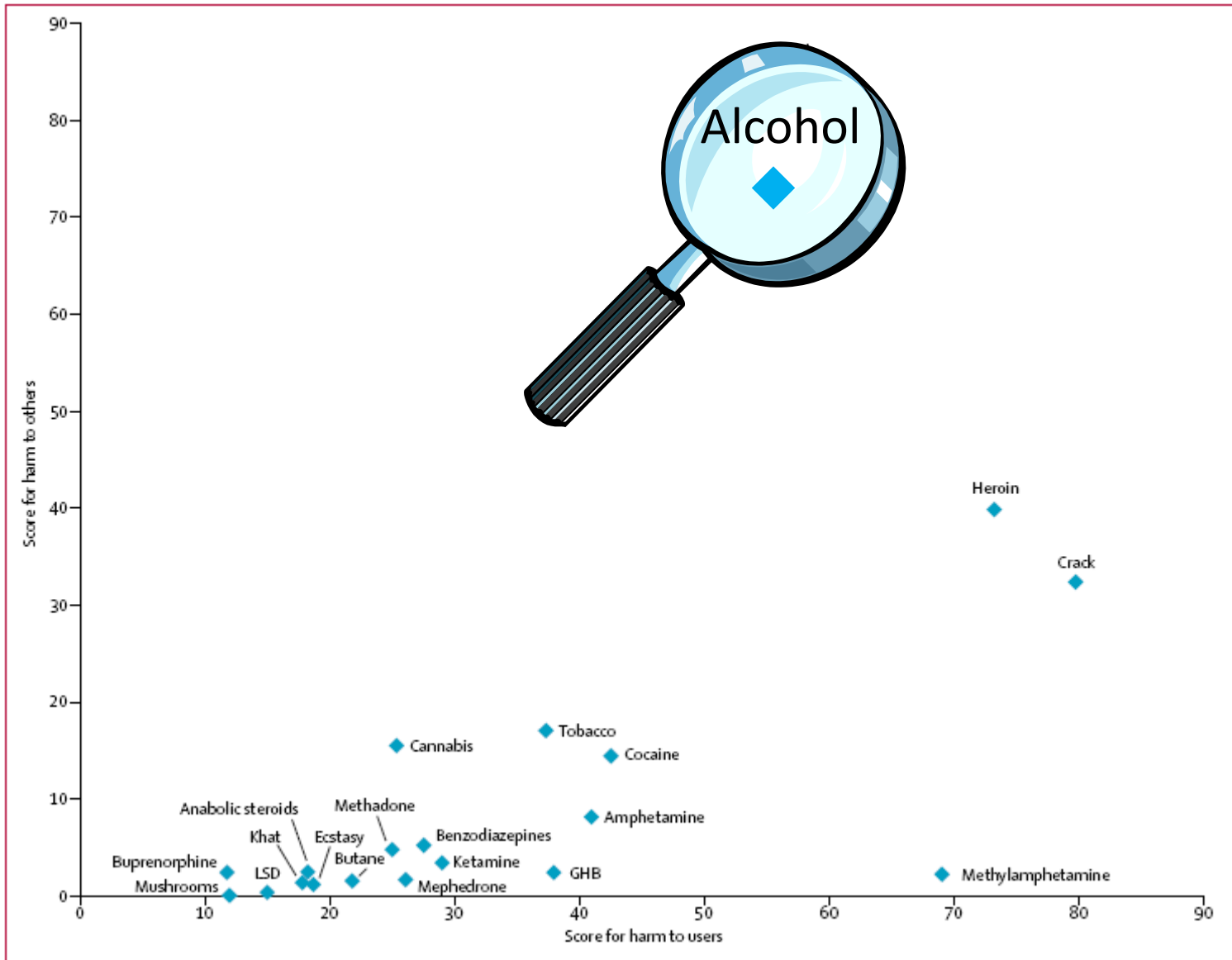
















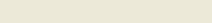
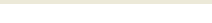
Figure 2: Drugs ordered by their overall harm scores, showing the separate contributions to the overall scores of harms to users and harm to others. The weights after normalisation (0-100) are shown in the key (cumulative in the sense of the sum of all the normalised weights for all the criteria to users, 46; and for all the criteria to others, 54). CW=cumulative weight. GHB= γ hydroxybutyric acid. LSD=lysergic acid diethylamide.



Harm
to
Others

Harm to Users

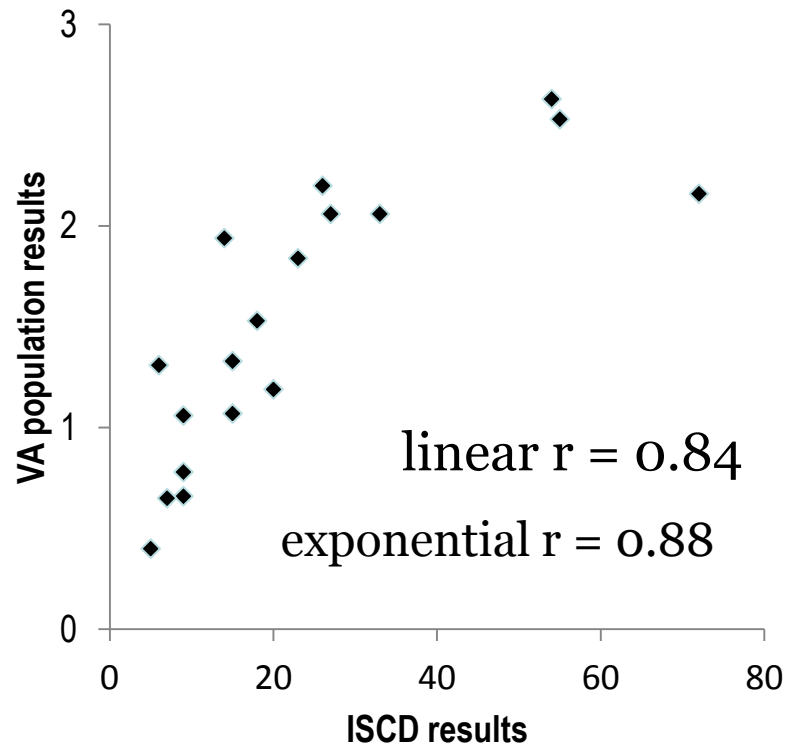
Why is alcohol so harmful?

	Model Order	Cum Wt	Diff	Wtd Diff	Sum	
SOCIAL2	ECONOMIC COST	12.8	100	12.8	12.8	
PHYSICAL_PSYCHOL2	INJURY	11.5	100	11.5	24.2	
SOCIAL2	FAMILY ADVERSITIES	8.9	100	8.9	33.2	
SOCIAL2	CRIME	10.2	50	5.1	38.3	
PHYSICAL1	DRUG REL MORT	6.4	60	3.8	42.1	
SOCIAL2	ENVIRONM DAMAGE	3.8	100	3.8	45.9	
PSYCHOL1	SPEC IMPAIR MENT FUN	5.7	65	3.7	49.6	
PSYCHOL1	REL IMPAIR MENT FUNC	5.7	58	3.3	53.0	
PHYSICAL1	DRUG SPEC DAMAGE	4.1	80	3.3	56.2	
PHYSICAL1	DRUG REL DAMAGE	4.1	80	3.3	59.5	
SOCIAL2	COMMUNITY	3.2	100	3.2	62.7	
SOCIAL1	LOSS OF RELAT	4.5	60	2.7	65.4	
PHYSICAL1	DRUG SPEC MORT	5.1	50	2.6	67.9	
PSYCHOL1	DEPENDENCE	5.7	30	1.7	69.6	
SOCIAL1	LOSS OF TANGIBLES	4.5	30	1.3	71.0	
SOCIAL2	INTERNATIONAL DAMAGE	3.8	20	0.8	71.7	
		100.0		71.7		

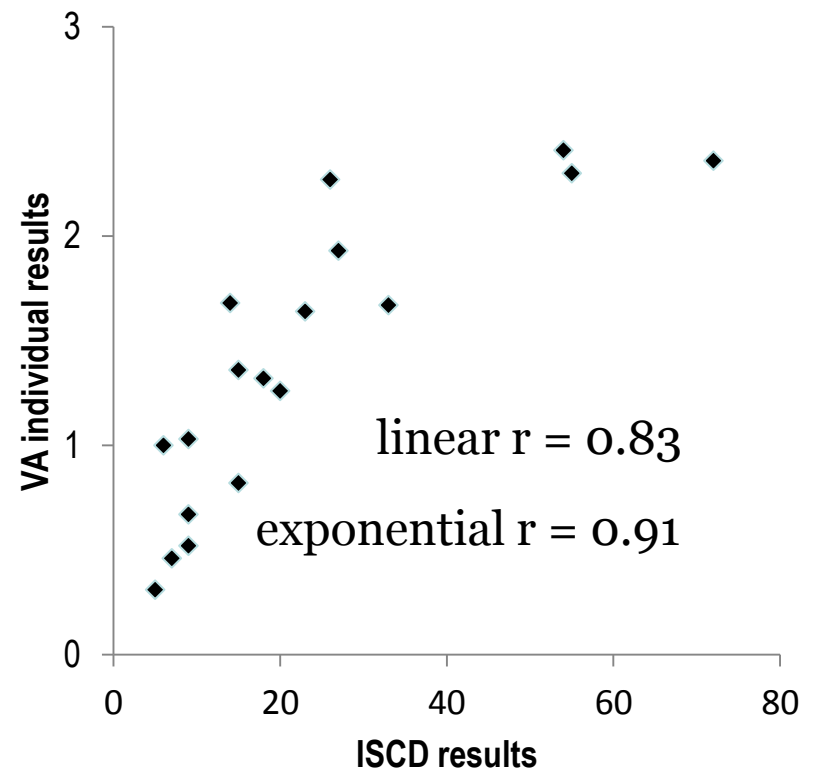
*Half
the
harm
from
these
four*

Correlations of ISCD scores with...

...van Amsterdam population



...van Amsterdam individual

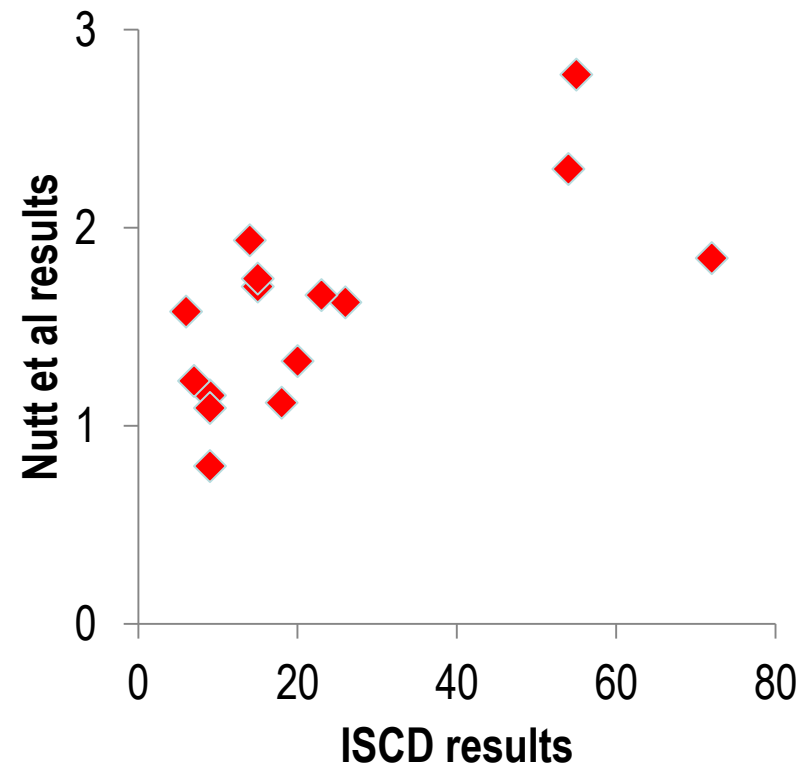


Reference: van Amsterdam, J. G. C., Opperhuizen, A., Koeter, M., & van den Brink, W. (2010). Ranking the harm of alcohol, tobacco and illicit drugs for the individual and the population. *European Addiction Research*, 16, 202-207.

Correlations of ISCD scores with...

Nutt et al 2007 Lancer results

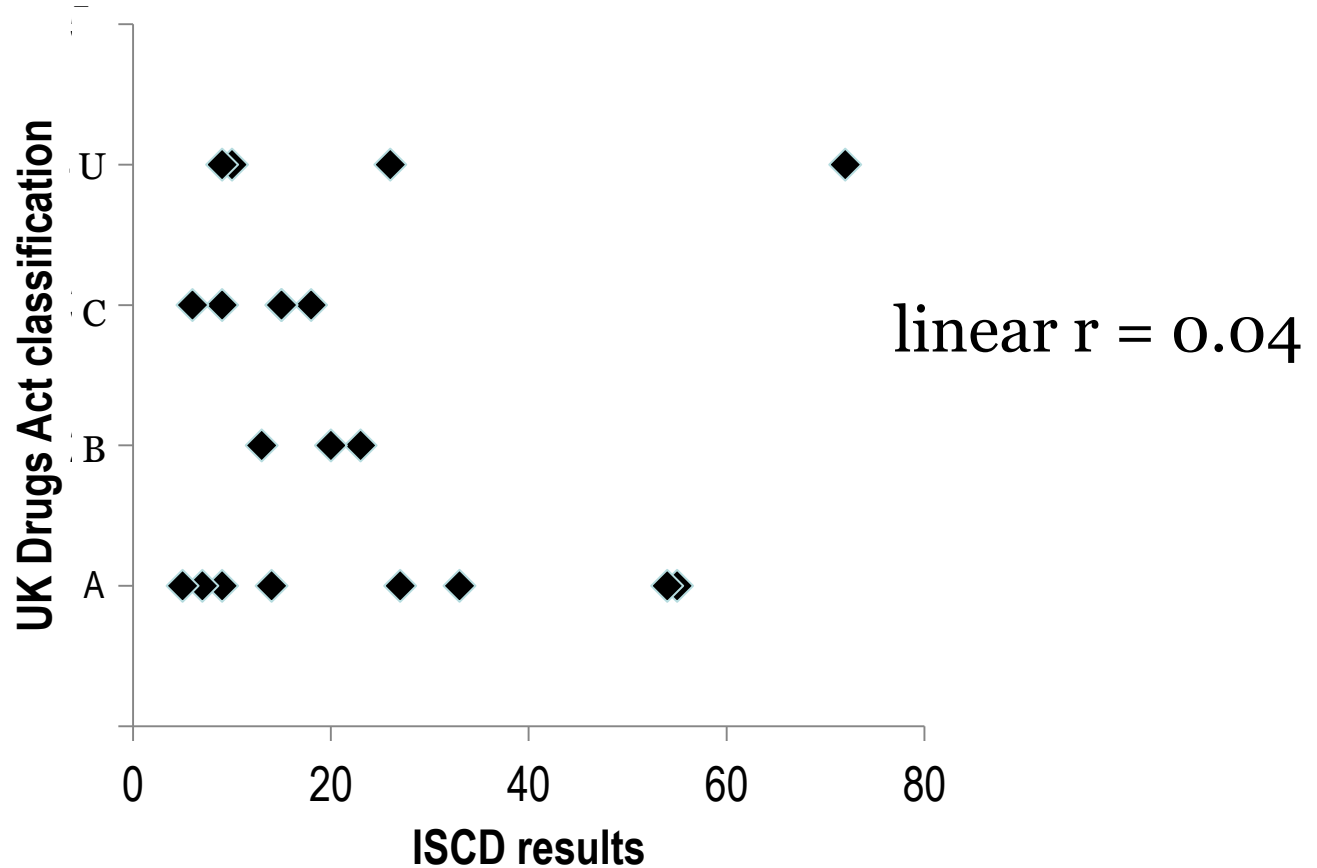
linear $r =$
0.70



ISCD input scores vs published studies

Study	ISCD criterion vs study criterion	N	r
Gable 2004	Drug specific mortality vs \log_{10} safety ratio	12	0.66
King & Corkery 2010	Drug specific mortality vs fatality statistics (other substances mentioned on death cert.)	5	0.98
	Drug specific mortality vs fatality statistics (sole mentions on death certificates)	5	0.99
Anthony et al 1994	Dependence vs lifetime dependence	5	0.95

No correlation of UK Drugs Act classification with ISCD results



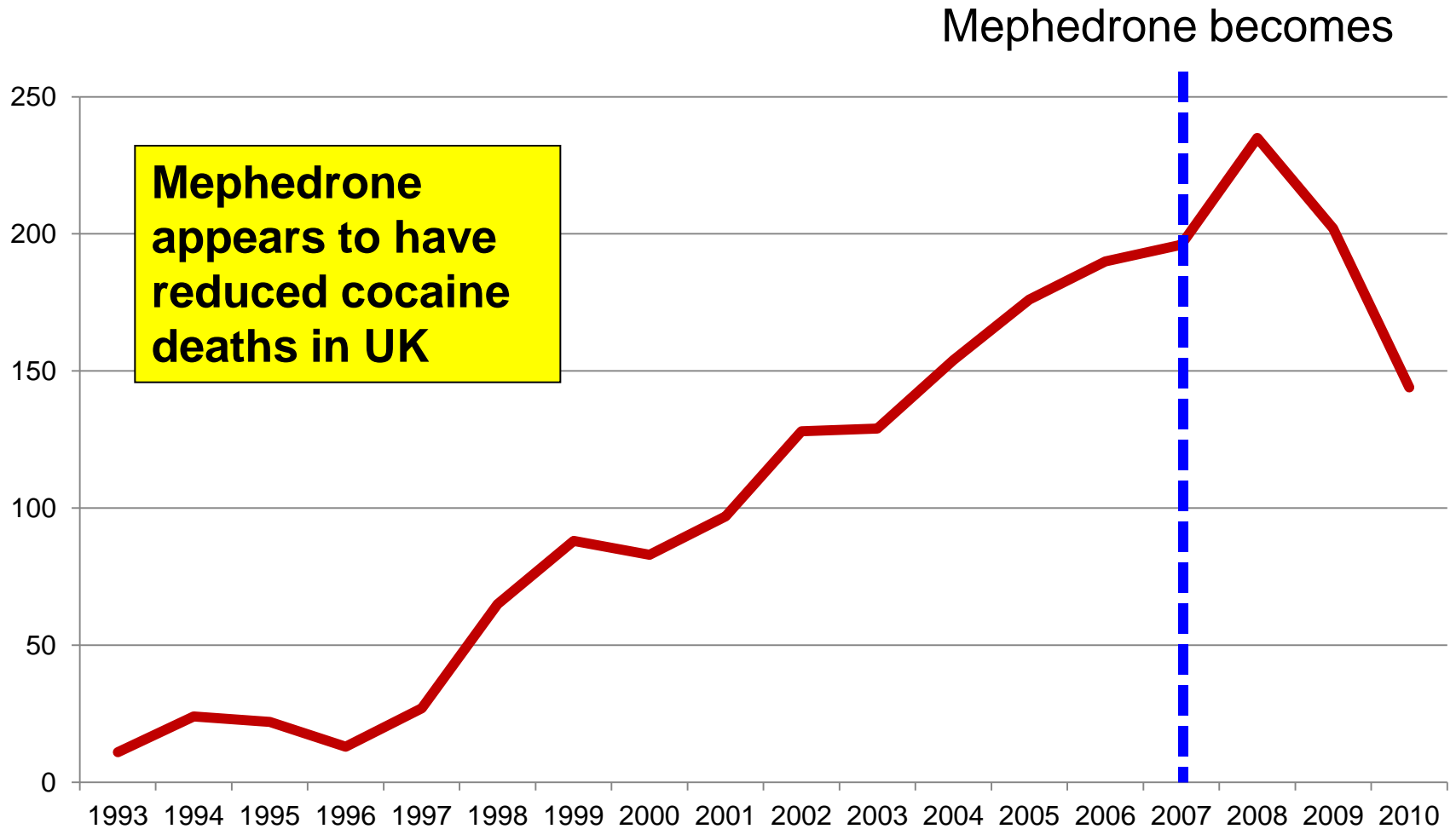
Main Implications

- 1. The UK MDAct1971 is fundamentally incorrect in many of its drug rankings
→ the law is unjust**
- 2. The International Conventions are likely similarly wrong**
- 3. Alcohol should be the major target for harm reduction in the UK**

Next steps

- **Continue to improve the harm model as data become available**
- **Expand the harm model to include criteria of relevance to other constituents (political, legal)**
- **Consult other expert panels and other stakeholder groups for their weights**
- **Apply the model in countries with differing views**
 - ISCD now doing this Europe-wide
- **Distinguish in the model between harms caused by drug use and those resulting from controls**
- **Develop two-stage model : 1. Classify? 2. Level?**
- **Explore the question of the benefits of drugs**

Paradoxical benefits?



Source: Deaths related to drug poisoning in England and Wales, 2010, Office for National Statistics

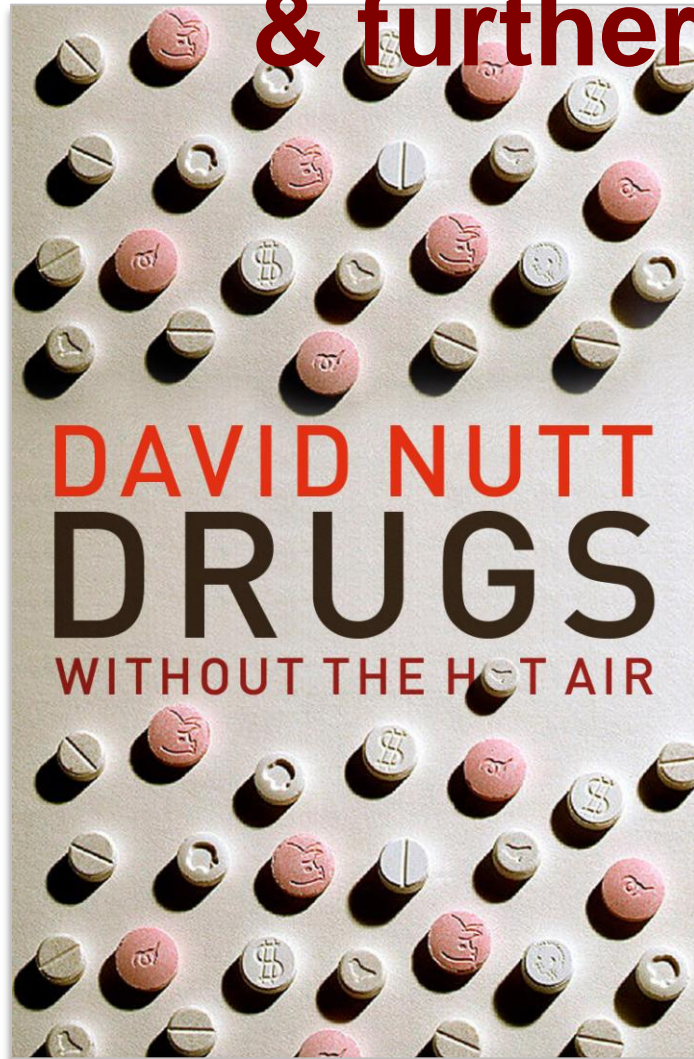
The truth about drugs



Independent Scientific
Committee on Drugs

Website = ***drugscience.org.uk***

Thanks, questions & further reading



All proceeds to ISCD

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Thanks and questions?

How harmful should a drug be to be banned?

What are the right comparators?

Appropriate comparators?



Ice climbing

British climbers die in the Alps Jan 2009



Rob Gauntlett climbed Everest with his friend when aged just 19

Third ice climbing accident in a week

Two local guides, Luc Avogadro and Eric Lazard were killed by falling ice climbing in the same sector last week.

About 100 die in Alps every year

Other enjoyable yet dangerous activities?



**Dangerous
pursuits?**

**Viking
helmets
unlikely to
help**

? kilts might



Peanuts?

New Scientist Feb 2009

Editorial: Drugs drive politicians out of their minds

IMAGINE you are seated at a table with two bowls in front of you. One contains peanuts, the other tablets of the illegal recreational drug MDMA (ecstasy). A stranger joins you, and you have to decide whether to give them a peanut or a pill. Which is safest?

You should give them ecstasy, of course. A much larger percentage of people suffer a fatal acute reaction to peanuts than to MDMA.

(Sun)tanning



(Sun)tanning

2009

Cancer Research UK warned earlier this year that heavy use of sunbeds was largely responsible for the number of Britons being diagnosed with melanoma topping 10,000 a year for the first time.

In the last 30 years, rates of the cancer have more than quadrupled, from 3.4 cases per 100,000 people in 1977 to 14.7 per 100,000 in 2006

Regulations now in place to stop under 18s using sunbeds

Should alcohol – or tobacco – be the comparator?

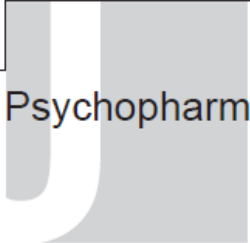
Editorial

A tale of two Es

David Nutt *Psychopharmacology Unit, University of Bristol, Bristol, UK.*

J of Psychopharmacology 2006

Ecstasy less harmful than alcohol (ethanol)

The logo for Psychopharm, featuring a stylized 'U' shape in grey and white.

Psychopharm

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CA and New Delhi
10.1177/0269881106064592

Or horse riding?



deaths

**spinal
transection**

brain damage

**all well
recognised**

**plus lots of
minor injuries**

Silver JR, Lloyd Parry JM. Hazards of horse-riding as a popular sport. *Br J Sports Med* 1991; 25: 105–110.

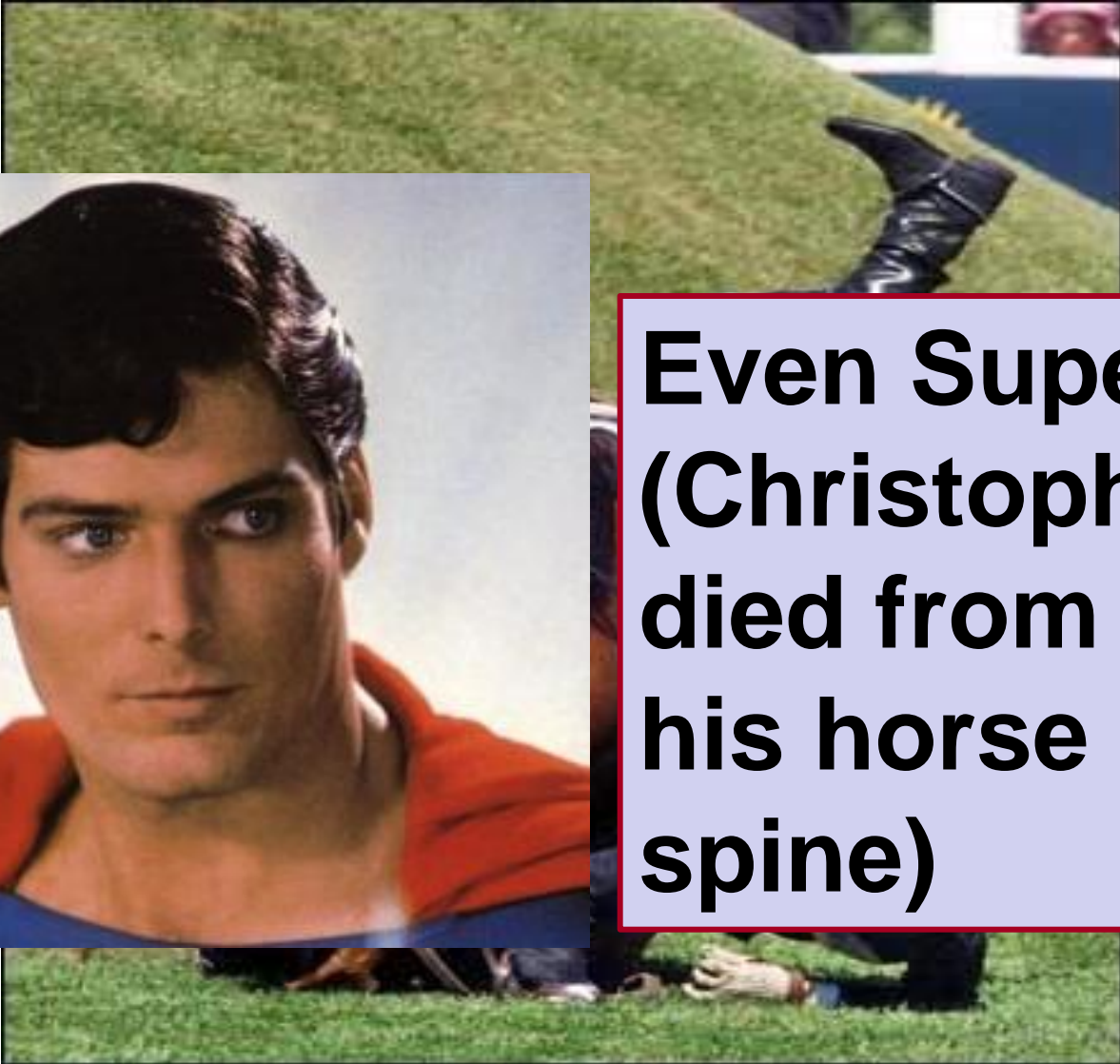
Silver JR Spinal Cord 2002

Or horse riding?

deaths

spinal
transection

brain damage




**Even Superman
(Christopher Reeve)
died from falling off
his horse (broken
spine)**

Equasy – equine addiction syndrome

Editorial

Equasy – An overlooked addiction with implications for the current debate on drug harms

DJ Nutt *Psychopharmacology Unit, University of Bristol, Bristol, UK.*

The logo for the Journal of Psychopharmacology, featuring a stylized 'J' shape composed of two overlapping grey rectangles.

Psychopharm

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10.1177/0269881108099672

Equasy – v- ecstasy - harms

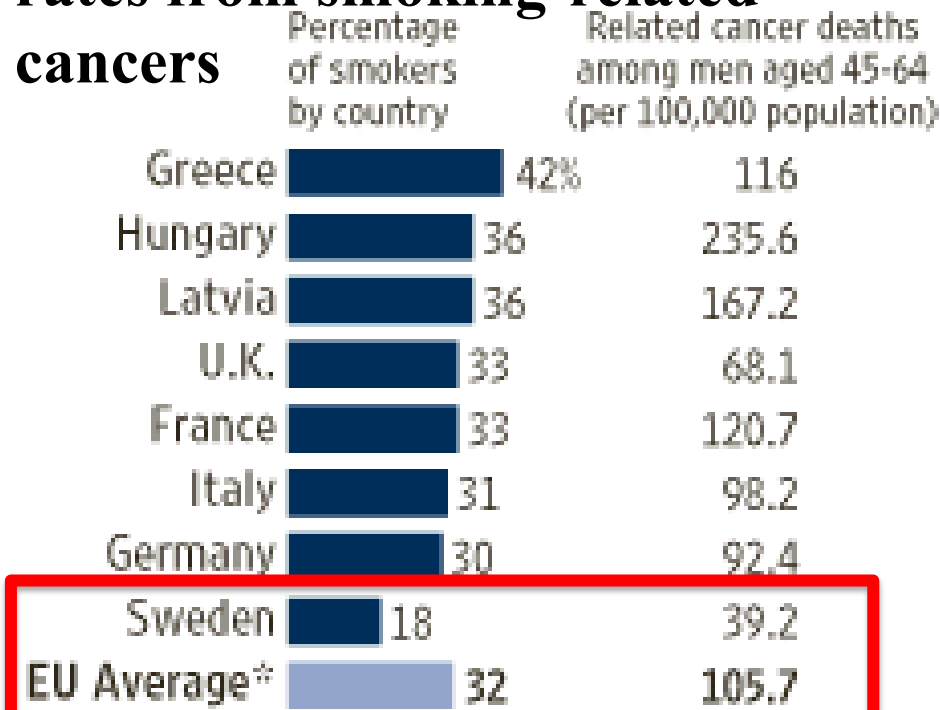
Table 1 A comparison of ecstasy and equasy using the 9-point scale.

Parameter of harm	Ecstasy	Equasy
Acute harm to person	+1 per 10000 episodes	++1 per 350 episodes
Chronic harm to person	+?	++
Intravenous use	Not applicable	Not applicable
Euphoric effects	++	+/++
Physical withdrawal	-/+	-
Psychological withdrawal	-/+	+?
Harm to society: RTAs etc.	?	+ (methane emissions also)
Dealing harms	+	- (as legal)
Societal costs: NHS etc.	+	+

RTA, Road Traffic Accident; NHS, National Health Service.

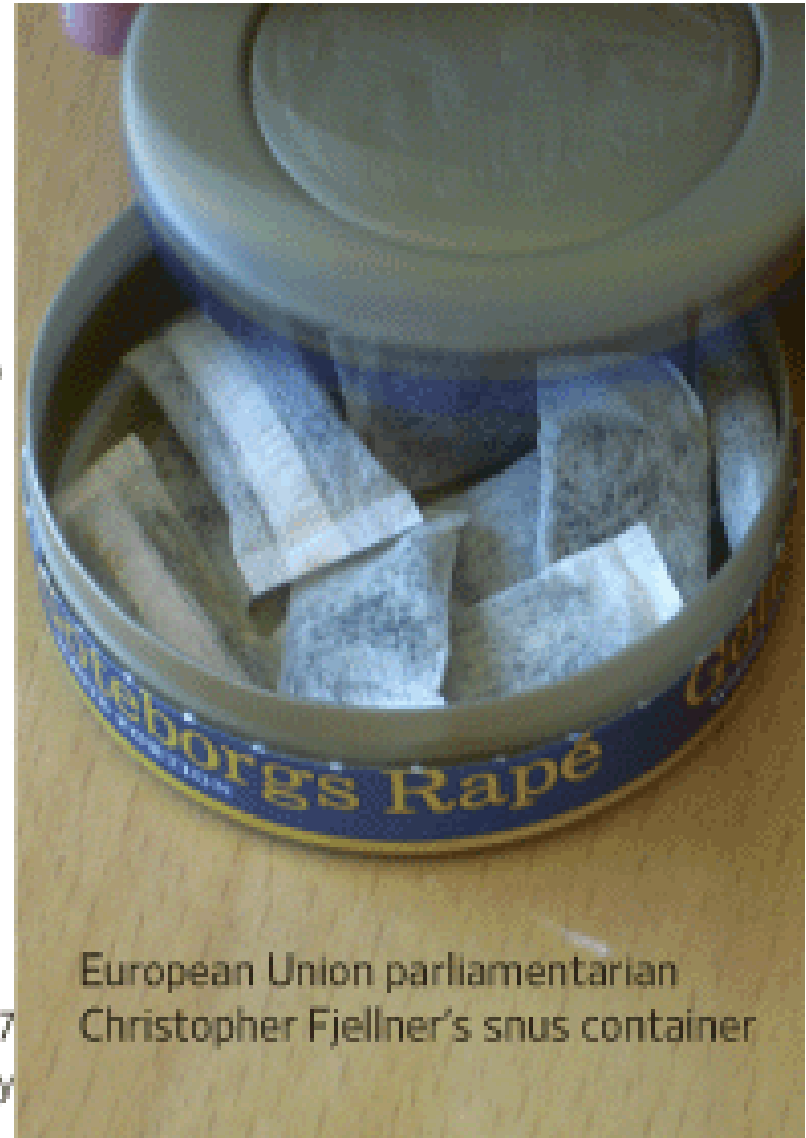
- = harm; + = more harm.

Sweden has lowest percentage of smokers and very low death rates from smoking-related cancers



*Excluding Romania and Bulgaria, which joined the EU in 2007

Sources: Eurostat 2006 report; European Commission Survey



European Union parliamentarian Christopher Fjellner's snus container

Snus reduces tobacco harm

“clean” form of tobacco used behind lips

- No increase in lung cancer
 - No increase in heart disease
- Major health benefits

20x safer than smoking

Contributes to Swedish longevity



Some more radical options

Drug testing facilities of Holland

A safer “synthetic” alcohol
- with antidote

New Scientist 2006

The Scientist Jan 2011

Legal supply of safer versions of
stimulants eg MDMA

