CANNABIS, ECSTASY, AMPHETAMINES AND LSD

- *Increases in drug-taking; patterns of use*
- *How drugs work and their health effects*
- *Educational approaches*
- *Science and public policy issues.*

POST REPORT SUMMARY **79** **May 1996**

This is a summary of a 110-page report available from the PARLIAMENTARY OFFICE OF SCIENCE AND TECHNOLOGY (extension 2840).

Illicit drug use worldwide, particularly among young people, continues to rise, and the UK is no exception to this trend. The debate over the consequences of such trends has a number of scientific components; e.g. how harmful to health are these drugs? How do they affect the brain, and what are their psychological effects? What are the factors that influence drug-taking behaviour in general, and what are the most effective educational strategies?

In view of the parliamentary interest, the Board of POST decided that a review would be timely. This note summarises the full 110-page report[1].

EXTENT OF DRUG-TAKING IN THE UK

The full report brings together **official statistics** and **social survey results** to paint a consistent picture of increasing drug-taking, especially among young people. Overall figures for the adult population are summarised in **Table 1**, where the most recent British Crime Survey reports 28% of 16-59 year-olds having tried an illegal drug at least once. The earliest age at which young people are likely to experiment with drugs is 12-13, with drug-taking being most common among young adults in their late teens and early twenties - around one half of young people will have tried a drug by their 20th birthday (see **Figure 1**).

Cannabis remains the most widely taken illegal drug. The other significant trend has been the growth in '**dance drugs**' since the late 1980s. These are largely confined to young adults under 25, with lifetime use of **ecstasy** ranging from around 3% to 10%, with amphetamines and LSD consistently more popular than ecstasy.

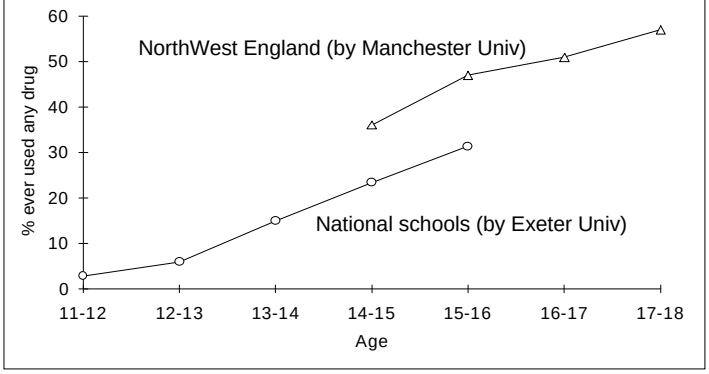
But prevalence merely means that people have tried drugs, and can give a misleading and 'alarmist' impression of both the scale of everyday drug-taking behaviour and its effects. Thus some will literally try, say cannabis, once, wonder what all the fuss was about and move on to more important things in life. At the other end of the scale, smaller numbers will develop drug-related problems and dependence, with their damaging effects on health and on personal or family relationships.

Table 1 OVERALL PREVALENCE OF DRUG-TAKING

Study	Scope	Age	% ever taken	% taken (last year)
BCS 1982	E,W,S	16-59	5% (cannabis)	1.7% (cannabis)
BCS 1984	E,W	16-59	2.9% (cannabis)	
MORI 1989	E,W,S	18-59	5% (cannabis)	
CDPU 1992	E,S	16+	15% (cannabis)	7% (cannabis)
			18% (any drug)	
BCS 1992	E,W	12-59	14% (cannabis)	5% (cannabis)
		12-59	17% (any drug)	
BCS 1994	E,W	16-59	28% (any drug)	10% (any drug)

E: England, W: Wales; S: Scotland; survey details - see full report

Figure 1 % OF YOUNG PEOPLE WITH EXPERIENCE OF DRUGS



Statistics which give a 'feel' for the current picture are covered in the full report; e.g.:-

- Lifetime experience of drugs is over 1 in 4 of the adult population. It is at its highest for 16-19 year-olds (46%) and 20-29 year-olds (41%) and falls off with higher age groups to 12% for 50-59 year-olds.
- Perhaps as many as 7 million people have tried cannabis at some point in their lives, while 250,000-800,000 young people may have tried ecstasy.
- Cannabis is more likely to be used frequently, with 9% of all cannabis users reporting daily use, and 14% taking it several times a week. With ecstasy, LSD and amphetamines users, very few take these drugs daily, but ~20% take them more than monthly.
- Overall, at least 6% of the population (~3M people) will have used cannabis in the last 12 months. Among young people, around 1 in 5 use drugs on a regular (monthly) basis.
- Of those who have tried cannabis, 1 in 10 develop some form of psychological dependence syndrome.
- Significant numbers are reporting experience with more than one illegal drug - 45% of 'ever-users' have tried two or more.
- Drug-taking is not just one-way - many people stop of their own volition - in one survey, of the 32% of 17-18 year-olds who had tried an illegal drug, 10% no longer took them.

1. "Common Illegal Drugs and Their Effects - Cannabis, Ecstasy, Amphetamines and LSD" is available from the Parliamentary Office of Science and Technology (POST), 7, Millbank, London SW1P 3JA (tel 0171-219-2840). Free to Parliamentarians; £15 otherwise.

FACTORS AFFECTING DRUG-TAKING

The full report also looks at factors affecting patterns of drug-taking, particularly among young people and the various 'scenes'. It also discusses the various factors which have contributed to the current high levels of drug-taking - the influence of the drugs themselves, their availability, affordability, individual susceptibility, and the social context of drug-taking, including the influence of peers and family on individual decisions.

Studies reveal an **increasingly complex and sophisticated market**, where the drug taken depends on situation, price, individual preference and social context. Thus some (e.g. LSD) may be used for a cheap, quick 'trip'; cannabis can be found in a wide range of social settings, and the 'dance' and 'clubbing' scenes are the venue where ecstasy, amphetamines and LSD are most common. These and other drugs and chemicals can be mixed to achieve different effects, and in some contexts **the line between 'soft/recreational' drugs and the 'harder', more addictive drugs is becoming blurred**.

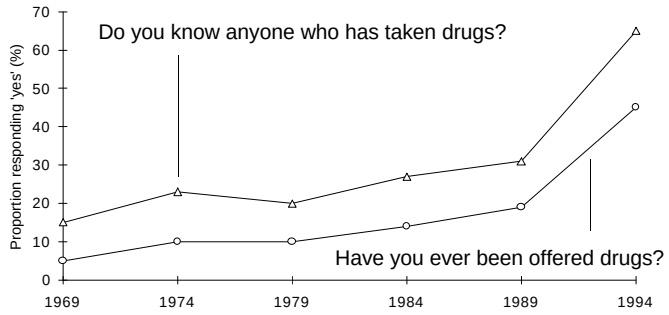
The **old social paradigms of drug use** being associated with male, working class, poor and socially deprived areas **have broken down**. Thus girls are now almost as likely as boys to experiment with drugs, 'middle class' areas and background no longer insulate against drugs and rural towns can be as affected as the inner cities.

Of the various contributing factors, the **sheer increased availability** is one of the most important (**Figure 2**), and along with that, their **affordability**. Equally important may be the **integration of drugs into whole areas of youth culture**. Thus where their parents smoked cigarettes or drank beer to demonstrate their growing independence, now cannabis or LSD feature, in many cases alongside alcohol. Parent(s) remain important in influencing attitudes to drugs, but after adolescence, friends often exert a greater influence.

These patterns may have policy implications. E.g.:

- Some of the older simpler paradigms on progression from one drug to another may no longer apply.
- Because of their integration with aspects of youth culture, if current tastes change, drug use could fade of its own accord. Equally, if they persist, it could make current high rates of use very resistant to change. Because of the size of the drugs 'economy', there are pressures to maintain and expand the role of drugs by marketing and other techniques.
- People's flexibility in response to market signals means that success in interdicting one drug to the extent of raising its price may cause a switch from one to another.
- The emergence of a young adult, 'polydrug' culture (who do not at present tend to inject drugs) may have implications for treatment services.

Figure 2 TRENDS IN THE AVAILABILITY OF DRUGS



HEALTH AND PSYCHOLOGICAL EFFECTS

The full report describes the ways in which drugs mimic, amplify or block the action of natural chemical 'neurotransmitters' in the brain. Their effects on the brain are however, much less subtle than those of natural neurotransmitters (NTs), which in the normal course of events, are released in response to specific signals at a particular place and time. Taking a drug is more akin to 'marinating' the brain in the particular chemical, so that it acts at every possible action site at the same time. Thus, even drugs which mimic the action of natural NTs, have far more profound effects than the NTs they resemble. In scientific terms, the current scale of use effectively amounts to **a voluntary but uncontrolled mass experiment**, whereby many people are taking chemicals which have not been through regulatory structures designed to protect the safety of consumers. As with tobacco and alcohol, a more complete picture may only emerge after long-term health effects have had time to manifest themselves in statistically significant numbers of people.

On the specific drugs covered in the full report, **cannabis** leads to short-term impacts on the cardiovascular system which may affect vulnerable people, but the main long-term physical health impacts are likely to be those associated with smoking - e.g. oral / respiratory tract cancers. More uncertainty surrounds the extent of effects in the psychological / psychiatric areas. There has been much debate over the effects of cannabis on motivation, inter-personal relationships and occupational performance, where studies carried out have associated higher rates of cannabis use with deleterious effects on these aspects. Some studies have also associated cannabis use with the triggering of latent psychoses such as schizophrenia in susceptible individuals. Experts disagree over the extent of such effects. Some assign only a small number of cases of psychoses to cannabis origin, but others suggest that cases may well be missed at the point of diagnosis because psychiatrists may not consider a drug origin[2]. Because of its effects on cognitive and motor skills, cannabis also has implications for work and driving.

2. A new trend is to grow new breeds of cannabis with very high (10-15%) THC content. This increases the dangers of more powerful psychological effects and therefore the risks of cannabis-induced psychoses.

With **ecstasy**, there may have been 50-100 acute deaths over the last 5 years, as a result of taking the drug. The main causes of these have been hyperthermia or hyponatraemia (see full report), and flowed from the effects of MDMA on kidney function, on behaviour patterns and on the body's warning systems. Such acute deaths are unusual in 'recreational' users and have led some commentators to compare the risks with other every-day activities. If some 250,000 people take the drug each year, and if there are 10-20 ecstasy-related deaths each year, the crude risk of death is 1 in 12,500 - 25,000 per user each year. Those seeking to down-play the risk could compare it with the risks of being killed in a traffic accident (of a similar magnitude). Others would compare a tolerance of 20 deaths a year with society's reluctance to accept even slightly enhanced risks in other fields- whether contraceptive pills or beef.

But these risks only derive from the acute deaths, and there is additional concern among experts on other aspects - particularly on **MDMA's potential neurotoxic properties**. A highly plausible hypothesis predicts damage to neurons using the serotonin neuro-transmitter, at levels of exposure which are typical of moderate ecstasy use. Damaged neurons, when allowed to 'recover', regrow (in animal experiments) to connect to different locations. **These effects are a consequence of MDMA and not a question of purity** even if that can cause additional threats to health.

While some remain sceptical over the validity of extrapolating potential effects at the neuron level to effects on the brain as a whole, others point out that the foundations of all brain functions (memory, intellect, personality) are the individual neurons themselves, and that damaging and then changing neural connections could have effects on any aspect of the individual's mental activity involving those cells. They point to evidence of reduced serotonin levels in some ecstasy users, and anecdotal evidence that some are experiencing depression and other psychiatric complications, as consistent with the effects anticipated from the animal tests. Given the large numbers taking ecstasy, even a small proportion becoming clinically depressed would have significant social and health service implications.

On **amphetamines**, their earlier medicinal uses have been restricted due to adverse effects - e.g. the physical and mental exhaustion which can follow extended use and the danger of amphetamine-induced psychoses and dependence. Turning to **LSD**, evidence so far suggests the primary concern is over the unpredictable and sometimes long-lived psychological effects.

One trend which emerges from many of the studies covered by this report is the growing 'polydrug' use (in addition to the tendency for illegal drug-takers to also consume alcohol in significant quantities). This makes predicting the health impacts more complicated still.

EDUCATION AND PREVENTION

With the emphasis being given to drugs education in current Government policy under "Tackling Drugs Together", the full report examines the evidence on the adequacy and effectiveness of drugs education programmes. Points include:

Children **learn most about drugs from Television, next most important are friends, with schools education coming further down the list**. School-based drugs education can only form part of the picture, and TV producers should be aware they have as much if not more influence through the way they depict drugs.

Youth culture is a powerful factor to be reckoned with when considering the likely effectiveness of different educational approaches. In the past few years, drugs culture has had a profound influence on youth culture, helping to shape youth magazines, music, advertising / marketing, fashion and language.

Official sources are one amongst a 'sea' of information, and have to compete with much 'street' information which facilitates drug use, information available over the Internet, etc. etc.

There is a dilemma in deciding **how 'officially-funded' sources should be pitched.** Material which focuses on the negative health and psychological effects has limited impact because of the inherent exploratory and risk taking attitude of the young. 'Value-free' information describing the pleasant effects, and placing illegal drugs in 'perspective' relative to legal 'drugs' such as caffeine, alcohol and tobacco, may end up more of a 'Which's guide', blurring the differences between the drugs.

There are more **uncertainties** over the potential health effects of illegal drugs than for a pharmaceutical product. Such uncertainties allow the underlying science to be distorted. Those wishing to deter people from taking drugs may gloss over the inherent uncertainties, e.g. in extrapolating effects in animals to humans. Those wishing to take drugs may take false comfort from health effects remaining statistically 'unproven', even where a scientifically sound hypothesis exists for them.

Of the various drug education programmes, pupils rated those delivered in the **context of science lessons** as being most useful. **Parental and peer influences are important** - on the whole, parents exercise most influence on their children up to the age of adolescence, after which time peer influences play a bigger role in shaping young people's decisions.

In arguing for young people to make an 'informed' decision, the establishment wishes that decision to be 'no'. Yet many, even a majority, decide to the contrary. This suggests that drugs education might benefit from **a more consistent intellectual framework** to explain

why Society seeks to contain the use of certain drugs; one which would mesh with intuitive moral codes of the young. The full report discusses possible approaches. For instance:

- To emphasis the positive/ethical aspects of not taking drugs - i.e. respect for your own and others' natural (i.e. chemically unmodified) personality.
- The need to engage Society's problems rather than to escape from them through drugs.
- Many of the brain responses manipulated by drugs have evolved as 'rewards' for socially constructive behaviour. Drugs deliver such 'rewards' at unnatural intensity at whim, short-circuiting and possibly permanently disabling their socially constructive role.
- Philosophical principles include a duty to ourselves and to develop our own talents, to look at and judge our life as a whole.
- Drugs in sport are widely accepted as unethical. Yet the contexts of other drug-taking can also be 'competitive' and can thus be portrayed as unfair, disadvantaging those who do not take them.

Whatever the approach, t**he information needs of young people vary greatly**. The same information may be too little too late for some but too much too early for others. Some cite the significant proportion of school children not remembering school drugs education as evidence that more needs to be done in this area. Others see a risk in going too far, and stretching young people's knowledge beyond their needs or wants.

Pulling together such considerations, **leads to the option** of providing only a 'safety net' of education to all at school, using the science curriculum to deliver knowledge of drugs' *modus operandi*, their health and psychological effects; other parts of the syllabus for their legal status and the reasons for it. More detailed information would be made available via other channels to those who have an interest or need. Other routes through local health and community groups may be more suitable for more 'advanced' briefing on drugs and for harm reduction strategies, and customised access points might be developed to allow young people to make personally more informed decisions about drugs.

As mentioned in the full report, given the plethora of possible approaches, and the very limited success of those tried so far, **evaluation of methods currently under trial is important**. While evaluation is a priority of current policy, the question is how to measure 'success' in a meaningful way. One option would be to use **more operationally significant performance indicators** - for instance how pupils viewed the risks of drug-taking before and after the educational programme; whether their own attitude to the costs and benefits of taking drugs has shifted; whether they understand better some of the ethical principles involved.

OTHER ISSUES

The full report also looks at the technical issues associated with drug testing particularly aimed at controlling **driving under the influence of drugs**. **Detection** of drug-drivers could be improved by **training** to better equip officers to spot the 'giveaway' signs, and through **drug screening** tests conducted at police stations or in mobile drug laboratories. Any increase in detection would have resource implications, since each case taken forward would necessitate a confirmatory test in the laboratory. Over half a million drivers are stopped each year, and pass the breathalyser. If these were also screened for drugs, costs could be as much as £12.5M each year across the country. Moreover, this would bring into focus the legal difficulties of defining what constitutes unfitness to drive through drugs.

C**landestine chemical synthesis** of ecstasy, LSD and amphetamines is of significant interest to regulatory authorities. The full report looks at the ways in which technology is being harnessed to manufacture illegal drugs and the options for tighter controls.

The full report also looks at some of the technical issues which relate to the debate on the **legal status of cannabis**. One point of debate is over cannabis' place **'in perspective'** against alcohol and tobacco, and the report includes a recent comparison of the health effects of these substances. Another point of issue is the extent of cannabis' role as a '**gateway' drug** to other potentially more harmful substances.

One question is whether legalisation or decriminalisation would increase (or tighter controls reduce) consumption of cannabis. As discussed in the full report, the evidence **does support the intuitive conclusion that other things being equal, more cannabis is consumed under a 'liberal' regime than a 'repressive' one**. The responses to changes in the regulatory environment may, however, be relatively short-lived, and the ability of a single national regime to depart substantially from the international trends is limited, given the international nature of the market.

Finally, the full report looks at the remaining **data and research** needs, and the priorities in this complex field - these range from a need for better understanding on how the drugs exert their effects on the brain, what information influences actual behaviour/ choice, the area of drug dependence, and better information on prevalence and patterns of use. Also, given the priority attached to education, better evaluation methods are needed which measure outcome (as opposed to process). Larger scale, epidemiological surveys can also highlight social, economic, cultural and individual factors that influence drug-taking patterns.