Science Media Centre Fact Sheet

Novel ‘legal highs’ in the UK

Introduction

Various compounds are sold as legal highs in the UK, often through internet sites though also in some shops. ‘Legal highs’ as a term can be used to describe everything from alcohol and nicotine, through to herbal mixtures and compounds synthesised in the lab.

This factsheet will focus only on novel laboratory-made compounds which have recently made their way into the UK market, often referred to as ‘designer drugs’. The compounds focussed on are:

- Synthetic cathinones (e.g mephedrone, ‘bath salts’)
- 6-APB (Benzo Fury)
- Methoxetamine
- MDAI
- Synthetic cannabinoids (e.g. Spice, K2)
- AMT

Legality

Many legal highs quickly become controlled (see sources/further information for a report on regulation), and the above drugs have a varying state of legality. The sale of substances is controlled in the UK through two acts of Parliament:

1. The Misuse of Drugs Act 1971, through which ‘temporary class drug orders’ can be imposed before classifying substances as class A, B or C
2. The Medicines Act 1968, which prohibits the sale of compounds for human consumption, hence products are sold as ‘research chemicals’ or similar

Prevalence and availability

![Apparent country of origin of online shops offering 'legal highs' detected in the 2010 and 2011 Internet snapshots](image)
• Between 1997 and 2010, more than 150 new psychoactive substances were identified by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
• The rate at which new substances appear on the market has increased, with record numbers of new substances being reported - 24 in 2009, 41 in 2010, and 49 in 2011
• Most of the 41 new psychoactive substances identified in 2010 were synthetic cathinones or synthetic cannabinoids (see below for chemical classes)

![Number of new psychoactive substances identified in the EU](image)

**Number of new psychoactive substances identified in the EU**
(For further information on chemical classes of legal highs see sources/further information)

### Types of drugs & classes of compounds

Psychoactive drugs are often described using three broad categories based on their effects: **Stimulants, depressants and hallucinogens**. Like most drugs, legal highs fall into one or more of these categories:

<table>
<thead>
<tr>
<th>Stimulants</th>
<th>Depressants</th>
<th>Hallucinogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic cathinones</td>
<td>Methoxetamine</td>
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</tr>
<tr>
<td>6-APB</td>
<td>Synthetic cannabis</td>
<td>MDAI</td>
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<tr>
<td>MDAI</td>
<td></td>
<td>AMT</td>
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</tbody>
</table>

Drugs are also often described by the class of chemicals which they belong to, and these are often tied to their psychoactive properties as above. Three commonly referred to classes are **phenethylamines, tryptamines and cannabinoids**.

There are examples of both illegal drugs and legal highs which fall into each of these classes:

<table>
<thead>
<tr>
<th></th>
<th>Phenethylamines</th>
<th>Tryptamines</th>
<th>Cannabinoids</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Illegal drug</strong></td>
<td>MDMA (ecstasy)</td>
<td>Psilocybin (in magic mushrooms)</td>
<td>THC (in cannabis)</td>
</tr>
<tr>
<td><strong>Legal high</strong></td>
<td>Synthetic cathinones</td>
<td>AMT</td>
<td>Synthetic cannabis</td>
</tr>
</tbody>
</table>
Recent novel legal highs

Synthetic cathinones (‘bath salts’)
- Compounds sold as ‘bath salts’ or ‘plant food’ are typically powders and come under various trade names including Ivory Wave, Ivory Coast, Purple Wave, Vanilla Sky and Cloud 9
- These products usually contain a synthetic cathinone, and are based on phenethylamines, with stimulant and some hallucinogenic effects
  - Cathinone is an organic compound found in the khat plant – used traditionally as a stimulant in middle eastern countries
  - Cathinone is structurally very similar to amphetamine
- There are a large number of synthetic cathinones, including:
  - Mephedrone
  - Naphyrone
  - Desoxypipradrol
  - MDPV
- Mephedrone and many similar synthetic derivatives were made class B illegal drugs in the UK in April 2010, though there are similar compounds that fall outside of this legislation

Benzo Fury: 6-APB and 5-APB
- Products labelled as Benzo Fury, usually containing the compounds 6-APB or 5-APB, are sold in powder or pellet form
- 6-APB or 5-APB are of the phenethylamine class and have amphetamine-like properties
- Chemically 6-APB and 5-APB are similar to MDA, with a benzofuran ring replacing a similar chemical structure in MDA
  - MDA is closely related to MDMA, the compound most commonly referred to as ecstasy
- Compounds other than 6-APB or 5-APB can wholly or partially make up products sold as Benzo Fury, including:
  - D2PM (illegal)
  - TFMPP (illegal)
  - BZP (illegal)
  - Benzophenone (legal)
  - Caffeine (legal)
- 6-APB and 5-APB are currently legal in the UK

Methoxetamine
- Methoxetamine, MXE or Mexxy is sold as a powder and is a near chemical analogue of the illegal drugs ketamine and PCP
- It has a hallucinogenic and depressant effect
- It is billed as a ‘bladder friendly’ alternative to ketamine though these claims are as yet unsubstantiated
  - Chronic use of ketamine can cause severe bladder damage
- Methoxetamine is currently subject to a temporary class drug order in the UK

MDAI
- MDAI is an amphetamine-like phenethylamine, which became popular after the banning of mephedrone
- Along with some other similar compounds compounds, MDAI was originally developed for research into the effects of MDMA
- The chemical structure is directly derived from MDA, but it has distinct pharmacological properties
- MDAI and similar compounds are currently legal in the UK
Spice and K2: synthetic cannabinoids

- Products sold as Spice or K2 consist of packets of herbs and claim to have a similar effect to that of cannabis
- In addition to the herbs listed on the packaging, the products contained small amounts of synthetic cannabinoids – compounds that mimic the effect of THC, the active ingredient in cannabis
- There are various groups of compounds that mimic THC, often with a much higher potency, making the small quantities added difficult to detect
- 5 distinct chemical classes of synthetic cannabinoids were classified as a class B drug in the UK in 2009, though other compounds have appeared since then that fall outside the legislation

AMT

- AMT is an LSD-like hallucinogenic drug, of the tryptamine class
- AMT and similar tryptamines currently lie outside of UK legislation

Sources / further information

ACMD report into legal highs (2011) – see Annexes for drug related deaths and specific pharmacologies

ACMD reports
http://www.homeoffice.gov.uk/agencies-public-bodies/acmd/reports-research/

EMCDDA Annual Report 2011 - New drugs and emerging trends

Detailed information on compound classes of legal highs

Drugscope page on legal highs
http://www.drugscope.org.uk/resources/drugsearch/drugsearchpages/legalhighs

Demos and UK Drug Policy Commission report on regulation of legal highs

RedNet project technical reports on latest substances (more will be added)
http://www.rednetproject.eu/groups/

Temporary class drug order factsheet

Links to up-to-date scientific literature on almost any psychoactive substance
http://www.erowid.org/

Independent Scientific Committee on Drugs
http://www.drugscience.org.uk/

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