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## Legal highs

# 'Our purity is above 99%': the Chinese labs churning out legal highs for the west

Chinese factories are mass producing novel psychoactive substances that mimic banned substances, destined for an eager market in the US and UK



Time magazine called China the 'new front in the global drug war', as local labs are willing to churn out legal highs to ship abroad to the US, the UK and Europe. Photograph: Nicola Davison for the Guardian

**Nicola Davison in Shanghai**

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At midnight on a recent Friday, in a backroom at Chemsun Global pharmaceutical laboratory in Shanghai, a Chinese chemist who called himself Terry was eager to close a deal. Outside in the lab a bright yellow liquid whirred around a flask. The smell of fumes was so intense it left a bitter, chemical aftertaste.

The place was filthy: surfaces were strewn with discarded rubber gloves and in one corner a sack of white powder spilled onto the floor.

I was there to “inspect” the lab, to take stock of the wooden barrels full of drugs, but Terry wasn’t interested in small talk. “You just take the samples, right?” he said, near shouting. “Let’s just be quick. Tell me what you want, how much you want, then we can talk about price, we can talk about shipment.”

In the last decade, the global trade in drugs has changed in profound and unpredictable ways. The reality of drugs in the digital age is that on deep web markets any illegal drug, from marijuana to methamphetamine, is a click or two away.



The production process for a legal high. Photograph: Nicola Davison for the Guardian

Meanwhile the newly interconnected, globalised drugs scene has grown too complex and fractured for existing laws to control – a situation vividly illustrated by the rapid emergence of “legal highs”, or what official bodies call novel psychoactive substances (NPS).

**Legal highs** are chemical compounds synthesised in labs that stimulate or depress the central nervous system in a way that mimics banned substances such as cannabis or cocaine. Chemists tinker with the structure of NPS compounds so that they fall outside international drug controls – at least when they first emerge.

And more of them are reaching the market every year: since 2009, the number, type and availability of these drugs has seen an “unprecedented increase”, according to a report by the European Monitoring Centre for **Drugs** and Drug

Addiction (EMCDDA). Scores of new substances are reported in Europe and the US each year, and drug control agencies have now categorised more than 400 substances.

Drug policies in consumer countries such as the US and UK were conceived long before the internet and globalisation radically transformed the drugs market.

The deluge of toxic substances, hyperventilating media coverage and a recent spate of hospitalisations have shattered any illusion of government control.

In the last month, [New York, Mississippi and Alabama](#) have all issued state health alerts following a dramatic rise in [NPS overdoses](#), while Arizona, Florida, New Jersey and Texas report a similar surge. In Tuscaloosa County, Alabama, where one person died and two dozen were hospitalised after taking “spice,” police declared a public safety crisis.

Curtailing NPS has been a “priority” for the Drug Enforcement Administration (DEA) since 2012, but last year one in five Americans told the Global [Drugs](#) Survey that they had taken a legal high in the last year – more than any other country in the world.



A pack of Spice Gold. Photograph: Alicia Canter for the Guardian

All this has happened in a relatively short time. The mass production of legal highs began only in 2008, when UN drugs officials destroyed 33 tonnes of safrole oil, a precursor of MDMA, in Cambodia.

As MDMA stocks in Europe dwindled, suppliers shopped around for an alternative – and found mephedrone, a substance that was chemically similar to MDMA but not controlled in the UK. For the two years before it was banned, users could not get enough of this cheap, cocaine-meets-ecstasy high.

**Pharmaceutical companies such as Pfizer originally developed synthetic cannabinoids** – drugs designed to mimic the effect of cannabis – as research tools to investigate the mechanisms of the brain’s endocannabinoid system for clinical therapy.

Vendors began trawling obscure scientific journals for compounds, consumers described their highs on online drug forums, and the nascent market took shape. Wholesale importers in the UK, US and Europe put in bulk orders from chemical companies to be delivered through the post or by international couriers.

**China** has long been the world’s factory for anything from iPhones to Christmas tree lights, so it was perhaps inevitable that it would fill the same role for drugs: local labs churn out huge amounts of chemicals for legitimate pharmaceutical or industrial purposes – so it was not hard for importers to find dozens of firms in Shanghai able to produce vast quantities of legal highs.

Local officials, if adequately bribed, would look the other way; the Chinese government was more concerned with rising domestic consumption of banned drugs than chemicals that are legal and headed abroad.

China, as one headline in Time magazine put it, soon became the “**new front in the global drug war**”.

I had been emailing another Shanghai chemist named “Charles” for months about a hypothetical order of a cannabinoid called AB-Chminaca (AB-C), a substance which is banned in the US, but not the UK. The headquarters of his company is on the 12th floor of a near-deserted office building on the edge of the city. On arrival, I am ushered into a meeting room and given a paper cup of steaming, loose-leaf green tea.

Charles’s company will sell 1kg of AB-C for £1,120 (\$1,720). On a UK vendor site, 10g costs £60 (\$92). Based on this sales price, the vendor makes £4,880 (\$7,500) profit per kilogramme before shipping, processing and packaging.

I ask whether Charles can guarantee delivery. “We divide into one kilo packages and can ship all in one day,” he says. “If you write down a couple of addresses, I can deliver 50 kilos.”

After a lunch of prawns with rice noodles and pumpkin – Charles chain smokes throughout – we drive across the city to an industrial park in the district of Pudong.

At the door a chubby woman in her 30s with cropped hair and a white coat greets us: she is the head chemist. We walk through a spotless lab of quietly industrious technicians (“I like a clean lab, I’m a girl,” says the chemist) to an expensive-looking machine that performs gas chromatography-mass spectrometry analysis. “Our purity is above 99%,” she says with pride.

A large plastic bag contains some 50 samples of off-white powders and crystals – stimulants, depressants, opioids. We sit down to talk. “I’m afraid this [compound] is not good,” the chemist says in accented English. “Firstly, somebody give us the feedback that it’s not strong. Second, it seems it has already [caused] dead in Russia. Do you know the news? So why do you still want it?”

She has a theory that the drug’s uneven performance is the result of clumsy synthesis, of molecules substituted in the wrong places. Does she know anything about its potency? “We know nothing about the performance side,” she says, hastily. “We are just chemists.”

AB-C was first mentioned on drugs forums in early 2014. As a synthetic cannabinoid it is one of the most popular types

of NPS and is a derivative, or close chemical cousin, of AB-Fubinaca, a substance [banned in February 2014 in the US](#).

Cannabinoids are designed to work in the same way as tetrahydrocannabinol (THC), the constituent of cannabis that acts on receptors in the brain to produce a psychoactive effect, or a high.

Today they are typically dissolved in solvents and sprayed on plant material before being packaged in 1g-3g foil packets with brand names such as Spice, K2 and Herbal Haze. They are labelled as “incense”, “research chemicals” or “potpourri” and marked not for human consumption so as to be sold legally in convenience stores, head shops or online. Vendors do not include dosage advice to avoid condoning use and breaking the law.

In order to keep ahead of legal control, the NPS market must constantly evolve: a small variation on the chemical structure of a banned drug allows the new substance to skirt most legislation – but this tiniest molecular tweak can create a drug with dramatically different psychoactive effects.

AB-C is active at a far lower dose than its parent compound, so mistakes are easily made. In a February post on an online drug forum, one user – who described himself as “very experienced” – described his accidental overdose of AB-C: “I drop onto my bed, towel over my face, wet hair, wet body, split naked, open windows at freezing point, blankets underneath [sic] me, I couldn’t care less. I’m so stoned, so so stoned ... Am I gonna die?”



AB-Chminaca, one of the most popular types of legal highs. Photograph: Nicola Davison for the Guardian

Under a haze of misinformation, the reality is that most people smoke whatever “spice” comes in the packet.

On 2 April, Alan Jones, chair of the emergency department at the University of Mississippi Medical Center in Jackson, received a phone call from a nurse in the ER. “She told me that we were receiving our fourth patient by ambulance who had reportedly used spice – the fourth patient in two hours,” he said. “We don’t typically see that.”

Over the next 72 hours, a further 25 patients arrived, and Dr Jones notified the state health department. “I have been working in emergency medicine for almost 20 years, and I’ve never seen anything like this,” he says.

Since early April, more than 500 people from almost every county in Mississippi have sought emergency medical treatment after overdosing on spice. The youngest patient seen at the hospital was 14.

Most arrive hallucinating, agitated and profusely sweating. Often, because they are confused, they are violent. “A couple of patients have had problems with their breathing – not breathing sufficiently to maintain life,” Dr Jones says.

A toxicological analysis of the Mississippi compound identified MAB-Chminaca, an AB-C derivative.

Since the DEA first encountered AB-C in March 2014 it has caused at least four deaths in the US. Adverse effects from taking the drug includes coma, loss of motor control, difficulty breathing and convulsions, [according to the DEA notice that temporarily banned AB-C and two other cannabinoids in December 21014](#). (AB-C is legal to sell in the UK.)

Soon after the ban, users of online drug forums started discussing which compounds could be “compared to or better than” AB-C. MAB-Chminaca was considered a sound alternative, and the endless “game of whack-a-mole”, as one DEA official has put it, continued.



'I have been working in emergency medicine for almost 20 years, and I've never seen anything like this', said Jackson doctor when nearly 30 patients arrived within 72 hours after overdosing on 'spice'. Photograph: Thomas Wells/Reuters  
The emergence of NPS has created an unprecedented challenge for drug policymakers worldwide. The current global prohibition on drugs was established by UN treaties dating back to the 1960s and has been incorporated into the domestic laws of 150 countries. Its roots are in the US prohibition of alcohol 1920-32, a costly experiment that failed to stop people drinking and instead fuelled a black market in moonshine run by rapacious gangs.

In 1971, US president Richard Nixon rebranded prohibition as a “war on drugs”.

Within prohibition, the UK and US use subtly different legislation, though neither approach has successfully stemmed NPS.

The US “analogue” controls can designate a substance not named in legislation illegal if it is “substantially similar” to a drug already controlled – a system criticised for being ambiguous.

In contrast, the UK’s “generic” controls list individual drugs or families on the recommendation of the Advisory Council on the Misuse of Drugs (ACMD), a body of scientists, academics, police and other experts.

But this system proved too clunky – it could take months for the experts to conclude a drug was unsafe – so in 2011 the UK introduced new measures called [Temporary Class Drug Orders](#), allowing the government to temporarily ban a substance while evaluating its harms. Despite these measures, only 60% of known cannabinoids are currently controlled in the UK.

More on this topic

Danny Kushlick, head of external affairs at

The North Korean Walter Whites funnelling crystal meth into China Transform, a British drugs reform thinktank, calls the UK's legislative response to NPS "terrible".

One of the "unintended consequences" of prohibition, according to the UN's Office on Drugs and Crime, is "substance displacement", whereby the control of one substance causes suppliers and users to move to another drug with similar effects but fewer controls.

"Legal highs appear to have arisen because of success in the enforcement on the supply side for cocaine and ecstasy particularly," Kushlick says. "The demand remains and the entrepreneurs, whether they be criminal or legit, move in to exploit that demand."

[Mike Power](#), author of *Drugs 2.0*, argues that the answer to the legal high dilemma does not lie in punitive controls and the annual spending of millions of taxpayers' dollars. Drugs law should be progressively dismantled, he says, recommending the introduction of a controlled, regulated market of cannabis as seen in Colorado.

"The strength and potency of the drug would be limited by law, with accurate labelling and age requirements for prospective users demanded as we currently have with alcohol," he says.

Kushlick, too, advocates legalising the more benign substances. "When prohibition goes and we have legally regulated markets for drugs that have been used, in the case of cannabis, for millennia, people will choose to use those," he says. "Why would you want to use a random white powder?"

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