SPECIAL REPORT

Opiates for the masses

Afghanistan produces almost all of the world's illegal opiates. Should it eradicate the poppy trade or experiment with legalizing it to make painkillers for the developing world? **Katharine Sanderson** reports.

During the next few weeks farmers in one of the world's poorest countries will begin sowing seeds for what is expected to become the biggest and most lucrative opium crop yet. Field upon field of beautiful blooms belie a dark legacy that wends a destructive path from the growing fields of Afghanistan to individuals in cities thousands of miles away.

Yet opium and its derivative heroin are the biggest cash exports in a country ravaged by war — the livelihoods of whole communities depend on the crop, which represents more than 40% of the country's gross domestic product. And it's not just Afghan villagers earning from the crops — insurgents, warlords, the Taliban and terrorist groups obtain a large part of their funding through trade in illicit narcotics, according to the United Nations Office on Drugs and Crime (UNODC), headquartered in Vienna, Austria. The nation's opium production — accounting for 93% of global illegal production — exceeds the world's demand for illicit opiates by more than 3,000 tonnes, according to a UNODC report released last month.

Opium poppy (*Papaver somniferum*) cultivation in Afghanistan is up 17% on last year, to 193,000 hectares. Good weather meant that each hectare yielded more opium — the crop in 2007 was up by more than one-third from 2006. It is an attractive crop for farmers in times of insecurity — opium lasts for a long time without spoiling, unlike other perishables. And, of course, it attracts high prices. In 2007 the average 'farm-gate' price of opium was US\$122 per kilogram. The southern province of Helmand, where there is little security and Taliban insurgents exert a huge influence, is now the world's biggest supplier of illicit drugs — the total opium income for farmers in that province was \$528 million. In 2006, according to the US state department, the export value of opium from Afghanistan was \$3.1 billion (for 6,100 tonnes), but by the time it reaches the streets of London, UK, for example, its price rises to about £20 billion (\$38 billion).

Internationally, the consensus is that the situation is at crisis point, but there remains intense disagreement on the best course of action. The United Nations and the Afghan government

have both called for assistance from North Atlantic Treaty Organization (NATO) troops to help to eradicate poppies. But last week NATO reiterated its opposition to direct action, saying: "The NATO International Security Assistance Force (ISAF) does not allow for ISAF to be directly involved in poppy eradication." Many fear that the sight of NATO troops ripping up crops would damage relations with ordinary Afghans and drive them towards the Taliban.

To spray or not to spray?

So what should be done? Many argue that indiscriminate aerial crop-spraying will be the only effective option. "Very strong pressure is now building up in favour of aerial eradication," UNODC's executive director, Antonio Maria Costa said recently. The United States also strongly supports this stance, and is leading the push to spray the growing poppy fields. But Afghan president Hamid Karzai is opposed to the idea. However, in a direct contradiction, Ahmad Zia Massoud, one of Afghanistan's vice-presidents, recently called for spraying.

His view is not shared by a number of other bodies. "We are against the policy of aerial spraying," says the British Embassy in Afghanistan's counter-narcotics expert. "We would likely be handing the insurgents a propaganda tool." Every subsequent birth defect, or "two-headed cow" would immediately be blamed on the spraying, he argues.

With the population so financially dependent on the crop, international bodies are increasingly looking at alternatives to eradication to address the illicit drugs trade problem, including introducing a legal, licensing scheme. On 12 September, the European Parliament's Committee on Foreign Affairs issued a report calling for its council to put a proposal to the Afghan government for turning part of the poppy crop into legal analgesics, such as morphine and codeine.

The Senlis Council, an international think tank with an office in Kabul, has its own scheme, called the Poppy for Medicine programme, which would give control of opium production to local communities, and would license them to produce morphine powder from their crop. "It's not just a policy choice, it symbolizes

"Legalizing trade symbolizes what sort of relationship you want to have with the Afghan people."

Heads in the clouds: heroin and morphine can be derived from the gum in opium poppy seed heads.

what sort of relationship you want to have with the Afghan people," says Norine MacDonald, president of the scheme. Opium-licensing schemes in Turkey, introduced in the 1970s, and a longer-running scheme in India have proved successful, MacDonald points out.

Law and order needed

But the proposal has its critics. "Legalizing is not an option," says Susan Pittman, from the US state department. And the British agree: "In order to have licit cultivation you need to have law and order," and Afghanistan is not in that situation. "You'd be putting the Afghanistan government in competition with the narcotics traders," the British Embassy spokesman says.

The Embassy's view is that producing morphine in Afghanistan would be uneconomic because of cheaper fertilizers and automated systems in other countries. The Senlis Council claims that in its Poppy for Medicine schemes, groups of farmers would sell their morphine to the Afghan government for \$3,100 per kilogram — a significant mark-up on the current gate-price of opium — and the government could then sell it on for \$4,300 per kilogram.

Opium is first processed to a crude morphine base, morphine hydrochloride. This can then be converted to either morphine powder, or heroin (see 'From flower to needle').

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BEAUTY IS IN THE NOSE OF THE BEHOLDER

Gene found that determines whether human pheromone smells nasty or nice.

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expert says that this is a misconception. "There may be fundamental problems with supply," he says, and problems with distribution, but "there is not a worldwide morphine shortage."

"For the past two decades morphine has been available in sufficient quantities at the global level to cover the demand," says Margarethe Ehrenfeldner from the International Narcotics Control Board (INCB) in Vienna, Austria. That morphine comes from licit opium, produced mainly in India, Turkey, Australia, France, Spain and the United Kingdom. GlaxoSmithKline, for example, supplies 25% of the world's medicinal opiates from poppies grown in Tasmania in Australia.

But the Senlis Council claims that the INCB's data are skewed. It says that the market demand defined by the INCB is not the same as the actual need for morphine and other poppy-derived medicines, such as codeine. The need for morphine in developing countries is underestimated because of a self-perpetuating cycle of under-prescription and inhibitory import regulations, the Senlis Council says. And Ehrenfeldner admits that some governments report low levels of morphine consumption. "The INCB and WHO are taking measures to increase accessibility of analgesics worldwide," she says, "however, this cannot be accomplished in the short run."

The Senlis Council had hoped to have its pilot scheme up and running by the October growing season, but this is looking "unlikely," it now says. The plan for a new Afghan industry in legal opium production could be thrown into jeopardy if aerial spraying is carried out during the February 2008 harvest. "The deal was essentially that if cultivation was up next season on 2007's, the United States would absolutely spray this coming year," says Senlis's Brigitte Scheffer. ■

To produce 1 kilogram of morphine takes around 8 kilograms of opium. According to the UNODC, this year's opium crop in Afghanistan — 8,200 tonnes — would produce 1,170 tonnes of heroin. Most of Afghanistan's opium is converted to heroin within the country, mainly in labs set up near the border with Iran. Surveyors reports showed that the number of these labs increased in 2007. The trafficking process includes bringing the chemicals needed to convert opium to heroin into Afghanistan. Under the Senlis Council proposal labs would be set up locally to produce morphine powder directly.

One of the Poppy for Medicine programme's strongest arguments is the need to provide painkillers to countries where there is a shortage, including Afghanistan itself. In North America, average annual morphine consumption is 55 milligrams per person, in north Africa and the Middle East this plummets to 0.29 milligrams per person, and in the Asia Pacific region it is 0.67 milligrams per person. "Afghans don't know what painkillers are; it's a rich person's idea," says MacDonald, who says that there is a large unmet need for painkillers. But the British Embassy counter-narcotics

From flower to needle

Opium comes from the poppy's seed pod. When first extracted it is a white gum, which turns into a black tar over a short period of time once it is released from the pod. This crude opium gum contains more than 20 alkaloid compounds. Morphine is one of those alkaloids, and makes up 10–20% of the gum, depending on the plant and the growing conditions. The amount of morphine is also related to the gum's codeine content, which varies from 1% to 3%. Heroin is not present in the opium gum but is produced through further

chemical reactions on morphine.

Morphine can be extracted easily: the opium gum is usually placed in a large drum filled with boiling water and lime (calcium hydroxide). This converts the morphine into calcium morphenate, making it water-soluble. Other organic molecules remain insoluble, and can be removed. As the solution cools, the calcium morphenate can be scraped out of the barrel, filtered, washed with ammonia, and dried to form a crude morphine clay. The conversion to heroin is a two-step process, and involves heating

An Afghan farmer collects poppy gum.

the morphine clay with acetic anhydride to replace both hydroxyl (OH) groups with acetyloxy (OCOCH₃) groups, leaving a crude form of diacetylmorphine (heroin). Further purification is needed to get

a sellable heroin base.

One kilogram of opium will produce 100–200 grams of morphine and 10–30 grams of codeine. More codeine can be made by replacing one of morphine's OH groups with a methoxyl (OCH₃) group.

And as the yield for the transformation to heroin is around 68%, depending on the production method, that single kilogram of opium, transformed to morphine, will produce about 60–70 grams of heroin.

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