

# Recent Deaths Possibly Linked to Fentanyl

April 2017

## Key Judgements

- Fentanyl – a powerful synthetic opioid - has recently emerged into the UK heroin street market in the North East of England. It is likely a contributory factor in recent multiple heroin-associated deaths.
- We do not fully understand why fentanyl is being introduced as an additive to heroin, to what extent users are aware of the addition, or whether there is an emerging demand for it. US and Canadian analysis suggested that the introduction of fentanyl into their heroin markets led to rising demand and profit margins, but the UK market differs from North America and we have not seen any evidence to date of UK heroin users demanding fentanyl-laced heroin.
- We assess that fentanyl was previously not prevalent in the UK, only emerging in late 2016. It is unlikely that fentanyl has been an instrumental factor in the gradual increase in heroin related deaths since 2013; heroin users remain vulnerable to overdose from high purity heroin even when fentanyl is not present.
- It is possible that the number of deaths attributable to fentanyl will rise further due to the time lag in revealing toxicology results after testing, and as a result of back-testing of toxicology blood samples (fentanyl does not show up in standard toxicology results).

## Assessment

### Possible Fentanyl-related Deaths

There has been a recent increase in deaths attributed to heroin in the North East of England. Some of these deaths have shown signs of being very sudden, potentially indicating an immediate and fatal overdose. Recent results from toxicology samples submitted for specific fentanyl screening generated 'additional substance' detections.

Separately, heroin tested from street seizures in the Yorkshire area confirm the presence of fentanyl. Additionally, a post-mortem on a victim of a heroin related death in April 2017 showed traces of the substance carfentanyl, a fentanyl analogue that is 100 times more powerful than fentanyl.

It is possible that the number of deaths attributable to fentanyl in late 2016/early 2017 will rise further. This is due to the delay in access to toxicology results after testing, as well as the delay of back-testing toxicology blood samples which were not previously screened for fentanyl (fentanyl does not show up in standard toxicology results). Following targeted testing, additional heroin related deaths in the North East have now been identified as showing positive results of fentanyl.

Until late 2016, very few deaths in England and Wales had been attributed to fentanyl. Deaths involving heroin and/or morphine in the UK doubled in 2015 (from the end of 2012) to 1,201 and are now the highest on record. This rise in deaths has coincided with an increase in the purity of street level heroin during this period. However, we judge it unlikely that fentanyl was an instrumental factor in this increase in deaths; heroin users remain vulnerable to

Fentanyl is a powerful synthetic opioid analgesic, originally created for surgery recovery and treatment of short term pain. It is similar to morphine, but is 50-100 times more potent. Although fentanyl is abused as a substance in its own right, it is more commonly detected as an additive in heroin. In recent years it has grown in prevalence across North America and Europe and now appears to have entered the UK heroin market. Further background information on fentanyl is provided in the annex at the end of this document.

overdose from high purity heroin even when fentanyl is not present and tolerance to heroin use can decrease rapidly even after only a short period of abstinence.

### Demand for Fentanyl

We do not yet fully understand why fentanyl is being introduced now, to what extent users are aware of its use as an additive to heroin, or whether there is an emerging demand for it. We have not yet seen any evidence that UK heroin users are demanding fentanyl-laced heroin. We have also not seen the use of fentanyl in counterfeit prescription medicine in the UK to date.

Prior to 2017, we had seen no evidence of conventional supply of fentanyl within the UK drug street market. The prevalence of fentanyl abuse in the UK was previously assessed as low due to the high purity level of heroin at street level in the UK, as well as the reputation of fentanyl as being dangerous. Additionally, the lower demand for counterfeit medicines in the UK compared to the US makes this method of fentanyl consumption less likely.

In the US, superior profits provide a motivation for crime groups involved in illicit fentanyl supply. Canadian analysis reports that heroin users who become familiar with fentanyl-laced supplies report a greater 'high' and different effect, which likely drives demand.

The US and Canadian experience may highlight possible motivation of local heroin distributors and street dealers in the UK in introducing fentanyl. However, a background of significant exploitation of prescription drugs, demand for counterfeit tablets and (in the US) prevalence of low grade heroin make for a different environment in North America to that experienced in the UK.

### Considerations and Risks

Lethal overdose can be caused by the ingestion of minute quantities of fentanyl analogues. This includes being absorbed via the skin and through an intake of breath. The public need to be aware that potentially contaminated heroin is in local/regional circulation, but there may be a delay in forensic data and toxicology results confirming this to be the case.

Fentanyl analogues are relatively stable and, as such, remain in the bloodstream after death. This allows the substance to be detected when tested for during post mortem. Blood samples are retained for six months affording opportunity to back test samples. However, as fentanyl is not routinely screened for, it could be a contributing factor in more deaths than is otherwise known. Contact with the local Coroner's Office would need to take place to establish whether routine screening for fentanyl is being conducted within toxicology after a specific death.

The Justice Institute of British Columbia (JIBC), Canada's leading public safety educator, has launched a fentanyl website for first responders containing information about the safe handling and processing of suspected fentanyl. The website can be found at [www.fentanylsafety.com](http://www.fentanylsafety.com).

## Annex

In the UK, Fentanyl and other analogues are Class A controlled drugs, under the Misuse of Drugs Act 1971. Additionally, the substance, and some of its analogues, are referenced in the UNODC Schedule I of the 1961 Single Convention on Narcotic Drugs; some fentanyl analogues are further placed in Schedule IV, the strictest control regime of that Convention.

Like heroin, morphine, and other opioid drugs, fentanyl works by binding to the body's opioid receptors, which are found in areas of the brain that control pain and emotions. Opioid receptors are also found in the areas of the brain that control breathing rate. Fentanyl can cause breathing to slow down and, in lethal dose levels, stop completely.

Fentanyl's effects resemble those of heroin and include euphoria, drowsiness, nausea, confusion, constipation, sedation, tolerance, addiction, respiratory depression and arrest, unconsciousness, coma, and death.

Although fentanyl is abused as a substance in its own right, it is more commonly detected as an additive in heroin. Small margins of error in dosage can result in death. Poor mixing methods when adding fentanyl to heroin or in the manufacture of counterfeit prescription pills can lead to overdose.

One fentanyl analogue, known as carfentanyl is approximately 100 times more potent again compared to fentanyl. Carfentanyl is used by vets to sedate large animals, such as elephants, and is not intended for human use. The lethal dose of fentanyl is extremely small at approximately 2 milligrams. Carfentanyl toxicity is even smaller, with lethal dosage in measured in micrograms.

Pharmaceutical brand names containing fentanyl include: Sublimaze (intravenous), Abstral (sublingual tablet), Actiq (lozenge or 'lollipop'), Duragesic (transdermal patch), Fentora (buccal tablet), Ionsys (transdermal device), Lazanda (nasal spray) and Subsys (sublingual spray).

### Fentanyl Prevalence in North America

Fentanyl abuse is at epidemic levels in the United States. In recent years the demand for fentanyl within recreational user drug markets in the US and Canada has grown significantly. Fentanyl initially entered the US illicit drug market through OCGs mixing the substance with low quality Latin American-produced heroin to increase potency. Subsequently, due to the high demand for prescription drugs made expensive by US private healthcare, drug cartels have increased production and supply of counterfeit pills (primarily Oxycodone) to exploit these high prices.

Canada has also experienced the emergence of fentanyl and associated deaths, despite Afghanistan being the source of a greater proportion of their imported heroin.

In September 2016, the DEA issued a warning about the rise of the fentanyl analogue carfentanyl. This drug has already been linked to 19 deaths in the United States (US) and is also now prevalent in Canada.

### Fentanyl Prevalence in Europe

In the past two years there has been a growth in fentanyl prevalence across Europe, which has led to an increase in associated deaths. In 2016 in Europe, there were three deaths linked to the fentanyl 4-chloro-isobutyrfentanyl (4CI-iBF) and four deaths linked to 4-fluoro-isobutyrfentanyl (4F-iBF). Both 4CI-iBF and 4F-iBF were detected for the first time on the European drug market in 2016.

Fentanyl substances have been detected in various formats across Europe; in a capsule, as a white powder (Denmark and Netherlands), as a light-green powder (Slovenia and Estonia), as a brown or light brown powder (Estonia), as a ready-to-use nasal spray (Sweden) and as light blue tablets (Finland).

In September 2016 EMCDDA produced a report on the prevalence of acryloylfentanyl, identifying 95 seizures in five EU member states: Denmark (1 seizure), Estonia (9), Finland (1), Latvia (2), and Sweden (82). Most seizures were made at street-level. Two seizures were made at a scene of death and one seizure was made in prison from incoming mail.

Information about 63 serious adverse events associated with acryloylfentanyl was reported to the EMCDDA by 4 Member States (Denmark, Finland, Latvia and Sweden). These cases comprised 21 acute intoxications and 42 deaths.

### Toxicology

Fentanyl and some other analogues can currently be detected within forensic examination. However, carfentanyl is more problematic, as (with toxicology) the minimum amount detectable within a sample (through current testing) is not known.

Fentanyl, flurofentanyl and certain other analogues will be identified post mortem, but only if specific tests are conducted. Carfentanyl has no human uses and there have been no known clinical trials. It therefore remains more difficult to definitively test for, as the actual levels of presence (required for an indication) are not known.

Recently ingested Fentanyl will likely identify in toxicology. If it is present in the body at the time of death, it is detectable. This is contrary to some previous messaging.

As toxicology blood samples are retained for 6 months, this affords opportunity to back test samples where the 'fentanyl test' was not previously routinely conducted. The current experience in the North East is confirming 'heroin related deaths' previously having not revealed fentanyl use, are now returning positive results following submission of samples for specific screening.

Toxicology results can typically be revealed 6 weeks in arrears from testing. For this reason the full extent of heroin related deaths attributed to fentanyl is not clear.

