Forensic Science Unit

Report on the Quality of Diamorphine Seized in Scotland
2010 - 2011
SCDEA Forensic Science Unit

Report on the Quality of Diamorphine seized by Police in Scotland, 2010 to 2011

The reader is advised that all references to diamorphine (heroin) in this report relate to heroin base only. Although not completely absent from the market, diamorphine hydrochloride is not commonly encountered in the UK.¹

Introduction

A briefing paper was distributed by the SCDEA in August 2011, highlighting the drop in diamorphine quality toward the end of 2010 and into 2011. In that report, the average diamorphine purity was charted over this period, clearly demonstrating that despite still being available (with some notable pockets of shortage) the quality had fallen to a fraction of its usual purity. This report expands and updates the briefing paper and adds some context and additional information.

It is widely accepted that the reason behind the drop in diamorphine purity was a decrease in its availability within the UK. This shortage led to the dealers adulterating the drug more than normal to ensure the market was sustained.

The reasons behind the decrease in availability of diamorphine in the UK are complex and will be examined in more detail later in this report.

This report is based upon the examination of all wholesale diamorphine cases, comprising of 1 kilogram blocks (13 records), ½ kilogram blocks (54 records) and ¼ kilogram diamorphine blocks (41 records) submitted to SPSA Forensic Services in 2010 and 2011. In the diamorphine trade, the one ounce unit is a significant dealer quantity and therefore this level of package has also been chosen for scrutiny (95 records). Finally, all the available street level purities (224 records) are also included.

Average diamorphine purities from 2010 to 2011

From years of forensic analysis, it is known that the purity of diamorphine varies enormously and for this reason it is difficult to make detailed analyses and form clear conclusions as can be done with cocaine.

¹ SOCA Report FOR-2744 Heroin Purities Police 2011 v1.0
The numerical average, albeit a blunt statistical instrument due to the inclusion of wholesale, middle-market and street level data points, is useful to observe the trend in diamorphine purity over a long timeframe. The data for average diamorphine purities from January 2010 to December 2011 are presented in the graph below:

![Graph showing average Scottish Diamorphine Purities 2010 - 2011](image)

**Figure 1: Average Diamorphine Purities, Scotland 2010 – 2011**

As can be seen from the chart, the average diamorphine purity was very gradually falling in 2010, going from 29 to 25 % by October time. However, at the end and turn of the year there was a dramatic fall in purity which troughed in January at 4 %. In February 2011 the purity began to recover and gradually increased until April when there was a plateau before the purity dropped slightly once more. By the end of 2011, although slight increases were observed, the purity had not recovered to the pre-shortage level (12 % cf. 25 %). The low average purity in December (6 %) should be treated with caution as it is based on only a small number of data points and may not be a reflection of the true average.

At the same time as the dramatic drop in Scottish average diamorphine purity, the general trend of a severe diamorphine shortage was also observed in several other European countries, notably Bulgaria, Ireland, Hungary, Slovakia, Switzerland and the UK as a whole. Belgium, France and Portugal saw no change (or a slight increase) in diamorphine purities. Some countries in Europe saw a protracted reduction in purity like that observed in the first part of 2010,
but failed to see the sudden drop like that endured in the UK, \(^2\,^3\) so it was by no means a shortage across the board.

**Changes in the Wholesale Market**

The purities of wholesale blocks of diamorphine are plotted below and clearly shows a wide range of values from a low of 1% in 2011 to a high of 64% in 2010. Comparing the 2010 values with the 2011 values, the quality of the wholesale blocks decreased sharply in 2011, with the vast majority of blocks having purities in the lower part of the chart (less than 20%).

![Wholesale block diamorphine purities](image)

*Figure 2: Purities of Wholesale block Diamorphine Blocks recovered in Scotland in 2010 and 2011*

**One ounce packages**

As already stated, one ounce\(^4\) is a significantly large unit in the supply of diamorphine. Wholesale blocks are commonly split into one ounce deals and sold by dealers in what is referred to in some areas as the ‘middle-market’. It would appear that adulteration from wholesale to one ounce level is not extensively done as the charts for these levels are very similar. Again, a wide range of purities are observed. When the comparison is made between quantities at one ounce dealer unit level in 2010 and 2011, a practically identical

\(^2\) EMCDDA Trendspotter Summary Report – Recent shocks in the European heroin market: Explanations and Ramifications.

\(^3\) DrugLink, Volume 26, Issue 2 March/April 2011 – The Great Heroin Crash.

\(^4\) For the purposes of this report, one ounce quantities have been defined as being in the weight range of 24 to 30 grams.
pattern of much lower purities in 2011 is observed (the vast majority less than 20%) as the graph below illustrates.

![Graph showing 'One ounce' level Diamorphine purities](image)

*Figure 3: Purities of one ounce quantities of Diamorphine recovered in Scotland in 2010 and 2011*

‘Street level’ deals

For the purposes of this report ‘street level’ is taken as being all deals with weights smaller than 0.2 grams (200 milligrams). Again, a wide the wide range of purities is seen and the same trend of significantly lower purities in 2011 is observed.

![Graph showing Street level Diamorphine purities](image)

*Figure 4: Purities of street level quantities of Diamorphine recovered in Scotland in 2010 and 2011*
The three charts above show the extent to which diamorphine quality at all points in the market decreased significantly in 2011.

**The average street level diamorphine purity for 2011 was 7% and the average street level diamorphine purity for 2010 was 29%.**

**Cutting agents**

The major cutting agents identified during forensic analysis of diamorphine samples recovered in Scotland include paracetamol, caffeine, diazepam, benzocaine and phenacetin. Other drugs are occasionally observed in samples of diamorphine and in 2011 these included gabapentin\(^5\) and griseofulvin\(^6\).

The presence of benzocaine and phenacetin (cutting agents that are normally associated with the cocaine market) in police-seized diamorphine samples suggests these chemicals are widely available in the UK and may indicate that those involved in the cutting of diamorphine are also engaged in or with others engaged in the cocaine market.\(^7\)

As well as the cutting agents found within diamorphine samples, in 2011 the police made a significant number of recoveries of brown powders that are assessed to be cutting agents for diamorphine. The majority of these were found to be mixtures of paracetamol and caffeine. In one case, a brown powder benzocaine and caffeine mixture was found and in another case a brown powder was found to contain paracetamol alone. Recently recoveries of wholesale blocks have been made where the diamorphine is recovered along with brown powder cutting agent, ready for mixing.

*It is known from examinations by other forensic laboratories that mannitol which is not detected by routine forensic analysis is also used for the adulteration of diamorphine.*

**Implications**

There are noticeable trends that emerged as a result of the shortage and these continued throughout 2011. They can be summarised as follows:

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\(^5\) Gabapentin is a drug that was developed for the treatment of epilepsy and is used to relieve neuropathic pain. There is some evidence that gabapentin is misused as it is commonly recovered by police in Scotland and within the prison estate.

\(^6\) Griseofulvin is an antifungal drug used to treat ringworm and fungal infections of skin, nails and hair.

\(^7\) SOCA Report, 2009. Heroin Cutting Agents within the UK Drugs Market.
• The lack of good quality diamorphine has led to an increased abuse of substitute opiate drugs such as buprenorphine, oxycodone and in one isolated area the powerful synthetic opiate fentanyl.

• The already buoyant benzodiazepine market in Scotland continued to thrive during the shortage and beyond. In the case of diazepam, in excess of 430,000 tablets\(^8\) were seized by police in 2011 which represents only a small proportion of the amount on the streets.

• Lower average purities increase the potential for overdose when good quality diamorphine becomes available which we know from analysis this happens from time to time.

Possible reasons for the shortage

The possible reasons for the shortage were discussed and debated at a summit held at the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in Lisbon in October 2011.

The report produced from that meeting contained the following paragraph in relation to the explanatory factors for the shortage:

““There is a limited literature available which provides some insight into factors that may have had a part to play in the 2010/2011 heroin shortage in some European countries. Firstly, it has been suggested that reduced production of opium in Afghanistan, due to poppy blight in the spring of 2010, may be responsible. However, this is debatable, as police reports suggest that heroin made from Afghan opium may not appear on the European drug markets until about 18 months after harvest. A second argument is that heroin destined for Western Europe has been diverted to the Russian (and Ukrainian) market, although Russia also appears to be undergoing a heroin shortage.\(^9\) It has also been suggested that law enforcement efforts have disrupted trafficking, in particular through the dismantling of wholesale heroin networks between Turkey and the United Kingdom. Recent years

\(^8\) The SPSA Forensic Services examined more than 430,000 diazepam tablets, however many cases never reach the laboratory due to the presumptive testing regime.

(2007, 2008) have seen record seizures of the heroin precursor acetic anhydride in Europe, and these confiscations may have affected the drug market over a longer period.\textsuperscript{10} According to SOCA, severe flooding in Pakistan during 2010 may also have had an impact.\textsuperscript{11} Finally, other developments in Afghanistan, such as heavy fighting in the south of the country, and law enforcement actions against heroin laboratories and opium stockpiles, may also be influencing heroin supply to Europe (Mansfield, 2011). It is likely that a combination of some of these factors has played a role in disrupting the supply of heroin to Europe.\textsuperscript{12}

Conclusions

1. The quality of diamorphine in Scotland dropped significantly in 2011 as a result of a shortage at the start of the year.

2. The quality of diamorphine has not returned to the pre-shortage levels and remains low.

3. Diamorphine purities at all points in the supply chain fall into a wide range of values rather than being clustered tightly around a common average.

4. Wholesale level diamorphine purities in Scotland in 2011 were predominantly less than 20\% with an average value of 13\% (compared to 23\% in 2010).

5. ‘Middle-market’ diamorphine purities (one ounce package level) in Scotland in 2011 were also less that 20\% in the main, with an average of 9\% (compared to 24\% in 2010).

6. Street level diamorphine purities in Scotland in 2011 were mostly less than 10\% with an average of 7\% (compared to 29\% in 2010).


\textsuperscript{12} EMCDDA Trendspotter Summary Report – Recent shocks in the European heroin market: Explanations and Ramifications.
7. There are many factors outwith the control of Scottish law enforcement that can have an impact upon the domestic diamorphine market. It is important to monitor global trends in order to be able to accurately value consignments of diamorphine arriving in the UK and to assess the impact of seizures.

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