

# Understanding the dynamics of international heroin markets: making better use of price data to measure the impact of drug control strategies

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## **ABSTRACT**

*The present article was prepared to support work undertaken in the United Kingdom of Great Britain and Northern Ireland towards the development of a better understanding of the dynamics of international heroin markets and also to support attempts to use analyses to measure the impact of international drug control strategies and interventions by law enforcement agencies in the United Kingdom. The author explores the types of data available to analysts in the United Kingdom engaged in drug control assessment work. He also explores whether price data alone should be used to improve the current understanding of how heroin markets function. The author also provides recommendations for improving the collection and structuring of existing data. The hypotheses of existing analyses are discussed, together with the weaknesses of the underlying data. The author concludes that, for data to be used in a meaningful way, a supply-side model of international heroin supply needs to be constructed. That would enable analysts to examine the data in their proper context and would allow the data to be interpreted and communicated to policy makers in a format that would facilitate the taking of action. The author provides examples of where price data can be used in a model to influence, and measure the impact of, drug control strategies.*

*Keywords:* heroin; United Kingdom; Afghanistan; opium; heroin prices; illicit drug markets

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## **Introduction**

Analysts working for many departments and agencies of the Government of the United Kingdom of Great Britain and Northern Ireland have been trying to improve their understanding of international markets for illicit drugs and how they function. A number of projects have been initiated in recent years to inform policy makers. Under the auspices of the Concerted Inter-Agency Drug Action

group,\* two projects were commissioned: one to help fill intelligence gaps on the origin of heroin destined for the United Kingdom and the other to provide details of the routes used to smuggle heroin into the country. The two projects have provided intelligence analysts in the United Kingdom with an analytical basis for making assumptions and testing theories relating to the sources and routes used by those smuggling heroin into the country.

There are still major gaps in understanding the economic characteristics of international heroin markets. Those gaps relate to the market structure of heroin supply routes and to the influences that the amount and cost of opium produced in Afghanistan, as well as the myriad relationships and payments involved in the smuggling of heroin into the United Kingdom, have on the eventual street price of heroin in the United Kingdom. International price data are required to fill those gaps. Equally important are the analysis and interpretation of the data.

Since 1998, the Concerted Inter-Agency Drug Action group has adopted an “end-to-end” disruption policy targeting the most harmful drugs (called class A drugs in the United Kingdom),\*\* both as they arrive in the United Kingdom and on the major routes leading from source countries to the United Kingdom. Data are available on the sources of heroin found in the United Kingdom, and on the trafficking routes used. However, there are currently no data that reveal the structure of the heroin trade; such data can be assessed to indicate potential vulnerabilities. Thus, there is a need for the structured collection and analysis of price data and transaction information along the routes leading from the illicit drug production areas to the illicit markets.

The systematic gathering of price data, together with the subsequent analysis of such data, is a key tool used to assess both the desirability of competing international projects designed to curtail the flow of heroin into Western Europe and the success or failure of existing projects in relation to their impact on the price and availability of heroin. In short, it provides a mechanism that shows what works.

To analyse such data, three key conditions need to be met:

(a) There must be sufficient price data from a broad range of sources for the analysis to be statistically meaningful;

(b) There must be a supply-side model for heroin flows that can show the impact of price increases further along in the supply chain;

(c) There must be a methodology similar to the demand-side model of National Economic Research Associates [1] used to assess the size of the illicit market in the United Kingdom, to interpret the data against and to predict the potential impact in the United Kingdom of supply-side shocks.

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\*The Concerted Inter-Agency Drug Action group is a committee comprising the heads of all agencies in the United Kingdom involved in reducing illicit drug supply. It is responsible for steering and coordinating drug law enforcement policies and activities.

\*\*In the United Kingdom, heroin and cocaine are the two class A drugs at which the greatest amount of drug control activity is directed.

## **Current price data in the United Kingdom**

In the United Kingdom, the overseas drug liaison officer network provides price data to analysts based in the country. However, there are a number of problems with the data. The key problems relate to quantifying the data provided. The data are from a myriad of different sources. Factors such as the quality of the heroin, the amount referred to and the relationship between the two parties involved in the transaction are often unclear. The data are accurate when they refer to a particular transaction. However, there is never enough data to provide a suitable sample size and therefore the danger remains that a wayward or uncharacteristically deviant figure could disrupt the findings. Although the data are collated and analysed, there is not enough depth in the data for them to be used to provide “hard” assessments of the function and nature of illicit drug transactions in international markets. (That is not to say that the data have no value, as the price intelligence collected by Her Majesty’s Customs and Excise is used to highlight emerging trends or to illustrate the effect of a certain operation.) Another weakness of the price data collated in the United Kingdom by the National Criminal Intelligence Service is that they represent an average of all police constabularies and are thus not weighted to reflect the level of use in any price area.

## **Type of data needed**

The Home Office of the United Kingdom has examined the type and nature of price data needed to provide meaningful intelligence in relation to changes in the availability of illicit drugs at the street level and on wholesale markets in the United Kingdom [2]. Currently, the main use of price data in the United Kingdom is to assign a value to the weight of drugs for court sentencing. Data of the National Criminal Intelligence Service show a range of street-level and wholesale prices reported by 52 police forces and the customs authorities and an average street-level and wholesale price in the United Kingdom. However, while this is an important source of information on drug prices in the United Kingdom, with an established data collection methodology, there are problems with the use of the data. The wide range of reporting authorities and the time delay between reports mean that the data are unsuitable in their current form for providing intelligence that can be used to highlight the impact of ongoing border or upstream interdiction operations in the United Kingdom. The calculation of an average drug price over a period of 3-6 months masks any increase in price brought about by successful interdiction because the resulting changes may only last weeks or may be geographically specific.

## **The purity question**

### *Data in the United Kingdom*

Price is not the only factor that needs to be taken into account in a meaningful analysis. Purity should be an integral part of any attempt to measure the

impact of an operation on a specific market. In the figures used by the Office of National Drug Control Policy of the United States of America to size the heroin market in the United States, heroin is calculated at 100 per cent purity; there is no relationship involving the purity of the drug in the figures of the National Criminal Intelligence Service for the United Kingdom, where what is reported is a price for heroin of unknown or variable purity.

According to research and analysis conducted by Her Majesty's Customs and Excise [3] at most points on the supply chain, drug traffickers and dealers respond to scarcity in two ways:

(a) The "Mars bar" effect: making a deal whereby the drug is sold at an agreed price, but the buyer is not aware that the amount of drug sold is actually less than the amount agreed on;

(b) Diluting the drug with more cutting agents, while holding the price at a constant level so as not to deter buyers or let competitors into the market.

That was seen in the United Kingdom in late 2001 and early 2002, when supply constriction following the ban on opium poppy cultivation issued by the Taliban in 2001 resulted in a marked fall in the purity of imported heroin seized by Her Majesty's Customs and Excise, from an average of 64.9 per cent in the first quarter of 2001 to 36.7 per cent in the second quarter of 2002, according to data of the Forensic Science Service, an agency of the Home Office. The Forensic Science Service attributed this to poorer-quality raw products and also to an increased level of cutting [4]. Some samples had been cut as many as three times before their arrival in the United Kingdom. Thus, while data from Her Majesty's Customs and Excise [3] and the Forensic Science Service [4] showed a falling purity level, street-level data showed heroin prices in the United Kingdom remaining at a constant level. This demonstrates that an analysis of the heroin market in the United Kingdom based solely on prices, without any reference to purity, can produce misleading results. A more useful and responsive measure of the illicit drug market in the United Kingdom is that of price (at the wholesale and retail levels) adjusted for purity.

### *International data*

The same problems apply in relation to international data, although there are benefits, such as the provision of data that have been verified and analysed by staff of the United Nations Office on Drugs and Crime both at its headquarters in Vienna and in the country in question. The problem with purity remains, although forensic data suggest that it may be less of a problem in relation to the international flow of heroin in relation to the flow of heroin into the United Kingdom and within the United Kingdom. Forensic analysis of heroin shows that cutting generally occurs at or close to the production stage and at various stages between the wholesale level and the street level. The Forensic Science Service analysed samples of heroin and found that approximately 40 per cent of the samples had been cut at the source and 60 per cent had been cut at the

wholesale level.\* Those findings are supported by intelligence. It is safe to assume that the pharmacology of heroin destined for the United Kingdom changes very little between its manufacture and its arrival on the European mainland.

### *Uses of price data*

There are a number of problems in using data from the overseas drug liaison officer network of Her Majesty's Customs and Excise. Firstly, there is no systematic process for the collection of the data. Secondly, there are no background data indicating the nature of the deal, the size of the deal, the relationship between the individuals concerned and credit agreement or payments in kind. Those two factors mitigate against the use of the data for analytical purposes. Authorities in the United Kingdom should make greater use of price data of the United Nations Office on Drugs and Crime. Those data are both up to date and verifiable and should be used as a baseline for any supply-side model or impact assessment upstream of the United Kingdom. While a number of small data sets would suffice to provide data for impact assessments, a comprehensive data set is required to build a supply-side price model. Such a model would have to be based on data from the United Nations Office on Drugs and Crime.

That does not mean that the data from the overseas drug liaison officer network are redundant. Those data assume more importance as they provide a credibility check on the data from the United Nations Office on Drugs and Crime. They can also act as an early warning system, showing price fluctuations caused by emerging over-supply or under-supply. What is needed is a systematic method of collecting the data, along with additional qualitative data relating to size of the deal, the relationship between the individuals involved and so on. In addition, the data could show that, although a specific operation has had no impact on the price level, it has had an impact in terms of the structure of the market, in terms of how deals are brokered, or it has had an adverse effect on a particular organization.

The price data set of the United Nations Office on Drugs and Crime is currently the only one of its kind. The data have been criticized by a number of authors, most notably Reuter and Greenfield, whose criticisms mainly consist of the following [5]:

(a) Figures for consumption are based on United States prices that inflate gross estimates;

(b) Consumption estimates are biased against consumption in "poorer" countries and in favour of consumption in "rich" countries;

(c) The analysis attributes too much value added to the international supply chain, when most value added occurs between the import stage and the street level.

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\*These figures are estimates based on the main cutting agent used: if paracetamol is used, according to intelligence, the cutting took place close to the source; caffeine is generally found to have been added closer to the consumption stage at the wholesale level.

The criticism of Reuter and Greenfield is valid, especially with regard to any estimate of the worldwide value of the heroin trade or any crude assessment of gross income ascribed to the illicit drug trade within a country. However, for developing a supply-side model what is required is the ratio of price increase across national boundaries or from between import into and export from a specific country. Those data are available from the United Nations Office on Drugs and Crime [6]. In fact, Reuter and Greenfield concurred that the data of the United Nations Office on Drugs and Crime could provide useful information on, among other things, the distribution of supply chain activities and value added across countries and the distribution of final consumption across countries [5].

### *Modelling*

Currently the only model in the United Kingdom is the demand-side model of the National Economic Research Associates. That model measures the size of the market in the United Kingdom based on the extrapolation of prevalence data. It produces a figure reflecting how much is supplied to the market from that. To calculate how much heroin is destined for the United Kingdom, analysts of Her Majesty's Customs and Excise calculate a figure for unsuccessful supply, which encompasses customs and police seizures of heroin in the United Kingdom, seizures abroad of heroin known to be destined for the United Kingdom, and a percentage of seizures of over 5 kg of heroin effected in Western Europe.\* The model is also used as the basis for attributing the flow of heroin, as defined by percentage and quantity, to different modes of transport. There are problems with the model; the main problem is that there is an inverse relationship between heroin purity and the size of the market. As purity falls, it is assumed that the size of the market increases and vice versa. This could be remedied if the consumption figure was worked out at 100 per cent purity. An additional problem with consumption models is that it is difficult to ascertain the exact nature of the drug being taken. That is particularly true in countries such as the Islamic Republic of Iran, where both opium and several different grades of heroin are consumed.

The model of the National Economic Research Associates is evidence that it is possible to construct models that illustrate the behaviour of illicit drug markets. It is also possible to construct supply-side models providing adequate data are available. Supply-side models are based on two determinants: (a) how much drug is available; and (b) how it arrives. To calculate how much drug is available, a figure is needed for the quantity of opium produced and its heroin equivalent. In relation to Afghan heroin, two figures are available: one is produced by the United States Department of State and the other by the United Nations

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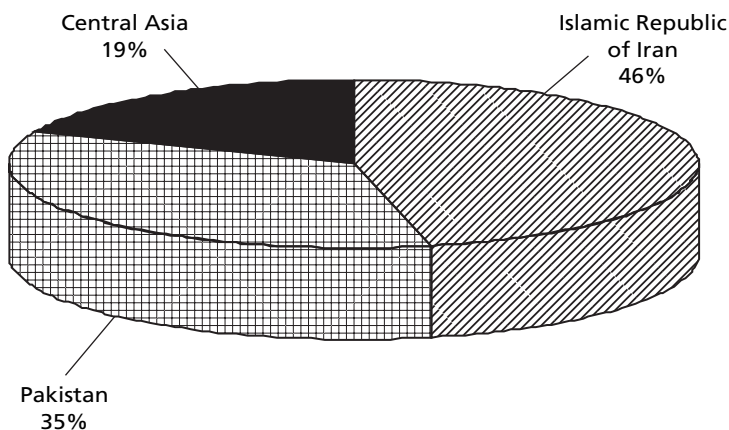
\*The methodology regards Western Europe as a "single" wholesale drug market, as a consignment of 100 kg of heroin seized on the German-Polish border would not necessarily have been intended for Germany but in most cases would have been split and dispatched to Belgium, Germany and the United Kingdom. As such, 10 per cent of gross seizures of heroin in Western Europe reported to the Customs Cooperation Council (also called the World Customs Organization) and the International Criminal Police Organization (Interpol) are added.

Office on Drugs and Crime. Differing methodologies are used by the two agencies, which explains their different figures. In addition, conversion rates are based on the assumption that 10 kg of opium are required to manufacture 1 kg of heroin, despite the fact that analysis of price data and scientific research suggest that the ratio is closer to 7:1 or 6:1. However, all that is needed is a starting point that shows gross potential heroin supply.

In the opinion of the author, little is served by constructing a complex supply-side model to show the flow into and out of each country in the supply chain from Afghanistan to the United Kingdom. It is equally difficult to determine how much goes to specific countries or regions based on prevalence of use. There are data to support both, but the evidence is currently not nearly strong enough. To construct overarching models of this nature would be at best speculative.

It is possible to use models to inform policy makers and persons making decisions on international project funding, quantifying the potential risk. In 2001, the amount of heroin and morphine seized totalled 12,669 kg in the Islamic Republic of Iran, 9,492 kg in Pakistan and 5,214 kg in Central Asia as a whole. Figure I shows the seizure patterns for heroin and morphine in the Islamic Republic of Iran and Pakistan (countries bordering Afghanistan) and in Central Asia, expressed as a percentage to indicate percentage flows [6].

**Figure I. Total amount of heroin and morphine seized in the Islamic Republic of Iran and Pakistan and in Central Asia, 2001**



Source: United Nations Office on Drugs and Crime.

A static reading of this model indicates that, of the total amount of heroin and morphine that leaves Afghanistan, almost one half does so via the Islamic Republic of Iran, and one third does so via Pakistan. However, if the model is run over time, then any sustained rise or fall in the percentage flow via a particular country will need to be examined more closely. A similar chart produced

five years earlier would have shown a much smaller percentage for Central Asia. Therefore, the increase in flow through Central Asia can be attributed to either increased flow or improved law enforcement or a combination of both. A model such as this can also be used as a baseline prior to the launching of an international project. If one of the aims of the project is to curtail the amount of heroin entering Pakistan then a better yardstick would be the amount of heroin seized in Pakistan expressed as a percentage of the total amount seized in its neighbouring countries. That figure has the advantage of not being influenced by the production level in Afghanistan or by abstracts of the domestic seizure total in Pakistan.

Models such as this are simple; they do not explain why certain routes are chosen or show where profits are made. The key to explaining this is market incentives expressed in terms of price differentials. If opium prices are low then that would force farmers to consider growing alternative crops to earn their livelihood. Falling international demand for heroin also diminishes the incentives for trafficking in opium and heroin. However, if consumer demand remains high, the market will be willing to pay high prices for opium to Afghan traders.

Traders in Afghanistan recognized that opium was one of the few commodities that could be produced in excess of local demand, and for which international demand was strong. Thus, they made a connection between Afghan opium production and international demand for heroin. By the late 1990s, the opium trade within Afghanistan did not have a risk premium, reflecting the fact that the authorities were not trying to prevent the trade. Traffickers correctly assumed that opium profits would increase rapidly once the borders of Afghanistan were crossed. Prices doubled once a consignment moved from southern Afghanistan to Pakistan, and the price of opium on the wholesale market in Tehran was six times as high as the price on the border of Pakistan [6]. It is generally assumed that the increase in the price of a consignment that has crossed the border is attributable to costs to cover such things as transport and bribes and to compensate for risk, as well as an element of speculation. What is interesting from an analytical perspective is that the increase in the price of opium as it moves across different borders is not constant.

According to Her Majesty's Customs and Excise pricing intelligence, over the past few years, wholesale heroin prices in the United Kingdom have been considerably higher than in the Netherlands, whereas there is little difference between the prices in Belgium and the Netherlands. This illustrates that there is a cost imposed on traffickers transporting heroin to the United Kingdom that is not imposed on those moving the drugs to Belgium. The additional cost is attributable to structural and transport costs imposed by moving concealed goods from a continent to an island, an element of profit and a cost to compensate for the risk posed by law enforcement interdiction. The same costs are likely to occur at all stages along transport routes leading from source countries. If it can be assumed that structural costs are constant, then increasing the costs imposed by law enforcement is likely to increase the cost of crossing a border. However, measurement of this is difficult; price data are not sufficient



to illustrate any sustained impact of operations. Perhaps a better way of assessing the longer-term impact of drug control policies is to look at changes in price ratios across borders. If a project designed to improve law enforcement effectiveness on the Afghan-Tajik border resulted in the ratio of prices between Afghanistan and Tajikistan increasing from 2:1 to 4:1, then it could be deemed a success. However, if the ratio remained the same, then it would be clear that little impact other than an increase in seizures had been made.

Although not an exhaustive list of indicators, a model or group of models that illustrate flow and price differentials and are capable of showing changes over time are vital to providing a quantitative basis for both funding and measuring overseas assistance. Models can show the parts of the supply chain where costs and profits are the highest and, by implication, where traffickers are most vulnerable. Models are also better indicators of the success of operations or projects, as they measure outcome rather than output.

### *Usefulness to policy makers in the United Kingdom*

A model of this nature can be used in the United Kingdom to plan in advance both where drug control interventions should be made and the type of interventions required to have the maximum impact. That is particularly important given the commitment of the United Kingdom Government to evidence-based policy-making and the need to pursue a drug control strategy based on what works and on value for money. Currently, funding is given in the United Kingdom for drug supply activities in areas identified as having top priority in terms of the threat posed to the country. However, there is little assessment of the type of interventions that would be the most effective in terms of meeting the government goals of reducing the availability of illicit drugs or at least in terms of increasing prices or reducing purity. An analysis based on the relative price increases between countries and within countries along the supply route leading from Afghanistan to Western Europe would be the key to this.

There are strong theoretical arguments favouring supply-side policies, which restrict the flow of narcotic drugs to consumer markets. From the prohibitionist paradigm, any restriction is per se a good thing. However, support for supply-side policies can also be seen from the harm reduction paradigm. Caulkins states that law enforcement can play a role in either micro or macro harm reduction, but the options for contributing to macro harm reduction are clearly greater [7]. International law enforcement actions need to show results, not just in terms of the amount of drugs seized, but also in terms of the impact in relation to constraining supply. For a policy such as “end-to-end” disruption to succeed, it would have to be shown that it had been successful in reducing drug-related harm. Indicators such as the size of the domestic market and street-level prices are currently being used in the United Kingdom to do that. Caulkins believes that these are valid indicators; he states that there is mounting evidence that consumption is in fact quite responsive to price [7]. In their study of the Australian heroin drought in the crop year 2000/01 Weatherburn and others

indicate the relative price elasticity of demand for heroin [8]. That evidence from Australia suggests that the domestic impact of supply restriction can be measured. To support effective policy-making in the United Kingdom, a supply-side model for heroin flows needs to be constructed. Such a model would be able to indicate which policies or operations would have the greatest impact on consumption in the United Kingdom and could be used to predict how future supply restriction may have an impact in the country and further downstream.

There are other indicators of harm that are not based on harm to individuals as represented by gross consumption of heroin in the United Kingdom. Law enforcement in the United Kingdom has focused on the harm caused by drug use in specific communities in the country. More recently, this approach has focused on the harm caused by crack cocaine in many inner-city black communities in the country and on the rising levels of “black-on-black” violence. Law enforcement action has targeted body carriers of cocaine (couriers carrying cocaine on their person), both as they leave Jamaica and as they arrive at airports in the United Kingdom. This is a case where a qualitative judgement in relation to the levels of harm has been made over a quantitative one: cocaine dispatched from Jamaica may not represent the bulk of the cocaine arriving in the United Kingdom, but it has the highest number of negative externalities: associations with crime involving guns; murder of participants; predominance of crack markets; and general lawlessness. Caulkins, however, puts forward the alternative view that a ton of heroin smuggled in by body carriers is less harmful than the same amount smuggled in large shipments. He states that large shipments are worth enough to create incentives for employing violence and that any organization that moves such large quantities must be powerful, whereas a smaller dealer who arranges delivery by body carriers may have fewer resources. Ten small organizations, each importing by body carriers, may have less capacity to corrupt or threaten state institutions than one large organization that imports as much as the 10 small organizations do collectively [7]. These two views illustrate the type of qualitative analysis that needs to be carried out when assessing the nature of domestic harm.

### *Understanding how illicit markets function*

An understanding of how the illicit market functions is imperative to planning operations and projects that have the greatest impact on (a) reducing the supply of narcotic drugs to the United Kingdom, (b) reducing the overall flow of narcotic drugs and (c) changes in purity and price in the illicit market in the United Kingdom. Much of the academic debate on this subject has focused on whether markets are “additive” or “multiplicative”. An “additive” price structure would mean that an increase of \$1,000 in the price of a kilogram of heroin as it crosses a national border would result in a similar price increase being passed on all the way down the supply chain to the user; this theory assumes that all actors—farmers, traders, traffickers and transport groups—are charged fixed prices for their goods and services. A “multiplicative” price structure means

that a price increase of 10 per cent paid to cross a border would result in a series of 10 per cent price increases all the way along the supply chain; in other words, each price increase is multiplied until the drug reaches the user [6].

The above-mentioned assumptions about the nature of drugs markets have significant policy implications. If the price structure of an illicit drug market is additive, then interventions at the source, such as eradication, are close to meaningless, as any increased cost to the trafficker will not be passed on to the user. In some cases, they may be counterproductive, driving up the price for opium and stimulating the market to demand more opium production in the years that follow. If, however, the price structure is multiplicative, then interventions both at the source and in transit countries will pass on price increases (or, in some cases, reductions in purity) to the user; interventions will therefore serve to meet government targets for supply reduction. If the supply chain is totally multiplicative, then the impact of increased opium prices caused by eradication will be passed on to the user.

However, illicit markets are never as straightforward as economic theory suggests. In relation to heroin, a casual reading of price data and intelligence reveals that there are parts of the supply chain that are additive and parts that are multiplicative. Reuter points out that drug crop cultivation is a classic case of an additive price structure [9]. Such cultivation is dominated by a large number of farmers who only have a fixed number of outlets for their produce. The farmers have no market power to push up the prices that they charge. As such, the cost that an opium trader pays to the farmer for the opium is an additive cost. Intelligence indicates that, for British customers, Turkish traffickers have two different prices for a kilogram of heroin: one for delivery to the Netherlands, to be collected by the customer; and the other for delivery to the customer in the United Kingdom. As that price increase is close to the price difference in the illicit market, it is likely that an increase in that cost could be passed on; however, it will probably be reflected in an increased wholesale price and then the cost will be absorbed in the supply chain before the heroin reaches the street-level user.

### *Example: functioning of the illicit market in southern Afghanistan*

With the Government of the United Kingdom committed to a policy of “end-to-end” disruption, it is vital that funding for overseas projects and operations targets the parts of the supply chain that are multiplicative, in order to have the maximum disruptive impact. For example, figures of the United Nations Office on Drugs and Crime show that prices for opium/heroin double between southern Afghanistan and Quetta, Pakistan [10]. Prices increase by only 30 per cent between Quetta and the port of Karachi. The first increase may be either multiplicative or additive, based on the level of risk. The increase between Quetta and Karachi would appear to be additive, reflecting fixed storage and transport costs in Pakistan. However, the price structure of the supply chain between southern Afghanistan and the Islamic Republic of Iran has multiplicative

characteristics. Data from the United Nations Office on Drugs and Crime suggest that the price of opium increases sixfold once it crosses the Iranian border; in some cases, it has increased by a factor of 10 [10]. This is a reflection of the higher fixed transport cost, the increased risk of interdiction, the increased likelihood of death if apprehended and increased security costs.

Economic logic suggests that policy should focus on law enforcement on the Afghan-Iranian border, which would be more effective than similar assistance on the Afghan-Pakistan border. However, if the policy objective is to provide drug control assistance to Pakistan, based on qualitative intelligence indicating that Pakistan may be the source of up to one fifth of the heroin entering the United Kingdom,\* then it would be important to examine the price structure in Pakistan.

Prices of heroin from Pakistan show that there is a very large increase, most likely of a multiplicative nature, between the Pakistan export price and the price of importing heroin from Pakistan into the United Kingdom. (The wholesale price of heroin in Pakistan is about \$3,500 per kilogram while in the United Kingdom heroin imported from Pakistan can fetch around \$24,000 per kilogram [11].) Economic logic suggests that, if British law enforcement activity is to have an impact on the supply of heroin from Pakistan to the United Kingdom, the area worth focusing assistance on is the part of the supply chain between Pakistan and the United Kingdom rather than the Afghan-Pakistan border.

### *Turkish drug traffickers: controlling prices on illicit markets*

Understanding the pricing structure of the heroin supply is the key to finding out where overseas assistance should be directed. However, there is also a need to understand the nature of relationships between traffickers and whether those involved in the heroin trade act in accordance with or counter to economic logic. The main impact in the United Kingdom of the 2001 ban on opium poppy cultivation in Afghanistan was a reduction in the purity of imported heroin. Intelligence indicated that, although there were large increases in the price of morphine base and heroin on arrival in Turkey, it was only followed by some small increases in the wholesale price between Turkey and Western Europe. Turkish traffickers appeared to prefer to hold prices constant. Analysis has shown a correlation between falling purity levels in Turkey and the United Kingdom [11]; however, there may be other factors at play. It could have occurred for a number of reasons; for example, perhaps traffickers did not want to lose customers to rivals; that the close, trust-based relationship between traffickers and buyers meant that traffickers had to hold the price that had been offered. Analysis presented to the Concerted Inter-Agency Drug Action group in

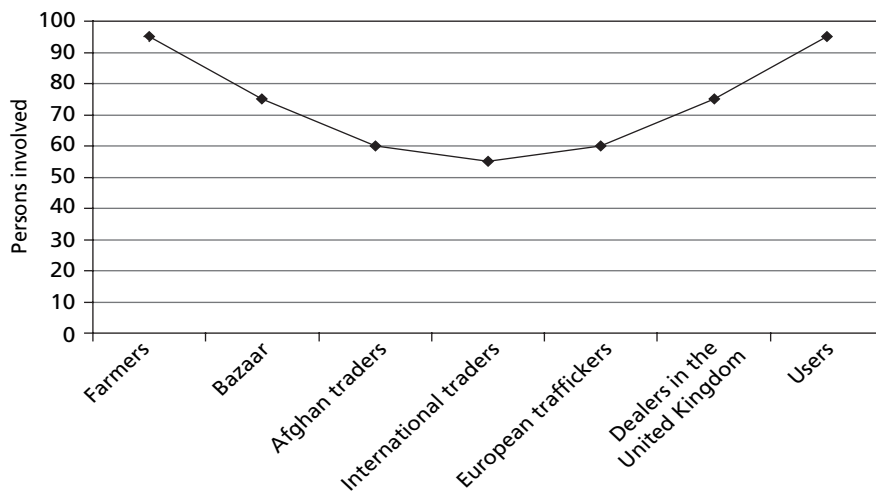
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\*In July 2002, The Forensic Science Service reported that analysis of samples of seized heroin revealed that 27 per cent of the samples had originated in Pakistan. Pakistan is one of the principal countries of origin of heroin seized in the United Kingdom; however, in the United Kingdom, heroin from Pakistan is usually found among air passengers and freight and the total weight of such seizures is considerably less than that of seizures of heroin arriving via Turkey and mainland Europe.

2002 suggested that increases in the price of opiates in Afghanistan and the Islamic Republic of Iran were not passed on to users in the United Kingdom because of the key role played in international markets by Turkish drug traffickers. That theory suggests that any price increase upstream was absorbed by the key Turkish trafficking groups and not passed on to others downstream.

Turkish drug traffickers are positioned between Afghan farmers and traders and European wholesalers and users. They have established upstream and downstream links and have considerable control over the processing of opium and morphine base into heroin. Whether the illicit goods physically move through Turkey or not, Turkish traffickers hold a dominant market position, dealing with many suppliers and buyers who are dependent on them. It is estimated that approximately 80 per cent of heroin destined for Western Europe passes through Turkey [6]. That means that traffickers based in Turkey are in a position to set prices. In terms of building a price-based model to show market behaviour, it can be assumed that the price of heroin in Turkey is subject to “cartel” or oligopolistic behaviour. Turkish traffickers are able to control the illicit market because they are at the mid-point of international markets and, consequently, are in the best position to exert oligopolistic pressure to increase prices, there being a small number of actors involved at this stage in the supply chain.

**Figure II. Number of persons involved in the heroin trade**



According to the Concerted Inter-Agency Drug Action group, a conservative estimate of the price differential between heroin entering and leaving Turkey would be 400 per cent. That is heroin is sold to European buyers at four times the price paid for it (or for morphine, taking into account the conversion costs). This illustrates that the maximum profit with regard to international heroin trafficking from South-West Asia to Western Europe is made in Turkey. This is not to be confused with the maximum profit from trafficking or dealing in

heroin, which the majority of research shows is made in the consumer country. The limited intelligence that Her Majesty's Customs and Excise has received indicates that, as the heroin consignments are moved from Turkey across Europe, costs return to being additive based on a fixed sum charged by transport groups to cross various national borders, which, in turn, is based on the level of law enforcement capability and the sum of the bribes to be paid.

With respect to the cost increases following the 2001 ban on opium poppy cultivation in Afghanistan, Turkish traffickers chose to respond to what they deemed short-term increases in their raw material costs by absorbing the increased cost instead of passing it on to their buyers in Europe. That approach runs counter to the multiplicative thesis. However, it is economically rational behaviour, particularly if the cost increases were considered to be temporary. The high profits made from the trade in Turkey enabled the traffickers to absorb the cost increases. Perhaps it was decided that it would be better to keep existing customers happy by delivering an agreed amount of heroin at agreed prices (albeit with a reduced purity level) than to face the possibility of raising the prices and then perhaps losing customers to alternative sources of supply. It is worth pointing out that other strategies, such as passing on the cost increase, would have to be pursued if the upstream cost increases were to continue beyond the short term.

## **Conclusion**

It can be assumed that drug trafficking is a profit-driven business that functions in accordance with conventional economic rationale. If law enforcement is to be successful in its goal of reducing illicit drug use, then it needs to concentrate its efforts on finding out what works. A better understanding of how illicit drug markets function is vital. The author has highlighted existing sources of data and ways to interpret them in order to provide better insight into the operation of illicit drug markets. Analysts in the United Kingdom should not function in a "black box"; much analysis in this area is currently being undertaken by the United Nations Office on Drugs and Crime and by analysts and academics in other countries. There are considerable theoretical and empirical data that can be analysed to provide the basis for a model of the heroin supply in the United Kingdom.

Only by developing models of supply can law enforcement in the United Kingdom assess the type of drug control interventions that will have the maximum effect. Such models could be used to direct government resources to regions and countries where they are likely to have the greatest impact in terms of increasing the costs to drug traffickers and reducing their profit margins. The models can also be used by analysts to assess the impact over time of the interventions, particularly in terms of reducing the use, reducing the flow or increasing the prices of illicit drugs, as well as increasing the costs to drug traffickers. Quantification of the impact of upstream intervention has long been a problem

for the Concerted Inter-Agency Drug Action group. The suggestions made in the present article offer a way forward, so that “outcome”, as well as “output”, can be measured.

## References

1. Edward Bramley-Harker, *Sizing the UK Market for Illicit Drugs*, RDS Occasional Paper No. 74.
2. Government of the United Kingdom of Great Britain and Northern Ireland, Home Office, “Towards a price target for drugs”, unpublished paper, 2003.
3. Jim McColm, “Towards a future heroin model: measuring the impact of supply-side interventions”, unpublished paper, October 2002.
4. Government of the United Kingdom of Great Britain and Northern Ireland, Home Office, Forensic Science Service, “Heroin Impurity Profiling Report”, unpublished paper, July 2002.
5. Peter Reuter and Victoria Greenfield, “Measuring global drug markets: how good are the numbers and why should we care about them?”, *World Economics*, vol. 2, No. 4 (October-December 2001), pp. 159-173.
6. *The Opium Economy in Afghanistan*, (United Nations publication, Sales No. E.03.XI.13).
7. Jonathan P. Caulkins, “Law enforcement’s role in a harm reduction regime”, *Crime and Justice Bulletin* (Sydney), No. 64, January 2002.
8. Don Weatherburn and others, “The Australian heroin drought and its implications for drug policy”, *Crime and Justice Bulletin* (Sydney), No. 59, October 2001.
9. Peter Reuter, “Comments on ‘Sizing the UK market for illicit drugs’”, unpublished manuscript.
10. “Greed, warlords and the opium trade”, *The Opium Economy in Afghanistan* (United Nations publication, Sales No. E.03.XI.13).
11. *Global Illicit Drug Trends 2002* (United Nations publication, Sales No. E.02.XI.9), p. 33.