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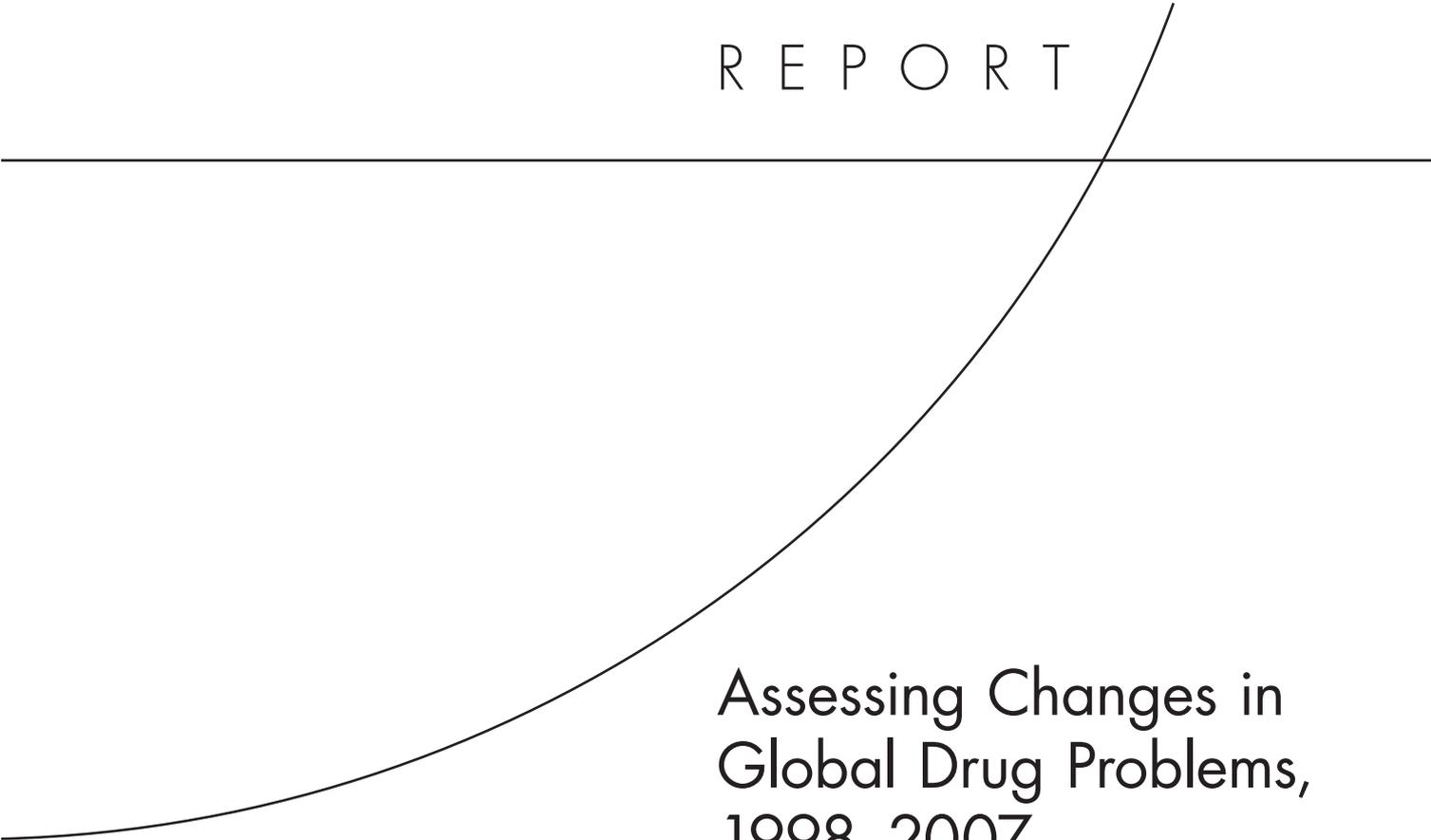
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R E P O R T



Assessing Changes in Global Drug Problems, 1998–2007

Main Report

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Prepared for the European Commission

This study has been produced by the Trimbos Institute and RAND with the financial support of the Commission of the European Communities (contract JLS/2007/C4/005). The study does not necessarily reflect the opinions and views of the European Commission, nor is it bound by its conclusions.

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Published 2009 by the RAND Corporation
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Preface

The European Commission contracted RAND Europe and the Trimbos Institute to analyse in detail the operation of the world market in illicit drugs and the policies aimed at curtailing it. This was in the context of the European Union's Strategy on Drugs 2005-2012 which calls for evidence-based policies and in turn responds to the EU Resolution adopted by the UN's Commission on Narcotic Drugs, calling for '... an objective, scientific, balanced and transparent assessment by Member States of the global progress achieved and of the difficulties encountered in meeting the goals and targets set by the General Assembly at its twentieth special session...'

The resulting study provides a dispassionate overview of the true nature and extent of the problem today, and to assist policy makers at national and regional levels to deal with it. It was suggested that the drugs market be looked at as if it were licit, in order to get a clearer picture of the way that it works.

This document reports on the main research findings. It is accompanied by six other reports, detailing specific aspects of the issue. RAND Europe and the Trimbos Institute anticipate that it will be of interest to policy-makers from the European Commission, as well as other governmental bodies which are concerned with drug markets. It is also believed to be of value to NGOs and private organisations which are involved in one way or another in tackling the drugs market and its impacts.

RAND Europe is an independent not-for-profit policy research organisation that aims to improve policy and decision making in the public interest, through research and analysis. RAND Europe's clients include European governments, institutions, NGOs and firms with a need for rigorous, independent, multidisciplinary analysis. This report has been peer-reviewed in accordance with RAND's quality assurance standards.

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Summary

The study has found no evidence that the global drug problem was reduced during the UNGASS period from 1998 to 2007. For some nations the problem declined but for others it worsened and for some of those it worsened sharply and substantially. The drug problem generally lessened in rich countries and worsened in a few large developing or transitional countries.

Production of opium was relatively stable until 2006, after which estimates show a large increase in Afghanistan. These estimates are somewhat troubling as there is no evidence in the world of unusual price declines or increases in consumption.

The global number of users of cocaine and heroin expanded over the period. In most Western countries the number of frequent users of heroin has declined through most of the last ten years, while a serious epidemic of opiate use occurred in some countries in Eastern Europe and Central Asia. The total number of cannabis users worldwide has probably declined.

Cannabis use has become part of adolescent development in many Western countries. For example in Australia, Switzerland and the United States about half of everyone born since 1980 will have tried the drug by age 21.

The markets for illegal drugs are mostly competitive, not vertically integrated or dominated by major dealers or cartels. The ties to terrorism and armed insurrection are important but only in a few places, such as Afghanistan and Colombia.

For cocaine and heroin the cost of production and refining in the source countries is only one to two per cent of retail price in developing or transitional countries. The same is true for Amphetamine Type Stimulants (ATS) manufacturers in rich countries. Only cannabis growers in rich countries receive a substantially larger share of the retail price. Trafficking across national boundaries accounts for perhaps 10 percent of the retail price of heroin and cocaine. The vast majority of costs for distribution are accounted for by payments to retailers and low level wholesalers in the consumer country.

Though illicit drug markets generate more than one hundred billion Euros in sales, the overwhelming majority of those involved in the drug trade make very modest incomes. Only a few individuals in the trafficking, smuggling and wholesale sector make great fortunes but that accounts for a small share of the total income.

The study concludes that the total revenues generated by illicit drug sales are smaller than the €285 Billion estimated by UNODC in 2002/2003. The study estimates a range for the

total global cannabis retail market in 2005 between €40 Billion and €120 Billion, with the best estimate being about half of the UNODC's €125 Billion estimate (these values are in €2005).

Drug retail prices have generally declined in Western countries, including those that increased the stringency of their enforcement against sellers, such as the U.K. and the U.S.A. The study concludes that the declines in heroin and cocaine prices in these major markets have been large enough that total revenues are probably smaller in 2007 than in 1998. There are no indications that drugs have become more difficult to obtain. With the exception of one or two production and trafficking countries, the drug trade forms no major part of the national GDP.

Interventions against production can affect where drugs are produced, such as the changing location of coca growing within the Andean region which is plausibly related to the actions of the governments of Bolivia, Colombia and Peru to control the problem. However, there is a lack of evidence that controls can reduce total global production. The same applies to trafficking.

In general there is evidence of convergence of national drug policies. Demand reduction receives increasing emphasis. Harm reduction, still controversial in some countries, is finding wider acceptance. Some countries for whom tough enforcement had been absolutely central now accept measures such as substitution treatment as an important instrument for reducing heroin related problems. Policies towards sellers and traffickers have toughened.

Enforcement of drug prohibitions has caused substantial unintended harms; many were predictable.

A major limitation for the description of problems and policies regarding the world drug problem, as well as for the assessment of the effectiveness of policies, is the weakness of existing and lack of availability of relevant data.

Acknowledgements

The authors would like to thank the many people who contributed to this study.

We owe a large debt to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in Lisbon for the relevant input and support we received on many issues. The EMCDDA proved to be a particularly valuable source of information and expertise for our purposes. We want to express special thanks to Paul Griffiths, Brendan Hughes, Rosemary de Sousa and Frank Zobel who provided high quality information, data and advice throughout the project, as well as to their colleagues who contributed to specific sections in this report.

We would like to express thanks to all the experts from the countries covered in the individual country reports in the Appendix. They took the time to answer all our questions and provided valuable information on drug problems and policy in their countries.

We also would like to thank Jon Caulkins (Heinz School, Carnegie-Mellon University) for his useful comments and Jim Burgdorf (RAND) for his excellent research assistance to the Market Report. Thanks also to Greg Falconer and Philipp-Bastian Brutscher (RAND Europe) for their great assistance with the research for the economic cost report.

Special thanks to the experts who made themselves available to review the draft report for their valuable input. The following experts gave input and precious suggestions for streamlining the final manuscript: Ruth Levitt (RAND), Wayne Hall (University of Queensland), Dick Hobbs (London School of Economics), Martin Bouchard (Simon Fraser University), William Rhodes (Abt Associates), Pierre Kopp (University of Paris-1), Michael Farrell (Institute of Psychiatry, London), Alison Ritter (University of New South Wales), Harold Pollack (University of Chicago) and Louisa Degenhardt (University of New South Wales). We also would like to thank Henri Bergeron (Institut d'Etudes Politiques de Paris), Constantijn van Oranje-Nassau (RAND Europe) and Esther Croes (Trimbos Institute) for their helpful comments.

Finally, many thanks to the people who gave precious support to get all things done: Toine Ketelaars (Trimbos Institute) for all the thorough literature searches, Yvonne Borghans and Danielle Branderhorst (Trimbos Institute) for their scrupulous text editing and for care and logistic support during the project, Pat O'Hare for again taking the job of copy editing (reports on drug problems and policy and on methodological challenges) and Andre Ladenius and his team for desk top publishing.

The authors are solely responsible for the views in this book.

This Report provides an assessment of how the global market for drugs developed from 1998 to 2007¹ and describes drug policy around the globe during that period. To the extent data allow, it then assesses how much policy measures, at the national and international levels, have influenced drug problems. The Report is intended to help inform the deliberations about the 1998 UNGASS resolution at the 2009 session of the Commission on Narcotic Drugs in Vienna, as well as longer-term discussions of drug policy at the national level. The analysis is focused on policy relevant matters but it does not attempt to make recommendations to governments, reflecting the diversity of contexts and values in which policy is implemented.

This document provides the main Report of a project conducted over a period of 12 months by the Trimbos Institute and the RAND Corporation under contract to the European Commission. The Report draws on a number of other supporting documents from the study that are briefly described in the following paragraphs along with the methodology of the project.

The European Commission launched this project by seeking an analysis of the main characteristics, mechanisms and factors that govern the global illicit drugs market and to examine the extent to which perception of this issue matches reality. The project was to address, inter alia, both supply and demand in the different parts of the world, estimate the size of the global illicit drugs market and also its costs for society, taking into account the costs of international control measures. Other objectives included an assessment of how the illicit drugs phenomenon developed over the past decade and how these developments can be explained.

In addition the Commission called for an analysis and description of the main drug policy models that have been implemented in different countries to tackle the drugs phenomenon in the past decade. This was to include a comparative analysis of the character and perceived impacts of drug-demand-reduction and supply-reduction policies on the drug problems, including health and social well-being, corruption and socio-economic development. The Commission also sought assessment of the possible unintended consequences of drug policy interventions.

¹ Though we aim to present data through 2007, for many countries and series data are available only through 2006 or even 2005.

Not all of these questions turned out to be answerable. We did conclude that during the period 1998 to 2007 the size of the global illicit drug problem did not decline; indeed, it has most probably grown somewhat worse over that time. Some countries' drug problems (especially the heroin and cannabis problems in many developed countries) have stabilized and probably declined but drug problems have worsened substantially in some developing and transitional countries. While it was not possible to produce a robust estimate of the total revenues from drug sales, it does appear that the existing estimates substantially overstate both the retail value and the international trade component of the drug market. Close examination of the methods used to produce estimates of the economic costs of the drug problem in various nations showed such differences in concepts used and the nature of the available data that it was judged impossible to produce estimates of the global costs of drug use and distribution.

We examined 18 countries in detail. Though there are many differences in drug policy across nations, we found that national drug policies changed in a moderately consistent fashion over the period, with an increased focus on helping users and, less strongly, on punishing traffickers and sellers. Though there is a strong research base for the claim that treatment can reduce the adverse effects of drug use for both users and society, there is no evidence that any specific policy instrument can reduce the number of drug users. The relationship between drug policy and changes for the better in drug use or drug problems is marginal at best. The strongest evidence for this conclusion is the marked similarity in drug trends (if not in levels of drug problems) in countries with very different drug policies e.g. the United States of America, the United Kingdom, the Netherlands, Switzerland and Australia.

There are many unintended negative consequences of drug policy interventions, particularly on the supply side. Building on an innovative analysis of the issue by the Executive Director of the United Nations Office for Drugs and Crime (UNODC), we present a new framework for understanding what generates these consequences.

The study covered four drugs in detail; cannabis, cocaine, heroin, and Amphetamine Type Stimulants (ATS²). These four drugs account for most of the global drug problem and certainly they dominate both discussion and measurement. In some nations other drugs are important but they either contribute little to the total global market for illicit drugs or they are not the subject of much explicit policy making. For example sniffing of volatiles by adolescents is common in countries as different as Scotland and Mexico; however little is known about this phenomenon and there are few interventions specifically targeted at it.

The project relies primarily on existing studies and data from national and international sources, particularly the EMCDDA (European Monitoring Centre for Drugs and Drug Addiction), and the UNODC (United Nations Office on Drugs and Crime). We did however attempt to augment these data sources for individual countries. Given that nations differ widely in the nature of their problems and policies, and given limitations of time and budget, we could not collect data in every country. Instead we selected 18 countries to examine in detail. Representing the various regions of the world we included: the largest by population (China, India, the United States Brazil and Russia); some

² The three main types of ATS are amphetamines, ecstasy and methamphetamines.

countries that had particularly important roles in the drug market (Colombia, Mexico and Turkey); some countries that had recently transitioned from Communist regimes (e.g. the Czech Republic, Hungary and Russia); and others that had tried a variety of drug policy approaches (e.g. Australia, the Netherlands, Switzerland and Sweden). South Africa was picked as the only major African nation for which adequate data might be available. In each country we interviewed selected experts to supplement the written data. Report 4 (“National drug problems and policies: an integration of 18 country studies”) presents the 18 individual country reports, as well as an integrating essay describing the patterns of change in problems and policies in those countries.

For Afghanistan, central to the heroin market, we relied on the many published studies. For Iran, an important nation for both problems and policies with respect to opiates, we were dependent on a much smaller published literature and on expert judgement.

This main report relies heavily on the other project activities. We developed new estimates of the size of the world drug market, summing a series of estimates of the major national markets and covering the retail, trafficking and production levels (Report 2 “Estimating the size of the global drug market revenues”). An effort was also made to estimate the economic costs of drug use in those countries for which appropriate data were available (Report 3 “Estimating social costs of illicit drugs across countries”). The study concluded that existing data and concepts varied so much across countries that it was possible neither to aggregate over countries nor to track how economic costs had changed over time in countries.

The study is analytically focused on the markets for drugs and brings a largely economic approach to the issue as reflected in Report 1 (“Assessing the operation of the global illicit drug markets”). That does not mean that we analyzed only those things that can be measured in money terms. Thus Report 5 (“The unintended consequences of drug policy”) assesses what is known about the unintended effects of drug control measures, many of which are essentially not susceptible to economic valuation.

A major limitation for our description of problems and policies, as well as for the assessment of the effectiveness of policies, is the weakness of existing data. Rather than provided detailed caveats for every component of the study, many of which draw on the same or similar data sources, we have described the most important methodological problems confronting this area of monitoring and analysis in a single document, Report 6 (“Methodological problems confronting cross-national assessments of drug problems and policies”).

2.1 **Operation of the markets**

Efforts to control drug production and distribution rest on assumptions about how the markets for these substances are organized, who participates and how the market responds to enforcement and other control efforts. This is the subject of Report 1.

A great deal can be learned simply from observation of the price of drugs as they flow through the distribution system from farm to retail. Table 1 presents some data for cocaine and heroin from about the middle of our study period, tracking the flow from growing in Colombia and Afghanistan to sale in Chicago or London.³ These figures are indicative rather than precise. A similar mark-up from production to retail sale can be observed with ATS⁴ but the mark-up from production to final sale is less for cannabis produced in the consuming country, probably both because the distribution chain is shorter⁵ and the penalties following detection are generally lower when compared to cocaine and heroin. The propositions emerge from this Table:

1. The cost of production, as opposed to distribution, is a trivial share of the final price in Western countries, roughly one to two per cent. That statement holds true even if one adds the cost of refining.
2. The vast majority of costs are accounted for by domestic distribution in the consumer country. Smuggling, which is the principal transnational activity, accounts for a modest share but much more than production and refining in the source country.
3. Most of the domestic distribution revenues go to the lowest levels of the distribution system, even though the great individual fortunes are made at the

³ These figures, like many others in this report, are presented in dollars rather than Euros. This is a consequence of how they appear in the source documents. Dates are often not precise, so conversion to Euros would also be approximate.

⁴For example, the UNODC reported that pills manufactured in the Netherlands cost 1-3 Euros per tablet and sold at retail in Germany for 8-22 Euro per tablet [<http://www.unodc.org/documents/commissions/CND-Session51/CND-UNGASS-CRPs/ECN72008CRP04.pdf>; accessed February 12 2009]

⁵ The smaller number of transactions from producer to final user means that fewer individuals have to be compensated for taking risks.

higher levels of the trade. The high costs of distribution represent primarily the need to compensate low level dealers for the risks of arrest or incarceration and, in some countries, of violence by other participants. This does not require that retailers be at higher risk of detection and punishment compared to wholesalers and traffickers; it is just that the risk is distributed over a much smaller quantity of drug at the retail level.⁶

Table 1 Prices of Cocaine and Heroin through the Distribution System ca. 2000 (per pure kilogram equivalent)

Stage	Cocaine	Heroin
Farm gate	\$650 (Leaf in Colombia)	\$550 (Opium in Afghanistan)
Export	\$1,000 (Colombia)	\$2,000-4,000 (Afghanistan)
Import	\$15-20,000 (Miami)	\$35,000
Wholesale (Kilo)	\$33,000 (Chicago)	\$50,000 (London)
Wholesale (Oz)	\$52,000 (Chicago)	\$65,000
Retail (100 mg. pure)	\$120,000 (Chicago)	\$135,000 (London)

Source: Drug Enforcement Administration; EMCDDA; UNODC; Matrix Knowledge Group, 2007.

Farmers in both Afghanistan and Colombia are independent entrepreneurs, though paying taxes to various quasi-state authorities like the Taliban and the FARC (The Revolutionary Armed Forces in Colombia). In the case of Afghan opium farmers, they are imbedded in a web of complex credit relations with richer farmers, which to some extent traps them in opium growing (Buddenberg and Byrd, 2006). Trading in Afghanistan is also characterized by many small traders, at least at the initial stage; there may be some degree of regional cartelization closer to the point of export (Byrd and Jonglez, 2006).

The industry is not vertically integrated; for example, smugglers mostly sell to independent wholesalers, who in turn sell to independent retailers.⁸ There is no indication of monopoly or even of cartels in most markets.⁹ While in some countries, such as Mexico, there is a great deal of competitive violence, in other nations there is also considerable working

⁶ This is easily explained in the standard risk compensation model used by economists. Assume that a trafficker sells 1 kilogram of cocaine and has a 1 percent probability of being imprisoned for one year as a result of the transaction; the rich trafficker values a year in prison at 100,000 Euros. A retailer sells 1 gram of cocaine and has only a 1 in 1,000 chance of the same imprisonment; he values a year in prison at 25,000 Euros. The trafficker will charge 1 Euro per gram to cover the risk, while the retailer, even though he has a lower chance of being jailed and values that less highly, needs 25 Euro to cover the risk associated with one gram. The figures are intended to be illustrative only.

⁷ The ratio of the retail price to the export price is misleading as a measure of the relative costs of the different chains in the distribution system because of seizures. For example, if one third of all cocaine exports are seized, then it takes three kilos of export level cocaine to support two kilos of retail sales and the cost share associated with exports should be increased by half. However, this makes small difference here because the export price is so low relative to retail.

⁸ There is no agreed terminology for the various levels of the market. We use the term smuggler or trafficker for those that bring drugs in large quantities (e.g. kilograms of heroin) across international boundaries. Those who handle large quantities domestically will be referred to as wholesalers and those who sell to final customers are designated retailers. Those who operate at intermediate levels, involving for example the sale of a few grams to heroin retailers, will be characterized as low level wholesalers.

⁹ References to the Medellin "cartel" were inaccurate. There was no evidence that it had the ability to restrict production or export. Rather it was a complex set of collaborative and competitive relationships for which the term "syndicate" would have been more appropriate.

collaboration among operators in the same market, at the same time as they compete on price for the same customers (Pearson and Hobbes, 2001). Paoli (2002), in a detailed study of drug markets in Frankfurt and Milan conclude that the sellers were essentially price takers rather than price setters.

The connection of drug production and trafficking to organized crime varies across countries but analysis is bedevilled by ambiguity about the proper use of the term “organized crime”. Since drug distribution often requires a degree of co-ordination in order to be efficient, it will involve at least a modicum of organization among criminals. The more useful question is whether it is connected to organized crime involving other criminal activity, such as gambling, prostitution, extortion etc. That seems to depend on the degree of centralized corruption in a country. For example in some countries it appears that the same police officials who protect corrupt public procurement rackets are also involved with drug trafficking. In contrast drug distributors in the United States over the last two decades have been specialized and independent of other racketeering organizations, as shown in a detailed study of large scale cocaine distribution organizations in the early 1990s (Fuentes, 1998). ATS production and distribution is frequently connected to gangs with broader interests, particularly motor cycle gangs. This may in part represent the lack of a strong ethnic base for importing of the drug, particularly if it is produced domestically. For example, in Australia, where the importation of heroin has been dominated by Chinese and Vietnamese groups, the amphetamine market is primarily composed of groups of local residents that produce domestically (Andreas, 2007).

There is also great interest currently in the connection between drug trafficking and terrorist and guerrilla groups. Al Qaeda and the Taliban certainly generate earnings from both the production of opium and early stage trafficking of heroin. FARC in Colombia has in the last decade depended heavily on taxation of coca growers and perhaps also on cocaine exports (Sheehan, 2000). The PKK (the principal Kurdish terrorist organization in Turkey) has earned money from heroin distribution in Western Europe (Bovenkerk and Yesilgöz, 2004) and there are occasional allegations of connections between drug trafficking and the Tamil Tigers in Sri Lanka (Cillufo, 2000) and the IRA in Northern Ireland (Cillufo, 2000). Drug trafficking may be an important source of income for these groups, even if they do not account for a large share of drug trafficking revenues. Separatist groups in Myanmar have long relied on opium and heroin related industries for income (Kramer, 2005).

A striking characteristic of drug distribution in the Western world is the prominence of immigrant groups. For example, in Australia, Chinese and Vietnamese organizations have been prominent in heroin smuggling and high level distribution (Parliament of the Commonwealth of Australia, 1995). In the United States Colombian and Mexican groups have dominated cocaine smuggling and are important in high level domestic distribution. Throughout Western Europe, immigrant groups from various transshipment countries have been important (Paoli and Reuter, 2008). This probably reflects on the one hand the advantages such groups have in dealing with exporters from the transshipping countries (such as Albania, Pakistan and Turkey) as well as in evading local police efforts¹⁰ and on

¹⁰ For example, language can be a major barrier. Few European police are able to understand the various dialects spoken in Albanian immigrant communities.

the other their relatively weak legitimate opportunities in their host countries¹¹. However in many of the same Western European nations, non-immigrant groups appear to be dominant in the distribution of cannabis and ATS.

Though drug markets generate hundreds of billions of dollars in sales and have created great wealth for some traffickers, it is important to understand that the overwhelming majority of those involved in the drug trade make very modest incomes. For example, though growing opium is much more profitable than growing other crops in Afghanistan, the average opium producing household probably earns less than \$3,000 from that activity throughout much of this period.¹² At the other end of the distribution chain, in retail markets in rich countries, a few studies of drug sellers in the U.S. have found net earnings in the order of a few thousand dollars per annum (e.g. Levitt and Venkatesh, 2000; Bourgois, 2002). Partly this reflects the fact that those who sell are themselves often heavy users of drugs and thus have poor legitimate earning prospects; this means that they are willing to sell drugs for relatively low wages.

The usual explanation for high earnings in the drug trade is compensation for risks. It is thus surprising that a number of studies of mid-level dealers (e.g. Matrix Knowledge Group, 2007; Pearson and Hobbs, 2001) find that these individuals earn very large incomes indeed, in the hundreds of thousands of euros annually, though the risk of incarceration or of experiencing violence seem to be small.¹³

Critical for understanding how drug markets respond to government interventions are two parameters, the elasticity of demand and supply. There is a great deal of work on the first (see e.g. the survey of Grossman, 2004) in Western countries, particularly the U.S. and Australia. In general the research finds that for cocaine and cannabis the elasticity of demand (the percentage decrease in demand in response to a one percent increase in price) is about -0.5, similar to that for tobacco. Thus an increase in the price of those drugs will reduce consumption but will also result in higher revenues for the distributors. For heroin there are few studies and these often draw on long-past experiences in countries where the opiates were legal.¹⁴ A rare exception is Bretteville-Jensen (2006), who estimates the elasticity of demand among heroin addicts in Oslo using interview data from 1993-2006; she finds that for those who are not active drug sellers the price elasticity of demand is -0.33 and for active sellers it is -0.77.

¹¹ In this respect Paoli and Reuter observe that the large Iranian Diaspora in Europe, though coming from a major trans-shipment and consuming country, are little involved in drug trafficking. This probably reflects their more middle-class origins and better opportunities in their new countries.

¹² UNODC (2003) estimated per farmer income for the period 1994-2000 at \$475-950 per annum (pp.62-64). In 2002, with opium prices ten times as high, the UNODC tentatively estimated that the figure might be \$5,000; prices have fallen substantially since then so that the per farmer income figure has also declined a great deal.

¹³ The claim of the low risk of incarceration is speculative but derives from the observation that many of the subjects interviewed by Matrix Knowledge Group (2007) had operated for years before being arrested. The sample is small and the response rate low, so that those who chose to participate may be systematically different from the larger universe of dealers.

¹⁴ For example, Chandra (2000) uses data from the opium regime in the Dutch East Indies in the early 20th century to show that higher prices reduced consumption by licensed opium users.

There are no estimates of the elasticity of supply, i.e. of how much supply increases in response to a 1% increase in price. Many economists (e.g. Becker, Grossman and Murphy, 2006) assume that there are no fixed factors of production and that the elasticity is infinite. I.e. producers and distributors are willing to produce any quantity at the existing price. This implies that shifting down demand, for example through effective prevention or treatment, will not result in any decline in price. Kleiman (1993) suggests that the supply curve may actually be downward sloping, since the principal cost of drug distribution is the risk of punishment, which declines when the market expands (i.e., moves along the supply curve). Plausible though that idea may be, it has not been readily accepted by economists (e.g. Manski, Pepper and Petrie, 2001)

The markets for cocaine and other psychoactive drugs are indeed markets and subject to the laws of economics. However they are not just markets; the absence of legal protections has consequences for example in determining the size and scope of enterprises. Economics is a useful frame for understanding these markets but the standard analysis may have to be modified at points. No published article examines specifically what modifications might be necessary, though there is a growing literature examining distinctive features that might explain the paradoxical decline in drug prices while enforcement became tougher.¹⁵

2.2 Production

2.2.1 Cocaine and Heroin

Amongst the most widely reported measures of drug related phenomena globally is production of coca and opium. Each year the United Nations Office on Drug and Crime, relying both on aerial observations and ground surveys, produces estimates in the *World Drug Report* of the area under cultivation for these two crops and also of the production of the raw materials and certain refined products (opium and cocaine). This is widely reported in media around the world.

The United States government also produces an annual estimate in its *International Narcotics Control Strategy Report*. This receives little attention. The two estimates differ substantially, as seen in Table 1 for the 5 year period 1998-2006.¹⁶ For example, in 2004, the UN estimate showed an increase in cocaine production of over 15%, while the US estimate showed a decline of almost 4%.¹⁷ In some years the figures have differed by as much as one third in absolute value (e.g. opium in 1999).

¹⁵ For example Caulkins, Reuter and Taylor (2005) developed a model in which tougher enforcement, if it removed more violent dealers first, would lead to price declines. They assume that sellers need to be compensated both for the risk of violence from other participants as well as for the risk of imprisonment. That may capture an element of reality but makes no claim to be a complete model of the determination of drug prices.

¹⁶ The U.S. has not yet published estimates for 2007.

¹⁷ Indeed, it is worth noting that for every year between 1998 and 2005, the UN and US cocaine estimates moved in opposite directions; i.e. if the UN estimate rose from the previous year, the UN estimate fell.

Table 2 United Nations and United States Estimates of Cocaine and Opium Potential Production 1998-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cocaine potential production										
UNODC	825	925	879	827	800	859	1,008	980	984	994
U.S.	825	765	777	780	975	805	775	910	970	n.a.
Potential opium production										
UNODC	4,346	5,764	4,691	1,630	4,250	4,783	4,850	4,620	6,610	8,870
U.S.	4,453	4,263	5,004	1,236	2,237	3,757	5,445	4,990	6,063	8,275
Sources: World Drug Report (2008), International Narcotics Control Strategy Report (annual).										

The purpose of presenting the comparison is not to be critical of the two agencies but rather to demonstrate how difficult it is to estimate these quantities. In many cases the cultivation takes place in scattered and concealed settings; these estimates are developed under very adverse circumstances, faithfully described in the technical sections of the reporting documents.¹⁸ Moreover the most basic story for the period of interest is consistent in the two sets of estimates. First, production since 1998 has fluctuated around a fairly constant level for cocaine and, until 2006, for opium; the increases in 2006 and 2007 for opium are hard to reconcile with other data.¹⁹ Second, though not shown in Table 2, production is increasingly concentrated in Afghanistan (opium) and Colombia (coca). A handful of countries have always accounted for most of total production but the dominant country now has an even higher share.

The shift of production to these two nations is itself an important phenomenon, partly driven by changes in other major producing countries (Myanmar for opium and Bolivia and Peru for coca) and partly by developments in the two nations themselves. In Myanmar opium production has long been concentrated in the Shan States, which have not been under the control of the central government for some decades. The ruling quasi-state, the United Wa State Army (UWSA) announced in 1998 its intention to end production of opium within ten years. Though they have not accomplished that, by 2005 they had reduced total production by about three quarters; despite a slight upturn in the last couple of years they have managed to keep the figure low by historic standards. This has been accomplished by highly coercive means, including the forced migration of hundreds of thousands of individuals from their traditional hill towns to a new area alongside the Mekong River (Kramer, 2005). The UWSA has been more successful than any government in suppressing opium production over the course of a decade; however its methods are not those that could be imitated by a democratic government.

¹⁸For example, after describing difficulties in estimating yields per hectare the UNODC goes on to say “The transformation ratios used to calculate the potential cocaine production from coca leaf or the heroin production from opium are even more problematic.” (*WDR* 2008; p.292).

¹⁹ The very large increases in estimated production for 2006 and 2007, entirely explained by rises in Afghanistan estimates, are troubling. The decline in farm gate prices, reported in the *World Drug Report 2008* (p.40) to be only about 20% in 2007 seem very small relative to the two year rise of more than 100 percent in production. The period 2002-2005 probably saw a re-stocking of inventory drawn down in 2001 when production fell so dramatically, so it is unlikely that a desire to build inventory would lead to higher demand in 2007. Nor is there evidence in the rest of the world of unusual price declines or increases in demand.

The increase in production in Afghanistan over the long term has been chronicled and analyzed in many studies, including an important collaboration between the UNODC and the World Bank (Buddenberg and Byrd, 2006). By 1998 the Taliban had authority over 90 percent of the country; in 2000 it used that authority to effectively prohibit the growing of opium, though not its trade; production fell by 94% in 2001. After the fall of the Taliban regime following the post September 11 invasion by the United States and allies, opium production resumed and quickly reached previous levels, before surpassing them substantially starting in 2006. The rising weakness of the central government, a proposition attested to in public statements by the most senior officials of Western Europe and the United States in 2008 (e.g., Gebauer, 2008), helps explain the expansion of opium production (Schweich, 2008). Though opium growing is formally banned, the central government lacks the authority to coerce or persuade the large number of rural households dependent on opium for their livelihood to turn to other crops that constitute a far less reliable source of earnings (Paoli, Greenfield and Reuter, 2009, Chapter 6).

The effect of the sudden and sharp decline in opium production in Afghanistan in 2001 on the world heroin market was surprisingly slight. As shown in Table 2, world production fell by 60 percent in 2001. This did have an effect on various opiate markets, traced in detail by Paoli Greenfield and Reuter (2009, Chapter 4). For example, there are signs that it reduced availability in the transshipment heroin market in Turkey in 2002 and may have accounted for observed purity declines in Western Europe in 2003. However it is clear that there were large stocks of opium and/or heroin in Afghanistan at the time of the ban, probably reflecting the bumper crops in the late 1990s. These were adequate to meet the needs caused by a one year dip in production.²⁰

For coca the story of the shift to Colombia in the 1990s is similar to that of the shift to Afghanistan for opium; it reflected both internal problems and pressures against growers in other countries. Bolivia and Peru undertook a variety of interventions against coca growing in the late 1990s and the early part of this decade. In the case of Bolivia, where coca was primarily grown in a relatively new area (the Chapare), the interventions were an unusual combination of alternative livelihoods, funded by many Western countries, and eradication, promoted by the U.S.A. The Chapare production fell substantially between 1994 and 2000 and has remained low even after the election to the Bolivian presidency of the former head of the indigenous coca growers (Evo Morales) in late 2005. In Peru a combination of a mid-1990s fungus that attacked the coca plants in the Upper Huallaga, eradication during the administration of President Fujimori and aggressive interception of air smuggling (supported by the U.S.) from Peru to Colombia made Peru a less attractive production site (Thoumi, 2003).

Colombia had long been the principal location for final processing, from cocaine base to cocaine hydrochloride, and for export to the principal market, the United States²¹. During the late 1990s and the early part of this decade there was an intensification of the civil war involving the FARC and a relatively new set of players, the paramilitary (the AUC; the

²⁰ The interesting analytic question is why the industry in Afghanistan seeks such a high ratio of inventory to annual shipments.

²¹ Brazil may now be comparably important for shipment to the growing European market.

United Self-Defense Forces of Colombia)). This led to a number of massacres in well settled rural areas, generating in turn mass migration to unsettled areas away from this conflict. The displaced farmers needed a source of revenue that was not dependent on good infrastructure. Coca growing was far superior to any other crop in that setting. Combined with the deteriorating conditions (from the producers' point of view) in Bolivia and Peru, this led to a large scale transfer of coca growing to Colombia. The UNODC estimates that in 1995 Colombia accounted for about 22% of total cocaine production; by 2000 that figure had risen to almost 80%; by 2007 it had fallen but was still over 60%.

These changes are reminders that the location of production can move rapidly. Afghanistan has dominated opium production for fifteen years, overtaking Myanmar in less than a decade; similarly Colombia moved to a dominant position in coca production in a very short time. If they become less attractive production sites, other nations are likely to emerge in a very few years to take their place. The question of why coca and opium production have settled in only a few countries and what determines which country dominates is one that has been analyzed by Thoumi (2003) and by almost no other scholars. Thoumi stresses the importance of social and political factors, a theme taken up by Paoli, Greenfield and Reuter (2009: Chapter 10).

2.2.2 Cannabis and ATS

Even though clandestinely planted and dispersed, coca and opium production are much easier to observe than the production of either cannabis or ATS. Cannabis is produced in over 170 countries²², often indoors and in very small plots. Regular official estimates, though of dubious provenance (Reuter, 1995), are available for Mexico and Morocco, which are thought to be by far the largest producers of the drug (Leggett and Pietschmann, 2008). For other countries, production estimates are nothing more than guesswork.

Estimating the production of ATS, itself a heterogeneous collection of substances with different production technologies and different user groups is even more difficult. Production in this case frequently occurs in small movable facilities. Methamphetamine in the United States in particular can be produced literally in kitchens, with batches of just a few thousand doses. It is hard to imagine a sampling and observation strategy that can develop defensible estimates of actual production. Existing estimates rely on seizure data, a questionable source, as discussed below, because it is impossible to determine from the available data whether a change in seizures is a function of a shift in enforcement effort and effectiveness or in the amount being produced in a specific country.

ATS production is distributed in a very different fashion geographically than are the other drugs. It is produced in a few countries but a higher number than for either coca or opium. The producer countries include Western countries (e.g. The Netherlands for ecstasy), transition countries (Russia for amphetamines) and developing countries (e.g. Myanmar for methamphetamine). Moreover new countries enter the market on the production side quite freely (e.g., Myanmar for methamphetamine in the 1990s), in contrast to coca and opium where there is only redistribution of markets shares among the existing production

²² This reflects statements about national responses to the UNODC Annual Reports Questionnaire.

countries; occasionally a country leaves production (e.g. the United Kingdom). This may reflect the fact that manufacture of synthetics is the quintessential “footloose” industry; it requires minimal fixed capital and uses a small labour force. In contrast opium and coca growing require hundreds of thousands of hectares and workers. ATS also offers instances of producers in rich countries selling to consumers in poor countries.

ATS production seems more tied to the growing globalization of industry and labour generally, with skilled manpower being recruited in one country to help produce inputs for a manufacturer in another (Europol, 2007). Moreover, this is an industry in which specific and easily targeted precursors, such as ephedrine and pseudo-ephedrine, play an important role and involve other countries. Most precursors for ATS are made in China and India, neither of which is an important source of the final product. Amphetamine, produced primarily in Europe, seems to offer an unusual instance of the rich Western world exporting an illicit drug to other poorer nations, though these exports account for a small share of the total production.

Thus it is hard to make definite statements about whether production of ATS and cannabis has increased or decreased over the period 1998-2007. Changes in the scale of the market will rely on consumption based estimates to make the determination, taking into account seizures as well.

2.3 Consumption

There has almost certainly been an expansion in the global number of users of cocaine and heroin over the period; the changes have been very uneven across countries, with declines in some major mature markets compensated by the emergence of user populations in countries that had quite modest consumption before. For cannabis there may have been a modest decline in the total number of users worldwide; the quantity consumed may only have stabilized. For ATS the data are exceptionally weak and no definite statement is possible.

As with production, it is necessary to analyze each of the four drugs separately. An added difficulty here is that the available data speak almost entirely to the numbers of users in individual countries, and not the quantities they consume. Since for cocaine and heroin an experienced user on average consumes more per annum than a new user, counts of users are insufficient to determine whether quantity consumed has increased. We developed quantity estimates for many countries in the course of estimating revenues (Report 3) but only in a very few countries is it possible to compare quantities in 1998 and 2007.

2.3.1 Measurement

Though in general we have consigned technical measurement issues to Report 6 (“Methodological problems confronting cross-national assessments of drug problems and policies”), a discussion of consumption measurement cannot be avoided here. The most widely reported statistics come from general population surveys, either of the household population or of specific age groups in schools. For example, ESPAD (the European School Survey Project on Alcohol and Other Drugs www.espad.org) collects data every four years in classrooms from school children aged 15-16 in most Western European

nations. There are no comparable consistent cross-national household surveys; instead each nation conducts its own from time to time. A few nations do it annually (e.g. the UK through the British Crime Survey) but most do it every two to five years (e.g. Australia conducts the National Drug Strategy Household Survey every three years).

These surveys provide good indicators of trends in occasional use of many drugs and useful information about heavy cannabis use. They are however of little value in estimating the size, or rate of change, of the much smaller populations that use psychoactive drugs frequently, particularly those drugs that are expensive and lead to high criminal offending rates among frequent users, notably cocaine and heroin. These populations have high rates of homelessness, lead erratic life-styles that make them hard to contact through a survey, have high rates of interview refusal and under-report consumption (Rehm *et al.*, 2005). As a consequence, in every country where efforts have been made to develop estimates of the extent of “problematic drug use” the term developed by the European Monitoring Centre for Drugs and Drug Addiction, they have been found to be much higher than suggested by the surveys. For example, in the United States for 1998 the National Household Survey on Drug Abuse (now the National Survey on Drug Use and Health) estimated that 253,000 persons had used heroin in the past year. In contrast, estimates that took account of drug tests and self-reports of arrestees estimated that roughly 900,000 individuals consumed heroin at least ten times in the previous month (ONDCP. 2001).

In what follows we rely primarily on general population surveys for cannabis and ATS. For cocaine and heroin we use instead estimates that come from a variety of other data sources, including criminal justice and treatment client populations. We consider each drug separately and then briefly discuss countries as the unit of aggregation.

2.3.2 Cannabis

For countries where cannabis use was common by the early 1990s (e.g. Australia, Canada, the U.K. and the United States) there has been a broadly common pattern of change over the period 1992 to 2006. Prevalence rates rose for the early part of the period, coming to a peak roughly between 1998 and 2002, and then fell substantially through to 2006. For example, in Australia the past year rate of cannabis consumption for the population over age 14 rose from 12.7% in 1993 to 17.9% in 1998 and then fell to 9.1% by 2007. Similarly in the U.K., for the population aged 16-59, prevalence rose from 8.4% in 1994 to 10.9% in 2003 before falling back to 8.2% in 2007. The pattern is particularly pronounced for adolescents across countries. The EMCDDA in its 2008 Annual Report (EMCDDA, 2008) concluded that throughout the European Union cannabis use had stabilized.²³

For some countries in which cannabis use was not well established the rise of the 1990s did not come to an end early in this decade. For example, France, where the prevalence rate for the 15-64 year range was only 3.9% in 1992, that rate rose in the following three surveys to 10.8% in 2005. However in the two of our sample of 18 countries that represent

²³ “Information from recent national surveys suggests that cannabis use is stabilising in many countries. Of the 16 countries for which it is possible to analyse the trend from 2001 and 2006, last year prevalence among young adults increased by 15% or more in six countries, decreased in three by a similar amount and was stable in seven.” (p.42)

transitional countries (the Czech Republic and Hungary), in which cannabis use was very slight under the pre-1990 Communist regime, there were clear indicators that prevalence had begun to decline by the middle of this decade after a long rise to Western levels. Russia has a high rate in the middle of this decade but trend data are unavailable.

Table 3 shows prevalence rates from national surveys of the household population for seven Western countries. Though the age ranges are somewhat different, the Table shows that experience with cannabis is a normative experience in many but not all countries, a part of the process of growing up. In some countries more than 50 percent of all those born since 1980 will have tried cannabis before they have reached the age of 25.

Table 3 Prevalence of Past Year and Lifetime Marijuana Use, among Younger Age Groups, in 8 Nations ca. 2004

Country (age range)	Lifetime	Last Year
France (15-34)	43.6	16.7
UK (15-34)	41.4	16.3
Netherlands (15-34)	32.3	9.5
USA (26-34)	56.7	19.9
Canada (25-34)	56.8	18
Australia (20-29)	54.5	26
Sweden (15-34)	19.1	4.8
New Zealand (25-34)	62	18
Sources: various national household surveys		

For the four major developing countries in our 18-country sample, cannabis use remains low. China does not have a tradition of cannabis use and the drug continues to be rare there (Hao et al, 2004). India has a long tradition of cannabis use in ceremonies and a few state licensed shops dispense the drug but again national prevalence is very low; it is estimated that 3.2% of the population had tried cannabis some time in their lifetime, barely one tenth the rate in countries such as Australia and Switzerland. Even Brazil, with a growing problem of drug trafficking and consumption of cocaine shows quite modest rates, an estimated 6.9% lifetime for the population over age 14 (Galduroz *et al.*, 2005.). Mexico, the principal foreign producer for the U.S. cannabis market, also does not have a high level of use in the most recent surveys, even among youth; for example, only 3.2% of 12-17 year olds in a 2005 Mexico City school survey reported ever having used the drug (Benjet *et al.*, 2007.).

2.3.3 Heroin

In most Western countries there is evidence that the number of frequent heroin users has been in decline through most of the last ten years. For example in Britain, the European Union member country most adversely affected by heroin following a twenty five year rise in incidence (De Angelis, Hickman and Yang, 2004) it is estimated that the number of dependent users declined between 2000 and 2005. In Australia, which also experienced a major heroin epidemic in the 1990s, there has been a marked reduction post-2000. For no

major Western country is there any indication of growth in the heroin using population over since 2000.²⁴

In the same period there has been a serious epidemic of opiate use in the Russian Federation²⁵ and many of its CIS neighbours, particularly in Central Asia. For Russia, the UNODC reports an estimate of 1.6% (ages 15-64) in the middle of this decade, giving a total opiate user population of about 1.5 million²⁶. Rates in some Central Asia countries are comparably high but the population base is small, so they contribute little to the global problem.

China experienced an epidemic of heroin dependence in the western provinces near the border with Myanmar in the 1990s (Chu and Levy, 2005). There is no evidence of much expansion of that epidemic since the late 1990s to other regions. Though the absolute number of heroin users is large (approximately 2 million, double the U.S. figure) in the context of China's huge population, it is a low prevalence, barely 0.25% of the population aged 15-64. India, like China a country with a long history of opiate addiction, has a modest reported prevalence, a high absolute total and no evidence of much expansion in the last decade.²⁷

Iranian data indicate that it probably has the most severe opiate²⁸ consumption problem (2.8% of the 15-64 population). However the prevalence estimates are too crude to determine whether the number has grown since 1998.

This has so far been an analysis of prevalence, not consumption. Heroin prices generally have fallen. Given the evidence reviewed above that consumption of current users is responsive to price (i.e. that a heroin user consumes more if the drug becomes cheaper), it is likely that consumption levels per user have risen during the period. ONDCP (2001) reports an increase in total consumption of heroin in the United States during the period 1988-1998, during a period in which the number of chronic heroin users fell, while the price of heroin declined precipitously; the implication is that average heroin consumption per user rose substantially. There are no other countries for which average per user or total heroin consumption over time has been estimated. Given the paucity of data on quantity

²⁴ In the press release accompanying publication of its 2008 Annual Report, the EMCDDA was more cautious "across Europe, data suggest that new recruitment to heroin use is still occurring at a rate that will ensure that the problem will not decline significantly in the foreseeable future". The specific countries cited by the EMCDDA in support were either small, new to the EU or (mostly) both.

²⁵ A substantial percentage of Russia's opiate users continue to consume a variety of less refined domestic products other than heroin or opium.

²⁶ The *World Drug Report 2008* (p.56) reports considerable uncertainty about this number. It does not appear that there is a documented base for the estimate.

²⁷ Even compared to other countries, where male rates exceed female, the Indian problem is disproportionately male, so that surveys are occasionally only of the male population

²⁸ Iran continues to be a major consumer of smoked opium, though heroin's share of the market has risen in recent decades. Given that heroin is a more efficient mode of consumption that may have reduced per addict annual consumption in morphine equivalents.

per user, it is impossible to develop robust estimates of how global consumption has changed over time or to match production and consumption for any recent year.²⁹

2.3.4 Cocaine

The United States has been the dominant market for cocaine, in terms of both users and quantity, since the emergence of the modern cocaine epidemic in the 1980s. In the study period there was a decline in estimated U.S. prevalence³⁰ and a substantial expansion in the European market, particularly in Spain and the United Kingdom. The European change is reflected most clearly in treatment statistics; for the first time there were nations in Europe in which cocaine was the primary drug of abuse for a substantial fraction of those entering treatment. In Spain 21% of 1998 treatment entries were for cocaine; by 2005 that had risen to 63%.³¹ No other EU country had a rate higher than 35% in 2005, but many had seen a large relative increase in the first half of this decade. The rise in treatment numbers for cocaine in Europe also indicates that the cocaine epidemic has reached a new stage at which a larger share of those who use the drug are using frequently and are experiencing problems with it.

There remains little evidence of wide-spread cocaine use in any country outside of North America, Europe and a few countries in South America (notably Brazil). This is a reminder that the spread of use of specific drugs is dependent on a variety of factors about which little is known.

2.3.5 ATS

We note once again the heterogeneity of ATS as a group and the difficulty of making general statements about the category for that reason. Patterns of change have varied considerably across the globe, with less consistency within groupings such as Western countries or Asia than even for cocaine and heroin. For example, methamphetamine, which seemed on the point of becoming a common recreational drug in the United States in the late 1990s, has since faded in the general population, even as the number of methamphetamine users showing up in treatment has increased.³² Australia on the other

²⁹ Paoli, Greenfield and Reuter (2009, Chapter 5) show that it is possible to reconcile consumption and production data for the years 1996-2003. In each year except 2001 there is a surplus of production (after taking into account seizures); in 2001 consumption plus seizures substantially exceeded production. No reconciliation has been done for any more recent year. Over the entire period the difference was not very large relative to the total estimated production.

³⁰ Changes in the methodology of the household survey in 2002 prevent comparison of the 1998 and 2007 figures for cocaine use in the household population. The new methodology appears to have resulted in higher estimated prevalence for cannabis and cocaine. Over the period 2002 to 2007 the estimated number of past year users of cocaine stayed essentially the same, around 5.8 million [<http://www.oas.samhsa.gov/nsduh/2k7nsduh/tabs/Sect8peTabs1to21.pdf>, last accessed February 14, 2009]. The evidence for the decline in consumption is that the population in treatment for cocaine continued to age: whereas in 1992 over 50% of those entering treatment were under the age of 31, that figure had dropped to less than 20% in 2005 (unpublished analysis of the Treatment Episode Data System).

³¹ Data from the EMCDDA Table TD1 <http://www.emcdda.europa.eu/stats08/tditab3b> [accessed December 7, 2008]

³² For example, the prevalence of last month methamphetamine use in the household population aged 18-25 rose from 0.3% in 2000 to 0.7% in 2001 but then has never risen higher than that. In 2007, the figure was

hand seems still to be in the midst of a methamphetamine and amphetamine epidemic³³ Japan has experienced an occasional outbreak of amphetamine use since 1945 but there is no sign of recent increases (UNODC, 2005a).

2.3.6 Modeling the patterns of change

The total number of users globally is dominated by the number of cannabis users; that is true both of 2007 and 1998. For example in 2007 there were an estimated 160 million past year cannabis users, compared to a total of just 40 million for the other listed drugs (ATS, cocaine and heroin). Statements about the change in the global prevalence of drug use thus are statements about cannabis, even though that drug accounts, in terms of health and social harms, for a small share of the global burden of drug-related harms. Thus we focus on individual drugs rather than on the total.

The crudest summary would be that consumption ten years after UNGASS is only moderately changed. The major changes in the decade since UNGASS are (1) the broad decline in the prevalence of cannabis use in many Western countries, many of which have also seen a modest decline in the number of heroin users; (2) the expansion of the Russian and neighbouring country heroin markets, now probably stabilized³⁴ (3) the growth of cocaine use in Western Europe apparently roughly compensated for a decline in the United States and (3) the stabilizing of the numbers of ATS users, though the pattern is uneven across countries.

An interesting feature is the variability of prevalence across countries. For example, amongst wealthy nations there is huge variation in the extent of cannabis use; for Sweden Life Time Prevalence (ages 15-64) was only 12% compared to 44.5% in Canada. Cocaine is hardly known in rich countries of Asia, such as Japan, Korea and Singapore, despite their deep integration into the global consumer culture. Some countries through which heroin has flowed for decades, such as Mexico and Turkey, have seen minimal local use emerging while the countries of Central Asia have been seen a serious epidemic following the development of the transshipment route of heroin to the Russian market.

2.4 Revenues

One adverse consequence of illicit drugs for global society is that they create large illegal incomes. It is these incomes that generate the corruption and violence that accompany drug markets in some countries and which lead many young people (mostly men) in those

0.6%. Meanwhile the total number of treatment admissions for methamphetamine rose from 67,000 in 2000 to 148,000 in 2005.

³³ McKerin *et al.* (2005) estimate that the number of heavy methamphetamine users in Australia at about 100,000, comparable to the peak number of heroin users and equivalent to about 5 per 1,000 population. While methamphetamine is the amphetamine most commonly used in Australia, other forms are also used.

³⁴ The evidence on the heroin market in the Russian Federation is exceptionally weak; the statement about the end of the epidemic, i.e. a sharp decline in annual initiation rates, is based on expert judgment. Weak support can be found in the time pattern of the number of "registered users", partly generated by criminal justice activities. This rose ten fold in the decade up to 2002 and then was constant over the next three years; approximately three quarters of that number are opiate addicts.

countries to abandon education and legitimate employment to seek their fortunes illegally. Thus one measure of how the world’s drug problem has changed since 1998 is the change in revenues generated by drug sales. Report 2 (“Estimating the size of the global drug market revenues”) presents new estimates, paying attention to their distribution across the various levels of distribution and production.

The United Nations Office on Drugs and Crime (2005) developed the first documented estimates of the global retail market for cannabis. Their estimate of the cannabis market circa 2003 is about €130B, which implies a larger retail market for cannabis than for cocaine and opiates combined.³⁵ The UNODC acknowledged the uncertainty surrounding this figure because of data inconsistencies. They suggested that the difference between their estimate and the “true value of the cannabis market could be significant . . .” (2005, 134). Table 4 compares UNODC’s figures with our low, best, and high estimates for North America, Oceania, and Western and Central Europe.

Table 4 Estimates of the Size of the Retail Cannabis Market

		UNODC circa 2003	RAND Low	RAND Best	RAND High
North America	Expenditures (Billions)	€56.6	€7.8	€17.3	€36.1
	Metric Tons Consumed	6,034	1,609	3,600	7,492
Oceania	Expenditures (Billions)	€5.5	€1.4	€3.1	€6.5
	Metric Tons Consumed	684	118.9	266.1	553.6
West/Central Europe	Expenditures (Billions)	€35.2	€6.1	€13.5	€28.5
	Metric Tons Consumed	6,051	1,165	2,607	5,424

While Table 4 only includes estimates from three of the 16 regions used in the UNODC calculations, the UNODC reports that these three regions account for 78% of the global cannabis retail market and hence represent the bulk of their global estimate. Because adequate data are not available for the other 13 regions (22%), the work presented in this chapter focuses on improving the estimates for the three regions and takes as correct those estimates constructed by the UNODC for the other 13. Assuming that consumption patterns have remained relatively stable in these 13 regions between 2002/2003 and 2005 (not an unreasonable assumption), adding this figure to the sum of the best estimates for North America, Oceania, and Western and Central Europe generates a global estimate of the retail market for cannabis of approximately €70B—about half of what the UNODC estimated for 2002/2003. A similar computation employing the low and high estimates for the three main regions generates an approximate range for the global retail market of €40B and €120B.

³⁵ The UNODC estimate for the United States (the largest market) is larger than ours since it implies that every past year user consumes on average 165 grams annually whereas we assume an average of 96 grams. Since the average joint has probably 0.30-0.50 grams of cannabis (see Report 2), this is equivalent to the average user being a daily smoker of cannabis. No survey suggests that more than about one fifth of last year users fall into that category. Further, the UNODC applies an average retail price that is more than twice as high as the figure we use (€4.8 per gram and €12.5, respectively). We prefer our price figure since it is based on self-reported information from cannabis buyers who consumed or gave their cannabis away, and hence has been purged of individuals who might have also resold some of their cannabis at a higher level. Further, our estimate accounts for the quantity discounts that often occur at the retail level (Wilkins et al., 2005; Caulkins and Pacula, 2006).

A number of assumptions in the UNODC calculations also seem likely to raise the estimate of total revenues for other drugs above plausible levels. For example, UNODC assumes a very high annual consumption of heroin per user in the region with the highest price; in Oceania (mostly Australia) the annual consumption per user is 57 grams (vs. 17 in the US) though the price is almost €500 per gram (vs. €350 in the US).

We do not report a total estimate for all drugs globally. There are too many countries for which the data are simply lacking or suspect, particularly on prices. For ATS there are simply too many prices and products for which the quality and quantity of price data are inadequate. For opiates, Iran, a very important market, is a nation for which data are conspicuously lacking.

Our stylized model suggests that the annual value of the cocaine trade (i.e., the revenue generated by shipping it from Colombia to Europe and North America) is likely to be between €6 billion and €9 billion. This value includes transportation costs, payoffs, compensation for trafficker risk, and other mark-ups. As previously mentioned, this model does not cover all consuming countries, but it accounts for those where the most of the trafficker revenue is generated. For opiates the intra-Asia trade is hard to value because of the dearth of import price data. Our rough calculations again suggest that total world international heroin trade can be no more than €20 billion.

This suggests that illicit drugs constitute a very modest item in international trade. The conclusion is different from that reached by UNODC in 2005; UNODC compared trade revenues for wine and beer (totalling €22 billion) with the wholesale value of illicit drugs. Wholesale prices are much higher than import prices; the difference is part of domestic value-added and thus not appropriately compared with other international trade figures. The use of wholesale rather than import prices overstates the value of the trade in illicit drugs.

Of similar importance for the current study is whether revenues have fallen or risen over the period 1998-2007. Revenues are a function of prices and quantities sold. Unfortunately the price data for a systematic estimate of 1998 global revenues for any of the four drugs are not available. However we think it likely that revenues have fallen because prices have generally declined and production quantities have fluctuated around a stable level for cocaine and heroin. Over the period, retail cocaine and heroin prices have fallen in much of the world; in the case of the United States and Europe, two major markets accounting for a large share of total revenues, the fall has been precipitous. For cannabis the prevalence estimates suggest no increase in total consumption and prices have also not had an upward trend.³⁶ For ATS the picture across countries is so mixed that no statement about change is possible.

For a handful of countries the revenues from the drug trade have macroeconomic significance, another dimension of the problem. It is well known that heroin exports may add nearly 50 percent to Afghanistan's GDP (Buddenberg and Byrd, 2006). For Tajikistan, a major transshipment country for those exports, the percentage GDP

³⁶ Another complication for cannabis is that a substantial share of users receives the drug as a gift and some of that is self-produced. Thus total retail revenues are less than the result of multiplying total consumption by average retail price; the share that is self-produced may have changed over the study period.

contribution may be comparable; Paoli, Greenfield and Reuter (2009; Appendix C) estimate that early in this decade the percentage was at least 30 percent. Given the crude nature of GDP and revenue estimates for Afghanistan in 1998, it is hard to assess whether the percentage has increased. There are no earlier estimates for Tajikistan. There is no indication that cannabis production is of macroeconomic significance for any nation.

With the possible exception of some small island states in the Caribbean, there is no country for which drug production or trafficking is as economically significant as it is in Afghanistan and Tajikistan. It has been moderately important for the Andean countries but the estimates of GDP contribution for Bolivia, Colombia and Peru never exceeded 10 percent (e.g., Alvarez, 1995) and have been much lower than that for the last decade, reflecting the stagnation of cocaine production and growth of the legitimate economy.

2.4.1 Prices

The fall of retail prices in many markets since 1998 is itself an important phenomenon. In terms of the subject of this section, revenues, the fall is desirable; lower prices will reduce criminal revenues for a given level of drug consumption and also reduce incentives for crime and theft related to drugs. On the other hand lower prices may lead to heavier consumption by current users and increase their health risks.

Prices have not fallen throughout the production and distribution chain. In particular, opium farm-gate prices in Afghanistan remain above their 1998 (\$60) levels in 2007 (\$120), even after adjusting for inflation.³⁷ They are much below the levels reached after the end of the Taliban opium production ban (ca. \$600 in early 2003). The ban depleted inventories and thus created higher demand in 2002-2003. However, even with the massive expansion in production that surely has restored inventories, the price remains well above earlier levels. This may reflect improved agricultural productivity generally, which would raise the price of land and rural labour, the two major inputs to opium production. However this increase in opium price has little consequence for the retail price of heroin, since the price of the opium input accounts for less than 1 percent of that retail price.

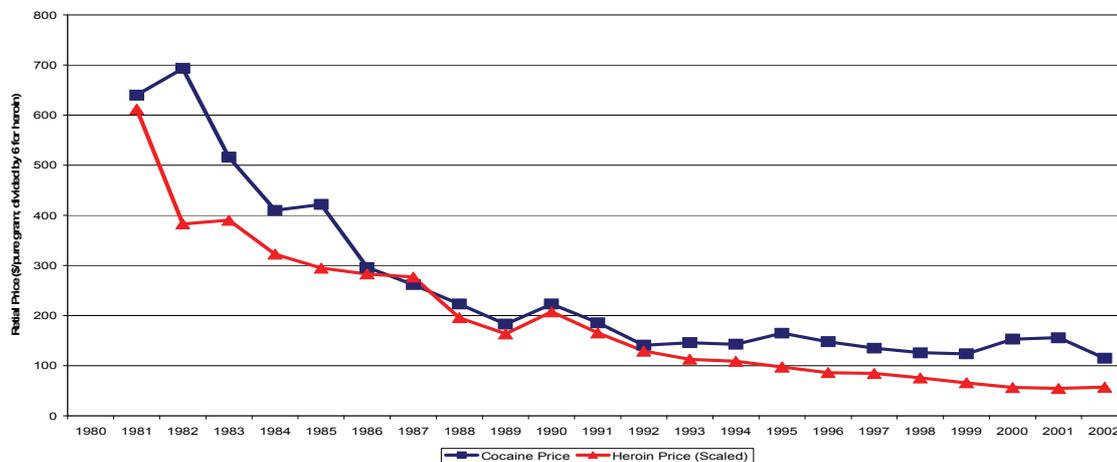
In the United States, the fall in retail prices for cocaine and heroin has occurred over more than a twenty year period. Figure 1 shows (inflation adjusted) prices for a pure gram of cocaine and heroin for the period 1980-2003.³⁸ As will be discussed in the policy section of this report, what is striking about these declines is that they have occurred during a period of massive increase in incarceration of sellers of cocaine and heroin. Nor are the falls found for every drug. Cannabis prices remained fairly constant over the period 1998-2003,

³⁷ The prices reported here are un-weighted averages of the provincial prices, which can vary a great deal. For example, in March 1998 the prices in the two major provinces were \$41 for Kandahar and \$95 for Nangahar. Since the composition of production across provinces changes substantially both year to year and in the long-run, a simple average may be misleading.

³⁸ Though the Office of National Drug Control Policy has issued brief statements about prices post-2003, the lack of documentation of the methods used for generating those estimates and the lack of match with the documented estimates in the short period of overlap give them low credibility; see http://voices.washingtonpost.com/fact-checker/2007/11/is_there_a_cocaine_shortage_1.html. There is evidence that the prices of cocaine and methamphetamine rose in 2007. See http://www.usdoj.gov/dea/concern/meth_prices_purity.html, last accessed 15 January 2009

increasing just slightly in inflation adjusted terms, though that may reflect a rise in potency.³⁹

Figure 1 Cocaine and Heroin Prices, United States, 1980-2003



Source: Office of National Drug Control Policy, 2004

For no European country except Norway is there a comparable price series based on individual observations of price and purity in seizures and undercover purchases. However the available data do suggest that there has been a decrease in inflation-adjusted prices for all drugs at least for the period 2001-2006. Table 5 reports an index of prices without adjustment for purity or potency (for cannabis).

Table 5 Indexed trends in EU Retail Prices for Major Drug Types, Adjusting for Inflation, 2001-06

Drug type	2001	2002	2003	2004	2005	2006
Cannabis resin	100	99	90	70	73	70
Herbal cannabis	100	98	88	80	85	83
Cocaine	100	93	88	83	79	76
Heroin brown	100	90	82	81	91	87
Amphetamines	100	91	93	85	80	89

Source: European Monitoring Centre for Drugs and Drug Addiction; <http://www.emcdda.europa.eu/stats08/ppfig1>

Consistent and systematic price data are available for only a few other countries, not including any of the other major consumer countries (Brazil, China, India, Iran, Russia). Thus it is impossible to assess what happened to revenues in those countries over the study period.

³⁹ The prices are unadjusted for potency. Data from a sample of the same seizures and purchases show that average potency has risen but this cannot be related to the individual observations.

3.1 **Introduction**

The drug problem of a nation is not measured simply by the number of drug users or even by the aggregation of the adverse effects of their drug use. A nation such as Turkey or Peru, with relatively few users, may still be seen as having a major drug problem because it either serves as a major trafficking route (Turkey) or a producer (Peru), with the attendant corruption and large illegal incomes. The UNODC has attempted to take account of this by constructing an Illicit Drug Index (IDI), which measures each nation's contribution to the global drug problem, summing those associated separately with consumption, production and trafficking (UNODC, 2005). Though the IDI has many weaknesses (e.g. its effort to turn all adverse consequences into health harms, its assumption that all grams of a given drug are equally harmful) it does represent an important step forward in aggregating across the many dimensions of drug problems.

For purposes of the UNGASS assessment it would be highly desirable to use something like the IDI and aggregate problems across nations for 1998 and 2007. Even putting aside the conceptual problems, this is impossible because of limited data availability. We were able to obtain data for only a very small number of the adverse consequences for most nations in our 18 country sample. We collected data on three measures: drug-related deaths (DRD), HIV, and crime.

3.2 **Drug-related deaths**

These data are available for a few Western countries. Comparability across countries is limited by differences both in the definition of a DRD and also in the methods by which death certificates are generated.⁴⁰ The procedure for determining whether death is the consequence of a drug overdose ranges from a full post-mortem to superficial medical check by a GP. Nations also differ in how the data are aggregated. In some countries data on overdose deaths are registered separately; in others these data are included in the general mortality register. The latter is the case in the Netherlands which guarantees national coverage but includes on the other hand only residents of the Netherlands. However,

⁴⁰ The EMCDDA studied this issue extensively in the 1990s (e.g. EMCDDA, 1997) and has developed guidelines for the reporting of deaths but compliance remains low.

though cross-country comparisons are of doubtful validity, it is possible to make comparisons of the number of overdose deaths within a country at two different points in time. Note that we are including only deaths in which drug use was the direct, acute cause. Not included are those in which drug use is the 'indirect' cause, e.g. death by drug use related diseases and accidents. For example, deaths related to Hepatitis B, in which the cause of the infection was previous injecting drug use are not counted as drug related deaths. Nor are homicides which result from drug-related disputes included in these figures.

In a large number of countries the number of such deaths has declined somewhat in the second half of our study period. For example, in the European Union the EMCDDA estimates that the number of DRD approximately doubled from 1990 to 2000 but then fell by about 15% to 2005.⁴¹ There was a decline of more than 50% in Australia over the period 2000-2005, reflecting presumably the influence of the heroin "drought" that started at the end of 2000.⁴²

No data on drug-related deaths are available for most non-Western countries, including Brazil, China, India, Iran or Russia. In Mexico there are regular newspaper statements about the number of drug-related homicides (approximately 4,000 in 2008) but they have not been verified and in any case fall outside the scope of drug-related deaths recorded in other nations. Given that these countries account for such a large share of all heroin addicts globally, it is impossible to make statements about how drug-related deaths have changed globally between 1998 and 2007.

3.3 HIV

The extent of drug related HIV varies substantially across countries, both expressed as the fraction of injecting drug users who are HIV positive or the share of HIV cases for which injecting drug use is the most likely vector of transmission. Among our 18 countries, the rates of HIV in IDUs are low (i.e. less than 5%) for most Western countries. These are mostly nations that undertook aggressive campaigns against HIV early on. Though the contribution of explicitly harm reduction programs such as Syringe Exchange Programs (SEP) to keeping the rates low remains controversial, the weight of the evidence is usually read as favouring that proposition (e.g., Institute of Medicine, 2006).

For HIV we were able to make use of the relatively sophisticated data systems that have been developed in many countries, including some impoverished nations, to track the spread of the AIDS virus. However, numbers on HIV+ drug users are frequently calculations based on samples and on assumptions of the actual source of infection, either

⁴¹ See EMCDDA (2008), table DRD5 'Indexed trends in drug-induced deaths and in the number of deaths occurring under the age of 25, available at: <http://www.emcdda.europa.eu/html.cfm/index52843EN.html> [accessed on April 7th 2009].

⁴² Opioid death figures rose rapidly through the 1990s to a peak of 1116 in 1999. Thereafter they fell sharply to 374 in 2005, close to the figures around 1990. [http://ndarc.med.unsw.edu.au/NDARCWeb.nsf/resources/NIDIP_FactSheet_Opioid/\\$file/OPIOIDS+OVERDOSE+2005.pdf](http://ndarc.med.unsw.edu.au/NDARCWeb.nsf/resources/NIDIP_FactSheet_Opioid/$file/OPIOIDS+OVERDOSE+2005.pdf) [accessed February 14, 2009]

sexual Behaviors or injecting drug use. The way they are collected differs substantially among countries. But recently a few global overview studies in the field of HIV prevalence and prevalence of injecting drug use were published that we considered useful for our purpose (Mathers *et al.*, 2008; Cook & Kanaef, 2008). The HIV infection rate among IDU is high for Iran and the United States both of which started their control campaigns only after the epidemic was well established among injecting drug users. HIV among injecting drug users is also a major problem in Russia, where IDU account for over 60% of all new HIV infections in the middle of this decade; the same was true for Iran. For India the best data suggest a modest level, about 10% among IDU; they account for a small share of the estimated 5 million HIV infections in the country. This last statement is in contrast to the situation in China where the estimated number of HIV infected drug users went up from 12,536 in 1998 to 637,000 in 2007, though again there are substantial differences between available estimates.

3.4 **Crime**

In Western countries there is considerable evidence from surveys of arrestees that drug use is much higher among the criminally active than it is in the general population. For example, in the United Kingdom voluntary urine tests of arrestees in eight sites found that about 30% tested positive for heroin use (Bennett and Holloway, 2005). The question of whether the relationship between drug use and crime is causal is a vexed one (Stevens, 2007) but the extent of drug use among arrestees is often cited as an indication of the extent of drug-related crime.

Much of the drug-related crime in Western countries is property crime, intended to generate income for the purchase of expensive illicit drugs. Though numerous studies show that offenders commit more property crimes when using drugs than when abstinent (e.g. Gossop, Marsden, Stewart and Kidd, 2003), there are no population level indicators that would permit tracking the change over time for a country.

In a few countries the more important crime is the violence related to drug markets themselves. For example, in Brazil it is asserted that many of the killings associated with gangs in the favelas surrounding Rio de Janeiro and Sao Paulo arise from the struggle to control drug markets (e.g. Zaluar, 2004). Similar competitive and transactional violence has been observed on a large scale in Mexico, the United States and Russia.

There is no systematic measure of this particular manifestation of drug-related crime in any country. Impressionistically, it seems that the violence has declined in the United States, perhaps because of the aging of the buyers and sellers in cocaine markets and perhaps because the more violent dealers are more likely to be incarcerated. For other countries there is no basis for making statements about change over the ten year period.

3.5 **Economic cost estimates**

One way of aggregating the severity of a nation's drug problems is to try to estimate the economic costs arising from use, production and distribution. A small literature is now

available for a few Western countries; for cross-country comparisons see Single *et al.* (2003).

Proper identification of the harms within a society is important for understanding the extent to which the individual drug problem affects individuals and the broader society vis-à-vis other societal problems. Inconsistencies in how harms are identified, how they are measured over time, and the extent to which they are measured consistently with other harms within the same geopolitical boundaries or across geopolitical boundaries makes it difficult to develop a solid understanding of the magnitude of the problem and how/whether it is changing over time. Report 3 reports the results of efforts to develop new estimates that use a consistent methodology for nine Western countries, Australia, Canada and the United States, along with the six of the largest member States of the European Union. It is based on a close examination of the published estimates for seven nations.

The most powerful finding from the study is simply that the exercise is infeasible even for the countries with the most advanced monitoring and data systems. To return to an issue previously discussed, drug related deaths (DRDs), we are faced with the following implausible comparison: DRDs are estimated to be 1,979 in the United Kingdom and 2612 in the United States. Yet the US is estimated to have at least five times as many cocaine and heroin dependent users as does the United Kingdom. It is simply not credible that the mortality rate amongst these users is so much lower in the United States. Similarly, the Hepatitis C. figure for IDU in Australia is 62,000 while for France it is only 1,000; given that France has more users in OST than does Australia and there are high rates of Hep C. in treatment populations, this is completely implausible.

3.5.1 Introduction

Just as drug problems vary across nations, there is a great deal of diversity in the approaches that nations take to deal with illegal drugs, even though all countries prohibit the same psychoactive substances and almost the same activities related to those substances, reflecting the three international conventions on psychoactive drugs.⁴³ Some governments provide many services for individuals experiencing drug problems and treat the enforcement of the criminal law as a last resort, aimed primarily at protecting the public from predatory and dangerous activities related to drug selling; this list includes the Netherlands and Switzerland. Other nations see law enforcement as central to controlling drug use and related problems, with services for problematic users available only on a very limited basis; Russia and the United States are leading instances of this group. Many countries have no clear strategy or policy, even if they have a formal document labelled “Drug Strategy”; that is true for example of Brazil and South Africa. The purpose of this section is to describe the variation in actual policies; the next section provides an assessment of the consequences of the differences.

In general we see evidence of convergence of policies. Harm reduction (HR), once controversial as a concept, has been accepted in a growing number of countries, albeit in

⁴³ The three conventions are the 1961 Single Convention on Narcotic Drugs, the 1971 Convention on Psychotropic Drugs and the 1988 Convention against Illicit Trafficking of Narcotic Drugs and Psychotropic Substances.

an inconsistent fashion. Some countries for whom tough enforcement had been absolutely central, notably China and Iran, now accept methadone maintenance as an important instrument for reducing heroin related problems. Globally, methadone maintenance has become much more widely available. Sweden, rhetorically at the forefront of the opposition to Harm Reduction in Europe, has now adopted many HR programs (Trimbos Institute, 2006). Even in the United States, whose federal government has aggressively challenged HR in international fora, state and municipal governments have begun to implement such programs domestically. Iran, long among the very toughest in its response to violators of drug laws, has moved toward the provision of services instead; literally hundreds of thousands are now being treated in methadone and other harm reduction programs (UNODC, 2008a).

A variety of legal changes have reduced the criminal sanctions against drug users, both in Western countries and elsewhere. Cannabis in particular has been the subject of reductions in legal penalties in many countries (EMCDDA, 2008; Room *et al.*, 2008). Portugal removed criminal sanctions for simple possession of any illegal drug in 2001. In a complementary fashion, more countries are finding ways of diverting criminal offenders whose activities are motivated by drug use, from the criminal justice system, an initiative which has been very much inspired by U.S. efforts to develop drug courts that use the power of judges to get drug-dependent offenders to seek treatment (e.g. Nolan, 2008). For example, the United Kingdom has used such programs since 2000 to massively increase the number of drug users in treatment from 100,000 in 2000 to 180,000 in 2005 (Reuter and Stevens, 2007).

At the same time, there has been a modest toughening of enforcement against sellers in many countries, including most of the European Union Member States. Even the Netherlands, an early and prominent proponent of more tolerant approaches to drug users, has become tough in its efforts to control cannabis production and trafficking, while also attempting to cut down on the number of coffee shops that sell primarily to foreign tourists. It undertook an extremely aggressive effort to deal with the smuggling of cocaine from the Netherlands Antilles into Amsterdam airport (World Bank/UNODC, 2007). The United Kingdom may actively espouse harm reduction programs but it has increased the number and length of sentencing for drug sellers in the last decade (Reuter and Stevens, 2007).

Data from non-Western countries do not show a clear trend of increasingly punitive measures toward drug sellers and producers.

Prevention

Prevention programs are increasingly central to the rhetoric of drug policy. All strategy documents emphasize that in the long-run, stopping youth from beginning drug use is essentially to controlling the drug problem. For example, in the United Kingdom the national strategy of 1998 Tackling drugs to build a better Britain identified “to help young people to resist drugs” as the first of its four goals.

However the limited available evidence suggests that little money is spent on primary prevention activities⁴⁴ and that programs are generally of limited effectiveness. Estimates of drug control expenditures for the Netherlands (Rigter, 2006) and Sweden (Ramsted, 2006) show that prevention programs account for a very small part of the total, 2% in the case of the Netherlands and 1% in the case of Sweden. Australia is an outlier, with an estimated 23 percent of the drug control budget going to prevention (Moore, 2005). For most countries such estimates are not available. The principal funded programs are school based; some countries eschew mass media campaigns.

Though there is research evidence that effective school based programs are possible the programs that are adopted often have no demonstrated effectiveness (EMCDDA, 2008). Moreover, they are poorly implemented (see e.g. Gottfredson, 1997). Most prominently, in the United States by far the most popular school-based prevention program is DARE (Drug Abuse Resistance Education), which has been frequently evaluated, with generally negative results (Samples and Aber, 1998) and is now being redesigned .

In countries facing major drug use for the first time, the prevention response has been uneven. China, despite very low prevalence of drug use, has both wide spread school based prevention programs and mass media campaigns involving sports and media stars. For Brazil and Russia there also appears to be increasing numbers of prevention programs. On the other hand India still has little systematic prevention efforts. For most countries, systematic data are not available on changes in the extent and nature of prevention services between 1998 and 2007.

Treatment

In contrast to prevention, there is a substantial body of positive evaluations of implemented treatment programs (e.g., McLellan and Meyers, 2004) though few of the evaluations have been done outside of rich Western nations. Studies show that on average treatment reduces the extent of drug use and related health and social problems in those who enter programs. Few of those who enter become lifelong abstinent thereafter but they are abstinent more frequently and for longer episodes over the following years. The evidence is much stronger for opiate substitution treatment (OST) than for any other kind of service. Opiates dominate treatment demand in most countries around the world; however that is not true for the United States and is decreasingly true for a number of European Union countries. Cannabis treatment demand has been rising throughout the Western world. For example, a study of Ontario treatment admissions in 2000 found that cannabis was the drug most frequently cited as the primary cause for admission (Urbanoski, Strike and Rush, 2005). The EMCDDA reports that cannabis treatment admissions accounted for 30 percent of entries in France and the Netherlands in recent years (EMCDDA, 2008; p.43).

Nonetheless, the total number of patients in methadone maintenance programs has grown substantially across the world. In the European Union alone, there is now an estimated 600,000 methadone clients, much increased from the late 1990s⁴⁵. The new programs in

⁴⁴ There are some indications that expenditure is rising.

⁴⁵ It is unclear whether this number includes all patients receiving their methadone from general practitioners, a common practice in countries such as Switzerland and France.

Iran and China have added substantially to the totals; for Iran the number of methadone patients may be close to 200,000 in late 2008. In some countries (e.g. Switzerland, the Netherlands and the United Kingdom) over half of the estimated opiate dependent population is now in treatment, mostly involving OST. Buprenorphine, a much more recently developed opiate agonist/antagonist substitute, is also now available in many countries, but is used extensively only in France and the Czech Republic.

However, some other countries, with established methadone programs, such as the U.S. and Sweden, continue to serve quite a small fraction, perhaps less than one quarter. Russia, despite its large population of dependent heroin users, continues to stand firmly against allowing any substitution programs. India, with a large addict population, provides few treatment services of any kind; the total number of service facilities is less than 500. Limited services are available in Brazil, Colombia and Mexico as well, though for none of them is heroin dependence a major element of their drug problem.

For drugs other than opiates the available treatments are psychosocial rather than substitution therapy. There are efficacy studies with positive results of such interventions for cannabis, cocaine and methamphetamine but the reductions in drug use are smaller and less reliable than for opiate substitution treatment.⁴⁶ In almost all countries the share of those in need of treatment for these other drugs who are receiving services is smaller than for opiates.

Harm reduction

Starting in the 1980s in the United Kingdom, when HIV related to needle sharing first emerged, and in the Netherlands a set of programs were developed that focused on reducing drug problems not by lowering the prevalence of drug use but by directly targeting the harms of drug use. These have been controversial since inception. Opponents argue that the programs are dangerous because they condone an illegal and dangerous behaviour; proponents argue that they are founded on the reality that some individuals will not be persuaded to give up drug use (MacCoun and Reuter, 2001).

Most harm reduction efforts are focused on injecting drug use. The canonical program, debated in many settings, involves the provision of clean needles by legally sanctioned operators (SEP: Syringe Exchange Programs). Other Harm Reduction interventions include safe injecting facilities or provision of Naloxone to injecting drug users so that they can revive friends who have overdosed. See Trimbos Institute (2006) for an inventory of HR programs in the European Union and a summary of the available evidence on their effectiveness.

Most European Union member states have implemented many HR programs, as have Australia, Canada and Switzerland among the eighteen countries in our sample. Even amongst these countries though there is resistance to some elements of Harm Reduction. For example, safe injecting rooms are rare and heroin maintenance, pioneered in

⁴⁶ For example, Higgins et al., 1994 report improvement in outcomes for treatment of cocaine dependence from offering incentives for abstinence, typical of a growing literature on such interventions. However a review of interventions aimed at amphetamines (Srisurapanont, Jarusuraisin and Kittirattanapaiboon, 2001) found limited evidence on treatment outcomes and most of that evidence pointing to modest effects.

Switzerland, is so far available on a routine basis in only two other countries, Germany⁴⁷ and the Netherlands (Fischer *et al.*, 2007).

The Russian Federation, until the early part of this decade amongst the most punitive of nations in its response to drug use, has begun to implement a variety of HR programs, such as SEP and safe use education, even though it does not explicitly acknowledge the change in policy and continues to prohibit the distribution of methadone. A few Asian countries have begun implementing SEP as well (International Harm Reduction Association, 2008).

There continues to be vigorous resistance in some countries. Apart from the United States, the opponents are mostly countries that have modest drug problems, such as Egypt and a group of Middle Eastern nations. HR remains essentially unknown in Latin America, where injecting drug use is not a primary concern. The United States government, though a major sponsor of methadone maintenance (which is now viewed as a Harm Reduction intervention), in international fora resists formal endorsement of SEP and other HR interventions. However SEP is available in many U.S. cities, funded either by private organizations or municipal government; the same is true for safe use programs.⁴⁸

Enforcement

Drug enforcement efforts take many forms. The categorization used here focuses on the targeted activity: production, smuggling, high level trafficking and retailing. Though it is properly a demand reduction activity, we also consider enforcement targeted against use in this sub-section. Table 6 presents a matching of programs to targets: It provides the basis for assessing program effectiveness, since it suggests which part of the distribution chain should be primarily affected by a specific type of enforcement.

Table 6 Enforcement Targets and Program

Target	Programs
Production	Eradication, alternative livelihoods, enforcement against manufacturers, growers
Smuggling	Interdiction
High level trafficking	Investigation, incarceration
Retailing	Arrest, confiscation
Consumption	Arrest, diversion

Production controls

Efforts to control opium production have been of mixed intensity during most of the study period. Myanmar has seen tough enforcement against the opium farmers in the Shan State by the separatist group in charge of that region of the country (the United Wa State Army) rather than the national government. The governments of Colombia and Mexico have been aggressive in their efforts against poppy growers, as indicated by the high share of

⁴⁷ In Germany implementation remains very partial.

⁴⁸ “[M]any states moved to amend their legal code to allow for or authorize syringe-exchange programs to operate legally and generally extended some legal protection to drug injectors participating in these programs... An estimated 225 syringe-exchange programs currently operate in the United States, run by a variety of community-based not-for-profit groups, health clinics and hospitals, and city public health departments”(Clear, n.d.) See also Beckwith et al. (2006) for an example of a state level intervention.

planted poppy fields that have been sprayed with herbicides. However, Afghanistan, far and away the dominant producer throughout the period 1998-2007, has lacked an effective government for most of the time. The President of Afghanistan has often spoken of the need for stringent enforcement of the ban on opium growing and trafficking (Islamic Republic of Afghanistan, 2005, 2006); however his government has been opposed to the spraying of planted crops, a program pressed by the United States, which might threaten the political stability of the country. The government has been unable to consistently mount either other kinds of eradication or effective alternative livelihoods programs (Rubin and Sherman, 2008).

The eradication efforts against coca fields in the Andes have been consistently intense. Colombia, where coca growing is now centred, has, with the support of the U.S. backed Plan Colombia, sprayed hundreds of thousands of hectares each year; it now also offers alternative livelihoods, a new initiative. In Bolivia relatively large sums (much provided by European and U.S. agencies) were spent on an array of programs aimed at developing legitimate economic opportunities in the principal coca growing area, the Chapare.⁴⁹ For example, European funders invested in developing roads and schools. Following the election of Evo Morales, former head of the coca growers association, as president in late 2005 there was some reduction in foreign funding of such programs. Bolivia also maintained its eradication program, employing the military for manual destruction of crops. In Peru the effort was primarily enforcement.

Because cannabis production is so dispersed around the globe, it is much more difficult to describe actions against growers. Mexico, one of the two major exporting countries, has been aggressive in spraying cannabis fields. Morocco, the other major international supplier, has adopted a more varied set of programs to deal with the problem, including alternative livelihoods (Gamella and Rodrigo, 2008; Department of State, 2008). In the consumer countries that are also producers, enforcement has generally been modest, partly reflecting the elusiveness of the target. The Netherlands, which is believed to be an exporter to Europe, is aggressive against the growers who supply the tolerated coffee shop outlets; it arrests over 4,000 individuals each year for cannabis production. The United States has regular eradication and enforcement campaigns against domestic cannabis growers (Drug Enforcement Administration, n.d.). Elsewhere enforcement is haphazard.

Enforcement against ATS producers involves quite different techniques, in part because the production itself is so unlike the growing of opium and coca. It is much more like investigation of traffickers or interdiction.

Interdiction

The flow of drugs across international borders, particularly those of Europe, is a disturbing reminder of the failure of rich and powerful governments to control what enters their countries. That may explain why there has been increasing attention to interdiction, the effort to seize drugs, couriers and vehicles on their way into major markets. For example, the UK 2008 Strategy gives emphasis to “creat[ing] more international partnerships to

⁴⁹ It is estimated that the U.S. narcotics related assistance amounted to about 1-2% of Bolivia's GDP between 2000 and 2005. The majority of that assistance was for programs other than eradication and law enforcement.

intercept drugs being trafficked to the U.K. and to implement[ing] border controls in countries of departure.” (U.K. Home Office, 2008, p.14)

However, interdiction is not only a rich country activity. Indeed, perhaps the most intense national efforts are those of the Iranian government, which has tried to intercept opiate shipments from Afghanistan (some indirectly through Turkmenistan). Iran estimates that 250 border guards have died in recent years in these efforts and invests substantial sums in the effort⁵⁰. The smugglers are heavily armed, even occasionally using military tanks for these purposes. Mexico has also targeted drug smugglers from its side of the border with the United States.

Global seizures have risen substantially for both cocaine and heroin, both in absolute terms and as a share of estimated global production. The most recent estimate, for 2007, suggests that 42 percent of cocaine is seized, up from 29 percent in 1998. The figure for heroin is lower but has also risen sharply from 13 percent in 1996 to 23 percent in 2006. The figures for cannabis are less reliable, both with respect to production (as discussed above) and to the interceptions; often these latter are denominated in “plants” rather than the quantity of drugs and thus cannot be summed.⁵¹

Investigation of High Level Dealers

Though high level dealers make attractive targets for law enforcement, offering the opportunity to remove entrepreneurial energy and organizational leadership from the drug trade, there is almost no systematic information available about programs aimed at accomplishing this. The 18 country reports rarely contained any description of targeted efforts.

In the United States the federal government targets such dealers and now has about 100,000 persons incarcerated for drug offenses, the vast majority for some involvement in high level trafficking (Mumola and Karberg, 2006). However, many of those incarcerated for such offenses were convicted because they were caught with large quantities; their actual responsibilities may have been minor. State prisons and local jails in the United States include approximately another 400,000 inmates incarcerated because of drug offenses; most are imprisoned for low level drug dealing.⁵²

Retail enforcement

Most drug enforcement efforts in any country are aimed at the retail market, either at the seller or the user. That is in part because most participants in the trade operate at that level; if each high level dealer has ten low level dealers as customers (a plausible but untested

⁵⁰ For example, Sami (2006) reports a senior Iranian official statement that his government had spent more than \$900 million on building fences, towers etc. to protect borders with Afghanistan and Pakistan from drug smugglers.

⁵¹ Note also that there is no adjustment for potency. Increased seizures from Mexico, known as a low potency producer, might not balance out declines in seizures of high quality Canadian exports, in terms of the total THC content removed from the market.

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figure) [Ref.], then about 90 percent of the dealers are at the retail end, some as look-outs or protectors rather than sellers themselves.

The retail market is also the most visible part of the market, at least in some countries and for some drugs. For example, numerous countries report active street markets for heroin addicts, whose needs are urgent and unpredictable and whose behaviour is threatening enough that a dealer may want to avoid exposing himself to in his own home. In contrast, for cannabis the retail market is not a major target because such a small share of transactions takes place in public or near-public spaces; many sales are conducted in the house or apartment of the seller and are hardly accessible to the police at all.⁵³

Thus most of those arrested and incarcerated are low level dealers. Information in many countries is restricted to the number arrested. Table 7 provides data on drug arrests, by type of drug, in the European Union over the period 2001-2006. Earlier data are available only on an occasional basis.

Table 7 Index of European Arrests for Drug Offenses, by drug, 2001-2006

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Source: EMCDDA Fig. DLO-3.

Note that cannabis dominates arrests for European nations, accounting for nearly 60 percent of the total. The same is true for other Western countries. In the United States cannabis arrests account for nearly one half of all drug arrests in recent years. For Switzerland the figure is about 60 percent. Drug specific arrest rates are not available for the developing and transitional countries.

It turns out that the offense of arrest is usually possession; that is discussed below. Incarceration, a much rarer event, involves drug sellers. Weatherburn and Jones (2001) report that in the Australian state of New South Wales in 1999, just 1.2 percent of those convicted of cannabis possession or use were sentenced to prison and such punishments typically came when the cannabis use offense happened in conjunction with other offenses and/or the offender had an extensive criminal record. In the United States an analysis of self-report data from those incarcerated for drug offenses found that a majority of those who said that they were in prison for conviction on drug possession charges reported that they had in fact been involved in drug selling in some way (Sevigny and Caulkins, 2004). This represents the effect of plea bargaining.⁵⁴

⁵³ Caulkins and Pacula (2006) analyze responses to the U.S. National Survey on Drug Use and Health to show that much marijuana dealing is imbedded in social relations.

⁵⁴ In a plea bargain, the defendant agrees to plead guilty to a lesser charge in return for a reduced penalty.

Enforcement against users

A majority of arrests in most countries (typically over 60%) are for possession rather than distribution of drugs; the Netherlands, because of its de facto legalization of cannabis in coffee houses, has a much lower percentage. In some arrests the offender maybe guilty of distribution but the police officer was unable to obtain evidence for that and could only charge possession of the drug. The numbers of persons arrested is large for some countries. For example, in Switzerland, the total number of possession arrests, mostly for cannabis, amounted to about 25,000 in 2006, a rate of about 500 per 100,000 inhabitants over the age of 12. In the United States cannabis possession arrest rates were about 250 per 100,000. More relevant though is the rate of arrests per user or per use episode. Even in the U.S. it is likely that a cannabis user has less than a 1 in 3,000 risk of being arrested for any given incident of cannabis use.

Considerable prominence has been given to efforts aimed at seizing the assets of drug dealers. Much of the initial impetus for creating the international money laundering control system arose from the belief that this could be used to cripple the international drug trade. In fact the seizures of drug related assets have been slight in all countries, at least relative to what is believed to be the scale of the trade (Reuter and Truman, 2004).

4.1 **Introduction**

Just as drug problems vary across nations, there is a great deal of diversity in the approaches that nations take to deal with illegal drugs, even though all countries prohibit the same psychoactive substances and almost the same activities related to those substances, reflecting the three international conventions on psychoactive drugs.⁵⁵ Some governments provide many services for individuals experiencing drug problems and treat the enforcement of the criminal law as a last resort, aimed primarily at protecting the public from predatory and dangerous activities related to drug selling; this list includes the Netherlands and Switzerland. Other nations see law enforcement as central to controlling drug use and related problems, with services for problematic users available only on a very limited basis; Russia and the United States are leading instances of this group. Many countries have no clear strategy or policy, even if they have a formal document labelled “Drug Strategy”; that is true for example of Brazil and South Africa. The purpose of this section is to describe the variation in actual policies; the next section provides an assessment of the consequences of the differences.

In general we see evidence of convergence of policies. Harm reduction (HR), once controversial as a concept, has been accepted in a growing number of countries, albeit in an inconsistent fashion. Some countries for whom tough enforcement had been absolutely central, notably China and Iran, now accept methadone maintenance as an important instrument for reducing heroin related problems. Globally, methadone maintenance has become much more widely available. Sweden, rhetorically at the forefront of the opposition to Harm Reduction in Europe, has now adopted many HR programs (Trimbos Institute, 2006). Even in the United States, whose federal government has aggressively challenged HR in international fora, state and municipal governments have begun to implement such programs domestically. Iran, long among the very toughest in its response to violators of drug laws, has moved toward the provision of services instead; literally hundreds of thousands are now being treated in methadone and other harm reduction programs (UNODC, 2008a).

⁵⁵ The three conventions are the 1961 Single Convention on Narcotic Drugs, the 1971 Convention on Psychotropic Drugs and the 1988 Convention against Illicit Trafficking of Narcotic Drugs and Psychotropic Substances.

A variety of legal changes have reduced the criminal sanctions against drug users, both in Western countries and elsewhere. Cannabis in particular has been the subject of reductions in legal penalties in many countries (EMCDDA, 2008; Room *et al.*, 2008). Portugal removed criminal sanctions for simple possession of any illegal drug in 2001. In a complementary fashion, more countries are finding ways of diverting criminal offenders whose activities are motivated by drug use, from the criminal justice system, an initiative which has been very much inspired by U.S. efforts to develop drug courts that use the power of judges to get drug-dependent offenders to seek treatment (e.g. Nolan, 2008). For example, the United Kingdom has used such programs since 2000 to massively increase the number of drug users in treatment from 100,000 in 2000 to 180,000 in 2005 (Reuter and Stevens, 2007).

At the same time, there has been a modest toughening of enforcement against sellers in many countries, including most of the European Union Member States. Even the Netherlands, an early and prominent proponent of more tolerant approaches to drug users, has become tough in its efforts to control cannabis production and trafficking, while also attempting to cut down on the number of coffee shops that sell primarily to foreign tourists. It undertook an extremely aggressive effort to deal with the smuggling of cocaine from the Netherlands Antilles into Amsterdam airport (World Bank/UNODC, 2007). The United Kingdom may actively espouse harm reduction programs but it has increased the number and length of sentencing for drug sellers in the last decade (Reuter and Stevens, 2007).

Data from non-Western countries do not show a clear trend of increasingly punitive measures toward drug sellers and producers.

4.1.1 Prevention

Prevention programs are increasingly central to the rhetoric of drug policy. All strategy documents emphasize that in the long-run, stopping youth from beginning drug use is essentially to controlling the drug problem. For example, in the United Kingdom the national strategy of 1998 *Tackling drugs to build a better Britain* identified “to help young people to resist drugs” as the first of its four goals.

However the limited available evidence suggests that little money is spent on primary prevention activities⁵⁶ and that programs are generally of limited effectiveness. Estimates of drug control expenditures for the Netherlands (Rigter, 2006) and Sweden (Ramsted, 2006) show that prevention programs account for a very small part of the total, 2% in the case of the Netherlands and 1% in the case of Sweden. Australia is an outlier, with an estimated 23 percent of the drug control budget going to prevention (Moore, 2005). For most countries such estimates are not available. The principal funded programs are school based; some countries eschew mass media campaigns.

Though there is research evidence that effective school based programs are possible the programs that are adopted often have no demonstrated effectiveness (EMCDDA, 2008). Moreover, they are poorly implemented (see e.g. Gottfredson, 1997). Most prominently, in the United States by far the most popular school-based prevention program is DARE

⁵⁶ There are some indications that expenditure is rising.

(Drug Abuse Resistance Education), which has been frequently evaluated, with generally negative results (Samples and Aber, 1998) and is now being redesigned .

In countries facing major drug use for the first time, the prevention response has been uneven. China, despite very low prevalence of drug use, has both wide spread school based prevention programs and mass media campaigns involving sports and media stars. For Brazil and Russia there also appears to be increasing numbers of prevention programs. On the other hand India still has little systematic prevention efforts. For most countries, systematic data are not available on changes in the extent and nature of prevention services between 1998 and 2007.

Treatment

In contrast to prevention, there is a substantial body of positive evaluations of implemented treatment programs (e.g., McLellan and Meyers, 2004) though few of the evaluations have been done outside of rich Western nations. Studies show that on average treatment reduces the extent of drug use and related health and social problems in those who enter programs. Few of those who enter become lifelong abstinent thereafter but they are abstinent more frequently and for longer episodes over the following years. The evidence is much stronger for opiate substitution treatment (OST) than for any other kind of service. Opiates dominate treatment demand in most countries around the world; however that is not true for the United States and is decreasingly true for a number of European Union countries. Cannabis treatment demand has been rising throughout the Western world. For example, a study of Ontario treatment admissions in 2000 found that cannabis was the drug most frequently cited as the primary cause for admission (Urbanoski, Strike and Rush, 2005). The EMCDDA reports that cannabis treatment admissions accounted for 30 percent of entries in France and the Netherlands in recent years (EMCDDA, 2008; p.43).

Nonetheless, the total number of patients in methadone maintenance programs has grown substantially across the world. In the European Union alone, there is now an estimated 600,000 methadone clients, much increased from the late 1990s⁵⁷. The new programs in Iran and China have added substantially to the totals; for Iran the number of methadone patients may be close to 200,000 in late 2008. In some countries (e.g. Switzerland, the Netherlands and the United Kingdom) over half of the estimated opiate dependent population is now in treatment, mostly involving OST. Buprenorphine, a much more recently developed opiate agonist/antagonist substitute, is also now available in many countries, but is used extensively only in France and the Czech Republic.

However, some other countries, with established methadone programs, such as the U.S. and Sweden, continue to serve quite a small fraction, perhaps less than one quarter. Russia, despite its large population of dependent heroin users, continues to stand firmly against allowing any substitution programs. India, with a large addict population, provides few treatment services of any kind; the total number of service facilities is less than 500.

⁵⁷ It is unclear whether this number includes all patients receiving their methadone from general practitioners, a common practice in countries such as Switzerland and France.

Limited services are available in Brazil, Colombia and Mexico as well, though for none of them is heroin dependence a major element of their drug problem.

For drugs other than opiates the available treatments are psychosocial rather than substitution therapy. There are efficacy studies with positive results of such interventions for cannabis, cocaine and methamphetamine but the reductions in drug use are smaller and less reliable than for opiate substitution treatment.⁵⁸ In almost all countries the share of those in need of treatment for these other drugs who are receiving services is smaller than for opiates.

Harm reduction

Starting in the 1980s in the United Kingdom, when HIV related to needle sharing first emerged, and in the Netherlands a set of programs were developed that focused on reducing drug problems not by lowering the prevalence of drug use but by directly targeting the harms of drug use. These have been controversial since inception. Opponents argue that the programs are dangerous because they condone an illegal and dangerous behaviour; proponents argue that they are founded on the reality that some individuals will not be persuaded to give up drug use (MacCoun and Reuter, 2001).

Most harm reduction efforts are focused on injecting drug use. The canonical program, debated in many settings, involves the provision of clean needles by legally sanctioned operators (SEP: Syringe Exchange Programs). Other Harm Reduction interventions include safe injecting facilities or provision of Naloxone to injecting drug users so that they can revive friends who have overdosed. See Trimbos Institute (2006) for an inventory of HR programs in the European Union and a summary of the available evidence on their effectiveness.

Most European Union member states have implemented many HR programs, as have Australia, Canada and Switzerland among the eighteen countries in our sample. Even amongst these countries though there is resistance to some elements of Harm Reduction. For example, safe injecting rooms are rare and heroin maintenance, pioneered in Switzerland, is so far available on a routine basis in only two other countries, Germany⁵⁹ and the Netherlands (Fischer *et al.*, 2007).

The Russian Federation, until the early part of this decade amongst the most punitive of nations in its response to drug use, has begun to implement a variety of HR programs, such as SEP and safe use education, even though it does not explicitly acknowledge the change in policy and continues to prohibit the distribution of methadone. A few Asian countries have begun implementing SEP as well (International Harm Reduction Association, 2008).

There continues to be vigorous resistance in some countries. Apart from the United States, the opponents are mostly countries that have modest drug problems, such as Egypt and a

⁵⁸ For example, Higgins *et al.*, 1994 report improvement in outcomes for treatment of cocaine dependence from offering incentives for abstinence, typical of a growing literature on such interventions. However a review of interventions aimed at amphetamines (Srisurapanont, Jarusuraisin and Kittirattanapaiboon, 2001) found limited evidence on treatment outcomes and most of that evidence pointing to modest effects.

⁵⁹ In Germany implementation remains very partial.

group of Middle Eastern nations. HR remains essentially unknown in Latin America, where injecting drug use is not a primary concern. The United States government, though a major sponsor of methadone maintenance (which is now viewed as a Harm Reduction intervention), in international fora resists formal endorsement of SEP and other HR interventions. However SEP is available in many U.S. cities, funded either by private organizations or municipal government; the same is true for safe use programs.⁶⁰

Enforcement

Drug enforcement efforts take many forms. The categorization used here focuses on the targeted activity: production, smuggling, high level trafficking and retailing. Though it is properly a demand reduction activity, we also consider enforcement targeted against use in this sub-section. Table 6 presents a matching of programs to targets: It provides the basis for assessing program effectiveness, since it suggests which part of the distribution chain should be primarily affected by a specific type of enforcement.

Table 8 Enforcement Targets and Program

Target	Programs
Production	Eradication, alternative livelihoods, enforcement against manufacturers, growers
Smuggling	Interdiction
High level trafficking	Investigation, incarceration
Retailing	Arrest, confiscation
Consumption	Arrest, diversion

4.1.2 Production controls

Efforts to control opium production have been of mixed intensity during most of the study period. Myanmar has seen tough enforcement against the opium farmers in the Shan State by the separatist group in charge of that region of the country (the United Wa State Army) rather than the national government. The governments of Colombia and Mexico have been aggressive in their efforts against poppy growers, as indicated by the high share of planted poppy fields that have been sprayed with herbicides. However, Afghanistan, far and away the dominant producer throughout the period 1998-2007, has lacked an effective government for most of the time. The President of Afghanistan has often spoken of the need for stringent enforcement of the ban on opium growing and trafficking (Islamic Republic of Afghanistan, 2005, 2006); however his government has been opposed to the spraying of planted crops, a program pressed by the United States, which might threaten the political stability of the country. The government has been unable to consistently mount to mount either other kinds of eradication or effective alternative livelihoods programs (Rubin and Sherman, 2008).

The eradication efforts against coca fields in the Andes have been consistently intense. Colombia, where coca growing is now centred, has, with the support of the U.S. backed Plan Colombia, sprayed hundreds of thousands of hectares each year; it now also offers alternative livelihoods, a new initiative. In Bolivia relatively large sums (much provided by

⁶⁰ “[M]any states moved to amend their legal code to allow for or authorize syringe-exchange programs to operate legally and generally extended some legal protection to drug injectors participating in these programs... An estimated 225 syringe-exchange programs currently operate in the United States, run by a variety of community-based non-profit groups, health clinics and hospitals, and city public health departments”(Clear, n.d.) See also Beckwith *et al.* (2006) for an example of a state level intervention.

European and U.S. agencies) were spent on an array of programs aimed at developing legitimate economic opportunities in the principal coca growing area, the Chapare.⁶¹ For example, European funders invested in developing roads and schools. Following the election of Evo Morales, former head of the coca growers association, as president in late 2005 there was some reduction in foreign funding of such programs. Bolivia also maintained its eradication program, employing the military for manual destruction of crops. In Peru the effort was primarily enforcement.

Because cannabis production is so dispersed around the globe, it is much more difficult to describe actions against growers. Mexico, one of the two major exporting countries, has been aggressive in spraying cannabis fields. Morocco, the other major international supplier, has adopted a more varied set of programs to deal with the problem, including alternative livelihoods (Gamella and Rodrigo, 2008; Department of State, 2008). In the consumer countries that are also producers, enforcement has generally been modest, partly reflecting the elusiveness of the target. The Netherlands, which is believed to be an exporter to Europe, is aggressive against the growers who supply the tolerated coffee shop outlets; it arrests over 4,000 individuals each year for cannabis production. The United States has regular eradication and enforcement campaigns against domestic cannabis growers (Drug Enforcement Administration, n.d.). Elsewhere enforcement is haphazard.

Enforcement against ATS producers involves quite different techniques, in part because the production itself is so unlike the growing of opium and coca. It is much more like investigation of traffickers or interdiction.

4.1.3 Interdiction

The flow of drugs across international borders, particularly those of Europe, is a disturbing reminder of the failure of rich and powerful governments to control what enters their countries. That may explain why there has been increasing attention to interdiction, the effort to seize drugs, couriers and vehicles on their way into major markets. For example, the UK 2008 Strategy gives emphasis to “creat[ing] more international partnerships to intercept drugs being trafficked to the U.K. and to implement[ing] border controls in countries of departure.” (U.K. Home Office, 2008, p.14)

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4.1.5 Retail enforcement

Most drug enforcement efforts in any country are aimed at the retail market, either at the seller or the user. That is in part because most participants in the trade operate at that level; if each high level dealer has ten low level dealers as customers (a plausible but untested figure) [Ref.], then about 90 percent of the dealers are at the retail end, some as look-outs or protectors rather than sellers themselves.

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Note that cannabis dominates arrests for European nations, accounting for nearly 60 percent of the total. The same is true for other Western countries. In the United States cannabis arrests account for nearly one half of all drug arrests in recent years. For Switzerland the figure is about 60 percent. Drug specific arrest rates are not available for the developing and transitional countries.

It turns out that the offense of arrest is usually possession; that is discussed below. Incarceration, a much rarer event, involves drug sellers. Weatherburn and Jones (2001) report that in the Australian state of New South Wales in 1999, just 1.2 percent of those convicted of cannabis possession or use were sentenced to prison and such punishments typically came when the cannabis use offense happened in conjunction with other offenses and/or the offender had an extensive criminal record. In the United States an analysis of self-report data from those incarcerated for drug offenses found that a majority of those who said that they were in prison for conviction on drug possession charges reported that they had in fact been involved in drug selling in some way (Sevigny and Caulkins, 2004). This represents the effect of plea bargaining.⁶⁶

4.1.6 Enforcement against users

A majority of arrests in most countries (typically over 60%) are for possession rather than distribution of drugs; the Netherlands, because of its de facto legalization of cannabis in coffee houses, has a much lower percentage. In some arrests the offender maybe guilty of distribution but the police officer was unable to obtain evidence for that and could only charge possession of the drug. The numbers of persons arrested is large for some countries. For example, in Switzerland, the total number of possession arrests, mostly for cannabis, amounted to about 25,000 in 2006, a rate of about 500 per 100,000 inhabitants over the age of 12. In the United States cannabis possession arrest rates were about 250 per 100,000. More relevant though is the rate of arrests per user or per use episode. Even in the U.S. it is likely that a cannabis user has less than a 1 in 3,000 risk of being arrested for any given incident of cannabis use.

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Considerable prominence has been given to efforts aimed at seizing the assets of drug dealers. Much of the initial impetus for creating the international money laundering control system arose from the belief that this could be used to cripple the international drug trade. In fact the seizures of drug related assets have been slight in all countries, at least relative to what is believed to be the scale of the trade (Reuter and Truman, 2004).

5.1 **Introduction**

Though the international regime consisting of the three major UN drug conventions and the UN bodies (CND, INCB and UNODC) constitute an important influence, policy is made primarily at the national and sub-national level and needs to be assessed against the specific problems and goals of the country, province or city. Moreover, assessing a specific intervention, such as prevention or harm reduction, requires a statement of what links that intervention to the various goals of policy.

5.1.1 **The International Regime**

Reference has already been made to the three major international conventions that essentially every nation has signed. The last of these was negotiated 20 years ago and the process of amendment is extremely cumbersome (Room *et al.*, 2008; Chapter VI), so they are unlikely to be changed in the near future.

Three bodies operate the international regime: (1) The International Narcotics Control Board (INCB) which has responsibility for assuring the availability of medications that fall under the control system, notably opioids. It also monitors compliance with the conventions and has not hesitated in recent years to issue critical reports of national innovations (2) The Commission on Narcotic Drugs (CND), a group of 53 nations which meets annually to set policy (3) the United Nations Office on Drugs and Crime (UNODC) which provides technical services to national governments, particularly in developing nations, and supports the work of the CND. It also publishes the now annual World Drug Report which has become the most cited document on the state of the world drug problem.

It is difficult to assess the effects specifically of the international system for at least two reasons. First, the three bodies have no policy powers outside of the convention; the INCB can administer no sanctions against nations that it judges not in compliance with the system. Second, the resources of the system are tiny; in 2006 UNODC had a staff of about 500 worldwide and a budget of less than \$70 million.

That is not to say that the system has no effect. First, countries that have been censured by the INCB react strongly; that suggests the censure stings. Moreover experts involved in drug policy believe that some policy changes have not been adopted because of concerns about such censures. Second, the UNODC does offer a unique and valued service in such

activities as price monitoring in the opium and coca producing countries and its flagship publications.

However it is clear that in assessing the progress globally since UNGASS that the international bodies are at most a marginal influence. National policy is the principal focus for assessment.

5.1.2 The Variety of National Problems

We start by noting again that nations differ substantially in the nature of their drug problems. For example, Colombia is greatly harmed by drug production and trafficking, both of which generate high levels of violence, corruption and political instability; consumption of drugs is modest, whether expressed as a share of the nation's drug problems or compared to many other countries. For Turkey, the problem is largely confined to the corruption surrounding transshipment of heroin. In contrast, rich European countries such as Sweden, Switzerland and the United Kingdom have large domestic populations of dependent users of expensive drugs and minimal problems of violence, corruption or political instability related to production or trafficking. The difference in problems implies that policy has different goals across countries.

In Table 8, we present a very brief assessment of the principal drug related problems of 10 of the 18 countries that we studied, simply to illustrate their variety. These assessments are based on the studies in Report 4 and are intended as rough judgments rather than nuanced statements.⁶⁷ Countries rarely present "pure" cases. For example, Canada does have some problems of violence around drug trafficking, particularly biker gangs in Quebec, while Turkey does have some heroin consumption. However these judgments do provide an indication of what problems the government in each nation is most likely to target in its policy decisions.

Table 10 Assessment of Principal Drug Problems for 10 countries

Country	Category	Major problems
Australia	Western	Consumption
Brazil	Developing	Trafficking violence
Canada	Western	Production and consumption
China	Developing	Use
Colombia	Developing	Production, trafficking violence and corruption
Mexico	Developing	Production, trafficking violence
Portugal	Western	Trafficking, consumption
Russia	Transitional	Consumption
Turkey	Developing	Heroin trafficking
United States	Western	Consumption, market violence

5.2 Unintended consequences

A distinctive characteristic of drug policy is the prominence and variety of unintended consequences, primarily negative. Indeed, in a much cited essay for the Commission on Narcotic Drugs meeting in 2008, the Executive Director of the UNODC identified five

⁶⁷ Western refers both to a cultural identity and to a high level of wealth. Some nations could clearly be placed in more than one category. For example, Portugal having emerged from fifty years of military rule and isolation in the mid-1970s might be regarded in 1998 as still in the process of transition to a Western nation with established democratic institutions and a predominantly middle class populace.

broad classes of unintended consequences of prohibition as implemented that should play a role in discussions of policy: creation of huge criminal black markets, policy displacement (from health to enforcement against those markets), geographic displacement, substance displacement (to less controllable drugs) and displacement in the way we perceive and deal with the users of illicit drugs (Costa, 2008). Report 5 provides an analytic categorization of the sources of unintended consequences that aims to extend Costa's discussion.

It is not hard to find illustrative unintended consequences. For example bans on the possession of syringes, intended to reduce drug use, lead to increases in needle sharing among injecting drug use and the spread of blood borne diseases such as HIV. In some settings tough enforcement of criminal laws against the possession of cannabis, intended to reduce the number of people who use cannabis, has large consequences in reducing the employment prospects of the arbitrarily selected set of cannabis users who end up convicted of a criminal offense.⁶⁸ These are gross statements about effects, not assessments about whether the interventions have a positive net benefit for society.

We focus here on the unintended negative consequences of enforcement. Some are at the macro-level. Colombia's political stability has been affected over a long period of time by the intense efforts to control coca production, which have given a lucrative role to the rebel movement, the FARC, in protecting coca farmers from the government. The crack-down on drug trafficking in Mexico since 2006 is one factor generating a wave of horrifying killings that has undercut the legitimacy of governments at all levels in Mexico. Spraying coca fields has caused considerable environmental damage not just directly but by creating a need to plant a larger area with coca, a crop whose cultivation itself has adverse consequences for the soil. The incarceration of numerous individuals for drug selling has resulted in many children deprived of the presence of a parent for extended periods

There are also positive unintended consequences; these receive little attention. For example, since many heroin addicts who enter treatment are also drug sellers the effect of treatment is partly to reduce the supply of drug selling labour. Similarly, many of those locked up for drug selling offenses are also drug users, so that the incarceration lowers drug demand.

The "balloon effect", i.e. the ability of drug production to move to a new location, either within a country or across international borders, in response to events that reduce the attractiveness of existing production areas, has been much noted as an unintended consequence. This causes damage because the positive effects of reducing production in the initial country are in general more than outweighed by the damage done in the new producer country. We take up its policy implications below.

Report 5 ("The unintended consequences of drug policy") identifies the various mechanisms that generate the unintended consequences. It distinguishes between those consequences that arise from prohibition per se, such as the lack of quality control, and those that are a function of the intensity and characteristics of enforcement. It identifies seven mechanisms that can generate unintended consequences: behavioural responses of

⁶⁸ This was an important element of the argument for removing criminal penalties for simple possession of marijuana in Western Australia in 2002. See, for example, Lenton *et al.* (2000)

participants (users, dealers and producers), behavioural responses of non-participants, market forces, program characteristics, program management, the inevitable effects of intended consequences and technological adaptation. The mechanisms, presented through analysis of specific example in Table 9, are useful for policy choices. Table 9 also highlights the variation in who bears the unintended consequences.

Table 11 Taxonomy of Some Major Unintended Consequences

Short name	Description	Mechanism	Bearers of consequences	Nature of harms
Geographic displacement	Shift of production in response to targeted enforcement	Behavioural response of growers	Countries	Increased corruption in new producer, possible environmental damage
Lack of quality control	Users purchase drugs of unknown composition	Government service restriction [consequence of intended effect]	Users	Morbidity and mortality
Needle sharing	Enforcement makes needles unavailable or incriminating	Behavioural response of users	Users, intimates	Morbidity and mortality
Inaccurate spraying	Herbicides affect legitimate crops	Program characteristics	Innocent farmers	Economic loss
Expanding production areas through eradication	Eradication forces opening of new areas for coca cultivation	Behavioural response of growers [participants]	Countries	Environmental damage
Supply reduction effect of treatment (+ve)	Many users in treatment programs are also sellers	Consequence of intended effect	Dealers, neighbours	Reduction in consumption (benefit)
Intensified interdiction	Seizing higher percentage of smuggled cocaine	Market forces	Countries	Corruption, environmental damage etc.

5.3 Drug Epidemics

Another important construct for policy assessment is a simple model of the spread of drug use in a population. In examining variation across countries and over time, it is useful to think of drug use as spreading as though there were an “epidemic” of the behaviour. There is not literally an epidemic but it is a useful metaphor and provides important statistical tools.

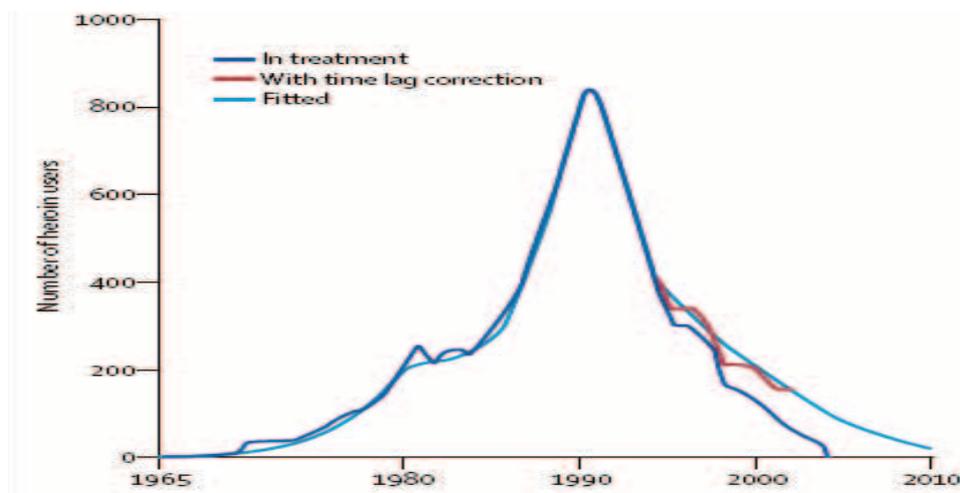
The notion of a drug epidemic captures the fact that drug use is a learned behaviour, transmitted from one person to another. Although there are individuals – drug importers and distributors – who consciously seek to create new markets for their drugs, it is now clear that almost all first drug experiences are the result of being offered the drug by a friend or family member. Drug use thus spreads much like a communicable disease. Users are ‘contagious’, and some of those with whom they come into contact are willing and thus become ‘infected’.

In an epidemic, rates of initiation in a given area rise sharply as new users of a drug initiate friends and peers. At least with heroin, cocaine, and crack, long-term addicts are not particularly ‘contagious’. They are often socially isolated from new users. Moreover, they usually present an unappealing picture of the consequences of addiction to the specific drug. In the next stage of the epidemic, initiation declines rapidly as the susceptible

population shrinks, because there are fewer non-users to infect, and because the drug's reputation sours, as a result of better knowledge of its effects. The number of dependent users stabilizes and typically gradually declines.

Heroin is the drug that is classically associated with 'epidemics' (Hunt 1974). In most Western countries there has been just one discrete heroin epidemic. That is true for example of the Netherlands and the United States, both of which experienced an epidemic of heroin use between the late 1960s and early 1970s; since then each has had only moderate endemic levels of initiation. Figure 2 shows this pattern for Zurich, using heroin treatment admission reports of year of first regular use (Nordt and Stohler, 2006)

Figure 2 Incidence of Regular Heroin Use among Methadone Patients, Zurich



However not all countries show this pattern for heroin. For example, in the United Kingdom there was an increase in heroin initiation rates from about 1975 to 2000 (Reuter and Stevens, 2007).

The model also works for cocaine powder and crack cocaine in the United States (Caulkins *et al.* 2004). It has not been fitted to the spread of cocaine in European countries; the required data are not available in those countries. Nor has it yet been fit to the distribution of methamphetamine in the United States.

The model does not seem to apply to cannabis, in part because the adverse effects of cannabis use appear modest to users (Hall and Pacula, 2003). It is not plausible for drugs that are not dependency creating, such as ecstasy.

It is however useful to keep this model in mind when considering changes in the number of Problem Drug Users in different nations in the same year. One country might be early in its epidemic, with the "natural" change from the past year being a substantial increase in new initiates; simply preventing an increase in the number of current users would be a major success. Another nation may be at the end of its epidemic, with the undisturbed trajectory being a modest decline from the previous year; an observed decline might then not indicate any particular policy success.

An important characteristic of a drug epidemic is that the distribution of drug use changes over its course. In the early stages of the epidemic there are many occasional users of drugs and few who are yet dependent. As the epidemic of new use comes to an end, many light

users desist, while a few go on to become frequent and dependent users. Thus the numbers of drug users may decrease even as total quantity consumed goes up. This is precisely the finding of Everingham and Rydell (1994) with respect to cocaine in the United States. The number of cocaine users declined sharply after about 1982, but because of the contemporaneous growth in the number of frequent users, total consumption continued to rise until 1988 at least, and declined only slowly after that.⁶⁹

This has two consequences for assessing policy toward cocaine and heroin. First, what can be accomplished through policy is a function of where a nation is in terms of the epidemic it is experiencing. Second, what policy interventions are likely to be effective will also depend on the epidemic stage.

In the early stages the goal will be to prevent rapid growth in the number of new users; later, after the explosive phase is past, it will be to accelerate the numbers who quit or at least substantially reduce their consumption levels. Caulkins and collaborators in a long series of papers (e.g. Tragler, Caulkins and Feichtinger, 2001), have explored the policy implications of these factors on the optimal choice of policy instruments.

In many Western countries the population dependent on heroin is aging. For example, the same aging pattern can be found in the Netherlands, Switzerland and the United States, despite different policy stances.⁷⁰ In the United States it can be observed very clearly in the cocaine population as well. It represents the consequences of a combination of a low rate of initiation, which brings in few younger users, and the long drug using careers of those persons dependent on cocaine and heroin.⁷¹ Treatment may reduce client drug use and has many beneficial effects for both users and society but it leads to long-term desistance by a small fraction of those who first enter.

Thus in assessing the effectiveness of drug policy at that stage of an epidemic, the number of drug users, even the number of problematic drug users, is not an appropriate indicator. Instead, governments can aim to reduce the adverse consequences of drug use by its current population of problematic drug users. Thus cocaine, there is then a sharp difference between the situation of the U.S. on the one hand and, say, Portugal on the other. Portugal may still be in the explosive stage of the epidemic and might reasonably aim at reducing the number of new problematic users. That should probably only a secondary goal for the U.S.

Is it possible to prevent an epidemic from starting? The first problem is that of detecting it, since surveillance systems are largely backward looking. The Drug Abuse Warning Network, set up in the United States in the early 1970s, was an attempt to use the appearance of Emergency Room patients with problems related to their drug use to rapidly detect the arrival of new drugs and thus allow for preventative policies. There has been no

⁶⁹ The consumption increase also reflected the decline in price that probably led to an increase in annual consumption per dependent user.

⁷⁰ The most explicit modeling of this phenomenon is Nordt and Stohler (2006) using treatment entry data for Zurich.

⁷¹ The length of heroin using careers is best documented in a remarkable 33 year follow-up of a sample of dependent users recruited in the 1960s, many of whom were still using 30 years later (Hser et al, 2001).

evaluation of how well it has worked in that respect but it does not seem to have provided valuable early warning for example of the spread of methamphetamine from its West Coast base in the 1990s. Moreover not all drugs with great potential for harm will manifest that harm in the early phases, defeating an Emergency Room based system. Other systems may be possible but have not yet been implemented.

We observe only those outbreaks of drug use that actually occur and not those that might have been, so analysis of past experiences will not be informative as to what actions might prevent an epidemic from occurring once it has begun. Instead one can only consider the plausibility of the various instruments that are available. Prevention is in principle the most useful; if youth can be persuaded that psychoactive substances are dangerous, then the potential for a new epidemic is limited. However both cocaine and heroin use have started at post-high school age, well after individuals have been exposed to prevention programs. Given the lack of evidence at the population level that prevention can substantially reduce the number of initiates among 12-17 year olds, there seems little potential for preventing a new epidemic in, say, 18-24 year olds.

Treatment can have only indirect effects on initiation rates, since it is an intervention aimed at those who have already become heavily involved with the drug.⁷² Harm reduction does not target either initiation or prevalence. That leaves enforcement as the one tool for preventing the start of an epidemic. Enforcement is not generic but rather aims at specific drug markets. Hence it is likely to lag in its effects for a new drug; moreover new drugs are often distributed through social networks rather than through markets and thus are particularly hard to police.

5.4 **Production and trafficking controls**

There is little doubt that interventions aimed at production can affect where drugs are produced. We noted above the changing location of coca growing within the Andean region that are plausibly related to the actions of the governments of Bolivia, Colombia and Peru. Changes in the location of ATS production over the last decade may also reflect such actions.

What is far less clear is that government interventions have been able to reduce total output, as opposed to where and in what way the drugs are produced. This is the essence of the claimed “balloon effect”, frequently noted by critics of the existing control system (e.g. Nadelmann, 1988) as well as by Costa (2008). What have not been developed are the implications of that balloon effect for policies at the national and international level. The well intended efforts of one nation to control production can harm other nations; thus the aggressive efforts at control of production by Peru may well have worsened Colombia’s problems.

Even within a country, the same analysis can provide useful conclusions. Large sections of Afghanistan are under the control of the Taliban, for which the drug trade is an important

⁷² As already mentioned, treatment may reduce the supply of drug selling labour since many of those treated for heroin or cocaine dependence are also drug distributors.

source of revenue. If the government cracks down on opium production in the territories it controls, it may shift production to the Taliban-controlled areas and thus enhance the funding and political base of the guerrillas. This presents a serious dilemma for the government, since ignoring opium growing undercuts its authority, in part by providing an independent source of finance for local warlords who may challenge the government.

Exactly the same argument can be made about efforts to control international trafficking. There are typically many paths by which drugs can travel from their production point to their final market. If tough enforcement makes smuggling along one route difficult, traffickers may try another.

In recent years this kind of interaction has been conspicuous with respect to trafficking of cocaine. We illustrate the phenomenon by taking advantage of an unusually detailed analysis of a successful control effort by the Dutch government.

The Netherlands Antilles is conveniently located for Colombian traffickers shipping to Europe; it has many direct flights to one of Europe's busiest airports, Schiphol in Amsterdam. In response to evidence of growing trafficking of cocaine primarily from Curacao to the Amsterdam airport, the Netherlands government implemented a 100 percent search policy for airline passengers in Curacao in March 2004 (World Ban and UNODC, 2007). Whereas cocaine seizures in the Netherlands Antilles had not exceeded 1.3 tons before 2003, in 2004 they reached 9 tons, a remarkable figure for a jurisdiction with fewer than 200,000 inhabitants; the U.S. seizes only about 150 tons. Seizures of cocaine at Schiphol airport have fallen sharply.

Very probably as a consequence new trafficking routes have opened up from South America to Europe via West Africa (EMCDDA, 2008).⁷³ For example, the nation of Guinea-Bissau is impoverished and small; it has no military or police capacity to deal with smugglers and the government is easily corrupted. Smugglers have started using landing strips there for large shipments. In 2007 there was one seizure of three quarters of a ton and it is believed that an even larger quantity from that shipment made it out of the country (Sullivan, 2008).

Ghana, a larger nation but one also with fragile institutions, has also seen a sudden influx of cocaine traffickers; in 2005 Accra accounted for more seized cocaine at London's Heathrow than did any other city. There are now regular reports of multi-kilo seizures of the drug either in Ghana itself or at airports after flights from Ghana.

Assuming that Ghana and Guinea-Bissau are serving as trafficking nations at least in part because of the effective crack-down on an existing route through Curacao, is the world better off as a result of the crack-down? Certainly the Netherlands has helped itself and one can not be critical of a country making a strong effort to minimize its involvement in the drug trade. However one can reasonably ask whether in making these decisions, the Netherlands should take into account the likely effects of their actions on other, more

⁷³In response to the emergence of this new route, seven European nations in the middle of 2007 set up a new entity named MAOC-N (Maritime Analysis and Operations Center-Narcotics). By the end of 2008, MAOC-N had helped in the seizure of 40 tons of cocaine <http://www.guardian.co.uk/world/2009/feb/09/drugs-patrol-cocaine-seizure> [accessed 15 February 2009]

vulnerable countries. We raise this not as a criticism of any government but to point to an interdependency that has not been explicitly recognized in discussions of international enforcement.

More generally, though, it appears that trafficking control efforts have had little effect in the last ten years. Iran remains a major transshipment country, despite its long-standing commitment of large resources to interdiction of opiates from Afghanistan and its willingness to administer tough punishment on convicted smugglers. Mexico in recent years has also made intense efforts to control smuggling of cocaine from Colombia to the United States. Though there is some indication of a reduction of export levels in 2007, perhaps reflecting the intensified violence in the market, there is good reason to see this as a temporary respite. This was the pattern when the flow of cocaine from Colombia was interrupted during the battle between the Medellin traffickers and Colombian government took place in 1989-1990; the flow resumed at comparable rates after the conflict subsided with government victory and the re-ordering of the cocaine trade. U.S. destined cocaine still seems to flow primarily through Mexico, even two years after the government's crack-down.

For Mexico corruption may have been a major factor explaining the ineffectiveness of the effort to reduce trans-shipment. Even in late 2008, two years after President Calderon made the effort against the traffickers a prominent part of his administration's agenda, there have been revelations of corruption at the very highest levels of the drug enforcement system (e.g., Stevenson, 2008). Too little is known about Iranian enforcement to make statements about the role of corruption in its lack of success in shifting the trans-shipment traffic to Europe to other routes).

A rare and controversial exception to the failure of interdiction is the Australian "heroin drought". In late 2000, Australian heroin markets experienced an abrupt and large reduction in drug availability (Weatherburn, Jone, Freeman and Makkai, 2003). Though there has been some recovery in availability in the following seven years, this event appears to have had long-term effects. The most likely cause of this interruption is an operation by the Australian authorities (together with agencies of other governments in Asia) aimed at the small number of major heroin shippers, in particular a seizure and set of arrests in Fiji (Degenhardt, Reuter, Collins and Hall, 2005). While Degenhardt *et al.* argue against other interpretations that give a role to treatment or supply side shifts in the Goilden Triangle, so little is known about the specific cause of this drying up of the heroin market that one can say little more than that perhaps effective interdiction against an isolated market is possible.

5.5 Domestic enforcement

We noted earlier that there has been a decline in the drug problems of some nations that have been particularly damaged by drugs in the past and that there has also been an increase in the stringency of enforcement against sellers. Could the more aggressive enforcement against traffickers and retailers account for the reduction in problems?

That question cannot be answered in a rigorous fashion, for a variety of methodological reasons and because of the lack of data on enforcement intensity and outcomes.⁷⁴ However the available evidence is roughly inconsistent with the hypothesis.

Tougher enforcement should reduce drug use by making drugs more expensive and/or less available. The underlying model is that the risk of arrest, imprisonment, seizure of drugs, money and assets are all costs to producers and distributors (Reuter and Kleiman, 1986). The higher those risks, the more suppliers will charge for the service. The one published effort, in the United States, to model rigorously the effects of increased enforcement found that a tripling of cocaine selling arrests had led to an increase of between 5 and 15% in the price of cocaine, a small return for such a large increase (Kuziemko and Levitt, 2004; Bushway *et al.*).

We have already noted that retail prices have generally declined in Western countries, including those that increased the stringency of their enforcement against sellers, such as the U.K. and the U.S.A. There are no indications that the drugs have become more difficult to obtain. Indeed, survey data such as Monitoring the Future, show very little evidence of changes in perceived availability (Johnston *et al.*, 2007).

5.6 Methodological issues

Drug problems and drug policy may attract considerable policy and political attention but that has not been matched by large scale data collection and analysis. There remains a dearth of data sets or indicators for comparing how one nation's drug problem compares to that of other nations; for describing how a nation's drug problem has changed over time; and for assessing how drug policies contributed to observed changes in national drug problems over time. Report 6 ("Methodological problems confronting cross-national assessments of drug problems and policies") describes some of the major data limitations facing assessments of drug problems (demand, supply, harms) and policies; it focused particularly on challenges to cross-national comparisons. It identifies both conceptual and empirical elements of those limitations.

Conceptual challenges include inconsistencies in definition and operationalisation of concepts. A well-known conceptual difficulty is the lack of consensus in defining problematic drug use. Another example is the very concept of "drug" itself. In English speaking countries this concept covers both illicit drugs and medical prescription drugs; in other countries (e.g. the Netherlands) the term drug is reserved for illicit drugs. This difference has large consequences for the registration of drug-related deaths. A third example is the question "What is drug-related crime?" The relationship between drugs and crime is complex. It has for example been noted that this relationship can be dynamic and may vary over time (EMCDDA, 2007a).

⁷⁴ The fundamental problem is the lack of sub-national measures of the size of drug markets that would allow the estimation of the intensity of enforcement. Is an increase in drug seller arrests or incarceration the consequence of more drug sellers or more effective enforcement? Without being able to measure variation in enforcement intensity within a country over time, the potential empirical analyses are weak.

Even simple differences across countries can create problems of comparison. For example, in Britain the household survey data is reported for ages 16-59, whereas in Australia it covers all persons over the age of 14. Though this would not present a problem for an analyst with access to all the data, the published data do not allow for exact comparisons of prevalence between the two nations, except for specific age groups. Some countries conduct in-person interviews, while others use telephones for interviews; the latter is known to result in lower prevalence rates. The cumulative effect of these differences is to make the comparative analysis very approximate.

This study is intended to inform policy makers, not to provide recommendations, except for a few about data and research. Policy decisions reflect not only research findings but also the specific values, institutional arrangements and concerns of a nation.

We find no evidence that the global drug problem was reduced during the UNGASS period. For some nations the problem declined but for others it worsened and for some of those it worsened sharply and substantially. The problem generally lessened in richer countries and worsened in a few large developing or transitional countries. The pattern for drugs was also uneven. For example, the number of cannabis users may have declined but the sudden and substantial rise in cannabis treatment seeking may suggest that the number of heavy users and harms have gone up. On the other hand, for cocaine a roughly stable consumption was redistributed among more countries. In aggregate, given the limitations of the data, a fair judgment is that the problem became somewhat more severe.

Between 1998 and 2007 policy changed in many ways. There was an expansion of efforts to help drug users, whether through treatment or other harm reduction measures, at the same time that there was generally a tougher policy toward sellers. There seemed to be a growing convergence of implemented policies, even if the rhetoric of international political debates did not shift much.

The fact that policy changed substantially of course makes a policy assessment difficult but again we think a fair judgment is that policy had no more than a marginal positive influence. Production controls had some local successes (for example in Myanmar and Peru) but were unable to affect the availability of drugs globally; trafficking controls were no more successful. Enforcement against local markets failed in most nations to prevent continued availability at lower price. Treatment reduced harms both of dependent users and of society without reducing the prevalence of drug use. Prevention efforts, though broad in many Western countries, were handicapped by the lack of programs of proven efficacy. Harm reduction has helped an increasing number of countries but is focused on a narrow element of the drug problem.

The enforcement of drug prohibitions has caused substantial harms, unevenly distributed across countries. No matter how well intentioned, there were predictable adverse effects to stringent enforcement; some of the effects were borne by nations other than the one doing the enforcement. The challenge for the next ten years will be to find a constructive way of building on these lessons so that the positive benefits of policy interventions are increased and the negative ones averted.

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