1.4 The global ATS market

1.4.1 What are ATS?

Amphetamine-type stimulants (ATS) refer to a group of synthetic substances comprised of amphetamine-group (primarily amphetamine, methamphetamine and methcathinone) and ecstasy-group substances (MDMA and its analogues). The amphetamine-group substances were originally synthesized in the late nineteenth century and marketed as over-the-counter nasal decongestants beginning in 1932. During the Second World War, the various amphetamines were used by military personnel and stockpiles were released onto the market after the war.[1]

The uncontrolled use of the amphetamine-group substances led to widespread abuse. By the 1970s, the therapeutic usefulness of these substances was recognized to be limited. National and international control measures appeared, as did a decline in licit pharmaceutical manufacture. However, demand for these substances did not decline at the same rate and clandestine manufacture gradually became the primary source of supply for these substances.

The ecstasy-group substances are chemically related to the amphetamines. The major compound, MDMA and other analogues such as MDA and MDEA were first synthesized early in the 1900s. While MDMA found limited therapeutic use in the 1970s, its recreational use increased dramatically throughout the 1990s and was associated with rave culture in the developed world.

All ATS are available in diverse forms and vary in purity. Methamphetamine or amphetamine can be in powder, tablet, paste or crystalline form while ecstasy is usually available in tablet or powder form.

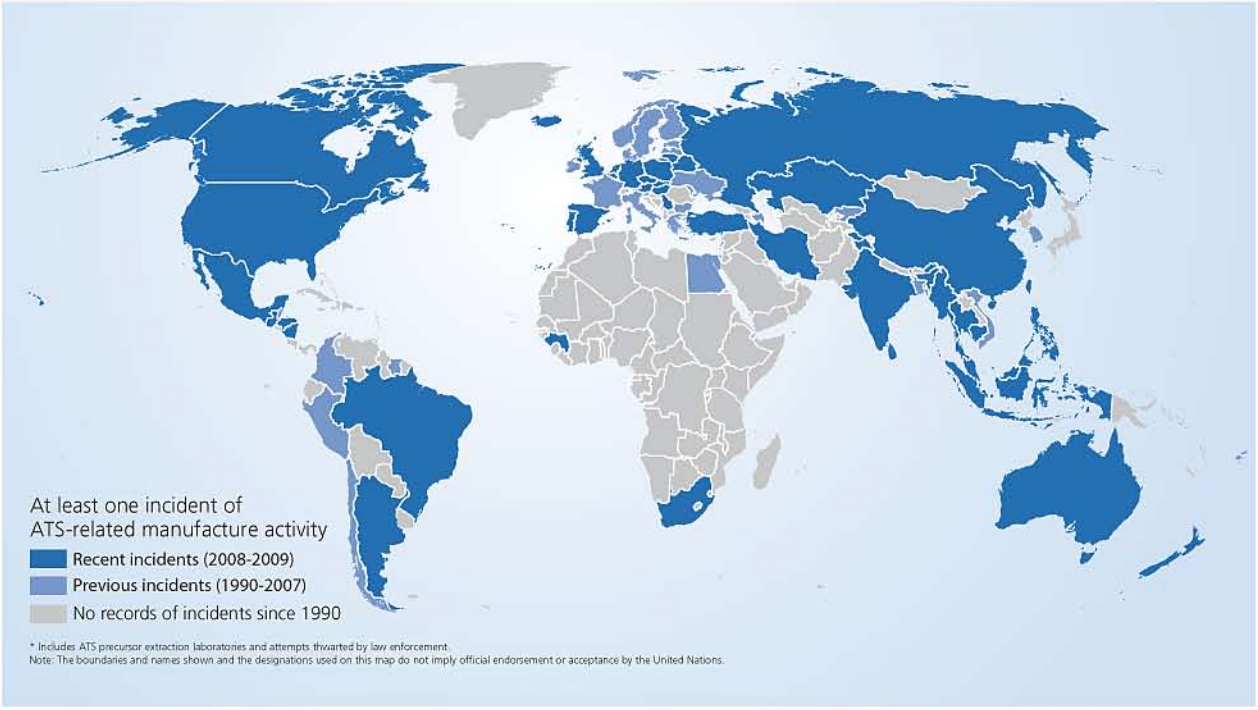
The spreading use of ATS can be attributed to their attractiveness to both users and the criminal organizations who manufacture them alike. They appeal to the needs of today's societies and have become part of what is perceived to be a modern lifestyle, both recreationally and occupationally. Their use is believed to enhance performance including sexual performance and their use is often initiated by mouth in 'convenient' and discrete pill form that avoids the dangers of injection or social stigma of smoking. They are affordable, often sold in single tablet units, which are often erroneously perceived as being less harmful than in other forms.

The popularity of ATS is also a result of a market potential with continuously high profits and low risks with little initial investment. Unlike the cultivation of the coca leaf or opium poppy, ATS manufacture is not limited to certain geographic locations, thus laboratories can clandestinely operate anywhere and be relocated as risk increases. One unique characteristic is that they can be synthesized from a variety of starting materials (precursor chemicals) using a variety of methods. If a traditional precursor becomes unavailable, replacements are easily found, often facilitated by readily available information on the Internet. New synthetic stimulants not yet under international controls can also be brought quickly to market. Additionally, large profits are not only made from the sale of the drug itself, but increasingly from illicit sourcing of the key precursor chemicals.

1 UNDCP Technical Series Number 3, *Amphetamine-type stimulants: a global review*, 1996.

Map 7: Member States reporting ATS-related manufacture* since 1990

Sources: UNODC ARQ/DELTA; Government reports; UNODC, Global SMART Update 2009, Volume 1, 2 and 3 (March); Amphetamines and Ecstasy: 2008 Global ATS Assessment (United Nations publication, Sales No. E.08.XI.12)



* Includes ATS precursor extraction laboratories and attempts thwarted by law enforcement.
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

1.4.2 The dimensions of the ATS market

Assessing the size and dynamics of illicit ATS markets is fraught with numerous obstacles due to the clandestine nature of these markets. Estimates are largely based on data reported by Member States but unfortunately, little more than half of Member States consistently provide annual information to UNODC. Irregular and/or incomplete reporting—even in developed regions—compounded by the varying quality of data provided from several key regions hinders the ability to provide timely evidence-based responses. For example, the assessment of prevalence of use, a basic demand indicator, only occurs annually in two countries and on average every three to five years in most countries, when it occurs at all. A number of countries on the Asian continent, including China, are believed to have significant levels of ATS abuse, but figures are elusive as many have never had nationally representative household surveys on drug use.

Another significant limitation is the lack of systematic forensic information required to accurately assess the specific ATS substances, their precursor chemicals, manufacturing processes, trafficking and the user base. The lack of information also hampers the determination of exactly how much ATS is illicitly manufactured. Manufacture is clandestine and cannot be assessed from remote sensing, as is the case with poppy plants and coca bushes. Previous UNODC models attempted to ascertain manufactured based on the triangulation of consumption, seized end product, and seized precursor chemicals. However, changes in the drug market, particularly those related to precursor chemical seizures and ability to ascertain seizure rates, made this model less useful. Additionally, Member State reports of clandestine laboratories dismantled annually fail to include standardized measures of manufacture capacity such as the frequency, duration and amount of each production cycle, thus limiting their analytical value. Because of these limits the scale of uncertainty is reflected in the range of many of the estimates provided.

The supply of ATS

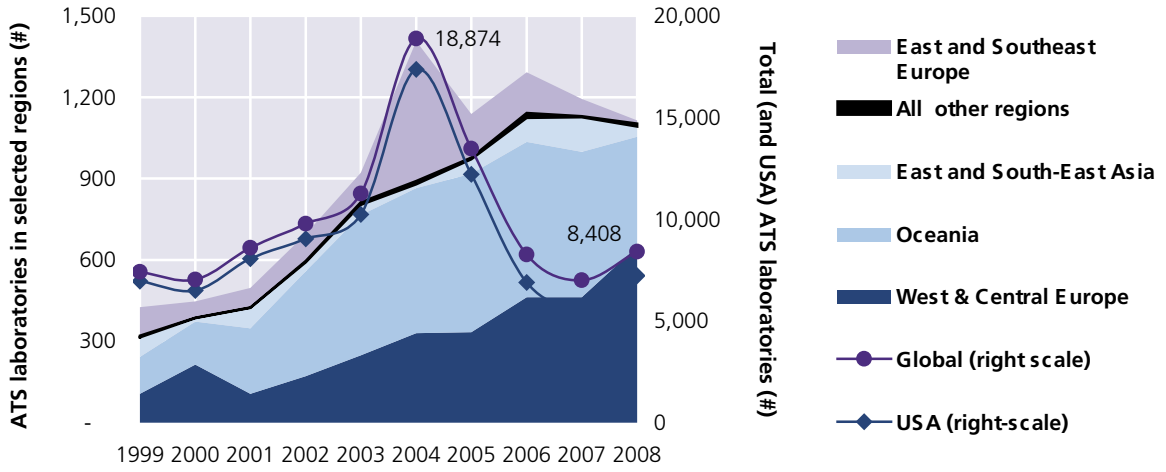
Unlike the illicit cultivation of the coca plant and opium poppy which is constrained to specific locations, the manufacture of ATS is not geographically limited. ATS laboratories therefore tend to be located close to consumer markets. Since 1990, there has been a spread in ATS manufacture with more than a third of Member States having reported ATS-related manufacture activity to date.[2]

Significant ATS manufacture occurs throughout East and South-East Asia (predominately methamphetamine

2 Manufacture can be considered in two broad categories—addiction-based, where small operations synthesize enough drug for the user, and economic-based operations which can be up to the size of industrial factories.

Fig. 60: Number of reported ATS laboratories (all sizes), by region, 1999-2008

Source: UNODC ARQ/DELTA



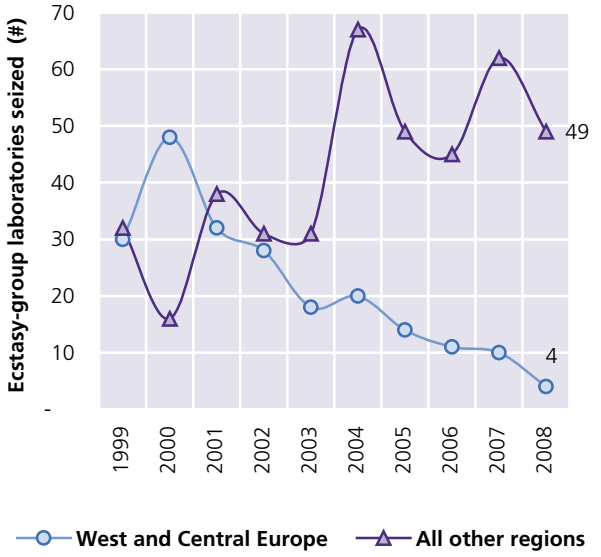
and – in recent years - also ecstasy), North America (methamphetamine and ecstasy in all three countries), Europe (mostly amphetamine and ecstasy, with increasing methamphetamine manufacturing), Oceania (methamphetamine and, to a lesser extent, amphetamine and ecstasy), and parts of Africa, most notably in the south (methamphetamine and methcathinone).

Since 2000, significant ATS manufacture has been reported to UNODC in either number of clandestine laboratories or size of operations from Australia, Belgium, Bulgaria, Canada, China,[3] the Czech Republic, Germany, Indonesia, Malaysia, Mexico, Republic of Moldova, Myanmar, the Netherlands, New Zealand, Philippines, Poland, the Russian Federation, Slovakia, South Africa and the United States of America. The overall number of dismantled ATS laboratories rose strongly until 2004, but declined thereafter and is now back to the level a decade ago. This reflects mainly the trends reported from the United States which regularly dismantles the majority of all clandestine ATS labs worldwide, typically concerning smaller methamphetamine incidents. The reported decline after 2004 can be linked to improvements in US precursor controls which made access to such chemicals in the United States far more difficult. The numbers in several regions outside the United States, in contrast, increased over the last decade, particularly for methamphetamine – though some stabilization can be noticed for the period after 2004.

A shift can be noted in the manufacture of ecstasy-group substances, which used to be located predominantly in Western Europe, closer to the main consumer market. Over the past 10 years, manufacture of ecstasy-group substances has shifted away from Europe to a number of consumer markets around the world. Large-scale manufacturing operations are more frequently being dismantled in East and South-East Asia, the Americas and Oceania. In 2008, only four ecstasy laboratories were reported to have been seized in West and Central Europe.

Fig. 61: Ecstasy-group laboratories by region, 1999-2008

Source: UNODC ARQ/DELTA.

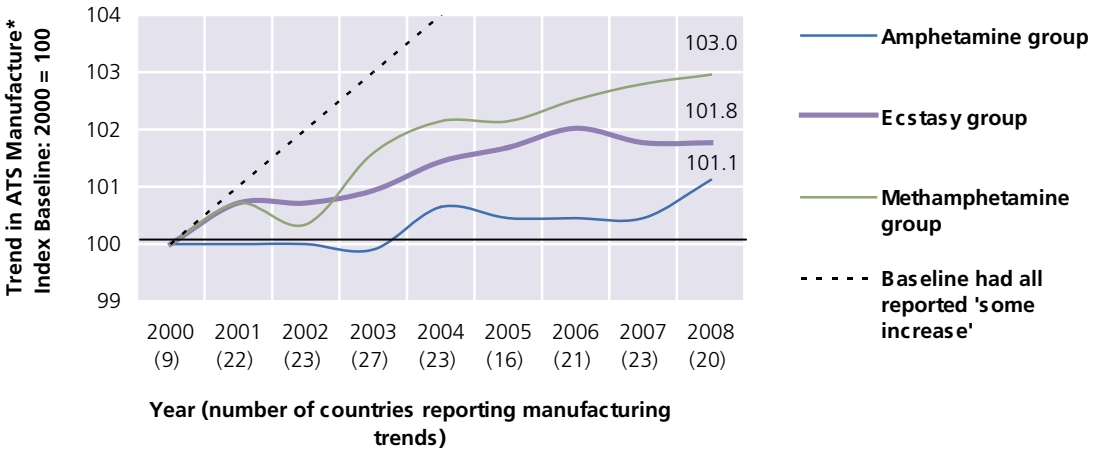


To supplement quantitative data, UNODC requests Member States in the Annual Reports Questionnaire (ARQ) to provide insights as to whether experts believe the trends in manufacturing are changing over time. Each year between 2000 and 2008, an average of 23 countries reported on these trends. Assigning a value to

3 Includes all provinces and Special Administrative Regions.

Fig. 62: Expert perceptions (unweighted) on ATS manufacturing trends, 2000-2008

Note: Expert perception in manufacturing trends were not weighted by the size of the countries' ATS manufacture as the latter is difficult to determine. Therefore, it cannot be excluded that countries with overall minor ATS manufacture may have a disproportionate influence on the global trend. Figures exclude clandestine poly-drug and other synthetic drug manufacture.
Source: UNODC ARQ/DELTA



the experts' responses[4] and trending them over time (indexed using the year 2000 as the baseline of 100) suggests that the trend in methamphetamine manufacture is perceived to be on the increase in most reporting countries, while until recently amphetamine has remained relatively unchanged. Trends in ecstasy manufacture, on the other hand, are perceived to have stabilized since 2006.

The expert perception trends of increased amphetamine and methamphetamine manufacture over this period are, however, supported by several other data, including rising seizures reported throughout this period, a growing proportion of countries reporting seizures of these substances, and both the volume and increasing size of dismantled laboratories.

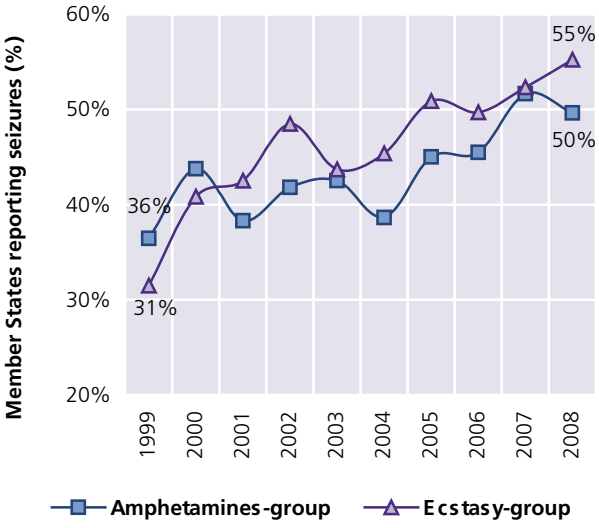
Over the past decade, the proportion of countries which reported seizures of ATS has increased markedly, indicating an increase in the size and spread of the market. Whereas in 1999, only 36% of all Member States returning an ARQ reported seizing amphetamine-group substances (34.4 mt), by 2008 that figure had increased to 50% (47.4 mt), with ecstasy-group substances following a similar pattern.

Seizures of ATS have also risen significantly. Between 1999 and 2008, seizures of ATS increased more than 30% from 39 mt to 51.3 mt. A significant amount of this increase was seen in Asia, notably the Near and Middle East with unprecedented increases in seizures of amphetamine-containing pills sold as *Captagon*.

Data show that the proportion of seized methampheta-

Fig. 63: Proportion of Member States returning an ARQ reporting ATS seizures, by type, 1999-2008

Source: UNODC ARQ/DELTA



mine has declined, from almost 70% of total ATS seizures to 38%. On the other hand, the percentage of amphetamine has quintupled. However, the amount of ATS diverted from the legitimate market—a significant source of illicit use in many regions—is rarely reported. The regional breakdown of ecstasy seizures shows a shift away from West and Central Europe, the former main region of production.

The trafficking in ATS substances remains to a large extent intra-regional, as manufacture can and does occur close to the consumer markets. In 2008, significant seizures of methamphetamine occurred in the following regions: East and South-East Asia (56%), North Amer-

4 ARQ expert perception data is reported unweighted. The following points are allocated if experts perceive: 'strong increase' 2; 'some increase': 1; stable: 0; 'some decline' -1; 'strong decline' -2.

Fig. 64: Seizure trends of ATS, by type, 1999-2008

Source: UNODC ARQ/DELTA

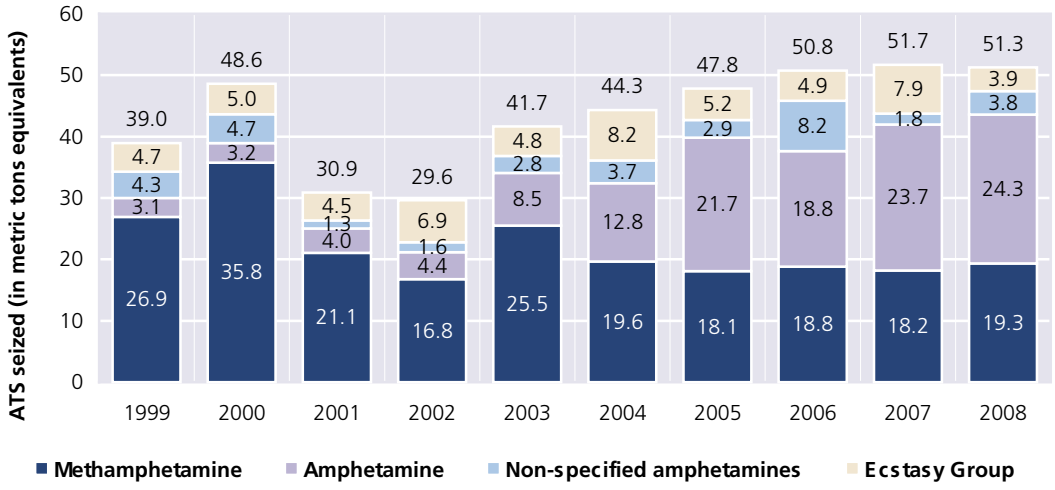


Fig. 65: Breakdown of ATS seizures, by substance group, 1999 and 2008

Source: UNODC ARQ/DELTA

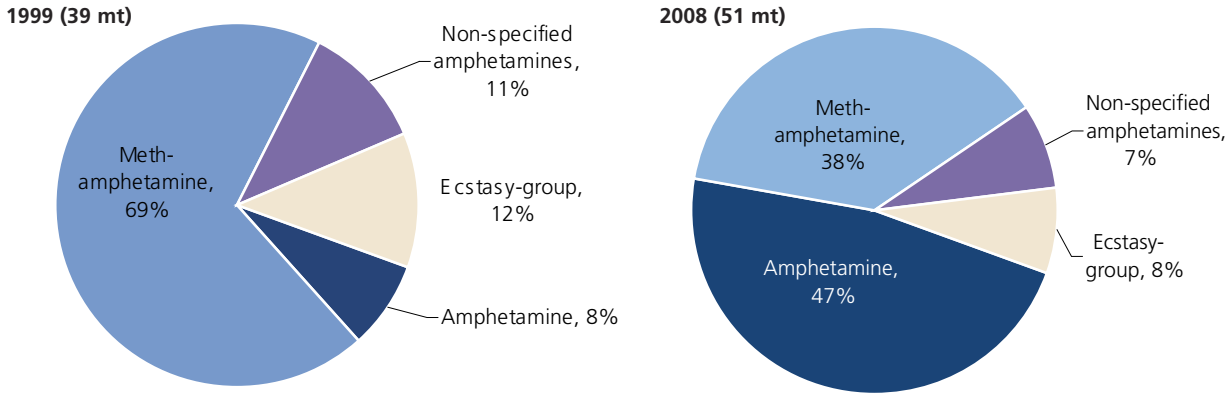
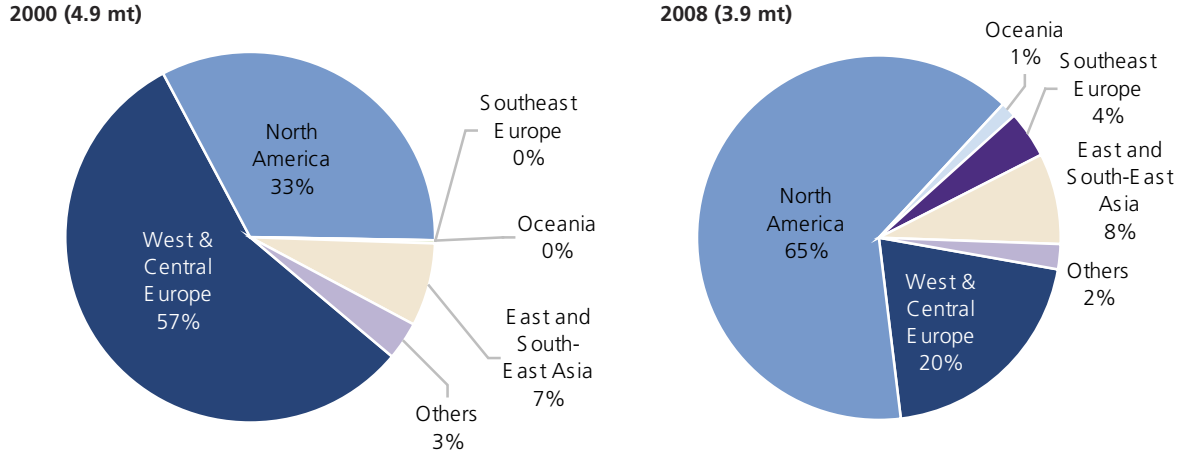


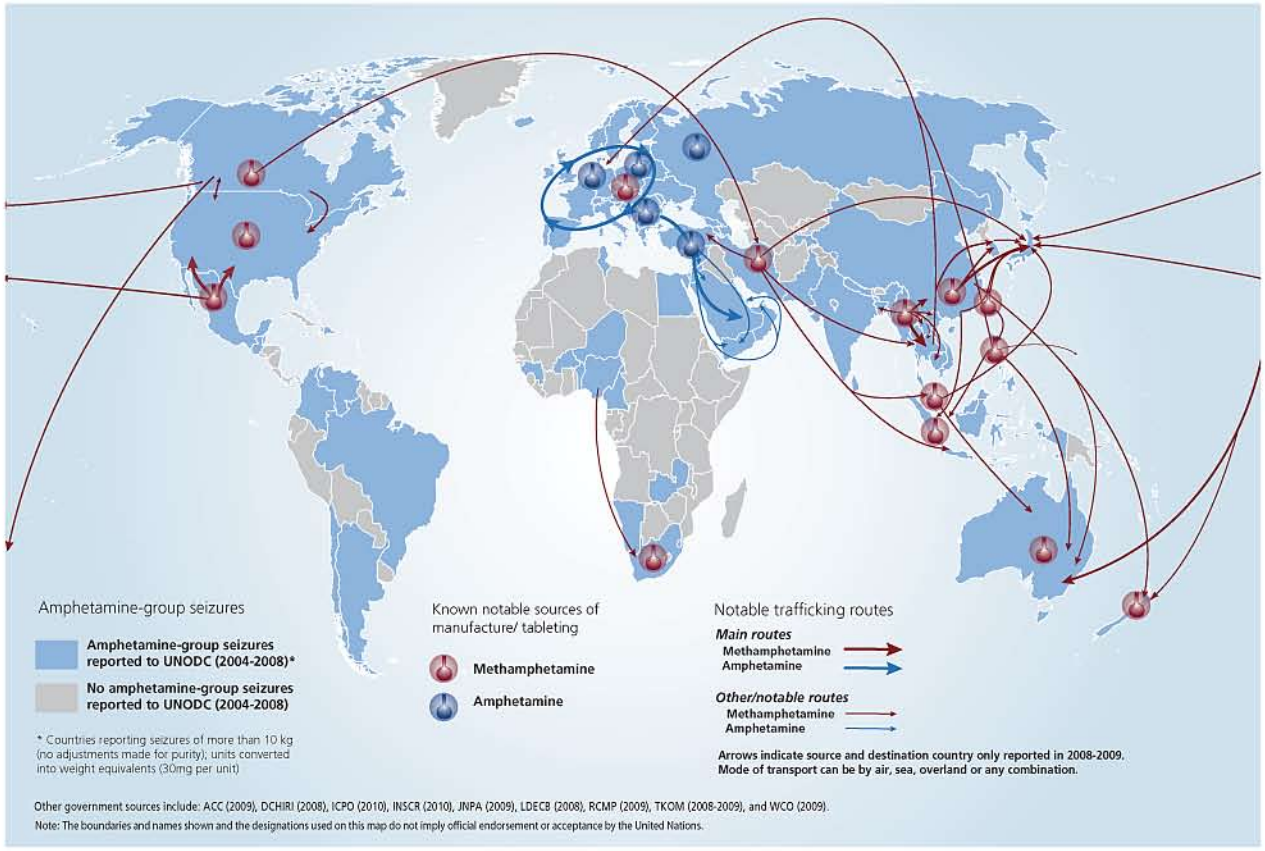
Fig. 66: Breakdown of ecstasy-group seizures, by region, 2000 and 2008

Source: UNODC ARQ/DELTA



Map 8: Notable locations of manufacture and main trafficking routes of amphetamine-group substances, 2008-2009

Sources: UNODC ARQ, Individual Drug Seizure Database, and other government sources



Other government sources include: ACC (2009), DCHIRI (2008), ICPO (2010), INSCR (2010), JNPA (2009), LDECB (2008), RCMP (2009), TKOM (2008-2009), and WCO (2009).

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

ica (42%) and to a much lesser extent, Europe. Amphetamine seizures occurred mainly in the Near and Middle East (63%), West and Central Europe (33%) and to a much lesser extent North America. Ecstasy (MDMA) was mostly seized in North America (65%), West and Central Europe (20%) and to a lesser extent in South-East Europe (4%). These figures may also include significant seizures of drugs sold as 'ecstasy', but often containing substances other than MDMA.

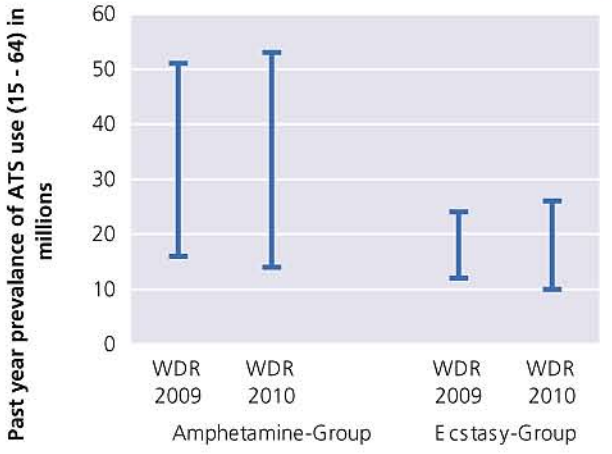
1.4.3 The demand for ATS

Data limitations are even more acute when determining the size of the demand for ATS. In many countries in the world—particularly developing countries—demand-related data on prevalence, patterns and extent of drug use, are not collected or not regularly collected, thus accounting for a substantial amount of uncertainty reflected in prevalence estimates with wide ranges. There is a paucity of established data collection systems and lack of sufficient data to allow for precise trend analysis and historical comparisons. The estimated number of global ATS users is therefore currently expressed in ranges rather than absolute numbers.

Bearing in mind these limitations, past year amphetamine-group and ecstasy-group users are estimated to be in the range of 14 to 53 million and 10 to 26 million, respectively. Thus the global number of ATS users likely continues to exceed the number of opiate and cocaine users combined. The already sizable 2008/2009 ranges are between 6% and 15% larger than the previous year's estimates of 16 to 51 million and 12 to 24 million for

Fig. 67: Estimated annual prevalence of ATS use, 2007/2008 and 2008/2009

Source: UNODC calculations



Map 9: Notable locations of manufacture and main trafficking routes of ecstasy-group substances, 2008

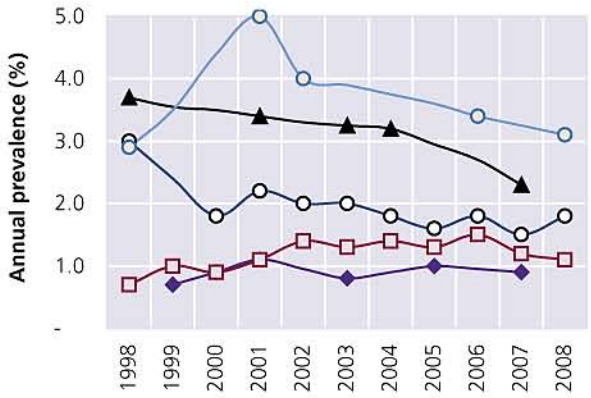
Source: UNODC ARQ

amphetamines-group and ecstasy-group substances, respectively, as little new prevalence data has become available, particularly in Africa and Asia. Indeed, the change in global prevalence may well reflect new reports from developed countries rather than actual changes at the global level.

These large ranges mask shifts in use. In developed ATS markets where regular assessments of drug use among the general population are carried out, annual prevalence of amphetamine-group substances by the general population has actually stabilized or declined over the past several years.

Fig. 68: Annual prevalence in select significant amphetamine-group markets, 1998-2008

Sources: Government reports[6]

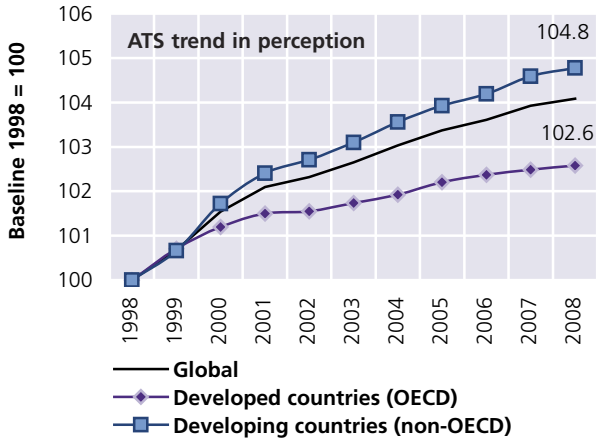


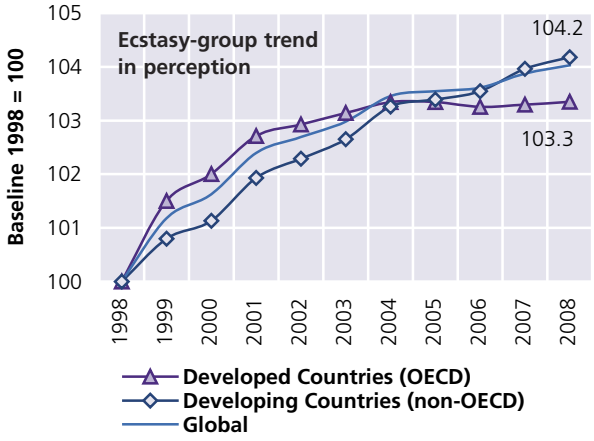
*Data for New Zealand (2008) were adjusted for ages 15-45 to remain comparable with previous past year prevalence studies.

5 Kershaw, C., Nicholas, S. and Walker, A., *Crime in England and Wales 2008/09: Findings from the British Crime Survey and police recorded crime*, Home Office Statistical Bulletin, London, 2009; Substance Abuse and Mental Health Services Administration, *Results from the 2008 National Survey on Drug Use and Health: National Findings*, Office of Applied Studies, Rockville, Maryland, 2009; Australian Institute of Health and Welfare, *2007 National Drug Strategy Household Survey: Drug statistics*, 22, Canberra, 2008; Wilkins C. and Sweetsur P., *Trends in population drug use in New Zealand: Findings from national household surveying of drug use in 1998, 2001, 2003 and 2006*, New Zealand Medical Journal, 121, 61-71, 2008; New Zealand Ministry of Health, *Drug Use in New Zealand: Key Results of the 2007/08 New Zealand Alcohol and Drug Use Survey*, Wellington, 2010; *Informe de la encuesta domiciliaria sobre alcohol y drogas en España* (EDADES) 2007/08, Delegación del gobierno para el plan nacional sobre drogas, Madrid, 2008.

Fig. 69: ATS use trends (unweighted) by type as perceived by experts of developed (OECD) and developing (non-OECD) countries: 1998-2008 (baseline: 1998 = 100)

Note: Expert perceptions of ATS use were not weighted by the size of the countries' population (either total or ATS drug using population), and thus, one cannot exclude the possibility that countries with only minor or emerging ATS use may have a disproportionate influence on the global trend.
Sources: UNODC ARQ, UNODC field offices, UNODC's Drug Use Information Network for Asia and the Pacific (DAINAP)





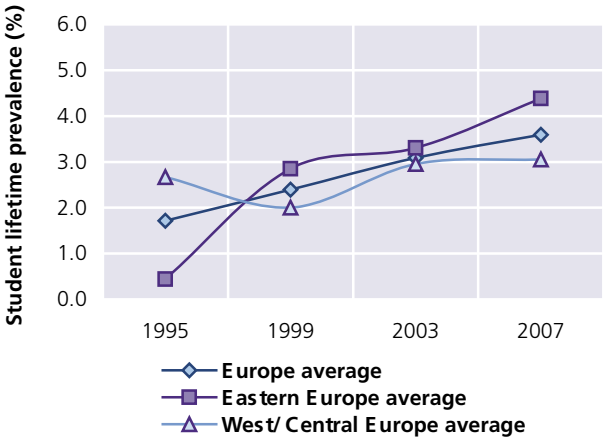
As prevalence data are simply not available in many developing countries, UNODC considers expert perceptions as reported by Member States to help assess demand trends. These trend data[6] over the 1998 to 2008 period suggest that there have been continued increases in ATS demand for developing countries. Beginning around 2000, the rate of increases perceived by experts of developed (OECD)[7] and developing countries (non-OECD) diverged, as a number of key industrialized countries showed a stabilization or decline while developing countries, particularly those in the Americas and parts of Asia reported ongoing increases in ATS use. Asia, with between a third and three quarters of estimated ATS users worldwide, has regionally diverse ATS user groups. This can be seen, for example, in increased treatment demand for problem amphetamine use in the Near and Middle East[8] and increases in methamphetamine use in tablet and high purity crystalline form in countries in South-East Asia in 2008.[9]

'Ecstasy' use as perceived by experts has steadily increased since 1998. Around 2006, developing countries began reporting more frequent and more significant increases in ecstasy use, with their frequency outpacing that of the more mature ecstasy markets in the developed countries, which have largely appeared stable since 2004.

The use of 'ecstasy' in developing markets may be spreading particularly among youth in Latin America and East Europe. For example, between 1995 and 2007, increased lifetime prevalence of 'ecstasy' use among students aged 15 and 16 from Central and East Europe[10] was reported. The unweighted average for students in East European countries in 2007 surpassed that in West

Fig. 70: Unweighted average of lifetime prevalence of 'ecstasy' use among students (age 15-16) in Europe: 1995-2007

Source: Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., and Kraus, L., *The 2007 ESPAD Report Substance Use Among Students in 35 European Countries*, The Swedish Council for Information on Alcohol and other Drugs (CAN), Stockholm, 2009



6 If all countries had reported 'some increase', the global trend line would have increased by one point each year and would have reached 110 by 2008.

7 OECD Member countries include: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States of America.

8 Abu Madini M. S., Rahima S. I. A., Al-Zahrani M. A. and Al-Johi A. O., *Two decades of treatment seeking for substance use disorders in Saudi Arabia: Trends and patterns in a rehabilitation facility in Dammam*, Drug and Alcohol Dependence, 97(3), 2008, pp 231-236.

9 UNODC, *Patterns and trends of amphetamine-type stimulants and other drugs in East and South-East Asia (and neighbouring regions) 2009*, November 2009.

10 Students of Eastern Europe include: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation (Moscow), Slovakia, Slovenia and Ukraine.

Fig. 71: Trends in annual prevalence of select 'ecstasy' markets, 1998-2008

Sources: Government reports[12]

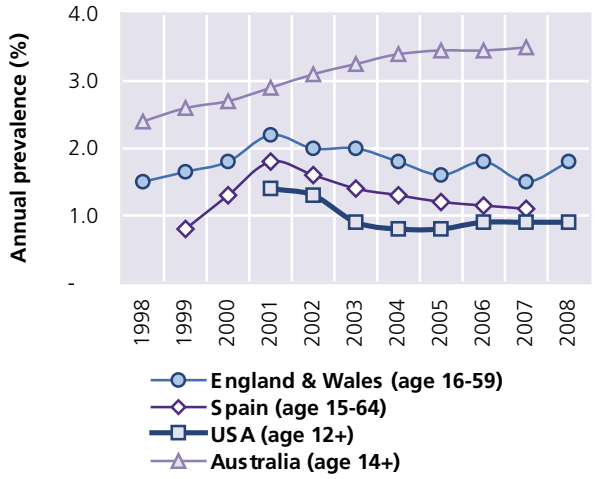
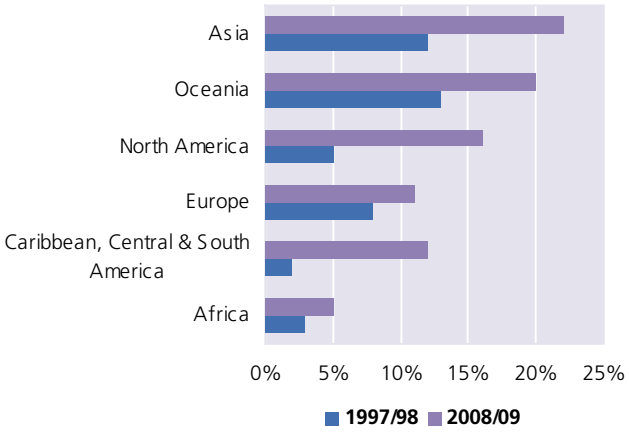


Fig. 72: Changes in unweighted regional treatment demand for problem ATS drug users, as a proportion of all drug treatment

Source: UNODC *2000 World Drug Report*, ARQ

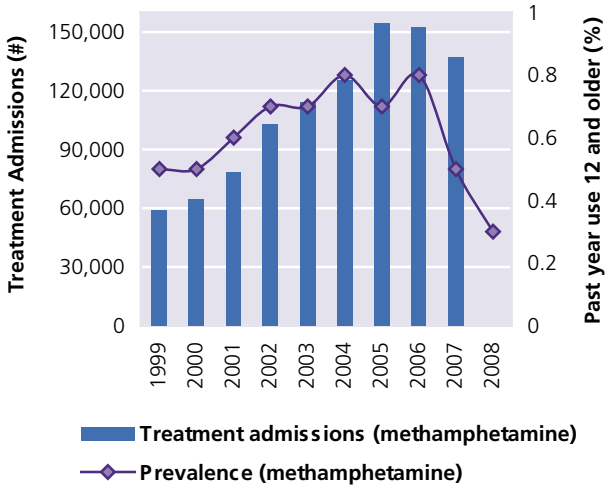


and Central European countries which had remained stable since 2003.

The expert perceptions in the developed countries show a stabilization or decline in 'ecstasy' use since 2004. This is also supported by the results of household surveys in these markets. Australia has reported relative stability, albeit at comparably high levels, in past year use by the general population since 2004 while declines have been reported for Spain, the United Kingdom (England and Wales) and the United States.

Fig. 73: United States: Past year use of methamphetamine and treatment demand, 1999-2008

Sources: Substance Abuse and Mental Health Services Administration, Office of Applied Studies, *Treatment Episode Data Set (TEDS) Highlights - 2007 National Admissions to Substance Abuse Treatment Services*, Rockville, Maryland, 2009



11 Refer to footnote 6

ATS problem drug use represents the only class of drug use in the past decade which has increased significantly in every region of the world. Although the patterns of ATS use with respect to the specific drug type and its form vary significantly across regions, unweighted treatment demand increased from between 2 (Africa) and 11 (North America) percentage points in the past decade. While improvements may have been noted in the annual prevalence rates among the general population in several developed countries, problem drug use as reflected in treatment admissions can remain high. For example, treatment demand for methamphetamine use in the United States declined only slightly in 2007 while annual prevalence rates showed a marked decline since 2006.

Amounts of amphetamine-type stimulants available for consumption

Exactly how much ATS is illicitly manufactured is for the moment impossible to directly ascertain because independent calculations based on remote sensing of manufacture cannot be done, as is the case with poppy plants and coca bushes.[12] Simple counts of clandestine laboratories dismantled annually fail to include standardized measures of manufacture type or capacity inter alia the frequency of production cycles, amount of output, purity levels, time in operation, thus limiting their overall analytical value. Additionally, it is not known how many laboratories exist for each laboratory discovered.

Nonetheless, there is value in trying to assess the orders

12 Previous UNODC models estimated manufacture based on the triangulation of consumption, seized end product, and seized precursor chemicals. However, changes in the drug market, particularly related to the precursor chemical seizures, and ability to ascertain seizure rates made this model less useful.

Table 11: Estimate of illicit amphetamine-group substances manufactured in 2008 (mt)

Source: UNODC calculation

	Amphetamines-group (retail purity)		Amphetamines-group (wholesale purity)	
	low estimate	high estimate	Low Estimate	High Estimate
Annual consumers (estimated 2008)	13,710,000	52,900,000	13,710,000	52,900,000
Average consumption (pure grams/year)	10.9	10.9	10.9	10.9
Metric tons estimated Consumed (pure)	149	577	149	577
Metric tons reported seized	47.4	47.4	47.4	47.4
Metric tons manufactured (unadjusted for purity)	197	624	197	624
Purity (weighted)	24%	24%	36%	36%
Metric tons seized (adjusted to pure)	11.4	11.4	17.2	17.2
Metric tons manufactured (pure)	161	588	167	594

of magnitude of the potential amounts of ATS available for consumption at the global level, which can also serve as a proxy or tentative result for the calculation of overall manufacture levels. Some studies have assessed actual consumption of amphetamine, methamphetamine and ecstasy, though mostly limited to a few developed countries.[13] Several studies assessed consumption as a product of the number of users in a given period, the frequency of drug use over that period and the amount used per typical episode; others indicated what the total consumption of drugs may be in a given year, while others calculated what chronic and occasional/recreational users may consume in a year.

Based on these studies, the orders of magnitude of the global amount consumed can be estimated, assuming that the values from these studies:

1. accurately represent the 'typical user',
2. can be generalized to other countries, particularly developing countries, and that
3. the epidemiology of drug patterns from the estimates is representative.[14]

Taking the studies and assumptions mentioned above into consideration, the average past year amphetamine-group substance user (that is, from the casual to problem user) may consume an estimated average of 10.9 g of pure substance[15] per year. The average past year ecstasy user may consume an estimated 5.1 g of pure MDMA (or analogue) per year, the equivalent of approximately two tablets at 50 mg per week. Multiplying these per capita use estimates by the range of past year users of amphetamine-group substances and ecstasy-group substances in 2008 provides for an order of magnitude of the amounts consumed.

Assuming that drugs seized in 2008 would have been consumed in 2008, or assuming that there was no significant change in the amounts of ATS stockpiled (if any), the amounts consumed plus (purity-adjusted)[16]

13 Office of National Drug Control Policy, *What America's Users Spend on Illicit Drugs, 1988-2000*, Washington, DC., 2001; Bramley-Harker, E., *Sizing the UK Market for Illicit Drugs* (RDS Occasional Paper. No. 74), London, Home Office, 2001.; Wilkins C., Reilly J., Rose E., Roy D., Pledger M. and Lee A., *The Socio-Economic Impact of Amphetamine Type Stimulants in New Zealand: Final Report*, Centre for Social and Health Outcomes Research and Evaluation, Massey University, Auckland, September 2004; Netherlands Scientific Research and Documentation Centre, Ministry of Justice meeting with UNODC, February 2004; Singleton, N., Murray, R. and Tinsley, L. (Eds), *Measuring Different Aspects of Problem Drug Use: Methodological Developments* (Online Report 16/06), London: Home Office.; Eisenbach-Stangl, I., Moskalewicz, J., Thom, B. (Eds), *Two Worlds of Drug Consumption in Late Modern Societies*, Farnham (UK), Ashgate, 2009.

14 Clearly drug epidemiology is ever changing—some countries have newly emerging markets for various ATS with fewer chronic drug users while others have more mature markets, where fewer new incidents may be occurring but where a larger number of problem drug users may exist.

15 There were three estimates for methamphetamine users at between 16.1 and 22.8 pure grams consumed per year (average 19.3), while nine estimates for amphetamine (includes one amphetamine and methamphetamine combined estimate) had consumer using between 1.6 and 35.8 grams of amphetamine per year (average 8.1). There were 11 estimates for typical ecstasy users. Estimates were for data between 1999 and 2008/2009 with the median estimate from users in 2005.

16 Adjustment was weighted based on reported purities of both retail and wholesale levels for a given country. When a country failed to report purities the unweighted regional average for either market was substituted. In cases where a country reports both low purity methamphetamine (for example tablets) and high purity crystalline

seizures provide for a proxy of the total ATS manufactured in 2008.[17]

Amphetamine-group substances available for consumption in 2008

The amounts of amphetamine-group substances potentially manufactured (with seizures unadjusted for purity) are estimated between 197 and 624 mt, or taking purity-adjusted seizures into account, between 161 and 594 mt. The range is larger than was reported in 2007 because the uncertainty in the annual prevalence increased as a number of older estimates (>10 years) were no longer considered to be reliable estimates for the current ATS use situation. If one assumes that the majority of seizures reported to UNODC best represents retail market level seizures at 24% purity,[18] the production range would decline slightly (161 to 588 mt), due to the removal of adulterants and diluents.[19] If reported seizures better represented the wholesale market (36% purity), the range would amount to between 167 and 594 mt. A significant amount of the difference between bulk and purity adjusted seizures are inter alia the massive amounts of seized tablets sold as Captagon in the Near and Middle East, which recent forensic analyses suggested to have an average amphetamine content between 1% and 16%.

Given the estimates from above and the amount of drugs seized, one can derive estimates of the amphetamine-group substances interdicted in orders of magnitude.[20] There were 47.4 mt of bulk amphetamine-group substances reported seized in 2008, which, adjusted for purity at the retail and wholesale levels, is between 11.4 and 17.2 mt, respectively. Assuming all of the drugs seized were interdicted from the retail market, estimates would range from 2% (11.4/588) to 7% (11.4/161). If the amounts seized were from the wholesale market, the estimated range would be between 3% and 10%. Such orders of magnitude would be also in line with a few other published rates.[21]

In contrast to the apparently low interdiction rates for ATS, the calculated interception rates for purity-adjusted cocaine have been exceeding 40% in recent years, and are around 20% for the opiates.[22] There are several reasons which lend support to the findings of far lower interception rates for the ATS as compared to cocaine and opiates. First, the source of most of the world's cocaine and opiates are restricted to just three specific regions: parts of South America (Colombia, Peru and the Plurinational States of Bolivia), Afghanistan, and the so-called 'Golden Triangle' (mainly Myanmar). Contrast that with the number of reported ATS manufacture locations which are spreading and shifting throughout the world. Second, since manufacture of ATS typically occurs close to their consumer markets they cross far fewer borders than either cocaine or opiates, and thus have significantly less chance of being detected, Next, large-scale manufacture locations—such as in East and South-East Asia—have porous borders and thousands of kilometres of unpatrolled coastline, making transfer of products into neighbouring countries a comparatively low risk activity. Lastly, ATS awareness remains low as governments in many regions continue to remain focused on the 'traditional drugs'—namely cocaine and heroin.

Ecstasy-group substances available for consumption in 2008

Ecstasy-group substances consumed were estimated between 53 and 132 mt in 2008. Adding seizures (and assuming no significant changes in the stocks) would give an estimate of between 57 and 136 mt, or adjusting for purity from 55 to 133 mt. The low end estimate is somewhat lower than in 2007 because the uncertainty in the estimated number of annual users increased. The high end estimate of ecstasy-group substances manufactured remained largely unchanged because far less was reported seized in 2008 than it 2007.

There were a total of 3.9 mt of ecstasy-group substances seized (unadjusted for purity), which, depending on the estimates, gives an interdiction rate ranging from 3% to 7%.

Adjusting the seizures for purity lowers the calculated interdiction rates to between 1% and 3%. Such unusually low rates—even lower than for the amphetamine-group substances—seems counter intuitive, as the countries known to be significant ecstasy manufactures,

methamphetamine, the purity was based on a weighted average (from seizure data). The reported seizures of 'non-specified amphetamines' were assumed to be either amphetamine or methamphetamine, and thus were given an average weighted purity of amphetamine and methamphetamine, based on total seizures.

17 This does not account for other forms of loss, such as discarding drug to avoid capture or spoilage which are assumed to be minimal.

18 Purity data are typically based on seizures which may not be representative of all drugs in the market, and given the various methods in sampling and forensic reporting (for example, as a drug base versus a salt) can impact purity estimates.

19 Unfortunately only total seizure weight by drug is reported, and not the distribution of seizure weights. Therefore, it is not possible to assign whether seizures best represented street or wholesale transaction amounts.

20 Annual drug seizures of drugs considerably greatly from year to year which impact the rates calculated.

21 Individual interception rates fluctuate considerably over time, place and drug type. New Zealand (2001) amphetamines-group interceptions were found to be between 2% and 7% of totals for consumption. Centre for Social and Health Outcomes Research and Evaluation, *The Socio-Economic Impact of Amphetamine Type Stimulants in New Zealand*, Auckland, New Zealand (2004). However, those figures changed notably in the following year.

22 *World Drug Report 2009* (United Nations publication Sales No. E.09.XI.12).

Table 12: Estimate of illicit ecstasy-group substances manufactured in 2008 (mt)

Source: UNODC calculation

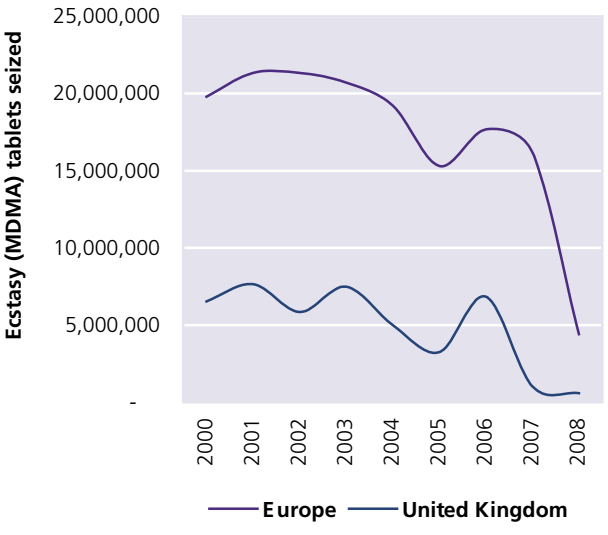
	Ecstasy-group (retail purity)		Ecstasy-group (wholesale purity)	
	low estimate	high estimate	low estimate	high estimate
Annual consumers (estimated 2008)	10,450,000	25,820,000	10,450,000	25,820,000
Average consumption (pure grams/year)	5.1	5.1	5.1	5.1
Metric tons estimated consumed (pure)	53	132	53	132
Metric tons reported seized	3.9	3.9	3.9	3.9
Metric tons manufactured (unadjusted for purity)	57	136	57	136
Purity (weighted)	36%	36%	45%	45%
Metric tons seized (adjusted to pure)	1.4	1.4	1.7	1.7
Metric tons manufactured (pure)	55	133	55	133

while spreading, remain more limited in number than for other ATS. In fact, only 10 countries reported having dismantled clandestine MDMA laboratories in 2008. Several of these countries have law enforcement personnel that are well trained in detecting this type of substance. Additionally, because of fewer locations, 'ecstasy' is likely to be trafficked across more borders when compared to other ATS like methamphetamine. Therefore, what could explain such extremely low interception rates?

The answer may lie in the fact that 'ecstasy' estimates assume the consumption of pure MDMA (or its analogues), drugs under international control. However, the 'ecstasy' market is undergoing significant transformations particularly in Europe. Since about 2007 the amount of 'ecstasy' (MDMA) tablets available in Europe and the United Kingdom—one of the largest markets—has been declining while tablets sold as 'ecstasy' increasingly contained greater proportions of substitute psychoactive substances not under international control, such as various piperazines like BZP, *m*CPP and TFMPP.[23] For example, in 2006 only 10% of tablets sold as 'ecstasy' in the EU contained *m*CPP, but by the end of 2008 it was as high as 50% in some large-market countries.[24] In other words, the model reflects what people consider to be 'ecstasy', while the actual number of MDMA users and the amount of MDMA consumed are likely to be lower than the number of 'ecstasy users' or the amounts of 'ecstasy' consumed. This leads to—statistically—very low interdiction estimates which may be misleading as they are based on a comparison of apples and oranges. Additionally, MDMA purity levels (retail or wholesale) typically represent the tablet market and not the powder market—which in Europe is roughly a third of reported seizures—and which has been associated with higher purity. Against this background, the seizure figures *unadjusted for purity*, resulting in interdiction rates ranging from 3% to 7%, are probably a far better reflection of actual interdiction successes in the ecstasy market than the figures based on purity adjusted data.

Fig. 74: Ecstasy (MDMA) tablets reported seized in Europe, 2000-2008

Source: UNODC ARQ



23 1-Benzylpiperazine, 1-(3-chlorophenyl)piperazine, and 1-(3-Trifluoromethylphenyl) piperazine.

24 EMCDDA, BZP and other piperazines. *(see http://www.emcdda.europa.eu/publications/drug-profiles/bzp)*, retrieved 8 April 2010.

Unfortunately, despite the efforts of some governments to improve the capacity to generate reliable data, the quality and timeliness of available data from which these estimates are derived are unlikely to improve in the very near future. This, coupled with the model's assumptions, suggests that the interdiction rates, derived from the tentative manufacture estimates and seizures, are not yet robust enough to be an effective indicator of annual market change, only its magnitude.

1.4.4 Key ATS issues

The significant growth seen in the ATS market over the past decade has been fueled by increased involvement by criminal organizations. Criminal groups have the ability to respond to market pressures on a corporate level. They are able to quickly retool manufacturing processes, develop new products, source new precursor chemicals and disguise their intentions by using complex supply routes for sourcing the required chemicals. Industrial-sized operations with production cycles in the hundreds and now thousands of kilograms dictate the involvement of organized crime, and have become more commonplace among developing countries with examples in Fiji, Guinea, Indonesia, Malaysia, Mexico and the Philippines, among others. Since manufacture often occurs in the consumer country or adjacent country, tracing trafficking flows of these drugs across regions—given the orders of magnitude of interception rates for various ATS—are far less meaningful than for either cocaine or heroin. Instead the dynamics of the market growth is better illustrated by developments in illicit manufacture seen by increases in laboratory size, sophistication, yield, precursor chemical types and sources, and the shifting location of operations into more vulnerable countries.

The importance of precursor control

Precursor chemicals are to ATS what opium is to heroin. These fundamental building blocks are diverted from legitimate trade into illicit manufacture. The United Nations 1988 Convention against the Illicit Traffic in Narcotic Drugs and Psychotropic Substances provides for measures to prevent diversion of key precursor chemicals for purposes of illicit drug manufacture.[25] In their bid to obtain these chemicals, criminal organizations have become increasingly innovative in circumventing these controls, and as such, many countries have also enacted progressively stronger domestic controls to stem their flow into illicit manufacture. Inter alia as precursors become more difficult and expensive to obtain, manufacturing costs to illicit operators increase which leads to a variety and combination of events, such as:

1. manufacture drops and the price and purity (that is, value) of the drug decreases,
2. the source(s) and/or supply routes of precursor chemicals change(s),
3. the precursor chemical itself (form or type) and/or manufacturing process changes,
4. the location of manufacture shifts to more vulnerable lower cost areas, and/or
5. substitute psychoactive substances may appear.

The degree to which controls are able to stem the flow of the requisite chemicals dictates the degree to which these events may occur. How long the effect lasts depends on the criminal's ability to circumvent these controls. The impact of regulatory controls on manufacturing dynamics is best illustrated with recent events in the largest ATS markets of North America, Europe and Asia.

North America: Relocation of methamphetamine manufacture to neighboring regions

Significant methamphetamine manufacture based in the United States of America relocated into neighbouring Mexico after stricter controls over precursor chemicals were enacted in the United States. The United States' methamphetamine market, the largest in North America, is predominantly supplied from Mexican-based criminal groups and to a lesser degree from domestic manufacture. The implementation in the United States over the last 20 years of progressively stricter domestic controls over bulk precursor chemicals, primarily pseudoephedrine and ephedrine, initially resulted in decreases in the purity of the methamphetamine.[26] As illicit manufacturers began to identify over-the-counter pharmaceutical preparations containing pseudoephedrine (that is, cold medicine) as a new unrestricted source of chemicals, the number of domestic laboratories, and users, increased. In 2005, national controls for pharmaceutical preparations were enacted in the United States and resulted in a sharp decline in the vast numbers of small to medium-size laboratories, although production loss was offset by increasing large-scale manufacture in neighbouring Mexico. The number, size and sophistication of laboratories in Mexico increased dramatically since then, as did the amount of methamphetamine trafficked back into the US.[27] For example, in August 2009, Mexico dismantled the largest industrial–scale laboratory involving the seizure of a manufacturing complex

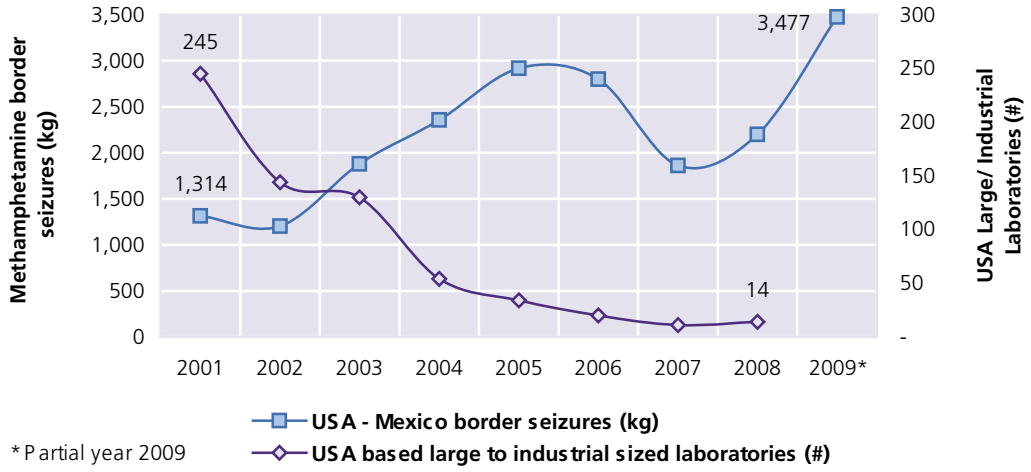
25 As of 31 October 2009, the Convention had been ratified, acceded to or approved by 183 UN Member States.

26 Cunningham, J. K., Liu L., and Callaghan, R., "Impact of US and Canadian precursor regulation on methamphetamine purity in the United States," *Addiction*, 104 (4), pp. 441–453, 2009.

27 US Department of Justice, *National Drug Threat Assessment 2010*, National Drug Intelligence Center.

Fig. 75: United States seizures of methamphetamine reported near the Mexico border versus seizures of large-scale USA-based clandestine methamphetamine laboratories, 2001-2009*

Source: *National Drug Threat Assessment 2010* (and previous years). US Department of Justice, National Drug Intelligence Center



*Partial year 2009

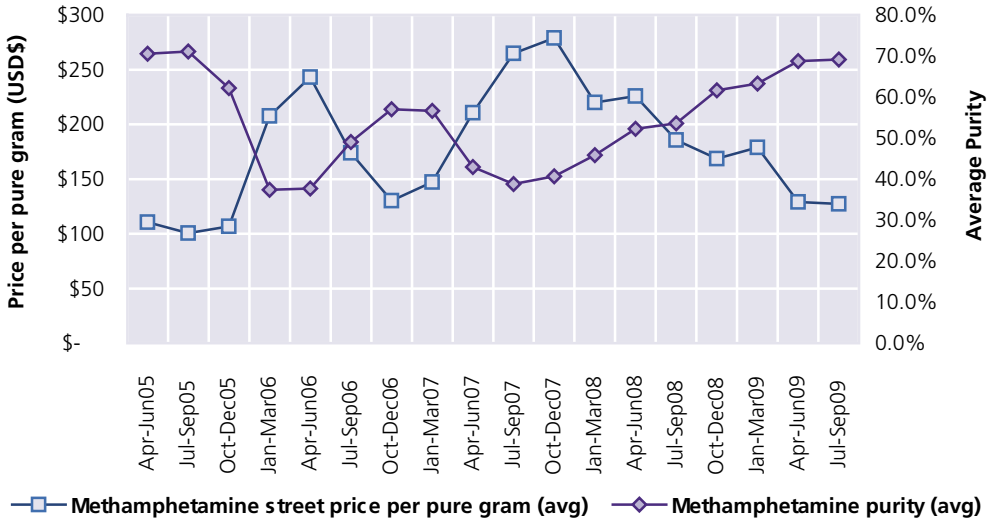
with more than 31,000 litres of chemicals in the 22 building complex spread over 240 hectares.[28]

Import restrictions on pseudoephedrine and ephedrine in Mexico to address the shift in the market dramatically cut manufacturing levels in that country in 2007. Mexico embarked on a campaign against organized crime groups involved in manufacturing of methamphetamine by inter alia reducing domestic diversions of precursors through the reduction of legitimate imports of ephedrine and pseudoephedrine, and ultimately banning the import, export of and trade in the substances by mid-2008. Manufacture dropped and seizures from Mexico into the United States subsequently declined nearly 40% in 2007/2008 from their peak in 2005/2006.

The decline in illicit manufacture of methamphetamine, first in the United States and then in Mexico, impacted the street economics; resulting in an increase in price and a decrease in purity. Methamphetamine price and purity data from the United States confirm that as domestic controls over precursors in the form of pharmaceutical preparations were strengthened, the price per

Fig. 76: Change in street price and purity of methamphetamine in the United States, 2005-2009

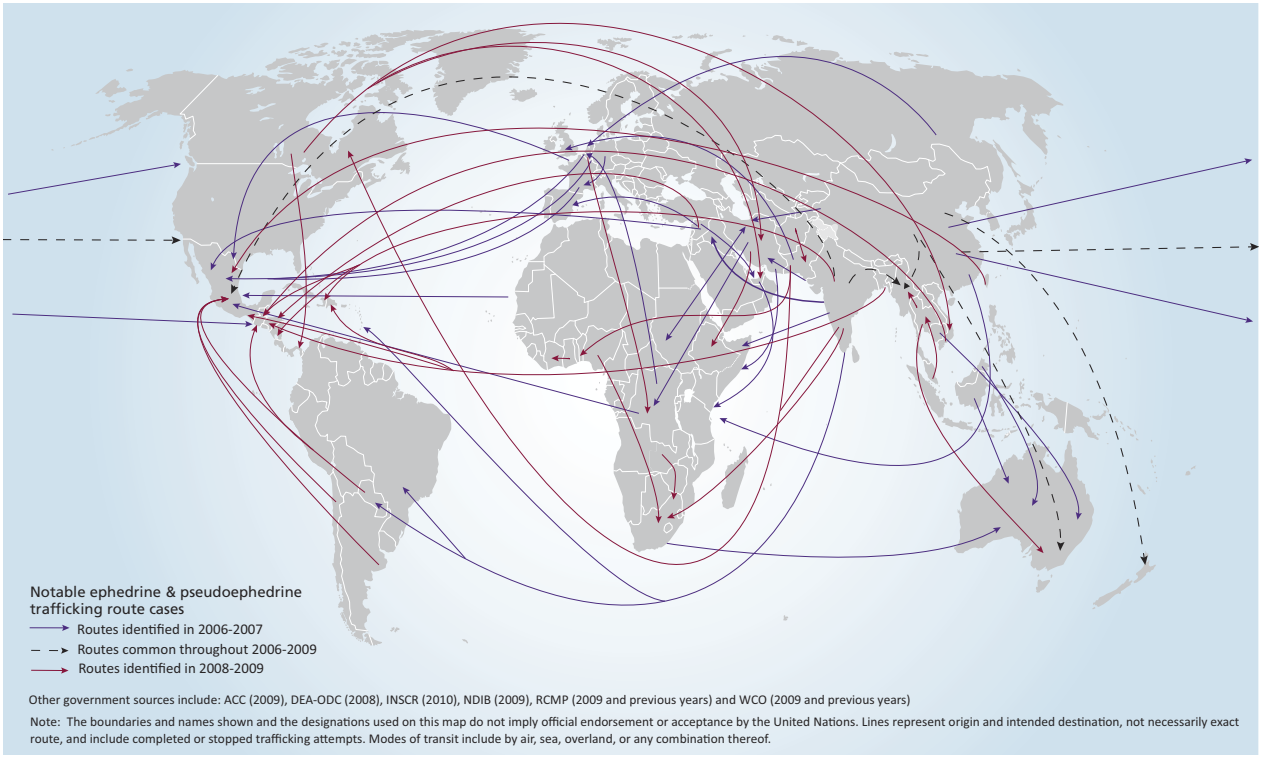
Source: *National Drug Threat Assessment 2009 and 2010*, US Department of Justice, National Drug Intelligence Center



28 La Secretaría de la Defensa Nacional informa de la localización de un complejo para el procesamiento de drogas sintéticas y mariguana, constituido con 22 instalaciones ubicadas en un terreno de 240 hectáreas, Secretaría de la Defensa Nacional (SEDENA), 7 August 2009. *Global SMART Update 2010*, vol. 3, March 2010.

Map 10: Routes from notable ephedrine/pseudoephedrine precursor diversion cases, 2006/2007 and 2008/2009

Sources: INCB, *Precursors and chemicals frequently used in the illicit manufacture of narcotic drugs and psychotropic substances* (2009 and previous years), Individual Drug Seizures Database and other government sources



Other government sources include: ACC (2009), DEA-ODC (2008), INSCR (2010), NDIB (2009), RCMP (2009 and previous years) and WCO (2009 and previous years)

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Lines represent origin and intended destination, not necessarily exact route, and include completed or stopped trafficking attempts. Modes of transit include by air, sea, overland, or any combination thereof.

pure gram nearly doubled from 2005 to 2006.[29] Cuts to legitimate imports of precursor chemicals in Mexico had a similar effect, again with the price per gram of pure methamphetamine nearly doubling in 2007, US$147 in the first quarter to US$279 in the final quarter. In both cases, the significant effect appeared to have lasted between six and nine months before manufacturers were able to retool operations and find new sources of chemicals to continue production. Since 2008, when manufacture in Mexico rebounded (and to a lesser degree the United States) the price per pure gram in the United States has been on the decline and was US$127 in the third quarter of 2009.

As both the United States and Mexico have tightened controls over the key precursors for methamphetamine both in bulk and in the form of preparations, new sources and supply routes of precursor chemicals have emerged quickly as organized crime groups exploit Latin America to maintain manufacturing operations throughout Mexico. By 2006/2007 precursor traffickers began obtaining and smuggling chemicals increasingly in the form of tableted pharmaceutical preparations from West Asia, Africa, and via Europe into Mexico. Many of these shipments were identified and subsequently stopped as a result of consistent utilization of existing precursor control mechanisms (namely online pre-export notification systems) and back-tracking investigations of suspicious shipments by law enforcement. However, new routes again emerged in 2008/2009 throughout Central and South America, and new significant sources of diversion were identified, such as Bangladesh.[30] Thus, criminals increasingly target countries with weak or non-existent precursor awareness and/or domestic control mechanisms and exploit loopholes within the existing international control mechanisms.

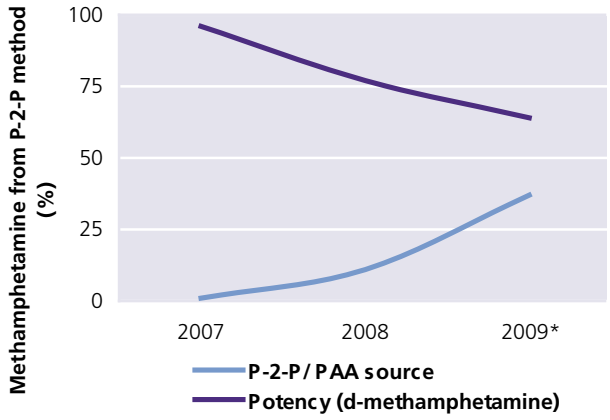
Criminals also continue to circumvent the control mechanisms by changing manufacturing processes to use chemicals with less strict or no international or domestic controls, or they manufacture controlled chemicals from non-controlled pre-precursors. During 2007, manufacturing processes in Mexico began to increasingly rely upon alternative manufacturing formulas starting from phenylacetic acid (PAA) and its derivatives to manufacture phenyl-2-propanone (P-2-P). In 2007, only 1% of seized methamphetamine was derived from the P-2-P method. However, by the end of 2009, it

29 The United States, with its Drug Enforcement Administration's (DEA) *System to Retrieve Information from Drug Evidence* (STRIDE), is the only country with a detailed administrative data system which includes information on drug transactions (undercover purchases, sales and seizures) in operation since the early 1980s.

30 INCB, *Precursors and chemicals used in the illicit manufacture of narcotic drugs and psychotropic substances*, 2009 (United Nations publication Sales No. E.10.XI.4), and previous years.

Fig. 77: Changes in methamphetamine manufacturing methods in Mexico, 2007-2009

Source: US DEA Special Testing Laboratory



*2009 P-2-P/PAA source reflects 4th quarter

had become more prominent with 37% of methamphetamine assumed to have been produced using this method.[31] During that same period there was also a decrease in the quantities of the more potent *d*-methamphetamine entering the United States as a result of greater reliance upon the P-2-P method.[32] Since October 2009, Mexico has reported seizing nearly 120 mt of phenylacetic acid (PAA) derivatives, which are not internationally controlled. These alone could produce up to 30 mt of methamphetamine, which is almost twice the global methamphetamine seizures reported in 2008.[33] PAA is under international control as a Table II substance with far fewer controls than other methamphetamine precursors. It was only in March 2010 that the Commission on Narcotic Drugs (CND) decided to transfer PAA to the same level of control as the other methamphetamine precursor chemicals P-2-P, ephedrine and pseudoephedrine.[34] While PAA derivatives continue to remain outside the international control regime, allowing for unfettered international trade, the Government of Mexico strengthened domestic controls and surveillance over the use and import of PAA salts and derivatives in November 2009.

At the same time there are now indications that significant manufacture is yet again shifting further south. In February 2010, Nicaraguan National Police reported the seizure of its first large-scale clandestine methamphetamine laboratory which police estimated had a production capacity of around 70 kg.[35] This is reportedly the third laboratory discovered in the country but unprecedented size. Manufacture-related activities have also been reported from Guatemala and Honduras and significant precursor chemical seizures are already being reported throughout the region, even though law enforcement and regulatory attention there continues to focus primarily on the cocaine trade.

There is currently little likelihood of methamphetamine substitutes appearing for methamphetamine on the US market, as has been observed with other ATS in Europe and parts of Asia. Manufacture in the United States shows its first signs of rebounding since 2005 with a 26% increase in laboratory incidents reported in 2009 over 2008. Greater amounts of high potency domestically produced methamphetamine will likely complement the somewhat less potent methamphetamine flowing from Mexico. Additionally, there may be increased flow of derivatives of PAA trafficked via Central American countries for use in retooled production operations in Mexico, as manufacturers attempt to circumvent new restrictions enacted by the Government.

Europe: The changing nature of MDMA manufacture

Organized crime groups in Europe, particularly in the Netherlands and Belgium, have long been considered a major global source of ecstasy (MDMA or its analogues).[36] Although ecstasy from Europe is still dominant on the global market, fewer countries identify Europe as the source for ecstasy seen in their markets. While more than 80% of all ARQ reporting countries have identified Europe as the source of their seized ecstasy in 2002, this share has been declining since 2004 to 73% in 2009, as a greater proportion of countries outside of Europe began reporting that the sources of their ecstasy were places other than Europe. This coincided with disruptions to precursor chemical supplies in Europe and emergence of MDMA manufacture in other locations closer to non-European consumer markets. At the same time, European countries continue to report that their seized ecstasy is sourced from within Europe.

There have been no seizures of 3,4-MDP-2-P (PMK), the most common MDMA precursor chemical used in Europe, since 2007, but there are indications that manufacturers are retooling operations to make use of alterna-

31 Extraction of Methamphetamine Precursor Material from Medicinal Preparations and Methamphetamine Profiling Results, presented by the DEA Special Testing and Research Laboratory at the forty-fifth regular session of the Inter-American Drug Abuse Control Commission (May 2009); US Department of Justice Drug Enforcement Administration, Special Testing and Research Laboratory (Jan 2010)

32 Pseudoephedrine and ephedrine result in the more potent central nervous stimulant d-methamphetamine while P-2-P methods result in the less potent racemic d,l-methamphetamine, unless separated in an additional synthesis step.

33 Secretaría de Seguridad Pública (SSP) México, Boletín de Prensa/189 México, D.F., 8 de abril de 2010. *Global SMART Update 2010,* vol. 3, March 2010.

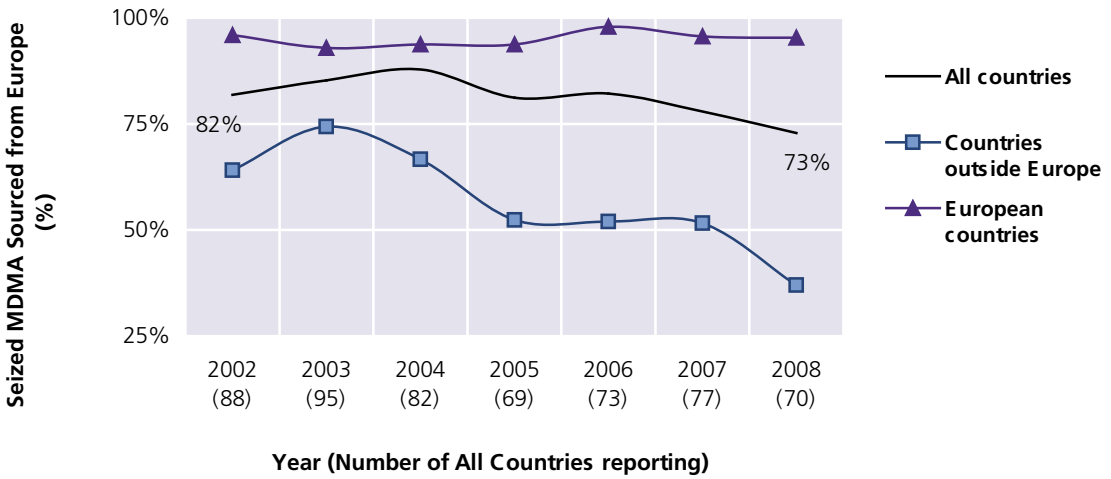
34 Member States have now six months to implement the increased control measures.

35 Policía Nacional de Nicaragua, *Policía detecta laboratorio de Anfetaminas*, 23 February 2010.

36 *Europol Organized Crime Threat Assessment*, 2009, European Police Office, The Hague.

Fig. 78: Europe as the source of seized ecstasy-group substances as mentioned by Member States, 2002-2008

Source: UNODC ARQ/DELTA.

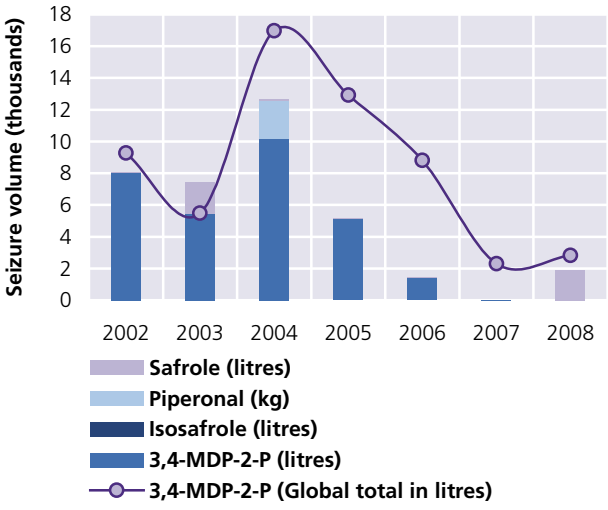


tive chemicals. Europe used to account for the majority of reported global 3,4-MDP-2-P seizures. However since 2004, there has been a decline in the amount of reported seizures of 3,4-MDP-2-P with the last reports in Europe occurring in 2007.[37] The likely reasons for the significant shortages may include: an increased demand for this precursor chemical in MDMA manufacture in other parts of the world, increased law enforcement strategies to curtail manufacture, including controlling the availability of key specialized equipment such as pill presses, and significant regulatory efforts to prevent illegitimate imports or diversions of precursor chemicals via more consistent utilization of pre-export notifications. In addition, China, traditionally the source of 3,4-MDP-2-P, entered into a new agreement with the European Union in 2009 to improve precursor controls and coordination. The country also announced tighter controls on the manufacture of 3,4-MDP-2-P. Taken together, this suggests that the trend towards retooling ecstasy manufacture in Europe will continue.[38]

In fact, criminals are already turning to alternative sources to manufacture MDMA to meet the demand in Europe. In 2008, 1,900 litres of safrole-rich oils (SRO) were reported seized in Europe, the first such seizure of any magnitude since 2003. Safrole-rich oils are typically sourced from South-East Asia. In 2006, there were an estimated 1,360-1,620 mt of SRO produced in East and South-East Asia, much of it for legitimate industry.[39] In February 2009, the Government of Cambodia disposed of almost 15 mt of safrole-rich oils with an additional 5.2 mt seized in June 2009, while 45 mt of safrole was reported seized by Thailand in 2007. Given the significant volume of safrole-rich oils available, there is a high likelihood that illicit manufacturers will turn to using SRO. It is important to note that SRO-based operations are already being reported by countries in Europe and around the world.[40]

Fig. 79: Seizures (in mt) of ecstasy-group precursor chemicals in Europe, 2002-2008

Source: INCB



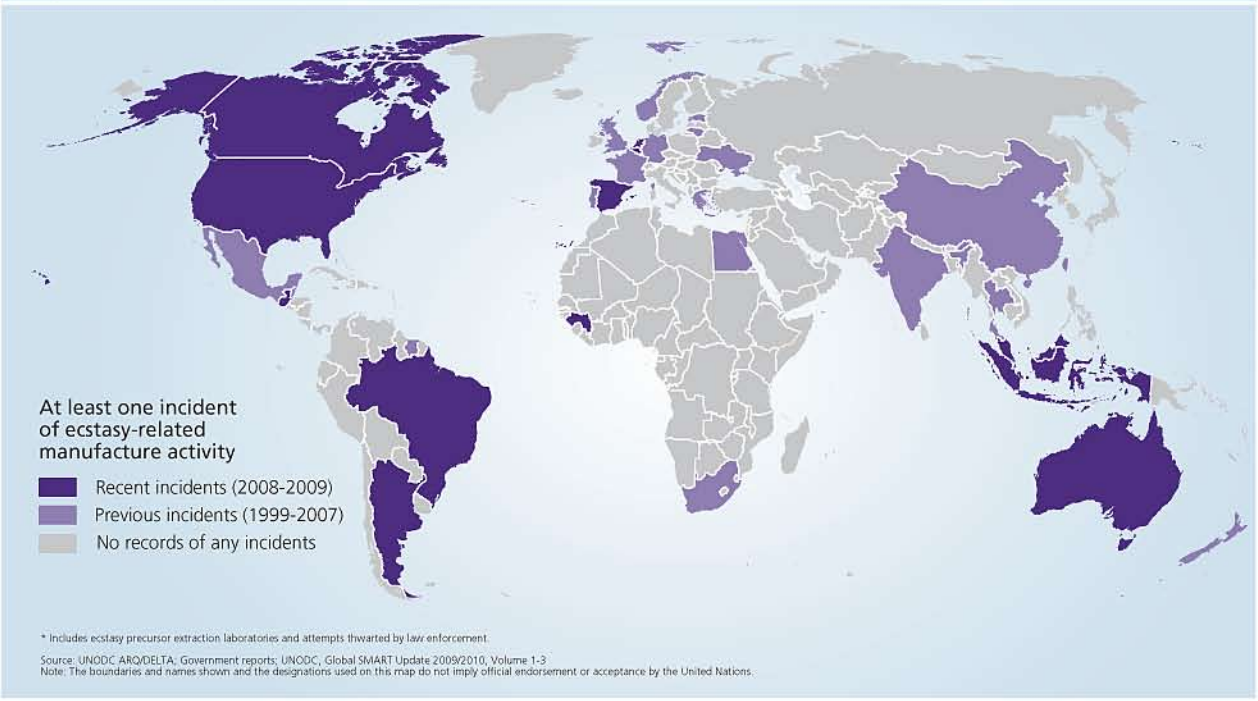
37 The activities of INCB's Project Prism and the PEN on-line system have focused on preventing the smuggling of both 3,4-MDP-2-P and P-2-P into the EU for use in the illicit manufacture of MDMA and amphetamine respectively. However, seizures have been noted in other countries, such as Canada.

38 China also announced tighter controls on the manufacture of ephedrine, P-2-P, and hydroxylamine hydrochloride (the precursor of ketamine).

39 UNODC, *Essential Oils Rich in Safrole, Survey of Production, Trade, and Use in East and South-East Asia*, 2006.

40 SYNDEC4, *Operation Counter Curse presentation by the DEA*, November 2009; *Two arrested and police uncover first ever clan lab used in manufacture of safrole oil precursor for MDMA*, New South Wales Police Media Release 28 January 2010.

Map 11: Ecstasy-related manufacture since 1999 and in 2008-2009



Until just a few years ago, MDMA manufacture on of large scale was uncommon outside of Europe. However, since 2003-2004, MDMA manufacturing operations have increasingly been encountered closer to the consumer markets in North America, South-East Asia and Oceania. There are now indications that manufacture is expanding into new regions such as Latin America with illicit manufacture having been reported in Argentina, Belize, Brazil, Guatemala, Mexico and Suriname. With its first small-scale laboratory seized in 2008, Brazilian authorities dismantled another larger and more sophisticated operation in 2009, which included the seizure of 30,000 tablets.[41] The first ever evidence of potential MDMA manufacture in West Africa was reported in 2009. Over 5,000 litres of SRO and 80 litres of 3,4-MDP-2-P, precursors for synthesizing MDMA, were found at multiple locations in Guinea in July 2009. These were enough to produce more than 18 million tablets (at 65 mg) of MDMA. While manufacture in Brazil appears limited, supplying the domestic market in the south of the country, there is little information to support local demand for ecstasy in West Africa, leaving Europe as the nearest significant export market.

Illicit manufacturers have been forced to substitute various other synthetic drugs, notably piperazines,[42] in tablets sold as 'ecstasy' to meet market demand in Europe. Almost half of the tablets seized or sold as 'ecstasy' in some EU Member States contained the piperazine *m*CPP alone or in combination with other psychoactive substances in the first half of 2009.[43] The increasing presence of piperazines in tablets sold as 'ecstasy' can be seen in both samples seized by law enforcement and also in those voluntarily surrendered by users beginning around 2006 but most notably in 2009. For example, the United Kingdom, whose tablet seizures account for roughly a quarter of the European market, showed marked declines in MDMA tablets seized and analysed by law enforcement. At the same time, the United Kingdom saw increases in tablets containing piperazines. Analysis of tablets sold as 'ecstasy' surrendered voluntarily by users in the Netherlands found similar trends with less MDMA and increasing proportions of other psychoactive substances. These, again, were due in large part to increases in various piperazines, a trend which continued into 2009.[44] In combination, piperazines can mimic the effects of MDMA.[45] However, users report that they are a poor substitute for high quality MDMA, with often unpleasant after-effects.

41 *Polícia Militar desativa laboratório do tráfico de drogas em Imaruí*, Polícia Militar de Santa Catarina, 4 August, 2008; *Global SMART Update 2009*, vol. 2, October 2009.

42 1-Benzylpiperazine (BZP), 1-(3-chlorophenyl)piperazine (*m*CPP), and 1-(3-Trifluoromethylphenyl) piperazine (TFMPP).

43 EMCDDA, BZP and other piperazines, (see http://www.emcdda.europa.eu/publications/drug-profiles/bzp), retrieved 8 April 2010.

44 SYNDEC4, presentation by EUROPOL, The Eye of the Storm. November 2009.

45 Thompson, I., Williams G., Aldington, S., Williams, M., Caldwell, B., Dickson, S., Lucas, N., MacDowall, J., Weatherall, M., Frew A., Robinson, G. and Beasley, R., *The benzylpiperazine (BZP) / triflouromethylphenylpiperazine (TFMPP) and alcohol safety study*, Medical Research Institute of New Zealand, 2006.

Fig. 80: The composition of 'ecstasy' tablets seized in the United Kingdom, 2006-2009

Source: United Kingdom Forensic Science Services

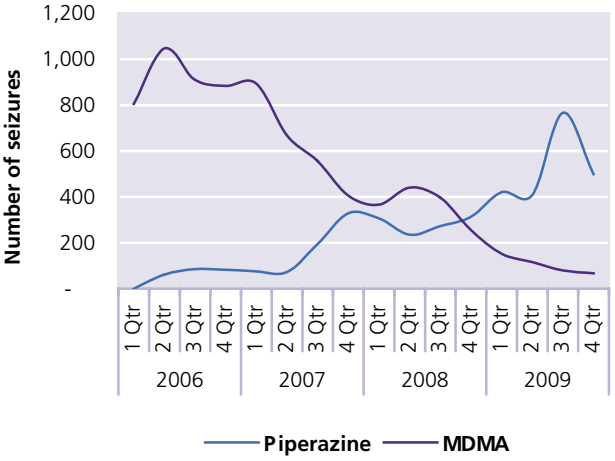
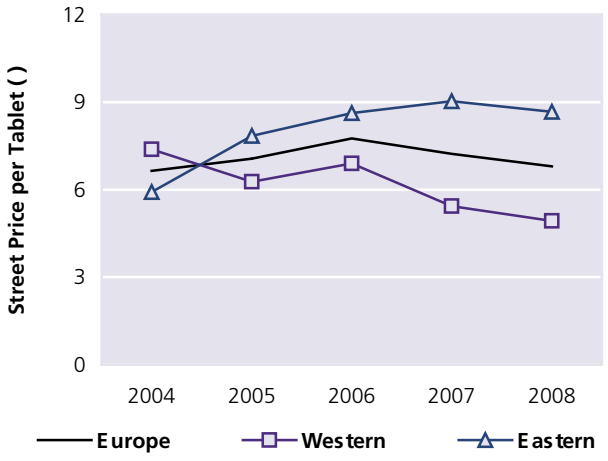


Fig. 82: Street price of European 'ecstasy' tablets, 2004-2008

*Weighted for population, currency and inflation-adjusted.
Source: UNODC ARQ



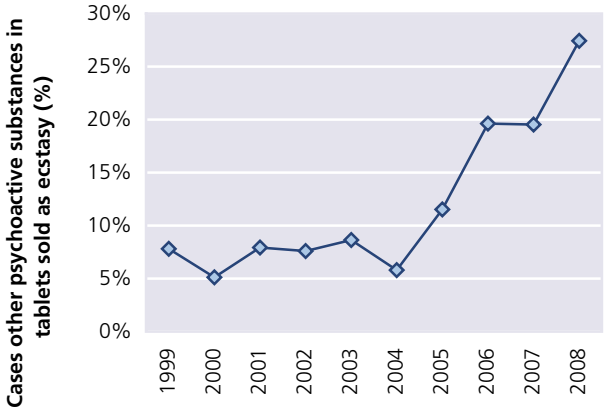
The average street price for a tablet sold as 'ecstasy' in Europe does not appear to have increased, particularly in the larger West European markets,[46] as the piperazine-containing tablets command a similar street price in Europe as MDMA, roughly €4 per tablet. However, after controlling for varying purity, the price per pure gram of a tablet of MDMA may likely increase in 2009, even though the price per tablet may not.

Illicit manufactures exploit the lack of national and international controls over piperazines and other new synthetic substances to continue 'ecstasy' sales. Piperazines are not under international control,[47] and with the exception of BZP, most countries have limited or no national controls. In addition to piperazines, many new synthetic substances are also being sold as or in the 'ecstasy' market.[48]

One of those, methyl-methcathinone (mephedrone), has been related to major headlines in European news, because of its association with fatalities. Given their legal status, their street sale at a similar price as MDMA would command significantly higher profit margins, provide little chance of criminal sanctions, and likely expand the 'ecstasy' user market.[49] It is also important to note that the toxicity in humans of the majority of these new substitutes has never been assessed.

Fig. 81: Tablets sold as 'ecstasy' containing non-controlled psychoactive substances in the Netherlands, 1999-2008

Source: Vogels N., Brunt T.M., Rigter S., van Dijk P., Vervaeke H. and Niesink R.J., "Content of ecstasy in the Netherlands: 1993-2008," *Addiction* 104(12): 2057-66, 2009



Until European demand for MDMA can be met by MDMA imported from other manufacturing locations, alternative MDMA precursor chemicals such as safrole can be adequately sourced, or the traditional MDMA precursor (3,4-MDP-2-P) can be obtained from alternative sources, the trend in end-product substitution can be expected to continue into the foreseeable future.

46 Estimated street price based on Member State responses for ecstasy (MDMA) tablets, weighted by population and adjusted for currency fluctuation and inflation. In cases where a price range was given, the mid-point was substituted.

47 Note though, that several piperazines have been proposed for critical review by WHO, the first step towards international controls.

48 The appearance of synthetic cannabinoid-like substances is not subject of this report as they are more related to the cannabis market. However, the same considerations for legal status, profits and risks to users apply.

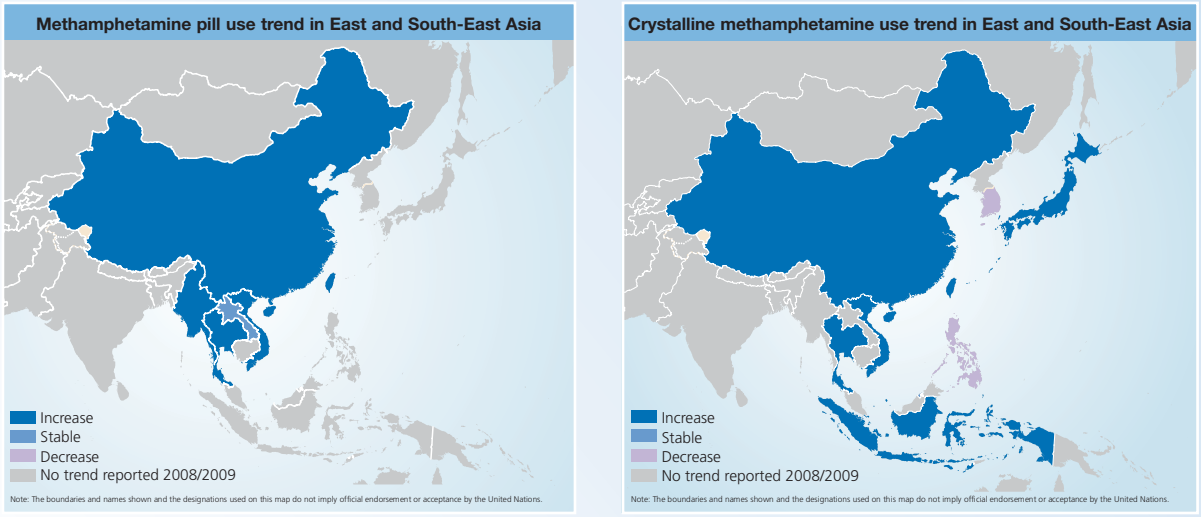
49 In 2006, legal piperazine party pills in New Zealand emerged as the fourth most widely tried drug type with twice as many people (aged 13-45) having tried legal party pills as the next most commonly tried drug, amphetamine. Wilkins C., et al., *Trends in drug use in the population in New Zealand: Findings from national household drug surveying in 1998, 2001, 2003 and 2006*, Centre for Social and Health Outcomes Research and Evaluation, Auckland, 2007.

More methamphetamine in East and South-East Asia

Indicators suggest increased availability and use of methamphetamine throughout East and South-East Asia. All countries in East and South-East Asia already report the use of methamphetamine with many reporting it as their primary drug of use, either in tablet form (yaba) or high purity crystalline form, with increasing use levels in 2008.[1] Increases in arrests and seizures also point to a significant growth in the availability of methamphetamine tablets on the market. Since 2004, methamphetamine arrests in Thailand— one of the largest consumer markets of tableted methamphetamine—have increased four-fold to 120,000 arrests in 2008, or 86% of the regional total. The number of tablets seized in Thailand also increased, jumping by more than 50% between 2007 and 2008 to 22 million tablets. Preliminary data suggest that further increases in the region are expected again for 2009.[2]

Fig. 83: Expert perception in the change in use of methamphetamine tablet or crystalline forms from 2007 to 2008

Source: UNODC, *Patterns and trends of amphetamine-type stimulants and other drugs in East and South-East Asia (and neighbouring regions) 2009*, November 2009



1 UNODC, *Patterns and trends of amphetamine-type stimulants and other drugs in East and South-East Asia (and neighbouring regions) 2009*, November 2009.

2 Ibid.

Asia: Vulnerable to illicit ATS manufacture

To limit the availability of precursor chemicals for illicit manufacture of synthetic drugs, there must be an international regulatory control system for the substance, it must be operationally used and enforced, and it should be coupled with domestic controls and fit-for-purpose cooperation mechanisms with relevant industries. There are several examples across Asia where the lack of controls have made countries vulnerable to attempts by criminals to obtain precursor chemicals for and/or establish illicit ATS manufacturing operations. The examples below illustrate the continuous flow of methamphetamine tablets from areas in Myanmar outside the central Government's control; the dramatically increasing use and availability of ketamine in parts of South-East Asia linked to the absence of international restrictions on the substance; and the unusually high annual legitimate requirements of key precursors in the Near and Middle East and South-West Asia, which may indicate potential for diversion of chemicals for illicit manufacture of methamphetamine and amphetamine (specifically in the form of Captagon)[50].

Myanmar: continuous flow of methamphetamine tablets from areas outside the central Government's control

Myanmar ranks fourth of the countries in East and South-East Asia that are most frequently cited as a source of methamphetamine (both crystalline methampheta-

50 Captagon was originally the trade name for a pharmaceutical preparation containing fenetylline, a synthetic stimulant. Today, most tablets seized as Captagon essentially contain amphetamine, typically in combination with caffeine and sometimes with a few other adulterants.

Fig. 84: Sources of seized methamphetamine (both crystalline and in tablet form) as mentioned by East and South-East Asian countries/territories, 2002-2008

Source: UNODC ARQ

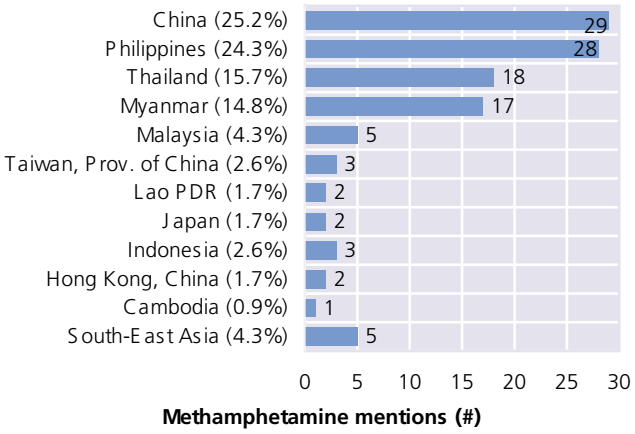
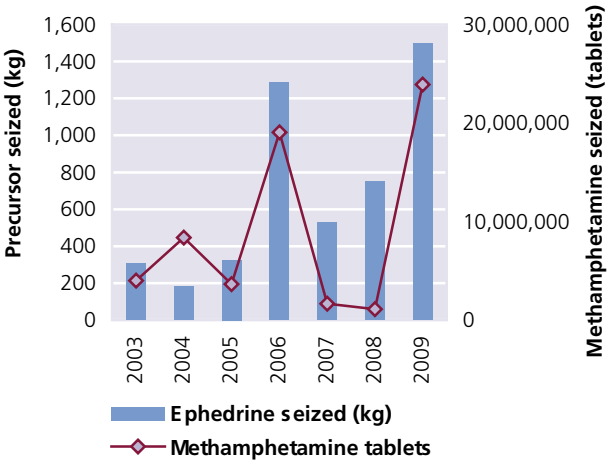


Fig. 85: Methamphetamine tablets and precursor seizures in Myanmar, 2003-2009

Source: INCB 2003-2009; Central Committee for Drug Abuse Control 2009



mine and methamphetamine tablets).[51] Of the countries traditionally associated with illicit methamphetamine tablets, Myanmar shares the top rank with Thailand.[52] Forensic data indicate that methamphetamine tablets come primarily from Myanmar's Shan State's various Special Regions near the eastern border with China and Thailand, which are under the control of armed ethnic groups operating outside the control of the central Government.[53] Because laboratories in these areas operate without fear of government forces, few significant seizures of precursor chemicals, ATS end-products or clandestine laboratories occur. For instance, between 1998 and 2009, the government reported seizing 39 'tableting' operations of which only two were reported to be of a 'large-scale'.[54] There are no reports of laboratories manufacturing methamphetamine powder (versus tableting laboratories). Similarly, of the 32 million tablets seized in East and South-East Asia in 2008, only about 3% (or 1.1 million) were reportedly seized in Myanmar. However the number of tablets and amount of precursor chemicals seized in Myanmar jumped in 2009, when, inter alia, the central Government entered by force parts of the North and Eastern Shan State not under their control.

Increasing amounts of precursors were seized in the form of tableted pharmaceutical preparations in 2009 which suggests that sourcing bulk precursor chemicals may have also become more difficult in Myanmar. Reports in 2009 identified the trafficking of preparations of ephedrine in liquid form with a seizure of 240 litres of ephedrine solution contained in more than 120,000 small nasal drop bottles, enough for about 5.5 million 30 mg methamphetamine tablets. The shift from bulk ephedrine to tableted and now liquid forms of pharmaceutical preparations containing ephedrine may be an indicator of a diversification of precursor supplies, a scenario which has also been reported in other countries with large-scale illicit drug manufacture.[55]

Ketamine in South-East Asia

Ketamine, while not under international control, is often found along with methamphetamine in tablets sold as 'ecstasy' and its use is an increasing concern in East and South-East Asia. There are also indications that it is starting to spread outside South-East Asia, reflected in the declining proportion of ketamine seizures in that region to 86% of global totals (8.2 mt or more than double global 'ecstasy' seizures) in 2008.

The growing use of ketamine is of particular concern in Hong Kong, China, as the demand for high quality MDMA ('ecstasy') appears to be decreasing. While the number of registered drug users for ecstasy-group substances has seen a 40% decline since 2004, the number of ketamine users has doubled.

Part of ketamine's growth in popularity has been its

51 Information based on 115 mentions of the source of seized methamphetamine (both crystalline and in tablet form). Mentions of Japan as a source country reflects the difficulty in identifying source countries and transiting countries. Japan has reported no clandestine manufacture to UNODC.

52 Note that Myanmar reports seizures of methamphetamine in the form of tablets, powder and in crystalline form.

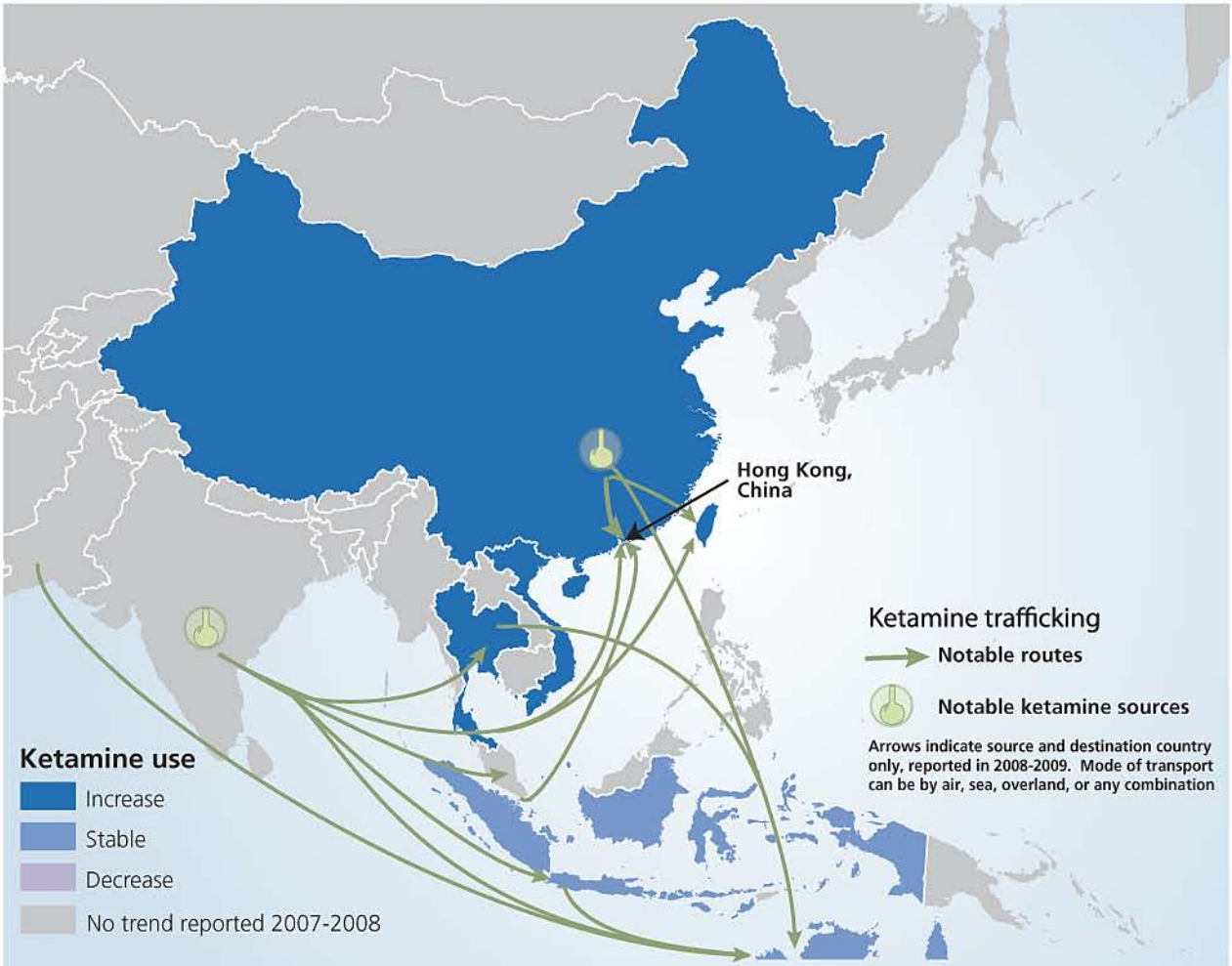
53 Primarily the north and east Shan State however illicit manufacture of methamphetamine is also reported to occur in the Wa and Kokang autonomous regions.

54 Myanmar, Central Committee for Drug Abuse Control.

55 In June 2009, authorities in Mexico seized 49,630 litres of a pharmaceutical solution containing pseudoephedrine. International Narcotics Control Board, *Precursors and chemicals frequently used in the illicit manufacture of narcotic drugs and psychotropic substances, 2009*, New York, 2010.

Map 12: Expert perception in the change in ketamine use and sources, 2007-2008

Sources: UNODC (2009), Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs in East and South-East Asia (and neighbouring regions); DAINAP; Individual Drug Seizure Database and other government sources



Other government sources include: ACC (2009), IDRI (2009), ONNCC (2010), & WCO (2009)

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Fig. 86: Global ketamine seizures and the proportion reported from South-East Asia, 2003-2008

Source: UNODC ARQ

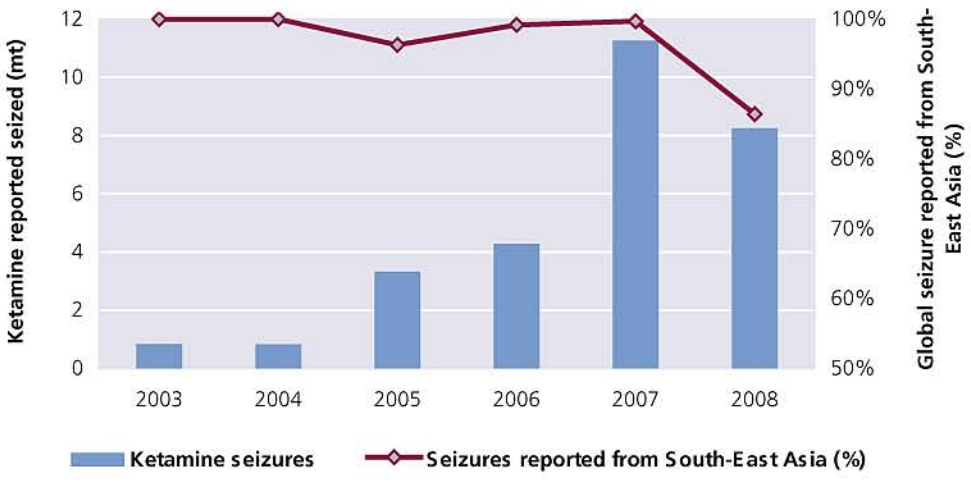


Fig. 87: Hong Kong, China: ketamine, methamphetamine and ecstasy-group drug registry cases, 1999-2008

Source: Central Registry of Drug Abuse, Narcotics Division (ND), Security Bureau, Hong Kong Special Administrative Region, China.

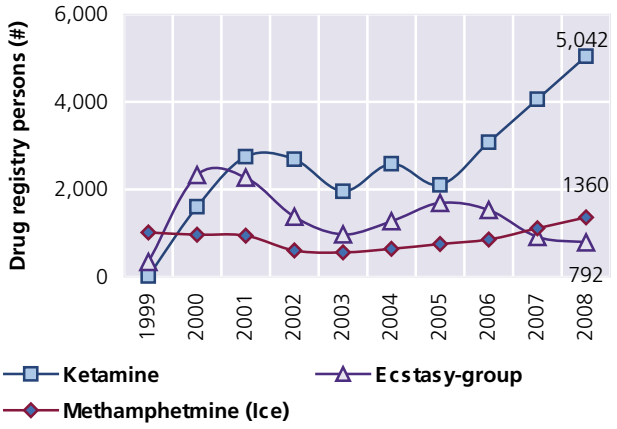
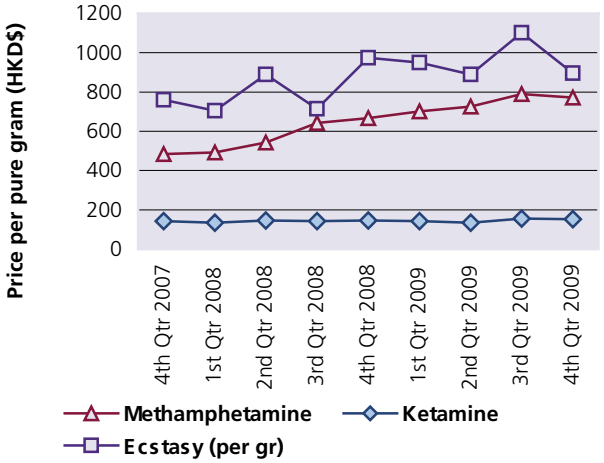


Fig. 88: Purity-adjusted quarterly street prices for various drugs sold in the ATS market in Hong Kong, China, 2007-2009

Source: Hong Kong Police Narcotic Bureau



continuously low price. For example, between 2007 and 2009, the average price per pure gram in Hong Kong, China was just HK$144, making it a cheap substitute for the increasingly expensive 'ecstasy' or methamphetamine.

Diversion from licit trade remains the primary source of ketamine with significant seizures being reported in various countries over the last couple of years. In December 2009, customs authorities in India seized a record 440 kg of ketamine en route to Malaysia.[56] However, industrial-scale illicit ketamine manufacture is also emerging. In 2009, China reported seizing two illicit laboratories processing hydroxylamine hydrochloride, the immediate precursor chemical for ketamine, and seizing 8.5 mt of this substance. In 2009, China announced tighter controls over the manufacture of hydroxylamine hydrochloride and other precursor chemicals.

Possible emerging locations for large-scale manufacture in parts of Asia

One of the most disturbing new ATS trends is the increase of methamphetamine in South-West Asia, a region already suffering from large-scale opium production and use. This specifically refers to the sudden and massive increase of reported seizures of high purity crystalline methamphetamine ('Shisheh") from the Islamic Republic of Iran which began in 2008. In 2008, the country also seized four clandestine methamphetamine laboratories—their first reports ever—and has since reported quickly decreasing street prices and an increase in methamphetamine use.[57] That manufacture outpaces domestic consumption is also reflected in the notable increase in 2009 in the frequency and extent of reported methamphetamine trafficking from Islamic Republic of Iran, with much of this destined for lucrative markets in East and South-East Asia.[58]

The starting material used in the illicit manufacture of methamphetamine in the Islamic Republic of Iran is most likely domestically diverted pseudoephedrine. Since 2006, the first year such reporting was required by the INCB[59], the Islamic Republic of Iran has reported notable increases in its annual legitimate requirement of the chemical. In just four years, the demand grew to give the Islamic Republic of Iran the fourth highest legitimate requirement in the world. Not only does this increase the likelihood of domestic diversion, but it also makes the country an attractive target for precursor diversion by transnational organized crime groups. That this may be more than a realistic concern is evidenced by recent reports of two stopped shipments of pseudoephedrine totaling 11 mt, both destined for Ethiopia.

An example of how rapidly increasing annual legitimate

56 DRI Chennai effects single largest ever seizure of 440 kgs. of ketamine worth RS. 44 crores at Tuticorin, Government of India, Ministry of Finance (Department of Revenue) Directorate of Revenue Intelligence, 25 December 2009.

57 DCHQ Deputy SG, *Prices of the synthetic drugs have dropped to one fourth*, 6 October 2009, Islamic Republic of Iran National Drug Headquarters; UNODC World Drug Report 2009

58 *737 kg of various drugs were found in airports this year*, Official Islamic Republic News Agency; *Global SMART Update 2009*, vol. 2, October 2009.

59 Countries provide INCB with annual estimates of their legitimate requirements for various ATS precursor chemicals to prevent their diversion into illicit manufacturing. In 2009, 91 countries reported their annual legitimate requirements for pseudoephedrine (bulk and preparations), 98 for ephedrine (bulk and preparations), and 15 for P-2-P. INCB, *Annual legitimate requirements reported by Governments for ephedrine, pseudoephedrine, 3,4-methylenedioxyphenyl-2-propanone, 1-phenyl-2-propanone and their preparations*, 2 March 2010 and past publications.

Fig. 89: Islamic Republic of Iran annual legitimate requirement of pseudoephedrine versus crystalline methamphetamine seizures, 2005-2009

Sources: ARQ/DELTA, INCB, Annual legitimate requirements reported by Governments for ephedrine, pseudoephedrine, 3,4-methylenedioxyphenyl-2-propanone, 1-phenyl-2-propanone and their preparations

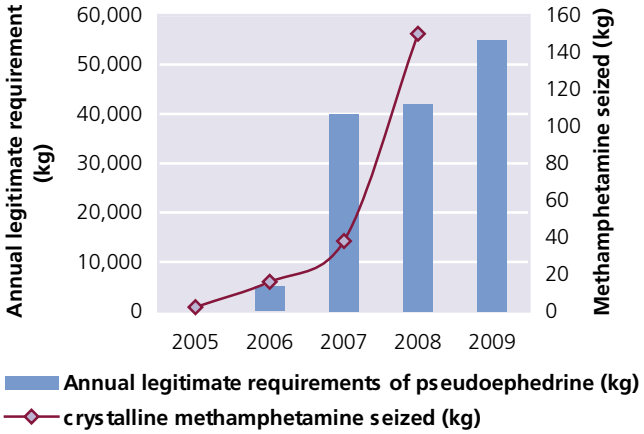


Fig. 90: Bangladesh annual legitimate requirement of pseudoephedrine, 2006-2009

Sources: INCB, Annual legitimate requirements reported by Governments for ephedrine, pseudoephedrine, 3,4-methylenedioxyphenyl-2-propanone, 1-phenyl-2-propanone and their preparations

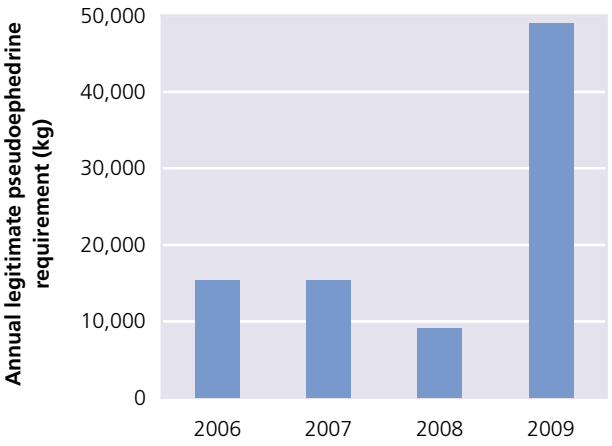
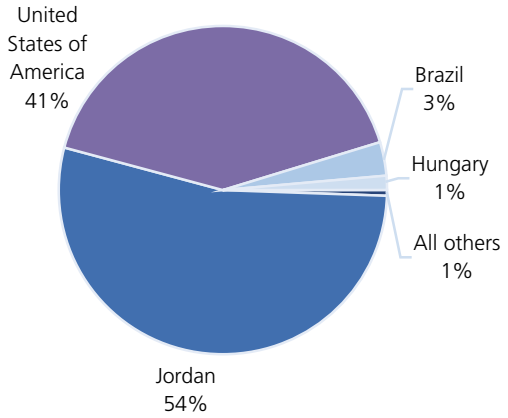


Fig. 91: Global annual legitimate requirement for P-2-P reported by Governments, 2009

Source: INCB, Annual legitimate requirements reported by Governments for ephedrine, pseudoephedrine, 3,4-methylenedioxyphenyl-2-propanone, 1-phenyl-2-propanone and their preparations



requirements can be an indicator for diversion into illicit manufacture can be seen in South-Asia. Since 2006, Bangladesh's annual legitimate requirement for pseudoephedrine has tripled, now making it the 6th highest in the world. In 2009, Bangladesh was first identified as a source country for tableted pharmaceutical preparations containing pseudoephedrine diverted into illicit drug manufacture with multi-million tablet shipments being seized in Central America, destined for Mexico. Bangladesh may also become a target for diversion of pseudoephedrine into neighboring Myanmar's illicit methamphetamine manufacture if pressure upon Myanmar's precursor supply continues.

A similar situation may also be occurring in the Near and Middle East, where the diversion of phenyl-2-propanone (P-2-P) may be fueling the region's expanding *Captagon* market. Jordan reported its annual legitimate requirement of P-2-P at 60,500 kg in 2009, accounting for more than half of the global total. The high legitimate need is based on the purported formulation of P-2-P into 'cleaning and disinfection' products. However the volume represents a significant risk of diversion into illicit *Captagon* manufacture, particularly as P-2-P is not an essential ingredient in the formulation of cleaning and disinfection products and alternative chemicals exist.

The most common way of obtaining requisite precursor chemicals and some of the common psychoactive substances substituting for controlled synthetic drugs, such as ketamine, is by their diversion from legitimate trade. The few examples highlighted herein illustrate that to be effective in preventing such diversions, governments must not only have functioning regulatory controls in place, addressing both international and domestic trade, but that they must be vigilantly re-assessed for purpose.

1.4.5 Implications for response

The increasing size and complexity of illicit ATS operations encountered over the past 10 years point to increased involvement of criminal organizations, from the sourcing of precursor chemicals to the manufacture and trafficking of the ATS end-products. Yet, the intrinsic characteristics of ATS manufacture and trafficking, namely the independence from geographically defined source regions for raw materials and the geographic

closeness of manufacturing locations and consumer markets, limit the range and effectiveness of supply-side interventions when compared to heroin and cocaine.

The discussion above indicates that control of ATS precursors can be successful. In addition, evidence-based prevention and treatment have shown some cost-effective results.[60] Both measures work best when implemented in a holistic, comprehensive manner and when accompanied by the early identification of emerging developments.

The generation of a timely evidence-base is the only way in which to quickly identify the rapidly changing ATS market and respond with appropriate policies and programmes. The expansion of targeted capacity building programmes, such as *Global SMART,* which support both forensic and synthetic drug data collection, have been shown invaluable in countries and regions with significant ATS markets. To avoid shifts from one country to another, or one region to the next, there is a growing need for a strategic early warning system to identify emerging synthetic drugs, new products and combinations, controlled and non-controlled, substitute precursor chemicals, diversions (including stopped, suspended and cancelled shipments), common adulterants and key equipment used in their manufacture. This information must be shared quickly at national, regional and international levels so as to allow timely or even preemptive responses.

Given the widespread availability of certain ATS, the rapid emergence of new synthetic drugs and non-controlled substitutes, and their use in school, work and recreational settings, a holistic approach is required which looks beyond internationally controlled ATS into the recreational 'pill market' more generally and integrates responses into the wider concept of health promotion. Investments in prevention programmes that increase the awareness as to the health risk of these drugs appear to have played a role in the decline in use, particularly among youth in developed countries. This has specifically proven successful where prevention and treatment services have met the needs of and been accepted by ATS users. The expansion of evidence-based treatment programmes in developed countries has also reduced the likelihood that problem ATS users return to patterns of chronic drug use. However, evidence-based ATS treatment programmes are often the exception, not the rule, especially in countries where emerging problem ATS use is occurring and health care and treatment professionals are simply not trained or do not have the resources to identify and respond to the unique characteristics manifested in ATS users.

Precursor control works. It is clear that when existing regulatory controls are implemented and all counterparts exert the necessary vigilance to identify unusual transactions, suspicious legitimate needs and fictitious end-uses of precursor chemicals, significant reductions in the availability of precursors for illicit purposes can be made. Understanding legitimate industrial requirements and monitoring the entire chain from precursor manufacture, distribution to end-use, both domestically and internationally, are the only means to identify unusual or suspicious transactions. This also includes scrutinizing annual assessments of legitimate requirements—particularly if these increase significantly year-over-year, and may initially be considered to reflect a newly developing legitimate industry. Systematically checking the legitimacy of individual precursor chemical shipments should become the norm for all countries trading in these substances. The tool for this is available in form of the INCB *Pre-Export Notification* (PEN) online system, which has already proven successful in international precursor operations by stopping suspicious shipments before they leave the country. However, currently only 76 countries (40% of UN Member States) regularly use this real-time system.

Regulatory controls must be complemented by law enforcement action. Seizures should be the beginning of an investigation, not the end. Available specialized investigative techniques include controlled deliveries and back-tracking investigations, which could be utilized more systematically for the ATS end-products, their precursors, and key manufacturing equipment such as new and used pill presses, so as to dismantle the entire criminal manufacture chain. This approach will be of increasing importance also as an element of precursor control strategies, as today diversions often occur at national level, followed by smuggling across international borders.

Better and more timely information, combined with increased awareness of the peculiarities of ATS and their precursors, can be expected to contribute to changing the prevailing low attention devoted towards ATS in some regions, especially those that have historically been associated with the cultivation and/or production of the 'traditional' drugs opium/heroin and cocaine, thus increasing interceptions. Finally, history also shows the importance of regionally and internationally coordinated responses to the ever-changing ATS and precursor chemical situation both in terms of regional shifts and emergence of new precursors, ATS and/or substitutes for either.

60 Spoth, R. and Guyll, M., *Prevention's Cost Effectiveness Illustrative Economic Benefits of General Population Interventions*, in United Nations Office on Drugs and Crime Technical Seminar on Drug Addiction Prevention and Treatment: From Research to Practice, 2008. Iowa State University (December 2008); *Cost effectiveness and cost benefit analysis of substance abuse treatment: an annotated bibliography*, National Evaluation Data Services, Center for Substance Abuse Treatment (SAMSHA), US Department of Health and Human Services, 2002.