

3. The coca/cocaine market



3.1 Introduction

Most indicators and research suggest that cocaine is – after heroin – the second most problematic drug worldwide in terms of negative health consequences and probably the most problematic drug in terms of trafficking-related violence.

The overall prevalence and number of cocaine users globally remain at stable levels. There are regional differences in recent trends, however, with significant decreases reported in North America, stable trends in West and Central Europe and increases in Africa and Asia. The estimated consumption of cocaine in terms of the quantities consumed appears to have declined, mainly due to a decrease in the United States and low levels of per capita use in the emerging markets. The most developed cocaine market outside of the Americas continues to be Europe, notably West and Central Europe, while cocaine use in East Europe is still limited. While demand in the United States was more than four times as high as in Europe in 1998, just over a decade later, the volume and value of the West and Central European cocaine market (US\$33 billion) is approaching parity with that of the US (US\$37 billion). The volume of cocaine consumed in Europe, however, has doubled in the last decade, even though data for the last few years show signs of stabilization at the higher levels.

Harm associated with cocaine use in terms of treatment demand, overdose cases and deaths, complications in health status due to polydrug use among cocaine users and from adulterants in cocaine, remain substantial in the major regions of consumption.

There has been a decline in the area under coca cultivation, as well as in cocaine production. Global seizures of cocaine have been generally stable over the period 2006–2009. Since 2006, seizures have shifted towards the source areas in South America and away from the consumer markets in North America and West and Central Europe. Some secondary distribution countries in South America seem to have acquired increasing importance as cocaine trafficking transit countries. Trafficking through West Africa continues to be significant, in spite of a reduction of seizures since 2007 (from 25% of European cocaine seizures that transited countries of West and Central Africa in 2007 to 13% in 2009). The area remains vulnerable to a resurgence. Some countries in the Asia-Pacific – with large potential consumer markets – have registered increasing cocaine seizures in 2008 and 2009.

The expansion of the cocaine market across the Atlantic and, more recently, in South America and beyond, highlights the need to treat cocaine as a global problem, and to develop strategies on the scale of the threat. Efforts must be increasingly coordinated and integrated into an international approach that adapts to new developments and trends.

3.2 Consumption

UNODC estimates the annual prevalence of cocaine use in 2009 at between 0.3% and 0.5% of the world population aged 15–64, corresponding to some 14.3 to 20.5 million people in this age range who used cocaine at least once in the preceding year. The lower and upper

Table 15: Annual prevalence and estimated number of cocaine users, by region, subregion and globally, 2009

Region/subregion	Estimated number of users annually (lower)	-	Estimated number of users annually (upper)	Percent of population age 15-64 (lower)	-	Percent of population age 15-64 (upper)
Africa	940,000	-	4,420,000	0.2	-	0.8
East Africa	-	-	-	-	-	-
North Africa	30,000	-	50,000	0.03	-	0.04
Southern Africa	270,000	-	730,000	0.3	-	0.9
West and Central Africa	550,000	-	2,300,000	0.3	-	1.1
Americas	8,280,000	-	8,650,000	1.4	-	1.4
Caribbean	110,000	-	330,000	0.4	-	1.2
Central America	120,000	-	140,000	0.5	-	0.6
North America	5,690,000	-	5,690,000	1.9	-	1.9
South America	2,360,000	-	2,480,000	0.9	-	1.0
Asia	400,000	-	2,300,000	0.02	-	0.2
Central Asia	-	-	-	-	-	-
East/South-East Asia	400,000	-	1,070,000	0.03	-	0.2
Near and Middle East	40,000	-	650,000	0.01	-	0.3
South Asia	-	-	-	-	-	-
Europe	4,300,000	-	4,750,000	0.8	-	0.9
East/South-East Europe	310,000	-	660,000	0.1	-	0.3
West/Central Europe	3,990,000	-	4,090,000	1.2	-	1.3
Oceania	330,000	-	400,000	1.4	-	1.7
Global	14,250,000	-	20,520,000	0.3	-	0.5

Table 16: Expert perceptions of trends in cocaine use, by region, 2009

Source: UNODC ARQ.

Region	Member States providing perception data	Member States perception response rate	Use problem increased*	Percent use problem increased	Use problem stable	Percent use problem stable	Use problem decreased*	Percent use problem decreased
Africa	8	15%	4	50%	2	25%	2	25%
Americas	15	43%	5	33%	7	47%	3	20%
Asia	13	29%	7	54%	3	23%	3	23%
Europe	27	60%	14	52%	13	48%	0	0%
Oceania	1	7%	0		1		0	
Global	64	33%	30	47%	26	41%	8	13%

* Identifies increases/ decreases ranging from either some to strong, unweighted by population.

ranges of cocaine users in 2009¹ have widened, suggesting some increase in the estimated number of users, but also the increasing uncertainty in these estimates. The main difference from previous years is the widening of the ranges, arising from a lack of recent or reliable information in Africa - particularly West and Central Africa²

¹ In 2008, the estimated annual prevalence number of cocaine users ranged between 0.3% and 0.4% of the population aged 15-64, or between 15.1 and 19.4 million people.

² This is partly due to the fact that in previous years, estimates for the Democratic Republic of the Congo were included in the Southern

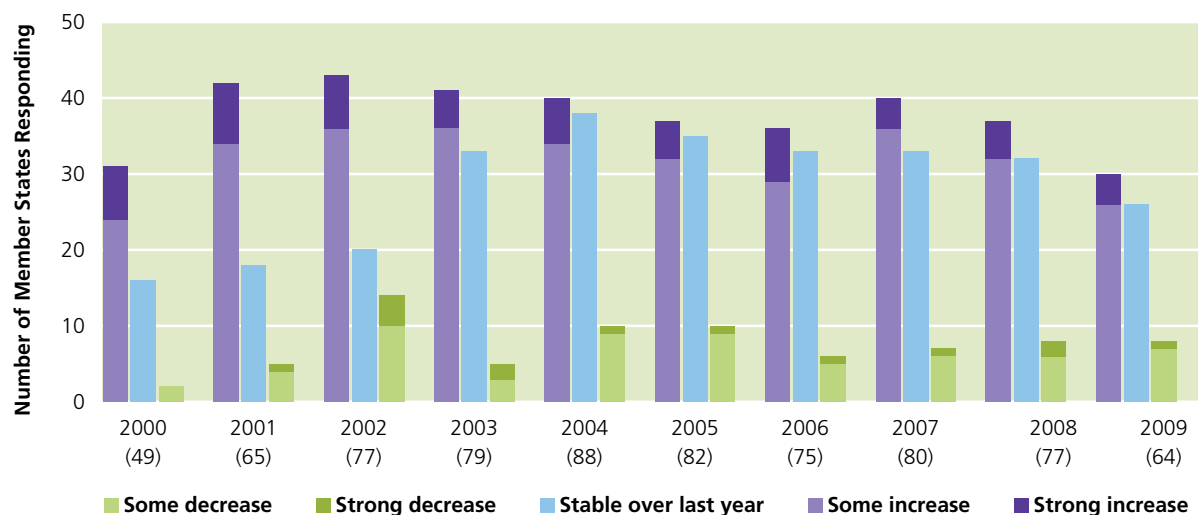
- and East and South-East Asia, where starting from low levels, the use of cocaine may have increased. There is no information on the extent of cocaine use in South or Central Asia. In 2009, a substantial decrease in the estimates of cocaine users was recorded for North America, while cocaine use in Europe appeared to have stabilized.

In geographical terms, however, cocaine use appears to have spread. In 2009, nearly half of the Member States

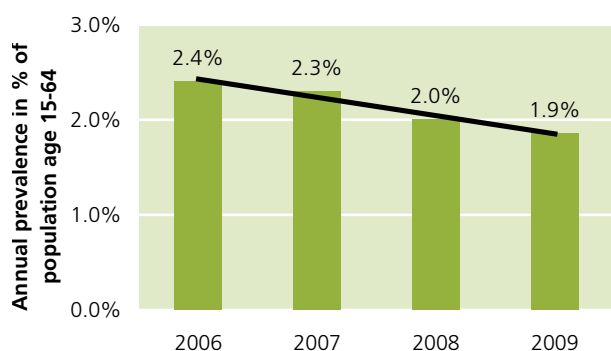
Africa subregion and for consistency were moved to the West and Central Africa subregion

Fig. 49: Expert perception of trends in cocaine use, 2000-2009

Source: UNODC ARQ.

**Fig. 50: Annual prevalence of cocaine use in North America, 2006-2009**

Sources: UNODC World Drug Report 2010 and previous years; update based on ARQ data.



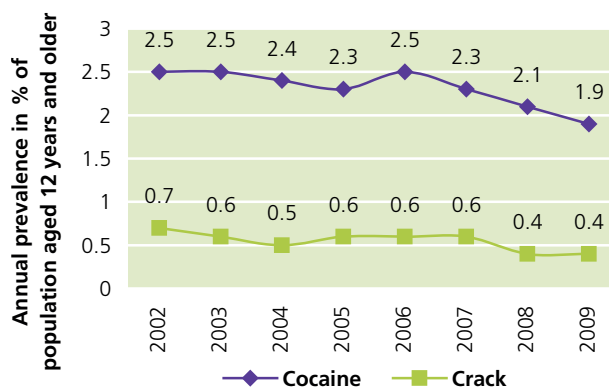
reporting expert opinion through the ARQ considered that cocaine use had increased in their countries. This was particularly noticeable in Africa and Asia, where increasing seizures of cocaine, though still at low levels, have also been reported in countries that had never reported any in the past. The long-term trends in expert perceptions officially reported to UNODC also point to a continuing perceived increase in the use of cocaine in Africa and Asia. Experts from half of the countries in Europe, especially West and Central Europe, considered cocaine use to be stable, while the other half of the countries perceived an increase. The main stabilization or decrease in cocaine use trends is perceived to be taking place in the Americas.

Cocaine use is decreasing in North America – one of the major regions of cocaine consumption

North America is still the subregion with the largest number of cocaine users worldwide (5.7 million in 2009), accounting for more than a third of all cocaine

Fig. 51: United States: Trends in annual prevalence of cocaine use in the population aged 12 years and older, 2002-2009

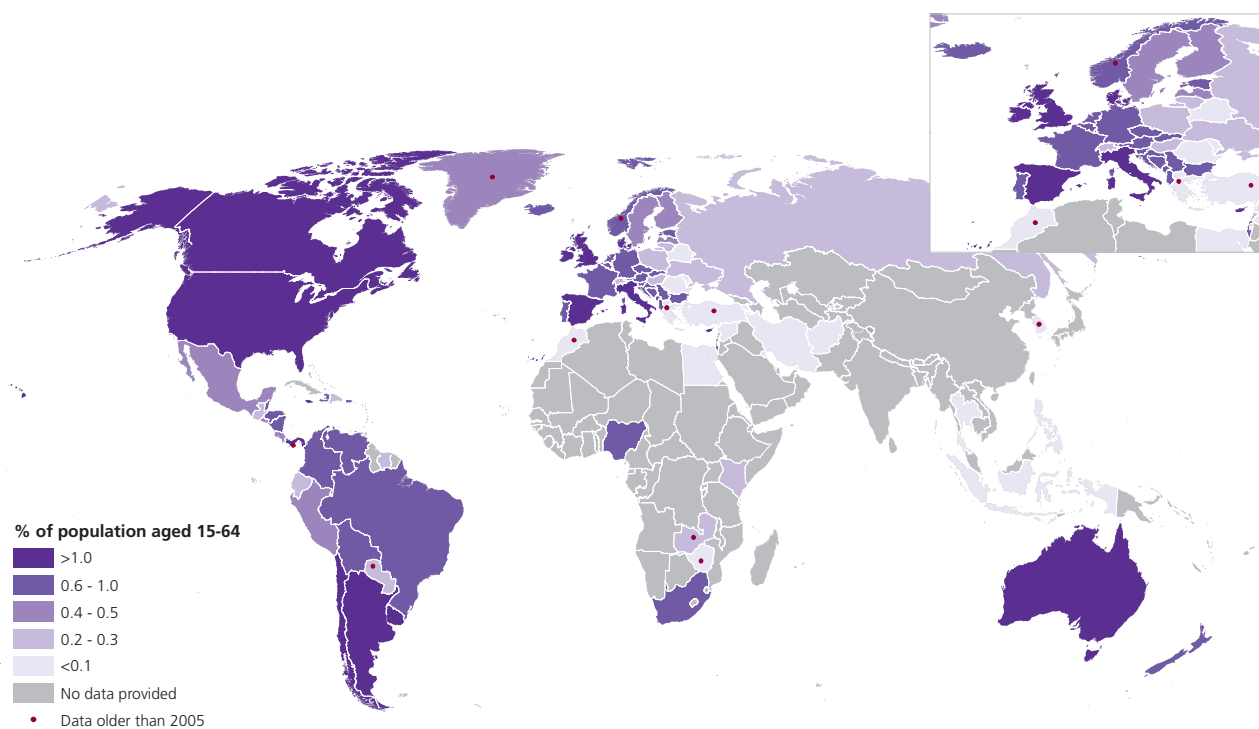
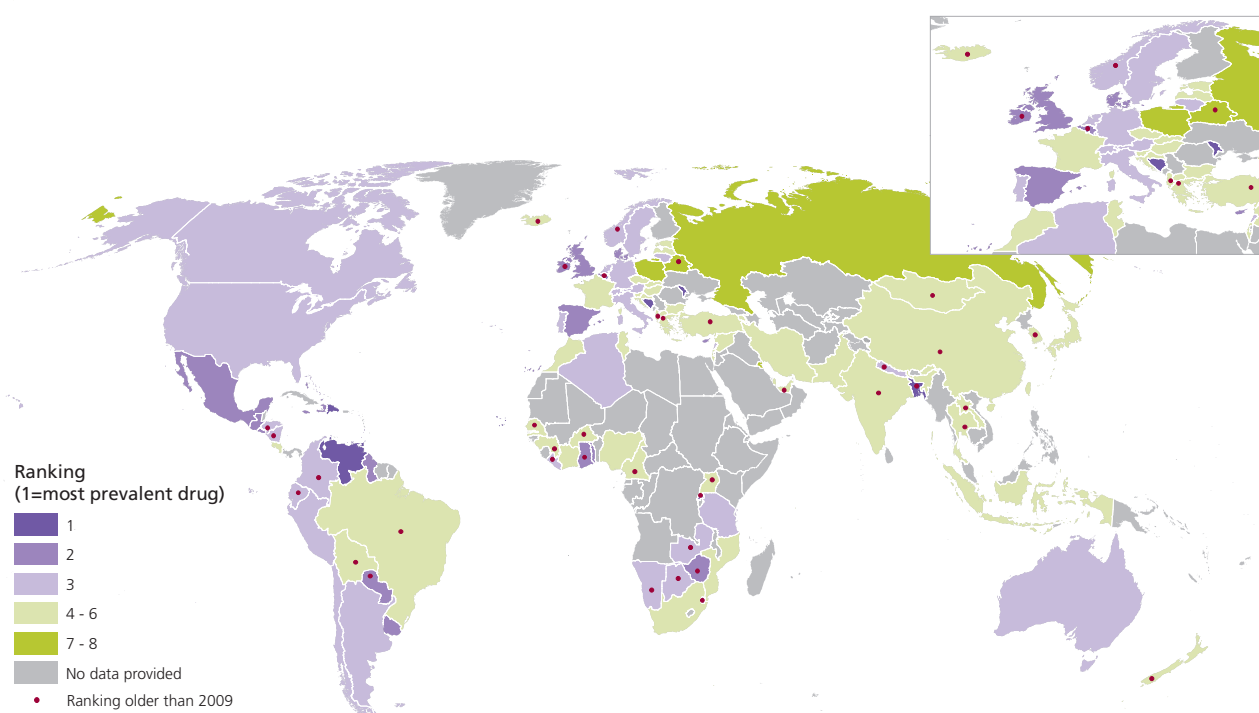
Source: Substance Abuse and Mental Health Services Administration, Results from the 2009 National Survey on Drug Use and Health: Volume I, Summary of National Findings.



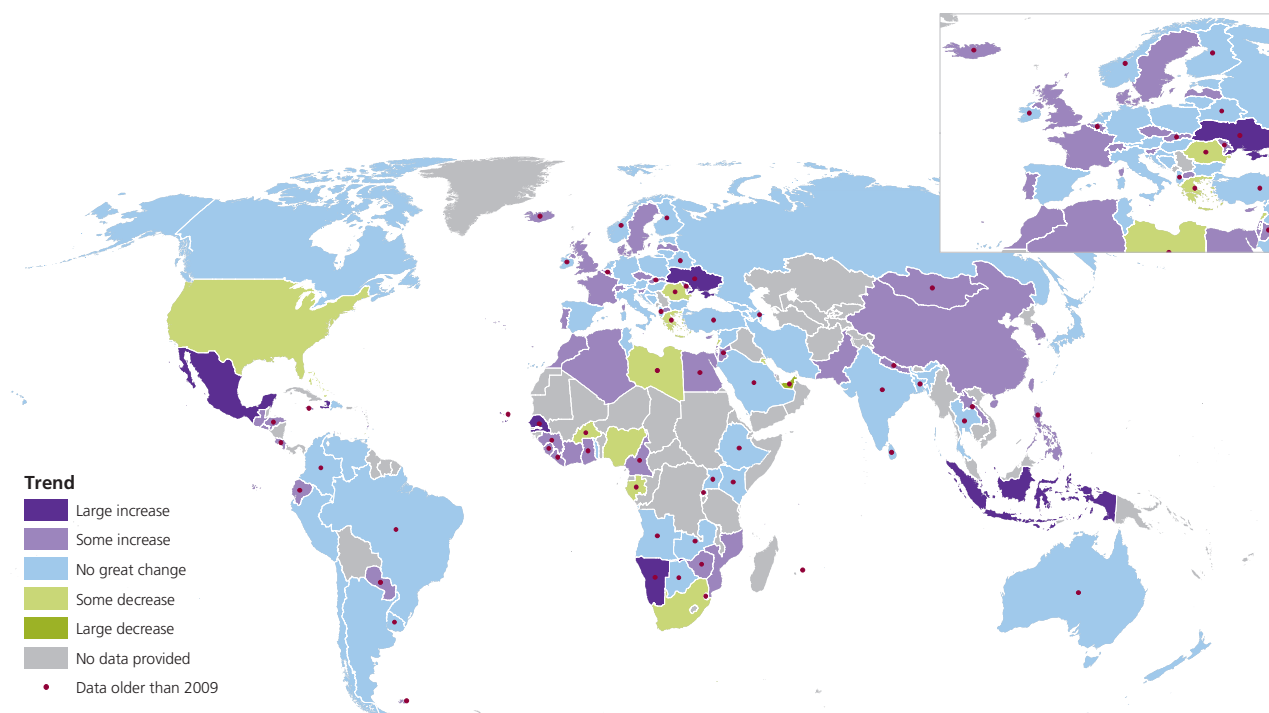
users worldwide. Household surveys in the countries of North America reveal a prevalence rate of annual cocaine use affecting 1.9% of the population aged 15-64 in 2009, down from 2.4% in 2006.

The United States of America has the highest prevalence of cocaine use in the region (2.4% of the population, or 5 million people aged 15-64), but there are indications of cocaine use declining over the past few years.

Since 2006, among the population aged 12 years and older, there has been a continuing decline in the annual prevalence of cocaine use (from 2.5% in 2006 to 1.9% in 2009), though crack use shows a less rapidly declining trend. The reduction coincided with a supply squeeze in the US cocaine market as less cocaine arrived via Mexico. Purity-adjusted cocaine prices rose by more than 80% between 2006 and 2009.

Map 17: Annual prevalence of cocaine use, 2009 (or latest year available back to 2005)**Map 18: Ranking of cocaine in order of prevalence, 2009 (or latest year available back to 2005)**

Map 19: Expert perception of trend changes in the use of cocaine, 2009 (or latest year available back to 2005)



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

In addition to significant drops in both annual and past-month cocaine use prevalence, the initiation of new cocaine use also fell. Some 617,000 people aged 12 or older used cocaine for the first time in the past 12 months in the United States in 2009, down from 722,000 a year earlier.

Among high school students in grades 8 to 12 in the United States, there has also been a substantial and steady decline in the annual prevalence of cocaine and crack use, especially since 2006. For both cocaine and crack use, the annual prevalence in 2010 among 12th grade students was 2.9% and 1.4%, respectively, which declined from 5.7% and 2.1% respectively in 2006.³

Cocaine remains a problem drug in the United States, however. Among the 7.1 million people aged 12 or older who were classified with 'dependence on or abuse of illicit drugs' in 2009, 1.1 million were classified with 'dependence on or abuse of cocaine.'⁴ This is nearly one fifth of the annual cocaine users in 2009 – a higher proportion than for all other illicit substances except heroin.

In the United States, there were 4.6 million drug-related emergency department visits in the 2009. Among these total visits, the highest rate related to the use of illicit drugs was for cocaine use (137.7 visits per 100,000 inhabitants),⁵ followed by cannabis (122.6 per 100,000) and heroin (69.4 per 100,000). Compared to other illicit drugs, the rate of cocaine-related emergency department visits was much higher among the patients who were 21 years or older (80.9%),⁶ indicating continuing problematic use among the older population.

Positive cocaine use hair tests among the general workforce also fell, from 5.3% in 2007 to 2.3% over the first two quarters of 2010. These tests reflect cocaine use over the past three months. Urine tests among the US workforce – reflecting cocaine use over the past two to three days – showed the same, strongly decreasing trend.

In Canada, the annual prevalence of cocaine use in 2009 was 1.4% among the population aged 15-64, corresponding to some 327,000 people who had used cocaine

3 Johnston, L. D., O'Malley, P. M., Bachman, J. G., and Schulenberg, J. E., *Monitoring the Future, national results on adolescent drug use: Overview of key findings, 2010, 2011*, Institute for Social Research, The University of Michigan, Ann Arbor, USA.

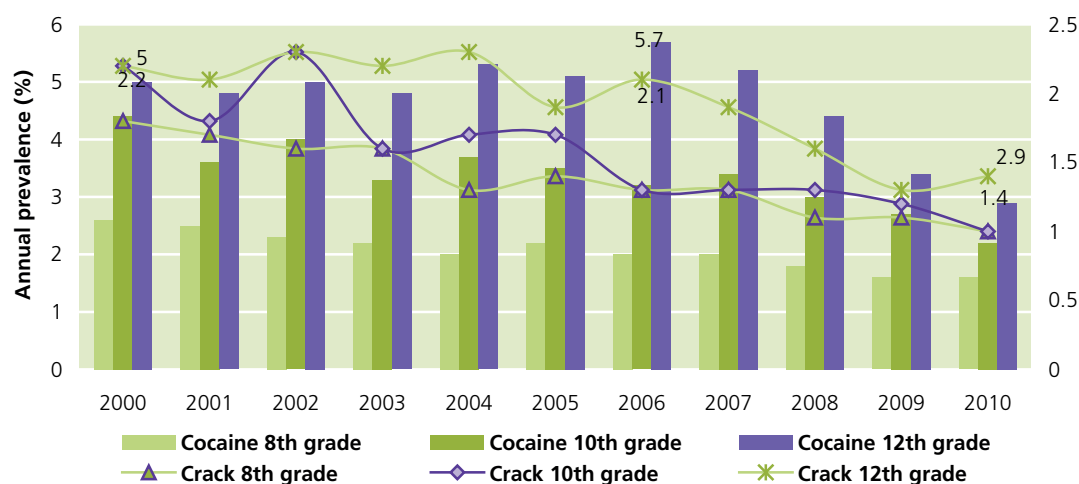
4 Substance Abuse and Mental Health Services Administration, *Results from the 2009 National Survey on Drug Use and Health: Volume I, Summary of National Findings, 2010*, Rockville, Maryland, USA.

5 Overall, taking into account emergency department visits related to misuse or abuse of drugs, the highest rate was for prescription opioids and pain killers with 405.4 visits per 100,000 inhabitants while the rate for ED visits related to cocaine use were second highest.

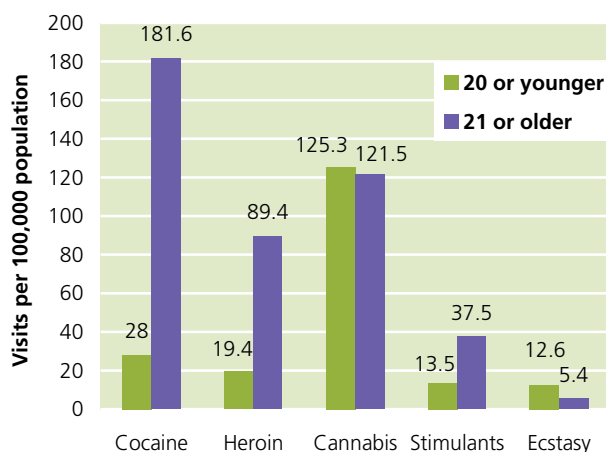
6 Substance Abuse and Mental Health Services Administration, Centre for Behavioural Health Statistics and Quality, *The DAWN Report: Highlights of the 2009 Drug Abuse Warning Network (DAWN) Findings on Drug-Related Emergency Department Visits, 2010*, Rockville, Maryland, USA.

Fig. 52: Annual prevalence of cocaine use among secondary school students in the United States, 2000-2010

Source: United States Monitoring the Future: national results on adolescent drug use.

**Fig. 53: United States: Emergency department visits related to illicit drugs, by age, 2009**

Source: SAMHSA Drug Abuse Warning Network (DAWN).



at least once in the past year. As in the United States, cocaine use has also been decreasing considerably in Canada since 2004, when it was reported as 2.3%. In 2008, it was 1.9% among the 15-64 age group. The past-year prevalence of cocaine use in 2009 was nearly the double (3.0%) among young people (15-24 years old); a rate that has also declined since 2008, when it was reported at 5.9%.⁷

In Mexico, compared to Canada and the United States, the annual prevalence of cocaine use is much lower, at 0.4%. Experts in Mexico perceived an increase in cocaine

⁷ Health Canada, *Canadian Alcohol and Drug Use Monitoring Survey*, 2009.

Fig. 54: Positive urine tests for cocaine use among the US workforce,* 2004-2010

*Positive tests for cocaine use among the general US workforce (4.2 million tests in 2009) and among the federally mandated, safety-sensitive workforce (1.3 million tests in 2009). Data for 2010 refer to the first two quarters.

Source: Quest Diagnostics, Drug Testing Index.



use from the previous year, whereas the treatment demand for cocaine as the primary substance of concern has declined to 7.9% of the total demand in 2009 from 20.6% in 2008.⁸

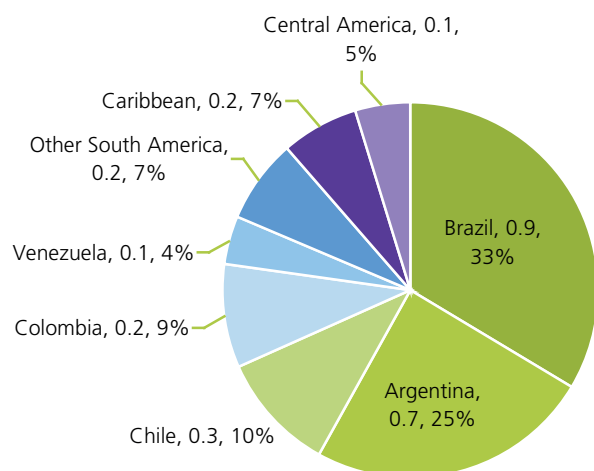
Cocaine use is now generally perceived to be stable in South and Central America

The estimated number of annual cocaine users in South and Central America and the Caribbean ranges between 2.6 and 2.9 million people aged 15-64. Cocaine use in South and Central America remains at levels higher than

⁸ This decline in treatment demand may stem from a change in treatment reporting.

Fig. 55: Cocaine use in South and Central American and Caribbean countries, in million persons and % of total (N = 2.7 million in 2009)

Source: UNODC ARQ.



the global average. The estimated annual prevalence among the adult population ranges between 0.9% and 1% in South America and 0.5% to 0.6% in Central America. The prevalence of cocaine use in South America, though much lower than North America, is comparable to that in Europe. The upward trend of cocaine use reported in previous years did not continue in 2009. Except for Ecuador and Guatemala, which reported

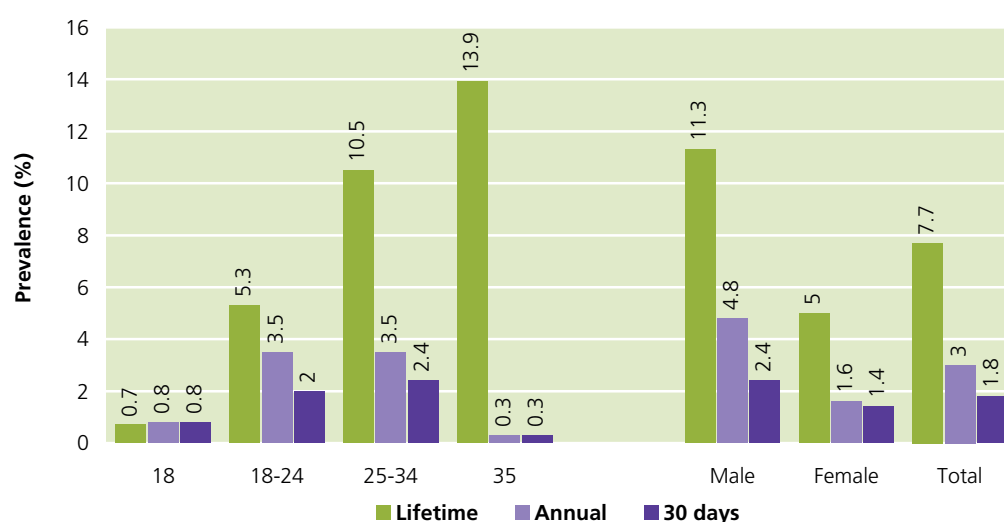
increases, experts from most of the other South and Central American countries perceived stable trends. Nearly 50% of all treatment demand reported from South and Central America (including the Caribbean) is reportedly for cocaine use, while cocaine is also ranked as the number one substance causing drug-induced or related deaths in the subregion.

There is no update on the extent of cocaine use in South and Central America. Argentina (2.6%), Chile (2.4%) and Uruguay (1.4%) remain countries with high prevalence of cocaine use among the general population in these subregions. The three Southern Cone countries, Brazil, Argentina and Chile, together account for more than two thirds of all cocaine users of South America, Central America and the Caribbean. The Caribbean countries account for 7% of the total and Central America for 5%.

Although Brazil has a lower prevalence rate of 0.7% of the population aged 15-64, because of its large population, the country has the highest number of cocaine users (900,000) in South America. According to a national survey conducted in 2009 among university students in Brazil, the annual prevalence of cocaine use was 3% of students aged 18 to 35. Cocaine use was much lower among female students than male. Among the students aged 18-24 and 25-34, comparable levels of recent and current cocaine use were reported, which was much higher than compared to cocaine use reported among the students 18 or 35 years old.⁹

Fig. 56: Brazil: Cocaine use among university students, 2009

Source: Nacional Sobre O Uso De Álcool, Tabaco E Outras Drogas Entre Universitarios Das 27 Capitais Brasileiras, Secretaria Nacional Políticas sobre Drogas.



⁹ Andrade, A.G., Duarte, P. and Oliveira, L.G., *I Levantamento Nacional Sobre O Uso De Álcool, Tabaco E Outras Drogas Entre Os Universitarios Das 27 Capitais Brasileiras*, Secretaria Nacional Políticas sobre Drogas, Brasília, 2010.

Polydrug use among cocaine users

Polydrug use – the use of multiple drugs at the same time, in combination or consecutively – is commonly observed among drug-using populations. In Europe and the United States of America, cocaine use is commonly reported among polydrug users.

In Europe, the prevalence of polydrug use has been reported as being higher among cocaine users than cannabis users, while cocaine users also reported higher rates of concurrent stimulant use. A study conducted in 14 European countries in 2006 revealed that around 62% of cocaine users were polydrug users. Alcohol, cannabis and heroin were the three main substances reportedly used by cocaine users.

Polydrug use among cocaine and cannabis users*

* The table compares polydrug use among long-term cocaine users and cannabis users entering treatment.

Source: EMCDDA, Annual report 2009: the state of the drugs problem in Europe.

Cocaine users	% of total
Alcohol	42
Cannabis	28
Heroin	16
Overall polydrug use among cocaine users	62
Cannabis users	% of total
Alcohol	65
Cocaine	13
Heroin	12
Overall polydrug use among cannabis users	85

Among the clients entering treatment in Europe, the most frequently reported secondary drug – by nearly one third – was cocaine (including crack). Among cocaine users in treatment, two main groups were identified: the socially integrated individuals using powder cocaine, often during the weekend, at parties or other social occasions. These users typically snort cocaine, sometimes in conjunction with alcohol or cannabis. The second group is a more marginalized group of clients, often injecting and using cocaine or crack-cocaine in combination with opioids. The marginalized group of cocaine users also presented precarious health and social conditions and included former opioid users re-entering treatment for cocaine use.

In a study conducted in the United States, after alcohol, cocaine was the second most used substance in combinations. It was included in combinations with alcohol, cannabis, alcohol and cannabis, and alcohol and opioids.

Speedballing – the concurrent or simultaneous use of cocaine and heroin – has also been commonly reported

in countries with high prevalence of cocaine use including the United States, Canada, the United Kingdom, Italy and Spain. In 14 European countries, more than a quarter of clients seeking treatment in 2006 reported concurrent use of cocaine and heroin. In a Canadian study, equal proportions of drug users were using cocaine and heroin sequentially, within the same hour or simultaneously – as in combination. A Mexican study among drug users in prison settings reported that nearly all of them (92%) were injecting drugs and less than half were speedballing.

Some reasons for speedballing suggested in the literature are: 1) when cocaine and heroin are used together, no new or novel subjective effect is experienced. Instead it simultaneously induces effects that are typical to both drugs; 2) using cocaine and heroin in low doses simultaneously could mutually reinforce their effects; 3) cocaine enhances some effects of opioids (as a group) and reduces some adverse effects of heroin or other opioids while maintaining the ‘rush’ induced by heroin use; 4) for some opioid users, including those on substitution or maintenance therapy, the use of opioids would be considered normal or ‘medicinal’ to prevent withdrawals and maintain normalcy while crack would be used to get a high.

As for subsequent use of heroin or cocaine, it is suggested that heroin use could occur after cocaine to induce a depressant effect to deal with the over-excitement caused by cocaine, while cocaine could be used to reduce unpleasant side-effects of heroin, such as adverse symptoms of withdrawal.

Risks and consequences

The main consequences of polydrug use, as in the case of cocaine use, are higher risks of overdose and chronic health damage. Using alcohol with cocaine can increase the levels of cocaine in the blood, enabling a longer psychoactive effect, but also increasing the risk of cardiovascular problems caused by increased heart rate and blood pressure. Cocaine can also decrease the perception of alcohol intoxication effects. Suicidal ideation and violent behaviour have been linked with the concurrent use of alcohol and cocaine. When alcohol and cocaine are combined, the liver produces a third substance called cocaethylene which intensifies the euphoric effects of cocaine. It has been associated with higher risk of heart attacks in users under 40 or even sudden death.

Similarly, when cocaine is mixed with opioids, the negative cardiovascular effects of cocaine are expanded, which can induce respiratory depression and hide the sedative effects related to opioids, thus leading to higher overdose risks. In Europe, deaths caused by the use of cocaine with other drugs represented 21% of drug-induced deaths, with opioids involved in 8% of these cases (2009).

The concurrent use of cocaine and heroin has also been related with a higher probability of dropping out from treatment, relapse and co-morbidity with psychopathol-

ogy than only opioid use. Users of opioids and cocaine experience more depression, anxiety and related symptoms than users of cocaine only. There is also a higher frequency of injecting among heroin and cocaine users that may result in more sharing of contaminated injecting equipment. Additionally, the reported use of citric acid to prepare the injection, and flushing,* increase the risk of HIV and other blood-borne infections such as hepatitis B and C as well as more soft tissue and vein damage at the injecting site.

Polydrug use – particularly with cocaine – and its associated risks therefore has important public health and policy implications in terms of prevention, treatment and care for heroin and cocaine users.

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Leri, F. et al., 'Patterns of opioid and cocaine co-use: A descriptive study in a Canadian sample of untreated opioid-dependent individuals,' *Experimental and Clinical Psychopharmacology*, 2005; 13(4): pp. 303–310.

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Prinzleve, M. et al., 'Cocaine Use in Europe – A Multi-Centre Study: Patterns of Use in Different Groups,' *European Addiction Research*, 2004;10: pp. 147–155

Rhodes, T. et al., 'Crack-heroin speedball injection and its implications for vein care: qualitative study,' *Addiction*, 2007; 102: pp. 1782–1790.

* Flushing is a term used to describe an injecting behaviour in which the plunger is pulled back and the fluid (mostly blood and in cases blood only) is re-injected. This is also referred to as booting and kicking in some literature

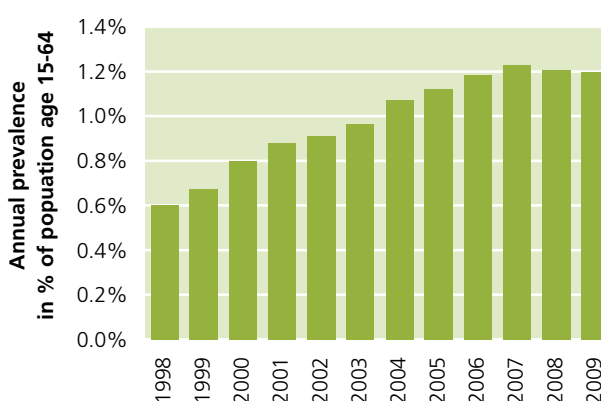
Most countries in Europe now report a stable trend in cocaine use

The annual prevalence of cocaine use in Europe is estimated at between 0.8% and 0.9% of the population aged 15-64, corresponding to some 4.3 to 4.8 million people who used cocaine at least once in the past year. These estimates are slightly lower than those for the previous year. Cocaine use is reportedly much higher in West and Central Europe (1.2%-1.3%) than in East and South-East-Europe (0.1%-0.3%). In 2009, many countries in Europe – mainly West and Central Europe – that provided expert opinion on trends reported a perceived stabilization in cocaine use for the year 2009.

Estimates of the prevalence rate for the 27 EU¹⁰ and 4 EFTA¹¹ countries suggest that the number of cocaine users doubled over the 1998-2006 period. Between 2006 and 2009 consumption appears to have stabilized. Despite the increase over the last decade in Europe and the decline in North America, overall cocaine use levels in the EU/EFTA region (annual prevalence of 1.2%) are still only half as high as in the USA (2.4% of the population aged 15-64 in 2009).

Fig. 57: Annual prevalence of cocaine use among EU and EFTA countries, 1998-2009

Sources: Annual Reports Questionnaire data; Government reports; UNODC, *World Drug Report 2009*; EMCDDA, *Statistical Bulletin 2009*.



High prevalence rates of cocaine use limited to a number of countries in western Europe

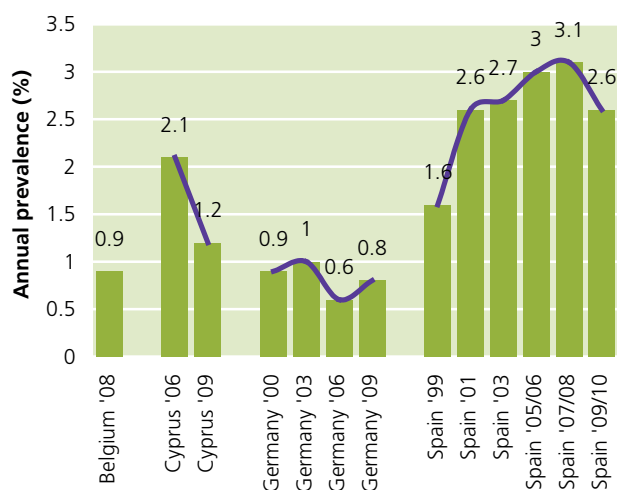
Two thirds of European cocaine users live in just three countries: the United Kingdom, Spain and Italy. With Germany and France, these countries represent 80% of European cocaine consumption. In terms of annual

¹⁰ EU countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

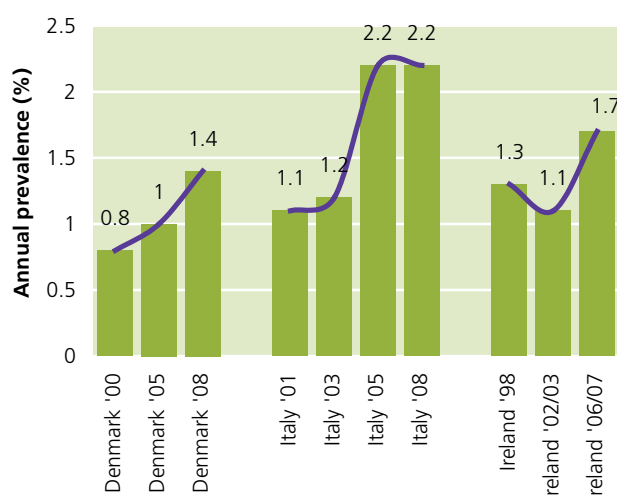
¹¹ EFTA countries: Iceland, Liechtenstein, Norway and Switzerland.

Fig. 58: Europe: Trends in cocaine use in countries that reported new data

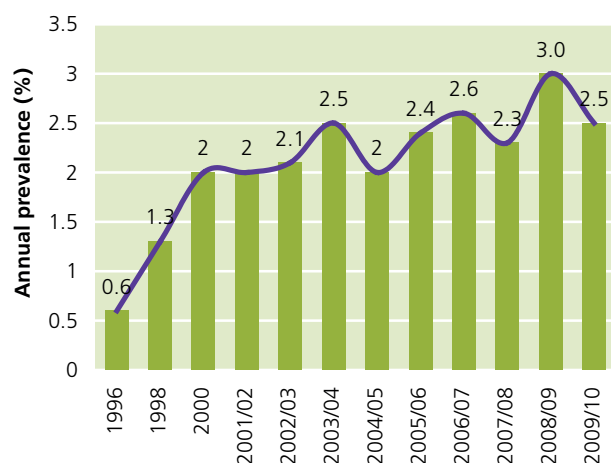
Source: UNODC ARQ; EMCDDA.

**Fig. 60: Europe: Trends in cocaine use in some high prevalence countries**

Source: UNODC ARQ; EMCDDA.

**Fig. 59: England and Wales (UK): Trends in annual prevalence of cocaine use, 1996-2009/10**

Source: UNODC ARQ; EMCDDA.



prevalence rates, Denmark, Ireland, Italy, Spain and the United Kingdom remain countries with rates higher than the West and Central European average. Cocaine use is considered to be particularly high among young people, especially males aged between 15 and 34. In the five high prevalence countries, annual prevalence among those aged 15-34 ranged from 4% to 8.4%. In these countries, cocaine is also reportedly used by opioid users who are undergoing substitution treatment.¹²

In 2009, Belgium, Cyprus, Germany, Spain and the United Kingdom (England and Wales) reported new prevalence data on cocaine use. Among these countries,

Cyprus and Spain reported a substantial decrease in cocaine use. The overall trend in England and Wales over the last few years has been fluctuating, following major increases since the late 1990s.

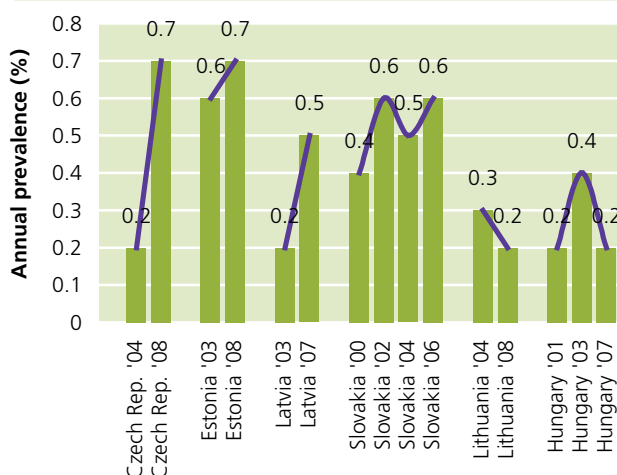
Among the other countries with high cocaine prevalence rates, Italy showed a stabilizing trend, but preliminary data from a survey undertaken in 2009 may indicate a decline. In contrast, older data for Denmark (2008) and Ireland (2007) showed rising trends in cocaine use over the previous survey period.

The situation in Central Europe is mixed, where countries such as the Czech Republic, Estonia, Latvia and Slovakia showed increases in cocaine use while others, such as Hungary and Lithuania, reported decreases in the latest surveys.

In West and Central Europe, cocaine was reported as the

Fig. 61: Trends in cocaine use in selected Central European countries

Source: UNODC ARQ and EMCDDA.



¹² EMCDDA, *Annual Report 2010: The state of the drugs problem in Europe*, Lisbon, 2010

Cocaine adulterants

A general phenomenon in recent years has been the decline of cocaine purity in the main consumer markets of North America and Europe. This went in parallel with an increasing role played by adulterants, which are changing the pharmacological properties of the white powder that is being sold as 'cocaine.'

While diluents or cutting agents (such as lactose) are simply used to increase the weight of the drugs, adulterants are typically psychoactive substances used to compensate for some of the pharmacological effects of the drug lost by lower levels of purity. The mixing of the drug with adulterants can lead to additional health problems for the users.

In the case of cocaine, different substances have been used as adulterants, including the following:

Common cocaine adulterants	
Levamisole	Likely stimulatory synergy between cocaine and levamisole
Lidocaine	Local anaesthetics, similar anaesthetic effects to cocaine
Procaine	Local anaesthetic
Benzocaine	Local anaesthetic
Caffeine	Stimulant
Boric acid	Looks like cocaine and acts as an anaesthetic
Hydroxyzine	Antihistamine
Phenacetin	Painkiller related to paracetamol

One of the adulterants that has been increasingly reported in cocaine samples in the United States and Europe since 2004 is levamisole. This is an anti-parasitic agent used in veterinary medicine in South America. In the United States, this was also used for the treatment of colon cancer and rheumatoid arthritis, but due to its adverse side effects, was removed from the market.

When levamisole is used for longer period and in high doses, it may cause serious adverse effects, one of which is agranulocytosis. This is a condition that results in a lowering of the white blood cell count, thereby impeding the body's mechanism to fight infection.

In Europe and the United States, up to 70% of the analysed cocaine samples were reported to contain levamisole. This led the European Early Warning System to issue a warning and initiate additional data collection. In 2009, SAMHSA also issued a public health warning on the risks of cocaine adulterated with levamisole.

References

SAMHSA, *Nationwide public health alert issued concerning life threatening risk posed by cocaine laced with veterinary anti parasitic drug*, 21 September 2009.

EMCDDA, *Annual report 2009: the state of the drugs problem in Europe*, Lisbon 2009.

primary drug of abuse in 11% of treatment cases, on average, compared to just 1% of treatment demand in East and South-East Europe. Within West and Central Europe, treatment demand for cocaine use also varied considerably. The highest treatment demand for cocaine-related problems was in Spain (46% as a proportion of all drug-related treatment) and the Netherlands (30%). In Germany, Italy, Switzerland and the United Kingdom, treatment demand for cocaine as a proportion of all treatment was around 15%.

Limited information on the extent of cocaine use is reported from Africa, however, experts from the countries that have reported information perceive increases

Information on the extent of cocaine use is only available from a limited number of countries in Africa. The annual prevalence of cocaine use is estimated between 0.2% and 0.8% of the population aged 15-64, corresponding to between 940,000 and 4.4 million people estimated to have used cocaine in the past year. The actual number of cocaine users in Africa is probably

close to the lower end of the estimates. The wide range in the estimates points to an increase in the uncertainty of the data available from Africa.

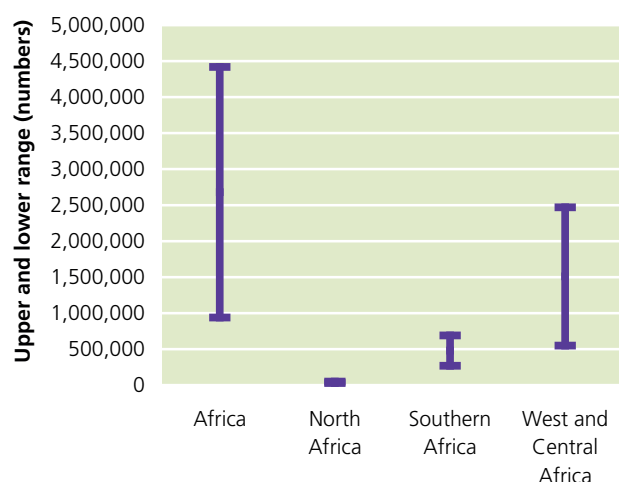
Among the eight countries that provided expert opinion on trends of cocaine use in Africa, four reported increases. In North Africa, where cocaine use is considered to be low (0.03% - 0.04%), Algeria and Morocco reported perceived increases. The other two countries that reported an increase in cocaine use in 2009 were Côte d'Ivoire and Mozambique. Nigeria and South Africa reported decreases in cocaine use as perceived by the experts.

In Kenya, a household survey conducted in the coastal provinces of the country in 2009 showed a lifetime prevalence of cocaine use of 1.6% and current¹³ prevalence of 1.2% among the population aged 12-51. The small difference between current and lifetime use indicates that cocaine use in these coastal provinces might be

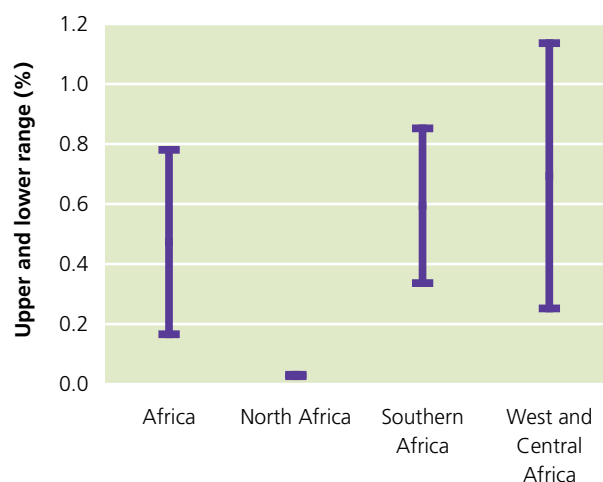
¹³ Current use of drugs was defined as use in the four weeks prior to the interview.

Fig. 62: Range of the estimated number of cocaine users in Africa, 2009

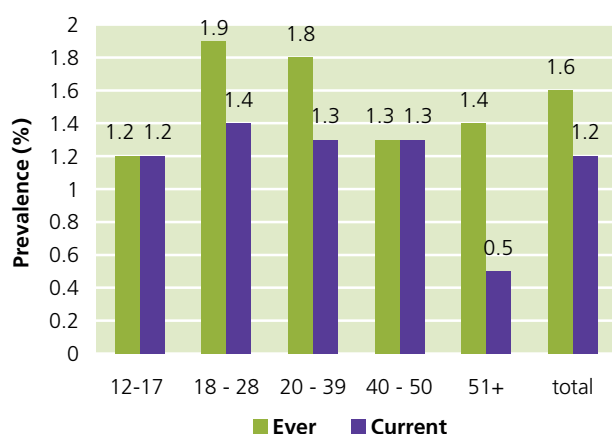
Source: UNODC.

**Fig. 63: Range of the annual prevalence of cocaine use in Africa, 2009**

Source: UNODC.

**Fig. 64: Kenya (coastal provinces): Lifetime and current use of cocaine, by age, 2009**

Source: NACADA, Report of Survey on Drug and Substance Abuse in Coast Province Kenya.

**Table 17: Africa: Cocaine as primary drug of abuse as a proportion of all treatment admissions, recent years**

	Year	Cocaine
Namibia	2006	24%
Burkina Faso	2008	21%
Mozambique	2004	11%
Kenya	2005	10%
Eritrea	2006	8%
South Africa	2009	8%
Togo	2009	8%
Senegal	2005	2%
Ghana	2008	1%
Swaziland	2004	1%
Nigeria	2004	1%

a new phenomenon. The extent of current cocaine use was comparable among all age groups in the 12-50 years age range, but, as in other countries, much higher among male (2.7%) than female (0.4%) survey respondents.¹⁴

Treatment demand for cocaine-related problems in Africa, from the countries that have provided data, is reported at around 5% of all treatment admissions. The highest treatment demand for cocaine-related problems, as a proportion of all treatment, was reported from Namibia and Burkina Faso. In South Africa, as reported by the South African Community Epidemiology Net-

work on Drug Use, treatment demand for cocaine use appears to have declined over the past few years, following increases in the previous years. Cocaine was reported by 5%-15% of clients in treatment as either a primary or secondary drug of abuse in the different reporting regions in the first half of 2010.¹⁵

Several countries in Asia - especially in East and South-East Asia - perceive cocaine use to be increasing

Information on the extent of cocaine use in Asia is scant and limited mainly to some countries in East and South-

¹⁴ National Campaign Against Drug Abuse Authority (NACADA), *Report of Survey on Drug and Substance Abuse in Coast Province Kenya – Main Report*, March 2010.

¹⁵ Plüddemann A. et al, *Monitoring Alcohol & Drug Abuse Trends in South Africa (July 1996 – June 2010), Phase 28, SACENDU research brief*, Vol. 13 (2), 2010, South African Community Epidemiology Network on Drug Use.

Table 18: Expert perception of trends in cocaine use in Asia, 2008 and 2009

Source: UNODC ARQ.

	2008	2009
Armenia		↔
Bahrain	↑	↑
China	↑	↑
Israel	↔	↑
Indonesia	↓	↑
Japan	↑	
Republic of Korea		↑
Hong Kong, China	↓	↓
Macao, China		↑
Mongolia	↑	
Pakistan	↑	↑
Philippines	↑	
Kuwait		↓
Lebanon	↔	↓
Syrian Arab Republic	↑	↔
United Arab Emirates	↓	

Legend: ↑ Increase; ↓ Decrease; ↔ Stable

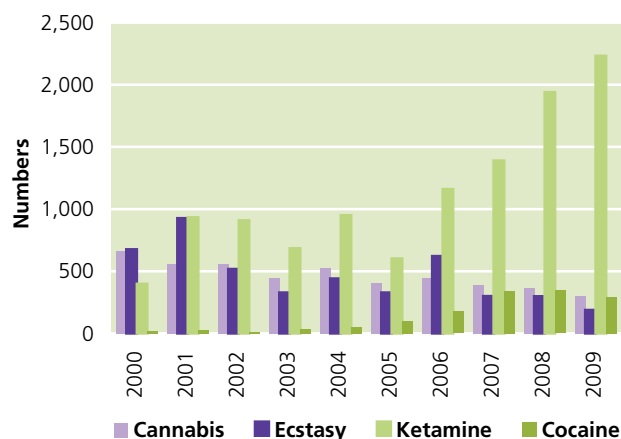
East Asia. Nevertheless, with this information gap, the annual prevalence of cocaine use in Asia is estimated between 0.02% and 0.2% of the population aged 15-64, or between 400,000 and 2.3 million people who may have used cocaine in the past year. The actual number of cocaine users in Asia is probably closer to the lower end of the range.

In Asia, most of the countries that provided expert perception on cocaine use, perceived that use had been increasing over the past year. In 2009, 7 out of 13 countries or territories reported a perceived increase in cocaine use. Many of the countries that had previously not identified any cocaine use now perceive an increase. Most of the countries that have perceived an increasing trend (starting from low levels of use) are located in East and South-East Asia; notably, China is among them. Some countries in other subregions have also perceived an increase.

Hong Kong, China, is one territory - although with a very small number of cocaine users - that has been reporting continuous decreases in cocaine use over the past years. This is also reflected in the decreasing number of cocaine users registered by the authorities between 2007 and 2009, reversing the upward trend noted between 2004 and 2007. In a limited study among cocaine users and key informants conducted in 2008, the pattern of cocaine use in Hong Kong, China, showed that nearly two thirds of respondents were using crack-

Fig. 65: Hong Kong, China: Trends for cocaine and other registered drug users, 2000-2009

Source: Central Registry Drug Abuse, Narcotics Division, Security Bureau, Hong Kong, China.



cocaine. Respondents strongly associated their cocaine use with night life and entertainment – clubs, discos and karaoke.¹⁶

Cocaine use in New Zealand and Australia appears to be stable following a period of strong increases

Cocaine use in the Oceania region appears generally stable following strong increases over the 2004-2007 period in Australia and over the 2003-2006 period in New Zealand. Information on cocaine use from Oceania essentially comprise survey data from Australia and New Zealand. The annual prevalence in Oceania is estimated to range between 1.4% and 1.7% of the population aged 15-64. The estimates are still lower than the levels reported from North America, but higher than those found for West and Central Europe.

In Australia, the annual prevalence of cocaine use in 2007 was estimated at 1.9% of the population aged 15-64, which is comparable to the level reported from North America. As reported in the Australian Illicit Drug Data Report (2008-2009), “recent increases in cocaine arrests and reported use, as well as considerable seizures of the drug in recent years, indicate a potential expansion of the Australian cocaine market.”¹⁷

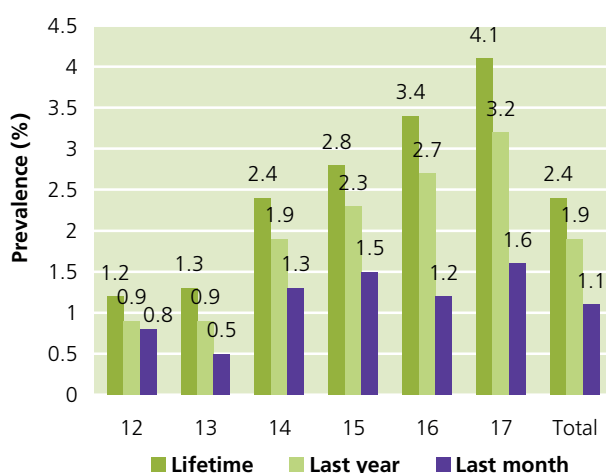
There are indications that this rise did not continue, however. Cocaine use among students has shown a decline in recent years. In 2008, among the 12-17 year old students, the lifetime prevalence of cocaine use was reported at 2.4%, while the past month prevalence was 1.1%. Among the students who participated in the

¹⁶ Yueying, L., Wing, D. and Fai, J., *Study of Cocaine Abuse in Hong Kong*, Report to the Narcotics Division, Department of Applied Social Studies, City University of Hong Kong, November 2008.

¹⁷ Australian Crime Commission, *Illicit Drug Data Report 2008-2009* June 2010.

Fig. 66: Australia: Cocaine use among secondary school students, 2008

Source: Australian secondary school students' use of tobacco, alcohol, and over the counter and illicit substances in 2008.



survey, cocaine use across all time periods, that is, lifetime, last year and past month use, increased by age and was highest among the 17-year-old students.¹⁸

Lifetime prevalence of cocaine use among 12-15-year-old students in Australia decreased significantly between 2002 and 2008 as well as between 2002 and 2005. The past month prevalence among this group was lower in 2008, but this was not statistically significant. The lifetime and past month prevalence among 16-17-year-old students has been at similar levels and has not significantly decreased over the three survey periods.¹⁹

In 2008, among the detainees tested for drug use in Australia, cocaine was found in 1% of urinalysis results. Male detainees were more likely to test positive, while the highest rates of positive urinalysis was among detainees aged 21 and 35 years. The prevalence of cocaine use among the detainees tested for drug use has remained consistently low over the previous years²⁰ which is in contrast to the high prevalence of cocaine use among the general population. Similarly, among the injecting drug users, relatively small proportions (2%-3%) have reported cocaine as the last drug injected,²¹ while cocaine accounted for less than 1% of the total treat-

Table 19: Trends in cocaine use among secondary school students in Australia, 2002, 2005 and 2008

* Significantly different from 2008 at $p < .01$.

Source: Australian secondary school students' use of tobacco, alcohol, and over the counter and illicit substances in 2008.

	12-15 years		
	2002	2005	2008
Lifetime	3*	2.6*	1.9
Past month	1.4	1.4	1
	16-17 years		
	2002	2005	2008
Lifetime	3.6	3.5	3.7
Past month	1.1	1.1	1.4
	12-17 years		
	2002	2005	2008
Lifetime	3.1*	2.9	2.4
Past month	1.3	1.3	1.1

ment demand in 2007-2008.²² This also indicates that cocaine use in Australia remains more common among the socially integrated groups of mostly recreational users.

The latest information on cocaine use from New Zealand dates back to 2008, when it was estimated that 0.6% (range 0.3% - 0.8%) of the population aged 16-64 had used cocaine in the year prior to the survey. The highest annual prevalence of cocaine use (1.8%) was found among youth aged 25-34.²³ As reported by New Zealand, experts perceive cocaine use to have been stable over the past couple of years.

For the remaining parts of Oceania, there is no recent or reliable information on the extent or pattern of cocaine use.

18 White V. and Smith G., *Australian secondary school students' use of tobacco, alcohol, and over the counter and illicit substances in 2008*, Drugs Strategy Branch, Australian Department of Health and Ageing.

19 Ibid.

20 Gaffney A., Jones W., Seeney J. and Payne J., *Drug Use monitoring in Australia: 2008 annual report on drug use among police detainees*, Monitoring Reports 09, Australian Institute of Criminology.

21 National Centre in HIV Epidemiology and Clinical Research, *Australian NSP Survey National Data Report 2005-2009*, National Centre in HIV Epidemiology and Clinical Research, The University of New South Wales, Sydney, 2010.

22 UNODC ARQ.

23 Drug use in New Zealand, *Key Results 2007/08 New Zealand Alcohol and Drug Use Survey*, Ministry of Health, 2010.



3.3 Production

Cultivation

The global coca cultivation estimate for 2010 is based on the 2009 figures for the Plurinational State of Bolivia and the 2010 figures for Colombia and Peru. The 2010 coca cultivation figure for Bolivia was not yet available at the time of printing of this report.

In 2010, the global area under coca cultivation decreased by 6%, mainly due to a significant reduction in Colombia which was not entirely offset by a small increase in Peru. The reduction of the global area under coca cultivation since 2007 has been driven by significant decreases in Colombia, which have been only partially offset by increases in the Plurinational State of Bolivia and Peru over the same period.

A major difference between coca and other narcotic plants such as opium poppy and cannabis is that the coca bush is a perennial plant which can be harvested several times per year. This longevity of the coca plant should, in principle, make it easier to measure the area under coca cultivation. In reality, the area under coca cultivation is dynamic, changes all the time and it is difficult to determine the exact amount of land under coca cultivation at any specific point in time or within a given year. There are several reasons why coca cultivation is dynamic: new plantation, abandonment of fields, reactivation of previously abandoned fields, manual eradica-

tion and aerial spraying. There are different methods to measure the area under coca cultivation which can be affected by some or all of these factors. From a government's perspective, it may be desirable to monitor illicit cultivation in a given year by measuring all coca fields, irrespective of whether they were being used for the whole year or only part of it (gross cultivation area). For estimating potential coca leaf and cocaine production, however, it is necessary to measure the *productive* area. This can only be done by determining the period in the year that the coca fields were productive before being, for example, eradicated or abandoned (net productive area). The area under cultivation at a specific cut-off date may be chosen for other reasons, for example, to monitor the effect of law enforcement activities implemented in a specific period (net area under cultivation at date x).

The national monitoring systems supported by UNODC currently in place in the Plurinational State of Bolivia, Colombia and Peru have developed different ways of tackling the challenge of measuring the dynamics of coca cultivation, depending on specific country factors, the availability of auxiliary information on eradication, as well as practical and financial considerations. While this approach helps to adjust the monitoring systems to the specificities of each country, it also limits the comparability of the area under cultivation across countries.

Table 20: Global illicit cultivation of coca bush, 1999-2010

Source: Bolivia: 2002 and before: CICAD and US Department of State, INCSR. Since 2003: National monitoring system supported by UNODC. Colombia: National Illicit Crop Monitoring System supported by UNODC. Peru: 1999: CICAD and US Department of State, INCSR; since 2000: National Illicit Crop Monitoring System supported by UNODC.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Bolivia	21,800	14,600	19,900	21,600	23,600	27,700	25,400	27,500	28,900	30,500	30,900	(30,900)*
Colombia ^(a)	160,100	163,300	144,800	102,000	86,000	80,000	86,000	78,000	99,000	81,000	68,000	57,000
Colombia ^(b)											73,000	62,000
Peru	38,700	43,400	46,200	46,700	44,200	50,300	48,200	51,400	53,700	56,100	59,900	61,200
Total	220,600	221,300	210,900	170,300	153,800	158,000	159,600	156,900	181,600	167,600	158,800*	149,100*

* The figure for Bolivia was not available at the time of printing of this report. Total area under coca cultivation in 2010 is based on the 2009 figure for Bolivia and will be revised once the 2010 figure becomes available. For Colombia, the series without adjustment for small fields was used to keep comparability.

(a) Area without adjustment for small fields.

(b) Area with adjustment for small fields.

Table 21: Reported cumulative eradication of coca bush (ha), 1996-2010

Sources: Governments of Colombia, Peru, the Plurinational State of Bolivia, Ecuador and the Bolivarian Republic of Venezuela.

		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Bolivia*	manual	7,512	7,000	11,620	15,353	7,653	9,395	11,839	10,089	8,437	6,073	5,070	6,269	5,484	6,341	8,200
Colombia	manual	4,057	2,262	3,126	1,046	3,495	1,745	2,762	4,219	6,234	31,980	43,051	66,805	95,634	60,544	43,792
	spraying	18,519	41,861	66,029	43,112	58,073	94,153	130,364	132,817	136,552	138,775	172,026	153,134	133,496	104,771	101,939
Peru**	manual	1,259	3,462	7,834	14,733	6,208	6,436	7,134	11,312	10,399	12,237	12,688	12,072	10,143	10,025	12,253
Ecuador	manual									4	18	9	12	12	6	
Venezuela	manual	18	0	0	0	38	47	0	0	118	40	0	0	0	0	

* Bolivia: Since 2006, voluntary and forced eradication.

** Peru: includes voluntary and forced eradication.

Since 1999, when the first coca cultivation survey started as a joint activity between UNODC and the Government of Colombia, the attention of experts has shifted from being primarily concerned with the area under coca cultivation to getting a better understanding of how much cocaine is being produced. This is partly due to more appreciation of the fact that eradication, whether carried out manually or by aerial spraying, does not necessarily translate into a corresponding reduction of the coca area. The impact of eradication carried out between date A and date B may or may not be seen by comparing the area under coca at these two points in time but it will certainly be noticeable in the coca yield as farmers lose harvests or have to replant their fields. Eradication has evolved from a tool to reduce the area under coca to one component of a complex counter-narcotics intervention system, geared towards reducing the productivity of the cocaine production chain from coca leaf to cocaine HCl at different levels.

Such a reduction in yield and production is captured by the *productive area* approach, where each hectare under coca cultivation is considered for the number of months the field is actually productive. For estimating cocaine production, the productive area approach seems to be the most appropriate but it is also the most demanding in terms of data requirements. Currently, the monitoring systems used in the three coca cultivating countries contain elements of both approaches, net area and productive area. In the Plurinational State of Bolivia and Peru, the area estimated from satellite imagery represents the average coca cultivation situation in the second half of the year, and it is used directly to estimate production. In Colombia, where a cut-off date at the end of the year is used for the area estimation, additional information is used to model the total productive area that contributes to the production of coca leaf and cocaine.

Efforts are being made in all three countries to improve the cocaine production estimates and the concepts of the net area and the productive area - detailed below - are an important part of that process.

Colombia

In 2010, the area under coca cultivation in Colombia decreased significantly, by 15%. Cultivation of coca bush decreased in all major growing regions of the country. The Pacific region remained the region with the largest coca cultivation, representing 42% (25,680 ha) of the national total, followed by the Central (25% or 15,310 ha) and Meta-Guaviare regions (14% or 8,710 ha).¹

Table 22: Approaches to measure coca cultivation (ha), 2010

	Net cultivation on 31 Dec 2010	Productive coca area 2010
Bolivia	n.a.	30,900*
Colombia ^(a)	57,000 ^(a) / 62,000 ^(b)	62,000-77,000 ^(b)
Peru	n.a.	61,200
Total	n.a.	154,100-169,100

* The 2010 figure for Bolivia was not available at the time of printing of this report. Total area under coca cultivation in 2010 is based on the 2009 figure for Bolivia and will be revised once the 2010 figure becomes available.

(a) Area without adjustment for small fields.

(b) Area with adjustment for small fields.

Since the first coca cultivation survey implemented by the national monitoring system supported by UNODC, the average size of coca fields has decreased from around 2 ha in 1999 to about 0.7 ha - 0.9 ha since 2006. An increasing proportion of coca was cultivated on small fields. This raised concerns because the type of satellite imagery used to detect coca fields in Colombia works best for field sizes over 0.25 ha and is not suitable for identifying very small fields.

Thus, a study using very high resolution imagery was conducted to determine the proportion of coca grown on fields below the 0.25 ha threshold. Based on this

1 All figures in this paragraph refer to the area adjusted for small fields.

Table 23: Colombia, adjustment of coca area for small fields, 2009-2010 (ha)

Source: National monitoring system supported by UNODC.

	2009	2010	Change from 2009
Without adjustment for small fields	68,000	57,000	-16%
With adjustment for small fields	73,000	62,000	-15%

study, an adjustment factor for small fields was introduced. This adjustment allows for the inclusion of coca cultivated fields that are smaller than the detectable threshold, and thereby improves the accuracy of the coca area estimate in Colombia.

In 2010, the area under coca cultivation was estimated at 57,000 ha without the adjustment for small fields. This was corrected to 62,000 ha after including the small field factor. To facilitate a comparison with 2009, the 2009 figure was also corrected, from 68,000 ha without to 73,000 ha with the adjustment for small fields.

Peru

In Peru, in 2010, the area under coca cultivation amounted to 61,200 ha, a 2% increase (+1,300 ha) on 2009, indicating an overall stable situation. However, the coca-growing regions showed diverging cultivation trends. Upper Huallaga, the largest growing region in recent years, experienced a strong decline of almost 4,500 ha due to intense eradication. In Apurímac-Ene, the second largest growing region until 2009, a significant increase in the area under coca of more than 2,200 ha was registered, and with 19,700 ha, it became the largest growing region in 2010.

Other growing regions such as Palcazú-Pichis-Pachitea (+59%) as well as Marañon, Putumayo and some smaller growing areas in the Amazon basin grew dramatically (+90%) and contributed to the overall increase.

Some smaller growing regions such as Aguatiya and Inambari-Tambopata, which have experienced a significant increase in the area under coca in recent years, remained relatively stable in 2010.

Production

Due to the ongoing review of conversion factors, no point estimate of the level of cocaine production can be provided for 2009 and 2010. Because of uncertainties about the level of total potential cocaine production and about the comparability of the estimates between countries, the 2009 and 2010 figures were estimated as ranges

(842-1,111 mt and 786-1,054 mt, respectively).²

High levels of cocaine seizures worldwide support the hypothesis that global cocaine production could be at a much higher level than previously estimated, mainly because traffickers have found ways to improve the efficiency of clandestine laboratories in extracting cocaine alkaloids from coca leaves. The lack of precise measurements of laboratory efficiency in the different countries increases the level of uncertainty, but does not affect the trend, which shows a clear decline in global cocaine production since 2007. A recent study (PRELAC) conducted jointly by UNODC and Governments of the coca cultivation countries confirmed that laboratory efficiency had improved and indicated that traffickers in the Plurinational State of Bolivia and Peru may have already reached efficiency levels comparable to Colombia.³ Thus, in other parts of this Report, the upper end of the global cocaine production range has been used. This, despite the uncertainty associated with the estimate, is considered to be a better approximation of reality.

Peru

Cocaine production in Peru has been going up since 2005 due to an increase in the area under coca cultivation. It is necessary, however, to add a caveat. Coca leaf yields in Colombia have been regularly studied and updated since 2005, and part of the decline in Colombian cocaine production is due to declining yields. In Peru, on the other hand, information on coca leaf yields dates back to 2004, and for some of the smaller cultivating regions, which experienced significant increases in the area under coca, no information on region-specific coca leaf yields is available. There are additional challenges involved in estimating the yield of new or reactivated coca fields as opposed to mature, well-maintained ones, as well as the effects of continued eradication pressure. As noted above, there are indications that the level of cocaine production in Peru could be higher than previously estimated due to improvements in laboratory efficiency, but more research is needed to improve the cocaine estimate for the country.

Colombia

Cocaine production in Colombia decreased to 350 mt in 2010. The drop since 2005 is the result of a decrease in the area under coca cultivation and a reduction of

- 2 More information on the review of conversion ratios is available in the Methodology chapter of this Report and in the *World Drug Report 2010* (p. 249 ff.).
- 3 PRELAC ('Prevention of the Diversion of Drugs Precursors in the Latin American and Caribbean Region') is a project financed by the European Commission and implemented by UNODC and Governments in Latin America and the Caribbean. Within this framework, several studies analysed coca leaf to cocaine conversion methods. For more information see <http://www.prelac.org>.

coca leaf yields. There are also indications of structural changes in the way the processing of coca leaves is organized. Unlike in the Plurinational State of Bolivia and Peru, where farmers sun-dry the coca leaves to increase their shelf life and facilitate transport, in Colombia, farmers typically process the fresh leaves into coca paste or cocaine base immediately after harvest. In 2005, only 24% of the coca leaf produced in that year was sold as fresh leaf, whereas in 2009, this proportion had almost doubled and reached 45%. Expressed in absolute terms, in 2005, farmers sold about 133,000 mt of fresh coca leaf to intermediaries, whereas in 2009, the same figures

amounted to almost 155,000 mt, an increase by 16%. This increase is even more remarkable when considering that it happened despite an overall decline in coca leaf production in Colombia over this period.

Studies show that farmers can increase their profit when processing coca leaf into coca paste and/or cocaine base rather than selling it. What could lead farmers to stop processing coca leaves themselves and sell them instead?

A study on cocaine precursors conducted in 2009/2010 (PRELAC) in South America and additional studies by UNODC and the Government revealed that in Colom-

Table 24: Global production of coca leaf and cocaine HCl (mt), 2005-2010

Source: Governments of Colombia, Peru and the Plurinational State of Bolivia.

	2005	2006	2007	2008	2009	2010
POTENTIAL PRODUCTION OF SUN-DRIED COCA LEAF IN METRIC TONS						
Bolivia	28,200	33,200	36,400	39,400	40,200	n.a.
Range			<i>34,200-38,300</i>	<i>37,300-41,800</i>	<i>37,900-42,500</i>	<i>n.a.</i>
Peru	97,000	105,100	107,800	113,300	119,000	120,500
Range	<i>85,400-108,600</i>	<i>91,000-119,200</i>	<i>93,200-122,000</i>	<i>97,600-127,800</i>	<i>102,400-134,200</i>	<i>103,000-136,300</i>

Source: Bolivia: Potential sun-dry coca leaf production available for cocaine production, National Illicit Crop Monitoring System supported by UNODC. Leaf yield source: UNODC (Yungas de Paz), Chapare (DEA scientific studies). The estimated amount of coca leaf produced on 12,000 ha in the Yungas of La Paz where coca cultivation is authorized under national law, was deducted. Range: Upper and lower bound of the 95% confidence interval of coca leaf yield estimate.

Peru: Potential sun-dried coca leaf production available for cocaine production, estimated by the National Illicit Crop Monitoring System supported by UNODC. 9,000 mt of sun-dry coca leaf were deducted, which, according to Government sources, is the amount used for traditional purposes. Range: Upper and lower bound of the 95% confidence interval of coca leaf yield estimate.

POTENTIAL PRODUCTION OF FRESH COCA LEAF IN METRIC TONS						
Colombia	555,400	528,300	525,300	389,600	343,600	305,300
Range						<i>305,300-349,600</i>
POTENTIAL PRODUCTION OF COCA LEAF IN OVEN-DRIED EQUIVALENT IN METRIC TONS						
Colombia	164,280	154,130	154,000	116,900	103,100	91,600
Range						<i>91,600-104,880</i>

Source: National monitoring system supported by UNODC. National Illicit Crop Monitoring System supported by UNODC.

Due to the introduction of an adjustment factor for small fields, 2010 estimates are not directly comparable with previous years.

The ranges express the uncertainty associated with the estimates. In the case of Bolivia and Peru, the ranges are based on confidence intervals and the best estimate is the mid-point between the upper and lower bound of the range. In the case of Colombia, the range represents the two approaches taken to calculate the productive area, with the lower bound being closer to the estimation used in previous years. The methodology to calculate uncertainty ranges for production estimates is still under development and figures may be revised when more information becomes available.

POTENTIAL MANUFACTURE OF 100% PURE COCAINE IN METRIC TONS						
Bolivia	80	94	104	113	n.a.	n.a.
Colombia	680	660	630	450	410	350
Range						<i>350-400</i>
Peru	260	280	290	302	n.a.	n.a.
Total	1,020	1,034	1,024	865	*	*

* Due to the ongoing review of conversion factors, no point estimate of the level of cocaine production could be provided for 2009 and 2010. Because of the uncertainty about the level of total potential cocaine production and about the comparability of the estimates between countries, the 2009 and 2010 figures were estimated as ranges (842-1,111 mt and 786-1,054 mt, respectively).

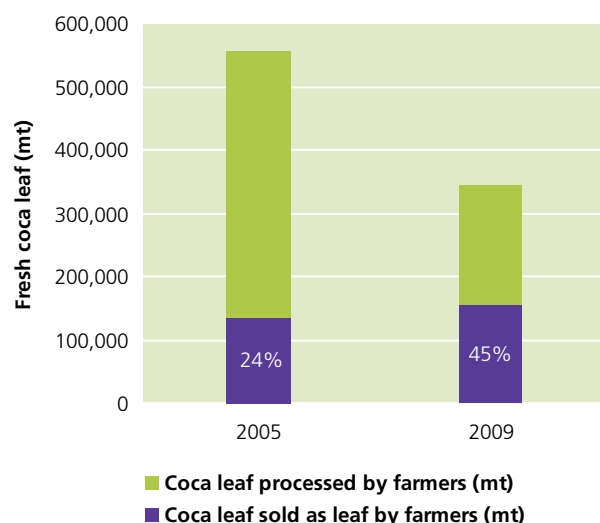
Source: Bolivia: UNODC calculations based on UNODC (Yungas de La Paz) and DEA scientific studies (Chapare) coca leaf yield surveys. Colombia: National Illicit Crop Monitoring System supported by UNODC and DEA scientific studies. Due to the introduction of an adjustment factor for small fields, 2010 estimates are not directly comparable with previous years. Peru: UNODC calculations based on coca leaf to cocaine conversion ratio from DEA scientific studies.

Detailed information on the ongoing revision of conversion ratios and cocaine laboratory efficiency is available in the World Drug Report 2010 (p. 249).

Figures in italics are being reviewed. Information on estimation methodologies and definitions can be found in the Methodology chapter of this Report.

Fig. 67: Colombia: Fresh coca leaf production (mt), 2005 and 2009

Source: UNODC/Government of Colombia, Coca cultivation surveys 2005 and 2009.



bia, quality differences in the coca paste and cocaine base provided by coca farmers reportedly became a problem for clandestine cocaine laboratories in recent years. A strategy employed by traffickers to obtain cocaine base of better or more homogeneous quality could be to try to execute more control over the cocaine alkaloid extraction process. Skilled 'cooks' with better know-how, equipment and precursor chemicals may be in a better position than farmers to produce cocaine base with the sought-after properties. It is not yet known how the purchasing of coca leaf from farmers is organized and who the actors are. Neither is sufficient information available on the chemical properties of coca paste or cocaine base produced in Colombia to verify this hypothesis.

What could have caused the apparent quality differences in the cocaine base produced by farmers?

Since 2005, probably due to increased counter-narcotics pressure, the per-hectare yields of coca fields went down in many growing regions of Colombia and there is a tendency towards smaller fields. This may make the assembly of amounts of coca leaves large enough for cocaine processing more difficult at the farm level. As coca leaf is not sun-dried in Colombia, storing the leaves until a sufficient amount is accumulated is not an option, as fresh coca leaves deteriorate rapidly in quality. An additional reason might be that, in 2009, it was more risky for farmers to engage in coca-processing in areas where the Government has increased its presence compared to 2005. Selling coca leaf rather than keeping processing chemicals and equipment on the farm may be part of a risk-aversion strategy employed by farmers.

On the other hand, field reports indicate the strong link between armed groups and coca cultivation and cocaine production. Thus, farmers may also have changed their sales strategy because of pressure from these groups.

Another measure taken by traffickers was the introduction of a previously unknown process called re-oxidation of cocaine base. This process is apparently an additional step used to homogenize and improve the quality of cocaine base of different quality received from different sources and geographic areas by using potassium permanganate. According to the information available, re-oxidation is linked to clandestine laboratories producing cocaine HCl, called 'cristalizadores' in Colombia, which presumably have a wide geographic area from where they source cocaine base. The introduction of this process into the clandestine cocaine production chain suggests that differences in the quality of cocaine base provided by farmers, and maybe partly also the low quality provided, indeed became a problem for traffickers producing cocaine HCl in recent years in Colombia.

Plurinational State of Bolivia

It can be assumed that, following the trend in cultivation, cocaine production in Bolivia increased between 2005 and 2009. 2010 figures were not available at the time of printing of this Report. There are indications that since about 2007, clandestine laboratories in Bolivia have benefited from a transfer of know-how from Colombia. Laboratories using the 'Colombian' method are much more efficient in extracting cocaine from coca leaves. More research is needed to better understand the current efficiency of clandestine laboratories in Bolivia.

Clandestine processing installations

In 2009, as in previous years, the extraction of cocaine alkaloids and manufacture of cocaine HCl remained geographically concentrated in South America. The illicit extraction of cocaine alkaloids from coca leaves takes place exclusively in the three countries cultivating coca bush, namely, the Plurinational State of Bolivia, Colombia and Peru. In 2009, the destruction of 8,691 installations involved in the production of coca paste or base was reported. This figure does not include the destruction of maceration pits, a typical feature of coca paste production in the Plurinational State of Bolivia and Peru.

Coca leaf: fresh – sun-dried – oven-dried

In this report, coca leaf production is presented in different ways: as fresh coca leaf, as sun-dried coca leaf and as coca leaf in oven-dried equivalents.

There are two main reasons. First, coca leaf is processed or traded in Colombia as fresh coca leaf, immediately after the harvest, whereas in Peru and the Plurinational State of Bolivia, farmers dry the fresh coca leaf before selling, by spreading the leaves on the ground and exposing them to air. The result is coca leaf with a much reduced moisture, which makes transport easier and allows storage of the leaves. Sun-dried leaves are also referred to as air-dried leaf.

The second reason is that the moisture content of both fresh and sun-dried coca leaf varies considerably, depending on the biological properties of the leaf as well as environmental factors such as the humidity of the air. A fresh coca leaf harvested in the early morning, for example, will have a different moisture content than leaves from the same bush plucked at noon. Coca leaves sun-dried after a heavy rainfall at a low altitude will have a different moisture content than leaves sun-dried in the dry season at a high altitude.

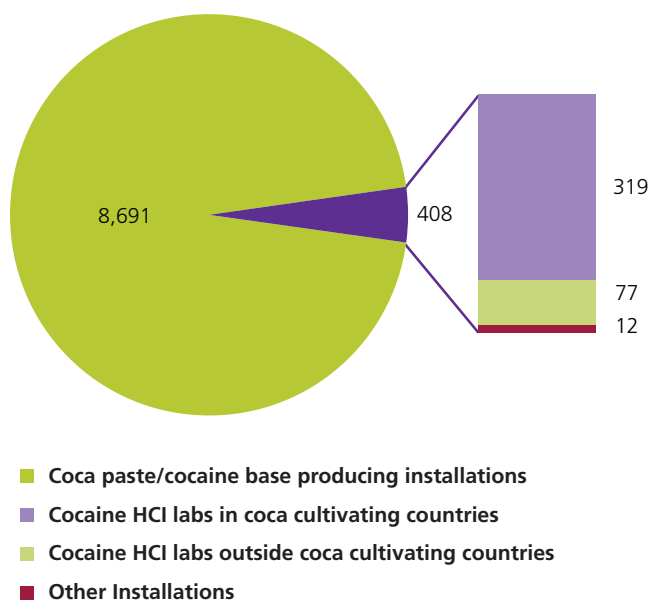
While differences may not matter much to farmers selling coca leaves, it matters from a scientific point of view, when comparing coca leaf production in different countries and estimating how much cocaine can potentially be extracted from the leaves. In other words, scientists are interested in how much dry plant matter is in the leaves, and which proportion of that dry matter consists of cocaine alkaloids. The water content of the leaves is not of interest in that context and has to be taken out of the calculation.

Like other live plant material, fresh coca leaves consist mainly of water (~70%). A kilogram of fresh coca leaves would typically lose over half of its weight through sun-drying. Even sun-dried leaves contain residual moisture. When drying in a laboratory oven to remove all moisture from the leaves, sun-dried coca leaves would still lose another third of their weight. In other words, a kilogram of fresh coca leaves weighs only about 300 grams after leaving the drying chamber, which is the weight of dry plant matter. Only a tiny proportion (around 0.5%) of that plant matter is actually cocaine.

Thus, when comparing coca leaf production, the weight in oven-dried coca leaf equivalent is the most appropriate. However, currently, not enough information on the moisture content of coca leaf in different regions of coca cultivating countries is available. Therefore, a direct comparison between fresh coca leaf in Colombia and sun-dried coca leaf in the Plurinational State of Bolivia and Peru by converting all figures into oven-dry equivalents is therefore not possible.

Fig. 68: Seizures of clandestine installations processing coca/cocaine, 2009

Source: UNODC ARQ.



In addition to coca paste or cocaine base processing installations, countries reported the destruction of 396 cocaine HCl production laboratories in 2009, 319 or 81% of which were located in coca cultivating countries. This confirms reports from previous years that most of the cocaine base produced in coca cultivating countries is converted into cocaine HCl in the same countries.

There are indications of some cross-border trafficking of cocaine base for further processing in other countries in the region: Argentina (36 laboratories), Ecuador (10) and the Bolivarian Republic of Venezuela (26) all reported destruction of cocaine producing facilities. Often reports did not specify if the installations detected were involved in producing cocaine base or HCl. It is assumed that most installations reported as being cocaine-producing were producing cocaine HCl, not cocaine base. Only a few installations involved in cocaine base or HCl manufacture were reported outside Latin America, for example, in Mexico (4) and Spain (1).

Spain also reported the detection of clandestine installations involved in secondary extraction of cocaine.



Cocaine is sometimes dissolved in other substances to prevent detection. Traffickers use secondary extraction laboratories to revert that process and recover the cocaine. Most of the clandestine installations detected in Spain in 2008 and 2009 were involved in secondary extraction (24 in 2008 and 11 in 2009). Greece also reported detection of clandestine installations involved in cocaine processing. These installations were involved in repackaging and adulterating cocaine. One installation handled only cocaine and four more were also handling heroin (reported under 'heroin').

More information on the detection of clandestine secondary extraction installations and repackaging and adulteration sites from other countries would be useful to understand potential changes in trafficking strategies. It would also indicate the development of trafficking hubs.

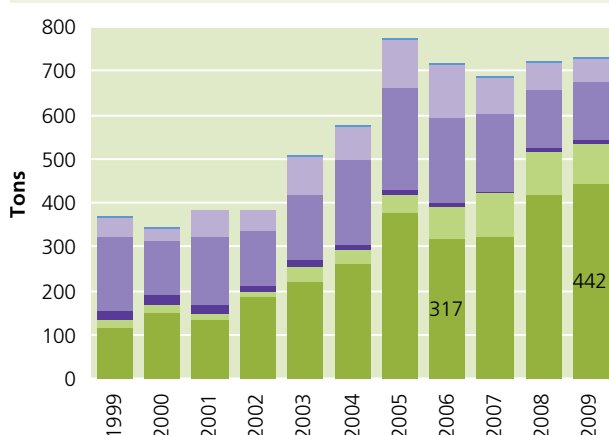
3.4 Trafficking

Global seizures of cocaine, including cocaine salts, cocaine base and crack-cocaine, increased strongly between 2000 and 2005 and were then generally stable over the 2006-2009 period, ranging between a minimum of 690 mt in 2007 and a maximum of 732 mt in 2009. Since 2006, seizures have shifted towards the source area of South America away from the consumer markets of North America and West and Central Europe, reflecting better international cooperation and exchange of information. South America accounted for a total of 317 mt in 2006 (44% of the global total for that year) and 442 mt in 2009 (60% of the global total). Over the same period, seizures declined by almost one third in North America (from 194 mt in 2006 to 132 mt in 2009) and by more than one half in West and Central Europe (from 121 mt in 2006 to 55 mt in 2009).

Slightly more than 60% of cocaine seizures in 2009 took place in South America. North America accounted for 18% and Europe for 8% of the total. Seizures outside the Americas and Europe accounted for just 0.3% of the total.

Fig. 69: Global cocaine seizures (mt), 1999-2009

Source: UNODC DELTA.



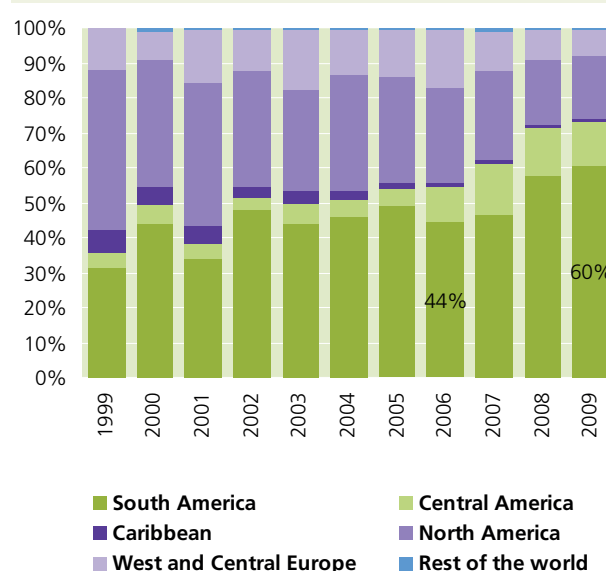
The three main markets for cocaine – in volume terms – are North America, notably the United States of America, followed by Europe, notably the EU and EFTA countries, and South America.

The US authorities have estimated for the last couple of years that some 90% of the cocaine consumed in North America comes from Colombia,¹ supplemented by some cocaine from Peru and limited amounts from the Plurinational State of Bolivia. For the year 2009, results of the US Cocaine Signature Program, based on an analysis of approximately 3,000 cocaine HCl samples, revealed that 95.5% originated in Colombia² (down from 99% in 2002³) and 1.7% in Peru; for the rest (2.8%), the origin could not be determined. The trafficking of cocaine into the United States is nowadays largely controlled by various Mexican drug cartels, while until the mid-1990s, large Colombian cartels dominated these operations.

The origin of cocaine consumed in Europe seems to be more evenly distributed. In terms of cocaine seizure

Fig. 70: Distribution of global cocaine seizures, 1999-2009

Source: UNODC DELTA.

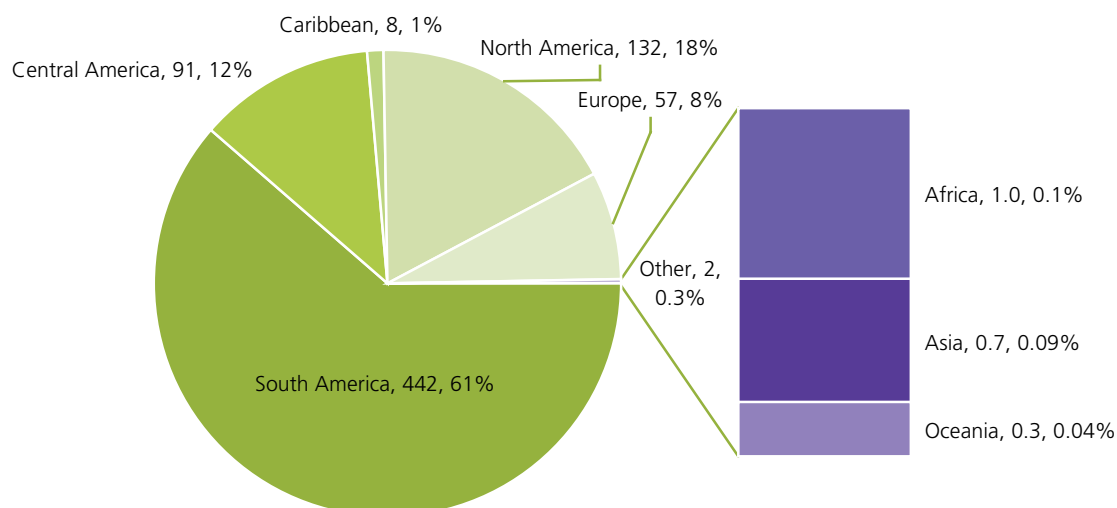


- 1 US Department of State, *2011 International Narcotics Control Strategy Report*, Washington D.C., 2011.
- 2 US Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, *Cocaine Signature Program Report*, January 2010, quoted in Inter-American Drug Abuse Control Commission (CICAD), DEA Special Testing and Research Laboratory and DEA Intelligence Division Briefing, OEA/Ser.L/XIV.2.47, CICAD/doc.1802/10, 3 May 2010.

- 3 US Department of Justice, Drug Enforcement Administration, Selected Intelligence Brief, 'Cocaine Signature Program Report,' January 2003, *Microgram Bulletin*, Vol. XXXVI, February 2003.

Fig. 71: Distribution of global cocaine seizures by region, 2009

Source: UNODC ARQ.



cases, cocaine from Colombia accounted for 8% of the cocaine seized in Europe over the 2008-2010 period, Peru for 7% and the Plurinational State of Bolivia for 5% (based on information from 13 European countries).⁴ The rest (80%) can only be traced back to various transit countries in the Americas (notably Argentina, the Dominican Republic, Brazil, Costa Rica, Panama, Ecuador and Paraguay), Africa (notably Senegal, Mali, Guinea and Nigeria) and Europe (notably Spain, the Netherlands and Portugal).

The importance of Colombia is more pronounced in terms of the origin of the quantities of cocaine seized in Europe. Cocaine from Colombia accounted for 25% of all cocaine seizures in volume terms in Europe over the 2008-2010 period, Peru for 6% and the Plurinational State of Bolivia for 2%. If cocaine that could be traced back to the Bolivarian Republic of Venezuela, Ecuador and Panama were added to the cocaine from Colombia, the 'Colombia-linked' cocaine seizures in Europe would rise to 69% of the total (2008-2010 period).⁵

Cocaine produced in Colombia is mainly destined for consumption in overseas markets. Cocaine produced in Peru and the Plurinational State of Bolivia, in contrast, is used more within South America, notably in countries of the Southern Cone. Even though cocaine produced in Peru seems to be playing a growing role in Europe, the criminal groups organizing the trafficking from South America to Europe are still primarily Colombian (notably for trafficking operations targeting Spain, the main entry point of cocaine into Europe) and – to a lesser extent – from other Latin American countries and

from various African and European countries. The influence of the Mexican drug cartels, which dominate cocaine sales to the United States, seems to be limited when it comes to trafficking to Europe or trafficking to countries in South America.

The global seizure total of 732 mt in 2009 refers to cocaine seizures as reported, that is, unadjusted for purity. Although precise purity adjustments at the level of individual countries are not feasible with the current available data, a range can be calculated for global purity-adjusted seizures of cocaine.⁶ By expressing this quantity as a percentage of the global supply of cocaine, one obtains the interception rate. In order to account for the time lag incurred between cultivation and trafficking, one may consider the average production in the preceding two years (2007 and 2008) as a proxy for global supply. This calculation yields a range of 46%-60% for the interception rate. However, this range should be interpreted with caution, as it depends on the current estimates of cocaine production, which are currently being reviewed.

Americas

In 2008 and 2009, the Americas accounted for more than 90% of global seizures of cocaine, with seizures amounting to 656 mt in 2008 and 673 mt in 2009. The largest seizures continued to be made by Colombia and the United States. Large quantities of cocaine continue to be trafficked from South America to the United States, with Mexico being the key transit country. Over

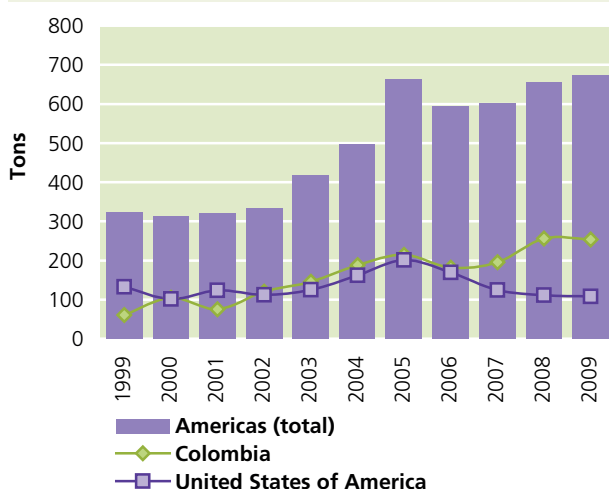
⁴ Austria, Belgium, Bulgaria, France, Germany, Ireland, Poland, Portugal, Romania, Spain, Switzerland, Turkey and the United Kingdom.

⁵ UNODC, Individual Drug Seizures database.

⁶ Considering data for 2009 only, global estimates indicate a range of 431-562 mt. The upper end of the range is obtained by considering purities at wholesale level only, which accounts plausibly for the vast majority of seizures by weight, while the lower end is obtained using both retail and wholesale purities and assuming that the retail level accounts for no more than one half of seizures by weight.

Fig. 72: Cocaine seizures in the Americas, 1999-2009

Source: UNODC DELTA.



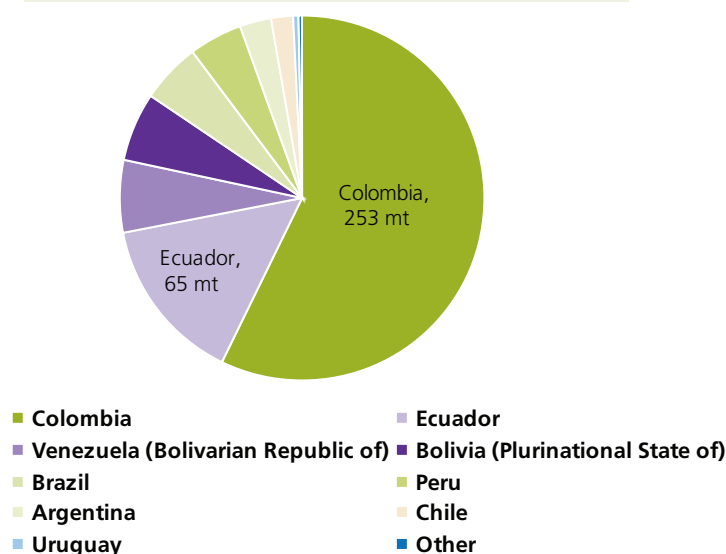
the 2002-2006 period, Colombia and the United States seized similar quantities of cocaine; however, the seizure totals started to diverge in 2007, with Colombia seizing more than twice that seized in the US in 2008 and 2009. This can be attributed to intensified efforts by the Colombian authorities to fight cocaine trafficking and to improved international cooperation, notably with law enforcement authorities of key countries such as the United States, the United Kingdom and Spain

Every year from 2002 to 2009, Colombia registered the highest national cocaine seizure total worldwide. In 2009, seizures amounted to 253 mt,⁷ essentially sustaining the record level of 2008 (256 mt). According to Colombian authorities,⁸ in 2009, 48% of cocaine seizures in Colombia were made in territorial waters. Colombia also continued to seize large quantities of substances that may be used in the extraction and processing of naturally occurring alkaloids.⁹

It appears that Ecuador, which shares borders with both Colombia and Peru, may have acquired increased importance as a hub for cocaine trafficking. In 2009, seizures in Ecuador reached a record level of 65 mt,¹⁰ the second

Fig. 73: Cocaine seizures in South America, by country, 2009

Source: UNODC DELTA.



highest level in South America. According to Ecuadorian authorities,¹¹ seizures of drugs and precursor chemicals by the Ecuadorian law enforcement agencies suggest that drug traffickers are increasingly seeking to use Ecuador for the stockpiling, storage and trans-shipment of vast quantities of cocaine. Cocaine is trafficked into Ecuador across the Colombia-Ecuador border, into the provinces of Esmeraldas, Carchi and Sucumbios, as well as across the Peru-Ecuador border, into the provinces of El Oro, Loja and Zamora Chinchipe,¹² and is then trafficked on to the consumer markets in North America and Europe. The country's more prominent role was also visible in reports of cocaine consignments seized in Europe involving Ecuador in the trafficking route, which rose from 6 seizure cases in 2005 (amounting to a total of 25 kg of cocaine) to 67 in 2009 (amounting to a total of 2.5 mt).

In the Bolivarian Republic of Venezuela, seizures peaked at 59 mt in 2005, and have fallen to approximately one half that level since then, amounting to 28 mt in 2009. According to preliminary data, this trend continued into 2010, with seizures falling to 20 mt.¹³ The decrease was also reflected in reports of significant individual drug seizures made in Europe; considering reports from nine countries¹⁴ which provided data on the provenance of

⁷ Data from the *Observatorio de Drogas de Colombia*, August 2010. Excludes seizures of 'basuco' (1.9 mt). The replies to the ARQ from Colombia for 2009 were not available at the time of preparation of the present report.

⁸ Presentation by Colombia to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

⁹ Country report by Colombia to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

¹⁰ Country report by Ecuador to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010. The replies to the ARQ from Ecuador for 2009 were not available at the time of preparation of the present report.

¹¹ Country report by Ecuador to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

¹² Presentation by Ecuador to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

¹³ Presentation by the Bolivarian Republic of Venezuela to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

¹⁴ Austria, Belgium, France, Germany, Ireland, Portugal, Romania,

Fig. 74: Cocaine seizures in Europe transiting selected countries in the Americas, by number of cases, 2005-2009

Source: UNODC IDS.

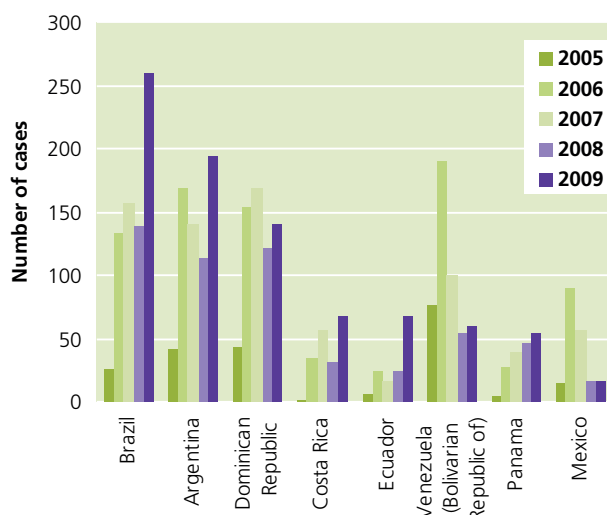
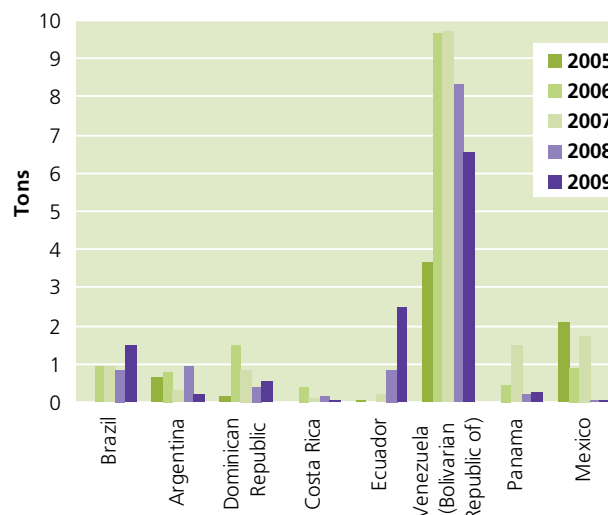


Fig. 75: Cocaine seizures in Europe transiting selected countries in the America, by quantity seized, 2005-2009

Source: UNODC IDS.



individual cocaine seizures in both 2006 and 2009, the number of seizures involving the Bolivarian Republic of Venezuela in the trafficking route fell from 151 (amounting to a total of 9.4 mt) in 2006 to 59 in 2009 (amounting to a total of 6.6 mt). Expressed as a proportion of the total cocaine seizures made in Europe (where information on provenance was included), these cases fell from 12% to 4% in terms of the number of seizures, but increased from 36% to 41% in terms of quantity.

In 2008, seizures of cocaine reached relatively high levels in both the Plurinational State of Bolivia and Peru, compared to previous years. Since then, seizures in Bolivia essentially sustained the high level, amounting to 27 mt in 2009 and 29 mt¹⁵ in 2010, while seizures in Peru receded to 21 mt (from 28 mt in 2008) and rose back to 31 mt¹⁶ in 2010. The Plurinational State of Bolivia assessed that, in 2009, more than 95% of cocaine trafficking on its territory occurred by land; moreover, according to Bolivian authorities,¹⁷ cross-border trafficking occurred from Bolivia into Argentina, Brazil and Chile and also from Peru into Bolivia. In contrast, according to Peruvian authorities,¹⁸ international trafficking organizations operating in Peru preferred maritime routes, with the ports of Callao, Chimbote and

Paita being the main points of departure. A variety of other trafficking methods are also used in Peru, including land routes, rivers, couriers, postal services and flights from clandestine airfields.

In recent years, seizures of cocaine have also increased significantly in Brazil, going from 8 mt in 2004 to 24 mt in 2009, of which 1.6 mt were seized in five aircraft interceptions.¹⁹ In 2009, Brazil was the most prominent transit country in the Americas - in terms of number of seizures - for cocaine consignments seized in Europe. The number of seizure cases which involved Brazil as a transit country rose from 25 in 2005 (amounting to 339 kg of cocaine) to 260 in 2009 (amounting to 1.5 mt).

According to the World Customs Organization, in 2009 the most important secondary distribution countries (apart from the Plurinational State of Bolivia, Colombia and Peru) were the Bolivarian Republic of Venezuela, Ecuador, Brazil and Argentina (ranked in order of the total weight of seized consignments departing from a given country).²⁰ With regard to cocaine reaching Europe, the World Customs Organization also noted the high quantity of cocaine arriving from Ecuador and the growing significance of Brazil and Suriname. With regard to cocaine reaching Africa, WCO noted that Brazil was the only South American country mentioned as a departure country for customs seizures made in Africa in 2009.

In Argentina, cocaine seizures rose steadily from 1.6 mt

■ ■ Spain and Switzerland.

15 Preliminary data from the Government of the Plurinational State of Bolivia.

16 Preliminary data from the Government of Peru.

17 Presentation by the Plurinational State of Bolivia to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

18 Country report by Peru to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

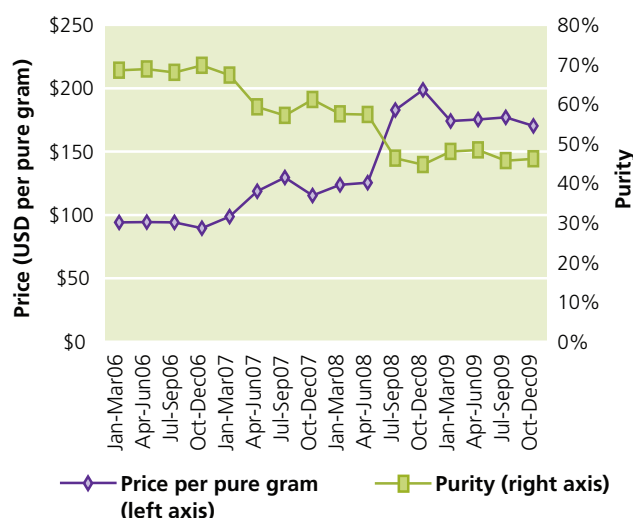
19 Presentation by Brazil to the Twentieth Meeting of Heads of National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

20 Based on seizures recorded in the Customs Enforcement Network database.

Fig. 76: Mean price and purity of all* cocaine purchases by law enforcement in the United States, 2006-2009

* The values represented here represent averages of all cocaine purchases, irrespective of the size of the transaction, and thus may correspond neither to wholesale nor to retail price levels. Although not collected as a representative sample of the US market, these data reflect the best information available on changes in cocaine price and purity in the US market.

Source: UNODC ARQ.



in 2002 to 12.1 mt in 2008, and in 2009 sustained the increased level, at 12.6 mt. Trafficking of cocaine from Argentina to Chile was reported by both countries in 2009; Argentina also assessed that, in 2009, some of the cocaine trafficked on its territory was intended for Europe, apart from Argentina itself. Seizures in Chile rose markedly in 2007, and have since then declined slightly, amounting to 8.4 mt in 2009. Argentina was also prominent - in terms of number of seizures - as a transit country for cocaine consignments seized in Europe, with 194 such cases reported in 2009. However, these seizures tended to be small in comparison with seizure cases transiting other countries, amounting to a total of 217 kg of cocaine.

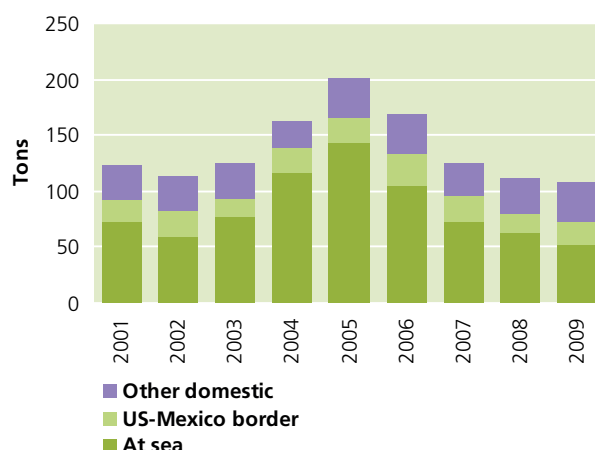
Other prominent transit countries included countries in Central America and the Caribbean such as the Dominican Republic, Costa Rica and Panama. In 2009, seizures in Panama were the third largest in Latin America and the Caribbean (53 mt). The Dominican Republic assessed that, in 2009, 18% of cocaine trafficked on its territory was intended for Spain, with the majority intended for the United States. Although the seizures involving the Dominican Republic in Europe were not large in comparison with other transit countries, some large seizures were made in the Dominican Republic itself: five of the seizures in 2009 accounted for almost two thirds of the total seized in the country that year (4.7 mt). According to Costa Rican authorities,²¹ in

■ ■

21 Country report by Costa Rica to the Twentieth Meeting of Heads of

Fig. 77: Cocaine seizures in the United States by location and quantity (mt), 2001-2009

Source: UNODC ARQ.



recent years, there has been a significant increase in the quantities of cocaine seized on the sea route, involving Costa Rican nationals mostly working in the fishing industry and operating under the direction of Colombian nationals, using fishing boats with Costa Rican flags to transport illicit drugs. Seizures in Costa Rica reached 21 mt in 2009.

Mexico continued to be a key transit country for cocaine trafficked into the United States. Cocaine seizures in Mexico fell sharply in 2008 (19 mt, down from 48 mt in 2007), in line with the trend in the United States, and increased slightly in 2009, amounting to 22 mt. The vast bulk - almost three quarters - was seized on the maritime route.

The decreased level of seizures was reflected in cocaine seizures by US authorities along the border with Mexico, which followed a generally decreasing trend between the last quarter of 2005 and the second quarter of 2008.²² In 2009, seizures along the US-Mexico border rose slightly, from 17.8 mt in 2008 to 20.5 mt, but remained below the peak level of 28 mt registered in 2006. It appears that several factors have contributed to a shift in the trafficking routes from Mexico to the United States, including high levels of inter-cartel violence in Mexico and efforts by Mexican authorities to confront the drug cartels.

Seizures by the United States peaked at 201 mt in 2005, and have since fallen considerably. In 2009, seizures appeared to stabilize at slightly more than half the 2005 level - 109 mt. Together with other indicators, this suggests that the availability of cocaine in the United States has stabilized at a reduced level.

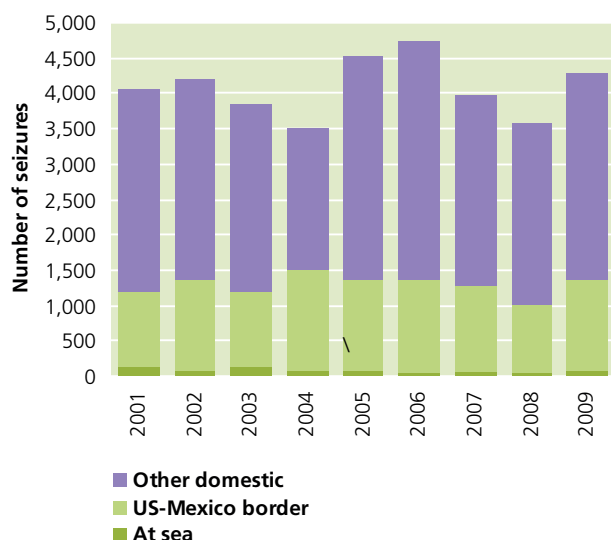
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National Drug Law Enforcement Agencies, Latin America and the Caribbean, Lima, Peru, 4-7 October 2010.

22 US Department of Justice, National Drug Intelligence Center, *National Drug Threat Assessment 2009*, December 2008.

Fig. 78: Cocaine seizures in the United States by location and number of seizures, 2001-2009

Source: UNODC ARQ.



The mean purity-adjusted price of cocaine, calculated from all cocaine purchases by law enforcement agencies in the United States,²³ more than doubled between the last quarter of 2006 to the last quarter of 2008 (from US\$90 to US\$199 per pure gram), and have remained relatively high since then (amounting to US\$170 per pure gram in the last quarter of 2009). This was largely due to a decline in purity, which fell from an average of 70% in the last quarter of 2006 to 45% in the last quarter of 2008 and 46% in the last quarter of 2009.

Seizures by the United States include large quantities of cocaine seized at sea. They accounted for approximately one half of the total for the United States in 2009. In terms of seizure cases, the majority continued to be smaller domestic cases.

A comparison of purity-adjusted cocaine prices at key points along the cocaine trafficking route in the Americas confirms that the mark-up in price occurs largely towards the end of the supply chain. The price at the wholesale level is about one quarter of the price at the retail level, while the price in producing countries only amounts to 1% of the final (retail) price.

At the global level, the total reported quantity of crack-cocaine seizures is negligible in comparison with seizures of cocaine base and cocaine salts. This may partly be due to the fact that some countries do not report seizures of crack-cocaine, but also because individual seizures of crack-cocaine, possibly made at street levels, tend to be much smaller.

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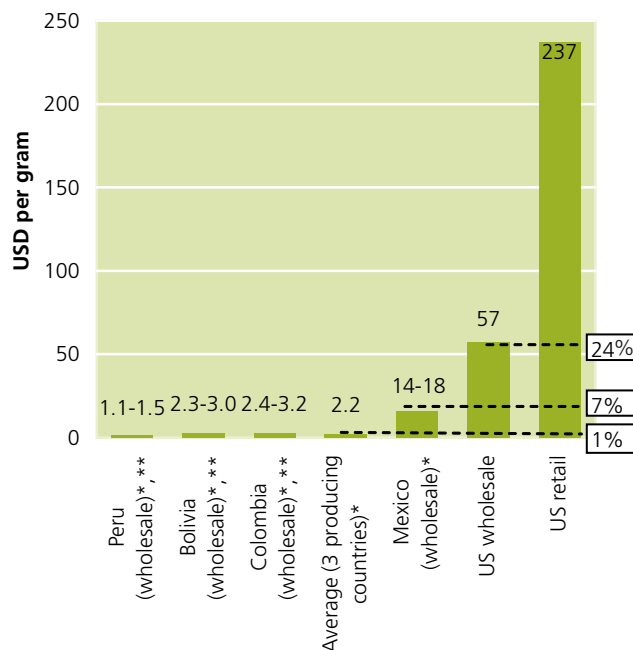
²³ This includes all purchases, irrespective of the size of the transaction, and thus may correspond neither to retail nor wholesale price levels.

Fig. 79: Accrual of purity-adjusted cocaine prices in the Americas, 2009

* For these countries, the calculation assumes a wholesale purity of 70%-90%; the vertical bars represent the midpoint of the resulting range.

** The value for Peru represents the price in producing regions, while the values for Bolivia and Colombia represent the price in major cities

Source: Data from UNODC field offices; UNODC ARQ.



Several countries in the Americas, notably in Central America and the Caribbean, as well as Brazil, the United States and the Bolivarian Republic of Venezuela, report seizures of crack-cocaine as well as cocaine base or cocaine salts. In 2009, seizures of crack-cocaine amounted to 194 kg in Panama, 163 kg in the United States and 80 kg in the Bolivarian Republic of Venezuela; in 2008, the largest quantity was seized in Brazil (374 kg).²⁴ In 2009, the largest number of such seizures worldwide were reported by the Dominican Republic (4,173 seizure cases), Canada (1,822) and the Bolivarian Republic of Venezuela (1,643).

Europe

Europe is the world's second largest consumer market for cocaine and continues to account for the majority of cocaine seizures made outside the Americas. Seizures peaked at 121 mt in 2006, then declined for three years in a row, falling to less than half this level – 57 mt – in 2009. The decreasing trend was observed in the West European countries that account for the biggest seizures in Europe, though several other countries have registered increases.

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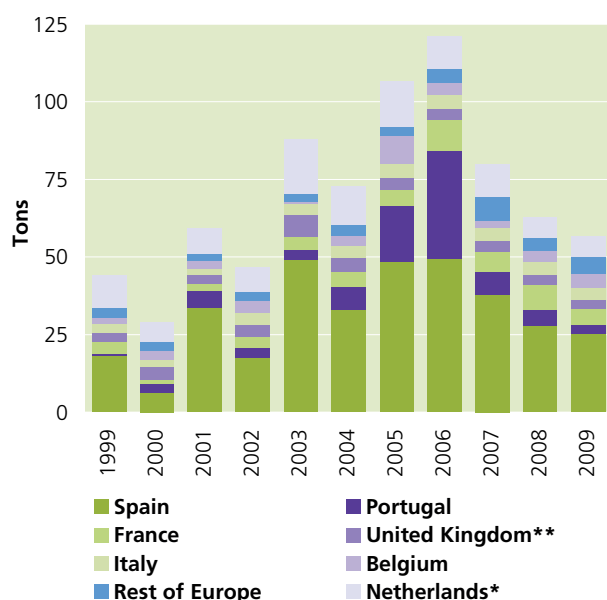
²⁴ A breakdown of cocaine seizures in Brazil for 2009 was not available.

Fig. 80: Cocaine seizures in Europe (mt), 1999-2009

* Data for 2009 for the Netherlands were unavailable; the value used is that corresponding to the year 2008, and is only included to estimate the regional total.

** Data for the United Kingdom for 2007, 2008 and 2009 are based on incomplete data for some jurisdictions for the financial years 2007/08, 2008/09 and 2009/10 respectively, and adjusted for the missing jurisdictions using the distribution in 2006/07.

Source: UNODC DELTA.



The Iberian peninsula is an important point of entry for cocaine reaching continental Europe. Spain consistently reports the highest cocaine seizures in Europe, though seizures fell from 50 mt in 2006 to 25 mt in 2009. In neighbouring Portugal, the decrease has been more pronounced, from 34 mt in 2006 (the second largest in Europe for that year) to 2.7 mt in 2009 (the seventh largest). Significant declines have also been registered in the Netherlands, where seizures fell from the peak level of 14.6 mt in 2005 to 6.8 mt in 2008.²⁵

In relative terms, seizure trends across Europe in recent years appear to fall broadly along a continuum ranging from strong declines close to the trafficking hubs that serve as the major points of entry or distribution in Europe to strong increases in countries, notably further east, that historically have not been associated with trafficking of cocaine in large amounts. When comparing average seizures over 2005-2006 with 2008-2009, marked declines (in both relative and absolute terms) were registered in Portugal, Spain, Belgium and the Netherlands;²⁶ more moderate declines were registered in the United Kingdom and France, while seizures were essentially stable in Italy and Germany. On the other hand, increases of more than 30% were observed in

several countries further east, including the Russian Federation, Turkey, Poland, Greece, Ukraine and Romania. In Ireland, seizures peaked in 2007, and have also declined significantly since then. This pattern suggests that, while the established trafficking routes for cocaine entering Europe continue to be important, cocaine may be entering Europe along new routes.

Romania reported cocaine seizures of 1.3 mt in 2009; this appears to include a single seizure of 1.2 mt at the port of Constanta, from two containers that arrived from the port city of Paranagua, Brazil in January 2009. The ensuing investigation also led to the seizure of 3.8 mt of cocaine in Paranagua in February 2009, also destined for Romania.²⁷

Purity-adjusted cocaine retail prices in West and Central Europe rose markedly in 2006, the year when seizures peaked; this was mainly due to a drop in purity. One possible explanation could be that heightened law enforcement efforts impacted on the availability of cocaine in the European cocaine market, and traffickers responded to this by selling the drug at reduced purities rather than raising the bulk price. Since 2006, the purity has remained relatively low, with adjusted prices. The purity-adjusted price – expressed in euros – declined between 2006 and 2008, and appeared to stabilize in 2009.

When adjusted for inflation, the purity-adjusted retail price in 2009, expressed in euros, was equal to (within 1%) that in 2005, prior to the increase in 2006. While these data need to be interpreted with caution, it is plausible that alternative cocaine trafficking methods and routes adopted by traffickers to counter more effective law enforcement efforts have corrected a short-term drop of cocaine availability in the European market. Moreover, the decline of cocaine prices expressed in euros over the 2006-2008 period went hand in hand with strongly falling value of the US dollar during that period, thus rendering imports, including cocaine imports, cheaper for the consumers.

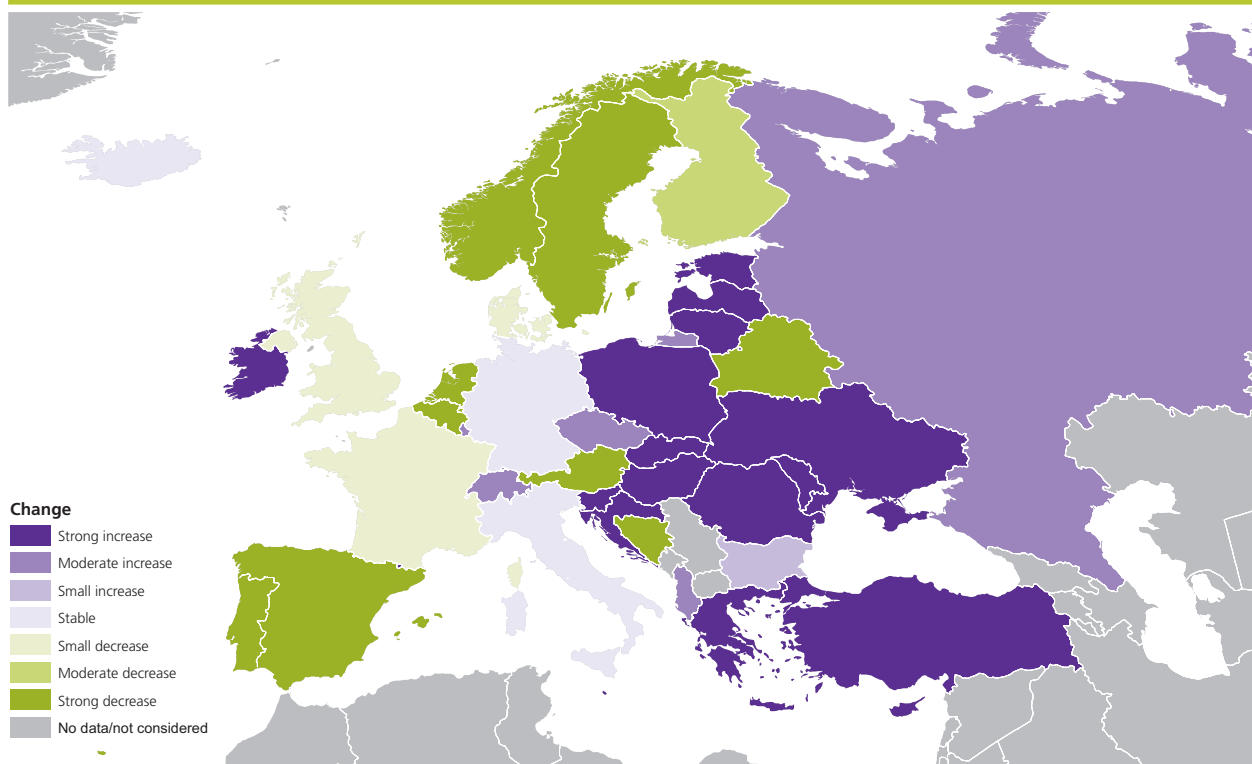
Africa

Cocaine seizures remained limited in Africa, amounting to less than 1 mt in 2009, down from 2.6 mt in 2008 and 5.5 mt in 2007. Although this quantity is very small in comparison with the quantities likely to be trafficked in and via Africa, seizure data from other regions also point to a decreasing trend for Africa, notably West Africa, for cocaine trafficking from South America to Europe. Nevertheless, cocaine trafficking in West Africa persisted, and Africa, especially West Africa, remained vulnerable to a resurgence. Benin, Burkina Faso, Ethiopia, the Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Mali, Niger, Nigeria, Senegal, South Africa and Togo

²⁵ Seizure data for the Netherlands for 2009 were not available.

²⁶ Considering data for 2008 only for the Netherlands.

²⁷ Embassy of the United States to Romania, *DEA and Romanian Police work together in stopping second cocaine shipment from Brazil to Romania*, press release, 9 February 2009.

Map 20: Cocaine seizure trends in Europe, average of 2008-2009 compared to average of 2005-2006

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

were all mentioned as transit countries²⁸ for cocaine trafficking in 2008 or 2009.

In 2008, the largest annual seizures of cocaine in Africa were registered by Ghana (841 kg), Sierra Leone (703 kg²⁹), Togo (393 kg, falling to 34 kg in 2009), Nigeria (365 kg, rising to 392 kg in 2009) and South Africa (156 kg, rising to 234 kg in 2009). On January 29, 2009, 230 kg of cocaine were seized by South African authorities on a vessel at Durban harbour.³⁰ In 2009, significant quantities – by African standards – were also seized in Angola, Senegal, Egypt and Morocco. In 2009, Senegal accounted for more than half (30) of cocaine seizure cases in Africa recorded in the WCO Customs Enforcement Network database. These customs seizures amounted to a total of 65 kg. The situation was different a year later. In 2010, 2.1 mt of cocaine were seized as part of an operation in the Gambia.³¹

²⁸ This includes references to African countries as countries of 'origin,' which likely refers to the origin of the trafficked drug as far back as it could be traced by the reporting country, rather than the country of manufacture.

²⁹ This quantity was seized from a plane in July 2008, in a single case. (Country report by Sierra Leone to the Nineteenth Meeting of Heads of National Drug Law Enforcement Agencies, Africa.)

³⁰ Country report by South Africa to the Fifteenth Asia-Pacific Operational Drug Enforcement Conference, Japan, 2-5 February 2010. The 2009 ARQ from South Africa was not available at the time of preparation of the present report.

³¹ EUROPOL, quoted in *European Cocaine Situation*, presentation at the Conference on combating the threat of illicit drugs and strength-

One factor contributing to the declining cocaine seizures in Africa may be the diversification of trafficking routes and methods, possibly in response to law enforcement efforts but also as a way of exploring new markets. Togo reported the emergence of new cocaine trafficking routes to Europe in 2009. Nigerian authorities estimated that half of the cocaine trafficked via its territory in 2009 might have been intended for the United States. This is possibly a reaction to the apparent shortage of cocaine on the US cocaine market, which is providing traffickers with incentives to look for alternative routes. Some reports also suggested a link between East and West Africa in cocaine trafficking. Swaziland reported an increase in cocaine trafficking in 2009.

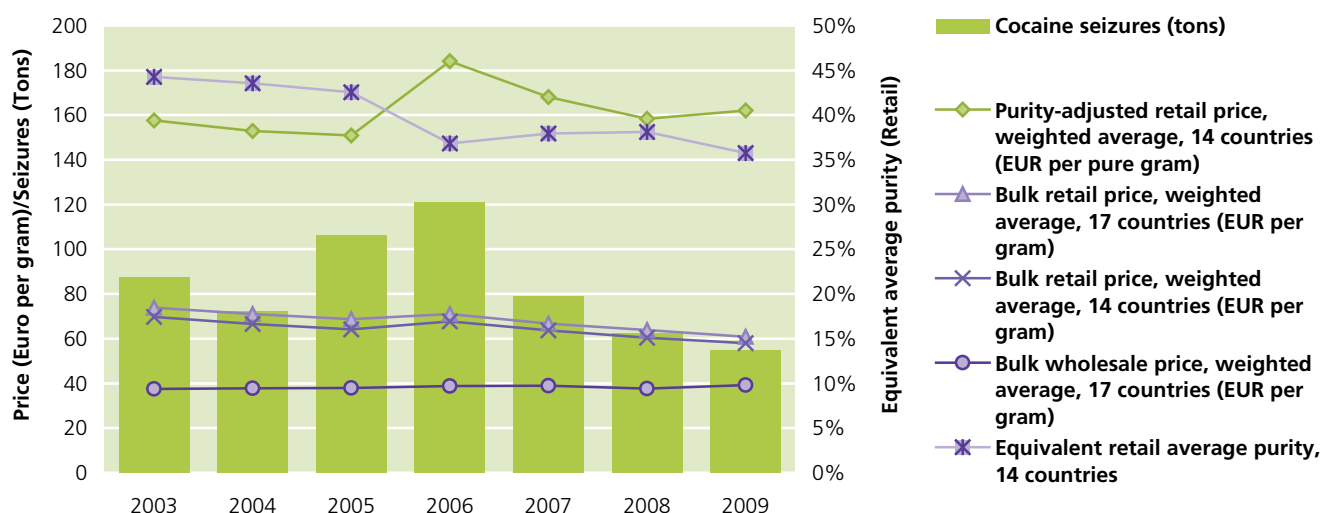
Cocaine is also trafficked directly from South America to South Africa, a country with a sizeable consumer market for this drug. South Africa assessed that, in 2008 and again in 2009, 40% of cocaine trafficked on its territory was intended for Europe, and the remainder for its domestic market. South Africa was also mentioned as a transit country for cocaine reaching several other African countries in 2009. According to Angolan authorities,³² cocaine usually reached Angola by air from Brazil via South Africa, Namibia and the Democratic Republic of the Congo.

³² ening control of precursor chemicals, Vienna, 8-9 July 2010.

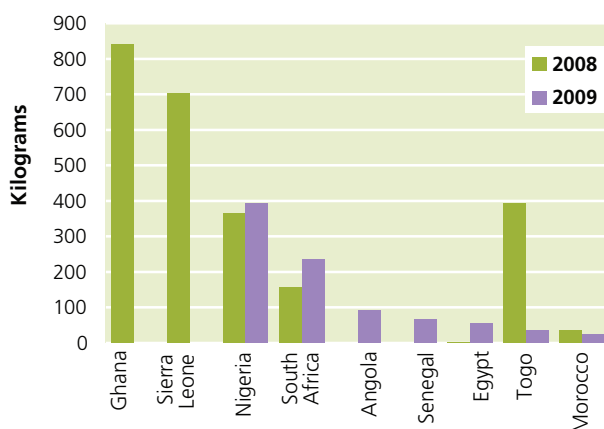
³² Country report by Angola to the Nineteenth Meeting of Heads of National Drug Law Enforcement Agencies, Africa.

Fig. 81: Cocaine prices and purity in West and Central Europe, 2003-2009

Source: UNODC ARQ.

**Fig. 82: Cocaine seizures in selected countries in Africa (kg), 2008-2009**

Source: UNODC DELTA.



The Asia-Pacific

The Asia-Pacific region continued to account for less than 1% of global cocaine seizures. However, there were signs that cocaine trafficking might be making inroads into new consumer markets. Seizures in the Asia-Pacific reached a record 1.6 mt in 2008, and stood at 766 kg in 2009.

In Australia, seizures rose from 626 kg in 2007 to 930 kg in 2008. In 2009, seizures in this country fell to 288 kg, but in 2010, two large seizure cases alone brought the partial total to more than 700 kg.³³ With reference to the period 1 July 2008 to 30 June 2009, Australia reported that nearly 70% of cocaine detections (by number) occurred in the postal stream, and that Mexico,

Colombia, Panama, Argentina, Canada, the United States, Brazil, the United Arab Emirates, Singapore, South Africa, the Plurinational State of Bolivia, Kenya and the Netherlands were all embarkation countries for the import of cocaine consignments larger than 1 kg. Moreover, Australia pointed to a possible shift away from imports of small quantities of cocaine.

In 2008 seizures rose to 664 kg³⁴ in China, including the 69 kg that were seized in Hong Kong, China and the 64 kg³⁵ in Taiwan Province of China. In 2009, China reported seizures of 163 kg, including 112 kg in Hong Kong, China. According to Chinese authorities, cocaine was mainly smuggled from South America across the Pacific ocean to cities on China's south-east coast.³⁶

In 2009, the Philippines registered a record level of cocaine seizures of 259 kg; in contrast, seizures in this country amounted to less than 3 kg annually over the period 2003-2008. The increase was partly due to a large quantity of cocaine that was jettisoned in December 2009 close to the Eastern Samar province from a vessel on its way from South America to China. Two other significant cases resulted in the seizure of a total of 15.5 kg of cocaine in the Port of Davao. The Philippines assessed that 30% of the total reached the Philippines via Germany, and an additional 30% via Malaysia, and that the cocaine was intended for China (40% was intended for Hong Kong, China).

³³ Australian Federal Police, *Drug syndicate smashed, 464 kg of cocaine seized*, media release, 14 October 2010.

³⁴ UNODC, data collated by DAINAP.

³⁵ Food and Drug Administration of Taiwan Province of China

³⁶ National Narcotics Control Commission of China, presentation at the Twentieth Anti-Drug Liaison Officials' Meeting for International Cooperation (ADLOMICO), October 2010

Table 25: Cocaine prices in Europe and the United States (not purity adjusted), 1990-2009

Retail price (street price), US\$/gram																				
EUROPE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Austria	198	180	167	120	126	156	138	118	113	93	94	78	71	90	103	101	78	99	110	97
Belgium	80	90	68	95	82	93	90	57	55	60	55	51	50	51	51	51	60	67	72	71
Denmark	144	135	111	90	150	176	169	108	119	165	106	120	91	122	82	82	81	74	99	93
Finland	159	150	126	105	165	191	184	123	179	157	138	121	111	151	146	125	100	110	154	139
France	99	119	140	153	151	174	125	87	84	82	50	87	75	90	99	94	97	96	103	83
Germany	120	103	111	95	109	103	90	77	72	68	57	58	57	68	73	79	74	86	91	87
Greece	150	120	105	54	116	111	144	91	54	82	69	72	75	96	93	79	110	110	110	104
Ireland	141	137	120	110	100	119	32	34	32	30	28	28	94	79	87	88	88	96	103	97
Italy	108	120	164	90	104	113	129	109	129	135	100	89	90	101	113	114	104	112	111	99
Luxembourg	150	150	150	150	172	194	127	115	110	119	119	119	107	96	114	105	106	89	89	89
Netherlands	66	70	74	66	60	79	52	64	38	33	33	33	33	33	50	59	60	59	63	63
Norway	176	170	255	156	145	150	153	177	133	128	114	157	165	170	155	155	157	164	154	154
Portugal	63	57	60	57	59	66	64	57	51	43	56	48	36	47	49	55	56	55	66	66
Spain	110	100	100	63	78	91	72	68	68	63	52	52	56	70	76	76	76	83	89	83
Sweden	160	152	183	123	148	118	118	98	88	97	77	79	87	99	93	92	101	96	138	104
Switzerland	178	144	188	136	146	148	127	117	110	109	77	69	74	89	86	86	74	75	65	82
United Kingdom	131	127	69	123	113	111	102	124	128	104	94	94	84	90	91	79	87	91	74	62
Unweighted average, US\$	131	125	129	105	119	129	113	95	92	92	78	80	80	92	92	89	88	92	99	93
Inflation adjusted, 2009 US\$	215	197	197	156	172	181	154	128	121	119	97	96	95	107	105	98	94	95	99	93
Weighted average, US\$	117	115	118	104	112	118	105	92	92	88	70	74	72	84	88	86	86	91	94	85
Inflation adjusted, 2009 US\$	192	180	180	154	162	166	144	123	121	113	88	90	85	97	100	95	91	95	94	85
Weighted average in Euro	92	92	91	88	94	91	83	81	82	82	76	83	76	74	71	69	71	67	64	61
Inflation adjusted, 2009 Euro	144	138	130	122	126	119	106	102	102	101	92	98	87	83	78	74	75	69	64	61

Sources: UNODC ARQ data and EUROPOL; UNODC estimates in italics

USA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Street price in US\$	97	93	81	84	79	91	91	81	81	81	96	96	83	90	84	85	94	104	119	120
Inflation adjusted, 2009 US\$	159	147	123	125	115	128	124	108	106	104	119	116	99	105	96	93	100	107	118	128
Purity adjusted	167	148	120	122	119	149	124	125	117	125	155	166	119	131	122	124	127	157	215	237
Purity and inflation adjusted, 2009\$	274	233	184	181	172	209	170	167	154	161	193	201	142	153	139	137	135	163	214	237

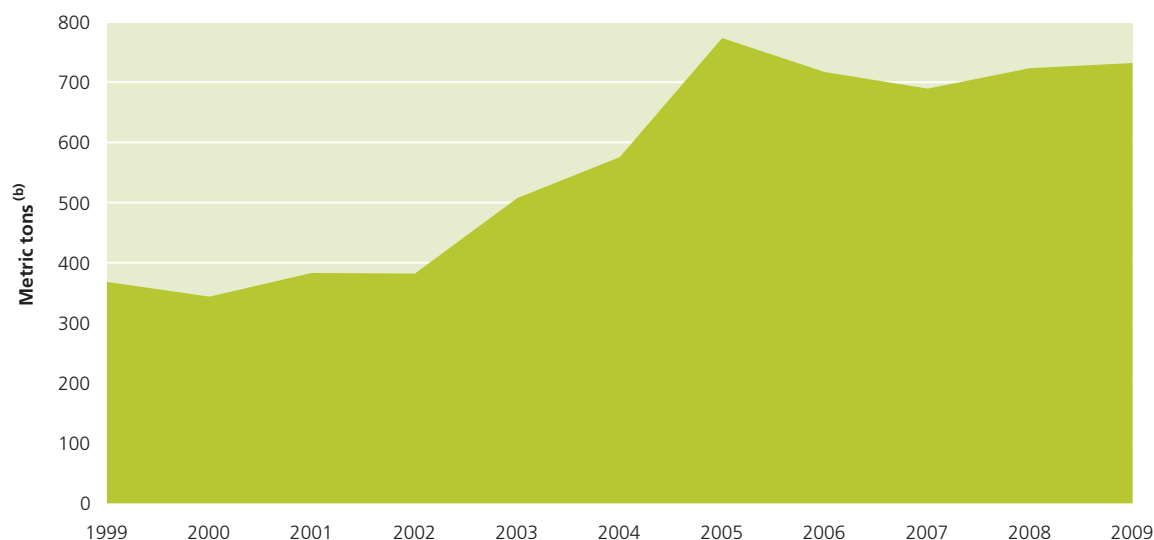
Sources: for 1990-2006, ONDCP, National Drug Control Strategy Data Supplement 2010; for 2007-2009, UNODC estimates based on ARQ (STRIDE data) and prices for 2006.

Wholesale price, US\$/kg																				
EUROPE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Austria	66,000	66,000	54,000	40,000	41,946	52,084	45,875	56,723	54,440	38,859	47,094	43,995	42,385	59,300	55,894	59,757	50,183	61,661	66,176	48,668
Belgium	25,000	24,000	38,250	28,000	26,920	30,560	21,927	17,025	19,167	23,859	22,376	26,771	28,111	29,610	32,480	32,480	32,480	47,956	53,757	46,675
Denmark	80,000	85,000	85,000	82,500	58,516	60,034	46,141	38,640	44,517	78,900	43,462	47,839	37,823	53,160	45,896	50,321	40,520	40,445	43,447	40,730
Finland	79,500	75,000	62,750	52,500	82,500	95,450	91,750	61,550	89,350	78,460	68,321	59,492	51,804	62,150	68,315	68,315	56,611	61,660	66,176	62,573
France	117,000	38,250	45,000	38,250	40,000	39,877	48,077	43,554	42,159	27,714	27,000	34,978	37,676	45,200	49,683	50,321	50,190	61,661	44,118	41,715
Germany	69,000	53,100	60,300	54,142	57,692	54,676	53,925	45,294	41,210	39,639	33,752	33,235	34,476	40,110	44,243	46,525	45,320	48,826	54,114	57,171
Greece	75,000	90,000	95,000	36,000	46,413	53,098	72,015	43,795	49,180	49,320	41,237	40,359	42,385	53,680	57,446	62,902	62,735	62,735	69,853	63,964
Ireland	45,000	45,000	40,000	50,000	45,000	42,000	31,646	33,733	31,530	29,891	29,891	29,891	29,891	30,510	38,557	38,506	39,636	41,107	44,118	36,161
Italy	54,000	48,000	94,000	41,935	51,097	51,455	55,633	50,629	49,091	47,250	46,000	40,529	41,412	47,440	51,759	52,188	52,920	56,029	63,514	57,153
Luxembourg	93,919	95,939	113,521	50,847	157,593	141,343	47,625	43,103	41,072	47,718	47,718	47,718	47,718	47,718	51,052	31,450	31,450	31,451	31,451	31,451
Netherlands	26,500	28,000	29,500	26,500	24,680	33,232	23,894	29,698	22,355	27,500	27,500	27,500	27,500	27,400	33,775	33,775	35,000	42,409	46,691	46,691
Norway	120,000	120,000	127,500	110,000	39,971	50,000	41,670	60,028	81,699	57,545	51,417	51,569	54,159	56,500	65,209	65,209	56,400	61,661	51,471	51,471
Portugal	39,500	39,285	33,000	27,000	27,950	34,483	42,591	37,908	33,447	30,000	28,000	29,080	31,046	32,410	36,399	36,399	31,365	34,256	44,118	41,716
Spain	65,000	60,000	55,000	35,000	36,434	41,322	38,760	36,806	38,924	38,898	30,882	38,898	31,511	38,830	42,167	41,321	41,210	46,274	48,709	45,941
Sweden	80,000	85,000	91,375	61,450	73,825	55,556	59,255	45,573	50,484	48,508	38,394	34,693	35,763	43,130	39,560	40,068	39,270	51,883	72,844	45,459
Switzerland	63,900	94,250	116,250	50,847	72,012	75,949	51,587	40,780	41,152	41,000	35,482	23,392	19,274	37,230	44,008	44,008	41,090	44,351	49,307	50,379
United Kingdom	47,850	46,475	20,625	43,210	45,000	46,774	40,625	47,500	47,500	33,981	38,168	36,008	35,848	40,880	50,036	50,036	50,943	60,362	64,682	76,963
Average unweighted	67,481	64,312	68,298	48,717	54,562	56,347	47,823	43,079	45,722	43,473	38,629	37,997	36,987	43,839	46,263	47,270	44,549	50,278	53,797	49,699
Inflation adjusted, 2009 US\$	110,766	101,301	104,437	72,329	78,985	79,320	65,391	57,582	60,179	55,982	48,126	46,029	44,108	51,114	52,542	51,926	47,407	52,023	53,605	49,699
Weighted average, US\$	67,639	51,835	57,493	44,032	47,117	48,204	47,823	44,011	43,456	38,510	35,592	36,089	35,941	42,308	46,898	47,739	46,963	53,390	55,261	54,577
Weighted average, US\$ per gram	68	52	57	44	47	48	48	44	43	39	36	36	36	42	47	48	47	53	55	55
Inflation adjusted, 2009 US\$	111,026	81,648	87,915	65,372	68,208	67,858	65,391	58,829	57,195	49,591	44,343	43,718	42,861	49,330	53,262	52,442	49,977	55,242	55,065	54,577
Inflation adjusted, 2009 US\$/gram	111	82	88	65	68	68	65	59	57	50	44	44	43	49	53	52	50	55	55	55
Weighted average, Euro/gram	53	42	44	38	40	37	38	39	39	36	38	40	38	37	38	38	39	39	38	39
Inflation adjusted, 2009 Euro/gram	83.1	62.2	63.4	52.0	53.3	48.4	48.4	48.6	48.3	44.3	46.3	47.4	43.9	42.2	41.7	41.0	41.1	40.4	37.7	39.2

Sources: UNODC ARQ, EUROPOL; UNODC estimates in italics

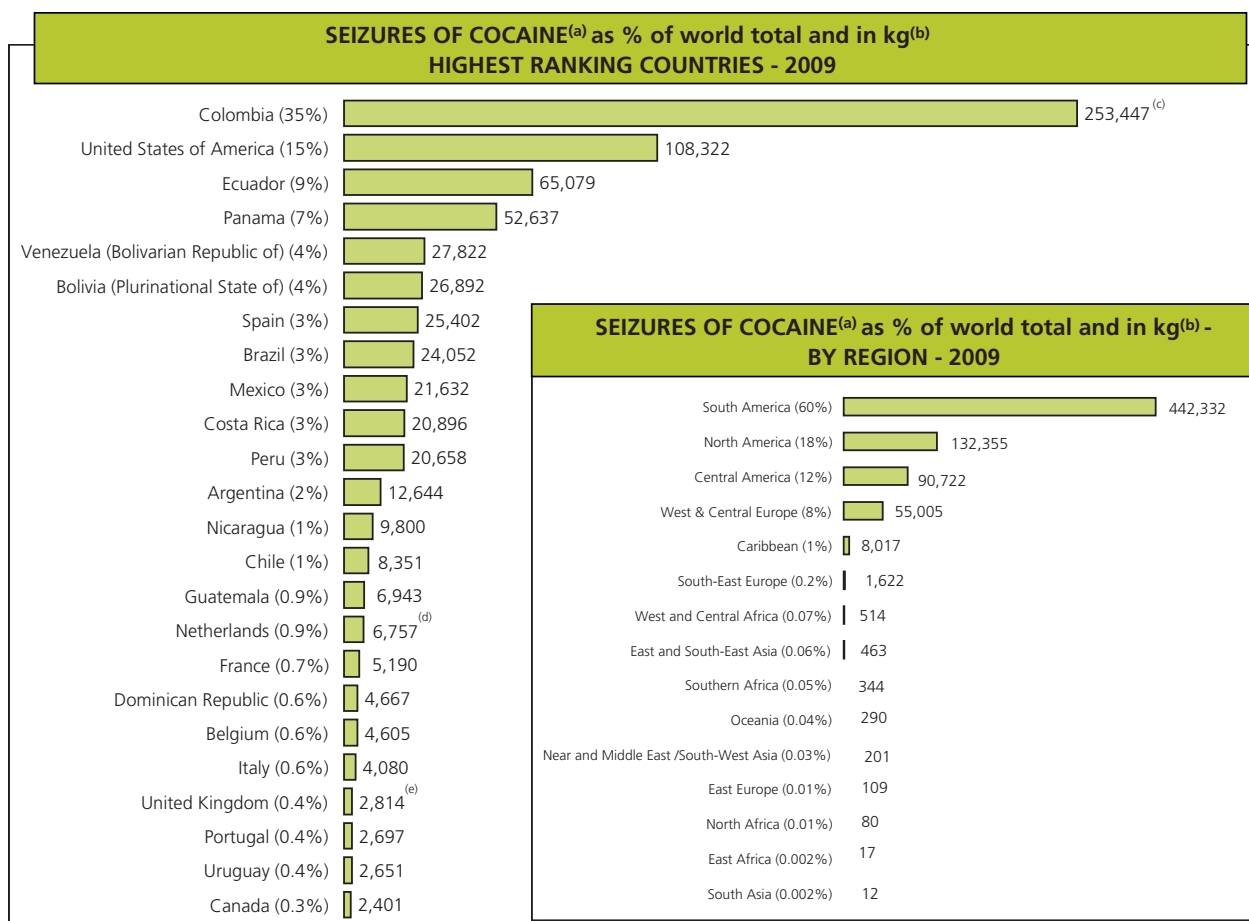
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
US wholesale price	34	32	31	29	27	28	27	28	25	25	26	24	24	24	24	24	23	23	26	27
Purity-adjusted	52	42	41	39	36	41	37	41	35	40	46	44	41	38	37	34	31	37	53	57
Inflation and purity adjusted, 2009 dollars	85	66	62	59	51	57	50	54	46	52	57	53	49	44	42	38	33	39	53	57

Source: ONDCP, transactions in excess of 50 grams, based on Expected Purity Hypothesis

Fig. 83: Global seizures of cocaine^(a), 1999-2009

^(a) Includes cocaine HCl, cocaine base and crack-cocaine

^(b) Seizures as reported (no adjustment for purity).



^(a) Includes cocaine HCl, cocaine base and crack-cocaine.

^(b) Seizures as reported (no adjustment for purity).

^(c) Excluding 1.9 tons of "basuco".

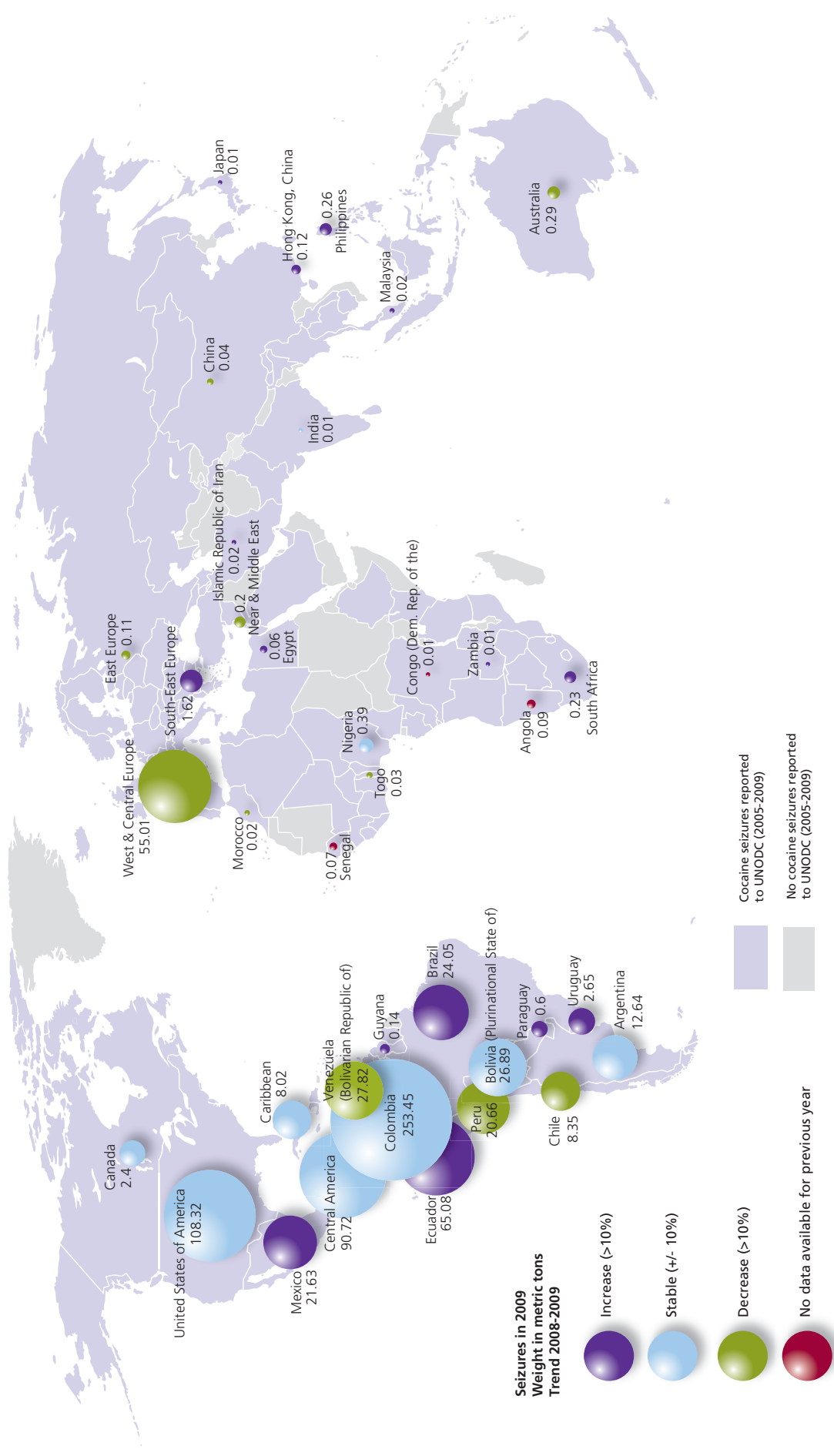
^(d) Data relative to 2008. Data for 2009 from the Netherlands were not available.

^(e) Data for the United Kingdom for 2009 are based on incomplete data for some jurisdictions for the financial year 2009/10, and adjusted for the missing jurisdictions using the latest available complete distribution (relative to the financial year 2006/07).

Fig. 84: Global seizures of cocaine, 1999-2009

^(a) Includes cocaine HCl, cocaine base and crack-cocaine

Map 21: Seizures of cocaine, 2009 (countries and territories reporting seizures of more than 10 kg)



* Seizures as reported (no adjustments made for purity). Includes cocaine base, cocaine hydrochloride and crack-cocaine.

Source: UNODC Annual Reports Questionnaires data supplemented by other sources

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



3.5 Market analysis

Transnational cocaine trafficking has been affecting the Americas for the last 40 years. The size of the United States' market – the single largest cocaine market for decades – has been shrinking in recent years, mainly due to a reduction of the cocaine flows from Mexico to the United States. The massive decline of the US cocaine market has been partly offset by a rise of cocaine use in new destination markets (mainly in areas with above average purchasing power) and countries caught in the transit flow. Cocaine trafficking and use have started to affect countries in the Oceania region (already showing high annual cocaine use prevalence rates by international standards), countries in western and southern Africa affected by the transit flow, and in some parts of Asia (some countries in the Near and Middle East as well as some emerging pockets in a few countries in the Far East).

The most developed cocaine market outside of the Americas continues to be Europe, notably West and Central Europe. Cocaine use in East Europe, in contrast, is still limited. The volume of cocaine consumed in Europe has doubled over the last decade, even though data for the last few years show signs of stabilization at the higher levels.

While European law enforcement agencies have increased their efforts, traffickers continue to innovate, seeking novel ways of getting their product to the consumer. Around 2004, South American traffickers began to experiment with some new trafficking routes via West Africa. In a few years, they managed to undermine security and sow high-level corruption in a number of West African states. Recognizing the threat, the international community undertook a variety of interventions to address this flow. The novelty aspect was lost, the political instability proved self-defeating, and some very large seizures were made. By 2008, there was a remarkable decline in the number of both large maritime seizures and the number of cocaine couriers detected flying from West Africa to Europe. Criminal intelligence work indicates that the flow may have declined, but it did not stop. This raises the possibility that traffickers had simply modified their techniques, finding new methods for bringing cocaine to Europe, including through West Africa, without detection. Statistical data support this scenario: European cocaine seizures decreased from 121 mt in 2006 to 57 mt in 2009. But demand has not

dropped by half during this period. Some (but not all) of the decline may be explained by improved upstream interception efforts as a result of improved sharing of intelligence with counterparts in South America.³⁷

Cocaine consumption estimates

One of the most challenging tasks is to transform estimates on the number of cocaine users into quantities of cocaine consumed. Information on per capita use is still limited (a few studies conducted in North America, South America, Europe and Australia) and any calculated results must be treated with caution (and results are subject to change, whenever more reliable information becomes available). The best reading of existing data and estimates suggests that some 440 mt of pure cocaine were consumed in 2009. This would be in line with a production estimate of some 1,111 mt of cocaine, wholesale purity-adjusted seizures of 615 mt and global losses of some 55 mt (5% of production).

Of the 440 mt available for consumption, around 63% were consumed in the Americas, 29% in Europe, 5% in Africa, 3% in Asia and less than 1% in Oceania. The largest subregional markets were found in North America (close to 180 mt or 41% of the total), West and Central Europe (123 mt or 28%) and South America (85 mt or 19%). These three subregions account for 63% of global cocaine consumption. The single largest cocaine market – despite strong declines in recent years – continues to be the United States of America, with an estimated consumption of 157 mt of cocaine, equivalent to 36% of global consumption, which is still higher than the cocaine consumption of West and Central Europe.

Cocaine consumption in volume terms appears to have declined by more than 40% over the 1999-2009 period in the United States to some 157 mt (range: 133-211 mt), with most of the decline (more than a third) having taken place between 2006 and 2009. As compared to estimates for 1989, cocaine consumption in the United States seems to be now some 70% lower (range: -63% to -77%), in parts reflecting the increase in treatment and successes in prevention, while the latest decline over the 2006-2009 period was attributed more to reduced supply.



³⁷ UNODC, *The Transnational Cocaine Market*, April 2011.

Fig. 85: Estimates of the amounts of cocaine consumed, by region, subregion and globally, 2009

Source: UNODC estimates based on ARQ data and the 2005 World Drug Report, as well as updates based on selected scientific studies.

Region/subregion	Best estimates				
	Users		Per capita use	Consumption	
	in million	in % of total	grams per year	in metric tons	in % of total
Americas	8.4	54%	32.6	275	63%
<i>of which</i>					
South America	2.4	15%	35.0	85	19%
Central America	0.1	1%	35.0	5	1%
Caribbean	0.1	1%	35.0	6	1%
North America	5.7	36%	31.5	179	41%
Europe	4.5	29%	28.4	129	29%
<i>of which</i>					
West and Central Europe	4.1	26%	30.3	123	28%
East and South-East Europe	0.5	3%	12.3	6	1%
Africa	1.7*	11%	12.0	21	5%
<i>of which</i>					
West and Central Africa	1.1	7%	12.0	13	3%
Southern Africa	0.3	2%	12.0	4	1%
North Africa	< 0.1	<1%	12.0	< 1	< 1%
East Africa	0.2	1%	12.0	3	< 1%
Asia	0.7*	4%	20.0	14	3%
Oceania	0.3	2%	7.3	2	< 1%
Total	15.6*	100%	28.1	440	100%

* Given the uncertainty of data from Asia and Africa, for the purpose of consumption estimates, a lower level of cocaine use is assumed for these regions.

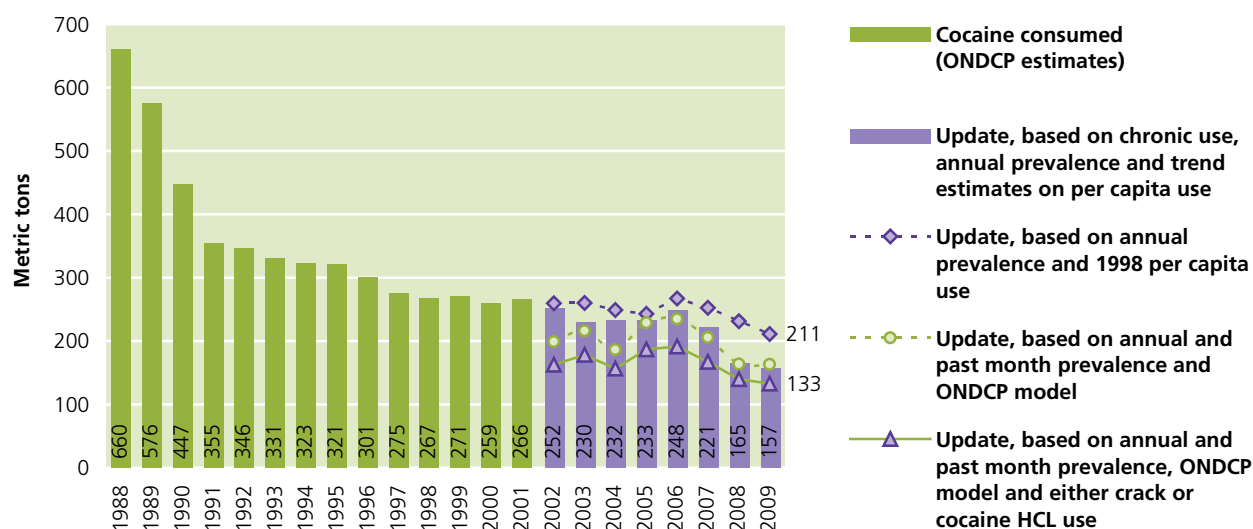
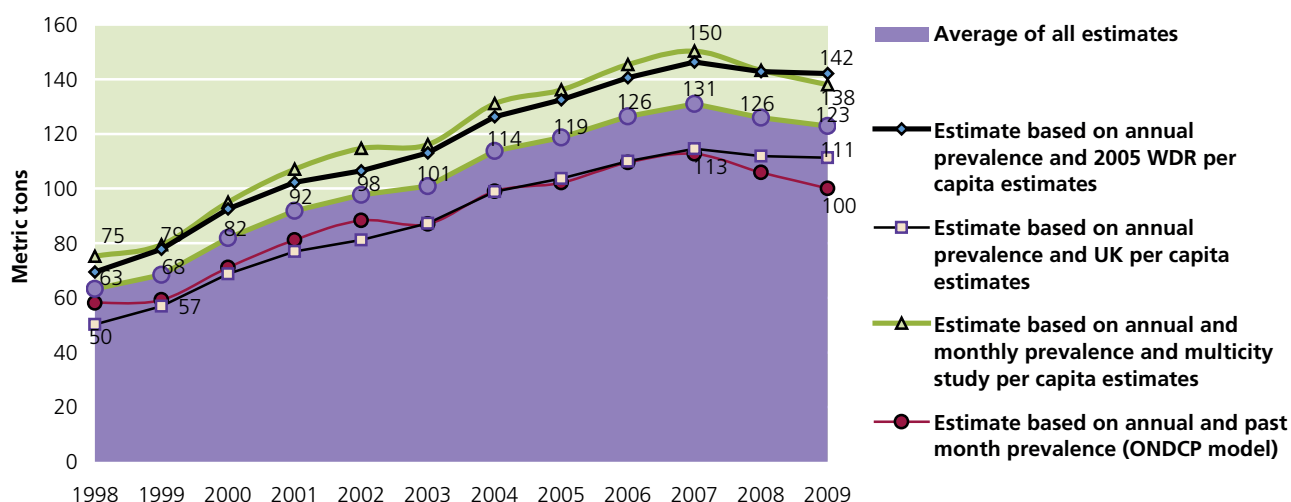
Fig. 86: Estimates of cocaine consumption in the United States (mt), 1988-2009Source: UNODC, *World Drug Report 2010* and UNODC update for 2009.

Fig. 87: Estimates of cocaine consumption in the EU and EFTA countries (mt), 1998-2009Source: UNODC ARQ; Government reports; UNODC, *World Drug Report 2010*; EMCDDA, *Statistical Bulletin 2009*.

The opposite trend has been observed in Europe. Cocaine consumption in the EU and EFTA countries is estimated to have almost doubled, from 68 mt in 1999 (range: 57-79 mt) to 123 mt in 2009 (range: 100-142 mt). Between 2006 and 2009, cocaine consumption stabilized, and between 2007 and 2009, it may have slightly declined.

Evolution of trafficking flows

These shifts in demand have also had an impact on the nature of transnational cocaine trafficking. In the late 1990s, the bulk of the world's cocaine was shipped to the United States, increasingly controlled by Mexican groups. The Caribbean, which was the preferred transit zone when the Colombian cartels dominated the market, saw decreased trafficking as a growing share was moved via the Pacific through Mexico into the United States. Colombian traffickers, who had largely been driven from the more lucrative portions of the supply chain to North America by the Mexican cartels, increasingly focused on the growing European market.

Traditionally, there have been several parallel streams of cocaine flowing into Europe. Commercial air couriers, sometimes directed by West African groups in the new millennium, have flown to Europe from various intermediate countries in the Caribbean. Colombian groups also made use of commercial air carriers, often in cooperation with groups from the Dominican Republic, with whom they have a long-standing relationship. Larger maritime consignments were often stored on board 'mother ships' and transported to shore by smaller vessels. The primary maritime points of entry were Spain (due to proximity and cultural links) and the Netherlands (due to the large port). These vessels typically transited the Caribbean.

Some time around 2004, the Colombian groups began experimenting with routing their cocaine shipments through West Africa. From 2005 to 2008, a series of very large cocaine seizures took place in or near West Africa. Many of these involved 'mother ships' intercepted by European navies. There were also incidents where modified small aircraft were used. High-level officials were involved in some countries. There was also a sharp increase in the number of cocaine couriers found on flights from West Africa to Europe.

Around 2008, local political events (leading to the toppling of some of the regimes in West Africa that cooperated closely with the narco-traffickers)³⁸ coupled with international attention to the issue, led to a dramatic reduction in the number and volume of seizures, including both maritime shipments and commercial air couriers. In parallel, the proportion of individual cocaine seizures in Europe that transited countries of West and Central Africa declined from around 25% in 2007 (range: 21%-30%) to some 13% in 2009 (range: 11%-17%).

In 2008, only four large (over 100 kg) seizures were made, and in 2009, only one. According to IDEAS, an air courier database, in the second quarter of 2007, 59% of cocaine couriers detected were from West Africa, while in the third quarter of 2009, there were none. Since then, some increases - up to 5% of couriers detected - were again reported in the fourth quarter of 2009 and, on average, 11% in 2010.

Despite this apparent reduction or even disruption, informal reports indicated that the trafficking continued. The use of jet aircraft, which can fly deeper inland in Africa, might have become an alternative method of moving cocaine through West Africa to Europe.

38 UNODC, *The Transnational Cocaine Market*, April 2011.

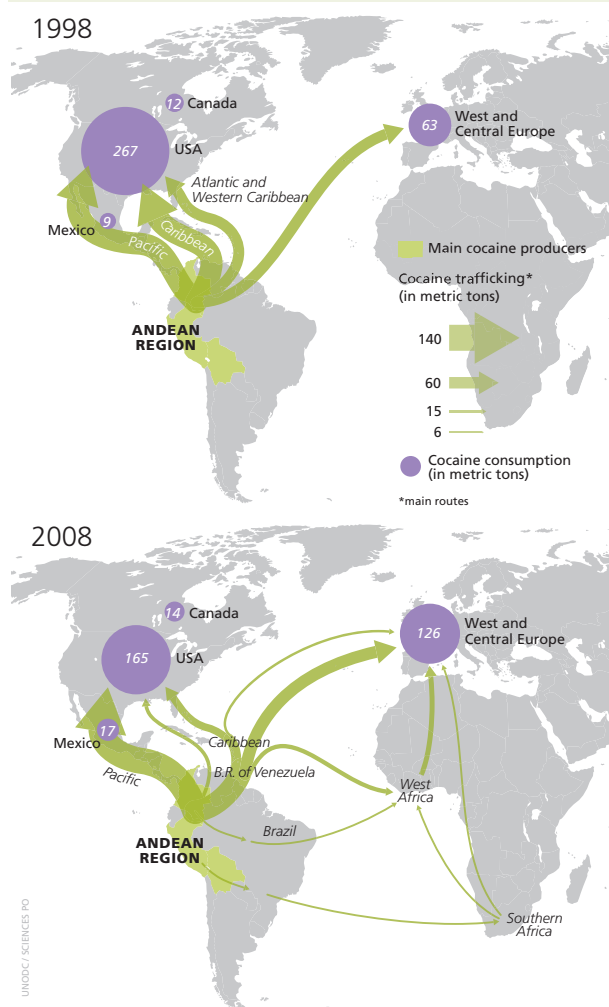
Table 26: Proportion of cocaine trafficked via West and Central Africa to Europe (based on individual drug seizures in Europe where the 'origin' of the shipment was known)

Source: UNODC IDS.

	2004	2005	2006	2007	2008	2009
Cocaine seizure cases	2.9%	14.7%	16.4%	29.5%	23.8%	16.0%
Amounts of cocaine seized	1.1%	2.7%	13.4%	21.3%	3.6%	10.7%
Mid-point ('best estimate')	2.0%	8.7%	14.9%	25.4%	13.7%	13.4%

Map 22: Global cocaine flows, 1998 and 2008

Source: UNODC World Drug Report 2009 and UNODC calculations informed by US ONDCP, Cocaine Consumption Estimates Methodology, September 2008 (internal paper).

**Current trafficking flows to main consumer markets**

It is estimated that almost 380 mt or 45% of the total cocaine exports from the Andean region leave for North America, a region with a population of some 460 million people. The bulk of cocaine shipments are still by sea across the Pacific to Mexico and on to the United States. In addition, Central American countries have gained prominence in recent years as trans-shipment locations. The Caribbean, in contrast, has lost significance as a trans-shipment hub over the last decade. More

recent data suggest that the downward trend did not continue in 2009 and some early indications for 2010 suggest that the importance of the Caribbean may have started to rise again. Seizures made in South American countries outside the Andean region, in Central America and the Caribbean in relation to shipments towards North America are estimated at slightly less than 100 mt (purity-adjusted). A further 100 mt of purity-adjusted cocaine seizures are made in North America. Thus, out of 380 mt exported to North America, only some 180 are available for consumption, of which the bulk (88%) is consumed in the United States.

The second largest flow is to Europe. The global shift in demand has also affected trafficking routes to Europe, with much greater volumes crossing the Atlantic by air and sea. Some 220 mt or 26% of total cocaine exports left the Andean countries for West and Central Europe in 2009. Of this, close to 60 mt (purity-adjusted) were seized in other South American countries or in the Caribbean. Thus, close to 160 mt left South America for West and Central Europe in 2009.

The seizures in West and Central Europe (including seizures on the open sea off the shores of Europe) amounted to some 35 mt (purity-adjusted), leaving 123 mt for consumption in this region (range: 100–138 mt). This is in line with an overall prevalence rate of 0.8% of the population aged 15–64 and per capita use levels of around 30 grams of pure cocaine per user per year, for a total population of around 480 million people in West and Central Europe (EU and EFTA countries). The overall amount consumed in Europe is estimated at 129 mt, suggesting that West and Central Europe (123 mt) accounts for 95% of the total European cocaine market.

An analysis of individual drug seizures reported in Europe suggests that more than 86% of the drugs were trafficked directly to West and Central Europe, while around 13% were trafficked via West Africa. Trafficking via West and Central Africa would have amounted to some 21 mt.³⁹ In addition, cocaine is trafficked for local demand to West and Central Africa – a subregion with a combined population of more than 400 million people, which may consume some 13 mt. Trafficking flows to

³⁹ 158 mt * 13.4% = 21 mt; range: 158*10.7% to 158*16% = 17–26 mt.

Table 27: Flows of cocaine, purity-adjusted*, to major consumer markets (mt), 2009

Source: UNODC estimates based on Annual Reports Questionnaire data and other government or scientific sources.

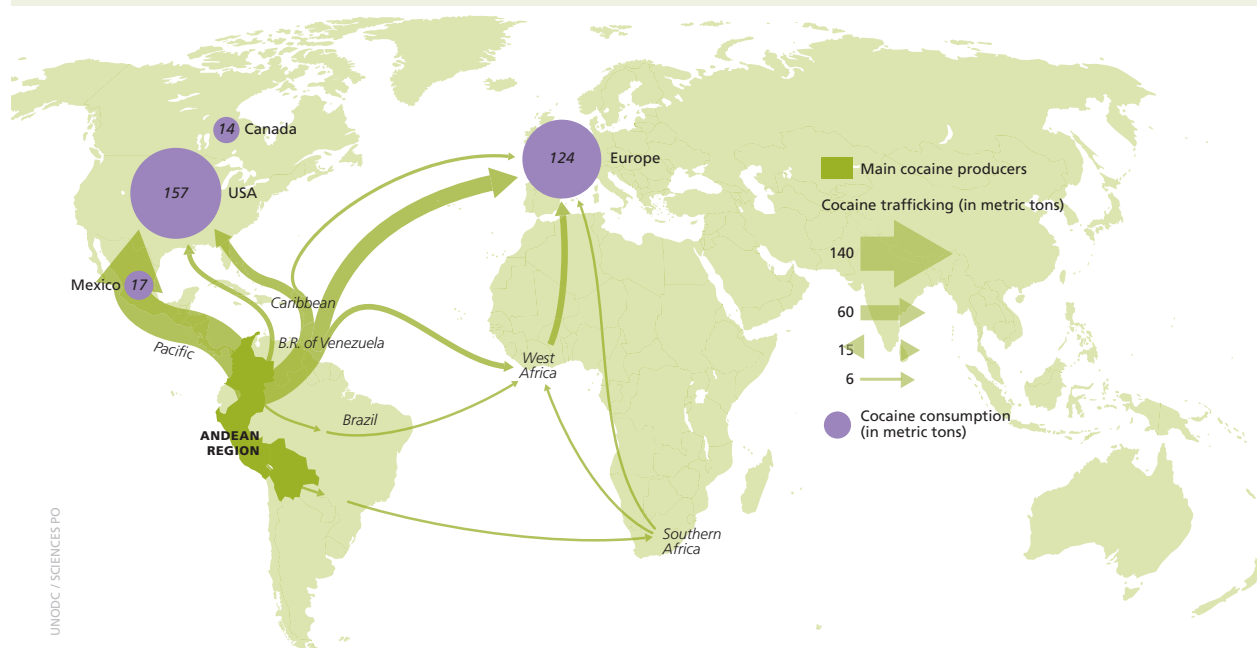
Production**		1,111	
Less seizures in Andean countries		-254	
Less domestic consumption in Andean region		-13	
Potential amounts available for export out of the Andean countries		844	
Less losses in production and/or losses in global trafficking which cannot be attributed to specific regions		-56	
Actual exports out of Andean countries		788	
	West and Central Europe	North America	Non-Andean South America / Caribbean, Central America, Africa, Asia, Oceania
Amounts of cocaine leaving the Andean countries	217	378	193
Less amounts seized in non-Andean South America, Caribbean and Central America linked to trafficking flows	-59	-98	-64
Less domestic consumption in non-Andean South America / Caribbean / Central America			-83
Amounts leaving South America, Caribbean and Central America	158 (incl. 21 mt via West Africa)	280	46
Less amounts seized in consumer countries outside South America / Central America / Caribbean	-35	-101	-3
Amounts of cocaine consumed in countries outside South America / Central America / Caribbean	123	179 (incl. 157 in the USA)	43 (incl. 21 Africa, 14 Asia, 6 East and South-East Europe; 2 Oceania)

*Purity levels tend to decline along the trafficking chain. All numbers in this table have been adjusted to pure cocaine equivalents. Seizure data were adjusted based on reported wholesale purity data.

** The global cocaine production in 2009 was estimated to amount to between 842 mt and 1,111 mt. Actual cocaine consumption for 2009 was estimated at 440 mt. Seizures, not adjusted for purity, amounted to 732 mt in 2009. Considering purity-adjusted seizures of cocaine (unweighted average of all purities at retail and wholesale level reported by Member States in 2009), some 481 mt would be available for consumption and losses if the lower cocaine production estimate were used. If the higher cocaine production estimate were used, deducting seizures adjusted for wholesale purity (based on 2009 purity data or the latest year available), some 496 mt would be left for consumption and losses. The upper and the lower production estimates could be thus sufficient to cover consumption (440 mt). For the calculation shown above, the higher production estimates and seizures adjusted at wholesale purities were used. This reflects the observation that wholesale seizures account for the bulk of seizures in volume terms and would support the higher production estimates. However, one cannot exclude the possibility that seizures may be over-estimated due to possible double-counting once several law enforcement agencies within or across countries have been involved in cocaine interceptions.

Map 23: Main global cocaine flows, 2009

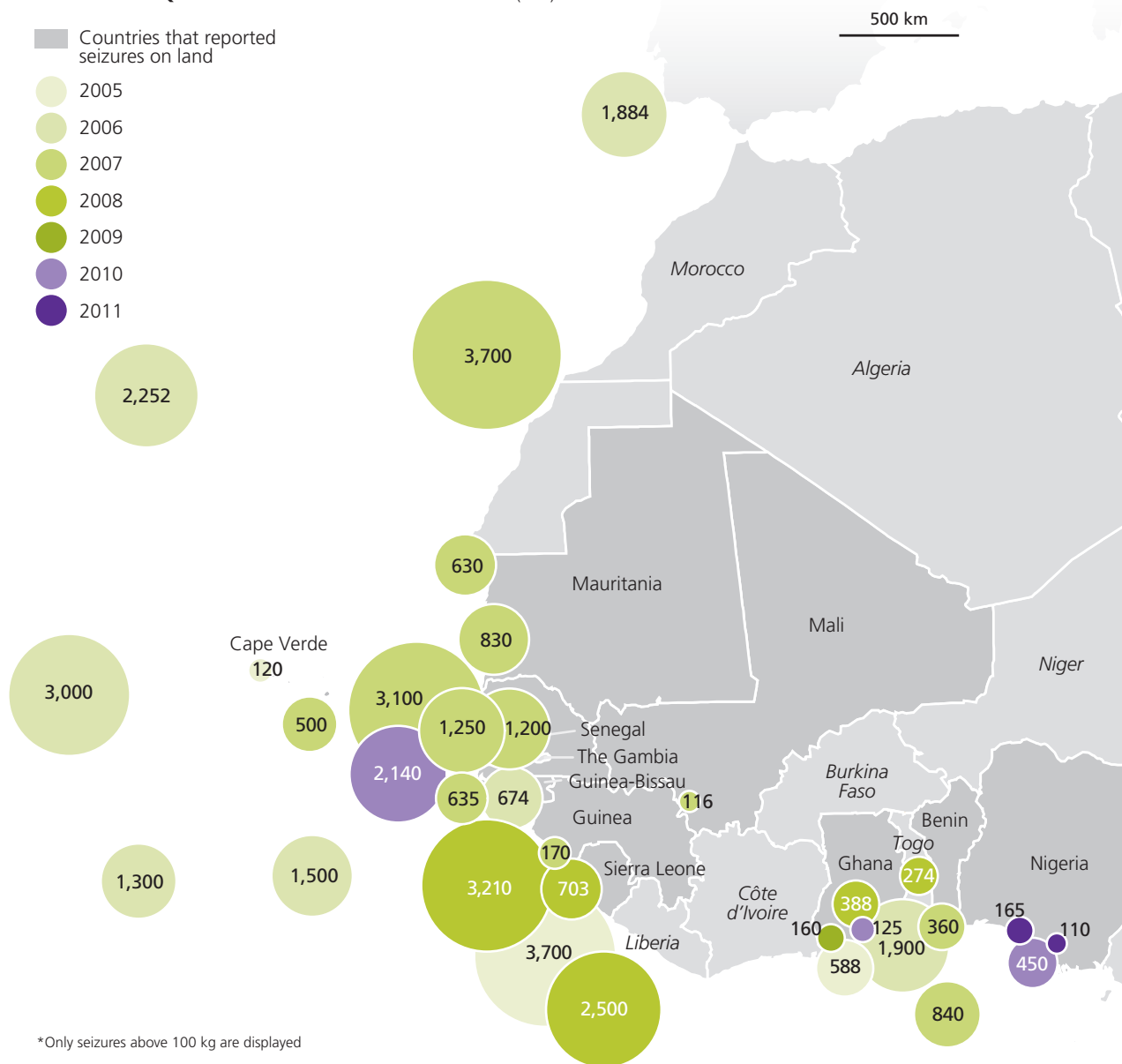
Source: UNODC, World Drug Report 2010, updates for 2009.



Map 24: Significant cocaine seizures affecting West Africa, 2005-2011*

* January 2011

Source: UNODC IDS; Government sources.

PLACE AND QUANTITY OF COCAINE SEIZURES (KG)*

West Africa could have thus amounted to some 35 mt in 2009 (range: 21-55 mt), equivalent to 4% (range: 2%-6%) of total cocaine exports out of the three Andean countries - of which almost two thirds was for subsequent onward transit traffic to West and Central Europe.

Current value and money flows

The value of the global cocaine market is most certainly lower than it was in the mid-1990s, when prices were much higher and the US market was strong. In 1995, the global market was worth some US\$165 billion, which had been reduced to just over half of this by 2009 (US\$85 billion; range: US\$75-US\$100 bn).

North America and West and Central Europe accounted for 86% of the global cocaine market in economic terms in 2009. North America accounted for 47% and West and Central Europe 39% of the total.

While the North American market shrank over the last two decades – due to lower volumes and lower prices – the European market expanded. Nonetheless, the US market remains the largest market globally, but the market of the countries of West and Central Europe (US\$33 billion at retail level in 2009) is – in economic terms – now nearly as large as the US market (US\$37 billion in 2009).

Fig. 88: Value of the global cocaine retail market (in billion constant 2009 US\$), 1995, 2008 and 2009

Sources: UNDCP, Economic and Social Consequences of Drug Abuse and Illicit Trafficking, 1997 (re-valued based on US consumer price index); UNODC estimates on the size of the global cocaine market for 2009, based on ARQ data and other Government sources.

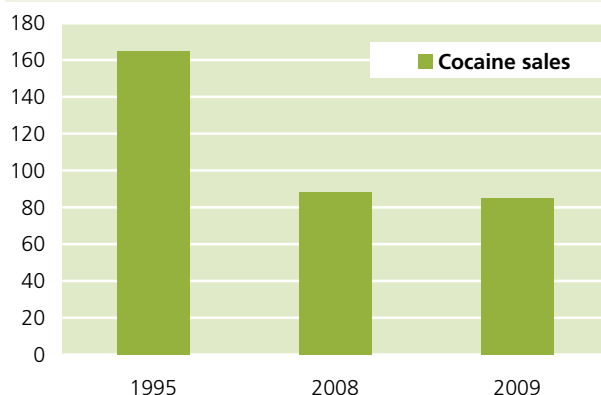
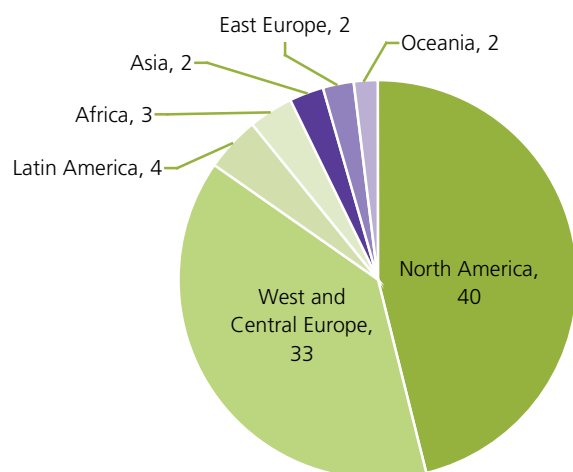


Fig. 89: Regional breakdown of the value of the global cocaine market in 2009 in billions of US\$ (N = US\$85 bn)

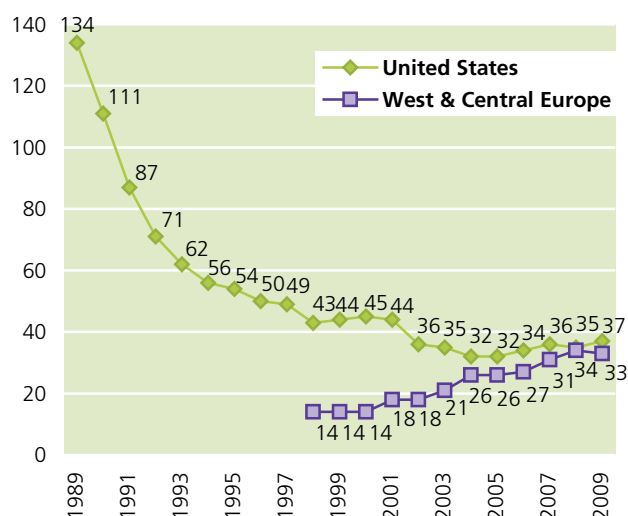
Source: UNODC estimates on the size of the global cocaine market for 2009, based on ARQ data and other Government sources.



Out of the US\$85 billion in income from global cocaine retail sales in 2009, traffickers are estimated to have reaped some US\$84 billion (almost 99%). The rest went to farmers in the Andean region. The largest gross profits were reaped from cocaine sales in North America (some US\$34 billion), followed by countries of West and Central Europe (some US\$23 billion). Expressed as a proportion of GDP, the cocaine profits were rather small (0.2% of GDP in North America and 0.1% in West and Central Europe). Profits from international trafficking to North America and Europe amount to some US\$15 bn. This suggests that more than 85% of global cocaine profits were related to demand for cocaine

Fig. 90: Value of the US and West and Central European cocaine markets, 1989-2009 (constant 2008 US\$ billions)

Source: UNODC, World Drug Report 2010 and updates for 2009.



in North America and West and Central Europe. Cocaine-related profits generated in South America, Central America and the Caribbean from trafficking cocaine to North America and West and Central Europe amounted to some US\$18 billion in 2009, equivalent to 0.6% of the total GDP of South America, Central America and the Caribbean.

Of the cocaine trafficked to meet demand in West and Central Europe, UNODC estimates – based on an analysis of reported individual drug seizures in terms of volumes and number of seizure cases – that some 13% (range: 11%-16%) transited West Africa in 2009. Reports indicated that up to one third of the shipments is paid in kind to service providers in West Africa, who then traffic most of this cocaine to Europe on their own behalf. In addition, profits are made in supplying the West African cocaine market. The potential wholesale profits affecting West Africa in 2009 amount to US\$0.8 billion, equivalent to 0.2% of GDP in West and Central Africa. These figures do not include profits made by West African citizens engaged in European cocaine retail sales (often European residents, illegal immigrants or asylum seekers). European retail profits amount to some US\$20 billion. Arrest statistics of West African citizens in relation to cocaine trafficking (for example, more than 23% in Portugal in 2008 and more than 16% in France in 2006) suggest that West African groups play an important role in cocaine street sales in several (mainly continental) European countries. Assuming that the West African groups reap, on average, between 5% and 10% of the European cocaine retail profits, this would amount to another US\$1-2 billion in potential cocaine-related income.

Table 28: Estimates of gross profits made by cocaine traffickers (billion US\$), by region, 2009

Sources: UNODC estimates based on ARQ data and other Government or scientific sources.

	In billion US\$	In % of GDP
South America, Central America, Caribbean		
local market	3	0.1%
export to North America*	6	0.2%
export to Europe**	9	0.3%
Subtotal South America, Central America, Caribbean	18	0.6%
North America (USA, Mexico, Canada)	34	0.2%
West and Central Europe (EU-25 and EFTA)	23	0.1%
West and Central Africa (local demand and export to Europe)	0.8	0.2%
Other	8	0.04%
Total trafficking profits	84***	0.1%

* Trafficking from producing areas in the Andean region to Mexico.

** All trafficking to transit countries (US\$4.9 bn) and from transit countries to Europe (US\$6.1 bn) of which 70% (US\$4.3bn) is assumed to be generated by trafficking groups from South America and the Caribbean; gross profits for trafficking to Europe are higher as prices in Spain (the main entry point into Europe) are much higher than prices in Mexico (the main entry point into North America).

*** The difference between the total size of the global cocaine market (US\$85 bn) and gross trafficking profits (US\$84 bn) is income of farmers; farmers are estimated to earn less than US\$1 bn.

Table 29: Tentative estimates of the profits reaped by West African groups out of cocaine trafficking, 2009

Source: UNODC estimates based on ARQ and IDS data.

	Gross profits	Proportion of (assumed) West- African involvement	West African cocaine related trafficking income
Profits made by importing cocaine from South America to West Africa for domestic use	US\$ 0.2 bn	10%	US\$ 0.02 bn
Profits made by selling cocaine to West African customers	US\$ 0.4 bn	100%	US\$ 0.4 bn
Profits made in shipping cocaine to countries in West and Central Europe and selling it to mid-level drug dealers	US\$ 9.2 bn	13.4%*33%	US\$ 0.4 bn
Subtotal			≈ US\$ 0.8 bn
Retail profits made in West and Central Europe	US\$ 20 bn	5% - 10%	US\$ 1 bn – US\$ 2 bn
Total			US\$ 1.8 – US\$ 2.8 bn