

Estimation of drug trade from demand side

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The research report summarizes results of the Workstream 6 under the EU Project New methodological tools for policy and programme evaluation (JUST/2010/DPIP/AG/1410). The objectives of the Workstream 6 were to provide models to estimate the impact of the drug market on the economy (in particular in relation to the GDP in terms of size). Expected results under the Workstream were (i) development of methodology for estimation of drug trade from the demand side, (ii) definition and (iii) identification of suitable indicators for the estimation of drug market with the possibility to include the drug trade into the system of national accounts as a part of illegal economy, (iv) data collection of available indicators and estimation of illicit drug market in project partners countries (Czech Republic, Italy, Portugal, Spain), (v) data collection of labelled public expenditure on drug policy (divided into prevention, harm reduction, treatment, law enforcement) and (vi) estimation of non-labelled public expenditure on drug policy. Finally, economic impact of illicit drug trade on GDP was analysed, and comparison of public expenditures on drug policy with total public expenditures was performed in a time series.

Expected utilizers of the Workstream results are the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in terms of the list of collected data; and the statistical office of the European Union (Eurostat) in terms of the financial indicators from drug market, that should be included in national accounts by the national statistical offices. And of course, the results are available for other experts and policy makers for future research and decisions.

The research report is written with the use of terminology from the field of drug policy makers, same as of national accountants, so that it is comprehensive to both groups of experts.

The total estimated value added on the illicit drug market was EUR 3 258 million in Italy, EUR 3 066 million in Spain, and 369 million EUR in the Czech Republic. The estimate is made with a combination of epidemiological data on illicit drug use in

general population and in hidden populations, research on quantities of drugs consumed per a use day / use occasion, and police statistics on drug prices and purities. It is, therefore, a demand-based estimation of the size of the drug market.

This report differentiates from pre-existing drug market estimates in two ways. For one, it aims to be a straightforward methodological toolkit for statisticians who aim at illicit drug market estimation, without being experts in drug policy research that often requires trans-disciplinary approach. For two, it follows the System of National Accounts rigorously, and classifies the different drug market estimates according to its standards.

As a result, we show that the illicit drug market ranged between 0.2 and 0.3 % of GDP in 2008/2009 in the countries we observed. It is important to point out that the above mentioned figure represents the value added at the national drug market. It would be misleading to compare, for instance, the total use of illicit drugs, that represented EUR 521 million in the Czech Republic, EUR 4 957 million in Spain, and EUR 5 023 million in Italy, to GDP, since not the entire value of drugs consumed is produced within the borders of the national economy.

Introduction

Illicit drug markets make a substantial part of nowadays national economies. Despite the trade with substances stated as illegal by the U.N. treaties from 1961, 1971 and 1988 remains highly punished in most countries in the world, and penalties for possession of these substances for personal use haven't been removed in many, supply of drugs continues to meet its demand.

Moreover, the illicit nature of these substances seems to bring high revenues to those who chose to take the associated risks. The baseline of research in the area of drug markets postulated that drug sellers are compensated for the risk of having their goods seized, for the risks of arrest, and also for the risk of suffering violence or homicide. While some chose not to take the risk at all, others, who are rather risk-takers, are taking the profits out of the market (Caulkins & Reuter, 1996; Peter Reuter & Kleiman, 1986; P. Reuter, MacCoun, & Murphy, 1990).

It has been subject to multiple research attempts to estimate what the actual size of the drug market is, in order to compare it with other, legitimate fields of economic activity, but also to enumerate the importance of illicit drug markets in national economies, and finally, to have a good estimate of the size of illegal economy in order to precise the system of national accounts with such estimates. Various institutions have been pursuing efforts in this area.

An annual or semi-annual estimate of the size of illicit drug markets in particular countries is published by UNODC, which relies predominantly on data provided by national governments and partially, their law enforcement agencies (UNODC, 2012). Their most recent figures value the global cocaine market at 85 billion USD (UNODC, 2011b), and the global opiate market at 68 billion USD (UNODC, 2011a). An estimate from 2003 provided wholesale and retail values for all U.N. countries, split by different drug types, the global retail drug market being evaluated at 320 billion USD (UNODC, 2005).

The second major contribution to the body of literature has been a cooperative study of Trimbos Instituut and RAND performed for the European Commission in 2006 (RAND, Trimbos, & EC, 2009). Contrary to UNODC, RAND relied on demand-side data, estimating the drug market based on the amount of drugs consumed in a given period (Kilmer & Pacula, 2009). Their estimate of cannabis market, for instance, brought less than half of the market value estimated by UNODC (a mid-point estimate of 13.5 billion EUR in Europe by Trimbos and RAND, contrary to 35.2 billion EUR estimated for the same area in 2003 by UNODC).

Neither of the above studies, however, paid great attention into framing this illegal market into the system of national accounts, despite the fact illegal drug markets in general have already been incorporated in both SNA93 and ESA95 (EC, 1996; UN,

1993), and several national states have been active in that matter (Baldassarini & Corea, 2008; Garcia, 2002; Groom & Davies, 1999).

The second part of the financial flows related to illicit drugs arises rather from public budgets than from private spending, and represents the cost of policies that are intended to reduce drug supply, drug use and harms incurred from using them (EMCDDA, 2008; Kopp & Fegnolio, 2003; P. Reuter, 2006). It shall be of interest to decision makers what is the total amount of money spent in drug policies on regional and/or national level, same as what is the balance between drug policy priorities and amounts invested in different drug policy pillars (supply reduction, demand reduction and harm reduction). At any case, adequate methods of estimation shall be used, and at some point, decision makers might want to compare the public and the private resources invested in the issue of illicit drugs.

In this report, we aim at guiding both researchers and national accountants into the basic methodology of estimating the size of illicit drug markets. The main goal is to make the methodology of illicit drug markets estimation as accessible as possible. The authors hope the toolkit they are presenting, with vast examples from their national country, will contribute to initiation and successful publication of as many internationally comparable estimates of illicit drug market size as possible, and to their sensible use.

1 ESTIMATION OF ILLICIT DRUG MARKET

In this chapter, estimation of illicit drug market is provided. The data from the Czech Republic are used as an example, and further implementation in other project participant countries is provided. The chapter describes the methodology that was used, available data sources, market volume of the main drugs consumed in the countries, and financial indicators of the drug market included in the system of national accounts.

1.1 Methods

The estimation of drug consumption can be done from both the supply side and from the demand side. Estimation of drug market from demand side is based on estimation of drug consumption. Estimation of drug consumption from supply side can be described by formula 1 (Mazegger, 1999):

$$C = S \cdot \left(\frac{1}{sr} - 1 \right) \cdot a \cdot \left(\frac{pu_i}{pu_{st}} \right) \cdot P_{st} \quad (1)$$

where Cvalue of final consumption of drugs,
 Sseized quantity,
 srrate of seizures on total supply,
 arate of total supply dedicated for domestic market,
 pu_idrug purity by import/production,
 pu_{st}drug purity by final consumption,
 P_{st}"street" price.

The value of final consumption of drugs calculated with the use of this formula is equal to drug quantity dedicated for domestic market (I), multiplied by purity rate and valued by "street" prices. Quantity of import dedicated for domestic market is estimated by the formula 2:

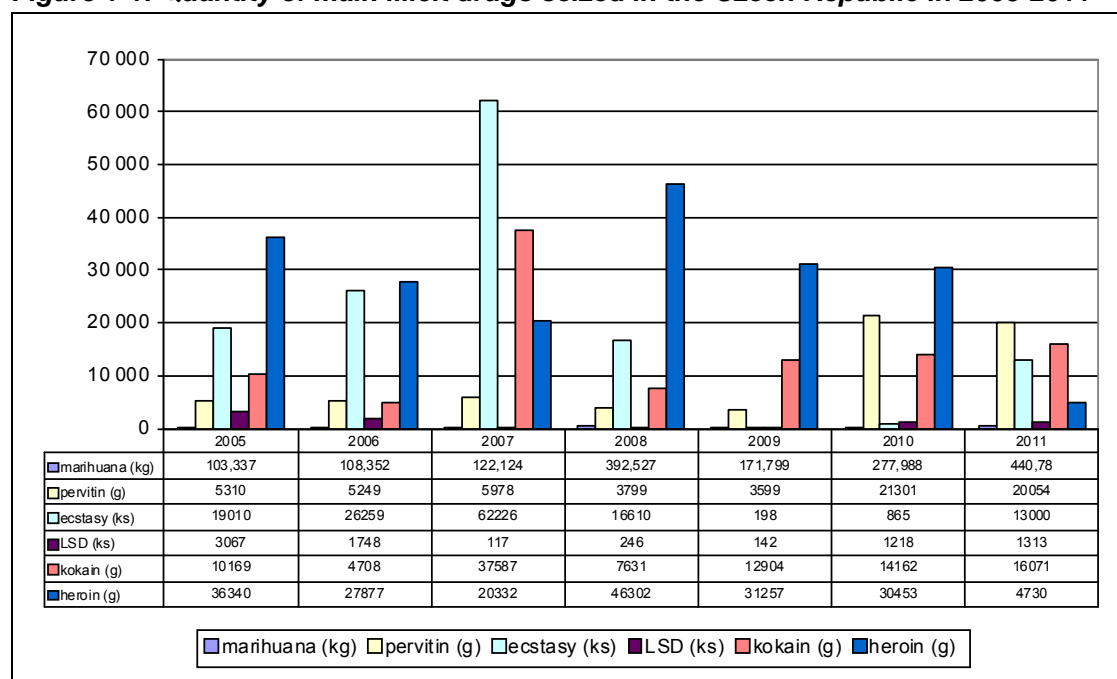
$$I = S \cdot \left(\frac{1}{sr} - 1 \right) \cdot a \quad (2)$$

The estimation contains a number of deficiencies, as for example rate of seizures or rate for domestic market, which are complicated to estimate. Quantities of seized drugs are published annually, but there are big differences between years. The rate of seizures on total supply remains rather unknown. The data explain rather success of police on reduction of drug supply than relevant data for estimation of drug consumption each year.

The Figure 1-1 shows quantities of main illicit drugs seized in the Czech Republic between years 2005 – 2011. There are visible different quantities of drug seizures of

individual drug categories between years. Therefore, methodology for estimation of drug consumption from supply side is not feasible for most countries.

Figure 1-1: Quantity of main illicit drugs seized in the Czech Republic in 2005-2011



Source: National Drug Squad of the Criminal Investigation Service of the Police of the Czech Republic

Estimation of the value of drugs consumed on demand side includes the indicators: number of drug users, their average consumption per a time period, and “street” prices. The estimation is possible to describe by the formula 3:

$$C = N \cdot Q_a \cdot P_{st} \quad (3)$$

where Cvalue of final consumption of drugs,
 Nnumber of users,
 Q_aaverage annual quantity consumed per user,
 P_{st}”street” prices.

All the indicators are currently available. Estimation of quantity of drugs consumed in each category of drugs based on formula (3) can be described by the formula 4:

$$C_i = N_i \cdot F_i \cdot O_i \quad (4)$$

where C_iquantity of illicit drug consumed
 N_inumber of users
 F_ifrequency of drug use during one year
 O_idrug quantity consumed per occasion
 iillicit drug category

When quantity of drugs consumed is estimated from the demand side, a question arises: "From where the drugs come?" There are two possibilities: the drugs are produced within the borders of the country of concern, or the drugs are imported from other countries. Some drugs could have both origins (e.g. cannabis type drugs). The cannabis type drugs, amphetamines, ecstasy and LSD have European origins. Cocaine is imported into Europe from South America, heroin is imported from Asia (UNODC, 2012).

Several drug categories (amphetamines, cocaine, and heroin) are diluted with other substances by drug dealers. These drugs thus have different purity on wholesale (imported/produced) level and on retail level. Domestic production of drugs could be partially exported. Transit of illicit drugs through country is not included in the model, because it doesn't have any economic impact on the country per se, and it is not reflected in consumption estimate. However, if purities of diluted drugs change during transit through different countries, the market value of the drug volume increased through the process of dilution shall be considered as domestic production. Drug market size and flows of particular drugs in the drug market are described in the chapter 1.3.3.

As the drug trade has wholesale and retail levels, the drug market can be valued both in wholesale and in retail prices. Financial indicators of the drug market and its inclusion into the system of national accounts are described in the chapter 1.3.4. Final estimation of drug market size represents the added value from drug trade, which is an indicator that can be directly compared with the size of GDP.

1.2 Data

This chapter describes different data sources for all indicators that are needed in order to estimate the size of illicit drugs market from demand side (such as prevalence rates of drug use, frequency of drug use, drug purities and prices etc.). The example of the Czech Republic is provided in all cases.

1.2.1 Prevalence of illicit drug use among general population (occasional use)

The General Population Surveys (GPSs) are the main data sources about prevalence rates of drug use among citizens, excluding hidden populations with problem drug use patterns (EMCDDA, 2009a). General population surveys present data on (i) any illicit drug use during the person's life (lifetime prevalence), so-called 'lifetime experience' with illicit drugs, (ii) any illicit drug use in the previous year (last-12-months prevalence), so-called 'recent use' of illicit drugs or 'occasional use', and (iii) any illicit drug use in the previous month (last-30-days prevalence), so-called 'current use' of drugs (EMCDDA, 2007). For the purpose of market size estimates, 'occasional use' ('recent use', use in the last 12 months) is used.

The example for the Czech Republic comes out from the GPS 2008¹ (Běláčková, Nechanská, Chomynová, & Horáková, 2012). The most consumed illicit drugs in the Czech Republic are cannabis type drugs, methamphetamine (pervitin), ecstasy, LSD and heroin. The following tables (Table 1-1 to Table 1-6) show prevalence rates of occasional user of illicit drugs. The tables are cross-tabulations of answers for questions in GPS 2008, presented as a percentage of totals within the age-gender category:

- rows: five-years age category;
- columns: prevalence of illicit drug use (standard EMCDDA indicator of past 12 months prevalence of illicit drug use /split into single and multiple times use in GPS 2008/, and standard EMCDDA indicator of use frequency in the past 30 days), divided by gender

The category 2-11 times in last year represents the share of users that used particular illicit drug more than once in last 12 months year and that didn't use that drug in the last 30 days at the same time. The last column in the following tables (Table 1-1 to Table 1-6) represents the prevalence of last 12 months use of a particular drug per selected age category (across genders).

Last 12 months prevalence of cannabis use in the Czech population (15 – 64 years of age) was 14.8 % in 2008. Last year prevalence of cannabis use in the population

¹ Actual GPS 2012 was realized in the September/October 2012 and results from the survey are not processed yet.

15 – 19 years old was 42.4 %, whereas, for instance, in the population 50 – 54 years old it was 4.7 %.

Table 1-1: Prevalence rates of cannabis drugs users in CZ in 2008 (in %)

Age groups	Once in the last year		2-11 times in last year		1-3 times in last month		1-2 times in last week		3-4 times in last week		5-7 times in last week		Total
	males	females	Males	females	males	females	Males	females	males	females	Males	females	
15 – 19	11,7	13,4	5,4	6,5	10,8	8,2	13,3	3,4	6,7	2,2	1,7	1,3	42,4
20 – 24	10,5	8,4	1,6	2,4	12,5	6,0	8,2	3,2	4,3	1,6	4,3	0,8	32,2
25 – 29	9,7	4,7	2,3	1,8	7,7	2,9	7,0	1,8	5,3	1,1	3,0	0,7	24,3
30 – 34	8,3	4,9	1,8	1,2	9,0	2,0	4,0	1,6	1,4	0,4	0,7	0,0	17,9
35 – 39	6,9	2,1	0,5	0,5	2,3	1,5	4,6	2,1	1,4	0,0	0,9	1,0	12,0
40 – 44	1,6	2,9	2,7	1,4	2,7	0,5	1,6	0,5	0,0	1,0	0,0	0,0	7,0
45 – 49	3,7	2,3	2,6	0,0	2,1	0,6	0,0	0,0	0,5	0,0	0,0	0,0	5,7
50 – 54	2,9	1,9	2,4	1,4	0,5	0,5	1,0	0,9	0,0	0,0	0,0	0,0	4,7
55 – 59	1,4	0,9	3,2	0,4	0,0	0,4	0,9	0,0	0,9	0,0	0,5	0,0	2,9
60 – 64	0,0	0,5	0,0	0,0	0,5	0,5	0,0	0,0	0,5	0,0	0,0	0,0	0,0
Total	5,8	4,0	2,2	1,5	4,9	2,1	3,9	1,2	1,9	0,5	1,1	0,4	14,8
	4,9		1,9		3,5		2,6		1,2		0,7		

Source: NFP (GPS 2008)

Prevalence of methamphetamine use in the last 12 months in the Czech Republic within the population of 15 – 64 years old was 1.8 % in 2008. Last 12 months prevalence of methamphetamine use was the highest in the age group 20 – 24 years old (4.6 %) and 25 - 29 years old (4.3 %).

Table 1-2: Prevalence rates of occasional methamphetamine users in CZ in 2008 (in %)

Age groups	Once in last year		2-11 times in last year		1-3 times in last month		1-2 times in last week		3-4 times in last week		5-7 times in last week		Total
	males	females	males	females	males	females	males	females	males	females	Males	females	
15 – 19	2,1	0,9	0,4	0,4	0,4	0,4	0,0	0,4	0,8	0,4	0,0	0,0	2,5
20 – 24	2,7	1,6	2,0	0,4	1,2	0,0	1,2	0,0	0,8	0,0	0,0	0,0	4,6
25 – 29	2,7	1,1	1,7	0,4	1,0	1,1	0,7	0,0	1,0	0,7	0,3	0,0	4,3
30 – 34	1,1	0,4	0,7	0,8	0,0	0,0	0,4	0,0	0,0	0,0	0,4	0,4	1,7
35 – 39	0,5	0,5	0,5	0,0	0,0	0,0	0,0	1,0	0,0	0,0	0,0	0,5	1,2
40 – 44	1,1	0,5	2,2	0,5	0,0	0,0	0,0	0,0	0,0	0,5	0,0	0,0	2,1
45 – 49	0,5	0,6	0,0	0,0	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,8
50 – 54	0,5	0,0	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,5
55 – 59	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
60 – 64	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total	1,1	0,5	0,8	0,3	0,3	0,2	0,2	0,1	0,0	0,0	0,0	0,0	1,8
	0,8		0,5		0,2		0,2		0,0		0,0		

Source: NFP (GPS 2008)

Last 12 months prevalence of ecstasy use in the in the Czech Republic within the population of 15 – 64 years old was 3.5 % in 2008. Last 12 months prevalence of ecstasy use was the highest in the age group 15 – 19 years old (11.9 %) and 20 - 24 years old (10.9 %).

Table 1-3: Prevalence rates of ecstasy users in CZ in 2008 (in %)

Age groups	Once in last year		2-11 times in last year		1-3 times in last month		1-2 times in last week		3-4 times in last week		5-7 times in last week		Total
	males	females	males	females	males	females	males	females	males	females	males	females	
15 – 19	6,3	7,3	3,3	1,3	1,3	1,3	1,7	0,4	0,8	0,0	0,0	0,0	11,9
20 – 24	7,4	4,0	2,3	0,8	2,0	2,4	2,0	0,4	0,4	0,0	0,0	0,4	10,9
25 – 29	4,0	1,1	1,0	0,4	2,0	1,8	1,7	0,0	0,0	0,4	0,0	0,0	6,2
30 – 34	3,6	1,6	0,0	0,4	0,7	0,4	0,7	0,4	0,0	0,0	0,0	0,0	4,0
35 – 39	2,3	1,0	0,0	0,5	0,9	0,5	0,0	0,0	0,0	0,0	0,0	0,0	2,7
40 – 44	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
45 – 49	1,0	0,6	0,0	0,0	0,0	0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0
50 – 54	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
55 – 59	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
60 – 64	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total	2,4	1,4	0,6	0,3	0,7	0,6	0,6	0,1	0,1	0,0	0,0	0,0	3,5
	1,9		0,5		0,7		0,4		0,1		0,0		

Source: NFP (GPS 2008)

Last 12 months prevalence of LSD use in the in the Czech Republic within the population of 15 – 64 years old was 2.1 % in 2008. Last 12 months prevalence of LSD use was the highest in the age group 20 – 24 years old (6.4 %) and 15 - 19 years old (6.4 %).

Table 1-4: Prevalence rates of LSD users in CZ in 2008 (in %)

Age groups	Once in last year		2-11 times in last year		1-3 times in last month		1-2 times in last week		3-4 times in last week		5-7 times in last week		Total
	males	females	males	females	males	females	males	females	males	females	males	females	
15 – 19	5,0	2,6	1,7	0,9	2,1	0,4	0,4	0,4	0,4	0,0	0,0	0,0	6,4
20 – 24	4,7	2,0	2,3	0,0	2,3	1,6	0,4	0,4	0,0	0,0	0,4	0,0	6,6
25 – 29	2,7	1,8	1,7	0,7	2,0	0,4	0,7	0,7	0,0	0,0	0,0	0,0	4,7
30 – 34	2,2	0,0	0,0	0,0	0,0	0,0	0,0	0,4	0,0	0,0	0,0	0,0	1,1
35 – 39	2,3	1,5	0,0	1,0	0,0	0,0	0,0	0,5	0,0	0,0	0,0	0,5	2,4
40 – 44	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,3
45 – 49	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,3
50 – 54	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
55 – 59	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
60 – 64	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total	1,8	0,8	0,6	0,3	0,6	0,2	0,0	0,0	0,0	0,0	0,0	0,0	2,1
	1,3		0,4		0,4		0,0		0,0		0,0		

Source: NFP (GPS 2008)

Last 12 months prevalence of cocaine use in the in the Czech Republic within the population of 15 – 64 years old was 0.7 % in 2008. Last 12 months prevalence of cocaine use was the highest in the age group 25 – 29 years old (2.2 %) and 20 - 24 years old (2.0 %).

Table 1-5: Prevalence rates of occasional cocaine users in CZ in 2008 (in %)

Age groups	Once in last year		2-11 times in last year		1-3 times in last month		1-2 times in last week		3-4 times in last week		5-7 times in last week		Total
	males	females	males	females	males	females	males	females	males	females	males	females	
15 – 19	1,7	0,0	0,4	0,0	0,0	0,0	0,8	0,0	0,4	0,0	0,0	0,0	1,5
20 – 24	1,6	0,8	0,4	0,0	0,4	0,4	0,4	0,0	0,4	0,0	0,0	0,0	2,0
25 – 29	2,0	0,4	0,0	0,0	1,0	0,0	1,0	0,0	0,0	0,0	0,0	0,0	2,2
30 – 34	0,7	0,4	0,4	0,0	0,0	0,4	0,0	0,0	0,0	0,0	0,0	0,0	1,1
35 – 39	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
40 – 44	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
45 – 49	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,3
50 – 54	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
55 – 59	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
60 – 64	0,0	0,0	0,0	0,0	0,0	0,0	0,5	0,0	0,0	0,0	0,0	0,0	0,0
Total	0,7	0,2	0,1	0,0	0,2	0,1	0,2	0,0	0,0	0,0	0,0	0,0	0,7
	0,4		0,1		0,1		0,1		0,0		0,0		

Source: NFP (GPS 2008)

Last 12 months prevalence of heroin use in the in the Czech Republic within the population of 15 – 64 years old was 0.4 % in 2008. Last 12 months prevalence of heroin use was the highest in the age group 20 – 24 years old (1.2 %) and 15 - 19 years old (1.1 %).

Table 1-6: Prevalence rates of occasional heroin users in CZ in 2008 (in %)

Age groups	Once in last year		2-11 times in last year		1-3 times in last month		1-2 times in last week		3-4 times in last week		5-7 times in last week		Total
	males	females	males	females	males	females	males	females	males	females	males	females	
15 – 19	0,8	0,9	0,4	0,0	0,0	0,0	0,4	0,0	0,0	0,0	0,0	0,0	1,1
20 – 24	1,2	0,8	0,4	0,0	0,0	0,0	0,4	0,0	0,0	0,0	0,0	0,0	1,2
25 – 29	0,7	0,0	0,7	0,0	0,0	0,0	0,3	0,4	0,0	0,0	0,0	0,0	0,7
30 – 34	0,7	0,8	0,4	0,0	0,4	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,0
35 – 39	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,5	0,0	0,0	0,0	0,0
40 – 44	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
45 – 49	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,3
50 – 54	0,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,2
55 – 59	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
60 – 64	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total	0,4	0,2	0,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,4
	0,3		0,1		0,0		0,0		0,0		0,0		

Source: NFP (GPS 2008)

1.2.2 Mid-year population

Mid-year population is an important indicator for calculation of number of “occasional” (last 12 months) illicit drug users from national prevalence rates. The indicator is published by national statistical offices. It represents the “number of inhabitants as balanced on July 1st of the reference year” (ČSÚ 2009). The structure of the data must be same as prevalence rates data (5 years age categories for the population 15-64 years old split by gender).

Table 1-7: Mid-year population by age groups and gender in 2008

Age groups	Mid-year population	
	males	females
15 – 19 years	329 067	313 123
20 – 24 years	363 689	340 364
25 – 29 years	410 785	385 908
30 – 34 years	481 285	456 950
35 – 39 years	395 569	373 381
40 – 44 years	364 169	346 584
45 – 49 years	329 019	319 378
50 – 54 years	368 444	372 990
55 – 59 years	373 369	394 273
60 – 64 years	328 281	367 904

Source: Czech Statistical Office

1.2.3 Problem drug use

Problem drug use is defined by EMCDDA as “injecting drug use or long-duration/regular use of opioids, cocaine and/or amphetamines” (EMCDDA, 2009b). Problem drug users (PDUs) are not obviously captured by general population surveys, and the size of PDU population is estimated separately, with a combination of two methods (EMCDDA, 2009b; Mravčík, Lejčková, & Korčíšová, 2005) :

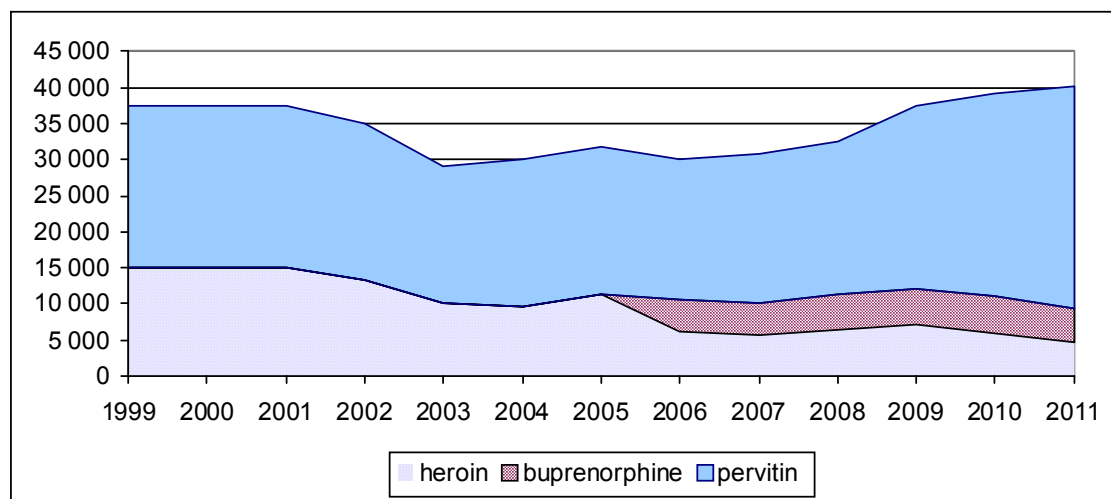
- Multiplication method (with use of drug treatment data, such as e.g. register of hospitalizations, statistics of low-threshold services clients, number of syringes exchanged etc.);
- Capture-recapture method.

PDU estimates are currently published in the national Annual Reports (Mravčík et al., 2012) and EMCDDA annual reports (EMCDDA, 2012); PDU data are also available on the EMCDDA website.

The number of PDUs in the Czech Republic between the years 1999-2011 is shown in the Figure 1-2. In 2008, there were 6 400 problem heroin users and 21 200 problem methamphetamine (pervitin) users. There was no problem cocaine users reported in the Czech Republic. Another specific of the Czech PDU data is occurrence of problem users of buprenorphine, a prescription drug used for opiate substitution. The statistics is available since 2006; however, problem users of buprenorphine are not included in the estimation of illicit drug trade. Although there is

“black” market with buprenorphine, it is a market with controlled (prescribed) substance.

Figure 1-2: Problem drug users in the Czech Republic (1999 – 2011).



Source: NFP

1.2.4 Purities of illicit drugs

Drug purities play an important role in the drug market. Drug dealers add inexpensive substances into illicit drugs in order to achieve a higher quantity of the drugs, and thereby to increase their profits. The main drugs which are diluted by drug dealers are methamphetamine (pervitin), cocaine and heroin.

There are two main levels of the drug trade – wholesale level and retail level. Wholesale level represents illicit drugs at import and at production stage (UNODC, 2012). Retail level represents the stage where illicit drugs are sold to the final consumer.

Table 1-8: Average drug purities in CZ in 2008.

	methamphetamine (pervitin)	cocaine	heroin
Wholesale level	80.0 %	70.0 %	40.0 %
Retail level	70.0 %	45.0 %	10.0 %

Source: National Drug Squad

When it comes to purity of illicit drugs in the Czech Republic, the information comes from the National Drug Squad of the Criminal Investigation Service of the Police of the Czech Republic (National Drug Squad), which is a specialised police department in the Czech Republic focused on illicit drug trade, and which collects data on enforcement of drug-related laws (NPC, 2009). Drug purities are measured on samples from drug seizures (analyses of active, illicit components in the seized substances are made). Average purity of illicit drugs on wholesale level therefore

represents average purity of drugs seized in big quantities. Average purity of illicit drugs on retail level represents average purity of drugs seized in small quantities (intended for sale or sold to the final consumer). Illicit drug purities on wholesale level are always higher than on retail level.

1.2.5 Seizures of illicit drugs

Data about seized quantities are, in general, not feasible for comparison in time. The indicator depends heavily on annual police activities and their success. However, database of drug seizures can provide us with information about the locations of seizures, same as on the direction where the contraband was heading. Drug seizures for the national country are performed inland or on the country's borders and/or airports. Border and/or airport drug seizures have contraband direction either into country (import), or outside of country (export).

Table 1-9: Share of illicit drugs intended for export in CZ in 2008.

cannabis drugs	methamphetamine
1.0 %	3.0 %

Source: National Drug Squad

1.2.6 Prices of illicit drugs

When it comes to illicit drug prices, they indeed differ on the wholesale and the retail level. Wholesale prices are representative of import and/or of domestic production in large quantities; retail prices are representative of the sale to the final consumer. The information on illicit drug prices in the Czech Republic is published by the National Drug Squad of the Criminal Investigation Service of the Police of the Czech Republic; it stems from illicit drug seizures on both national and regional level. Both mean and modus (most commonly reported) prices of drugs are published in the national Annual Reports on Drug Situation by the National Focal Point - NFP (Mravcik et al., 2010; Mravčík, et al., 2012; Mravčík et al., 2011; Mravčík et al., 2009).

Table 1-10: Prices of illicit drugs (in EUR)

Prices	cannabis type drugs	methamphetamine	ecstasy	LSD	cocaine	heroin
wholesale	5	30	4	6	60	32
retail	7	40	8	8	78	40

Source: National Drug Squad of the Criminal Investigation Service of the Police of the Czech Republic Current prices of illicit drugs in the Czech Republic are in the national currency Czech Crowns (CZK). The data in Table 1-10 were recalculated to Euros (EUR), with average exchange rate for 2008: 1 EUR = 24.942 CZK.

The difference between wholesale and retail prices is called trade margin, which in fact represents untaxed profit of drug dealers.

1.3 Results: Estimation of illicit drug market in the Czech Republic

This chapter presents the results of estimation of illicit drug market size with the example for the Czech Republic for the year 2008. It includes estimation of total consumption of main illicit drugs consumed by both occasional and problem drug users, estimation of the overall illicit drug market in the Czech Republic (including domestic production), estimation of import and export of illicit drugs, and finally, financial indicators of the drug trade that are included into the system of national accounts.

1.3.1 Number of occasional drug users

The numbers of occasional (last 12 months) illicit drug users in the Czech Republic was estimated from GPS 2008 prevalence rates (Table 1-1 to Table 1-6) multiplied by the population size (Table 1-7) in each 5years age category and gender. The results are presented in the following tables (Table 1-11 to Table 1-16). The number of illicit drug users was calculated for both genders in total.

Table 1-11: Estimation of number of cannabis drug users in the Czech Republic in 2008.

Age groups (in years)	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week	Total
15 – 19	80 231	38 069	61 293	54 673	28 686	9 533	272 486
20 – 24	66 834	13 819	65 802	40 682	21 051	18 339	226 528
25 – 29	57 820	16 551	42 639	35 721	26 088	15 110	193 929
30 – 34	62 253	14 260	52 725	26 542	8 807	3 475	168 062
35 – 39	35 003	3 738	14 859	25 888	5 469	7 475	92 431
40 – 44	15 983	14 919	11 570	7 612	0	0	50 084
45 – 49	19 486	8 613	8 747	0	0	0	36 846
50 – 54	17 499	14 001	3 497	0	0	0	34 997
55 – 59	8 682	13 804	0	0	0	0	22 486
60 – 64	0	0	0	0	0	0	0
Total	363 791	137 774	261 132	191 118	90 102	53 933	1 097 850

Source: (Vopravil 2010)

Table 1-12: Estimation of number of occasional methamphetamine (methamphetamine) users in the Czech Republic in 2008.

Age groups (in years)	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week	Total
15 – 19	9 555	2 721	2 721	1 350	0	0	16 346
20 – 24	15 369	8 459	4 262	4 262	0	0	32 352
25 – 29	15 134	8 240	8 287	2 739	0	0	34 399
30 – 34	7 070	7 190	0	1 737	0	0	15 998
35 – 39	3 738	1 823	0	3 830	0	0	9 390
40 – 44	5 633	9 591	0	0	0	0	15 224
45 – 49	3 579	0	1 723	0	0	0	5 302
50 – 54	1 754	1 754	0	0	0	0	3 509
55 – 59	0	0	0	0	0	0	0
60 – 64	0	0	0	0	0	0	0
Total	61 832	39 778	16 993	13 917	0	0	132 520

Source: (Vopravil 2010)

Table 1-13: Estimation of number of ecstasy users in the Czech Republic in 2008.

Age groups (in years)	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week	Total
15 – 19	43 511	15 018	8 162	6 834	2 742	0	76 268
20 – 24	40 553	11 236	15 239	8 459	1 421	0	76 908
25 – 29	20 611	5 501	15 182	6 846	1 393	0	49 533
30 – 34	24 805	1 858	5 333	5 333	0	0	37 328
35 – 39	12 944	1 915	5 561	0	0	0	20 419
40 – 44	0	0	0	0	0	0	0
45 – 49	0	0	0	0	0	0	0
50 – 54	0	0	0	0	0	0	0
55 – 59	0	0	0	0	0	0	0
60 – 64	0	0	0	0	0	0	0
Total	142 424	35 527	49 476	27 472	5 556	0	260 456

Source: (Vopravil 2010)

Table 1-14: Estimation of number of LSD users in the Czech Republic in 2008.

Age groups (in years)	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week	Total
15 – 19	24 551	8 164	8 205	0	0	0	40 940
20 – 24	23 828	8 524	13 948	0	0	0	46 300
25 – 29	17 920	9 633	9 609	0	0	0	37 162
30 – 34	10 425	0	0	0	0	0	10 425
35 – 39	14 859	3 830	0	0	0	0	18 688
40 – 44	1 979	0	0	0	0	0	1 979
45 – 49	1 723	0	0	0	0	0	1 723
50 – 54	0	0	0	0	0	0	0
55 – 59	0	0	0	0	0	0	0
60 – 64	0	0	0	0	0	0	0
Total	95 285	30 170	31 762	0	0	0	157 217

Source: (Vopravil 2010)

Table 1-15: Estimation of number of cocaine users in the Czech Republic in 2008.

Age groups (in years)	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week	Total
15 – 19	5 484	1 371	0	2 742	0	0	9 598
20 – 24	8 395	1 421	2 777	1 421	0	0	14 013
25 – 29	9 609	0	4 108	4 108	0	0	17 825
30 – 34	5 333	1 737	3 595	0	0	0	10 665
35 – 39	0	0	0	0	0	0	0
40 – 44	0	0	0	0	0	0	0
45 – 49	1 723	0	0	0	0	0	1 723
50 – 54	0	0	0	0	0	0	0
55 – 59	0	0	0	0	0	0	0
60 – 64	0	0	0	0	0	0	0
Total	30 543	4 529	10 480	8 271	0	0	53 823

Source: (Vopravil 2010)

Table 1-16: Estimation of number of occasional heroin users in the Czech Republic in 2008.

Age groups (in years)	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week	Total
15 – 19	5 442	1 371	0	0	0	0	6 813
20 – 24	6 974	1 421	0	0	0	0	8 395
25 – 29	2 739	2 739	0	0	0	0	5 477
30 – 34	7 190	1 737	0	0	0	0	8 928
35 – 39	0	0	0	0	0	0	0
40 – 44	0	0	0	0	0	0	0
45 – 49	1 723	0	0	0	0	0	1 723
50 – 54	1 754	0	0	0	0	0	1 754
55 – 59	0	0	0	0	0	0	0
60 – 64	0	0	0	0	0	0	0
Total	25 821	7 268	0	0	0	0	33 089

Source: (Vopravil 2010)

1.3.2 Consumption of illicit drugs from demand side

In the following calculation, the formula (4) from the Chapter 1.1 was used for estimation of the size of the market with the main illicit drugs consumed in the Czech Republic. Numbers of occasional (last 12 months) illicit drug users and their frequency of use were used from the Chapter 1.3.1; numbers of problem drug users were used from the Chapter 1.2.3.

Cannabis type drugs

Cannabis type drugs were the most consumed drugs in the Czech Republic in 2008. Number of cannabis users comes from the Table 1-11. Average frequency of use per year is calculated from GPS frequencies of illicit drug use in the last month (e.g. average frequency 1-3 times in last month is averaged to 2 times per month, and for a yearly result, it is multiplied by 12; that results into 24 use days per year). Cannabis

cigarette in Europe contains on average 260 mg of cannabis (EMCDDA, 2004). For occasional users, one such cigarette per a use day was assumed; since there is no estimate of the number of problem cannabis users, the number of daily or almost daily cannabis users was used instead (those who used cannabis 5-7 times in week). In terms of their consumption, twice the quantity per a use day (0.52 gram) was assumed, which corresponds to the results of a longitudinal study CANLONG that was focused on long-term cannabis users (Miovský et al., 2008). The total consumed quantity of cannabis type drugs in the Czech Republic in 2008 was about 18.8 tons. While the occasional cannabis users (excluding the daily users) consumed the total of 10.1 tons of cannabis in 2008, the daily cannabis users consumed 8.7 tons.

Table 1-17: Quantity of cannabis drugs consumed in the Czech Republic in 2008 (in grams)

	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week
Number of users	363 791	137 774	261 132	191 118	90 102	53 933
Number of use days per year	1	6,5	24	78	182	312
Average quantity consumed per one opportunity (use day)	0,26	0,26	0,26	0,26	0,26	0,52
Total consumed quantity	18 846 470					

Source: (Vopravil 2010)

Methamphetamine

Methamphetamine (pervitin) was the second most consumed illicit drug in the Czech Republic in 2008. Number of occasional methamphetamine users comes from the Table 1-12. Their average quantity per one use opportunity (use day) is 0.3 grams. Number of problem methamphetamine users comes from the Chapter 1.2.3. Average quantity consumed by one problem users per one week is 3.53 grams (Petroš, Mravčík, & Korčíšová, 2005). Total consumption of methamphetamine in the Czech Republic in 2008 was about 4.4 tons. Problem drug users consumed 87.7 % of the total methamphetamine consumption.

Table 1-18: Quantity of methamphetamine consumed in the Czech Republic in 2008 (in grams)

		Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week
Occasional users	Number of users	61 832	39 778	16 993	13 917	-	-
	Number of use days per year	1	6,5	24	78	-	-
	Average quantity consumed per one opportunity (use day)	0.3	0.3	0.3	0.3	-	-
Problem users	Number of users	-	-	-	-	21 200	
	Average quantity consumed by one user per week	-	-	-	-	3.53	
	Average quantity consumed by one user during year	-	-	-	-	183,56	
Total consumed quantity		4 435 600					

Source: (Vopravil 2010)

Ecstasy and LSD

In case of ecstasy and LSD, the average quantity of the drugs consumed at one opportunity was one piece of a pill or a crystal (in some cases, an impregnated paper of LSD). Number of ecstasy users comes from the Table 1-13; number of LSD users comes from the Table 1-14. Total consumption in the Czech Republic in 2008 was estimated as 4.7 million pieces of ecstasy and 1.0 million pieces of LSD.

Table 1-19: Quantity of ecstasy consumed in the Czech Republic in 2008 (in pieces)

	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week
Number of users	142 424	35 527	49 476	27 472	5 556	0
Number of use days per year	1	6,5	24	78	182	312
Total consumed quantity		4 714 833				

Source: (Vopravil 2010)

Table 1-20: Quantity of LSD consumed in the Czech Republic in 2008 (in pieces)

	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week
Number of users	95 285	30 170	31 762	0	0	0
Number of use days per year	1	6,5	24	78	182	312
Total consumed quantity		1 053 683				

Source: (Vopravil 2010)

Cocaine

Number of cocaine users comes from the Table 1-15. Average consumption of cocaine per an opportunity was estimated at 1 gram. Total consumption of cocaine in the Czech Republic in 2008 was estimated at 957 kilograms.

Table 1-21: Quantity of cocaine consumed in the Czech Republic in 2008 (in grams)

	Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week
Number of users	30 543	4 529	10 480	8 271	0	0
Number of use days per year	1	6,5	24	78	182	312
Average quantity consumed per one opportunity (use day)	1	1	1	1	-	-
Total consumed quantity	956 610					

Source: (Vopravil 2010)

Heroin

Table 1-22: Quantity of heroin consumed in the Czech Republic in 2008 (in grams)

		Once in last year	2-11 times in last year	1-3 times in last month	1-2 times in last week	3-4 times in last week	5-7 times in last week
Occasional users	Number of users	25 821	7 268	0	0	0	0
	Number of use days per year	1	6.5	-	-	-	-
	Average quantity consumed per one opportunity (use day)	0.4	0.4	-	-	-	-
Problem users	Number of users	-	-	6 400			
	Average quantity consumed by one user per week	-	-	3.86			
	Average quantity consumed by one user during year	-	-	200.72			
Total consumed quantity		1 313 833					

Source: (Vopravil 2010)

Same like in the case of methamphetamine, heroin users are split into occasional (Table 1-16) and problem users (Chapter 1.2.3). Average quantity consumed by an occasional heroin user at one opportunity was assumed as 0.4 gram; average

consumption by problem heroin user per week was assumed as 3.86 grams (Petroš, et al., 2005). Total consumption of heroin in the Czech Republic in 2008 was estimated at 1.3 tons. Problem drug users consumed 97.7 % of the total heroin consumption.

1.3.3 Volume of illicit drug market

This chapter describes the origin of the different illicit drugs, and the process they undergo through the market chain, till they arrive to the final customer. In this chapter, the market is described in quantity figures (units of weight, pieces); monetary evaluations of the market are described in the Chapter 1.3.4).

Illicit drugs consumed within the EU are both domestically produced (part of domestic drug production is dedicated to export), and imported from countries outside of the EU. Purities of drugs such as heroin, cocaine or methamphetamine at the point of consumption are much lower than purities of the same drugs on the level of production or imported. This also means that the volume of drugs consumed is much higher than the volume at the point of import or production.

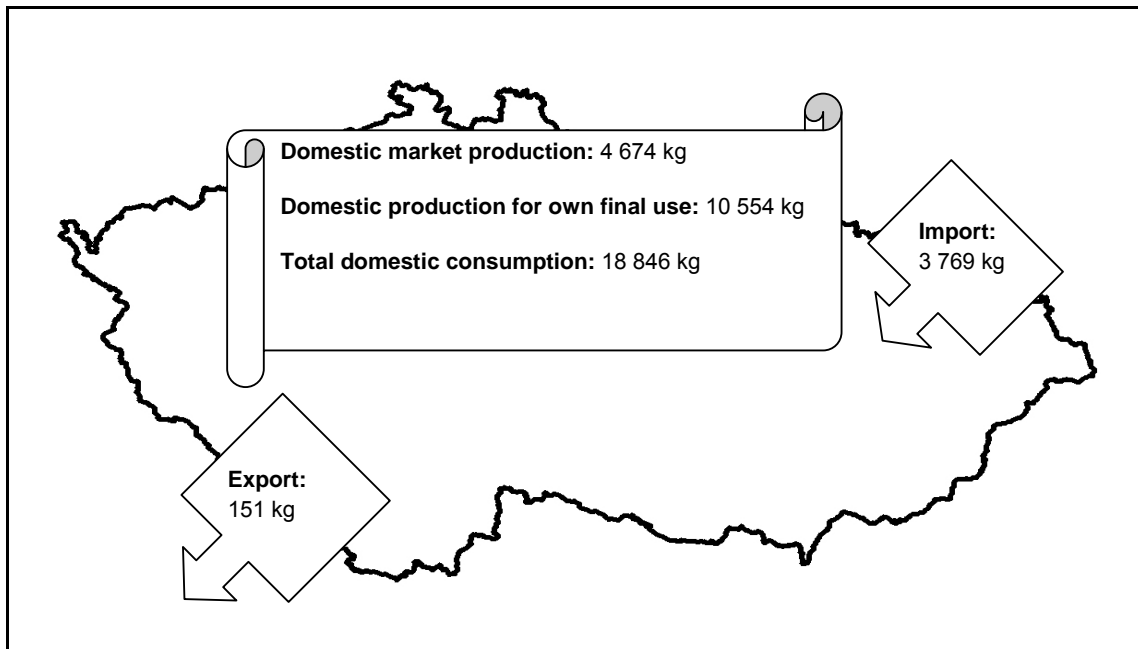
Cannabis type drugs

Marihuana (dried leaves and female flowers of the cannabis plant) is most commonly used drug in the EU. In the example of the Czech Republic, there exists both domestic production and import. The total consumption of cannabis is estimated at 18 846 kg.

The share between domestically produced and imported cannabis drugs can be estimated from information from cannabis users. In 2008, general population survey in the Czech Republic adopted a special module focused at cannabis type drugs. The module focused on marijuana market characteristics, and was answered by all last 12 months (occasional) cannabis users in the survey. According to GPS 2008, about 80 % of cannabis drugs consumed in the Czech Republic come from domestic production, which is about 15 228 kg. Out of this domestic production, about 70 % (10 554 kg) were dedicated for own final use, and 30 % (4 674 kg) were placed on market. The results of the study were published in the Annual Report (Mravčík et al 2009).

The remaining share of the market with cannabis (20 %) amounts to 3 769 kg that we suppose to be imported. As shown in police records, about 1 % of all seized cannabis was intended for export (Table 1-9); the same rate applied to overall domestic production would imply that 151 kg of domestic cannabis production was exported in 2008. The operation of the illicit cannabis market is drawn in the Figure 1-3.

Figure 1-3: Market with cannabis drugs in the Czech Republic in 2008.

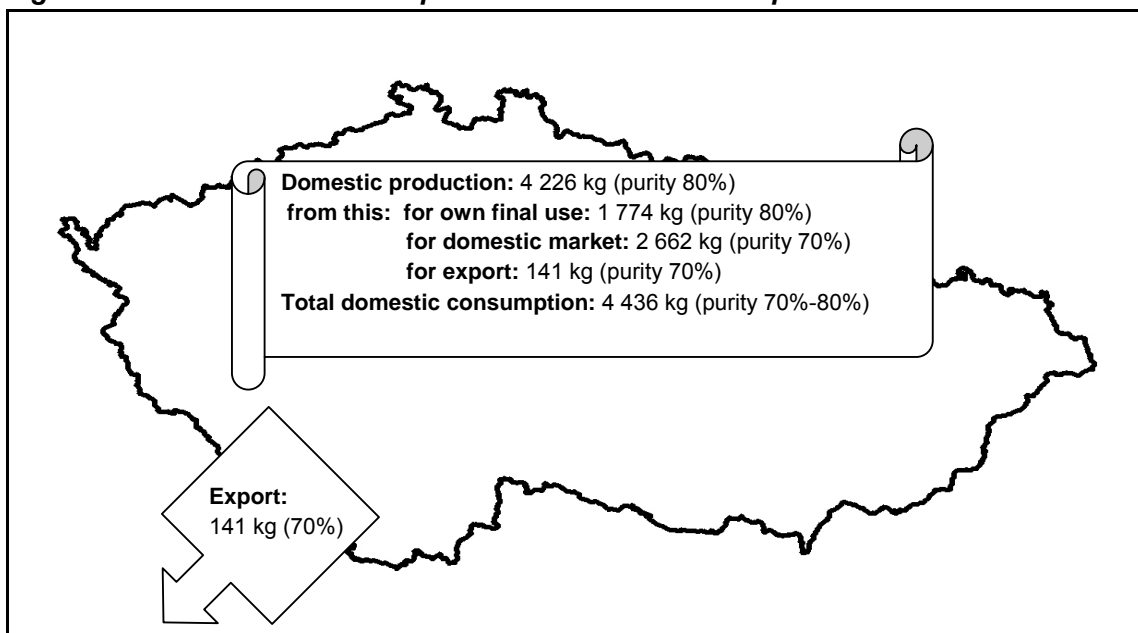


Source: (Vopravil 2011)

Methamphetamine (pervitin)

The Czech Republic has domestic production of methamphetamine (pervitin). Consumption in 2008 was about 4 436 kg of 70% methamphetamine. However, average purity of methamphetamine was 80 %; then total domestic production was 4 226 kg of 80% methamphetamine.

Figure 1-4: Market with methamphetamine in the Czech Republic in 2008.



Source: (Vopravil 2011)

According to expert opinions, 60 % of the production is placed on the market and 40 % of the production is used by the producers and their companions (1 774 kg). Before the production intended for the market is sold, it is diluted by drug dealers to 70% purity (see Table 1-8); this increases the quantity of methamphetamine placed on the market to 2 662 kg.

The total domestic production can be calculated with the use of the formula 5:

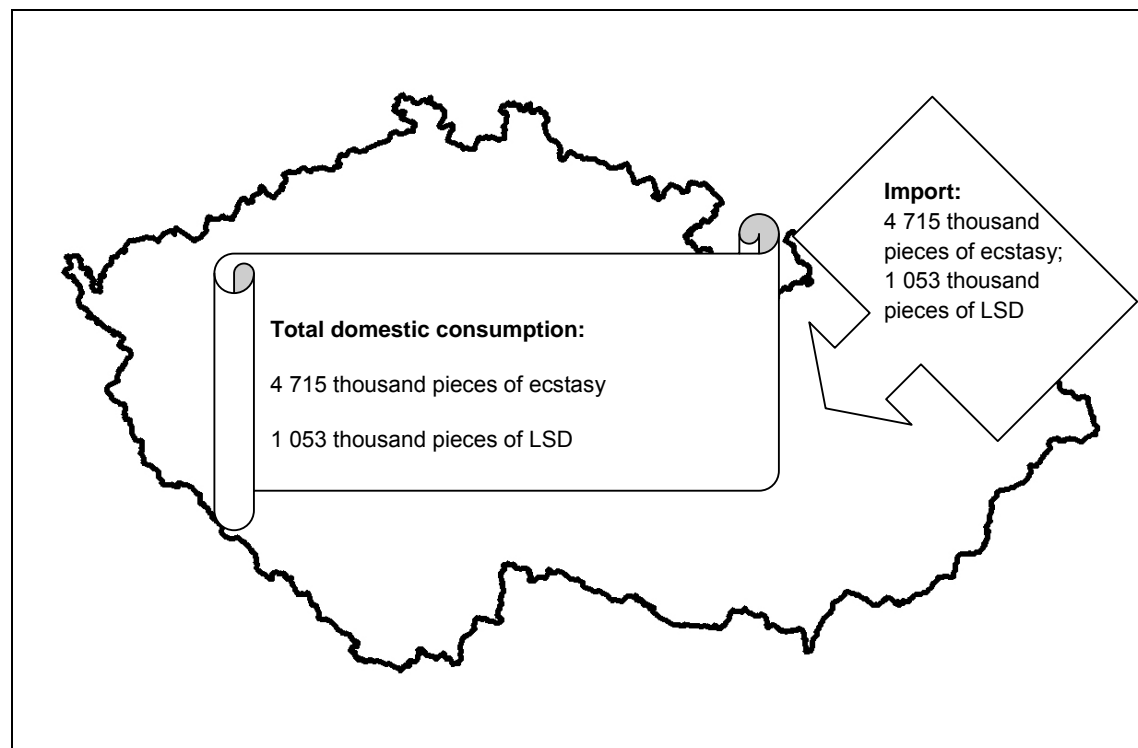
$$quantity\ produced = \left(quantity\ consumed \cdot \frac{purity\ at\ consumption}{purity\ at\ production} \right) + export \quad (5)$$

As shown in police records, about 3 % of all seized methamphetamine was intended for export (Table 1-9); the same rate applied to overall domestic production would imply that 141 kg of 70 % pure methamphetamine was exported in 2008. The operation of methamphetamine market is drawn in the Figure 1-4.

Ecstasy and LSD

Ecstasy and LSD are non-diluted drugs, which are imported into the Czech Republic. The quantity of these drugs that is consumed equals to the quantity that is imported (about 4.7 millions of ecstasy tablets and 1.0 LSD trips in 2008). The operation of ecstasy / LSD market is drawn in the Figure 1-5.

Figure 1-5: Market with ecstasy and LSD in the Czech Republic in 2008



Source: (Vopravil 2010)

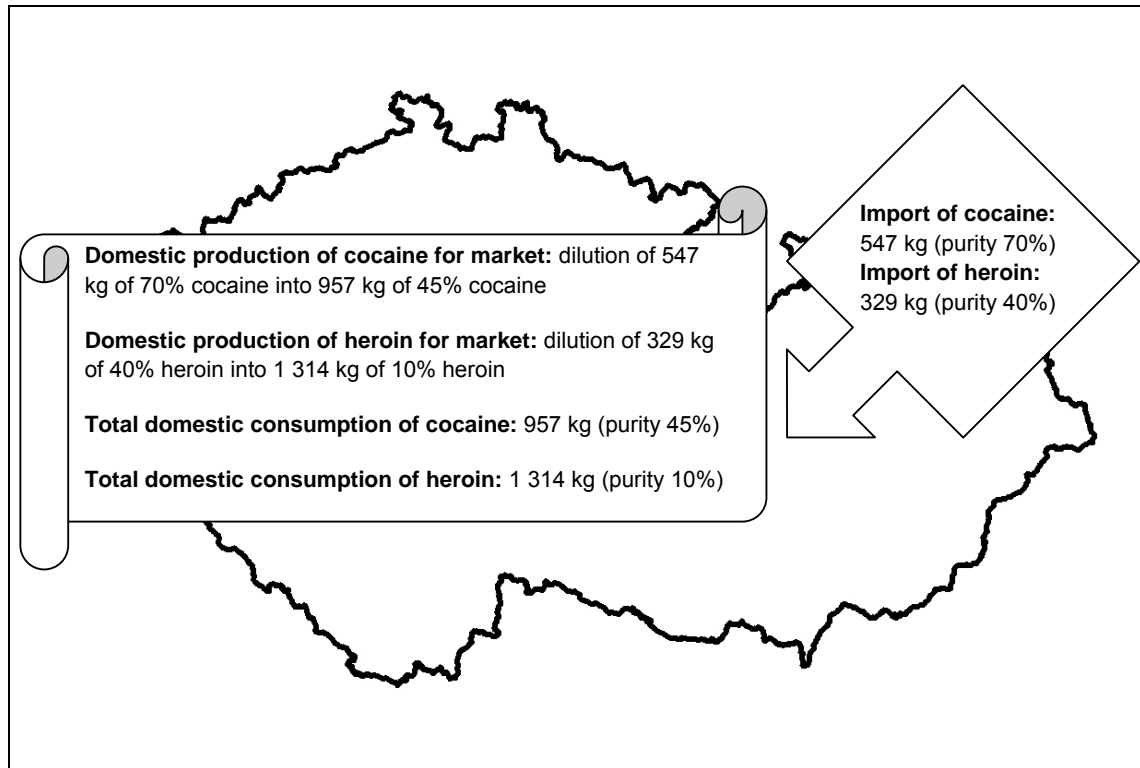
Cocaine and heroin

Cocaine and heroin are diluted drugs, which are imported into the Czech Republic. The import of the drugs was estimated with the use of the formula 6:

$$\text{import of cocaine, heroin} = \text{consumption of cocaine, heroin} \cdot \frac{\text{purity at consumption}}{\text{purity at import}} \quad (6)$$

The import in 2008 reached 547 kg of 70% cocaine and 329 Kg of 40% heroin. The market value of the heroin and cocaine volume increased through the process of dilution shall be considered as domestic production of the Czech Republic. The operation of cocaine and heroin market is drawn in the Figure 1-6.

Figure 1-6: Market with cocaine and heroin in the Czech Republic in 2008



Source: (Vopravil 2010)

1.3.4 Inclusion of illicit drug market into the system of national accounts

Drug market should be included in the system of national accounts (SNA) as a part of illegal activities. Illegal activities are already described in the System of National Accounts 1993 (SNA93) in the paragraphs 6.30 to 6.33 (UN, 1993). They are also mentioned in the European System of Accounts 1995 (ESA95) in the paragraphs 1.13g, 1.42 and 3.08 (EC, 1996).

The drug trade is an illegal activity, which consists in a part of non-observed economy, referred to as NOE (OECD, 2002). The statistical office of the European Union (Eurostat) defines seven categories (N1-N7) of producers in non-observed economy (Eurostat, 2005) in the framework of SNA. The drug market falls under the category N2: “Producers that deliberately fail to register as a legal entity or as entrepreneurship because they are involved in illegal activities”.

The drug market was described in the previous chapters by epidemiological indicators (prevalence of drug use, frequency of use) and by volume indicators (quantity of drug used per occasion /use day/, quantity of illicit drugs produced or imported). This chapter describes the drug market valued in currency, in order to build up financial indicators that can be incorporated into the system of national accounts (see Table 1-23).

Output (P.1)

According to ESA95, the output consists of the total product created during the selected accounting period (EC, 1996). When it comes to illegal drugs, the indicator shall incorporate domestic production (such as the total domestic production of cannabis type drugs and methamphetamine). The output of illicit drug market shall be divided on market output (P.11) and on output produced for own final use (P.12), see bellow. The total production of illicit drugs in the Czech Republic reached EUR 307 million.

Market output (P.11)

ESA95 defines Market output as follows: “market output consists of output that is disposed of on the market or intended to be disposed of on the market” (EC 1996).

The Czech Republic produced 4 674 kg of cannabis type drugs and 2 803 kg of methamphetamine in 2008 for both domestic market and for export. Domestic market production in the Czech Republic contains also drug dilution of imported cocaine and heroin. For instance, there were 547 kg of 70% cocaine imported into the Czech Republic, that were further diluted into 957 kg of 45% cocaine for the domestic market; and there were 329 kg of 40% heroin imported, that were further diluted into 1 314 kg of 10% heroin for the domestic market (see Figure 1-6). The market output is valued by wholesale prices (see Table 1-10). The value of the market production amounted EUR 157 million, from this cannabis drugs accounted for over EUR 22 million, methamphetamine EUR 84 million, cocaine EUR 21 million and heroin EUR 30 million.

Output for own final use (P.12)

According to ESA95, producers also retain their production for own final use. The Czech producers consumed 10 554 kg of own marihuana and 1 774 kg of own methamphetamine. The output for own final use is valued by retail prices (see Table 1-10). The value of own marihuana reached EUR 78 million and own methamphetamine EUR 71 million.

Import (P.7)

According to the definition 3.129 from ESA95, import includes transfer of goods from non-residents to residents. In terms of illicit drugs, it' can be assumed that non-resident contrabands sell illicit drugs to domestic drug dealers – residents. The total drug import to the Czech Republic consists of 3 769 kg of cannabis drugs, 4 715 thousand pieces of ecstasy, 1 053 thousand pieces of LSD, 547 kg of cocaine and 329 kg of heroin. The import is valued by wholesale prices (see Table 1-10). The value of illicit drugs import to the Czech Republic in 2008 amounted EUR 83 million; from this cocaine EUR 37 million, cannabis drugs EUR 18 million, ecstasy EUR 12 million, heroin EUR 10 million and LSD about EUR 6 million.

Trade margin

According to ESA95, output of trade is measured by trade margin, which is incurred by goods purchased with purpose to sale. In case of drug trade, trade margin is incurred by the difference between wholesale per unit prices, for which drug dealers purchase illicit drugs in large quantities, and retail per unit prices, for which drug dealers sell illicit drugs in smaller quantities to final customers. This applies also to the price differential between wholesale and export. The total trade margin in the illicit drug market is estimated as a multiple of quantity of drugs that were marketed, and of price differential between the wholesale and the retail level. The trade margin is estimated by the formula 8:

$$\begin{aligned} \text{TRADE MARGIN} = & (\text{IMPORT} + \text{MARKET PRODUCTION} + \text{EXPORT}) \\ & \times (\text{RETAIL PRICE} - \text{WHOLESALE PRICE}) \end{aligned} \quad (8)$$

The quantity of illicit drugs marketed in the Czech Republic that composed the trade margin in 2008 were 8.4 tons of cannabis drugs (3.7 tons from import and 4.7 tons from domestic production), 2.8 tons of methamphetamine (70 % purity), 4.7 millions of ecstasy tablets, 1 million of LSD pieces, 957 kg of cocaine (45 % purity) and 1.3 tons of heroin (10 % purity). The trade margin of illicit drug market in the Czech Republic then was EUR 22 million for cannabis, EUR 28 million for methamphetamine, EUR 49 million for ecstasy, EUR 2 million for LSD, EUR 17 million for cocaine, and EUR 13 million for heroin; this was EUR 131 million in total. In fact, this amount represents an untaxed profit of drug dealers.

Intermediate consumption (P.2)

By definition ESA95, intermediate consumption consists of the value of products and services used as inputs in the production process. It is therefore the production cost. In case of the Czech Republic, production costs can be identified for cannabis type drugs and for methamphetamine.

Occasional cannabis users who participated in the general population survey in the Czech Republic (GPS, 2008) were asked supplementary questions about the nature of domestically produced cannabis they consumed most recently. 44 % of last 12

months cannabis users who knew the source of the cannabis they used last time claimed it was grown outdoor, 56 % claimed it was grown indoor (Běláčková, et al., 2012). From interviews with cannabis producers it is known, that the cost of producing one gram of cannabis produced by "indoor" technology is around 2.5 EUR per gram (70% of the cost is for the electricity consumption, 20% of the cost for the fertilizer, substrates, and water, 10% of the investments is for the initial investment to growing facilities: lamps, filters, etc.). Growing hemp "outdoor" technologies require almost no cost. The total cost of cannabis grown in the Czech Republic in 2008 was EUR 20 million.

It is estimated that the cost of 70 grams of methamphetamine production is about EUR 800 (95% for expenditure on chemicals, the rest are spending on chemical glassware, lamp, weight, etc.). Given that in 2008, about 3 998 kg methamphetamine (80 % purity) were produced in the Czech Republic, the total cost of methamphetamine production in the Czech Republic was EUR 48 million.

Final consumption of households

The final consumption of households is divided into the expenditure on final consumption of households, and the consumption of production for own final use. According to the definition 3.75 from ESA95, the expenditure on final consumption consists of expenditure incurred by resident institutional units on goods or services that are used for the direct satisfaction of individual needs or wants. The final consumption of households including the consumption of production for own final use is valued in retail prices.

In the example of the Czech Republic, drug consumers paid for final consumption of cannabis EUR 61 million, methamphetamine EUR 107 million, ecstasy EUR 61 million, LSD EUR 8 million, cocaine EUR 75 million and heroin EUR 53 million. In addition, the Czech drug users consumed their own production of cannabis drugs in the value of EUR 78 million and methamphetamine in value of EUR 71 million. The total expenditure on illicit drugs that were purchased reached EUR 365 million; total consumption of illicit drugs that were produced for own consumption amounted EUR 149 million. The total value of drugs consumed in the Czech Republic in 2008 was EUR 515 million.

Export (P.6)

According to definition 3.128 from ESA95, export of goods consists of transactions in goods from residents to non-residents. Export is valued in retail prices. The Czech drug dealers exported 151 kg of domestically produced cannabis in the value of EUR 1 million, and 141 kg of domestically produced methamphetamine in the value of EUR 5 million. The total value of drugs exported from the Czech Republic in 2008 amounted EUR 59 million.

According to definition 3.133d from ESA95, the drug market model doesn't include drug transit through country, referred to as re-export. Re-export includes cases when

wholesale dealers buy illicit drugs from non-residents, and then sell them again to non-residents within the same accounting period.

Value added (B1.g) and gross domestic product (B.1*g)

The Table 1-23 summarizes the estimate of the total illicit drug market in the Czech Republic in 2008 for use in the national accounts. The total Supply (domestic production + import + trade margin) is equal to the total Use (final consumption + export).

The added value of the drug market is calculated with the use of the formula 8:

$$VALUE\ ADDED = OUTPUT + TRADE\ MARGIN - INTERMEDIATE\ CONSUMPTION \quad (8)$$

The trade margin is included in the formula, because it is actually an output of merchants. According to our estimation, the added value of the drug market in the Czech Republic for the year 2008 amounted to EUR 369 million.

Table 1-23: Drug market in the System of National Accounts in the Czech Republic in 2008 (EUR million)

	Total	cannabis drugs	methamp hetamine	ecstasy	LSD	cocaine	heroin
Domestic production	307	101	155			21	30
production for market	157	22	84			21	30
production for own use	149	78	71				
Import	83	18		12	6	37	10
Trade margin	131	22	28	49	2	17	13
Total Supply	521	141	183	61	8	75	53
Final consumption	515	140	178	61	8	75	53
expenditure for final consumption	365	61	107	61	8	75	53
consumption of own account production	149	78	71				
Export	59	1	5				53
Total Use	521	141	183	61	8	75	53
Intermediate consumption	68	20	48				0
Value added	369	102	135	49	2	38	43

In the System of National Accounts, the drug market is recorded in the institutional sector of households. Production of cannabis, its import and export, consumption, intermediate consumption and value added is recorded in the Statistical Classification of Economic Activities (NACE) under the code 011 (Growing of non-perennial crops). The import/export of other, "synthetic" drugs and their dilution is recorded under the NACE 212 (Manufacture of pharmaceutical preparations). The trade margin of all illicit drugs is recorded under the NACE 479 (Retail trade not in stores, stalls or markets).

In the Supply/Use Tables, cannabis type drugs should be recorded in the Statistical Classification of Products by Activity (CPA) under the code 011 (Non-perennial

crops). Other, “synthetic” drugs should be recorded under the CPA 212 (Pharmaceutical preparations).

1.4 Estimation of illicit drug market in Spain

Estimation of the illicit drug market in Spain was made with the use of the same methodology as the estimation for the Czech Republic. The detailed structure of prevalence rates and frequencies of use of the main illicit drugs were obtained from the survey EDADES 2009 (see Table 1-24 to Table 1-29).

Table 1-24: Prevalence rates of cannabis use in Spain in 2009

Age groups (in years)	1-3 days in the last year		4-9 days in the last year		10-19 days in the last year		20-29 days in the last year		30-150 days in the last year		>150 days in the last year	
	males	females	males	females	males	females	males	females	males	females	males	females
15 – 19	5.8	6.1	2.7	2.7	2.7	1.9	2.1	1.9	6.7	2.0	5.9	1.9
20 – 24	5.8	4.7	3.1	2.9	3.1	2.3	3.2	1.2	8.8	3.7	10.6	3.8
25 – 29	4.1	4.6	3.3	2.3	3.4	0.9	3.4	0.7	5.6	1.1	9.8	2.9
30 – 34	2.9	2.8	2.2	0.5	1.9	0.4	1.3	0.2	4.2	0.8	5.7	1.0
35 – 39	2.9	1.4	1.3	0.4	2.0	0.6	1.2	0.3	2.7	0.6	3.0	0.6
40 – 44	2.8	1.2	1.3	0.1	1.1	0.4	0.5	0.1	1.0	1.5	1.9	0.8
45 – 49	1.4	1.0	1.0	0.5	1.1	0.3	0.2	0.0	1.9	0.2	1.5	0.4
50 – 54	0.9	0.2	0.3	0.0	1.2	0.2	1.6	0.0	1.0	0.1	1.4	0.0
55 – 59	0.0	0.2	0.0	0.2	0.5	0.0	0.4	0.0	0.7	0.0	0.1	0.2
60 – 64	0.4	0.2	0.0	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.0	0.0

Source: EDADES 2009

Table 1-25: Prevalence rates of amphetamine use in Spain in 2009

Age groups (in years)	1-3 days in the last year		4-9 days in the last year		10-19 days in the last year		20-29 days in the last year		30-150 days in the last year		>150 days in the last year	
	males	females	males	females	males	females	males	females	males	females	males	females
15 – 19	1.2	0.4	0.5	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
20 – 24	2.0	1.1	0.9	0.2	0.5	0.4	0.5	0.1	0.2	0.1	0.2	0.1
25 – 29	1.0	0.4	0.3	0.1	0.2	0.0	0.2	0.0	0.1	0.0	0.1	0.0
30 – 34	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0
35 – 39	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40 – 44	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0
45 – 49	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
50 – 54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
55 – 59	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60 – 64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: EDADES 2009

Table 1-26: Prevalence rates of heroin use in Spain in 2009

Age groups (in years)	1-3 days in the last year		4-9 days in the last year		10-19 days in the last year		20-29 days in the last year		30-150 days in the last year		>150 days in the last year	
	males	females	males	females	males	females	males	females	males	females	males	females
15 – 19	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 – 24	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
25 – 29	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30 – 34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
35 – 39	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
40 – 44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
45 – 49	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50 – 54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55 – 59	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
60 – 64	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

Source: EDADES 2009

Table 1-27: Prevalence rates of cocaine use in Spain in 2009

Age groups (in years)	1-3 days in the last year		4-9 days in the last year		10-19 days in the last year		20-29 days in the last year		30-150 days in the last year		>150 days in the last year	
	males	females	males	females	males	females	males	females	males	females	males	females
15 – 19	2.0	0.4	0.5	0.4	0.4	0.0	0.1	0.1	0.1	0.1	0.2	0.0
20 – 24	3.3	1.5	1.6	1.0	0.9	0.8	1.1	0.2	1.1	0.4	0.3	0.0
25 – 29	3.3	1.9	1.5	0.5	1.5	0.2	1.1	0.1	0.9	0.1	0.3	0.1
30 – 34	2.7	0.6	1.0	0.2	0.7	0.0	0.7	0.0	0.5	0.2	0.3	0.1
35 – 39	1.7	0.3	1.2	0.0	0.4	0.0	0.4	0.0	0.6	0.1	0.0	0.0
40 – 44	1.4	0.4	1.3	0.0	0.3	0.0	0.3	0.0	0.3	0.4	0.3	0.0
45 – 49	1.3	0.0	0.6	0.3	0.1	0.0	0.2	0.0	0.5	0.0	0.1	0.0
50 – 54	0.9	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.1	0.0
55 – 59	0.4	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60 – 64	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0

Source: EDADES 2009

Table 1-28: Prevalence rates of ecstasy use in Spain in 2009

Age groups (in years)	1-3 days in the last year		4-9 days in the last year		10-19 days in the last year		20-29 days in the last year		30-150 days in the last year		>150 days in the last year	
	males	females	males	females	males	females	males	females	males	females	males	females
15 – 19	2.1	0.3	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0
20 – 24	2.3	1.0	0.7	0.5	0.5	0.1	0.5	0.2	0.4	0.3	0.0	0.0
25 – 29	1.3	0.3	0.6	0.0	0.7	0.2	0.0	0.0	0.3	0.0	0.0	0.0
30 – 34	1.0	0.1	0.3	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0
35 – 39	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

40 – 44	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
45 – 49	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50 – 54	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
55 – 59	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
60 – 64	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: EDADES 2009

Table 1-29: Prevalence rates of LSD use in Spain in 2009

Age groups (in years)	1-3 days in the last year		4-9 days in the last year		10-19 days in the last year		20-29 days in the last year		30-150 days in the last year		>150 days in the last year	
	males	females	males	females	males	females	males	females	males	females	males	females
15 – 19	1.9	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
20 – 24	1.9	1.0	0.4	0.3	0.3	0.1	0.1	0.2	0.1	0.0	0.1	0.0
25 – 29	0.9	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30 – 34	0.4	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35 – 39	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40 – 44	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
45 – 49	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
50 – 54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55 – 59	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60 – 64	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: EDADES 2009

The population size in Spain for the year 2009 split into 5 years age categories, and divided by gender were retrieved from the United Nations Economic Commission for Europe (UNECE) database.

Table 1-30: Population size by age groups and by gender in Spain in 2009

Age groups	Mid-year population	
	Males	females
15 – 19 years	1 159 305	1 096 220
20 – 24 years	1 362 733	1 307 719
25 – 29 years	1 776 673	1 689 576
30 – 34 years	2 099 076	1 956 335
35 – 39 years	2 024 398	1 901 884
40 – 44 years	1 877 211	1 818 194
45 – 49 years	1 699 886	1 694 862
50 – 54 years	1 468 697	1 501 119
55 – 59 years	1 260 143	1 317 493
60 – 64 years	1 151 227	1 242 149

Source: UNECE

Consumption of illicit drugs in Spain was estimated as a multiple of the number of users, the average frequency of use, and the average amount of drug used per a use day/opportunity. The average frequency was calculated as an average of frequencies in the heading of the Table 1-24 to Table 1-29. The average amount of drug used per day in Spain was assumed to be the same as in the Czech Republic.

The estimations of illicit drug consumption in Spain in 2009 reached about 113 tons of cannabis drugs, 1.2 tons of amphetamines, 19 tons of heroin, 51 tons of cocaine,

4.6 millions of ecstasy tablets and 1.6 millions of LSD trips. The daily users of illicit drugs (>150 days in the last year) consume the majority of illicit drug quantity.

Table 1-31: Quantity of cannabis consumed in Spain in 2009 (in grams)

	1-3 days in the last year	4-9 days in the last year	10-19 days in the last year	20-29 days in the last year	30-150 days in the last year	>150 days in the last year
Number of users	760 142	387 180	372 004	249 111	555 865	717 836
Average frequency of use per year	2	6.5	14.5	24.5	90	257.5
Average quantity consumed per one opportunity / use day (grams)	0.26	0.26	0.26	0.26	0.26	0.52
Quantity consumed (kilograms)	395	654	1 402	1 586	13 007	96 118
Total quantity consumed (kg)	113 164					

Table 1-32: Quantity of amphetamine consumed in Spain in 2009 (in grams)

	1-3 days in the last year	4-9 days in the last year	10-19 days in the last year	20-29 days in the last year	30-150 days in the last year	>150 days in the last year
Number of users	114 390	30 817	22 620	11 675	11 167	7 909
Average frequency of use per year	2	6.5	14.5	24.5	90	257.5
Average quantity consumed per one opportunity / use day (grams)	0.3	0.3	0.3	0.3	0.3	0.3
Quantity consumed (kilograms)	68 634	60 093	98 397	85 809	301 518	610 965
Total quantity consumed (kg)	1 225 416					

Heroin users were divided into occasional users (any use in the last 12 months) and problem users (PDUs). For the purpose of our estimation, heroin users who used heroin more than 10 times per year in 2009 were marked as problem users; this figure corresponds to the mean number of problem heroin users reported to EMCDDA by the Spanish Focal Point. The same data on frequency of use and the average amount of drug used per day by a problem heroin user were used as for the Czech Republic.

Table 1-33: Quantity of heroin consumed in Spain in 2009 (in grams)

		1-3 days in the last year	4-9 days in the last year	10-19 days in the last year	20-29 days in the last year	30-150 days in the last year	>150 days in the last year
Occasional users	Number of users	7 340	1 151	-	-	-	-
	Average frequency of use in year	1	6.5	-	-	-	-
	Average contain of drug by one opportunity of use (grams)	0.4	0.4	-	-	-	-
	Consumed quantity (grams)	2 936	2 993	-	-	-	-
Problematic users	Number of users	-	-	95 000			
	Average consumption of one user per week (grams)	-	-	3.86			
	Average consumption of one user per year (grams)	-	-	200.72			
	Consumed quantity (grams)	-	-	19 068 400			
Total consumed quantity (grams)		19 074 329					

As for cocaine, the mean number of its problem users in Spain, as reported to EMCDDA, was 145 000. We used this figure as an estimation of daily or almost daily cocaine users (see Table 1-34).

Table 1-34: Quantity of cocaine consumed in Spain in 2009 (in grams)

	1-3 days in the last year	4-9 days in the last year	10-19 days in the last year	20-29 days in the last year	30-150 days in the last year	>150 days in the last year
Number of users	370 105	173 450	95 702	74 068	98 511	145 000
Average frequency of use per year	2	6.5	14.5	24.5	90	257.5
Average quantity consumed per one opportunity / use day (grams)	1	1	1	1	1	1
Quantity consumed (kilograms)	740	1 127	1 387	1 815	8 866	37 337
Total quantity consumed (kg)	51 273					

Table 1-35: Quantity of ecstasy consumed in Spain in 2009 (in pieces)

	1-3 days in the last year	4-9 days in the last year	10-19 days in the last year	20-29 days in the last year	30-150 days in the last year	>150 days in the last year
Number of users	152 903	39 507	31 542	13 405	15 800	7 348
Average frequency of use in year	2	6.5	14.5	24.5	90	257.5
Average quantity consumed per one opportunity / use day (pieces)	1	1	1	1	1	1
Consumed amount totally (pieces)	4 662 588					

Table 1-36: Quantity of LSD consumed in Spain in 2009 (in pieces)

	1-3 days in the last year	4-9 days in the last year	10-19 days in the last year	20-29 days in the last year	30-150 days in the last year	>150 days in the last year
Number of users	111 145	17 502	9 272	5 796	2 522	3 063
Average frequency of use in year	2	6,5	14,5	24,5	90	257,5
Average quantity consumed per one opportunity / use day (pieces)	1	1	1	1	1	1
Consumed amount totally (pieces)	1 628 108					

The data for average drug purities on wholesale and retail level, and on prices, were collected from the Spanish NFP, from EMCDDA, and from UNODC reports. In comparison with the Czech Republic, cocaine purity on both retail and wholesale level were much higher in Spain.

Table 1-37: Average purities of illicit drugs in Spain in 2009

	heroin	cocaine
Wholesale level	48.0 %	73.0 %
Retail level	33.0 %	51.0 %

Source: Spain NFP, EMCDDA, UNODC

Table 1-38: Average prices of illicit drugs in Spain in 2009 (in EUR)

Prices	Cannabis	Amphetamine	Heroin	Cocaine	Ecstasy	LSD
Wholesale price	1.4	17.7	35.8	33.8	4.5	6.0
Retail price	4.8	25.8	62.7	60.8	10.7	11.4

Source: Spain NFP, EMCDDA, UNODC

In the case of Spain, no domestic (primary) production of illicit drugs could be identified from available data sources, for the purpose of this analysis, all drugs were considered to be imported into Spain. The domestic market production is represented by drug dilution of imported heroin and cocaine. Domestic production and import of all drugs is valued by wholesale prices. Trade margin was calculated with the use of the formula 7.

The expenditure on final consumption (valued at retail prices) represented the entire estimate on the total Use side in Spain. Total use was equal to total supply, and the total value of illicit drug market was EUR 4 957 million in 2009.

Added value was calculated by the formula 8. The total value added from the drug trade in Spain was estimated as EUR 3 066 million in 2009, which was 0.29 % of GDP.

Table 1-39: Drug market in the System of National Accounts in Spain in 2009 (EUR million)

	Total	cannabis	ampheta mine	heroin	cocaine	ecstasy	LSD
NA indicators							
Supply	4 957	543	32	1 196	3 117	50	19
Domestic production	736	0	0	213	522	0	0
production for market	736	0	0	213	522	0	0
production for own use	0	0	0	0	0	0	0
Import	1 891	158	22	469	1 211	21	10
Trade margin	2 330	385	10	513	1 384	29	9
Use	4 957	543	32	1 196	3 117	50	19
Final consumption	4 957	543	32	1 196	3 117	50	19
expenditure for final consumption	4 957	543	32	1 196	3 117	50	19
consumption of own account production	0	0	0	0	0	0	0
Export	0	0	0	0	0	0	0
Intermediate consumption	0	0	0	0	0	0	0
Value added	3 066	385	10	726	1 907	29	9

1.5 Estimation of illicit drug market in Italy

Number of the occasional drug users in Italy was estimated on the basis of the last year prevalence rate applied to the population aged 15-64 years. For the number of daily users, an estimation of PDU was used. The total quantity of illicit drugs consumed was estimated with the use the formula 4 (see Table 1-40).

Table 1-40: Consumption of illicit drug consumption in Italy in 2008

	Regular users				Occasional users			
	Number of users	frequency (days of use per year)	consumed quantity per a use day (g)	Total quantity consumed (kg; 1,000 pieces)	number of users	frequency (days of use per year)	consumed quantity per a use day (g)	Total quantity consumed(kg; 1,000 pieces)
cannabis	618 086	240	0.52	77 137	2 472 343	12	0.26	7 714
amphetamine	26 805	52	1.00	1 394	107 219	12	1.00	1 287
heroin	251 997	240	0.50	30 240	-	-	-	-
cocaine	147 426	100	1.50	22 114	589 704	12	1.50	10 615
ecstasy	33 506	52	1	1 742	134 023	12	1	1 608
LSD	40 207	52	1	2 090	160 828	12	1	1 929

The data on average drug purities on the wholesale and the retail level, as well as the data on prices, were collected from the Spanish NFP, from EMCDDA, and from UNODC reports (see Table 1-41 and Table 1-42).

Table 1-41: Average purities of illicit drugs in Italy in 2008

	heroin	cocaine
Wholesale level	53.0 %	90.0 %
Retail level	41.0 %	66.0 %

Source: EMCDDA, UNODC

Table 1-42: Average prices of illicit drugs in Italy in 2008 (in EUR)

Prices	Cannabis	Amphetamine	Heroin	Cocaine	Ecstasy	LSD
Wholesale price	2.0	5.0	24.0	41.0	4.0	6.0
Retail price	8.1	17.5	53.6	76.2	18.1	28.6

Source: EMCDDA, UNODC

In the case of Italy, no domestic (primary) production of illicit drugs could be identified from available data sources, for the purpose of this analysis all drugs were considered to be imported into Italy. The domestic market production is represented by drug dilution of imported heroin and cocaine. Domestic production and import of all drugs is valued at wholesale prices. Trade margin was calculated with the use of the formula 7.

The expenditure on final consumption (valued at retail prices) represented the entire estimate on the total use side in Italy. Total use was equal to total supply, and the total value of illicit drug market was EUR 5 025 million in 2008.

Added value was calculated by the formula 8. The total value added from the drug trade in Italy was estimated as EUR 3 258 million in 2008, which was 0.21 % of GDP.

Table 1-43: Drug market in the System of National Accounts in Italy in 2008 (EUR million)

	Total	cannabis	ampheta mine	heroin	cocaine	ecstasy	LSD
NA indicators							
Supply	5 025	687	47	1 621	2 494	61	115
Domestic production	522	0	0	164	358	0	0
production for market	522	0	0	164	358	0	0
production for own use	0	0	0	0	0	0	0
Import	1 766	170	13	561	984	13	24
Trade margin	2 736	518	34	895	1 152	47	91
Use	5 025	687	47	1 621	2 494	61	115
Final consumption	5 025	687	47	1 621	2 494	61	115
expenditure for final consumption	5 025	687	47	1 621	2 494	61	115
consumption of own account production	0	0	0	0	0	0	0
Export	0	0	0	0	0	0	0
Intermediate consumption	0						
Value added	3 258	518	34	1 059	1 510	47	91

2 Analyses

This chapter describes several examples of analytical procedures that bring insight into the dynamics of illicit drug market economy and drug policy expenditures.

2.1 Potential impact of illicit drug market on GDP

The National Statistical Offices in the European Union shall report the estimations of illegal activities, including the illicit drug market, in their national accounts system (see chapter 1.3.4). As shown in Chapter 1, the share of value added from drug market on GDP in the Czech Republic amounted to 0.22 %, the share on GDP in Italy was about 0.21 %, and it reached 0.29 % in Spain. All estimations used the same methodology, only epidemiological indicators and some market characteristics differed across the countries. Our results show that the contribution of the illicit drug market to the national economy is about 0.2-0.3 % GDP.

Several drug market estimates, however, focus on the total value of illicit drug market at the point of consumption (RAND, et al., 2009) that correspond rather to the estimation of total use or total supply (see Table 1-23). Reporting these estimates as a share of GDP, however, seems rather inappropriate and yields into over-estimation of illicit drug market share on national economies. We suggest that total use / total supply figures are presented in absolute figures only.

2.2 Time series of drug market size in the Czech Republic

The main data source for the detailed structure of use prevalence rates and frequencies of use are the general population surveys (GPS). General population surveys on substance use and attitudes towards it were conducted in the Czech Republic in the years 2004, 2008 and 2012 (results of the GPS2012 were not available till finalization of this study). In the Czech Republic, further surveys into general population with the focus on substance use were conducted, one of them was the Gender, Alcohol, and Culture: an international study (GENACIS) for the population 18-64 years old in 2002. The GPSs can be completed with data on the population of 16-18 years old from the European School Survey Project on Alcohol and Other Drugs (ESPAD); in the Czech Republic, ESPAD was conducted in the years 1995, 1999, 2003, 2007, and 2011. In between the years when large surveys are conducted, prevalence rates can be updated with results of small surveys on drug use conducted by the NFP or other research institutions (e.g. (Kubů, Škařupová, & Csémy, 2006).

Data on drug purities and prices are updated each year, and are published by the NFP in its Annual Reports. A time trend of the drug market size based on the above mentioned data was developed for the Czech Republic (see Table 2-1: Drug market

in the System of National Accounts in the Czech Republic in 1999-2011 (EUR million).

Table 2-1: Drug market in the System of National Accounts in the Czech Republic in 1999-2011 (EUR million)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
NA indicators													
Total supply	224	230	237	258	247	258	303	350	387	475	460	488	517
Domestic production	169	172	178	193	184	189	208	218	220	247	237	247	262
production for market	78	78	80	86	80	87	100	111	126	152	150	164	167
production for own use	37	38	39	43	42	46	65	87	107	141	138	144	163
Import	18	20	20	22	22	23	30	44	61	88	85	97	92
Trade margin	91	94	98	107	104	102	108	107	94	94	87	82	96
Total use	224	230	237	258	247	258	303	350	387	475	460	488	517
Final consumption	224	229	237	257	247	258	302	347	384	469	453	481	505
expenditure for final consumption	187	191	198	214	205	211	237	260	277	329	315	337	342
consumption of own account production	37	38	39	43	42	46	65	87	107	141	138	144	163
Export	1	1	1	1	1	1	2	3	4	6	6	7	12
Intermediate consumption	37	38	39	42	40	42	47	52	56	66	68	65	102
Value added	169	172	179	194	186	194	226	254	271	321	307	326	323

The time series was used in the Czech NA revision in 2011. In the future, the time series will be updated with the use of the GPS2012 data, and drug consumption will be adjusted with the use of the moving average method.

Conclusions and discussions

The methodology for estimation of illicit drug market from demand side was presented in this publication. The methodology is built upon illicit drug consumption of drug users, and therefore stems from epidemiological indicators of substance use. The data for number of occasional (last 12 months) drug users comes from General Population Surveys, which are performed in most European countries. The number of problem drug users is estimated separately. The average quantity used per one opportunity (use day) is used in the estimation process; however, quantities consumed per a use day/occasion may differ between countries because of different drug users behaviour in different drug supply markets. The data on drug quantities consumed remain scarce in Europe.

Illicit drugs are imported into the European Union, while some countries have domestic production of particular kinds of illicit drugs at the same time. Prices and purities on wholesale and retail levels are different across countries. Data on prices and purities are published by EMCDDA and UNODC; however, they are not acquired through systematic collection.

Market size estimates can be further incorporated into the System of National Accounts (ESA95) as a part of export (P.6), import (P.7), output for final use (P.12), output (P.1), market output (P.11), value added (B.1g), intermediate consumption (P.2), final consumption of households, and trade margin.

The example of estimation of illicit drug market size in the Czech Republic for 2008 was shown. The size of illicit drug market as an expression of both total supply and total use of was 141 mil EUR in the case of cannabis, 183 mil EUR in the case of methamphetamine, 75 mil EUR in the case of cocaine, 53 mil EUR in the care of heroin, and 61 mil EUR in case of ecstasy and 8 mil EUR in case of LSD – a total of 521 mil EUR.

However, a correct estimation of the impact illicit drug markets have on national economies, shall account for added value only (B.1g in SNA). In the Czech Republic, the value added within the national economy was EUR 102 million for cannabis type drugs, EUR 135 million for methamphetamine, EUR 49 million for ecstasy, EUR 2 million for LSD, EUR 38 million for cocaine and EUR 43 million for heroin – a total of EUR 369 million. The share of value added from drug market on GDP in the Czech Republic amounted to 0.22 %. With the use of the same methodology, we estimated the share of illicit drug market on GDP in Italy to be about 0.21 %, and in Spain to be 0.29 %. Our results indicate that the contribution of the illicit drug market to the national economies in the European Union (or at least the project participant countries) ranges from 0.2 to 0.3 % GDP.

Our results seem to be lower than what was previously published in the body of literature on drug market size in the Czech Republic. While estimates of drug use

prevalence are generally retrieved from EMCDDA and represent a comparable part of different methodological approaches, a greater level of uncertainty lies in quantity estimates. For example, other studies used 150 grams for last month cannabis users in annual cannabis consumption, which is more than what we assumed for the Czech cannabis users (Kilmer and Pacula 2009). Another difference lies in the fact that previous studies tended to relate the total consumption to GDP, and thus yielded higher results.

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Abbreviations

CPA	Statistical classification of products by activity
CZK	Czech national currency (Czech Crown)
CZSO	Czech Statistical Office
EC	European Commission
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
ES	Spain
ESA95	European System of Accounts 1995
ESPAD	European School Survey Project on Alcohol and Other Drugs
EU	European Union
EUR	Euro (European currency)
Eurostat	statistical office of the European Union (situated in Luxembourg)
GDP	Gross Domestic Product
GENACIS	Gender, Alcohol, and Culture: an international study
GPS	General Population Survey
ICD	International Classification of Diseases
IDT	Instituto da Droga e da Toxicodependencia (in Portugal)
IHIS	Health Information and Statistics
LSD	Lysergic acid diethylamide, hallucinogenic drug
NA	national accounts
NACE	Statistical classification of economic activities in the EU
NFP	National Focal Point
NOE	Non-Observed Economy
OECD	Organisation for Economic Co-operation and Development
PDU	problem drug users
SHA	System of Health Accounts
SNA93	System of National Accounts 1993
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNODC	United Nations Office on Drugs and Crime

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