

**New psychoactive substances (NPS):**  
 Building knowledge and evidence  
 based training through research

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# Executive Summary

Recent years have been dominated by the appearance of an increasing number of new psychoactive substances (NPS), often intended to mimic the effects of traditional controlled drugs. Developments in this area move rapidly with new substances appearing at a fast rate in the EU. Some substances are sold directly on the illicit market, through internet sources via chat forums while others, so-called 'legal highs' are sold more openly (i.e. in the streets).

The Cyprus Anti-Drugs Council (CAC) as the supreme coordinating body in the field of illegal drugs and alcohol in Cyprus participated for the first time in the implementation of a project supporting the European Pact against Synthetic Drugs, with a specific focus on New Psychoactive Substances (NPS). With the aid of its partner, the Cyprus Police Drug Law Enforcement Unit (DLEU), the CAC attempted to increase its knowledge on the internet supply chain for NPS and to promote cooperation among the parties involved (police, customs, private and public postal companies). The Internet is an important marketplace for new psychoactive substances and countries have experimented with a range of control measures to respond to the new-drug problem, although there is still place for strengthening the legislative framework and responses in dealing with the phenomenon of NPS (EMCDDA, 2013). This, along with the apparent dynamic nature of the phenomenon makes the continuous study of NPS imperative, in order to acquire more knowledge about them and hence counter their use which hides many unknown dangers. Although for the time being prevalence levels are generally low (5% of young Europeans used legal highs at some time) there may be a potential for rapid rise of use in certain sub-populations (EMCDDA, 2012).

## **Main objectives of the project**

Taking into account the broader picture regarding NPS, along with the absence of relevant information regarding the prevalence of use of NPS, among young Cypriots, the major objectives of the project were: a) to estimate the prevalence of use of NPS among youth and their behaviors b) to map the transaction history of users in online drug marketplaces b) to classify the names of NPS, c) to identify marketing and distribution techniques used in the online market, d) to train the front line agencies, namely the Drug Law Enforcement Unit, customs, as well as private and public postal services.

## Results of the project

In order to achieve these objectives the following actions were implemented:

### Research

#### Cyprus prevalence survey on NPS among youth

The quantitative survey amongst youth was carried out with the aim of estimating the prevalence of new substances which imitate the effects of illicit drugs in Cyprus. The instrument utilized was developed within the framework of the General Population Survey Indicator as monitored by the CMCDDA, while the methodology applied followed the standards implemented by the EMCDDA.

Research goals included the acquisition of reliable data concerning the extent of use of new substances which imitate the effects of illicit drugs in the youth population, aged 18-35 and the socio-demographic characteristics of these users.

#### Key findings:

- Two out of three Cypriots aged 18 to 35 are aware of the existence of NPS (65%). Specifically, one out of ten Cypriots aged 18 to 35 is aware of the existence of mephedrone (10.7%) while one out of four Cypriots is aware of the existence of GHB (27.1%). More than half of the participants admit to being aware of the existence of synthetic cannabinoids.
- The lifetime prevalence of NPS (use at least once in lifetime) reaches 5.3%. Specifically, the lifetime prevalence of ketamine is 0, 2% of mephedrone is limited to 0.3%, of GBH is 0,4%, and of synthetic cannabinoids is 1,5%.
- The last year prevalence of NPS (use within the past 12 months) reaches 2.0% in terms of the total population. More specifically, mephedrone reaches 0,1%, GHB 0,3%, synthetic cannabinoids 0,9% and ketamine is limited to 0,1%.

This information will be used to evaluate the extent of use amongst youth, of new addictive substances which imitate the effects of illicit drugs, to determine priorities, and to design ways of countering the problem, in the framework of the National Strategy.

#### Qualitative research: Monitoring anonymous online drug marketplaces

This research was conducted, aiming at a systematic online monitoring of transactions on anonymous drug sites. This monitoring provided important insight information and a rapid assessment of the online drug market. It is important to note that so far, no research on the prevalence of use of NPS has been conducted in Cyprus, nor has any kind of online research taken place regarding the NPS while at European level, according to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA, 2013) only a few countries have repeated surveys that include NPS.

Through this project, the CAC and partner provided training and exchange of expertise. For the implementation of the qualitative research there was training in order to gain technical knowledge on the methodology of monitoring anonymous online drug marketplaces. Also, through the project, it was possible to provide evidence-based training seminars on how to handle NPS-related cases and how to develop an evidence-based strategy that will help drug related agencies (Drug Law Enforcement Unit, customs, private and public postal companies) to strengthen supply reduction measures as regards the importation of NPS.

**Key findings:**

- Through the eight “darknet” websites which were monitored, 148 types of new psychoactive substances NPS were identified, out of 450 identified by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA).
- The category of phenethylamines was the most popular category available. In particular, 156 distinct sources offer new psychoactive substances of the category of phenethylamines, such as 2C-B or 2C-E
- New psychoactive substances NPS existed in all drug categories on all the markets examined.
- Drugs were the most popular product sold on the “darknet” market

**Training and Exchange of best practice**

Activities under this pillar of the project, concerned training from other EU countries through a) study visits and b) a “training the trainer” workshop where experts from Lithuania, Czech Republic and UK trained officers of the Cyprus Police Drug Law Enforcement Unit and other drug-related professionals regarding drug law enforcement actions and interventions for NPS-related cases. Following this, officers of the Cyprus Police Drug Law Enforcement Unit (DLEU), and the State General Laboratory, provided 8 educational training seminars to 230 officers from customs, private and public postal companies. An informative leaflet regarding NPS was developed by the DLEU in order to be disseminated to all these front line professionals.

**Dissemination**

During the beginning of the project a dissemination strategy was developed. The key stakeholders were identified while the methods for dissemination were specified. In the final stage of the project, the concluding conference was organized in order to present the results of the project while the report regarding the project findings and recommendations will be disseminated to national partners.

Report findings will also be disseminated to partners in the drugs field (such as the European Monitoring Centre for Drugs and Drug Addiction and its Reitox Network, the Horizontal Working Party on Drugs of the EU, the Pompidou Group of the Council of Europe and Europol). Finally, the project’s website (<http://www.iseccyproject.com>) contains all relevant information with a section dedicated to the project’s findings.

**Evaluation of the project**

For purposes of the project’s evaluation, an internal mechanism of evaluation was foreseen, but also experts were seconded in order to externally evaluate the project. The two processes ran in parallel and continuous feedback was provided in order to safeguard the smooth implementation of the project as well as its outputs.

# Introduction

Recent years have been marked with a proliferation of new psychoactive substances, which are becoming more and more available worldwide. The major challenges to be faced are the diversity of the new substances, the speed with which they have been appearing and their unknown health consequences. Some substances are sold directly on the illicit market, through internet sources via chat forums while others, so-called 'legal highs' are sold more openly (i.e. in the streets). While the EU is in the process of improving its legal system so as to respond to this threat in a timely and efficient way, the situation continues to evolve.

Having said the above, what is needed, is an understanding and sharing of methods and lessons learnt as regards national responses to the situation involving NPS, before exploring the setting up of a European or global response to the problem.

As to the current knowledge on NPS, over the last four years, 38 synthetic substances were detected in Cyprus. The Cyprus Police Drug Law Enforcement Unit estimated that seized quantities of NPS were transported by mail via courier companies in approximately 90% of cases. Moreover, we did not have any information regarding the prevalence of the use of specific substances among the general population (adults or school children). Having the above in mind through this project it was possible to a) provide training to customs, private and public postal services, since the majority of NPS are transported via express mail services, b) estimate the prevalence of NPS use among the young adults aged 18-35, and c) provide an insight into anonymous drug marketplaces.

The increasing availability of a range of NPS, together with the impact of new modes of communication, signals a need to develop measures by which to routinely monitor the extent to which NPS are penetrating the youth population. It is important to note that until the writing of the project's proposal there was no research on the prevalence of use of synthetic drugs, nor any kind of online research regarding the NPS in Cyprus. As regards the training of customs officers and private and public postal services, sporadic educative seminars had taken place. These however have not been grounded in evidence-based practice.

## Objectives

The apparent dynamic nature of the phenomenon makes its study a substantial need in order to counter the unknown dangers arising from the abuse of new psychoactive substances. Although for the time being prevalence levels are generally low (8% of young Europeans aged 15-24 had used a new psychoactive substance at least once) there may be a potential for rapid rise of use in certain sub-populations (Flash Eurobarometer, 2014).

In relation to this situation and in the absence of relevant information regarding the prevalence of use of NPS, among young Cypriots, this project aimed to address: a) the extent of the emerging and spreading of new psychoactive substances among the young Cypriots aged 18-35 who are the highest risk group b) the need to identify and introduce appropriate supply reduction measures.

The project's major objectives were: a) to estimate the prevalence of use of NPS among youth and their behaviors b) to map the transaction history of users in online drug market-places b) to classify the names of the preferred substances, c) to identify marketing and distribution techniques used in the online market, d) to train the front line agencies namely the Drug Law Enforcement Unit, customs, private and public postal services.

The target groups of the project were: 1) Young people aged 18-35. The selection of this population group is based on the rationale that surveys amongst high drug-using populations are able to detect use of a substance that may not be detected in a general population survey. Another reason is that young people reported having used NPS were less likely to recognize the seriousness of the risks associated with regular and occasional use of various illicit and licit substances (European Commission, 2011). 2) Drug Law Enforcement officers who were trained in order to train the customs and the private and public post staff. The reason for using this methodology stems from the fact that the personnel of private postal services has a very fast rate of changing, thus making it indispensable to ensure the existence of a permanent body of expertise, namely the DLEU officers. 3) The courier companies. They were chosen based on the Drug Law Enforcement Unit estimations that seized quantities of NPS were transported by mail via courier companies in approximately 90% of cases. 4) The customs department was chosen to be trained in order to be in a position to identify suspicious packages that may contain NPS.

## Method

As regards the first research, "Cyprus prevalence survey on NPS among youth", it was conducted among 1000 young Cypriots aged 18-35, residents in the areas under the control of the Republic of Cyprus, using face to face interviews. Interviews were conducted on tablets with the use of the CAPI (computer aided personal interviewing) specialised software NIPO nfield. Given the sensitivity of the topics under investigation, following the introductory part of the interview, interviewers would hand over the tablet with the electronic version of the questionnaire to the respondent, so that respondents could respond confidentially to questions on the use of illicit substances.

The questionnaire used for the research was based on the structured part of the European Model Questionnaire, which covers the use of new substances that imitate the effects of illicit drugs. The questionnaire was available for interviewing in both Greek and English.

Fieldwork was conducted between 08/05/2015 and 26/06/2015. In order to maximise response rates, interviews were conducted both on weekdays and weekends.



The second research “Monitoring anonymous online drug marketplaces” involved four distinct phases: a) to identify new psychoactive substances by their official name and by their street name in darknet markets; b) to monitor new psychoactive substances in the illicit markets, b) to describe popular darknet markets, c) to monitor eight vendors. This monitoring provided important insight information and a rapid assessment of the online drug market. Despite the fact that the initial objectives of the project include the examination of possible combination of NPS with other illicit substances or ever prices of NPSr, it was not possible to detect this information in the darknet.

As regards “Training and Exchange of best practice”, training was provided during the beginning of the project on qualitative research methodology to both the CAC officers and the subcontractor of the CAC that conducted the research. As regards other activities in this field, involving the leading partner for this pillar of the project, the Cyprus Police Drug Law Enforcement Unit (DLEU), these concerned the exchange of best practices and training from other EU countries through a) study visits and b) a “training the trainer” workshop (experts from Lithuania, Czech Republic and UK) which trained officers of the Cyprus Police Drug Law Enforcement Unit and other drug-related professionals regarding drug law enforcement actions and interventions for NPS-related cases. Following this, officers of the Cyprus Police Drug Law Enforcement Unit (DLEU), and the State General Laboratory, provided 8 educational training seminars to 230 officers from customs, private and public postal companies.

### Dissemination

The last work stream of the project mainly focused on the dissemination strategy. A concluding conference was organized in order to present the results of the project while a report regarding the project findings and recommendations was prepared and disseminated to EU and national partners. Finally, a special section of the website of the CAC is dedicated to the project.

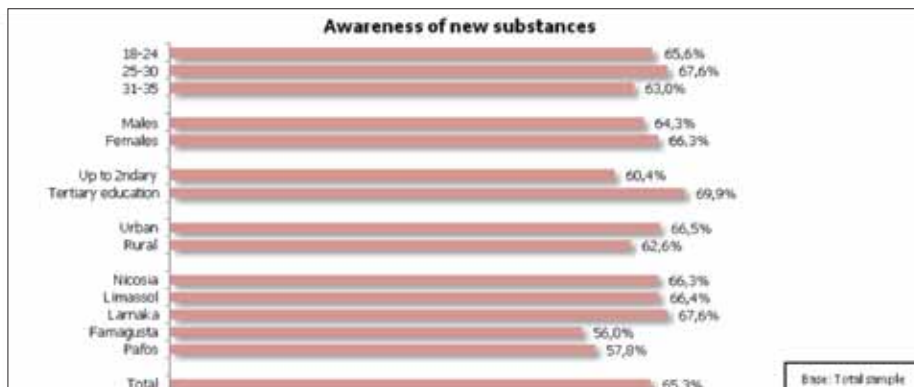
## 1. Quantitative research: Cyprus Prevalence survey on NPS among youth

Cyprus prevalence survey on NPS among youth

General category of new substances that imitate the effects of illicit drugs

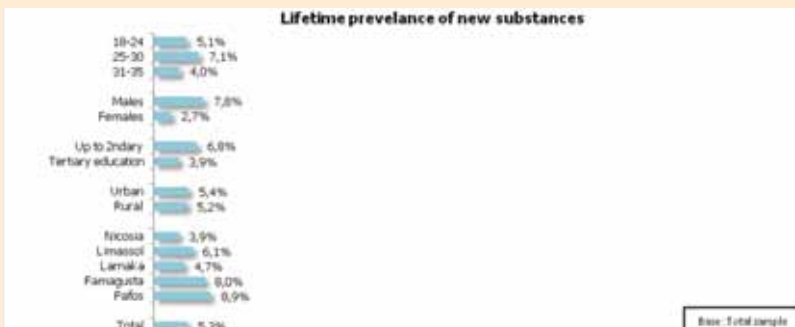
### 1.1 Awareness

Two out of three Cypriots aged 18 to 35 are aware of the existence of new substances that imitate the effects of illegal drugs (65%). Awareness levels are recorded higher amongst individuals with tertiary education and those residing in Nicosia, Limassol and Larnaca.



### 1.2 Lifetime prevalence

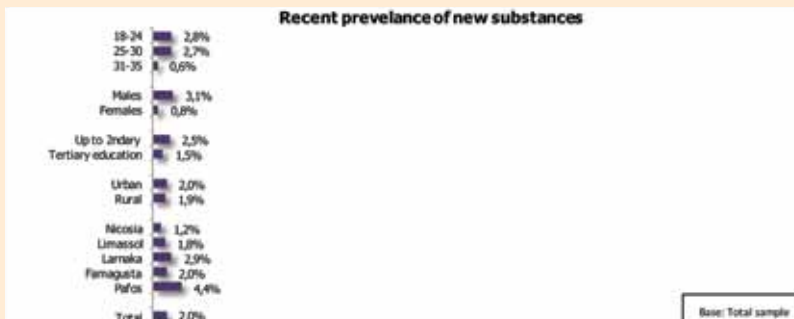
The lifetime prevalence of new substances that mimic the effects of illicit drugs reaches 5.3%. The incidence of having ever tried such substances is recorded higher amongst males and residents of Famagusta and Paphos.



### 1.3 Last Year Prevalence

The Last Year Prevalence of new substances (use within the past 12 months) reaches 2.0% in terms of the total population.

The incidence of Last Year Prevalence is higher amongst individuals aged 18 to 30 years old, males and residents of Paphos.



### 1.4 Format of new substances used

Most of the substances that mimic the effects of illicit drugs that have been used within the past twelve months were in the form of mixtures of herbs that could be smoked up (1.5%).

The use of new substances in the form of powder, crystals, tablets (0.5%) and liquids (0.4%) is more limited.

Consumption of new substances in a different form was very restricted (0.1%).

### 1.5 Supply of new substances

The primary sources of new substances are friends and acquaintances (1.6%). Comparatively, the supply of such substances from drug dealers is more restricted (0.8%).

The study did not capture any cases of new substances being supplied over the internet or through specialised stores.

## 1.6 Profile of users

The profile of Lifetime and Last Year Prevalence users indicates more experience with new substances that mimic the effects of illegal drugs by individuals up to 30 years old, males, individuals without tertiary education and residents of urban areas.

	Lifetime prevalence		Last Year Prevalence	
	No.	%	No.	%
18-24	18	34,0%	10	50,0%
25-30	21	39,6%	8	40,0%
31-35	14	26,4%	2	10,0%
Males	40	75,5%	16	80,0%
Females	13	24,5%	4	20,0%
Up to 2ndary	33	62,3%	12	60,0%
Tertiary education	20	37,7%	8	40,0%
Urban	37	69,8%	14	70,0%
Rural	16	30,2%	6	30,0%
Nicosia	16	30,2%	5	25,0%
Limassol	17	32,1%	5	25,0%
Larnaca	8	15,1%	5	25,0%
Famagusta	4	7,5%	1	5,0%
Paphos	8	15,1%	4	20,0%

## 2. Mephedrone

### 2.1 Awareness

One out of ten Cypriots aged 18 to 35 is aware of the existence of mephedrone (10.7%) Awareness levels are recorded higher amongst individuals residing in Nicosia, Limassol and Larnaca. Also, are recorded higher amongst males than females and individuals who live in urban areas.

### 2.2 Lifetime prevalence

The lifetime prevalence of mephedrone is limited to 0.3%.

Exposure to mephedrone is limited to males and is recorded higher amongst younger individuals and Paphos residents.

### 2.3 Last Year Prevalence

The Last Year Prevalence of mephedrone (use within the past 12 months) is limited to 0.1% of the total population.

### 2.4 Last Month Prevalence

The Last Month Prevalence of mephedrone (use within past 30 days) is limited to 0.1% of the total population.

### 2.5 Profile of users

The captured sample of mephedrone users is very limited and does not offer a reliable analysis of users.

	Lifetime prevalence		Last Year Prevalence		Last Month Prevalence	
	No.	%	No.	%	No.	%
18-24	2	66,7%	1	100,0%	1	100,0%
25-30	0	0,0%	0	0,0%	0	0,0%
31-35	1	33,3%	0	0,0%	0	0,0%
Males	3	100,0%	1	100,0%	1	100,0%
Females	0	0,0%	0	0,0%	0	0,0%
Up to 2ndary	3	100,0%	1	100,0%	1	100,0%
Tertiary education	0	0,0%	0	0,0%	0	0,0%
Urban	2	66,7%	0	0,0%	0	0,0%
Rural	1	33,3%	1	100,0%	1	100,0%
Nicosia	0	0,0%	0	0,0%	0	0,0%
Limassol	1	33,3%	1	100,0%	1	100,0%
Larnaca	1	33,3%	0	0,0%	0	0,0%
Famagusta	0	0,0%	0	0,0%	0	0,0%
Paphos	1	33,3%	0	0,0%	0	0,0%

### 3. GHB

#### 3.1 Awareness

One out of four Cypriots aged 18 to 35 is aware of the existence of GHB (27.1%) Awareness levels are recorded higher amongst individuals with tertiary education. Also, awareness levels are higher between females and individuals who live in rural areas (29,9% in Larnaca, 28,8% in Nicosia, 28,0% in Famagusta).

#### 3.2 Lifetime prevalence

Lifetime prevalence of GHB is limited to 0.4% (age between 18-30) Exposure to GHB is recorded only amongst males and is higher amongst Paphos residents.

#### 3.3 Last Year Prevalence

Last Year Prevalence of GHB (use within the past 12 months) reached 0.3% in the target population. The percentage refers only to males and the scores are higher in Paphos district.

#### 3.4 Last Month Prevalence

Last Month Prevalence of GHB (use within past 30 days) is limited to 0.1% of the total population. Incidences of recent use of GHB are limited to the Paphos district.

#### 3.5 Profile of users

The captured sample of GHB users is very limited and does not offer a reliable analysis of the profile of users.

	Lifetime prevalence		Last Year Prevalence		Last Month Prevalence	
	No.	%	No.	%	No.	%
18-24	2	50,0%	2	66,7%	0	0,0%
25-30	2	50,0%	1	33,3%	1	100,0%
31-35	0	0,0%	0	0,0%	0	0,0%
Males	4	100,0%	3	100,0%	1	100,0%
Females	0	0,0%	0	0,0%	0	0,0%
Up to 2ndary	3	75,0%	3	100,0%	1	100,0%
Tertiary education	1	25,0%	0	0,0%	0	0,0%
Urban	3	75,0%	2	66,7%	1	100,0%
Rural	1	25,0%	1	33,3%	0	0,0%
Nicosia	0	0,0%	0	0,0%	0	0,0%
Limassol	1	25,0%	1	33,3%	0	0,0%
Larnaca	1	25,0%	1	33,3%	0	0,0%
Famagusta	0	0,0%	0	0,0%	0	0,0%
Paphos	2	50,0%	1	33,3%	1	100,0%

#### 4. Synthetic cannabinoids

##### 4.1 Awareness

Awareness of the existence of synthetic cannabinoids amongst young, adult Cypriots is quite high. More than half of the participants in the study admit to being aware of the existence of these substances.

Awareness of synthetic cannabinoids is recorded higher amongst individuals with tertiary education and Limassol residents. Also, the recording is higher amongst females and individuals living in urban areas.

##### 4.2 Lifetime prevalence

Lifetime prevalence of synthetic cannabinoids reaches 1.5%.

There are no important deviations in the level of lifetime prevalence amongst different demographic groups.

##### 4.3 Last Year Prevalence

Last Year Prevalence of Synthetic Cannabinoids (use within the past 12 months) reached 0.9% within the target population of young, adult Cypriots.

The records are higher amongst males, individuals living in urban areas and individuals in Paphos district.

##### 4.4 Last Month Prevalence

Last Month Prevalence of synthetic cannabinoids (use within past 30 days) is limited to 0.6% of the total target population.

Incidences of recent use of synthetic cannabinoids are more prevalent in the Paphos district.

##### 4.5 Profile of users

The profile of users of synthetic cannabinoids points to a higher incidence of usage by young adults up to 30 years old, males and residents of urban areas.

	Lifetime prevalence		Last Year Prevalence		Last Month Prevalence	
	No.	%	No.	%	No.	%
18-24	6	40,0%	4	44,4%	3	50,0%
25-30	7	46,7%	4	44,4%	3	50,0%
31-35	2	13,3%	1	11,1%	0	0,0%
Males	11	73,3%	6	66,7%	4	66,7%
Females	4	26,7%	3	33,3%	2	33,3%
Up to 2ndary	9	60,0%	5	55,6%	4	66,7%
Tertiary education	6	40,0%	4	44,4%	2	33,3%
Urban	11	73,3%	8	88,9%	5	83,3%
Rural	4	26,7%	1	11,1%	1	16,7%
Nicosia	4	26,7%	2	22,2%	2	33,3%
Limassol	6	40,0%	3	33,3%	1	16,7%
Larnaca	3	20,0%	2	22,2%	1	16,7%
Famagusta	0	0,0%	0	0,0%	0	0,0%
Paphos	2	13,3%	2	22,2%	2	33,3%

## 5. Ketamine

### 5.1 Awareness

Awareness of Ketamine reaches 14.3% amongst young, adult Cypriots.

Awareness of Ketamine appears to be comparatively higher in Nicosia and Limassol, higher amongst males with tertiary education and higher between the ages 25-30.

### 5.2 Lifetime prevalence

Lifetime prevalence of Ketamine is limited to 0.2%.

Experience with Ketamine is limited to males residing in Paphos and Larnaca.

### 5.3 Last Year Prevalence

Last Year Prevalence of Ketamine is limited to 0.1%.

The only incidences of recent use are encountered amongst males in Paphos.

### 5.4 Last Month Prevalence

Last Month Prevalence of Ketamine (use within past 30 days) is limited to 0.1% of the total target population.

Incidences of recent use of Ketamine are limited to males in the Paphos district.

### 5.5 Profile of users

The limited number of Ketamine users captured in the sample does not allow for a reliable analysis of the profile of users.

	Lifetime prevalence		Last Year Prevalence		Last Month Prevalence	
	No.	%	No.	%	No.	%
18-24	1	50,0%	0	0,0%	0	0,0%
25-30	1	50,0%	1	100,0%	1	100,0%
31-35	0	0,0%	0	0,0%	0	0,0%
Males	2	100,0%	1	100,0%	1	100,0%
Females	0	0,0%	0	0,0%	0	0,0%
Up to 2ndary	2	100,0%	1	100,0%	1	100,0%
Tertiary education	0	0,0%	0	0,0%	0	0,0%
Urban	2	100,0%	1	100,0%	1	100,0%
Rural	0	0,0%	0	0,0%	0	0,0%
Nicosia	0	0,0%	0	0,0%	0	0,0%
Limassol	0	0,0%	0	0,0%	0	0,0%
Larnaca	1	50,0%	0	0,0%	0	0,0%
Famagusta	0	0,0%	0	0,0%	0	0,0%
Paphos	1	50,0%	1	100,0%	1	100,0%

## 6. Use of illegal drugs in general

### 6.1 Lifetime prevalence

Lifetime prevalence of illegal drugs reaches 11.8% amongst the target population of 18 to 35 year olds.

Lifetime prevalence of illegal drugs is significantly higher amongst males.

The prevalence is higher in Famagusta district, in urban areas, amongst individuals with tertiary education and age: 25-30.

### 6.2 Last Year Prevalence

Last Year Prevalence of illegal drugs (use within the past 12 months) is logged at 3.2% within the target population and is recorded higher amongst males in Paphos district. Also, is higher in individuals aged between 18-30.

### 6.3 Last Month Prevalence

Last Month Prevalence of illegal drugs (use within past 30 days) is recorded at 1.0% within the target population. The scores are higher between males, age 18-24, up to secondary education, urban areas in Paphos and Larnaca districts.

## 7. Epidemiological indicators and population projections

This chapter presents the epidemiological indicators, providing an analysis by substance examined.

Included in this chapter are estimates of the prevalence of use of each substance in the True Population. These estimates are based on intervals constructed at a 95% confidence level.

Projections of population size are based on demographic data of the 18 to 35 age cohort (244720 individuals) of the 2011 Population Census of the Statistical Service of the Republic of Cyprus.

### 7.1 Lifetime Prevalence

Lifetime Prevalence is an indicator of the incidence of use of a substance at least once in a lifetime amongst the target population.

It is estimated that amongst the target population of 18 to 35 year olds (244720 individuals) some 28877 have at some point in their life tried an illegal narcotic.

Of these, some 4160 young adults have tried one or more of the substances investigated (mephedrone, GHB, Synthetic cannabinoids, Ketamine), with most of them trying synthetic cannabinoids (3671 individuals). Use of other substances under examination is more limited. Some 978 have tried GHB at least once, some 734 have tried mephedrone at least once and some 489 have tried ketamine at least once.

Lifetime Prevalence - LTP						
	Mephedrone	GHB	Synthetic cannabinoids	Ketamine	Any of the 4 substances under investigation	Any type of illegal drugs
Valid sample (N)	1000	1000	1000	1000	1000	1000
Frequency of users in the sample (f)	3	4	15	2	17	118
Estimated prevalence (%)	0,30	0,40	1,50	0,20	1,70	11,80
Lower bound at a 95% confidence interval	0,10	0,16	0,91	0,05	1,06	9,95
Upper bound at a 95% confidence interval	0,88	1,02	2,46	0,73	2,71	13,95
Estimated frequency in True Population	734	979	3671	489	4160	28877
Lower bound at a 95% confidence interval	250	381	2230	134	2604	24338
Upper bound at a 95% confidence interval	2149	2506	6020	1777	6621	34132



## 7.2 Last Year Prevalence

Last Year Prevalence is an indicator of the incidence of use of a substance at least once within the past 12 months amongst the target population.

It is estimated that amongst the target population of 18 to 35 year olds (244720 individuals) some 7831 have used illegal narcotics at least once within the past 12 months.

Within the past 12 months, it is estimated that some 2937 individuals aged 18 to 35 have used at least once one of the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine). Most of them used synthetic cannabinoids (2202 individuals) and GHB (734 individuals). Last year prevalence of mephedrone (245 individuals) and ketamine (245 individuals) is more limited.

Last Year Prevalence - LYP						
	Mephedrone	GHB	Synthetic cannabinoids	Ketamine	Any of the 4 substances under investigation	Any type of illegal drugs
Valid sample (N)	1000	1000	1000	1000	1000	1000
Frequency of users in the sample (f)	1	3	9	1	12	32
Estimated prevalence (%)	0,10	0,30	0,90	0,10	1,20	3,20
Lower bound at a 95% confidence interval	0,02	0,10	0,47	0,02	0,69	2,28
Upper bound at a 95% confidence interval	0,56	0,88	1,70	0,56	2,09	4,48
Estimated frequency in True Population	245	734	2202	245	2937	7831
Lower bound at a 95% confidence interval	43	250	1160	43	1683	5569
Upper bound at a 95% confidence interval	1381	2149	4164	1381	5104	10970

## 7.3 Last Month Prevalence

Last Month Prevalence is an indicator of the incidence of use of a substance at least once within the past month amongst the target population. It serves as a proxy indicator of current use.

It is estimated that amongst the target population of 18 to 35 year olds (244720 individuals) some 7831 have used illegal narcotics at least once within the past 12 months.

Within the past month, some 2447 individuals aged 18 to 35 have used at least one of the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine). Most of them used synthetic cannabinoids (1468 individuals). Respectively, GHB, mephedrone and ketamine were respectively used by about 245 individuals.

Last Month Prevalence - LMP						
	Mephedrone	GHB	Synthetic cannabinoids	Ketamine	Any of the 4 substances under investigation	Any type of illegal drugs
Valid sample (N)	1000	1000	1000	1000	1000	1000
Frequency of users in the sample (f)	1	1	6	1	7	10
Estimated prevalence (%)	0,10	0,10	0,60	0,10	0,70	1,00
Lower bound at a 95% confidence interval	0,02	0,02	0,28	0,02	0,34	0,54
Upper bound at a 95% confidence interval	0,56	0,56	1,30	0,56	1,44	1,83
Estimated frequency in True Population	245	245	1468	245	1713	2447
Lower bound at a 95% confidence interval	43	43	674	43	831	1331
Upper bound at a 95% confidence interval	1381	1381	3188	1381	3519	4481

#### 7.4 Other indicators

Abstinence is an indicator of the incidence of individuals within the target population who have never tried a substance in their lifetime.

The overwhelming majority of young adult Cypriots has never tried any of the substances that mimic the effects of illegal drugs (98.3%). The incidence, however, of never having tried any illegal drugs is significantly lower at 88.2%.

Termination is an indicator of the incidence of individuals within the target population who have tried a substance at least once in their lifetime (Lifetime Prevalence), but have not used it within the past twelve months (Last year Prevalence).

Estimated prevalence (%): Mephedrone: (0,2), GHB (0,1), Synthetic Cannabinoids (0,6), Ketamine (0,1), any type of illegal drugs (8,6).

#### Recent Continuation Rate

Recent Continuation Rate is an indicator of the proportion of individuals who have tried a substance at least once in their life and have also used that substance within the past 12 months (Recent Continuation Rate= $[LYP/LTP]*100$ ).

The Recent Continuation Rate is significantly higher for the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine) than it is for traditional illegal drugs in general (27.1%).

Estimated prevalence (%): Mephedrone: (33,3), GHB (75,0), Synthetic Cannabinoids (60,0), Ketamine (50,0)

#### Recent Discontinuation Rate

Recent Discontinuation Rate is an indicator of the proportion of individuals who have tried a substance at least once in their life and have not used that substance within the past 12 months (Current Discontinuation Rate= $[(LTP-LYP)/LTP]*100$ ).

The Current Discontinuation Rate is significantly higher for traditional illegal drugs (72.9%) than it is for the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine) (29.4%).

Estimated prevalence (%): Mephedrone: (66,7), GHB (25,0), Synthetic Cannabinoids (40,0), Ketamine (50,0).

#### Current Continuation Rate

Current Continuation Rate is an indicator of the proportion of individuals who have tried a substance at least once in their life and have also used that substance within the past month (Current Continuation Rate= $[LYP/LMP]*100$ ).

The Current Continuation Rate is significantly higher for the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine (41.2%) than it is for traditional illegal drugs (8.5%).

Estimated prevalence (%): Mephedrone: (33,3), GHB (25,0), Synthetic Cannabinoids (40,0), Ketamine (50,0).

#### Current Discontinuation Rate

Current Discontinuation Rate is an indicator of the proportion of individuals who have tried a substance at least once in their life, but have not used that substance within the past month (Current Discontinuation Rate= $[(LTP-LMP)/LMP]*100$ ).

The Current Discontinuation Rate is quite high for the category of traditionally illegal drugs (91.5%). The Rate, however, is significantly lower for the four substances under investigation (58.5%).

Estimated prevalence (%): Mephedrone: (66,7), GHB (75,0), Synthetic Cannabinoids (60,0), Ketamine (50,0).

## 8. Prevalence analysis by demographic group

In order to investigate possible associations between demographic attributes and prevalence, Lifetime Prevalence (LTP), Last Year Prevalence (LYP) and Last Month Prevalence (LMP) were correlated with demographic characteristics.

The test statistic used for this exercise was Goodman and Kruskal's gamma ( $\gamma$ ), which takes values from -1 (absolute negative correlation) to 1 (absolute positive correlation). In the tables that follow, positive values for gamma ( $\gamma$ ) indicate a stronger correlation of the first demographic category with the indicator under investigation, while negative values for gamma ( $\gamma$ ) indicate a stronger of the second demographic category with the indicator under investigation.

The gamma ( $\gamma$ ) values derived from this exercise were subjected to testing of significance. Testing was conducted at three levels of significance and whenever the captured correlation between variables is statistically significant, it is indicated in the tables that follow accordingly:

- \* = correlation is significant at a 95% confidence interval.
- \*\* = correlation is significant at a 99% confidence interval.
- \*\*\* = correlation is significant at a 99.9% confidence interval.
- Values without an asterisk indicate the lack of statistically significant correlation

### 8.1 Analysis by sex

Males are more correlated with drug use than females.

The analysis by sex shows a statistically higher association of Lifetime Prevalence of GHB and, in general, of the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine).

Males also show a statistically higher level of correlation with Lifetime Prevalence and Last Year Prevalence of traditional illegal drugs in general.

Indices	Frequency in sample		Valid % of users within demographic category		Correlation coefficient
	Males	Females	Males	Females	$\gamma$
LTP Mephedrone	3	0	0,58	0,00	1.000
LYP Mephedrone	1	0	0,19	0,00	1.000
LMP Mephedrone	1	0	0,19	,00	1.000
LTP GHB	4	0	0,78	0,00	<b>1.000*</b>
LYP GHB	3	0	0,58	0,00	1.000
LMP GHB	1	0	0,19	0,00	1.000
LTP synthetic cannabinoids	11	4	2,13	0,83	0.447
LYP synthetic cannabinoids	6	3	1,16	0,62	0.307
LMP synthetic cannabinoids	4	2	0,78	0,41	0.306
LTP Ketamine	2	0	0,39	0,00	1.000
LYP Ketamine	1	0	0,19	0,00	1.000
LMP Ketamine	1	0	0,19	0,00	1.000
LTP Any of the 4 substances under investigation	13	4	2,52	0,83	<b>0.512*</b>
LYP Any of the 4 substances under investigation	9	3	1,74	0,62	0.480
LMP Any of the 4 substances under investigation	5	2	0,97	0,41	0.404
LTP any illegal drugs	88	30	17,05	6,20	<b>0.514***</b>
LYP any illegal drugs	25	7	4,84	1,45	<b>0.553**</b>
LMP any illegal drugs	7	3	1,36	0,62	0.376

## 8.2 Analysis by age

### 8.2.1 18-24 year olds vs. 25-35 year olds

The analysis of Prevalence indicators does not show significant differences in the level of association with these indicators between individuals aged 18 to 24 and individuals aged 25-35.

Indices	Frequency in sample		Valid % of users within demographic category		Correlation coefficient γ
	18-24	25-35	18-24	25-35	
LTP Mephedrone	2	1	0,56	0,16	0.570
LYP Mephedrone	1	0	0,28	0,00	1.000
LMP Mephedrone	1	0	0,28	0,00	1.000
LTP GHB	2	2	0,56	0,31	0.291
LYP GHB	2	1	0,56	0,16	0.570
LMP GHB	0	1	0,00	0,16	-1.000
LTP synthetic cannabinoids	6	9	1,69	1,40	0.097
LYP synthetic cannabinoids	4	5	1,13	0,78	0.187
LMP synthetic cannabinoids	3	3	0,85	0,47	0.292
LTP Ketamine	1	1	0,28	0,16	0.291
LYP Ketamine	0	1	0,00	0,16	-1.000
LMP Ketamine	0	1	0,00	0,16	-1.000
LTP Any of the 4 substances under investigation	7	10	1,97	1,55	0.122
LYP Any of the 4 substances under investigation	7	5	1,97	0,78	0.441
LMP Any of the 4 substances under investigation	4	3	1,13	0,47	0.418
LTP any illegal drugs	41	77	11,55	11,94	-0.019
LYP any illegal drugs	15	17	4,23	2,64	0.239
LMP any illegal drugs	7	3	1,97	0,47	0.623

### 8.2.2 18-30 year olds vs. 31-35 year olds

When comparing between young adults up to 30 years old and those who are between 31 and 35 some statistically significant differences are observed in the computed Indices.

Younger adults up to 30 years old show higher levels of correlation than adults aged 31 to 35 with respect to:

- Lifetime Prevalence of GHB
- Lifetime Prevalence of synthetic cannabinoids
- Last Month Prevalence of synthetic cannabinoids
- Last Year Prevalence of the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine)
- Last Month Prevalence of the four substances under investigation (mephedrone, GHB, synthetic cannabinoids, ketamine)
- Last Year Prevalence of any illegal drugs
- Last Month Prevalence of any illegal drugs

Indices	Frequency in sample		Valid % of users within demographic category		Correlation coefficient γ
	18-30	31-35	18-30	31-35	
LTP Mephedrone	2	1	0,31	0,29	0.035
LYP Mephedrone	1	0	0,15	0,00	1.000
LMP Mephedrone	1	0	0,15	0,00	1.000
LTP GHB	4	0	0,61	0,00	<b>1.000*</b>
LYP GHB	3	0	0,46	0,00	1.000
LMP GHB	1	0	0,15	0,00	1.000
LTP synthetic cannabinoids	13	2	2,00	0,57	<b>0.559*</b>
LYP synthetic cannabinoids	8	1	1,23	0,29	0.625
LMP synthetic cannabinoids	6	0	0,92	0,00	<b>1.000*</b>
LTP Ketamine	2	0	0,31	0,00	1.000
LYP Ketamine	1	0	0,15	0,00	1.000
LMP Ketamine	1	0	0,15	0,00	1.000
LTP Any of the 4 substances under investigation	14	3	2,15	0,86	0.434
LYP Any of the 4 substances under investigation	11	1	1,69	0,29	<b>0.714*</b>
LMP Any of the 4 substances under investigation	7	0	1,08	0,00	<b>1.000**</b>
LTP any illegal drugs	85	33	13,06	9,46	0.180
LYP any illegal drugs	27	5	4,15	1,43	<b>0.497**</b>
LMP any illegal drugs	10	0	1,54	0,00	<b>1.000**</b>

8.2.3 18-24 year olds vs. 25-30 year olds vs. 31-35 year olds  
 Comparing between young adults 18 to 24 years old, 25 to years old and 31 to 35 year olds some statistically significant differences are observed in the computed Indices.

Younger adults show higher levels of correlation with respect to:

- Lifetime Prevalence of GHB
- Lifetime Prevalence of synthetic cannabinoids
- Last Month Prevalence of synthetic cannabinoids
- Last Year Prevalence of new substances mimicking effects of illegal drugs
- Last Month Prevalence of new substances mimicking effects of illegal drugs
- Last Year Prevalence of any illegal drugs
- Last Month Prevalence of any illegal drugs

Indices	Frequency in sample			Valid % of users within demographic category			Correlation coefficient
	18-24	25-30	31-35	18-24	25-30	31-35	
LTP Mephedrone	2		1	0,01	0,00	0,00	0.035
LYP Mephedrone	1			0,00	0,00	0,00	1.000
LMP Mephedrone	1			0,00	0,00	0,00	1.000
LTP GHB	2	2		0,01	0,01	0,00	<b>1.000*</b>
LYP GHB	2	1		0,01	0,00	0,00	1.000
LMP GHB		1		0,00	0,00	0,00	1.000
LTP synthetic cannabinoids	6	7	2	0,02	0,02	0,01	<b>0.559*</b>
LYP synthetic cannabinoids	4	4	1	0,01	0,01	0,00	0.625
LMP synthetic cannabinoids	3	3		0,01	0,01	0,00	<b>1.000*</b>
LTP Ketamine	1	1		0,00	0,00	0,00	1.000
LYP Ketamine		1		0,00	0,00	0,00	1.000
LMP Ketamine		1		0,00	0,00	0,00	1.000
LTP Any of the 4 substances under investigation	7	7	3	0,02	0,02	0,01	0.434
LYP Any of the 4 substances under investigation	7	4	1	0,02	0,01	0,00	<b>0.714*</b>
LMP Any of the 4 substances under investigation	4	3		0,01	0,01	0,00	<b>1.000**</b>
LTP any illegal drugs	41	44	33	0,12	0,15	0,09	0.180
LYP any illegal drugs	15	12	5	0,04	0,04	0,01	<b>0.497**</b>
LMP any illegal drugs	7	3		0,02	0,01	0,00	<b>1.000**</b>

### 8.3 Area

The prevalence of use of illegal substances does not show significant variation between urban and rural areas.

Indices	Frequency in sample		Valid % of users within demographic category		Correlation coefficient
	Urban	Rural	Urban	Rural	
LTP Mephedrone	2	1	0,29	0,32	-0.054
LYP Mephedrone	0	1	0,00	0,32	-1.000
LMP Mephedrone	0	1	0,00	0,32	-1.000
LTP GHB	3	1	0,43	0,32	0.149
LYP GHB	2	1	0,29	0,32	-0.054
LMP GHB	1	0	0,14	0,00	1.000
LTP synthetic cannabinoids	11	4	1,59	1,29	0.107
LYP synthetic cannabinoids	8	1	1,16	0,32	0.568
LMP synthetic cannabinoids	5	1	0,72	0,32	0.386
LTP Ketamine	2	0	0,29	0,00	1.000
LYP Ketamine	1	0	0,14	0,00	1.000
LMP Ketamine	1	0	0,14	0,00	1.000
LTP Any of the 4 substances under investigation	12	5	1,74	1,61	0.038
LYP Any of the 4 substances under investigation	9	3	1,30	0,97	0.150
LMP Any of the 4 substances under investigation	5	2	0,72	0,65	0.058
LTP any illegal drugs	87	31	12,61	10,00	0.130
LYP any illegal drugs	22	10	3,19	3,23	-0.006
LMP any illegal drugs	8	2	1,16	0,65	0.287

#### 8.4 Educational level

The prevalence of use of illegal substances does not show significant variation given the educational level of respondents.

Indices	Frequency in sample		Valid % of users within demographic category		Correlation coefficient
	Urban	Rural	Urban	Rural	$\gamma$
LTP Mephedrone	3	0	0,62	0,00	1.000
LYP Mephedrone	1	0	0,21	0,00	1.000
LMP Mephedrone	1	0	0,21	0,00	1.000
LTP GHB	3	1	0,62	0,19	0.528
LYP GHB	3	0	0,62	0,00	1.000
LMP GHB	1	0	0,21	0,00	1.000
LTP synthetic cannabinoids	9	6	1,87	1,16	0.238
LYP synthetic cannabinoids	5	4	1,04	0,77	0.148
LMP synthetic cannabinoids	4	2	0,83	0,39	0.367
LTP Ketamine	2	0	0,41	0,00	1.000
LYP Ketamine	1	0	0,21	0,00	1.000
LMP Ketamine	1	0	0,21	0,00	1.000
LTP Any of the 4 substances under investigation	11	6	2,28	1,16	0.332
LYP Any of the 4 substances under investigation	8	4	1,66	0,77	0.369
LMP Any of the 4 substances under investigation	5	2	1,04	0,39	0.460
LTP any illegal drugs	65	53	13,49	10,23	0.155
LYP any illegal drugs	17	15	3,53	2,90	0.102
LMP any illegal drugs	7	3	1,45	0,58	0.433

## 2. Qualitative research: Monitoring anonymous online drug marketplaces

Over the last few years the variability and availability of new psychoactive substances has introduced a new and significant challenge to our society, as the number and diversity of new psychoactive substances increases continually. A new psychoactive drug can be defined as “a new narcotic or psychotropic drug, in pure form or in preparation, that is not controlled by the United Nations’ drug conventions, but which may have negative effects on health” (EMCDDA 2006). In this context, the term ‘new’ does not necessarily refer to new inventions, but to substances that have recently become available (EMCDDA 2015c). The new psychoactive substances may be preferred by drug dealers and addicts to traditional drugs, as they are more easily accessible and are constantly being adapted to avoid legislative control (United Nations Office on Drugs and Crime, 2014). These new drugs which have been designed to evade drug laws are widely available in markets and have the potential to cause serious risks to health and safety as they can be lethal (United Nations Office on Drugs and Crime, 2014). They have similar effects to traditional drugs, such as paranoia, psychosis, seizures and even death. Some new psychoactive substances appear to have more adverse and dangerous effects, as contrasted to the traditional drugs they mimic (Home Office, 2015).

According to the United Nations Office on Drugs and Crime, 348 new psychoactive substances were reported (UNODC, 2013). However, the actual number of new psychoactive substances is considered to be significantly higher. Therefore, the new psychoactive substances market has seen dramatic growth in these past few years.

The majority of new psychoactive substances were created in European and North American countries, as UNODC (2014) reported. Also, there is evidence that the majority of new psychoactive substances have been distributed via mail and fast parcel services while the Home Office (2014) found that new psychoactive substances are also being distributed to users through friends, dealers and head shops with only a minority of users buying directly from the web. DrugScope (2013) in a research regarding street drug trends found that other retail outlets including garages, newsagents and takeaways were selling substances to their customers.

It is important however to clarify the reasons for which people prefer the new drugs to the old ones. The new psychoactive drugs mimic the effects of the old drugs, while consumers make choices based on availability, price and perceived 'quality' of a drug. It has been frequently reported that traditional drugs have many negative consequences on people's physical and mental health, influencing many aspects of their life, such as occupational, social, and interpersonal functioning. On the other hand, the effects of new psychoactive substances have not yet been well documented. However, the dominance of new psychoactive substances poses a major challenge to society as the EU Early Warning System identified signals of serious harm, such as the acute toxicity of new psychoactive substances which can lead to hospitalisation and death (EMCDDA 2013a,b, 2015a). Currently, the toxicity and effects of numerous new psychoactive drugs remain unknown. For example, the new psychoactive drug named 4-Methylamphetamine (4-MA) which was originally developed as an appetite suppressant, (development was halted due to side effects), has recently resurfaced as a new psychoactive substance in Europe. This substance is mostly found together with amphetamine (Blanckaert et al., 2013), however its side effects have not been identified, while at the same time several fatal incidents after 4-MA use combined with amphetamine were observed in Belgium, the United Kingdom and The Netherlands (Blanckaert et al., 2013). It is important to note that in the specific cases observed, blood amphetamine levels were too low to be fatal. Therefore the assessment of new psychoactive drugs is imperative in order to identify relevant risks and impact on people's life as well as making recommendations for effective controls at a European level is critical. A great number of new psychoactive drugs being reported are less known as many of them contain mixtures of a lot of substances (EMCDDA 2013a, 2014, 2015a). Consequently, due to the absence of pharmacological and toxicological researches for these substances, the long term health effects caused by their use are unknown (EMCDDA 2013a).

The sale of new psychoactive substances through an open market started in 2000 with the sale of the stimulant 1-benzylpiperazine, which is a piperazine derivative with methylone. Since then, the market of 'legal drugs' and 'research chemicals' took off (EMCDDA, 2013). The availability of new psychoactive drugs is very high; in fact, it is considered that anyone can locate them easily. As documented by the EMCDDA, the annual expansion of new psychoactive substances could be due to the continuous growth of their markets (EMCDDA 2016).

Many of the new psychoactive substances are produced in China while it is important to note that on the 27th September 2015, the Chinese Food and Drug Administration announced the control of 116 new psychoactive substances, effective as from 1st October 2015 (UNODC announcements, 2015). Imported psychoactive drugs mostly originate from China and India and are packaged and marketed in Europe (EMCDDA 2015a). Nevertheless, numerous new psychoactive drugs are produced in secret laboratories in Europe so that they are distributed directly within the European market. To avoid being ceased in airports, customs offices or post offices, psychoactive drug suppliers usually attach fake labels to the drugs, marking them as 'research chemicals' or 'plant food' attempting to deceive the authorities (EMCDDA 2013b). The boxes look professional and are generally marked as coming from a company. Also, a great number of new psychoactive substances are intended and promoted as 'legal' substitutes of controlled traditional drugs (EMCDDA-Europol, 2013). However, not many of the boxes would nowadays be marked as research chemicals, as this method is now known

Most of the new psychoactive substances are being sold within the illegal drug market, while a decade ago, such drugs were promoted as amphetamine, ecstasy or as a new type of 'ecstasy'. They were produced in small amounts in amateur laboratories or in larger amounts in secret laboratories by organised crime groups. These new psychoactive substances were called 'designer drugs' (EMCDDA 2015a). Nowadays, the internet is being extensively used by drug dealers for selling their drugs and there are numerous online marketplaces available which sell new psychoactive substances (EMCDDA, 2013). In 2012, 693 online markets were reported. In 2013, EMCDDA online monitoring identified 651 websites selling 'legal highs' to Europeans (EMCDDA-Europol, 2013). So, via the internet, where any physical or geographical boundaries are diminished, the new psychoactive substance markets have grown more powerful. Unfortunately, the internet enables the new psychoactive drugs to be easily accessible worldwide (EMCDDA, 2013).

The new psychoactive substances are also sold on the Deep Web. The anonymous Deep Web contains databases and other web services which are hidden from the normal, Surface web (Wright 2009, EMCDDA 2016). The Deep Web is a part of the Internet not accessible to traditional search engines such as Google. More specifically, the dark web is a small part of the deep web that has been intentionally hidden and is inaccessible through standard web browsers. The development of specialized dark web tools, such as Tor, has made it possible for anybody to browse the Internet anonymously and access several anonymous online markets. Tor (The Onion Router) is an anonymisation tool which hides a computer's IP address when accessing websites. On the deep web, drug sales can take place in a marketplace which can be accessed anonymously through Tor. Drug cryptomarkets have received increased traffic in the last few years (EMCDDA 2015d). Cryptomarkets are located in the dark web and can be accessed using Tor. A cryptomarket can be defined as an online forum where goods and services are exchanged between parties who use digital encryption (Martin, 2014). In the light of the above, further research is required on the drug markets of deep web distribution networks (Wright 2009, EMCDDA 2016).

Dark web marketplaces offer substances from numerous categories such as cannabis, dissociatives, ecstasy, opioids, precursors, prescription, psychedelics, stimulants and other substances. Also, Dark Web marketplaces sell various illegal products other than illicit substances, such as child pornography, hacking tools and firearms (Van Buskirk, Roxburgh, Bruno & Burns 2015).

It is remarkable to note that many buyers prefer sellers from their country because they believe that they would have less risk with fewer borders to cross and less controls from authorities (Van Buskirk, Roxburgh, Bruno, & Burns, 2015). Such an example is Silk Road, a cryptomarket that operated as a Tor-hidden service and used bitcoin as its currency. After Silk Road closed, a new Finnish marketplace was established on the deep web, targeting Finnish buyers who may not want to buy from abroad (Van Buskirk, Roxburgh, Bruno, & Burns, 2015). Similarly, most US and Australian vendors were found not willing to ship drugs across international borders as Australian buyers are among those preferring local sellers (EMCDDA 2015d). Therefore, correlation appears to exist between existing domestic drug markets and consumer preferences (EMCDDA 2015d).

According to Bartlett (2015), about 700 vendors were recorded selling drugs on the dark net markets. UK and USA were the most popular countries into which products from marketplaces were shipped (Bartlett 2015). Another research relevant to the monitoring of marketplaces was carried out by the National Drug and Alcohol Research Centre in Australia (Van Buskirk, Roxburgh, Bruno & Burns 2015). The two largest marketplaces which were monitored were Agora and Evolution. The Evolution market was considered as a more trusted marketplace than Agora and more vendors were trading there (Van Buskirk, Roxburgh, Bruno & Burns 2015). Moreover, the most common substances which were sold across all marketplaces were cannabis, pharmaceuticals and MDMA. From the new psychoactive substances, mephedrone and alpha-PVP appear to be increasing in availability compared to MDA and the 5-MeO (Van Buskirk, Roxburgh, Bruno & Burns 2015). Finally, based on previous findings from surveys for people who use drugs, the most commonly available substances on marketplaces were the traditional illicit substances, such as cannabis, ecstasy and pharmaceutical drugs, rather than new psychoactive substances (Van Buskirk, Roxburgh, Bruno & Burns 2015). This study will try to monitor the darknet markets via online observation of the new psychoactive substances that are being sold and the vendors that are acting in these sites in order to provide the current situation and a rapid assessment of the markets.



# Methodology

The study involved four distinct phases: a) the identification of new psychoactive substances by their official name and by their street name in darknet markets; b) the monitoring of new psychoactive substances in the illicit markets, c) the description of popular darknet markets, d) the monitoring of eight vendors. This monitoring provided important insight information and a rapid assessment of the online drug market.

For purposes of alignment with national legislation, as a first step, approval for the project was granted by the Cyprus National Bioethics Committee

The first phase involved the identification and listing of new psychoactive substances by their official name and by their street name in the darknet markets. The criteria for the websites' selection during the research were the popularity of the markets (the overall number of sales/purchases and the overall number of the NPS that were available for sale by each vendor). During this phase, markets that were selected were a) Agora, b) Outlaw Market, and c) Nucleus Market. The websites were firstly searched via the TOR browser and secondly via the "dnstats.net", where someone can find all the available dark net markets.

After the selection of the markets and the registration (username and password) the access to the markets was feasible. The next step included the search for each distinct type of NPS by its name. According to the Home Office (2014), each type of new psychoactive substances may get a number of various names starting with the official name and including the chemical name as well as the street name. The study was accomplished with an average of two searches for each type of NPS separately, therefore the number of the total searches that have been made in each dark net website was 1,060 and for the three markets the searches reached 3,192 in total. The searches were firstly made by the official name of the NPS, given from EMCDDA, and secondly by its street name if available on the EMCDDA's website. If the street name wasn't available, the NPS was searched by its chemical name.

In the case that the search was unable to detect the official name of the substance, there was an attempt to choose the category which includes the particular substance (e.g. "Cannabinoids" and then the subcategory "Synthetics" if this existed).

The second phase of the research was to collect data regarding new psychoactive substances that are sold on the darknet markets, from eight dark net market places in two different periods. During the first period, six market places (Abraxas, Nucleus Market, Alphabay, Middle earth, Outlaw and Agora) were covered until October 2015. During the second period, the remaining two markets (Valhalla and Dream Market) were covered until March 2016. It is important to note that all these markets were chosen because they were the most popular markets with the highest traffic according to the search engine 'Grams' (search engine for Tor based darknet markets). However, the main challenge of this phase lied in the fact that the markets undergo changes very often while some of the darknet markets were closed and others were opened during the time period of the project. Inevitably, during the research, a market was closed (Agora) which was one of the most famous and used markets, for security reasons and therefore, only data for cannabis and cannabinoids were included in the research regarding the specific market.

During the second phase nine points were recorded for analysing new psychoactive substances available through darknet market places: a) the names of new psychoactive substances as provided by EMCDDA and as identified from darknet market places, b) the vendors' nicknames, c) the name of the market where specific new psychoactive substances were found, d) the amount sold (e.g. 1ml or 1gr or 1 pill), e) the price of new psychoactive substances, f) the payment method used (e.g. Bitcoin or dash or litecoin), g) the country of origin, h) the destination country or countries and i) the percentage of the drugs' purity.

For the third phase, five markets (Nucleus, Alphabay, Outlaw Market, Valhalla and Dream Market), were selected for further examination. The goal of this phase was to describe the structure and appearance of the five darknet markets. So, the objectives were to:

- a) Describe the main characteristics of the markets (the language used in the market, description of the market's home page and what was included in vertical and horizontal menus, a brief description of each market and their rating as given from the [www.dnstats.net](http://www.dnstats.net) or [www.gram.com](http://www.gram.com)).
- b) Record the products each market sells and the quantities (e.g. how many weapons, substances, services, etc).
- c) Identify the new psychoactive substances (all categories and subcategories of substances which were sold were recorded and if there was a separate category of new psychoactive substances or a substance subcategory (e.g. subcategory "cannabis" can be divided into other sub-categories, such as "cannabinoids") it was separately documented.
- d) Collect relevant information on transactions (e.g. information about vendors or customer safety, the feedback given to vendors, the currency of the transactions -e.g. bitcoin),
- e) Compare the similarities and differences between the five markets.
- f) Identify if there were specific areas that each market emphasized.

The researchers recorded the related information exactly as given by each market and gave a brief summary of the main points mentioned. Also, images of the market and products were collected in order to keep the relevant information saved for the analysis.

The fourth phase was heavily influenced by the first phase, from which all the new psychoactive substances were recorded including some of the most 'interesting' NPS. An "interesting" substance in the present study was defined as a substance which has a significant track record on EMCDDA's database and was related to a significant number of intoxications, fatalities, seizures and health risks.

During this phase, eight vendors were monitored. They were selected because they were selling numerous types of new psychoactive substances and had an active presence in three markets (Agora, Outlaw, and Nucleus). However, after analyzing the three markets, it was observed that the Outlaw Market, compared to the rest of the markets, did not have available a significant number of new psychoactive substances (0.9%) and as a consequence the criteria mentioned above for the selection of the vendors were not met. Additionally, after a short period of time, Agora market was suddenly shut down, a fact that led the researchers to redesign the vendors' selection. So, the Agora and Outlaw markets were replaced with the Abraxas and AlphaBay Market, considering that Nucleus Market remained unchanged.

As to the criteria for the selection of vendors, these related to their active presence in the three darknet markets, as well as to the quantity of new psychoactive substances they had for sale. All the selected vendors had to have during the time of the survey, a minimum of four NPS available for sale. The methodology and process followed for the monitoring of the vendors ensured that any changes related to the selected variables (Vendor's Information, Substance's Information, Shipping Policy, Ordering Policy, Refund and Resend Policy and Customer's Evaluation and Feedback) were checked through triple monitoring. More specifically, the first step included searching for the vendors' names separately in each market. Secondly, after the detection of the selected vendor profile, all the variables were examined and compared with the particular profile in a previous monitoring (e.g. a vendor's profile at the second monitoring was compared with the vendor's profile obtained during the first monitoring).

## Results

**First Phase:** The identification and listing of new psychoactive substances on Darknet Markets

As mentioned above, the specific aim of the study was to come up with a list of NPS that have been detected from the monitoring of the dark net markets (Agora, Nucleus and Outlaw Market). Also, each type of NPS was listed separately in the category which belongs while each distinct type of NPS includes all the different and/or street names of the substances that were reported. The number of NPS that were available in "Agora", "Nucleus" and "Outlaw" darknet markets was 89. However, the above process was repeated once to verify if there had been any changes or additions to the list that was created. Thirteen NPS were added to the list during the follow up. Therefore, the total NPS available in the three markets during the time of the survey amounted to 102.

**Second Phase:** Data on new psychoactive substances that are sold in eight darknet markets, in two different periods

### First Period

During the first period, six market places (Abraxas, Nucleus Market, Alphabay, Middle earth, Outlaw and Agora) were monitored. It was found that 148 types of new psychoactive substances were available for sale out of the 450 identified by EMCDDA. Most of them had similar names to those listed in the database of EMCDDA.

The new psychoactive substances were classified into ten categories: arylalkylamines, arylcyclohexylamines, benzodiazepines, cannabinoids, cathinones, indolalkylamines, opioids, phenethylamines, plants & extracts and others. Through this observation it was found that the category of phenethylamines was the most popular category. In particular, 156 distinct sources offer new psychoactive substances that fall under the category of phenethylamines, such as 2C-B or 2C-E, from five out of the six darknet markets (since Agora was no longer operating). Also, the indolalkylamines (n=117), benzodiazepines (n=108) and cathinones (n=100) were the next most sold and popular categories offered by vendors. The category of cannabinoids was the only category which was recorded from all six dark net markets (the recording took place just before Agora shut down) and 99 distinct sources offer new psychoactive substances that fall under the category of cannabinoids.

As regards vendors, 336 of them were selling new psychoactive substances in one or more markets (out of the six that were examined). During the observation, it was found that most vendors were selling multiple types of new psychoactive substances in multiple markets at the same time. Moreover, the price of each drug varied depending on the seller, the market and the quantity. It was also observed that the higher the quantity the better the price per gram was.

Among the six markets, those with the most sources of new psychoactive substances were the Abraxas Market (n=234) and the Nucleus Market (n=202). It should be noted that Agora appears to have only 45 sources at it was closing its operations at the time of observation.

Furthermore, this observation produced statistical analysis for the countries of origin and destination of new psychoactive substances as identified in the six darknet markets. USA, UK and Czech Republic were the most frequent countries of origin of new psychoactive substances. Moreover, approximately 29% of new psychoactive substances were originated from Europe and especially from the countries of Germany (8.3%), Austria (7.9%), Belgium (0.1%), Ireland (3.9%), New Zealand (5.4%), Norway (0.6%), Netherlands (0.1%), Poland (0.1%), Slovakia (0.9%), Spain (0.1%), Sweden (0.1%) and UK (1.3%). However, more than half of the new psychoactive substances (57%) can be delivered worldwide. Furthermore, 11.4% and 18.3% of the new psychoactive substances can be delivered from Europe, USA and Canada respectively.

Concluding, this observation analysed also the purity level of the new psychoactive substances offered on the six darknet markets. It was found that the majority of the sources did not disclose the purity level of the drugs they offered. However, those sources which did indicate the purity level of the drugs being sold were indicating that their drugs were of very good or high purity.

The first period of observation was concluded in October 2015.

### Second Period

During the second period, two market places (Valhalla and Dream Market) were monitored.

The two markets were selling 105 types of new psychoactive substances out of the 450 identified by EMCDDA. The new psychoactive substances were classified into eleven categories:

arylalkylamines, benzodiazepines, cannabinoids, cathinones, indolalkylamines, opioids, phenethylamines, dissociatives, piperidines and pyrrolidines, plants and extracts and others. This observation pointed out that the category “others” was the most popular category among the two darknet markets. In particular, 31 distinct sources offer new psychoactive substances from the category “others”, such as diphenidine, zopiclone and DMAA. Also, the phenethylamines and benzodiazepines were the next most sold categories of new psychoactive substances offered by vendors. Specifically, 24 and 20 distinct sources of new psychoactive substances were recorded in Valhalla and Dream Market, respectively.

As regards vendors, 60 of them were found to sell new psychoactive substances. As in previous observations, most vendors were selling multiple types of new psychoactive substances in multiple markets. When it comes to comparing the two markets, Valhalla Market had more sources of new psychoactive substances than Dream Market (about 65% for Valhalla Market and 34% for Dream Market). As regards the countries of origin of new psychoactive substances as identified in the two darknet markets, China was the most frequent country of origin following by UK and USA. Most new psychoactive substances were delivered to Europe. Regarding the purity level of new psychoactive substances in the two darknet markets, the majority of the sources was indicating that their drugs were of very high purity (at least 98% pure). The second period of observation was concluded in March 2016.

Comparison of the observed markets during the two periods

During the two periods, three out of eight markets (Agora, Abraxas, Middle Earth) were closed which indicates how complex and dynamic the darknet market is. The table below illustrates the numerous products sold by the five darknet markets. Drugs were the most popular product sold in these markets; in almost all markets new psychoactive substances were placed in the same category of products as the traditional drugs. Only as regards cannabis there was a separate category for regular cannabis and synthetic cannabis (cannabinoids).

Categories	Nucleus	AlphaBay	Outlaw	Valhalla	Dream Market
Drugs	*	*	*	*	*
Cannabis	*	*	*	*	*
Cannabis: synthetic subcategory	*	*	*	*	*
Dissociatives	*	*	*	*	*
Ecstasy	*	*	*		*
Opioids	*	*	*	*	*
Prescriptions	*	*	*	*	*
Psychedelics	*		*	*	*
Steroids	*	*			*
Stimulants	*	*	*	*	*

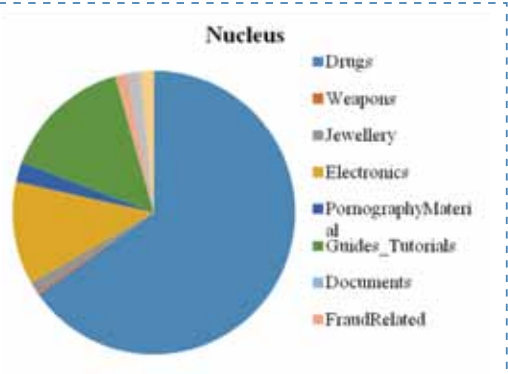
Synthetics					
Hormone			*		
Anesthetics			*		
Weight loss	*	*			*
Paraphernalia	*	*		*	
Tobacco	*	*	*	*	
Weapons	*	*	*		*
Documents	*	*	*	*	*
Jewellery	*	*			*
Electronics	*	*	*	*	*
Lab supplies	*			*	*
Pornographic material	*			*	*
Services	*	*	*	*	*
Information for	*	*	*	*	*
Safety/security					
Information for			*	*	*
vendors					
Information for how to					*
become a vendor					
Feedback to vendors	*				
Feedback to the		*			
market					

### Third Phase: Description of five markets

For the third phase of the research, five markets (Nucleus, Alphabay, Outlaw Market, Valhalla and Dream Market), were selected in order to describe their structure and appearance, their main characteristics, the products each market sells and the quantities, to identify the new psychoactive substances, to collect relevant information on transactions and to compare the similarities and differences between the five markets.

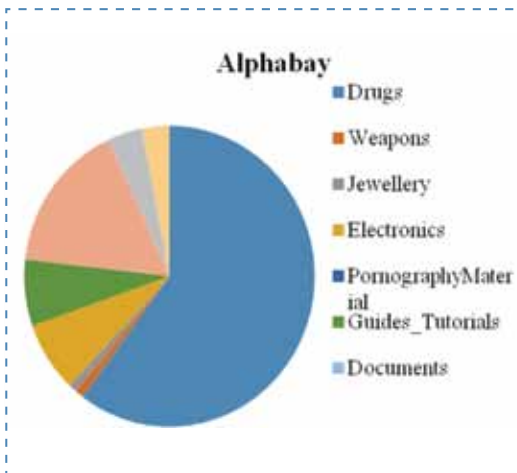
#### Nucleus Market:

The customers of this darknet market were required to create an account and use a username and password to log in. To access the market, use of Pretty Good Privacy (PGP) was also required. PGP is a data encryption and decryption computer program that provides cryptographic privacy and authentication for data communication. PGP is often used for signing, encrypting, and decrypting texts, e-mails, files, directories, and whole disk partitions and to increase the security of e-mail communications (Zimmermann, 1999).



Nucleus was a relatively new online darknet market place at the time of the survey; it initiated its operation in September of 2014. This market had a total of 314 user ratings by the end of October 2015. The rating score of this market was 2.73 out of 5 (1= terrible, 2= poor, 3= average, 4= very good, 5= excellent), which is an average rating. After signing in a list of all the products (drugs, fraud related, guides and tutorials, service, counterfeits, digital goods, drug paraphernalia, electronics, erotica, jewellery, lab supplies, miscellaneous and weapons) and a welcome message appears. The message focuses on how you can be protected from hackers and how you can buy the products safely.

The website also provides information on how to become a seller, view the balance, make bitcoin deposits, make bitcoin withdrawals and provide feedback to vendors. On the Nucleus market a variety of products were being sold: 15968 drugs, 321 fraud related products, 3624 guides and tutorials, 402 services, 365 counterfeits, 2838 digital goods, 43 electronics, 555 erotica, 315 jewellery, 13 lab supplies, 66 miscellaneous, 73 weapons.



Customers could choose from eleven different types of currency. The currencies which were available were: bitcoin, Australian dollar, Canadian dollar, Chinese Yuan Renminbi, euro, dash, British pound, Japanese Yen, litecoin, USA dollar and Russian Ruble. According to the Nucleus market, vendors had three days to accept or cancel the vendee's orders. If vendors cancelled the orders, then the money would be returned to the vendee within 72 hours. Vendees were able to check the process of delivery or refund by logging into the market. When products were successfully delivered, the vendees could provide feedback for the vendor and the products bought. In addition, the customers had the option to send a message to the managers of the market to report any issues and request their support.

## Alphabay Market:

Alphabay Market began operating on the 26th of December 2014 with the welcome message on their homepage "Alphabay Market is now live! The marketplace is open and ready to accept transactions. Happy selling! ". Alphabay market had a total of 305 ratings until early December of 2015. Its score was 3.05 out of 5, which is an average rating. When you sign in to this market you will see random pictures of six products (e.g. pills, crystal, money, watch, visa cards), a list of all the products (drugs and chemicals, fraud, guides and tutorials, services, counterfeits, digital products, software, jewellery, lab supplies, miscellaneous, weapons, carded items and other listings), a brief report for the account (first sign in, trust level, total sales, total orders), a welcome message and news.

The horizontal menu of market includes, among others, the welcome message and news, a list of the products, the user's balance, orders, feedback, forums, the currency (USA dollar, euro, Australian dollar, British pound and Canadian dollar) and a search menu.

In the sales menu, customers could view their history as well as the shipping information. There was also a notice that shipping would be carried out as soon as possible and that history would disappear from the panel 30 days after being finalized. On this market, customers could become vendors, by activating a vendor account. Before activation, individuals had to read the provided rules and then give their acceptance. The PGP software was used for data encryption and decryption.

Also, this darknet market provided information for fund deposits. In particular, customers had to send bitcoins to a specific address ("1Gc2EoLcML9D1EfpsFR8E2KKxLguoHDpmG").

The balance was to appear after three confirmations and the payment was to be completed in 45 minutes. If the customer wanted to withdraw funds, there was a fee of BTC 0.0002. Furthermore, in the horizontal menu there was a choice regarding contact info. If customers wanted or needed to contact the administrators of the marketplace, they had to communicate with administrators via the forums. Customers had to write their question or any query or issue in the forum and the administrators of the Alphabay were to respond.

**Private Messages**

Here, you can view your private messages. You can see your incoming and outgoing messages, as well as your trash bin. Your messages are never deleted unless you manually delete them, and there is no preset limit on your inbox folder capacity.

Conversations Trash Send message

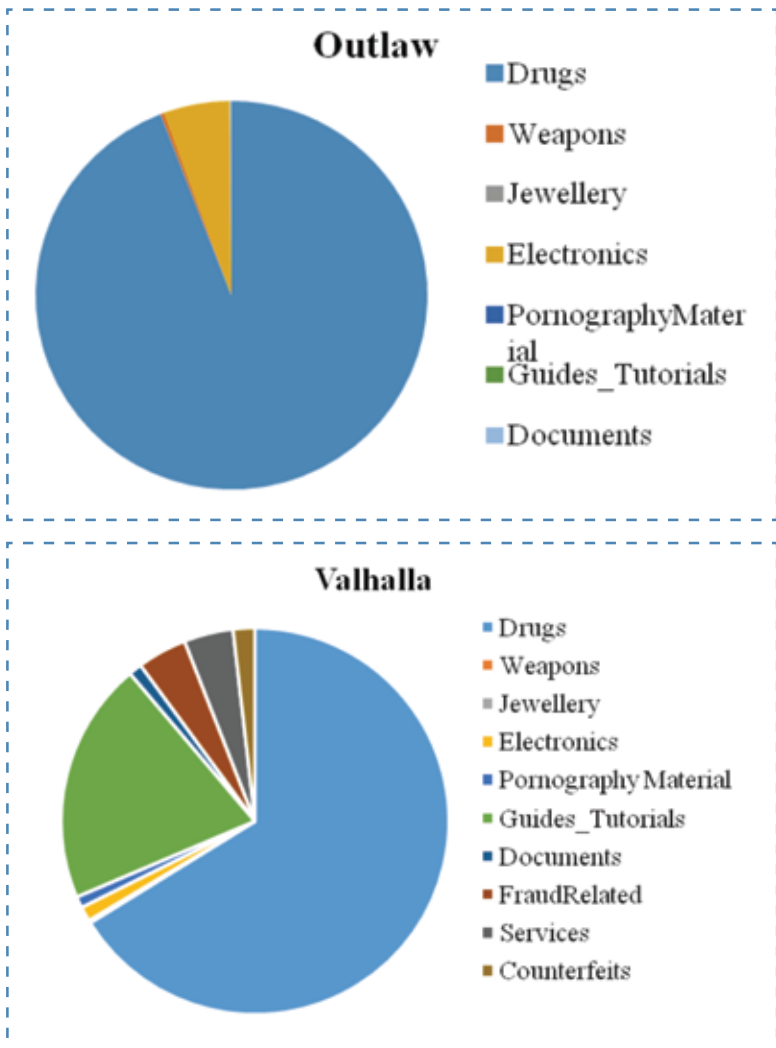
Search [input] Search Reset

To / From	Subject	Date / Time
<input type="checkbox"/> Eftand Apostis FD67 ketanjar -AlphaBay-Support-	***IMPORTANT*** (1) Hi, As you have noticed lately, our website has encountered difficulties due to repeated DDos attacks. As a solution to...	Nov 11, 2015

Delete Mark as read Mark as unread Sticky Un-sticky

The vertical menu of Alphabay market included information about the account, categories of products sold, search options, alternative onion links and a CC/account autoshop which gives the potential to customers to buy stolen credit cards. Drugs were the most popular product in Alphabay, as illustrated in the pie chart.

Outlaw Market: Outlaw market began operating during May of 2014. This market had a total of 41 ratings at the time of the observation. The rating score was 3.71 out of 5, which is more than average. When you sign in to this market you see the discount for certain products, a list of all the products (digital goods, drugs, electronics, laboratory, real goods, services, weapons) and a list of all the drugs. The horizontal menu includes: the currency from bitcoin to euro (during the time of the observation 1 BTC = 357 EUR) and the listings menu for all the products, such as digital goods, drugs, electronics, laboratory, real goods, services and weapons. Also, in the horizontal menu the customer can view personal messages, profile, orders, account, vendors' profiles, information for lottery and poker and questions posted by buyers. Additionally, some important information is provided for buying products and for the security of purchases. The vertical menu includes all the available products, a chat link for questions (FAQ) and a chat link for users.





Valhalla market: Valhalla was a Finnish only market/website when it first started in October 2013, only in Finnish, and under the name Silkkitie. It has recently been renamed to Valhalla and has become available in English expanding to an international level. It offers traditional financing policies like escrow and multising, the possibility of a two factor authentication of the identities/authenticities and the obligatory use of PGP (Pretty Good Privacy). In February 2016 its evaluation by deep.dot.web was 3.86 with 4 stars out of 5 and with 33 comments/reviews of which almost all were positive. For the creation of an account on the Valhalla website the first request is the clarification whether the visitor is a buyer or a vendor (both options are provided calling for the choice of one among the two). The homepage is the "All products" page. Therefore, by accessing the site, someone can simply find all the products being sold. The horizontal menu includes "All products", "My purchases" and "Messages" and "Account (O.O BTC)". The "Search Products" is stated and the possibility of writing the product or/and the name of the seller that someone might be looking for is provided, with the corresponding indication of word in it. Also, a customer has the chance to select the country of product origin via the option of "all countries".

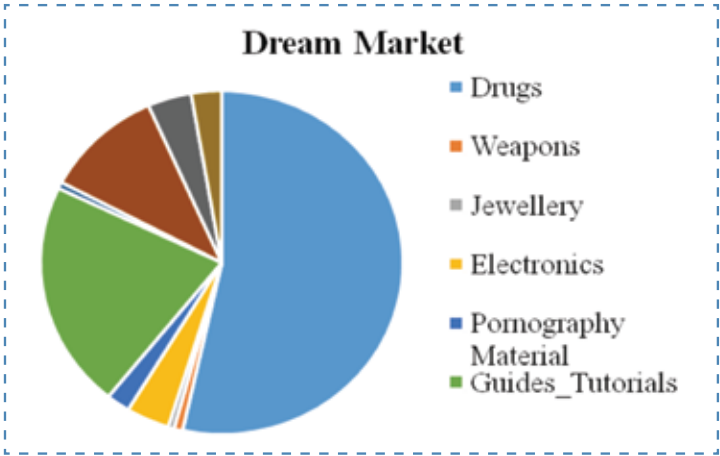
On the left side of the page there appears a column with all product categories that are for sale in the specific website/market. All products are split into two basic groups: "Drugs" (7495) and "Other products" (4761), a data that proves the importance of drugs sale in the market. Under the categories of products, the abbreviations "EUR", "USD", "GBP", "NOK" and "BTC" of Euro, American Dollar, Great Britain Pound, Norwegian Krona and Bitcoin currency respectively can be found. By clicking on one of them, the prices of the products are shown in the relevant currency. Moreover, vendees have the option to send a message to vendors via the market. By clicking on "Support" button, the visitor gets connected to the page on which he/she can solve questions related to technical matters regarding the operation of the site. In addition, the "Accounts" category consists of four subpages: "Wallet", "Withdraw money", "Settings" and "Invite earnings". Also, the "Settings" page includes the creation of Pretty Good Privacy (PGP) public key, the choice of three languages English, Finnish and Latvian, and the selection of 13 currencies (Euro, US Dollar, British Pound, Norwegian Krone, Bitcoin, Canadian Dollar, Australian Dollar, Japanese Yen, China Yuan Renminbi, Russia Ruble, Swedish Krona, Danish Krone, Iceland Krona). The "sales category" includes all the products available for purchase. In case the vendor has not yet had a sale, a relevant notice is displayed reminding the advertisement of the various products in the forums.

#### Dream Market:

Dream Market has been operating since November - December 2013 and has been using an escrow account. On 18/02/2016 the website evaluation/rank was 3.90 with 4 stars out of 5 and 257 reviews of which were almost entirely positive. For the creation of a new user, a user name, the creation of a password and the Withdraw pin are needed. For the creation of the account the user is also required to insert a captcha code to verify their human nature.

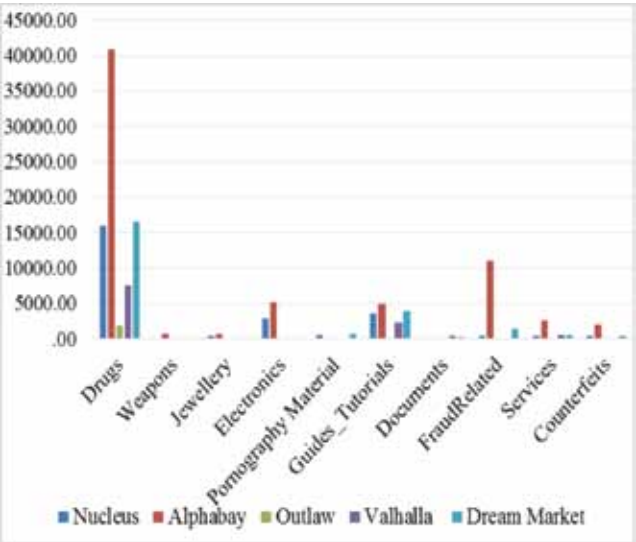
On the welcome page of Dream Market the news are displayed as registered by the administrators of the website. There are only 5 categories on the front page, which are Digital goods, drugs, drugs paraphernalia, services and other. Under these categories there are 4 Dream Market onion mirrors with different addresses for the same website. On the shop page all the products are presented. It is worth noting that at any given time the user logs in, the products displayed in the shop page are different/randomised. Moreover, on the messages page the users can go back to conversations they had previously or receive new messages. It is also worth noting that users cannot send a message from the messages page. To do that, they would have to post their message in the forums; this will in turn be filed under the messages page. Furthermore, through the account page users can manipulate their bitcoins or deposit money and convert them to bitcoins. Generally the account page functions as a bank for users allowing them to deposit and withdraw money. It should be noted that for any transaction the users were requested to provide a bitcoin address and a withdraw code that was presented to them right after the first time they register with the website. Regarding the profile of vendees, they have the option of changing their status to active, on vacation or retired. Users are also provided with a currency option between dollars, euro and British pound.

The user can also upload a picture that will be used as their avatar. Amongst the choices that the users have for formulating their profile, is the encryption of incoming messages (inbox encryption), the terms and conditions regarding the visibility of their profile and their PGP key choice. For the encryption there were two choices, activation and deactivation, through which users didn't allow or allow any comments or messages to be posted on their page without previous consent. Within terms & conditions users were allowed to write the information to be displayed on their profile, while the public PGP key of the user can also be determined in the same page.



On the Dream Market Website there were 5 different product groups, while categories only existed for 4 out of the 5. The product groups were: “Digital Goods” (8790), “Drugs” (15908), “Drugs Paraphernalia” (481), “Services” (502) and “Other” (920).

The five darknet markets: Nucleus, AlphaBay, Outlaw, Valhalla and Dream Market  
 Drugs were the product with the biggest quantity sold in all markets. The most frequent categories of drugs which were sold in the five markets examined were cannabis, dissociatives, ecstasy, opioids, prescriptions, psychedelics, steroids and stimulants. It is important to note that a distinct synthetic subcategory of drugs did not exist in any of the five markets. However, under the subcategory of cannabis, there was a category of synthetic cannabis in all markets. This exception can be due to the popularity of cannabinoids. New psychoactive substances existed in all drugs categories in all the markets examined. Also, electronics, tobacco, weapons, documents, jewellery, lab supplies, pornographic material and services were some other products sold in almost all of the markets examined.



## The monitoring of eight vendors on Abraxas, AlphaBay and Nucleus Markets

During the observation of the darknet market there was an attempt to give a specific frame and description of the operation mode of darknet, partially through the monitoring of eight active users (vendors) on various “darksites”. It is important to note that the variables collected from the vendors’ profiles in the present study, remain constant and identical in all the markets that the vendors reported available.

Furthermore, the present study attempted to give an improved view and a more comprehensive description of the vendors’ behaviour in three phases during a three-month period: 29/11/2015 – 15/12/2015.

The criteria for choosing the eight vendors were the following:

1. The availability of the vendors on the darknet markets. Those chosen were available at least at three markets and maximum at ten. That means that the majority of the vendors were operating in multiple markets simultaneously.

2. The total number of the available substances that each vendor was selling (including all categories of drugs and also new psychoactive substances). The vendors had minimum five and maximum 33 illicit substances available for sale and at least four and maximum 16 NPS. From the total number of all the available substances each vendor had, at least 50% of them were NPS.

During the observation of the eight vendors it was found that four of the vendors are supplied from European countries, and the rest of them from the Asian or American continents while some of them get their products from a variety of countries. As to the shipping county of the substances, the majority of the vendors could ship their products worldwide.

Also during the observation of the vendors, we became aware of two procedures, the PGP key and FE (Finalizing Early) procedure. As for the PGP key, some of the vendors were suggesting to the customers to use the particular method so the text messages (e.g. via chat, via email) could be encrypted by the time the customer was going to send the message and decrypted by the time the vendor was going to receive it, and vice versa. However, other vendors did not mention the use of the PGP key in their profiles and the method wasn’t a requirement for the ordering and selling process.

As for the FE (Finalizing Early), half of the vendors had the FE procedure as a requirement for ordering and selling. During this procedure an escrow agent (usually the administrator of the market) ensures that a transaction payment will be made to a seller on completion of items sent to a buyer. Generally after a purchase is made, the funds are held ‘in escrow’ to be released when the buyer will mark the purchase as ‘finalized’. This procedure stops vendors from taking money from customers without first delivering the product. Also, this procedure is used to reduce seller risk from BTC price fluctuation, and against market shutdown. This is also used to scam buyers as after the escrow has been released, there is no recourse for the buyer if the seller does not deliver on their promises. It was observed that in some cases the vendor offers benefits if the customer uses the FE (One of the vendors followed mentioned: ‘If you do FE however, I’ll be sure to include you some extra weight as a thanks’). In some cases FE procedure was not required and that was for the case of existence of a highly level of trust between buyers and sellers or if suggested from the majority of the costumers in the comments section.

The majority of the vendors had an almost stable score as to their costumers’ evaluation. Only one out of eight vendors presented a gradual rise on the ratings. Also, it can be observed that the costumers’ evaluations for the majority of the vendors were just about in high rating ranks (starting from 4.6/5 to 5).

As to the sales of the eight vendors, it was observed that there were some differences to the number of sales that had occurred in all the phases (the minimum number of sales was 2 and the maximum reached the 831 sales).

It is important to note that all the vendors in AlphaBay Market had a gradual increase in their sales during the 3-month period of monitoring. Also, it can be observed that the vendors had significant differences between them as to the total number of sales occurred. The vendor with the minimum number of sales had 36 sales at time 1 and 82 at time 3, and the vendor with the maximum number occurred 461 sales at time1 and 837 at time 3.

Moreover, it’s observed that a particular number of vendors in Nucleus Market had an increase regarding to the number of their sales during the 3- month period of monitoring. The number of sales occurred by the vendors during the three phases was minimum 224 and maximum 455 substances.

Observing the sales by all vendors in each market separately and calculating the mean (the average number) of sales, a clear preference of AlphaBay market than Nucleus market is noted, since the mean of sales in AlphaBay was more than twice as compared to the Nucleus market. The average number of sales in AlphaBay market between the three months period was 202.5 and in Nucleus market was 75.6.

### Limitations

The findings of this research support some evidence about NPS and the online darknet markets. However, some limitations were noted during the implementation of the qualitative online research, which require further attention for any relevant future research. At any time of the research there was a risk of a sudden shut down of the market place that was under observation. More specifically, at the beginning of the identification as to the distinct types of synthetic drugs available through the darknet markets, Agora Market was closed due to security reasons. Unfortunately, researchers were able to collect data only for cannabinoid drugs, and no data was available for other NPS. The accessibility to Abraxas Market place was also limited due to the sudden shutdown of the market. This resulted to a partial lack of data collection from the Abraxas Market. Nevertheless, the missing data had a minimum impact on the main research value as the abovementioned markets were replaced by other markets which were popular during the time of the survey.

The popularity and traffic of the markets varied during the research. Therefore, the monitoring of markets was focused on those that at the time of the research were popular and with high traffic. In addition, the selection of the markets had some restrictions. One restriction was the language used. Markets which were not in the English language were unfortunately excluded. Another restriction was the difficulty logging in to markets where approval was mandatory in order to be granted access. In such cases, the buyers and vendors had to complete an online form giving their email, their personal contact information, the reason they required access to the market, and some of their personal characteristics. Consequently, the access to such markets was very difficult for researchers. Furthermore, monitoring of online darknet markets was generally a very difficult task. Most of the markets kept continuously changing the available NPS for sale, the quantities of NPS, the vendors and the countries where NPS could be delivered.

### Discussion

According to the EMCDDA and Europol (2014) the number of new psychoactive substances is increasing significantly each year. This phenomenon was also seen during this research as during the repeated observations that there was an intention to examine whether the first-recorded new psychoactive substances had changed or remained stable, it was concluded that the new psychoactive substances changed over time with the addition of new and removal of some older substances. The EMCDDA (2013) attempted to clarify the reasons for which individuals prefer the new psychoactive substances compared to traditional drugs. Some of the reasons are that consumers make choices based on availability, price and perceived 'quality' of a drug. During the monitoring of the new psychoactive substances in the five darknet markets examined in this research, it was found that each vendor can sell different drugs in different quantity in multiple markets. Also, it was identified that as the quantity of a drug was increasing the price of the drugs was decreasing as in any marketplace that is driven by market laws. Moreover, in each market there were numerous vendors who sold multiple drugs; therefore the buyers had more chances to find the particular drug that they wanted. In each market there were some vendors who delivered worldwide. This made the availability of the illegal products easier for buyers. In addition, the purity level for some of the drugs was stated, while most of the time, the purity level was very good to excellent. All this information shows that anyone can easily find illegal products with the quantity, quality and the desired price

The Internet facilitates movement of products, money and information across global borders. It also allows the movement of drugs, medicines, NPS, precursors and information on production techniques (EMCDDA, 2015). At present, the extent of Internet-enabled drug transactions taking place on the deep web is very limited; however, growth has been exponential and there is no evidence to suggest these markets will remain restricted for long (EMCDDA, 2015). Undoubtedly, the speed with which the Internet allows transformation to occur in drug markets poses a major

challenge across the board, to law enforcement and public health, as well as to research and monitoring agencies (EMCDDA, 2015). Nowadays, the availability of new psychoactive substances has been increased significantly. Almost every day at least one new psychoactive substance is being created. Considering that both the use and sale of new psychoactive substances have been increasing as did the use of internet and online markets, the appearance of new psychoactive substances in the internet was to be expected. The main goal of this research was to examine the new psychoactive substances sold in darknet markets, to describe popular markets and to monitor eight vendors in order to provide important insight information and a rapid assessment of the online drug market.

During the monitoring of the new psychoactive substances we identified that the category of phenethylamines was the most popular category available through the six darknet markets: Abraxas, Nucleus Market, Alphabay, Middle earth, Outlaw and Agora. In Valhalla and Dream Market we identified that the most popular categories were Others, such as diphenidine, zopiclone, DMAA, and then the phenethylamines and benzodiazepines.

According to the EMCDDA (2013), many of the new psychoactive substances are produced in China, as well as in secret laboratories in Europe so the distribution directly to the European market is easier. Also, according to Bartlett (2015), UK and USA were the most popular countries into which products from marketplaces were shipped. In this research, through the monitoring of Abraxas, Nucleus Market, Alphabay, Middle earth, Outlaw and Agora, it was found that approximately 29 % of new psychoactive substances originated from Europe and specifically from Germany, Austria, Belgium, Ireland, New Zealand, Norway, Poland, Slovakia, Spain, Sweden and UK. Moreover, more than half of the new psychoactive substances (57%) could be delivered worldwide. Furthermore, in the second phase when the Valhalla and Dream Market were examined, China was the most frequent country of origin of new psychoactive substances. Also, UK and USA were the other two most frequent countries of origin while during the monitoring of the Valhalla and Dream Market, it was found that most new psychoactive substances were delivered to Europe.

Through this research numerous darknet markets were observed. However during the period of this research, some of the darknet markets were closed and new darknet markets emerged. The Agora darknet market was closed due to safety reasons in October of 2015. On September of 2015, the most popular markets were Abraxas, Nucleus Market, Alphabay, Middle earth, Outlaw and Agora. Through a further examination of the new psychoactive substances on February 2016, Nucleus and Outlaw Market were still considered as popular markets. Moreover, new popular markets emerged, Valhalla and Dream Market, which were not popular on September of 2015. Therefore, it is evident that the popularity of darknet markets varies over time.

The data emerged from this research suggest that the market of new psychoactive substances is complex and dynamic and will continue to pose challenges to drug policy makers. It is likely that the growth of the market will be responsible for the increase in serious harms as new psychoactive substances will come up with limited information about their effects and harms. It is here that strong early warning systems can play a critical role in ensuring a timely response in order to protect public health (EMCDDA, 2015). On a positive note, darknet forums and their evaluation from online customers appear to act, according to Hout and Bingham (2013), as information mechanisms for the promotion of safer and more acceptable or responsible forms of recreational drug use.

### 3. Training and Exchange of Best Practice

Activities under this work stream of the project, concerned training from other EU countries through a) study visits and b) a “training the trainer” workshop where experts from Lithuania, Czech Republic and UK trained officers of the Cyprus Police Drug Law Enforcement Unit and other drug-related professionals regarding drug law enforcement actions and interventions for NPS-related cases. Following this, officers of the Cyprus Police Drug Law Enforcement Unit (DLEU), and the State General Laboratory, provided 8 educational training seminars to 230 officers from customs, private and public postal companies. An informative leaflet regarding NPS was developed by the DLEU in order to be disseminated to all these front line professionals (see in the materials developed, the Leaflet to front line drug professionals about NPS).

#### A) Study visits:

As concerns the study visits, two members of the Cyprus Police Drug Law Enforcement Unit (DLEU) visited two EU member states (Belgium and UK) in order to experience the local Authorities cooperation with the postal services in the framework of the fight against drug trafficking, especially as regards NPS.

#### Study visit 1: Belgium

Visit at the International airport of Liege in Belgium  
TNT international courier delivery service company  
European Express Centre (Euro hub)

The visit took place between 3-4/11/2015. The Eurohub has been the main air hub center of TNT Express in Europe since 1988. It is the largest courier company in Europe and is closely linked to the Trans-European road network company, which has its headquarters in the Dutch town of Duiven.

The TNT European Express Centre (EEC) at Liege Airport, in Belgium processes all air freight consignments within Europe and forms the central link with the rest of the world.

Every night, 40 planes and 125 trucks arrive at Liege airport (where a total of 1,500 people are employed) carrying a total of 90,000 consignments, using ultra-modern sorting equipment.. Very strict safety measures for all staff, regardless of position or status take place, both when entering and exiting the main airport building.

During this visit, important information was given on how consignments are controlled on a daily basis, noting that the customs have access to the TNT’s operational system. Based on intelligence and modus operandi, commands are inserted into the company’s system so that consignments considered suspicious based on the country of origin (countries at risk), can be identified. They are opened for inspection at a specific point under a security camera. All consignments are checked, and in case of finding nothing suspicious after they are recorded, they are resealed with adhesive tape that does not bear any markings.

During control and when suspicious substances are detected, including new psychoactive substances, they are sent to the laboratory for analysis in order to proceed with the seizure and for a possible controlled delivery to be placed.



Visit at the Zaventem International airport in Brussels  
Meeting with the Belgian Customs Authorities

The meeting was held with the main duty Customs officer in Brussels who presented the activities of the Belgian customs authorities in combating drug trafficking at the airport. Daily checks based on risk analysis, on information and also routine checks, take place for cargo, passengers (luggage & physically) and for parcels arriving by courier companies. Important information was given on drug seizures recorded during the past four years giving emphasis to the countries of origin. As mentioned, during risk analysis any suspicious air cargo is identified through the bill of landing documents mainly in high-risk flights. The flights that are considered high risk for the Belgian authorities are from the Dominican Republic, Mexico, Brussels airlines flights from African countries and European flights from Lisbon, Madrid, Zurich and Frankfurt. Based on the information gathered, synthetic cannabinoids and precursors are imported from China.

During the visit, a suspicious consignment's profile was set based on risk analysis, information and on analysis of previous seizures. A suspected passenger profile was also created according to specific criteria such as possessing a new passport, air ticket paid in cash, passenger's body language, suitcase brand, nationality, country of residence, arriving directly from a high-risk country or transiting from and to other countries. All luggage is radio-graphed and in many cases physically controlled. Customs officials are also facing problems with drug swallows. In the luggage drugs are hidden in false- and double- bottom cases and in suitcase handles, in shampoo plastic containers or powders, in cans, air fresheners, and also impregnated in clothes. It is important to mention that a memorandum of understanding was signed with the DHL Company in combating drug trafficking, and access to DHL's database was also gained.

Study visit 2: UK

Visit to the East Midlands airport and Parcelforce depot at Coventry, Border Force controls parcels on a risk assessment and trends basis, using x-ray machines, sniffer dogs, special devices and an electronic computer systems. Small quantities up to 2-3 kg are usually traced, with trends constantly changing. Only staff has access to the sorting centre. The Border Force special group which monitors and identifies suspicious mail parcels, has access to the delivery services database and uses equipment which helps control suspect substances without the need to open packages. It was also noted that almost all deliveries from UK airports and ports end up at the Coventry sorting centre, where national and international deliveries are separated.

NCA Office, Birmingham, 20.01.2016

As witnessed in the study visit in Birmingham, the NCA operational activity in drug trafficking including NPS is done on an individual case basis. Recent confiscations identified the use of Parcel2go, <https://www.parcel2go.com/> which delivers parcels to the UK.

B) "Training the trainer" workshop

As previously mentioned, in the "training the trainer" workshop experts from Lithuania, the Czech Republic and the UK trained officers of the Cyprus Police Drug Law Enforcement Unit and other drug-related professionals regarding drug law enforcement actions and interventions for NPS-related cases. Following this, officers of the Cyprus Police Drug Law Enforcement Unit (DLEU), and the State General Laboratory, provided 8 educational training seminars to 230 officers from customs, private and public postal companies. An informative leaflet regarding NPS was developed by the DLEU in order to be disseminated to all these front line professionals.

As concerns the training, on the first day, the DLEU presented an introductory talk on NPS, their definition and legal status as well as the European mechanisms to deal with them and the legal framework in Cyprus.

After the introductory presentation, Lithuania presented its own national NPS situation and responses. A number of social and health issues relating to NPS use in many countries were discussed.

Following this, the situation across Europe was presented, where these substances can be described as “legal highs” or “designer drugs” and distributed as food supplements, research chemicals, medicines or detergents bearing the label “products unsuitable for human consumption”. As mentioned, they may be found in various shapes and colours, such as pills, herbal mixtures, powder and tiny crystals; but frequently they contain both natural and synthetic products (e.g. products from natural oils). The most widespread method of their distribution is via online stores on the so-called “dark net hidden web”. Producers of such substances, distributors, wholesale merchants, website owners and payment services are usually located in different countries with distribution taking place through postal and parcel services and purchase via virtual currency such as “bitcoin”.

In order to control the illicit distribution of drugs EU Member States apply measures according to the three UN conventions (UN Single Convention on Narcotic Drugs of 1961, UN Convention on Psychotropic Substances of 1971 and UN Convention against Illicit Trafficking in Narcotic Drugs and Psychotropic Substances of 1988 (especially Articles 12 and 13)), which define drug distribution as a criminal offence. On a national level each MS applies different measures for the effective control of drugs and psychoactive substances on the basis of existing national legislation, as well as the though the introduction of regulations as in Lithuania. The range of legislation on psychoactive substances is broad because it is impossible to define with 100% accuracy what these substances are exactly.

Moreover, as mentioned control of psychoactive substances is quite difficult, because little is as yet known about these substances, hence the creation of an integrated system of effective monitoring which includes psychoactive substance use case analysis and assessment of potential risks to the human organism is imperative. The seminar concluded with a presentation on the chemistry of NPS and the analysis of use trends in Europe.

During the second day of the seminar Lithuania presented the three levels of legislation adopted (national level, EU level and UN conventions), as well as the application of control measures for NPS. The national Early Warning System (EWS) was described, as well as the NPS Committee which was formed for the purpose of risk assessment and the application of control measures on psychoactive substances. Finally, reference was made to existing cooperation on the NPS issue and the legal challenges faced by MS.

There followed a presentation from a Czech expert on customs controls, who offered an analysis of risks confronted by his national customs authorities. Their fields of activity were presented together with a detailed description of Prague airport and the operational departments. There was also an update on the ICARUS programme in which 11 Customs Directors from European airports participate for purposes of discussion and finding solutions to problems faced by airport customs controls. The ICS electronic programme which is used as an analytical instrument during customs controls was also presented. Finally statistics concerning NPS and the Czech legislation on NPS were discussed.

The seminar finished with the presentation by British experts focusing on methods of illicit transport of NPS. This involved detailed presentation of the methods of transport via post, air cargo, commercial packages, concealment within the human body (by drinking) and the RO-RO method (Rip On – Rip Off). Finally the methods of NPS transport control used by the UK were discussed.

#### 1. Future Action

The seminar allowed for an exchange of expertise as regards the handling of NPS cases and the development of relevant strategies. Knowledge as regards the internet supply chain of NPS was increased while participants were updated on the methods used to import parcels as well as the measures that have to be implemented to prevent their import to Cyprus.



During the seminar, there emerged a need for continuous monitoring and updating of the legislation for drugs which cannot be covered by the 'generic approach'. Furthermore, a request emerged from private parcel delivery companies, the Department of Customs and Excise, and the Cyprus Postal Service for strengthening the cooperation with the DLEU. More specifically the suggestion was made for the designation of contact persons in the relevant services for more effective cooperation and an improved handling of information. It is noted that there is already a Memorandum of Cooperation in place with the Department of Customs and Excise; therefore the designation of contact persons is of particular priority as regards the private parcel delivery companies and the Cyprus Postal Service.

Besides the designation of a contact person, the issue of establishing a Memorandum of Cooperation between the DLEU and private parcel delivery companies was raised. It was suggested that 'front-line' workers could be provided with continuous updates and feedback regarding information which could make DLEU operations more effective (such as importer profiles, countries of origin, labels for differing contents, new ways of importing substances etc). Additionally, suggestions were made on behalf of the services to locate and purchase drug detection devices for packages, which could be used mainly by the Customs Department. Through discussion and exchange of views it was determined that such devices are absolutely necessary for more effective control.

Also, a suggestion was made to place an X-RAY machine in the storage room at the former airport in Larnaca, where all packages imported into Cyprus are sent. Due to the present economic situation, there is an immediate need for services to thoroughly look into the possibility of European funding.

Finally, there is need for the use of a mobile scanner for customs control of drug imports through packages received in Cyprus ports as well as the need to train public services in matters of national, but also European legislation.

## 2. Added Value of the Seminar

The 2-day training added value to the existing knowledge since the participating services had the opportunity to be informed by the experts on the methods used for distribution of NPS. The experts / trainers come from countries having to deal with large quantities of NPS in recent years, who therefore have acquired experience and knowledge in identifying these substances. The update and gain in knowledge and best practices necessarily led to questions emerging from the trainees concerning the handling of possible difficulties arising in the course of duty, as well as suggestions for improvement, which were the primary aims of the seminar. Another important element was the face to face meeting, for the first time, between government officers and their counterparts in the private sector. A spirit of cooperation between the involved parties was cultivated, and there was an exchange of views and technical know-how which led to a constructive discussion. Areas needing improvement were identified which will be further discussed by the programme's steering committee with the aim of improving the efficacy of each service.

## 4. Dissemination

During the beginning of the project a dissemination strategy was developed (see in the materials developed, the Dissemination Strategy). The key stakeholders were identified while the methods for dissemination were specified. In the final stage of the project, the concluding conference (May 6th of May 2016) was organized in order to present the results of the project while the report regarding the project findings and recommendations will be disseminated to national partners.

With respect to the European level, report findings and the press release were also disseminated to EU partners in the drugs field (such as the European Monitoring Centre for Drugs and Drug Addiction and its Reitox Network, the Horizontal Working Party on Drugs of the EU, the Pompidou Group of the Council of Europe and Europol).

In addition, the Cyprus Police Drug Law Enforcement Unit, as partner of the project, undertook the role of disseminating the results to Europol. Effective dissemination and transferability of the project's results were ensured since, all EU partners have been provided with an insight regarding the characteristics of online drug markets, along with an outline of the user behaviours, characteristics and their histories on these sites. Thus, the dissemination facilitated the broadening and reinforcing of the existing European knowledge on NPS.

Finally, the project's website (<http://www.iseccyproject.com>) contains all relevant information with a section dedicated to the project's findings.

## 5. Internal Evaluation

For the purposes of continuous and systematic monitoring, feedback and recommendations regarding the project actions, internal evaluation was scheduled in connection with all project workstreams: Coordination and Management, Research, Training and Exchange of Good Practices, and Dissemination.

The internal evaluation for each action took place on the basis of a specific time schedule and its main axis concerned the targets each action intended to fulfil, while the instruments used included questionnaires and personal interviews.

### Workstream 0 - Coordination and Management

This package concerned the following:

- Systematic (monthly) meetings between partners (CAC and DLEU)
- Steering Committee meetings (CAC, DLEU, companies which carried out the quantitative and qualitative research)

The meetings aimed at ensuring the smooth flow of the project as a whole (keeping time schedules, targets, financial management), but also for each separate action. This process was smooth and without significant issues arising or unpredictable conditions making the implementation of the project more difficult. Furthermore, there was continuous communication between the internal and external evaluators through feedback but also through the external evaluators' participation in specific project actions, so as to gain a direct impression of their progress.

### Workstream 1 – Qualitative and Quantitative Research

A large part of the project concerned carrying out quantitative and qualitative research. The quantitative research was completed during September 2015, and the qualitative during February 2016. While the quantitative research was completed in the expected time, the qualitative research took longer than initially expected, due to its complexity and the difficult nature of the subject matter. In the qualitative research the objective was to monitor NPS, sellers and e-markets on the darknet.

For optimum application of the internal evaluation and the Action Packages 1 and 2, an evaluation plan which included all actions was drafted. These actions were evaluated on the basis of the time schedule within which they were to be completed, while the extent to which targets were met also constituted an evaluative parameter, as did the extent to which participant expectations were met, and how any occurring problems were solved.

#### 1.1 Qualitative Research

The main objective of the qualitative research was to record the availability of NPS on illegal websites, and to compare these with those recorded by the European Monitoring Centre for Drugs and Drug Addiction. Also, 8 websites were carefully scrutinized (Agora, Abraxas, Alphabay, Outlaw, Nucleus, Middle earth Dream and Valhalla Market) and the NPS being sold on these were recorded. In particular, for every NPS the name of the seller was recorded, the name of the marketplace, the quantity bought, the price, the country of origin, the country of distribution and the purity of the substance. The main purpose of recording all this information was to obtain a fuller and well-documented picture of the availability, distribution and the characteristics of those NPS on illegal websites.

During this part of the project some difficulties arose concerning the shutting down of the Agora and Abraxas markets; consequently the Dream and Valhalla markets were immediately chosen as alternatives for the research. The general instability with respect to factors influencing the darknet, the continuous changes observed and the shutting down of the markets determined the noted delay. Nevertheless these changes were within reasonable expectation and easily handled.

## 1.2 Quantitative research

The objective of the quantitative research was to estimate the prevalence of NPS use and associated behaviours amongst youth aged 18-35 in Cyprus. The research was based on interviews of 1000 persons aged 18-35. The research company expected to record NPS prevalence amongst youth in a reliable and statistically sound manner, a fact which will assist in providing better information on NPS and the creation of new policies. No significant difficulties were encountered during the quantitative research, and the response to the project was deemed satisfactory.

## Workstream 2 - Training and Exchange of Good Practices

### 2.1 Training in research methodology concerning anonymous monitoring of web-based markets

This training concerned the acquisition of knowledge for the purpose of carrying out the qualitative research, and the monitoring of anonymous web-based drug markets. Participants in this training included the DLEU, the State General Laboratory, the companies which carried out the quantitative and qualitative research, as well as the contractor for the external evaluation of the project. All participants completed an evaluative quality questionnaire at the end of the training, which contained questions pertaining to various aspects of the training received, while also covering issues relating to the trainer (1-5 scale, where 1= low satisfaction and 5=high satisfaction).

The results regarding the training's content indicated a high level of satisfaction, since all participants reported almost full satisfaction (above 4.5/5) concerning the clarity, structure, organisation of the training as well as the means employed.

Moreover similar levels of satisfaction were observed for the content of the training, the understanding and relevance of the contents, the appropriateness of the training materials and training means, which covered expectations within the framework of the project to a large extent, but also the possibility of future professional needs for the participants.

As regards the evaluation of the trainer, participants responded very positively, noting his excellent knowledge of the topic, but also his ability to communicate the content, to motivate participants and maintain their interest, and to encourage opportunities for active participation.

### 2.2 "Train the Trainers"

As regards the "train the trainer" seminars, these were given by experts from the Czech Republic, the UK and Lithuania who shared valuable information as to the handling of NPS transportation through postal services. Participants in the training were officers of the Cyprus Antidrug Council, the Drug Law Enforcement Unit, the Customs Department, the public and private postal services, as well as the Pharmaceutical services and the State general Laboratory. The seminars covered approximately 300 officers from the above mentioned services, with the aim of disseminating valuable expertise to front line officers. Important information was also provided as to the policies and legislation in the different countries relating to NPS, while it was underlined that practices as well as law enforcement mechanisms differ from country to country.

In relation to the evaluation of the above action, interviews took place before the actual training, with the aim of recording the expectations as to the knowledge to be acquired as regards the handling of NPS packages and training needs. As mentioned by DLEU participants, the expectations as to the qualitative research had to do with the acquisition of new expertise especially regarding new technologies and the internet, and the role these played in the evolving and dynamic market of NPS. It was also mentioned that WS2, would facilitate the exchange of valuable experiences and the dissemination of knowledge amongst experts of different countries and the DLEU officers, both as regards theoretical and practical aspects of the phenomenon. The State General Laboratory, which was a participant in the "train the trainer" seminars and an expert in the training of the DLEU and the postal services, mentioned that a successful completion of the seminars to front line officers and the acknowledgment on their part, of the crucial importance of the phenomenon, ranked high in their expectation list. This, they felt, would in turn enable the implementation of policies and measures to successfully prevent the import of NPS to Cyprus. It was also emphasized that of particular importance was the specialized training of the customs officials, the systematic controls along with the acquisition of modern equipment. Equally important, was the new expertise and tools and the continuous feedback with colleagues of other countries, which the project allowed. Along the same lines, the Customs officers as well as the public and private postal services were looking forward to the new knowledge which would permit more effective controls, ways of handling clients attempting to send or to receive NPS, and concrete steps to deal with the phenomenon as front line officers. Main problems foreseen during this stage of the evaluation were the lack of adequate and modern equipment.

In the post training stage, the questionnaire covered issues such as the quality of the training (rating being 1-5, 1 corresponding to "not satisfied", 5 corresponding to "highly satisfied") as well as the trainer (rating 1-5, 1 corresponding to "poor"- 5 corresponding to "excellent"). The questionnaire was answered by 198 out of 300 participants. As to the "train the trainers", there was a broad satisfaction as to the quality of the training as well the adequacy of the trainers. As reflected in the answers, the goals were described as very specific and clear and relevant to the general content, the methods and the material were described as appropriate. Expectations as to the training seemed to have been fulfilled to a large extent, given an average rating of 4. Furthermore, the trainers were rated with 4.6 as regards their knowledge of the subject matter, the structure of their presentation, and their skills as regards communication, motivation, and active participation, while it was noted that similar trainings were of great additional value.

A similar mechanism was used to evaluate the study visit which took place in the UK and Belgium. The main goal of these was the enrichment of knowledge as regards NPS but in particular as to the way they are transported, with the more long term aim for this knowledge to be disseminated internally to all DLEU front line officers. The study visits which included the observation of control measures and specialized equipment procedures, was rated as particularly important and of great added value for future policies in Cyprus.

### Workstream 3- Dissemination

Dissemination of the project's results to stakeholders directly or indirectly related to the issue, revolved around a central axis throughout the implementation of the project and included the preparation of press releases, the creation of a website and the realization of the concluding conference as well as the dissemination of the results at a national, European an international level.

In conclusion, the internal evaluation was running in parallel with each action and specific aim of the project, to ensure a smooth monitoring of its implementation and the introduction of potential adjustments, if need arose. As a general remark, it can be safely stated that the evaluation process is considered satisfactory, as the deadlines were met and the participants responded to it with willingness and sincerity.

## Conclusion/Discussion

The phenomenon of NPS is fast-paced in nature, as the availability of the substances is constantly increasing, patterns of use are changing and the widespread trade in these substances is due to draw international concern.

Serious harms have been reported as regards NPS while long-term harms are still unknown and we still have an incomplete understanding of acute and longer-term health harms knowing very little about any associated social harm.

As the market has grown in recent years, the EMCDDA has reported serious harms, often related to acute toxicity leading to hospitalization and deaths, while serious harms were also identified outside Europe.

NPS are advertised and sold as 'legal highs', often under a variety of brand names, this putting them at low risk as regards their control, while countries still try to reach effective legal tools to control them and the global market on the internet makes this control and monitoring even more difficult.

The monitoring of the phenomenon requires the establishment of common fronts, both in the EU but also with other countries. The responses have to cover Demand and Supply Reduction measures and include the reduction of harm through the provision of exact and reliable information, treatment options and the implementation of an effective and dynamic control mechanism including legislation that permits fast responses.

The data that emerged from the qualitative research suggest that the market of new psychoactive substances is complex and dynamic and will continue to pose challenges to drug policy makers. It is likely that the growth of the market will be responsible for the increase in serious harms as new psychoactive substances will come up with limited information about their effects and harms. It is here that strong early warning systems can play a critical role in ensuring a timely response in order to protect public health (EMCDDA, 2015). On a positive note, darknet forums and their evaluation from online customers appears to act according to Hout and Bingham (2013) as information mechanisms for the promotion of safer and more acceptable or responsible forms of recreational drug use.

From the quantitative research data, we can see that the prevalence of new psychoactive substances in Cyprus is relatively low, but prevention measures are necessary for demand and supply reduction, as it is an emerging issue with implications for public health.

In order to develop the evidence base, knowledge gaps need to be addressed in order to have a solid base as to future policy responses. We are beginning to get a better picture of the NPS market but still have significant evidence gaps around prevalence, purchasing and supply. The project "New Psychoactive Substances (NPS): Building knowledge and evidence based training through research" was an attempt to increase the knowledge on the internet supply chain for NPS, to promote cooperation among the parties involved (customs, private and public postal companies) and to train the parties regarding patterns of delivery and supply reduction measures of importation of NPS in the country. Although it was a first attempt to plunge into the world of the "darknet" and the data gathered can only be considered as a starting point, we are confident that on a national level, the information will be of added value in relation to the drafting of the new Action Plan 2017-2020, and hopefully a useful tool for other countries. Furthermore, we believe that the actions realized, paved the way for the establishment of invaluable synergies amongst the various players in the Supply Reduction field, which are of great importance, as NPS will remain an area of concern and interest in the years to come.

## **Recommendations for Further Development**

As can be derived from above, the project has given a sound base for the acquisition of new information, knowledge and expertise, as well as the establishment of new synergies. There are clear steps to follow, however, if we are to fully exploit these, namely

1. The establishment of an Memorandum of Understanding between the Drug Law Enforcement Unit and private postal services aiming at a regulation of all procedures as regards cooperation in the field of NPS.

2. The upgrading of cooperation between Drug Law Enforcement Unit, and the Custom Department of the Ministry of Finance, and the possible establishment of common mechanisms in order to more effectively act as front line officers.

It is clear; the project initiated a closer monitoring of the situation as regards NPS, although this can only be seen as a first step. Further to the above, we believe that its value will also find its place, in the framework of the New Action Plan to be drafted in the coming year, which will reflect the real commitment of all stakeholders as regards the implementation of the above recommendations.

### **Project materials developed:**

**Press release 1**

**Dissemination Strategy**

**Press release 2**

**Leaflet to front line drug professionals about NPS**

## References – footnotes/references/cross-references

1. Bartlett, J. (2015). What 'dark net' drug buyers say about their dealers. Retrieved from <http://www.telegraph.co.uk/technology/internet/11466413/What%C2%ADdark%C2%ADnet%C2%ADdrug%C2%ADbuyers%C2%ADsay%C2%ADabout%C2%ADtheir%C2%ADdealers.html>
2. Blanckaert, P., van Amsterdam, J.G.C, Brunt, T.M et al., (2013). 4-Methyl-amphetamine: A health threat for recreational amphetamine user. *Journal of Psychopharmacology*, 0(0) 1-6.
3. DrugScope (2013). Street Drug Trends Survey, UK.
4. EMCDDA (2006). Monitoring new drugs. Luxembourg: Publications Office of the European Union.
5. EMCDDA (2013a). EMCDDA-Europol 2013 Annual Report on the implementation of Council Decision 2005/387/JHA. Europol joint publication.
6. EMCDDA (2013b). European drug report: Trends and developments. Luxembourg: Publications Office of the European Union.
7. EMCDDA (2014). EMCDDA-Europol 2013 Annual Report on the implementation of Council Decision 2005/387/JHA. Europol joint publication.
8. EMCDDA (2015a). New psychoactive substances in Europe. An update from the EU Early Warning System. Luxembourg: Publications Office of the European Union.
9. EMCDDA (2015b). Drugnet Europe. Lisbon: European Monitoring Centre for Drugs and Drug Addiction.
10. EMCDDA (2015c). Perspectives on drugs. Legal approaches to controlling new psychoactive substances. Luxembourg: Publications Office of the European Union.
11. EMCDDA (2015d). The Internet and drug markets. Summary of results from an EMCDDA Trendspotter study. Luxembourg: Publications Office of the European Union.
12. EMCDDA (2016a). EU Drugs Market Report: In depth Analysis. Luxembourg: Publications Office of the European Union.
13. EMCDDA (2016b). New release from the EU drugs agency in Lisbon. Lisbon.
14. Home Office (2014). The New Psychoactive Substances Review Expert Panel, UK.
15. Home Office (2015). New Psychoactive Substances (NPS) Resource Pack for informal educators and practitioners, UK.
16. Hout, M.C.V., & Bingham, T. (2013). Surfing the Silk Road: A study of users' experiences. *International Journal of Drug Policy*, Nov; 24(6): 524-9.
17. Martin, J. (2014). 'Lost on the Silk Road: online drug distribution and the 'cryptomarket'', *Criminology and Criminal Justice*, 14, 351-367.
18. United Nations Office on Drugs and Crime (UNODC) (2013). So-called mimetics are substances that are chemically different but mimic the pharmacological effects of a particular substance, notably by acting on the same receptors of the brain, *World Drug Report 2013*, New York.
19. United Nations Office on Drugs and Crime (UNODC) (2014). *Global Synthetic Drugs Assessment Amphetamine-type stimulants and new psychoactive substances*, New York.
20. UNODC announcements (2015). China announces controls over 116 New Psychoactive Substances. <https://www.unodc.org/LSS/Announcement/Details/83b02e73-4896-4ed5-944c-51a7646647aa>.
21. Van Buskirk, J., Roxburgh, A., Bruno, R., and Burns, L. (2015). *Drugs and the Internet*. Sydney: National Drug and Alcohol Research Centre.
22. Wright, A. (2009). Exploring a 'Deep Web' That Google Can't Grasp. *The New York Times*.
23. Zimmermann, Philip R. (1999). "Why I Wrote PGP". *Essays on PGP*. Philip Zimmermann.

# Appendices

## Appendix A: Questionnaire



SAMPLING POINT		POSTAL CODE	
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Interviewer name.....	<b>INTERVIEWER CODE</b>	
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Start time		End time		Duration	
------------	--	----------	--	----------	--

<b>INTERVIEW DATE</b>	<b>DAY</b>						
...../...../ 2015	Monday	Tuesday	Wedn.	Thursd.	Friday	Satur.	Sunday
	1	2	3	4	5	6	7

<b>AREA</b>								
Nicosia urban	Nicosia rural	Limassol urban	Limassol rural	Larnaka urban	Larnaka rural	Ammocho stos	Pafos urban	Pafos rural
1	2	3	4	5	6	7	8	9

Hello. My name is... and I am working for CYMAR Market Research Company. We are currently conducting a survey on behalf of the European Commission and the Cyprus Monitoring Centre for Drugs and Drug Addiction. The survey is related to the usage of new synthetic substances among young people. The project is funded jointly from the Cyprus Monitoring Centre for Drugs and Drug Addiction and the European Union. We would like to discuss for a while with you in order to hear your views.



You have been selected randomly in our sample. Your answers are confidential and will be used only for statistical analysis. Beyond measures taken for the anonymity of respondents, on sensitive issues we ask you to record your answers on your own on the tablet. After the interview is completed all answers are transferred automatically to the central server for processing and can no longer be accessed through the tablet.

Your participation in the survey is very important and we appreciate a lot your effort and the time you have allocated for the survey.

Q1 New substances that imitate the effects of illicit drugs (such as cannabis, ecstasy, cocaine, etc.) may now be sometimes available. They are sometimes called synthetic drugs and can come in different forms, for example – herbal mixtures, powders, crystals or tablets.

**1. Have you ever used such substances?**

1. Yes, I have used such substances	<b>Go to q2</b>
2. No, I never used such substances	<b>Go to q17</b>
3. Don't know/not sure	<b>Go to q25</b>

**2. Have you used such substances in the last 12 months?**

1. Yes, I have used such substances in the last 12 months	<b>Go to 3</b>
3. No, I haven't used	<b>Go to 17</b>
4. Don't know/not sure	<b>Go to 5</b>

**3. What was the appearance/form of the new substances you used in the last 12 months?**

1. Herbal smoking mixtures, with drug-like effects	<b>1. yes</b>	<b>2. no</b>
2. Powders, crystals or tablets, with drug-like	<b>1. yes</b>	<b>no</b>
3. Liquids, with drug-like effects	<b>1. yes</b>	<b>2. no</b>
4. Other _____ (specify)	<b>1. yes</b>	<b>2. no</b>

**4. Thinking about your use of new substances in the last 12 months, how did you get them?**

1. Been given or bought them from a friend	<b>1. yes</b>	<b>2. no</b>
2. Bought them from a specialised shop	<b>1. yes</b>	<b>2. no</b>
3. Bought them from the internet	<b>1. yes</b>	<b>2. no</b>
4. Bought them from a drug dealer	<b>1. yes</b>	<b>2. no</b>
5. Other _____ (specify)	<b>1. yes</b>	<b>2. no</b>

**5. Have you ever taken mephedrone also called “M-Cat”, “mew”, “doves” or “bubbles”?**

1. Yes	Go to 6
2. No	Go to 5a
3. Don't know/not sure	Go to 5a

**5a. Have you ever heard of mephedrone also called “M-Cat”, “mew”, “doves” or “bubbles”?**

1. Yes	Go to 8
2. No	Go to 8

**6. During the last 12 months, have you taken mephedrone also called “M-Cat”, “mew”, “doves” or “bubbles”?**

1. Yes	Go to 7
2. No	} Go to 8
3. Don't know/not sure	

**7. During the last 30 days, have you taken, mephedrone also called “M-Cat”, “mew”, “doves” or “bubbles”?**

1. Yes	} Go to 8
2. No	
3. Don't know/not sure	

**8. Have you ever taken GHB also called “Liquid Ecstasy”, “Liquid E”, “Liquid X” or “Crack juice”?**

1. Yes	Go to 9
2. No	Go to 8a
3. Don't know/not sure	Go to 8a

**8a. Have you ever heard of GHB also called “Liquid Ecstasy”, “Liquid E”, “Liquid X” or “Crack juice”?**

1. Yes	Go to 11
2. No	Go to 11

**9. During the last 12 months, have you taken GHB also called “Liquid Ecstasy”, “Liquid E”, “Liquid X” or “Crack juice”?**

1. Yes	Go to 10
2. No	} Go to 11
3. Don't know/not sure	

**10. During the last 30 days, have you taken, GHB also called “Liquid Ecstasy”, “Liquid E”, “Liquid X” or “Crack juice”?**

1. Yes	} Go to 11
2. No	
3. Don't know/not sure	

**11. Have you ever taken synthetic cannabinoids also called “legal cannabis”, “synthetic cannabis”, «spice» and “herbal mix”?**

1. Yes	Go to 12
2. No	Go to 11a
3. Don't know/not sure	Go to 11a

**11a. Have you ever heard of synthetic cannabinoids also called “legal cannabis”, “synthetic cannabis”, «spice» and “herbal mix”?**

1. Yes	Go to 14
2. No	Go to 14

**12. During the last 12 months, have you taken synthetic cannabinoids also called “legal cannabis”, “synthetic cannabis”, «spice» and “herbal mix”?**

1. Yes	Go to 13
2. No	} Go to 14
3. Don't know/not sure	

**13. During the last 30 days, have you taken synthetic cannabinoids also called “legal cannabis”, “synthetic cannabis”, «spice» and “herbal mix”?**

1. Yes	} Go to 14
2. No	
3. Don't know/not sure	

**14. Have you ever taken Ketamine also called «SPECIAL K», «K», and «vitamin K»?**

1. Yes	Go to 15
2. No	Go to 14a
3. Don't know/not sure	Go to 14a

**14a. Have you ever heard of Ketamine also called «SPECIAL K», «K», and «vitamin K»?**

1. Yes	Go to 18
2. NO	Go to 18

**15. During the last 12 months, have you taken Ketamine also called «SPECIAL K», «K», and «vitamin K»?**

1. Yes	Go to 16
2. No	} Go to 18
3. Don't know/not sure	

**16. During the last 30 days, have you taken Ketamine also called «SPECIAL K», «K», and «vitamin K»?**

1. Yes	} Go to 18
2. No	
3. Don't know/not sure	

**17. Which of the following substances have you ever heard of?**

	Have Heard	Have not heard
--	------------	----------------

1. Mephedrone also called “M-Cat”, “mew”, “doves” or “bubbles”	1	2
2. GHB also called “Liquid Ecstasy”, “Liquid E”, “Liquid X” or “Crack juice”	1	2
3. Synthetic cannabinoids also called “legal cannabis”, “synthetic cannabis”, «spice» and “herbal mix”	1	2
4. Ketamine also called «SPECIAL K», «K», and «vitamin K»	1	2
5. New substances that imitate the effects of illicit drugs	1	2

**18. Have you ever taken any illicit drugs?**

1. Yes	<b>Go to 19</b>
2. No	<b>Go to 21</b>

**19. During the last 12 months, have you taken any illicit drugs?**

1. Yes	<b>Go to 20</b>
2. No	<b>Go to 21</b>

**20. During the last 30 days, have you taken any illicit drugs?**

1. Yes	<b>Go to 21</b>
2. No	<b>Go to 21</b>

**21. What is your marital status?**

Married	1
Living with partner	2
Single	3
Widowed	4
Divorced	5
Separated	6
Other	7

**22. What is the composition of your household? Who live in this house?**

Living alone	1
Family without children (Minor or adults)	2
Family with children (Minor or adults)	3
Single parent family	4

**23. Do children under 18 years old live in this house?**

Yes	1
NO	2

**24. What is your working status?**

Unemployed	1
Part time work	2
Full time employment	3
Inactive person (retired, housewife, unable for work)	4
Secondary school student	5
College/university student	6
Soldier	7
Other	8

**25. What is your educational level?**

I did not go to school	1
Did not complete elementary	2
Completed elementary	3
Did not complete lower secondary education	4
Completed lower secondary education	5
Did not complete higher secondary education	6
Completed higher secondary education	7
Some years in college	8
Completed college	9
Some years university	10
Completed university	11

**26. Which is your family monthly gross income (family with which you live):**

Less than 1000 euro per month	1
1001-2000 euro per month	2
2001-3000 euro per month	3
3001-4000 euro per month	4
4001-6000 euro per month	5
6001-8000 euro per month	6
8001-10000 euro per month	7
More than 10000 euro per month	8

**27. Your sex:**

Male	1
------	---

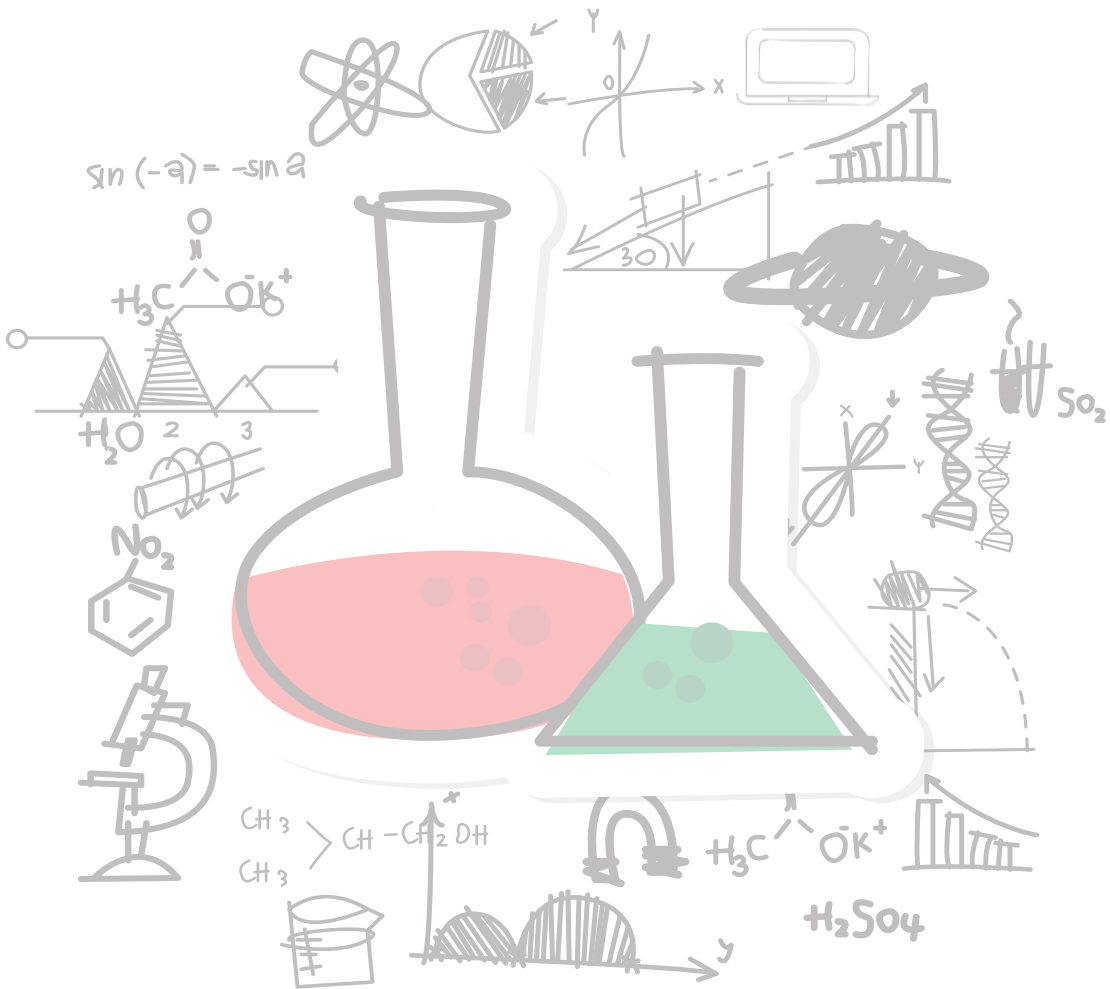
Female	2
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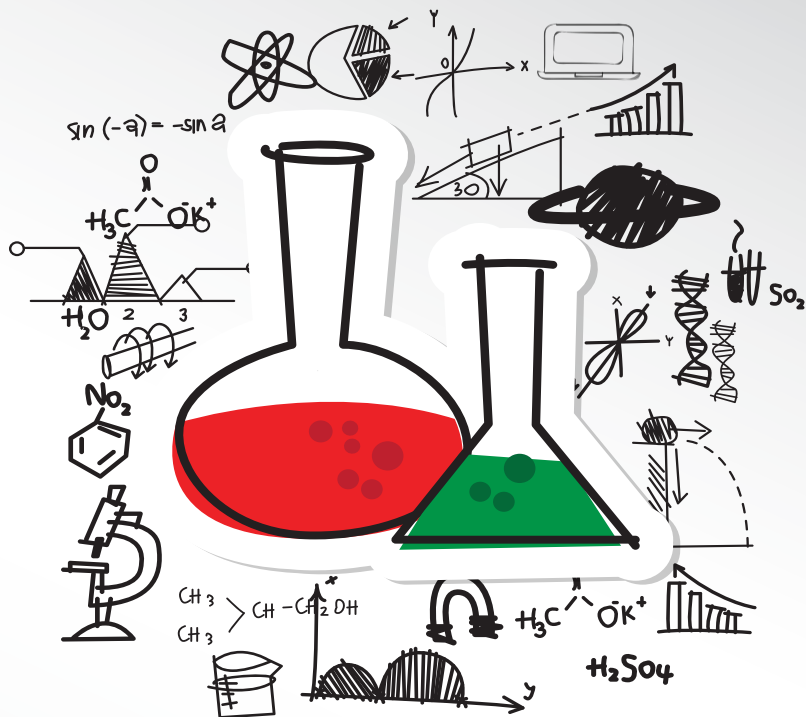
**28. How old were you during your last birthday?**

WRITE THE AGE ON LAST BIRTHDAY	.....years
--------------------------------	------------

**29. Are you:**

Greek Cypriot	1
Turkish Cypriot	2
Other EE country ..... (specify)	3
Other European non EE country ..... (specify)	4
Asian	5
Other	6





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