UNODC
United Nations Office on Drugs and Crime

Survey on the impact of UNODC assistance in the Scientific and Forensic Field

Member States whose laboratories have participated in the International Collaborative Exercises (ICE) programme.

2017

Highlights

- **UNODC's assistance in the scientific and forensic field was in the areas of proficiency testing in drug analysis, reference standards, and provision of drug and precursor field detection kits and scientific publications; in 2017 this assistance was provided to 276 forensic institutions in 84 countries, an 8 per cent increase in 12 months.**

- **The UNODC International Collaborative Exercises (ICE) programme continues to assure the quality and reliability of laboratory results; 97 per cent of respondents assessed the impact of the programme on their performance as good or very good.**

- **Access to reference standards for scientific purposes remains an obstacle for the implementation of the drug control conventions.**

Introduction

The UNODC laboratory and forensic science services programme seeks to ensure that Member States have access to, and use quality forensic science services in their efforts against drugs and crime. It ensures the availability of scientific evidence for fair and transparent trials worldwide by supporting forensic laboratories to assure the quality and reliability of their results, a prerequisite for safeguarding human rights and fundamental freedoms (SDG16). UNODC support to the forensic sector is to a large extent delivered directly to beneficiaries worldwide, comprising drug analysis and forensic science laboratories, law enforcement authorities and health and regulatory authorities, from its headquarters in Vienna, Austria. Various country/regional capacity building projects and initiatives are implemented by UNODC field-offices under the substantive guidance of the Laboratory and Scientific Section (LSS).

In 2017 UNODC ICE, assisted 276 laboratories from 84 countries, an 8 per cent increase in 12 months. Laboratories participating in ICE were provided with over 973 units of reference standards of controlled substances, and the direct assistance to support law enforcement interdiction capacity included the provision of 1,136 drug and precursor field testing kits and related training to countries worldwide.

Following the scheduling decisions of the Commission on Narcotic Drugs in March 2017, UNODC supported implementation by Member States through the development and dissemination of a Supplement to the Multilingual Dictionary of Narcotic Drugs and Psychotropic Substances Under International Control. (link)

The 2017 survey was conducted in June/July 2018 and responses were received from 229 institutions in 70 Member States, a 14% increase in the number of institutions and a 21% increase in the number of countries represented compared to the 2016 survey. UNODC is grateful for the feedback and comments provided.

The International Collaborative Exercises (ICE)

The UNODC ICE programme allows drug testing laboratories from both developing and developed countries to continuously monitor their performance on a global scale. Two rounds are offered per year with options for participation in the analysis of drugs in Seized Materials (SM) and/or in Biological Specimens (BS, specifically urine). Figure 1 shows the continuous participation of the survey respondents in the past four rounds of the ICE programme, reflecting their continuous participation. An increase was observed in the total number of laboratories participating in the BS test group as well as those who participated in both test groups. The impact of the ICE Programme on the work done in their laboratories was assessed as either very good or good by 97% of respondents in 2017 (Figure 2). The information presented in Figure 3 shows the rating of various different aspects of the ICE programme by respondents to the survey. The UNODC ICE portal facilitates the submission of participant results and greatly assists in the preparation of summary reports and regional/global reports. Its continued use is reported by 99% of survey respondents.

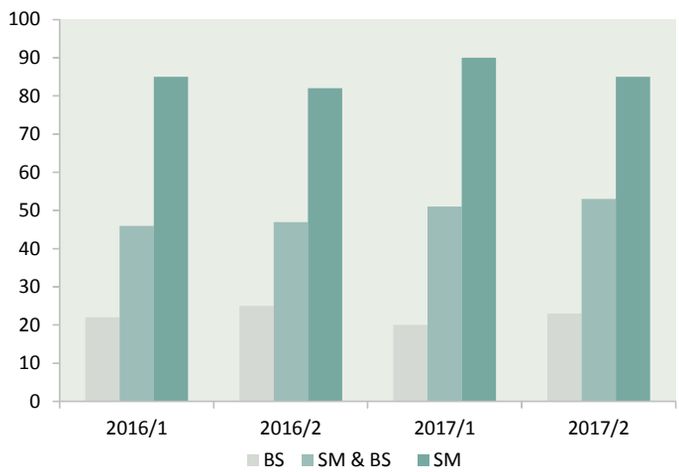

Figure 1: Participation of survey respondents in the ICE Programme in 2016 and 2017.

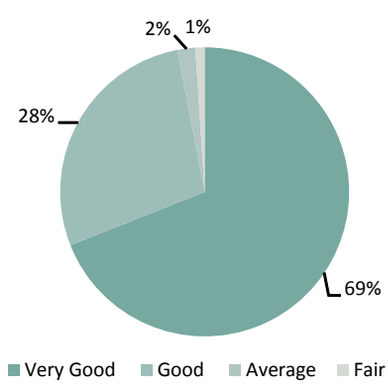

Figure 2: Assessment by participants of the impact of the UNODC ICE Programme on work done in their laboratory.

Reference Materials

Reference materials of substances under international control and their selected metabolites are provided to ICE participating laboratories biennially and to other national drug testing laboratories upon request. LSS continues to develop the range of reference materials to suit the needs and specific requests of laboratories. A total of 973 reference material samples were provided to laboratories participating in the ICE programme or to laboratories upon specific request in 2017. Figure 4 shows the range of areas in which reference materials were used by recipients in 2016 compared to 2017. 69% of laboratories

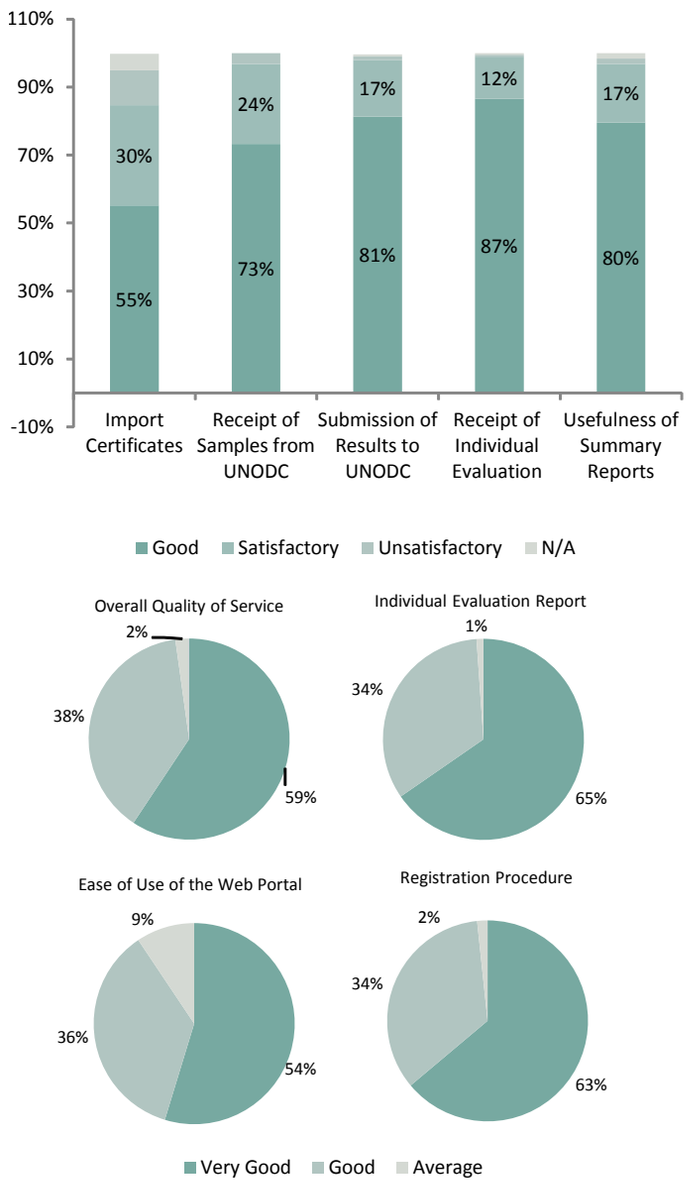

Figure 3: Ratings of various aspects of the ICE Programme by participants in 2017.

uses the reference materials for laboratory analysis/case work. This reveals the importance of UNODC's assistance in terms of reference materials for the routine laboratory analytical work.

Drug and Precursor Field Testing Kits

UNODC supplies institutions in Member States with field testing kits for drugs, drug precursor chemicals and pocket-sized test kits for acetic anhydride. Figure 5 illustrates the numbers of each type of test kits that have been provided to Member States in the 2014-2017 period. Of the institutions receiving these test kits who responded to the survey, 86% of respondents rated the kits as very good or good and 71% of respondents used the kits regularly or often (Figures 6 + 7).

UNODC Publications (guidelines and manuals)

In 2017, 90% of survey respondents indicated that they used UNODC/LSS publications (guidelines and manuals) in their work and 92% of these respondents rated the usefulness of these publications as very good or good (Figure 8). The majority (94%) of the respondents accessed the publications via the internet, while 11% also obtained hard copies by post.

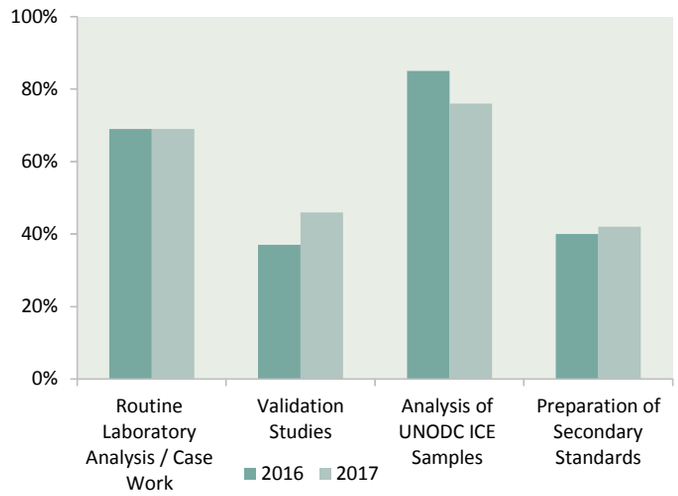

Figure 4: Purposes for which the reference materials supplied by UNODC/LSS are used by laboratories participating in the ICE Programme (2016/2017).

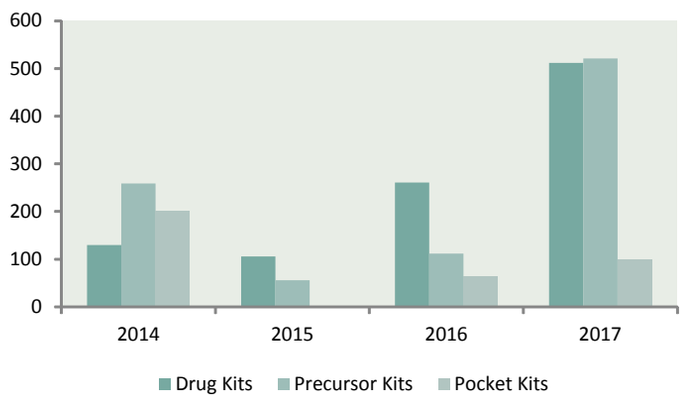

Figure 5: Numbers of drug, precursor and pocket field testing kits provided by UNODC to Member States in the years 2014-2017.

Substances recently placed under International Control

In 2017, ten new substances were controlled at the International level. Survey respondents were asked:

- If analytical methods were available in their laboratories for the identification of the recently scheduled substances.
- If they had access to reference materials for each substance.
- If they had identified the substance(s) in their laboratory.

The responses reflect the capacity of laboratories in addressing the challenges in the identification of substances recently scheduled (Figure 9).

On average 46% of respondents stated they had methods available for the identification of these substances with 58% indicating they had methods for 4-methylethcathinone (4-MEC). In contrast, only 38% of respondents have analytical methods available for the identification of the synthetic opioid, butyrfentanyl.

Regarding the ease of access to reference materials for these recently scheduled substances, 24% of respondents indicated they had access to reference materials for 4-methylethcathinone (4-MEC). However, on average 14% of laboratories indicated they had access to reference materials, with only 7% of respondents indicating they had access to reference materials for butyrfentanyl. With regard to whether the recently scheduled substances had been identified in their laboratories, on average, 24% of survey respondents indicated that one of these substances had been identified. While 37% indicated that they had identified ethylone, only 5% indicated that the synthetic opioid butyrfentanyl had been identified.

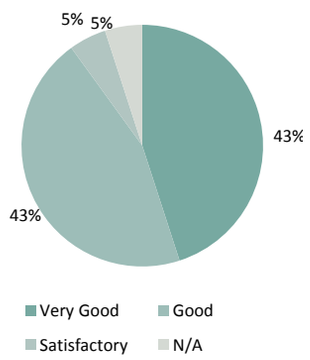

Figure 6: The usefulness of the drug and/or precursor field testing kits.

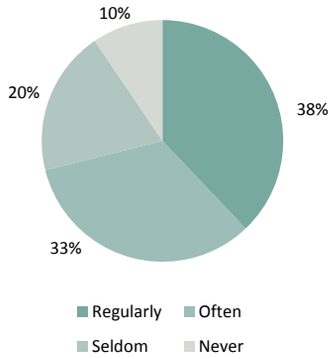

Figure 7: The regularity of use for the drug and/or precursor field testing kits.

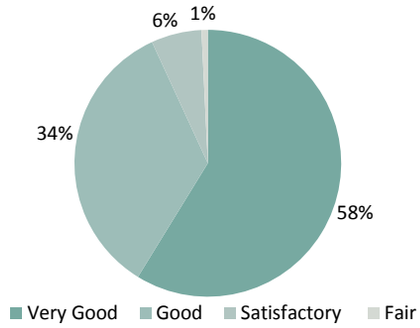

Figure 8: Rating of the usefulness of UNODC/LSS publications in the work of participating institutions.

Challenges in the identification and analysis of controlled drugs and new psychoactive substances (NPS)

Survey respondents listed cannabis as the controlled substance most commonly analysed in their laboratories in 2017, followed by cocaine, heroin, amphetamine, methamphetamine and MDMA. With regard to NPS, the most commonly analysed substances were equally from the groups of synthetic cathinones and synthetic cannabinoids. Of the respondents who answered this question, 12% did not identify any NPS in 2017 and 8 % of respondents erroneously categorised a number of internationally controlled substances as NPS.

In terms of the challenges faced by laboratories in the analysis of controlled substances and NPS, the most predominant areas identified by survey respondents are listed hereafter and illustrated in Figures 10 and 11 respectively.

Challenges in the analysis and identification of controlled substances

- Reference materials: 74% of respondents indicated challenges in this area. Cost and availability together with import/export and regulatory procedures were most commonly indicated.
- Validated methods: 38% of respondents mentioned challenges in a range of different aspects of validation of methods including training and access to validated methods for certain substances.
- Analytical techniques: 29% of respondents faced challenges in this area. The need for gas/liquid chromatography as well as techniques such as tandem mass spectrometry were mentioned by a number of respondents.
- Others: Among the "other" challenges mentioned by 17% of respondents, training, lack of human and financial resources were most often mentioned.

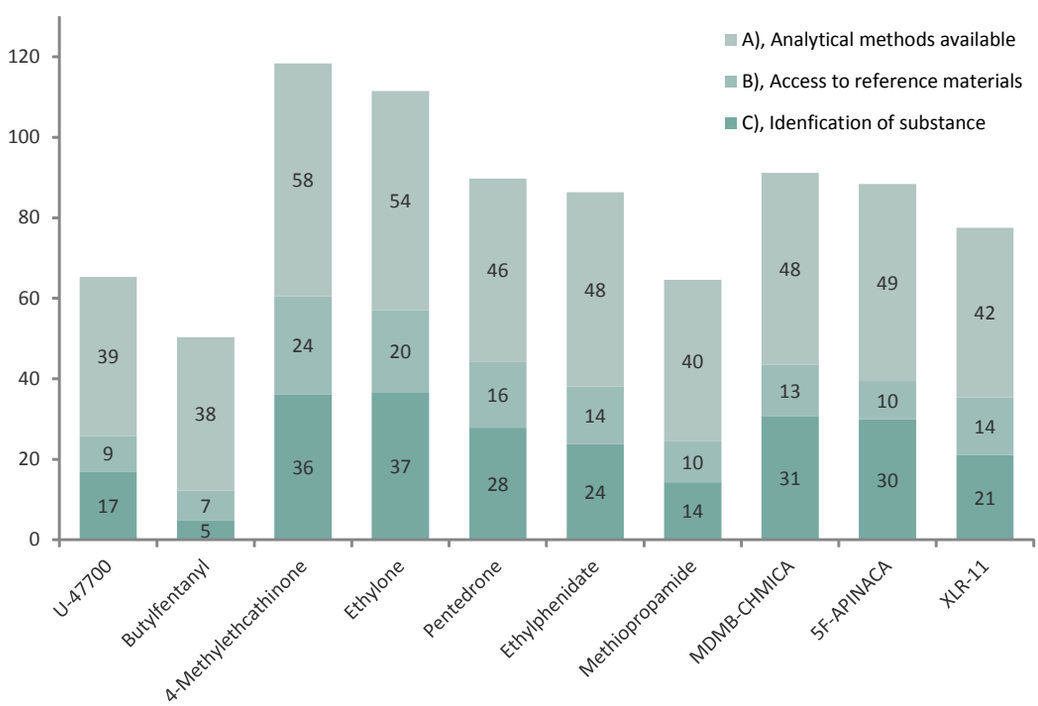

Figure 9: Percentage of survey respondents who for the 10 susbtances scheduled internationally in 2017 stated;
A), that they had analytical methods available for the identification of these substances
B), that they had access to reference materials for these substances
C), that they had identified a particular susbtance.

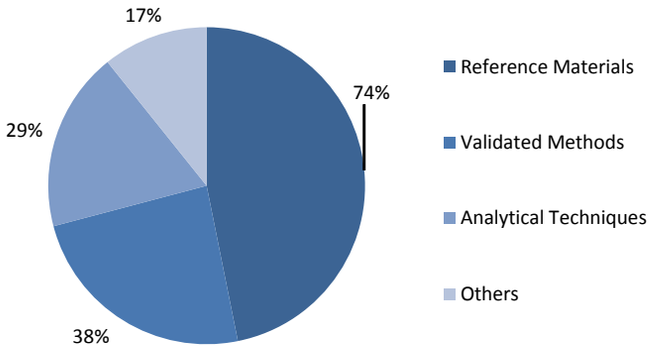

Figure 10: Challenges in the analysis and identification of controlled substances

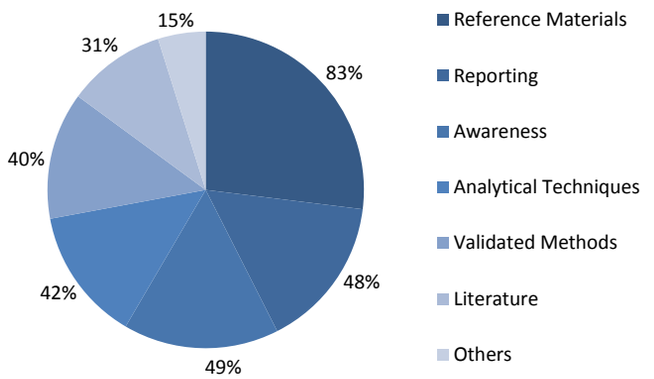

Figure 11: Challenges in the analysis and identification of NPS

Challenges in the analysis and identification of NPS

- Reference materials: 83% of respondents mentioned challenges related to the analysis of NPS in the area of reference materials. Cost, availability and access were mentioned most often together with issues of regulatory requirements.
- Reporting: 48% of respondents mentioned difficulties they have in reporting NPS, particularly due to gaps in national legislation and in how to report and discriminate between positional isomers.
- Awareness: 49% of respondents noted challenges due to a lack of knowledge of current trends in NPS and insufficient expertise/experience in how to approach the identification of NPS, particularly in the interpretation of mass spectral fragmentation patterns. Some respondents also noted that they have not yet encountered NPS in their laboratories.
- Analytical techniques: 42% of respondents mentioned the lack of techniques as being a challenge. A range of techniques from screening methods to GC/MS, LC/MS, tandem mass spectrometry and NMR were mentioned.
- Validated methods 40% of respondents noted not having access to methods for the analysis of a wide range of both NPS and controlled substances, mainly due to the lack of the reference material required for validation procedures.
- Literature: 31% of respondents mentioned that they have little or no access to scientific publications, lack of resources to subscribe to scientific journals, and little or no access to NPS databases. Some respondents mentioned that they have only access to information/manuals produced by UNODC.
- Others: Comments in areas not covered previously were mentioned by 10% of respondents and included the need for updating out of date libraries, greater access to training courses in the identification and analysis of NPS using modern analytical equipment. Some respondents indicated difficulty in interpretation of results and limited time to improve knowledge due to workload.

Additional feedback from survey respondents

Respondents to the 2017 survey were requested to provide additional comments or suggestions to assist UNODC in improving its services. Specifically, continued collaboration with UNODC and the continuous implementation of the ICE programme were highlighted. 29% of the comments received from respondents were related to requests for further support with reference materials of controlled drugs and NPS. The need for training in analytical methodologies and techniques as well as awareness raising seminars and scientific meetings were also indicated.

Notable survey results

- The ICE Programme has a significant impact on the work of laboratories to generate reliable results and provides an important tool to continuously monitoring their performance on a global basis (97% of responders assessed the programme as very good or good; 97% assessed the usefulness of ICE summary reports as good or satisfactory).
- The reference samples provided by UNODC are essential for the routine laboratory analysis/case work, validation studies and preparation of secondary standards in addition to their use for the analysis of ICE test samples. Survey respondents request UNODC's further support with reference materials of controlled substances and NPS.
- The UNODC/LSS publications (guidelines and manuals) are used by the majority of respondents and their usefulness is rated as good or very good (92%). In some cases, they are the only available source of scientific information.

Main challenges identified

- The need for enhanced capacity and skills in analytical methodologies and techniques, awareness raising and improved knowledge to address the challenges in the identification and analysis of the newly scheduled substances (10 substances in 2017) and NPS is indicated. UNODC's further support in this area by providing training and awareness workshops is requested.
- The main reasons for laboratories not continuously participating in the ICE programme are difficulties in obtaining import certificates, regulatory issues related to customs and postal services, and laboratory related obstacles such restructuring, changes in legal requirements and workload.
- Limited or lack of access to reference materials is the major obstacle in the identification of scheduled substances which affects the timely implementation by Member States of the Commission of Narcotic Drugs scheduling decisions.

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