Community Drug Early Warning System (CDEWS-3): Honolulu, Hawaii -- Site 1 of 4

Office of National Drug Control Policy
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Disclaimer

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Abstract

The Community Drug Early Warning System (CDEWS) provides timely information about emerging drug use in criminal justice populations in local communities by collecting and re-testing urine specimens already obtained and tested for a limited panel of drugs by local criminal justice testing programs. CDEWS or local staff sample specimens that are ready to be discarded and send them to an independent laboratory for testing for an expanded panel of drugs. By using already collected de-identified urine specimens, CDEWS can provide a relatively quick and inexpensive snapshot of the types of drugs recently used by participating populations.

The CDEWS methodology has been implemented in five jurisdictions and the results are contained in two reports already released by the Office of National Drug Control Policy (Wish et al., 2013, 2015). We introduce here a new report format that contains the findings from a single jurisdiction -- the Hawaii's Opportunity Probation with Enforcement (HOPE) and General Supervision (GS) probationer populations in Honolulu, Hawaii -- as part 1 of 4 sites for the third CDEWS Study, called CDEWS-3.

In 2004, Judge Steven Alm launched the HOPE program in Hawaii. HOPE enrolls higher risk felony probationers with serious criminal histories and extensive substance abuse histories in a program that includes frequent urine drug monitoring coupled with brief jail sanctions for drug violations (The Institute for Behavior and Health, Inc., 2015). With Judge Alm's strong support, local staff were able to provide anonymous urine specimens previously collected from a sample of adult male probationers from the HOPE program (n=194) and the neighboring GS probation program (n=143), which were then sent to the CDEWS independent laboratory for expanded testing. While the onsite screens used by the HOPE and GS probation programs only tests for 6 drugs, the CDEWS independent laboratory tested for over 150 legal and illegal drugs.

The expanded testing showed that the current onsite test screens used by these programs had identified most of the drug *users* in the HOPE and GS probationer programs. The most common drugs found were methamphetamine and amphetamine. Any additional legal and illegal drugs detected by the CDEWS independent laboratory were primarily detected in specimens that had previously tested positive for at least one of the drugs in the standard local onsite screens. The major exception was methamphetamine, which was detected in a minority of the specimens that had tested negative for all drugs, including methamphetamine, by the onsite criminal justice system (CJS) drug screens. Subsequent analyses suggested that this under-detection was because the onsite screens for methamphetamine were less sensitive than the tests utilized by the CDEWS independent laboratory.

We had hypothesized that the HOPE probationers might be more likely than GS probationers to turn to synthetic cannabinoids (SCs) to evade detection, because of the HOPE program's focus on sanctioning people for "dirty" urines. While SCs were found only in specimens that had tested

negative by the CJS onsite drug screens, few specimens (2% or less) from HOPE or GS probationers tested positive for SC. However, the SC metabolites that were detected were later generation SC metabolites recently added to the CDEWS-3 laboratory test panel. **None of these later generation metabolites could have been detected by either the onsite or laboratory SC screens used by the GS and HOPE probation programs at the time of the study.** This finding attests to the need for jurisdictions to routinely update their test panels for synthetic drugs, whose formulations tend to change rapidly. Although SC use was found in some probationers in this jurisdiction in Hawaii, SCs may not be as large a problem as was found in some prior CDEWS studies. Nevertheless, the Hawaii HOPE and GS programs may want to consider expanding their SC test panel to include the newer SC metabolites (AB-PINACA, 5F-AB-PINACA, AB-CHMINACA (metab 4), 5F-AMB) that were detected in their populations.

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Introduction

The Community Drug Early Warning System (CDEWS) provides timely information about emerging drug use in criminal justice populations in local communities by sampling and re-testing urine specimens already obtained and tested for a limited panel of drugs by local criminal justice testing programs. CDEWS or local staff sample the specimens that are ready to be discarded and send them to an independent laboratory for testing for an expanded panel of drugs. By using already collected de-identified urine specimens, CDEWS can provide a relatively quick and inexpensive (see Appendix A for details) snapshot of the types of drugs recently used by criminal justice populations.

The CDEWS results are especially important because prior epidemics in the use of illegal drugs have often shown up in the trends in urinalysis results from criminal justice populations before they have become evident in the larger community (DuPont & Wish, 1992; Wish, 1997). The CDEWS results can also be used by the local testing program to gain some insight into whether their standard limited test panel is identifying most of the drugs being used by their monitored population. The CDEWS methodology has been piloted in five jurisdictions and the results are provided in two reports already released by the Office of National Drug Control Policy (ONDCP) (Wish et al., 2013, 2015). These prior reports contain results from all of the jurisdictions in each study and were produced only after the results from all of the study sites could be analyzed and interpreted. In the interest of releasing CDEWS results more quickly as each site is completed, we introduce here a new report format that contains the findings from a single jurisdiction -- the Hawaii's Opportunity Probation with Enforcement (HOPE) and General Supervision (GS) probationer populations in Honolulu, Hawaii -- as part 1 of 4 sites participating in the third iteration of CDEWS (CDEWS-3).

In 2004, Judge Steven Alm launched the HOPE program in Hawaii. HOPE enrolls higher risk felony probationers with serious criminal histories and extensive substance abuse histories in a program that includes frequent urine drug monitoring coupled with brief jail sanctions for drug violations (The Institute for Behavior and Health, Inc., 2015). At a meeting convened by Dr. Robert DuPont and the Institute for Behavior and Health (IBH) to review the HOPE program, the CDEWS Principal Investigator (Dr. Eric Wish) asked Judge Alm if he would like his program to participate as a CDEWS study site. While HOPE already relied upon onsite urinalyses to monitor the probationers, CDEWS could provide him with an indication of whether its standard urine test panel was missing any of the large number of licit or illicit drugs that were included in the larger CDEWS test panel. Further, if a GS group of probationers (a standard probation population) not in the HOPE program could also be studied, it would be possible to see if there were differences in the drugs used by the two populations.

This comparison might be important because some prior CDEWS results had shown that synthetic cannabinoids (SCs) were often more likely to be found in persons who had passed the more limited local criminal justice system (CJS) drug screens (Wish et al., 2013, 2015). People subject to

drug testing often know if the programs do not test for SCs, and that they can use SCs without being detected (Bonar et al., 2014; Perrone et al., 2013). Thus, SCs might be more likely to be detected among HOPE probationers than GS probationers because of the more rapid and consistent sanctions that HOPE probationers were subject to when they failed a drug test. With Dr. DuPont's and Judge Alm's strong support, CDEWS staff were able to launch a CDEWS study in Honolulu, Hawaii (Judge Alm's jurisdiction) and obtain urine specimens from HOPE probationers and GS probationers. This report presents the findings from the Honolulu, Hawaii CDEWS-3 study.

Methodology

Site Selection Procedures

We sought adult participants from the HOPE and GS probation programs. HOPE and GS probationers came primarily from Oahu, with a few probationers originating from the other islands in Hawaii. Logistics for this site were discussed with site staff over the phone to establish the study protocols. Prior to data collection, CESAR submitted an application for the necessary approvals and obtained approval for the CDEWS-3 study from University of Maryland's Institutional Review Board (IRB). The specific steps taken to recruit and work with this site are described in Appendix A, along with more details about the specimen collection in Appendix B. Table 1 provides an overview of the key characteristics of these two study populations.

Hawaii's Opportunity Probation with Enforcement (HOPE) Probationers

The Hawaii HOPE program collects an estimated 21,600 urine specimens annually, from an average number of approximately 2,500 probationers. An onsite test cup that detects 6 drugs (benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and oxycodone) is the standard screen used by this program. A limited onsite test for 11 SC metabolites is also available. A small number of specimens whose results are contested by the probationer are sent to an outside laboratory for confirmation. Upon the probation officer's request, some specimens may also be sent to the outside laboratory for testing for specific drugs not included in the onsite screen, including amphetamines, EtG (alcohol), MDMA, methadone, PCP and a larger SC panel of 19 metabolites.

General Supervision (GS) Probationers

The GS program collects an estimated 16,000 specimens annually from an average number of approximately 5,500 probationers using one of two onsite 6-drug test panels. The standard 6-drug panel is identical to the one used by the HOPE program. However, if SC use is suspected, an alternative 6-drug panel is used, substituting SC for oxycodone. A limited onsite test for 11 SC metabolites is used for this purpose. Again, the same offsite laboratory used by HOPE may be used to confirm a contested positive or for suspected use of a specific drug.

Targeted Number of Specimens

From each program, we sought a total of 200 specimens from unduplicated male probationers. There were too few specimens available from female probationers (approximately 20%) so specimens from females were not sought. As was the case with prior CDEWS studies, we wanted to collect an equal number of specimens that had tested positive (CJS+) or negative (CJS-) for anything by the standard local CJS drug screen. We therefore worked with the local staff to collect 100 CJS+ and 100 CJS- specimens from each of the HOPE and GS probationer populations.

Table 1: Description of the Participating Study Sites

Site	Populations Covered	CJS Testing Protocol	Drugs in Standard CJS Screen	Targeted Number of Specimens to be Collected for CDEWS
Honolulu, Hawaii: Adult Client Services Branch, First Circuit, Hawaii State Judiciary	Adult HOPE probationers (males only) (est. 21,600 specimens per year from approximately 2,500 probationers)	Onsite test cup screening; Offsite laboratory confirmation for contested positives and other suspected use	6-drug panel screen: benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and oxycodone. Amphetamines, EtG (alcohol), MDMA, methadone, PCP, and synthetic cannabinoids (SC) upon request. **Onsite SC panel includes:** JWH-018, JWH-019, JWH-073, JWH-081, JWH-122, JWH-200, JWH-210, JWH-250, JWH-398, MAM-2201, and RCS-4. **Laboratory SC panel includes:** 5F-PB-22, AKB-048, AM-694, AM-2201, JWH-018, JWH-019, JWH-072, JWH-073, JWH-081, JWH-122, JWH-203, JWH-210, JWH-250, JWH-398, MAM-2201, PB-22, RCS-4, UR-144, and XLR-11.	200 specimens (100 CJS positives; 100 CJS negatives)
Honolulu, Hawaii: Adult Client Services Branch, First Circuit, Hawaii State Judiciary	Adult GS probationers (males only) (est. 16,000 specimens per year from approximately 5,500 probationers)	Onsite test cup screening; Offsite laboratory confirmation for contested positives and other suspected use	6-drug panel screen: benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and oxycodone. For suspected SC users - 6-drug panel screen: benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and SC (instead of oxycodone). **Onsite SC panel includes:** JWH-018, JWH-019, JWH-073, JWH-081, JWH-122, JWH-200, JWH-210, JWH-250, JWH-398, MAM-2201, and RCS-4. **Laboratory SC panel includes:** 5F-PB-22, AKB-048, AM-694, AM-2201, JWH-018, JWH-019, JWH-072, JWH-073, JWH-081, JWH-122, JWH-203, JWH-210, JWH-250, JWH-398, MAM-2201, PB-22, RCS-4, UR-144, and XLR-11.	200 specimens (100 CJS positives; 100 CJS negatives

Collection of Urine Specimens

Prior to collecting the urine specimens, CESAR staff talked with staff from each program by phone to determine their policies regarding required specimen holding periods, testing protocols, detection limits and other relevant site details. We decided that it would not be feasible to seek the minority of specimens that had been sent off-site for special testing (See Appendix B for details). Specimens were then accumulated by each program using the specific CDEWS guidelines provided by CESAR as to how specimens were to be handled and stored.

If a person had contributed more than one specimen, only one specimen per donor (if feasible, the most recent) was selected for the CDEWS study. Once the desired number of unique specimens was reached, CESAR staff arranged to have them shipped directly to the CDEWS independent laboratory. All specimens were de-identified during preparation for transfer to the CDEWS independent laboratory. We were able to record the date the specimen was collected, specimen test result (CJS+ or CJS- for any drug), and the person's year of birth, gender, zip code of residence, and race/ethnicity.

Designated probation staff shipped specimens directly to the CDEWS independent laboratory for expanded drug testing. Additional details of the specimen selection appear in Appendix B. Details about the CDEWS independent laboratory test panel appear in Appendix C.

Interviews with Toxicologists to Develop the CDEWS-3 Testing Panel

In prior CDEWS studies, we had learned that both the chemical composition of synthetic drugs available and patterns of use can vary widely even within a brief period of time. It is a recognized challenge for both laboratories and law enforcement to keep up with the rapid changes in the composition of synthetic drugs. The chemists producing these drugs modify the chemical structures of the drugs as existing formulations are scheduled by the DEA and then made illegal. To ensure that the drug test panel for this third phase of the study, CDEWS-3, was as current as possible and included the most relevant drugs/metabolites, CESAR staff contacted 13 chemists at 9 labs, as well as 3 other experts from programs including the High Intensity Drug Trafficking Area Program (HIDTA) in Hawaii and other law enforcement drug testing divisions prior to finalizing the test panel for CDEWS-3. The persons interviewed were selected from existing networks of toxicologists with expertise in the area of new psychoactive substances (NPS) and/or urine testing that we have identified from the CDEWS-1 and CDEWS-2 studies, as well as through other professional networks. We also identified contacts through referrals from our existing network of toxicologists, researchers, and law enforcement representatives. A list of persons interviewed appears below in Table 2.

Table 2: Toxicologists Interviewed for CDEWS-3

NAME	TITLE/AFFILIATION
Dr. (CDR) Thomas Bosy; Major William McCalmont	Armed Forces Medical Examiner System (AFMES)
Dr. Gregory Endres; Donna Iula	Cayman Chemical
Dr. Barry Logan	NMS Labs
Dr. Jeffery Moran	Arkansas Public Health Laboratory, Arkansas Department of Health
Dr. Marilyn Huestis	National Institute on Drug Abuse, National Institutes of Health Biomedical Research Center
Staff (2 unnamed per request)	State of HI Narcotics Enforcement Division
Wayne Kimoto; Michele Shishato	Honolulu Police Department Crime Laboratory
Kathy Pung	Hawaii Police Department Crime Laboratory
Jerome Robinson	Pretrial Services Agency for the District of Columbia
Gary Yabuta	Hawaii HIDTA
Jill Head; Emily Dye	Special Testing and Research Laboratory, Drug Enforcement Administration

To plan our test panel, we also reviewed data and information from multiple international, national and local sources. These included a review of the 2014 National data from the Drug Enforcement Administration's (DEA) National Forensic Laboratory Information System (NFLIS), special data runs for 2014-2015 provided by the DEA's Special Testing and Research Laboratory, as well as reports from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), United Nations Office on Drugs and Crime (UNODC) Early Warning Advisories, and other sources (Baumann, 2015; Dye, 2014; EMCDDA, 2015; Head, 2014; NMS Labs, 2015; UNODC, Early Warning Advisory, 2013a, 2013b, 2013c, 2014a, 2014b, 2014c, 2014d, 2014e, 2015a, 2015b, 2015c; U.S. DEA, Office of Diversion Control, 2014, 2015; U.S. DEA, Office of Diversion Control, NFLIS, 2015c; U.S. DEA, Special Testing and Research Laboratory, Emerging Trends Program/Reference Material Program, 2015). We also reviewed local NFLIS data for Hawaii, as well as from the states of the other sites participating in CDEWS, to assess local drug trends (Maryland Poison Center, University of Maryland School of Pharmacy, 2015; U.S. DEA, Office of Diversion Control, NFLIS, 2015a, 2015b, 2015d, 2015e; Washington Baltimore HIDTA, Investigative Support Center, 2015; Winter et al., 2014).

Based on the information reviewed, we added six new SC metabolites to our previous CDEWS-2 metabolite screen: 5F-AMB, AB-CHMINACA (parent), AB-CHMINACA (metab 4), AB-CHMINACA (metab 6), AB-FUBINACA (parent), and ADB-FUBINACA (parent), along with 14 additional designer stimulants (see Table C-1 in Appendix C for the full panel). Other SC metabolites were identified, but tests for many of them were not available at the time of CDEWS-3, and therefore could not be included in the test panel.

Testing of Urine Specimens by the CDEWS-3 Independent Laboratory

All specimens were sent to the CDEWS independent laboratory, the Armed Forces Medical Examiner System (AFMES) Laboratory located in Delaware, for an expanded drug testing panel (see Table C-1 in Appendix C). All specimens were tested for a panel of 27 SC metabolites and 37 designer stimulants, along with 87 other illicit and prescription drugs.

Results

The term *CJS test result* refers to the limited 6-drug screens routinely used by the local criminal justice agency to screen the HOPE and GS probationers. *CDEWS test result* refers to the expanded drug tests used by the CDEWS independent laboratory, which included all of the drugs tested for by the smaller CJS test panels.

We first describe the specimens collected and some basic demographic information about the probationers who provided them. Next, we describe the CDEWS test results for specimens tested with our expanded drug screen, including synthetic cannabinoids (SCs). The results for CJS positive (CJS+) and CJS negative (CJS-) specimens are presented separately because we stratified our sample selection to collect equal numbers of CJS+ and CJS- specimens. Given this stratification, it would be inappropriate for our analyses to simply combine and average the results from these two groups.

A. Specimens Received

Specimens were collected between May 26, 2015 and September 25, 2015. While we had targeted 200 specimens (100 CJS+; 100 CJS-) each from the HOPE and GS programs, we actually received a total of 194 from HOPE and 143 from GS. Slightly fewer specimens than the number we targeted were tested from the HOPE program due to specimen leakage in transit. Also, we discontinued collection at the GS site when the probation office experienced difficulty accumulating enough positive specimens from unduplicated persons. Table 3 shows the specimens received, according to the local CJS testing results. Seventeen of the specimens from the HOPE (n=10) and GS (n=7) probationers were received without a recorded CJS test result. We found that these 17 specimens contained only two drugs that were not already found in the other specimens from their site (1 HOPE specimen contained cyclobenzaprine and 1 GS specimen contained citalopram). We therefore decided to drop these 17 specimens from further study. After excluding them, we analyzed a total of 184 specimens (91 CJS+ and 93 CJS-) from HOPE probationers and 136 specimens (46 CJS+ and 90 CJS-) from GS probationers.

Table 3: Number of CJS Positive and Negative Specimens Sampled from Each Population

Site and Population	CJS Test Result			
	Positive	*Negative*	*Unknown*	*Total*
Honolulu, Hawaii: Adult Client Services Branch, First Circuit, Hawaii State Judiciary				
HOPE Probation	91	93	10	194
GS Probation	46	90	7	143
Total	137	183	17	337

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-3), July 2016.

B. Demographic Characteristics of Persons Providing Specimens

Table 4 presents the demographic information obtained. Information on ethnicity was less likely to be obtained from the GS specimens. Table 4 shows that the majority of specimens from HOPE probationers who tested CJS+ or CJS- came from men 40 years of age or younger (56% and 61%, respectively). The majority (60%) of CJS- GS probationers were also age 40 years or younger. However, the majority (65%) of the GS probationers who tested CJS+ were *over* age 40. The majority of specimens from both programs came from persons identified as Native Hawaiian/Other Pacific Islander, with small numbers coming from persons identified as Asian, Caucasian and Other. Almost all persons were of Non-Hispanic descent.

C. Drugs Detected by the CDEWS Independent Laboratory

HOPE Probationers

CJS+ Specimens: The most common drug found among CJS+ specimens from the HOPE probationers was methamphetamine (45%), followed by amphetamine (43%) which may also be a metabolite of methamphetamine (see Table 5). The next most frequent drug found among CJS+ probationers was marijuana (18%); cocaine was found in 9%. We found that 26% of the specimens contained one or more of 12 opioids included in our table. The three most frequently detected were morphine (12%), oxymorphone (11%), and hydromorphone (10%). 12% of specimens tested positive for one or more of nine benzodiazepines. The three benzodiazepines most detected were oxazepam (7%), α-hydroxyalprazolam (6%), and temazepam (6%). Only 2% tested positive for an NPS (tradozone (2%) and mCPP (2%)). Trazodone is an anti-depressant, for which mCPP is its major active metabolite. It is not possible to know whether mCPP was present due to Tradozone use or because it was taken separately. No SCs were detected in the CJS+ group.

CJS- Specimens: Few drugs were found in the CJS- specimens. However, 12% of the CJS- specimens from the HOPE probationers contained methamphetamine and are discussed in a

separate section below. SCs were found only in 2% of the CJS- specimens. The detection of other, mostly prescription drugs, in CJS- specimens was rare.

GS Probationers

CJS+ Specimens: The results for GS probationers who were CJS+ positive were similar to the CJS+ specimens from HOPE probationers (see Table 5), with methamphetamine and amphetamine being found most frequently (both at 59%), followed by marijuana (30%), and cocaine (11%). We found that 15% of the specimens contained one or more of the 12 opioids in Table 5. Hydromorphone (9%) and hydrocodone (7%) were most frequently detected; buprenorphine and methadone were rarely detected. Only 7% contained one or more of the nine benzodiazepines in the table, and 7% tested positive for an antidepressant, SSRI, NDRI, or SNRI. Only 4% tested positive for an NPS (2% for β-methylphenethylamine and 2% for methylone).

CJS- Specimens: As was found with the CJS- HOPE probationers' specimens, few specimens in the CJS- negative group from the GS probationers contained any drugs. A few CJS- specimens contained methamphetamine (4%) and amphetamine (3%), 3% contained an opioid, and 1% contained SCs.

D. SC Metabolites Detected in HOPE and GS Probationers

SCs were detected only in specimens from HOPE and GS probationers that had tested negative for all drugs in the standard limited CJS screens. Only 2% of HOPE CJS- specimens and 1% of GS CJS- specimens tested positive for SCs.

The HOPE SC positive specimens included: one specimen positive for AB-PINACA and a second specimen positive for AB-PINACA, 5F-AB-PINACA, and AB-CHMINACA (metabolite 4). Only one specimen from the GS group tested positive for SC and contained 5F-AMB.

E. Methamphetamine in CJS- Specimens

We found that 12% of the CJS- specimens from the HOPE probationers and 4% of those from the CJS- GS probationers tested positive for methamphetamine. Given that both Hawaii probation programs include methamphetamine in their instant test cup screens, we wanted to determine why methamphetamine was not detected in these specimens. Our most probable hypothesis was that the CDEWS independent laboratory was using much more expensive and sensitive urinalysis tests. The onsite test cup used by both probation programs had a detection level of 500 ng/mL for methamphetamine. The CDEWS LC/MS/MS (Liquid Chromatography/Tandem Mass Spectrometry) procedure had a detection level of 25 ng/mL, indicating it could detect a much smaller concentration of methamphetamine in a urine specimen.

To test our hypothesis, we requested from the CDEWS independent laboratory the exact

concentration of methamphetamine that had been found in the 15 discordant CJS- specimens. As Table 6 shows, we found that all of these specimens contained less than 500 ng/mL of methamphetamine metabolite, which was the minimum detection level of the onsite test cup being utilized. We estimate that an onsite test with a methamphetamine cutoff of 100 ng/mL would have detected 9 of 15 of the methamphetamine positives that had been missed with their current onsite tests.

Table 4: Demographic Characteristics of Adult Males Providing Specimens from Hawaii HOPE and General Supervision Probation, by CJS Drug Screen Result

	HOPE Probation – Honolulu, Hawaii		General Supervision – Honolulu, Hawaii	
	CJS Screen Positive (for any drug) %	CJS Screen Negative (for any drug) %	CJS Screen Positive (for any drug) %	CJS Screen Negative (for any drug) %
Age	(N=91)	(N=93)	(N=40)	(N=89)
18 to 20	1	0	3	2
21 to 25	10	14	15	12
26 to 30	13	19	7	16
31 to 40	32	28	10	30
41 to 50	27	22	32	23
51 and older	17	17	33	17
Total	100%	100%	100%	100%
Race	(N=87)	(N=87)	(N=46)	(N=86)
Native Hawaiian/Other Pacific Islander	59%	63%	50%	54%
Asian	17	19	18	21
Caucasian	13	7	24	12
Black/African-American	1	3	4	3
Other	10	8	4	10
Total	100%	100%	100%	100%
Ethnicity	(N=82)	(N=84)	(N=27)	(N=66)
Non-Hispanic	95%	94%	82%	79%
Hispanic/Latino	5	6	18	21
Total	100%	100%	100%	100%

Notes:

N's differ for some characteristics because of missing information.

Some percentages have been rounded.

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-3), July 2016.

Table 5: CDEWS Laboratory Test Results, by Probation Population and CJS Drug Screen Result

(Collected between May 2015-September 2015§)

	HOPE Probation – Honolulu, Hawaii* (N=184)		General Supervision – Honolulu, Hawaii+ (N=136)	
Percent Positive by CDEWS Lab for:	CJS Screen Positive (for any drug) (N=91) %	CJS Screen Negative (for any drug) (N=93) %	CJS Screen Positive (for any drug) (N=46) %	CJS Screen Negative (for any drug) (N=90) %
Methamphetamine	45	12	59	4
Amphetamine	43	2	59	3
Marijuana	18	0	30	0
Cocaine	9	1	11	1
Any Opioid	26	0	15	3
Morphine	12	0	4	1
Hydromorphone	10	0	9	1
Oxymorphone	11	0	2	0
Oxycodone	9	0	4	0
Hydrocodone	8	0	7	0
Codeine	7	0	2	1
Methadone Metabolite (EDDP)	3	0	2	1
Tramadol	2	0	0	1
6-Acetylmorphine (6-MAM)	1	0	2	0
Buprenorphine‡	0	0	4	0
Fentanyl	1	0	0	0
Norfentanyl	1	0	0	0
Any Benzodiazepine	12	1	7	1
Oxazepam	7	1	2	0
α-Hydroxyalprazolam	6	0	4	0
Temazepam	6	0	2	0
Alprazolam	4*	0	4	0
Nordiazepam	3	0	2	0
7-Aminoclonazepam	2	0	0	0
Demoxepam	1	0	0	0
Diazepam	1	0	0	0
Lorazepam	0	0	0	1

Table 5 (Cont'd): CDEWS Laboratory Test Results, by Probation Population and CJS Drug Screen Result

Any Antidepressant/SSRI/NDRI/SNRI	7	0	7	3
Venlafaxine	3	0	4	0
Desvenlafaxine/Desmethylvenlafaxine	3	0	4	0
Paroxetine	1	0	2	0
Fluoxetine	0	0	0	2
Bupropion	1	0	0	0
Sertraline	0	0	0	1
Duloxetine	1	0	0	0
Amitriptyline	1	0	0	0
Any New Psychoactive Substance (NPS)	2	1	4	0
Trazodone†	2	1	0	0
mCPP†	2	1	0	0
β-Methylphenethylamine	0	0	2	0
Methylone	0	0	2	0
DMBA	0	0	0	1
Any Synthetic Cannabinoid	0	2~	0	1≈
AB-PINACA	0	2	0	0
5F-AB-PINACA	0	1	0	0
AB-CHMINACA (metab 4)	0	1	0	0
5F-AMB	0	0	0	1
Other Drugs				
Dextromethorphan	1	2	7	1
Pseudoephedrine	4	0	7	0
Cetirizine	2	0	4	2
Carisoprodol	3	0	2	0
Zolpidem	0	0	2	1
Hydroxyzine	1	0	0	1
MDMA	0	0	2	0
Naloxone	0	0	2	0
Promethazine	1	0	0	0
Quinidine/Quinine	0	0	0	1

§The collection date is unknown for 18 specimens, as it was inadvertently omitted at the time of sampling.

*Hawaii's Opportunity Probation with Enforcement (HOPE) program for Honolulu, Hawaii routinely tests this population with a 6-drug panel screen, including: benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and oxycodone. Upon request, amphetamines, EtG (alcohol), MDMA, methadone, PCP, and synthetic cannabinoids are also tested. The synthetic cannabinoid panel includes: JWH-018, JWH-019, JWH-073, JWH-081, JWH-122, JWH-200, JWH-210, JWH-250, JWH-398, MAM-2201, and RCS-4.

+Specimens from the General Supervision probation program in Honolulu, Hawaii are routinely tested for a panel of six drugs, including: benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and oxycodone. Suspected synthetic cannabinoid users are tested for synthetic cannabinoids instead of oxycodone.

‡All buprenorphine specimens were confirmed by LC/MS/MS and contained norbuprenorphine.

†Trazodone is an antidepressant whose major active metabolite is mCPP. It is not possible to definitively determine whether the presence of mCPP was due to Trazodone use or whether mCPP was taken on its own.

~Among Hawaii's HOPE probation program specimens testing positive for synthetic cannabinoids, one specimen tested positive for AB-PINACA and a second specimen tested positive for AB-PINACA, 5F-AB-PINACA, and AB-CHMINACA (metab 4).

≈Among Hawaii's General Supervision probation program specimens testing positive for synthetic cannabinoids, one specimen tested positive for 5F-AMB.

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-3), July 2016.

Table 6: Concentration of Methamphetamine Found by the CDEWS Independent Lab in Specimens Testing Negative for Methamphetamine by the CJS Onsite Test

(N=15 discordant specimens)

Concentration Level (ng/mL)	N
300 - 499	1
200 - 299	2
100 - 199	6
29 - 99	6

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-3), July 2016.

Study Limitations

The CDEWS model depends on collecting a small number of specimens that have already tested positive or negative by the CJS agency's routine drug screen. Every attempt was made to randomly select from the specimens available that met our selection criteria. We do not know whether this small number of samples is representative of all persons tested in the participating CJS populations. However, CDEWS results have been found to be internally consistent and often agree with other indicators of drug use in the studied populations (Wish et al., 2013, 2015). CDEWS is designed to produce an indication of the relative use and availability of drugs in a community rather than prevalence estimates.

CDEWS obtains samples of urine specimens that have already been collected and tested as part of an existing drug testing program. The persons selected for testing are typically at high risk for drug use because of their prior use or treatment history, suspected drug misuse and/or drug offense history. While a population at high risk for drug use is exactly what we seek in order to achieve the CDEWS mission of discovering the use of emerging drugs, it also means that the CDEWS findings do not necessarily represent all persons in the CJS programs we studied. Nevertheless, drug trends in high risk criminal justice populations often foreshadow trends that appear later in the general population (DuPont & Wish, 1992).

The CDEWS test results can only provide an indication of the recent use of prescription and illicit drugs by the people who submitted the specimens. A more complete understanding of the results would require additional study. For example, we cannot tell whether a person testing positive for a prescribed drug is taking it under medical supervision. Nor can our test results tell us why or how often persons used the drug or where they obtained it.

Decisions regarding modifying CJS drug testing protocols should not be based on CDEWS results alone. Rather, local policymakers should review the CDEWS results and weigh the complex law enforcement, public health, and budgetary considerations involved. CDEWS studies may provide critical information with which to paint a picture of the age and gender characteristics of likely CJS drug users and, most importantly, the local communities where one might wish to collect more detailed information about a particular emerging drug's availability and use.

Discussion

Under-detection of methamphetamines. This study of HOPE and GS probationers in Honolulu, Hawaii found that the 6-drug onsite test cup currently used by these programs has identified most of the drug *users* in these populations. While the CDEWS independent laboratory's expanded drug screen identified many additional drugs, the additional drugs were primarily detected among persons who had tested positive for at least one of the drugs in the standard local onsite screen. The major exception was that the CDEWS independent laboratory detected the presence of methamphetamine in a minority of the specimens that had tested negative for all drugs included in the onsite test screen (CJS-). This difference was likely because all of these discordant specimens contained concentrations of methamphetamine that were below the detection thresholds of the onsite tests.

To the best of our knowledge, onsite tests that can detect the low levels (<500ng/ml) of methamphetamine found only by the CDEWS independent laboratory are not commercially available. To detect the concentration of methamphetamine missed by their onsite tests, the probation programs in Hawaii would have to send their specimens to an outside laboratory to conduct more sensitive and expensive tests. These programs will have to weigh the benefits of the increased detection of methamphetamine use against the increased costs and delays inherent in sending specimens to an off-site laboratory. Some programs might choose to limit these more sensitive laboratory procedures to specimens obtained from suspected high risk users who have tested negative for all drugs by their current onsite tests.

Detection of latest generation SCs. The comparison between CJS+ and CJS- specimens for the presence of SCs was especially important because prior CDEWS studies have found that SCs are often more likely to be detected in specimens that tested negative for all of the drugs in the limited local CJS screen. In addition, we had hypothesized that HOPE probationers might be more likely than GS probationers to turn to SCs to evade detection because of the HOPE program's special focus on sanctioning people for "dirty" urines. As expected, SCs were found only in specimens that had tested negative by the CJS drug tests (CJS-), but SCs were relatively rare, found in 2% or less of HOPE or GS specimens. The presence of SCs only in CJS- specimens is consistent with prior CDEWS-1 and CDEWS-2 study findings that suggested that probationers used SCs to avoid detection because they knew that few CJS monitoring programs typically test for SCs.

Most important, while relatively rare, the four SC metabolites detected were later generation SCs found to have emerged onto the US markets since 2013. The DEA's Special Testing and Research Laboratory reports that AB-PINACA and 5F-AB-PINACA were initially detected in 2013, followed by the detection of AB-CHMINACA (metab 4) and 5F-AMB in 2014 (Dye, 2014; Head, 2014; U.S. DEA, Special Testing and Research Laboratory, Emerging Trends Program/Reference Material Program, 2016). Two of the metabolites detected in Hawaii, AB-CHMINACA (metab 4) and 5F-AMB, were metabolites recently added to the CDEWS-3 laboratory screen, and reinforces the need for

jurisdictions (and the CDEWS independent laboratory) to continually update their test screens for synthetic drugs. Based on the information provided to us at the time of the study, the SC metabolites we found cannot be detected by the current (onsite or laboratory) screens being used by the two probation programs studied.

If it is critically important to detect SC use in probationers, the HOPE and GS programs in Hawaii may want to add tests that can identify these newer SC metabolites. These additional tests for SCs might be reserved for suspected users who have already passed the local onsite screen or could be used for only small samples of specimens. Once the message were to get out that the programs could test for SCs, probationers might cease turning to them in the hope of avoiding detection. We can conclude from our results that although SCs are used by some probationers in these programs in Hawaii, it may not be as large a problem as we have found in some prior CDEWS studies (Wish et al., 2013, 2015).

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Appendices

Appendix A: Site Selection Procedures

The HOPE probation program offered a unique opportunity to collect specimens from a new population of probationers under more frequent monitoring than probationers under GS. This site tests its specimens using on-site test cups, and also utilizes an offsite testing laboratory (Norchem) for confirmations of contested positive specimens. For this study, we sought only uncontested positive and negative specimens that could be collected directly from the probation program office. However, due to the paucity of uncontested positive specimens, the GS program aliquoted some urine from positive specimens that were contested prior to sending them to their offsite testing laboratory. Judge Steven Alm was interested in implementing the study in the Hawaii probation program and helped us to obtain approval for the study. We held telephone conferences with the judge, probation administrators, and program staff to share information on the study and learn about the procedures being used by their site. An overview of the proposed methods was then sent to these staff for review. Using this document, approval was obtained for the study. Negotiations and approval took approximately 2.5 months. The UM IRB application was then submitted and approved. Using a specified protocol, specimens were prepared by the probation staff and sent to the CDEWS independent laboratory. Specimen collection took approximately 5 months, as the accumulation of positive specimens from unique persons took several months. The decision was therefore made to cease field data collection before meeting the ultimate targeted number of specimens.

Table A-1: Time to Obtain Approval and Collect Specimens On-Site

Site	Time to Obtain Approval	Researcher Time On-Site Collecting Specimens
Honolulu, Hawaii: Adult Probation (HOPE and General Supervision) - Adult Client Services Branch, First Circuit, Hawaii State Judiciary	2.5 months	No time spent on site

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-3), July 2016.

Appendix B: Collection of Urine Specimens

Specimens are routinely tested by probation staff onsite using a test cup for a panel of six drugs (benzodiazepines, cocaine, marijuana, methamphetamine, opiates, and oxycodone). Other drugs, including amphetamines, EtG (alcohol), MDMA, methadone, PCP and/or synthetic cannabinoids may be tested for suspected users and by request. Contested positives are sent by the probation program to an offsite laboratory, Norchem, for confirmation testing.

Over the period of approximately 5 months (May 2015 to September 2015), staff at the Hawaii Adult Probation program identified specimens for possible inclusion in the study. Hawaii Adult Probation staff began by identifying any uncontested positive and negative specimens that could be released for the study. Most of the sample was comprised of uncontested positives given that a large sample of uncontested positive specimens were available directly from the probation program for sampling. However, the GS program aliquoted urine from some of their contested positive specimens prior to sending them to their offsite testing laboratory due to an insufficient number of uncontested positive specimens for sampling. The probation programs have no required holding period for uncontested positive and negative specimens so specimens were identified for the study as they were being collected. Positive specimens were defined as specimens positive for any drug on the six-drug panel screen. Probation staff tracked the names of the persons from whom specimens had been collected for the study using a participant list to ensure that only one specimen per person was included in the study sample. Specimens selected for the study were de-identified and labeled with the following demographic and other elements: population group, specimen collection date, year of birth, zip code of residence, test result (positive/negative), and race/ethnicity. Specimens were collected from males only due to an insufficient number of specimens available from females. Only specimens with a minimum volume of 15mL were included in the study. Selected specimens were packaged and shipped to the CDEWS independent laboratory. 93 negatives, 91 positives, and 10 with an unknown CJS screen test result were collected from the HOPE probation program. 90 negatives, 46 positives, and 7 with an unknown CJS screen test result were collected from the GS probation program. See Table 3 for the number of specimens collected from each population.

Appendix C: Testing of Urine Specimens by the CDEWS Independent Laboratory

Armed Forces Medical Examiner System Laboratory

CESAR contracted with the Armed Forces Medical Examiner System Laboratory for testing, as this laboratory has a shared mission to identify emerging drugs for testing in the United States. The drugs and metabolites included in the CDEWS-3 panel were selected after interviewing 13 chemists at 9 labs, as well as 3 other experts from programs including the High Intensity Drug Trafficking Area Program (HIDTA) in Hawaii and other law enforcement drug testing divisions to identify new psychoactive substances (NPS) to consider adding to our panel and to assess the availability of tests for these drugs. We also reviewed data and information from multiple international, national and local sources before finalizing the testing panel. All specimens were held in cold storage for the duration of the study. Over 150 drugs were tested for using Gas Chromatography/Mass Spectrometry (GC/MS) and Liquid Chromatography-Tandem Mass Spectrometry (LC/MS/MS). The test results, labeled by study ID, were sent electronically to CESAR.

Selecting Substances for Inclusion in the Testing Panel

Selecting substances to include in the study test panel was critical to the ability of the study to detect emerging drugs, particularly as related to synthetic cannabinoids since those in use are constantly altered, presumably to avoid detection and legal sanction. NPS are also an area of fast-paced change in terms of availability and use.

To plan our test panel, we reviewed data and information from multiple international, national and local sources. This included a review of the 2014 National data from the Drug Enforcement Administration's (DEA) National Forensic Laboratory Information System (NFLIS), special data runs for 2014-2015 provided by the DEA's Special Testing and Research Laboratory, as well as reports from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), United Nations Office on Drugs and Crime (UNODC) Early Warning Advisories, and other sources (Baumann, 2015; Dye, 2014; EMCDDA, 2015; Head, 2014; NMS Labs, 2015; UNODC, Early Warning Advisory, 2013a, 2013b, 2013c, 2014a, 2014b, 2014c, 2014d, 2014e, 2015a, 2015b, 2015c; U.S. DEA, Office of Diversion Control, 2014, 2015; U.S. DEA, Office of Diversion Control, NFLIS, 2015c; U.S. DEA, Special Testing and Research Laboratory, Emerging Trends Program/Reference Material Program, 2015). We also reviewed local NFLIS data for Hawaii, as well as from the states of the other sites participating in CDEWS, to assess local drug trends (Maryland Poison Center, University of Maryland School of Pharmacy, 2015; U.S. DEA, Office of Diversion Control, NFLIS, 2015a, 2015b, 2015d, 2015e; Washington Baltimore HIDTA, Investigative Support Center, 2015; Winter et al., 2014).

In addition, we also interviewed 13 chemists at 9 labs, as well as 3 other experts from programs including the High Intensity Drug Trafficking Area Program (HIDTA) in Hawaii and other law enforcement drug testing divisions prior to finalizing the test panel for CDEWS-3. The persons interviewed were selected from existing networks of toxicologists with expertise in the area of NPS and/or urine testing that we have identified from past CDEWS studies, as well as through other professional networks. We also identified contacts through referrals from our existing network of

toxicologists, researchers, and law enforcement representatives. A standard set of questions was asked including:

- What specific substances do you think are most important for us to include in our testing panel?
- Are there any new or emerging synthetic drugs that we should include?
- What synthetic drugs do you test for at your agency?
- What synthetic cannabinoid metabolites have you been finding in your most recent specimens? cathinones? other synthetic drugs?
- To your knowledge, are there tests available for each of these drugs? What would be the recommended test (EIA, LC/MS, etc.)?

Based on the information reviewed, we added six new SC metabolites to our previous CDEWS-2 metabolite screen: 5F-AMB, AB-CHMINACA (parent), AB-CHMINACA (metab 4), AB-CHMINACA (metab 6), AB-FUBINACA (parent), and ADB-FUBINACA (parent) (see Table C-1 in Appendix C for the full panel). We also tested specimens for the following SC metabolites that were part of our earlier CDEWS studies: JWH-018, JWH-019, JWH-073, JWH-081, JWH-122, JWH-210, JWH-250, AM-2201, MAM-2201, RCS-4, UR-144, XLR-11, AKB-48, 5F-AKB-48, BB-22, PB-22, 5F-PB-22, AB-PINACA, 5F-AB-PINACA, ADB-PINACA, and ADBICA. Many additional SC metabolites were identified as relevant to the study, however, urine tests were not available for these metabolites at the time the study began. The synthetic cannabinoid tests were performed using liquid chromatography-tandem mass spectrometry (LC/MS/MS).

Further, for CDEWS-3, we expanded the designer stimulant panel to add 14 new compounds. The new additions are: 25C-NBoMe, 2C-T-7, AH-7921, alpha-PVP, B-Methylphenethylamine, Flephedrone, Methiopropamine, Methoxetamine, Mitragynine, Naphyrone, Phenmetrazine, Phentermine, PMMA, and Trazodone. Several additional NPS were identified as relevant to the study but were not included due to test availability and cost.

Table C-1: The CDEWS-3 Laboratory Expanded Drug Screening Panel and Levels of Detection

SYNTHETIC CANNABINOID PANEL

	COMPOUND	LOD (ng/mL)
1	JWH-018-5-COOH	0.25
2	JWH-019-6-OH	0.25
3	JWH-073-4-COOH	0.25
4	JWH-081-5-OH	0.25
5	JWH-122-5-OH	0.25
6	JWH-210-5-OH	0.25
7	JWH-250-5-OH	0.25
8	AM2201-4-OH	0.50
9	MAM-2201-5-COOH/JWH 122 COOH	0.50
10	RCS-4-5-COOH	0.50
11	UR-144-5-COOH	0.50
12	XLR-11-4-OH	Presence
13	AKB-48 COOH	0.50
14	5F AKB-48 metabolite	0.50
15	BB-22 metabolite	0.50
16	PB-22 Carb Indole	0.50
17	5F PB-22 Carb Indole	0.50
18	AB-PINACA	0.50
19	5F AB PINACA	0.50
20	ADB-PINACA-5-COOH	0.50
21	ADBICA-5-COOH	0.50
22	AB-FUBINACA (Parent)	0.50
23	AB-CHMINACA (Parent)	0.50
24	AB-CHMINACA (metab 4)	0.50
25	AB-CHMINACA (metab 6)	0.50
26	ADB-FUBINACA (Parent)	0.50
27	5F-AMB	0.50

Table C-1 (Cont'd): The CDEWS-3 Laboratory Expanded Drug Screening Panel and Levels of Detection

DESIGNER PANEL

	COMPOUND	LOD (ng/mL)
1	25B-NBoMe	2.5
2	25I-NBoMe	2.5
3	25C-NBoMe	2.5
4	2C-B	10
5	2-Fluoroamphetamine	10
6	2-Fluoromethamphetamine	10
7	3-Fluoromethcathinone	10
8	4-Methylethcathinone (4-MEC)	10
9	Buphedrone	10
10	Butylone	10
11	Benzylpiperazine	10
12	Cathinone	10
13	Methcathinone/Ephedrone	10
14	Ethylone	10
15	Eutylone	10
16	mCPP	10
17	MBDB	10
18	MDPV	10
19	α-PVP	10
20	Mephedrone	10
21	Methedrone	10
22	Methylone	10
23	Pentedrone	10
24	Pentylone	10
25	TFMPP	10
26	Phentermine	10
27	B-Methylphenethylamine	10
28	Trazodone	10
29	Phenmetrazine	10
30	Naphyrone	10
31	Mitragynine	10
32	Methoxetamine	10
33	PMMA	10
34	2C-T-7	10
35	Flephedrone	10
36	AH-7921	10
37	Methiopropamine	10

Table C-1 (Cont'd): The CDEWS-3 Laboratory Expanded Drug Screening Panel and Levels of Detection

THC/BARBS/BUPRENORPHINE/LSD PANEL

	COMPOUND	SCREEN	LOD (ng/mL)	CONFIRM	LOD (ng/mL)
1	THC-COOH	PMOD	15	LC/MS/MS	5
2	Amobarbital	PMOD	200	LC/MS/MS	25
3	Butalbital	PMOD	200	LC/MS/MS	25
4	Pentobarbital	PMOD	200	LC/MS/MS	25
5	Phenobarbital	PMOD	200	LC/MS/MS	25
6	Secobarbital	PMOD	200	LC/MS/MS	25
7	Buprenorphine	PMOD	10	LC/MS/MS	1
8	Norbuprenorphine	na	na	LC/MS/MS	1
9	Naloxone	na	na	LC/MS/MS	1
10	LSD	PMOD	0.5	LC/MS/MS	0.05

Table C-1 (Cont'd): The CDEWS-3 Laboratory Expanded Drug Screening Panel and Levels of Detection

GENERAL PANEL

	COMPOUND	LOD (ng/mL)		COMPOUND	LOD (ng/mL)
1	6-Monoacetylmorphine (6-MAM)	5	41	Hydroxyzine	25
2	7-Aminoclonazepam	25	42	Ketamine	25
3	Acetylfentanyl	1	43	Lorazepam	25
4	Alprazolam	25	44	MDA	25
5	Amitriptyline	25	45	MDEA	25
6	Amphetamine	25	46	MDMA	25
7	Atomoxetine	25	47	Meperidine	25
8	Benzoylecgonine	25	48	Methadone	25
9	Bupropion	25	49	Methamphetamine	25
10	Carisoprodol	50	50	Methylphenidate	25
11	Cetirizine	25	51	Morphine	25
12	Chlorpromazine	25	52	Naloxone	25
13	Citalopram	25	53	Nordiazepam	25
14	Clonazepam	25	54	Norfentanyl	4
15	Codeine	25	55	Normeperidine	25
16	Cyclobenzaprine	25	56	Nortriptyline	25
17	Demoxepam	25	57	Oxazepam	25
18	Desalkflurazepam	25	58	Oxycodone	25
19	Desmorphine	25	59	Oxymorphone	25
20	Desmethylvenlafaxine/Desvenlafaxine	25	60	Paroxetine	25
21	Dextromethorphan	25	61	PCP	10
22	Diazepam	25	62	Phenmetrazine	25
23	Diclazepam	25	63	Phenazepam	25
24	Doxepin	25	64	Prazepam	25
25	Duloxetine	25	65	Promethazine	25
26	EDDP	25	66	Pseudoephedrine	25
27	Ephedrine	25	67	Pyrazolam	25
28	Estazolam	25	68	Propoxyphene	25
29	Etizolam	25	69	Quinidine	25
30	Fentanyl	1	70	Quinine	25
31	Flubromazepam	25	71	Sertraline	25
32	Flunitrazepam	25	72	Tapentadol	25
33	Fluoxetine	25	73	Temazepam	25
34	Flurazepam	25	74	Thioridazine	25
35	Haloperidol	25	75	Tramadol	25
36	Hydrocodone	25	76	Venlafaxine	25
37	Hydromorphone	25	77	Zaleplon	5
38	α-Hydroxyalprazolam	25	78	Zolpidem	5
39	α-Hydroxymidazolam	5	79	Zopiclone	5
40	α-Hydroxytriazolam	25			

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-3), July 2016.

Appendix D: Glossary of Abbreviated Terms

6-MAM: 6-Monoacetylmorphine, a unique metabolite of heroin used to definitively determine heroin use

CDEWS: Community Drug Early Warning System

CESAR: Center for Substance Abuse Research

CJS: Criminal Justice System

DEA: Drug Enforcement Administration

EIA: Enzyme Immunoassay, a method of urine drug testing

GS: General Supervision Probation program

HOPE: Hawaii's Opportunity Probation with Enforcement Probation program

IRB: Institutional Review Board at the University of Maryland, a committee that must approve all human subjects research at the University of Maryland

LC/MS: Liquid Chromatography/Mass Spectrometry, a method for confirming drug positives in urine

LC/MS/MS: Liquid Chromatography-Tandem Mass Spectrometry, a method for confirming drug positives in urine

LSD: Lysergic Acid Diethylamide, a hallucinogen

MDMA: 3,4-methylenedioxy-N-methylamphetamine, also known as ecstasy or Molly

NFLIS: National Forensic Laboratory Information System

NIDA: National Institute on Drug Abuse

ONDCP: Office of National Drug Control Policy

PCP: Phencyclidine, a dissociative anesthetic and hallucinogen

SC: Synthetic Cannabinoid, also known as synthetic marijuana, K2, or spice

THC: Tetrahydrocannabinol, the primary active ingredient in marijuana

UM: University of Maryland