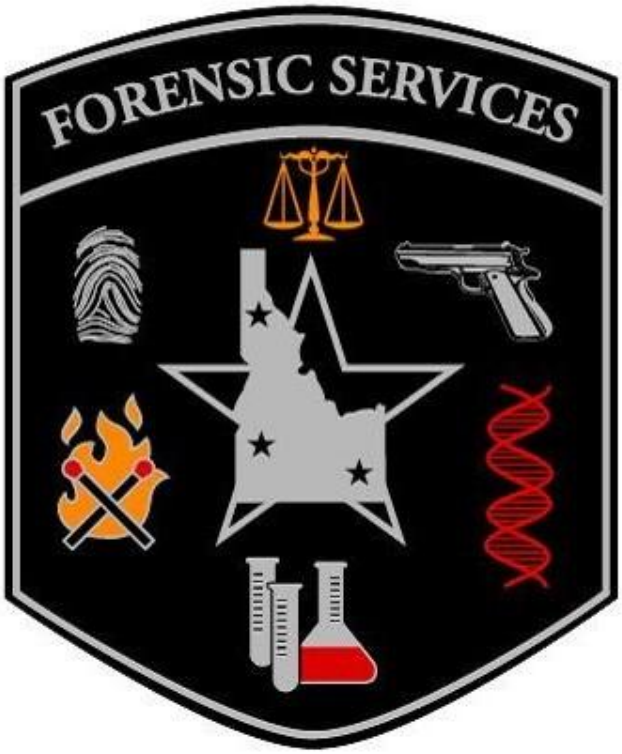
IDAHO STATE POLICE



Toxicology Program Trends

2013

2013 IDAHO STATE POLICE FORENSIC SERVICES: TOXICOLOGY TRENDS

Overview and Background

This report discusses trends in the toxicology program, as well as the number of toxicology cases submitted to the following Idaho State Police Forensic Services laboratories (ISPFS) for the fiscal year 2013 (FY2013): District 1, Coeur d' Alene; District 5, Pocatello; and District 3, Meridian (blood alcohol only). A "toxicology case" is any case which has urine, blood, or vitreous humor submitted to the laboratory for qualitative or quantitative drugs and/or alcohol analysis. A case may have multiple items submitted for analysis (e.g. blood and urine samples taken from both drivers in a two car auto accident account for one case with four items).

Toxicology analysis falls under three major disciplines: blood alcohol (the level of alcohol in blood), blood toxicology (drugs in blood) and urine toxicology (drugs in urine).

These statistics were compiled from the Idaho Evidence Tracking System (IETS) which is used to log in and track all evidence submitted to the forensic laboratory system. The case information in IETS is taken directly from the Evidence Submission Form (ESF) submitted simultaneously with the evidence to the laboratory.

Toxicology Tracking Information

	Blood Toxicology	Blood Alcohol	Urine Toxicology	Total	FY2013 Percent
DUI					
Adult	551	1718	354	2623	**75.8%**
Juvenile	60	107	65	232	**6.7%**
Probation & Parole					
Adult	1	1	18	20	**0.6%**
Juvenile	0	0	31	31	**0.9%**
Other Criminal Offenses	77	100	80	257	**7.4%**
Auto Accident Fatalities	74	94	9	177	**5.1%**
Accident Victim Kits	0	6	0	6	**0.2%**
Death (non-homicide)	26	56	30	112	**3.2%**
Not analyzed	*	1	*	1	**0.0%**
NJDT	0	0	0	0	**0.0%**
Total:	**789**	**2083**	**587**	**3459**	**100.0%**

Table 1: Statistics were compiled from the Idaho Evidence Tracking System (IETS) which is used to log in and track all evidence submitted to the forensic laboratory system. *Data not available from IETS system (see toxicology section of report).

Terms and Drug Categories

Central Nervous System Depressants (CNS-D's), Central Nervous System Stimulants (CNS- S's), and carboxy-THC account for most of the positive toxicology results obtained from analysis. The report appendix includes term definitions, drug category descriptions, and drugs included in each category.

Carboxy-THC is an inactive metabolite of marijuana (MJ). After ingestion, MJ is broken down in the body to a form that the body can eliminate as waste. There are many MJ metabolites, and carboxy-THC is one of them. ISPFS current methods for extracting MJ from blood and urine will extract this metabolite.

Driving under the influence of impairing prescription drugs is an increasing problem in Idaho. Some of the most impairing drugs fall under the CNS-Depressants category of drugs. CNS-Depressant drugs have many sub-categories: anti-depressant, anti-anxiety, anti-histamine, barbiturate, narcotic analgesic (NA), and others.

- ***Narcotic****--a drug that in moderate doses dulls the senses, relieves pain, and induces profound sleep but in excessive doses causes stupor, coma, or convulsions.*
- ***Analgesic****--relives pain.*

Some of the most commonly confirmed narcotic analgesics in Idaho DUI cases are hydrocodone, methadone, and oxycodone.

The benzodiazepine class drugs are anti-anxiety or tranquilizers; the most commonly found benzodiazepines in DUI cases are alprazolam, nordiazepam, temazepam, and diazepam.

Inhalation of paint or air duster is the etiology reported most often by investigators of inhalant cases. 1,1-difluoroethane (DFE) is the most common compound found from air duster inhalation; acetone and toluene are the volatiles found from canned paint inhalation.

CNS-Stimulant drugs such as methamphetamine and cocaine are usually not distributed in prescription form. The CNS-stimulant amphetamine may be obtained as a prescription, but is most commonly seen as an active metabolite of methamphetamine. Methamphetamine is metabolized to amphetamine after ingestion, and is excreted partly as amphetamine. Once broken down into amphetamine, the amphetamine acts as its own drug (i.e. it is an active metabolite), and produces stimulant effects aside from those produced by methamphetamine. ISPFS laboratory analysis yields relatively few positive results for cocaine.

ISPFS lists drug combinations in each of the drug toxicology categories because drug combinations may cause *additive* or *synergistic* effects. Additive effects are those in which the sum of the drugs could be achieved by taking twice the comparable dose of either drug alone (i.e. additive 1+1=2). For example, the pain relieving properties of aspirin and acetaminophen are additive. Synergistic effects means that 1+1 may equal more than 2. A common example of this would be the mixture of codeine and acetaminophen for the relief of moderate pain. Taken separately either of these substances will provide relief for a lesser amount of pain, but when taken together the synergistic reaction between the two drugs allows for a greater amount of pain relief from the combined total than if taken separately.

A negative sample result in one discipline (i.e. blood alcohol, blood toxicology, or urine toxicology) only reflects the testing performed in that discipline; the sample may have a positive result from testing in another discipline. For example, a case may have a negative result in blood alcohol, but a positive result for drugs in blood. ISPFS laboratory policy is not to process a sample for toxicology if the blood alcohol result is above 0.10g/100cc. In special circumstances (e.g. vehicular manslaughter, assault, homicide, or possible overdose cases) the toxicology may still be analyzed even if the blood alcohol is above 0.10g ethanol/100cc of blood. An ISPFS policy change in 2013 requires blood toxicology analysis on samples from deceased drivers in fatality accidents when the blood alcohol level is below 0.20g ethanol/100cc of blood.

Toxicology Discipline Results FY2013

The ISPFS laboratory system received 3,459 toxicology cases for FY2013, a decrease of 269 cases from FY2012. **Figure 1** contains a line graph of the total yearly toxicology submissions for the last ten years. Some samples may be counted twice because a blood alcohol sample may also be processed for blood toxicology. The number of cases submitted to ISPFS has been relatively stable since FY2009, with a five-year average of 3400 cases.

Topics covered in this report include:

Blood Alcohol Concentration	Adult and Juvenile Trends
	Fatality Accidents
	Other Offenses
Toxicology	Adult and Juvenile Trends
	DUI Related Trends
	Other Offenses

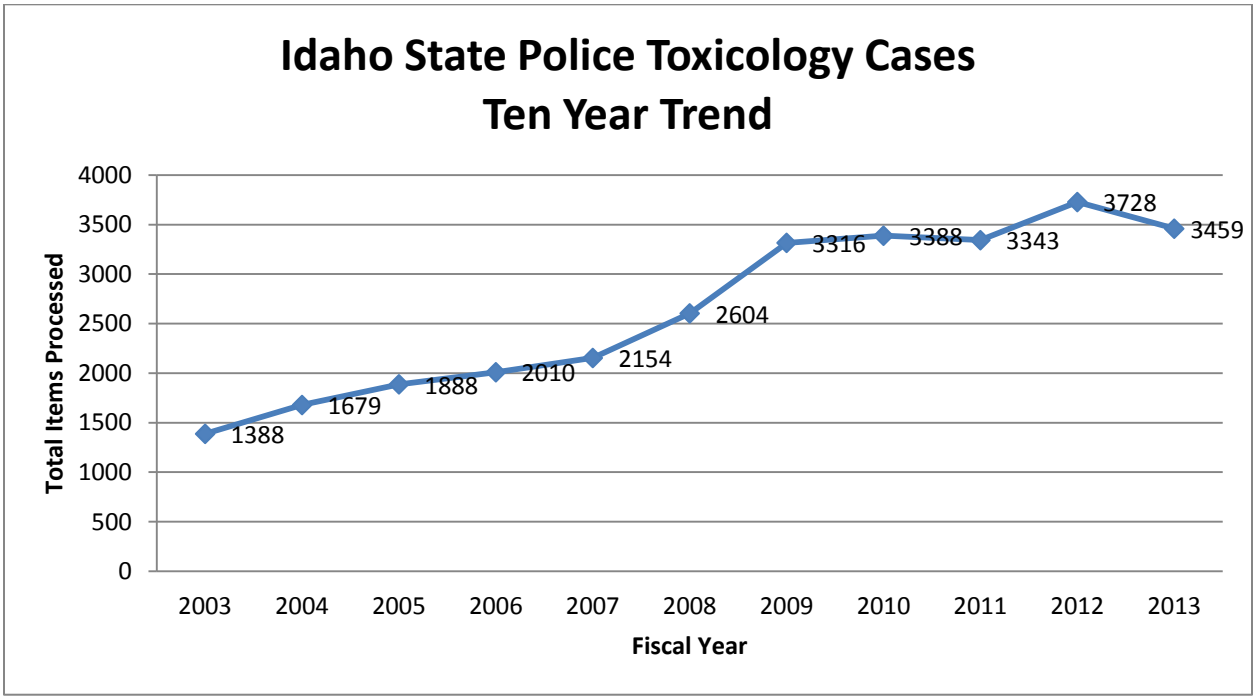


FIGURE 1

Blood Alcohol Concentration (BAC)

The number of blood alcohol case submissions to ISPFS decreased by over 80 cases from FY2012 to FY2013. A possible explanation for this trend is forced blood draw constitutionality concerns. There was a noticeable decrease in the number of blood samples submitted for BAC and toxicology analysis. Once the legal issue over forced blood draws was resolved, mainly by officers obtaining warrants, case submissions returned to normal submission levels. ISPFS noted a submission decrease for approximately 2-3 months of FY2013.

BAC laboratory requests result from DUI, sexual assault (SA), accident, and death investigation cases.

Adult Result Categories	Juvenile Result Categories
None detected (0.00 g ethanol/100cc of blood)	**None detected** (0.00 g ethanol/100cc of blood)
Below reportable limit (>0.00 g ethanol/100cc of blood and <0.02 g ethanol/100cc of blood)	**Below reportable limit** (>0.00 g ethanol/100cc of blood and <0.02 g ethanol/100cc of blood)
≥0.02 g ethanol/100cc of blood and <0.08 g ethanol/100cc of blood	≥0.02 g ethanol/100cc of blood
≥0.08 g ethanol/100cc of blood	

Many inhalants and other volatiles can be detected when alcohol analysis is performed on blood or urine samples.

Adult Blood Alcohol Concentration

Figure 2 contains a visual representation of the adult blood alcohol levels. ISPFS processed 1943 samples in FY2013 for blood alcohol and inhalants. Each blood alcohol sample is also tested for the presence of inhalants. ISPFS discourages the use of urine for alcohol analysis due to the questionable value of results (IDAPA 11.03.01).

Number of Samples	Result Category
1	Not analyzed
317	<0.02 g ethanol/100cc of blood
83	≥0.02 g/100cc and <0.08 g ethanol/100cc of blood
1542	≥0.08 g ethanol/100cc of blood
1943 Total	

For purposes of this report, BAC results of 0.00 g ethanol/100cc of blood and <0.02 g ethanol/100cc of blood are reported as negative. The 317 negative BAC samples is 40 more than FY 2012. If BAC and toxicology testing is requested, then a negative BAC sample is also processed for drugs. Negative BAC samples may be positive for drugs.

13 adult BAC samples tested positive for inhalants. 12 of the 13 positive inhalant samples were from negative BAC samples.

Surprisingly, only one juvenile sample was positive for inhalants. The adult population appears more likely to get arrested for DUI while under the influence of inhalants. Considering the 1943 BAC samples submitted, 13 positive inhalant samples is quite low. The inhalants used in the 13 positive samples include:

- 9 samples positive for DFE (air duster)
- 2 samples positive for acetone
- 1 sample positive for acetone/ toluene (paint)
- 1 sample positive for diethyl ether (starter fluid)

Samples submitted for **pending DUI charges** were 1723 of the total 1943. Of the 1723 samples from pending DUI charges, 1466 were over the per se limit of 0.08 g/100 cc of blood. If BAC and toxicology were both requested on the submission, any sample that fell below 0.10 g ethanol/100cc of blood was forwarded for drug testing.

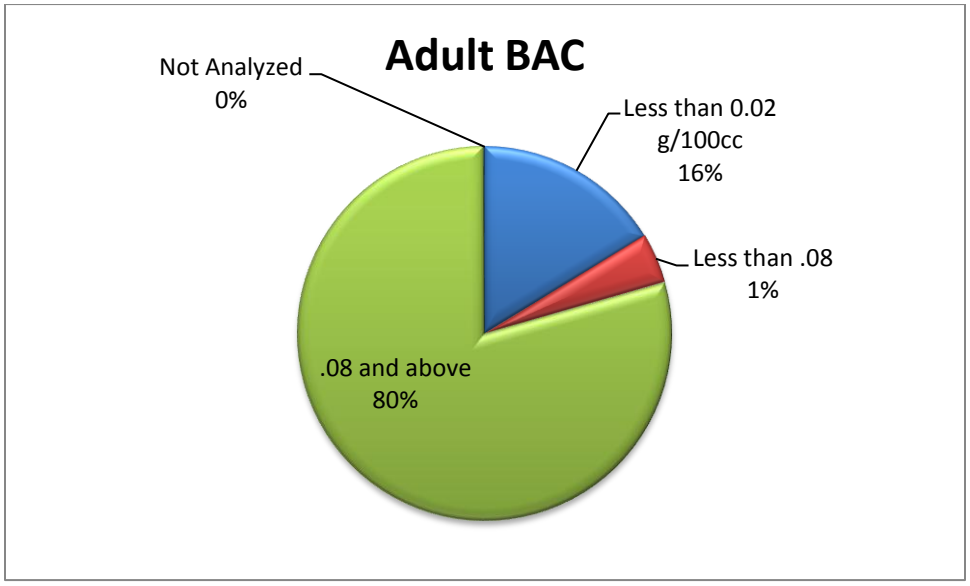


FIGURE 2

Many urine samples are submitted for inhalant testing, but undergo alcohol testing as well since it is the same test. Urine alcohol results are of questionable value, and are reported by ISPFS with a disclaimer statement. The urine alcohol results are of questionable value for several reasons. First, bacteria and yeast can grow in the urine. Bacteria and yeast can be common in urine samples and produce alcohol. Second, urine collection procedures are critical to the laboratory analysis. The urine needs to be voided, then a 15 minute wait period observed before a fresh urine sample is collected for alcohol analysis.

One of the categories with a large sample set is **adult BAC fatality accidents**. A total of 77 auto accident fatality case samples were submitted to ISPFS in FY2013. 77% of the 77 cases were negative for alcohol, but 19% were equal to or above the legal limit of 0.08 g ethanol/100cc of blood. **Figure 3** show the BAC results for the auto accident fatality samples.

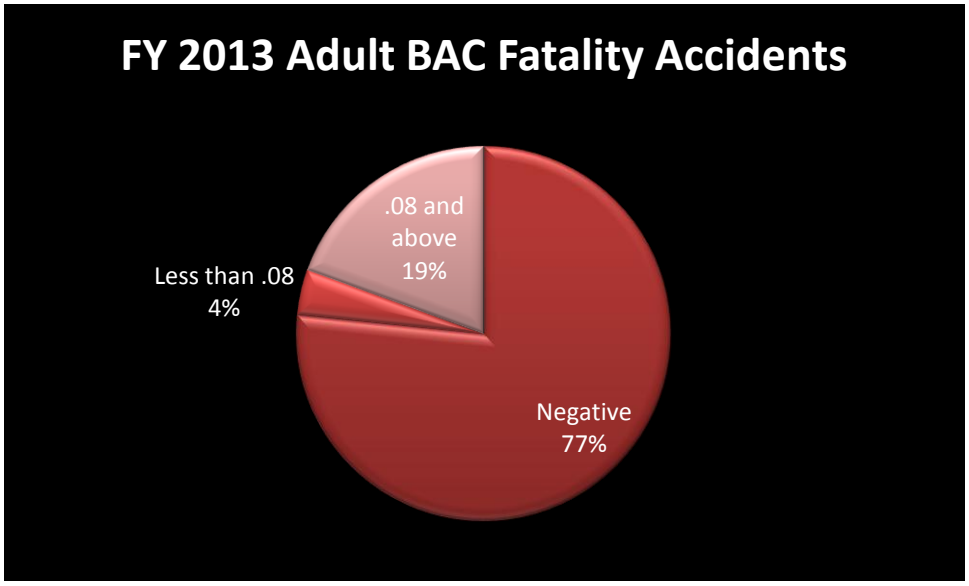


FIGURE 3

Figure 4 is a ten year trend line of auto accident fatality cases submitted to ISPFS. The ten year average of 84 submissions is relatively stable. Law enforcement efforts, including their increased presence on Idaho roads, have helped to keep these cases from rising significantly.

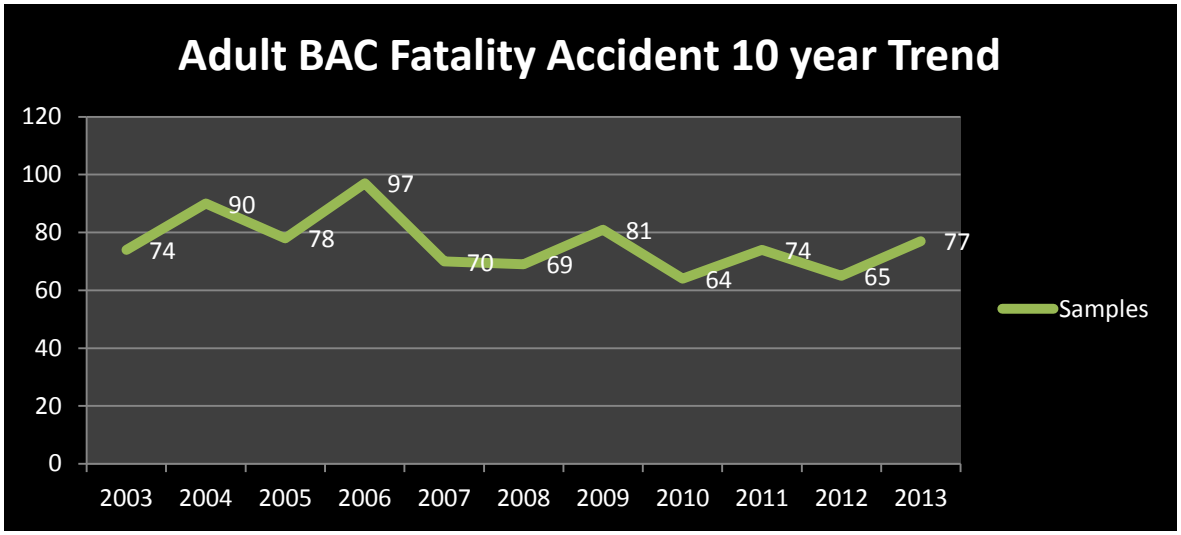


Figure 4

Juvenile Blood Alcohol Concentration

ISPFS processed 140 juvenile BAC cases in FY2013. 61% of these samples were over the legal limit for minors (0.02 g/100 cc of blood). 59 of the 140 samples were 0.08 g ethanol/100cc of blood or higher. The number of samples submitted and the number of positive results decreased in FY2013. 107 of the 140 samples submitted to ISPFS were **juvenile DUI cases**, and 76 % of the juvenile DUI cases were over the legal limit of 0.02 g/100 cc of blood. In FY2012, there were 86 total cases submitted for testing on juvenile DUI cases. In FY2013, more than 80 juvenile DUI cases tested positive. All juvenile results are reported based on 0.02 g ethanol/100cc of blood, not the adult legal limit of 0.08 g ethanol/100cc of blood. The three blood alcohol result levels for juveniles are: none detected (0.00 g ethanol/100cc of blood), below reportable limit (>0.00 g ethanol/100cc of blood and <0.02 g ethanol/100cc of blood), and ≥0.02 g ethanol/100cc of blood. The "none detected" and "<0.02 g ethanol/100cc of blood" categories are reported together as "negative" on figure 5. **Figure 5** demonstrates the juvenile case results.

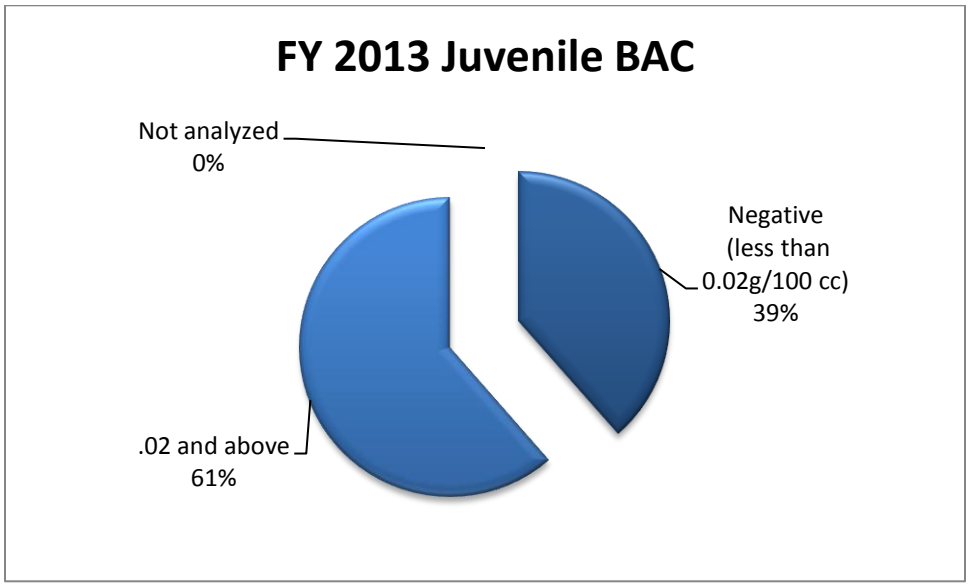


FIGURE 5

Inhalants were not found in the same abundance in juvenile samples as they were in the adult samples. One DUI sample tested positive for DFE (air duster). FY2012 had no positive juvenile results for inhalants. Inhalants are volatiles and evaporate easily. Inhalants do not stay in the blood or urine in detectable amounts for a long period of time, so the laboratory results may not be indicative of the prevalence of use.

Juvenile BAC samples submitted in **fatality cases** increased from 11 cases in FY2012 to 16 cases in FY2013. One FY2013 juvenile fatality case result was 0.11 g ethanol/100cc of blood.

Figure 6 is trend chart to show the juvenile auto accident fatality cases submitted for BAC analysis over the last 10 years.

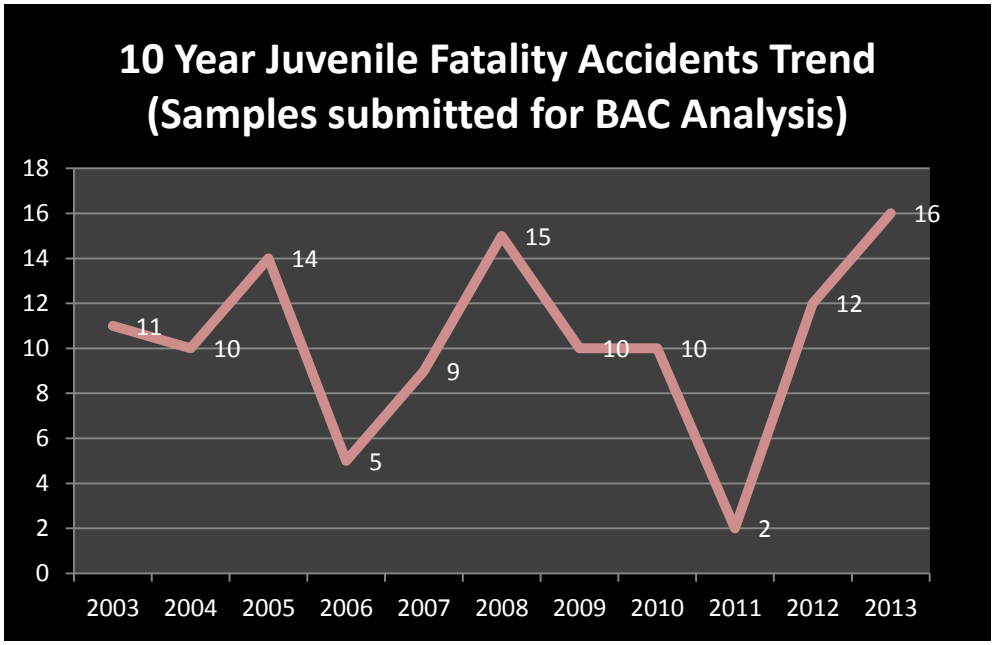


Figure 6

Other Offense BAC Results

Cases submitted for Blood Alcohol Concentration in FY 2013 also included several other offenses.

Adults:

Count	Offense	BAC Result
5	Homicide	• 3 negative • 2 above 0.20g ethanol/100cc of blood
17	Sexual Assault	• 9 greater than or equal to 0.08g ethanol/100cc of blood
48	Drug Violation	• 35 greater than or equal to 0.08g ethanol/100cc of blood
37	Death Investigation	• 11 greater than or equal to 0.08g ethanol/100cc of blood
1	Probation Violation	• Negative
12	Other Offenses**	• 2 greater than or equal to 0.08g ethanol/100cc of blood
19	Officer Involved Shooting	• All negative
5	Accident Victim Kit***	• Not disclosed

Juveniles:

Count	Offense	BAC Result
6	Sexual Assault	• 5 negative for ethyl alcohol • 1 positive @ 0.08g ethanol/100cc of blood
7	Other Offenses**	• All negative for ethyl alcohol
2	Drug Violation	• Both more than double 0.08 g ethanol/100cc of blood
1	Accident Victim Kit***	• Not disclosed

*ISPFS also processes proficiency test for analysts.

**Other offenses can be many different crimes such as: burglaries, possession of firearms, hit and runs, injury accident and assaults. Death investigations can be suicides, unattended deaths, or any other death that is deemed non-criminal.

***Accident Victim Kits (AVK) are submitted by coroners for statistic purposes only.

In special circumstances, such as felony possession, suicide, or possible overdose cases, the toxicology may be pursued even if the blood alcohol is above 0.10g ethanol/100cc of blood. In other words, many of the cases listed above with negative or low BAC, may have a positive result for other drugs in the blood toxicology results section of this report.

Toxicology (Drugs in Blood and Urine)

The difference between the blood and urine matrices submitted for testing drugs (toxicology) depends on many things: pH, methods of analysis, drug metabolism, and many others. Based on this knowledge, some drugs may be found in one matrix and not the other. For instance, carboxy- THC may be found in urine many days after use, but not in blood. If carboxy-THC is found in the blood, it may be indicative of more recent use. The type of fluid sample sent for toxicology analysis may depend on legal considerations. Blood is a better sample for BAC, and can easily be retained for toxicology testing. Blood is often the preferred sample for toxicology because it shows that substances were "in the system," and blood is usually obtained for BAC purposes. Urine is a much cleaner matrix, and allows easier extractions of drugs. The benzodiazepines extraction method for urine allows a wider range of compound detection than the current extraction method for blood. Obtaining a urine sample is not an invasive procedure, whereas a blood sample collection is invasive. Blood is the preferred sample for BAC purposes, so urine is often not collected. The blood and urine results cannot be compared against each other, but using both blood and urine methods allows for more diverse and comprehensive analysis.

ISPFS Toxicology policy states that samples with a result over a set amount of blood alcohol, currently 0.10g ethanol/100cc of blood, will not be tested for toxicology unless extenuating circumstances are present.

Adult

ISPFS accepted 789 blood samples and 587 urine samples for adult toxicology testing in FY2013. The total number of samples in each category was significantly reduced from FY2012 to FY2013. Figure 7 shows the blood and urine toxicology results for FY2013. The data for adult blood and urine samples show some interesting differences. For instance, blood analysis data indicates single drug use is more prevalent than drug combinations. Urine analysis shows the opposite indication. The graph shows that many samples were not analyzed. The "not analyzed" data is generated by comparing the law enforcement agency request for laboratory analysis to the analysis actually completed in the lab. Many of the blood samples submitted had a request for both BAC and toxicology testing. When the BAC result is 0.10g ethanol/100cc of blood or higher, the blood sample and urine sample (if present in the same case) is returned without toxicology testing in most cases. The urine samples are sometimes insufficient for analysis.

It is common in Idaho for the **most common single drugs** present in both adult urine and blood matrices to be a central nervous system depressant(CNS-D), followed by carboxy-THC, and then a central nervous system stimulant (CNS-S). CNS-D's can be many drugs. Carboxy-THC is commonly the metabolite of either MJ or the prescription drug dronabinol. Carboxy-THC is the most commonly used drug for adults and juveniles. This is a recurring trend.

Data from FY 2013 indicates the **most prevalent drug combination** is CNS-D and a narcotic analgesic (NA), followed by carboxy-THC/CNS-S. The drug combination of CNS-D/NA is often prescribed together (e.g. muscle relaxers and pain killers). Alprazolam (anti-anxiety /tranquilizer) and diphendramine (OTC cold medicine/ motion sickness medication) are the most prevalent CNS-D's found, followed by citalopram (anti-depressant) and meprobamate (active metabolite of the muscle relaxer Carisoprodol). Other popular CNS-D's are citalopram, zolpidem, and venlafaxine. Hydrocodone is by far the most commonly found narcotic analgesic. Narcotic analgesics and benzodiazepine-class compounds (e.g. alprazolam) are widely abused and addictive.

The most common CNS-S's are amphetamine and methamphetamine. CNS-S's also include cocaine, phenethylamines like MDMA (Ecstasy), and phentermine (commonly prescribed for weight loss). If methamphetamine is present in a urine or blood sample, amphetamine will likely be present as well. Amphetamine is an active metabolite of methamphetamine; it is impossible to determine exactly how the drug entered the body. Amphetamine is available as prescription Adderall®. The metabolite amphetamine is less abundant in blood samples because the methamphetamine may not have metabolized completely. A urine sample will have amphetamine present in almost all cases where methamphetamine is present because of increased time in the body for metabolism of the methamphetamine to amphetamine.

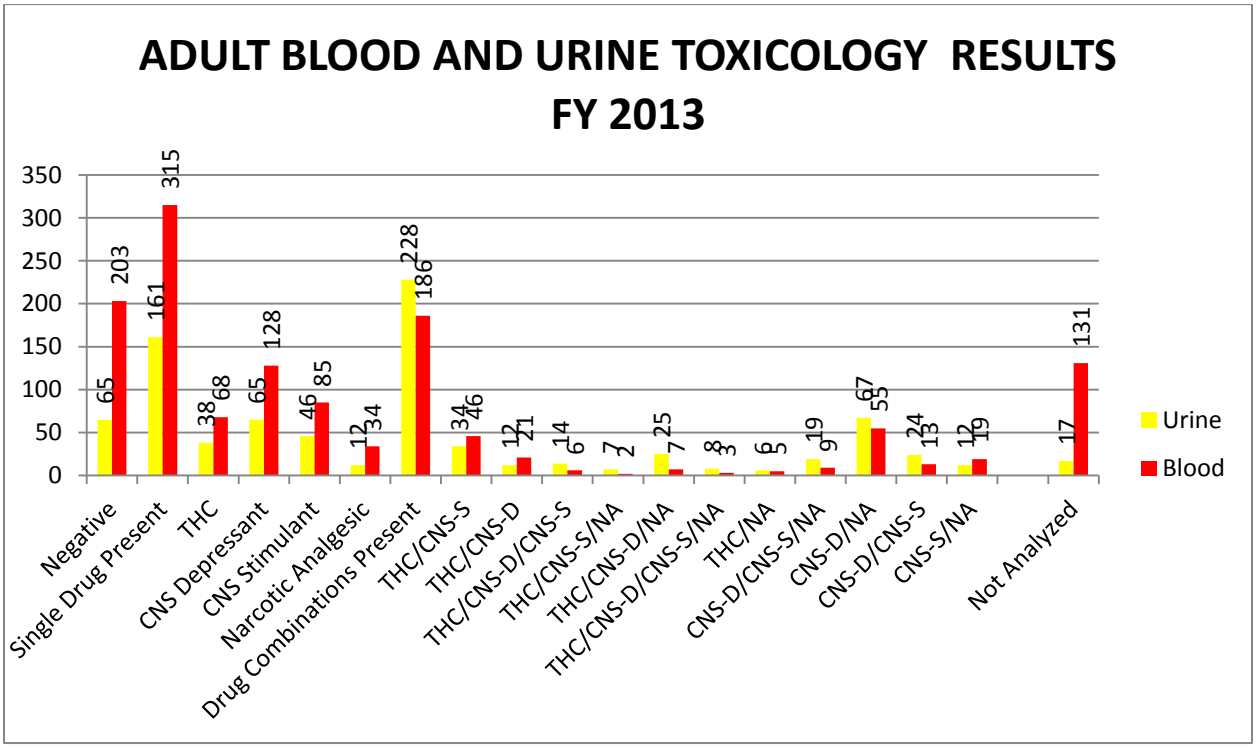


FIGURE 7

The final breakdown of the adult drug results is as follows: 1,376 samples submitted for adult toxicology (blood and urine). 268 total samples for blood and urine were negative. 17 urine and 131 blood samples were not analyzed.

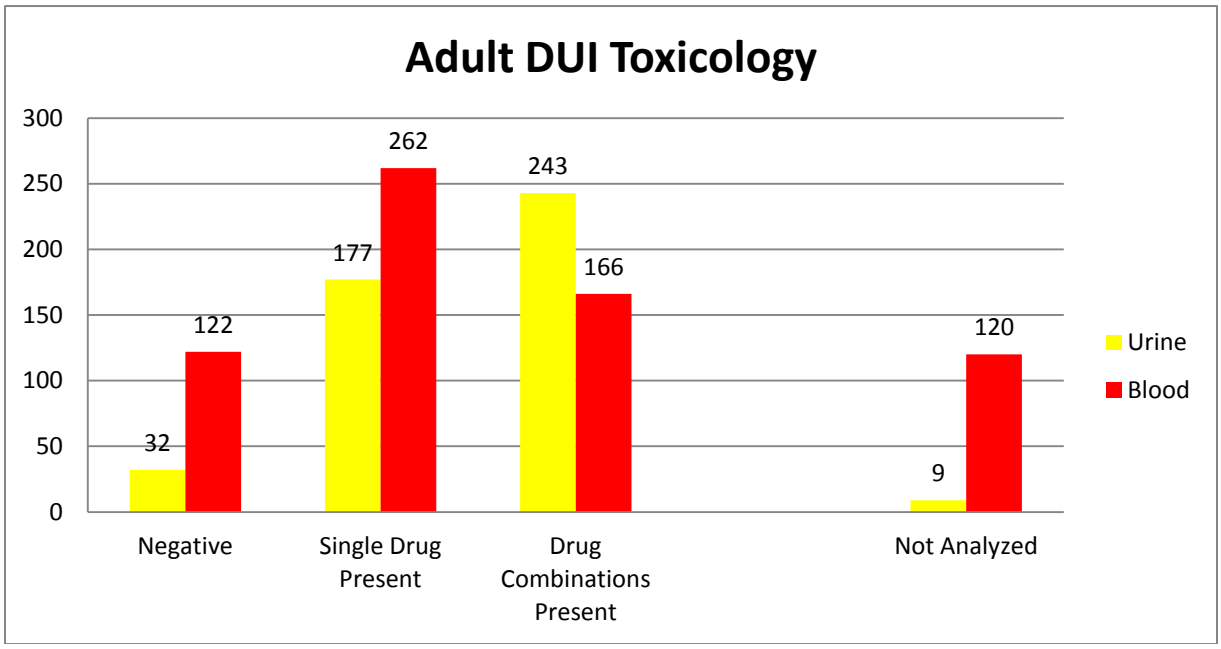


Figure 8

Figure 8 illustrates adult drug results for both blood and urine associated with DUI. The pattern is the same as demonstrated with all adult toxicology (see **Figure 7).** This trend is expected since the majority of cases submitted for toxicology are DUI's. Drug combinations present were also in line with the overall adult toxicology results for all crime categories.

Submissions to ISPFS for BAC, blood toxicology, and urine toxicology all decreased in FY2013. As mentioned in the BAC section of this report, the decrease was due in part to the forced blood draw constitutionality concerns. The long-term submission trend to ISPFS is relatively stable.

Figure 9 shows the result categories for the 71 adult toxicology accident fatality samples submitted for toxicology in FY2013. By comparison, 68 adult toxicology accident fatality samples were submitted in FY2012.

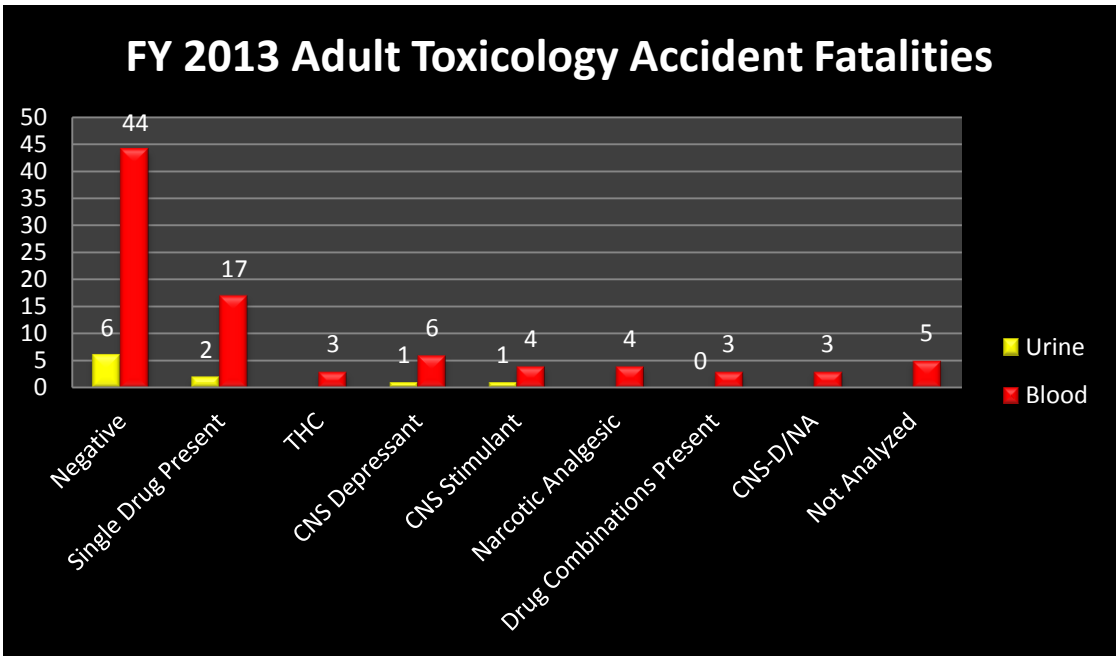


Figure 9

In FY2013 only 28 of the 71 cases submitted for adult fatality cases were positive. The most common drug present in these cases was diphenhydramine (CNS-D). ISPFS also reported the CNS-D's alprazolam, amitriptyline and cyclobenzaprine. Hydrocodone was the most common NA.

Juvenile

Juvenile blood toxicology case submissions remained nearly the same as in FY2012. Juvenile urine toxicology cases increased slightly from FY2012. Year after year ISPFS reports carboxy–THC in the majority of juvenile cases. Carboxy- THC is an inactive metabolite of MJ.

ISPFS reported 136/213 (63.8%) of the total blood and urine samples contained at least one drug. 91 samples (blood and urine samples included) were positive for a single drug. 62 of the 91 single drug samples were positive for carboxy-THC, and the majority of drug combination samples contained carboxy-THC. Overall, carboxy-THC was reported in 46% (98/213) of the total juvenile toxicology samples. 30% (64/213) of the total juvenile samples were negative, and 6% (13/213) of the total samples were not analyzed. **Amazingly, 72% (98/136) of the total positive juvenile samples contained carboxy-THC.**

Some of the most commonly reported drug combinations are carboxy-THC with a CNS-D, and carboxy-THC with a CNS-S. The stimulants were almost completely methamphetamine and the metabolite/drug amphetamine. Diphenhydramine and methorphan (OTC cold medications) were the major CNS-D drugs detected in juvenile samples. These two drugs are commonly abused; in other words, the drugs are taken in higher than recommended doses for the side effects. Abuse of these drugs seems to be more common in juveniles than adults. **Figure 10** shows the distribution of results in the juvenile blood and urine toxicology categories.

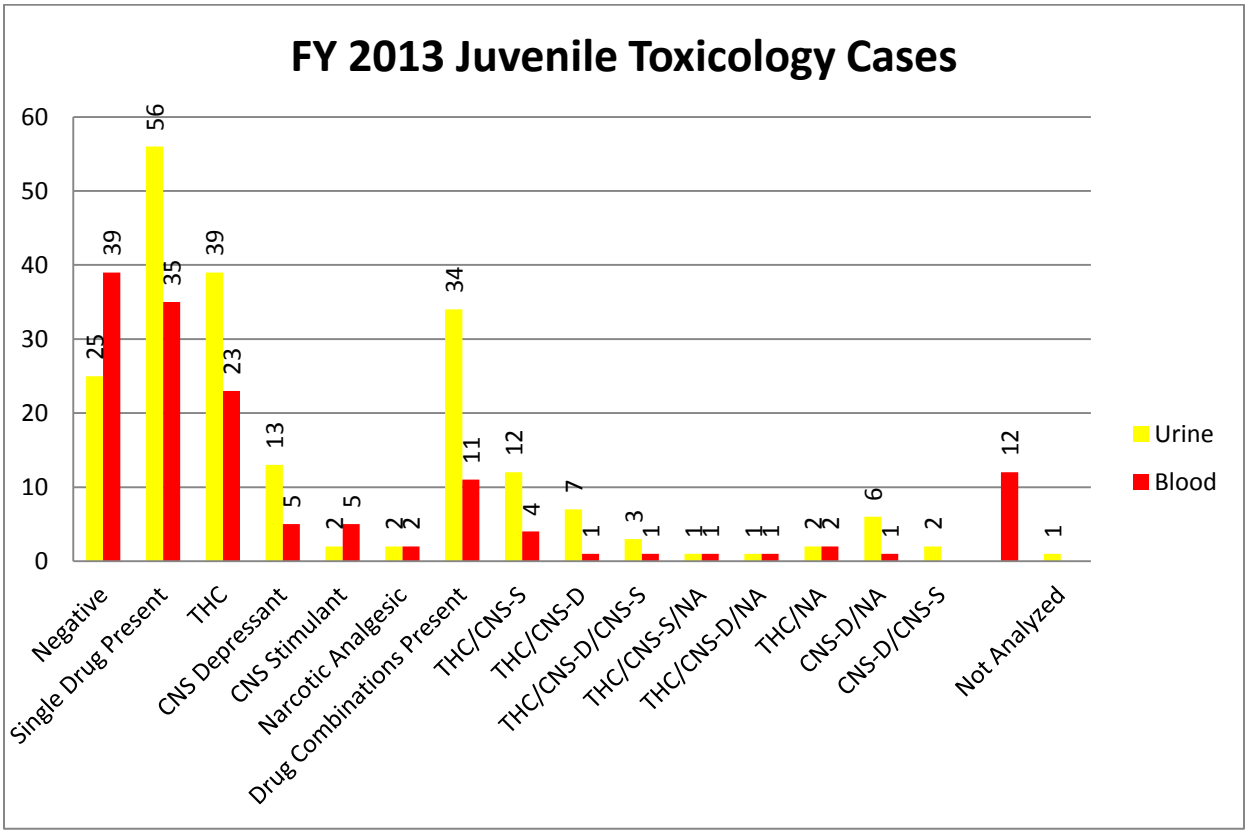


Figure 10

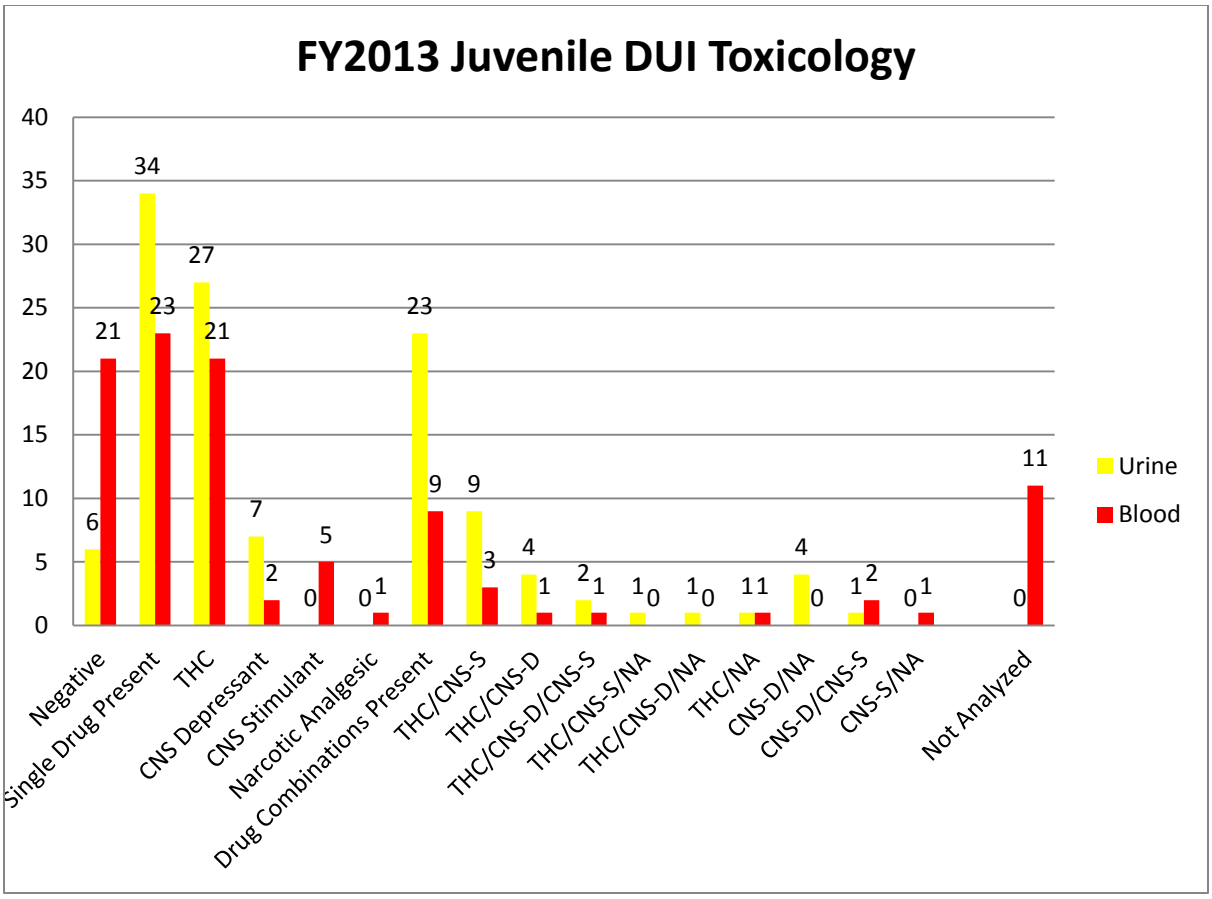


Figure 11

Figure 11 illustrates juvenile DUI results. Juvenile DUI results follow the same trend as the juvenile results for all laboratory submissions. Carboxy–THC is commonly reported in juvenile DUI cases. CNS-S's (primarily methamphetamine) are reported frequently in juvenile DUI cases. Methamphetamine continues to be problematic in both adult and juvenile populations. The total number of juvenile DUI case submissions decreased by about 50 cases in FY2013. Again, the decrease in sample submissions may be due to the change in forced blood draw legal interpretation.

Juvenile accident fatalities numbered 12 in FY2013, the same as in FY2012. Results were positive for 1 of the blood samples (carboxy-THC) and 1 of the urine samples (morphine). The remaining 10 samples were negative.

Other Offense Toxicology Results

Cases submitted for toxicology analysis in FY2013 also included several other offenses.

Adults:

Count	Offense	Toxicology Results
14	Homicide	• 8 negative • Positive--almost even distribution of CNS-D, carboxy-THC and CNS-S
29	Sexual Assaults	• 14 negative • Positive--CNS-D was the most positive result by far. Most of the CNS-D drugs were benzodiazepine class compounds such as alprazolam, diazepam, temazepam, and others
53	Drug violations	• 9 negative • Positive--almost even distribution of CNS-D, carboxy-THC and CNS-S
37	Death Investigations***	• 15 negative • Positive--almost even distribution of CNS-D, carboxy-THC and CNS-S
23	Other offenses**	• 10 negative • Positive--more CNS-S (methamphetamine), mostly even distribution of CNS-D, Carboxy-THC and NA
20	Officer involved Shootings****	• 19 negative • 1 positive for CNS-S (methamphetamine)

Juveniles:

Count	Offense	Toxicology Results
2	Homicide	• 1 negative • 1 positive for CNS-S (amphetamine)
18	Sexual Assaults	• 7 negative • Positive--mostly even distribution of CNS-D, carboxy-THC and NA
3	Drug violations	• All positive--CNS-D, CNS-S and carboxy-THC
12	Other offenses**	• 5 negative • Positive--CNS-S and carboxy-THC

*ISPFS analyzed other cases as proficiency tests for analysts.

****Other offenses** can be many different crimes such as: burglaries, possession of firearms, hit and runs, and assaults.

*****Death investigations** can be suicides, unattended deaths or any other death that is deemed non-criminal.

******Samples submitted in **officer involved shootings** may include officer, subject, and suspect samples.

Top ten ISPFS reported drugs:

1. Carboxy- THC

2. Methamphetamine (CNS-S)*

3. Amphetamine (CNS-S)*

4. Hydrocodone (NA)

5. Alprazolam (CNS-D)

6. Oxycodone (NA)

7. Diphenhydramine (CNS-D)

8. Citalopram (CNS-D)

9. Meprobamate (CNS-D)**

10 Zolpidem (CNS-D)**

*Amphetamine and methamphetamine were about equal, dependent upon sample matrix.
**Meprobamate and Zolpidem were nearly equal as well.

Summary

The laboratory system received 3,459 toxicology cases in FY 2013, 269 cases fewer cases than in FY2012. A possible explanation of why we did not see an increase in cases this fiscal year may be due, in part, to legal issues related to forced blood draws. There was a noticeable decrease in the number of blood samples submitted for BAC and toxicology analysis. Once the legal issue was resolved, by the officers obtaining warrants, samples submission to the laboratory returned to normal levels.

Urine toxicology case submission continued to decline in FY2013. The trend has been predicted over the last few years. We expect slight, but further decline in urine toxicology submission in FY2014. Greater laboratory testing capabilities in blood toxicology will further decrease the need for analyzing urine samples. ISPFS is moving toward testing only blood for DUI cases whenever possible.

ISPFS improved turnaround times in FY2013. More ISP forensic scientists have completed training, and trained scientists have worked diligently to reduce backlogs. Training a toxicologist is a long and expensive process. Without new analysts and financial resources, backlogs will continue to be problematic.

In FY2013, ISPFS validated a new detection method using Liquid Chromatography / Tandem Mass Spectrometry (LC/MS/MS). The new method allows analysts to detect more of the benzodiazepine class compounds and "Z drugs" (zolpidem, zopiclone) from samples than the Gas Chromatograph/ Mass Spectrometry (GC/MS) methods allowed. This new method is more sensitive, and has decreased the number of inconclusive reports by 48%. The new detection method allows analysts to confirm compounds that could not be confirmed with other methods.

In FY2014 ISPFS is implementing a new laboratory information management system (LIMS). The LIMS will more efficiently track evidence, and provide more customer interaction. ISPFS analysts will input case data and results directly into the system. The LIMS is programmed to provide performance metrics needed for agency reports. Information for the annual toxicology report should be much easier to access using the LIMS system.

Adult toxicology results in every category (DUI'S, fatalities, other offenses, etc.) remained consistent with data from FY2012. The highest single drug categories reported from urine testing were CNS-D's, followed by carboxy-THC (marijuana metabolite). The CNS-D category covers a wide range of drugs and drug classes, so this result was expected. The significant CNS-D drugs found in samples were alprazolam, diphenhydramine, and anti-depressants. CNS-S data may not be as prominent as CNS-D data because the definition covers a much smaller range of drugs than CNS-D, but CNS-S drugs remain a problem in Idaho. Methamphetamine and amphetamine were the most prominent CNS-S drugs reported by ISPFS. Methamphetamines are overwhelmingly the most common CNS-S. Methamphetamine continues to be a large problem in Idaho. Methamphetamine is second only to carboxy-THC in frequency reported by ISPFS. Marijuana and methamphetamine continue to appear in

all toxicology categories. Year after year, carboxy-THC becomes more prevalent in juvenile test results. This trend was true over all the categories (blood and urine toxicology overall crime categories, DUI drug cases, and auto accident fatalities) presented in this report. Perhaps educating Idaho teens more aggressively can help reduce these numbers.

For FY2014, it continues to be essential that ISPFS personnel get the funding, training, methods, and instruments needed to be able to extract synthetic cannabinoids (e.g. “spice”), synthetic cathinones (e.g. “bath salts”), other designer drugs, and metabolites of designer drugs from toxicology samples. These drugs have widely impacted our controlled substances section, and they will also impact the toxicology section when the testing can be accomplished. It is anticipated that many of our current “negative” samples will be positive for synthetic cannabinoids or other designer drugs. ISPFS receives constant requests for analysis of synthetic cannabinoids in toxicology samples. ISPFS scientists are working hard to reduce backlogs, but more analysts, instruments, and space (bench space work areas) are needed to keep up with the demands of Idaho population growth and law enforcement activities.

APPENDIX

Non Random Juvenile Drug Testing (NJDT) Please see Idaho Statues *Title 33. Education, Chapter 2.*

Drug Evaluation and Classification (Information below was provided by the NHTSA *Drug Evaluation and Classification Training Manual,* January 2006 edition.) Changes have been made to help the understanding of the reader, such as Benzodiazepines have been added to anti-anxiety column in the chart and Methamphetamine has been added to list of stimulants.

Central Nervous System Depressants

Central Nervous System (CNS) Depressants slow down the operation of the brain. They first affect those areas of the brain that control a person's conscious, voluntary actions. As dosage increases, depressants begin to affect the parts of the brain controlling the body's automatic, unconscious processes, such as heartbeat and respiration.

Possible Effects of CNS Depressants:

- ✓ Reduced social inhibitions
- ✓ Divided attention impairment
- ✓ Slowed reflexes
- ✓ Impaired judgment and concentration
- ✓ Impaired vision and coordination
- ✓ Slurred, mumbled or incoherent speech
- ✓ A wide variety of emotional effects, such as euphoria, depression, suicidal tendencies, laughing or crying for no apparent reason, etc.

Alcohol is the model for the CNS Depressant category of drugs.

Some major subcategories of CNS Depressants other than alcohol include:

- Barbiturates
- Non-Barbiturates (synthetic compounds with a variety of chemical structures)
- Anti-Anxiety Tranquilizers
- Anti-Depressants (to combat psychological depression)
- Anti-Psychotic Tranquilizers
- Combinations of the above five subcategories

Examples of CNS Depressants

Barbiturates	Other	Anti-Anxiety Tranquilizers Benzodiazepines	Anti-Depressants	Anti-Psychotic Tranquilizers	Combinations
Amobarbital	Carisoprodol Meprobamate-M	Alprazolam	Amitriptyline Hydrochloride	Chlorpromazine	Chlordiazeproxide and Amitriptyline
Pentobarbital	Chloral Hydrate	Chlordiazepoxide	Bupropion	Droperidol	Chlordiazepoxide Hydrochloride and Clidinium Bromide
Phenobarbital	Diphenhydramine Hydrochloride	Clonazepam	Citalopram	Lithium Carbonate	Perphenazine And Amitriptyline
			Desipramine Hydrochloride	Lithium Citrate	
Secobarbital	Diphenylhydantoin Sodium	Diazepam	Doxepin Hydrochloride	Haloperidol	
			Escitalopram		
Barbital	Ethchlorvynol	Estazolam			
	Gamma-Hydroxybutyrate (GHB)	Flunitrazepam	Fluoxetine		
		Flurazepam	Impramine		
	Glutethimide	Lorazepam	Paroxetine		
	Methaqualone	Meprobamate	Phenelzine Sulfate		
	Paraldehyde	Oxazepam	Sertaline		
	Zolpidem	Temazepam	Venlafaxine		
		Triazolam			

Central Nervous System Stimulants

Central Nervous System (CNS) Stimulants speed up the operation of the brain and spinal cord. It is import to emphasize that "speed up" does *not* mean "improve" or "enhance". The CNS Stimulants definitely do not make the brain work better. Rather, they cause the brain and the rest of the nervous system to work *harder*, and often to make more mistakes.

The "speeding up" caused by CNS Stimulants results in significantly increased heartbeat, respiration and blood pressure, all of which can lead to physical harm to the abuser. In addition, the stimulant user experiences nervousness, irritability and an inability to concentrate or think clearly.

Possible Effects of CNS Stimulants

- ✓ Euphoria
- ✓ Anesthetic effect
- ✓ Hyperactive
- ✓ Impaired ability to perceive time and distance
- ✓ Confusion and loss of the ability to concentrate or to think clearly for any length of time

Some major subcategories of CNS Stimulants

- ➢ Cocaine
- ➢ Amphetamines
- ➢ Methamphetamines
- ➢ Others such as phentermine, methylphenidate etc…

Hallucinogens

Hallucinogens are drugs or substances that affect a person's perception, sensation thinking, self awareness and emotions. They may also cause hallucinations. A hallucination is a sensory experience of something that does not exist outside the mind. It may involve hearing, seeing, smelling, tasting or feeling something that isn't really there. Or, it may involve distorted sensory perceptions so that things look, sound, smell, taste or feel differently from the way they actually are.

Possible Effects of Hallucinogens

- ✓ Hallucination
- ✓ Perception of reality severely distorted
- ✓ Delusions
- ✓ Illusions

Examples of Hallucinogens

Naturally occurring Hallucinogens

- ➢ Peyote
- ➢ Psilocybin

Synthetically manufactured Hallucinogens

- ➢ LSD
- ➢ MDA, MDMA, MMDA, TMA, STP, DET, DMT

Narcotic Analgesics (In the annual toxicology report Narcotic Analgesics are counted as Central Nervous Systems Depressants)

There are two subcategories of Narcotic Analgesics. The first subcategory consists of the Opiates. The second subcategory is the Synthetics.

Possible Effects of Narcotic Analgesics

- ✓ "on the nod" (A semiconscious state of deep relaxation, eyelids will be droopy and the head will slump.)
- ✓ Slowed reflexes
- ✓ Slow and raspy speech
- ✓ Slow, deliberate movement
- ✓ Inability to concentrate
- ✓ Slow breathing
- ✓ Skin cool to touch
- ✓ Possible vomiting
- ✓ Itching of the face, arms, or body

C**ommonly-Abused Opiates and Their Derivation From Opium**

- Morphine
- Codeine
- Heroin
- Dilaudid
- Hydrocodone
- Numorphan
- Oxycodone

Common Synthetic Opiates

- Demerol
- Methadone
- Fentanyls
- MPPP
- Darvon