



## Indiana State Department of Toxicology

### Cover photo:

The front cover documents, by county, the number of completed evidentiary breath tests administered in 2018 and the number of cases submitted for laboratory analysis. All counties use the Intox EC/IR II breath test instrument provided by the Department of Toxicology, though not all counties use the Department of Toxicology for forensic laboratory analysis. Both the number of agencies using the Department of Toxicology for laboratory analysis and the total number of cases submitted have continued to increase over the last several years.

## Indiana State Department of Toxicology

### **Overview**

The mission of the Indiana State Department of Toxicology (ISDT) is to provide quality forensic toxicological services and education for the state of Indiana. ISDT's objectives are to provide an accurate and reliable alcohol breath test program, produce quality toxicology analyses of blood samples for alcohol and selected drugs, supply expert testimony, and provide education on the science of forensic toxicology.

ISDT management and staff understand that quality results are obtained through professional, ethical, and unbiased analyses of evidentiary specimens entrusted to the Department for testing. The key to interpreting and understanding these results is the Department's policy of open communication and willingness to provide instruction on the science of forensic toxicology.

### **Budget**

ISDT's budget is comprised of general fund appropriations, limited Breath Test Program fees, and, when awarded, federal grants. In 2018 the Indiana Criminal Justice Institute (ICJI) awarded the Department of Toxicology \$250,000 from National Highway Traffic Safety Administration funds for reduction of its analytical case backlog and \$50,000 for staff overtime. These funds are being used to decrease turnaround times for traffic-related drug analysis request cases. ICJI also awarded the Department approximately \$277,000 to purchase a Liquid Chromatograph Time of Flight (LC/TOF) instrument. This instrument is used to screen blood samples for drugs. Drug confirmation testing is then performed on those samples with positive drug screens.

### **Staffing**

ISDT ended 2018 with 20 of its 24 positions filled, as detailed in Table 1. The Department contracts with the Indiana Office of Technology, the State Budget Agency, and the State Personnel Department for computer support, accounting services, and human resource matters, respectively. ISDT filled the vacant Assistant Director position in 2018. This created a vacant Analytical Laboratory Supervisor position, which was then also filled. The organization chart and contact information for ISDT are provided in the last two pages of this report.

**Table 1: Department of Toxicology Staffing as of 12/31/18**

<b>Position</b>	<b>Staff</b>	<b>Position</b>	<b>Staff</b>
Director	1	Analytical Lab Supervisor	1
Assistant Director	1	Forensic Scientist	10 (1 vacant)
Toxicologist/QC Coordinator	1	Evidence Control Specialist	2
General Counsel	1	Breath Test Program Supervisor	1
Program Coordinator	1 (1 vacant)	Breath Test Instrument Inspector	4 (1 vacant)
Administrative Assistant	1 (1 vacant)		

### **Training**

As part of ISDT's objective of providing education on the science of forensic toxicology, various members of the Department gave presentations at national conferences as well as provided training for prosecutors and public defenders. Two of the presentations at national conferences

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discussed ISDT's current method for screening whole blood cases for the presence of THC using LC/TOF. In addition, the Department provided several tours of its facility.

Department members also attended numerous trainings in 2018. The Department Toxicologist attended a postmortem interpretive course, and she and the Breath Test Program Supervisor attended the International Association for Chemical Testing conference. The Assistant Director and a Breath Test Instrument Inspector attended the Intoximeters Maintenance School for the Intox EC/IR II breath test instrument. The Director and Assistant Director attended the Midwest Crime Directors Meeting. Finally, four members of the Department attended the Midwest Association of Toxicology and Therapeutic Drug Monitoring conference.

Employees who attended training or conferences, upon their return, shared the knowledge gained with other ISDT staff.

### **Customers**

In 2018, ISDT analyzed blood samples submitted by 397 agencies, including coroners, town marshals, municipal and county departments, and state law enforcement agencies, which is consistent with the number of agencies submitting blood samples in 2017. Nineteen new agencies submitted blood samples to ISDT in 2018, which equates to approximately 5% of submitting agencies in 2018 using the Department's laboratory services for the first time. Most agencies submit samples for analysis in evidence collection kits provided by the Department. ISDT encourages agencies to return expired ISDT-furnished evidence collection kits for refurbishment and redistribution, which results in cost savings to the Department of approximately \$3.00 per kit.

The breath test program includes 4,716 trained and certified breath test operators who work for 410 different law enforcement agencies. The reduction of trained and certified breath test operators from the total of 5,056 reported in the 2017 Annual Report may be due, in part, to the manner in which the statistics were gathered by different individuals.

In 2017, ISDT implemented an online program that allows the public to obtain certified copies of certifications of breath test instruments and breath test operators at any time. This program has now been in use for one year, with positive results. ISDT has received very few requests for these records. Requesting parties directed to the online program have provided positive feedback.

The information on ISDT's web site ([www.IN.gov/isdt](http://www.IN.gov/isdt)) was updated in 2018 to make it more user-friendly and to provide more relevant information. The site still contains information on ordering evidence collection kits, sample submission protocols, testing parameters, available training, fees related to the breath test program, directions for use of the online breath test officer recertification program, and a link to the database that provides free, certified copies of breath test instrument and operator certifications, as well as a list of certified ignition interlock device models along with contact information for providers of ignition interlock devices.

### **Testimony**

The Department received approximately 1,013 subpoenas in 2018, or 13 more than in 2017. This included subpoenas related to laboratory testing, breath tests, and interpretation of laboratory and breath test results. Testimony was provided only 64 times: 34 times by forensic scientists and the assistant director, 3 times by the breath test program supervisor, and 27 times by the forensic toxicologist. This is a 38% reduction in testifying events from 2017. Several times during 2018, as in past years, ISDT personnel appeared in response to a subpoena but did not testify due to plea agreements or continuances.

### **Blood Analysis**

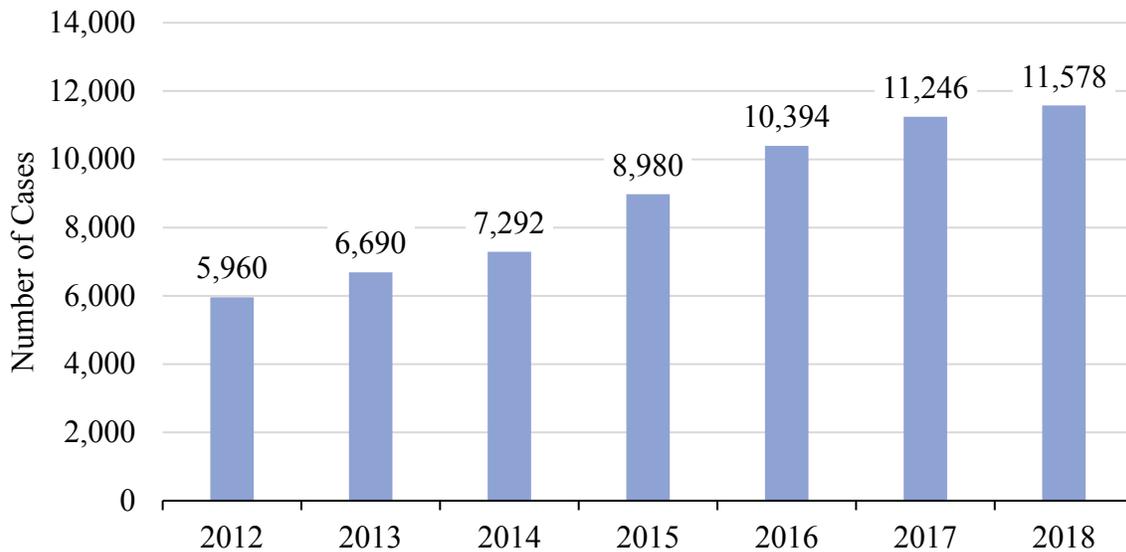
The Department moved all drug screening analysis to the LC/TOF platform in 2018, eliminating the use of Enzyme Link Immunosorbent Assay (ELISA) for drug screening analysis. This move will allow ISDT more flexibility in the future when adding additional drugs to its screening panel. This move did negatively impact the drug backlog. It is ISDT's goal that significant decreases in the backlog and turnaround times for drug analysis will be seen in 2019.

ISDT continued to see an increase in case submissions in 2018, as shown in Chart 1. The Department received 11,578 submissions in 2018, which is 332 more cases than were received in 2017. This averages to 27.66 more cases submitted each month, or a 3% increase over 2017 submissions. Submissions have climbed steadily since the Department's first year as a state agency in 2012, when the Department received 5,960 cases for analysis. The number of 2018 submissions compared to 2012 submissions amounts to an increase of 94% in just seven years.

Cases may be submitted to ISDT for alcohol analysis, drug analysis, or both. Cases submitted in 2018 included 8,368 requests for alcohol analysis and 8,201 requests for drug analysis. In total, the Department received 16,569 requests for analysis in 2018. Due to the number of cases with single requests, the total number of requests decreased in 2018, even though the total number of cases submitted increased.

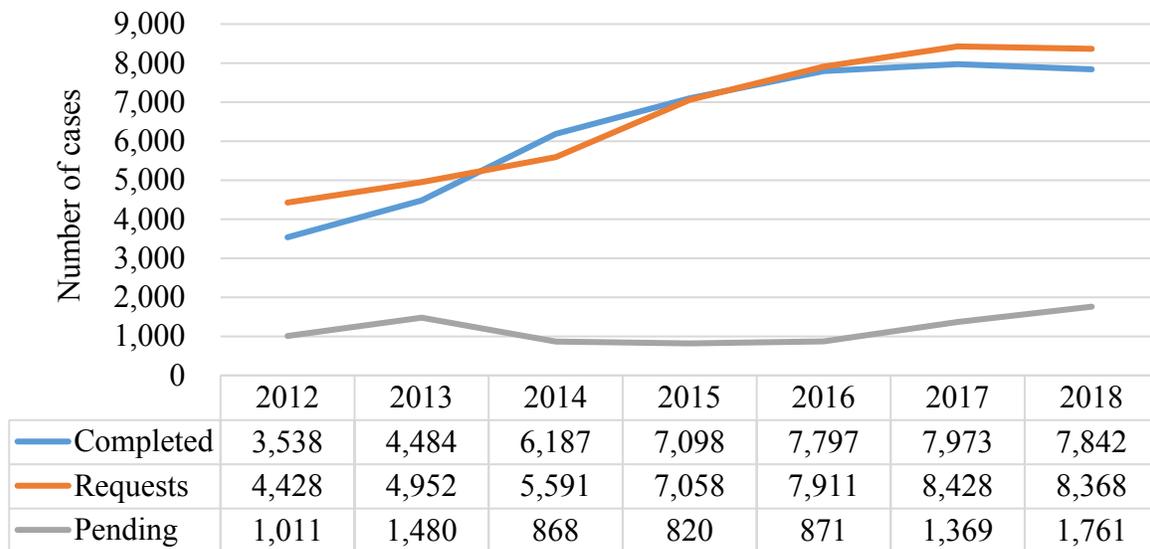
When cases are submitted to ISDT, the submitter indicates offense information on the Toxicology Analysis Request form. The offense information in the 2018 submissions indicated that 59.9% of the cases received by ISDT involved operating a vehicle while intoxicated; 15.7% involved personal injury crashes including serious bodily injury; 13.6% involved property damage crashes, and 3.1% involved fatal crashes, with other types of submissions accounting for the remaining 7.7%. Of the 11,578 cases analyzed, 92.3% of the cases were traffic related. Overall, traffic-related cases decreased by 2.8% as compared to 2017. This may be partially accounted for by the increase in homicide indicated cases.

**Chart 1: Department of Toxicology Submissions**



ISDT completed 7,842 requests for alcohol analysis in 2018, compared to 7,973 requests in 2017, as shown in Chart 2. The number of requests for alcohol analysis pending at the end of 2018 was 1,761. This was slightly higher than the 1,369 cases pending at the end of 2017. In 2018, the number of scientists performing alcohol analysis was limited due to training of a new scientist and another scientist being on extended leave.

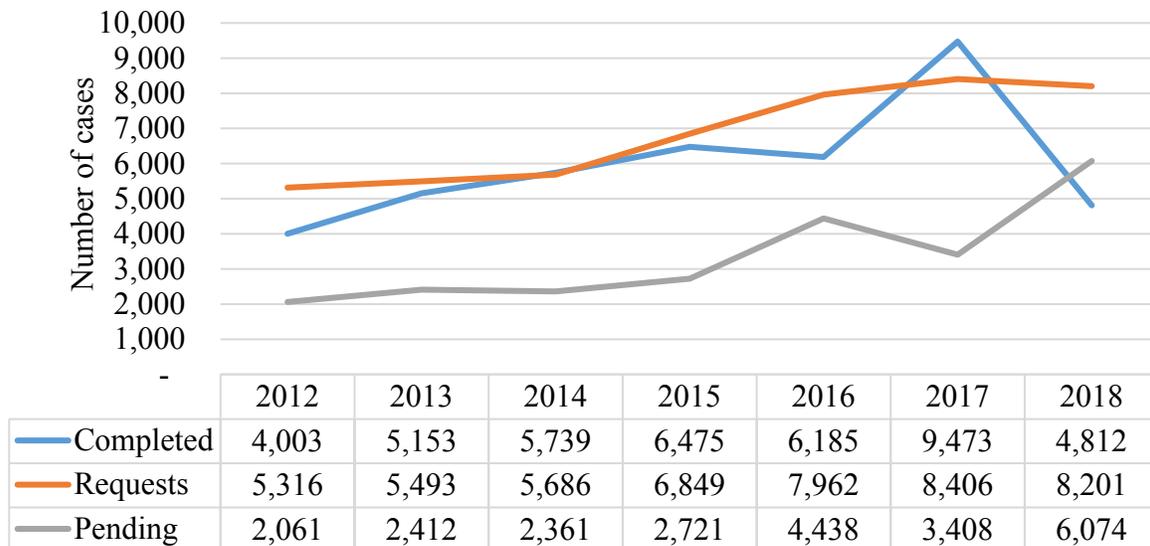
**Chart 2: Alcohol Analyses Completed, Requests, and Pending**



ISDT completed 4,812 requests for drug analysis in 2018, as shown in Chart 3. This was a significant reduction compared to 2017. A limited number of scientists trained to conduct drug screening and staff time spent in validations of new instruments and methods contributed to the decrease in productivity. In addition, backlogs in drug screening limited the number of cases available for confirmatory analysis in 2018. The number of pending requests for drug analysis at

the end of 2018 was 6,074, or approximately 78% more cases than in 2017. Many factors contributed to this increase in the drug analysis backlog, and ISDT has been working to address these issues with an emphasis on significantly reducing the backlogs in 2019.

**Chart 3: Drug Analyses Completed, Requests, and Pending**



Sixty-eight percent of cases screened for drugs in 2018 screened positive for one or more drugs or drug metabolites. Of the cases that screened positive, 35.2% were positive for opioids (with 11.4% being positive for Fentanyl), 33.4% were positive for benzodiazepines/z-drugs; 38.9% were positive for stimulants; 1.5% were positive for muscle relaxants, and less than 1% were positive for barbiturates. Drugs from the cannabinoids drug class were the most common, screening positive in 60.6% of cases with positive drug screens. This year’s distribution was consistent with the 2017 distribution, with the exceptions that stimulants increased from 34% to 38.9% and cannabinoids decreased from 64% to 60.6%.

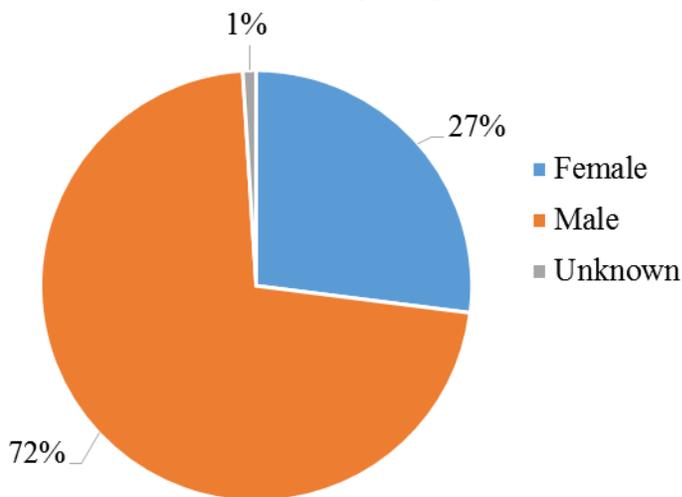
A list of all the drugs and drug metabolites included in the Department’s current drug screening panel can be found on ISDT’s web site “[www.IN.gov/isdt](http://www.IN.gov/isdt).”

**Table 2: Pending Analysis Summary**

	2012	2013	2014	2015	2016	2017	2018
Alcohol Analysis	1011	1480	868	820	871	1369	1761
Drug Analysis	2061	2412	2361	2721	4438	3408	6074
Total	3072	3892	3229	3541	5309	4777	7835
<b>Over 15 Days</b>							
	2012	2013	2014	2015	2016	2017	2018
Alcohol Analysis	856	1390	680	555	681	1062	1492
Drug Analysis	1895	2318	2165	2477	4252	3095	5823
Total	2751	3708	2845	3032	4933	4157	7315
<b>Over 30 Days</b>							
	2012	2013	2014	2015	2016	2017	2018
Alcohol Analysis	691	1063	461	261	396	762	1279
Drug Analysis	1688	1989	1956	2181	3944	2752	5586
Total	2379	3052	2417	2442	4340	3514	6865

As shown in Table 2: Pending Analysis Summary, there were 7,835 pending alcohol and drug requests at the close of 2017. The majority of the requests (77.5%) were for drug analysis. The number of pending alcohol analysis requests increased in 2018 as compared to 2017. Although the average turnaround time for completion of an alcohol analysis request increased from the 2017 turnaround time, it was consistent with the 2016 turnaround time of 54 days.

**Chart 4: Blood Alcohol Analysis by Gender**



As indicated by submitting agencies on Toxicology Analysis Request forms, the majority (72%) of samples submitted for alcohol analysis were from male subjects, with samples from female subjects comprising 27%. The distribution of male and female subjects remained the same in 2018 as reported in 2017. The male-to-female ratio for blood alcohol analysis is also consistent with the ratio of male-to-female breath test subjects: 75% to 25%.

**Chart 5: Blood Alcohol Case Distribution by Results**

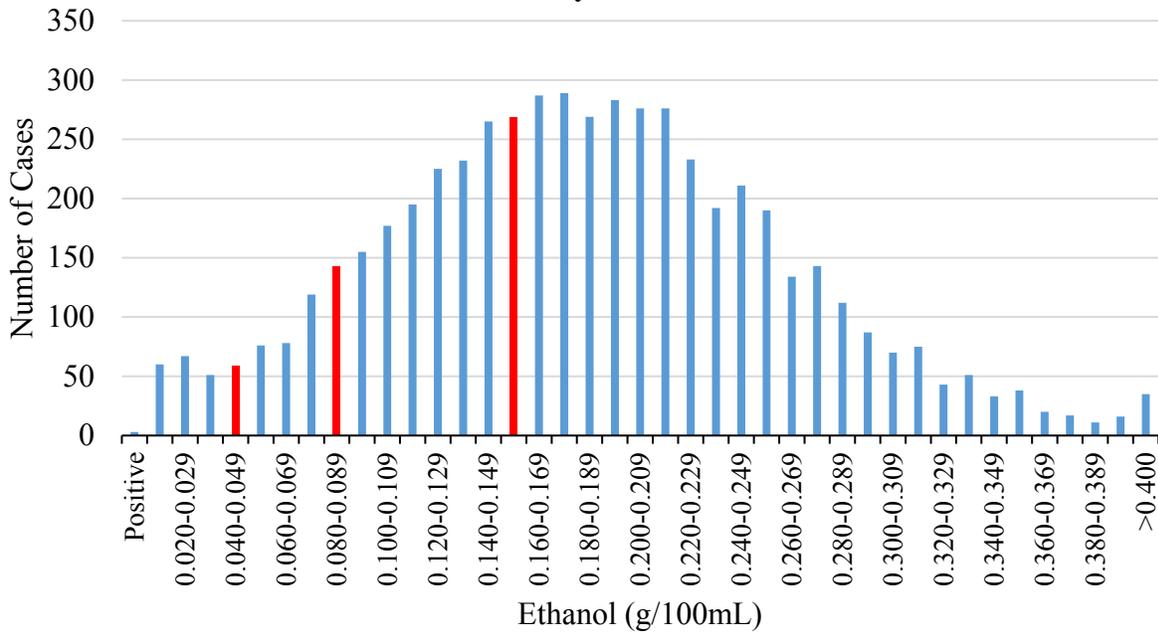
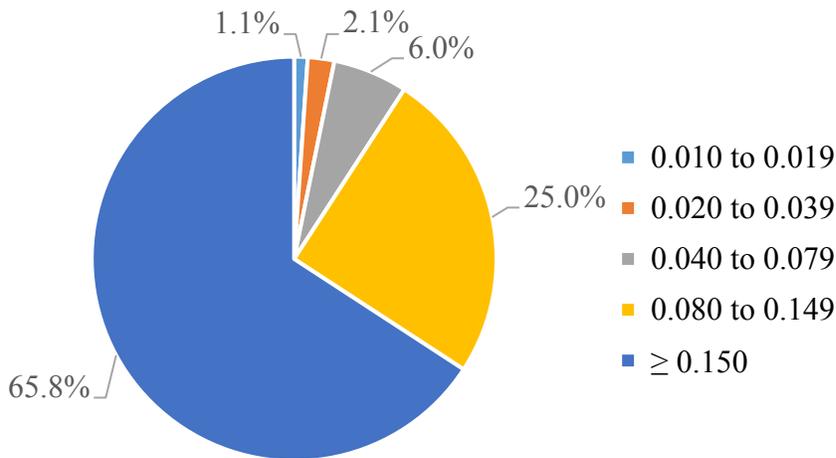


Chart 5 shows the distribution of blood alcohol analysis results by blood alcohol concentration. The red bars indicate the statutory alcohol limits for commercial driver license holders (0.040 g/100 mL of blood), and operation of a vehicle (0.080 and 0.150 g/100 mL of blood).

Of the total number of blood alcohol results reported, 90.8% of the alcohol concentrations were 0.080 g/100 mL of blood or higher, which is consistent with the 90.9% of breath test subjects with alcohol concentrations of 0.080 g/210 L of breath or higher. The percentage of blood test subjects with alcohol concentrations of 0.150 g/100 mL of blood or higher was 65.8% (Chart 6), which is significantly more than the 44% of breath test subjects with alcohol concentrations of 0.150 g/210 L of breath or higher.

**Chart 6: Blood Alcohol Subject Test Results by Selected Ranges**





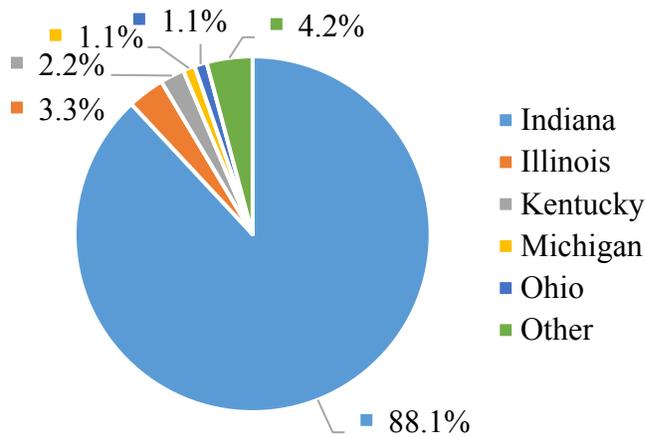
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Table 3 lists the number of breath tests administered in each county.

**Table 3: County and Number of Subject Tests Conducted**

Lake	1835	Howard	192	Washington	88	Sullivan	44
Allen	1205	Boone	189	Vermillion	87	Brown	42
Elkhart	1091	Dearborn	178	Dubois	86	Carroll	42
Marion	993	Cass	172	Jennings	86	Jefferson	40
Porter	829	Bartholomew	168	Wabash	86	Perry	39
Hamilton	811	Warrick	157	Morgan	83	Newton	38
Clark	570	Miami	153	Noble	80	Ripley	38
Hendricks	444	Whitley	151	Greene	78	Crawford	36
Vanderburgh	438	Decatur	137	Montgomery	78	Fayette	35
St. Joseph	428	Grant	132	Owen	78	Marshall	34
Floyd	410	Adams	125	Tipton	77	Ohio	34
Tippecanoe	379	Shelby	120	Scott	75	Martin	32
Monroe	345	Jasper	118	White	72	Switzerland	32
Johnson	344	LaGrange	118	Orange	70	Warren	28
LaPorte	332	Jackson	117	Parke	65	Benton	27
Hancock	283	Putnam	99	Clay	57	Union	26
Madison	259	Harrison	97	Pike	56	Pulaski	23
Henry	251	Knox	97	Fountain	55	Blackford	22
Vigo	242	Steuben	95	Jay	55	Gibson	22
Delaware	223	Wells	94	Randolph	55	Wayne	18
Clinton	218	Huntington	93	Spencer	52	Starke	11
DeKalb	208	Daviess	89	Posey	50	Rush	8
Kosciusko	204	Lawrence	88	Franklin	45	Fulton	3

**Chart 7: State of Issued Driver License**

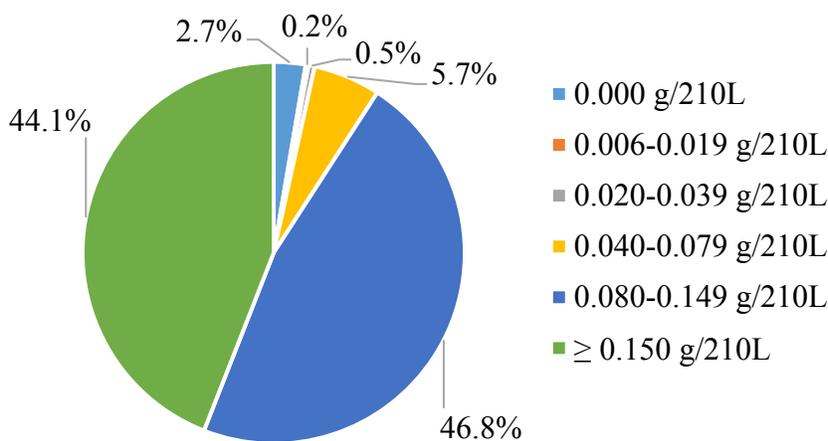


Certified breath test operators administered 12,391 completed subject breath tests in 2018, which is 1,336 fewer than in 2017, and 2,057 fewer than in 2016. This decrease in the number of breath tests could account for some of the increase in laboratory submissions. The seven counties with the greatest number of subject tests administered were the same in 2018 as reported in 2017 and 2016. The actual order varied slightly, but Lake County has consistently had the greatest

number of breath tests administered. These seven counties accounted for approximately 38% of all the breath tests attempted and/or completed in 2018. Of the subjects tested in 2018, 88.1% had licenses from Indiana, 3.3% from Illinois, 2.2% from Kentucky, 1.1% from both Michigan and Ohio, and the remaining 4.2% were from other states and countries. This breakdown by states is consistent with those reported in 2017 and 2016.

Of the subjects whose tests resulted in at least two reported alcohol concentrations, 9% had results between 0.000 and 0.079 g/210 L of breath; 47% had breath alcohol concentrations between 0.080 and 0.149 g/210 L of breath; and 44 % had results of 0.150 g/210 L of breath or higher, as indicated in Chart 8. Subjects with breath alcohol concentrations over 0.040 g/210 L of breath, but under the 0.080 g/210 L of breath limit for vehicle operation, constituted 5.7% of all breath test subjects.

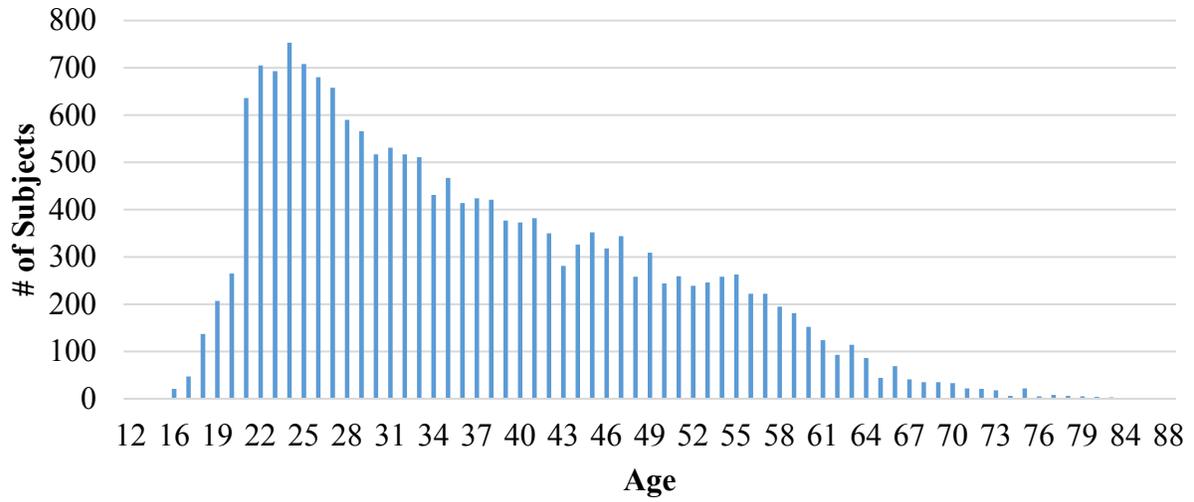
**Chart 8: Breath Alcohol Subject Test Results by Selected Ranges**



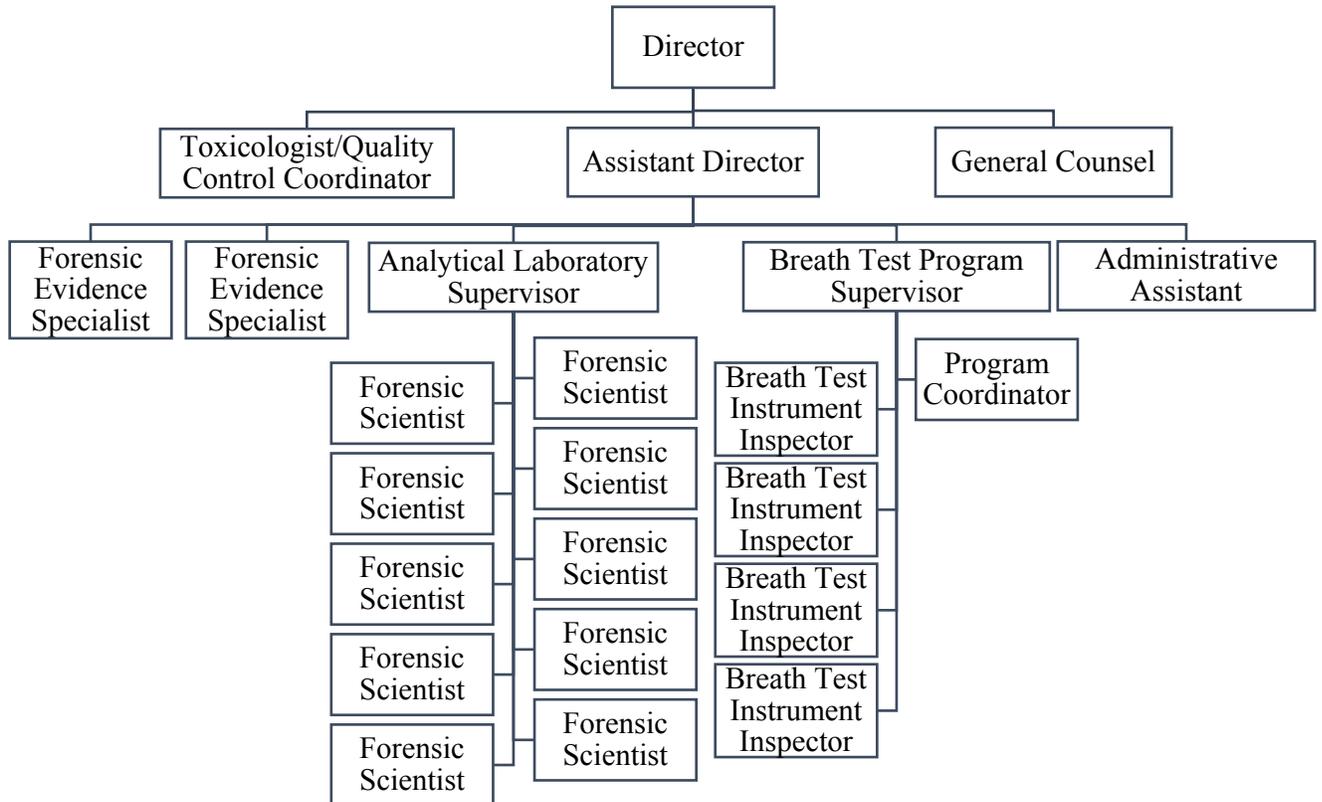
As shown in Chart 9, the age range of subjects tested using the Intox EC/IR II evidentiary breath test instrument was between 12 and 88 years old, with the greatest number of subjects at age 24,

or 4.7 % of all tests attempted. Subjects under age 21 constituted 4.4% of all subjects tested in the 2018 distribution, as compared to 4.6% in 2017.

**Chart 9: Number of Breath Alcohol Subjects Tested by Age**



**Organizational Chart**



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**Contact Information:**

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