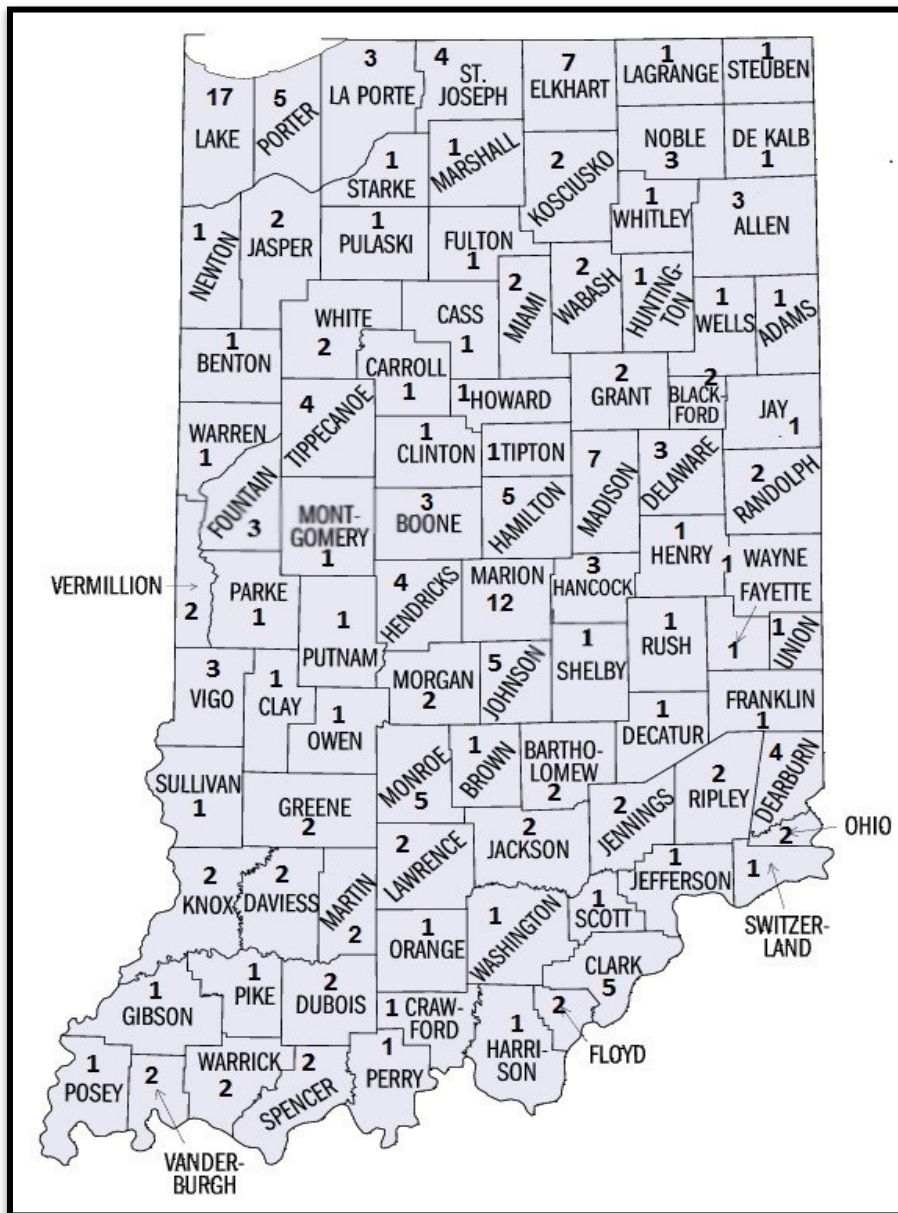


# Indiana State Department of Toxicology

## 2021 Annual Report



Cover:

The map on the front cover shows the distribution in 2021 of the Intox EC/IR II evidentiary breath test instruments deployed in Indiana, totaling 205 instruments dispersed throughout the state's 92 counties.

## **Overview**

The Indiana State Department of Toxicology (ISDT) is comprised of the two primary areas: analytical laboratory services and breath test program. Both areas provide forensic toxicology services for the state of Indiana. ISDT maintained its ongoing accreditation by ANAB in 2021. The result of the audit held in April of 2021 was no findings in either the analytical laboratory services or the breath test program for the second consecutive year.

The mission of ISDT is to provide quality forensic toxicological services and education for the state of Indiana. The Department'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. ISDT's policy of open communication and ability to provide instruction on the science of forensic toxicology facilitates the interpretation and understanding of test results.

## **Budget**

The Department's budget is comprised of general fund appropriations, limited breath test program fees, and, when awarded, federal grants. The Indiana Criminal Justice Institute (ICJI) awarded ISDT \$654,445 in National Highway Traffic Safety Administration grant funds in 2021. These funds will be used for reduction of ISDT's analytical drug case backlog/turnaround times and the purchase of supplies, equipment, and instruments to support the validation of additional drug confirmation test methods. It was ISDT's goal to discontinue outsourcing barbiturate confirmation testing and to provide a more extensive benzodiazepines panel in 2021, but due to staffing issues and an increase in case submissions these goals have been postponed to 2022.

## **Staffing**

ISDT ended 2021 with 21 of its 24 positions filled, as detailed in Table 1. Staffing has remained the same since 2019, but in 2022 the vacant breath test instrument inspector position will be converted to a forensic scientist position, increasing the number of forensic scientists to eleven while maintaining the three filled breath test instrument inspector positions. 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. 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 12/31/21**

<b><i>Position</i></b>	<b><i>Staff</i></b>	<b><i>Position</i></b>	<b><i>Staff</i></b>
Director	1	Analytical Lab Supervisor	1
Assistant Director	1	Forensic Scientist	10
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**

In furtherance of ISDT’s objective of providing education on the science of forensic toxicology, Department personnel provided training on numerous occasions in 2021. The assistant director presented at the IPAC Traffic Safety Conference and instructed a forensic toxicology workshop for Indiana University – Purdue University Indianapolis. The Department toxicologist provided training at three professional meetings, four Law Enforcement Basic courses, two Drug Recognition Expert schools, two prosecutor trainings, and at the statewide Sexual Assault Response Team training. In addition, the breath test program supervisor oversaw thirteen breath test operator training courses.

Several ISDT staff members completed training in 2021. Two forensic scientists attended the Borkenstein Course on Alcohol and Highway Safety: Testing, Research, and Litigation; one scientist and the laboratory supervisor attended the Borkenstein Course on Drugs: Effects on Human Performance and Behavior; one scientist attended the annual conference of the American Academy of Forensic Sciences; the assistant director attended the Leadership Academy I and II of the American Society of Crime Laboratory Directors (ASCLD) and the annual ASCLD symposium; the assistant director and laboratory supervisor attended the annual meeting of the Midwest Crime Laboratory Directors; the department toxicologist attended the annual meeting of the Society of Forensic Toxicologists, and the agency’s general counsel attended the Impaired Driving Defense 101 and Annual DUI Defense Update seminars of the Indiana Continuing Legal Education Forum, as well as the Legal and Ethics Conference of the Indiana Office of Inspector General.

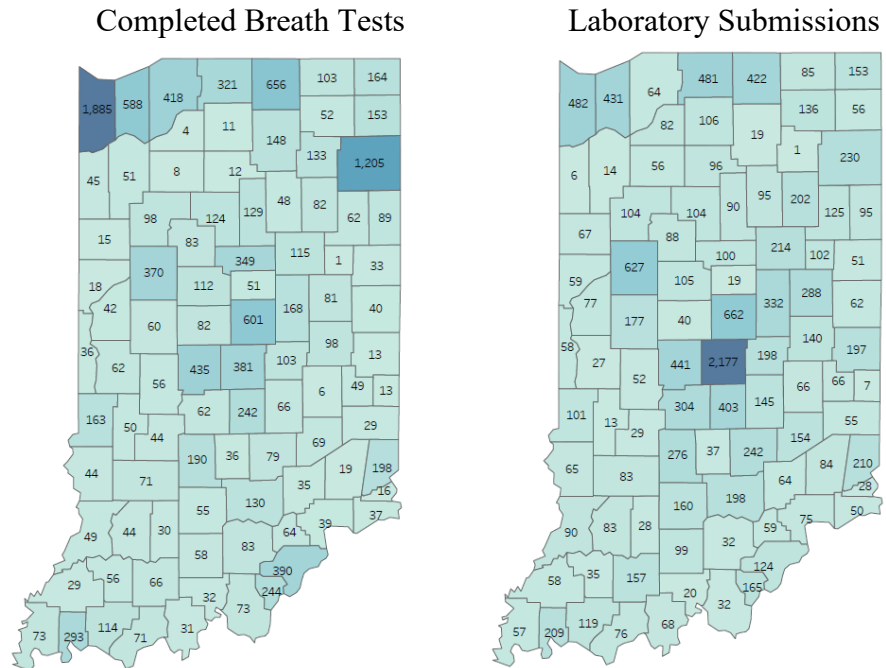
Additionally, three forensic scientists became proficient in additional assays: one in benzodiazepines (increasing the number of scientists trained in this assay to three), one in cannabinoids (increasing the number of scientists trained in this assay to four), and one in the drug screening method (increasing the number of scientists trained in this assay to five).

Two staff members participated in ANAB ISO audits of other forensic laboratories during 2021. This participation involved observing another forensic program and evaluating its compliance with international standards. Participation in these audits allows ISDT personnel the opportunity to see how other forensic laboratories are managed. and information gained from these audits helps ISDT strengthen its own analytical and breath test programs.

## Customers

The maps on the right depict by county the numbers of completed evidentiary breath tests administered (*see* map on left) and the numbers of cases submitted to ISDT for laboratory analysis (*see* map on right) in 2021. By statute all evidentiary breath tests are required to be performed on instruments certified by ISDT; consequently, the numbers of breath tests provided here account for all evidentiary breath tests conducted in the state last year. The numbers of laboratory submissions provided here, however, only account for cases submitted to ISDT rather than all 2021

**Figure 1: Maps of breath test completions and laboratory submissions in 2021**



laboratory case submissions, as law enforcement agencies may have specimens tested by laboratories other than ISDT (e.g., private laboratories, other public laboratories, hospitals).

## Testimony

The Department received approximately 1,520 subpoenas in 2021, which was a 47% increase from the 1,040 subpoenas received in 2020, which, in turn, was a 32% increase from the number of subpoenas received in 2019. These increases can, in part, be attributed to trial cancellations and rescheduling due to COVID. ISDT personnel provided testimony 82 times in 2021, compared to 56 times in 2020 and 58 times in 2019. Testimony was provided 46 times by forensic scientists, 2 times by breath test instrument inspectors, 6 times by the assistant director, 3 times by the breath test program supervisor, and 25 times by the forensic toxicologist. Testimony includes depositions and court appearances related to laboratory testing, breath test procedures, and interpretation of laboratory and breath test results.

## Analytical Laboratory Services

ISDT analyzed blood specimens submitted by 435 agencies, compared to 407 agencies in 2020 and 392 agencies in 2019. Submissions were received from coroners, town marshals, and state and local law enforcement agencies. ISDT received cases from 16 agencies that had not made previous submissions to ISDT and from 44 agencies that did not submit cases in 2020 but had submitted cases in previous years. Most agencies submit specimens for analysis in evidence collection kits provided by the Department. ISDT encourages agencies to return expired ISDT-

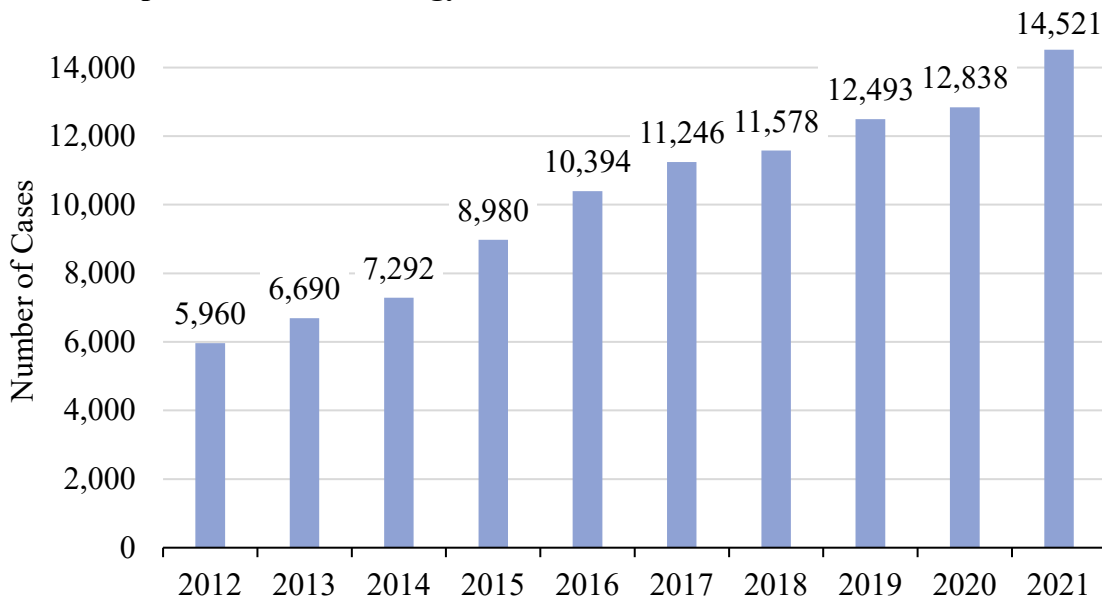
furnished evidence collection kits for refurbishment and redistribution. Each refurbished kit results in cost savings to the Department of approximately \$3.00.

ISDT continued to see an increase in case submissions (as shown in Chart 1) in 2021 as compared to previous years. The Department received 14,521 case submissions in 2021, which is a 13% increase from the number received in 2020 and 144% from the number received in 2012.

Cases may be submitted to ISDT for alcohol analysis, drug analysis, or both. Cases submitted in 2021 included 10,548 requests for alcohol analysis and 9,466 requests for drug analysis, making 2021 the first year ISDT has ever received more than 10,000 alcohol analytical requests. In total, the Department received 20,014 requests for analysis in 2021, or 11% more requests than in 2020. Of the cases submitted, 5,083 (35%) had requests for both alcohol and drug analyses, while 65% of the cases submitted had requests for either alcohol or drug analysis only.

In 2021 the average time from receipt of a case specimen to entry of the analysis request into the Department's Laboratory Management Information System (LIMS) was 1.6 days, which is approximately the same as in 2020. The average time from request for alcohol analysis to issuance of a laboratory report was 23.3 days, which is an increase of 5.8 days from 2020. For a drug analysis request, the average time from request to report issuance was 55.4 days, or an increase of approximately 12 days from 2020. The increase in case submissions, an increase in extended leave times of forensic scientists, and greater turnaround times by the laboratory to which ISDT outsources some testing all contributed to these increases. The time between request entry and report issuance varied in individual cases depending on whether case screening results were presumptively positive or negative and, for drug cases, whether one or multiple drugs were detected.

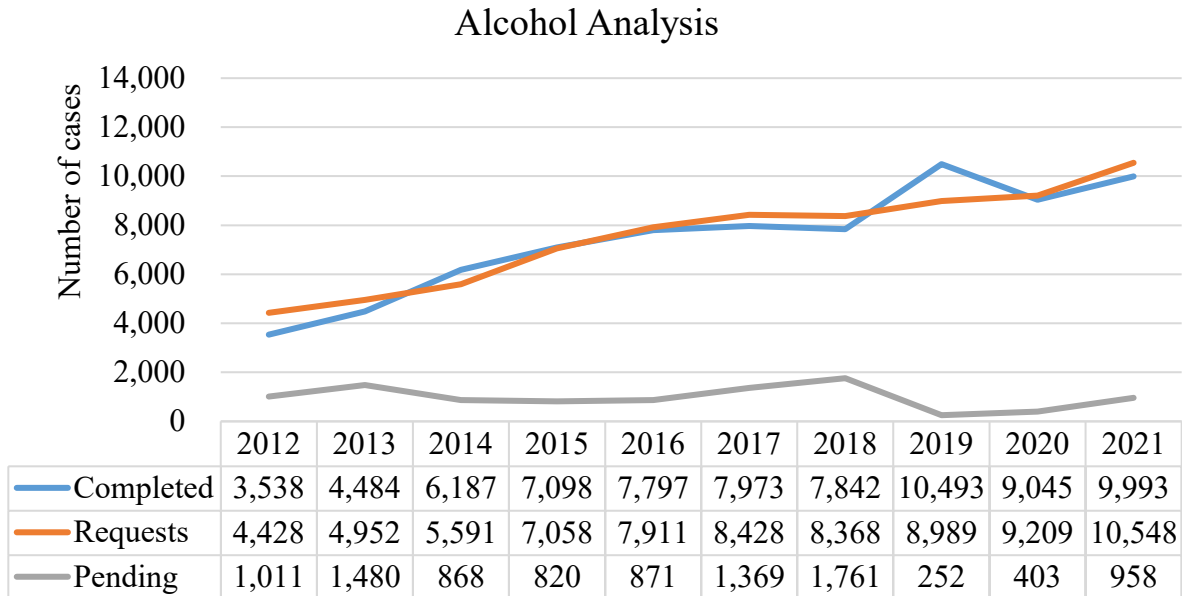
**Chart 1: Department of Toxicology Submissions**



ISDT completed 9,993 requests for alcohol analysis in 2021, which was the highest number in any one year except for 2019, as shown in Chart 2. The number of cases pending alcohol

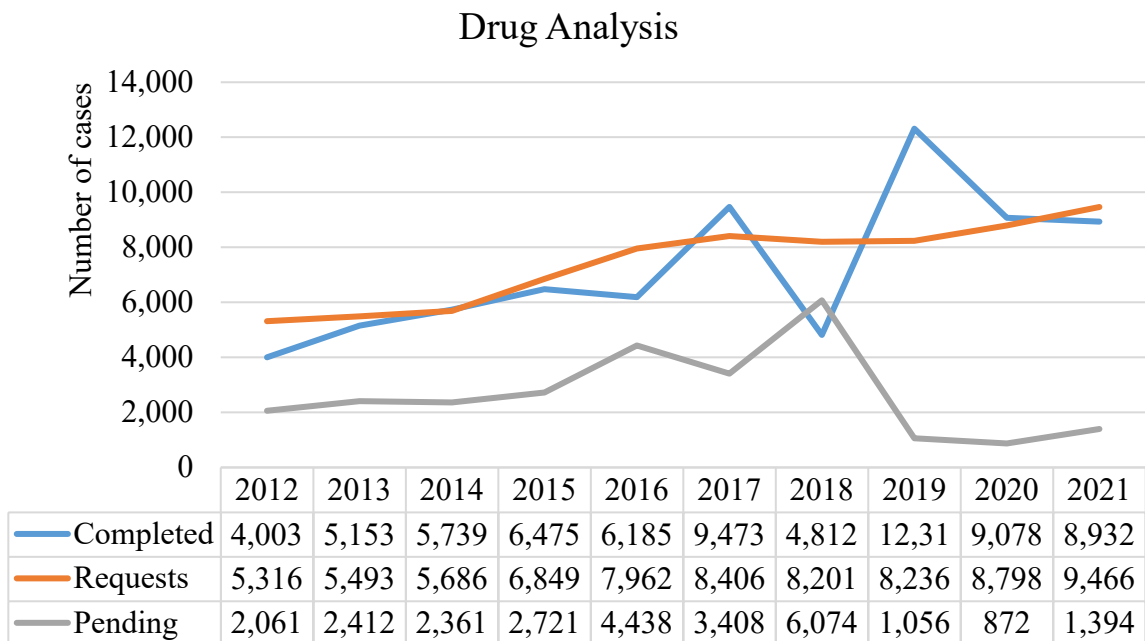
analysis at the end of 2021 was higher than in 2020 or 2019, but it is anticipated that this trend will be reversed in 2022 with the hiring of an additional forensic scientist. While outsourcing has been used for some drug analysis over the past ten years, all alcohol analysis during that period has been completed by ISDT staff.

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



The number of cases pending drug analysis at the end 2021 was greater than in 2020 due to the factors listed above; increase case submissions, increase in scientist’s leave times, and greater turnaround times by the outsource laboratory.

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



Of the cases ISDT screened for drugs in 2021, 71.1% were positive for one or more drugs or drug metabolites, which was relatively consistent with 2020. Of the cases with positive drug screens, 29.2% were positive for opioids, which was also consistent with 2020. From 2020 to 2021 positive screens for benzodiazepines/z-drugs decreased by 0.6% from 20.8% to 18.8%, while positive screens for stimulants increased from 37.3% to 39.6%. Positive screens for barbiturates dropped from 0.8% in 2020 to 0.7% in 2021. Positive screens for drugs from the cannabinoids class continued to increase in 2021: to 53.4%, as compared to 52.1% in 2020 and 40.4% in 2019.

As shown in Table 2: Pending Analysis Summary, there were 2,352 alcohol and drug analysis requests pending at the close of 2021, which was significantly higher than at the end of 2020. As the number of pending cases has increased, so have the ages of the cases awaiting analysis.

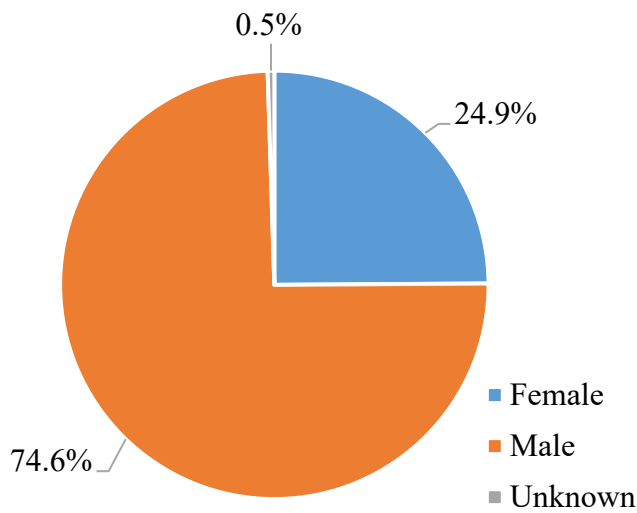
**Table 2: Pending Analysis Summary**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Alcohol Analysis	1011	1480	868	820	871	1369	1761	252	403	958
Drug Analysis	2061	2412	2361	2721	4438	3408	6074	1056	872	1394
Total	3072	3892	3229	3541	5309	4777	7835	1308	1275	2352
Over 15 Days	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Alcohol Analysis	856	1390	680	555	681	1062	1492	6	68	652
Drug Analysis	1895	2318	2165	2477	4252	3095	5823	783	556	1173
Total	2751	3708	2845	3032	4933	4157	7315	789	624	1825
Over 30 Days	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Alcohol Analysis	691	1063	461	261	396	762	1279	3	2	207
Drug Analysis	1688	1989	1956	2181	3944	2752	5586	483	261	790
Total	2379	3052	2417	2442	4340	3514	6865	486	263	997

Agencies submitting specimens to ISDT for testing indicate offense information on the Toxicology Analysis Request form (TAR). In 2021, 67.1% of the requests ISDT received were related to investigations of operation of a vehicle while intoxicated; 16.8% were related to personal injury crashes, including those involving serious bodily injury; 18.3% were related to property damage crashes, and 3.1% were related to fatal crashes, with other request types accounting for 9.5% of case submissions (i.e., other traffic, juvenile, death investigation, homicides, and unknown). (The total of these percentages is greater than 100 due to some officers indicating multiple offenses on the TAR.) Of the 14,521 cases received in 2021, 95% were traffic related, which was consistent with 2020.



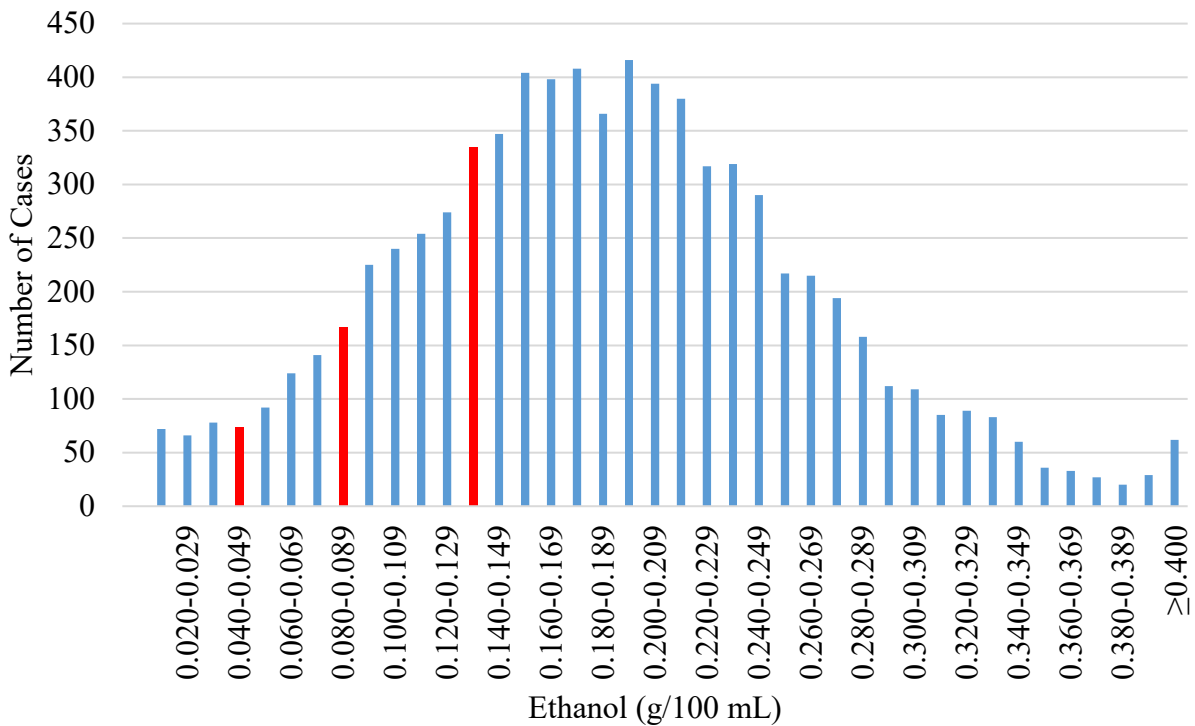
**Chart 4: Blood Alcohol Analysis by Gender**



As indicated by submitting agencies on the TAR, the majority (74.6%) of specimens submitted for alcohol analysis were from male subjects, and 24.9% were from female subjects, which is consistent with past years. (In 0.5% of cases gender was not indicated.) The male-to-female ratio for blood alcohol analyses is consistent with the ratio of male-to-female breath test subjects of 75.2% to 24.8%.

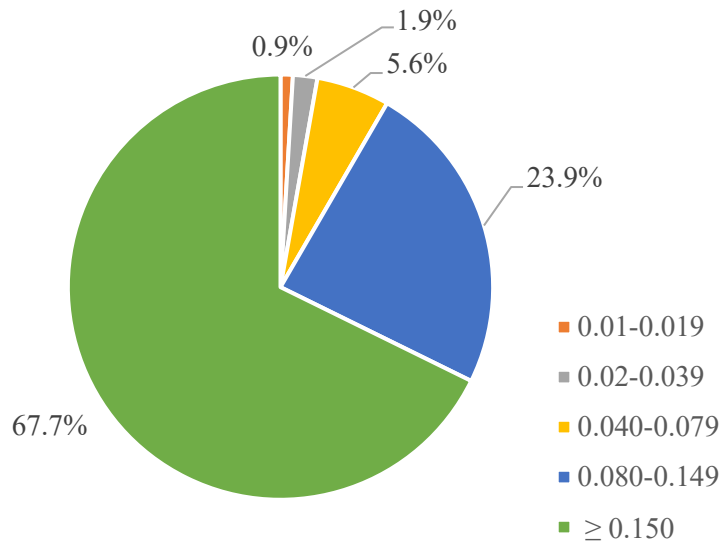
Chart 5 shows the distribution of blood alcohol analysis results by blood alcohol concentration. The red bars indicate the statutory alcohol limits for commercial driver license holders (0.040 g/100 mL of blood) and operation of a vehicle (0.080 and 0.150 g/100 mL of blood).

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



Of the total number of blood alcohol concentrations reported, 91.7% were greater than or equal to 0.080 g/100 mL of blood, which is consistent with the 93% of breath test subjects (Chart 9) with alcohol concentrations greater than or equal to 0.080 g/210 L of breath. The percentage of blood test subjects with alcohol concentrations greater than or equal to 0.150 g/100 mL of blood was 67.8% (Chart 6), which is significantly greater than the 47.1% of breath test subjects with alcohol concentrations greater than or equal to 0.150 g/210 L of breath (Chart 9).

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



### **Breath Test Program**

The online breath test operator training and recertification program is accessible from the ISDT website ([www.IN.gov/isdt](http://www.IN.gov/isdt)). The website also includes instructions for ordering evidence collection kits, sample submission protocols, lists of drugs included in testing, available breath test operator training, breath test program fees, 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 with contact information for the device providers.

There are currently ten ignition interlock device models certified by ISDT. Certifications are valid for three years. Three device models were recertified in 2021. Vendors of certified device models reported that 1,505 ignition interlock devices were installed in vehicles in Indiana at the beginning of December 2021, compared to 1,541 in 2020. This number is a snapshot in time and does not reflect all devices installed over the course of the entire year.

Indiana Administrative Code Title 260 requires ISDT to inspect and certify each breath test instrument deployed for evidentiary use at least once every 180 days. All breath test instrument inspections and certifications remained current during 2021, with over 850 inspections completed by ISDT's three breath test instrument inspectors. The measurement uncertainty for each evidentiary breath test instrument is calculated as part of each inspection and is reported on the breath test instrument certification as required by ISO/IEC 17025 accreditation standards.

ISDT conducted 13 breath test operator classes at the Indiana Law Enforcement Academy in 2021, with enrollment for each class limited to 40 students. A total of 480 law enforcement officers were trained and certified as breath test operators in 2021. At the end of 2021, statewide there were 4,696 certified breath test operators employed by 342 law enforcement agencies. (The

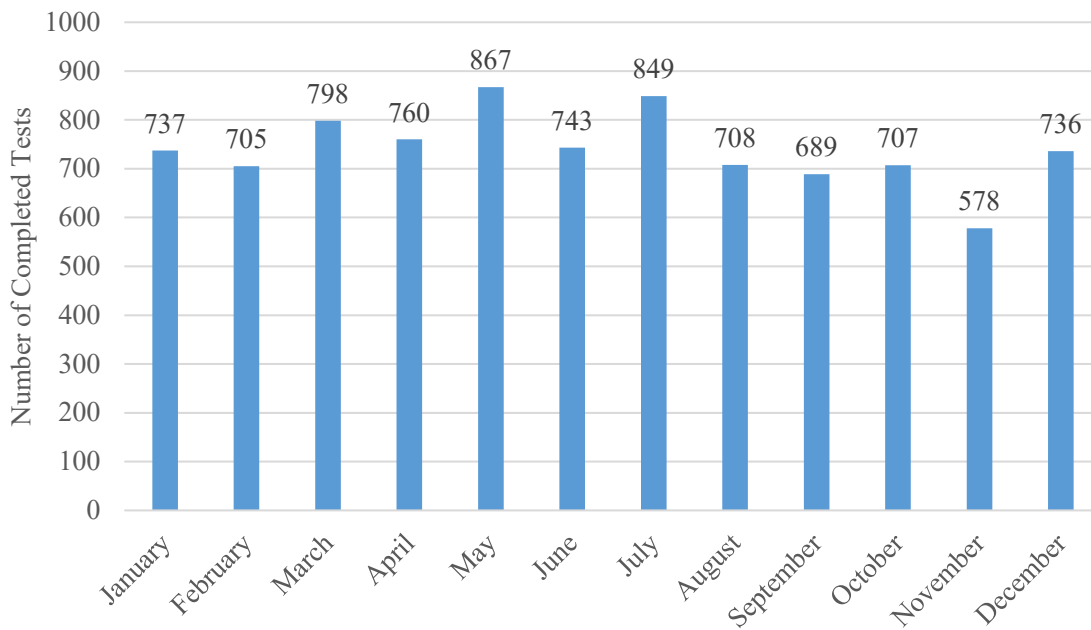
significantly higher number of law enforcement agencies reported in 2020 may have been the result of the way the numbers were obtained.)

To maintain certification, a breath test operator must be recertified at least every two years from the month of the last certification or recertification. The number of recertifications each year is determined by the number of certifications that expire during that year. Upon deployment of the Intox EC/IR II breath test instrument in 2014, ISDT provided training to all certified breath test operators, who were then recertified, resulting in a majority of breath test operators being recertified in even-numbered years. In 2021, 966 operators were recertified, as compared to 2,825 operators in 2020 and 802 operators in 2019.

There were 13,536 attempted breath tests in 2021, with 8,877 tests (66%) completed, for an increase of 88 breath tests from the number completed in 2020. (A breath test is completed when the subject delivers two breath samples with measurable results that agree with each other within 0.020 g/210L of breath.)

The number of breath tests completed each month during 2021 is shown in Chart 7 (Number of attempted tests by county is shown in Table 3).

**Chart 7: Number of Completed Breath Tests by Month**

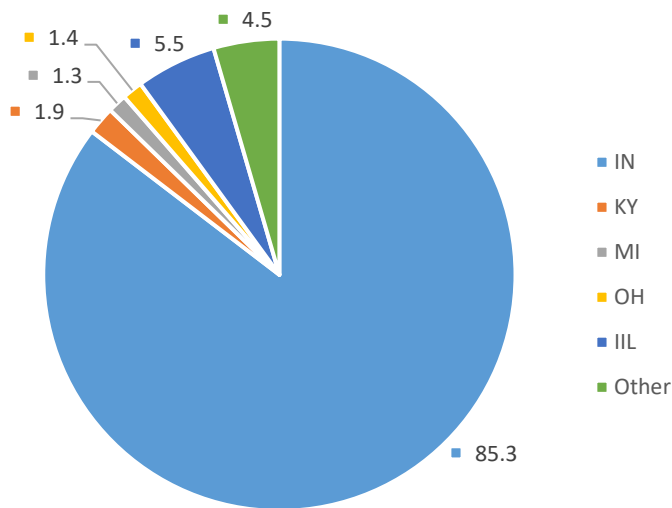


The six counties with the highest number of attempted breath tests have remained consistent, with few exceptions, over the last six years with Lake County having the highest number. The ten counties with the most attempted breath tests account for approximately 51% of all attempted breath tests in 2021.

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

Lake	1885	Jackson	130	Dubois	66	Jefferson	39
Allen	1205	Miami	129	Scott	64	Switzerland	37
Elkhart	656	Cass	124	Wells	62	Vermillion	36
Hamilton	601	Grant	115	Parke	62	Brown	36
Porter	588	Warrick	114	Morgan	62	Jennings	35
Hendricks	435	Clinton	112	Montgomery	60	Jay	33
LaPorte	418	LaGrange	103	Orange	58	Crawford	32
Clark	390	Hancock	103	Putnam	56	Perry	31
Marion	381	White	98	Pike	56	Martin	30
Tippecanoe	370	Henry	98	Lawrence	55	Gibson	29
Howard	349	Adams	89	Noble	52	Franklin	29
St. Joseph	321	Washington	83	Tipton	51	Ripley	19
Vanderburgh	293	Carroll	83	Jasper	51	Warren	18
Floyd	244	Huntington	82	Clay	50	Ohio	16
Johnson	242	Boone	82	Knox	49	Benton	15
Dearborn	198	Delaware	81	Fayette	49	Wayne	13
Monroe	190	Bartholomew	79	Wabash	48	Union	13
Madison	168	Posey	73	Newton	45	Fulton	12
Steuben	164	Harrison	73	Sullivan	44	Marshall	11
Vigo	163	Spencer	71	Owen	44	Pulaski	8
DeKalb	153	Greene	71	Daviess	44	Rush	6
Kosciusko	148	Decatur	69	Fountain	42	Starke	4
Whitley	133	Shelby	66	Randolph	40	Blackford	1

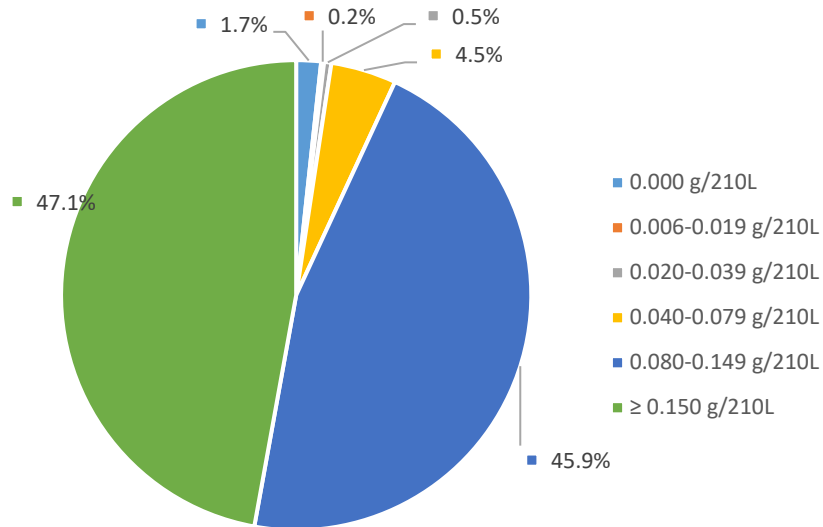
**Chart 8: State of Issued Driver License**



Of the subjects tested in 2021, 85.3% had licenses from Indiana, 5.5% from Illinois, 1.9% from Kentucky, 1.4% from Ohio, 1.3% from Michigan, and the remaining 4.5% were from other states and countries. These numbers are consistent with those reported each year since 2016 when tracking of this information began.

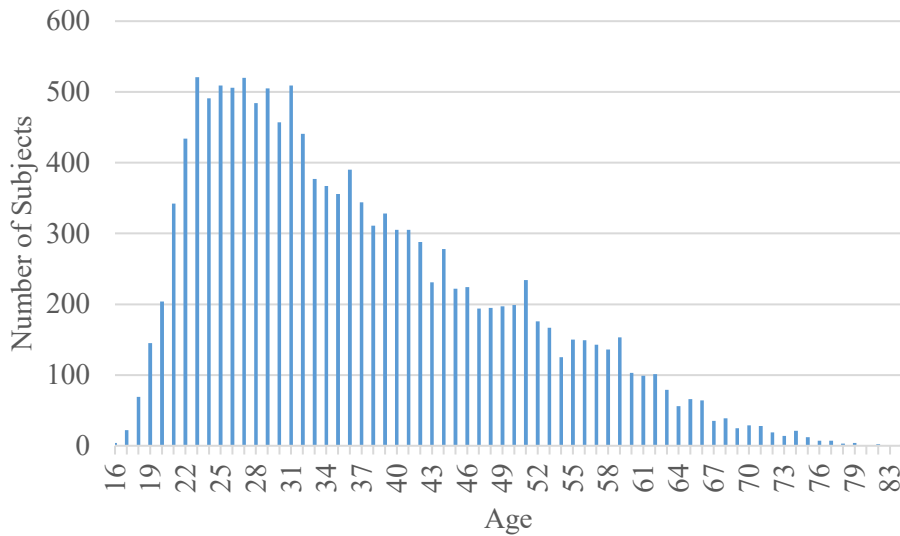
**Chart 9: Subject Breath Alcohol Test Results by Selected Ranges**

Of the subjects with completed breath tests, approximately 7% had results between 0.000 and 0.079 g/210 L of breath; 45.9% had results between 0.080 and 0.149 g/210 L of breath, and 47.1% had results greater than or equal to 0.150 g/210 L of breath, as indicated in Chart 9. The number of subjects with breath alcohol concentrations greater than 0.150 g/210 L of breath was slightly higher in 2021 than in 2020. The number of subjects with a 0.00 breath alcohol concentration was consistent with 2020 and 2019.

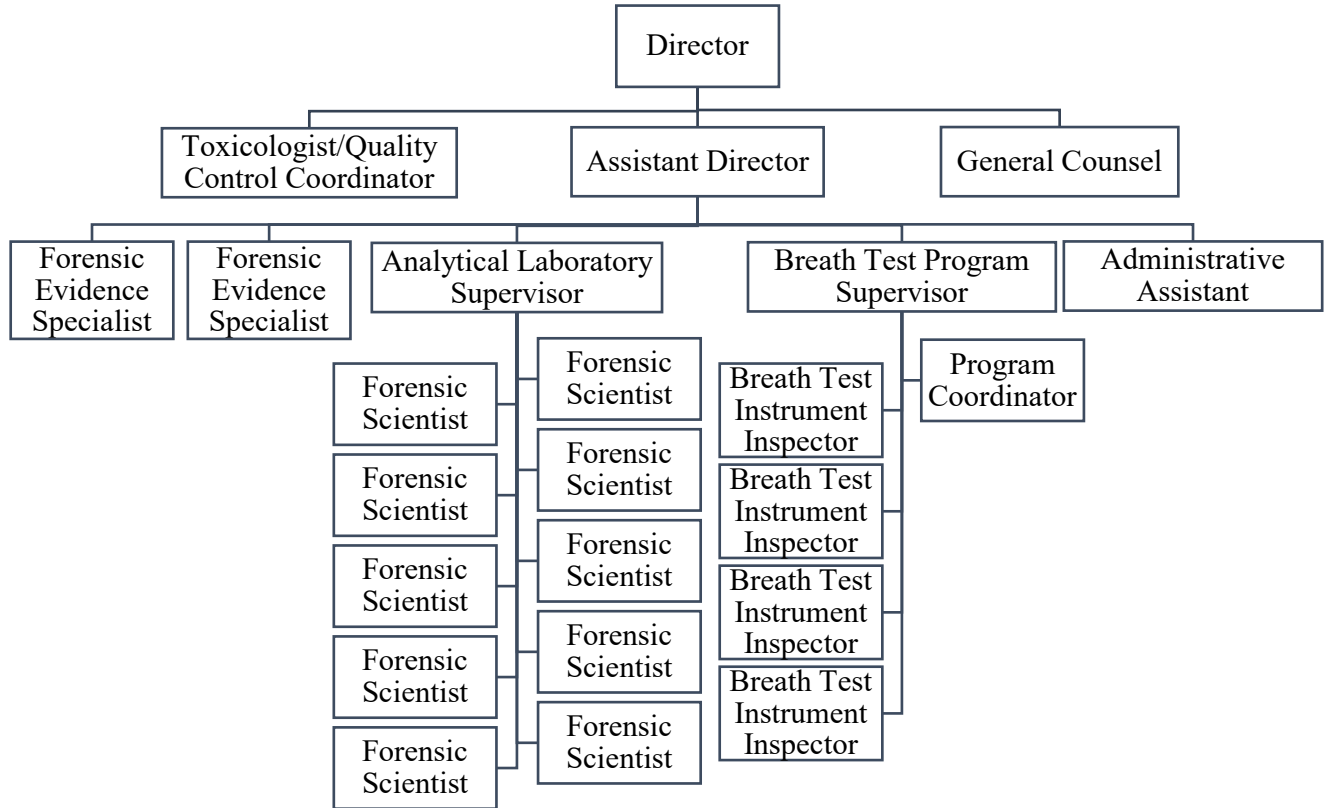


As shown in Chart 10, the subjects tested on the Intox EC/IR II evidentiary breath test instrument were between 16 and 84 years of age, with the greatest number of subjects at 23 years of age. Subjects under age 21 constituted approximately 3.3% in the 2021 distribution, compared to 5% in 2020, 3.8% in 2019, 4.4% in 2018, and 4.6% in 2017.

**Chart 10: Number of Breath Alcohol Test Subjects by Age**



# Organizational Chart



## **Contact Information:**

### **Indiana State Department of Toxicology**

550 W. 16th Street, Suite A  
Indianapolis, IN 46202-2203

Web: [www.IN.gov/isdt](http://www.IN.gov/isdt)



General agency number	(317) 921-5000
Fax	(317) 925-9430
Director	Ed Littlejohn (317) 921-5006 <a href="mailto:elittlejohn@isdt.IN.gov">elittlejohn@isdt.IN.gov</a>
Assistant Director	Christina Beymer, Ph.D. (317) 921-5005 <a href="mailto:cbeymer@isdt.IN.gov">cbeymer@isdt.IN.gov</a>
General Counsel	Teri Kendrick (317) 921-5002 <a href="mailto:tkendrick@isdt.IN.gov">tkendrick@isdt.IN.gov</a>
Forensic Toxicologist Quality Control Coordinator	Sheila A. Arnold, Ph.D. (317) 921-5003 <a href="mailto:sarnold1@isdt.IN.gov">sarnold1@isdt.IN.gov</a>
Analytical Lab Supervisor	Stephen A. Davis, Ph.D. (317) 921-5004 <a href="mailto:stdavis@isdt.IN.gov">stdavis@isdt.IN.gov</a>
Breath Test Program Supervisor	Dana Bors, Ph.D. (317) 921-5008 <a href="mailto:dbors@isdt.IN.gov">dbors@isdt.IN.gov</a>