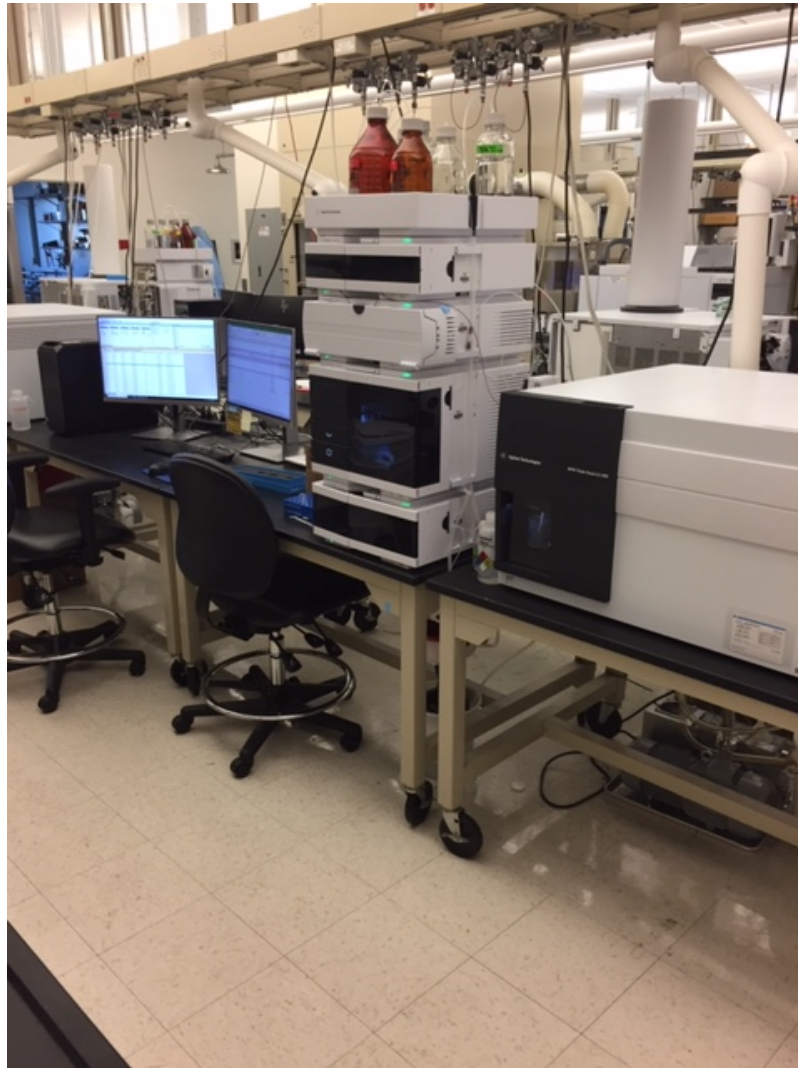


Indiana State Department of Toxicology

2020 Annual Report



Cover photo:

The front cover shows one of the two Liquid Chromatograph Mass Spectrometers (LC/QQQ) at the State Department of Toxicology. The Department uses these instruments to perform confirmation testing of blood samples for benzodiazepines, stimulants, and opioids*. Visit <https://www.in.gov/isdt/> for a complete list of the drug and metabolite screening and confirmation testing performed by ISDT.

*The Department has performed screening for opioids since 2017 and added opioids confirmation testing to its capabilities in July of 2020, increasing the number of drugs and metabolites it confirms from 26 to 43, not including alcohol analysis.

Overview

The Indiana State Department of Toxicology (ISDT) is divided into the two primary areas analytical laboratory services and the breath test program. Both areas provide forensic toxicological services for the state of Indiana. ISDT continued its ongoing accreditation by ANAB in 2020. The audit held in April of 2020 resulted in no findings in either the analytical laboratory services or the breath test program.

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 budget is comprised of general fund appropriations, limited breath test program fees, and, when awarded, federal grants. In 2020 the Indiana Criminal Justice Institute (ICJI) awarded ISDT \$281,201 from unspent 2019 funds and \$373,244 in new funds, for a total award of \$654,445 in National Highway Traffic Safety Administration grant funds. These funds will be used for reduction of ISDT's analytical drug case backlog/turnaround times, the purchase of supplies and equipment/instrumentation to support the validation and analysis of barbiturate confirmation testing, and expansion of the current benzodiazepines confirmation panel. It is ISDT's goal to discontinue outsourcing barbiturate confirmation testing and to provide a more extensive benzodiazepines panel in 2021.

Staffing

ISDT ended 2020 with 21 of its 24 positions filled, as detailed in Table 1. Staffing has remained the same from 2019. 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 12/31/20

| <i>Position</i> | <i>Staff</i> | <i>Position</i> | <i>Staff</i> |
|-----------------------------|---------------------|----------------------------------|---------------------|
| 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

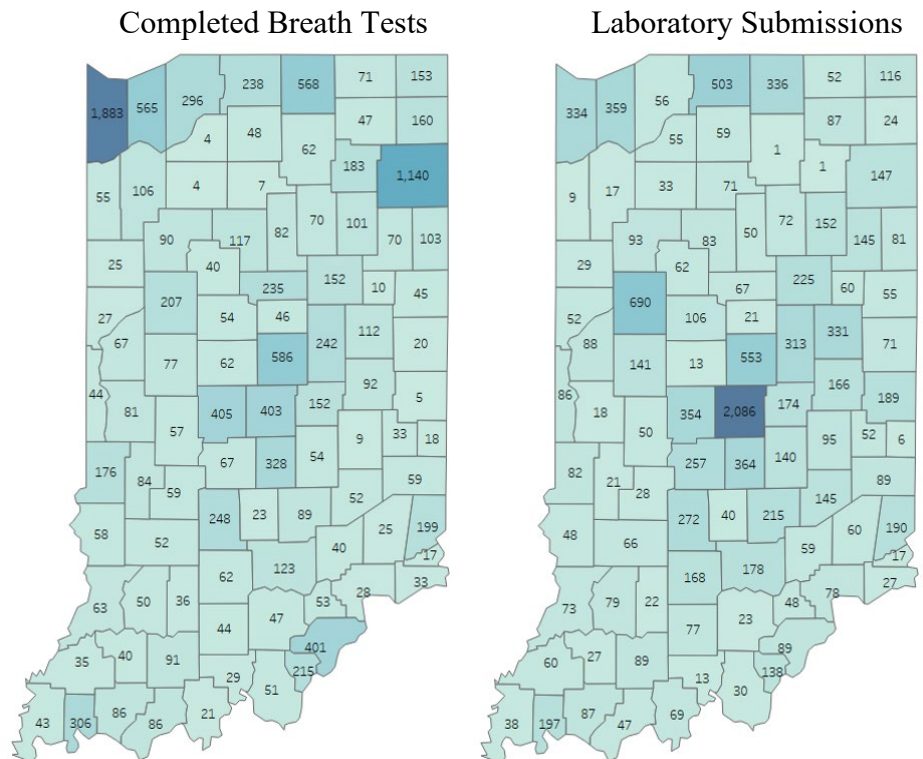
In furtherance of ISDT’s objective of providing education on the science of forensic toxicology, Department personnel provided training on numerous occasions in 2020. The Department toxicologist provided training at two Drug Recognition Expert schools and one Indiana Law Enforcement Academy Police Basic Training school. The toxicologist also provided training for the Marion County Prosecutor’s office, the Laporte-Starke Regional SART meeting, and the DFSA meeting for the Academy of Forensic Nurses. The assistant director was a guest lecturer at Purdue University.

Several ISDT staff members received training in 2020. Two forensic scientists became proficient in opioid confirmation testing as part of the opioid confirmation panel validation process, and another scientist was trained in THC analysis. One forensic scientist attended the ANAB Assessor training, bringing the number of staff who have received this training to four. The ANAB training allows ISDT staff to participate in accreditation audits of other forensic laboratories, which provides opportunities to observe other forensic programs. The information gained from these audits helps ISDT strengthen its own analytical and breath test programs. Finally, the department toxicologist attended several online trainings, and the general counsel attended the annual OVWI defense seminar and the Legal and Ethics Conference of the Indiana Office of Inspector General.

Customers

The following maps depict by county the numbers of completed evidentiary breath tests administered (*see* map on left) and the number of cases submitted to ISDT for laboratory analysis (*see* map on right) in 2020. By statute all evidentiary breath tests are required to be performed on instruments certified by ISDT, so 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 those cases submitted to ISDT and do not account for all 2020 Indiana law enforcement

Figure 1: Maps of breath test completions and laboratory submissions in 2020



laboratory submissions, as law enforcement agencies may choose to use laboratories other than ISDT's (e.g., private laboratories, other public laboratories, hospitals) for their analysis.

Testimony

The Department received approximately 1,040 subpoenas in 2020, which is an increase of 32% compared to 2019. Despite this increase, actual testimony was provided 56 times in 2020 as compared to 58 times in 2019. Testimony was provided twenty times by forensic scientists, seven times by the assistant director, three times by the breath test program supervisor, and twenty-six 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. Sixteen times in 2020 ISDT personnel appeared at courts in response to subpoenas but did not testify due to plea agreements, continuances, or other case resolutions.

Blood Analysis

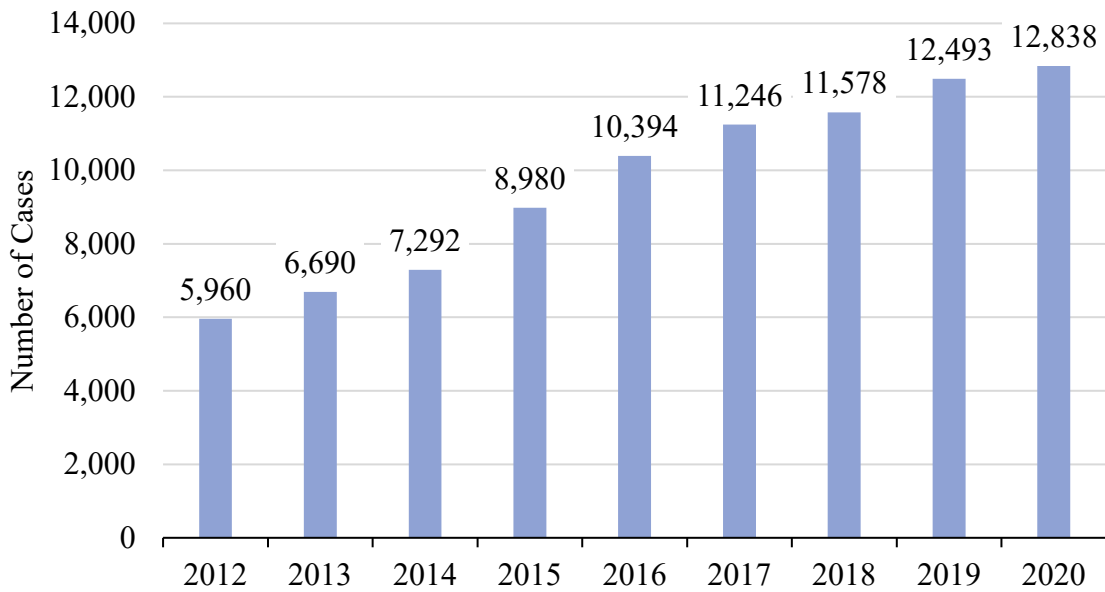
ISDT analyzed blood specimens submitted by 407 agencies in 2020 compared to 392 agencies in 2019. Submissions were received from coroners, town marshals, municipal and county departments, and state law enforcement agencies. ISDT received cases from sixteen agencies that had not previously submitted cases to ISDT and from 53 agencies that did not submit cases in 2019 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 expired kit returned to the agency results in cost savings to the Department of approximately \$3.00 per kit.

ISDT continued to see an increase in case submissions in 2020 as compared to previous years, as shown in Chart 1. The Department received 12,838 submissions in 2020, which is 345 more submissions than were received in 2019, or an increase of approximately 2.8%. This equates to a 115% increase in case submissions since 2012.

Cases may be submitted to ISDT for alcohol analysis, drug analysis, or both. Cases submitted in 2020 included 9,209 requests for alcohol analysis and 8,798 requests for drug analysis. In total, the Department received 18,007 requests for analysis in 2020 compared to 17,225 in 2019, or a 4.5% overall increase in analysis requests. Of the cases submitted, 5,061, or 39.4%, had requests for both alcohol and drug analyses, while 60.6% of the cases submitted had requests for either alcohol or drug analysis.

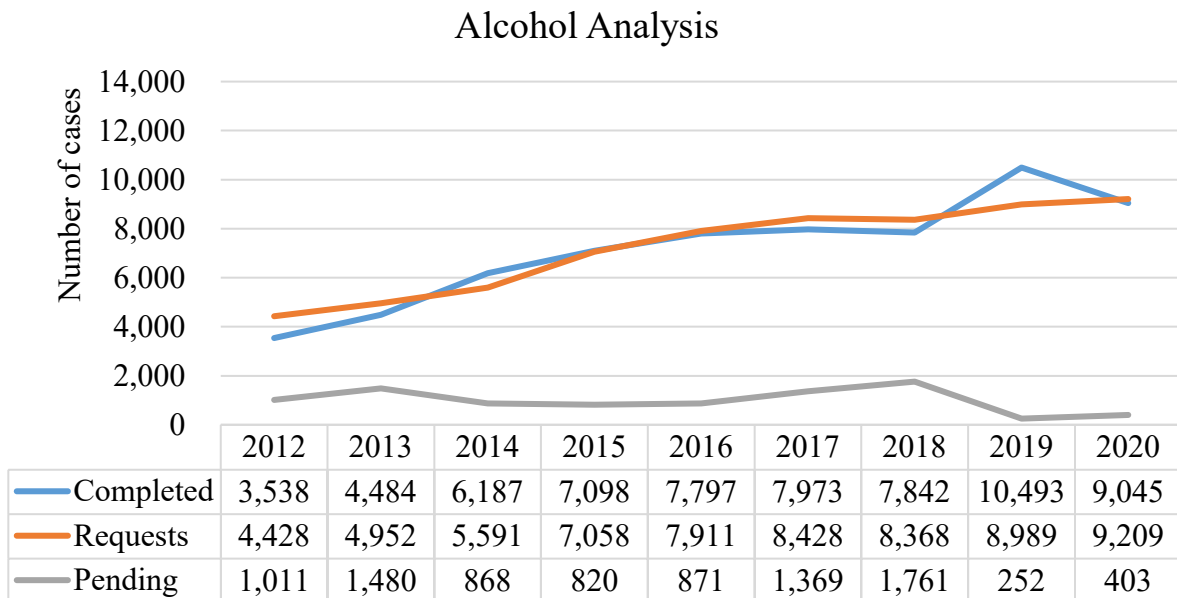
From January 1, 2020, to December 31, 2020, the average time from receipt of a case specimen to entry of the analysis request into the Department's Laboratory Management Information System (LIMS) was one and a half days. The average time from entry of a request for alcohol analysis to issuance of the laboratory report was 17.54 days. For a drug analysis request, the average time from request entry to report issuance was 43.25 days. The time between entering the request to issuing a report varied in individual cases depending if the case was positive or negative and for drug cases whether a positive case had only one drug present or multiple drugs.

Chart 1: Department of Toxicology Submissions



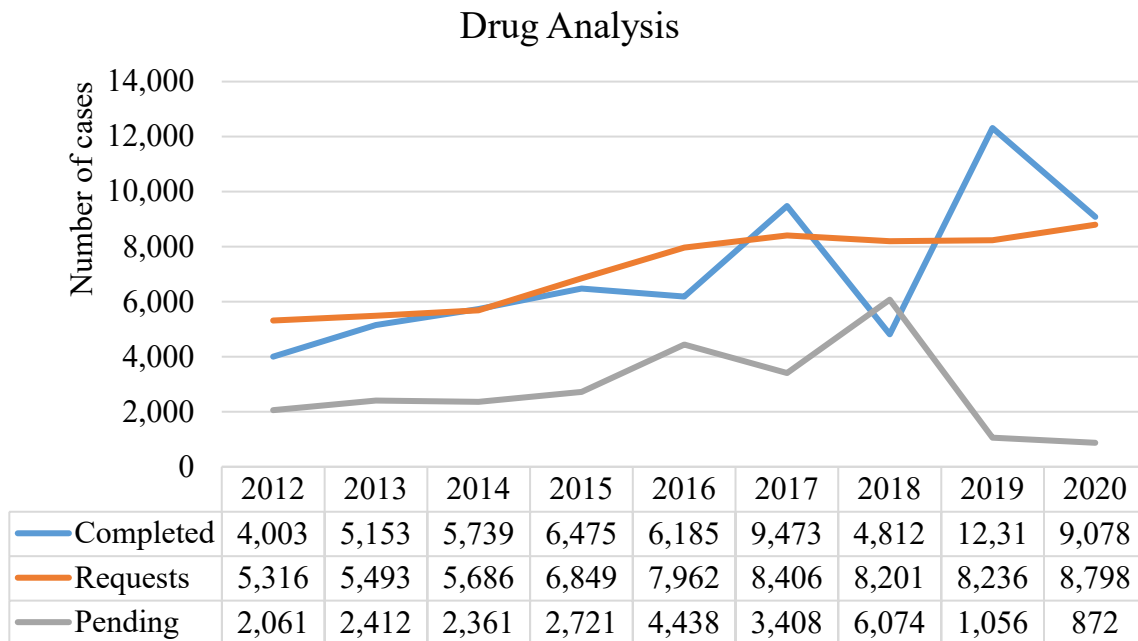
ISDT completed 9,045 requests for alcohol analysis in 2020, compared to 10,493 completed requests in 2019, as shown in Chart 2. The number of pending cases in queue for alcohol analysis at the end of 2020 was higher than in 2019 but still lower than the previous seven years prior to 2019. While outsourcing has been used for some drug analysis over the past nine years, all alcohol analysis has been completed in-house by ISDT.

Chart 2: Alcohol Analyses Completed, Requests, and Pending



The number of cases pending drug analysis at the end 2020 was the lowest in ISDT’s history as a state agency, as shown in Chart 3. Several factors contributed to this success, including grant funding for outsourcing provided by ICJI, the hiring of a tenth scientist in 2019, and ISDT’s doubling its drug screening capabilities by adding a second drug screening instrument and training two additional scientists in drug screening in 2019.

Chart 3: Drug Analyses Completed, Requests, and Pending



Of cases ISDT screened for drugs in 2020, 70.7% screened positive for one or more drugs or drug metabolites, compared to 72% in 2019 and 68% in 2018. Of the cases that screened positive, 28.4% were positive for opioids, which was an increase from the 20.6% positive for opioids in 2019. From 2019 to 2020, positive screens for benzodiazepines/z-drugs decreased from 21.4% to 20.8%, while positive screens for stimulants increased from 30.5% to 37.3%. Positive screens for barbiturates dropped from 1.3% in 2019 to 0.8% in 2020. Positive screens for drugs from the cannabinoids class increased from 40.4% in 2019 to 52.1% in 2020.

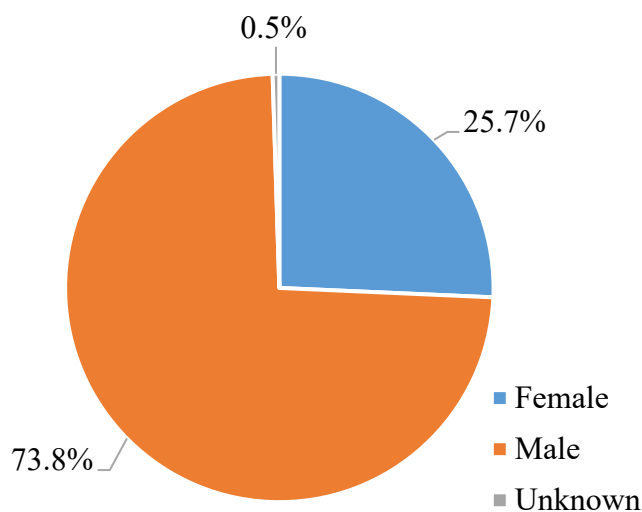
As shown in Table 2: Pending Analysis Summary, there were 1,275 pending alcohol and drug requests at the close of 2020. Most of the pending requests were for drug analysis, which is consistent with previous years. As the number of pending drug cases has decreased, so have the ages of the drug cases awaiting analysis.

Table 2: Pending Analysis Summary

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

When specimens are submitted to ISDT for testing, the submitting agency indicates offense information on the Toxicology Analysis Request form. In 2020, 66.5% of the requests ISDT received were related to investigations of operating a vehicle while intoxicated; 18.3% were related to personal injury crashes, including serious bodily injury; 18.9% were related to property damage crashes, and 3.5% were related to fatal crashes, with other request types accounting for the remaining 9.3%. Some officers indicate multiple offenses on the analysis request form, which pushes the total percent for all types of offenses to over 100%. Nonetheless, of the 12,838 cases received, 94.7% were traffic related.

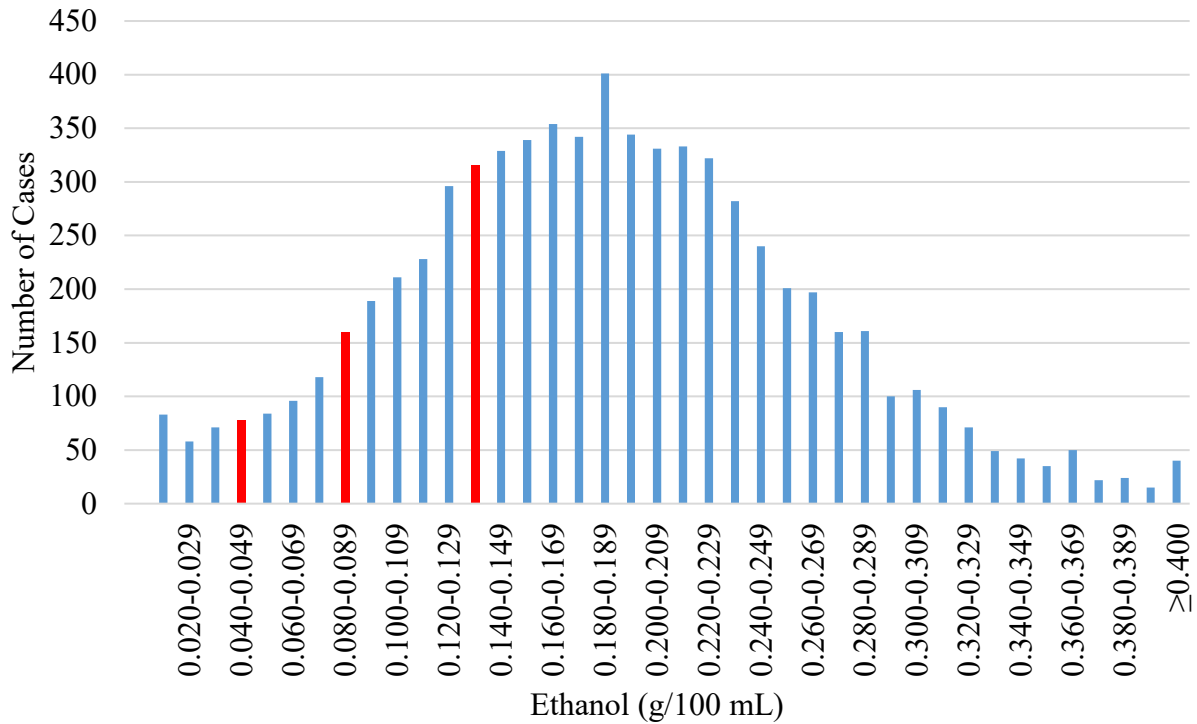
Chart 4: Blood Alcohol Analysis by Gender



As indicated by submitting agencies on Toxicology Analysis Request forms, the majority (73.8%) of specimens submitted for alcohol analysis were from male subjects, and 25.7% were from female subjects, which is consistent with 2019. (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, 75.3% to 24.7%.

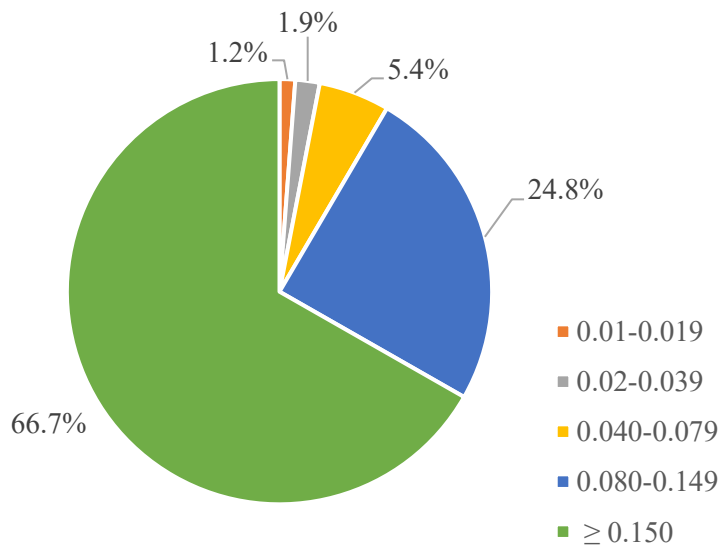
Chart 5 shows the distribution of blood alcohol analysis results by blood alcohol concentration. The red bars indicate the statutory alcohol limits for commercial driver license holders (0.040 g/100 mL of blood), the operation of a vehicle (0.080 and 0.150 g/100 mL of blood).

Chart 5: Blood Alcohol Case Distribution by Results



Of the total number of blood alcohol results reported, 91.5% of the alcohol concentrations were greater than or equal to 0.080 g/100 mL of blood, which is consistent with the 92.4% of breath test subjects (Chart 9) with alcohol concentrations greater than or equal to of 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 66.7% (Chart 6), which is significantly more than the 46.8% 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



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 2020, with over 850 inspections completed by ISDT’s three breath test 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.

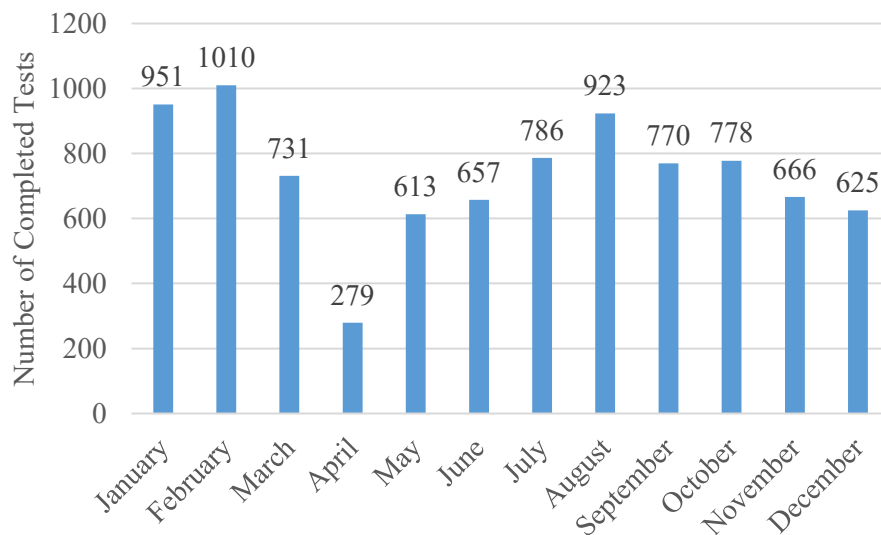
ISDT conducted 11 breath test operator classes at the Indiana Law Enforcement Academy in 2020, despite having to cancel four classes scheduled March through June. Enrollment for each class was limited to 40 students. A total of 425 law enforcement officers were trained and certified as breath test operators in 2020.

In 2020 the breath test program included 4,492 certified breath test operators employed by 417 law enforcement agencies. While the number of agencies with trained breath test operators increased from the 2019 number of 392, the total number of certified operators decreased from the 2019 total of 4,970.

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 per 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, all certified breath test operators were trained and recertified, which has resulted in most breath test operators being recertified in even numbered years: 2,825 operators were recertified in 2020, compared to 802 in 2019; 3,269 operators were recertified in 2018, compared to 549 in 2017.

There were 13,102 attempted breath tests in 2020, with 8,789 tests (67%) completed. 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. In 2019 there were 16,680 attempted breath tests with 11,990 tests completed.

Chart 7: Number of Completed Breath Tests by Month



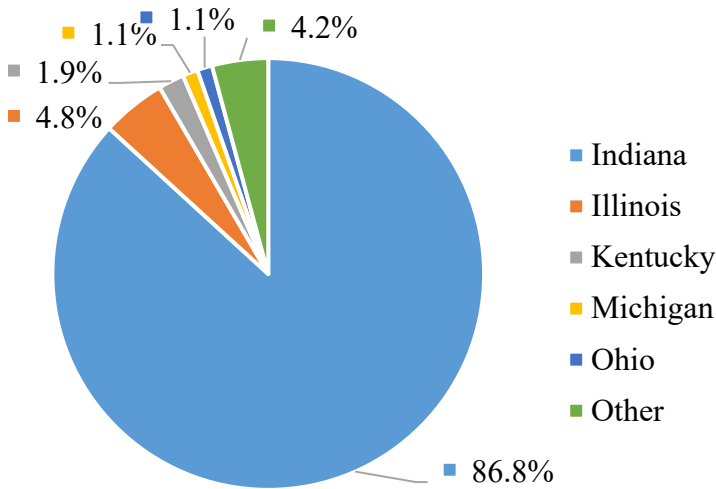
The number of tests completed each month during 2020 is shown in Chart 7. The least number of completed breath tests was in April, while the highest number was in February. (Number of tests attempted is shown in Table 3).

The six counties with the greatest number of attempted breath tests have remained consistent, with few exceptions, over the last six years. For each of the last five years, Lake County has had the highest number of attempted breath tests. Marion County had the highest number of attempted breath tests in 2015, but the numbers of attempted tests in Marion County have decreased each year since then. The ten counties with the most attempted breath tests in 2020 account for approximately 50% of all 2020 attempted breath tests.

Table 3: County and Number of Subject Tests Attempted

| | | | | | | | |
|-------------|------|-------------|-----|------------|----|-------------|----|
| Lake | 1883 | Hancock | 152 | Boone | 62 | Carroll | 40 |
| Allen | 1140 | Jackson | 123 | Kosciusko | 62 | Jennings | 40 |
| Hamilton | 586 | Cass | 117 | Lawrence | 62 | Pike | 40 |
| Elkhart | 568 | Delaware | 112 | Franklin | 59 | Martin | 36 |
| Porter | 565 | Jasper | 106 | Owen | 59 | Gibson | 35 |
| Hendricks | 405 | Adams | 103 | Sullivan | 58 | Fayette | 33 |
| Marion | 403 | Huntington | 101 | Putnam | 57 | Switzerland | 33 |
| Clark | 401 | Henry | 92 | Newton | 55 | Crawford | 29 |
| Johnson | 328 | Dubois | 91 | Clinton | 54 | Jefferson | 28 |
| Vanderburgh | 306 | White | 90 | Shelby | 54 | Warren | 27 |
| LaPorte | 296 | Bartholomew | 89 | Scott | 53 | Benton | 25 |
| Monroe | 248 | Spencer | 86 | Decatur | 52 | Ripley | 25 |
| Madison | 242 | Warrick | 86 | Greene | 52 | Brown | 23 |
| St. Joseph | 238 | Clay | 84 | Harrison | 51 | Perry | 21 |
| Howard | 235 | Miami | 82 | Daviess | 50 | Randolph | 20 |
| Floyd | 215 | Parke | 81 | Marshall | 48 | Union | 18 |
| Tippecanoe | 207 | Montgomery | 77 | Noble | 47 | Ohio | 17 |
| Dearborn | 199 | La Grange | 71 | Washington | 47 | Blackford | 10 |
| Whitley | 183 | Wabash | 70 | Tipton | 46 | Rush | 9 |
| Vigo | 176 | Wells | 70 | Jay | 45 | Fulton | 7 |
| De Kalb | 160 | Fountain | 67 | Orange | 44 | Wayne | 5 |
| Steuben | 153 | Morgan | 67 | Vermillion | 44 | Pulaski | 4 |
| Grant | 152 | Knox | 63 | Posey | 43 | Starke | 4 |

Chart 8: State of Issued Driver License

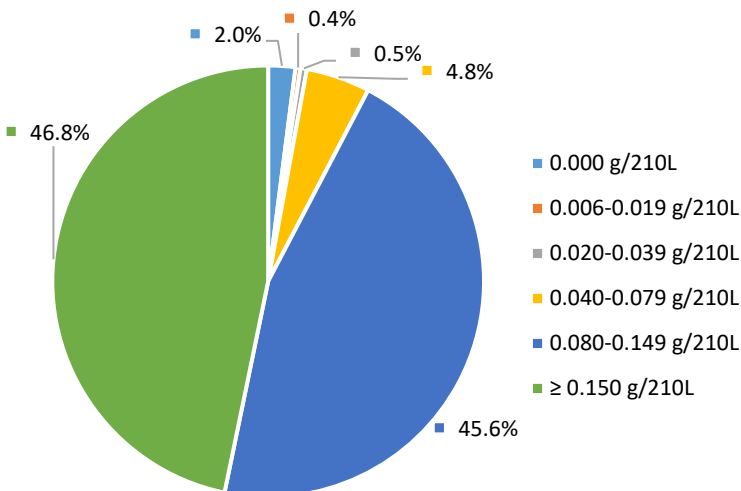


Of the subjects tested in 2020, 86.8% had licenses from Indiana, 4.8% from Illinois, 1.9% from Kentucky, 1.1% each from Michigan and Ohio, and the remaining 4.2% were from other states and countries. These numbers are consistent with those reported since 2016, when tracking of this information began.

Of the subjects whose breath tests resulted in at least two reported breath alcohol concentrations, approximately 7.7% had results between 0.000 and 0.079 g/210 L of

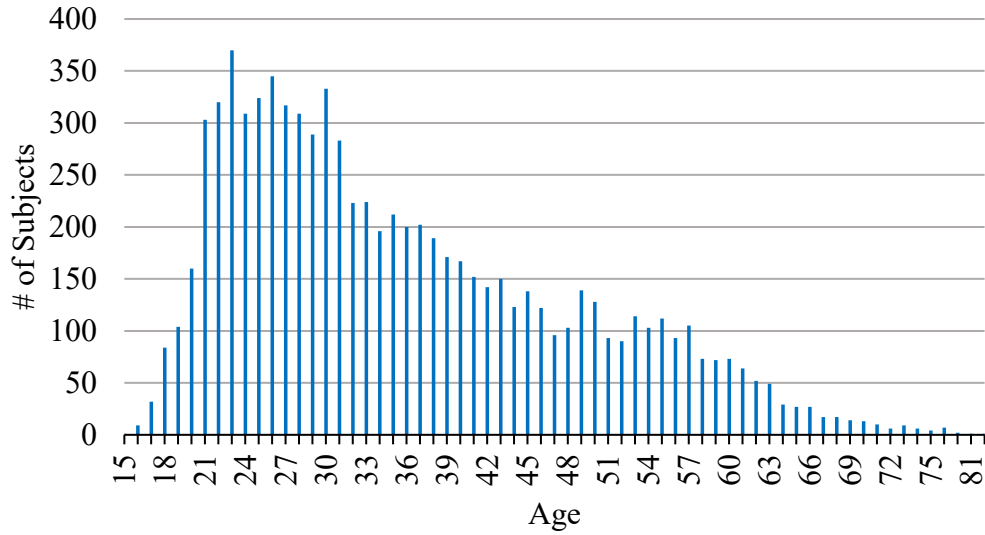
breath; 45.6% had results between 0.080 and 0.149 g/210 L of breath, and 46.8% had results greater than or equal to 0.150 g/210 L of breath, as indicated in Chart 9. The number of subjects with breath alcohol concentrations greater than 0.150 g/210 L of breath was slightly higher in 2020 than in 2019, while the number of subjects with breath alcohol concentrations between 0.080 and 0.149 g/210 L of breath is slightly lower. The number of subjects with a 0.00 breath alcohol concentration was consistent with 2019.

Chart 9: Subject Breath Alcohol Test Results by Selected Ranges

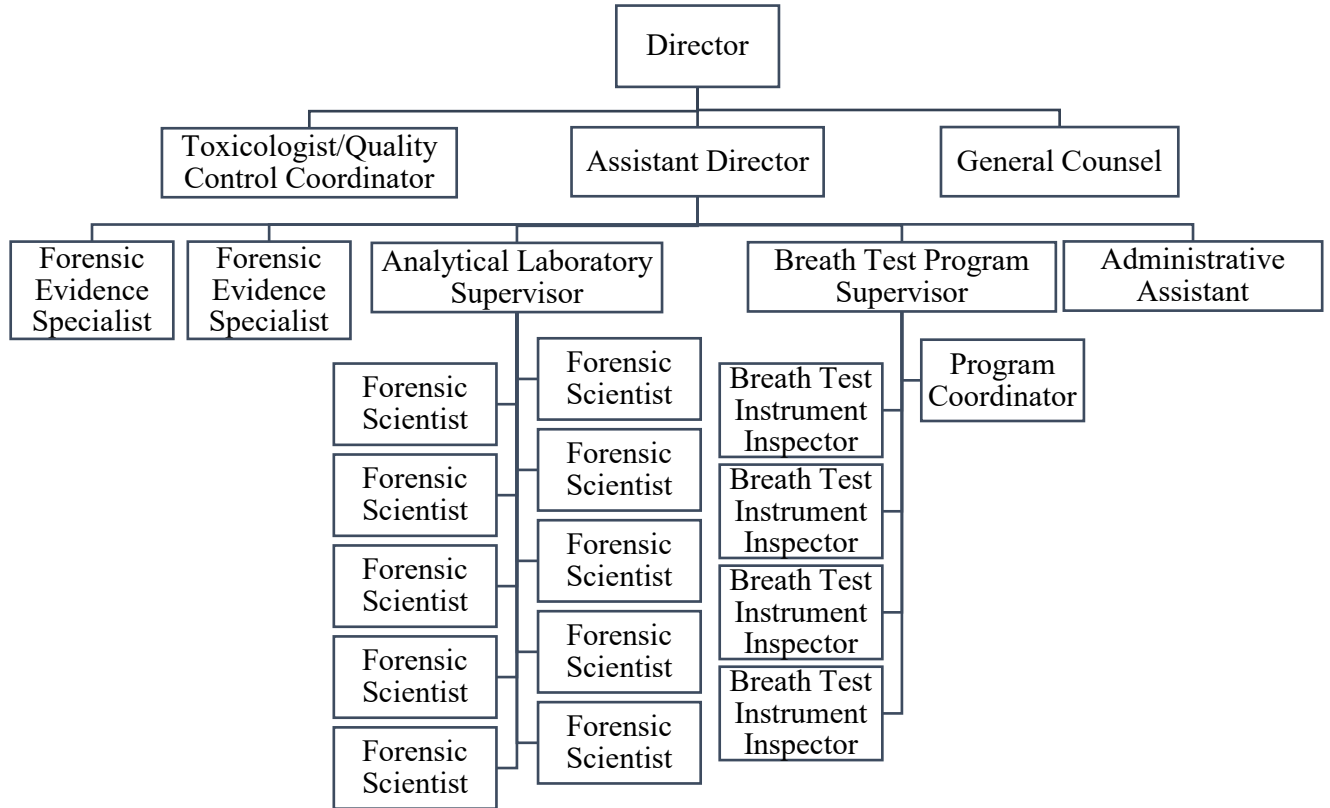


As shown in Chart 10, the subjects tested on the Intox EC/IR II evidentiary breath test instrument were between 15 and 82 years of age, with the greatest number of subjects at 23 years of age. Subjects under age 21 constituted approximately 5% of all subjects tested in the 2020 distribution, as compared to 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

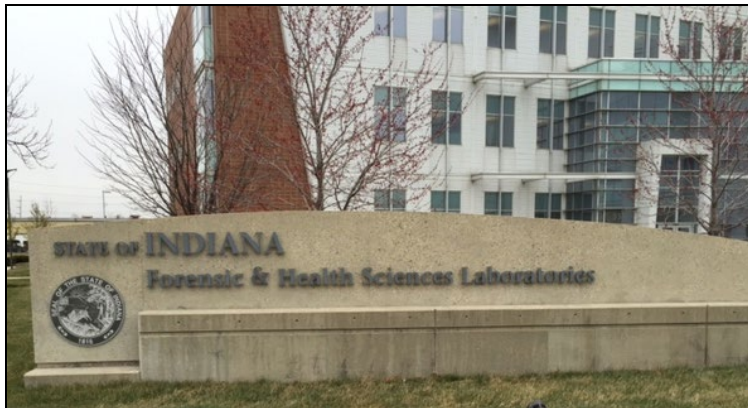


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