



MAP MARKERS

15, 234, 37, 319
16, 31, 31, 319
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POTENTIAL MATCHES

2020000-000
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2020 ANNUAL REPORT

LIFE-SAVING SCIENCE. SAFER STREETS.

DISCOVERY PHASE
All public evidence is collected and
processed in a secure environment.

Morgan Levitas
EMPLOYEE OF THE YEAR



DISTRICT OF COLUMBIA
DFS
DEPARTMENT OF
FORENSIC SCIENCES

WE ARE
WASHINGTON
DC GOVERNMENT OF THE
DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

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We're 'The
was no way

Here in the nation's capital, it was scientists in a tiny laboratory on the Hill who discovered the District's first presumptive case of the novel coronavirus on March 3, 2020. That first presumptive test not only changed the course of history for the 770,000 residents of the District and the 220-plus scientists, administrators, staff, and contractors at the Department of Forensic Sciences (DFS); it also changed the laboratory's trajectory as one of the top public health laboratories in the country.

- Dr. Anthony Tran, Director, DFS Public Health Laboratory



Scientists who joined DFS when it was first established on October 1, 2012, embarked on a mission to “produce high-quality, timely, accurate, and reliable forensic science with the use of the best available technology and practices, unbiased science, and transparency with the overall goal of enhancing public health and safety.” With scientists focused on being a step ahead of the next disaster, virus, or pandemic, and thinking about next-level preparedness in terms of methodologies and technologies, it was almost serendipitous that DFS was ready to confront the “invisible enemy.”



On February 11, 2020, the World Health Organization announced an official name for the disease caused by the 2019 novel coronavirus: coronavirus disease 2019, abbreviated as COVID-19 (“CO” stands for “corona,” “VI” for “virus,” and “D” for disease).

In the FY13-14 Council Performance Oversight Hearing testimony, the first director of the agency, Dr. Max Houck, said, “Simply put, in just 16 months of existence, the Department of Forensic Sciences has accomplished what many individual laboratories take many years to accomplish.” One such achievement was the Public Health Laboratory’s approval in January 2014 as a top-tier member of the Centers for Disease Control and Prevention’s (CDC) Laboratory Response Network; with that approval, the Public Health Lab joined 10 existing facilities nationwide as a front-line responder for bioterrorism, chemical terrorism, and other public health emergencies.

That designation also made the District’s Public Health Laboratory the nation’s 11th Level 1 Laboratory; these serve as surge-capacity labs for the CDC and can detect cyanide, nerve agents, and many toxic metals and industrial chemicals.

It would be only a few years later that those capabilities would come into play. However, it would not be for the prototypical

foreign adversary threatening the United States with bioterrorism, or even for chemical terrorism—but for a pandemic. The testing to detect the coronavirus performed at the Public Health Lab provided the District’s leaders with crucial data that led to shutting down hundreds of businesses, closing schools, and halting public transportation, bringing Washington, DC, to a standstill. The pandemic was unprecedented, and operations at DFS were just that, as well. For the first time, crime scene scientists served as couriers, transporting specimens to the lab for testing. Meanwhile, laboratorians visited the District’s nursing homes and critical care facilities to perform testing on site.

As DFS Laboratory-Epidemiology Coordinator Nia Deot said, “We’ve saved multiple lives. All the asymptomatic people [who] we are diagnosing and [who are] quarantining, I think they are saving multiple lives. That diagnosis of them having to quarantine is keeping other people from getting sick.”

By the end of 2020, the District’s Public Health Lab had performed 150,000 coronavirus tests and was recognized nationally as one of the few public health labs sequencing the virus to examine how it mutates and where it might go next.



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LETTER FROM THE DIRECTOR



Dear Resident:

In a year of high-volume testing, the Department of Forensic Sciences (DFS) was also put to the test, receiving more samples than ever before and meeting the challenge by providing timely and accurate results. The dedication of our diverse team of professionals encompasses our guiding principle for fiscal year 2020 (FY20): Life-Saving Science, Safer Streets.

The COVID-19 pandemic showed how critical testing from the District's Public Health Laboratory (PHL) can save lives. It is our job to go to work while many others are asked to stay home. According to our statutory mission statement, DFS is to provide high-quality, timely, accurate, and reliable forensic science services using best practices and the best available technology, with a focus on unbiased science and transparency, toward the

goal of enhancing public safety. Put more simply, it is our job to make you safer by ensuring we use the best scientists and equipment to process the evidence we receive. We are independently capable of meeting all the District's forensic science needs, and to ensure we accomplish that, we have a dedicated Science Advisory Board whose sole purpose is to ensure our science stays as strong as the current state of the art permits.

FY20 was a year of immense growth for PHL, with skyrocketing test requests eight times the prior year's total. When COVID-19 spread across the globe and arrived in the nation's capital, PHL was ready. When the District offered free testing to healthcare workers and residents, PHL was ready. When long-term care facilities caring for the elderly and vulnerable needed fast and reliable results, PHL was ready. Indeed, the scientists at the District's Public Health Laboratory are among the countless healthcare heroes in our community.

Other DFS divisions also helped support PHL's COVID-19 response. Our Crime Scene Sciences (CSS) Division transported samples to the laboratory for testing and supported mobile testing efforts. The Cyber Operations Section launched an

electronic submission portal to increase the speed and efficiency of receiving requests and providing test results.

The pandemic did not deter crime in our city, however. CSS processed more than 6,000 crime scenes in FY20, highlighting the commitment of local women and men to making our community safer. In FY20, our Forensic Science Laboratory generated more than 2,600 leads to investigators to help identify perpetrators, link crime scenes together, and identify sources of gun crimes for immediate disruption, investigation, and prosecution. The division's Firearms Examination Unit continued to track the prevalence of untraceable firearms known as "ghost guns" in our community and helped draft legislation to ban these weapons in the District.

The events of FY20 also inspired the scientists of tomorrow. Through our continued community outreach, we are embracing our role as The People's Lab and using technology to connect with young minds to educate them about the world of forensics.

On behalf of DFS, I would like to thank Mayor Muriel Bowser and the DC Council for continuing to provide funding and resources,

demonstrating the District's deep commitment to public safety and its faith in objective, repeatable, and rigorously refined science.

We also acknowledge the support of Deputy Mayors Kevin Donahue and Dr. Roger Mitchell, as well as that of our federal and local partners. Without their support, your labs could not have reached their full potential in FY20 and would not be so well positioned to get even more done in FY21. We appreciate all that you and your neighbors have invested in our work. We are proud to have this opportunity to share our FY20 annual report with you, and to demonstrate that Life-Saving Science leads to Safer Streets.

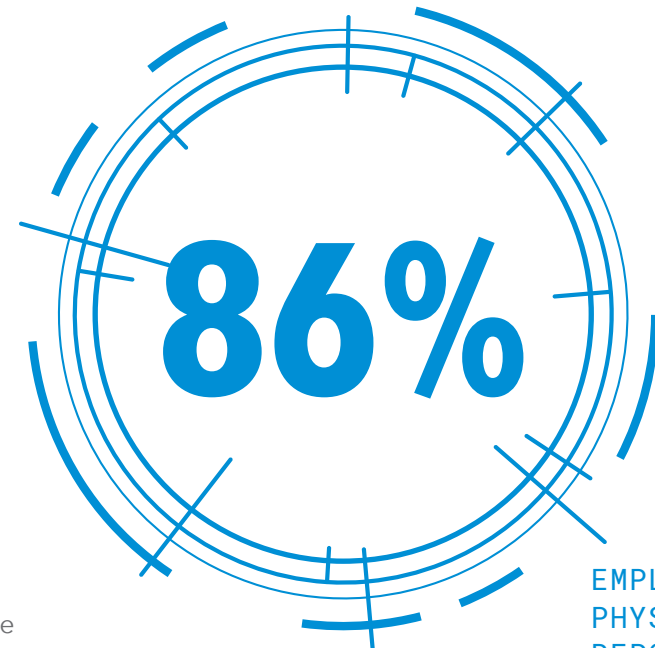
Sincerely,

Jenifer Smith, Ph.D.
Director

EMPLOYEES REPORTING TO WORK

The COVID-19 pandemic brought much of the District and the entire country to an abrupt halt. As many businesses, schools, and even some government agencies were forced to shut down, the Department of Forensic Sciences (DFS) remained open to perform critical, life-saving science to keep DC residents and visitors safe and healthy.

During the pandemic, 86% of DFS employees physically reported to work every day. These scientists were responsible not only for providing COVID-19 testing, collecting evidence from crime scenes, and analyzing samples submitted to the lab, but also for ensuring that DFS's services, internal processes and systems, and human and financial resources were properly managed and allocated.



EMPLOYEES
PHYSICALLY
REPORTING
TO WORK

To meet the increased demand for testing and services in FY20, the Human Resources team successfully onboarded 22 new employees, including seven District residents, and several contractors. DFS also achieved its lowest yearly turnover at 9%.



LOWEST YEARLY
TURNOVER

MARKERS
4, 07.113
90.794
37.82
7, 20.125
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3, 07.46

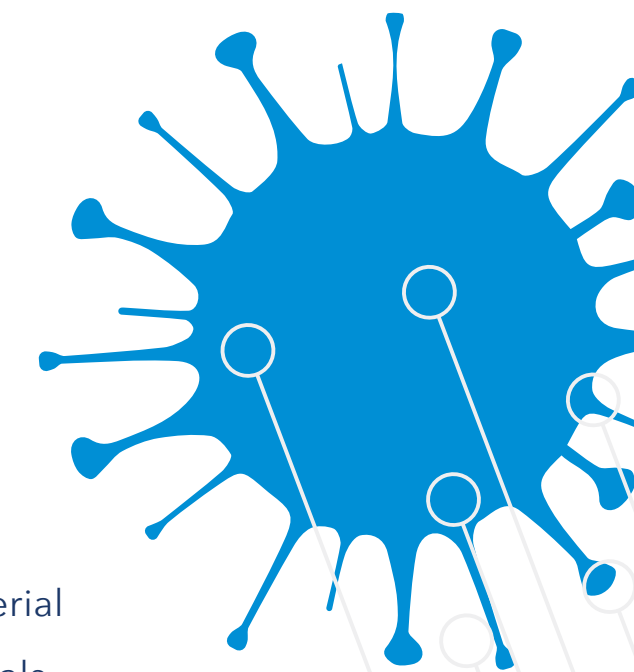
NTIAL MATCHES
4280.920
0717.118
1754.218
1031.805



PUBLIC HEALTH LABORATORY



The Public Health Laboratory (PHL) is responsible for thoroughly testing samples of various materials for bacterial and viral infections, heavy metals, toxic or volatile materials, and other hazards to public health and safety. In FY20, these services were more critical than ever as the District worked to “flatten the curve” of COVID-19 infections.

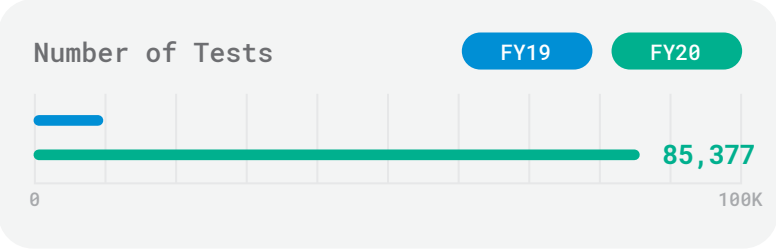


PHL performed eight times as many tests in FY20 as in FY19. Total PHL testing included 85,377 tests on samples received, 62 proficiency tests, and 26 validation efforts to bring on new tests. The lab adjusted its hours of operation to accommodate sample submission, operating seven days a week from 6 a.m. to 11 p.m. PHL also contracted additional staff to assist with the COVID-19 response, recruiting 20 new contractors to work as medical technologists, lab assistants, and administrative assistants who handled all training and paperwork.

PHL went online with COVID-19 testing on March 2, 2020, with four scientists using the manual test developed by the Centers for Disease Control and Prevention (CDC) approved by the Food

ACCESSIONING UNIT

During the seven months of the pandemic in FY20, the Accessioning Unit (ASU) received 71,028 samples for molecular testing, an average of 333 per day. The samples tested included those from the District’s community drive-thru/walk-up testing sites, those from the DFS Mobile Testing Unit, and those submitted by healthcare providers to the lab. In addition to COVID-19 molecular testing to determine whether a sample was positive or negative, PHL also provided serology testing to detect antibodies to the virus.



and Drug Administration’s Emergency Use Authorization. Initially, PHL’s testing capacity was 50 samples per day. By the end of March, the introduction of the Panther Fusion—an automated, high-throughput testing platform—had increased capacity to 600 samples per day.

COVID-19 Testing Submissions	
Drive-thru & Community Testing Sites	19,576
Mobile Testing Unit	887
Samples Submitted to PHL	50,565
Molecular Total	71,028
Serology Total	7,231

IMMUNOLOGY/VIROLOGY UNIT

From March 2 to June 23, PHL was the primary COVID-19 testing lab in the nation’s capital.

With the introduction of the Panther Fusion in March, PHL was able to perform free community testing for District residents. Initially, DC offered COVID-19 testing to essential workers with symptoms of COVID-19. Community sampling expanded in the summer from two sites to seven as firehouses were added as location options. To meet the high volume, the lab occasionally extended testing operations to 24 hours a day. In June, the

MOBILE TESTING UNIT

PHL launched the first Mobile Testing Unit (MTU) to perform on-site COVID-19 tests with same-day results. The truck, complete with a lab area with bio hood and space for rapid testing equipment, was loaned to DFS from the CDC’s National Health and Nutrition Examination Survey.

The MTU allowed small teams of DFS scientists to get out of the lab and perform tests at long-term care facilities and homeless shelters. In FY20, the MTU completed more than 25 visits to over 12 locations and tested 887 samples.

District began to utilize a corporate lab to perform community testing, therefore allowing PHL to focus on DC’s vulnerable populations in long-term care facilities.



MICROBIOLOGY UNIT

PHL added regular testing for the Metropolitan Police Department (MPD) and DC Fire and Emergency Medical Services (FEMS) to detect whether first responders were infected. The testing was completed with an average turnaround time of 11 hours.

Police and Fire Clinic Submissions

DC FEMS	219
DC MPD	460
Total	679

MOLECULAR DIAGNOSTIC UNIT

To support the Office of the Chief Medical Examiner (OCME), the Molecular Diagnostic Unit (MDU) verified the use of the CDC test for post-mortem specimens. In FY20, PHL provided 245 results to aid in death investigations.

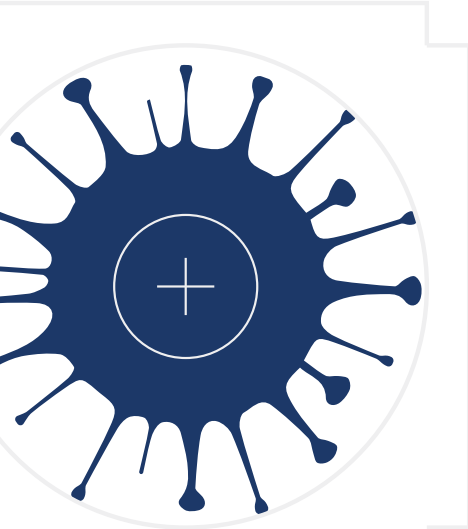
PHL was also one of the few public health laboratories with the ability to perform whole genome sequencing of SARS-CoV-2, providing definitive epidemiological linkages to assist with outbreak investigations. Through this process, MDU confirmed that cases in a coronavirus outbreak at an assisted living facility in Northwest Washington were all linked to one healthcare worker.



OFFICE OF HEALTH AND SAFETY

In response to the COVID-19 pandemic, the PHL Health and Safety group created an agency-wide personal protective equipment (PPE) policy to provide key structures and to meet the CDC’s workplace recommendations. The updated policy requires personnel and visitors to wear face coverings in all common areas of the Consolidated Forensic Laboratory, limits group gatherings, and enforces social distancing guidelines.





ROUND 3
Based on data acquired during the collection of various evidence pertaining to the transmission of compounds during criminal investigations, the proposed reaction to support materials and elements to be developed as the basis for litigation.



CLINICAL TOXICOLOGY UNIT AND FORENSIC CHEMISTRY UNIT

In addition to its coronavirus response efforts, PHL also worked to prepare for other health crises and biological threats. Working within the Laboratory Response Network for Chemical Threats, the Clinical Toxicology Unit (CTU) has maintained its clinical testing capabilities to assess exposure to a wide range of chemical threats, from chemical terrorism (e.g., attacks involving ricin, nerve agents, or cyanide) to accidents involving industrial chemicals (e.g., xylene, toxic metals, or lead).

The Forensic Chemistry Unit (FCU) has continued to closely work with MPD and DC FEMS. FCU and CTU conduct critical investigations on drug impurities, support knowledge sharing with law enforcement regarding fentanyl, streamline synthetic opioid detection in syringes for OCME, and screen controlled buys within the District to gain an upper hand in detecting emerging drugs.



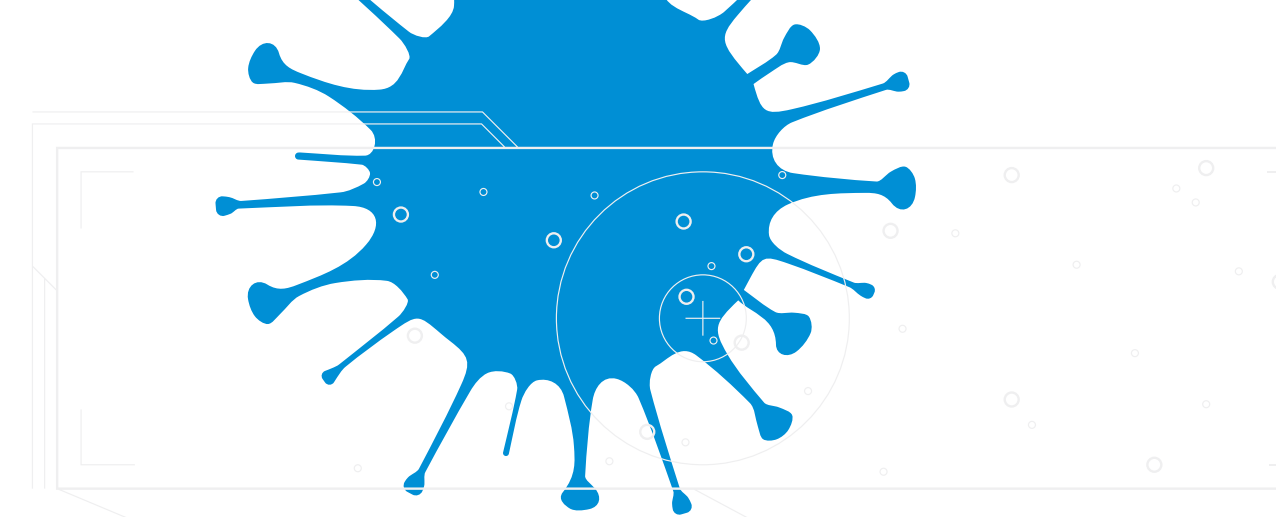
PUBLIC HEALTH LABORATORY ACCOMPLISHMENTS

Pandemic response: In FY20, PHL tested nearly 100,000 samples for SARS-CoV-2. Staffing increased by 110% to meet the heightened demand. PHL was also one of the few public health labs in the United States sequencing for SARS-CoV-2.

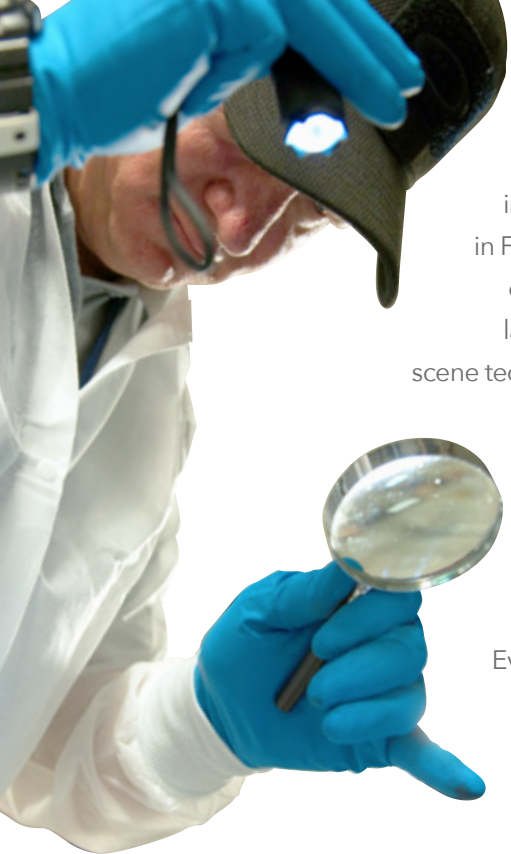
BioWatch: PHL added a BioWatch Unit with nine full-time employee positions. The unit provides continuous testing of potentially dangerous microbes to improve public safety.

Nation's Healthiest Lab: The Association of Public Health Laboratories awarded PHL the Healthiest Laboratory Award, which celebrates excellence in environmental stewardship and health promotion in both practice and policy.

CRIME SCENE SCIENCES DIVISION



Despite the pandemic and health guidelines to limit outdoor activities and refrain from unnecessary contact with others, the Crime Scene Sciences (CSS) Division continued to respond to thousands of crime scenes. Our dedicated scientists remained on duty 24/7 to collect and preserve more than 80,000 items of evidence—at or as close as possible to their original state—until they could be recorded and brought back to the laboratory for analysis.



CENTRAL EVIDENCE UNIT WORKLOAD MEASURES

Providing an invaluable resource to MPD’s Evidence Control Branch, CEU received 83,529 pieces of evidence in FY20, an 8% increase over FY19 totals. Evidence is collected from crime scenes across the District and brought to CEU for evaluation.

CSS comprises 76 specially trained individuals, five of whom were hired in FY20. The diverse team includes law enforcement professionals, forensic laboratory technicians, civilian crime scene technicians, and property technicians. This diversity of backgrounds is the team’s strength.

CSS provides high-quality, around-the-clock support through its two units—the Central Evidence Unit (CEU) and the Crime Scene Sciences Unit (CSSU).

When crimes occur, there are often hundreds if not thousands of pieces of evidence (e.g., blood, fingerprints, weapons, cartridge casings, and clothing) that must be collected and preserved for later analysis. Once identified, CSS personnel thoroughly document, collect, and preserve the evidence to keep it from degrading or changing over time. To yield greater clarity on what occurred during a crime, the evidence must be viewed within the context in which the crime took place, and its integrity must not be compromised.

CSS also helped support PHL’s COVID-19 response, stepping in to safely transport samples from hospitals and healthcare facilities to the laboratory for testing.

Quantity of Most Common Evidence Types

Cartridge casings	23,737	Firearms	2,455
Fingerprints	13,100	Narcotics/drugs	2,348
Bullets/projectiles	5,396	Swabs (general)	2,219
Clothing	3,867	Buccal (cheek) swabs	2,173
Cartridges	2,560	Vehicle swabs	1,713

CENTRAL EVIDENCE UNIT ACCOMPLISHMENT

Transfer of potentially flammable evidence: A total of 1,100 potentially flammable evidence items stored at DFS were transferred to the MPD Evidence Control Branch.

CRIME SCENE SCIENCES UNIT WORKLOAD MEASURES

CSSU independently processed 6,194 crime scenes and received 8,256 service requests in FY20. At right is a breakdown of CSSU’s activity by quarter.



Breakdown of CSSU Activity by Quarter, FY20

CSSU Measures	Q1	Q2	Q3	Q4	Totals
Number of evidence items received	18,742	19,482	21,584	23,721	83,529
Number of crime scene service requests	2,188	1,926	1,945	2,197	8,256

CRIME SCENE SCIENCES UNIT ACCOMPLISHMENTS

Lesson plan committee: CSSU supervisors and staff created a three-week course, “Fundamentals of Crime Scene Investigation.”

Revision of standard operating procedures: A committee was formed to review CSSU policies, procedures, manuals,

and memoranda in an effort to identify outdated information, inconsistencies, and gaps.

New evidence processing room: An outdated storage and supply room was converted into a large evidence processing room.

MARKERS
4 37.113
90.794
37.82
7 28.146
10 49.1
5 49.46
INITIAL MATCHES
4288.920
8717.118
1224.288
1031.805

FORENSIC SCIENCE LABORATORY



The COVID-19 pandemic forced all agencies to reexamine workplace conventions to adapt to the new normal. The Forensic Science Laboratory (FSL), comprising three units—the Firearms Examination Unit (FEU), Forensic Biology Unit (FBU), and Latent Fingerprint Unit (LFU)—adjusted scheduling while maintaining its commitment to providing high-quality, timely, accurate, and self-reliant forensic science services using best practices and the best available technology.

FSL is authorized to independently examine evidence submitted by any DC government agency investigating a criminal offense. Federal agencies, such as the US Park Police, are also able to use the services of FSL.

FORENSIC SCIENCE LABORATORY ACCOMPLISHMENT

DFS educational initiative: In FY20, DFS partnered with Trinity University to offer a pattern recognition course as part of Trinity's Forensic Science Program. When in-person learning was

suspended because of pandemic restrictions, FSL transitioned to a virtual format and provided instruction and practical exercises over video conferencing platforms.

FIREARMS EXAMINATION UNIT

Firearms are used in various types of crimes, including rapes, robberies, homicides, and assaults. It is the job of FEU to examine and compare firearms as well as the tool marks left when a harder object encounters a softer object. This vital unit can evaluate the functionality of firearms, determine the distance from muzzle to target, and microscopically compare bullets and cartridge cases to determine the possible source of firing.

FEU's FY20 target was to process 90% of received samples related to priority and homicide cases within 60 days of the date the analyst was assigned the case. FEU exceeded this target, consistently performing above 90% for priority and at 96% or better for homicide cases.

FEU Key Performance Indicators by Quarter, FY20					
Indicators	Q1	Q2	Q3	Q4	Target
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days of the date the analyst was assigned the case	100%	95%	100%	91%	90%
Percentage of requested homicide cases completed within 60 days of the date the analyst was assigned the case	98%	99%	98%	96%	90%

FIREARMS EXAMINATION UNIT WORKLOAD MEASURES

FEU utilizes the National Integrated Ballistic Information Network (NIBIN) to provide leads in shooting-related investigations. NIBIN is a 3D-automated ballistics imaging and analysis system that populates a database of digital ballistic images of cartridge cases. The system identifies potential leads, which are used by forensic scientists to confirm NIBIN hits.

In FY20, FEU entered a total of 5,081 cartridge cases into the system, generating 208 confirmed NIBIN hits. FEU also test-fired 2,271 firearms. Below is the quarterly breakdown of entries, hits, and firearms test-fired:

FEU Measures by Quarter, FY20					
Measures	Q1	Q2	Q3	Q4	Totals
NIBIN entries	931	1,281	1,293	1,576	5,081
NIBIN hits	70	74	52	12	208
Firearms test-fired	520	692	515	544	2,271



FIREARMS EXAMINATION UNIT ACCOMPLISHMENTS

Responding to the dramatic rise in homemade firearms: In FY20, FEU saw a 198% increase over FY19 in homemade firearms. These firearms, called “ghost guns” because of their untraceable nature, are manufactured by individuals and lack serial numbers. The guns are assembled from parts that can be purchased, machined, and assembled without background checks or licensing requirements. FEU tested 12 ghost guns related to homicide cases.

Serial number restoration training: FEU was successful in conducting its own internal serial number restoration training course for firearms examiner trainees. This training is normally taught at the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) laboratory. Handling this training at DFS prevented any workload backlogs that can occur when attending an external training.

FORENSIC BIOLOGY UNIT

Because of the pandemic, FBU was able to limit the number of in-office staff through rotational telework schedules while continuing to improve its serological and DNA testing. FBU saw an increase in productivity as analysts made more efficient use of time in the laboratory. In addition, telework allowed for uninterrupted, dedicated time to address technical and administrative reviews of both in-house and outsourced cases, DNA data analysis and interpretation, and report writing.

In FY20, DFS received 218 sexual assault kits from MPD and tested them with an average turnaround time of 73 days. Of these, 214 kits were completed within 90 days, according to section 202(b) of the Sexual Assault Victims’ Rights Amendment Act (SAVRAA). The four kits completed outside 90 days were subject to lengthy permission to consume concerns, which require FBU to delay the start of testing until specific approvals are obtained from authorities outside DFS.

FORENSIC BIOLOGY UNIT KEY PERFORMANCE INDICATORS

FBU performed at 99% or better with respect to processing priority cases within 60 days, and at 96% or better when handling homicide cases.

FBU Key Performance Indicators by Quarter, FY20

Indicators	Q1	Q2	Q3	Q4	Target
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days of the date the analyst was assigned the case	99%	100%	100%	100%	90%
Percentage of requested homicide cases completed within 60 days of the date the analyst was assigned the case	96%	100%	96%	100%	90%

FORENSIC BIOLOGY UNIT WORKLOAD MEASURES

FBU uses the FBI’s Combined DNA Index System (CODIS) to search DNA profiles to form possible links between violent crimes, known offenders, and arrestees. In FY20, FBU completed 750 CODIS entries and obtained nearly 260 hits.

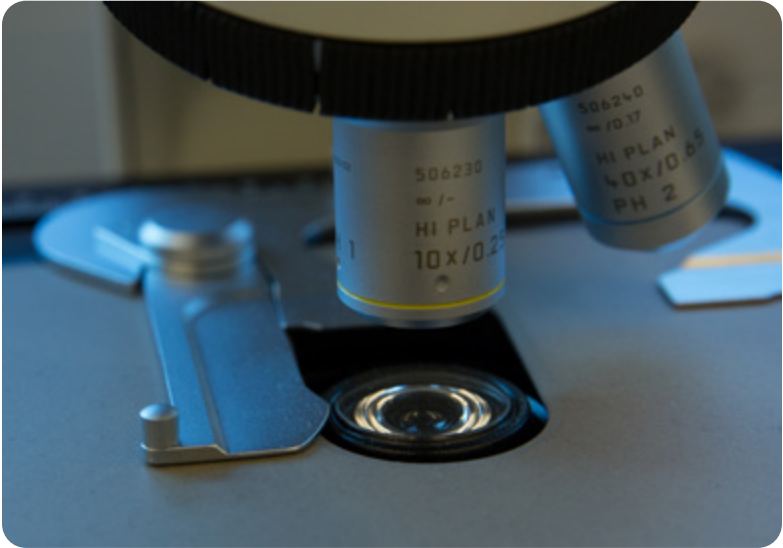
FBU Measures by Quarter, FY20

Measures	Q1	Q2	Q3	Q4	Totals
Number of CODIS database entries	137	155	246	212	750
Number of CODIS database hits	48	67	71	71	257

FORENSIC BIOLOGY UNIT ACCOMPLISHMENTS

External audits: In August 2020, FBU underwent annual inspection for accreditation in accordance with the ISO 17025:2017 standards. For the fifth year in a row, FBU received no findings of non-conformance with either set of standards, ISO 17025:2017 or the FBI’s Quality Assurance Standards for Forensic DNA Testing Laboratories.

Validation of new technologies: In May 2020, FBU completed the validation project of Next-Generation Sequencing (NGS) technology in collaboration with Verogen and transitioned its focus to NGS casework implementation.



LATENT FINGERPRINT UNIT

In FY20, roughly 25% of LFU staff were able to telework at a given time to accommodate pandemic restrictions. LFU analysts examine unknown or latent fingerprints and palmprints collected from items of evidence to determine their value. Suitable latent prints are then compared to known fingerprints in an effort to determine their source. Latent prints may be entered into the

Automated Fingerprint Identification System (AFIS), a biometric database that uses digital imaging technology to obtain, store, and analyze fingerprint data. Latent prints are searched against stored known prints, and possible source candidates are generated and examined by LFU analysts. AFIS results have helped produce intelligence leads for several DFS customers.

LATENT FINGERPRINT UNIT KEY PERFORMANCE INDICATORS

LFU’s performance target for FY20 was to handle priority and homicide cases within 60 days. LFU far exceeded the 90% standard and, for each quarter of the year, consistently performed at 98% or better with respect to priority and homicide cases completed within the stated time frame.

LFU Key Performance Indicators by Quarter, FY20					
Indicators	Q1	Q2	Q3	Q4	Target
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days of the date the analyst was assigned the case	100%	98%	100%	100%	90%
Percentage of requested homicide cases completed within 60 days of the date the analyst was assigned the case	100%	98%	100%	100%	90%

LATENT FINGERPRINT UNIT WORKLOAD MEASURES

The collection and entry of latent fingerprints into AFIS are integral functions of LFU. The division has maintained its threshold for high levels of entries for four years running. In FY20, LFU entered a total of 7,940 entries into AFIS and made a total of 1,828 hits. Below, AFIS entries and hits are broken down by quarter:

LFU Measures by Quarter, FY20					
Measures	Q1	Q2	Q3	Q4	Totals
AFIS entries	2,097	1,944	1,944	1,955	7,940
AFIS hits	397	439	476	516	1,828

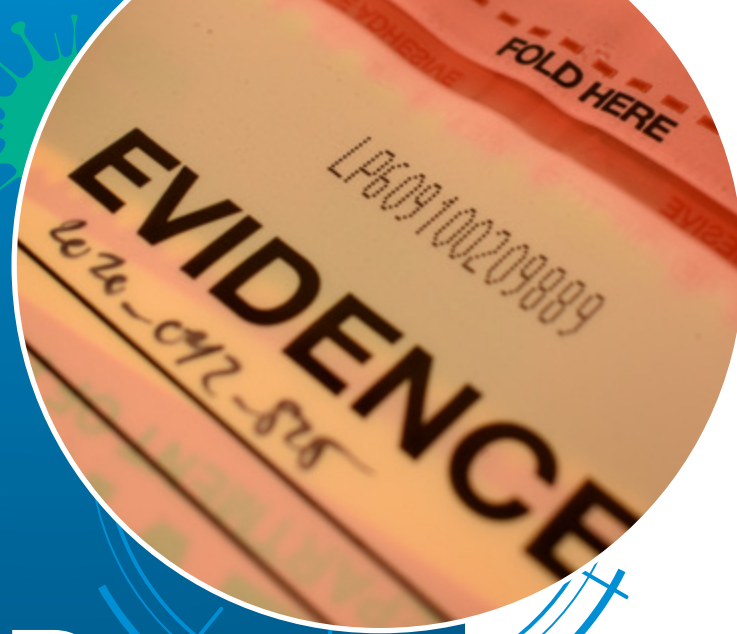
LATENT FINGERPRINT UNIT ACCOMPLISHMENTS

LFU evidence processing: LFU scientists received 1,880 evidence processing requests in FY20. Most of those requests involved collecting possible latent prints and DNA from firearms. The three-person team had an average turnaround time of 2.1 days.

Paperless laboratory: LFU is the first FSL laboratory to go paperless. This cost-saving initiative utilized electronic

capabilities, such as automated worksheets and modified review forms to perform casework, reviews, and verifications virtually and through telework.

Accelerated testing: LFU created fillable forms for DFS employees to complete reviews and tested different methods for reviews and verifications.



OFFICE OF THE SENIOR DEPUTY DIRECTOR

The Office of the Senior Deputy Director (SDD) consists of the Cyber Operations Section, Forensic Intelligence Unit (FIU), Human Resources, Training, and Quality. SDD's mission proved vital during the COVID-19 pandemic, providing high-level oversight and support to each division within DFS and ensuring that employee needs and concerns were met.

CYBER OPERATIONS SECTION

The Cyber Operations Section—made up of the Forensic Technologies Unit (FTU) and the Digital Evidence Unit (DEU)—provides state-of-the-art support to combat cybercrime along with any crime that has been committed, orchestrated, or

FORENSIC TECHNOLOGIES UNIT

The Cyber Operations Forensic Technologies Unit manages several vital and highly specialized systems that support the work of DFS. At the start of the pandemic, PHL test requests were

accompanied by a digital device. These scientists also offer technological support for forensic services and help protect the District from the constant threat of cyberattacks.

manually input into the Laboratory Information Management System (LIMS), and results were sent via fax machine. FTU helped create electronic test ordering and reporting to ensure speed and accuracy when sharing critical results with DC Health and other health care providers while eliminating the tedious task of faxing paper reports.



DIGITAL EVIDENCE UNIT

The pandemic introduced new forms of communication while taking advantage of new technologies. The Digital Evidence Unit (DEU) examines the digital landscape for cases involving malware, unauthorized network intrusions, and data breaches. Following four consecutive years of growth, DEU scientists saw a nearly 15% caseload increase in FY20, and utilized evolving techniques in digital forensics to extract and analyze seized digital evidence from a wide range of devices (e.g., smartphones, personal computers, vehicles, credit card skimmers, and video recording systems). DEU was able to decrease its average turnaround time despite the increase in cases. DEU scientists also acquired the capability to unlock iPhones and Android phones, allowing access to data previously unattainable.

The reliance on improved technology required DEU to regularly add resources to expand its capabilities. In FY20, DEU received the Paul Coverdell Forensic Science Improvement Grant. These funds allowed DEU to purchase Cellebrite Premium, add two forensic workstations, and buy needed supplies.

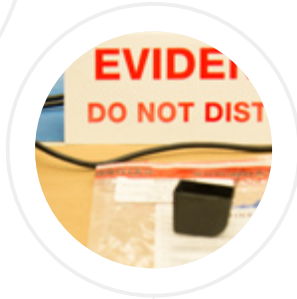
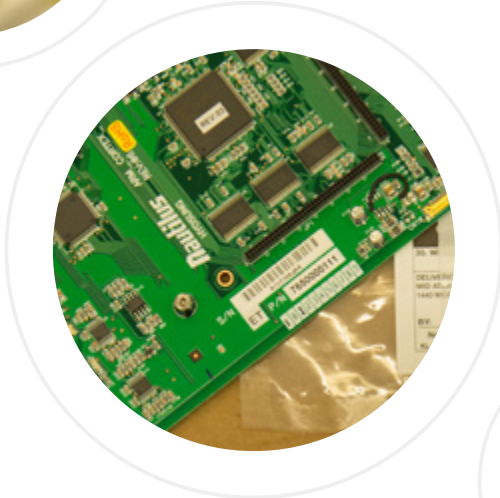
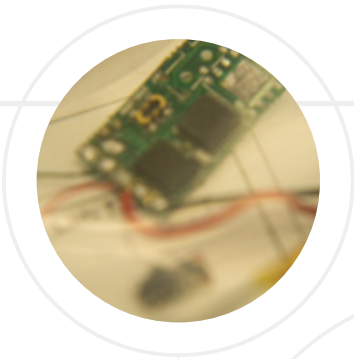
DEU Case Statistics

Year	Caseload	TAT
2014-2015	23	N/A
2016	98	N/A for annual
2017	394	4.59
2018	636	5.2
2019	1,147	2.28
2020	1,315	1.41

DIGITAL EVIDENCE UNIT KEY PERFORMANCE INDICATORS

DEU consistently performed at 100% for quarterly processing of priority and homicide cases marked in LIMS and completed within 60 days.

DEU Key Performance Indicators by Quarter, FY20					
Indicators	Q1	Q2	Q3	Q4	Target
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days of the date the analyst was assigned the case	100%	100%	100%	100%	90%
Percentage of requested homicide cases completed within 60 days of the date the analyst was assigned the case	100%	100%	100%	100%	90%



FORENSIC INTELLIGENCE UNIT

The Forensic Intelligence Unit (FIU) is charged with ensuring that evidence submitted to FSL is prioritized, subjected to all appropriate testing, and reported in a timely and efficient manner. FIU acts as a statistical review board of sorts, following FSL's tests and reports through their return to DFS stakeholder

agencies and tracking their impacts on the criminal justice process. FIU performs statistical analyses of these impacts to ensure that FSL's resources are being appropriately deployed in support of District residents.

FORENSIC INTELLIGENCE UNIT WORKLOAD MEASURES

In FY20, FIU received and processed a total of 4,387 requests from key stakeholder agencies, 190 more requests than in FY19. This unit provides an invaluable service to the following agencies: MPD, the United States Attorney's Office (USAO), the Office of the Attorney General (OAG) for the District of Columbia, the Office of the Inspector General (OIG) for the District of Columbia, and other entities including the United States Park Police, the Naval Criminal Investigative Service, the Federal Protective Service, and the Metro Transit Police Department.

FIU's FY20 requests for testing are broken out by unit, illustrating the relative volume of requests passed on to each unit:

Customer Requests						
FY20	FBU	FEU	DEU	LFU	Evidence Processing	Total
MPD	1,555	261	458	934	360	3,568
USAO	451	15	42	111	54	673
OAG	10	0	0	9	3	22
OIG	1	0	0	1	1	3
Others	20	18	11	45	27	121
Total	2,037	294	511	1100	445	4,387

Though 4,387 customer requests were received and processed, many more forensic testing services were proactively completed without the need for a customer request. FSL automatically initiates forensic processing of all firearms and related evidence, as depicted in the chart at right, in addition to handling all customer-generated requests:

FORENSIC INTELLIGENCE UNIT ACCOMPLISHMENTS

Supporting the Mayor’s FY20 Summer Crime Prevention Initiative (SCI): In FY20, Mayor Bowser continued her strong support of the District’s SCI, a coordinated effort to reduce and eventually eliminate violent crime, remove dangerous illegal guns from neighborhood streets, and hold repeat violent offenders accountable. FIU was successful in tracking daily offenses, confirming evidence submissions to DFS, prioritizing forensic examination requests, and collating analyzed information into viable intelligence.

Proactive Testing				
FY20	Test Fires	Firearm Analysis	Evidence Processing	Latent Analysis
FEU	2,271	290	N/A	N/A
LFU	N/A	N/A	1,140	527

Tracking major cases: In FY20, FIU supported the Criminal Justice Coordinating Council’s GunStat, focusing on the reduction of violent gun offenses. FIU was able to determine spatial patterns of linkages between gun-related offenses through NIBIN, a database that allows scientists to upload and check digital images of cartridge casings against similar images uploaded by other forensics laboratories nationwide. Further, FIU updated its partners in the criminal justice community on ghost guns in the District of Columbia.

Analyzing intelligence impact: FIU and the MPD Investigative Services Bureau collaborated to determine the criminal justice impact of various pieces of forensic evidence. Impact, in these cases, is defined as evidence that leads to an arrest, confirms an arrestee, or provides an investigative lead.

- » **Automated Fingerprint Identification System (AFIS):** FIU analyzed 921 latent print identifications made by LFU through AFIS, a biometric database that uses digital imaging technology to obtain, store, and analyze fingerprint data to determine impact. Of those AFIS identifications, 68% had a criminal justice impact.
- » **Combined DNA Index System (CODIS):** FBU scientists use CODIS to search DNA profiles to form possible links between violent crimes and known offenders. CODIS yielded 594 hits or matches for offenses ranging from robberies, carjackings, and property crimes to sex cases, assaults, and incidences that resulted in death. Of the cases examined that resulted in a CODIS hit, the majority (61%) provided an offender hit. These hits impacted the criminal justice system because they are reported as providing an investigative lead.

- » **National Integrated Ballistic Information Network (NIBIN):** There were also outcomes of forensic intelligence linking NIBIN hits to MPD cases. There were 5,081 NIBIN entries, 3,921 NIBIN leads, and 208 NIBIN hits. Of the 208 NIBIN Hits, 97% link MPD cases and 3% link MPD cases to cross-border jurisdictions, namely in Maryland. In addition, serial number restoration was performed on 167 firearms.
- » **Digital Evidence Unit (DEU):** FIU surveyed members of the MPD Investigative Services Bureau to determine the criminal justice impact of forensic testing of digital evidence. Respondents indicated that the forensic testing completed by DEU most often provided an investigative lead to aid in their investigations. Respondents indicated the next most common impact was an arrest, followed by confirmation with an arrest. A total of 14 respondents ranked confirmation without arrest fourth. Last, 61% of those surveyed indicated no impact to the investigation as the least common.

TRAINING UNIT

The Training team ensures that the agency maintains the highest standards with respect to technology and emerging methodologies, and regularly conducts trainings to inform scientists on the latest advancements in forensic science.

In FY20, the Training team developed a DFS training strategy to include individual training plans that correlate appropriate training to the designated position descriptions.

TYPES OF TRAINING

MULTIPLE DIVISIONS

- » ISO/IEC 17025 Internal Auditor Training
- » Root Cause Analysis
- » Diversity and Inclusion (D&I) Initiative Trainings and Workshops
- » Dale Carnegie—Effective Team Building
- » Real Colors

TRAINING UNIT WORKLOAD MEASURES

DFS scientists completed a total of 3,780 hours of training in FY20. Below is a breakdown of training hours by employees over the past five years:

Training Unit Measures, Previous 5 Years					
Measures	FY16	FY17	FY18	FY19	FY20
Hours completed by employees	N/A	2,200	3,400	3,719	3,780

- » Intro to Intelligence Training
- » Evidence Management Conference
- » The Top Ten Management Survival Skills
- » HSEMA Communications
- » The Basics of Coronavirus
- » The Basics of Contact Tracing
- » OCTO Cyber Security
- » Webex Training

CRIME SCENE SCIENCES DIVISION

- » Drug Familiarization
- » Vehicle Concealment
- » Firearms Familiarization
- » Human Remains K-9
- » Integrity Medical Courier Training
- » Evidence Processing Capabilities
- » Leica Refresher
- » 2020 FBU Sample Success for CSSU

FORENSIC SCIENCE LABORATORY (FORENSIC BIOLOGY UNIT)

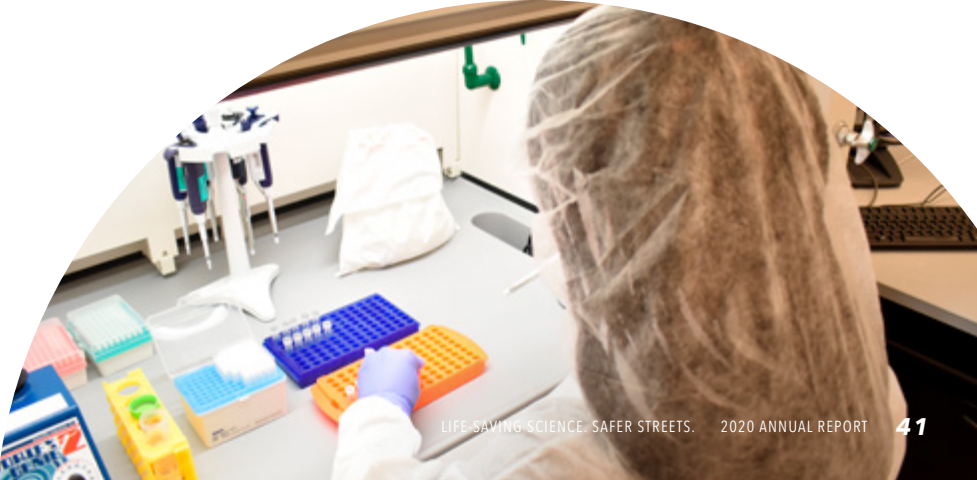
- » 26th National CODIS Conference
- » 2020 Annual Review of DNA Data Accepted at NDIS
- » 2019 HID University Roadshow: Future Trends in Forensic DNA Technology
- » STRmix (v.2.7) USA Workshop
- » 2020 6th Annual Workshop on STRmix Implementation and Casework Approach
- » 2020 QAS Auditor Training
- » Forensic Genealogy: Unlocking the Science of Genealogy
- » 2020 Forensic Genetic Genealogy
- » Why NGS, Why Now?
- » How the NGS Workflow Compares to CE

FORENSIC SCIENCE LABORATORY (FIREARMS EXAMINATION UNIT)

- » Firearms Examination Unit 360 Review Training
- » Leica FSC and FSM Measurement Software
- » Dowel Rod Measurement Training
- » NIBIN Triage and Acquisition Training
- » NIBIN Authorized Trainer Course
- » Mideo Training

FORENSIC SCIENCE LABORATORY (LATENT PRINT EXAMINATION UNIT)

- » DCS Advanced Enhancements
- » International Association for Identification (IAI) Forensic Educational Conference
- » Common Sense Digital Imaging for Latent Print Examiners



PUBLIC HEALTH LABORATORY

- » Agents of Bioterrorism: LRN Conventional Methods Training
- » DiaSorin LIAISON XL Training
- » Lab Management
- » IS-00100.c Introduction to Incident Command System, ICS-100
- » IS-00200.c Basic Incident Command System for Initial Response
- » Validation and Verification Processes in PHLs
- » COVID-19: Laboratory Risk Assessments and Lessons Learned
- » Every Contact Counts: Contact Tracing for Public Health Professionals
- » Public Health 101 Series—Introduction to Public Health Surveillance

QUALITY ASSURANCE UNIT

The Quality Assurance Unit provides oversight of all quality assurance measures that maintain DFS’s validity and ability to conduct self-sustaining science. The Quality Unit is responsible for the coordination of audits, policy and procedure oversight, certifications, and accreditations. These processes are designed to safeguard the public’s confidence in DFS test results through imparting robust quality systems that improve responsibility, impartiality, traceability, reproducibility, transparency, and the overall utilization of scientific approaches to problems.



TRAINING UNIT ACCOMPLISHMENTS

Establish training strategy: The DFS training strategy includes individual training plans that correlate appropriate training to the designated position descriptions.

The following audit was conducted in FY20:

FSL–ANAB audit: FEU, LFU, DEU, and FBU underwent the annual inspection for accreditation in accordance with ISO/IEC 17025. FBU successfully passed its audit and for five consecutive years has yielded no findings of non-conformance with either set of standards. The DFS off-site surveillance assessment was successfully completed, and accreditation has been continued by ANAB.

QUALITY ASSURANCE UNIT KEY PERFORMANCE INDICATORS

The Quality Assurance Unit monitors competency and provides proficiency tests for scientists who perform functions in any of DFS’s 14 scientific units. In FY20, the number of scientists went from 127 to 161, reflecting a 27% staff increase.

QUALITY ASSURANCE UNIT ACCOMPLISHMENTS

Pandemic contact tracing support: For 120 days, two members of the Quality team supported the Mayor’s public health initiative as part of the COVID-19 Contact Trace Force.

Audits and assessments: In FY20, the Quality team performed risk assessment analyses on FY19 and FY20 corrective action reports, participated in the successful ANAB interim assessment of the FEU Unit and in the ANAB ISO/IEC 17025 accreditation surveillance audit, and performed internal audits of the ISO/IEC 17025 and CLIA units.

Quality Assurance Key Performance Indicators by Quarter, FY20

Indicators	Q1	Q2	Q3	Q4	Target
Percentage of scientists meeting technical competency requirements	98%	100%	99%	99%	95%



OUTREACH



The pandemic provided a great opportunity to educate District residents about the life-saving work performed at DFS. This was accomplished through dozens of media reports, increased social media engagement, and community outreach.

Community outreach is the vehicle by which we interact with District residents and educate them about our work, continue to build trust in DFS's services within our neighborhoods, and support a robust science, technology, engineering, and mathematics (STEM) career pipeline for District residents and those who choose to work in our city. In FY20, DFS continued to support the District's public safety agenda and deepened partnerships with stakeholders.

PEOPLE AND CULTURE

The scientists, laboratory technicians, senior leaders, administrative staff, and interns who do the important work of this agency are our “People.” It is our job as an agency to ensure they receive the training, education, and support necessary to continue to deliver on our commitment of self-sufficient science and safer streets. Equally important is the “Culture” that we cultivate for our People. We want to build camaraderie and a support system that creates an enabling environment for our work. To that end, FY20 brought with it several People and Culture initiatives, including:

DFS awards ceremony: This event was organized by the all-volunteer DFS Awards Committee. Employees were nominated by their peers and recognized across several categories, including Employee of the Year, Supervisor of the Year, the Years of Service Award, the Director’s Award, and the Gauntlet Award for Teams.

Purple Thursday: In FY20, we held an employee-wide initiative to wear purple in recognition of Domestic Violence Month.

Celebrate our veterans: On Veterans Day, DFS saluted veterans for their service to our country and for their contributions to forensic science.



Holiday initiatives: In honor of the holiday season, DFS hosted an internal toy drive to collect gifts for District youth. The initiative partnered with MPD to deliver the donations to the community.

DFS Family Day: DFS employees were invited to participate in virtual events with their families, highlighting the work performed at DFS.

Health and wellness initiatives: In FY20, DFS held a blood drive that led to the collection of 19 units of blood, saving 57 lives.

DIVERSITY AND INCLUSION

Racial injustice cast a dark shadow over many cities across the United States in 2020, with several controversial police shootings involving white officers and African American victims. There were large protests and loud calls for change in communities and at workplaces. Prior to FY20, DFS had already initiated a diversity and inclusion (D&I) program designed to build upon the successes of the agency’s diverse workforce and create an inclusive cultural climate to ensure that all DFS employees have access to the tools and support they need to succeed. As part of this effort, DFS employees established the agency’s core values—accountability, trust, and integrity. All employees had access to training and counseling to help manage their stress and mental health during the pandemic.

The D&I team accomplished the following:

- » Established a D&I advisory board of DFS managers and staff.
- » Hosted a town hall event to launch the D&I program.
- » Conducted four management development sessions.
- » Conducted two health and wellness workshops on vicarious trauma for all agency staff.
- » Conducted a communications workshop to improve internal communications and provide strategies for employee engagement.

- » Created a D&I page on the agency Intranet to provide employees access to previous trainings, events, and announcements.
- » Developed a series of FAQs to address many of the inquiries and concerns that were shared during the assessment.
- » Improved the look and feel of the Intranet, with new features to provide employees with access to the latest information.
- » Instituted private on-site vicarious trauma counseling for employees.
- » Created a “quiet room” to offer employees a safe space to decompress.



DFS EDUCATES AND MENTORS

In FY20, restrictions on in-person events forced us to reimagine how we highlight the vitally important work of our agency and promote careers in forensic science and other STEM fields. While we were not able to open our doors for public tours, we embraced video and technology to engage with students and community groups.

Virtual educational outreach: DFS scientists and staff hosted high school students during virtual field trips to help young people understand some of the work we perform within the agency. We provided demonstrations for Excel Academy, Friendship Chamberlain Charter School, Columbia Heights Educational Campus, and other schools.

STEM in the Community: This program finds creative ways to introduce students to forensic science. The sessions, which meet weekly for four weeks, allow groups to hear from DFS scientists in varying disciplines and ask questions about their respective fields.



SPECIAL PROJECTS AND INITIATIVES

Each year, DFS supports several special projects and initiatives that are cross-cutting in nature and that involve stakeholders from across the District.

National Forensic Science Week: This event was held September 20–26, 2020. In the past, it has included several community programs and a DFS open house; because of the pandemic, however, this year’s activities were scaled back in favor of an all-virtual celebration. DFS shared messages of appreciation with staff from District leaders and organized activities to celebrate all our forensic disciplines.



INTERN SPOTLIGHT

Internships are an integral component of DFS’s outreach efforts. In FY20, we attracted 29 interns through a myriad of feeder programs and relationships with multiple colleges and universities. We also support internship initiatives prioritized by the Mayor’s Office, such as the District Leadership Program, which promotes employment opportunities that build pathways to the middle class.

Our internship program provides students with practical experience and the type of exposure needed to strongly consider careers in forensic science and public health. From mentorship and shadowing opportunities to conducting research and data collection, our internship projects run the gamut and are based on students’ grade level, background, experience, and interests.

The best part is that our pool of interns is just as diverse, interesting, and dynamic as are the scientists, technicians, and administrative staff at DFS.

DIRECTORATE AND THE OFFICE OF THE SENIOR DEPUTY DIRECTOR

In FY20, the Directorate and the Office of the Senior Deputy Director (SDD) had 10 interns providing support for a range of projects, including conducting communications, performing research and studies, and uploading information into inFlow.

CRIME SCENE SCIENCES DIVISION

In FY20, CSS had one intern who worked on digitizing legacy MPD crime scene reports and refrigerator evidence inventory.

FORENSIC SCIENCE LABORATORY

In FY20, FSL employed nine interns who provided either year-round support or a summer-long commitment to the division and its various units.

PUBLIC HEALTH LABORATORY

In FY20, PHL had seven interns providing support across the division. Of note were the number of university-level interns we were able to attract, as well as the complexity of the projects assigned (e.g., optimizing parameters for detection of rat poison in the K-12 studies, conducting cell culture isolation and identification of potential arboviruses circulating in the District’s mosquito population, and completing extensive literature reviews for key projects and research papers).

TRAINING

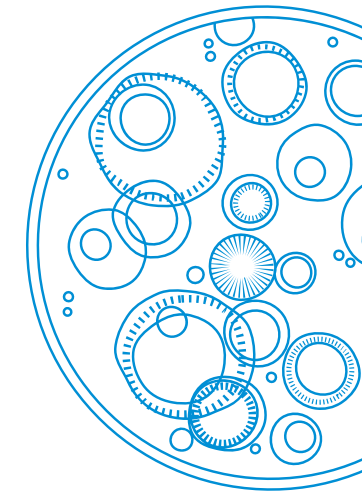
The Training team is responsible for the coordination of DFS’s overall internship program. Interns included students from American, Bowie State, George Mason, George Washington, and Howard universities.



FUTURE PROJECTS



FY20 was a difficult year that tested our ability to provide life-saving science and promote safer streets across the District. From rapidly increasing resources and staffing to combat a new disease to processing thousands of crime scenes and related evidence, tracking homemade weapons, and receiving the necessary certifications and accreditations to further validate our independence, we are poised to build on our accomplishments in FY21.



PLANNED INITIATIVES FOR FY21

OPERATIONS

- » Streamline budget planning, formulation, and execution processes
- » Implement more efficient contract performance methods to achieve greater fiscal discipline

OFFICE OF THE SENIOR DEPUTY DIRECTOR (SDD)

- » **Forensic Intelligence Unit (FIU):** Identify trends in evidence collection based on geographic District boundaries
- » **Training:** Expand the DFS onboarding training program
- » **Quality:** Provide units with training and quarterly risk assessment reports
- » **Human Resources:** Develop talent acquisition pools
- » **Cyber Operations Section:** Perform Justice 3.8 upgrade

CRIME SCENE SCIENCES DIVISION (CSS)

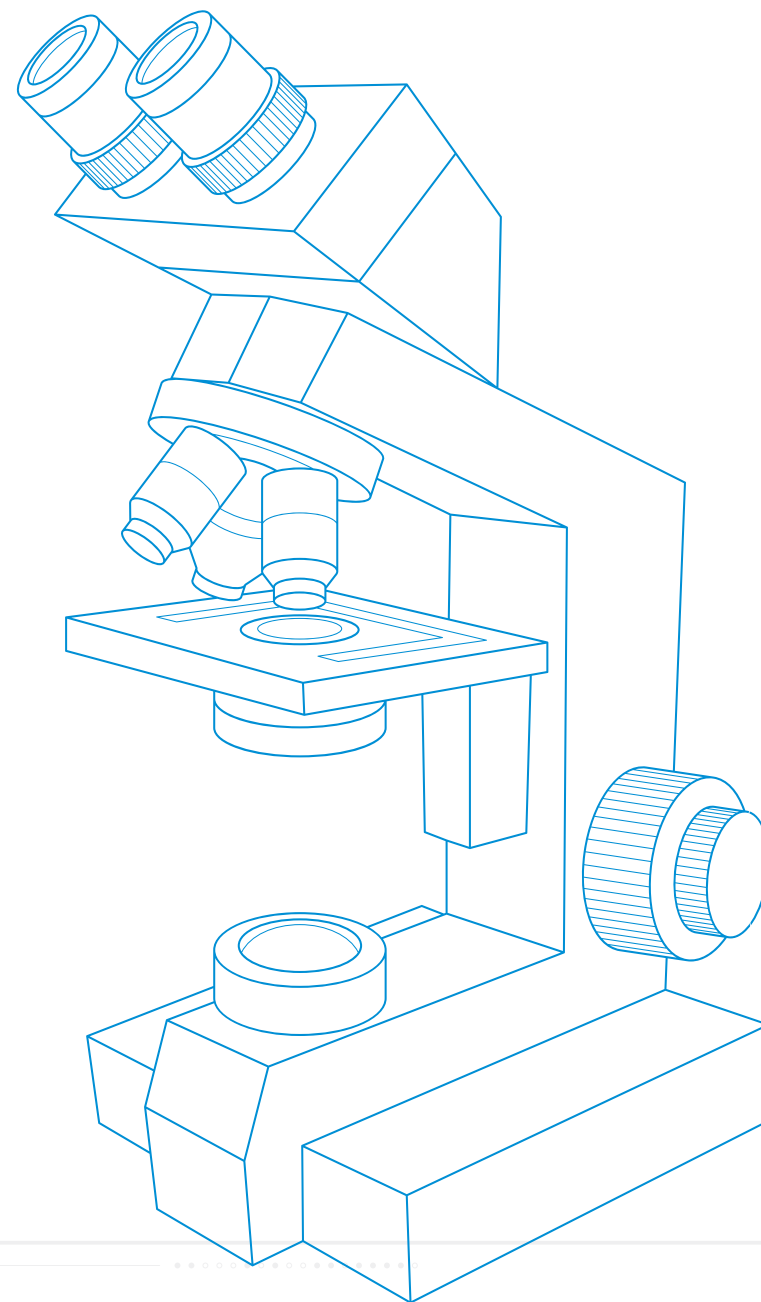
- » Explore going paperless and creating electronic case files
- » Present to all MPD units the “Strategic Forensic Science Leads to Better Results” training
- » Update CSSU retention schedule for files

FORENSIC SCIENCE LABORATORY (FSL)

- » **Firearms Examination Unit (FEU):** Go paperless
- » **Latent Fingerprint Unit (LFU):** Conduct an internal 360 review of laboratory operations and policies
- » **Forensic Biology Unit (FBU):** Implement Next-Generation Sequencing technology

PUBLIC HEALTH LABORATORY (PHL)

- » **Forensic Chemistry Unit (FCU):** Continue new syringe-exchange program and increase surveillance to include all K2/Spice exhibits
- » **Immunology/Virology Unit (IVU):** Implement respiratory virus multiplex and rabies variant typing
- » **Microbiology Unit (MBU):** Add BioFire SARS-CoV-2 testing and add Cepheid to Mobile Testing Unit
- » **Molecular Diagnostic Unit (MDU):** Implement multiplex assay for respiratory viral surveillance and add supervisory-level staff





2020 ANNUAL REPORT

LIFE-SAVING SCIENCE. SAFER STREETS.

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DISTRICT OF COLUMBIA
DFS
DEPARTMENT OF
FORENSIC SCIENCES



GOVERNMENT OF THE
DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

