forensic science ireland

Annual Report 2020



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Excellence Through People 1000:2017



Foreword

While Covid-19 imposed some considerable constraints on FSI throughout 2020, the commitment, resilience and adaptability of our staff has helped FSI deliver another year of strong contribution and impact to the criminal justice system.

As an essential service FSI have remained open throughout all stages of Covid-19 restrictions, with the key objective of providing a sustainable service while keeping our staff safe. I am very proud of how our staff and our organisation have embodied selfless public service values at all stages of this pandemic in support of the justice system. I want to sincerely thank all our staff for your continued support and commitment to FSI during a challenging year for us all.

While Covid-19 has presented us with some significant challenges, it has also led to new ways of working and some enduring changes for FSI and its customers. There has been ample opportunity for innovation and our staff have embraced this. We have implemented a new appointments-based system for case submissions that has reduced queue times and has made the submission process more efficient for staff and customers alike. This improvement is all the more significant given that submissions increased by 52% in 2020 compared to 2019. For the first time, FSI scientists presented expert testimony remotely through video-conferencing technology. Considering that FSI staff present in courts around the country, this is a significant leap forward in efficiency for FSI staff. Finally, while FSI is predominantly a laboratorybased service, we have fully embraced remote working platforms over the past 12 months. Secure remote access and videoconferencing technologies have helped our staff remain productive and connected over the past year. Remote attendance at virtual meetings and courses across the world has providing access to expertise from leaders in the field, previously only accessible by long-distance travel. While these new practices were triggered by Covid constraints, FSI will learn from our experiences over the past year and implement them on a sustainable basis.

This was the first full year where the Fingerprints and Documents & Handwriting services have been integrated into FSI, following a transfer from the Garda National Technical Bureau in December 2019. I am impressed by the level of expert knowledge and professionalism demonstrated by the Garda experts and staff that transferred to FSI. There are now combined teams of Garda experts, FSI scientists, analysts and administration staff working collaboratively to deliver and improve these services.

FSI reported on close to 22,000 investigations last year, including almost 6,000 from Fingerprints and Documents & Handwriting. This represents an increase of 36% in reported cases compared to 2019. FSI also expanded its intelligence services over the course of the year. FSI supported the validation and preparations for fingerprint exchange as part of the Schengen Information System in 2020. This is the most commonly used IT system to control public security in Europe, enabling law enforcement agencies to check and share data on banned, missing, and wanted individuals. Ireland also currently exchanges fingerprint data with Austria, Romania and the Czech Republic under the Prüm agreement. FSI expanded connectivity for Prüm DNA Exchanges, with 8 countries now actively exchanging (Austria, Latvia, Netherlands, United Kingdom, Slovakia, Poland, Sweden and Estonia) with further expansions planned for 2021. FSI also completed a comprehensive Drugs Quantification trend reports for the previous 4 years (2016 - 2019) on Heroin, Cocaine and Amphetamine and shared these insights with stakeholders in An Garda Síochána and the Department of Health.

Last year was also a very successful year for the National DNA Database, with close to 50,000 DNA profiles on this database by the end of 2020. The number of reference profiles increased by 8,631 in 2020 and the number of crime-scene profiles increased by 1,555. The impact of the database has also increased over time, with 47% of uploaded crimestains now linked to a person. A report on the operation of the DNA Database in 2020, in compliance with the Criminal Justice (Forensic Evidence and DNA System) Act 2014, is also included in this annual report.

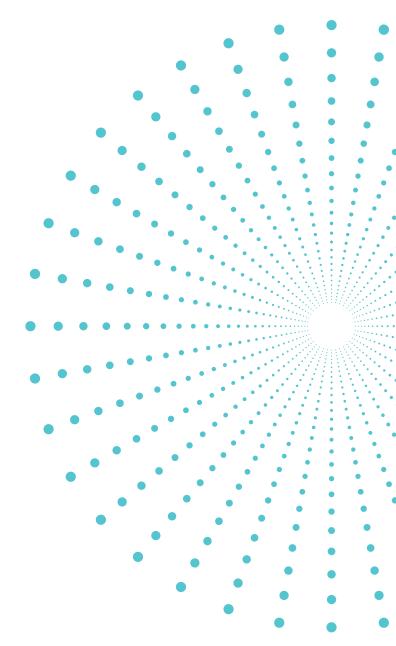
FSI was awarded with several extensions to the scope of our ISO-17025 accreditation in 2020. These extensions to the scope of our services included DNA relationships testing (technology, process & software), evaluative expert opinion for several evidence types as well as new instrumentation and new methodologies across the range of services we offer.

I am delighted to witness the progress in the construction of FSI's new facility at the Backweston Laboratory Campus in County Kildare. Construction commenced in March 2020 under the supervision of the Office of Public Works and progress over the course of the year has been remarkable. The scheduled completion timeframe is Summer 2022 and FSI very much looks forward to moving to this new fit-forpurpose facility which will enable an expansion of capacity and services for our customers.

Although 2020 was challenging, the Covid crisis has given us many opportunities to learn and implement new approaches that will benefit FSI and our customers in the long-term. I am confident that we will build on this in 2021 and continuously improve expand the services we offer for our justice system.

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Chris Enright Director General FSI



Introduction

Forensic Science Ireland is an associated office of the Department of Justice and Equality. We work together to deliver, to best international standards, comprehensive scientific analysis, independent expert opinion, advice and training to support the Irish Criminal Justice system. Originally known as the Forensic Science Laboratory, FSI was established in 1975 to provide a scientific service to the Criminal Justice System by analysing samples submitted from crime scenes and providing expert evidence in criminal trials. In June 2014, President Higgins extended our scope when he signed into law the Criminal Justice (Forensic Evidence and DNA Database System) Act 2014. Under this act, FSI is named as the custodian of that database and our name was changed from Forensic Science Laboratory to Forensic Science Ireland to recognise this broader remit.

In December 2019, the responsibility for the Fingerprints and Documents and Handwriting services transferred from the Garda National Technical Bureau to Forensic Science Ireland. This consolidates most laboratory-based forensic work under Forensic Science Ireland. FSI currently has 193 staff, including seconded Garda members, scientists and analysts trained in forensic testing and reporting techniques, supported by administration professionals.

FSI is currently based in Garda Headquarters in the Phoenix Park but the construction of a new fitfor-purpose building on the scientific campus at Backweston, Celbridge is well underway, with an expected completion of Summer 2022. The transition to this new facility will be completed on a phased basis as soon as possible afterwards. FSI is a founding member of the European Network of Forensic Science Institutes (ENFSI), as well as the Association of Forensic Service Providers (AFSP). These organisations are focused on developing and sharing best international forensic practices and research within its members. Our staff are active on all the relevant ENFSI and AFSP working groups. This international engagement is important in ensuring that expert evidence presented is grounded in the most recent scientific research and best international practice.

FSI is accredited according to ISO17025 (2017) and holds a Gold Excellence through People certification.

Who Are We and What We Do

Our Management Team



Director General Chris Enright



Director of Physical Analysis Dr. Dyan Daly



Director of DNA Dr. Geraldine O'Donnell



Director of Science & Development Dr Martina McBride



Director of Corporate Services Dr. Tom Hannigan



Director of Chemical Analysis Dr. Yvonne Kavanagh

Our Staff

Forensic Science Ireland is a knowledge-based organisation and the expertise of our staff is its most valuable attribute. Since December 2019, 25 Garda members as well as a number of Garda staff seconded to FSI to support the Fingerprints and Documents and Handwriting services. They bring a wealth of experience and expertise within their fields that is very much appreciated by FSI. Both of these services now have a blend of expert Garda members, scientific and analytical staff recruited by FSI within the teams. FSI currently has 193 staff, including the seconded staff. We have recruited a significant number of new scientific, analytical, ICT and administrative staff over the last year to meet the demands of current and new services in Chemical, DNA and Physical Analysis. We are fortunate to be able to attract high calibre scientific and technical professionals into FSI. Forensic science analysis and interpretation are always evolving and consequently FSI places a significant emphasis on ongoing education and development. This is vital in ensuring that the Justice System has the benefit of international best practice.

Our Services

FSI contributes to both the investigation of crime and the judiciary process within the Irish Justice System. In broad terms, forensic investigations involve the examination of items recovered from crime scenes and the use of various techniques to investigate links between suspects and victims, and between suspects and scenes. This is underpinned by an objective evaluation of context and scientific facts, frequently leading to the elimination of suspects from investigations. There are few major criminal trials that do not feature some contribution from FSI.

The area of most sustained growth is DNA, which is also the discipline of greatest recent developments. In the DNA area, DNA profiles are generated from submitted items and compared with DNA profiles obtained from suspects to assist the investigation of crimes ranging from burglaries to sexual assaults and murder. Blood Pattern Analysis (BPA) and the examination of damage to clothing is also carried out. Since the establishment of the National DNA Database, the DNA department plays a key role in managing the Database in accordance with the legislation as well as quality and security best practices. This department reports on matches between individual crime stains and suspects as well as cluster matches. This offers on-going intelligence to An Garda Síochána in the investigation of crime. In accordance with the Forensic Evidence and DNA Database, FSI's policies and practices relating to the DNA Database are overseen by an independent DNA Database Oversight Committee. Since 2019, FSI is exchanging DNA profiles with other European countries through the Prüm Treaty. This treaty allows for the automated anonymous comparison of profiles among participating countries and enables fast information exchange for intelligence purposes.

The analysis of materials thought to contravene the Misuse of Drugs Acts constitute the highest number of submissions to FSI and are supported by the Chemical Analysis department. Case submissions vary widely in size, drug mix and complexity. These cases can involve new psychoactive substances that pose particular analytical challenges. The drugs team have influenced legislation through the identification and characterisation of drugs in the market place. This team also quantifies drug purity levels in the market and provides trend information to stakeholders in An Garda Síochána as well as the Department of Health. In addition to drugs submissions toxicology samples associated with sexual assault cases are analysed and evaluated. The Physical Analysis area is the most recently formed department in FSI. This department was formed to take advantage of the overlaps between disciplines moving from the Garda National Technical Bureau (GNTB) and disciplines that exist today within FSI. This department includes the Fingerprints and Documents & Handwriting disciplines that integrated into FSI over the course of 2019. It also includes a diverse range of examinations where trace evidence recovered from scenes or suspects (e.g. glass, paint, fibres, firearm residue) is compared to reference samples. Physical or digital tachographs and marks/impressions are also examined e.g. footwear or tyre impressions left at crime scenes or manufacturing marks on plastic bags. Debris samples from suspicious fires are analysed for accelerants (e.g. petrol), offensive sprays (such as pepper spray) are evaluated and suspect materials are also analysed for explosives within this department.

The majority of cases for analysis at FSI are submitted by An Garda Síochána, but material is also received from Garda Síochána Ombudsman Commission (GSOC), Customs & Excise, and Military Police. Cases are accepted by FSI reception/case intake staff who ensure that items are safely and securely stored or passed directly to a scientist depending on the situation. In either situation, the chain of custody is carefully recorded.

In addition to analysing samples in the laboratory, staff from FSI provide professional advice and training on the appropriate samples to be taken from crime scenes and individuals and, in some circumstances, attend crime scenes. We also operate an out-of-hours service for situations where investigating Gardaí need access to time-critical analysis or when it is necessary to visit crime scenes, or suspected clandestine drug laboratories.

We liaise directly with the Garda on investigations where we identify there is probative evidential value rather than where scientific findings would not help progress the investigation.

Staff provide expert testimony in criminal trials. There is the potential for this to occur in all cases, but some areas of work are more likely to result in court cases than others. Attendance at court can involve robust defence of scientific findings and/or an outline of routine processes related to continuity or laboratory procedures. This annual report is organised under six main headings, corresponding to the strategic themes identified in FSI's strategic plan 2019 – 2022.

Service Development and Growth

This section focuses on how we are improving the capacity of services we are delivering today and how we are increasing the breadth of services in support of the justice system in Ireland. This section also includes a report on the DNA Database and Prüm DNA exchange.

Science Technology and Innovation

This section focuses on how the organisation is progressing our application of science and technology, innovating to maximise the impact of forensic science and maintaining our standing within the international forensic community.

Partnership and Integration

This section focuses on how we are strengthening relationships within the criminal justice system and beyond, to maximise FSI's contribution to society.

Quality Systems

This section focuses on how we maintain a robust quality-focused forensic science service and operate to the very best international practices.

Fit-for-purpose Environment

This section outlines progress in transitioning to a new fit-for-purpose facility at the Backweston scientific campus and how we manage risk in the intervening period.

Excellence through People

This section focuses on how we build an inclusive and integrated team within FSI that helps us collectively achieve our mission.

PILLARS \mathbf{C} STRATEG



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Costa Rica to Cork in a banana boat

On the 18th of February 2021 the Maersk Nimes completed its voyage from Costa Rica by docking in Cork Harbour. Known in Cork Harbour as 'The Banana Boat', the massive container ship filled with fruit is a regular feature in the port each week. An operation by An Garda Siochana, Customs and the Naval Service was in place based on information that controlled drugs may be present in the cargo. A sniffer dog, X-ray equipment and officers trained to search for contraband discovered multiple packets of compressed white powder. Upon analysis at FSI it was confirmed that the 172 kg of compressed white powder contained cocaine. The street value of such a haul is placed at approximately 12 million Euro making this one of the biggest single drug seizures in the Republic of Ireland for a number of years.

New Synthetic Cannabinoid linked to deaths and Acute Poisonings

Methyl 3,3-dimethyl-2-(1-(pent-4-en-1-yl)-1H-indazole-3-carboxamido)butanoate (MDMB 4en-PINACA) is a synthetic cannabinoid receptor agonist. Similar to other synthetic cannabinoids, it is sold as a replacement for cannabis. Because of their high potency, synthetic cannabinoids can pose a high risk of severe poisoning, which in some cases can be fatal. A total of 11 acute non-fatal poisonings with confirmed exposure to MDMB-4en-PINACA were reported by the United Kingdom in 2020. In 10 of the cases, the poisoning was considered life threatening and required hospitalisation of the patient. A total of 4 deaths with confirmed exposure to MDMB-4en-PINACA were reported by the United Kingdom (3) and Sweden (1). The cases occurred between 2019 and 2020*.

In July 2020 An Garda Siochana seized approximately 80 grams of green plant material suspected of being cannabis. Upon analysis, FSI confirmed that it was not cannabis but green plant material impregnated with MDMB 4-en PINACA. Subsequently we have seen more cases containing MDMB 4-en PINACA submitted to FSI for analysis. FSI have a role in reporting first instances of new psychoactive substances to the Early Warning and Emerging Trends (EWET) group and to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA).

* European Monitoring Centre for Drugs and Drug Addiction (2020), EMCDDA initial report on the new psychoactive substance methyl 3,3-dimethyl-2-(1-(pent-4-en-1-yl)-1H-indazole 3carboxamido)butanoate (MDMB-4en-PINACA), Initial reports, Publications Office of the European Union, Luxembourg.

Case Study 3

DNA Database and Cluster of Dublin Burglaries:

Matching unknown male DNA profiles were obtained in seven Dublin burglary cases, which occurred from 2014 to 2020. The DNA profiles were obtained from bloodstaining found at the different scenes as well as from various items including a knife and a pair of glasses.

Following an intercountry exchange of DNA profiles under the Prüm Council Decision a match was obtained in June 2020 between the DNA profiles from the crime scene samples obtained in these cases on the Irish DNA Database and the DNA profile of a person on the DNA Database in the Netherlands.

Subsequently a DNA reference sample from a male suspect was submitted to FSI for one of these burglary cases. The DNA profile obtained from the reference sample matched the crime stain in that case and the other crime stains when it was uploaded to the Irish DNA Database.



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Murder of Timmy Foley in Macroom, Co. Cork on the 8th of October 2018

On the 8th of October 2018, a scientist attended the scene of the murder of Timmy Foley in a house in Macroom, Co. Cork to assist with bloodstain pattern analysis (BPA) and in the selection of samples for subsequent examination and DNA analysis in the laboratory.

Mr Foley had been stabbed 28 times and died from his injuries. During the scene examination, significant bloodstain patterns were observed and their source subsequently identified by DNA profiling. This allowed the scientist to provide an expert opinion as to the activities that occurred in the house to create these bloodstain patterns.

A number of items were also examined in the laboratory including the knife recovered from the cistern of the toilet in and mobile phones associated with the incident. Specialised examinations were also carried out on intimate swabs and footwear comparisons.

In October 2020, Rita O'Driscoll went on trial in the Central Criminal Court in Cork for the murder of Timmy Foley. On the 16th of October 2020, FSI scientists gave evidence in this trial remotely via a virtual link to the court.

Sexual Assault Case Example

One of our roles within FSI is to interpret our results within the framework of the case circumstances. The outcomes of our analysis can provide a weight of evidence that supports either the prosecution or defence. For example a woman alleged she was raped by a man in her bed. She bled at the time and was medically examined at a Sexual Assault Treatment Unit (SATU). The man agreed he was in the woman's bed but denied he had sex with her. He said that the clothes he was currently wearing were those worn while he was in her bed. Samples taken from her during this examination were submitted to the laboratory.

Clothing and penile swabs were also taken from the nominated suspect and submitted, however the man had showered prior to these swabs being taken. He said that if any blood from the injured party was found on him or on the clothes he wore in her bed, that the blood must have transferred from the bed to him. The issue addressed in this case was whether or not sexual intercourse had occurred.

To help address this issue, the woman's intimate samples, taken during her medical examination, were examined and no semen was found. Given that semen is evidence of ejaculation rather than penetration the absence of semen did not help to address the issue in this case.

No blood was found on the man's penile swabs. However as he had showered prior to these swabs being taken, the absence of blood did not help to address the issue. The top and boxer shorts that the man said he was wearing in the woman's bed were examined for blood. Blood and DNA matching the woman was found on the lower front of his top. A chemical test indicated the presence of blood on the inside front of his underwear, but there was no visible blood. DNA matching the woman was also found on the inside front of this pair of underwear. Additionally on the inside of a pair of his underwear, that he said he was not wearing when he was in the woman's bed, visible blood and DNA matching her was found.

To evaluate the strength of the evidence the likelihood of obtaining each result was considered if what she said were true, versus if what he said were true.

If what the woman said was true then finding blood matching her on the lower front of his top and at the inside front of his underwear would be an expected outcome.

If what the man said was true then the expected outcome would be either no blood was found or that the blood would be on the outside of his clothing. On the underwear that he said he was not wearing while he was in her bed no blood or DNA from her would be expected.

The results in this case provided very strong support that they had sexual intercourse rather than they did not.



Development and Growth



Service Development and Growth

Service Delivery

Since March 2020 the Covid-19 pandemic imposed significant restrictions on how FSI went about its business in the workplace. FSI is predominantly a laboratory-based service and much of the work requires presence within the laboratory workplace. The design and nature of our current facilities as well as occupancy limitations presented some unique challenges to FSI in 2020 but our staff have adapted extremely well to these challenges and have delivered an uninterrupted sustained service throughout all stages of the pandemic. This was supported by changes in remote technology, work patterns and work practices coupled with the flexibility and commitment of our staff.

This was also the first year where the fingerprints and documents and handwriting services have been provided by FSI. The integration of these services as well as the growth in demand for Drugs and DNA investigations have led to a 74% increase in case submissions when compared to 2018. For last year alone drugs & toxicology submissions increased by 26% and more specifically, complex case submissions (related to possession with intent to supply, or cultivation) increased by 34%.

Service	2018	2019	2020	% Growth (2018 – 2020)
Drugs and Toxicology Cases	9,577	10,480	13,184	38%
DNA (including Sexual Assault Cases)	6,190	7,367	8,028	30%
Chemistry Cases	821	899	849	3%
Fingerprint Cases	-	-	6,072	
Document & Handwriting Cases	-	-	783	
Biometrics - DNA	11,045	16,185	15,515	
Biometrics - Fingerprints	-	-	7,928	
Total Cases Submitted (excludes biometric samples)	16,588	18,746	28,916	74%

Table 1: Case Submissions (Demand). Biometric Samples are DNA or Fingerprint samples of individuals submitted to FSI

The number of cases reported by FSI increased by 36% compared to 2019 (including new services). FSI prioritised the more complex drug submissions and reported close to the same number of cases as 2019. We have also supported all urgent drugs case (typically custody cases) within the 24-hour timeframe, despite a significant increase in demand (31% vs 2019). FSI increased the number of DNA case reports by 24% in 2020 and reported on all Body Identifications within the agreed timeframe, despite the significant increase in submissions (up 23% vs 2019). Given the sustained increase in drug submissions, it is clear that further increases in the capacity of our drugs analysis service is needed this year. FSI will also continue to prioritise cases on the basis of the importance to An Garda Síochána and forensic potential, in accordance with our Service Level Agreement.

Service	2018	2019	2020	Change vs 2019
	7,717 Total	9,667 Total	8,106 Total	
Drugs and Toxicology Cases	(4,845 complex, 2,872 Section 3)	(5,555 complex, 4,112 Section 3).	(5,267 Complex, 2,839 Section 3)	-16%
DNA Cases (including Sexual Assault)	4,500	5,860	7,237	24%
Chemistry Cases	675	555	581	5%
Fingerprint Cases	-	-	5,601	-
Document & Handwriting Cases	-	-	514	-
Biometrics - DNA	11,045	16,185	15,515	
Biometrics - Fingerprints	-	-	8,434	-
Total Cases Reported (excludes biometric samples)	12,892	16,082	22,039	37%
Table 2: Reported Cases				

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Types of Drug Analysed in 2020

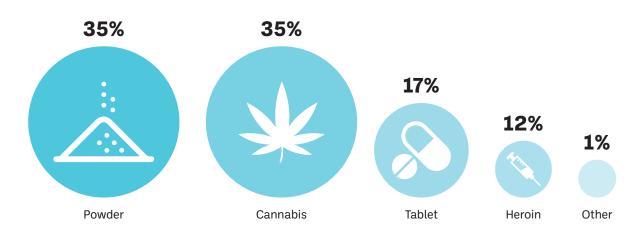
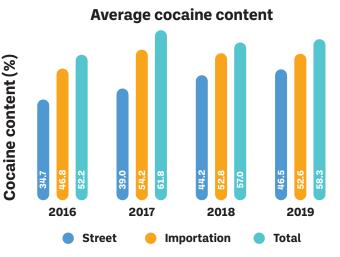


Figure 1: Types of Drug Analysed in 2020

Drug Quantification trends 2016-2019

Quantification data is produced for intelligence purposes for cocaine, diamorphine (heroin), and amphetamine the second, third, and tenth most commonly seized drugs, respectively, in 2019. Commonly identified adulterants are also identified. Two distinct levels of seizure are analysed for quantification of cocaine and diamorphine: street level and importation level. Street level samples are defined as those submitted from seizures less than 30 g while importation level samples are defined as those submitted from seizures primarily over 500 g. For amphetamine, all seizures over 25 g were quantified.

"Year on year increase seen for street level cocaine 2016-2019"



Cocaine

Figure 1: The average cocaine content at street and importation level

Cocaine was the most commonly seized stimulant in Ireland across the period examined and the second most commonly identified compound after cannabis. In 2019, 26% of all drugs cases analysed in FSI contained cocaine, which was equivalent to 222 kg of powder/substance. Figure 1 illustrates the annual average cocaine content - the content has remained broadly consistent over the four-year period, with an increase at street level noted. The importation level content is consistently higher than the average at street level. Of the three analytes examined, cocaine demonstrates the widest variety in adulterants. With the exception of 2017, benzocaine is the most commonly detected adulterant across the time period, closely followed by levamisole.

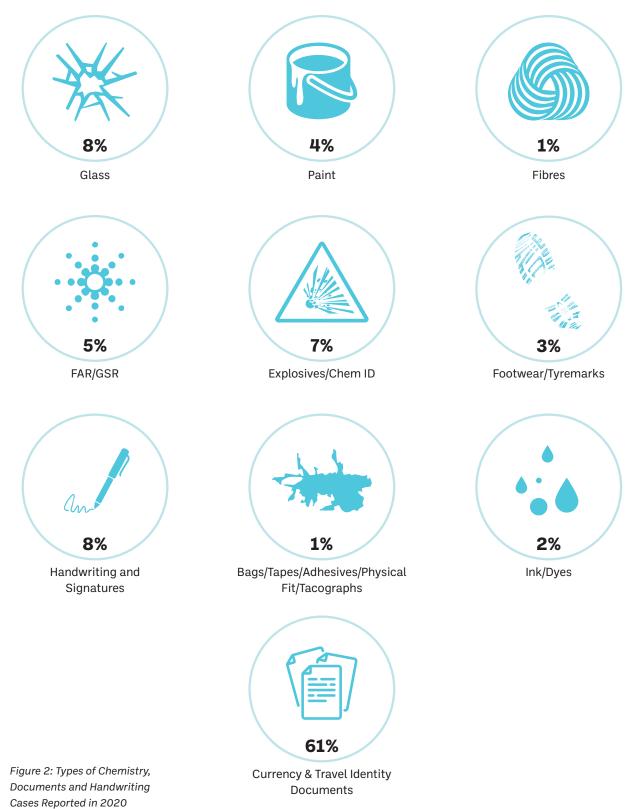
Diamorphine (heroin)

Diamorphine is a semi-synthetic product produced by the acetylation of morphine, which occurs as a natural product in opium. The drug is controlled in the Republic of Ireland. Diamorphine is the most commonly encountered opioid in Ireland and throughout the EU and was the third most commonly identified compound in FSI in 2019. In 2019, 15% of all drug cases analysed in FSI contained diamorphine, which was equivalent to 50 kg of powder/substance. Across the period examined, the annual average diamorphine content shows some year-to-year variability with the importation level average content higher than street level value. The average street level and importation level contents are 35% (range 30.4-40.6%) and 41% (38.1-44.8%) respectively. Caffeine and paracetamol are the most commonly detected adulterants in diamorphine seizures. Other adulterants detected include clotrimazole and MDMA.

Amphetamine

Amphetamine is the second most commonly encountered phenethylamine in Ireland, after MDMA. It was the tenth most commonly identified compound in FSI in 2019. In 2019, 2.5% of all drugs cases analysed in FSI contained amphetamine, which was equivalent to 27 kg of powder/substance. Across the period examined, the annual average amphetamine content has remained broadly consistent with an average content of 8% (range 6.7- 9.4%). Caffeine is by far the most consistently detected adulterant in amphetamine seizures. In terms of adulterants, 86% of samples submitted for analysis over the four-year period were found to contain at least one adulterant with caffeine always detected.

The broad variety of chemistry cases analysed is represented in Figure 2. Each discipline represents a unique speciality and field of expertise.



Types of Chemistry Cases Reported in 2019

Figure 3 represents the different investigations supported by the fingerprint section over the course of 2020.

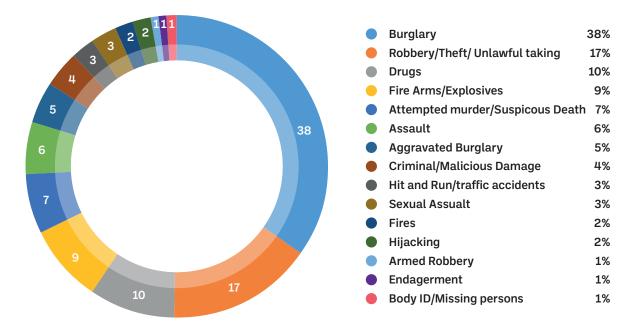


Figure 3: Percentage of Case types reported in Fingerprints in 2020

Figure 4 represents the types of DNA cases reported from FSI over the course of 2020.



The statistics alone cannot represent the contribution and impact that FSI staff are having on the justice system in Ireland. Forensic evidence from FSI was used extensively in Garda investigations and court cases in many murders, serious assaults, sexual assaults, drug seizures and other offences associated with gangland and organised crime throughout 2020.

Contribution to Cold Case and Missing Person investigations

In 2020 FSI reopened investigations into sixteen Cold Cases in conjunction with the Serious Crime Review team of An Garda Síochána. These included investigations as part of Operation Fiach, which was established to identify undetected historical stranger rapes, which may have further forensic investigative opportunities with a view to identifying the offender.

DNA profiling and relationship testing was used to assist in the identification of nine unidentified human remains in 2020 in partnership with the Missing Person Unit of An Garda Síochána. One of the identifications, that of Stephen Corrigan, missing since November 2011 was a 'Cold Hit'. There was no prior indication who the skeletal remains were from when they were located in Rathmines in April 2020. The remains were only identified by comparison with a DNA sample which had been submitted by his mother in 2015 to the Missing Persons Database in a bid to search for her son. Sadly she has since died, without ever knowing what happened to her son.

The identification of a Polish man brought closure to a cold case FSI had been investigating for over five years. A body found in 2014 in Rusheen Woods, Barna, Co Galway, was identified as Teodor Bruzgo, His identification was confirmed by comparison with a DNA profile from his father in Poland.

Another cold case that saw a breakthrough this year was the identification of Kendra MC whose body was taken out of Dublin's Royal Canal in 2002. A post-mortem established the man had suffered a cardiac arrest, and he was buried unidentified at Glasnevin Cemetery. A DNA profile was generated from a sample stored in the laboratory from the remains and this was uploaded onto the Missing Persons Database following the commencement of the Database in 2015. A DNA sample provided this year by a man in the United States who had been searching for his missing brother, lead to the identification of Kendra MC who had travelled to study in Ireland in 2001.

Other identifications, those of Tony Lynch (missing since 2002 and whose remains were discovered in a car recovered from Upper Lough Erne in Co. Fermanagh), Mark Smyth (missing since May 2018 and whose skeletal remains were found in Dundalk), Patrick Healy (whose body washed up in Cumbria in October 1986 and whose remains were exhumed in July 2020), Ross Williams (whose remains were found in his house in Tallaght), Ross McBride whose remains were located on Booterstown Marsh only two weeks after he was reported missing) and Joseph Caufield (whose body was recovered in Spain) were more targeted. There was some indication from other sources who the person was and this was confirmed by comparison with DNA samples from relatives.

Finally we were instrumental in the reunification of additional bones washed up from the sea from the remains of Stephen Davitt, Milan Kisik and an unidentified male found off Kilmore Quay in Wexford. At the end of 2020, sixteen profiles from human remains are on the DNA Database, thirteen men and three women whose identities remain unknown.

Service Flexibility

The system to facilitate an Out of Hours service continued in 2020. Each scientist carries an on-call phone for a week at a time and a smaller group are available to attend scenes or to carry out necessary urgent laboratory work. This service is provided by a panel of 34 scientists with two scientists being called in to the laboratory for out of hours services, for capacity and health and safety reasons. This service was availed of on 23 occasions over the course of 2020 – covering the full gamut of case types. FSI attended 4 crime scenes to provide specialist knowledge, particularly for Blood Pattern Analysis (BPA) in murder investigations.

Court Cases

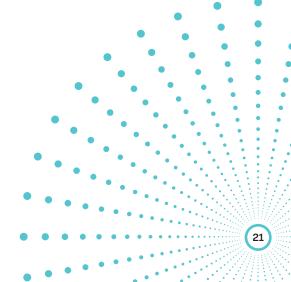
A percentage of the cases examined by FSI result in court attendances each year. Frequently these cases relate to reports issued in earlier years. Staff from FSI attended court as expert witnesses on 50 occasions in 2020, down from 108 occasions in 2019. This reduction is undoubtedly due to a reduction in the number of trials proceeding due to Covid-19. 30 of these were for DNA, 12 for Chemistry, 5 for Toxicology and 3 for Drugs cases. The most common case type on which staff gave evidence in 2020 was sexual assaults (21) followed by suspicious deaths (12) and burglary (5). In all cases, scientific evidence was presented professionally and objectively and, on occasion, subjected to rigorous cross-examination.

Visits from Defence Scientists

Scientists employed by the defence visited FSI on 14 occasions in 2020, compared with 27 occasions in 2019. This reduction was partly due to the reduction in the number of trials proceeding, and also to restrictions on travel from outside the State due to Covid-19. Of these, 6 related to drugs cases, 4 to suspicious deaths, 3 to sexual assaults and 1 to an assault.

Benchmarking

During 2020, FSI engaged in formal and informal benchmarking on our response to Covid-19 with other members of the Association of Forensic Science Practitioners (AFSP). These are laboratories, public and private, providing forensic services around the UK and Ireland. Dialogue focussed around issues such as occupancy levels in laboratories, working from home, case file security, and sanitisation practices. FSI also engaged with the Metropolitan Police Laboratory London and the Netherlands Forensic Institute to explore the advantages and disadvantages of combined evidence recovery e.g. the possible recovery of fingerprints and DNA from an evidential item in a single process. This engagement is continuing and will feed into the discussion on work practices at the new laboratory in Backweston.



Focus on: Case Intake Service (CIS)

FSI's Case Intake Service (CIS) play a critical role in the management of exhibits and case information in the laboratory. CIS is a customer-facing team and interacts daily with stakeholders from across the Justice sector that rely on FSI's services. This includes divisional Evidence Liaison Officers (ELO's) and all delivery members of An Garda Síochána; investigators from Customs; the Garda Síochána Ombudsman Commission (GSOC); the Garda National Drugs and Organised Crime Bureau (GNDOCB); the Garda National Immigration Bureau (GNIB) and a host of other criminal justice representatives.

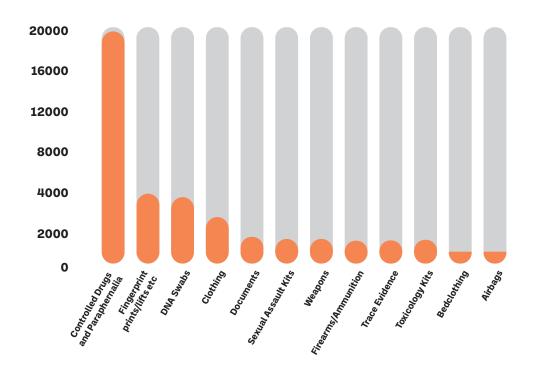
Their responsibilities include:

- → Reviewing case documentation, reviewing and documenting investigative and judicial facts related to criminal cases;
- \rightarrow Preserving health and safety during the handling of evidence;
- → Inspecting evidence packages for proper seals and markings and taking possession of exhibits;
- \rightarrow Applying laboratory policies and accreditation requirements to the intake of evidence;
- ightarrow Initiating and coordinating communication among multiple scientists for submissions;
- \rightarrow Returning exhibits when analysis has been completed;
- \rightarrow Testifying in court when necessary to establish chains of continuity.

CIS staff are trained in all aspects of evidence intake and are continuously educated about how to gather information of strategic interest to the laboratory, making them better informed and better prepared to deal with the myriad of issues that arise every day.

CIS staff received approx. 70,000 exhibits into FSI in 2020 (including biometric samples) – an increase of more than 50% compared to 2019.

The following graph illustrates the approximate number of commonly received case exhibits into FSI



Casework Exhibits Received in 2020

DNA Database

This section is a report on the operation of the DNA Database in 2020, in compliance with the Criminal Justice (Forensic Evidence and DNA Database System) Act 2014.

The DNA Database commenced operation on the 20th November 2015 and is one of the most important crime fighting tools within the State.

Using the database, information is supplied to the Gardaí about links between people and unsolved crimes. These crimes have ranged from burglary/ criminal damage to crimes against the person, sexual assaults and suspicious deaths. The power of the database as an investigative tool is that it is providing Gardaí with investigative leads in previously unsolved serious crimes. The database can replace more traditional and time-consuming police investigative methods and provide more focus to a criminal investigation. It is now also possible to retain samples from relatives of missing persons to aid in the investigation of unknown remains.

Overall 2020 saw an increase in the volume of Database records, as well as an increase in the impact and effectiveness of the system.

Number of DNA profiles on the National DNA Database

Figure 5 displays the overall growth in the National DNA Database since 2015

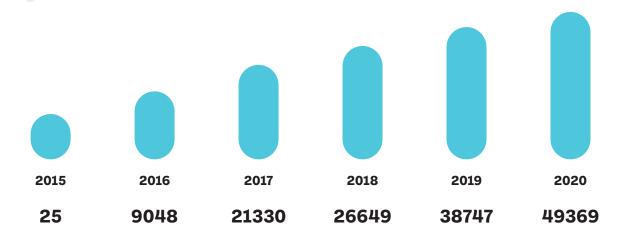


Figure 5:Total numbers of individual profiles (person or crime stain) on the DNA database, displaying overall growth since 2015. Increase in profiles in 2020: 10,622

Profiles on the DNA Database System by Index

Figure 6 shows the numbers of DNA profiles held in the four indices of the National DNA Database at the end of December 2020

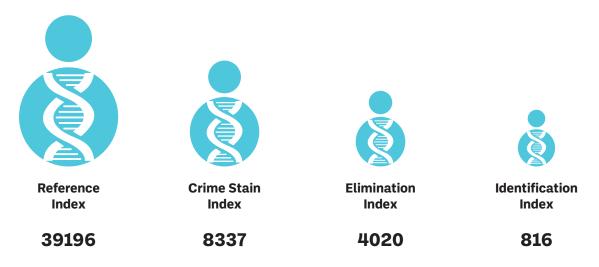


Figure 6: DNA Database System by Index

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Breakdown of profiles on the DNA database system by Index

Reference Index – Includes the Suspect Known, Convicted Offender and Section 28 Volunteer specimen categories Crime stain Index – Includes the Forensic Unknown and Forensic Mixture specimen categories Elimination Index – Includes FSI, Garda, Garda CSI, GSOC and S44 Prescribed Person specimen categories Identification Index – Includes profiles from missing person, unidentified human remains and relatives

Number of persons' profiles on the DNA Database System

Figure 7 shows the number of profiles from persons on the DNA Database from the date of commencement to end of December 2020. This figure takes account of the significant numbers of DNA profiles from persons destroyed in compliance with part 10 of the Criminal Justice Act 2014 over this period (as illustrated in figure 10)



Figure 7: Increase in Profiles on Reference Index

Number of unsolved crime stains added to the DNA Database System

Since the commencement of the Database 8,337 unsolved crime stains were added to the crime stain index (as of the end of December 2020), with 1,555 crime stains added in 2020 (Figure 8).

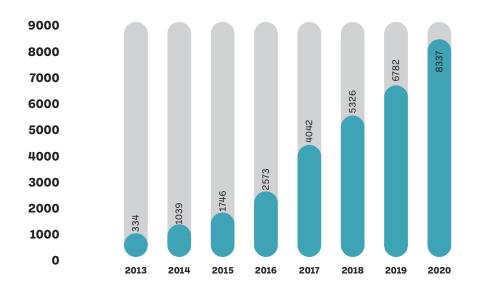


Figure 8: Cumulative number of crime stains uploaded to the Database to the end of 2020

Sample destruction and profiles removal from the DNA Database System

Figure 9 shows the number of samples destroyed since commencement of the DNA database (53,007 samples destroyed up to 31st December 2020, 11,569 samples destroyed in 2020), while Figure 10 shows the number of profiles removed since commencement of the DNA database (23,276 profiles removed up to 31st December 2020, 5,576 profiles removed in 2020).

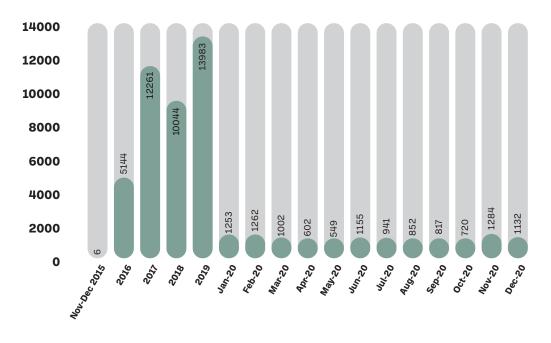


Figure 9: DNA Sample Destruction

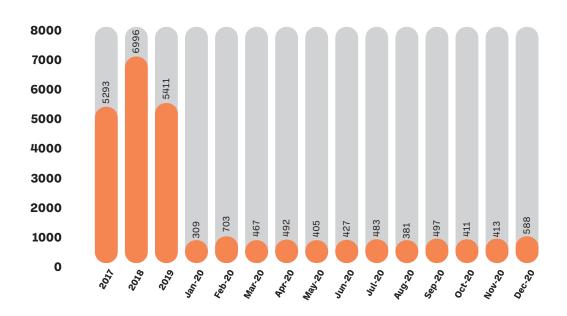


Figure 10: DNA Profile Removal

Investigative links:

Two potential matches can occur when an additional profile is added to the Database – a crime stain can match another crime stain suggesting a link between crimes or the crime stain can match to a person suggesting a link between the person and the crime. Overall, the DNA Database identified 856 hits in 2020, which assisted 1,102 cases. The types of hits are detailed below:

(a) Persons linked to crime stains

There were 797 person-to-stain matches in 2020- 545 of these were person to single case matches providing assistance to 528 investigations while in 252 cases the person was linked to multiple case matches providing assistance to 430 investigations. In total 958 cases have been aided. The details of the cases involving person to stain matches is available on Figure 11.

(b) Crime scene samples linked to other crime scene samples

This type of match occurred 59 times in 2020. In 42 such cases, a case-to-case match was reported while in the other 17 cases, there were clusters of cases associated with each other. Overall, this resulted in 144 investigative links ('hits') between unsolved crime stains - see Figure 12 below

Case Type	Number	
Aggravated Burglary	20	
Assualts	31	
Burglary	346	
Criminal Damage	149	
Drugs	38	
Firearms	18	
Robbery/Theft	113	
Sexual Assualt	30	
Unlawful Taking of Vehicle	73	
Other	140	
Total	958	

Case Type	Number
Armed Robbery	1
Assualt	5
Burglary	56
Criminal Damage	29
Drugs	7
Firearms	7
Robbery/Theft	14
Unlawful Taking of Vehicle	1
Other 6	24
Total	144
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Figure 12: Stain to Stain matches [Types of investigations and the number of each involved in 2020]

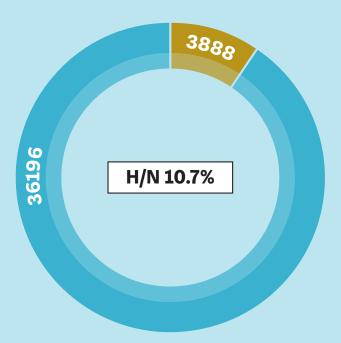
Figure 11: Person to Stain matches [Types of investigations and the number of each involved in 2020]

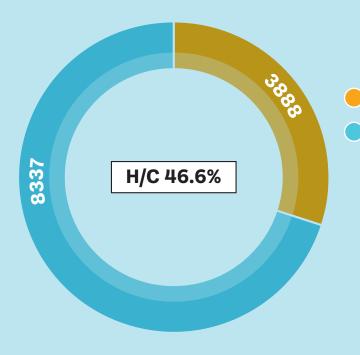
Metrics used internationally to assess the effectiveness of databases are available in Figures 13 and 14. These figures were as of the end of December 2020 and they are well within the norms of functioning databases and are indicative that the database is performing well.

H = Person to stain matches

N = Number of profiles in reference index

Figure 13: This figure indicates the appropriateness of the sampling policy (i.e. sampling suspected offenders and convicted offenders).





H = Person to stain matches

C = Number of profiles in crimestain index

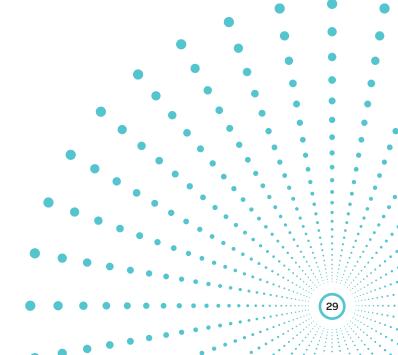
Figure 14: This measures the crime solving capacity and is expected to grow as the database grows (i.e. 47 out of every 100 crime scene samples uploaded onto the database will be linked to a person).

Prüm Treaty

The Prüm treaty includes cross-border cooperation by means of exchanging judicial and police information and by providing mutual assistance. With regards to the exchange of information, each European member state has to make its DNA database available to other Member States for automated searches on a hit/ no hit basis. After a match, personal data and case information are exchanged between countries by existing mutual legal assistance procedures (police or judicial). On the 2nd of October 2019, FSI began live exchange of DNA data and at the end of 2020 was exchanging data with eight Member States. Figure 15 shows the match results obtained between the Irish DNA database and the DNA databases of the eight Member States.

Prüm Match Statistics 2020

	Irish Crime Stain to Prüm person	Prüm Crime Stain to Person on Irish Database	Prüm Crime Stain to Ireland Crime Stain
Austria	15	6	0
Latvia	0	1	0
Netherlands	9	8	6
United Kingdom	284	119	27
Slovakia	1	1	0
Poland	2	3	1
Sweden	2	9	1
Estonia	0	0	0
Total	313	147	35





Science, Technology and Innovation



Science, Technology and Innovation

Covid-19 restrictions provided an opportunity for work practice innovation during 2020. For the first time, FSI scientists presented remotely as expert witnesses at a Circuit Court trial in Cork.

This is an example of a very welcome change in work practices, supported by the right technology, that could lead to enduring efficiencies within the criminal justice sector. Secure remote access, and videoconferencing platforms and remote streaming have helped staff remain productive, progress their training and development and stay connected over the course of the year. FSI was awarded a Public Service Innovation Fund in 2020 to develop a mobile application to share content regarding forensic sampling, packaging and labelling of exhibits restored from crime scenes in Ireland.

The funding was used to build the digital platform for the app and prepare quality content, instructional videos and information documents. The application has been launched on a pilot basis and FSI is considering how to deploy this more broadly with colleagues in An Garda Síochána.



Dr. John O'Shaughnessy Presenting His Final Report for the Public Service Innovation Fund.



Ms. Amanda Lennon, Preparing a Training Video on Paint Recovery

FSI also progressed several projects over the course of the year to improve the efficiency and capacity of our services and to extend the capabilities of those services.

The annual assessment by INAB took place to the standard ISO 17025 (2017) in November 2020. As part of this assessment FSI successfully included relationship testing and an additional DNA kit with an extended number of DNA markers to our accredited scope of techniques. This considerably enhances our ability to perform familial testing the cornerstone of many missing person and cold cases.

FSI procured a Next Generation Sequencing (NGS) instrument during the year. When commissioned and validated, this will be a significant improvement on the PCR technology used in case work today. NGS technology allows for the analysis of many genomic loci which is particularly helpful for limited or degraded DNA samples (such as those found in Missing Persons identifications or Cold Case studies).

FSI's drugs quantification service (purity assessment) by validating new High-Performance Liquid Chromatography (HPLC) methods, and recent purity trends have been reported based on the analysis of samples over several years on that method.

FSI has also invested in services that recently transferred into the organisation – with the procurement of a new fingerprint mark image capture and enhancement system (used for capturing fingerprint marks found an exhibit and storing digitally), as well as a system for analysing suspect documents (for example, suspected forged passports or currency).

Significant progress was also made over the course of the year in FSI's approach to Expert Evaluative Opinion (EEO). This is a rigorous approach to the critical evaluation of scientific evidence that ensures that forensic reporting and representation in court is robust and transparent. FSI has implemented detailed procedures and practices, based on best international practice, for sexual assault cases, blood pattern analysis and trace evidence analysis such as fibres, glass and firearm residue. These services have been extended to FSI's scope of ISO accreditation.

The following papers were authored or co-authored by staff in FSI over the course of the year:

Response to: Commentary on: Bright et al. (2018) Internal validation of STRmix[™] - A multi laboratory response to PCAST, Forensic Science International: Genetics, 34: 11-24. Buckleton JS, Bright JA, Ciecko A, Kruijver M, Mallinder B, Magee A, Malsom S, Moretti T, Weitz S, Bille T, Noël S, Oefelein RH, Peck B, Kalafut T, Taylor DA. Forensic Sci Int Genet. 2020 Jan;44:102198. doi: 10.1016/j.fsigen.2019.102198. Epub 2019 Nov 4.

On the relevance of cocaine detection in a fingerprint. Jang M, Costa C, Bunch J, Gibson B, Ismail M, Palitsin V, Webb R, Hudson M, Bailey MJ. Sci Rep. 2020 Feb 6;10(1):1974. doi: 10.1038/s41598-020-58856-0. PMID: 32029797

Distinguishing between Contact and Administration of Heroin from a Single Fingerprint using High Resolution Mass Spectrometry. Costa C, Ismail M, Stevenson D, Gibson B, Webb R, Bailey M.J Anal Toxicol. 2020 Apr 30;44(3):218-225. doi: 10.1093/jat/bkz088.PMID: 31711209

An unusual detection of tert-butyl-4anilinopiperidine-1-carboxylate in seizures of falsified 'Xanax' tablets and in items in a suspected heroin seizure submitted by Irish law enforcement. May, C., Downey, C.,Power, P.,and Kavanagh P. https://doi. org/10.1002/dta.2884 DNA transfer to worn upper garments during different activities and contacts: An inter-laboratory study. Bianca Szkuta, Ricky Ansell, Lina Bois, Edward Connolly, Ate D. Kloosterman, Bas Kokshoorn, Louise G. McKenna, Kristy Steensma, Roland A.H.van Oorschot. Forensic Science International: Genetics Volume 46, May 2020, 102268

An evaluation of the SIRCHIE Nark®II Presumptive Drug Testing (PDT) kit for the identification of Methylenedioxymethamphetamine (MDMA) and Methylamphetamine (MA) in casework samples at Forensic Science Ireland. Mr. Robert Kennedy, Dr. Gavin McLaughlin, Dr. Shane O'Malley, Dr. David Casey.

Quantification Summary 2016-2019 (Cocaine, Diamorphine and Amphetamine) Chemical Analysis Department Contact: Sarah Hanniffy email: SLHanniffy@fsi.gov.ie Tel: +353 (0)1 666 0492

Drug Data 2019 Chemical Analysis Department Contact: Dr Shane O'Malley email: somalley@fsi.gov.ie Tel: +353 (0)1 666 1926

Benzodiazepines and other medications 2019 Chemical Analysis Department Contact: Dr Shane O'Malley email: somalley@fsi.gov.ie Tel: +353 (0)1 666 1926

Presentations

Dr. Lorna Flanagan presented at the National Sexual Assault Treatment Units (SATUs) conference in October.

FSI also hosted the following lunch-time talks, aimed at societal applications of science and staff development.

Tuam Babies, Dr. Linda Lynch 6/2/20

Learn at Lunchtime (via Dept of Justice initiatives: Internet Safety (12/2/20)

Space Week Lunchtime Talk by Manya Sahni, King's College London, Wed Oct 7th 2020



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Partnership and Integration

This section focuses on how we are strengthening relationships and improving FSI's integration within the criminal justice system and beyond.

Although some of our formal face-face engagement mechanisms were not possible in 2020 (such as forensic conferences, regional conferences with Garda management), the cooperation from our partners within the sector was tremendous over the course of the year. FSI is grateful for the active support and cooperation with An Garda Síochána and the Irish Prison Service in particular for the practical support with the supply of PPE at different points during the year.

FSI has proposed a number of legislative changes to the Department of Justice to improve the efficiency and effectiveness of the services we provide and the efficiency of the sector as a whole. An upcoming Miscellaneous Provisions Bill will include amendments to the Firearms Act, giving a statutory basis for possession of firearms by FSI staff as well as an amendment to provide for continuity evidence to be given by certificate in non-drugs cases. FSI has placed an active role in the discussions around the Adult Caution scheme and the extension of that scheme to Section 3 drugs offences. This scheme was updated in December 2020 and could provide for greater efficiency in the processing of drugs cases in time. FSI is also in active discussions about providing a stronger statutory basis for Presumptive Drug Testing (PDT).

FSI responded to 7 Freedom of Information requests in 2020 and provided material to the Department of Justice to assist them in replying to 6 Parliamentary Questions. FSI also supported 10 media requests over the course of the year, including radio/TV interviews, filming requests and journalist interviews. These included interviews of Dr. Dorothy Ramsbottom by Anne Heffernan of 'Mind the Gap' productions on a Missing Persons series, as well as interviews with Dr. Dorothy Ramsbottom and Detective Sergeant Shane Farrell for the programme 'The case I can't forget' aired on RTE TV. FSI is also developing new relationships with our colleagues at the Backweston campus, including the Department of Agriculture, Food and the Marine (DAFM) laboratories and the State Lab. FSI staff assisted with the initial phase of Covid-19 testing on the campus, under the supervision of the National Virus Reference Laboratory.

Finally, FSI developed a Memorandum of Understanding with Forensic Science Northern Ireland for mutual cooperation. A programme of collaborative work has been developed, under the Intergovernmental Agreement on Co-Operation on Criminal Justice Matters and this work is well underway.



Quality Systems



Quality Systems

It is imperative that FSI maintains a robust quality system so that all our stakeholders have confidence in our services and our findings.

FSI maintained its accreditation to the ISO-17025 (2017) standard and significantly added to the scope of its accreditation in 2020. Our compliance to this standard was assessed from detailed reviews of our quality system, management systems, operating procedures and validation reports across all our forensic disciplines during the year.

The extensions to the scope of FSI's accredited services include –

- → DNA relationships testing (technology, process, software);
- → Screening & confirmation drug toxicology methods;
- → Evaluation of Sexual Assault cases;
- → Evaluative reporting for Blood Pattern Analysis, Fibres, Glass, Firearm Residue, Footwear;
- \rightarrow A new UV/IR digital imaging system for fingerprint;
- → A new questioned document assessment system for Documents & Physical Methods.

All FSI staff also attended unconscious bias workshops during the year. These workshops, coupled with our Expert Evaluative Opinion (EEO) training serve as critical elements of are on-going learning and development plans so that all our staff report scientific findings in an objective and transparent manner.



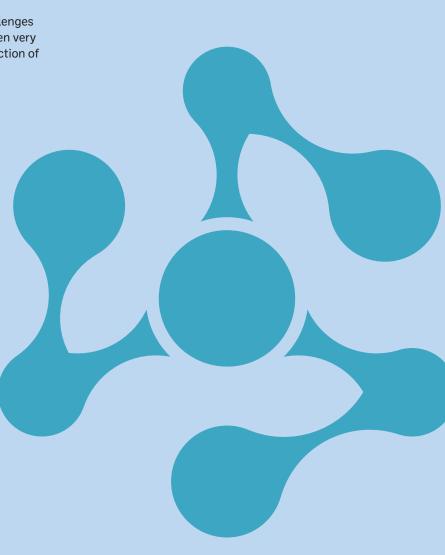
Fit-For-Purpose Environment



Fit-for-purpose Environment

FSI has two primary goals with regards to our work environment – transition to a new fit-for-purpose building at Backweston and manage the risks to our staff and services in the meantime.

While Covid-19 presented very significant challenges within our current work environment, it has been very encouraging to see the progress in the construction of our new facility.

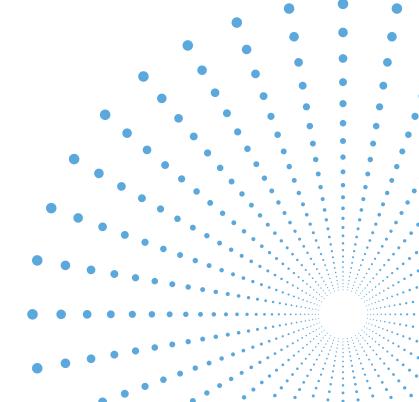


Great credit is due to all our staff for the manner in which we have maintained uninterrupted services over the year while keeping each other safe. We implemented several protocols, including social distancing, occupancy limits, face coverings, cleaning protocols and contact tracking to limit and manage the risk to our staff in a very constrained setting. Our sustained service throughout the year would not have been possible without the dedication and commitment of our staff.

The progress in the construction of our new building, which is being managed by the Office of Public Works, was remarkable. This is a major capital project within the Justice sector and a very significant investment in the future of forensic services in Ireland. FSI's transfer to this facility, scheduled to commence next year will be a significant transition for our staff and our services and mark the end of an era at our current facilities at Garda Headquarters in the Phoenix Park. We expect that the external structural works should be completed by this Summer and the building is expected to be substantially completed by July 2022 and ready for commissioning and fit-out.

There are very unique requirements and specifications for the building. Firstly, the search rooms in the building, necessary for the recovery of trace evidence from exhibits, must comply with ISO 14644. This is a cleanroom standard (often used in advanced semiconductor manufacturing) that specifies the controlled environment required for search room work. The facility also needs to accommodate the growing diversity and volume of forensic services that FSI supports - including fingerprint recovery and comparison work and documents & handwriting assessments which recently transferred from the Garda National Technical Bureau. It also supports new capabilities and services within Chemical, Physical and DNA Analysis that will benefit the criminal justice system - including Next Generation Sequencing (for Missing Person investigations). The facility must also complies with the most recent Building Control Regulations (2014) and the 2018 European Performance of Buildings Directive Requirements, including the Nearly Zero Energy Buildings (NZEB) requirement (with natural ventilation and energy efficient systems). Finally, the facility as well as our systems, ICT technology and operational procedures must support the ISO-17025 standard, which is the cornerstone of FSI's accredited services.

FSI expects to start transitioning to the new facility in Q3 2022 and complete the transition on a phased basis over 6 – 9 months. We'll need to continue to provide forensic services at our current facilities (within Garda Headquarters in the Phoenix Park) while we commission instruments, validate for use and accredit services at the new facility. This is a very significant transition for all our staff – it's the end of an era in many ways and the start of a new journey in a new facility. We have set up a cross-functional transition team that will coordinate the transition and help us settle in to our new home. We'll look forward to the grand opening and issuing our first forensic case report from our new facility!





Drawing of the completed building (Courtesy of OPW)



Recent aerial photo, showing completion to roof level of 2 wings



Excellence In the second secon

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Excellence through People

The goals of this strategic theme are to build an inclusive, integrated team within FSI that focuses on continuously improving our services and to promote an open, collaborative and respectful climate across the organisation.

While Covid has limited our progress in some ways, particularly with face-face training and integration events, we have been able to progress the learning and development of staff over the course of the year. We have been able to access learning and development programmes from renowned international experts and institutions remotely that would have been inaccessible before. FSI engaged with a number of external providers to design custom-made courses for FSI in excel, data analytics and many other subjects. These areas were highlighted as skills needed in the future by the Learning and Development plan. See table below;

Course	No of participants
Excel	51
Data analytics	22
Resilience Webinar	84
Performance Management	24
Communications	23
Prince 2 foundation	3
Lean six sigma yellow belt	4
Managing people	1
Customer service	12
Professional Diploma. In public service innovation.	1
Bias workshop	90
The Science of Wellbeing(Yale university)	6
Challenging Forensic Science	Approx. 50
Quality and Paradigm training	19 (6 remote)
Train the trainer	5

We are also supporting longer-term training such as MSc's each year as the need arises and we provide study leave in keeping with departmental circulars. We were able to host a courtroom skills course and an expert witness course before the Covid lock down.

In the past few years, members of FSI have taken part in the Department of Justice Cross Sectoral Leadership programme. This year one of our Garda Inspectors is participating. This course provides the opportunity to work with Civil Servants outside of FSI, it provides for a cross pollination of ideas and is a great networking forum.

Staff can avail of a number of other learning and development formats such as conferences. In 2020 most conferences were deferred or moved on-line. The on-line conferences gave us the opportunity for more people to attend as it is much more time and cost effective. For example 12 people attended a major conference in November, we would normally only send 3 or 4 people to this.

FSI has an active Staff Development Group, a social committee and a partnership team focused on developing our staff professionally, creating a healthy work environment and working through changes collectively. We conducted several staff engagement sessions and staff surveys over the course of the last year to address issues and concerns and gather insights on changes impacting our staff. This has been especially important over the past year given the unique challenges and uncertainties our staff have faced, coupled with the challenges of providing an essential service. More recently, FSI has formed a Well-Being working group and is implementing a systematic well-being programme. FSI also participates in the 'Excellence Through People' programme (managed by the National Standards Authority of Ireland) and maintained its Gold accreditation in 2020.

We recognise that more than half of FSI staff are in the organisation less than 2 years. This includes Garda members and staff that seconded to FSI in December 2019. Covid-19 health guidelines have presented particular challenges to the more organic integration of staff into our work environment. This integration and connectedness is crucial for staff and FSI alike and we look forward to the time when we can interact more freely and develop our organisation together.

Corporate Governance

FSI confirms its compliance with the relevant requirements of the Code of Practice for the Governance of State Bodies. In particular, FSI confirms that:

The Oversight Agreement for 2020 has been reached with the Department of Justice and Equality and that,
as a non-statutory body without a Board, FSI is compliant with the relevant requirements of the Code of Practice for the Governance of State Bodies.

FSI is adhering to the relevant aspects of the Public Spending Code.

FSI has implemented a risk management system which identifies and reports key risks and the management actions being taken to address and, to the extent possible, to mitigate those risks. A risk register is in place which identifies the key risks facing FSI and these have been identified, evaluated and graded according to their significance. The principal risks identified for FSI in 2020, and associated mitigation strategies are summarised below.

- Service disruption risk based on issues with laboratory spaces and offices. This is being partially
 mitigated by some remedial M&E works and facilities management. The completion of the new facility at
 Backweston alleviates this risk.
- b Inadequate space for receipt and storage of exhibits, staff accommodation and laboratory work. Some improvements were made in 2020 to accommodate more staff but with some trade-offs. This remains a significant risk and is exacerbated by the current Covid-19 pandemic.

c Contamination risks based on building/facility design are being mitigated through contamination control and workflow processes. The new building design offers a robust mitigation of this risk.

Demand and capacity are not matched across multiple disciplines within FSI, risking incomplete, erroneous or late reporting of cases for court. Although there are plans to increase capacity, but demand and submissions are increasing at a faster rate. This risk is being managed currently through a prioritisation process agreed with An Garda Síochána and reflected in the Service Level Agreement between both organisations.

e Instability of ICT systems, including Automated Fingerprint Identification System (AFIS) will lead to reduced productivity and may lead to service disruptions. To mitigate these risks, a roadmap of ICT improvements has been defined, including the stabilisation of the AFIS system.

Statement of Internal Control

Scope of Responsibility

On behalf of Forensic Science Ireland, I acknowledge responsibility for ensuring that an effective system of internal control is maintained and operated. This responsibility takes account of the requirements of the Code of Practice for the Governance of State Bodies (2016).

Purpose of the System of Internal Control

The system of internal control is designed to manage risk to a tolerable level rather than to eliminate it. The system can therefore only provide reasonable and not absolute assurance that assets are safeguarded, transactions are authorised and properly recorded and that material errors or irregularities are either prevented or detected in a timely way. The system of internal control, which accords with guidance issued by the Department of Public Expenditure and Reform has been in place in Forensic Science Ireland for the year ended 31 December 2020.

Capacity to Handle Risk

Forensic Science Ireland reports on all audit matters to the Audit Committee in the Department of Justice and Equality. Forensic Science Ireland's senior management team acts as the Risk Committee for the body. Senior managers from Forensic Science Ireland completed a risk register in 2020 and shared the findings with the Department of Justice and Equality. The Internal Audit Unit of the Department of Justice and Equality carry out audits on financial and other controls in Forensic Science Ireland. Forensic Science Ireland's senior management team has developed a risk management policy which sets out its risk appetite, the risk management processes in place and details the roles and responsibilities of staff in relation to risk. The policy has been issued to all staff who are expected to work within Forensic Science Ireland's risk management policies, to alert management on emerging risks and control weaknesses and assume responsibility for risks and controls within their own area of work.

Risk and Control Framework

Forensic Science Ireland has implemented a risk management system which identifies and reports key risks and the management actions being taken to address and, to the extent possible, to mitigate those risks. A risk register is in place which identifies the key risks facing Forensic Science Ireland and these have been identified, evaluated and graded according to their significance. The register is reviewed and updated by the senior management team on a quarterly basis. The outcome of these assessments is used to plan and allocate resources to ensure risks are managed to an acceptable level. The risk register details the controls and actions needed to mitigate risks and responsibility for operation of controls assigned to specific staff.

I confirm that a control environment containing the following elements is in place:

- procedures for all key business processes have been documented;
- financial responsibilities have been assigned at management level with corresponding accountability;
- there is an appropriate budgeting system with an annual budget which is kept under review by senior management;
- there are systems aimed at ensuring the security of the information and communication technology systems, The ICT division of the Department of Justice and Equality provide Forensic Science Ireland with ICT services. They have provided an assurance statement outlining the control processes in;
- there are systems in place to safeguard Forensic Science Ireland's assets. Control procedures over grant funding to outside agencies ensure adequate control over approval of grants and monitoring and review of grantees to ensure grant funding has been applied for the purpose intended;
- The National Shared Services Office provide Human Resource and Payroll Shared services. The National Shared Services Office provide an annual assurance over the services provided. They are audited under the ISAE 3402 certification processes.

Statement of Internal Control

Ongoing Monitoring and Review

Formal procedures have been established for monitoring control processes and control deficiencies are communicated to those responsible for taking corrective action and to management, where relevant, in a timely way. I confirm that the following ongoing monitoring systems are in place:

- Key risks and related controls have been identified and processes have been put in place to monitor the operation of those key controls and report any identified deficiencies;
- An annual audit of financial and other controls is carried out by the Department of Justice and Equality's Internal Audit Unit;
- Reporting arrangements have been established at all levels where responsibility for financial management has been assigned; and
- There are regular reviews by senior management of periodic and annual performance and financial reports which indicate performance against budgets/forecasts.

Procurement

I confirm that Forensic Science Ireland has procedures in place to ensure compliance with current procurement rules and guidelines and that during 2020 Forensic Science Ireland complied with those procedures..

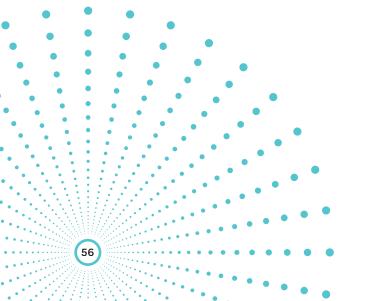
Review of Effectiveness

I confirm that Forensic Science Ireland has procedures in place to monitor the effectiveness of its risk management and control procedures.

Forensic Science Ireland's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal and external auditors, the Audit Committee, and the senior management team. The senior management within Forensic Science Ireland is responsible for the development and maintenance of the internal financial control framework. I confirm that Forensic Science Ireland conducted an annual review of the effectiveness of the internal controls for 2020. It should be noted that this extended beyond financial controls and examined ICT controls, management practices and other governance processes.

Internal Control Issues

No weaknesses in internal control were identified in relation to 2020 that require disclosure in the financial statements.



Forensic Science Ireland

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