

Drug-related deaths (DRD) in Portugal (update from the toxicological examinations) and liaison and interactions with hospitals

Antonio Castañera, Susana Simões

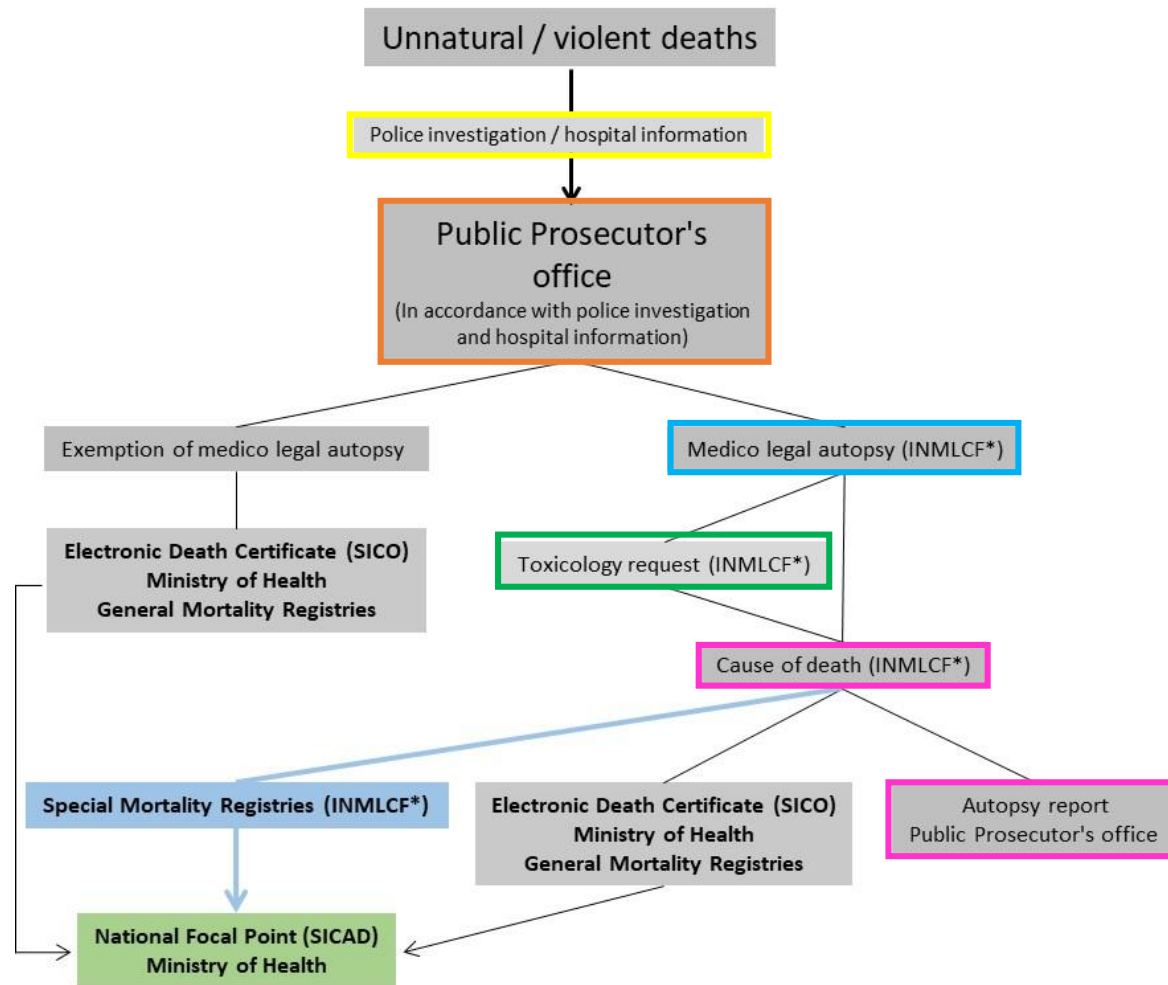
National Institute of Medicine and Forensic Sciences - Portugal

DRD. Data collection system

- 1 National Institution of Legal Medicines and Forensic Sciences:
- 3 Regional branches (Lisbon, Porto, Coimbra)
- 27 Legal Medical Office's spread all over the country



DRD. Data collection system

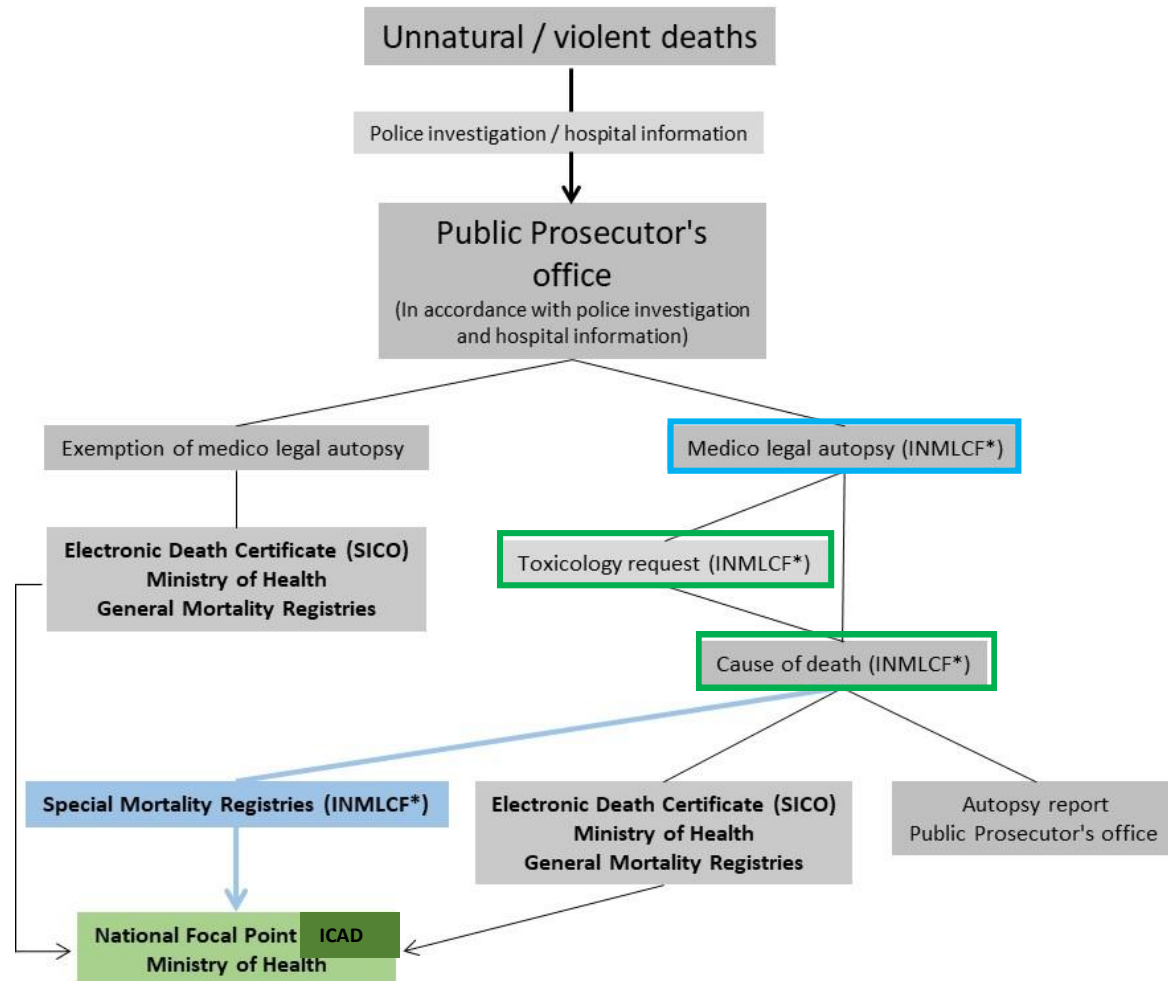


*INMLCF– National Institute of Legal Medicine and Forensic Sciences (Ministry of Justice)

Key Issues

- **Police investigation** (Forensic doctor: yes / no)
- **Public prosecutor** (medico legal autopsy: yes / no)
- **Forensic pathologist** (toxicological analysis: yes / no)
- **Forensic toxicology** (analytical protocol: screening / confirmation)
- **Forensic pathologist** (final certificate with cause of death: overdose / natural / indeterminate)

DRD. Data collection system



*INMLCF– National Institute of Legal Medicine and Forensic Sciences (Ministry of Justice)

▪ **Forensic pathologist** (toxicological analysis: yes / no)

▪ **Forensic toxicology** (analytical protocol: screening / confirmation)

DRD. Data collection system

Forensic Pathologist

- Ethanol
- Drugs of abuse
- Medicines
- Pesticides
- Carbon monoxide
- Others

Forensic Toxicology

- Quantification of ethanol in blood by GC/HS/FID
- Screening, confirmation and quantification of drugs of abuse by LC/MSMS
- Screening, confirmation and quantification of medicines by LC/MSMS
- Screening and confirmation of pesticides by LC/MSMS
- Detection of carboxihemoglobine by UV/VIS
- Others (volatile compounds) by GC/HS/FID
- Others ("unknown" compounds) by LC/TOF

DRD. Data collection system (*target compounds* vs *unknown substances*)

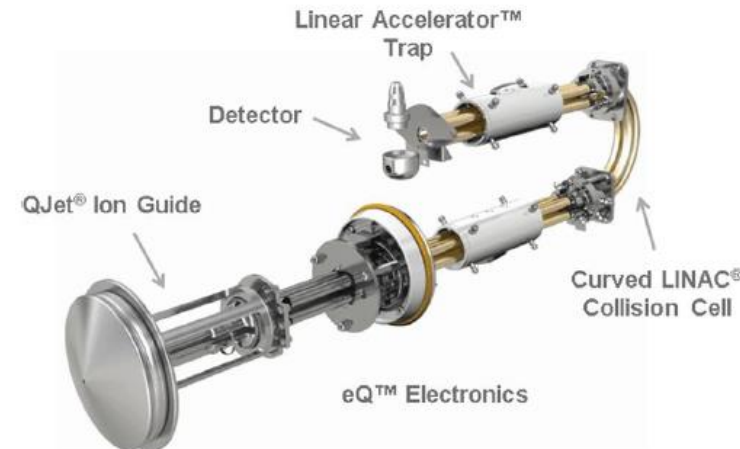


Técnica analítica: Ultra High Performance Liquid Chromatography / QTRAP Triple Quad Mass Spectrometry (UHPLC-QTRAP MS/MS)

- Detetor: Triplo quadrupolo híbrido com armadilha de iões linear (Qtrap)
- Modos de aquisição principais:
 - **Product ion scan**
 - **MRM**
 - **MS³ (Q-Trap)**



Sciex - LC/MSMS QTrap 6500 +

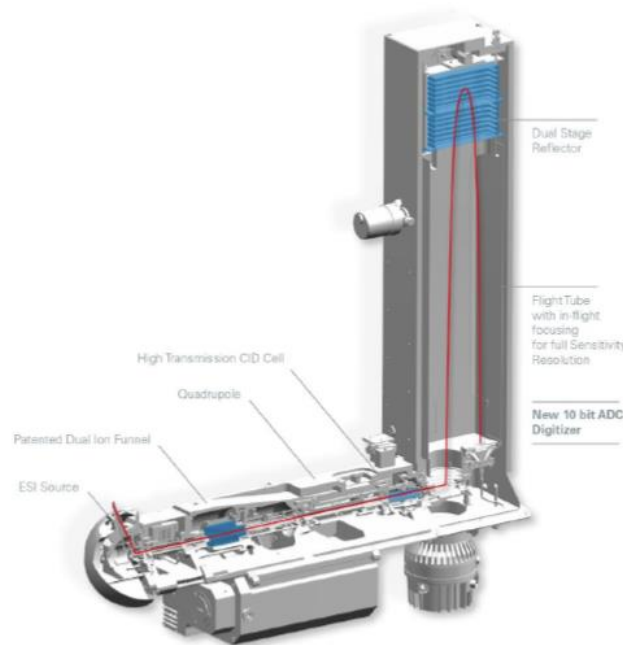


Source: Evolução analítica no Serviço de Química e Toxicologia Forenses – Os últimos 20 anos. (XXII Legal Medicine and Forensic Sciences National Congress) – Susana Simões

DRD. Data collection system (*target compounds vs **unknown substances***)



Técnica analítica: Liquid Chromatography or Gas Chromatography /
High Resolution Mass Spectrometry (QToF)



Bruker – GC/LC QToF Impact II
HRMS



- Detetor: Quadrupolo Tempo de Voo (QToF)
- Modos de aquisição principais:
 - Data Independent Acquisition (DIA) / bbCID
 - Data Dependent Acquisition (DDA) / AutoMSMS

Source: Evolução analítica no Serviço de Química e Toxicologia Forenses – Os últimos 20 anos.
(XXII Legal Medicine and Forensic Sciences National Congress) – Susana Simões

DRD. Data collection system (integrated data)



Bem-vindo/a ao SIIMP

Insira as suas credenciais para utilizar a plataforma

Username


Password

ENTRAR



Versão: 2025.03.25.1938

DRD. Data collection system (integrated data)

Identificação	Indivíduo	Requisição	Requisições Complementares	Contentores / Exames	Ofícios	Anexos	Relatório	Faturação	Logs
Nº Processo 	NUIPC			Nº Requisição		Tipo Requisição			
<input type="text"/>	<input type="text"/>			<input type="text"/>		<input type="text" value="Patologia Forense"/>			
Nome				Idade		Sexo			
<input type="text"/>				<input type="text" value="86 Anos"/>		<input type="text" value="Feminino"/>			
Peso	Altura	IMC		Afinidade Populacional		Profissão			
<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>		<input type="text"/>			
Entidade Responsável				Código GeRFIP					
<input type="text" value="MINISTÉRIO PÚBLICO - Procuradoria da República da Comarca de Lisboa Oeste, Departamento de Investigação e Ação P..."/>				<input type="text"/>					
PEDIDO POR				Urgente <input checked="" type="radio"/> Não					
<input type="text" value="26/02/2025 11:04:30"/>									
REQUISITADO POR				Local					
Serviço				<input type="text" value="Gabinete Médico Legal e Forense da Grande Lisboa Noroeste (Cascais)"/>					
<input type="text" value="Unidade Funcional de Patologia Forense"/>									

DRD. Data collection system (integrated data)

Identificação | Indivíduo | **Requisição** | Requisições Complementares | Contentores / Exames | Ofícios | Anexos | Relatório | Faturação | Logs

▼ INFORMAÇÕES AUTÓTICAS/CLÍNICAS

Risco	Outro Risco
Não existe informação	
<input type="text" value="-- Seleccionar risco --"/>	<input type="text" value="Outro risco"/> +

Toxicodependente
 Não

Substâncias habitualmente consumidas

Internamento hospitalar
 Não

Medicação e terapêuticas administradas

Duração


Unidade

Informação circunstancial
Mulher de 86 anos, que sofreu uma queda de escadote no domicílio (queda de 2,5 m de altura), de que resultaram traumatismos crânio-encefálico e torácico graves.




DRD. Data collection system (integrated data)


Identificação Individuo Requisição Requisições Complementares **Contentores / Exames** Ofícios Anexos Relatório Faturação Logs









EXAMES

Exame	Quantidade	Observações	Pedido	Concluído	Estado
Álcool	1		26/02/2025 11:04		Requisitado  
Medicamentos	1		26/02/2025 11:04		Requisitado  
Outros	1		25/03/2025 14:45		Requisitado  

Tipo amostra	Data colheita	Colheita	Vol/Massa	Recipiente	Localização	Objetivo	<input type="checkbox"/> Outra
1 Sangue cavidade cardíaca 	26/02/2025 09:45		22.000 mL	Tubo 30 mL	G1022P23	Processamento	<input type="checkbox"/>

> Exame	R	C	Q	Procedimento/Teste	Estado	PE anterior	Comentário	Pedido	
Não existe informação									
<input type="text"/>				<input type="text"/>			<input type="text"/>	 	

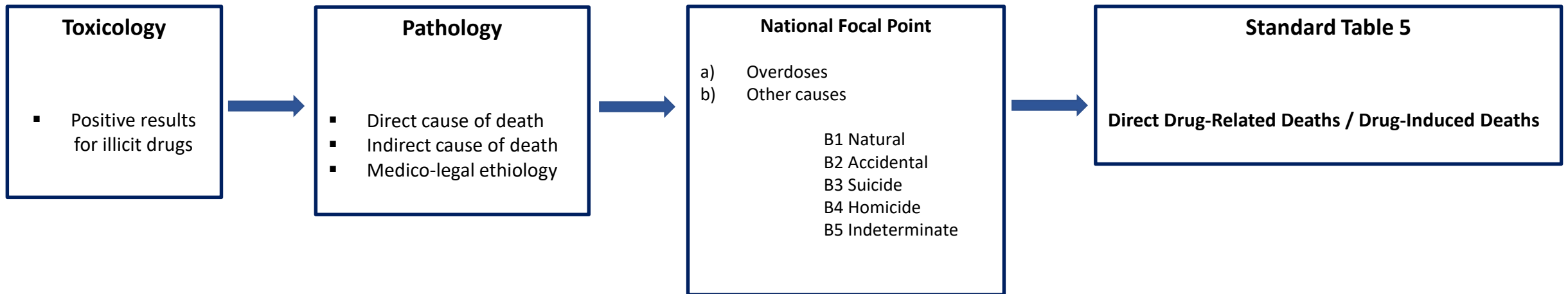
2 Sangue periférico 	26/02/2025 09:45		9.000 mL	Tubo 10 mL	P0454P35	Processamento	<input type="checkbox"/>
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> Exame	R	C	Q	Procedimento/Teste	Estado	PE anterior	Comentário	Pedido	
> Álcool				PE-STF-S-401	Atribuído (Concluído)				
> Medicamentos				PE-STF-S-301	Atribuído (Concluído)				
> Medicamentos				PE-STF-S-303	Atribuído (Concluído)	PE-STF-S-301	Anfetamina-2 Clonazepam-7A-17 Fenatnilo-3 Metadona-12 Primidona-16010 Propranolol-30 Sertralina-8 Sertralina-D-67 AS-165 Fenobarbital-19317 Hidroclorotiazida-119		
> Outros				PE-SQTF-340	Atribuído (Concluído)				

DRD. Data collection system (integrated data)


Classificação	Etanol g/L	Substances detected	Age	Gender	Ethiology	Death type 1	Death type 2	Death type 3	Death type 4	A) Overdoses B) Other causes B1 Natural ; B2 Accident; B3 Suicide; B4 Homicide; B5 Indeterminate
A+D	2,19	Cocaína, benzoilecgonina, ecgonina metil éster, cocaetileno, etanol	24	M	Acidente	Violent	Trauma injuries	Mechanical agent	NULL	B2
A	4,02	Etanol	56	M	Indeterminada	Violent	Intoxication	NULL	NULL	A
D		Cocaína, benzoilecgonina, ecgonina metil éster, atorvastatina	50	M	Indeterminada	Violent	Intoxication	NULL	NULL	A
A	0,66	Etanol, Metoclopramida	59	M	NULL	Natural	Cardio-vascular	Heart attack	NULL	B1
A	4,4	Etanol, bromazepam	57	M	NULL	Natural	Cardio-vascular	Heart attack	NULL	B1


DRD. Data collection system (integrated data)



- The **number of DRD is dependent of:**
 - The autopsies in which it was requested toxicological analysis by the forensic pathologist
 - The autopsies in which it was possible to obtain information about the cause of death
 - The cause of death by overdose is dependent on the criteria of each forensic pathologist
 - The toxicological analytical protocols.

DRD. Data collection system (integrated data)

	PROCEDIMENTO DE ENSAIO	PE-SQTF-S-316 PE-SQTF-C-325 PE-SQTF-N-613	
		Rev00	Pág. 1/12
CONFIRMAÇÃO E QUANTIFICAÇÃO DE DROGAS DE ABUSO POR LC-MS/MS			

	PROCEDIMENTO DE ENSAIO	PE-SQTF-C-308 PE-SQTF-S-315 PE-SQTF-N-609	
		Rev00	Pág. 1/10
CONFIRMAÇÃO E QUANTIFICAÇÃO DE CANABINÓIDES POR LC-MS/MS			

- **Accreditation: ISO 17025:2018** _ General requirements for the competence of testing and calibration laboratories.
- **Certification: ISO 9001: 2015** _ Quality management system.

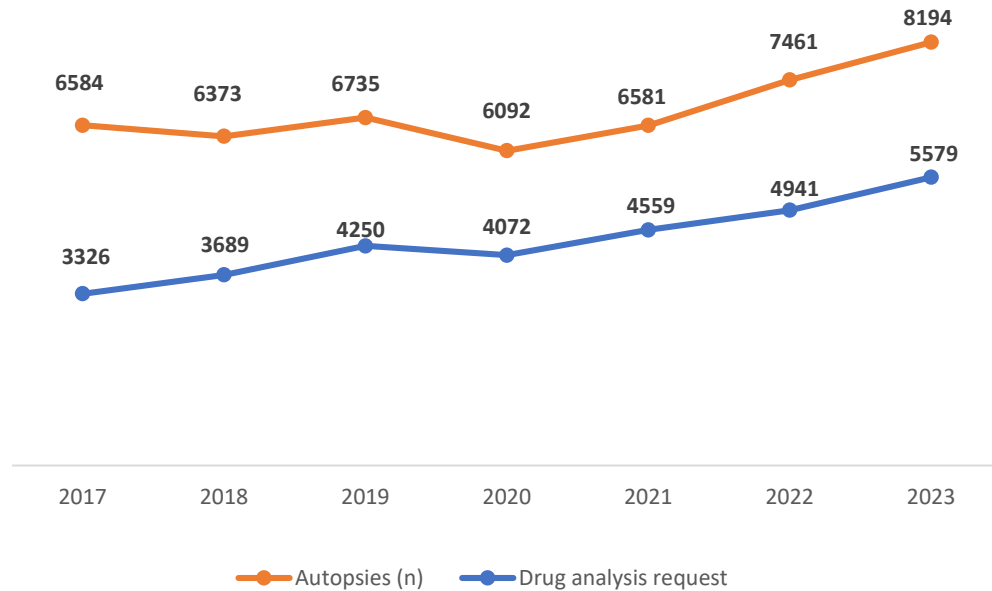
DRD. Data collection system (integrated data)

National Challenges:

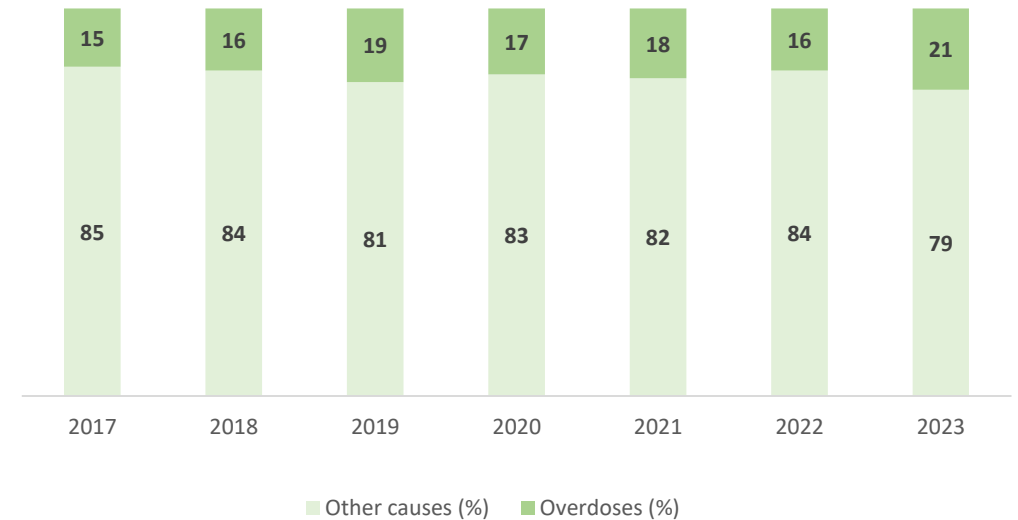
- Interaction and communication between Pathology and Toxicological services
- Missing key information (case details)
- Toxicology result interpretations
- Keep up new challenges (new tendencies: New Psychoactives Substances, nitazines, sodium nitrite....)

DRD. Data collection system (2017-2023)

Autopsies vs Drug analysis request

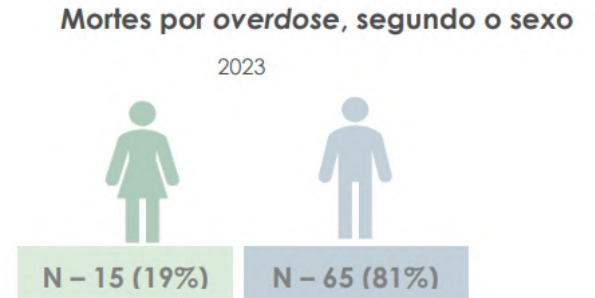
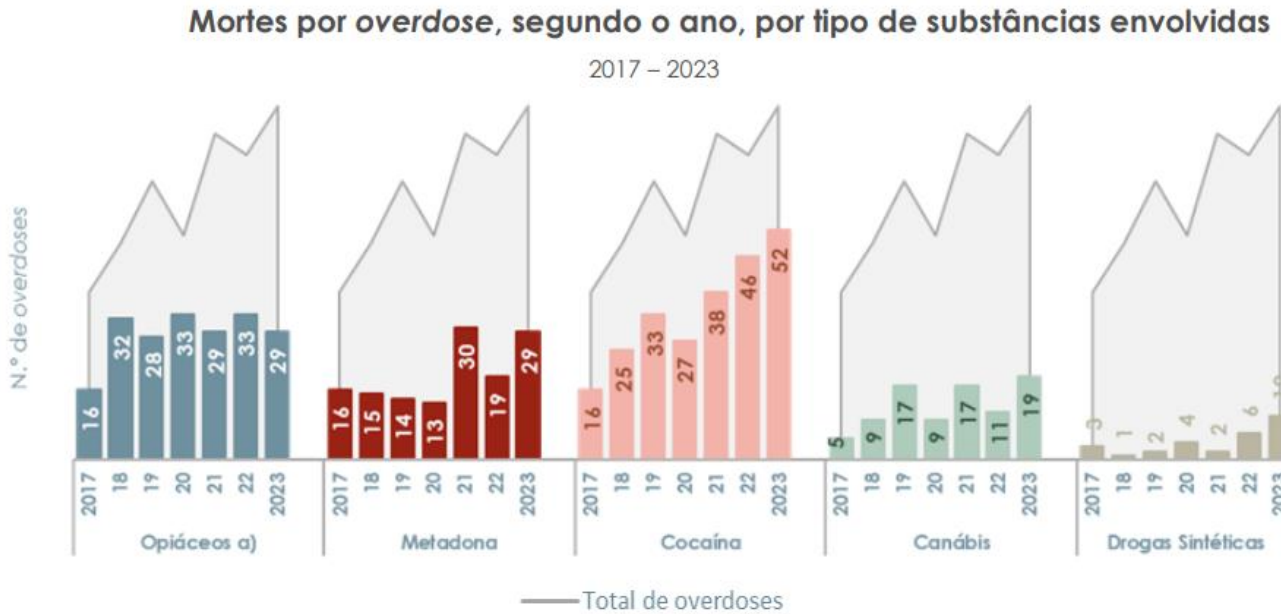


Drugs of abuse positive results



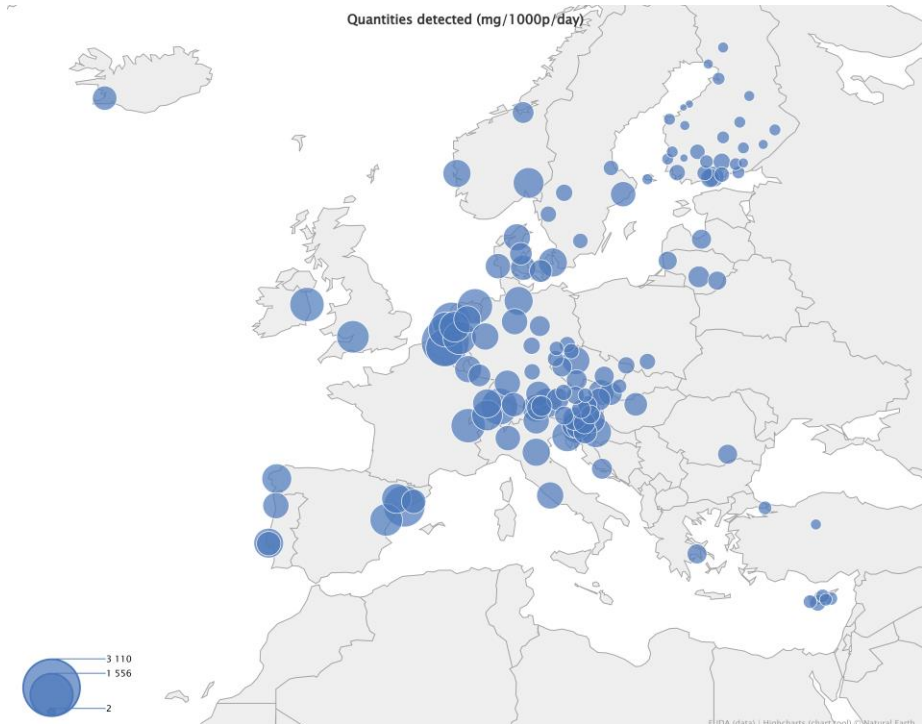
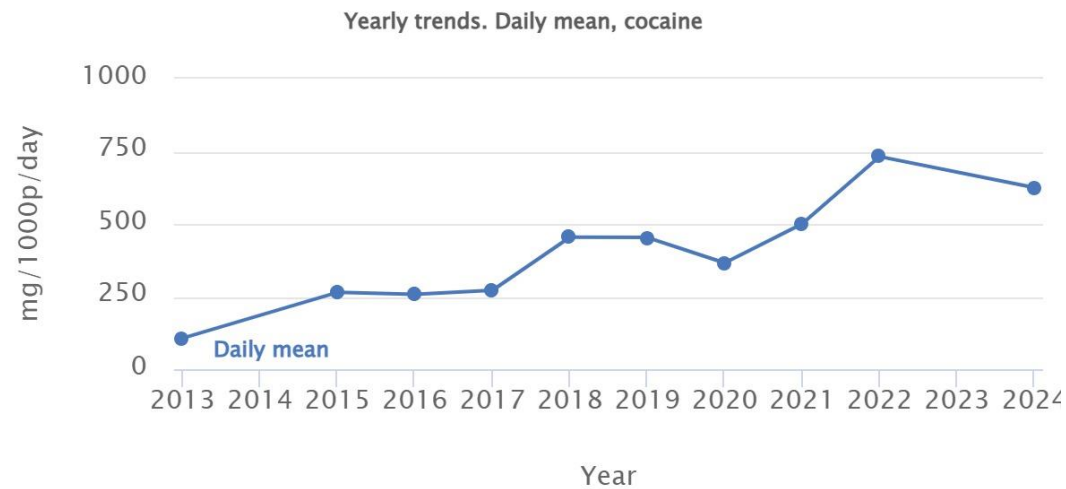
Source: INMLCF, IP / ICAD – Relatório anual 2023 – A Situação do país em Matéria de Drogas e Drogodependências (<https://www.icad.pt/DocumentList/GetFile?id=882&languageId=1>)

DRD. Data collection system (2017-2023)



Source: INMLCF, IP / ICAD – Relatório anual 2023 – A Situação do país em Matéria de Drogas e Drogodependências (<https://www.icad.pt/DocumentList/GetFile?id=882&languageId=1>)

DRD. Data collection system (SCORE – Wastewater analysis - Cocaine)



DRD. Data collection system (2017-2023)

Outras causas de morte* dos casos com resultados toxicológicos positivos, segundo o ano, por causa de morte

2017 – 2023

Outras causas de morte*	2017	%	2018	%	2019	%	2020	%	2021	%	2022	%	2023	%
Total	221	100	258	100	262	100	249	100	339	100	367	100	307	100
Acidente ^{a)}	72	32,6	99	38,4	94	35,9	81	32,5	121	35,7	96	26,2	86	28,0
Homicídio	7	3,2	8	3,1	6	2,3	11	4,4	11	3,2	22	6,0	14	4,5
Natural	83	37,6	108	41,9	108	41,2	94	37,8	141	41,6	152	41,4	127	41,4
Suicídio	51	23,1	35	13,6	37	14,1	44	17,7	44	13,0	55	15,0	46	15,0
Causa Indeterminada	8	3,6	8	3,1	17	6,5	19	7,6	22	6,5	42	11,4	34	11,1

Source: INMLCF, IP / ICAD – Relatório anual 2023 – A Situação do país em Matéria de Drogas e Drogodependências (<https://www.icad.pt/DocumentList/GetFile?id=882&languageId=1>)

Drug Emergencies cases

Interaction Forensic Toxicology vs Hospitals (emergencies cases):

- First contact made by telephone:
 - Emergency medical service chief.
 - Doctor responsible for the case.
 - Administrative sample.

- Call usually made 1-3 days after the patient is admitted in the emergency service:
 - Usually for substance identification and record purposes.
 - Negative and/or undetermined results in clinical toxicology results.
 - After 1-3 days an abnormal value remains in some clinical parameter.
 - Most of the contacts are made from hospitals nearby Lisbon area.

- Background information:
 - Children involved
 - Munchausen by proxy cases
 - Suspected intoxication
 - Clinical symptoms



Drug Emergencies cases

Interaction Forensic Toxicology vs Hospitals (exchange information):

Hospital

- ❖ Background information
- ❖ Clinical toxicology results
- ❖ Forensic toxicology analytical procedure fit for purpose?
- ❖ What type of sample to send
 - Sample volume?
 - Blood, urine, sérum?
 - Dry tubes, EDTA?
 - Sample shipping (refrigerated, frozen?)
 - Quantification results if possible

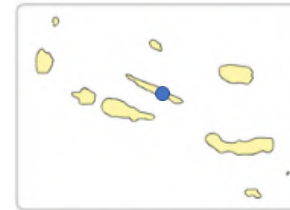


Forensic toxicology

- ❖ Background information
 - Sample collection data?
 - Sample volume available?
 - Therapeutic administration of substances?
- ❖ Response time
- ❖ E-mail and phone number of the person in charge of the case

Drug Emergencies cases (profile)

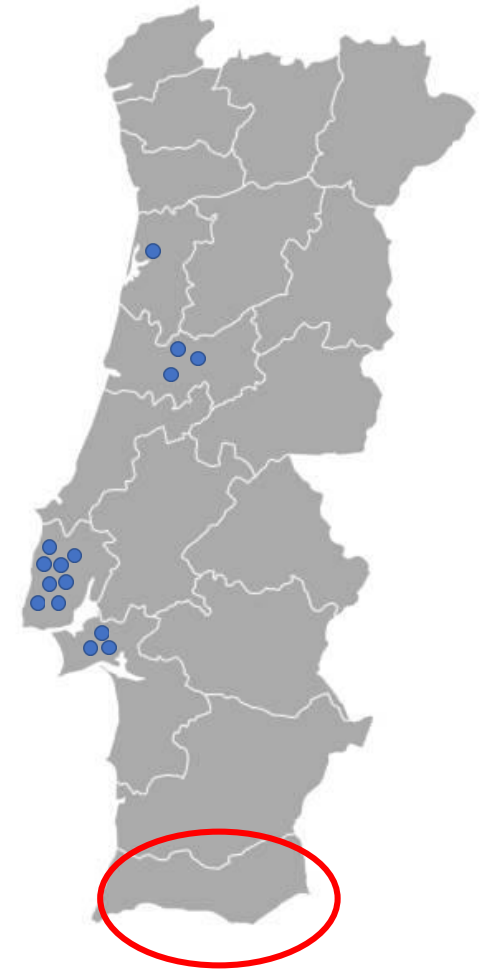
- 2024:
 - 16 cases
 - 78% (M) / 12% (F)
 - 38 % age under 5 years old



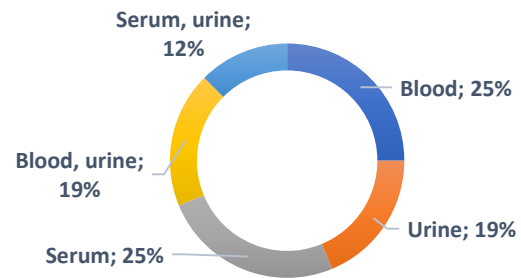
Açores



Madeira

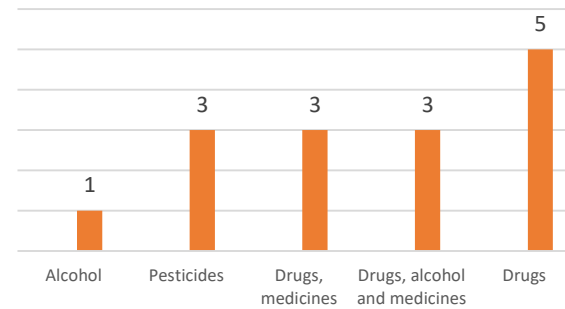


Samples



■ Blood ■ Urine ■ Serum ■ Blood, urine ■ Serum, urine

Analysis request



Drug Emergencies cases

<i>Requesting entity</i>	<i>Samples</i>	<i>Tox. Request</i>	<i>Toxs. Results</i>	<i>Age</i>	<i>Gender</i>
Hospital do Divino Espírito Santo - São Miguel (Açores)	Blood, urine	Pesticides	Clorpirifos	76	M
Unidade Local de Saúde de Coimbra, EPE	Serum	Alcohol	Methanol	46	F
Unidade Local de Santo António, EPE	Blood, urine	Pesticides, anticoagulants	Negative	78	M
Unidade Local de Saúde da Arrabida, EPE	Blood	Alcohol, drugs	THC, MDA, MDMA	29	M
Unidade Local de Saúde de Almada-Seixal, EPE	Urine	Drugs	Ketamine, Fentanil	17	M
Unidade Local de Saúde de Amadora Sintra, EPE	Serum	Drugs, medicines	Negative	1	M
Unidade Local de Saúde de Amadora Sintra, EPE	Serum	Drugs, medicines	Risperidone, Paliperidone	1	M
Unidade Local de Saúde de Amadora Sintra, EPE	Serum, urine	Drugs, medicines	THC, diazepam, midazolam	25	M
Unidade Local de Saúde de Amadora Sintra, EPE	Urine	Alcohol, drugs, medicines	Ketamine, clonidine, paracetamol	1	M
Unidade Local de Saúde de Amadora Sintra, EPE	Blood, urine, cerebrospinal fluid	Alcohol, drugs, medicines	Ketamine, midazolam, levetiracetam, morphine	3	M
Unidade Local de Saúde de Lisboa Ocidental, EPE	Serum	Drugs	Negative	74	M
Unidade Local de Saúde de São José, EPE	Blood	Pesticides, anticoagulants	Negative	5	F
Unidade Local de Saúde de São José, EPE	Serum, urine	Alcohol, drugs, medicines	Perampanel, acetone	3	M
Estabelecimento Prisional de Coimbra	Urine	Drugs	Morphine	-	M
Estabelecimento Prisional de Linhó	Blood	Drugs	Negative	30	M
Estabelecimento Prisional de Pinheiro da Cruz	Blood	Drugs	Cocaína, MDMA	-	-

Drug Emergencies cases (prisons)



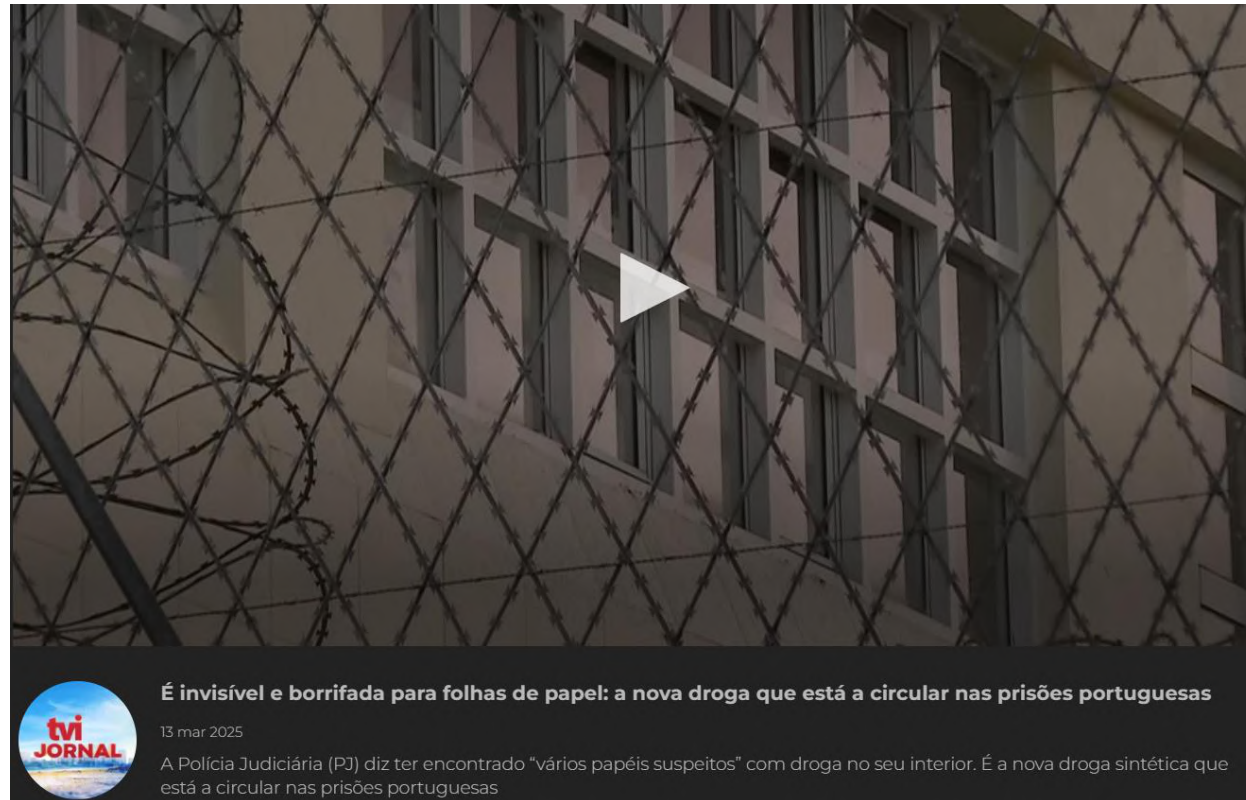
ÚLTIMAS JN DIRETO ASSINE O JN

#Ucrânia #MédioOriente

4-K: 5F-MDMB-PICA

K4: a droga indetetável à vista desarmada que deixa os reclusos violentos

🕒 Leitura: 3 min 12 março, 2025 às 19:02



Drug Emergencies cases

Outcome:

- Sample storage procedures
- Improve communications between hospitals and forensic toxicology
- Keep up new challenges (new tendencies: New Psychoactives Substances, nitazines, sodium nitrite....)