Synthetic Cannabinoid Related Deaths in Turkey_2017

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- National Expert on Drug Related Deaths (TUBIM-National Focal Point)

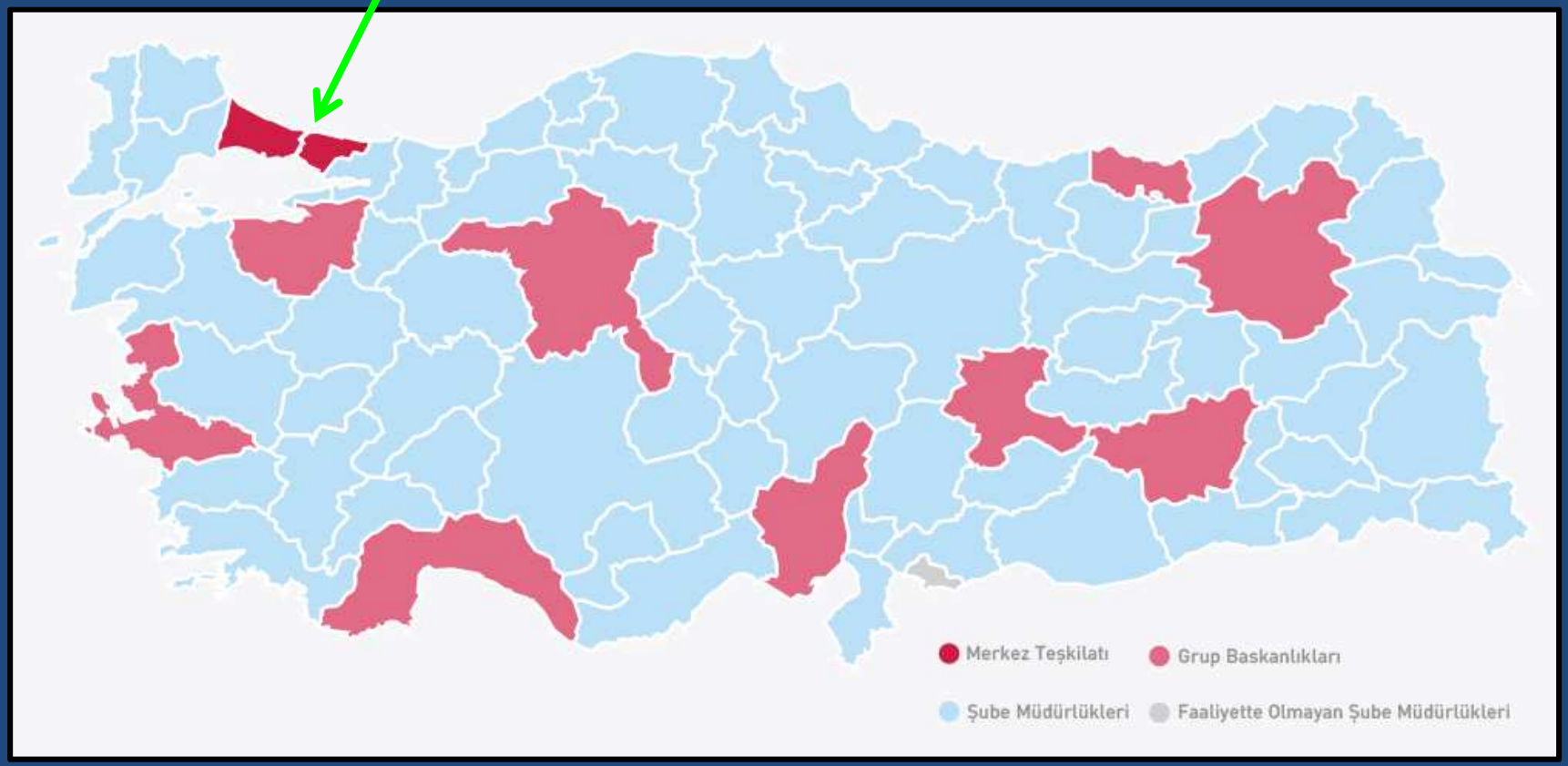
Special Mortality Registries

Monthly and Annualy Reporting by

Council of Forensic Medicine (Ministry of Justice)

Council of Forensic Medicine

Headquarters, Regional Offices, Field Offices



Council of Forensic Medicine

Quality of Autopsies and Toxicological Analysis

- **Standart Autopsy Protocol (≈ 25.000 cases)**, good photographing, standart sampling materials and transfer container.

- **Standart Validated Toxicological Analysis Procedures (≈ 55.000 cases)**
  - SOP managment in Acredited Central Lab.
  - **Only Confirmation Analysis** (Orbitrap LC-MS Screening, QTOF LC-MS)

Autopsy Rates

- **Council of Forensic Medicine ≈ 97%**
- Forensic Medicine Departments of Universities ≈ 3%

Drug Test Anal. 2018 Mar;10(3):449-459. doi: 10.1002/dta.2248. Epub 2017 Aug 24.

Detection of metabolites of the new synthetic cannabinoid CUMYL-4CN-BINACA in authentic urine samples and human liver microsomes using high-resolution mass spectrometry.

Öztürk YE[1], Yeter O[1], Öztürk S[1], Karakus G[2,3], Ates I[1], Buyuk Y[4], Yurdun T[3].

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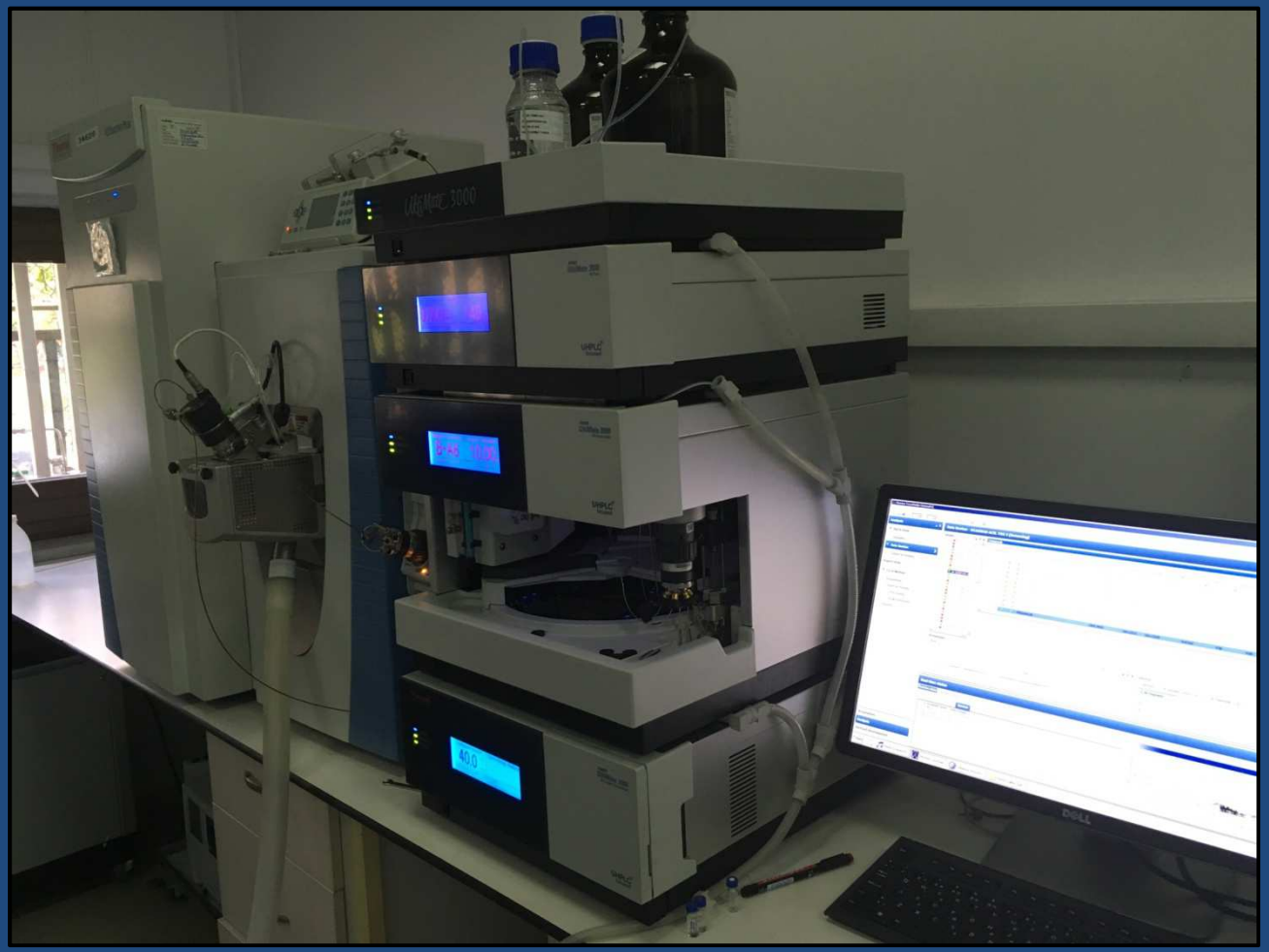
Identification of the Synthetic Cannabinoid 1-(4-cyanobutyl)-*N*-(2-phenylpropan-2-yl)-1H-indazole-3-carboxamide (CUMYL-4CN-BINACA) in Plant Material and Quantification in Post-Mortem Blood Samples

Oya Yeter ✉

Journal of Analytical Toxicology, Volume 41, Issue 9, 1 November 2017, Pages 720–728, https://doi.org/10.1093/jat/bkx061

Central Forensic Toxicology Lab.
ORBITRAP



Central Forensic Toxicology Lab.
LC-MS/MS, LC-QTOF/MS

Central Toxicology Department Acredited by Council of Turkish Acreditation for S.C. Analysis Method for Blood Samples

List of S.C.s (101 Validated Confirmation Analysis)

-JWH-018 and metabolites
-JWH-019
-JWH-073 and metabolites
-JWH-081 and metabolites
-JWH-122 and metabolites
-JWH-200 and metabolites
-JWH-201 and metabolites
-JWH-203 and metabolites
-JWH-210 and metabolites
-JWH-250 and metabolites
-JWH-398 and metabolites -AM-2201 and metabolites
-RCS-4 and metabolites
-RCS-8 and metabolites
-UR-144 and metabolites
-XLR-11 and metabolites
-MAM-2201 and metabolites
-AKB48 and metabolites
-5F-AKB48 and metabolite
-PB-22 and metabolite
-5F-PB-22 and metabolite
-AB-PINACA and metabolites
-AB-FUBINACA and metabolite
-AB-CHMINACA and metabolites
-ADB-PINACA and metabolite
-HU-210
-(+-)CP 47, 497
-(+-)CP 47, 497 C Homolog
-(+)WIN 55, 212-2
-(+/-)CP 55, 940
-5F-AB-PINACA and metabolite
-5F-ADB-PINACA

-ADB-FUBINACA and metabolites
-AMB-FUBINACA
-MAB-CHMINACA and metabolite
-5F-ADB and metabolites
-CUMYL-4CN-BINACA
-FUB-AMB
-5F-MDMB-PICA and metabolite
-5F-AMB and metabolites
-BB-22 and metabolites
-FU-AEB (AEB-FUBINACA)
-FUB-AKB48
-MDMB-FUBINACA
-MMB-CHMICA
-MMB-CHMINACA
-NM-2201
-THJ-2201
-ADBICA
-5F ADBICA
-5F ABICA
-CUMYL-P7AICA
-CUMYL PEGACLON and metabolites
-AB-7 FUBAICA
-5 F MDMB 2201
-5 F JWH 018 Adamantyl analogue
-5 F CYPPICA
-5 CI UR 144
-5 CI AB PINACA
-5 F SDB 005
-MMB 2201
-MDMB CHMICA
-MDMB CHMINACA

Cumyl 4-CN Binaca

Toxic or Lethal Cyanide Concentrations in some Samples

More Lethal than the other S.C.s
False Diagnosis of Reason of Death (as Cyanide Intox.)

National Definition: Selection D

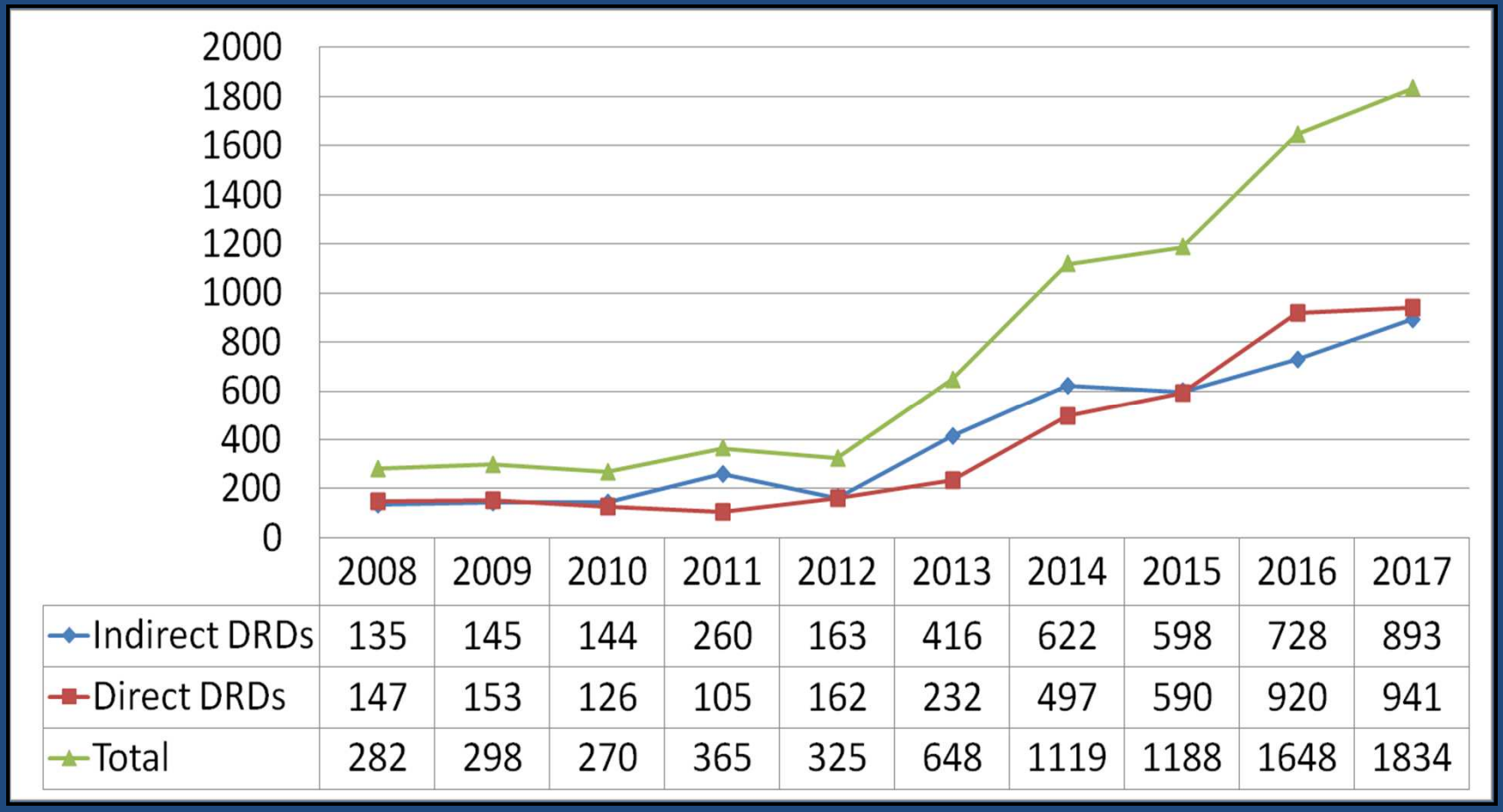
Direct DRD (2017)

	M	F	Total
n	909	32	941

Indirect DRD (2017)

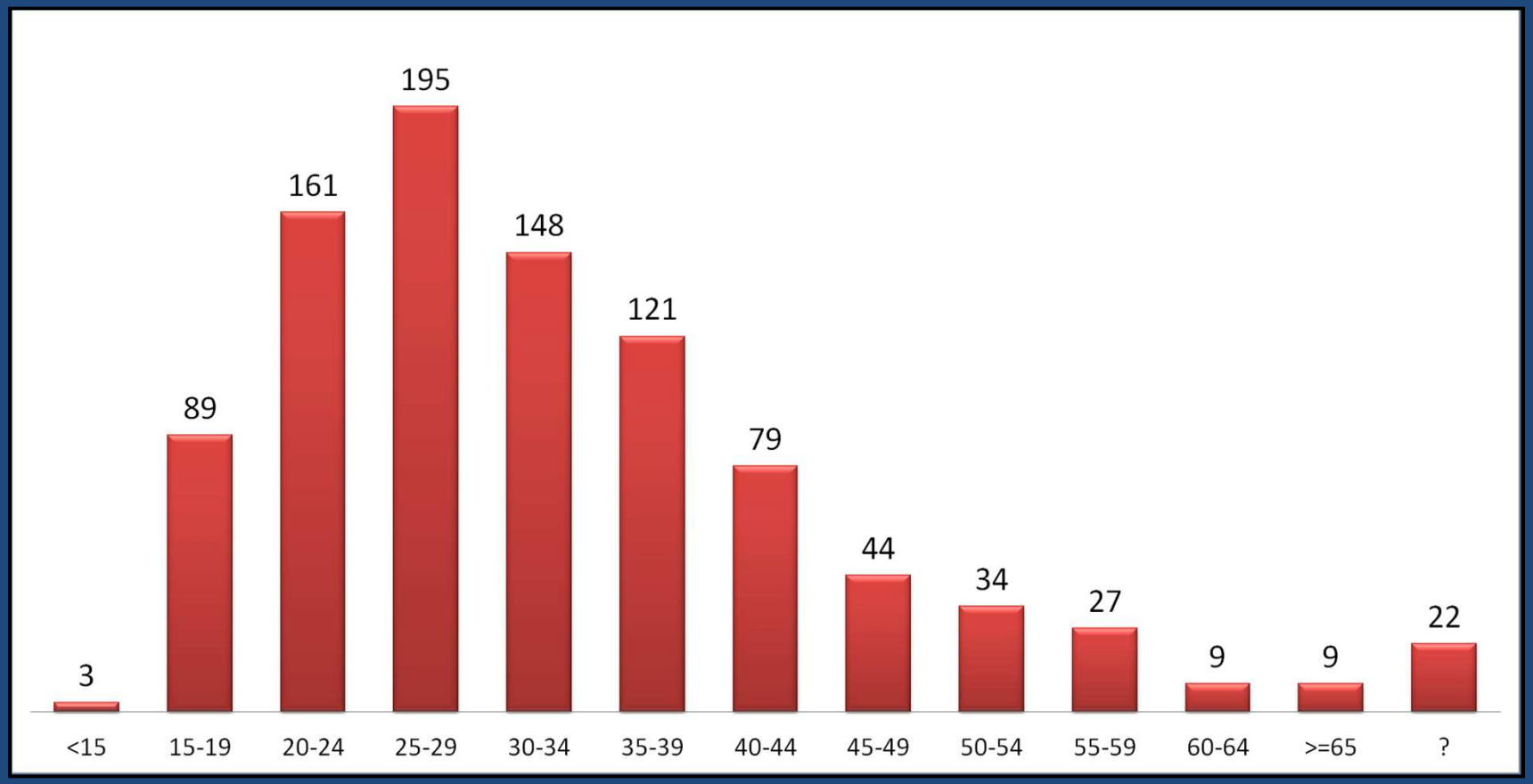
	M	F	Total
n	850	43	893

DRDs in Turkey (2017)

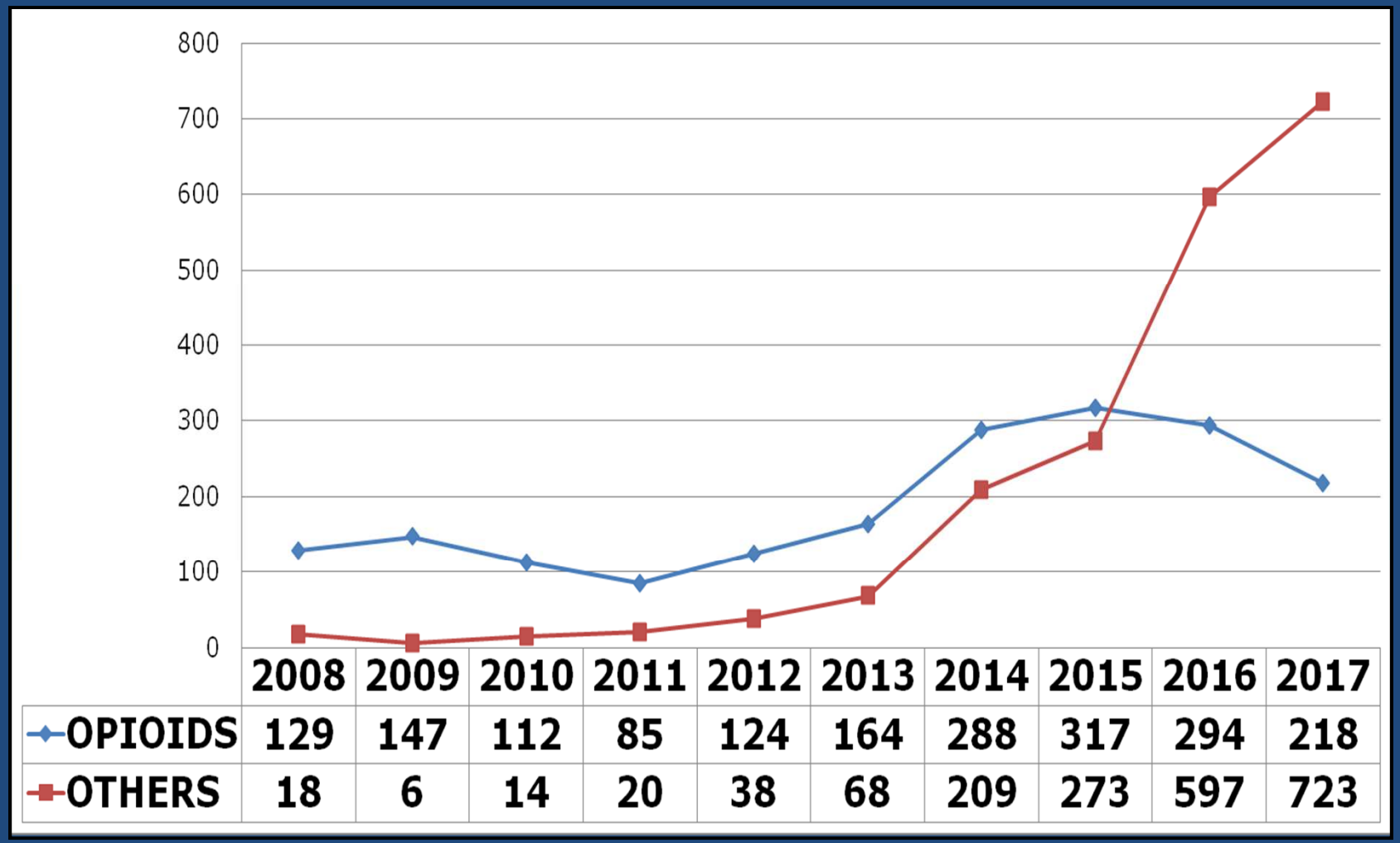


	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Indirect DRDs	135	145	144	260	163	416	622	598	728	893
Direct DRDs	147	153	126	105	162	232	497	590	920	941
Total	282	298	270	365	325	648	1119	1188	1648	1834

Direct DRDs: Age Groups

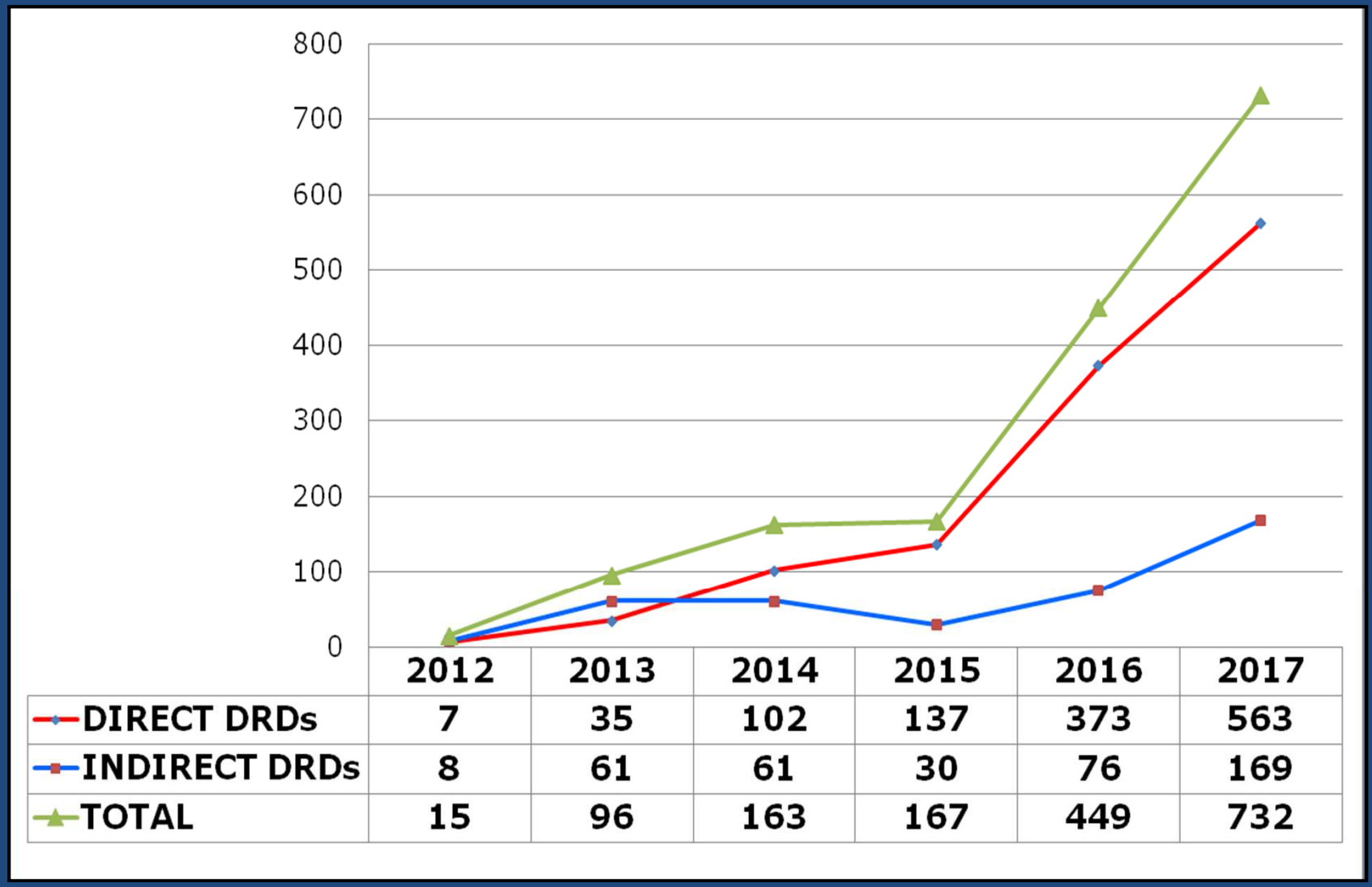


DIRECT DRDs



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
OPIOIDS	129	147	112	85	124	164	288	317	294	218
OTHERS	18	6	14	20	38	68	209	273	597	723

Synthetic Cannabinoids

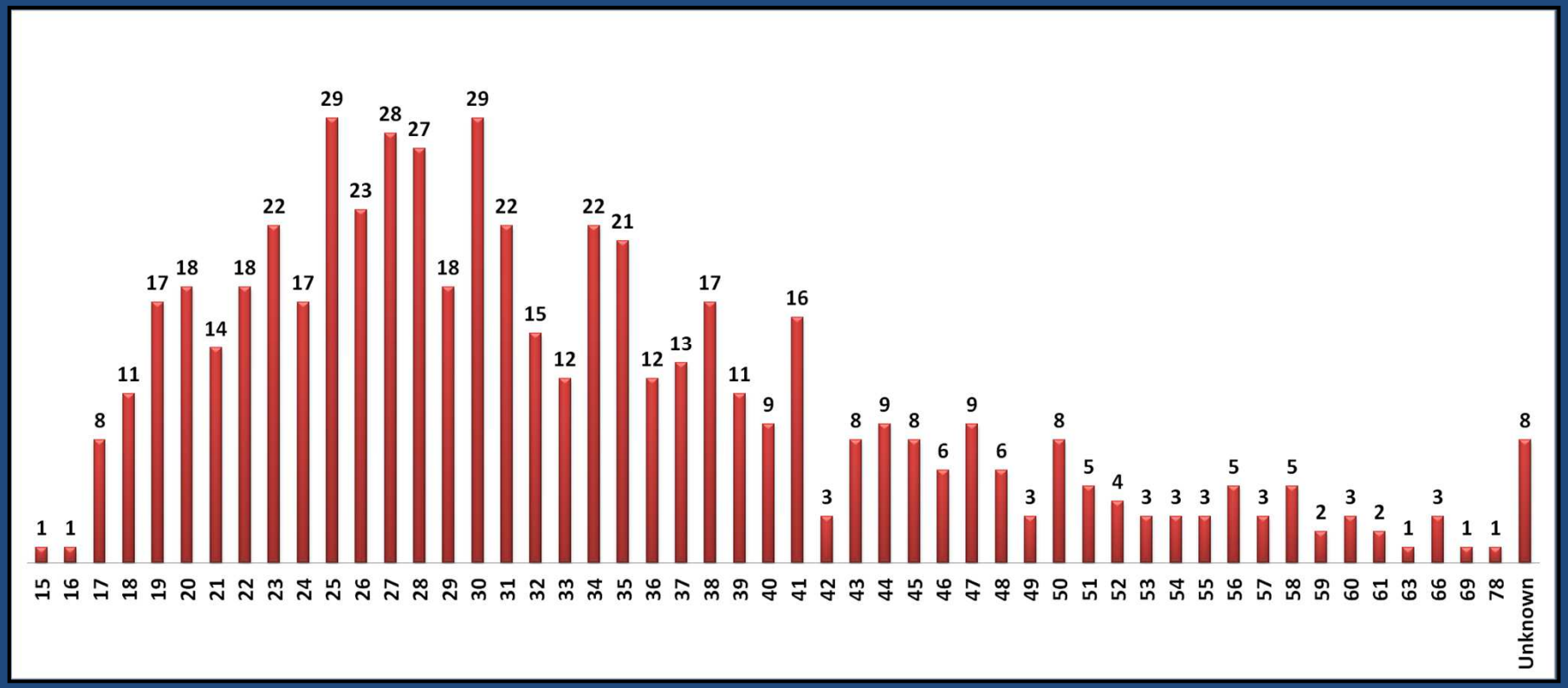


	2012	2013	2014	2015	2016	2017
DIRECT DRDs	7	35	102	137	373	563
INDIRECT DRDs	8	61	61	30	76	169
TOTAL	15	96	163	167	449	732

Synthetic Cannabinoid Deaths: Average Ages

	N	Average Ages	Min-Max Ages
MALE	11	31,4	18-56
FEMALE	552	32,8	15-78
TOTAL	563	32,8	15-78

Synthetic Cannabinoid Deaths by Ages



Shifting with cannabis (and heroin?)

Direct DRDs_S.C. Positive Cases

Alone	**258**
With Alcohol Only	**77**
With Other Substances	**228**
Heroin	30
Methadone	1
Tramadol	1
Cannabis	151
Cocaine	34
MDMA	50
Methamphetamine	22
Toluen (Solvents)	5
N-butane (Lighter Gas)	1
Benzodiazepines	9
Gabapentine	1
Antidepressant/Antipsychotic	15

Shifting

Cannabis ↔ Synthetic Cannabinoids

Low Cannabis Availability (2015)

↓

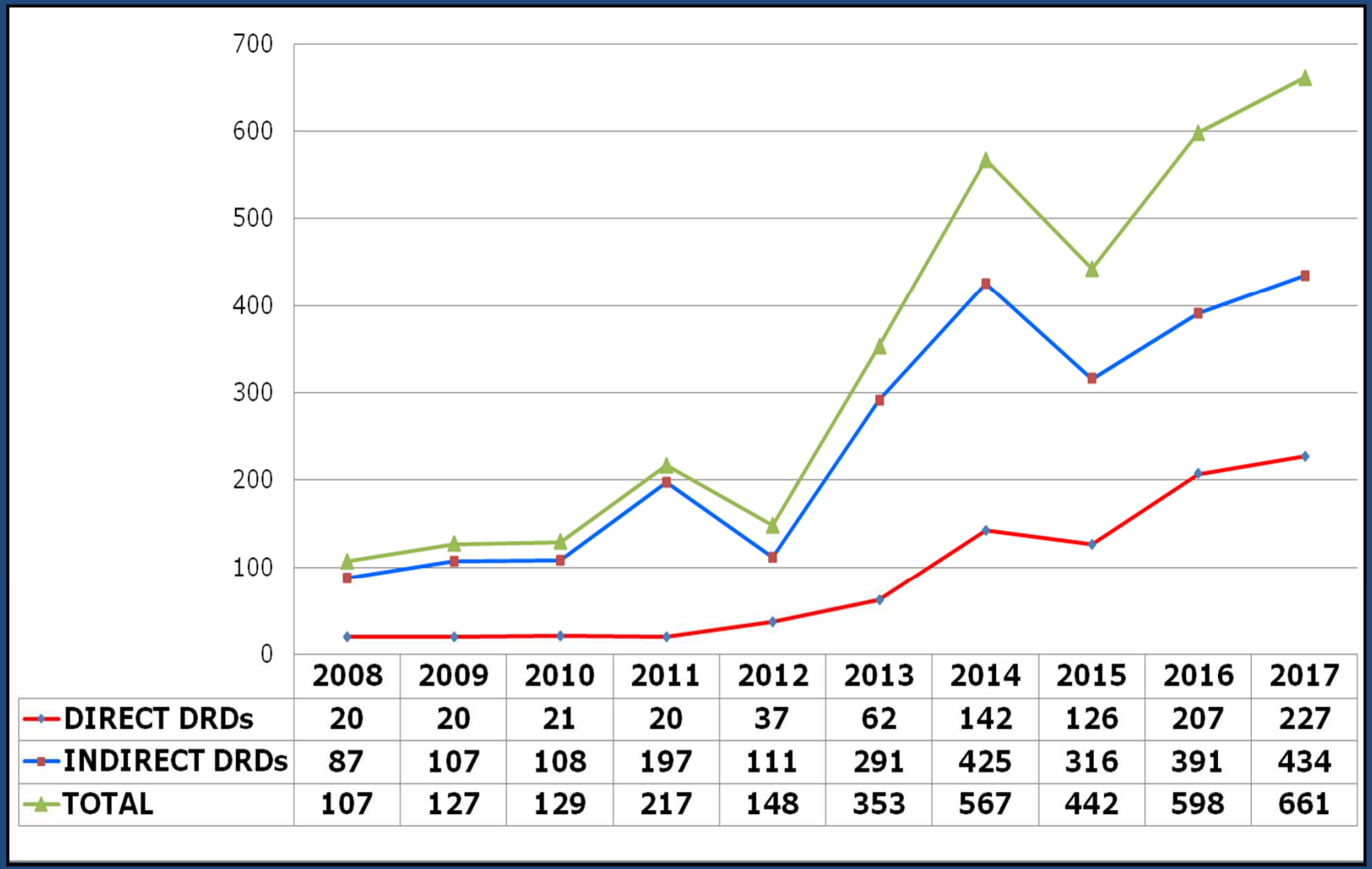
Synthetic Cannabinoid Sprayed Poor Cannabis Plants Sold as SCANC

Cannabis and S. C. Together in 188 cases (2017)

Shifting between Heroin and Synthetic Cannabinoids

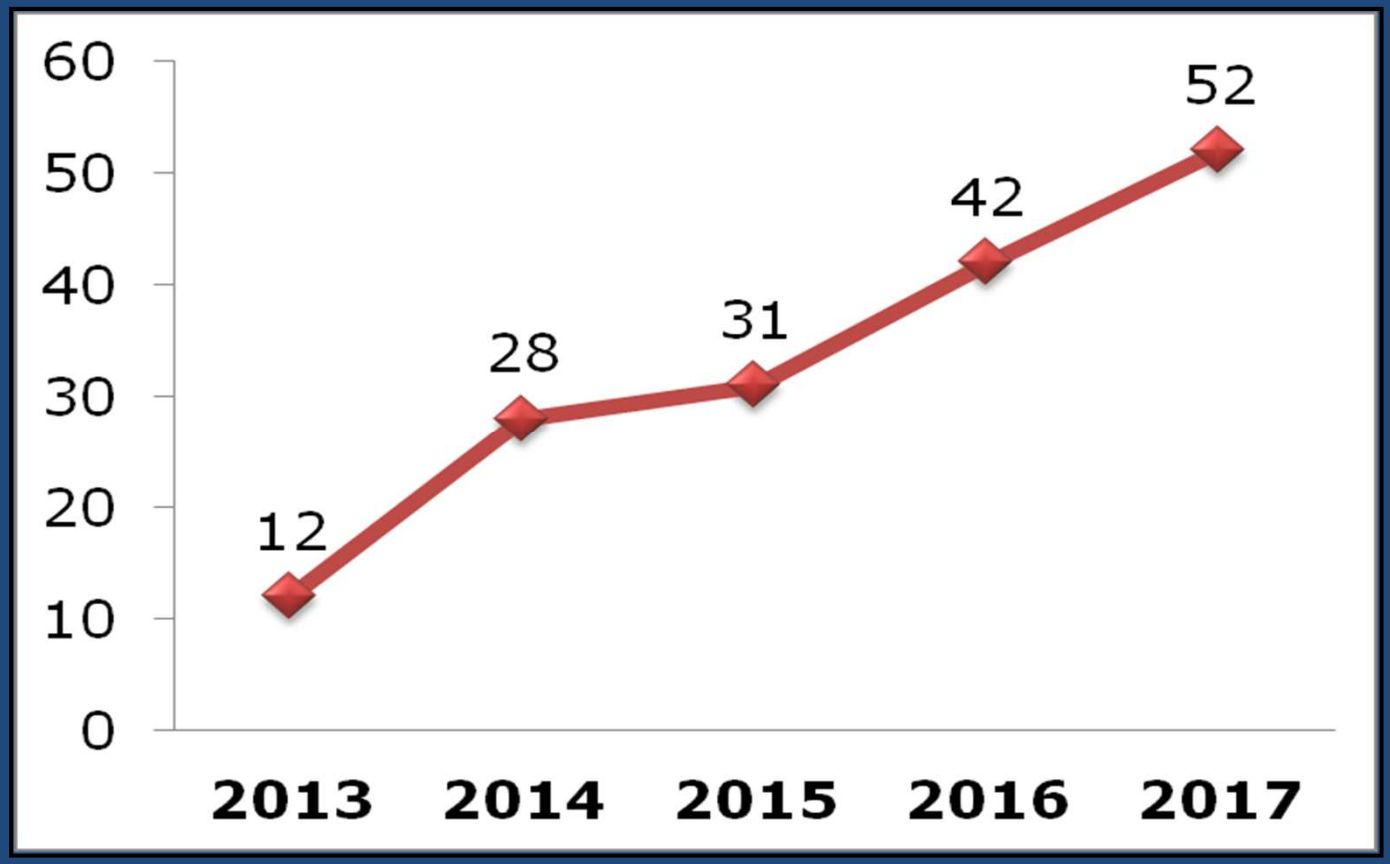
(reported verbally by a chief psychiatrist in a Local Meeting)

CANNABIS



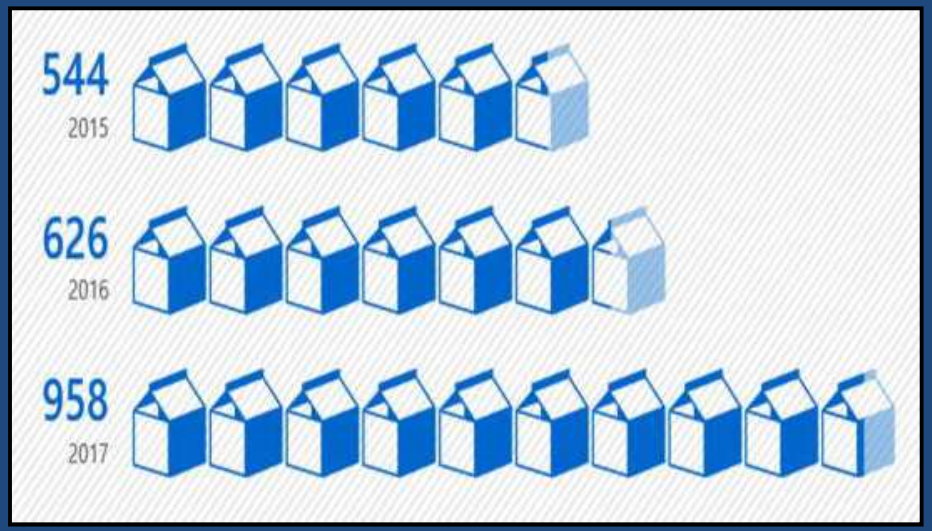
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DIRECT DRDs	20	20	21	20	37	62	142	126	207	227
INDIRECT DRDs	87	107	108	197	111	291	425	316	391	434
TOTAL	107	127	129	217	148	353	567	442	598	661

Direct and Indirect Synthetic Cannabinoid Deaths Data Regarding the Number of Provinces (Total Number:81)



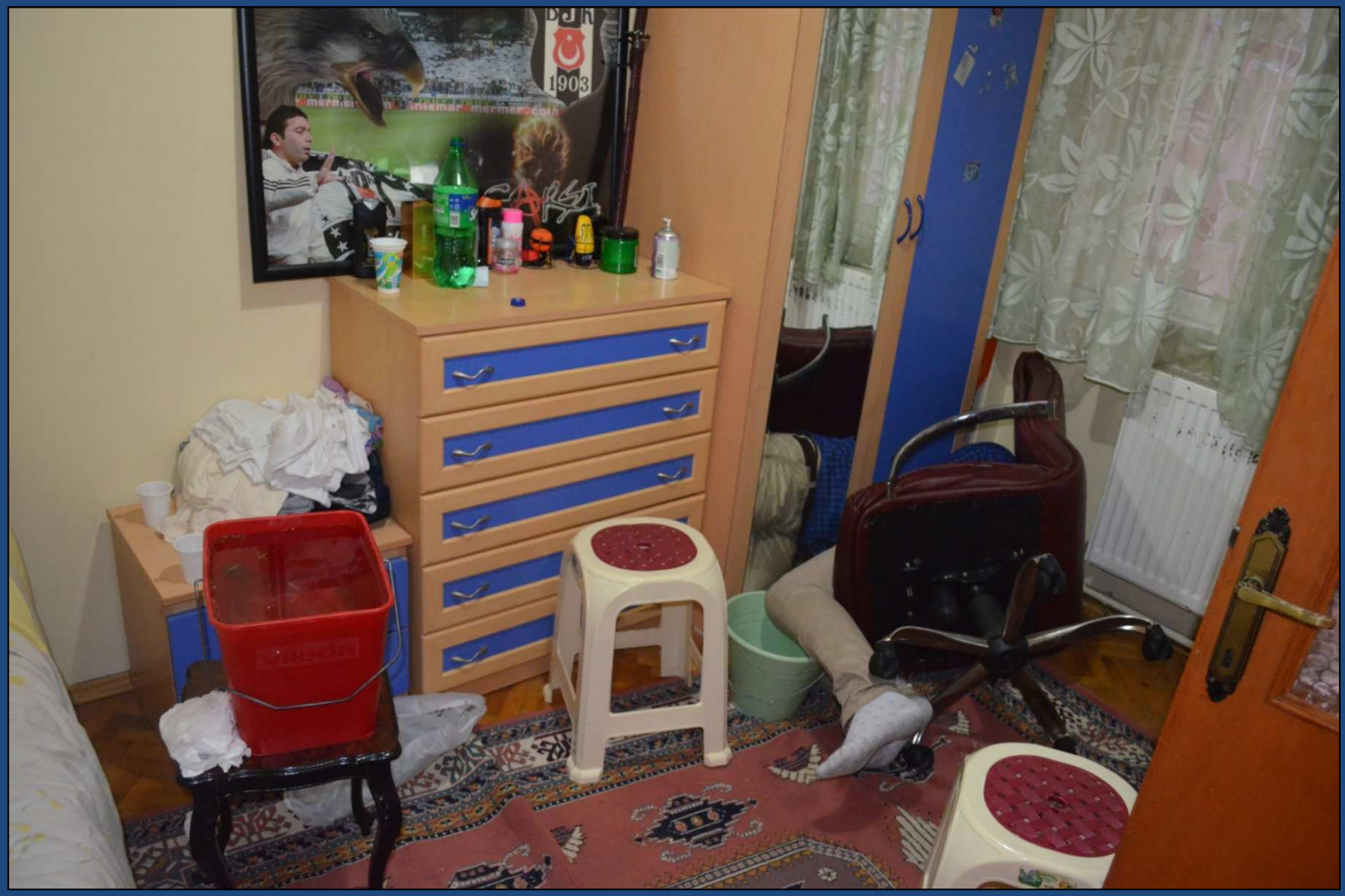
Litigation Numbers by Years

Seizures (kg) by Years



Bucket Method

S. C. Intox.: Scene



Place of Deaths

(Autopsy findings, in cases that toxicological analyses confirmed the presence of synthethic cannabinoids (2012-2016), Thesis, Seher Koçer (2017))

Home %45

Outdoor %27,5

Offices %8,1

The most frequent findings identified at macroscopical and microscopical examination

Heart: hyperemia and ischemic changes

Lungs: edema, hyperemia and increased weights (900-1200g Normal Range: 300-350g)

Hülya Karadeniz et al, The evaluation of cases using synthetic cannabinoid in Trabzon and the surrounding provinces, J For Med 2017;31(2):45-52

Average Ages		
Female	**22,1±6,9**	**11 (3, 8%)**
Male	**26,1±9,5**	**280 (96,2%)**
Education	**n**	**%**
Primary School	**201**	**69,1**
High School	**70**	**24,1**
Universty	**8**	**2,7**
Just literate	**12**	**6,9**
Marital Status	**n**	**%**
Single	**172**	**59,1**
Married	**99**	**34**
Divorced	**20**	**6,9**
Employment	**n**	**%**
Unemployed	**120**	**41,2**
Irregular Employed	**111**	**38,1**
Regular Employed	**60**	**20,6**

The use of synthetic cannabinoids among probation population

Elif Mutlu et al.

Adli Tip Dergisi / Journal of Forensic Medicine, Cilt / Vol.:29, Sayı / No:3

Employment	Cannabis User (%)	S.C. User (%)
Unemployed	17.9	24
Irregular Employed	1.1	2.1
Regular Employed	68	71
Criminal Records (+)	29.8	27.1

Percentage of patients (n: 277) reporting synthetic cannabinoids as the sole toxicologic agent (USA)

https://www.cdc.gov/mmwr/volumes/65/wr/mm6527a2.htm?s_cid=mm6527a2_w

Organ system/Syndrome	Clinical sign/symptom	Patients reporting SC as sole agent (%)†
Nervous	Agitation, coma, toxic psychosis, other	**66.1**
Cardiovascular	Bradycardia, tachycardia, other	**17.0**
Pulmonary	Respiratory depression	**5.4**
	Other	**2.2**
Renal/Muscle	Acute kidney injury	**4.0**
	Rhabdomyolysis	**6.1**
Other	Metabolic	**8.7**
	Gastrointestinal/Hepatic	**1.4**
	Significant leukocytosis	**2.9**
Toxidrome	Sedative-hypnotic	**6.9**
	Sympathomimetic syndrome	**5.4**
	Other	**2.2**

Adnan Doğan et al, Acute Coronary Syndrome Following the Use of the Bonsai, Koşuyolu Heart Journal 2017;31(2):45-52
EKG POSITIVE, CARDIAC ENZYMS NEGATIVE

Ayhan H, Aslan AN, Süygün H, Durmaz T. Bonsai induced acute myocardial infarction. Arch Turk Soc Cardiol 2014;42(6):560-563

Köklü E, Yüksel İÖ, Bayar N, Üreyen ÇM, Arslan Ş. A new cause of silent myocardial infarction: Bonsai. Anadolu Kardiyol Derg. 2015 Jan;15(1):69-70.

Sarıkaya M, Taşer N. Bonzai Kullanımına Bağlı Toksik Hepatit. EP-17. 5. Hepatoloji Okulu 30 Mayıs-1 Haziran 2014, Kocaeli.

Ahmet Tarık Eminler et al. Sentetik Kannabinoidler (BONZAİ) ve Gastrointestinal Sistem Üzerine Etkileri: "Kannabinoid Hiperemezis Sendromu" güncel gastroenteroloji.

Capgras Syndrome After Use of Synthetic Cannabinoids: an Adolescent Case.

Ozer, Urun; Ceri, Veysi; Evren, Cuneyt, Journal of Psychiatry & Neurological Sciences . Dec2016, Vol. 29 Issue 4, p374-378.

"Seventeen years old male, who reported using "bonzai" for about 10 days, was brought to the emergency room by his family. Capgras syndrome, defined with delusion that his mother and father have been changed and replaced by others, has been detected."

A new threat in the emergency department: Synthetic cannabinoids (Bonzai, Jameika)

Egemen Küçük et al, Genel Tıp Derg 2015;25:18-22.

Symptoms	%
Chest pain, Gasping	16.96
Palpitation	16.07
Rapid aggression, Absurd behaviours	25
Syncope, confusion	13.39
Nausea, Vomit	14.28
Stupor (stupidity), Vertigo	10.71
Hallucinations	3.57

Sönmez İ, Köşger F. Synthetic Cannabinoid Receptor Agonist-Associated Psychotic Disorder: A Case Report, *Türk Psikiyatri Dergisi 2014;25.*

Dursun Fırat Ergul, Serdar Ekemen, Birgul Buyukkıdan Yelken Synthetic Cannabinoid 'Bonzai' Intoxication. Turk J Anaesth Reanim 2015; 43: 347-51

Tablo 1. Birinci olguya ait biyokimyasal değerler tablosu

Yatış günü	AST ($U\ L^{-1}$)	ALT ($U\ L^{-1}$)	LDH ($IU\ L^{-1}$)	CK ($U\ L^{-1}$)	Kreatinin ($mg\ dL^{-1}$)	BUN ($mg\ dL^{-1}$)	aPTT	INR
1. gün	1350	250	24000	139.890	2,28	16,5	14,8	1,29
2. gün Birinci ölçüm	3598	810	14830	243.920	1,34	13,1	54,8	1,59
İkinci ölçüm	1780	450	6376	62.652	1,6	16,3	90	1,95
3. gün	1651	370	3147	43.220	2,86	30,94	74,9	1,43
8. gün	158	1	928	1668	3,46	29,86	44,4	1,01
9. gün	74	3	724	440	5,63	90,2	64,25	1,12
20. gün	50	0			4,03	57,45		
22. gün	27	2	523	65	5,10	95,0	39,9	1,15
25. gün	32	26	821	618	0,53	23,66	35,9	1,05
38. gün					0,86	20,49	31,2	1,12

AST: aspartat transaminaz; ALT: alanin aminotransferaz ; LDH: laktat dehidrogenaz; CK: kreatin kinaz; BUN: kan üre nitrojen; aPTT: aktive parsiyel tromboplastin zamanı; INR: uluslararası düzeltme oranı

Ebru Gok Oguz et al, Synthetic cannabinoid ("bonsai") induced rhabdomyolysis; two case reports, (Published Online: 2016-01-30 | DOI: https://doi.org/10.1515/tjb-2016-0008)

Tolga Han Efe et al. Atrial fibrillation following synthetic cannabinoid abuse. Turk Kardiyol Dern Ars 2017;45(4):362-364

Last Words

-Impotance of Awareness Campaigns: **It's not Synthetic Cannabis**

-More Lethal than Opioids

-Toxicology Lab.s blind at least 6 Months: **Need to know metabolytes for the analysis of body fluids**

-CSI and testimonies important: **Easy analysis for suspicious materials**

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