VICTORIAN INSTITUTE OF FORENSIC MEDICINE

THE RISE OF NOVEL PSYCHOACTIVE SUBSTANCES IN AUSTRALIA:

CHALLENGES FOR DRUG SURVEILLANCE AND PUBLIC HEALTH

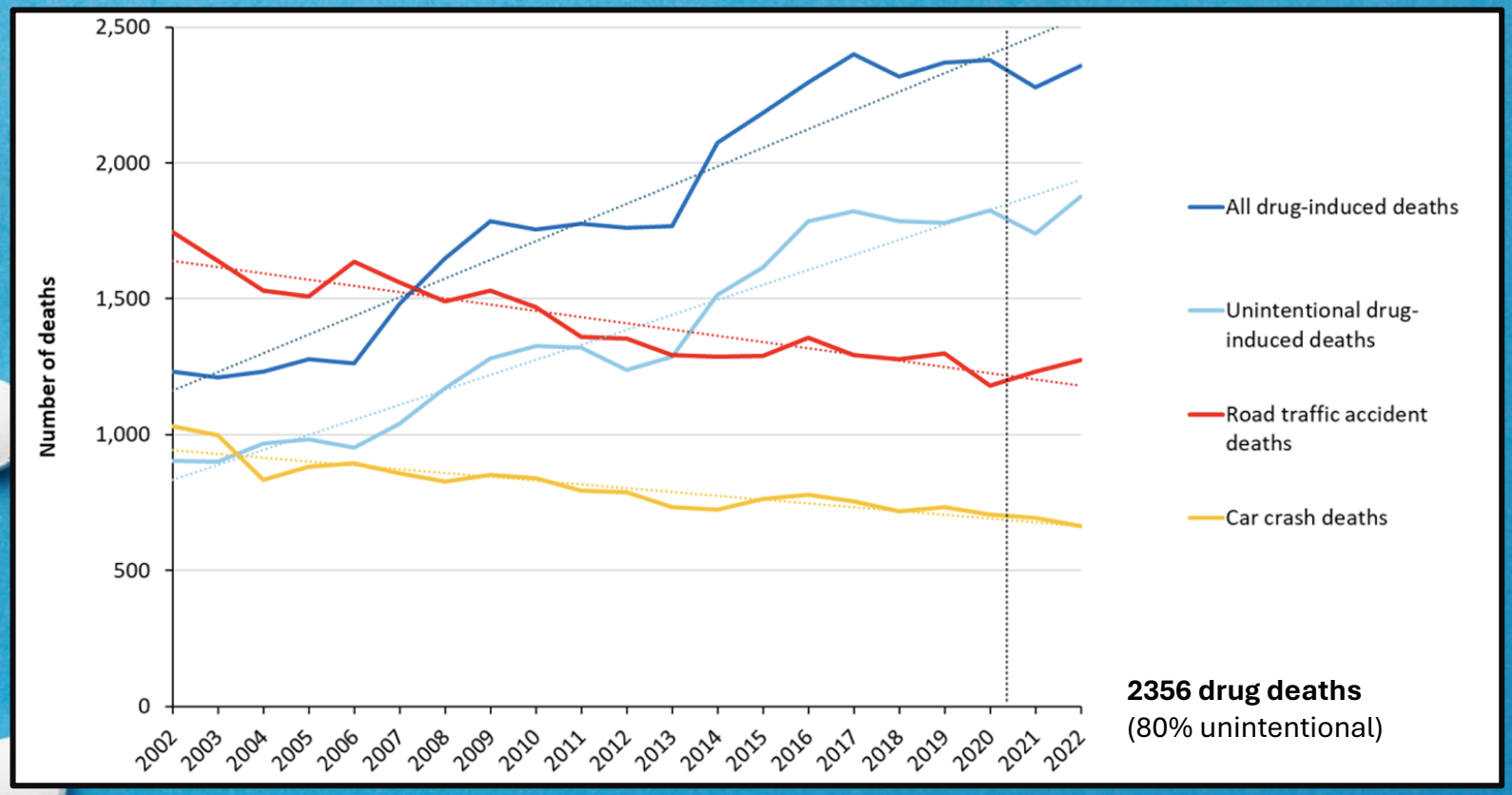
Jennifer Schumann, PhD

Head, Drug Intelligence Unit , Victorian Institute of Forensic Medicine

Associate Professor, Monash University

MONASH University

DRUG DEATHS IN AUSTRALIA

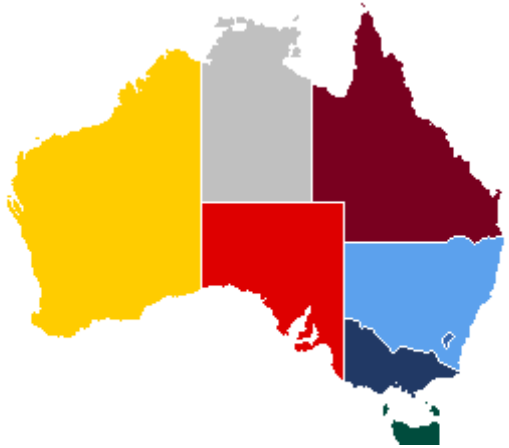


2356 drug deaths
(80% unintentional)

There is a fatal overdose every 4 hours

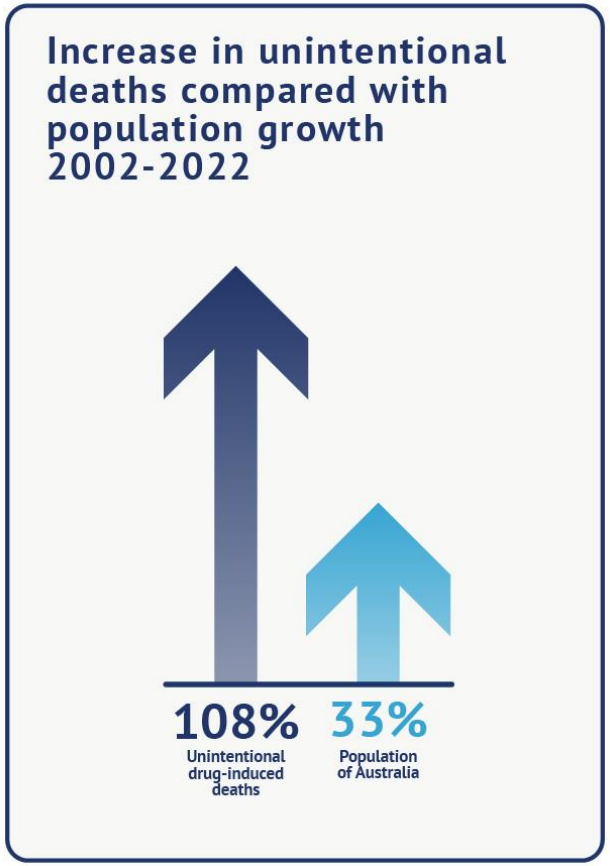
42,000 drug deaths since 2001

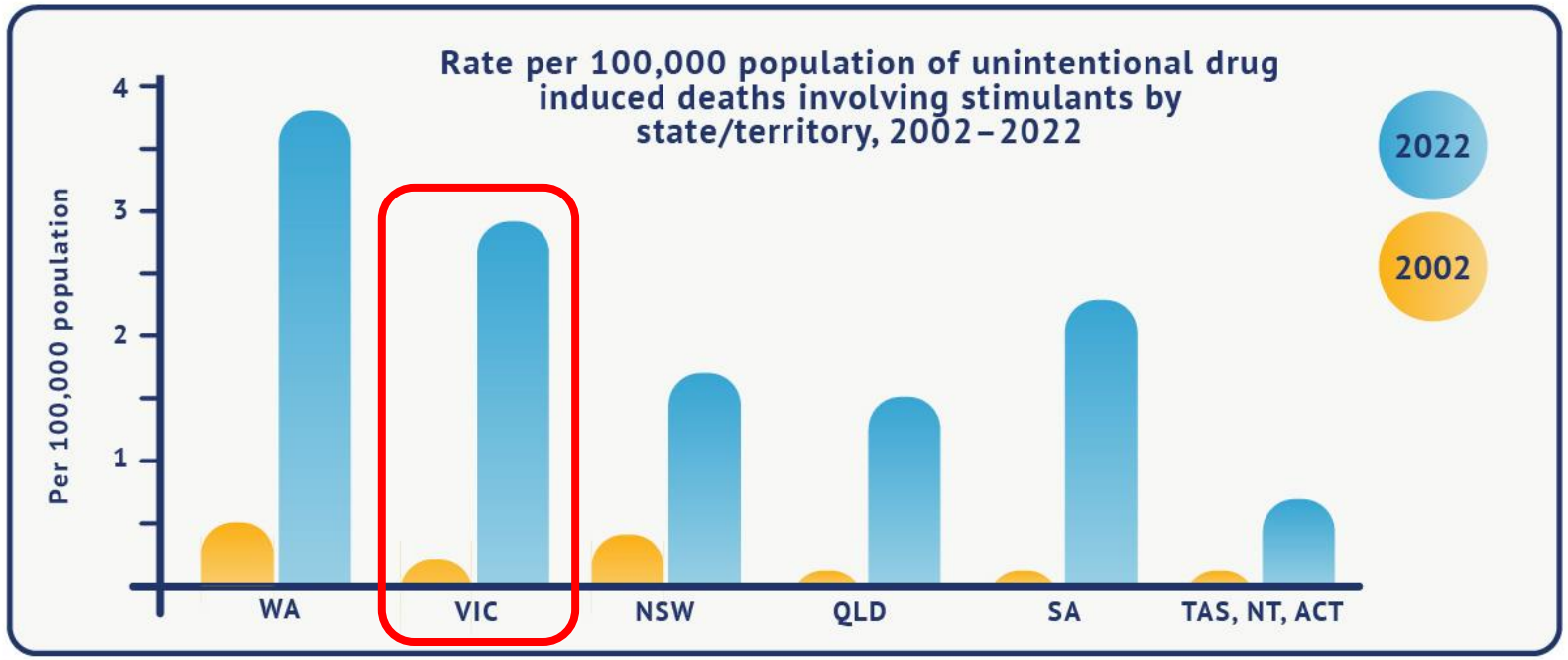
Penington Institute Annual Overdose Report 2024



DRUG DEATHS IN AUSTRALIA

- **47% of Australians aged >14 years have used an illicit drug in their lifetime**

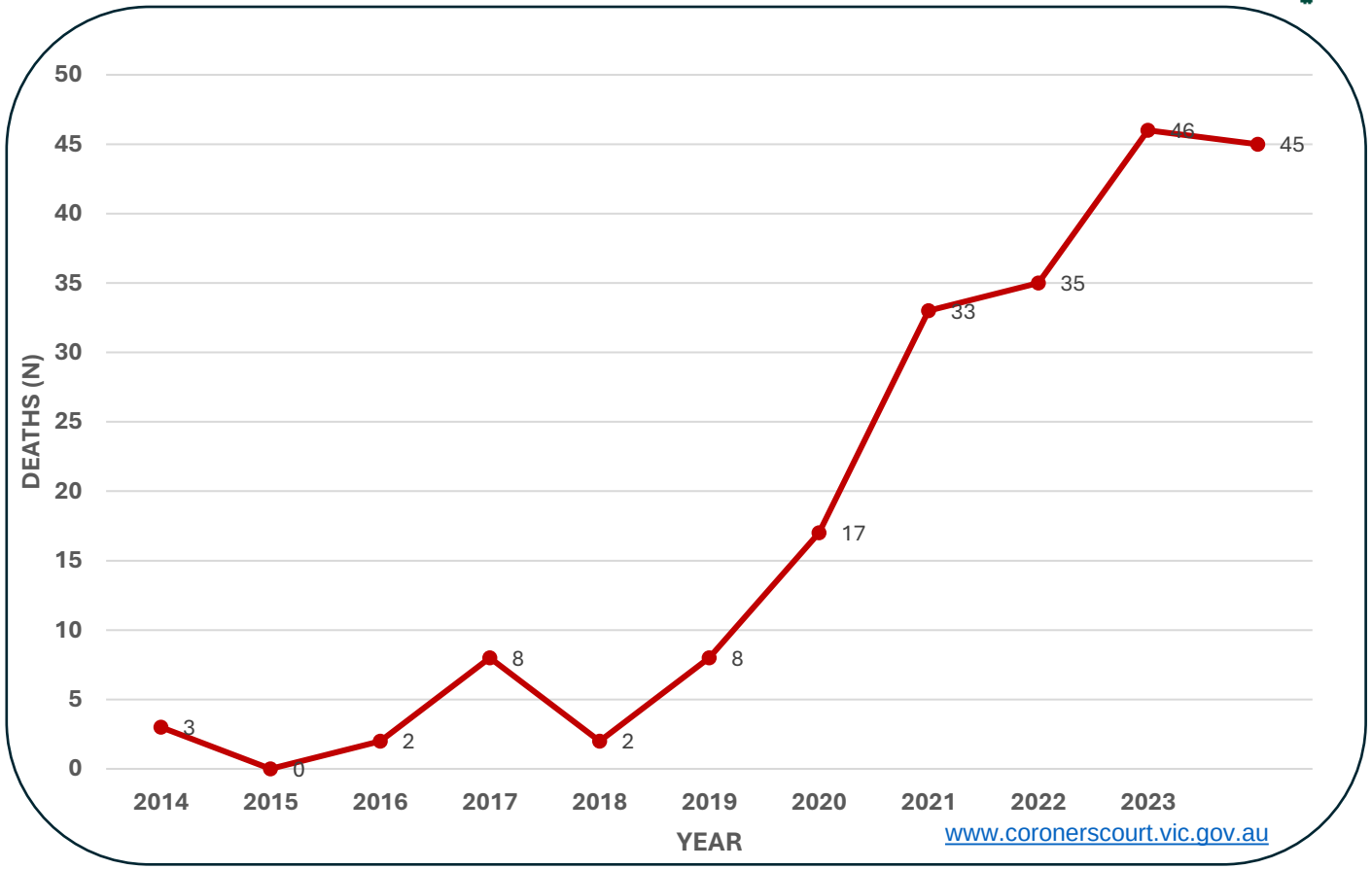




National Drug Strategy Household Survey 2022-2023. https://www.aihw.gov.au/about-our-data/our-data-collections/national-drug-strategy-household-survey (Accessed February 2025)

NEW PSYCHOACTIVE SUBSTANCES (NPS)

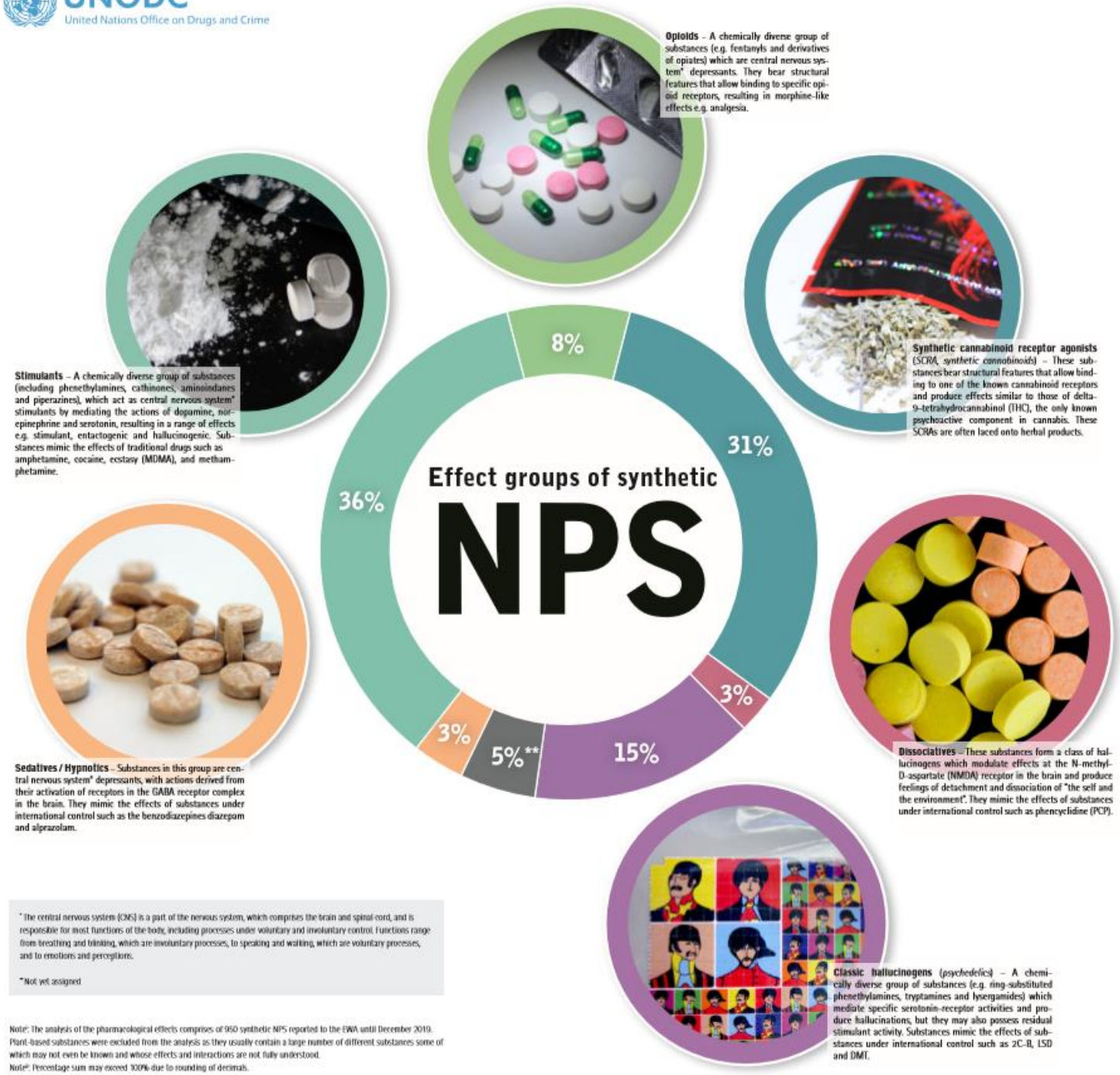
NPS RELATED DEATHS IN VICTORIA 2013 - 2023



NPS, novel psychoactive substances.

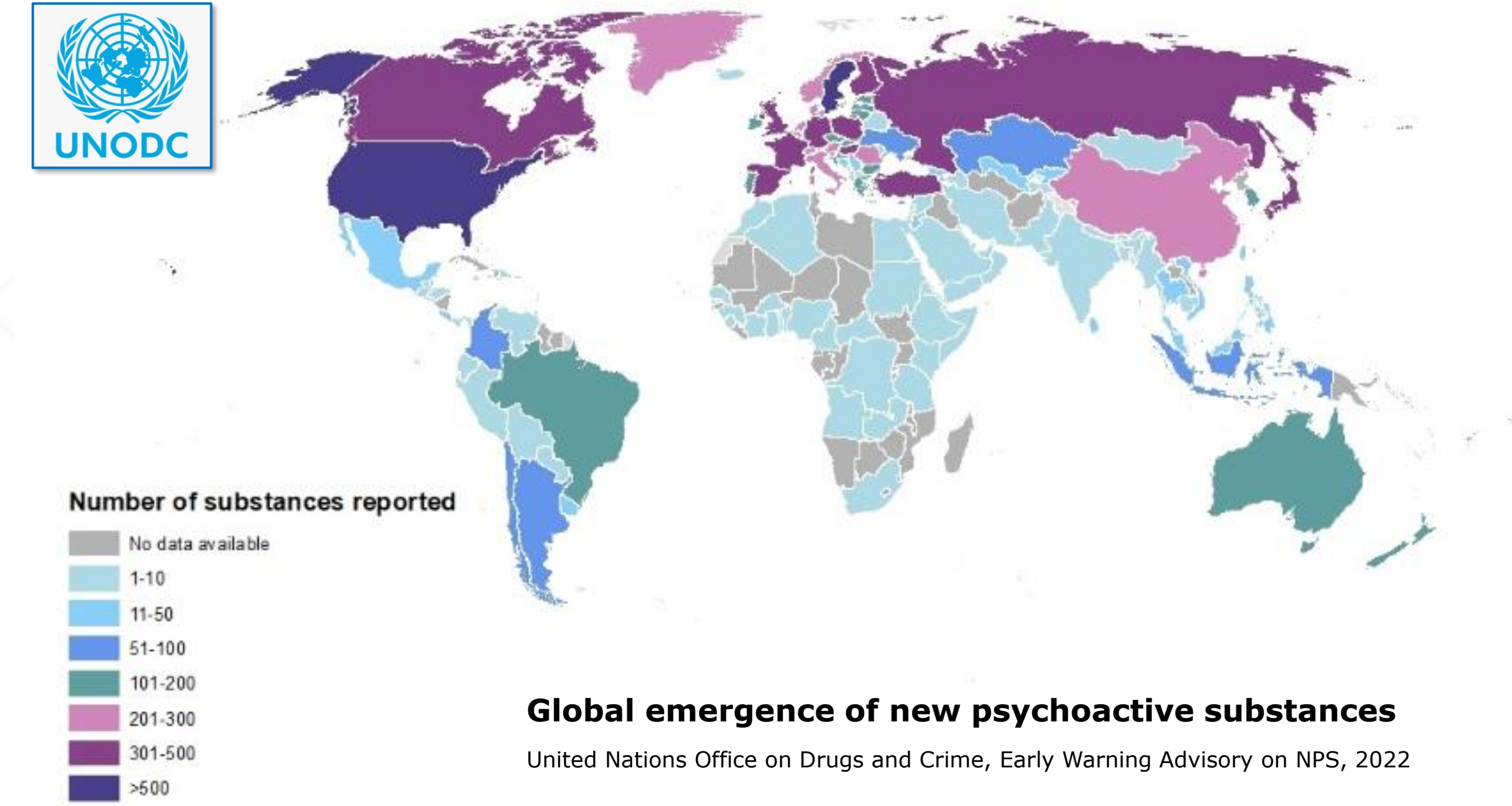
1. UNODC. NPS Substance Groups. Available at: https://www.unodc.org/LSS/SubstanceGroup/GroupsDashboard?testType=NPS (Accessed January 2025); 2. UNODC. NPS data visualisations. Available at: https://www.unodc.org/LSS/Page/NPS/DataVisualisations (Accessed January 2025). 2. Coroners Court of Victoria: Drug overdose deaths 2013 – 2022 (8 November 2023)

UNODC
United Nations Office on Drugs and Crime



NOVEL/NEW PSYCHOACTIVE SUBSTANCES (NPS)

- Legal highs, designer drugs, herbal highs, bath salts, spice etc
- Some first designed in the 1950s
- Mimic the effects of illicit drugs and are produced by introducing slight modifications to the chemical structure of controlled substances
- Complicated pharmacology/toxicology
- >1200 compounds



Global emergence of new psychoactive substances

United Nations Office on Drugs and Crime, Early Warning Advisory on NPS, 2022

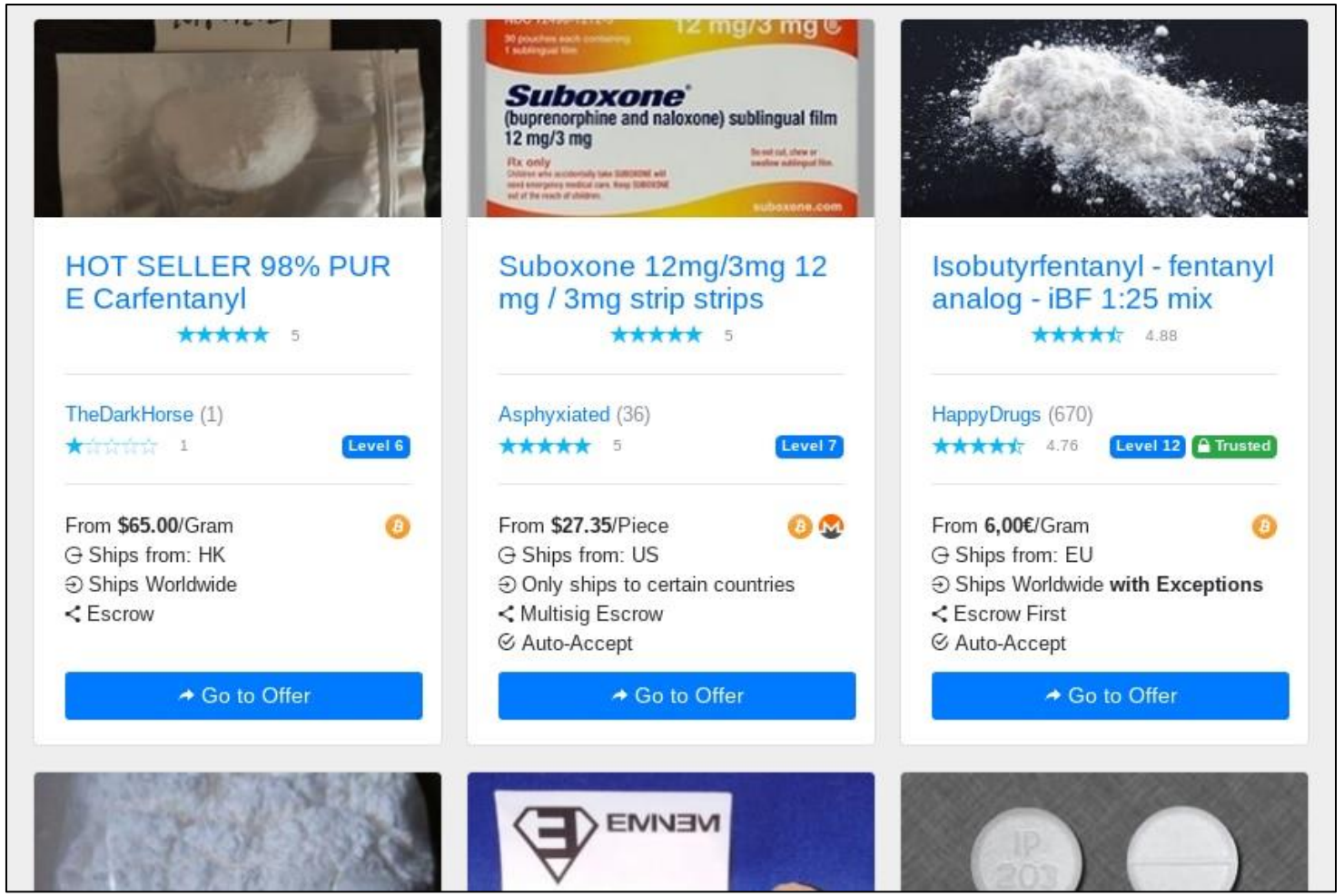
NPS, novel psychoactive substances.

UNDOC. Current NPS Threats Vol. V/2022. Available at: https://www.unodc.org/documents/scientific/Current_NPS_Threats_V.pdf (Accessed January 2025).

Is your postman delivering drugs?

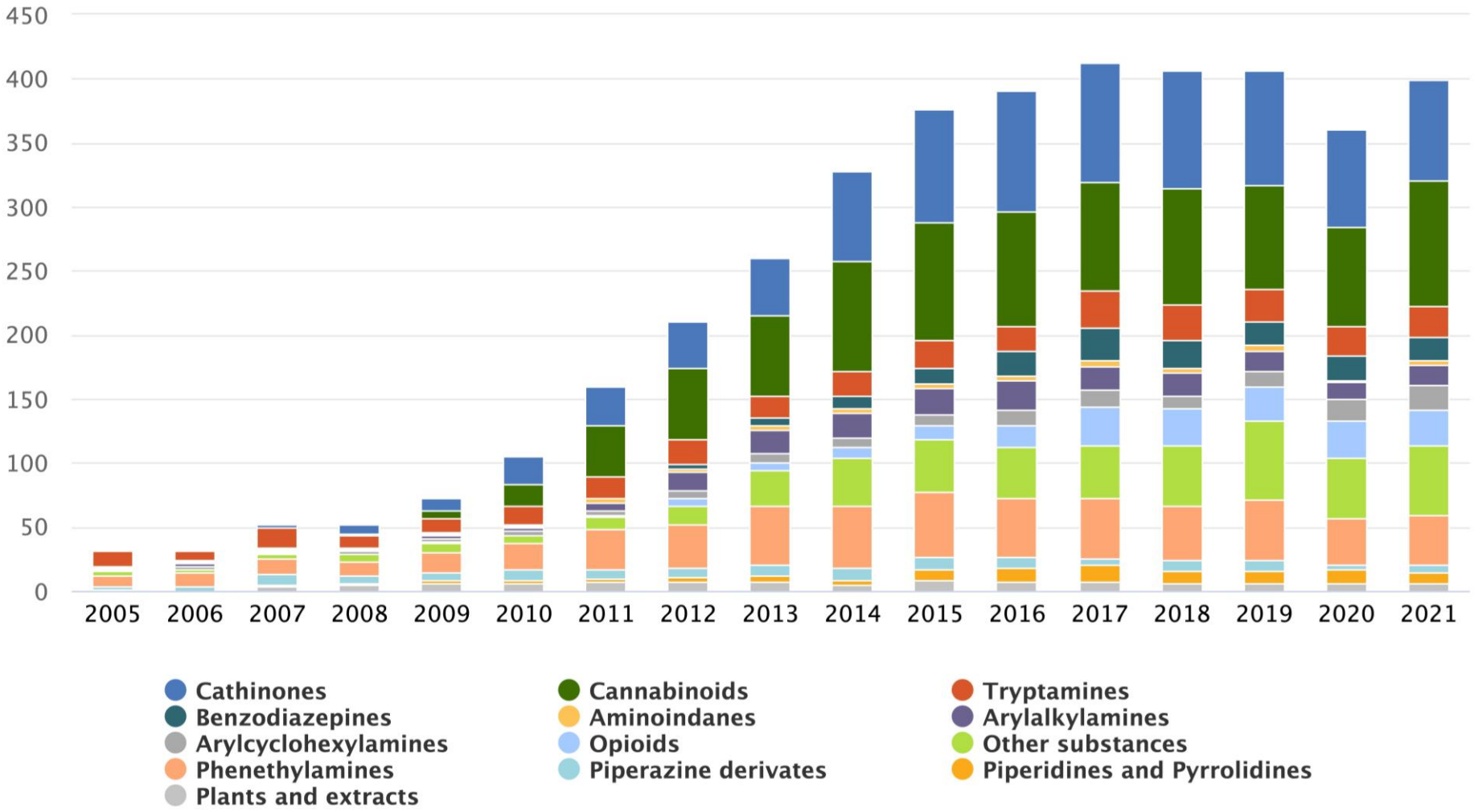
BBC

5 January 2017



1. BBC News. Is your postman delivering drugs? Available at: https://www.bbc.co.uk/news/newsbeat-38223838 (Accessed January 2025); 2. ABC News. Fentanyl is being sold on the dark web, raising fears of an Australian opioid crisis. Available at: https://www.abc.net.au/news/2019-04-12/dark-web-fentanyl-sales-spark-fears-of-australian-opioid-crisis/10996602?future=true& (Accessed January 2025).

NOVEL PSYCHOACTIVE SUBSTANCES (NPS)



Number of new psychoactive substances reported each year following their first detection in the European Union, by category, 2005–2021

EUDA. New psychoactive substances – the current situation in Europe (European Drug Report 2023). Available at: https://www.euda.europa.eu/publications/european-drug-report/2023/new-psychoactive-substances_en (Accessed January 2025).

UNODC Early Warning Advisory
Summary Dashboard

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What are New Psychoactive Substances?

NPS are substances of abuse, either in a pure form or a preparation, that are not controlled under the Single Convention on Narcotic Drugs of 1961 or the 1971 Convention, but that may pose a public health threat. In this context, the term "new" does not necessarily refer to new inventions but to substances that have recently become available. NPS that have been placed under international control since 2014 continue to be included under the term NPS to enable times series analysis.

Effect Groups and Structural Groups

Within the UNODC EWA, NPS are classified based on the pharmacological effect that it exerts on the central nervous system - **effect group classification** (eg. stimulants, classic hallucinogens, dissociatives etc.), and based on similarities in chemical structure - **structural group classification** (eg. synthetic cathinones, fentanyl analogues, benzodiazepines etc.).

Note: Not all NPS that have been reported to UNODC have been assigned to an effect group classification. Substances with similar chemical structures do not necessarily have similar pharmacological effects. Plant-based substances were excluded from the effect group classification as they usually contain a large number of different substances some of which may not be known and whose effects and interactions are not fully understood.

*Note: Data for 2024 is preliminary

Number of NPS reported

290

Number of countries/territories that reported NPS

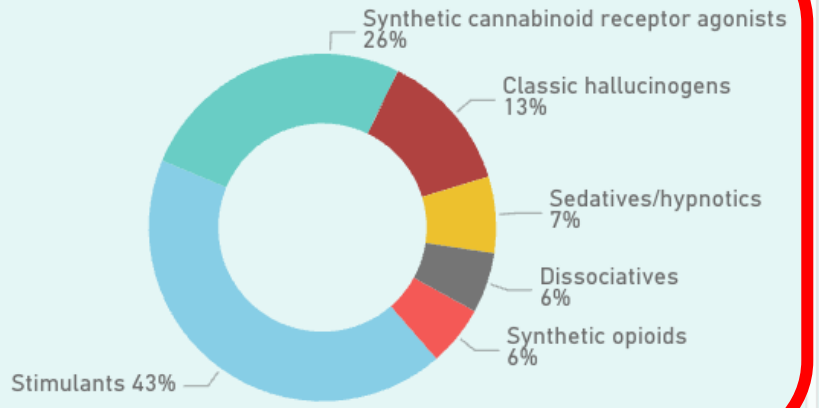
6

Region

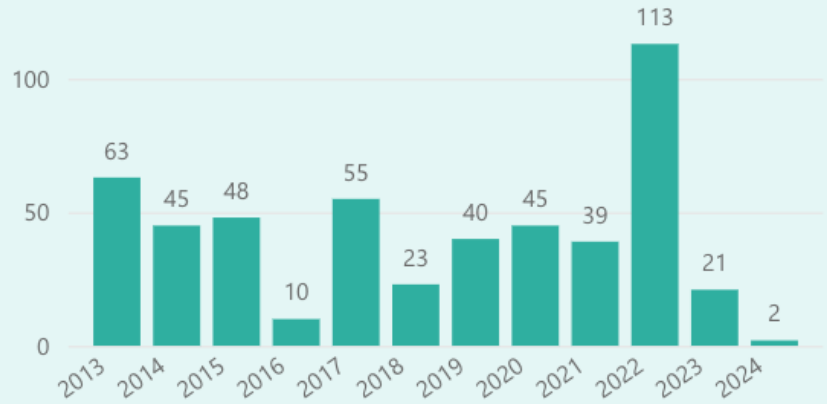
Oceania

2013 — 2025

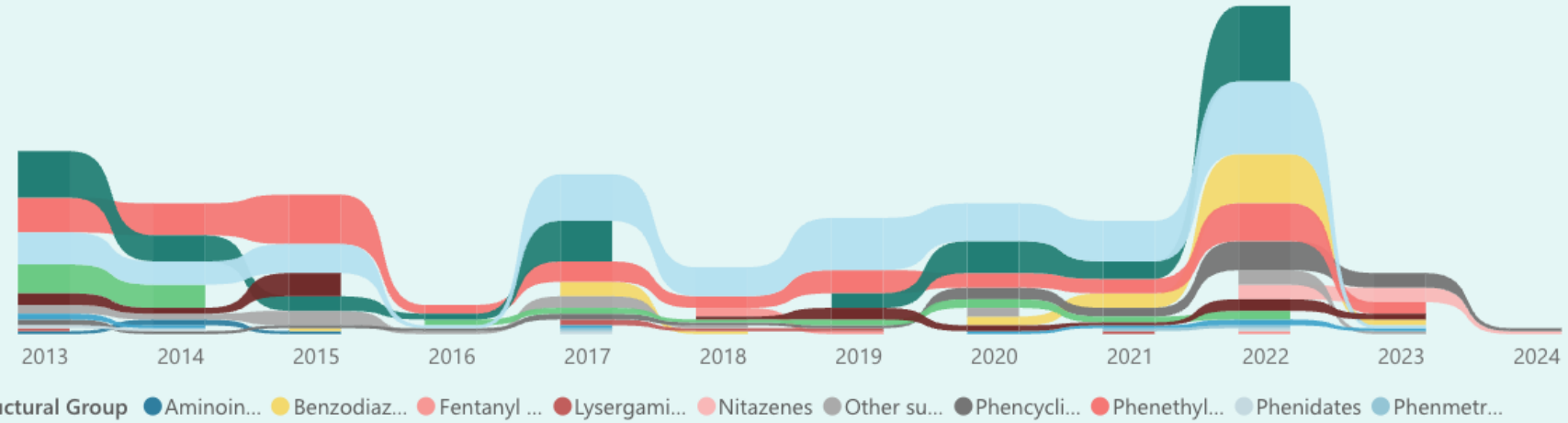
Distribution of NPS reported, by effect group



Total number of NPS reported, by year*



Overall trend in the number of NPS reported within each structural group, by year*



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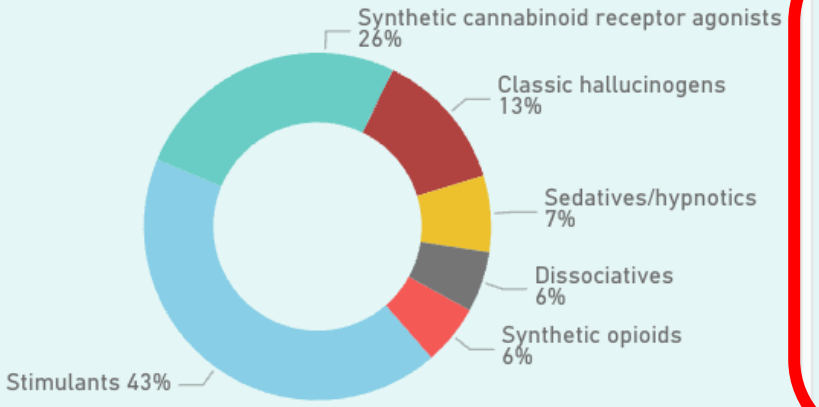

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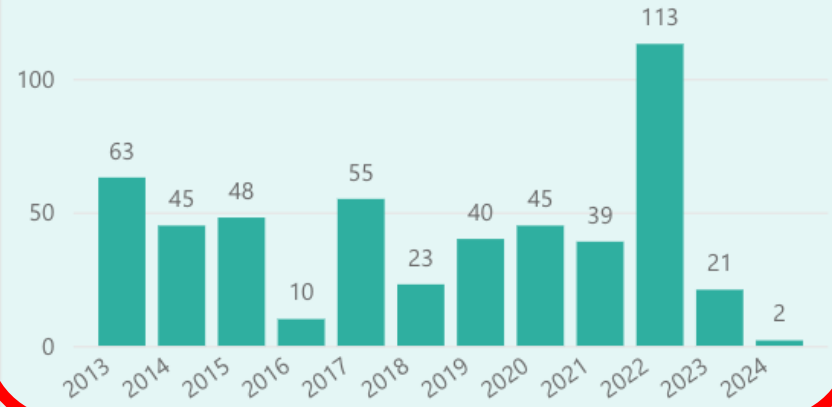

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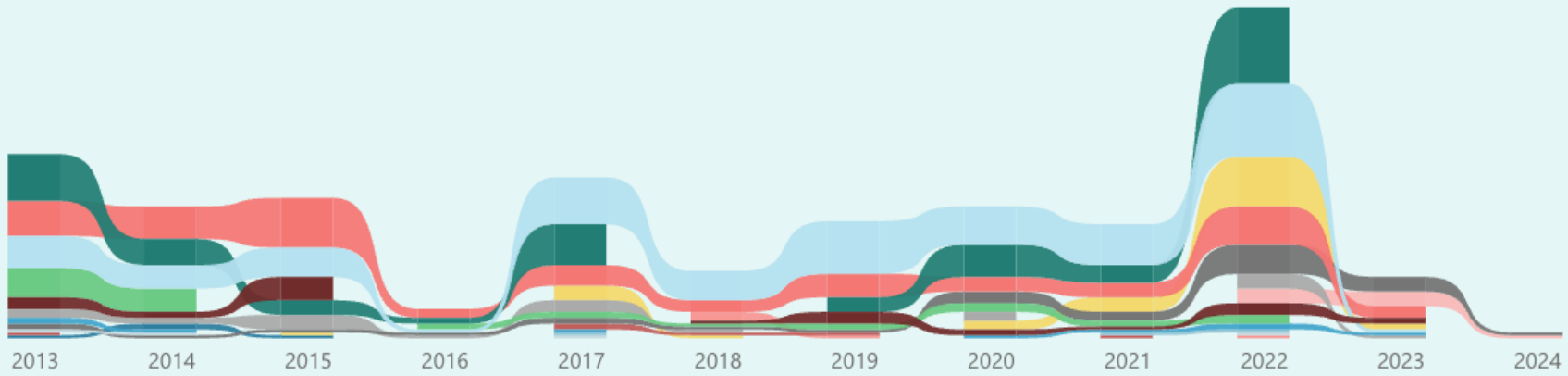

BORDER SEIZURES

- Number of NPS border detections doubled from 609 in 2019–20 to 1299 in 2020–21
- Typically transported by international mail (84%) or air cargo (16%)

ACIC Illicit drug report 2020-21.. https://www.acic.gov.au/sites/default/files/2023-10/illicit_drug_data_report_2020-21_forweb.pdf Accessed January 2025.

BORDER SEIZURES

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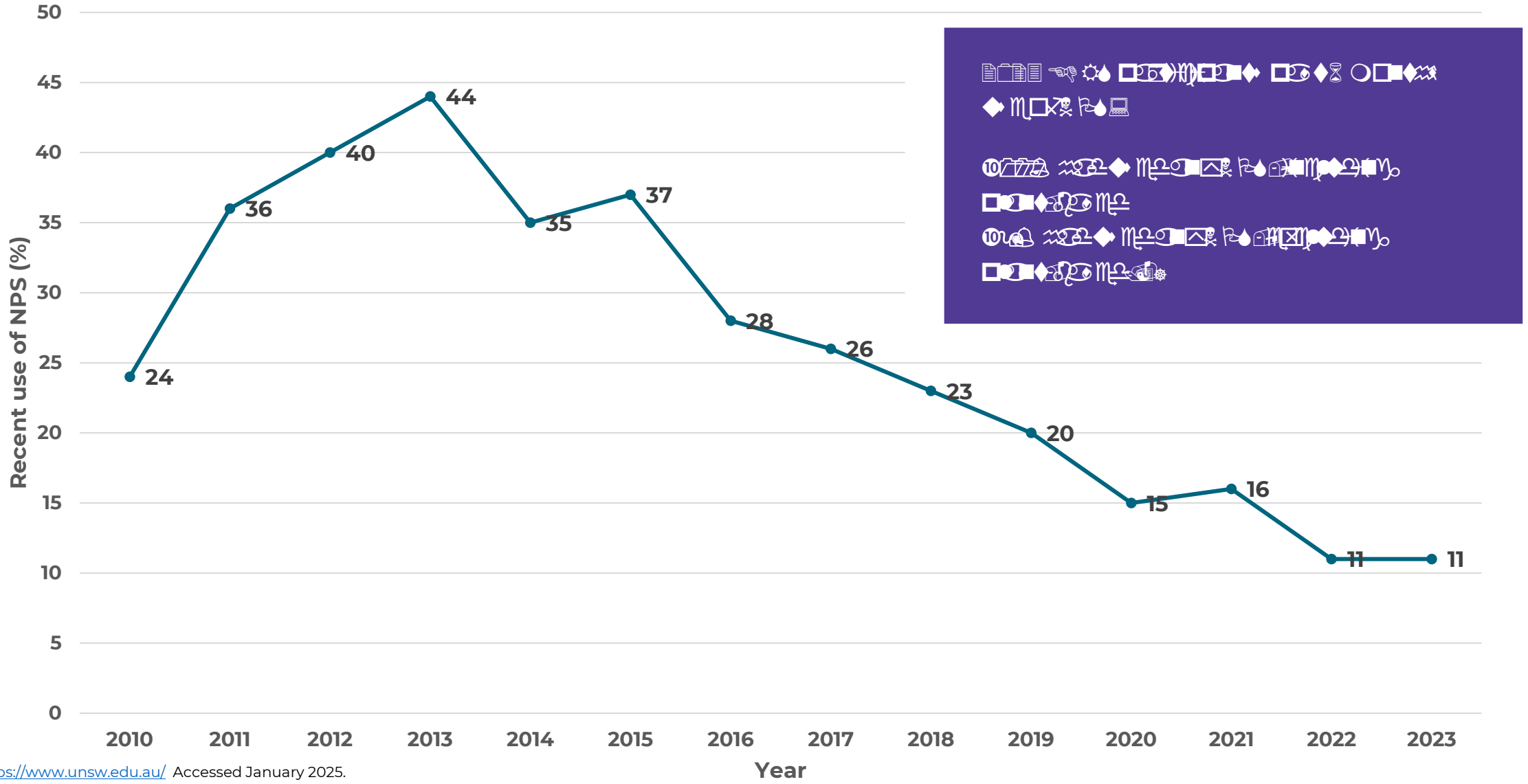
- Typically transported by international mail (84%) or air cargo (16%)
- Total analysed seizures: tryptamines (40%); ‘other NPS’: *2C-group substances, synthetic opioids and ketamine analogues* (40%); or cathinones (20%)

ACIC Illicit drug report 2020-21.. https://www.acic.gov.au/sites/default/files/2023-10/illicit_drug_data_report_2020-21_forweb.pdf Accessed January 2025.

REPORTED RECENT NPS USE

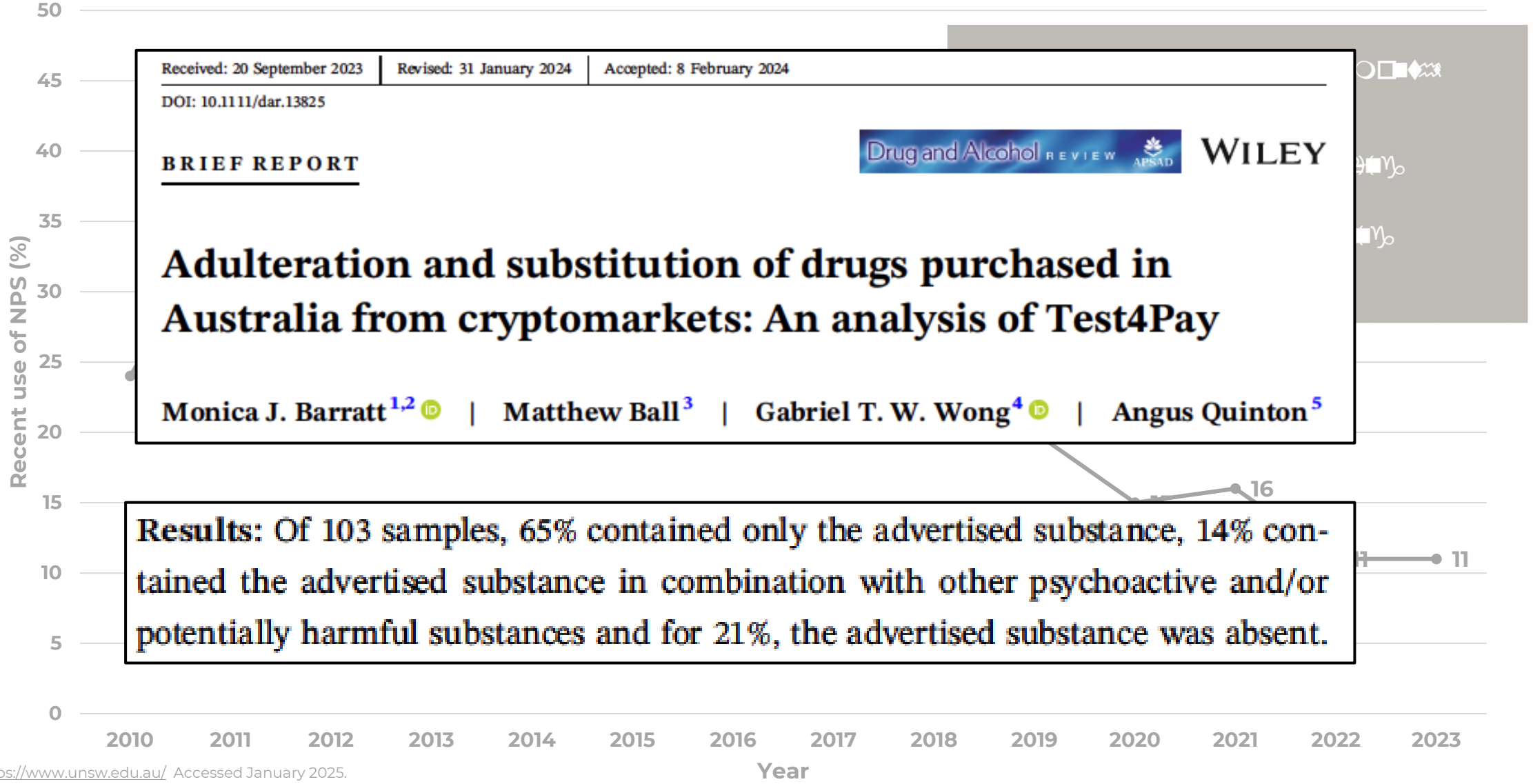
Ecstasy and Related Drugs Reporting System



EDRS.. www. https://www.unsw.edu.au/ Accessed January 2025.

REPORTED RECENT NPS USE

EDRS
Ecstasy and Related Drugs Reporting System



Received: 20 September 2023 | Revised: 31 January 2024 | Accepted: 8 February 2024

DOI: 10.1111/dar.13825

BRIEF REPORT

Drug and Alcohol REVIEW APSAD WILEY

Adulteration and substitution of drugs purchased in Australia from cryptomarkets: An analysis of Test4Pay

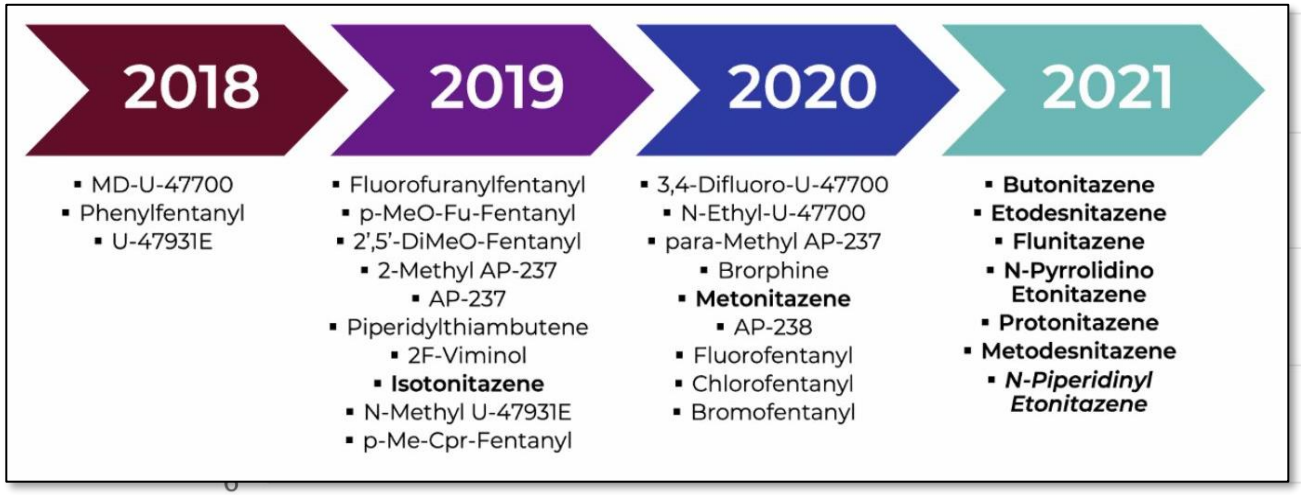
Monica J. Barratt[1,2] | Matthew Ball[3] | Gabriel T. W. Wong[4] | Angus Quinton[5]

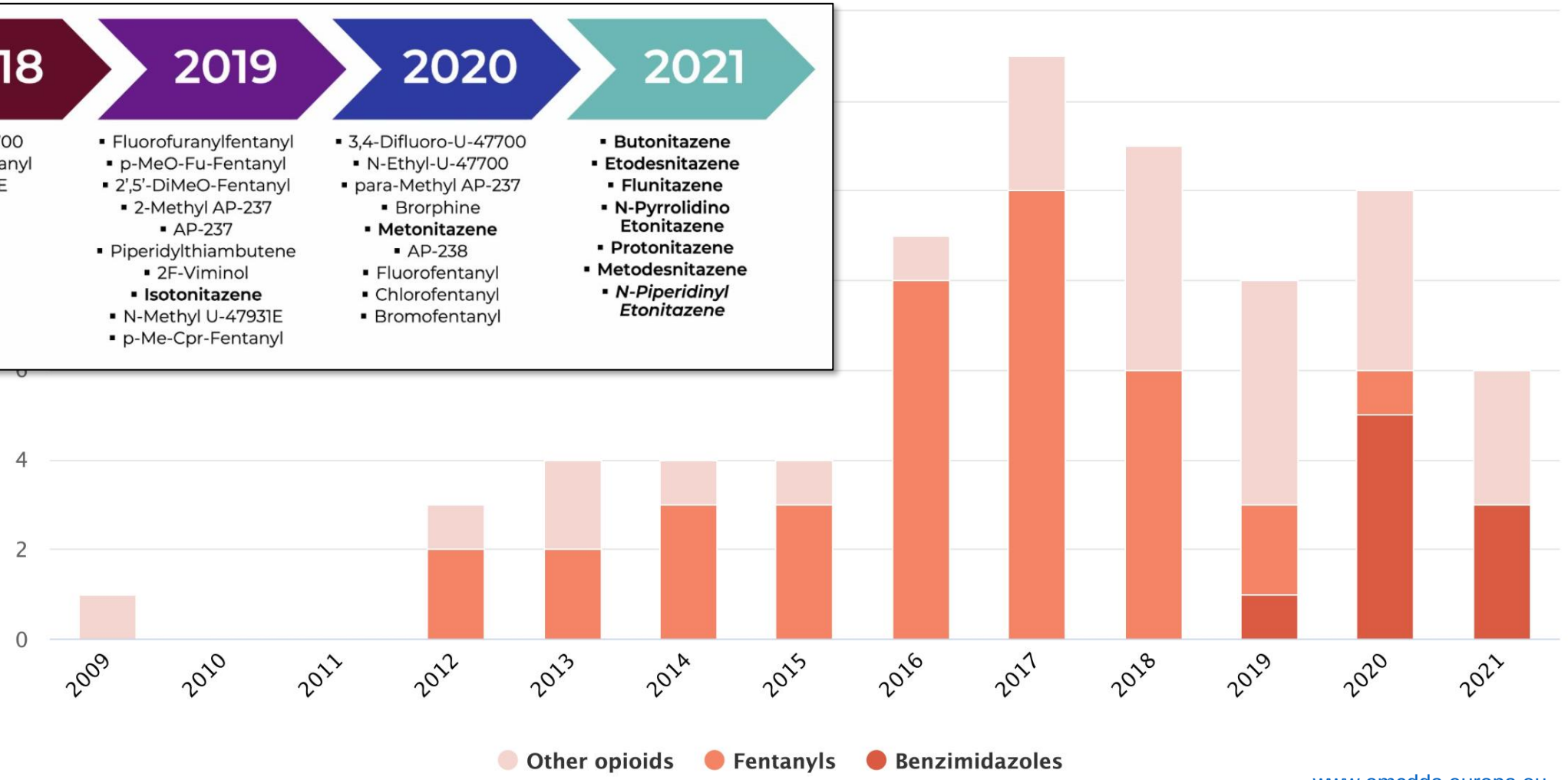
Results: Of 103 samples, 65% contained only the advertised substance, 14% contained the advertised substance in combination with other psychoactive and/or potentially harmful substances and for 21%, the advertised substance was absent.

EDRS.. www. https://www.unsw.edu.au/ Accessed January 2025.

EMERGENCE OF PSO

Number and types of new synthetic opioids notified for the first time, 2009–2021 (EU+2)



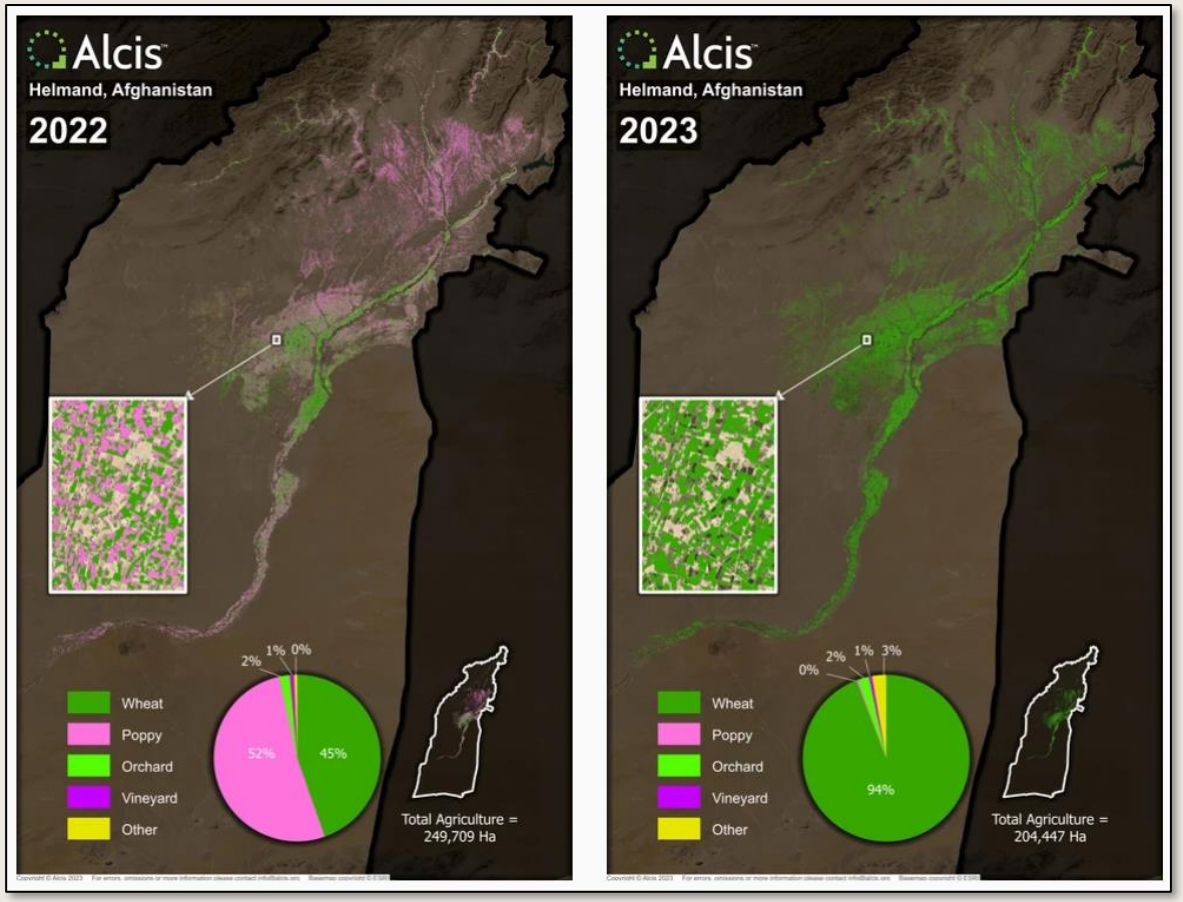


www.emcdda.europa.eu

NSO, new synthetic opioid.

1. EUDA. Infographic: opioids notifications to the Early Warning System and seizures. Available at: https://www.euda.europa.eu/media-library/infographic-opioids-notifications-early-warning-system-and-seizures_en (Accessed January 2025); 2. Novel Synthetic Opioids (NPOS). New York Society of Addiction Medicine. X available at: https://x.com/NYSAM_connect/status/1492583012499918854 (Accessed January 2025).

WHY?



- Taliban poppy cultivation ban
- Afghanistan supplies 95% of UK/Europe's heroin
- Poppy cultivation reduced by 95% in 2023

(UNODC, 2023)

1. UNODC. Afghanistan opium survey 2023; 2. BBC News. Inside the Taliban's war on drugs - opium poppy crops slashed. Available at: https://www.bbc.co.uk/news/world-asia-65787391 (Accessed January 2025);
3. Alcis. Unprecedented 85% reduction of opium poppy cultivation in Afghanistan. Available at: https://www.alcis.org/poppy (Accessed January 2025).

WHY?

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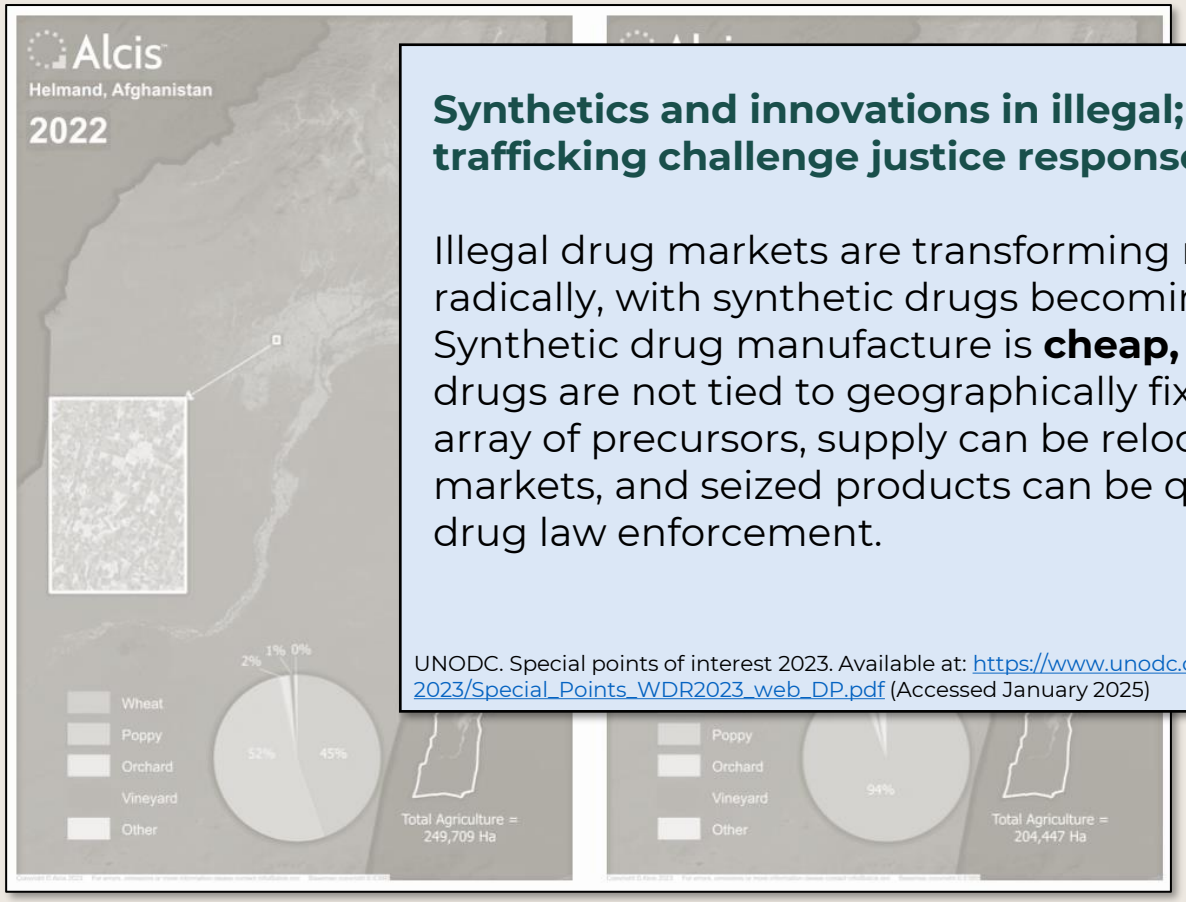
- ion reduced by



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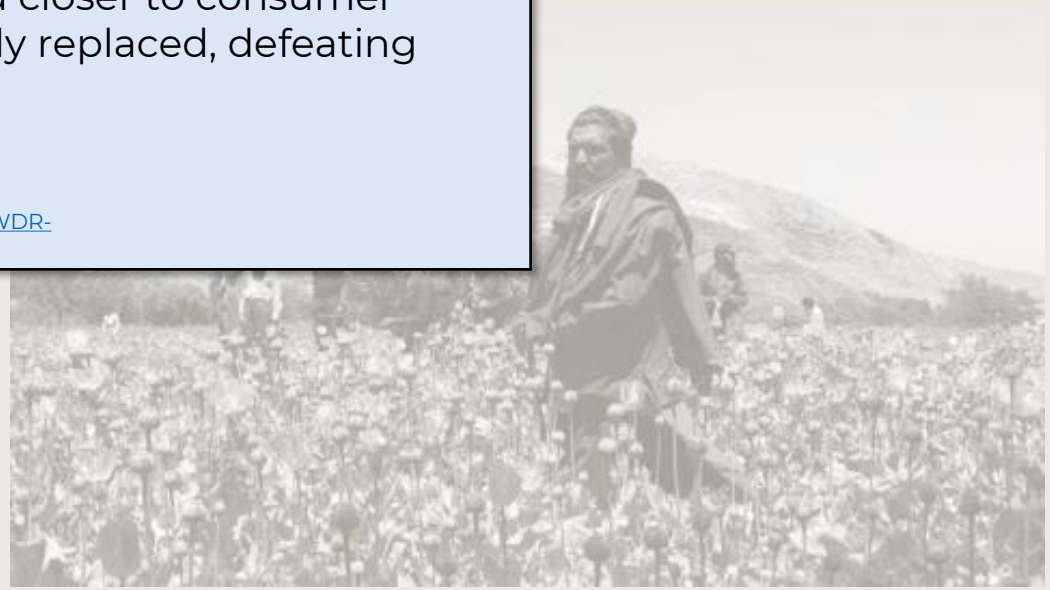
Synthetics and innovations in illegal; drug manufacturing and trafficking challenge justice responses

Illegal drug markets are transforming rapidly and, in some regions, radically, with synthetic drugs becoming increasingly dominant. Synthetic drug manufacture is **cheap, easy and fast**. As synthetic drugs are not tied to geographically fixed crops, using instead a wide array of precursors, supply can be relocated closer to consumer markets, and seized products can be quickly replaced, defeating drug law enforcement.

UNODC. Special points of interest 2023. Available at: https://www.unodc.org/res/WDR-2023/Special_Points_WDR2023_web_DP.pdf (Accessed January 2025)



1. UNODC. Afghanistan opium survey 2023; 2. BBC News. Inside the Taliban's war on drugs - opium poppy crops slashed. Available at: https://www.bbc.co.uk/news/world-asia-65787391 (Accessed January 2025);
3. Alcis. Unprecedented 85% reduction of opium poppy cultivation in Afghanistan. Available at: https://www.alcis.org/poppy (Accessed January 2025).

If you bought $1,000 worth of product and chopped it up for retail sale ...

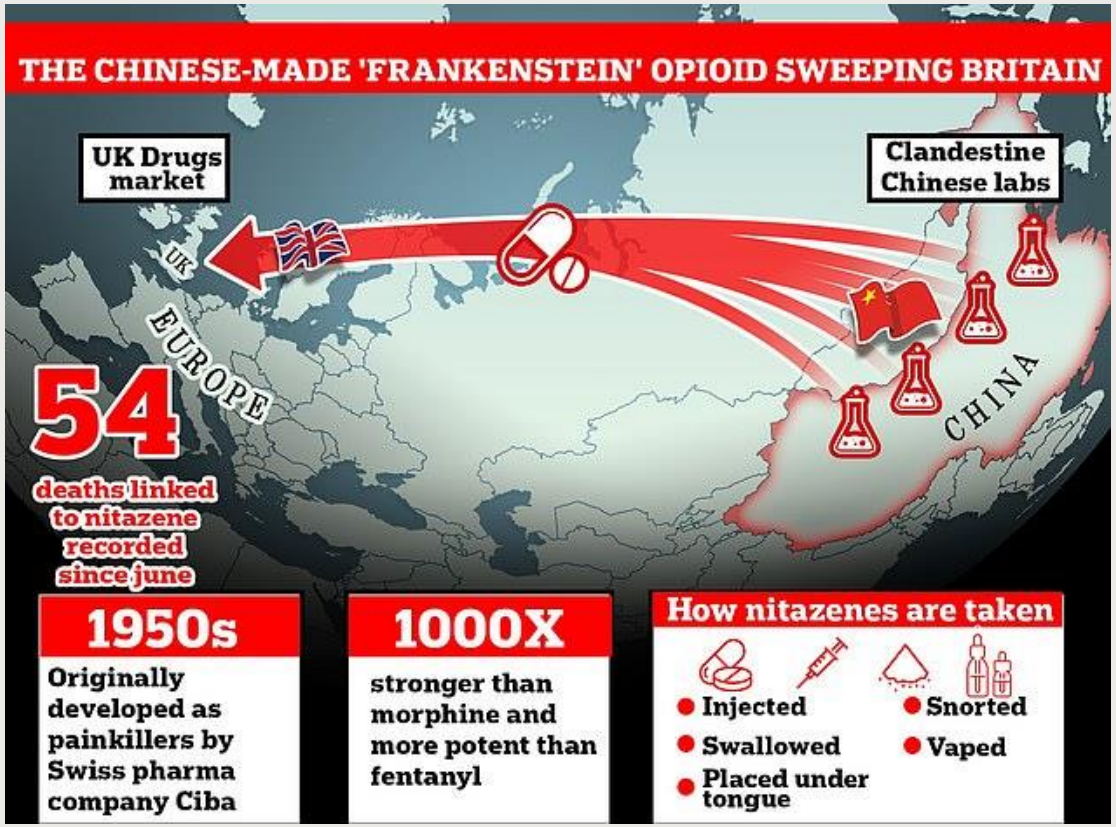
With heroin purchased in Mississippi, you could make a profit of USD$4000

■■■■

NITAZENES: An emerging NSO subclass

- First synthesised in 1950s as alternative to morphine
- Reemerged in Europe and USA in 2019[1]
- By 2023, 13 nitazenes reported to UNODC[2]

- Highly potent μ-opioid receptor agonists with heroin-like effects, including dose-dependent respiratory depression[1]
- High lipophilicity, leading to rapid uptake by the brain and other lipid-rich tissues in comparison with traditional opiates[3]



Daily Mail UK

NSO, new synthetic opioid; UNODC, United Nations Office on Drugs and Crime.

1. Pergolizzi J *et al. Cureus* 2023;15:e40736; 2. UNODC. February 2024 – UNODC EWA: Nitazenes – a new group of synthetic opioids emerges. Available at: https://www.unodc.org/LSS/Announcement/Details/cbec8f4c-73aa-49ee-9e2b-75620af8a910 (Accessed January 2025); 3. Skolnick P. *Pharmacol Ther.* 2022;233:108019; 4. MailOnline. Chinese-made 'Frankenstein' opioid up to 40 TIMES more potent than fentanyl is now sweeping Britain. Available at: https://www.dailymail.co.uk/health/article-12562789/Chinese-Frankenstein-opioid-fentanyl-sweeping-Britain.html (Accessed January 2025).

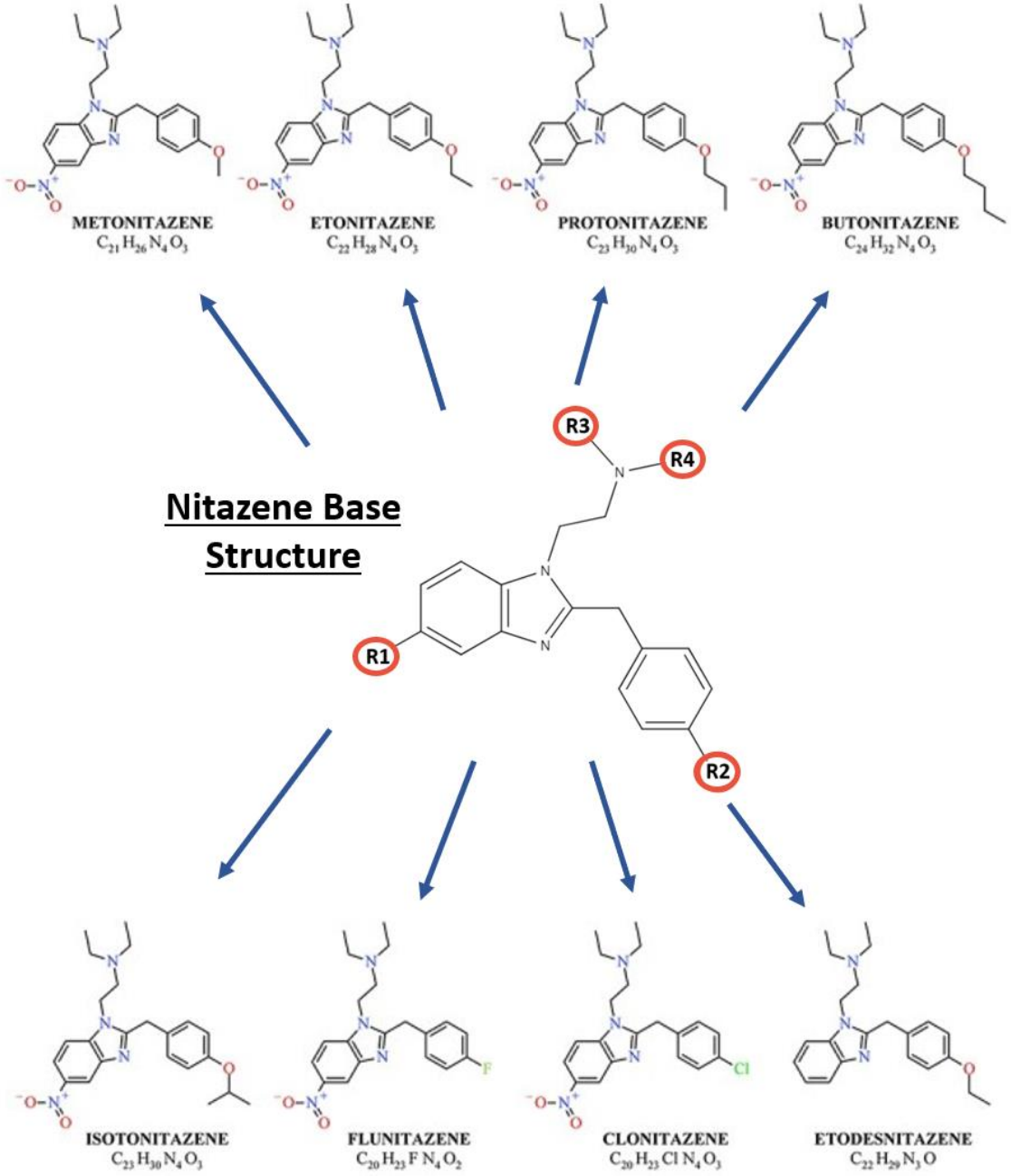
POTENCY

- Potency varies between nitazenes from similar to morphine to much stronger than heroin or fentanyl[1]

	Relative potency to heroin
Heroin	1
Fentanyl	50
Metonitazene	50
Protonitazene	100
Isotonitazene	250
Etonitazene	500

Table: **The relative potency of fentanyl and selected nitazenes in comparison to heroin[2,3]**

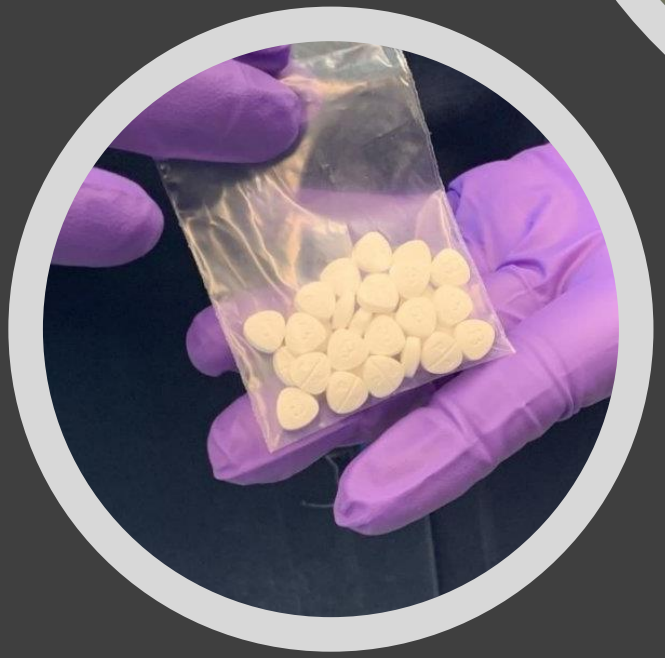
Holland A, Copeland CS, Shorter GW, Connolly DJ, Wiseman A, Mooney J, Fenton K, Harris M. Nitazenes—heralding a second wave for the UK drug-related death crisis?. The Lancet Public Health. 2024 Feb 1;9(2):e71-2.



1. Holland A *et al. Lancet Public Health* 2024;9:e71–2; 2. Walton S *et al. J Anal Toxicol.* 2022;46:221–31; 3. Pergolizzi J *et al. Cureus* 2023;15:e40736.

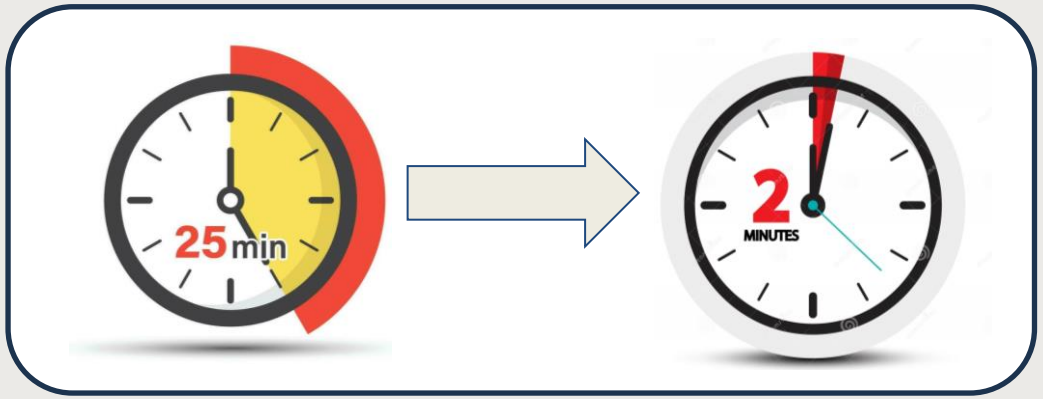
FORMS

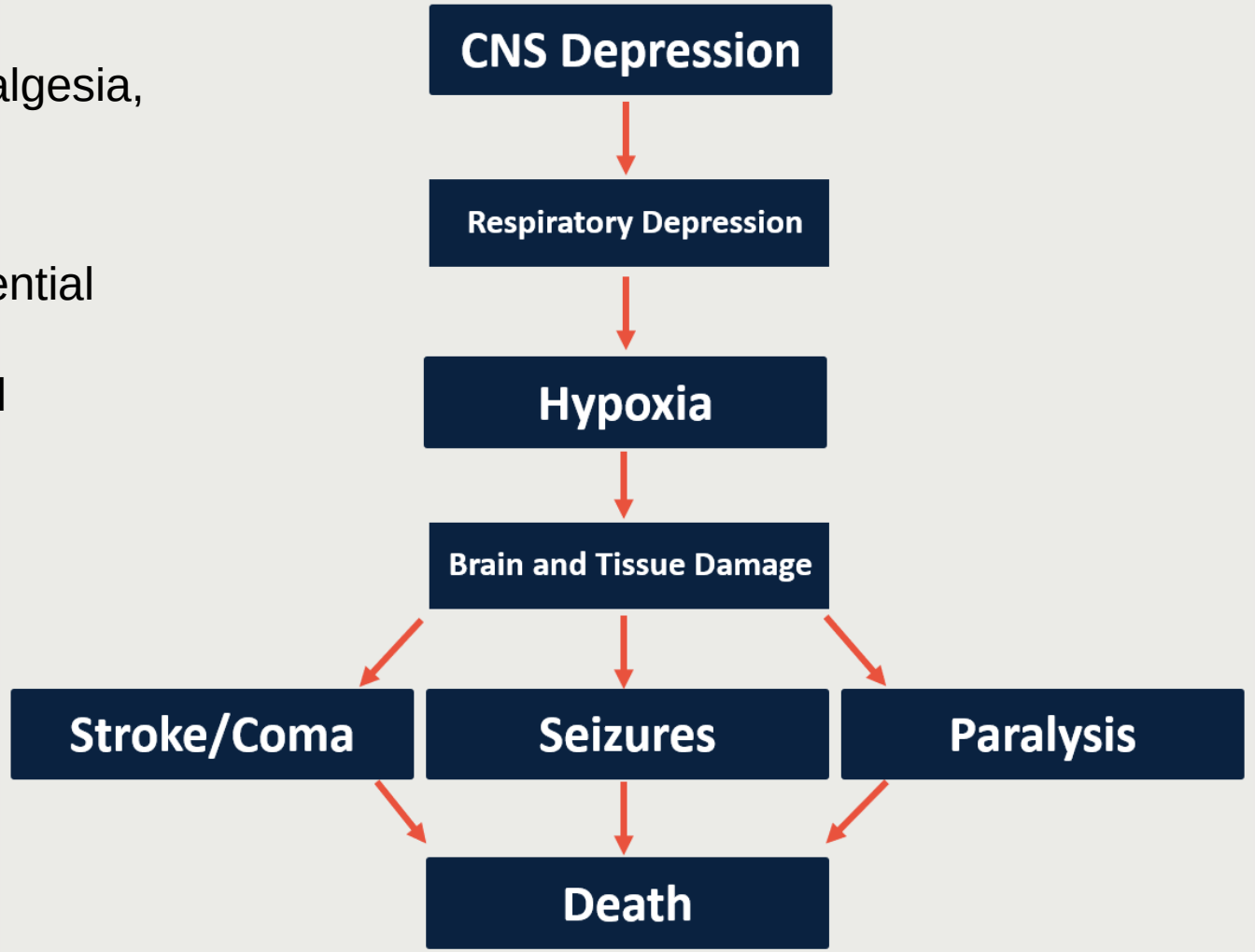
- Powder (white/brown/yellow), crystalline solid, liquid
- Counterfeit opioid tablets
- Substances sold as heroin, ketamine, MDMA and synthetic cannabinoids
- Can be injected, inhaled or swallowed (tablet)



NITAZENE TOXICITY

- Desired effects include relaxation, euphoria, analgesia, sedation[1]
- Like fentanyl, activation of μ-opioid receptor by butonitazene and protonitazene involves preferential activation of β-arrestin pathways >> increased respiratory depression compared with traditional opiates[2,3]
- Concomitant CNS depressant use exacerbates overdose risk[1]





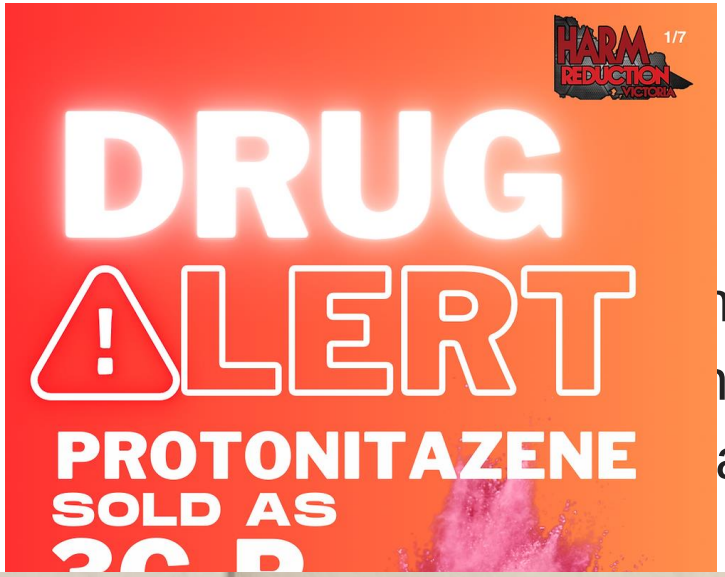
CNS, central nervous system.

1. Alcohol and Drug Foundation. Nitazines. Available at: https://adf.org.au/drug-facts/nitazenes/ (Accessed January 2025); 2. World Health Organization. Critical review report: Butonitazene. 2023; 3. Drug Enforcement Administration. Benzimidazole-Opioids. 2024.

WHO IS AT RISK?

- 1 million (5%) Australians used cocaine in the past year
- 400,000 (2%) Australians used MDMA in the past year
- 1 million (5.3%) Australians reported recent non-medical pharmaceutical drug use

National Drug Strategy Household Survey 2022-2023. https://www.aihw.gov.au/about-our-data/our-data-collections/national-drug-strategy-household-survey (Accessed February 2025)


HARM REDUCTION VICTORIA
1/7
DRUG
ALERT
PROTONITAZENE
SOLD AS


CANTEST COMMUNITY NOTICE
18 MAY 2024
COMMUNITY NOTICE
N-PYRROLIDINO PROTONITAZENE FOUND IN BROWN POWDER SAMPLE
A GRANULAR BROWN POWDER SAMPLE was found to contain N-pyrrolidino protonitazene (NPP), a nitazene and protonitazene analogue. This is a potent synthetic opioid that is stronger than other opioids including fentanyl.
EFFECTS. All nitazenes carry a high risk of fatal overdose and there is no safe level of use. The overdose effects can include lowered or loss of consciousness, breathing slowly or not at all, tiny/pinned pupils, discoloured lips/nails, cold or clammy skin, choking/coughing/gurgling or snoring sounds.
Nitazenes are responsive to Naloxone, but several doses may be


NSW HEALTH
DRUG ALERT
WARNING
PILL LACED WITH
POTENT OPIOID NITAZENE
Several hospital presentations linked to
"Red Bull" logo red/ orange rectangular


N-PYRROLIDINO
ISOTONITAZENE FOUND IN
COUNTERFEIT
OXYCODONE PILL
9 SEPTEMBER 2024
CanTEST
CanTEST


HARM REDUCTION VICTORIA
1/8
DRUG
ALERT
JULY 2024
PROTONITAZENE
(NEW SYNTHETIC OPIOID)
SOLD AS
COCAINE
www.hrvic.org.au
@harmreductionvictoria


NSW DRUG WARNING
OPIOIDS FOUND IN
BLACK MARKET VAPES
NUAA
NSW Health

AUSTRALIA

- Increasing border seizures of nitazenes
- Many coming by cargo mail from UK[1]
- 22 seizures containing >800 tablets intercepted by AFP in October 2023[1]
- 4kg seized in Melbourne, July 2024[2]
- Cluster of 20 overdoses in NSW April 2024[3]
- 22 deaths in Victoria *(Schuman et al, DAR, in press)*

	2022	2023	2024
Australian Capital Territory	Metonitazene (23)		
New South Wales	Etodesnitazene (25) Nitazene (25)	Isotonitazene (26)	Protonitazepyne(27)
Queensland		Protonitazene (28)	
South Australia		Protonitazene (29) Nitazenes (30)	
Victoria	Protonitazene (31)	Metonitazene (32)	Protonitazene (33)

*Not all Australian jurisdictions issue public drug alerts

Figure from NCCRED[8]

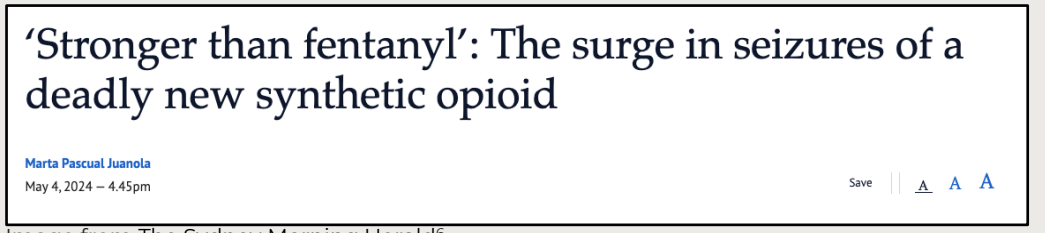
Experts call for pill testing after Nitazenes detected in Australia

Experts have renewed calls for pill testing in NSW after a surge of powerful opioids that are 300 times stronger than heroin.

Aisling Brennan

@AislingBrennan9 2 min read May 24, 2024 - 12:01AM NCA NewsWire

Image from News.com.au[5]



'Stronger than fentanyl': The surge in seizures of a deadly new synthetic opioid

Marta Pascual Juanola

May 4, 2024 — 4.45pm

Save A A A

Image from The Sydney Morning Herald[6]

Police seize 'extraordinary' amount of fentanyl in Melbourne, enough to kill 5 million

David Estcourt and Lachlan Abbott

Updated August 22, 2022 — 9.40am, first published at 9.22am

Save Share A A A 4 View all comments

Image from The AGE[7]

Image from News.com.au[5]

Image from The AGE[7]

AFP, Australian Federal Police; NSW, New South Wales;.
1. AFP. Rising imports of potent drug nitazene raises concern. Available at: https://www.afp.gov.au/news-centre/media-release/rising-imports-potent-drug-nitazene-raises-concern (Accessed January 2025); 2. AFP. AFP warn over alarming potent synthetic opioids in 2024. Available at: https://www.afp.gov.au/news-centre/media-release/afp-warn-over-alarming-potent-synthetic-opioids-2024 (Accessed January 2025); 3. The Guardian. Synthetic opioids: warning issued in NSW after nitazenes cause cluster of overdoses. Available at: https://www.theguardian.com/society/2024/apr/25/synthetic-opioids-warning-issued-in-nsw-after-nitazenes-cause-cluster-of-overdoses (Accessed January 2025); 4. Schumann et al. Identification of nitazene-related deaths in Australia: How do we make is accurate and timely? Drug Alc Rev (accepted). 5. News.com.au. Experts call for pill testing after Nitazenes detected in Australia. Available at: https://www.news.com.au/national/nsw-act/politics/experts-call-for-pill-testing-after-nitazenes-detected-in-australia/news-story/43cf128e78329adf92d89e0a757da35f (Accessed January 2025); 6. The Sydney Morning Herald. 'Stronger than fentanyl': The surge in seizures of a deadly new synthetic opioid. Available at: https://www.smh.com.au/national/stronger-than-fentanyl-the-surge-in-seizures-of-a-deadly-new-synthetic-opioid-20240503-p5fooo.html (Accessed January 2025); 7. The AGE. Police seize 'extraordinary' amount of fentanyl in Melbourne, enough to kill 5 million. Available at: https://www.theage.com.au/national/victoria/federal-police-seize-record-drug-shipment-of-fentanyl-20220822-p5bbmx.html (Accessed January 2025); 8. NCCRED. Emerging drug briefing. 2024.

EUROPE & NORTH AMERICA

- Two deaths a week in UK[1]
- >400 deaths in UK since June 2023 (gov.UK)[2]
- Dublin – 57 overdoses in 5 days (November 2023)[3]
- Detected in 48% of drug-deaths in Estonia and 29% in Latvia in 2023[4]
- >2000 deaths in America since 2019[5]

https://www.bbc.com/news/uk-scotland-67710207

Synthetic opioids could fuel 'second wave' of UK drug deaths crisis, experts warn

Government urged to act as experts sound the alarm on nitazenes, with 54 deaths in past six months likely 'tip of the iceberg'

Andy Gregory • Friday 12 January 2024 23:15 GMT

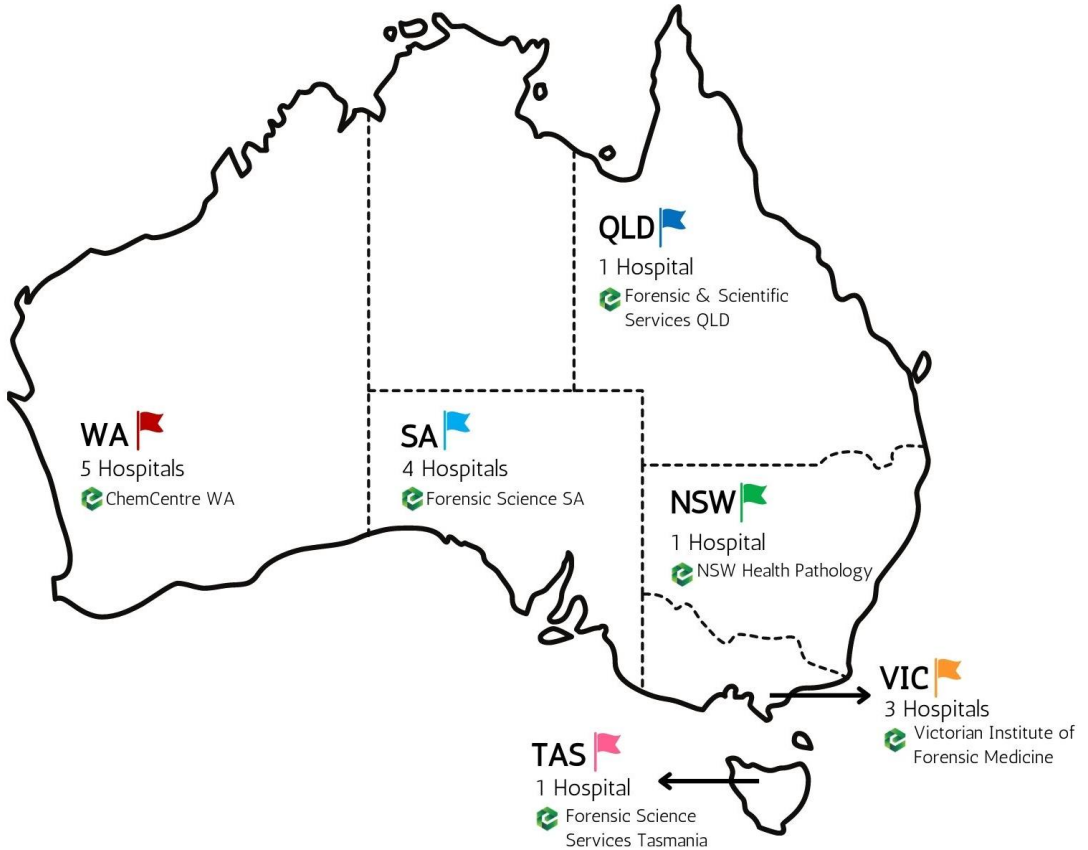
1. Independent. Synthetic opioids could fuel 'second wave' of UK drug deaths crisis, experts warn. Available at: https://www.independent.co.uk/news/uk/home-news/synthetic-opioids-drug-deaths-uk-b2477552.html (Accessed January 2025); 2. Gov.UK. Britain working at pace to curb rising synthetic drugs threat. https://www.gov.uk/government/news/britain-working-at-pace-to-curb-rising-synthetic-drugs-threat (Accessed January 2025); 3. Irish Examiner. 17 drug overdoses in Cork in 10 days linked to nitazene. Available at: https://www.irishexaminer.com/news/munster/arid-41291914.html (Accessed January 2025); 4. Giraudon I *et al. Lancet Public Health* 2024;9:e216; 5. Even worse than fentanyl. https://www.utmb.edu/mdnews/podcast/episode/even-worse-than-fentanyl May 7 2024.

EMERGING DRUGS NETWORK OF AUSTRALIA (EDNA)

EDNA is a multi-centre toxicosurveillance system focused on identifying & monitoring illicit and emerging drug-related presentations in sentinel EDs

Sentinel Sites:

- Royal Perth Hospital (WA)
- Royal Adelaide Hospital (SA)
- Austin Hospital (VIC)
- Princess Alexandra Hospital (QLD)
- Royal Hobart Hospital (TAS)
- Liverpool Hospital (NSW)



ED, emergency department; EDNA, Emerging Drugs Network Of Australia.
Kotkis E *et al. Emerging Drugs Network of Australia* 2024:1–19.

THE EDNA APPROACH

Patients presenting with **severe/unusual** recreational drug toxicity or **clusters** of overdoses

Blood sample collection, storage & transfer

Analytical confirmation of compounds & metabolites

- ED Triage Information
- Drug Exposure
- Clinical Findings
- Management
- Outcomes
- Analytical Findings

ED, emergency department; EDNA, Emerging Drugs Network Of Australia.

Kotkis E *et al. Emerging Drugs Network of Australia* 2024:1–19.

EDNA: Presentation Characteristics

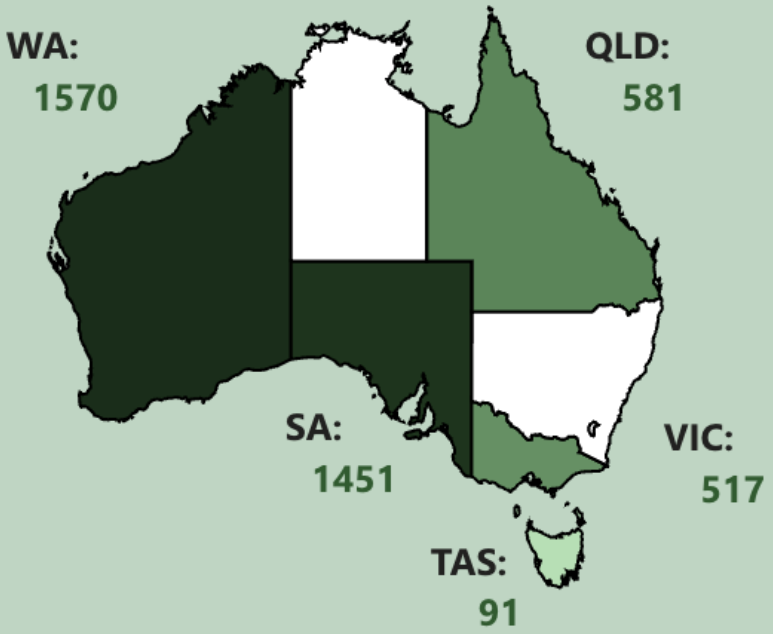
EDNA
EMERGING DRUGS NETWORK OF AUSTRALIA

Count of Presentations
4210

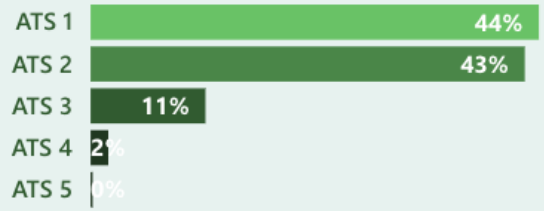
Count of Presentations with analytical data
4111

Median Age
33 Years

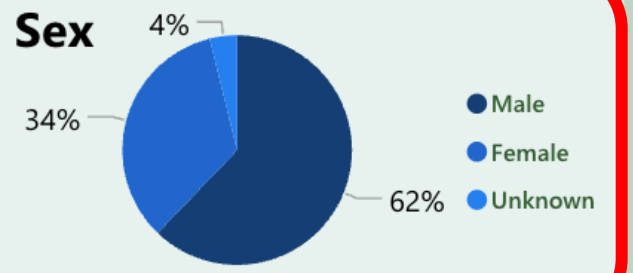
Median Hours in ED
4.8



Australasian Triage Score

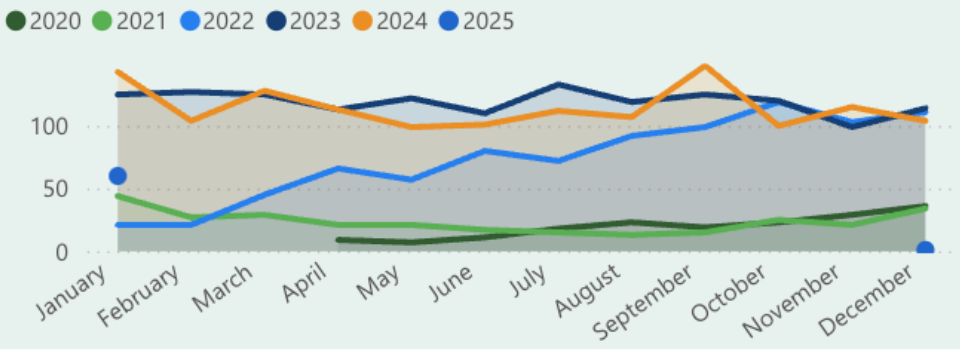


Sex

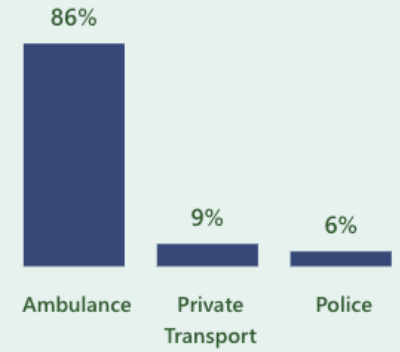


Triage Month

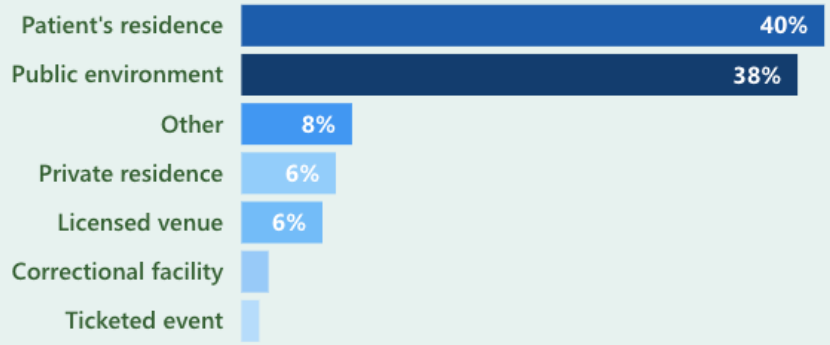
2020 2021 2022 2023 2024



Arrival Mode



Setting of Drug Use



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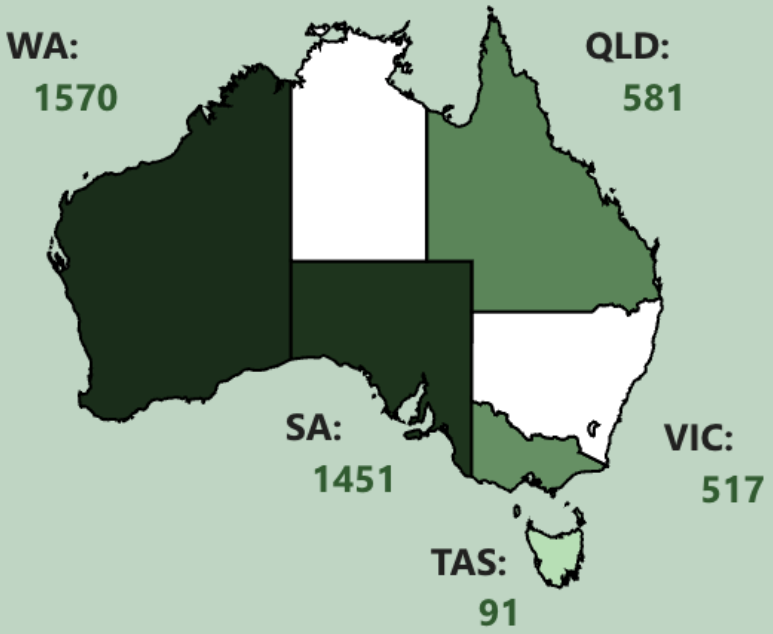
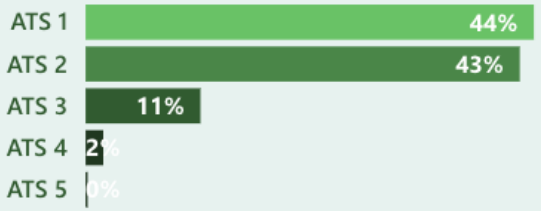
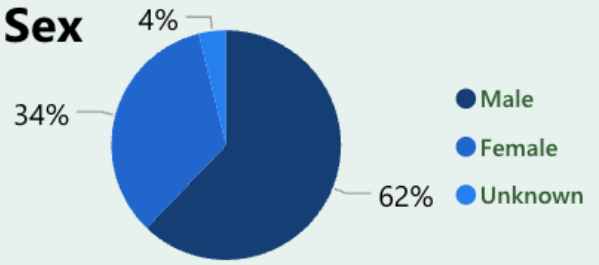


Australasian Triage Score

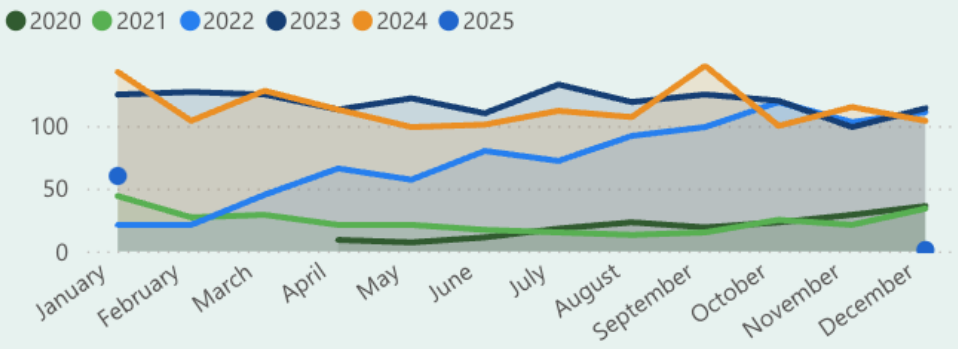


Sex

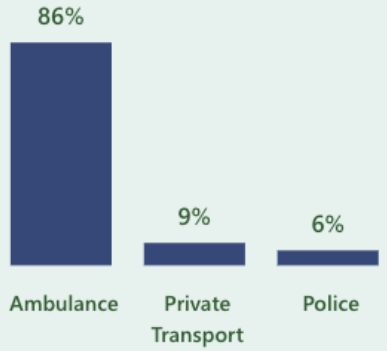


Triage Month

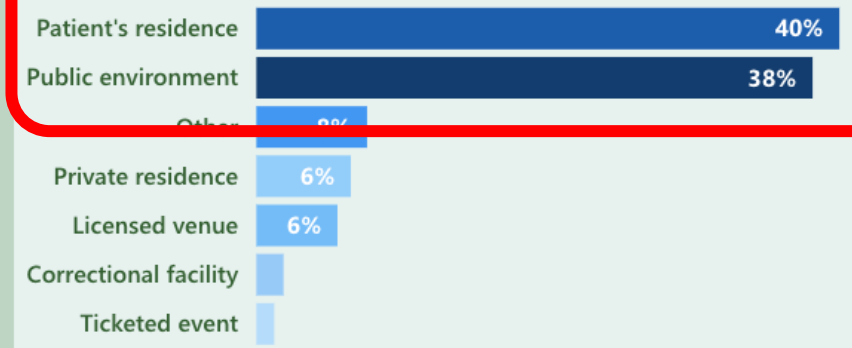
2020 | 2021 | 2022 | 2023 | 2024



Arrival Mode



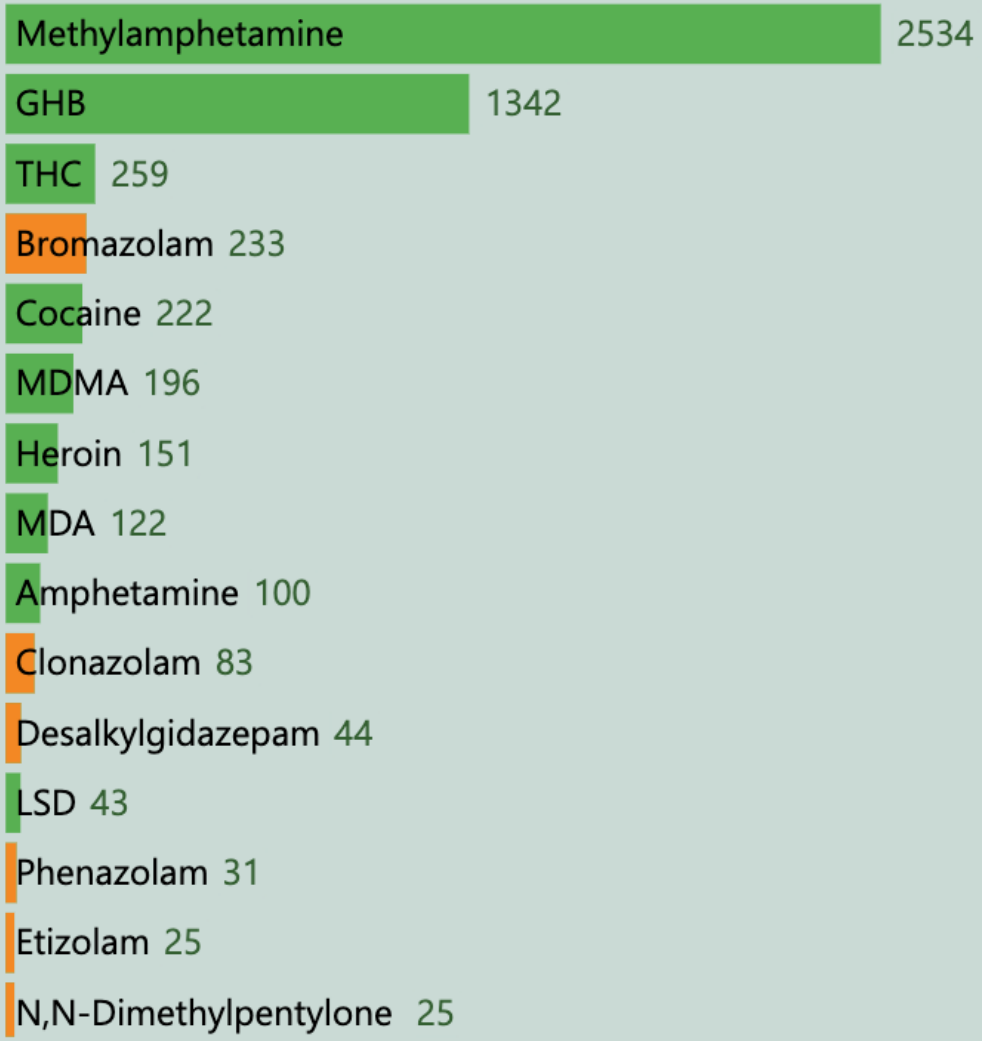
Setting of Drug Use



EDNA: NPS and Illicit Drug Detections

EDNA
EMERGING DRUGS NETWORK OF AUSTRALIA

Top 15 most frequent illicit drug/NPS



Count of Presentations with illicit drugs/NPS

3190

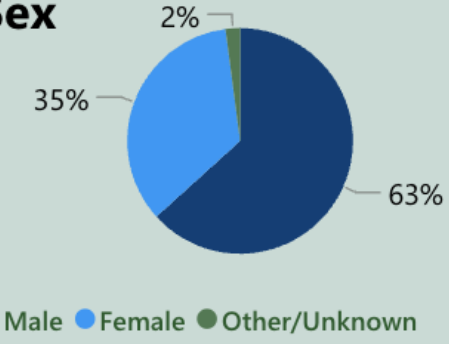
Median Age

34 Years

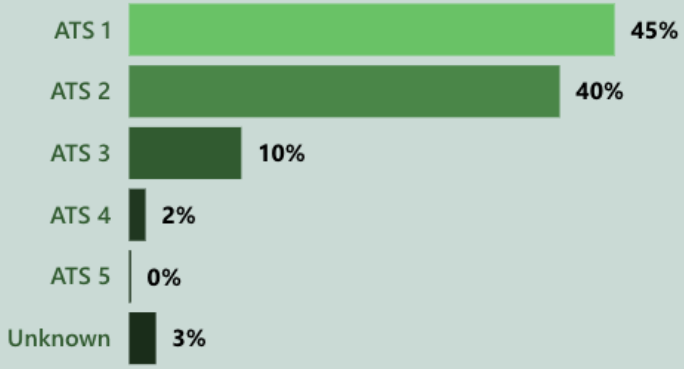
Median Hours in ED

4.5 Hours

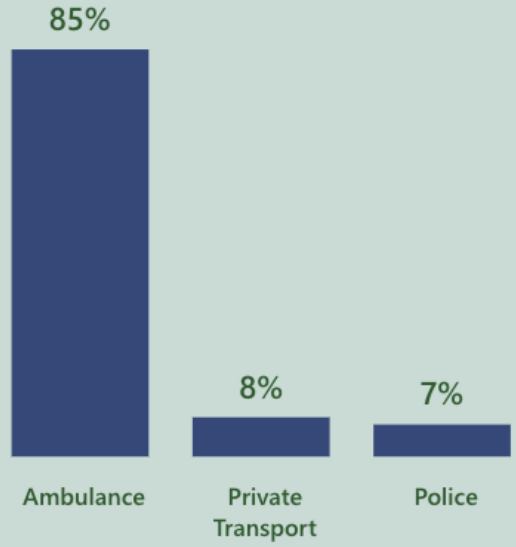
Sex



Australasian Triage Score



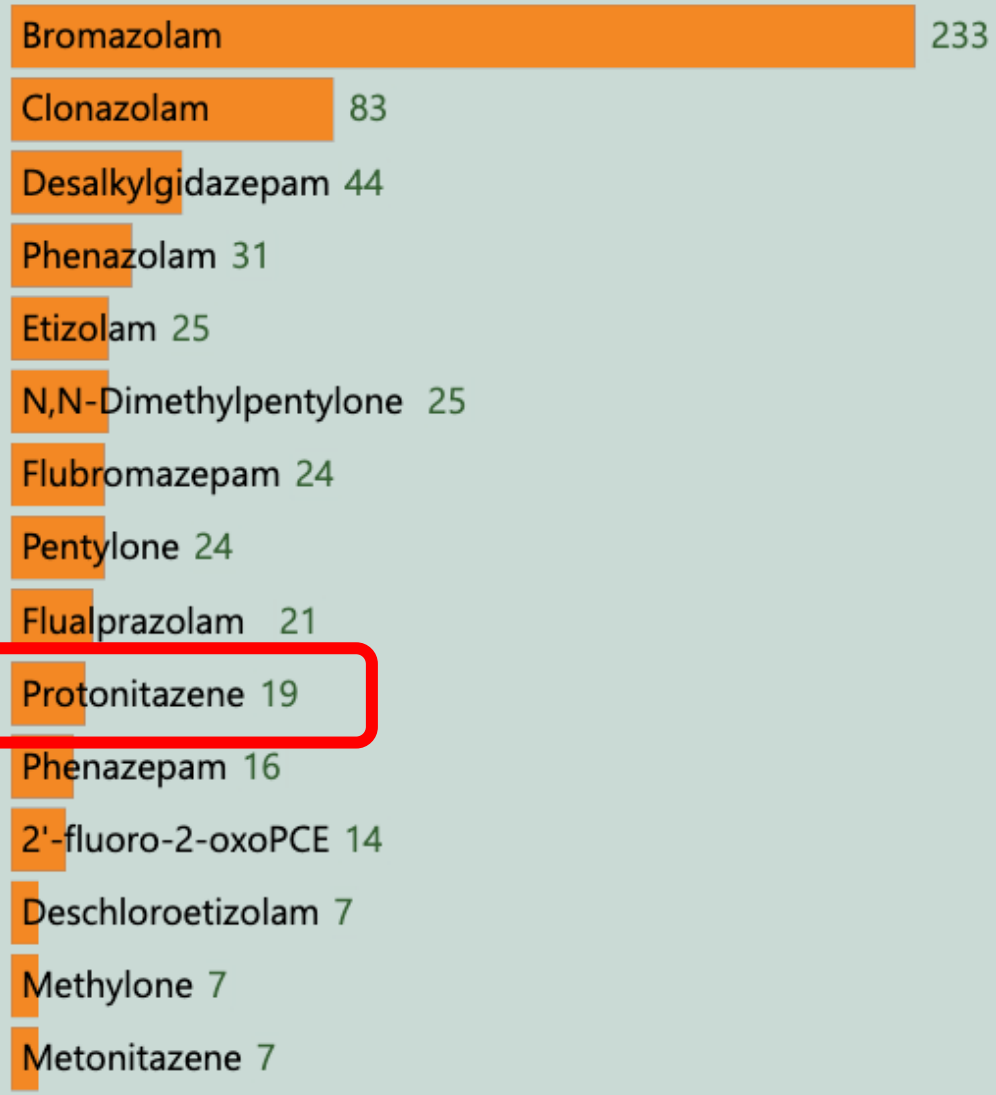
Arrival Mode



EDNA: NPS Detections

EDNA
EMERGING DRUGS NETWORK OF AUSTRALIA

Top 15 most frequently detected NPS

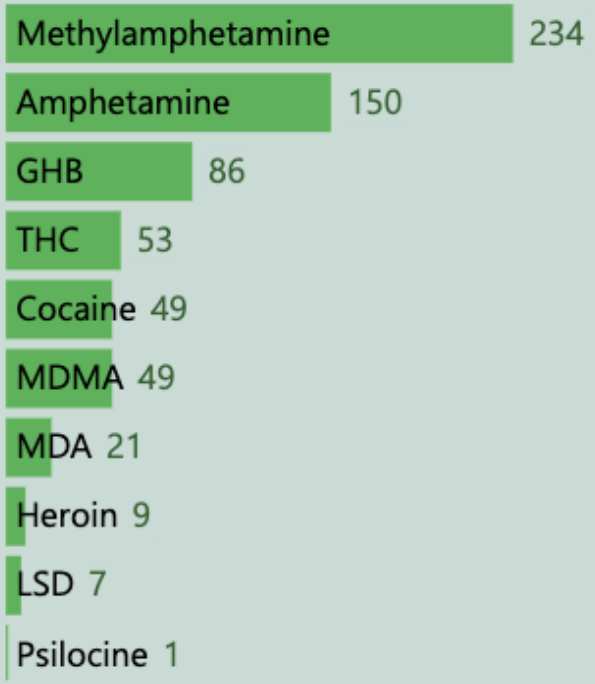


Count of Presentations with NPS

415

Co-detected traditional illicit drugs

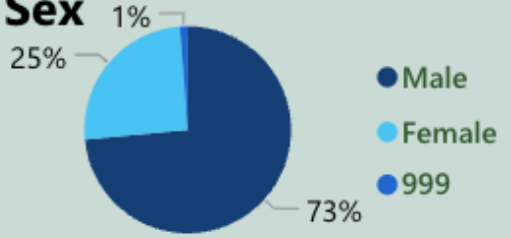
Count of Patients= 319



Median Age

27 Years

Sex



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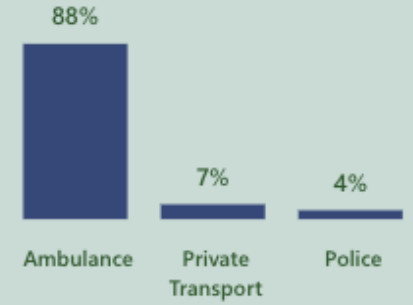


Median Hours in ED

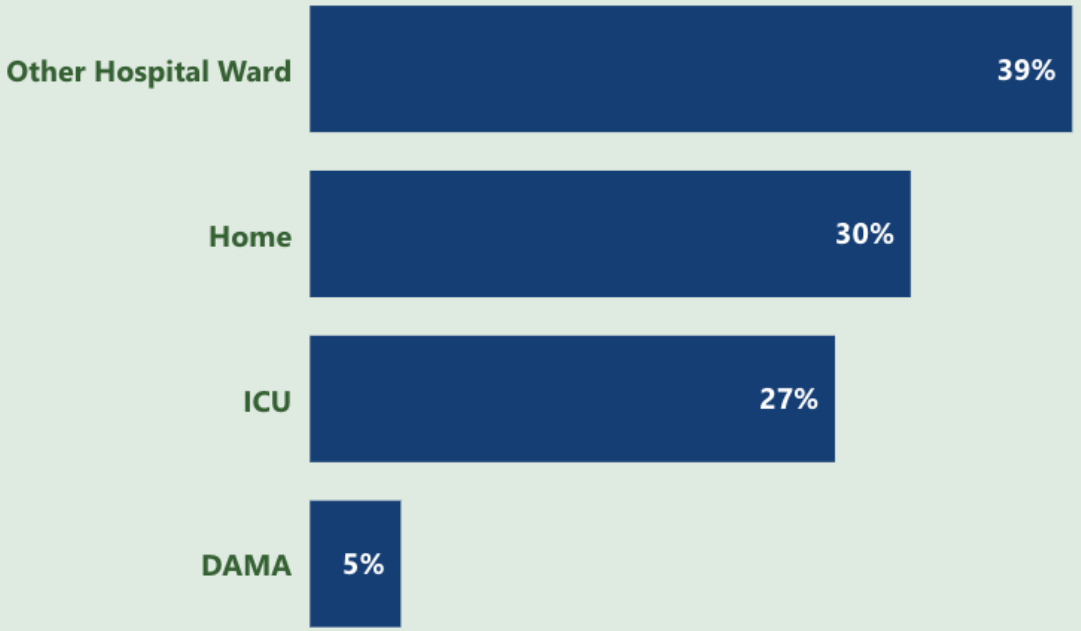
5.5

EDNA: Clinical Outcomes

EDNA
EMERGING DRUGS NETWORK OF AUSTRALIA

Illicit | NPS | Other | Pharmaceutical

Discharge from ED

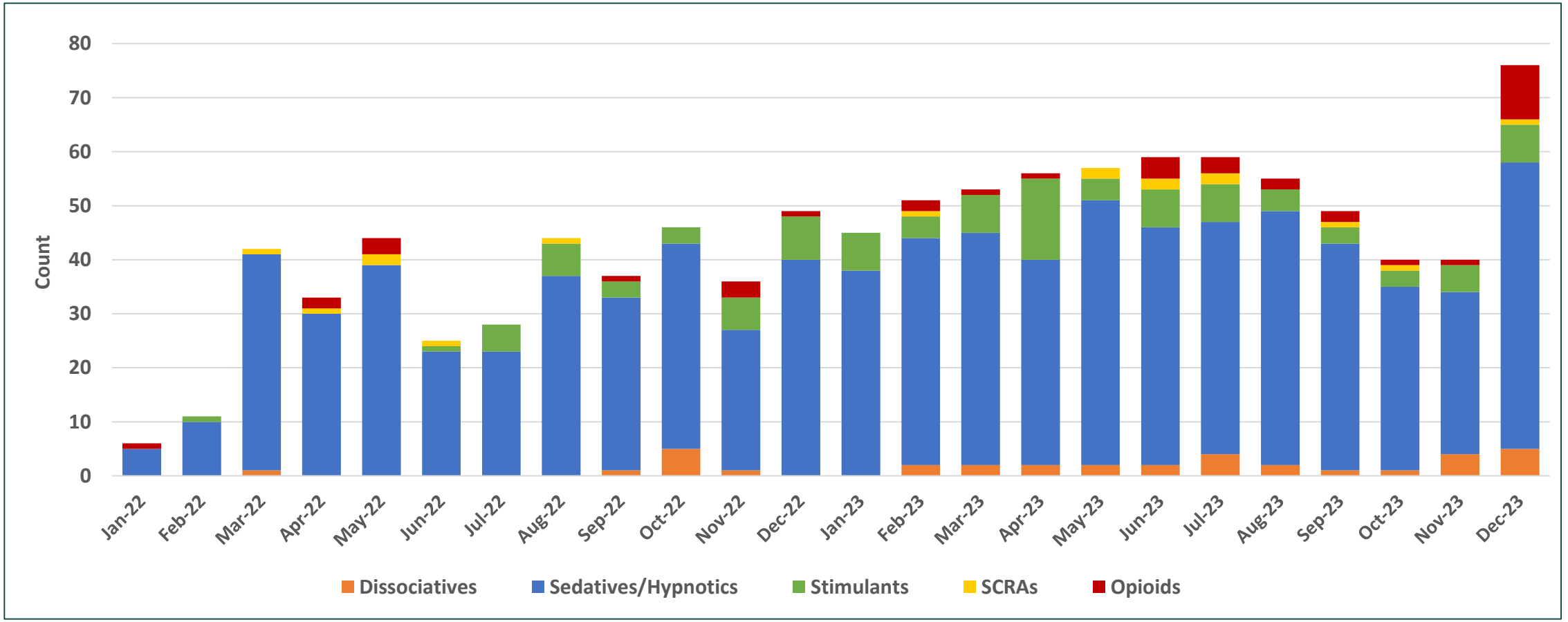


Top 10 most frequent drugs found in ICU patients

Notes:

1. Pharmaceuticals detected in blood samples may be due to use in the hospital management of the case.
2. "Other" represents all drugs that are not currently in the EDNA Drug Target List, but have been detected in samples.

NPS DETECTIONS 2022-2023



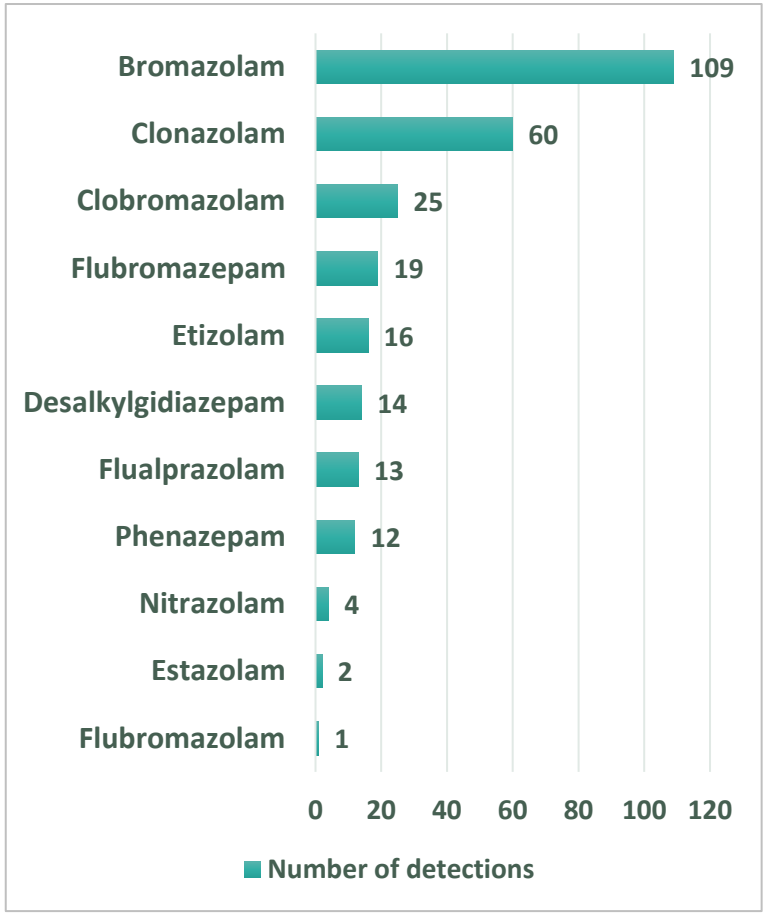
EDNA, Emerging Drugs Network Of Australia; EDNAV Emerging Drugs Network Of Australia – Victoria; NPS, novel psychoactive substances; SCRA, synthetic cannabinoid receptor agonist.

Acknowledgement: Smith, J. EDNA, Emerging Drugs Network Of Australia Dashboard. Personal communication using Power BI, 1 November 2024.

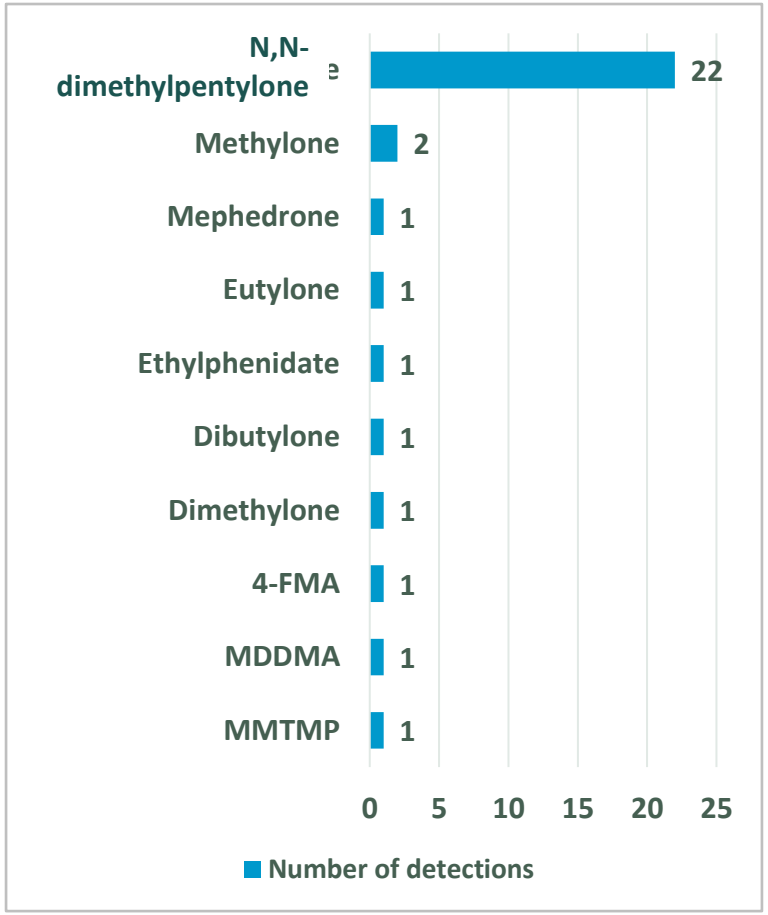
NPS DETECTIONS, 2022-2023

EDNA
EMERGING DRUGS NETWORK OF AUSTRALIA

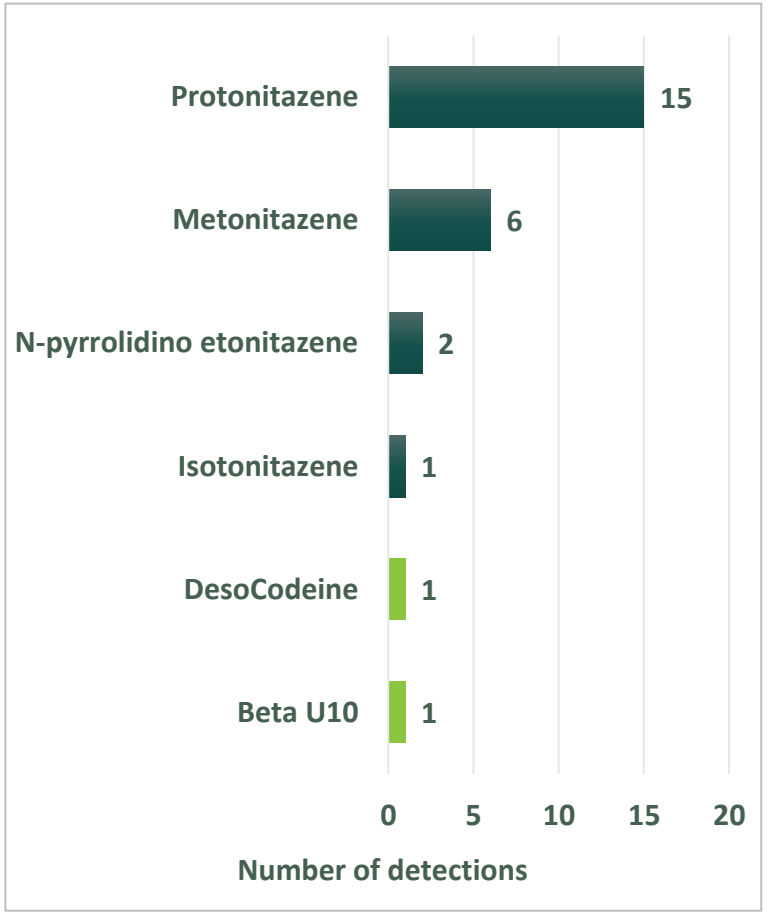
Benzodiazepines



Stimulants



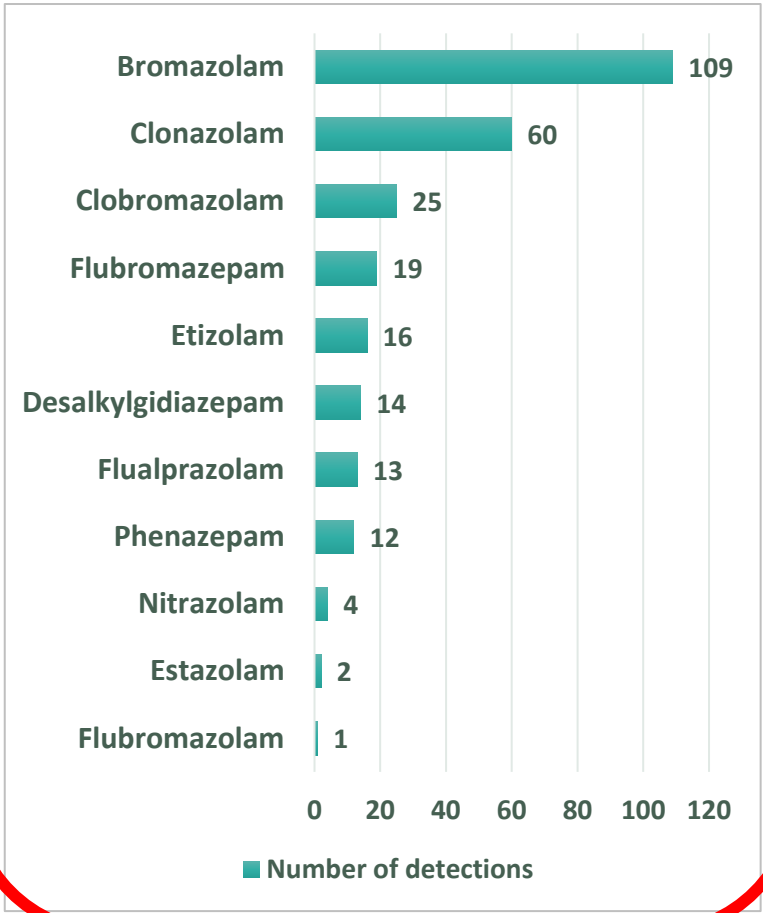
Opioids



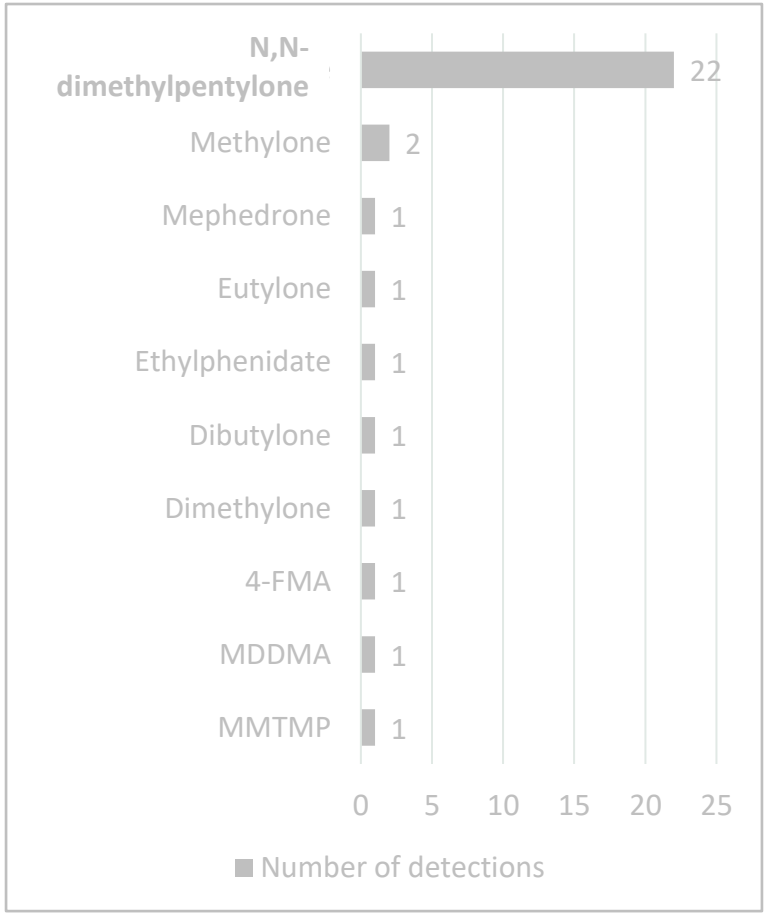
Acknowledgement: Dr Jen Smith, UWA

NPS DETECTIONS, 2022-2023

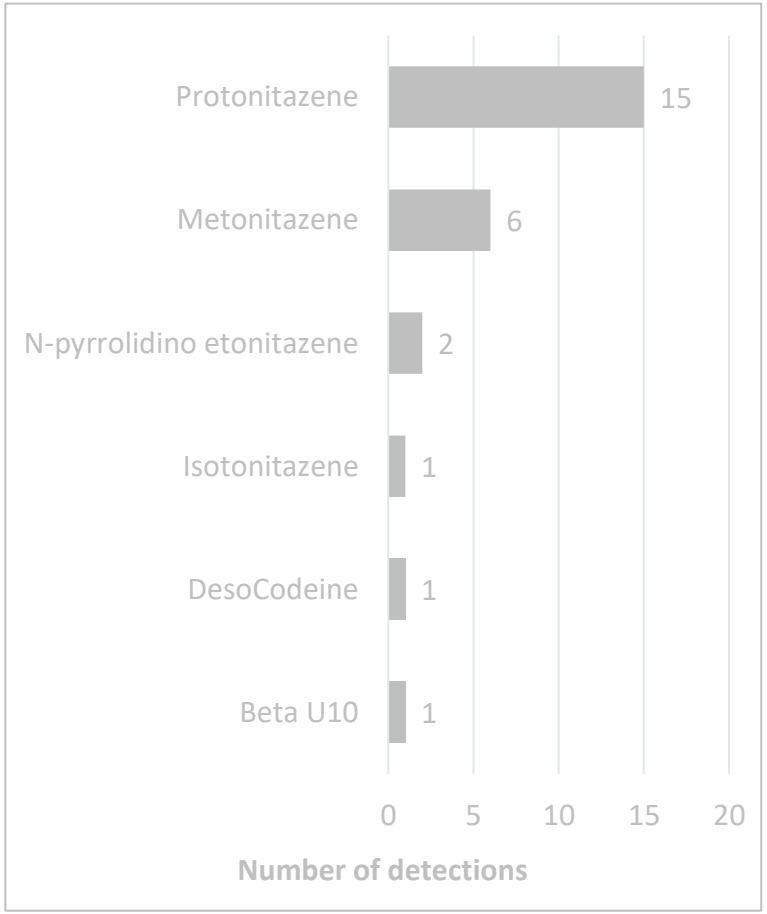
Benzodiazepines



Stimulants



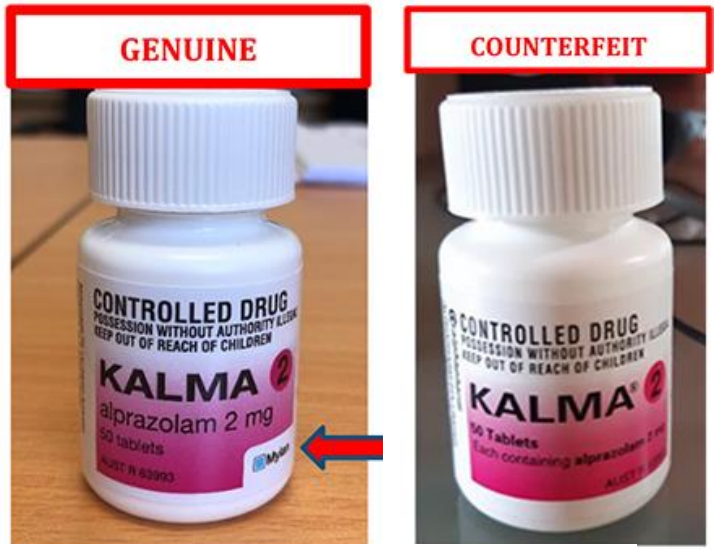
Opioids

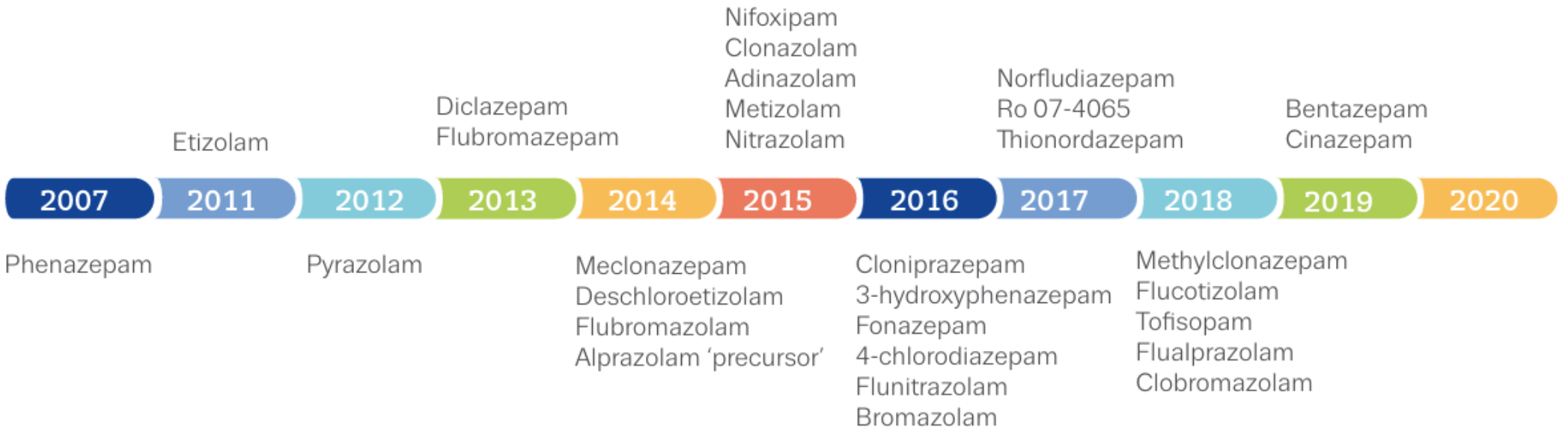


Acknowledgement: Dr Jen Smith, UWA

DESIGNER BENZODIAZEPINES

- EUDA monitoring >33 different new benzodiazepines
- Different potencies and half-lives
- Anxiolytic, anticonvulsant, hypnotic and sedative effects
- Some can induce euphoria – e.g., flubromazolam
- May be licitly prescribed in some countries, illicitly in others
- Mixed in illicit drug supply – 'benzo dope'

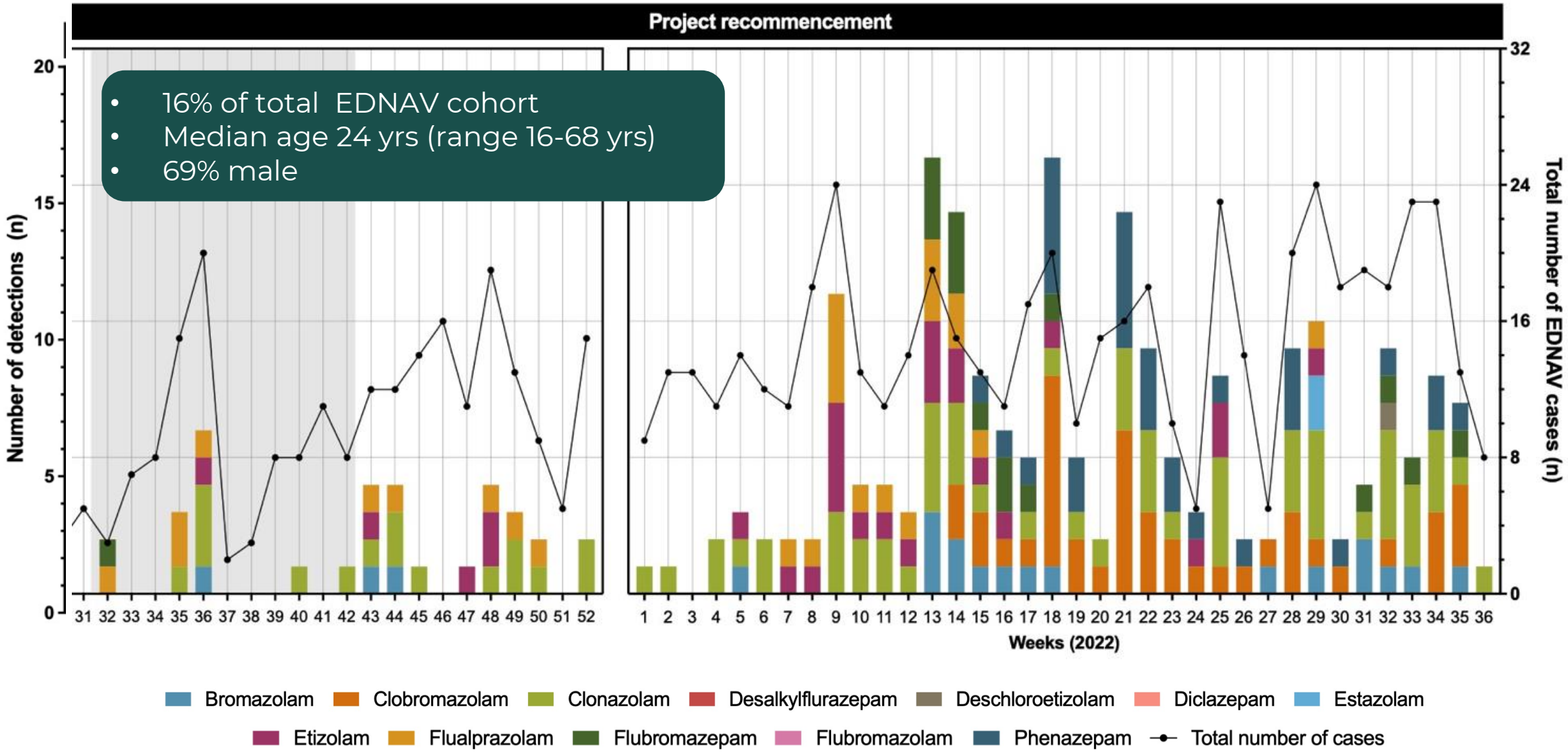




New Benzodiazepines in Europe – a Review. European Centre for Drugs and Drugs Addiction. 2021 Luxembourg. Publications Office of the EMCDDA.

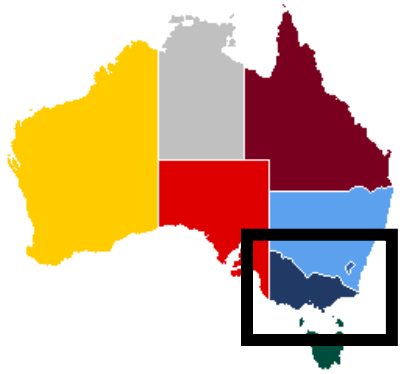
NOVEL BENZOS IN VICTORIA

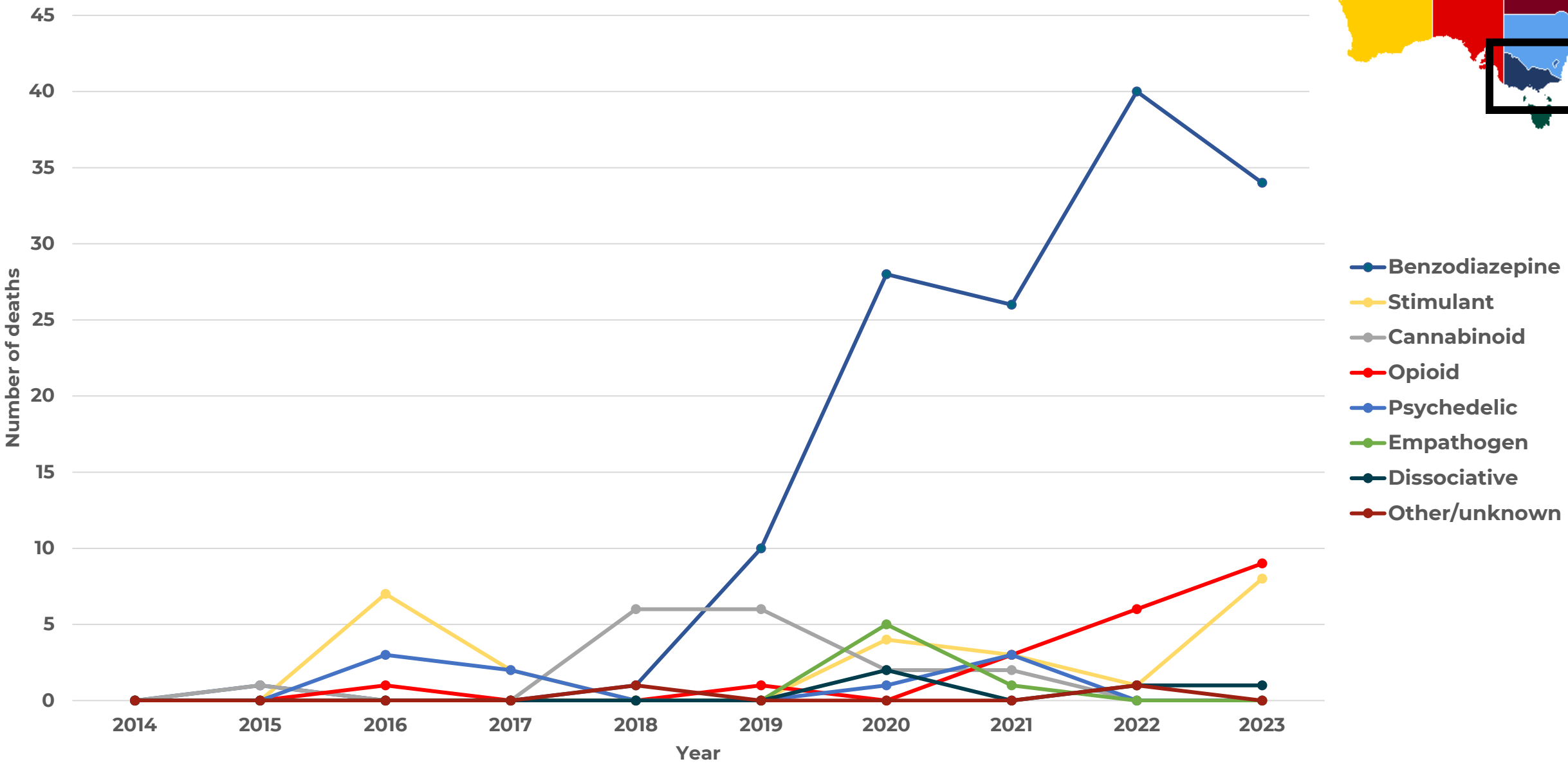
- 16% of total EDNAV cohort
- Median age 24 yrs (range 16-68 yrs)
- 69% male



Syrjanen, B. et al. Characteristics and time course of benzodiazepine-type new psychoactive substance detections in Australia: results from the Emerging Drugs Network of Australia - Victoria project 2020-2022 (2023) International Journal of Drug Policy, 122.

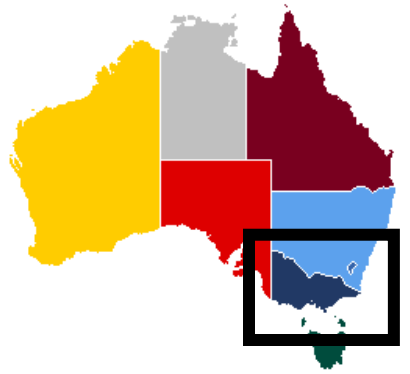
VICTORIAN OVERDOSE DEATHS: 2014-2023 (n=140)



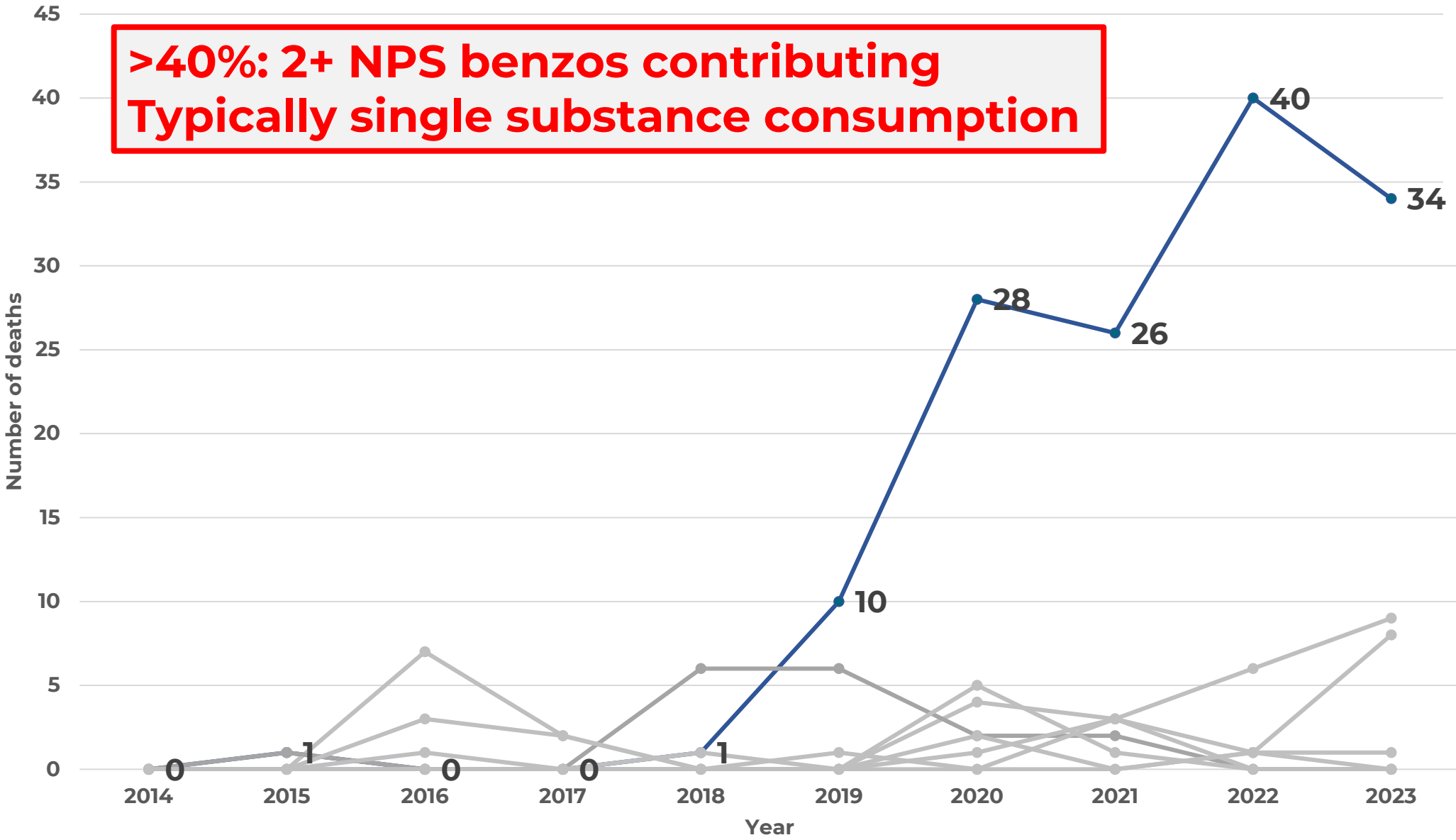


Coroners Court of Victoria: Drug overdose deaths 2013 – 2022 (8 November 2023)

VICTORIAN OVERDOSE DEATHS: 2014-2023 (n=140)



>40%: 2+ NPS benzos contributing
Typically single substance consumption



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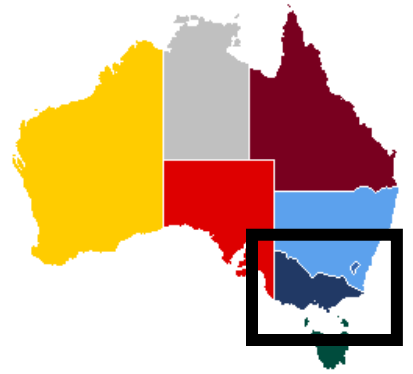

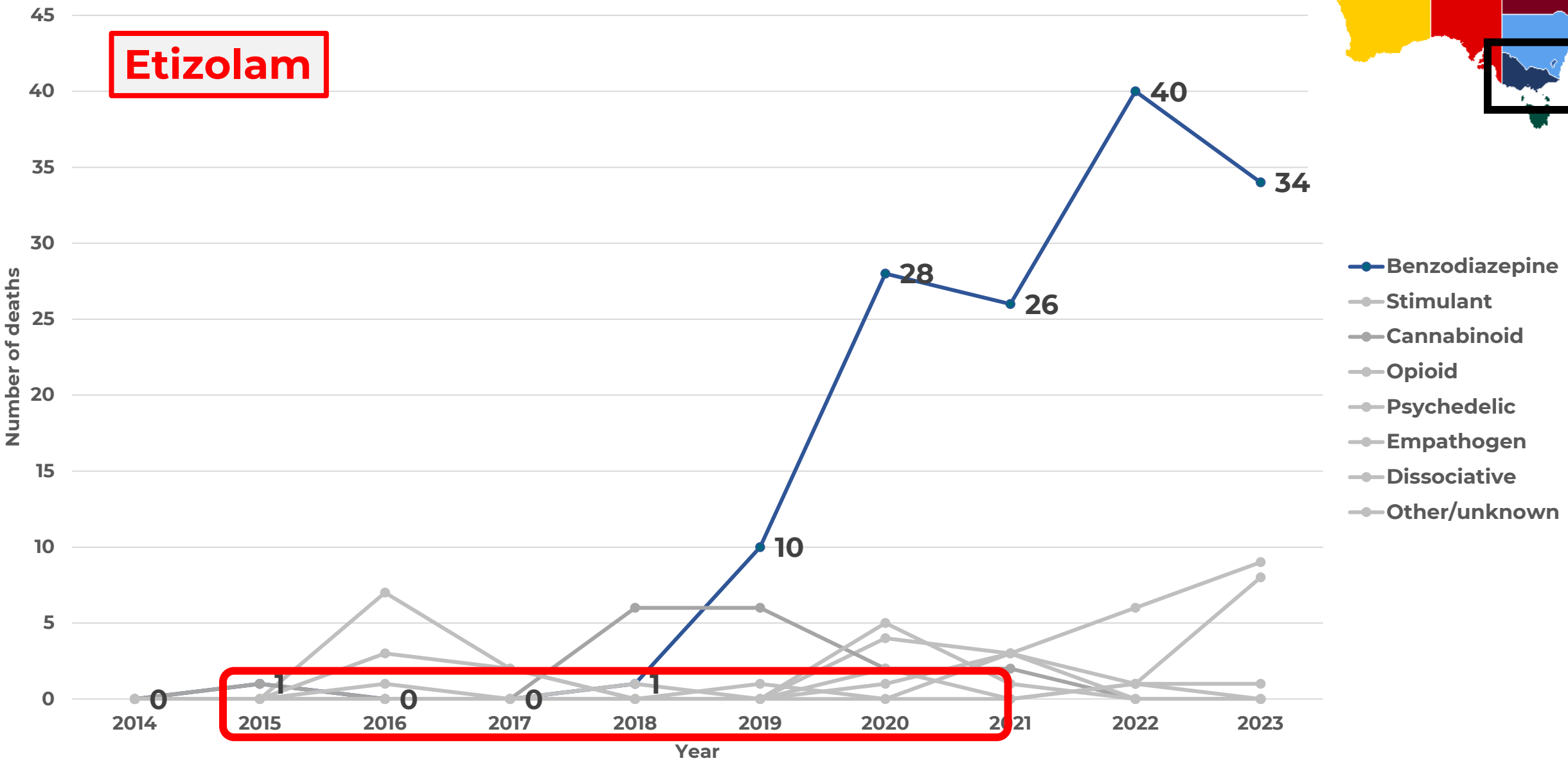

Coroners Court of Victoria. Victorian overdose deaths 2014–2023. Available at: https://www.coronerscourt.vic.gov.au/sites/default/files/2024-10/CCOV%20-%20Victorian%20Overdose%20Deaths%202014%E2%80%942023%20-%2003102024.pdf (Accessed January 2025)

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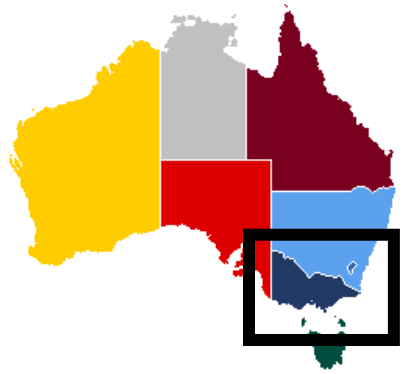
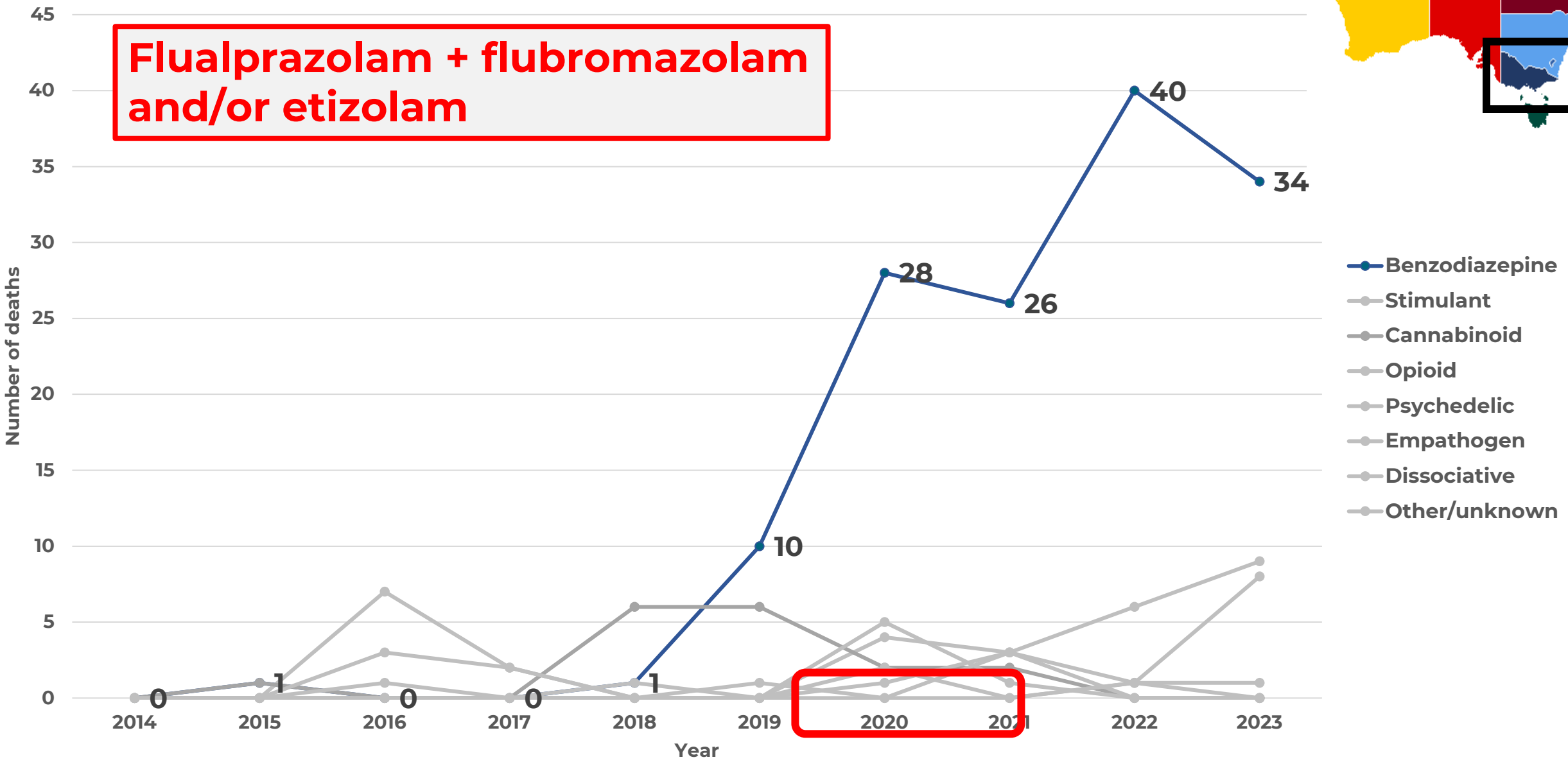


Flualprazolam + flubromazolam and/or etizolam



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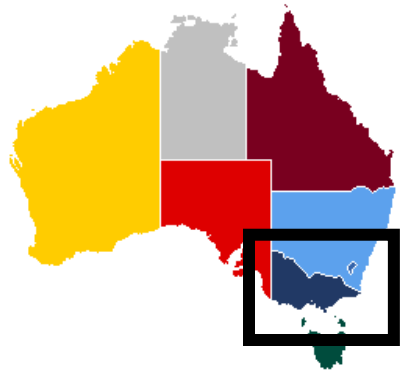
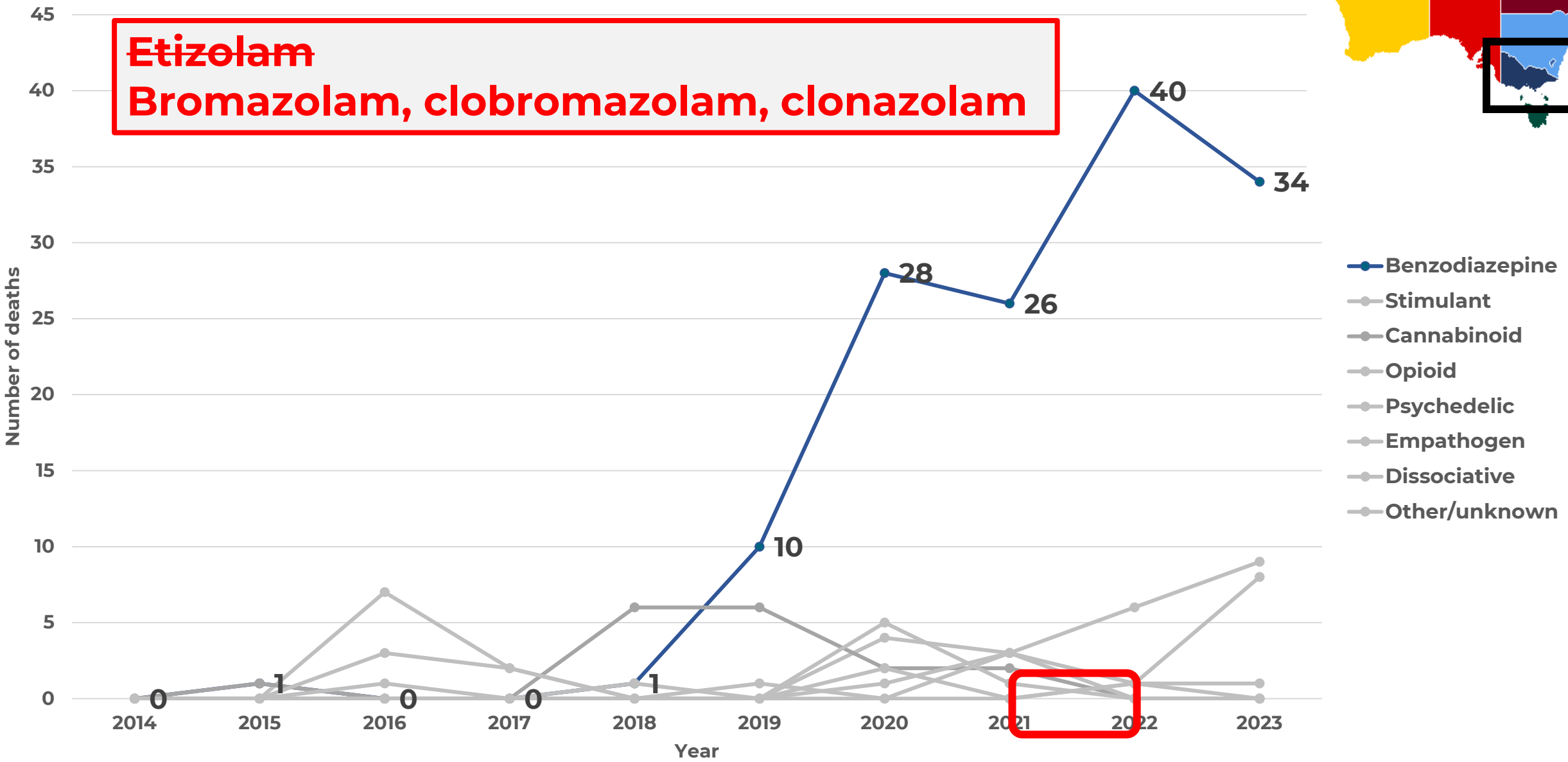
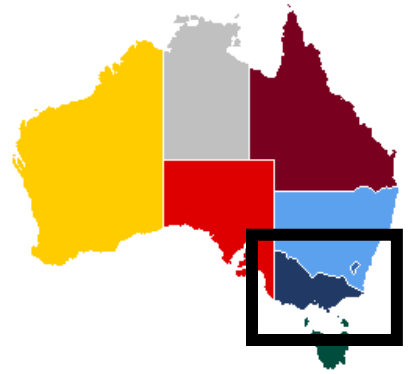


~~Etizolam~~
Bromazolam, clobromazolam, clonazolam



Coroners Court of Victoria. Victorian overdose deaths 2014–2023. Available at: https://www.coronerscourt.vic.gov.au/sites/default/files/2024-10/CCOV%20-%20Victorian%20Overdose%20Deaths%202014%E2%80%942023%20-%2003102024.pdf (Accessed January 2025)

VICTORIAN OVERDOSE DEATHS: 2014-2023 (n=140)



Bromazolam

Number of deaths

45
40
35
30
25
20
15
10
5
0

2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

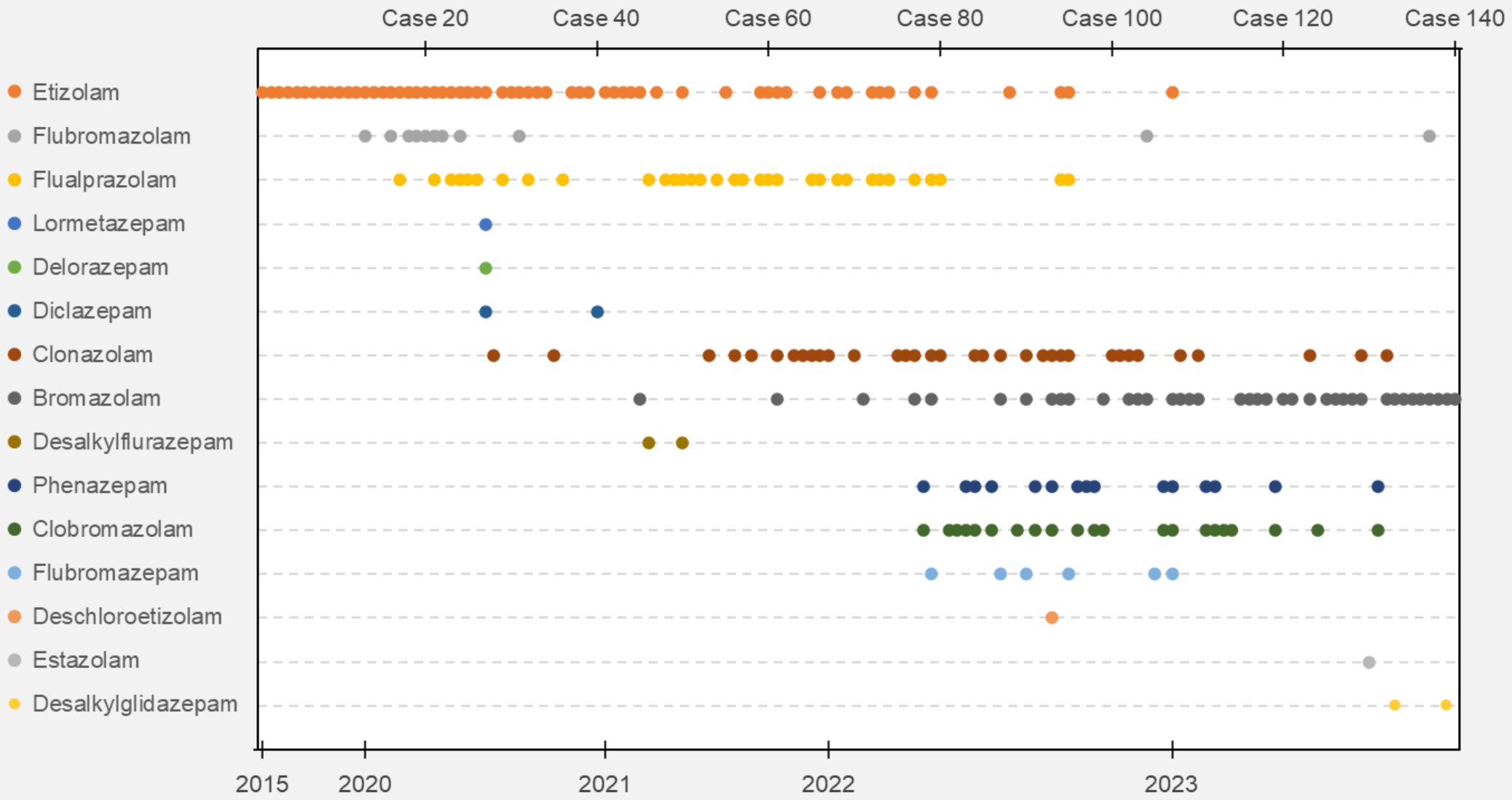
Year

0 1 0 0 1 10 28 26 40 34

- Benzodiazepine
- Stimulant
- Cannabinoid
- Opioid
- Psychedelic
- Empathogen
- Dissociative
- Other/unknown

Coroners Court of Victoria. Victorian overdose deaths 2014–2023. Available at: https://www.coronerscourt.vic.gov.au/sites/default/files/2024-10/CCOV%20-%20Victorian%20Overdose%20Deaths%202014%E2%80%942023%20-%2003102024.pdf (Accessed January 2025)

NOVE BENZODIAZEPINE OVERDOSE DEATHS

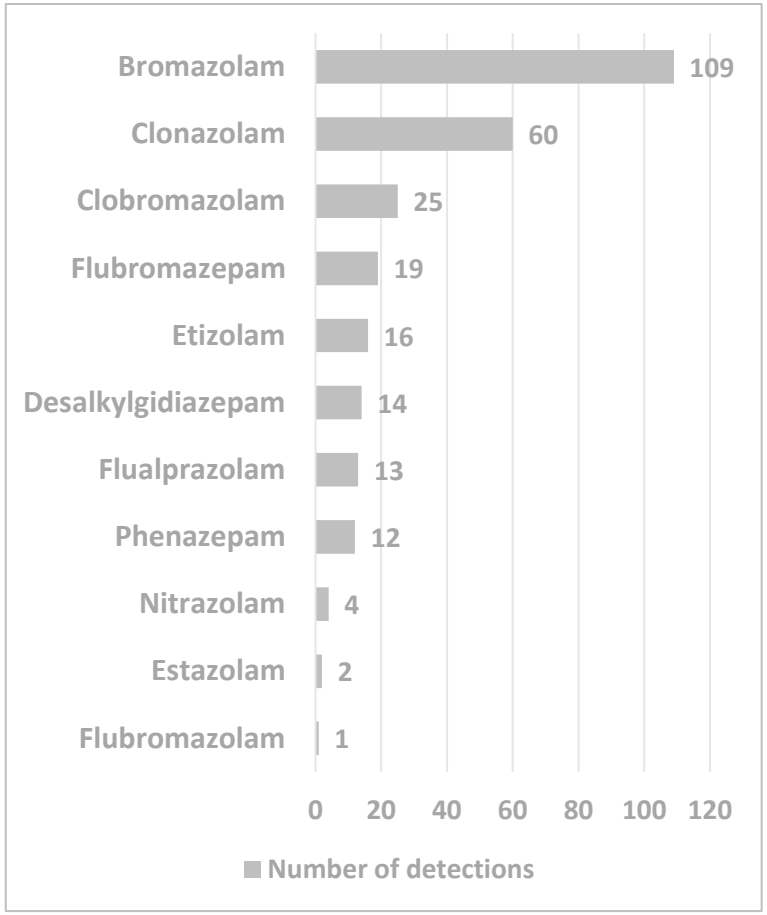


Schumann, J.L., Syrjanen, R. & Dwyer, J. Changing trends of novel benzodiazepine detections in fatal overdoses in Victoria, Australia (submitted)

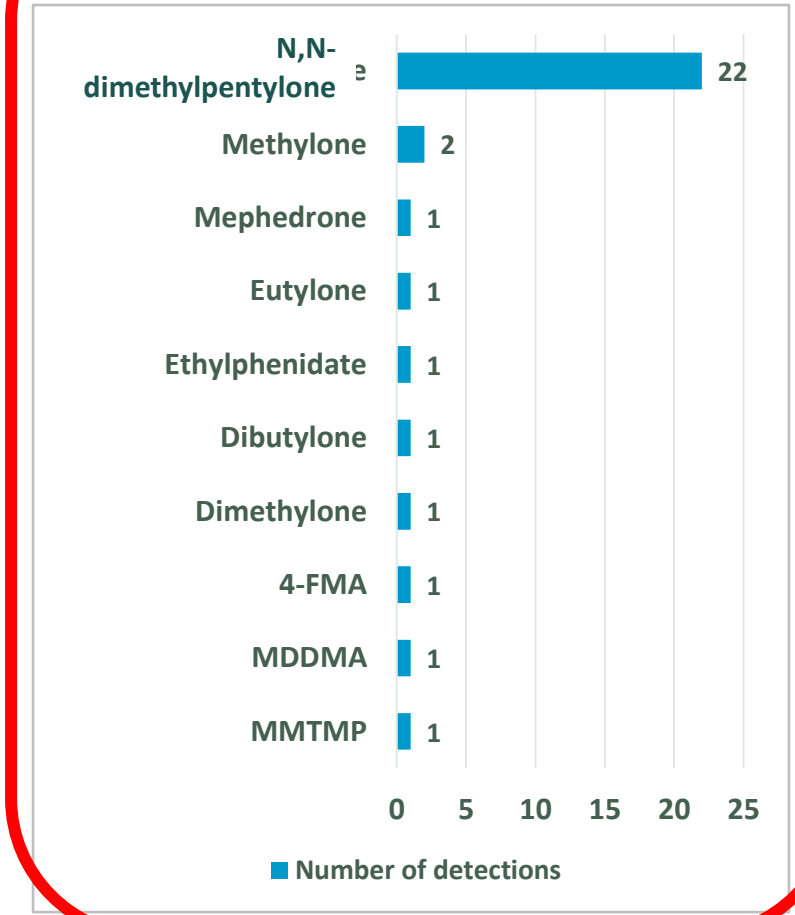
NPS DETECTIONS, 2022-2023

EDNA
EMERGING DRUGS NETWORK OF AUSTRALIA

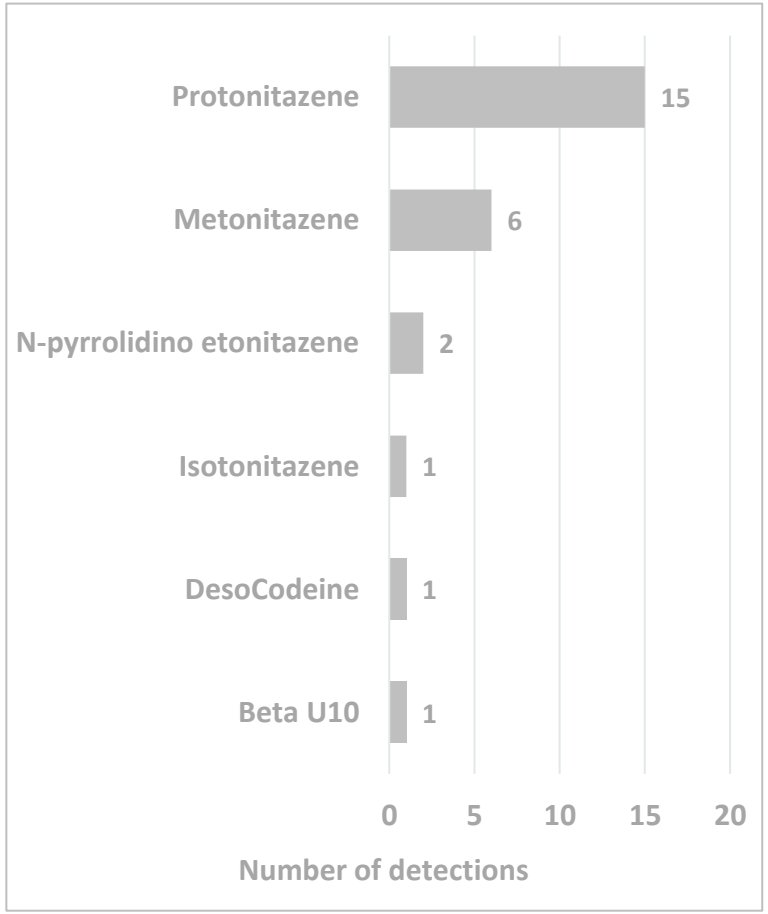
Benzodiazepines



Stimulants



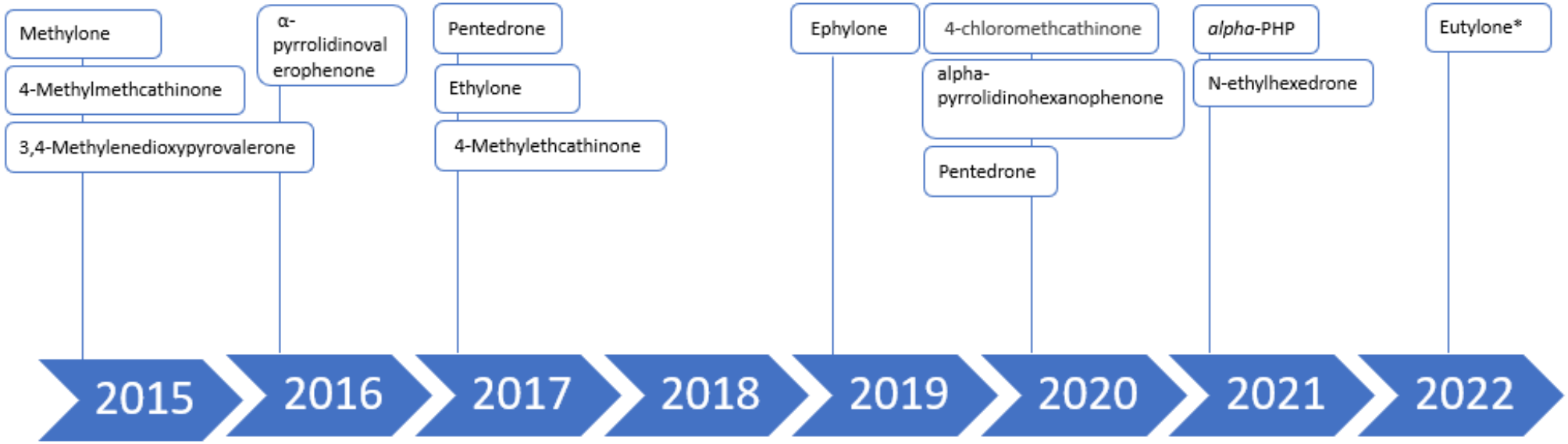
Opioids



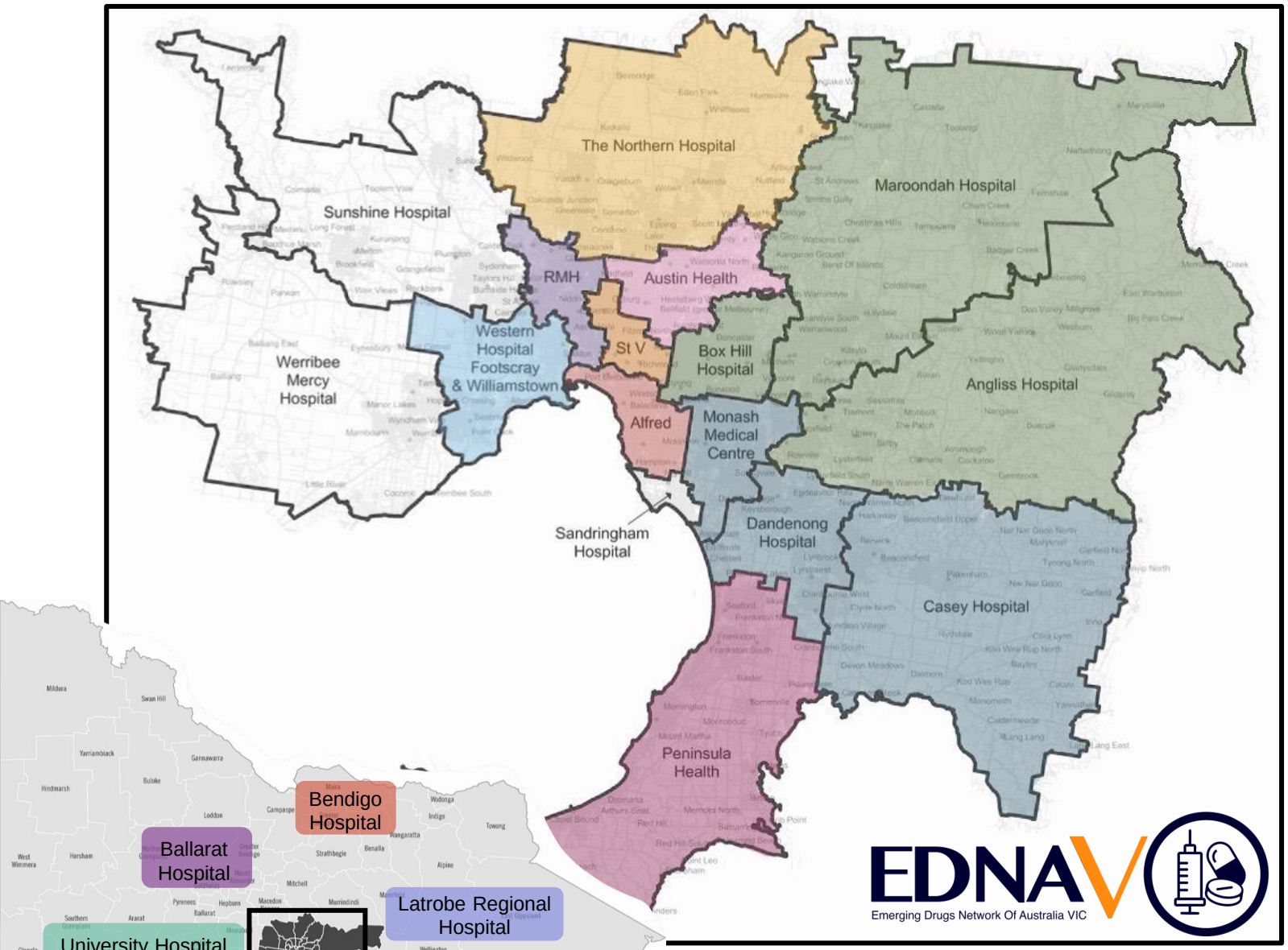
Acknowledgement: Dr Jen Smith, UWA

NOVEL STIMULANTS

- EUDA monitoring ~170 different synthetic cathinones
- Phenethylamine derivatives of cathinone - principle psychoactive component of khat
- Amphetamine-like effects but higher potency
- Similar to existing stimulants (e.g. methylamphetamine) – potential for increased use
- Common adulterants in traditional stimulants



July 2022 – UNODC EWA: Large seizures of synthetic cathinones in Europe reflect their growing importance on the illicit stimulants market.
https://www.unodc.org/LSS/Announcement/Details/189e540f-515b-475a-b9d2-30b6868bb454



Austin Health

The Royal Melbourne Hospital

theAlfred

St Vincent's Hospital Melbourne

Monash Health

Northern Health

Eastern Health

Peninsula Health

Western Health

Bendigo Health

LRH Latrobe Regional Hospital

Barwon Health

Grampians Health Ballarat

St John Ambulance Victoria

Ad hoc festival testing – priority for large multiday events

Austin Health

The Royal Melbourne Hospital

theAlfred

St Vincent's Hospital Melbourne

Monash Health

Northern Health

Eastern Health

Peninsula Health

Western Health

Bendigo Health

LRH Latrobe Regional Hospital

Barwon Health

Grampians Health Ballarat

ST JOHN AMBULANCE VICTORIA

- Temporary field hospital (up to 30 beds)
- Medical Assistance Team (MAT)
  - Critical care physician
  - Advanced airway management (tracheal intubation)

EDNAV
Emerging Drugs Network Of Australia VIC

RESULTS: DEMOGRAPHICS

Six festival events

Thirty-nine blood samples collected

64% identified as male

Median age **22 years** (range 18-39 years)

Presentation:

- Altered conscious state (n=16)
- Agitation (n=10)
- Seizure (n=7)
- Unconscious (n=6)

Management:

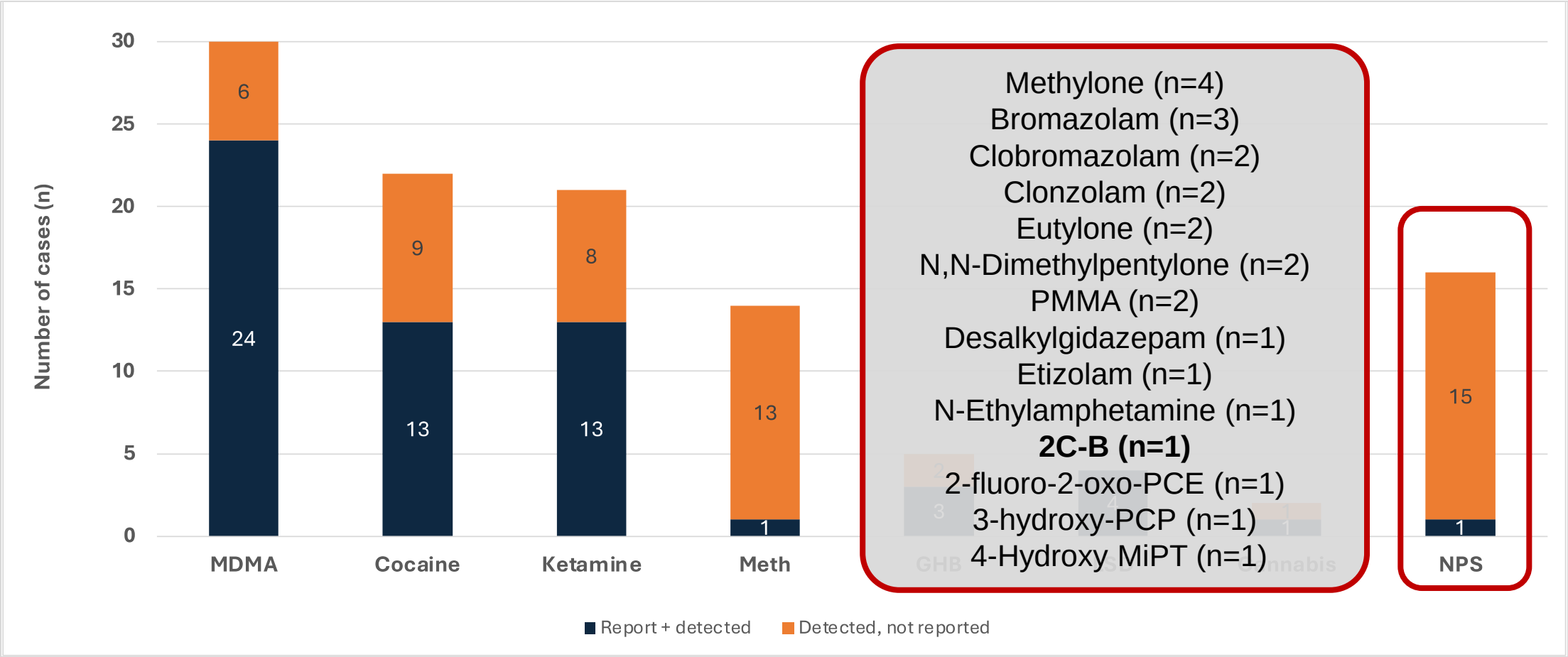
- Supportive care (n=18)
- Sedation (n=10)
- Airway support / critical care (n=11)

Outcomes:

- Returned to the festival (n=20)
- Transfer to hospital (n=16)
- Discharged home (n=3)

Syrjanen R. et al. Novel harm reduction measures at music festivals in Australia: Pilot implementation of the Emerging Drugs Network of Australia–Victoria toxicosurveillance met
(2024) Drug and Alcohol Review, 43 (7), pp. 2045 - 2054

RESULTS: ANALYTICALLY CONFIRMED DRUG EXPOSURE(S)



GHB: gamma-hydroxybutyrate, LSD: lysergic acid diethylamide, Meth: methylamphetamine, MDMA: 3,4-methylenedioxymethamphetamine, NPS: new psychoactive substance

Comparison of reported and detected drugs use in festival patrons seeking medical care for severe illicit drug-related toxicity (n=36).

Syrjanen R. et al. Novel harm reduction measures at music festivals in Australia: Pilot implementation of the Emerging Drugs Network of Australia–Victoria toxicosurveillance methodology (2024) Drug and Alcohol Review, 43 (7), pp. 2045 - 2054

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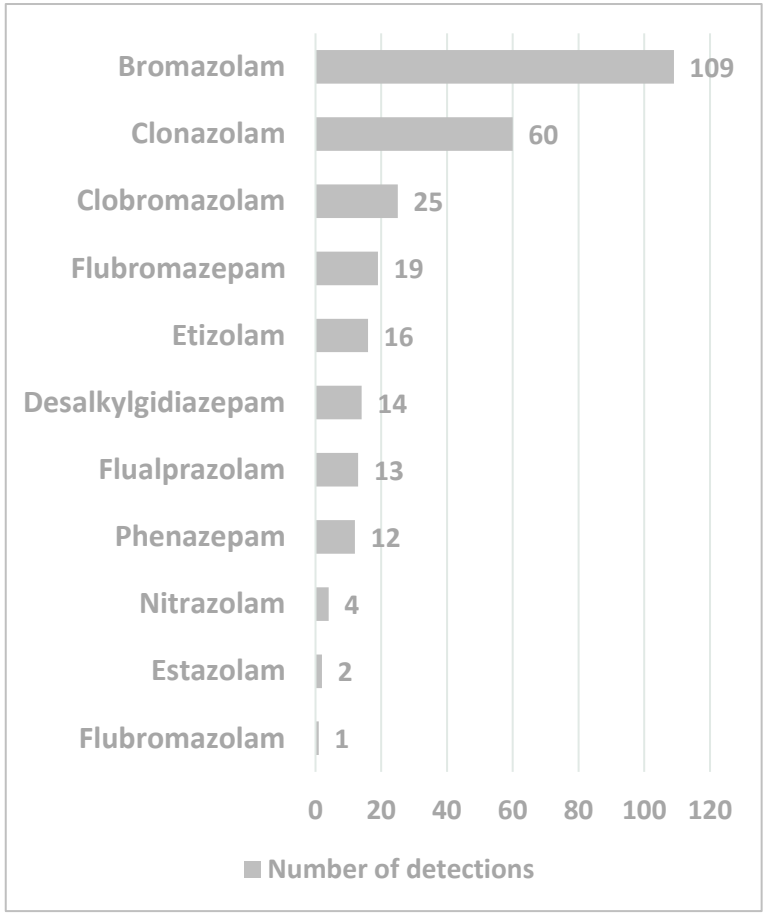

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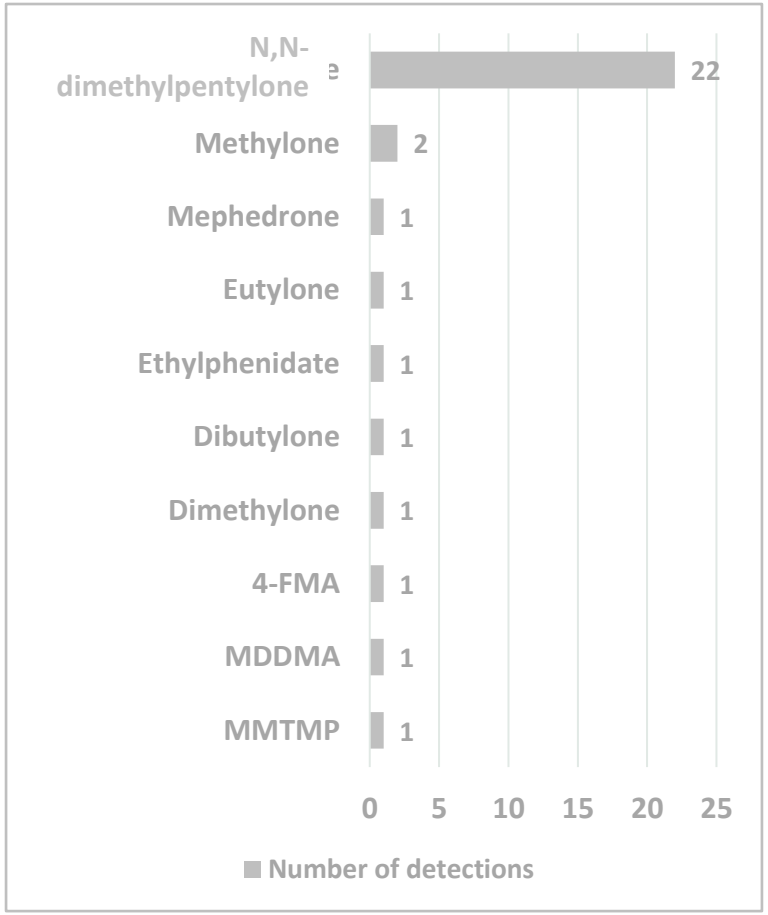

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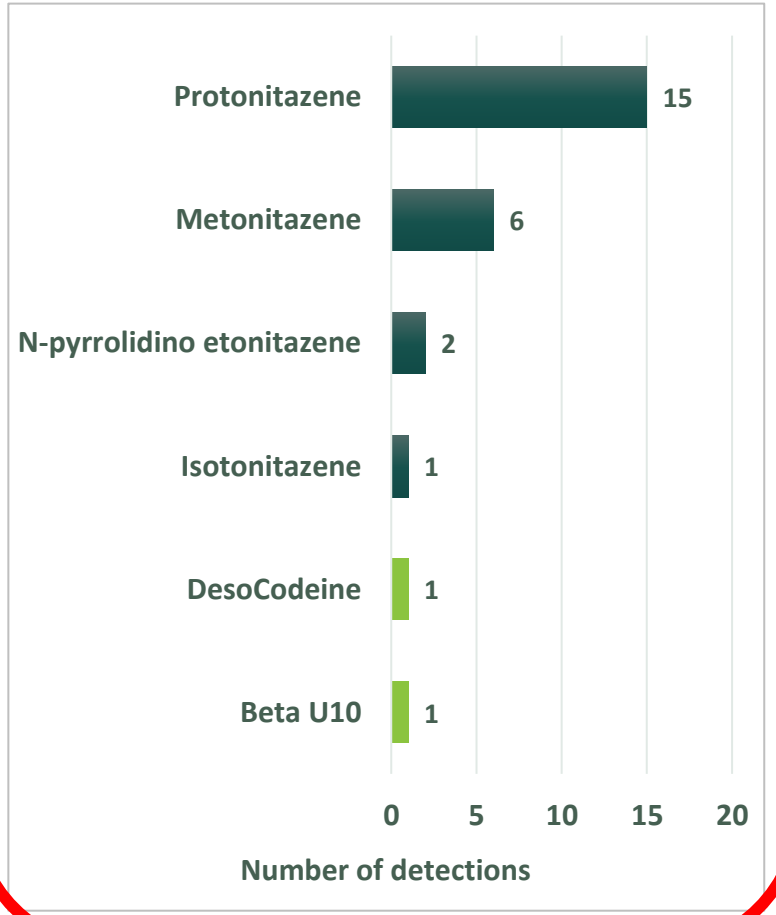

Acknowledgement: Dr Jon Smith, UWA

EDNA NITAZENE PRESENTATIONS

- July 2020 – February 2024
- 32 presentations, 72% male, median age 31yrs
- 16% intentional use, 38% intended other opioid, 46% no idea using opioid

Nitazene	n (%)
Protonitazene	23 (72%)
Metonitazene	9 (28%)
N-pyrrolidino etonitazene	2 (6%)
Isotonitazene	1 (3%)
Butonitazene	1 (3%)
Etodesnitazene	1 (3%)
Multiple nitazenes	5 (16%)

Analytically confirmed co-exposure	31	(97%)
Methamphetamine	18	(56%)
Xylazine	4	(13%)
THC	4	(13%)
Amphetamine	2	(6%)
Ketamine	2	(6%)
Heroin	2	(6%)
GHB	2	(6%)
Cocaine	2	(6%)
Pharmaceuticals	**21**	**(66%)**
benzodiazepines	9	(28%)
opioids	5	(16%)
antidepressants	5	(16%)
non-opioid analgesics	4	(13%)
sildenafil/tadalafil	3	(9%)
pregabalin	2	(6%)
NPS	**12**	**(38%)**
novel benzodiazepine	10	(31%)
ketamine analogue	1	(3%)
novel stimulant	2	(6%)

Isoardi K.Z. et al. Clinical toxicity of nitazene detections in two Australian emergency department toxicosurveillance systems (2025) Drug and Alcohol Review (in press)

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EDNA NITAZENE PRESENTATIONS

Miosis 54%

Median RR
8 (IQR 4–12)

Median GCS 3
(IQR 3–8)

CGS, Glasgow Coma Scale; EDNA, Emerging Drugs Network Of Australia; IQR, interquartile range; IV, intravenous; LOS, length of stay; RR, respiratory rate.

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EDNA NITAZENE PRESENTATIONS

Miosis 54%

Median RR
8 (IQR 4–12)

Median GCS 3
(IQR 3–8)

Naloxone used in 72%
Median total dose 300 µg IV
Naloxone infusion in 13%

Intubation 31%

Median LOS 17 hours
No deaths

"Standard doses" appear to be effective
Appears to behave like other short acting opioids

CGS, Glasgow Coma Scale; EDNA, Emerging Drugs Network Of Australia; IQR, interquartile range; IV, intravenous; LOS, length of stay; RR, respiratory rate.

Isoardi K.Z. et al. Clinical toxicity of nitazene detections in two Australian emergency department toxicosurveillance systems (2025) Drug and Alcohol Review (in press)

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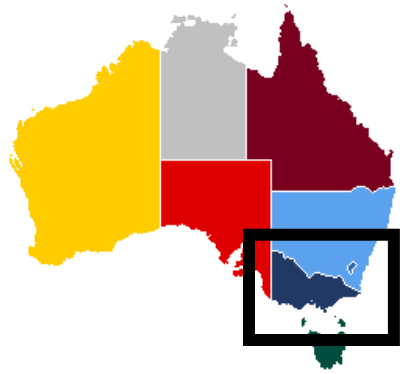
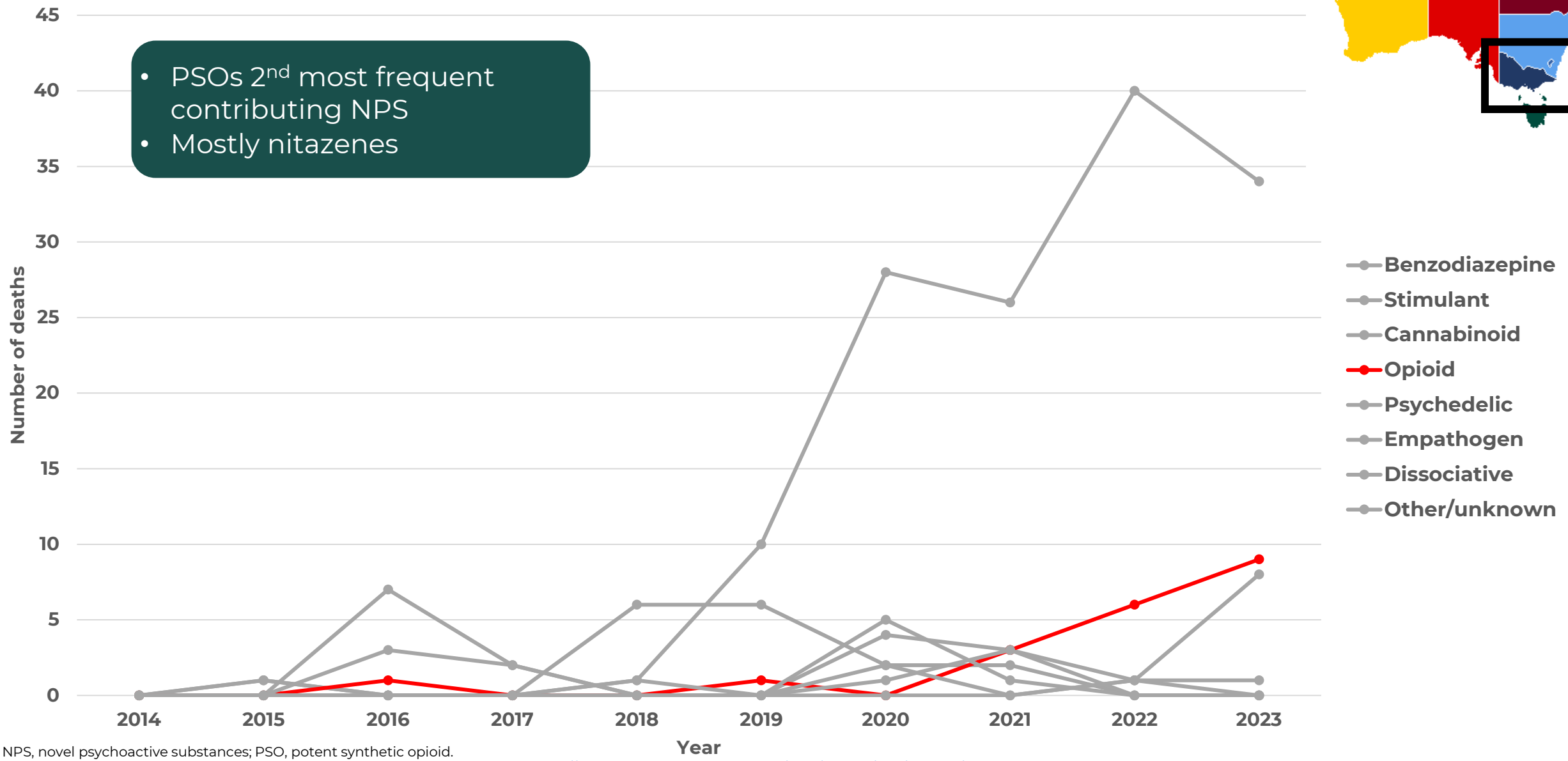


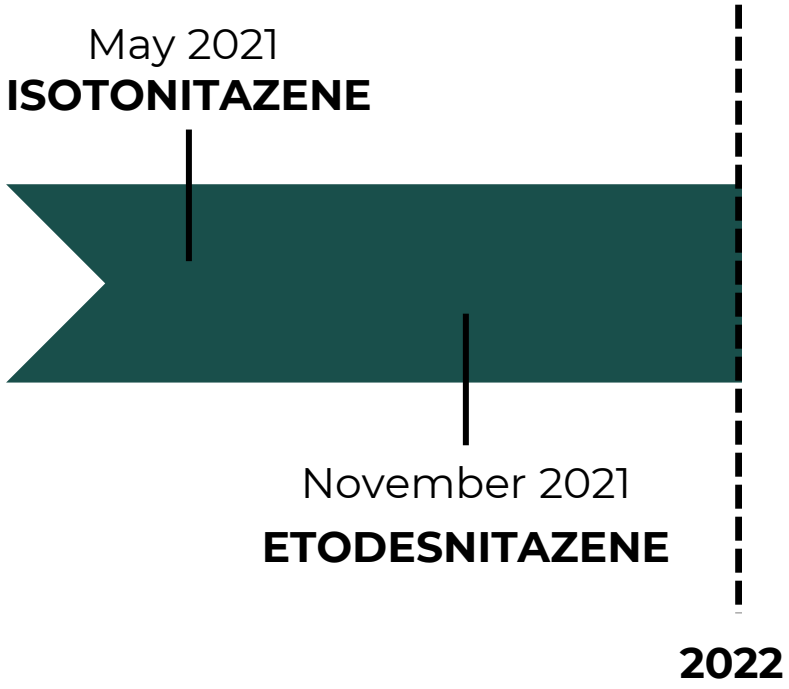
- PSOs 2nd most frequent contributing NPS
- Mostly nitazenes



NPS, novel psychoactive substances; PSO, potent synthetic opioid.

Coroners Court of Victoria. Victorian overdose deaths 2014–2023. Available at: https://www.coronerscourt.vic.gov.au/sites/default/files/2024-10/CCOV%20-%20Victorian%20Overdose%20Deaths%202014%E2%80%942023%20-%2003102024.pdf (Accessed January 2025)

FIRST DETECTIONS OF NITAZENES IN CORONIAL CASES



- Mostly male, 18–50 years old
- Mixed drug toxicity, often with benzodiazepines

NPS, novel psychoactive substances; PSO, potent synthetic opioid.

Acknowledgement: Lachlan Scully, VIFM
Speaker's own centre's knowledge.

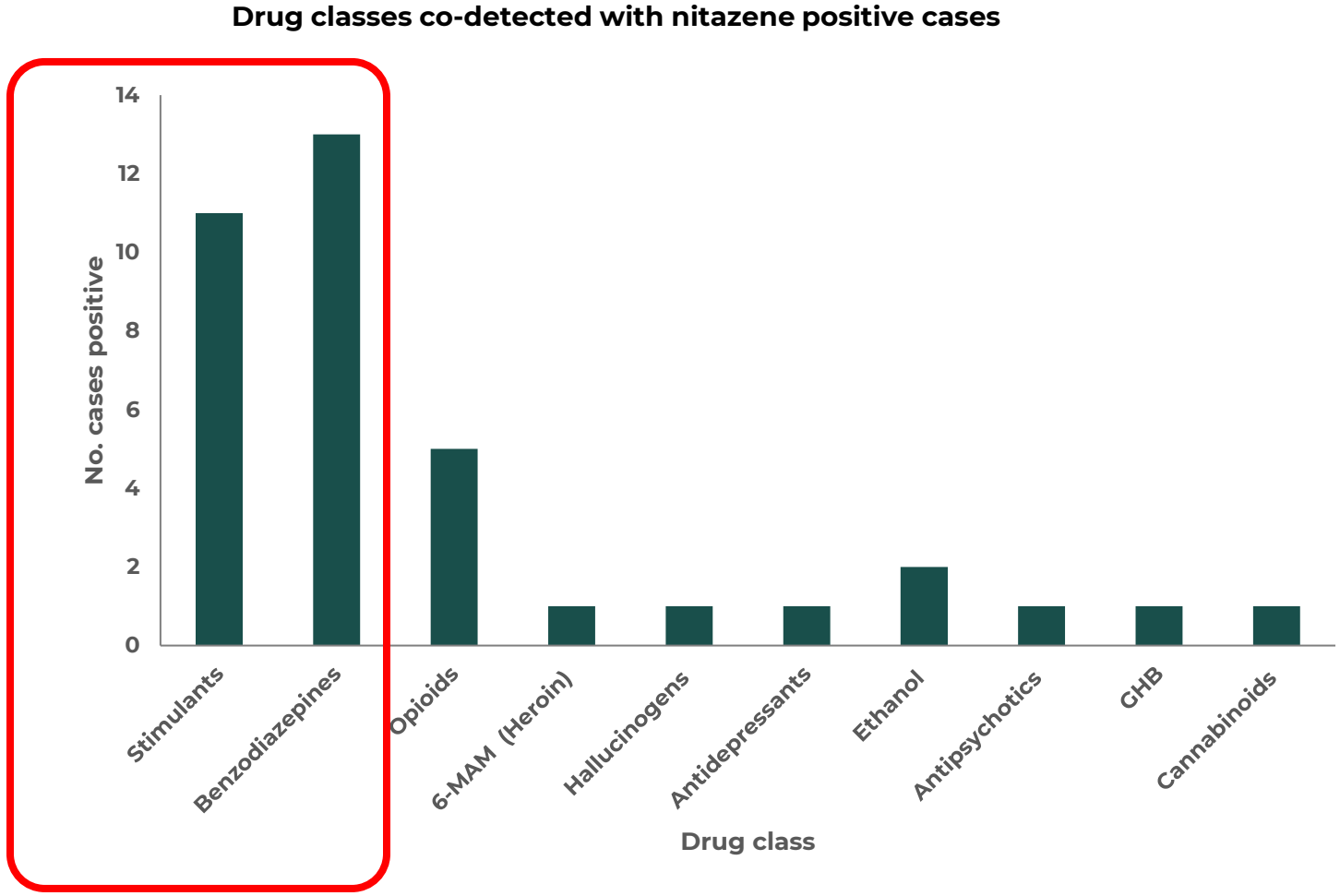
POST-MORTEM CONCENTRATIONS

	n	Mean (ng/mL)	Range (ng/mL)	Potency relative to fentanyl[1,2]
N-pyrrolidino etonitazene	2	0.4	0.3–0.6	~43x
Isotonitazene	2	1.7	0.1–3.4	~9x
Protonitazene	6	1.0	0.3–1.7	~3.5x
Metonitazene	4	15.7	0.4–33.0	~2x
Etodesnitazene	1	32.2	32.2	~¼–½x

1. Vandeputte M *et al. ACS Chem Neurosci.* 2021;12:1241–51; 2. Vandeputte M *et al. Arch Toxicol.* 2022;96:1845–63.

CO-DETECTED DRUGS

- All cases contain >2 other drugs
- No monointoxications
- High prevalence of stimulants and benzodiazepines



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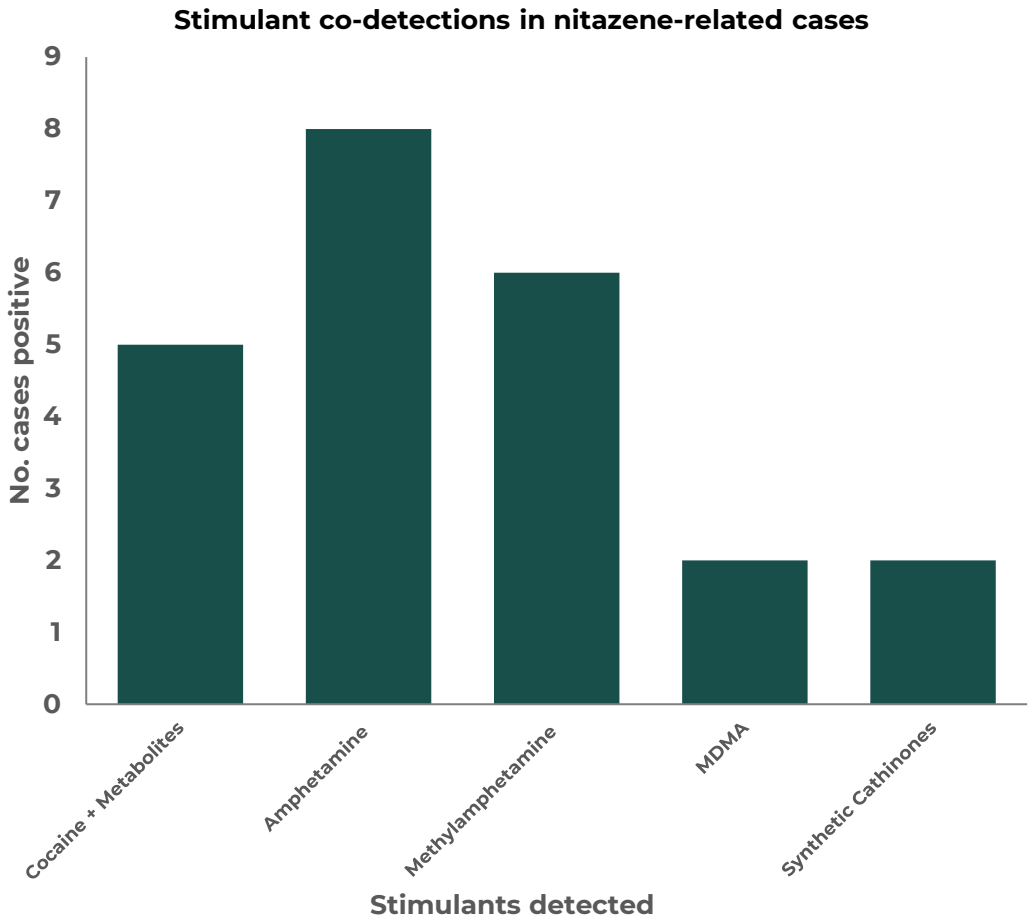
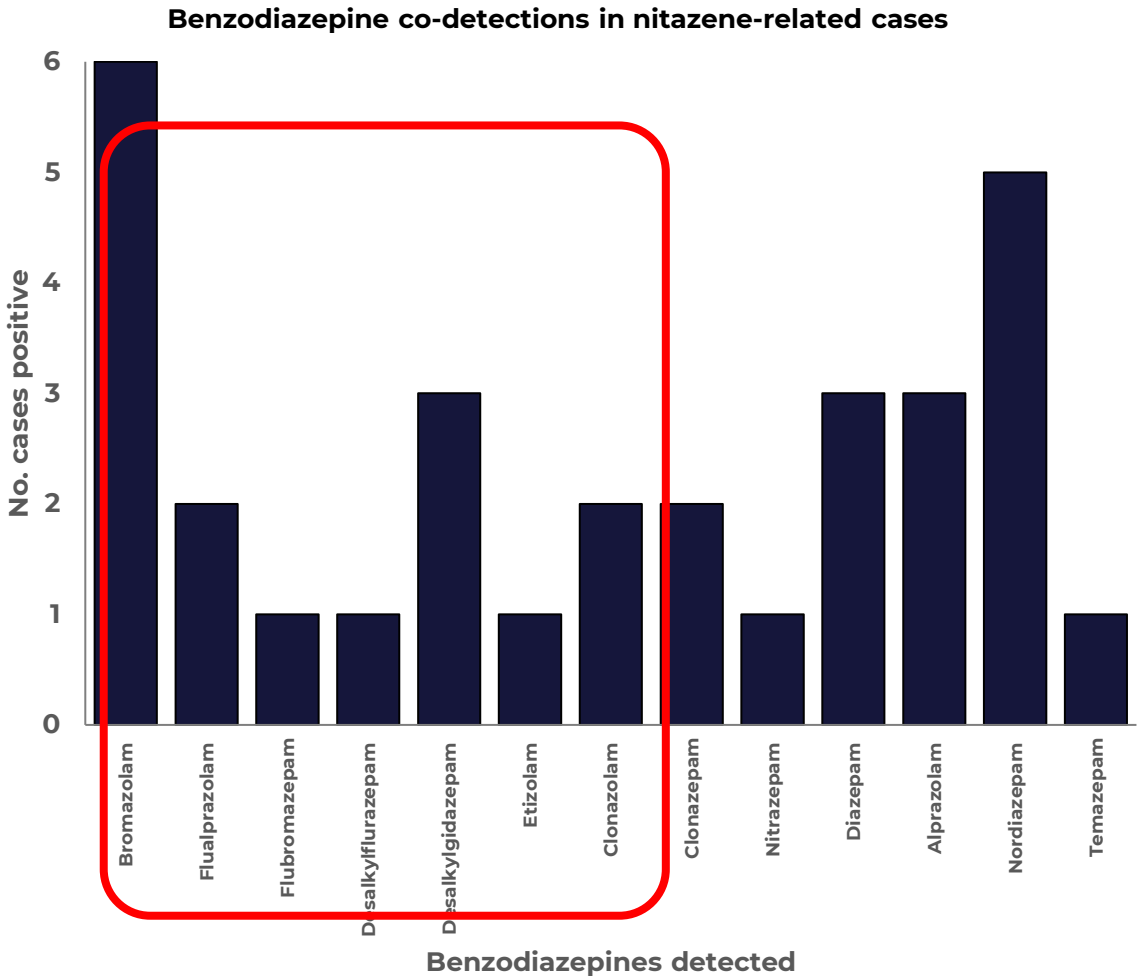
STIMULANT AND BENZODIAZEPINE CO-DETECTIONS





Acknowledgement: Lachlan Scully, VIFM
Speaker's own centre's knowledge.

VICTORIA'S CURRENT DRUG SIGNALS

RAPID
Residue analysis
Used syringes
(Uni Melb)

EDNAV
Overdose blood toxicology
(VPIC, Austin Health)

Coronial findings
Overdose blood toxicology
(Coroners Court)

Drug Checking
Voluntary drug samples
(The Loop)

Acknowledgement: John Fitzgerald

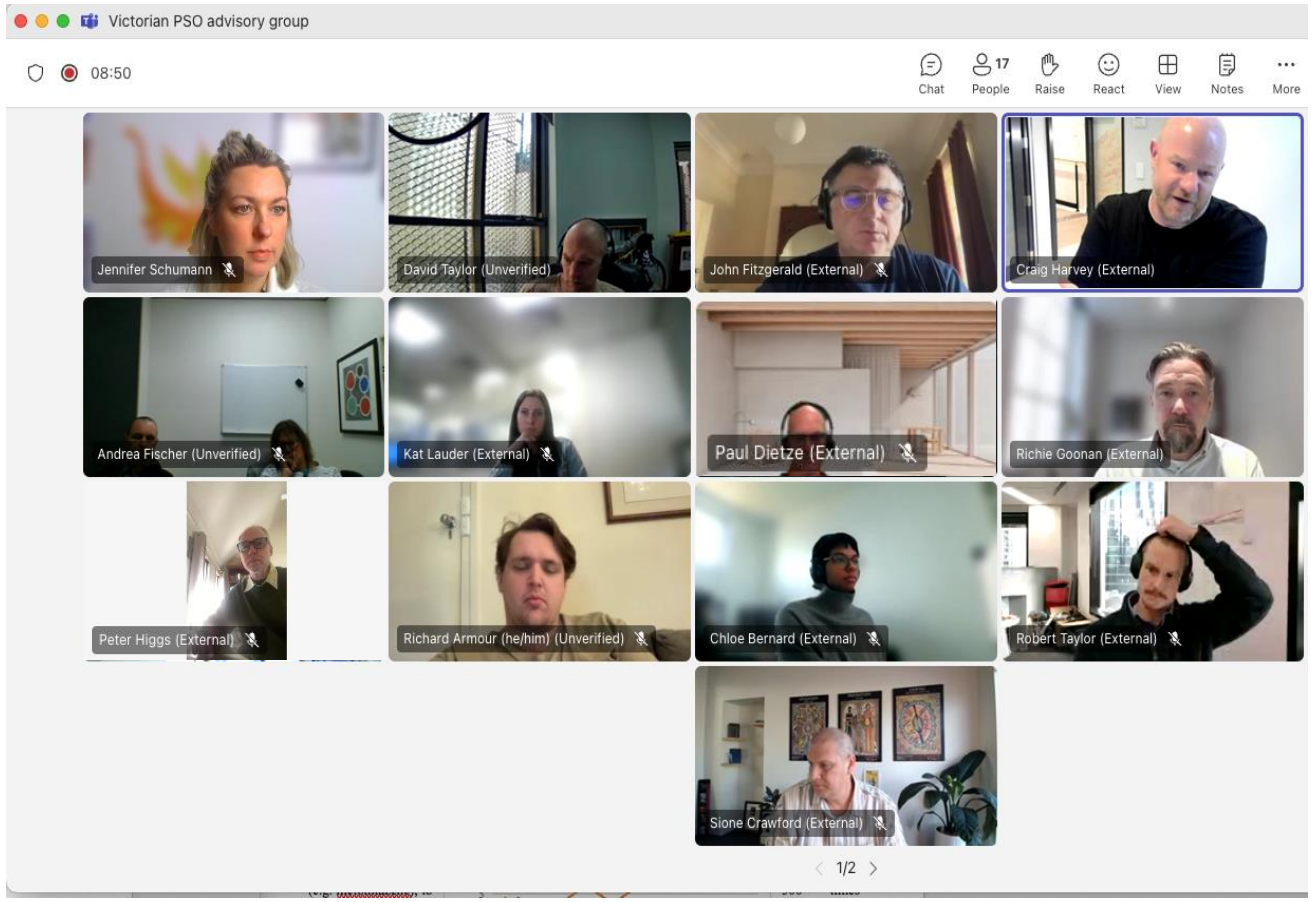
NITAZENE OVERDOSE IN DUBLIN- EMERGENCY RESPONSE

- 9 November 2023: Health Service Executive Ireland notified of an unusually high pattern of opioid overdoses occurring in Dublin CBD among people attending homeless services
- Reflected early signs of drug market changes and the emergence of *N*-pyrrolidino protonitazene
- 57 overdoses in 5 days among people who use heroin in Dublin CBD[1]
- Rapid responses helped to protect PWUD through an urgent analytical review of samples, mobilisation of frontline services to deliver tailored harm reduction measures, and ‘Red Alert’ risk communications
- Takeaways:
  - These substances can emerge without warning
  - Outbreaks require urgent responses and preparedness

1. Killen, N. et al. The emergence of nitazenes on the Irish heroin market and national preparation for possible future outbreaks. https://onlinelibrary.wiley.com/doi/10.1111/add.16525 (Accessed February 2025).

POTENT SYNTHETIC OPIOIDS ADVISORY GROUP (PSOG)

- Victorian working group formed July 2024 in response to increasing concern from the sector
- 25+ members: VAADA (Secretariat support), HRVic, Burnet Institute, MARC, The Loop, Penington, CoHealth, Alfred Health, Youth Projects, Barwon Health, Launch housing, RAPID, ADF, VIFM, paramedics



PSOG OBJECTIVES

- **Detect and monitor** information on potential signals of potent synthetic opioids (and other relevant substances) identified by Victorian drug monitoring systems and other intelligence.
- Develop protocols and **information dissemination mechanisms** to alert peers and harm reduction services.
- Facilitate **rapid and optimal responses** to changes in substance use patterns and other high-risk signals in relation to potent synthetic opioids.

Image credit: *theage.com.au*

PSOG ACTIVITIES

- Online reporting form to monitor community signals
- Developing individualised service responses to potential outbreak
- Fortnightly meetings and WhatsApp to stay informed
- Unique to Australia
- Ability to rapidly reach PWUD

SUMMARY

- NPS market constantly evolving and expanding, increasing drug adulteration
- Huge concern globally with devastating impacts
- Often adulterated, unknown exposures => higher fatality risk for **huge** at-risk population
- Need to be prepared to rapidly respond to the imminent threat of an outbreak- particularly with changes in international drug market

CONCLUDING THOUGHTS

*"**The future drugs of abuse will be synthetics** rather than plant products.*

– G.L Henderson, J Forensic Sci, 1988

[1] Henderson GL. Designer drugs: past history and future prospects. J Forensic Sci. 1988;33:569–75.

CONCLUDING THOUGHTS

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[1] Henderson GL. Designer drugs: past history and future prospects. J Forensic Sci. 1988;33:569–75.

ACKNOWLEDGEMENTS

Jennifer Smith, Courtney Weber, Rebekka Syrjanen, Lachlan Scully, Katherine Isoardi, Jessamine Soderstrom, Daniel Fatovich, Shaun Greene, and all EDNA & EDNAV Investigators

vaada
Victorian Alcohol & Drug Association

EDNAV
Emerging Drugs Network Of Australia VIC

RPH Research Foundation

Perkins
HARRY PERKINS INSTITUTE OF MEDICAL RESEARCH

CCREM
Centre for Clinical Research in Emergency Medicine

Department of Health
GOVERNMENT OF WESTERN AUSTRALIA

THE UNIVERSITY OF WESTERN AUSTRALIA

Health
Central Adelaide Local Health Network
Government of South Australia

Government of Western Australia
Mental Health Commission

VIFM
VICTORIAN INSTITUTE OF FORENSIC MEDICINE

Metro South Health

Curtin University

peer based harm reduction wa

Government of Western Australia
East Metropolitan Health Service

ROYAL HOBART HOSPITAL

LIVERPOOL HOSPITAL
Established 1813

Austin HEALTH

Royal Adelaide Hospital

Royal Perth Hospital

theAlfred

NHS
The Princess Alexandra Hospital
NHS Trust

ST VINCENT'S HOSPITAL
SYDNEY

NSW GOVERNMENT Health Pathology

Chem Centre
EXPERT SOLUTIONS

NSW GOVERNMENT Health Pathology

FORENSIC SCIENCE SA

Queensland Government

THE UNIVERSITY OF SYDNEY

NCCRED

VICTORIAN INSTITUTE
OF FORENSIC MEDICINE

THANK YOU

Jennifer.schumann@vifm.org

MONASH University