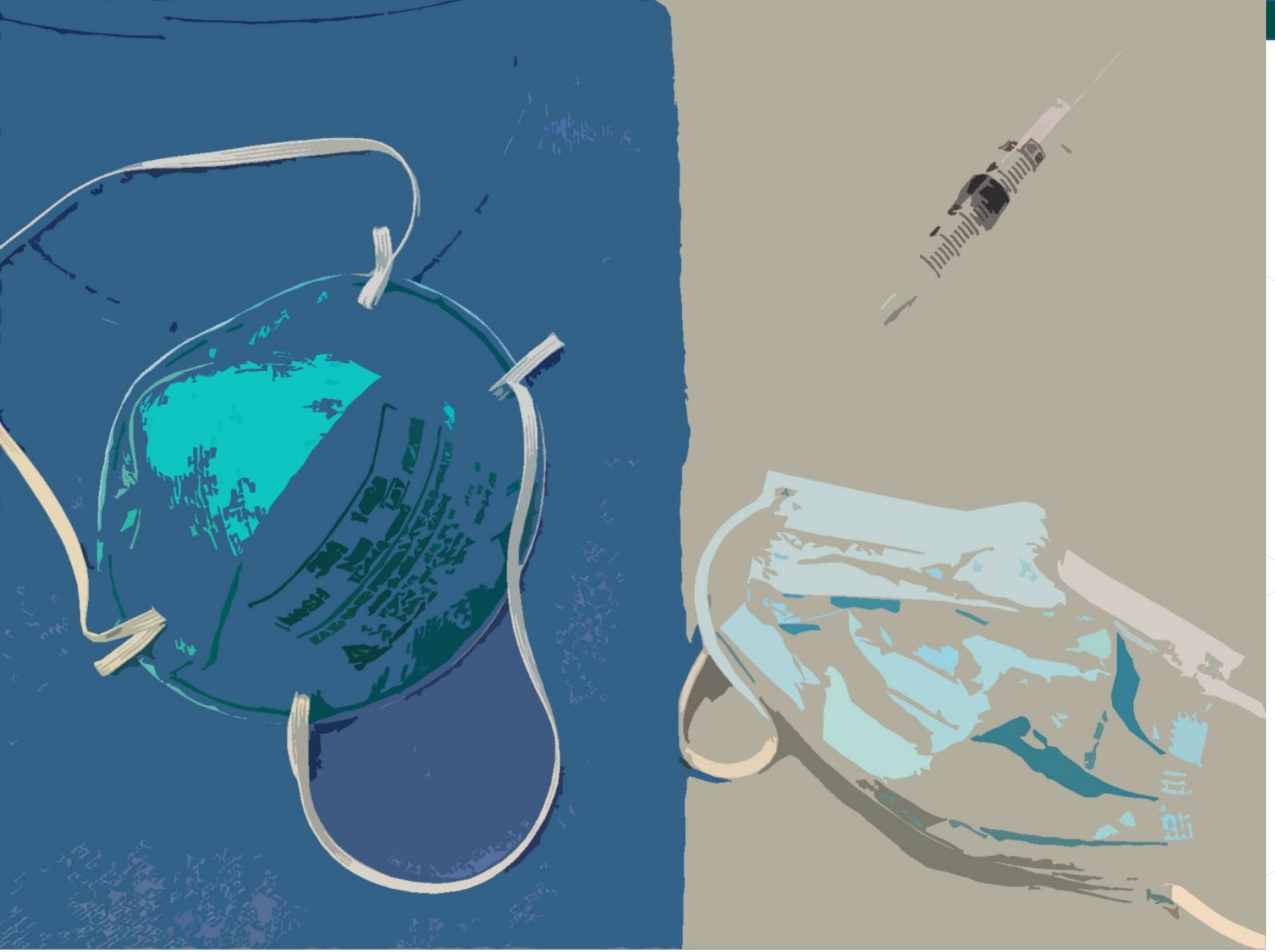

The impact of the COVID-19 pandemic on acute toxicity related to recreational drug abuse presenting to emergency departments

2019冠狀病毒大流行對急症室處理急性毒品中毒的影響

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Acknowledgements and disclosures
鳴謝及利益申報

- Supported by the Beat Drugs Fund (Project Reference No. BDF210069)
  獲禁毒基金資助（項目編號 BDF210069）

- Ethics approval
  - HKU/HA HKW IRB UW 22-544
  - HA Kowloon Central/Kowloon East Cluster KC/KE-22-0138/ER-4

  研究已通過道德審查
  - 香港大學／醫院管理局港島西聯網研究倫理委員會 UW 22-544
  - 醫院管理局九龍中／九龍東聯網研究倫理委員 KC/KE-22-0138/ER-4

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Content 內容

- Background
  研究背景
- Methods
  研究方法
- Key findings
  主要發現
- Discussion and conclusions
  討論和結論

Background 背景 (1)

- The COVID-19 pandemic has brought many changes in drug production, trafficking and consumption[1]

  2019冠狀病毒病大流行對毒品需求、供應和販毒影響深遠

- Drug users have increased stress, more free time and boredom, fewer socialising events

  吸毒者面對更大的生活壓力，同時更加寂聊及較少有社交活動的機會

1. UNODC. World Drug Report 2021

Background 背景 (2)

- Limited access to drug rehabilitation services and treatment in many countries
  在很多國家，疫情限制有需要人士使用戒毒治療和復康服務

- Heterogeneous shift in drug use pattern across different regions and periods of the pandemic but the impact in Hong Kong is not well-studied
  藥物濫用的模式在不同地區及疫情不同的階段有不同的變化，但本港缺乏相關的研究

Knowledge gaps 知識缺口 (1)

- How does the pandemic affect the trends and characteristics of patients who present to EDs with acute toxicity related to the abuse of amphetamines, cocaine, cannabis, heroin or ketamine in Hong Kong?

  冠狀病毒大流行如何影響在香港因濫用安非他明(冰毒)、可卡因、大麻、海洛英及氯胺酮引致急性中毒而被送至急症室的個案趨勢及臨床特徵？

- Is there any impact of the pandemic on ED intervention, including psychosocial intervention and referral to drug rehabilitation services and treatment?

  冠狀病毒大流行是否影響急症室處理濫藥急性中毒後的治療，包括精神心理治療及戒毒治療和復康服務的轉介？

Knowledge gaps 知識缺口 (2)

- Unique opportunity to observe the impact of closure of social and recreational venues and social distancing measures on drug use and toxicities

  2019冠狀病毒病大流行亦提供一個特別的機會去觀察關閉社交及娛樂場所和社交距離措施對濫藥和相關中毒的影響

Study objectives 研究目標

1. To characterise the trends and patterns in acute toxicity related to amphetamine, cocaine, cannabis, heroin and ketamine abuse presenting to EDs in HK during the pandemic
   分析香港在冠狀病毒大流行期間，濫用冰毒、可卡因、大麻、海洛英及氯胺酮引致急性中毒送至急症室的個案趨勢和濫藥模式

2. To evaluate the practice of ED interventions, including psychosocial interventions, and referral to substance abuse services during the pandemic

   評估冠狀病毒大流行期間，急症室的介入措施，包括精神心理治療和戒毒服務的轉介

Methods 研究方法 (1)

- Retrospective study 回顧性研究

- All consecutive patients reported to the **Hong Kong Poison Control Centre** (HKPCC) by all accident and emergency departments (A&Es) in HK
  所有本港公立醫院急症室呈報至香港中毒控制中心的個案

- Study period: 23 Jan 2017 to 22 Jan 2023
  研究時期：二零一七年一月二十三日至二零二三年一月二十二日

Methods 研究方法 (2)

- Pooled data from our previous research BDF190053
  匯集前次研究 BDF190053 的數據

- Drug use defined based on clinical diagnosis +/- immunoassay or laboratory confirmation
  根據臨床診斷及化驗結果判斷所濫用的毒品

Data collection 數據收集 (1)

- Case identified and retrieved from the HKPCC poison database
  從HKPCC的資料庫中辨識並提取相關個案
- Review of electronic medical records
  回顧電子醫療記錄
- Parallel data entry
  平行資料輸入法
- Standardised coding manual
  標準的資料輸入法則及指南

Data collection 數據收集 (2)

- Verification by clinical toxicologists
  經由臨床毒理學家核對
- Poison Severity Score (PSS) for rating of the severity of acute toxicity
  以中毒嚴重度評分（PSS）評估病人中毒的程度
- AAPCC Outcome ranking
  - No effect, mild effect, moderate effect, major effect, death

  美國中毒防控中心協會（AAPCC）之結果評分
  - 沒有影響、輕微影響、中度影響、嚴重影響、死亡

Definition of social and recreational venues
社交及娛樂場所的定義

Group 組別	Premises 場所
Group 1 組別1	1. Amusement game centres 遊戲機中心 2. Places of amusement 遊樂場所 3. Places of public entertainment 公眾娛樂場所 4. Fitness centres 健身中心 5. Sports premises 體育處所 6. Beauty parlours 美容院 7. Club-houses 夜店 8. Mahjong-tin kau premises 麻將天九耍樂場所 9. Massage establishments 按摩院 10. Cinemas 電影院
Group 2 組別2	1. Bars or pubs 酒吧 / 酒館 2. Nightclubs 夜總會 3. Karaoke establishments 卡啦OK場所 4. Party rooms 派對房間 5. Bathhouses 浴室

Data analysis 數據分析 (1)

- **Annual incidence 每年個案**

- **Correlation analyses (whole year data 2018-2022)**
  - CRDA statistics and drug seizure data from the Customs and Excise Department

相關分析 (整年資料 2018-2022)

- 藥物濫用資料中央檔案室的統計和海關的毒品緝毒數據

Data analysis 數據分析 (2)

- **Interrupted time series (ITS) analyses of the trends**
  間斷時間序列分析趨勢

- **72-monthly intervals**
  72個月的時間節點

- **Oxford Coronavirus Government Response Tracker (OxCGRT) Stringency Index** as a composite measure of social distancing measures
  牛津大學冠狀病毒政府反應追蹤系統 (OxCGRT Stringency Index)
  嚴格指數作為社交距離措施的綜合衡量標準

Oxford Coronavirus Government Response Tracker (OxCGRT) Stringency Index

- 9 Metrics 指標
  - School closures 停課
  - Workplace closures 停工
  - Cancellation of public events 取消公共活動
  - Restrictions on public gatherings 限制公眾聚會
  - Closures of public transport 公共運輸停運
  - Stay-at-home requirements 留家規定
  - Public information campaigns 公共資訊活動
  - Restrictions on internal movements 內部出行限制
  - International travel controls限制跨國旅行
- Score ranges from 0 to 100 (100 = strictest response最嚴格的政策措施)

Data analysis 數據分析 (3)

- **Univariate and multivariable logistic regression**
  - Change in drug use patterns, toxicities and outcome
  - The impact of the COVID-19 pandemic on clinical outcome

單變量及多變量的邏輯迴歸

- 濫藥模式、毒性及結果的改變
- 2019冠狀病毒大流行對臨床結果的影響

Results 結果

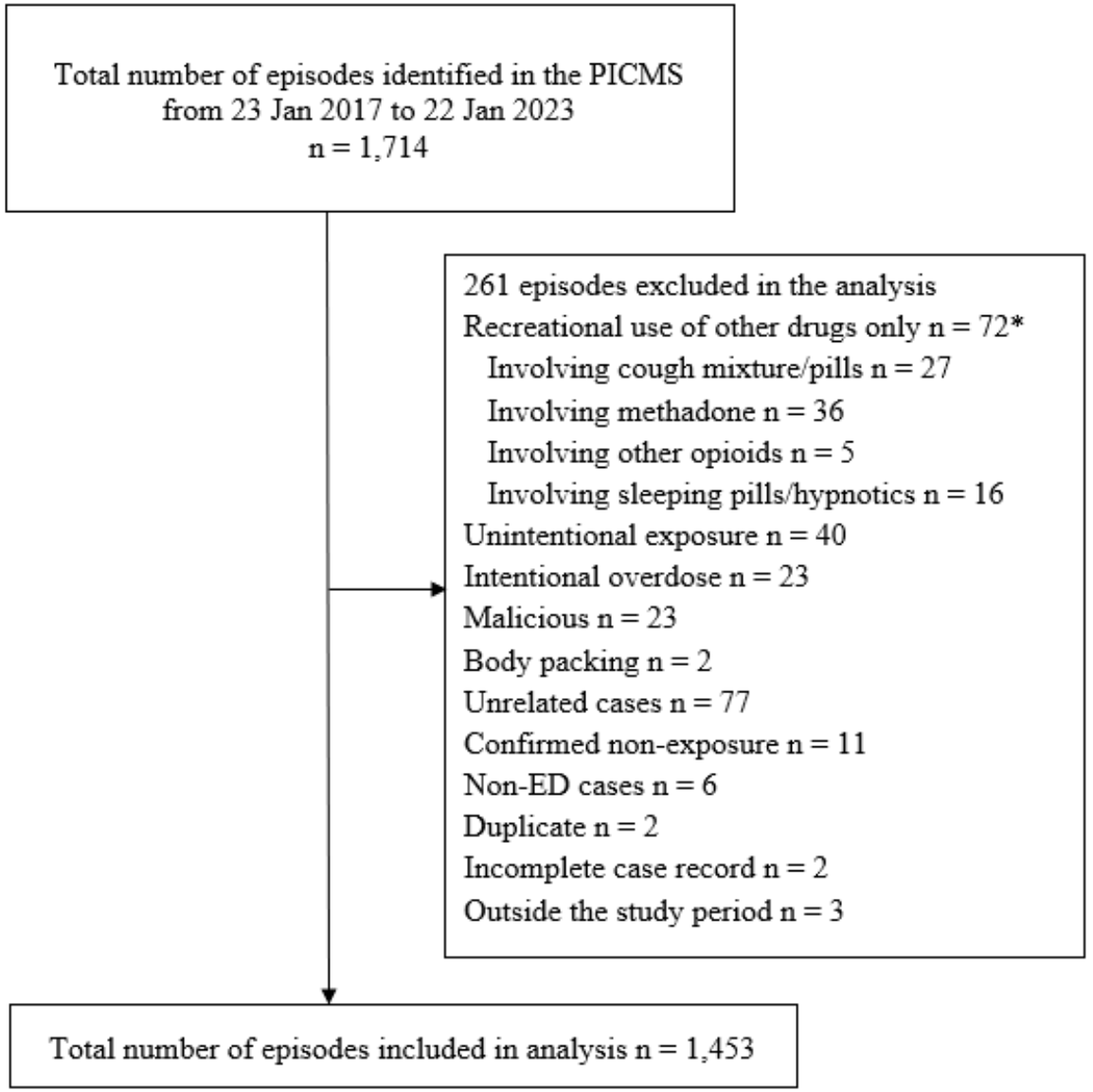


Figure 1. Patient flow diagram and reasons for exclusion

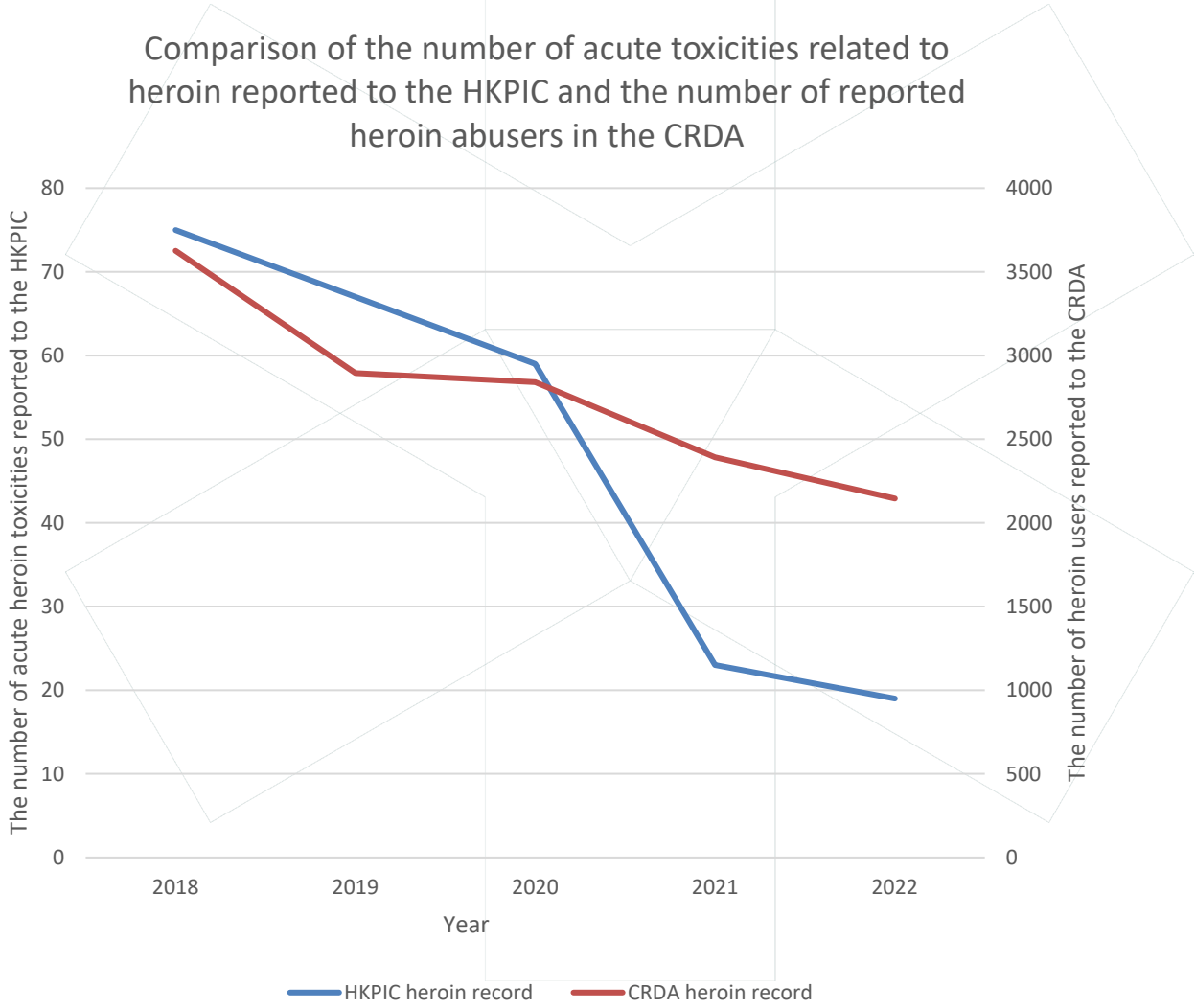
Annual incidence 每年個案

- Median annual incidence of acute toxicity per 100,000 ED attendances
  每年每十萬個急症室個案中出現相關急性中毒的中位數
  - Methamphetamine冰毒 **6.01 (IQR 4.36–7.16)**
  - Cocaine 可卡因 2.65 (IQR 2.36–3.17)
  - Cannabis 大麻 1.50 (IQR 1.26–2.39)
  - Heroin 海洛英 3.15 (IQR 1.22–3.65)
  - Ketamine 氯胺酮 1.24 (IQR 1.07–2.27)

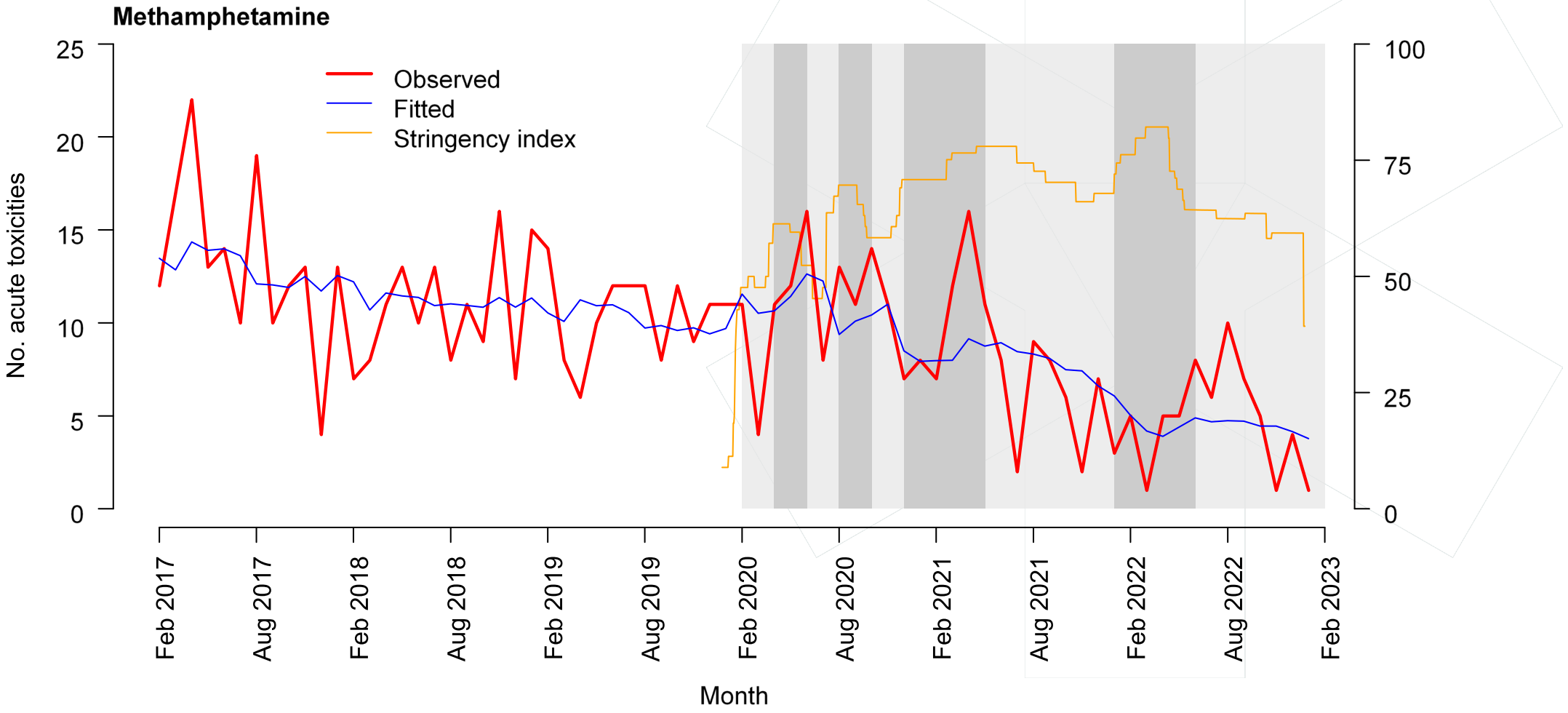
- Median annual incidence of drug-related ED visits per 100,000 population
  每年每十萬人中因濫藥問題被送至急症室人數的中位數
  - Methamphetamine冰毒 **1.69 (IQR 1.02–1.73)**
  - Cocaine可卡因 0.65 (IQR 0.59–0.78)
  - Cannabis 大麻 0.43 (IQR 0.32–0.54)
  - Heroin 海洛英 0.79 (IQR 0.28–0.95)
  - Ketamine 氯胺酮 0.35 (IQR 0.26–0.51)

Correlation analyses with CRDA and drug seizure data
藥物濫用資料中央檔案室的統計和海關的毒品緝毒獲數據的相關分析

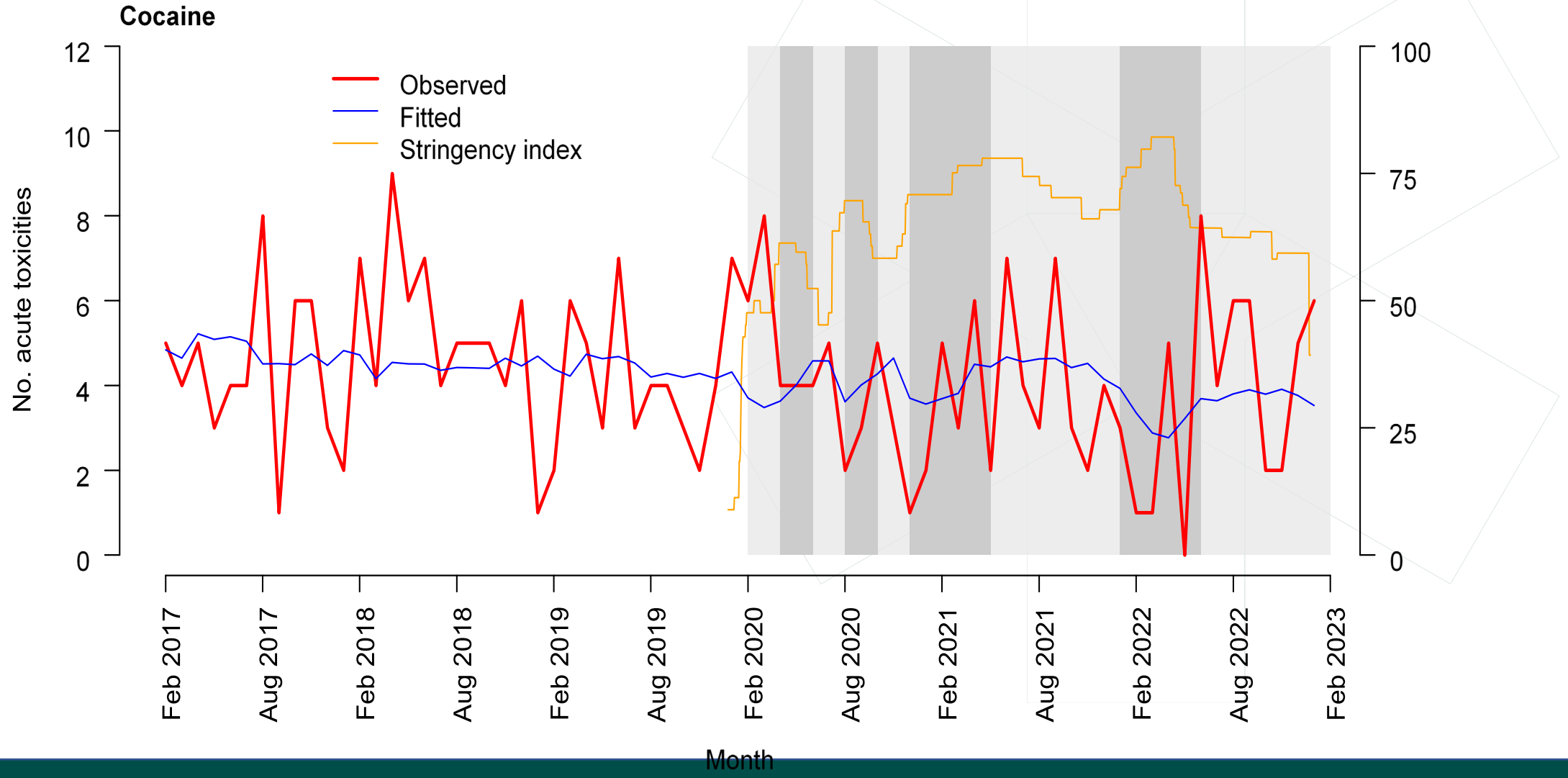
- **Methamphetamine** 冰毒
  - No significant correlation (沒有關聯性)
- **Cocaine** 可卡因
  - No significant correlation (沒有關聯性)
- **Cannabis** 大麻
  - No significant correlation (沒有關聯性)
- **Heroin** 海洛英
  - HKPIC and CRDA data had significant correlation (r=0.89, p=0.045)
- **Ketamine** 氯胺酮
  - No significant correlation (沒有關聯性)



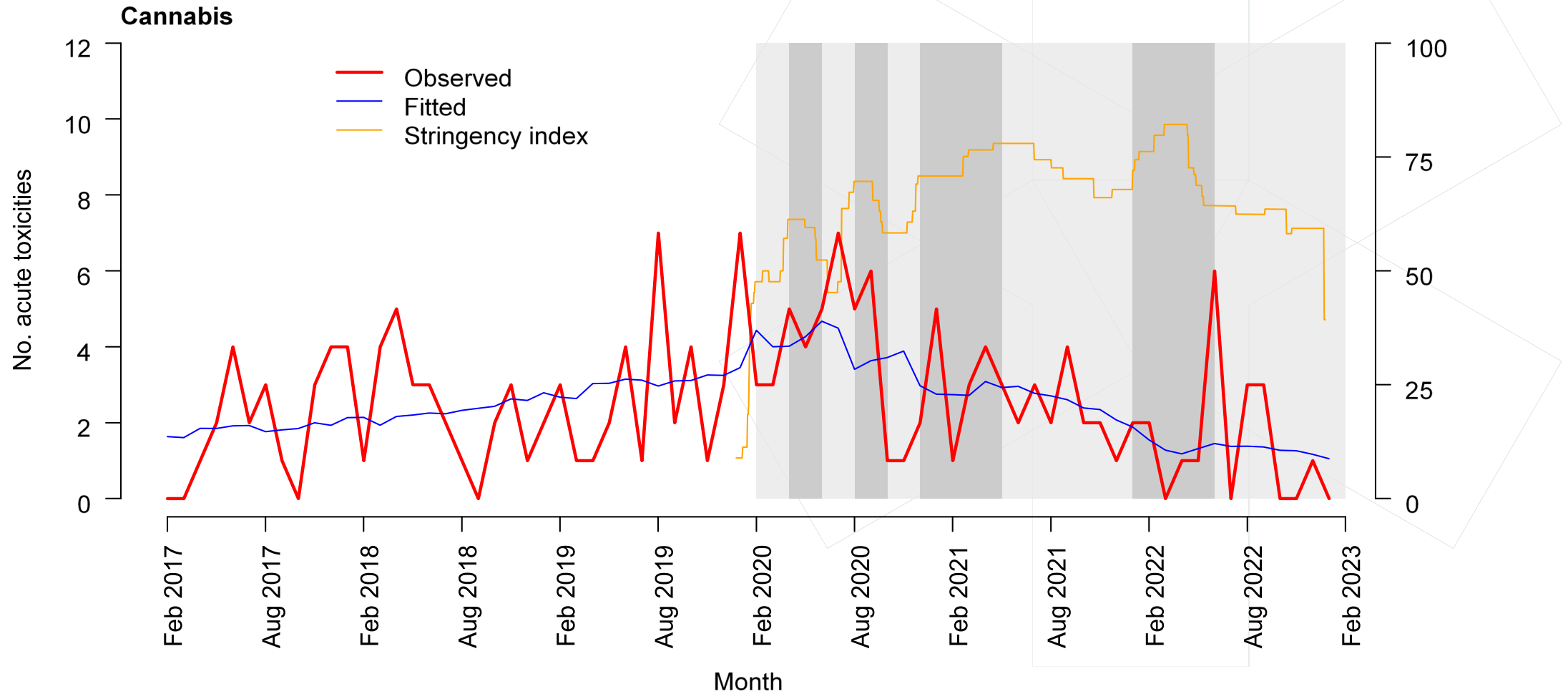
ITS analysis – Methamphetamine
間斷時間序列分析 - 冰毒



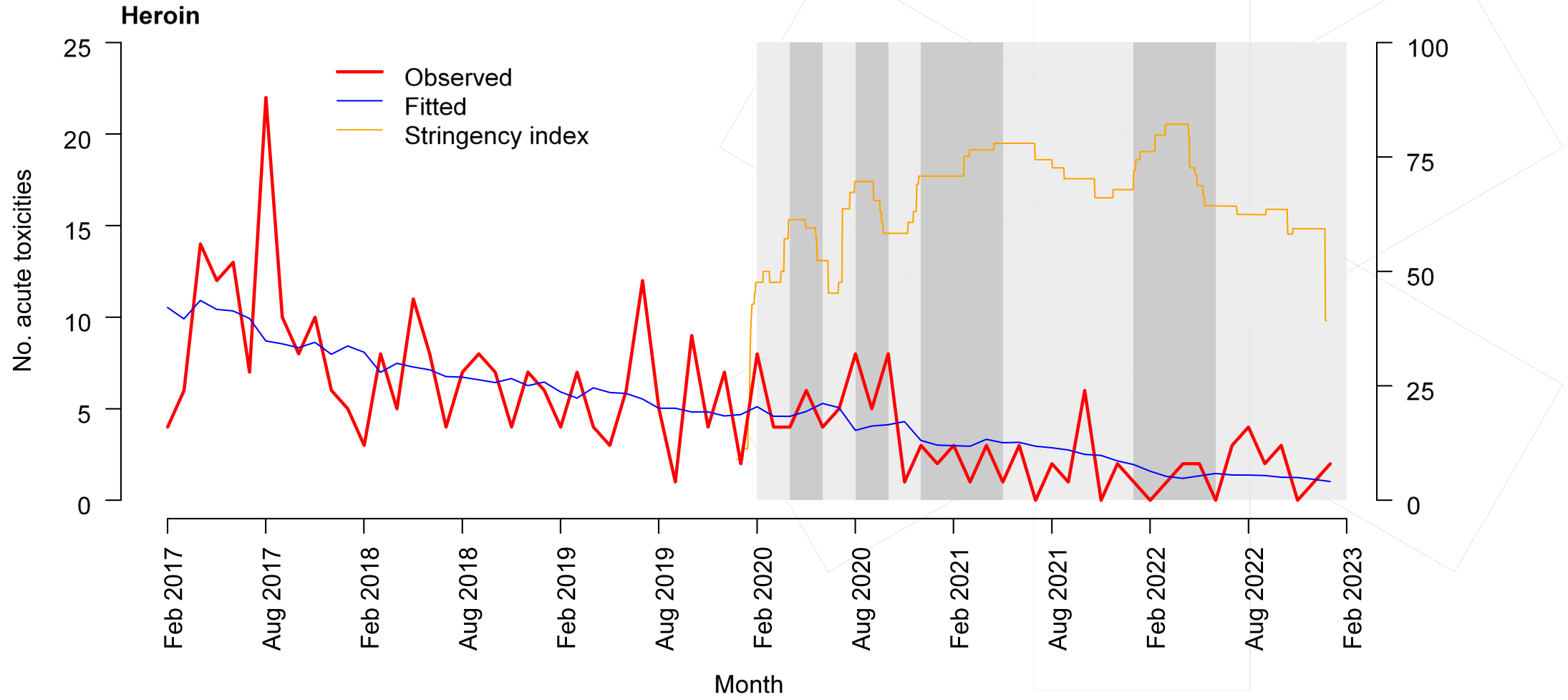
ITS analysis – Cocaine
間斷時間序列分析 - 可卡因



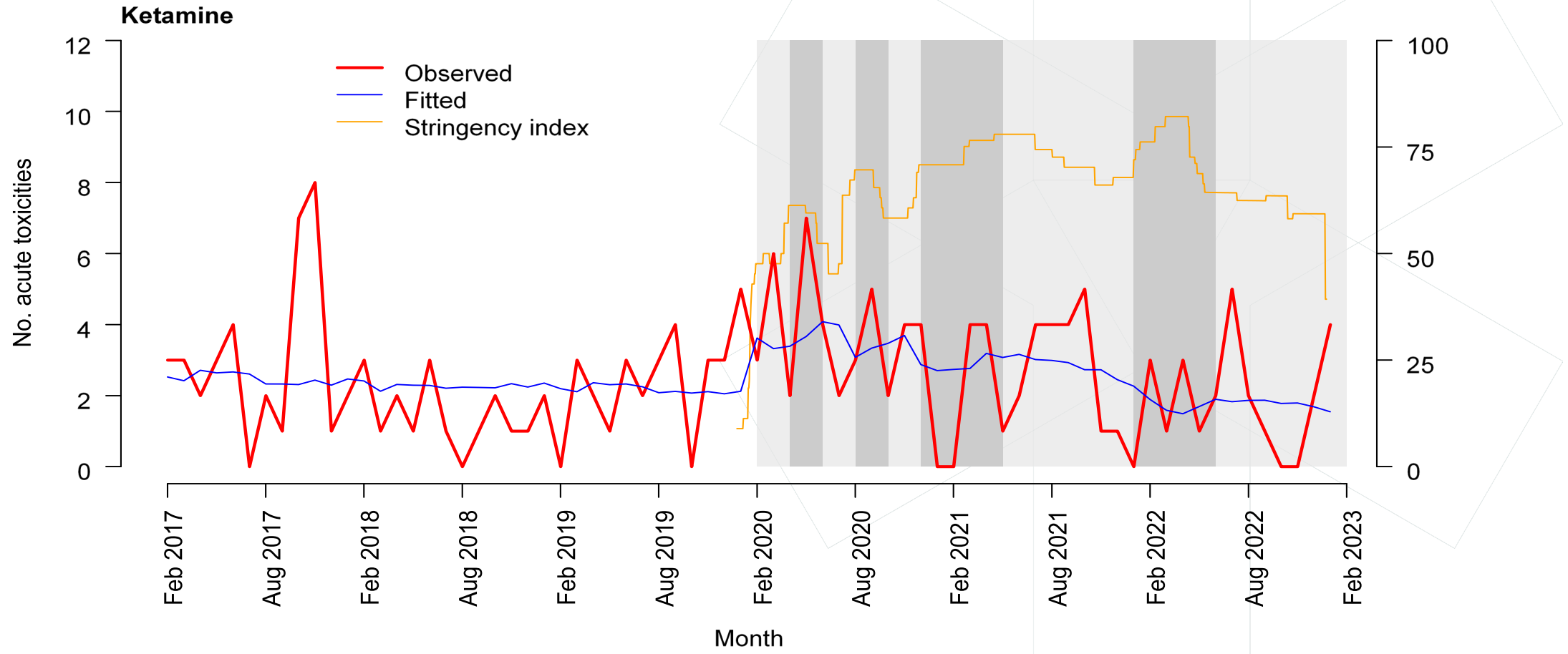
ITS analysis – Cannabis
間斷時間序列分析 - 大麻



ITS analysis – Heroin
間斷時間序列分析- 海洛英



ITS analysis – Ketamine
間斷時間序列分析- 氯胺酮



The impact of the COVID-19 pandemic on the levels and trends of acute drug toxicities
疫情期間各種毒品急性中毒的短期增幅和趨勢

Acute toxicities 急性中毒	Level change增幅		Trend change趨勢	
	RR	P value	RR	P value
Methamphetamine 冰毒	5.11	<0.001	0.97	<0.001
Cocaine* 可卡因	1.49	0.410	1.00	0.769
Cannabis 大麻	23.57	<0.001	0.93	<0.001
Heroin 海洛英	4.77	0.011	0.97	0.045
Ketamine氯胺酮	6.50	0.003	0.98	0.122

Abbreviation: RR, relative risk

* Poisson regression was used due to instability of the negative binomial model

The impact of the COVID-19 pandemic and closure of Group 2 social and recreational venues on acute drug toxicities
疫情期間關閉社交及娛樂場所對急性中毒情況的影響

Acute toxicities 急性中毒	Level change		Trend change		Group 2 social and recreational closure	
	RR	P value	RR	P value	RR	P value
Methamphetamine 冰毒	4.50	<0.001	0.97	<0.001	1.16	0.242
Cocaine* 可卡因	2.05	0.151	0.99	0.530	0.69	0.055
Cannabis 大麻	20.05	<0.001	0.94	<0.001	1.21	0.363
Heroin 海洛英	4.72	0.016	0.97	0.048	1.01	0.952
Ketamine氯胺酮	6.45	0.005	0.98	0.127	1.01	0.969

Abbreviation: RR, relative risk

* Poisson regression was used due to instability of the negative binomial model

The impact of the COVID-19 pandemic and social distancing measures on acute drug toxicities
疫情期間社交距離措施對急性中毒情況的影響

Acute toxicities 急性中毒	Level change		OxCGRT	
	RR	P value	RR	P value
Methamphetamine 冰毒	1.33	0.383	1.00	0.311
Cocaine* 可卡因	1.88	0.120	0.99	0.274
Cannabis 大麻	0.77	0.679	1.02	0.060
Heroin 海洛英	4.38	0.003	0.98	0.012
Ketamine氯胺酮	3.70	0.026	1.00	0.545

Abbreviation: RR, relative risk

* Poisson regression was used due to instability of the negative binomial model

In summary 總結 (1)

- Methamphetamine, cannabis, heroin
  - Initial increase in acute toxicities in the pandemic, but then decreased faster than the pre-pandemic period

冰毒、大麻、海洛英

  - 急性中毒的個案在疫情的初期上升，然後對比疫情前迅速下降

- Cocaine
  - No significant changes

可卡因

  - 沒有明顯變化

In summary 總結 (2)

- Ketamine
  - Initial increase in acute toxicities in the pandemic, then followed a similar trend as the pre-pandemic period

氯胺酮

  - 急性中毒的個案在疫情的初期上升，然後走勢持續

- Closure of Group 2 social and recreational venues appeared to have a limited impact

關閉組別2的社交及娛樂場所的影響有限

- The Stringency Index was associated with reduced acute heroin toxicities

社交距離措施與減少海洛英的急性中毒有關

Implications 影響 (1)

- Resilience of the drug market 毒品市場對公共衛生措施的有一定的抗壓性
- Increasing hidden drug use 隱閉吸毒可能增加
- Limited impact of the closure of social and recreational venues
  關閉社交和娛樂場所對吸毒的影響有限
- Reduced number of methamphetamine and heroin toxicities DID NOT translate into a lower severity of poisoning.
  冰毒和海洛英中毒個案的減少並不意味著中毒嚴重程度的降低
- In particular, the combination of heroin and methamphetamine is worrying.
  海洛英和冰毒的組合令人擔憂

Implications 影響 (2)

- Cocaine 可卡因
  - More myocardial injuries and major effects during the pandemic
    在疫情期間有更多的急性心肌損傷和嚴重影響
- Cannabis 大麻
  - More female patients with acute toxicities presenting to the ED during the pandemic -> gender-specific research and education
    在疫情期間更多女性病人因急性中毒進入急症室 -> 針對性別的研究與教育
- Ketamine 氯胺酮
  - Increased number and similar trend during the pandemic
    疫情期間數量增加且趨勢持續
  - Polydrug use with other stimulants was common
    常見與多種藥物及其他興奮劑一起使用

Implications 影響 (3)

- No significant changes in ED clinical management of acute recreational drug toxicities during the pandemic

  疫情期間急診室對急性濫藥中毒的臨床治療沒有顯著變化

- The pandemic did not have a negative impact on psychosocial interventions, referral to social workers and NGO drug rehabilitation and treatment services

  疫情並未對精神心理治療、社工以及非政府組織戒毒治療服務轉介產生負面影響

- Such referrals can be further strengthened

  相關轉介可進一步加強

Implications 影響 (4)

- Presentation during the COVID-19 pandemic was not associated with a worse clinical outcome for acute methamphetamine, cocaine, cannabis, heroin and ketamine toxicities, after adjusting for confounding variables

在調整其他混雜的變數後，COVID-19與急性冰毒、可卡因、大麻、海洛英和氯胺酮中毒較差的臨床預後沒有統計學上的關聯

Strengths of the study 本研究之優勢

- First local study to evaluate the impact of the COVID-19 pandemic on acute recreational drug toxicities

  第一個本地研究去評估2019冠狀病毒大流行對濫藥急性中毒的影響
- Territory-wide data with a consistent reporting mechanism

  全港數據及一致的通報機制
- Long time scale to evaluate the full impact of the whole pandemic

  長時間區間來評估整個大流行的全面影響
- Full access to electronic health records of all included cases

  回顧所有個案的電子醫療記錄
- Data quality assurance

  數據品質保證

Limitations of the study 本研究之局限 (1)

- Retrospective design 回顧性研究
  - Missing data, errors in recording, mis-interpretation, information bias

    資料缺失、錯誤記錄、誤解、資料偏見
- Reliance on clinical judgement 依賴臨床判斷
  - Not all cases had toxicology screen 非所有病例都進行毒理學篩檢
  - Under-reporting of novel psychoactive substance is likely 新型精神活性物質可能有漏報狀況
- Not all recreational drug toxicities were reported to the HKPCC but the reporting mechanism was consistent throughout the study period

  並非所有急性中毒個案均呈報 HKPCC，但報告機制在整個研究期間保持一致
- Impact of the pandemic on the use of different forms of drug (e.g. crack vs powdered cocaine) not studied

  並未針對大流行對不同形式毒品（如純可卡因與粉狀可卡因）濫用的影響

Limitations of the study 本研究之局限 (2)

- Polysubstance use might confound some of our observations

  多種藥物濫用可能會混淆我們的一些觀察結果

- Not possible to assess the severity of addiction of included patients – the pandemic might have different impact on chronic users and causal users

  無法評估納入的患者成癮的嚴重程度—冠狀病毒大流行可能對長期吸毒者和偶爾使用者有不同的影響

- The impact of individual waves of the COVID-19 pandemic was not studied

  未有研究2019冠狀病毒大流行的個別階段的影響

Future research 未來研究

- Trends in the drug use pattern and clinical presentations of acute toxicities in the aftermath of the Pandemic

  疫情後濫藥模式的趨勢和急性中毒的臨床表現

  - More combination of heroin and methamphetamine?
    更多同時使用海洛英及冰毒?
  - More acute myocardial injury due to cocaine?
    更多因吸食可卡因導致急性心肌損傷的出現?
  - Resurgence of the popularity of ketamine?
    氯胺酮再次流行？
  - More female cannabis drug users with acute toxicities?
    更多女性大麻濫用者急性中毒?

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THE END 完
Thank you! 謝謝！

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Supplementary slides

	2017 (from 23 Jan 2017)	2018	2019	2020	2021	2022	2023 (up to 22 Jan 2023)
MDMA	12	5	9	16	6	8	0
Phenylethylamines							
PMMA/PMA	2	0	0	2	0	0	0
2-FEA/3-FEA/4-FA	0	0	1	0	0	0	0
2C-B	0	0	0	1	0	0	0
Synthetic cathinones							
N-cyclohexylmethylone/ Dibutylone/ Ethylone/ Eutylone/ Pentylone	1	1	1	4	0	0	1
Tryptamines							
5-MeO-MiPT/ 5-MeO-DET	0	1	0	0	0	0	0
Psilocin (magic mushroom)	0	0	0	0	1	0	0
Piperazines							
TFMPP	1	0	0	0	0	0	0
Phencyclidines							
2-oxo-PCE	20	2	0	2	0	0	0
DCK	0	0	0	2	0	0	0
Fluoro-2-oxo-PCE	0	0	0	0	0	0	1
2F-DCK	0	0	0	3	0	0	0
Tiletamine	0	0	1	0	4	2	0
Novel benzodiazepines							
Etizolam	0	0	0	1	0	0	0
Novel opioids							
Fentanyl	0	0	0	0	0	1	0
Protonitazene	0	0	0	0	0	1	0
Synthetic cannabinoids							
5F-MDMB-PICA	1	0	0	0	0	0	0
Other substances							

Change in drug use pattern, toxicities, interventions and outcome – **Methamphetamine**
濫藥模式、中毒表徵、臨床治療的變化 – **冰毒(1)**

- Pre-pandemic period (412 episodes) vs pandemic period (275 episodes)
  疫情前（412個中毒個案）對比疫情期間（275個中毒個案）
- Compared to the pre-pandemic period, during the pandemic
  與疫情前比較，在疫情期間

- **Older patients (median age 37 vs 39 years)**
  病人年紀較大 (年齡中位數 37歲 vs 39歲)
- **More male**
  更多為男性 (71% vs 83%)
- **More social allowance recipients**
  更多為社會津貼領取者 (24% vs 32%)
- **Polydrug use more prevalent**
  多種藥物濫用更普遍 (11% vs 20%)

Change in drug use pattern, toxicities, interventions and outcome – **Methamphetamine**
濫藥模式、中毒表徵、臨床治療的變化 – **冰毒 (2)**

- Compared to the pre-pandemic period, during the pandemic

  與疫情前比較，在疫情期間

  - **More agitation**

    更多煩躁表現 (30% vs 41%)
  - **More injuries and self-harm behaviours**

    更多受傷及自殘行為 (10% vs 16%)
  - **High proportions of death and major effects**

    更高的死亡及嚴重中毒比例 (4% vs 9%)
  - **More intensive care and organ support**, longer hospital stay

    更多重症監護和器官支持, (5% vs 10%) 較長留院時間
  - **More referral to social workers**

    更多需要轉介社工 (19% vs 28%)

Change in drug use pattern, toxicities, interventions and outcome – **Cocaine**

濫藥模式、中毒表徵、臨床治療的變化 - **可卡因**

- Pre-pandemic period (164 episodes) vs pandemic period (142 episodes)
  疫情前（164個中毒個案）對比疫情期間（142個中毒個案）
- Compared with the pre-pandemic period, during the pandemic
  與疫情前比較，在疫情期間
  - More social allowance recipients更多社會津貼領取者 (4% vs 9%)
  - Fewer non-local residents 較少非本地居民 (10% vs 1%)
  - **Higher proportion of acute myocardial injury 更高急性心肌損傷比例 (5% vs 13%)**
  - More drowsiness 更多意識模糊 (15% vs 25%)
  - **Higher proportion of major effects 更高的嚴重中毒比例 (2% vs 11%)**
  - **More ICU admission** and longer hospital stay **更多重症監護(4% vs 13%)**和較長留院時間
  - More patients discharged against medical advice or left before or after consultation 更多病人不遵醫囑自動出院 (20% vs 34%)

Change in drug use pattern, toxicities, interventions and outcome – **Cannabis**

濫藥模式、中毒表徵、臨床治療的變化-**大麻**

- Pre-pandemic period (87 episodes) vs pandemic period (93 episodes)

  疫情前（87個中毒個案）對比疫情期間（93個中毒個案）

- Compared with the pre-pandemic period, during the pandemic

  與疫情前比較，在疫情期間

  - **More female patients 更多女性病人 (18% vs 36%)**
  - More ambulance transport 更多召喚救護車 (63% vs 77%)
  - less co-ingestion of alcohol 減少同時攝取酒精 (25% vs 11%)
  - No significant difference in drug use patterns, clinical presentations, outcome or ED interventions

    在濫藥模式、臨床表現、臨床治療及預後沒有明顯變化

Change in drug use pattern, toxicities, interventions and outcome – **Heroin**
濫藥模式、中毒表徵、臨床治療的變化- **海洛英**

- Pre-pandemic period (259 episodes) vs pandemic period (101 episodes)
  疫情前（259個中毒個案）對比疫情期間（101個中毒個案）
- Compared with the pre-pandemic period, during the pandemic
  與疫情前比較，在疫情期間
  - **More methamphetamine** and benzodiazepine use
    更多同時濫用冰毒 (15% vs 26%) 和苯二氮卓類 (16% vs 27%)
  - **More agitation, confusion and hallucination** leading to more chemical restraints
    更多的焦躁、混亂和幻覺導致更多需要藥物約束 (4% vs 10%)
  - **More psychiatric consultations** needed
    更多需要精神科會診 (21% vs 36%)

Change in drug use pattern, toxicities, interventions and outcome – Ketamine

濫藥模式、中毒表徵、臨床治療的變化- **氯胺酮**

- Pre-pandemic period (83 episodes) vs pandemic period (96 episodes)
  疫情前（83個中毒個案）對比疫情期間（96個中毒個案）
- Compared with the pre-pandemic period, during the pandemic
  與疫情前比較，在疫情期間
  - Older patients 病人年紀較大 (年齡中位數 31歲 vs 35歲)
  - More alcohol but fewer benzodiazepine use
  更多同時飲酒但濫用苯二氮卓減少
  - **Around 2/3 had >/= 2 drug co-ingestions 約2/3 同時吸食2種**或以上
  - **More violent behaviours 更多暴力行為 (1% vs 8%)**
  - No significant difference in clinical management and psychosocial interventions 在臨床和精神心理治療上沒有明顯變化