BDF190053 Acute toxicity related to psychoactive substance abuse and the impact of emergency department interventions on drug-related reattendance
濫用精神藥物引致的急性中毒及急症室介入對因濫藥而再度到急症室求診的影響

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  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（參考編號：UW 20-597）
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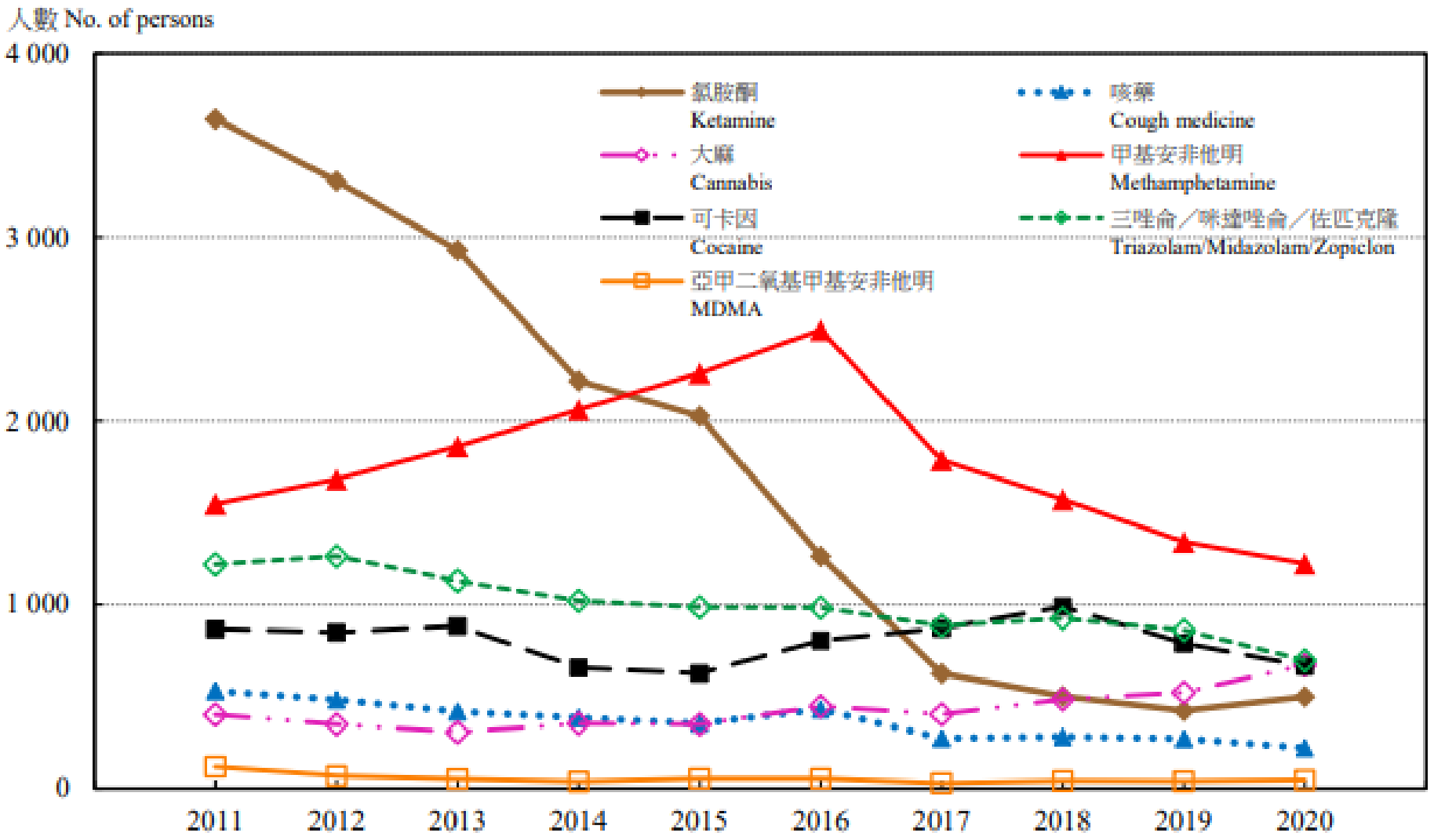
  - Our research team members 我們的研究團隊成員

Topics

- Overview
- Key findings of the research project
- Implications for anti-drug sector
- Key points to note during project implementation

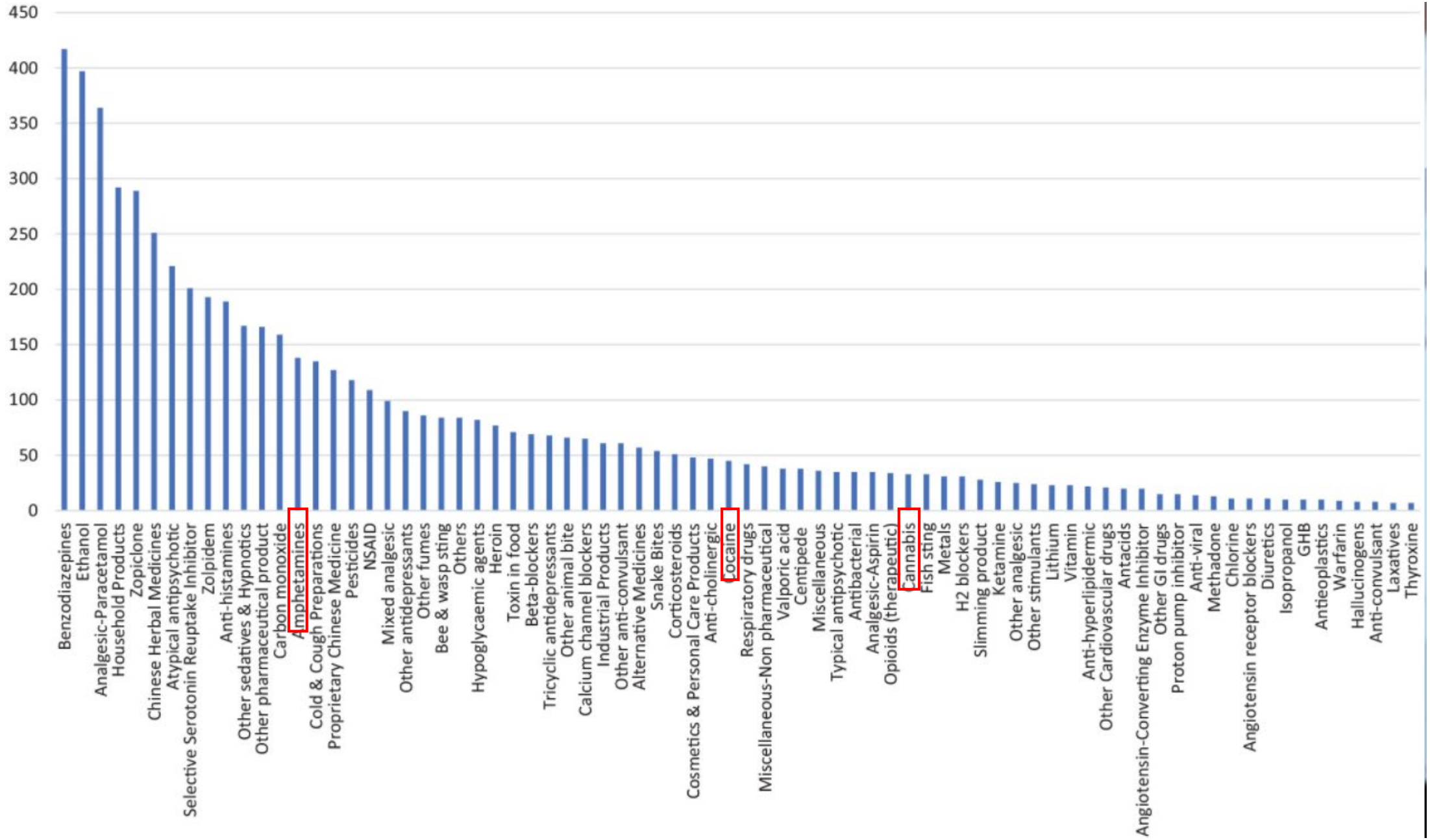
圖 2.5　被呈報吸食各種主要危害精神毒品者

Chart 2.5　Reported drug abusers of major types of psychotropic substances



Source: Central Registry of Drug Abuse 70th Report

藥物濫用資料中央檔案室第七十號報告書



Source: Hong Kong Poison Information Centre: Annual Report 2019

資料來源：香港中毒諮詢中心二零一九年年報

Knowledge gaps 知識缺口

- Trend and characteristics of acute toxicity related to **methamphetamine, cocaine and cannabis** in drug abusers presenting to emergency departments

  濫用**冰毒、可卡因及大麻**引致急性中毒而被送至急症室的吸毒者趨勢及臨床特徵

- Current practice ED interventions
  - Psychiatric consultation or referral
  - Referral to social workers and NGO anti-drug services

  急症室處理濫藥急性中毒後介入措施的現況
  - 提供精神科會診或轉介
  - 轉介予社工或提供戒毒服務的非政府機構

- Pattern of drug-related ED reattendance and risk factors for revisits

  因濫藥再次到急症室求診的臨床特徵及再度求診的風險因素

Study objectives 研究目標

- **Trends** over the past 10 years in HK

  香港過去十年的濫用冰毒、可卡因及大麻的趨勢

- **Patterns of drug use** – past, present, future

  吸毒者過往、目前、及往後使用毒品的模式

- **Harms** – characterized the presentations of acute toxicity and identify factors associated with a poor clinical outcome

  歸納急性中毒的臨床特徵及辨識導致器官受損的因素

- **Burden** – utilization pattern of health care services, ED reattendance due to drug-related problems and the associated risk factors

  對公營醫療服務負荷—因濫藥問題再次到急症室求診之吸毒者的臨床特徵及有關風險因素

- **Novel psychoactive substances** - 'designer drugs' or 'legal highs'

  新型精神活性物質

Methods 研究方法

- Retrospective study 回顧性研究

- All consecutive patients reported to the Hong Kong Poison Information Centre (HKPIC) by all accident and emergency departments in HK
  所有本港急症室呈報至香港中毒諮詢中心的個案

- Study period: 1 Jan 2010 to 31 Dec 2019
  研究期間：二零一零年一月一日至二零一九年十二月三十一日

- 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

- Case identified and retrieved from the HKPIC poison database
  從HKPIC的資料庫中辨識並提取相關個案
- Review of electronic medical records
  翻閱電子醫療記錄
- 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
- American Association of Poison Control Centers (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

Study outcomes 研究結果

- Primary outcome 主要分析目標
  - Time interval between the index ED attendance and the first ED reattendance for a drug-related problem

    指標急症室求診日期與第一次因濫藥而再到急症室求診日期的間距

- Secondary outcome 次要分析目標
  - a composite outcome of end-organ toxicities

    器官因濫藥而受損程度

Data analysis 數據分析(1)

- **Trend analysis** using a negative binomial regression model
  - Population-level estimates of annual incidence
  - Comparison with the number of drug users in the Central Registry of Drug Abuse (CRDA)
  - Correlation with the market value of the drugs seized by Customs and Excise Department in the same year

以負二項式分佈模型分析趨勢

- 估算出每年濫毒的新發率
- 與藥物濫用資料室中央檔案室（CDRA）的數據的相關性
- 與該年海關搜獲的毒品之市場價值的相關性

Data analysis 數據分析(2)

- **Descriptive analysis** of drug use patterns and harms
  - Univariate analysis to identify factors associated with severe complications
  - Multivariable logistic regression to identify independent predictors
  - The same procedure repeated for individual drugs

分析濫藥的臨床特徵及禍害

- 以單變量分析辨識引起嚴重併發症的因素
- 以多元邏輯斯迴歸分析辨識獨立預報因素
- 為冰毒、可卡因及大麻各種個別毒品重複同一步驟

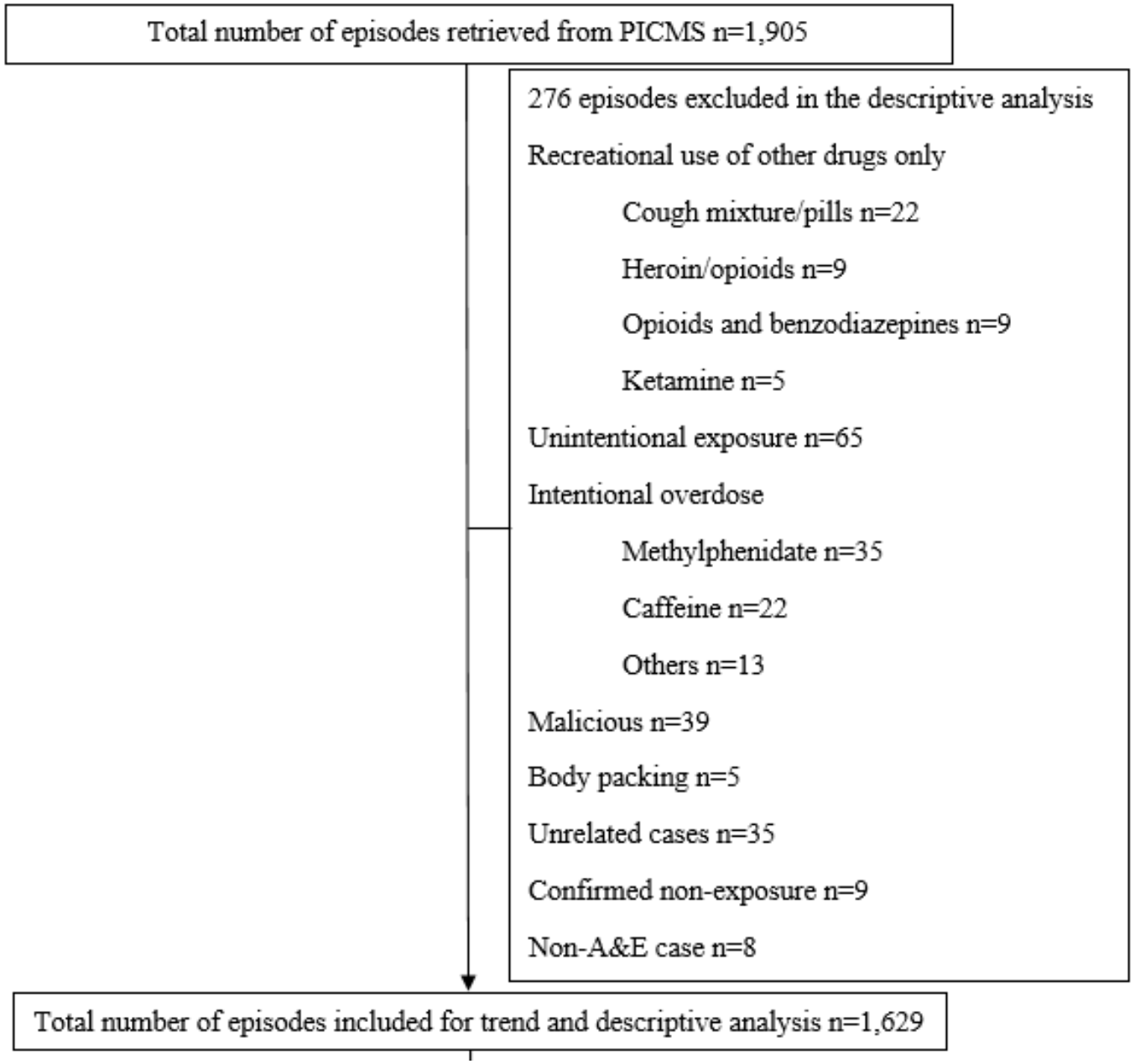
Data analysis 數據分析(3)

- **Reattendance**
  - Kaplan Meier curves to illustrate reattendance rate over time
  - Cox regression analysis to identify factors associated with ED revisits

再度入院率

- 以Kaplan Meier曲線圖顯示隨着時間變化的再度入院率
- 以Cox 迴歸分析辨識再度入院的因素

Results


Total number of episodes retrieved from PICMS n=1,905
276 episodes excluded in the descriptive analysis
Recreational use of other drugs only
Cough mixture/pills n=22
Heroin/opioids n=9
Opioids and benzodiazepines n=9
Ketamine n=5
Unintentional exposure n=65
Intentional overdose
Methylphenidate n=35
Caffeine n=22
Others n=13
Malicious n=39
Body packing n=5
Unrelated cases n=35
Confirmed non-exposure n=9
Non-A&E case n=8
Total number of episodes included for trend and descriptive analysis n=1,629

Trend analysis 趨勢分析

- 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 5.64 (IQR 4.14–6.72)
  - Cocaine 可卡因 1.32 (IQR 0.96–2.14)
  - Cannabis 大麻 0.67 (IQR 0.54–1.01)

- Median annual incidence of 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 1.63 (IQR 1.31–2.06)
  - Cocaine 可卡因 0.41 (IQR 0.30–0.60)
  - Cannabis 大麻 0.21 (IQR 0.17–0.30)

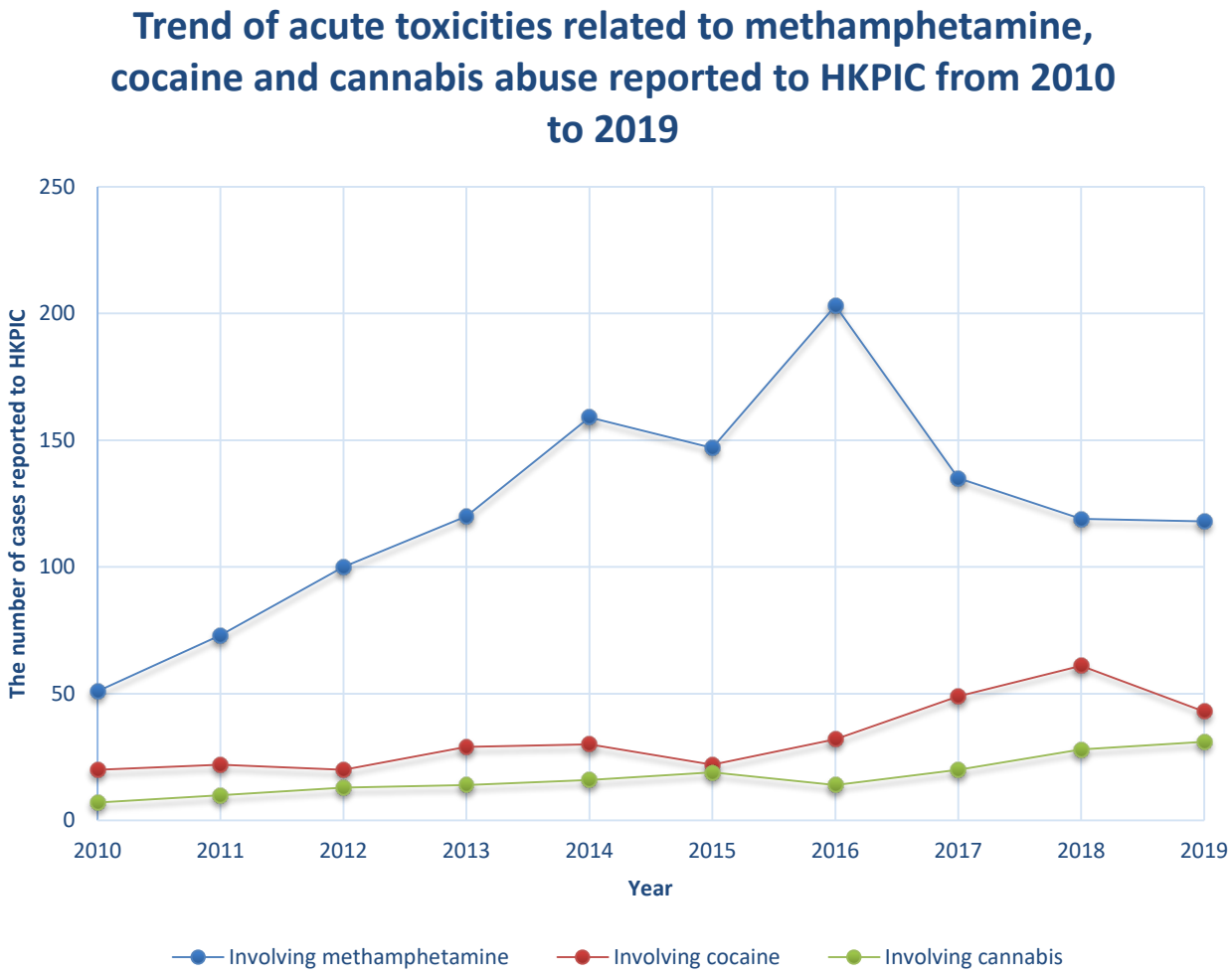
Overall trend 整體趨勢

- Acute toxicities that involved meth-amphetamine, cocaine and cannabis **did not** increase significantly during the study period

  過去十年濫用冰毒、可卡因及大麻而引致急性中毒的個案並**沒有**顯著上升

- For drug abusers ≤21 years old, no significantly increasing trend was observed for methamphetamine and cocaine; an upward trend was seen for cannabis

  21歲或以下濫用冰毒及可卡因的人數沒有顯著上升，但濫用大麻的則有上升趨勢

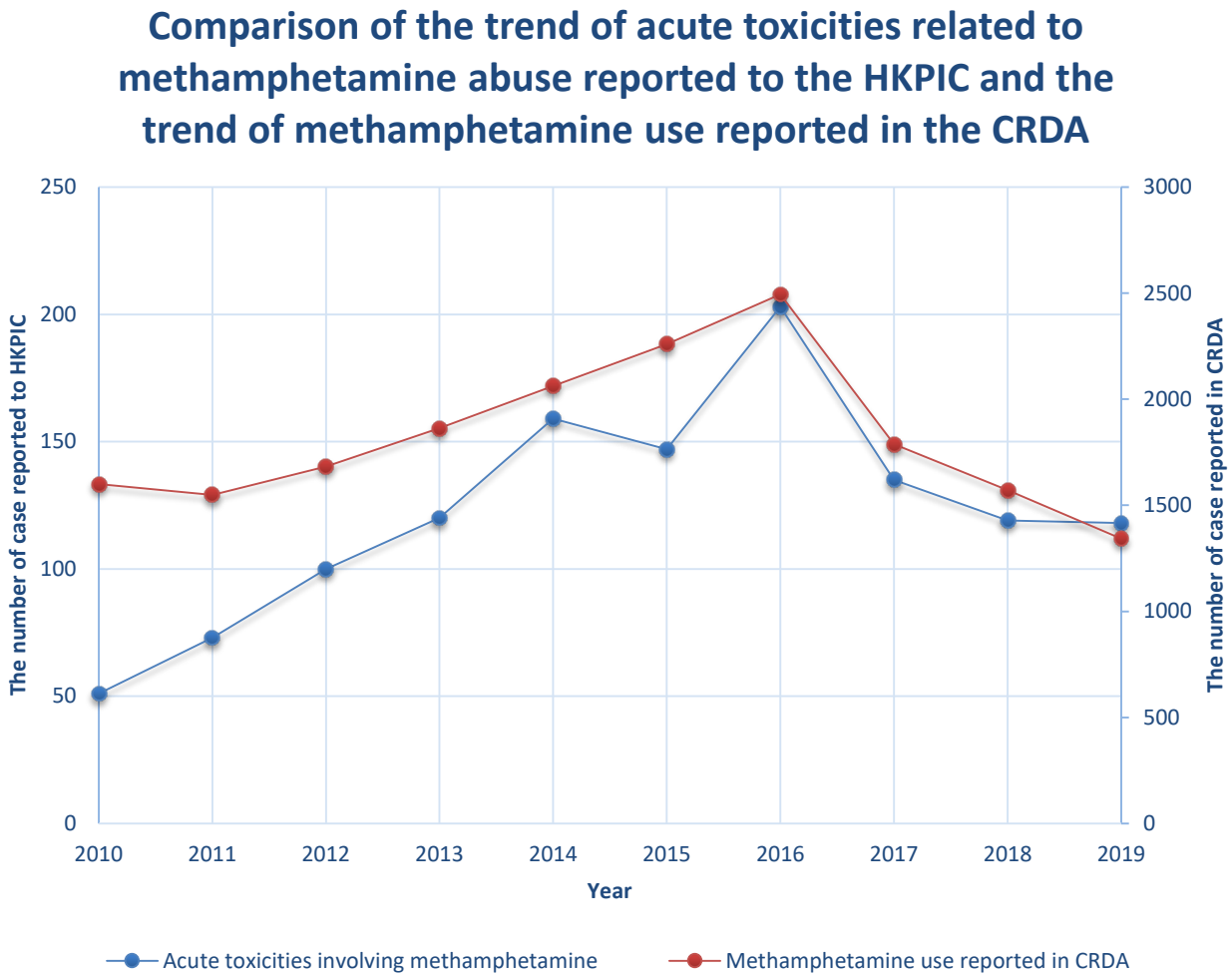


HKPIC vs CRDA data HKPIC與CDRA數據比較

- Strong correlation for meth-amphetamine (Spearman's rho 0.82, p=0.004) , but not for cocaine and cannabis

只有冰毒有高度的相關性

（Spearman's rho 0.82, p=0.004）

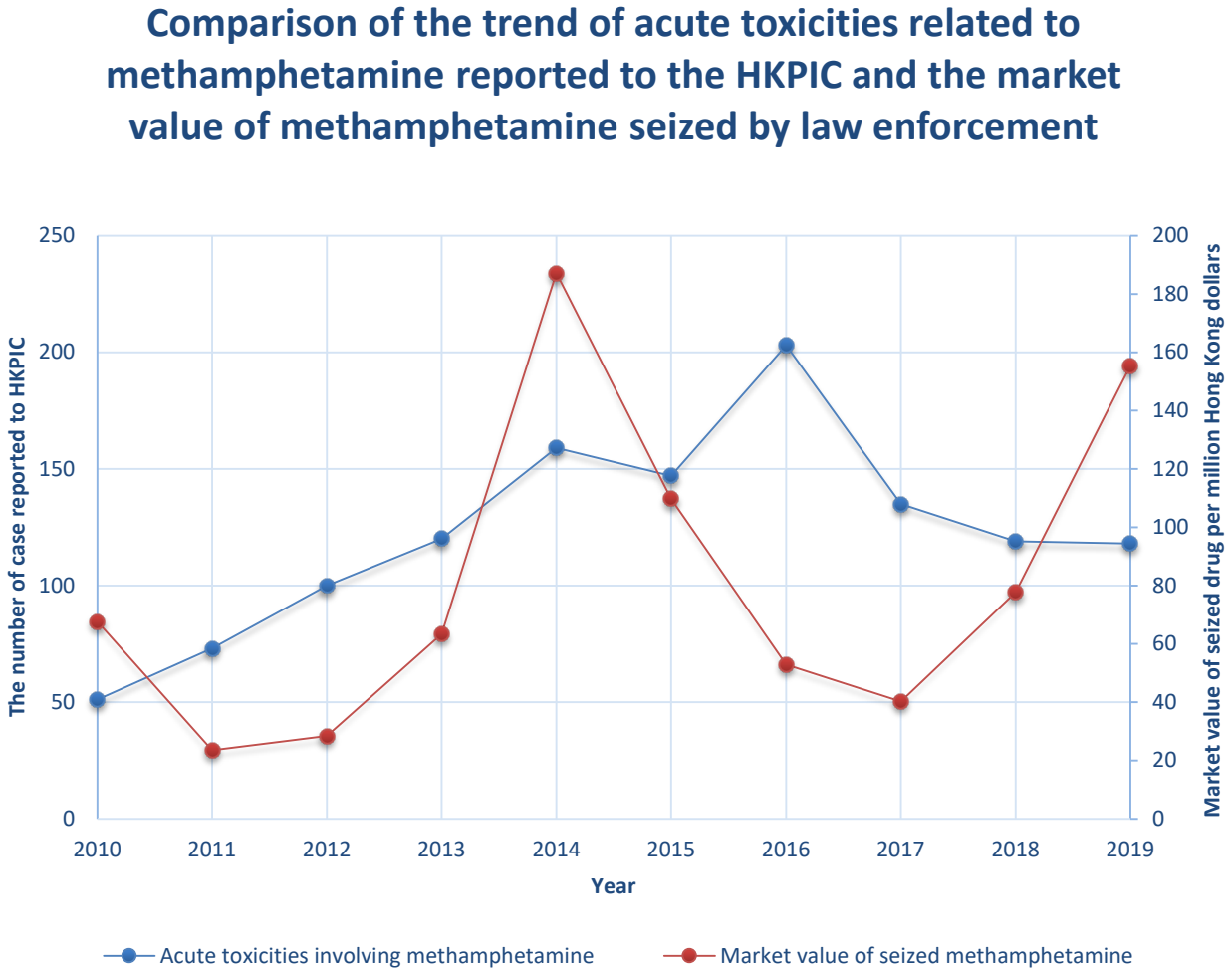


HKPIC vs drug seizure data HKPIC與緝毒數據比較

- Strong correlation for cannabis (Spearman's rho 0.87, p=0.001), but not for methamphetamine and cocaine

只有大麻有高度的相關性

（Spearman's rho 0.87, p=0.001）



Pattern and clinical presentations 臨床特徵

- 1,629 episodes, 1,348 patients involved
  - 1,168 (86.6%) had only one reported episode of methamphetamine, cocaine or cannabis abuse within the study period

1,629個中毒個案，共涉及1,348名病人
  - 1,168人（86.6%）在研究期間只被呈報過一次濫用冰毒、可卡因或大麻

- Median age at the time of presentation 32.0 years (IQR 25.0–39.0)

送至急症室時的年齡中位數為32歲（IQR 25.0–39.0）

- 70.6% were men

70.6%為男性

- 17.9% of episodes involved patients who received social allowance
  17.9%個案的病人有領取綜援金

- Ambulance transportation required in 1,191 (73.1%) episodes
  1,191（73.1%）個案需要救護車服務

- Individual groups 個別群體
  - Non-local residents such as tourists 非本地人士如遊客 73 episodes 個案 (4.5%)
  - Pregnant patients 孕婦 10 episodes 個案 (0.6%)
  - **MSM 男男性行為者** **56 episodes 個案 (3.4%)**

- Polysubstance abuse 同時濫用多種毒品 **>50%**
  - Involved 涉及
    - Methamphetamine 冰毒 (n=1,225)
    - Cocaine 可卡因 (n=328)
    - Cannabis 大麻 (n=172)

- Top 3 combinations of drugs **最常見的三種毒品使用組合**
  - Methamphetamine with alcohol 冰毒及酒精 (n=141, 8.7%)
  - Methamphetamine with ketamine 冰毒及氯胺酮 (n=116, 7.1%)
  - Methamphetamine with cough mixture冰毒及咳藥水 (n=109, 6.7%)

- Only one drug abused **只使用一種毒品**
  - Methamphetamine 冰毒 (n=605, 37.1%)
  - Cocaine 可卡因 (n=63, 3.9%)
  - Cannabis 大麻 (n=61, 3.7%)

19 NPSs in 24 episodes
24個個案中發現19種新型精神活性物質

Stimulants 興奮劑

- PMMA/PMA n=5
- Ethylone n=1
- N-ethylpentylone n=1
- 4-fluoroamphetamine n=1
- 2-/3-fluoroethylamphetamine n=1

Cannabinoids 大麻素

- 5F-MDMB-PICA n=1
- AB-FUBINACA and ADB-FUBINACA n=1

Hallucinogens (including dissociatives and psychedelics) 致幻劑（包括解離性麻醉藥及迷幻藥）

- TFMPP n=6
- 5-MeO-DIPT n=2
- 25B-NBOMe and 25C-NBOMe n=2
- IP-LSD n=1
- 2-methoxydiphenidine n=1
- 2-oxo-PCE n=1
- 5-methoxy-*N,N*-methylisopropyltryptamine/5-methoxy-*N,N*-diethyltryptamine n=1
- Tiletamine n=1

Past drug abuse, and psychiatric, medical and treatment history
吸毒者過往藥物濫用、精神科、醫療及治療紀錄

- Previous history of drug abuse 送院時已有濫用藥物的紀錄 >70%
  - The most common drug abused 最常濫用的藥物
    - Methamphetamine 冰毒 (58%), ketamine 氯胺酮 (34%), cannabis 大麻 (23%)

- The respective drugs were the most commonly reported drugs abused in the past, indicating addiction to individual substances

  現在濫用的藥物皆為過去最常被濫用的毒品， 顯示吸毒者對該毒品成癮的問題

- History of drug-induced psychosis 藥物引致思覺失調 35.6%

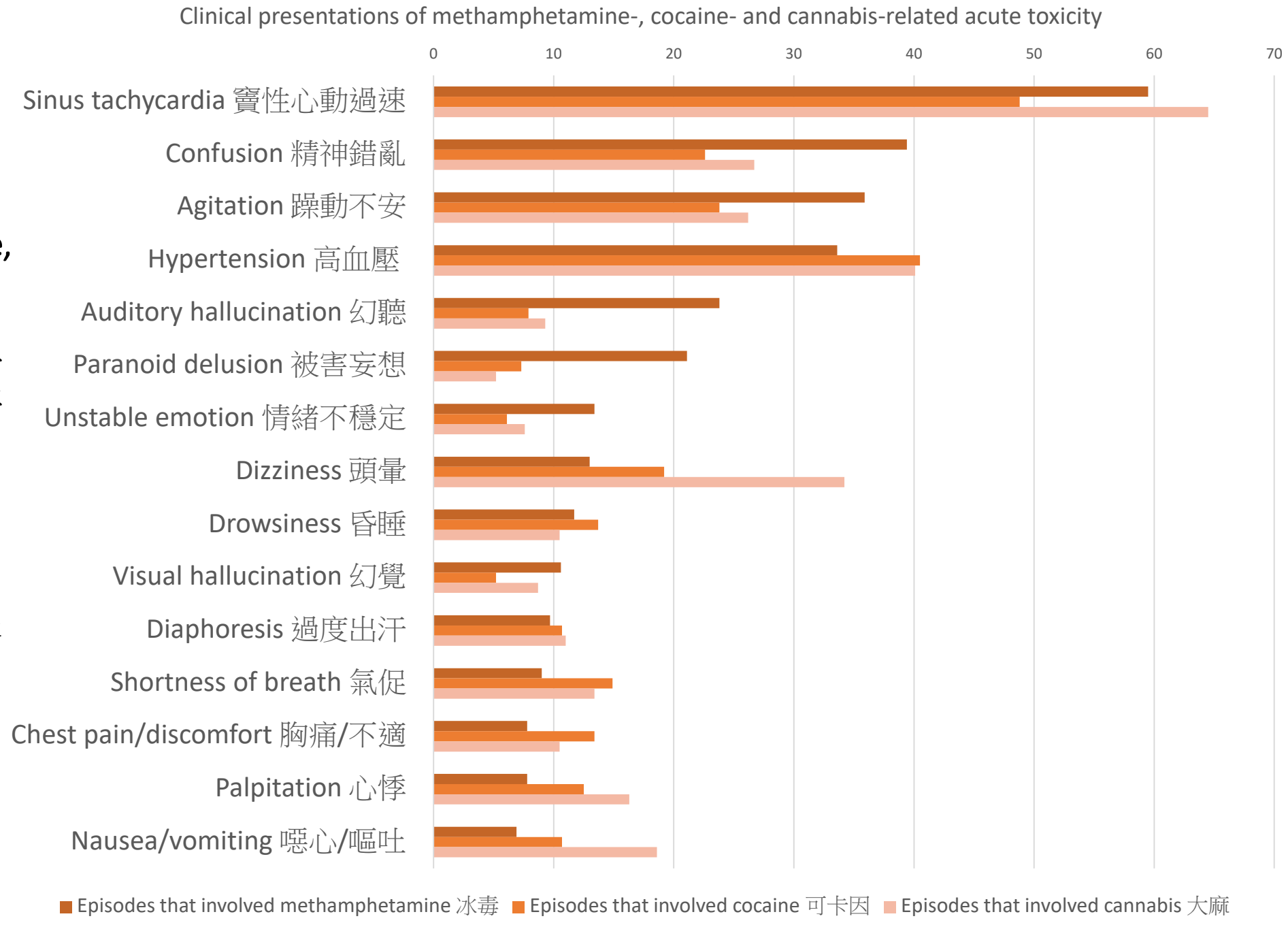
- Methamphetamine
  - Higher proportion of drug-induced psychosis, schizophrenia, anti-social and borderline personality disorder than cocaine and cannabis
  - Higher proportion of psychiatric follow-up
  - Only half of the patients were compliant to psychiatric treatment

- 冰毒濫用者
  - 比可卡因及大麻較常出現藥物引致的思覺失調、精神分裂症、反社會人格障礙、邊緣型人格障礙
  - 較需要精神科跟進服務
  - 只有一半接受精神病治療的患者有定期覆診

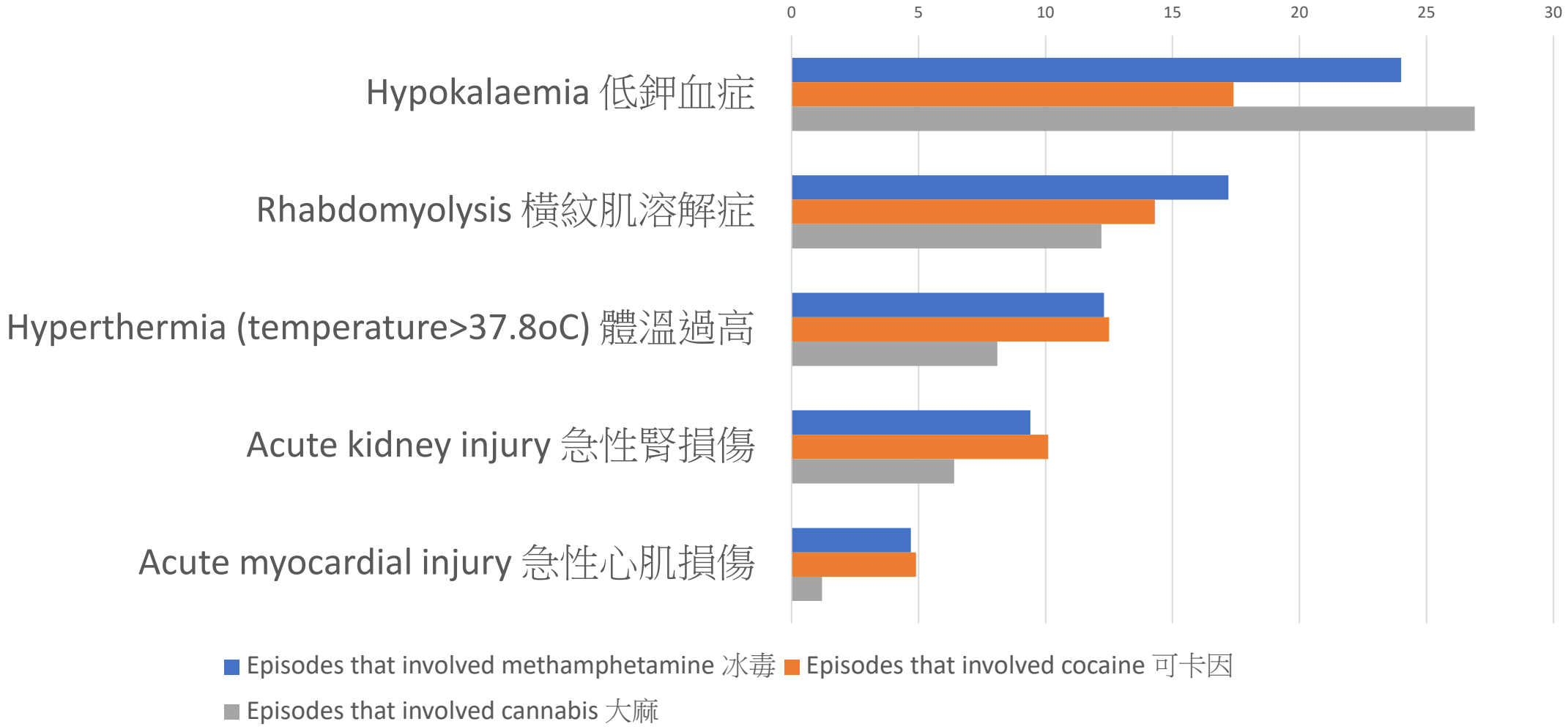
- Previous detoxification treatment 曾接受戒毒治療 (整體17.1%, 男性16.2%)
- Social worker follow-up 獲社工跟進 (整體22.1%, 男性17.6%)
- NGO anti-drug services 正接受非政府機構的戒毒治療 (整體7.6%, 男性6.5%)

Clinical presentations of acute methamphetamine, cocaine and cannabis toxicity
急症室急性冰毒、可卡因及大麻中毒之臨床特徵

Most triaged to a high acuity (Category 3 or above)
大部分個案被分流至緊急或更高類別



Complications of acute methamphetamine, cocaine and cannabis toxicity
急性冰毒、可卡因及大麻中毒的併發症



Injuries and behavioural problems associated with drug intoxication 藥物引致的受傷及行為問題

- Disorganised behaviours were common 行為紊亂十分常見
  - Wandering 遊蕩
  - Lying on the floor 躺在地上
  - Streaking or exposing their body indecently in public areas 公共場所赤裸身體
- Drug-driving was found in 17 episodes 17宗藥後駕駛
- Self-harm behaviours 自我傷害 15.7%
  - Drug overdose or self-poisoning 過量服藥或自我下毒
  - Self-inflicted injuries 自殘
- Violent behaviours to others 對他人使用暴力 13.3%
  - family members were the most common target, followed by police officers and healthcare workers 家人是最普遍的對象，其次是警察及醫護人員

青年離奇墮樓 警揭單位種大麻

【本報訊】九十後男荃灣工廈離奇墮樓傷，警方揭發單位栽種大麻！現場楊屋道一三七號永華工業大廈，前晚十時許，姓傅（廿四歲）男子突然從上址九樓一單位墮下，倒臥大廈對開地下重創昏迷，途人發現報警。其後，救護員接報趕至，立即將傷者送往瑪嘉烈醫院救治。警員隨即登樓調查，在傅墮樓的單位廁所內，發現四株懷疑大麻植物，以及一批大麻種植工具等。

Source: Oriental Daily

Treatment offered in the emergency department
急症室提供的治療

- Supportive treatment was the mainstay 主要是支持性治療
- A significant proportion of patients required physical and chemical restraint
  相當大比例的患者需要用到身體拘束及鎮靜劑
- Gastrointestinal decontamination and other antidotes were rarely needed
  甚少需要腸胃道解毒或用到其他解毒劑
- Most were managed in the emergency medicine ward or observation ward
  大部分個案都能在急症科病房或觀察病房處理
- 1/4 were admitted to the general ward or psychiatric ward
  四分一病人被送至普通病房或精神料病房

Patient disposition and clinical outcome
吸毒者出院及臨床結果

- PSS for the whole cohort = 2 整體PSS結果為2分
- AAPCC moderate effect or above 31% AAPCC 結果評分中重度或以上 31%
- End-organ damage in 24.1% of the cases 24.1%個案出現器官受損
- 96 (5.9%) patients required ICU admission 深切治療部留醫96例 (5.9%)
  - Respiratory support with mechanical ventilation 59 cases 使用呼吸機 59 例
  - Circulatory support with inotrope infusion 23 cases 強心劑及循環系統支援23例
  - Renal replacement therapy 12 cases 腎透析12例
  - 2 ECMO cases in total 人工心肺機2例
- 18 patients died of acute toxicity (17 male drug users)

  18名病人死於急性中毒(17名為男性吸毒者)

- Discharge against medical advice 14.7% (Particularly those abusing cocaine)
  不遵醫囑自動出院 14.7% (尤其是可卡因濫用者)

- Referral to social workers – around 1 in 6
  每六名病人只有一名獲轉介社工

- NGO anti-drug services – only a small number of episodes
  只有少部分個案獲轉介至非政府機構的戒毒治療服務

Predictive factors for end-organ damage
器官受損的預測因子

Significant high risk factors重要的高風險因素

- Triage temperature > 39°C 分流體溫 > 39°C
- Diaphoresis 過度出汗
- Agitation 躁動不安
- Triage category 較緊急分流等級
- Current abuse of cough mixture or pills 同時濫用咳水或藥丸
- Co-ingestion of other medications同時攝入其他藥物
- Sluggish or non-reactive pupils瞳孔遲鈍或無反應
- Associated injury 同時受傷
- Tachycardia > 120 beats per minute 心動過速每分鐘超過 120 次

Drug-related ED reattendance
因濫藥而再度到急症室求診

- Median time interval between the index presentation and the first ED drug-related reattendance = 170 days (IQR 33–565 days)

  指標急症室求診日期與第一次因濫藥而再度到急症室求診日期的間距中位數為170天 (IQR 33–565 days）

- The median number of drug-related ED reattendance within 1 year was 2 (IQR 1 to 4, range from 0 to 40)

  1 年內因濫藥而再入院的中位數為 2次（IQR 1 至 4，範圍從 0 至 40）

- The most common drug abused when the drug users reattended 吸毒者再度到急症室求診時最常濫用的藥物

  Methamphetamine 冰毒 (77%), cocaine可卡因 (12%), cannabis 大麻 (5%)

- The most common reason for reattendance in drug users吸毒者再次就診的最常見原因
- Psychiatric symptoms 精神科症狀 (49.4%), intoxication 急性中毒 (26.8%), violence to others 對他人施暴 (9.9%)

Cox regression analysis of drug-related ED reattendance
以Cox 迴歸分析找出再度入院的因素

- Significant high risk factors 重要的高風險因素
  - Methamphetamine abuse 濫用冰毒 (**HR 2.10**, 95% CI 1.64–2.68, p<0.001)
  - Need for urgent psychiatric consultation 需要安排緊急精神科會診 (**HR 1.60**, 95% CI 1.31–1.95, p<0.001)
- Significant low risk factor 重要的低風險因素
  - A major effect of acute toxicity at the index presentation 指標入院時經歷嚴重急性中毒 (**HR 0.54**, 95% CI 0.33–0.88, p=0.013)
- No significant association 沒有明顯關係的因素
  - Referral to social workers 獲轉介社工
  - Referral to NGO anti-drug services 獲轉介至非政府機構的戒毒治療服務
  - However, the number of such referrals was too small for any meaningful conclusion
    但是，此類轉介的數量太少，無法得出任何有意義的結論

Key findings of the study 研究的主要發現

Methamphetamine 冰毒

- A trajectory of strong addiction, a high acuity in the ED and a high proportion of mental health co-morbidities, acute psychosis, self-harm, violence and injuries

  冰毒有很強成癮軌跡，在急症室的臨床表現通常更嚴重，有較高比例的吸毒者同時有精神科問題、思覺失調、自殘、暴力、受傷

- Devastating to both the drug abusers and their family members

  對吸毒者及其家人造成極大傷害

- Some drug abusers were replacing heroin or ketamine with methamphetamine

  一部分吸毒者以冰毒代替海洛英或氯胺酮

- Prevention is important - More resources to educate young people on its harms

  預防措施十分重要—應繼續投放更多資源教育年輕一代冰毒的禍害

- Public education should focus on the major effects and psychiatric consequences, as there is a general lack of understanding of the risks

  基於公眾對冰毒的缺乏了解，公共教育應該聚焦在吸食冰毒的副作用及精神損害的後果

Cocaine 可卡因

- Less likely to be already in contact with social workers or NGO drug services
  較少濫用者已經與社工或提供戒毒服務的非政府機構有接觸

- More likely to self-discharge without completing treatment and drug abuse assessment, posing a higher risk to cocaine users
  較常在治療或藥物檢驗完成前自行出院，對濫用者健康構成風險

- ED remains an important sentinel point for cocaine-use surveillance
  急症室仍然是監測濫用可卡因的前哨

- ED consultation represents an important opportunity to link cocaine abusers to various drug abuse services
  急症室診症是讓濫用者接觸不同戒毒服務的好機會

- **Cannabis 大麻**

  - Close monitoring of the local trend needed, especially among the youths
    需要監測本地使用趨勢，尤其是年青人

  - Given the non-specific presentations of some cannabis abusers (such as cyclical vomiting in those with cannabinoid hyperemesis syndrome), frontline healthcare workers should be more vigilant
    由於濫用大麻有時沒有明確的症狀（如患大麻素嘔吐症候群的病人常出現週期性嘔吐），因此前線醫護人員需要更為警惕

- **NPSs** 新型精神活性物質

  - Low awareness among drug abusers and healthcare providers
    吸毒者及醫護人員對此問題的意識較低

  - Limited access to diagnostic services
    醫護人員較難安排相關的藥物測試

  - There is a need to continue to strengthen the current surveillance system for emerging drugs of abuse
    應改善目前濫用藥物監管系統以加強應對未來可能愈來愈多的濫用個案

Implications for anti-drug sector

- **ED remains a critical point** in the patient help-seeking journey

  急症室對戒毒求助仍然十分重要

- Routine checking of serum potassium, creatinine, creatine kinase and cardiac troponins for all patients who present to the ED with acute toxicity related to methamphetamine and cocaine abuse, and for selected cases of cannabis abuse

  為所有急性冰毒及可卡因中毒及部分急性大麻中毒者檢查鉀、肌酸酐、肌酸激酶、心肌肌鈣蛋白

- Patients with unexplained rhabdomyolysis should be screened for methamphetamine or other illicit drugs

  若出現不明橫紋肌溶解症，應為病人進行冰毒或其他毒品檢驗

- Screen for psychotic symptoms when methamphetamine abusers present to the ED with acute toxicity

  當冰毒濫用者因急性中毒被送至急症室時，檢查該病人有否出現精神病症狀

- For ED patients with undifferentiated presentations of stimulant abuse, a triage temperature > 39°C, diaphoresis, agitation, sluggish or non-reactive pupil response to light, tachycardia > 120 beats per minute, and concurrent use of cough mixture and other non-recreational medications predict a higher risk of end-organ toxicity

  分流站時體溫超過攝氏39度、過度出汗、躁動不安、瞳孔放大或無反應、心跳率每分鐘超過120、同時濫用咳藥水或咳藥丸或服用其他藥物較有可能出現器官受損

- Predictive factors of poor outcome vary for methamphetamine, cocaine and cannabis

  每類毒品因急性中毒而導致器官受損的預測因素各有不同

The role of ED in anti-drug campaign
急症室在禁毒運動中的角色

- ED presentation represents a unique opportunity to engage drug abusers and motivate abstinence through communication of the risks of major harms

  濫藥者到急症室求診時正是一個讓他們了解吸毒的主要害處，幫助他們戒毒的好機會

- Such messages should be tailored to drug abusers who have heightened impulsivity and altered risk perception

  為濫藥者傳遞切合他們需要的吸毒風險訊息，改變其風險感知

- There is a need to integrate the network of service providers at the ED and bring them to the patients while they are still in the hospital to maximise contact

  有需要讓各機構的戒毒服務融入急症室，當病人仍在醫院接受治療時將服務帶到病人身邊，以確保最大程度的接觸

Implications for future research
未來研究建議

- It remains unclear which care model in the ED would have an impact on the trajectory of drug use and prevention of associated harms
  - Prospective study with standardised follow-up and data collection needed

目前仍未知道哪種急症室護理方式可防止病人再度濫藥及預防濫藥帶來的傷害

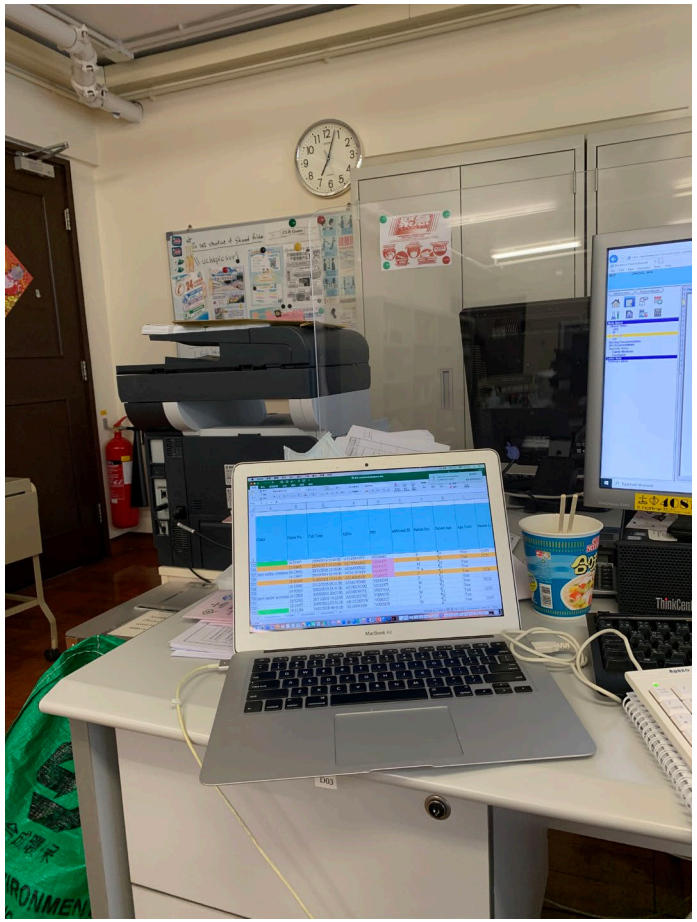
  - 需要進行有標準化跟進的前瞻性研究及收集數據

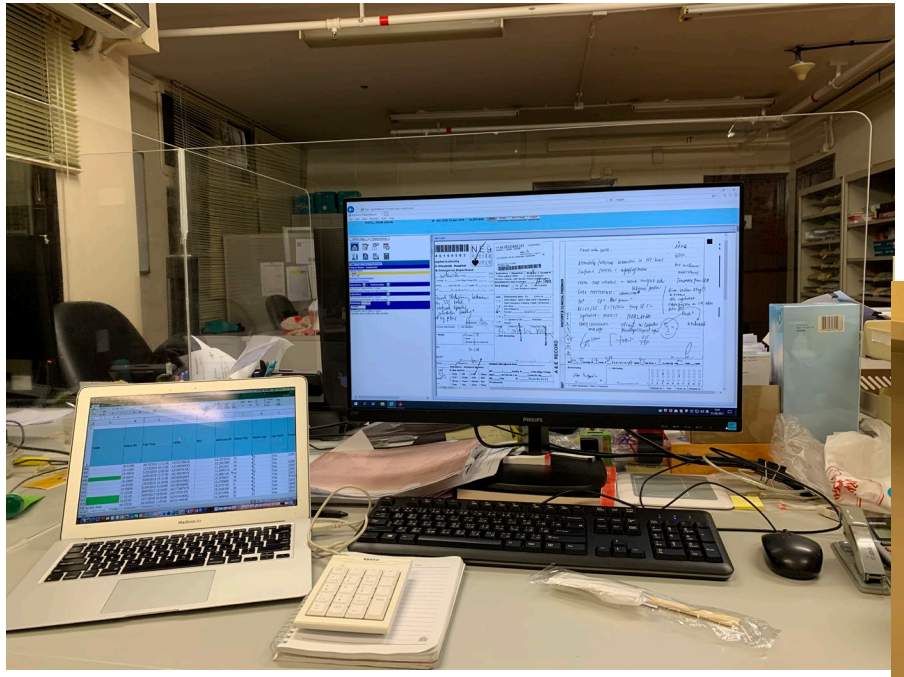
- Future studies should factor in the impact of the COVID-19 pandemic

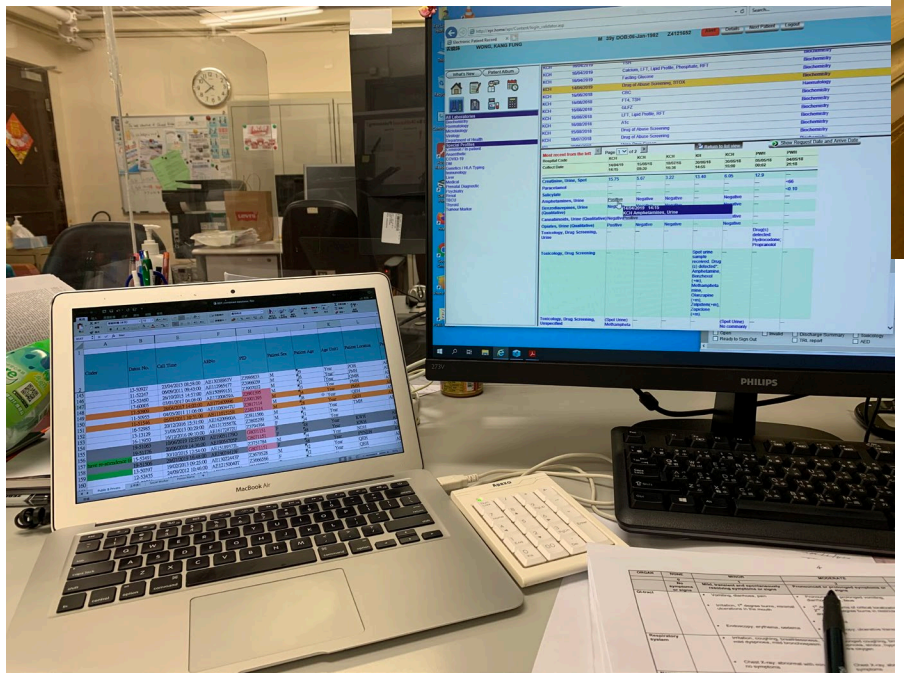
未來研究應考慮新冠肺炎對濫藥的影響

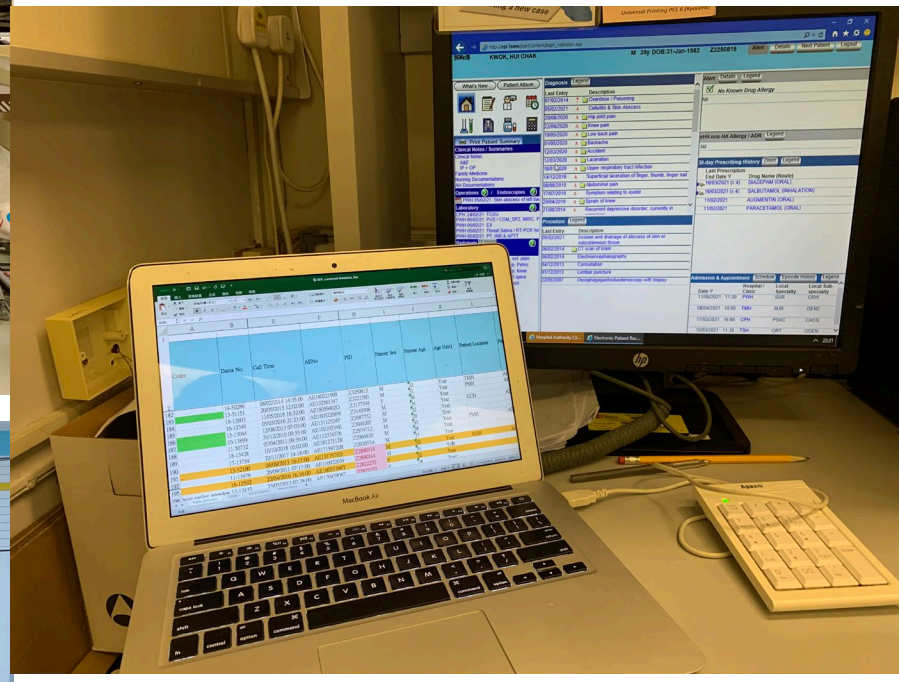
Key points to note during project implementation

- Continued communication with the Beat Drugs Fund Association throughout the project implementation
- Be prepared for the impact of the COVID-19 pandemic
  - Research staff entry to clinical area for data collection
  - Work from home arrangement
- To collaborate important stakeholders in anti-drug sector
- To leverage available resources









THE END 完
Thank you! 謝
謝！
Q&A

lampkrex@hku.hk

Full report available at
https://www.nd.gov.hk/pdf/BDF190053_Final_Report_en.pdf

HKU Med School of Clinical Medicine
Department of Emergency Medicine
香港大學急症醫學系

Knowledge Exchange Forum

Acute toxicity related to psychoactive substance abuse and the impact of emergency department interventions on drug-related reattendance
濫用危害精神藥物引致的急性中毒及急症室介入對因濫藥而再度到急症室求診的影響

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林沛堅醫生
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謝萬里醫生
Director
Hong Kong Poison Information Centre

Ms Carol Suet Kam Ng
吳雪琴社工
Service Director
Hong Kong Lutheran Social Service

31/5/2022 Tuesday 星期二
16:30-18:00

Lecture Theatre 1, Cheung Keung Hai Conference Centre, G/F, William MW Mong Block, Faculty of Medicine Building, 21 Sassoon Road, Pokfulam
薄扶林沙宣道21號香港大學李嘉誠醫學院蒙民偉樓地下鍾江海會議中心1號演講廳

Online Zoom Meeting
Meeting ID: 932 1899 0282
Password: HKUDoEM

Registration:
https://rb.gy/dprc0m
or scan QR code:

Supplementary slides
補充資料

Exclusion criteria 排除標準

- Recreational abuse of other drugs 濫用其他毒品
- Unintentional exposure 非有意接觸
- Malicious exposure 被蓄意投毒
- ‘Body packing’; ‘body stuffer’ were still included as they were likely to be drug abusers 體內藏毒（由於「體內塞毒者」很有可能也會濫藥，因此他們也被納入數據中）
- Unrelated cases 無關個案
- Confirmed non-exposure with objective evidence that the initially suspected involvement of methamphetamine, cocaine, cannabis or NPSs had not occurred
  檢驗結果證明沒有使用過冰毒、可卡因、大麻或新型精神活性物質的疑似個案
- Non-ED cases 非急症室個案

Pattern and clinical presentations
模式及臨床特徵

- Most common route of drug intake 最常見的吸毒方式
  - Methamphetamine: inhalation/smoking 冰毒：吸入
  - Cannabis: inhalation/smoking 大麻：吸入
  - Cocaine: inhalation, insufflation 可卡因：吸入／以鼻吸入
- Place of drug abuse was not documented in most episodes

  大部分個案都沒有記錄使用毒品的地方
  - 11 episodes had drug abuse in places outside of Hong Kong
  - 十一個個案發生在外地
    - Mainland China 中國 n=3
    - Thailand 泰國 n=2
    - Macau 澳門 n=1
    - Cambodia柬埔寨 n=1

Secondary outcome

- Secondary outcome (a composite outcome of end-organ toxicities)
  次要結果（器官受損情況）
  - Cardiac arrest 心臟驟停
  - Acute myocardial injury, ventricular dysrhythmias, heart failure, shock
    急性心肌梗塞、心室心律不整、心臟衰竭、休克
  - Respiratory failure 呼吸驟停
  - Acute kidney injury急性腎損傷
  - Liver injury 肝損傷
  - Rhabdomyolysis 橫紋肌溶解症
  - Seizure, coma, acute ischaemic stroke, intracranial bleeding that was not due to injury
    癲癇、急性缺血性中風、非受傷引致的顱內出血
  - Disseminated intravascular coagulation 瀰漫性血管內凝血

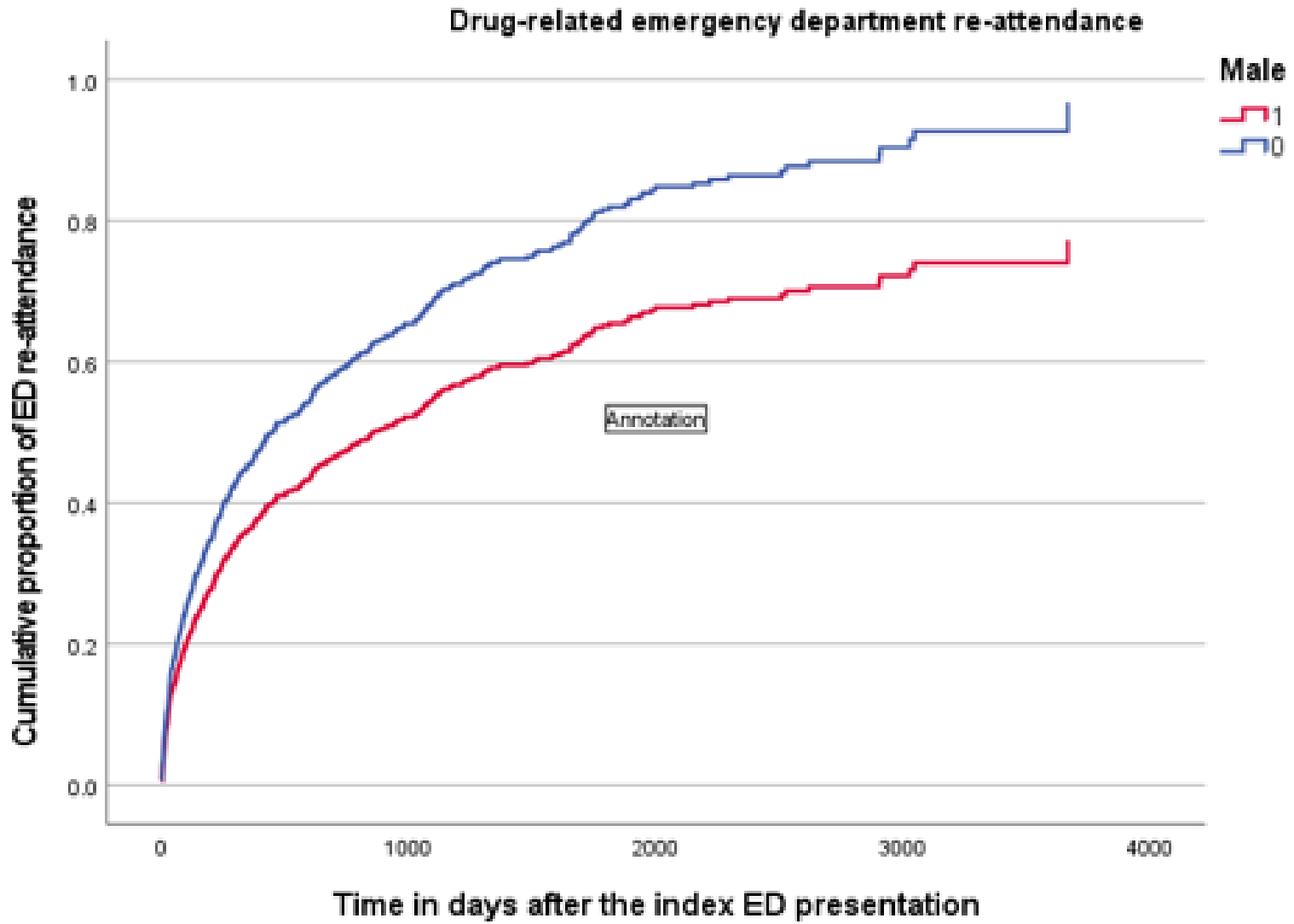
Clinical presentations and poison severity score of different organ systems 各器官系統的臨床特徵及中毒嚴重度

- Other severe conditions identified during the index presentation
  其他指標入院時出現的嚴重症狀
  - Ventricular dysrhythmia 心室心律不整 n=5
  - acute myocardial infarction 急性心肌梗塞 n=4
  - heart failure 心臟衰竭 n=1
  - coma 昏迷 n=55
  - Seizure 癲癇發作 n=55
  - acute ischaemic stroke 急性缺血性中風 n=4
  - acute haemorrhagic stroke 急性出血性中風 n=3
  - respiratory failure 呼吸驟停 n=24
  - extreme hyperthermia 體溫嚴重過高 n=24
- cardiac arrest 心搏停止
  - Methamphetamine 16 episodes 16個冰毒個案
  - Cocaine 6 episodes 6個可卡因個案
- Median PSS of the whole cohort was 2 整體PSS結果為2分
  - Similar across groups 各個組別大致相同
  - No fatality in episodes involving cannabis 大麻個案沒有出現死亡個案

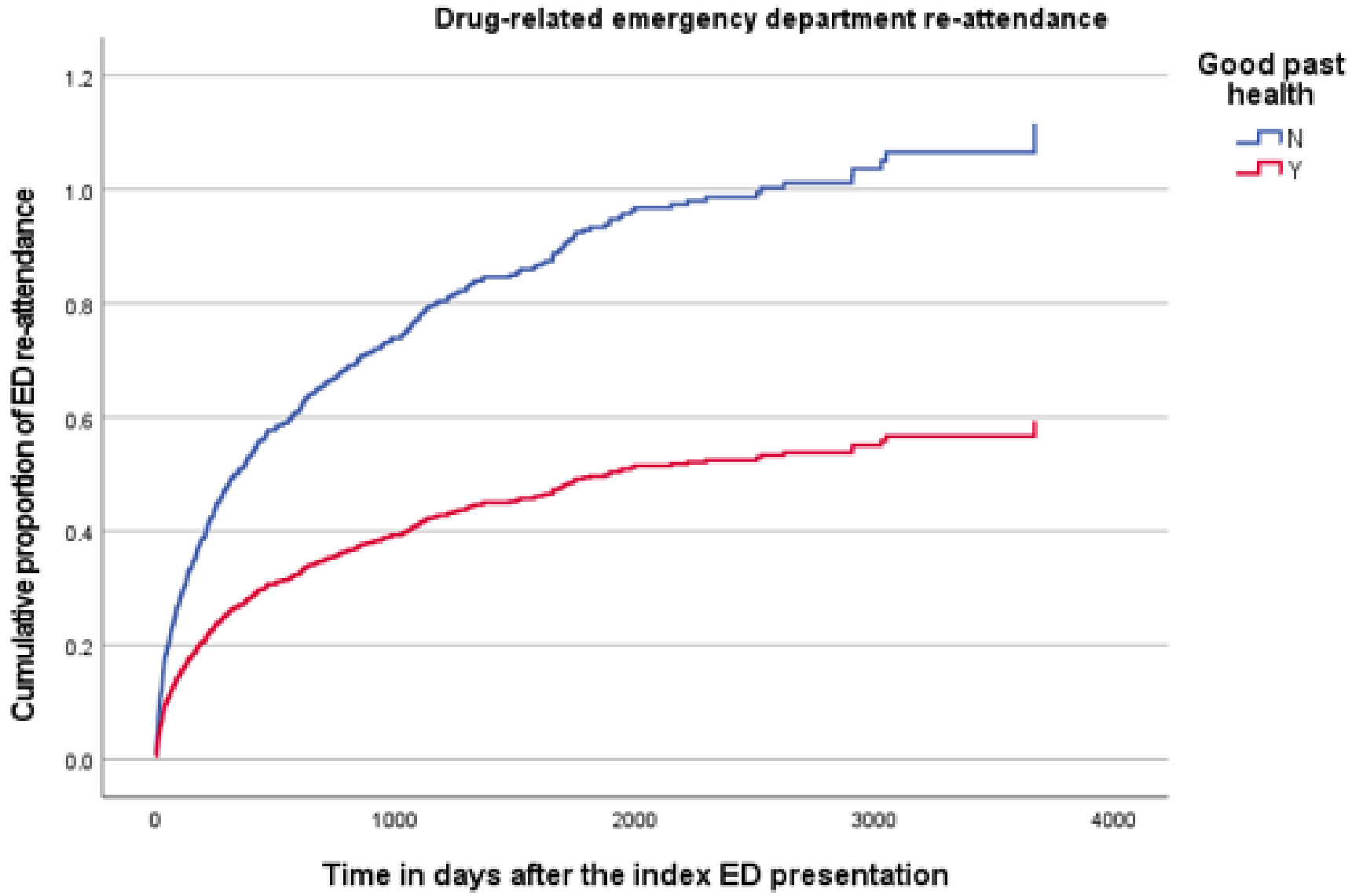
Emergency department treatment of drug users
急診室對吸毒者的治療

- Intubation and mechanical ventilation 插管及呼吸機 55 cases
- Antiarrhythmic 抗心律不整藥 9 cases
- Electrical therapy for arrhythmia 電擊療法 4 cases
- Inotrope infusion 強心劑 7 cases
- Cardiopulmonary resuscitation (CPR) 心肺復甦法 10 cases
- Veno-arterial extracorporeal membrane oxygenation (ECMO) was initiated in one case
  有一個個案使用到體外膜氧合（人工心肺機）

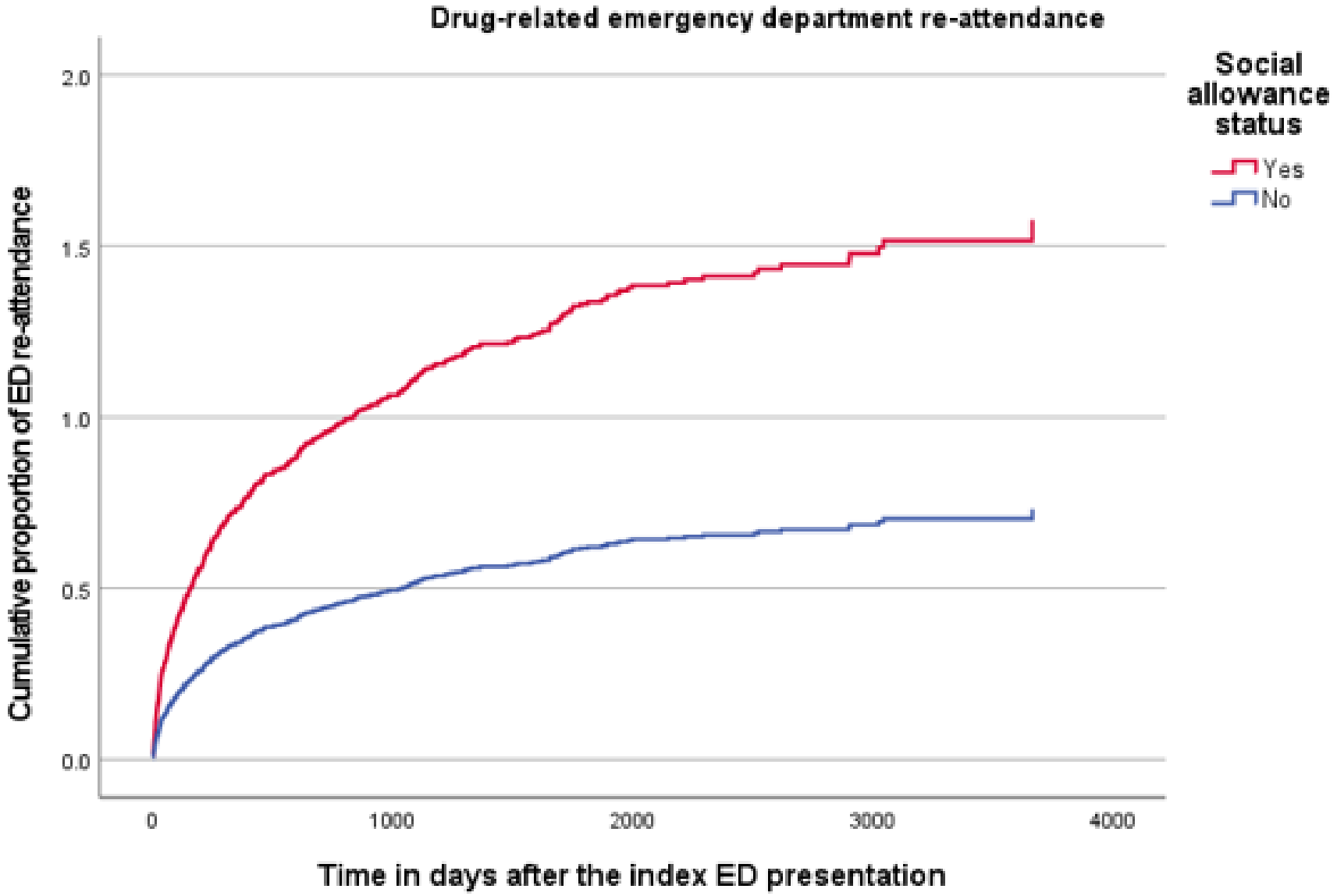
Supplementary Figure 1. Kaplan-Meier curve showing drug-related ED reattendance rate as a function of male gender



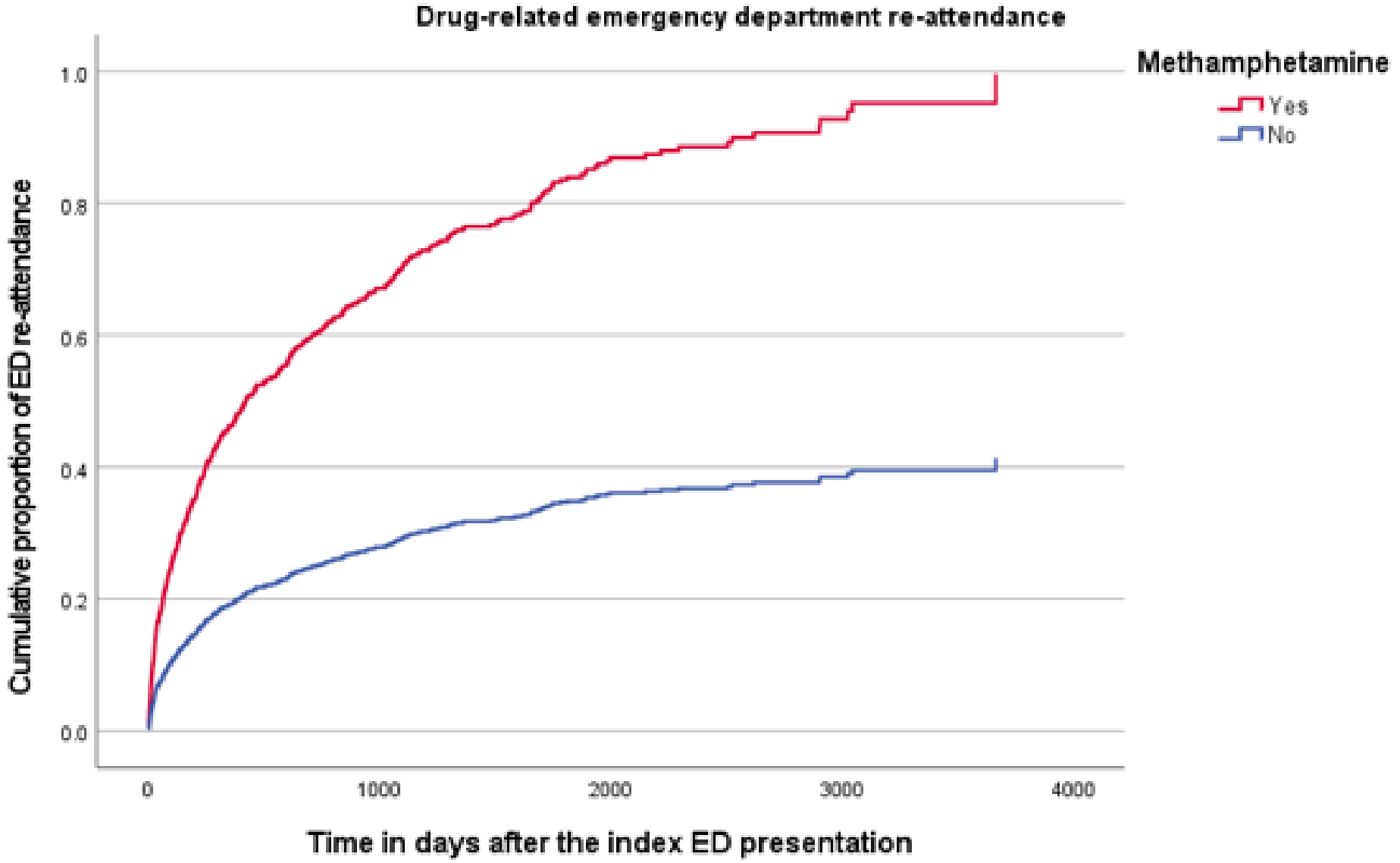
Supplementary Figure 2. Kaplan-Meier curve showing drug-related ED reattendance rate of drug abusers with good past health as compared with those with comorbidities



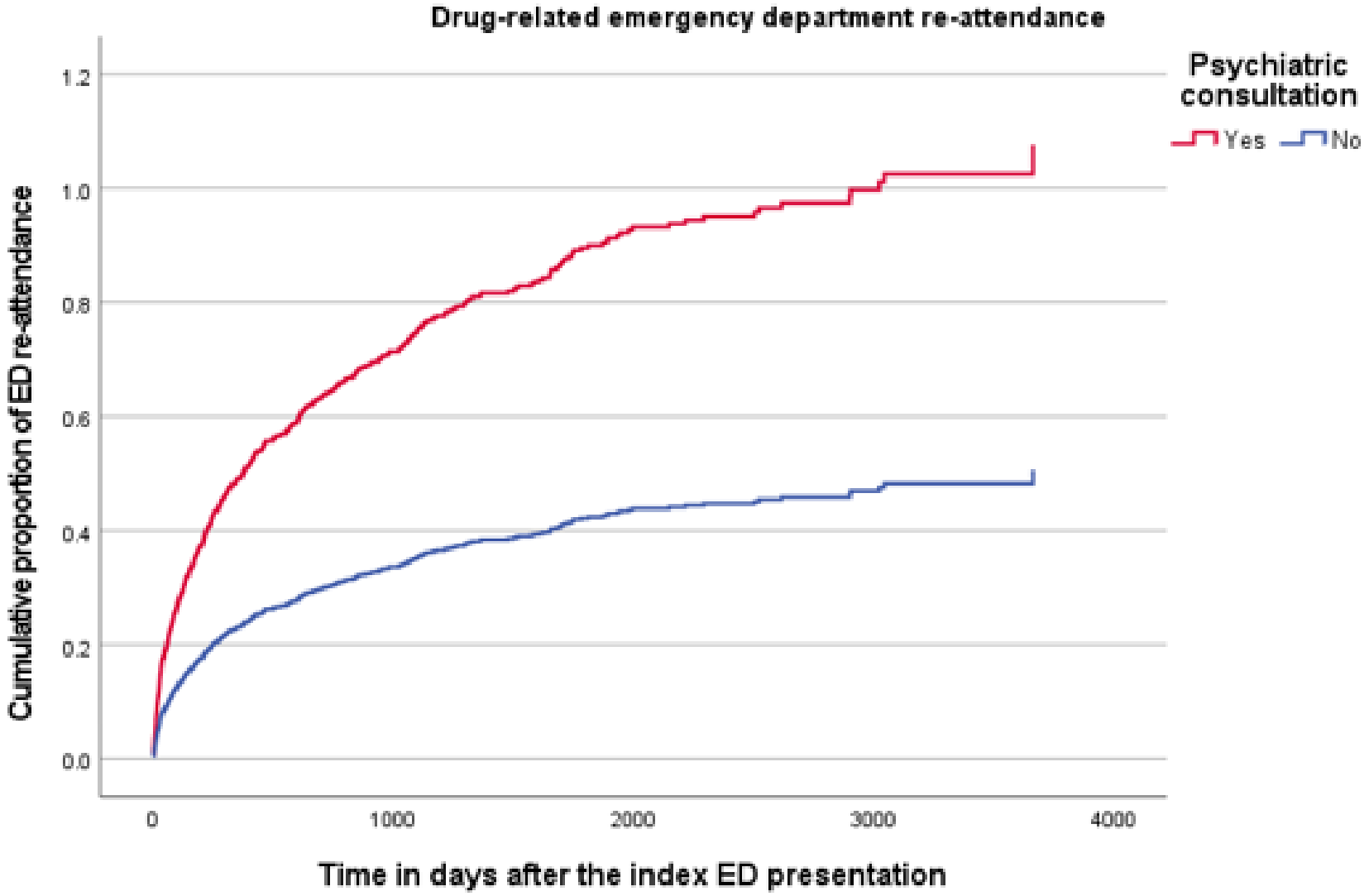
Supplementary Figure 3. Kaplan-Meier curve showing drug-related ED reattendance rate as a function of social allowance status



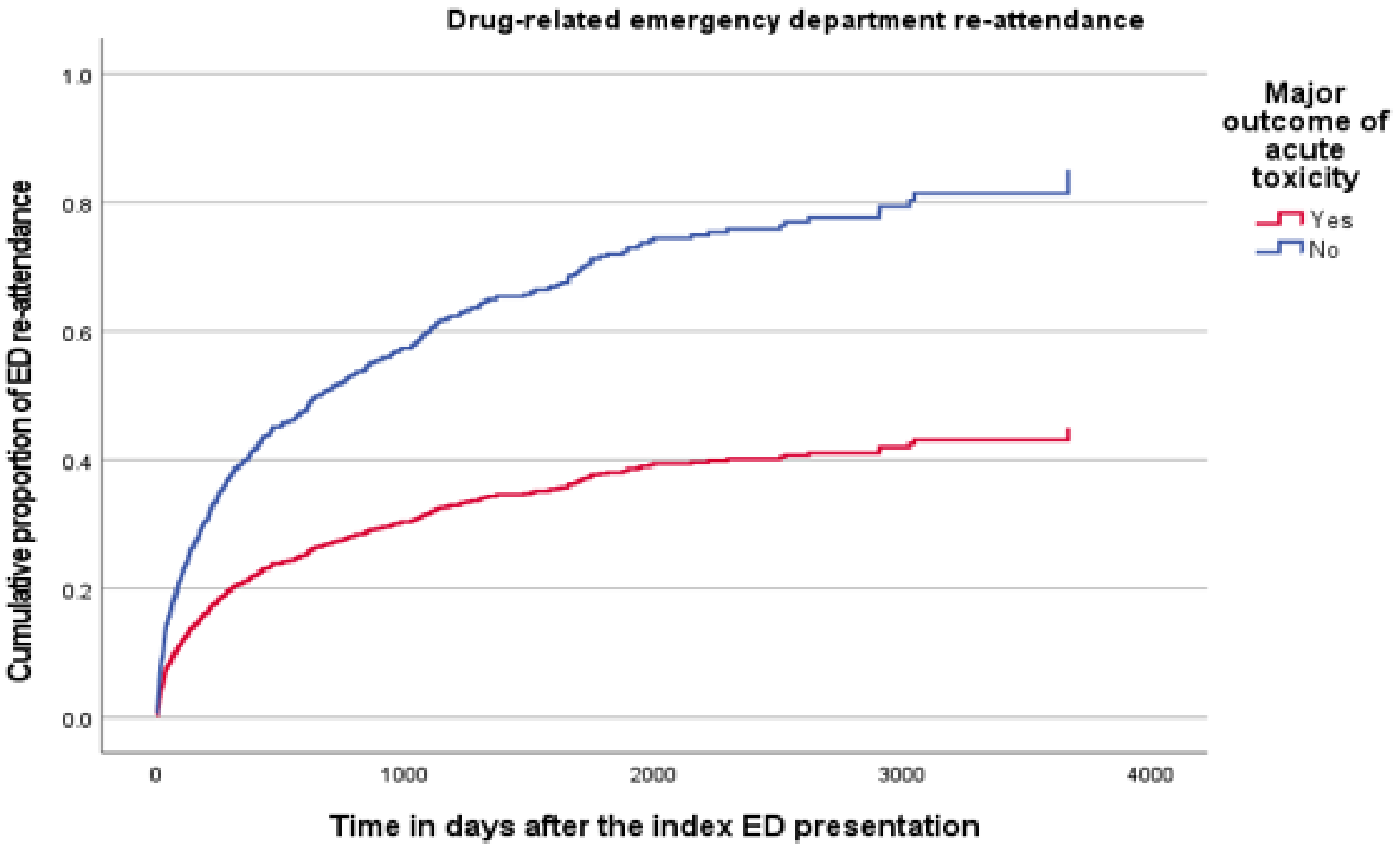
Supplementary Figure 4. Kaplan-Meier curve showing drug-related ED reattendance rate of methamphetamine abusers compared with cocaine and cannabis abusers

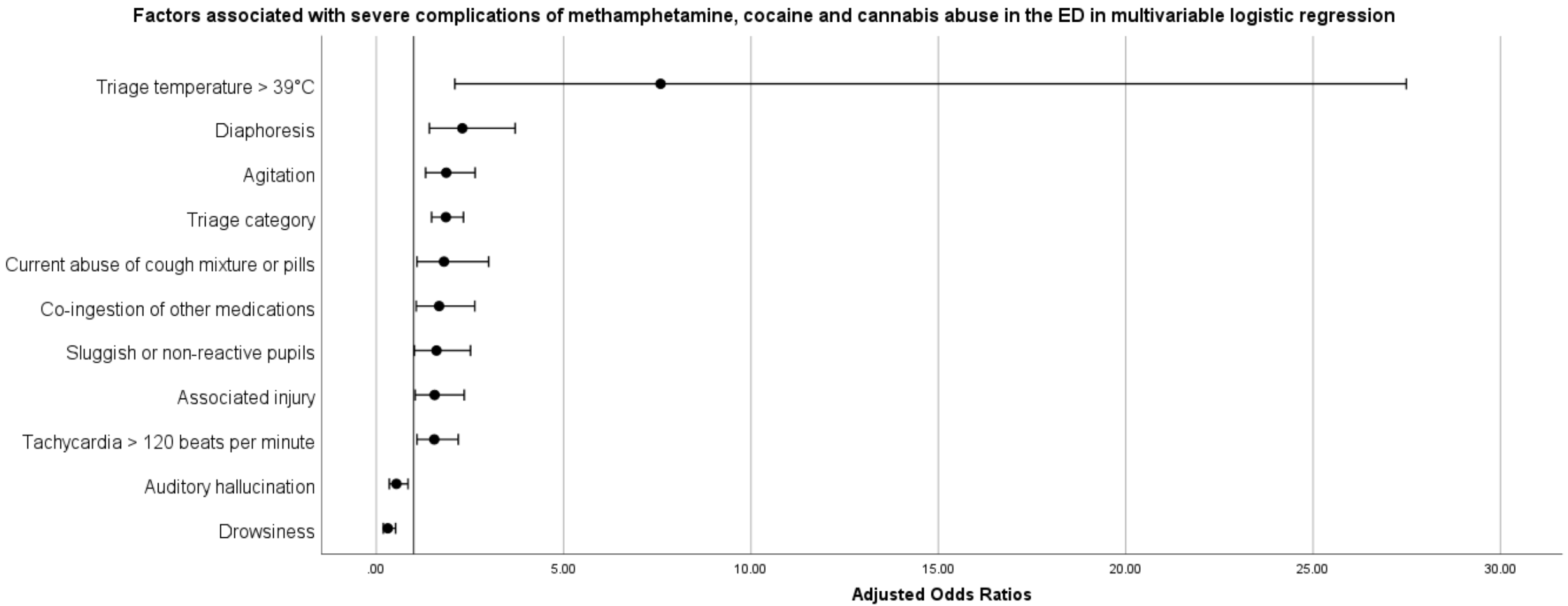


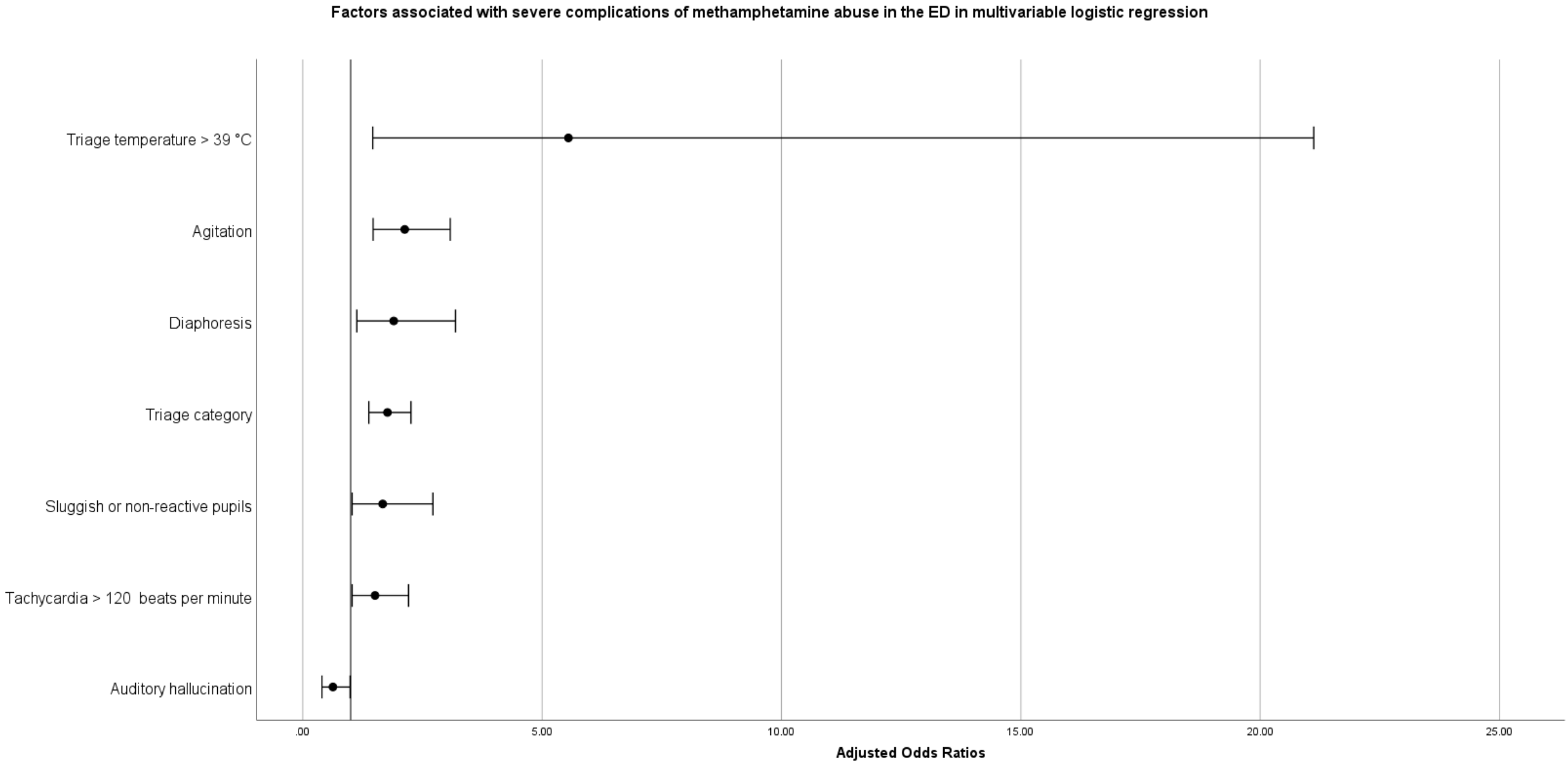
Supplementary Figure 5. Kaplan-Meier curve showing drug-related ED attendance rate of durg abusers who required urgent psychiatric consultation during the index ED presentation as compared with those who did not

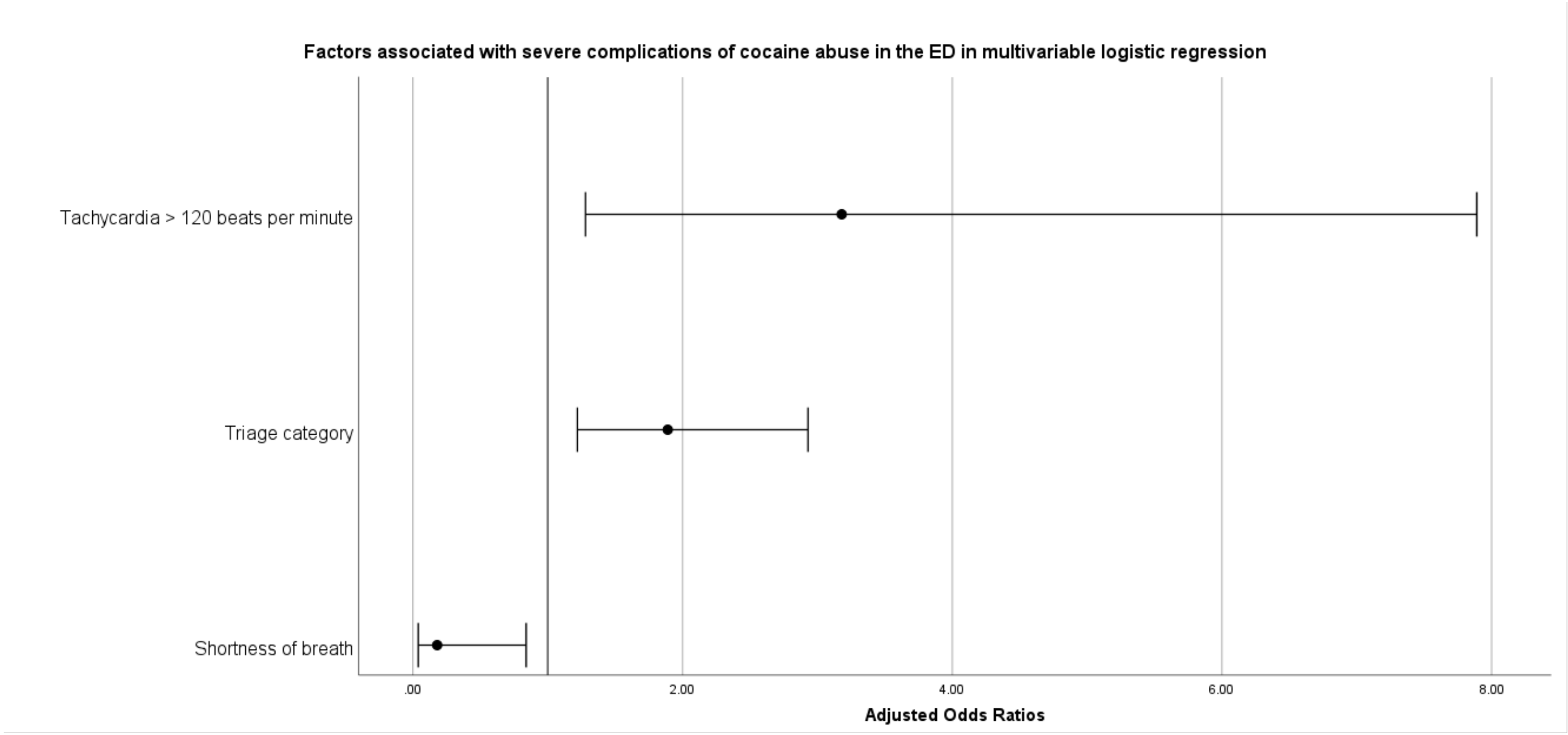


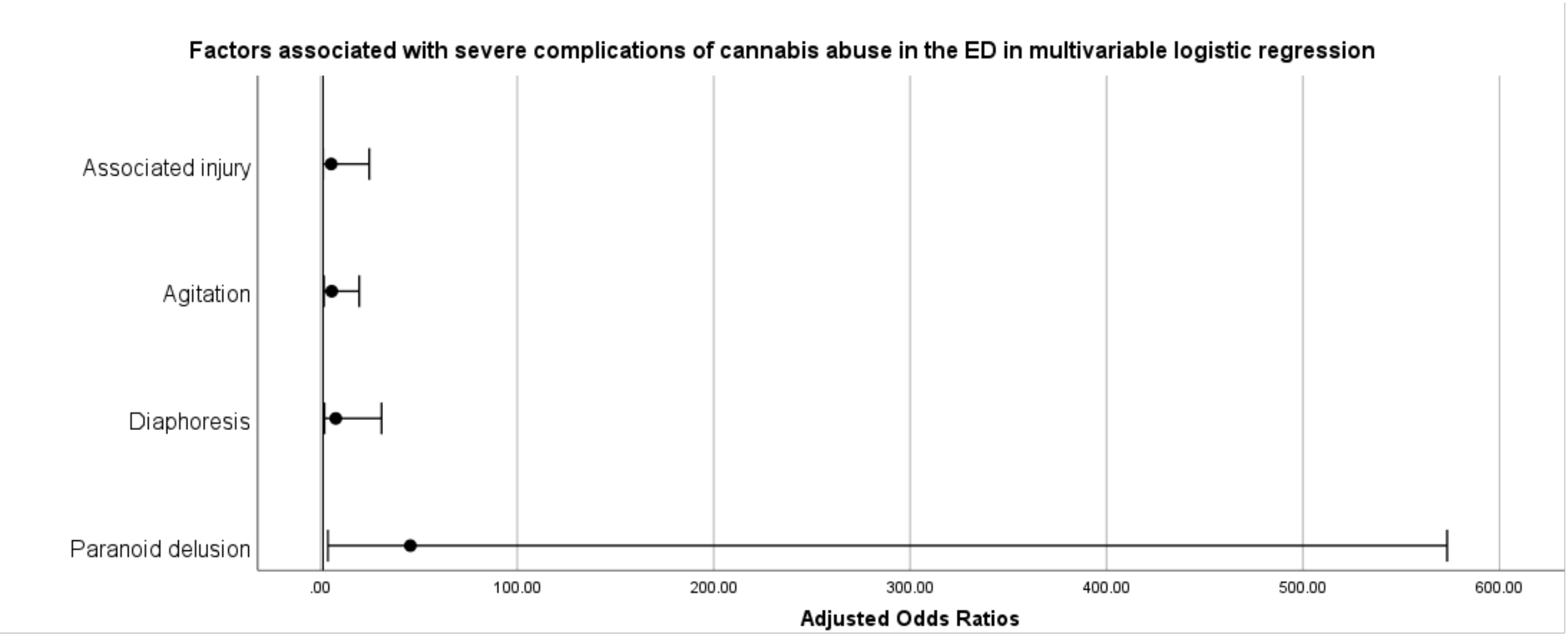
Supplementary Figure 6. Kaplan-Meier curve showing drug-related ED attendance rate of drug abusers with a major acute toxicity as compared with those with milder toxicity




Factors associated with severe complications of methamphetamine, cocaine and cannabis abuse in the ED in multivariable logistic regression
Triage temperature > 39°C
Diaphoresis
Agitation
Triage category
Current abuse of cough mixture or pills
Co-ingestion of other medications
Sluggish or non-reactive pupils
Associated injury
Tachycardia > 120 beats per minute
Auditory hallucination
Drowsiness
.00
5.00
10.00
15.00
20.00
25.00
30.00
Adjusted Odds Ratios


Factors associated with severe complications of methamphetamine abuse in the ED in multivariable logistic regression
Triage temperature > 39 °C
Agitation
Diaphoresis
Triage category
Sluggish or non-reactive pupils
Tachycardia > 120 beats per minute
Auditory hallucination
.00
5.00
10.00
15.00
20.00
25.00
Adjusted Odds Ratios


Factors associated with severe complications of cocaine abuse in the ED in multivariable logistic regression
Tachycardia > 120 beats per minute
Triage category
Shortness of breath
.00
2.00
4.00
6.00
8.00
Adjusted Odds Ratios


Factors associated with severe complications of cannabis abuse in the ED in multivariable logistic regression
Associated injury
Agitation
Diaphoresis
Paranoid delusion
.00
100.00
200.00
300.00
400.00
500.00
600.00
Adjusted Odds Ratios

Limitations of the study 本研究之局限

- Retrospective study design

  回顧性研究
- No standard criterion for the determination of drug use and its relationship with an ED visit

  沒有統一準則斷定病人曾經使用哪種毒品以及使用該毒品與被送往急症室的關係
- No standardised protocol for ordering toxicology screens in different A&Es

  公共急症室沒有進行藥物測試的統一規程

- The impact of different forms of drug (e.g. powder vs crack cocaine), and the pattern, quantity and time of drug use were not studied

  沒有進行毒品的型態（如霹靂可卡因及粉狀可卡因的分別）使用模式、

  分量 、時間長度之影響的研究
- Influence of co-ingestions

  同時使用其他毒品的影響
- No access to non-clinical data that might affect ED reattendance, such as imprisonment and travel records

  未能存取會影響再度入院率的非醫療數據，如入獄或外遊紀錄

- The severity of addiction not quantified with validated tools
  - The current cohort contained a mixture of causal drug abusers and patients with drug dependence disorder who might have a significantly different trajectories for future drug use and outcome

沒有以受認可方式量化藥物成癮的嚴重性

- 研究對象包含不定期濫用藥物及患有藥物成癮症的病人，兩者未來使用毒品狀況及治療成效或有很大差距