出國報告（出國類別：國際會議）

參加 2017 年
「第 21 屆國際鑑識科學年會」
出國報告書

服務機關：法務部法醫研究所
姓名職稱：蕭開平組長
派赴國家：加拿大多倫多
出國期間：**106** 年 **08** 月 **21** 日至 **106** 年 **08** 月 **25** 日
報告日期：**106** 年 **11** 月 **23** 日

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摘要

2017年8月21至25曰，每三年一次的國際法醫科學會（The International Association of Forensic Sciences, IAFS）會議在加拿大的多倫多市隆重登場。來自七十多個國家的法醫刑事鑑識人員在短短的五天會期內，彼此的學習交流，提昇了法醫鑑識的科技與創新。2017年會議將著重於追求多方面法醫學科的合作以利於司法與人權的維護。會議討論主題包括法醫類、生物鑑識-DNA、電腦犯罪、刑案現場調查、濫用藥物分析、工具痕跡鑑定、刑事鑑識護理和性侵害調查、法律和道德、大型災難調查、實驗室品質保證和品質管制、文書鑑定…等多項議題。

國際法醫科學會係一國際性科學研究組織，包含法醫病理學、法醫毒理學、法醫人類學、法醫齒科學、文書鑑定、槍彈分析、微物跡證、現場重建等領域，其宗旨為發展法醫科學、提供資訊交流。每隔三年輪流在世界各地舉辦，為世界各國法醫或鑑識科學之專家學者、執法人員互相交流、切磋的盛會。

壹、 目的

2017 年度 IAFS 年會會議主軸為恐攻和械鬥事件死亡案例應變、人類在躲避戰亂饉荒的遷徙中死亡案例的管理，以及對弱勢、兒童、老人施暴造成死亡的案例管理。會議目標在於使與會者學習到恐攻、械鬥死亡案例之解剖技術、對於為逃避戰亂饉荒的人類大遷徙所造成的死亡案例，在年齡,性別的鑑定和個別遣送回國死亡案例的鑑定有較佳的瞭解與技巧，並且對於弱勢族群，兒童，老人的死亡案例的解剖鑑定有更多的瞭解。

本次以科技計畫補助經費出席國際會議，目的包括：

一、學習法醫科技新知，建立國際交流管道。

二、汲取有關法醫刑事科學鑑定之專業鑑定技術與實務經驗

三、增加我國法醫工作成果在世界上的能見度，提高我國法醫在世界各國的形象。

四、了解世界最新流行趨勢，適時應用最新科技及知識，以輔助法醫刑事案件之鑑識

工作。

貳、 參加會議過程

一、 原由：

國際法醫科學會（The International Association of Forensic Sciences, IAFS）係一國際性科學研究組織，由有關法醫病理學、法醫毒理學、法醫人類學、法醫齒科學、文書鑑定、槍彈分析、微物跡證、現場重建或其他鑑識相關之延伸領域之從業人員或學者專家發起組成。它的主要宗旨為發展法醫科學、提供鑑識相關人員新知及技術交流之平台，以及辦理 3 年一次的 IAFS 國際鑑識科學年會。

二、 大會過程

會議期程共 5 日(21~25 日)，前 2 日主辦單位安排許多工作坊供與會者報名付費參加，後 3 日會議安排早上為大型專題演講，下午為特邀講座演講、小型講座或口頭發表，以及壁報展示時間。23 日早上為正式開幕式，以鑑識科學應用在移民遷徙上作為開場，24 日早上之專題演講為面對新挑戰環境之鑑識科學，25 日早上專題演講題目則為安大略大型事故應變管理系統介紹。

圖 1、筆者與 Dr. Thomas Noguchi(左)合照

高齡 90 歲的 Thomas Noguchi 為世界享譽盛名法醫病理學家，曾擔任洛杉磯地區法醫師，負責許多知名人物包括約翰·甘迺迪總統、瑪麗蓮夢露等政治名流死亡案件解

剖工作，廣受國際肯定。長年擔任世界法醫協會(World Association for Medical Law, WAML)主席。


圖 2、(左圖)與 Heesun Chung 女士(左 1)合照、(右圖)韓國與會代表團

南韓籍 Heesun Chung 女士曾任南韓國家法醫科學中心主席、IAFS 2014 年會主席、國際法醫毒理學家協會(International Association of Forensic Toxicologists, TIAFT)會長，曾在 2015 年率團來訪法務部法醫研究所，與我方建立深厚的建立法醫學學術交流。此次不僅受邀演講有關新興藥物之鑑識技術，並率領近二十位韓國學者與會，可知韓國的法醫刑事科學發展一日千里，非昔日之場景。

圖 3、北京司法務科學技術鑑定研究所 (原大陸法醫研究所)設置攤位

圖 4、與 Dr. Daniel J. Spitz 合照

Dr. Daniel Spitz 美國洛杉磯警政署犯罪實驗室退休，曾任美國刑事鑑識學會(American Academy of Forensic Sciences, AAFS)、IAFS 主席以及美國犯罪實驗室協會主席，受大會邀請給予有關婦幼安全與犯罪之演講。

圖 5、與刑事警察局公派人員葉雅玲合照

圖 6、發表壁報之現場狀況

參、 會議重要內容摘要

本次會議 2017 年 8 月 21 日至 25 日在多倫多市中心喜來登酒店舉行。IAFS 2017 年會主軸為法醫及鑑識科學各專業領域間合作及人權維護之訴求，反映了主辦方欲透過各專業領域之間合作，提昇法醫鑑識科學技術至更高層次，以達到維護人權、落實司法正義之目的。依據年會主軸而衍伸出相關會議主題包括：法醫鑑識科學在人類遷徙上的應用、全球環境變遷挑戰與鑑識科學之應用等。

筆者主要參與了多項研討會及發表論文共三篇，包括口頭發表論文一篇以及壁報展示論文兩篇，呈現台灣濫用藥物致死流行病學、濫用藥物與交通事故相關性特色，並整理國內重大飛航事故法醫調查經驗。

一、台灣本土 9 件飛安事故法醫科學調查(口頭發表)：

其中演講論文發表，題目為台灣本土 9 件飛安事故法醫科學調查(Medico-legal Management of Nine Mass Aviation Disasters of Passenger Aircraft in Taiwan (1989-2014))。內容蒐集台灣 1989 年至 2014 年間發生之飛安事故，比較發生地點、原因、搜救時間以及死傷人數，並經由各個案件回顧法醫鑑識調查之始末。例如新航 SQ006 國際重大飛安事故中，台灣警消、鑑識單位協調緊急重大事件應變機制；與復興航空 GE222 及 GE235 飛安事故中，法醫與飛航安全委員會合作，利用座位圖的方式呈現死傷分布及各種形態傷分布狀況。

在呈現的 9 件案件中，以復航 GE235 墜於基隆河事故最為值得深究，因空難事故少有墜於都市河道中個案，即便美國有著名「哈德遜奇蹟」之稱的全美航空 1549 號班機事故，但結果卻和復航事故大相逕庭。因此復航墜於基隆河事故之處理與法醫鑑識，實為珍貴的空難處理參考素材。

二、濫用藥物相關致死流行病學分析(壁報發表)：

壁報展示兩篇論文均為濫用藥物相關。第一篇為濫用藥物相關致死流行病學分析(Surveillance and Epidemiological Study of Illicit Drug-Related Fatalities in Taiwan（2001-2015）)，內容呈現 15 年間本土法醫鑑定案例中濫用藥物相關致死案件之流行病學統計，結果顯示法醫鑑定案件中，濫用藥物相關致死比例仍呈緩上升趨勢，個案

之死亡方式依濫用藥物種類具有明顯差異性，濫用藥物種類在近年以安非他命類及嗎啡類為最大宗，而新興濫用藥物(NPS)案件逐年增加，不僅平均死亡年齡較傳統濫用藥物為低，品項亦層出不窮，為我政府近年度大為重視之課題。

歐美主流新興濫用藥物，以合成大麻類、合成卡西酮類為主，且以浴鹽(MDPV)氾濫程度特別嚴重。而台灣之新興濫用藥物以 K 他命為主，可見新興濫用藥物種類流行趨勢有地域性之差別。

三、濫用藥物相關交通事故死亡流行病學分析(壁報發表)：

第二篇為為濫用藥物相關交通事故死亡流行病學分析(Driving Under Influence of Psychoactive Substances-Related Casualties in Taiwan (2003-2015))。呈現共 13 年間台灣交通事故的流行病學概況，帶出兩大重點：近年來台灣區法醫鑑定交通事故死亡案例中，酒駕比例明顯獲得控制，而病駕(當事者高齡且本身具有自然疾病) 事故比例漸增，另外，交通事故涉及濫用藥物種類以鎮靜安眠藥類為主，近年來亦發現涉及新興濫用藥物(NPS 之個案)，與政府亟力掃蕩新興濫用藥物之目標密切契合。

肆、 建議與感想

一、由此次三年一度的盛會觀察體會，世界各國包括加拿大對於法醫鑑識科學以及預防犯罪的重視與深耕，並顯對於人口遷徙移民、婦幼暴力受害等議題均有長期關注，既符合近年西亞難民潮之國際情勢，強調法醫鑑識科學對於人權議題上之助益。相對於以往聚焦於落實司法正義、打擊犯罪之面向，此次年會主軸面向著重於提升法醫鑑識科學技術對於社會之廣泛正面效益，體現了科學發展之終極目標乃為人類社會謀求長期共同利益、建立恆久價值。

二、此次會議在加拿大多倫多舉行，加拿大以良好治安聞名世界，但在傲人的低犯罪率下，法醫鑑識科學在加拿大的發展並未停滯不前，並且更加深了人權主義色彩。反觀法醫鑑識科學在台灣現況，尚處於發展期，應落實知識及技術的持續充實與傳承，以利與國際接軌。

三、各國與會程度相當踴躍，會場中見證南韓近二十人之法醫刑事鑑識專家團隊與會，且在給予專題演講、壁報展示均非常活耀，而以前均有至少十人參加的台灣刑事鑑

識界，今年只有我和刑事警察局同仁共 2 位。法醫及刑事鑑識科學隨社會發展，勢必遭逢新興挑戰，面對法庭活動亦講求證據證明力，若是故步自封，勢必無法稱職擔任法庭守門人的角色。身為法醫刑事鑑識領域中之一員，除了要有熟練的技術外，仍需廣編經費鼓勵新進人員出國參與國際會議，汲取先進國際鑑識科學發展新知，不斷充實知識以強化鑑定專業能力，參加國際會議即是拓展視野、吸收新知的最佳途逕！

五、永遠的建議與遠景：

(一）鑑識科技發展一日千里，我國法醫硬體設施之貧乏與不足，建立並維護法醫專用解剖室及法醫實驗室以提昇我國死因鑑定品質，應視為我國法務政策上須長期關注並支持之議題，以符合世界發展趨勢。

(二）本所為全國唯一專責解剖及死因鑑定之法定機關，承接案件來自全國各地，而專業人員業務繁雜，嚴重影響發展腳步，造成法醫鑑識工作無法深入，對於鑑識品質之影響實令人憂慮，故人員之進用及訓練為亟待解決之議題。

(三）鼓勵法醫刑事專業人才藉參加國際會議更新科技新知，提昇工作技術、以求自我充實的目的，有助於檢驗技術之創新與改良。

(五）增列經費，讓法醫人員能參加國際法醫刑事學會，讓國內鑑識專家有機會接觸世界級的鑑識專家，增加揣摩學習機會，提昇法醫刑事鑑識技術。

(六）應鼓勵鑑識領域從事研究工作人員以參加國際會議、並且發表研究成果為績效指標，如此可提昇本所實驗室在國際上的地位。

(七）於國內宜持續舉辦國際性法醫鑑識科學研討會，可促進國際學術交流、增進與同領域內學者專家之情誼、建立日後聯繫的管道，使我國法醫鑑識工作邁向國際化，拓展科技視野，建立國際宏觀。

伍、 附件：

1、 主講議題摘要(共三篇)

Medico-legal Management of Nine Mass Aviation Disasters of Passenger Aircraft in Taiwan (1989-2014)

Kai-Ping Shaw [1], Hui-Chi Cheng [2], Chih-Hsin Pan [1], Bo-Yuan Tseng [1], Ju-Hui Chung [1], Hsiao-Ting Chen [1], Hsiao-Fan Yan [1], Pei-Da Lin [3]

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Abstract

Mass aviation disaster is a major issue that requires extensive collaboration of experts to categorize the types and manage the disaster including forensic pathologists, forensic anthropologists, forensic genetics and odontology accompanied with aviation experts, urgent rescuing teams and supporting groups. Experiences of elected nine aviation crashes of passenger aircraft during 1989-2014 were reviewed and analyzed. In addition to unique mid-air disintegration (CI-611), four crashes(GE-235, SQ-006, CI-204, FA-CTR) during initial climbing or takeoff (2/4 human error, 1/4 mechanical failure, 1/4 environmental effect), four crashed (CI-676, FA-7613, FA-7601, GE-222) during approaching (2/4 human error, 2/4 environmental effect) were reported. All fatalities were identified by anthropological methods including forensic odontology, subsequently after 1998, CODIS STRs profiling system were applied in every body fragment to match with paternity for CI-676, FA-CTR, SQ-006, CI-611, GE-222 and GE-235, unless it is clearly identified. This report is to demonstrate (deceased/total person on board) of CI-204 (54/54), FA-7613 (6/17), FA-7601 (16/16), CI-676 (202/202), FA-CTR (13/13), SQ-006 (83/122), CI-611 (225/225), GE-222 (48/58) and GE-235 (43/58). After establishment the computing program of Aviation Disaster Management System, an automatic input of number of seat, injury pattern of each passenger, anthropological and DNA profilers matching with family member of fatalities as well as survivals during the disaster management is available in Taiwan. The survivability of passenger and crew member on-board is highly correlated with the patterns of crash. In addition to the focusing on deceased collection and identities, medico-legal investigation plays an important role during the investigation of the mockup of the aircraft wreckage and useful to correlate with survivability of passenger is part of the responsibility of medical examiner to investigate the cause of the airplane crash.

This work was supported by Ministry of Justice(Taiwan), project no. 106-1301-05-04-02.

Keyword: injury pattern, mass disaster, aviation disaster management system

Surveillance and Epidemiological Study of Illicit Drug-Related Fatalities in Taiwan（2001-2015）

Hsiao-Ting Chen [1] , Ju-Hui Chung [1], Chih-Hsin Pan [1], Bo-Yuan Tseng [1], Hsiao-Fan Yan [1] , Hui Chi Cheng [2], Kai-Ping Shaw [1]

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Abstract

A retrospective study of 5236 (19.6%) substance abuse-related fatalities (3872 cases of illicit drugs-related and 1364 cases of alcohol-related) collected from 26655 medico-legal autopsy cases during 2001-2015. The manners of death of 3872 illicit drug-related fatalities includes: accidental cause of death (2070 cases), suicidal cause of death (804 cases), homicidal cause of death (384 cases), natural cause of death (404 cases) and unknown cause of death (210 cases). The group consists primarily of male with 2668 (68.9%) drug-related fatalities with an average age of 39.5±0.4 years. The illicit drug abuse patterns of in Taiwan have become multifarious. In addition to methamphetamine and heroin, multiple-drugs abusers became the major category of illicit drug-related fatalities including, ketamine (16 cases in 2007 to 107 cases in 2015), flunitrazepam (FM2; from 12 cases in 2005 to 74 cases in 2015) and zolpidem (from 16 cases in 2005 to 45 cases in 2015) and became the major trend with contaminated syringe injection to induce bacterial emboli with great diversity of infectious diseases including AIDS, myocarditis, bronchopneumonia and hepatitis, etc. Mephedrone, PMMA, PMA, 5-MeO-MiPT, ethylone, methylone, 4-methylethcathinone (4-MEC), methylone (bk-MDMA), 4-fluoroamphetamine (4-FMA), 4-chloroamphetamine (4-CA), methedrone, MDPBP and have been recognized as emerging new psychoactive substances (NPS) in Taiwan. From 2013 to 2015, there is increased NPS abuse cases, such as ethylone (0 to 31 cases), PMMA/PMA (1 to 41 cases) and methylone (3 to 13 cases). These trends and results will arouse public attention and play a crucial role for the sketching the government's strategic of the anti-drug scheme.

This work was supported by Ministry of Justice, project no. 106-1301-05-04-02.

Key words: fatalities, illicit drug abuse, epidemiology, new psychoactive substances (NPS)

Driving Under Influence of Psychoactive Substances-Related Casualties in Taiwan (2003-2015)

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Abstract

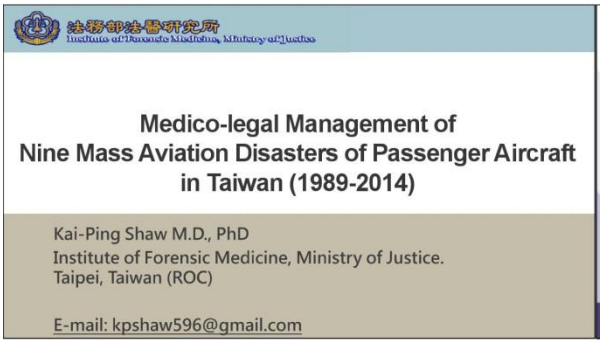
Driving under influence (DUI) of psychoactive substances including alcohol and other illicit drugs has become a major issue of public safety. The traffic casualties of traffic accidents have increased annually with a trend of involving diversities of DUI including New Psychoactive Substances (NPS) that raise public attention. Thus, traffic accidents have seriously endangered public safety and imperiled national productivity. Publicizing enforcement of drunk driving laws, reinforced enforcement of these laws, and restricting alcohol availability can reduce alcohol-related traffic deaths and injuries, which is important in tackling college and underage drinking problems. However, DUI of illicit psychoactive substance has been recognized as an essential contributing factor to the traffic accidents worldwide. From 2003 to 2015, the total 3008 (12.4%) traffic accident's forensic fatalities out of 24284 forensic autopsy fatalities from the Institute of Forensic Medicine, Ministry of Justice (Taiwan) were collected. All traffic-related fatality information were collected and analyzed according to epidemiological investigation. The cause of traffic accident-related death includes natural cause, driving under the influence of illicit drugs, or other extrinsic factors. These results demonstrated that the total 3008 traffic fatalities include 2791 (92.8%) accidental cause, suicide 25 (0.8%), homicide 31 (1.0%), natural cause 120 (4.0%) and unknown 41 (1.4%). In addition, male (2349, 78.1%) occurrence of traffic accident death rate was about 3.6 times the amount of women's (656, 21.9%) and the average age was 52.6 ± 13.9 years old. From the analysis of alcohol and illicit drug abuse, there were 74.7% absent of alcohol and drug, 21.8% alcohol abuse (with blood alcohol concentration above 50 mg/dL), 5.4% of illicit drug abuse, 1.9% for combined alcohol and illicit drug use. In spite of declining traffic fatalities involving alcohol abuse from 33.2% (2006) to 11.5% (2015), the percentage of traffic accidents involving illicit drug abuse remains between 2.2 and 9.5% during 2003-2015. The study demonstrated that despite the steady decline of drunk driving, DUI of drug and alcohol still represent the major causes of traffic accidents. The result can be referenced for the establishment of traffic accident prevention strategies.

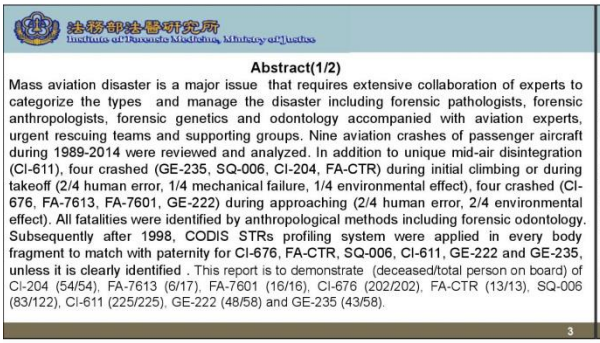
This work was supported by Ministry of Justice, project no. 106-1301-05-04-02.

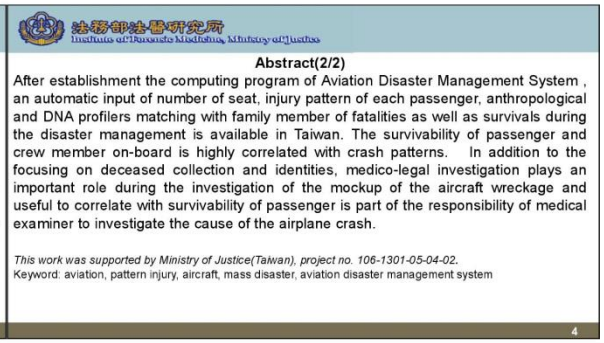
Keywords: Traffic Accidents, Alcohol, Illicit Drug, Substance Abuse

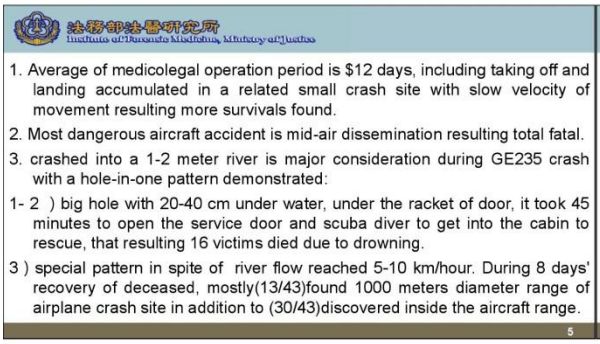
2、演講簡報

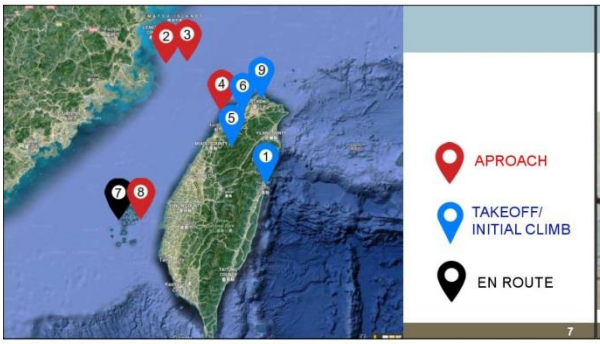
Medico-legal Management of Nine Mass Aviation Disasters of Passenger Aircraft in Taiwan (1989-2014)　簡報











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Formosa Airline-7601
1997-08-10

APPROACH
On board:16
Fatal:16

9

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China Airlines CI-676
1998-02-16

APPROACH
On board:202
Fatal:202

10

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China Airlines CI-611
2002-05-25

EN ROUTE
On board:225
Fatal:225

11

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EXPERIENCES OF SINGAPORE AIRLINES SQ006 BOEING 747-400 CRASHED ACCIDENT IN TAIPEI

Kai-Ping Shaw [1], John M. Fong [1], John Wang[1], Ching Hu[1], Ming-Houng Chen[1] , Chiang-shin Liu[1] , Tse-Hua Lo[1], Chang-En Pu[2]

[1]Institute of Forensic Medicine, Ministry of Justice (IFM), Taipei, Taiwan,
[2]Ministry Justice Investigation Bureau (MJIB),

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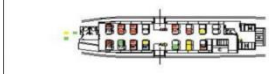
Institute of Forensic Medicine, Ministry of Justice

Injury / Fatality Distribution

Singapore Flight 006
747 - 400 Accident in Taipei, Taiwan
October 31st, 2000



Fuselage Separation

Figure 1.2-1 Injury/Fatal Distribution

13

Singapore Airlines said the flight was carrying

55 passengers from Taiwan,
47 from the United States,
11 each from Singapore and India,
8 from Malaysia,
5 from Indonesia,
4 each from Mexico and Britain,
2 each from Thailand, New Zealand and Vietnam,
1 each from Australia, Canada, Cambodia, Germany, Japan, the Philippines, Ireland and Spain's Canary Islands.

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Management of Aviation Disaster

15

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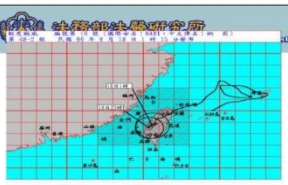

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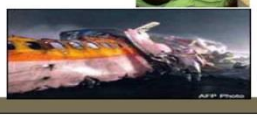
Forensic Pathologist

- Cause of accident
- Mass disaster management
- Rescued Wounded patients
- Scene managementDecadent: dead bodies
- Scene
- Recorded
- reconstruction



19

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Risk Factors of Aviation Accident
航空災難危險因素

20

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Crashed Accident

- October 31, 2000, midnight(23:17pm)
- Singapore Airlines Flight SQ-006, with Singapore registration 9V-SPK, Boeing 747-400 aircraft
- entered the runway under construction at Chiang- Kai-Shek (CKS) Airport, Taiwan before taken off.

21

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Caused of Accident

- Environment: Heavy thunderstorm and strong wind from typhoon "Xiang Sane" arrived at the time of this aviation accident.
- Human factor:miss the runway recognition warning
- Aircraft:mechanical

22

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Thanks for your attention.

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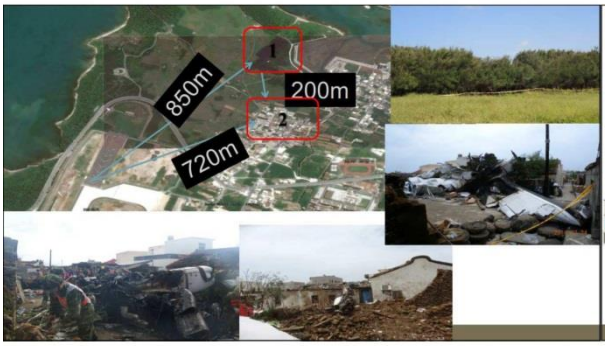
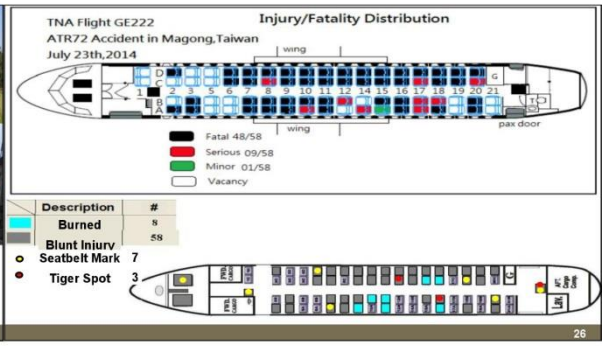
Transasia Airways Flight 222 Crash

Date and Flight	2014-07-23 (GE-222)
Flight Phase	APPROACH
Occurrence Category	CFIT (Controlled Flight Into or Toward Terrain)
Probable Causes	Weather(Visibility) ; Human Error(Lower altitude and deviation from designated path)
Fatal injuries on board	48/58
Period of management	3 days
Local Time	19:06pm
Location	Penghu


850m
200m
720m
1
2


TNA Flight GE222
ATR72 Accident in Magong,Taiwan
July 23th,2014
Injury/Fatality Distribution
wing
wing
pax door
Fatal 48/58
Serious 09/58
Minor 01/58
Vacancy
Description #
Burned 8
Blunt Injury 58
Seatbelt Mark 7
Tiger Spot 3
26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Flight : GE-222
Description #
Fatalities 48
Survivor 10
Description #
Chest Injury 14
Description #
Pelvis Fault 22


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Institute of Forensic Medicine, Ministry of Justice
Transasia Airways Flight 235 Crash
Date and Flight 2015/2/4 (GE-235)
Flight Phase INITIAL CLIMB
Occurrence Category LOC-I(Loss of Control-Inflight)
Probable Causes Human Errors(Turnoff the normal engine);
Fatal injuries on board 43/58
Period of management 8 days
Local Time 10:54am
Location Taipei


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Institute of Forensic Medicine, Ministry of Justice
10:54:23 組員開始呼叫重新開車
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獨家
NEWS
TVBS新聞台HD
TVBS版權所有
2015/02/04-11:07:00 PAPAGO!P0


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Turned left to avoid building
Loss Control
Sharp Roll
左傾
Crash on Highway
撞擊
Crash into River
蘋果日報
© Apple Daily News

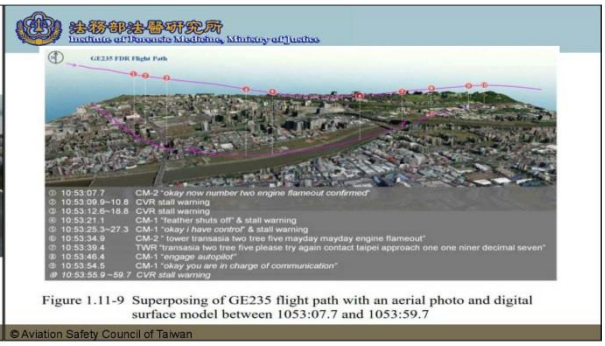


Figure 1.11-9 Superposing of GE235 flight path with an aerial photo and digital surface model between 1053:07.7 and 1053:59.7

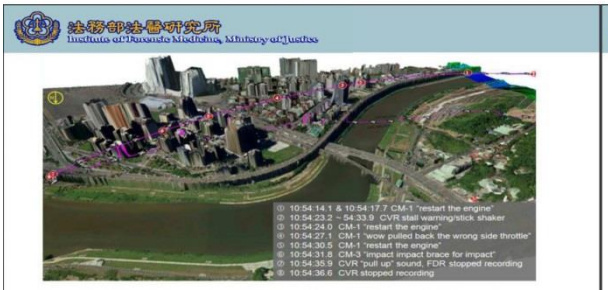


Figure 1.11-10 Superposing of GE235 flight path with an aerial photo and digital surface model during the last 23 seconds.

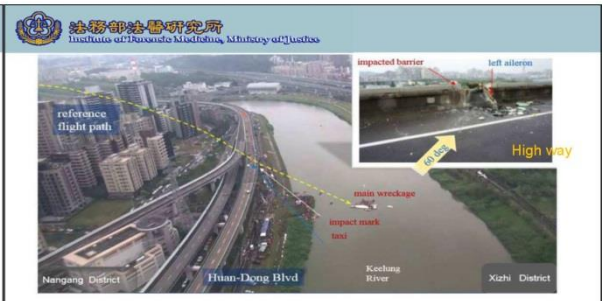


Figure 1.12-1 Aerial Photo of GE235 crash site

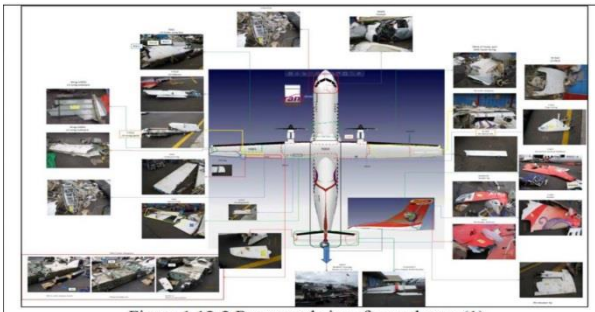
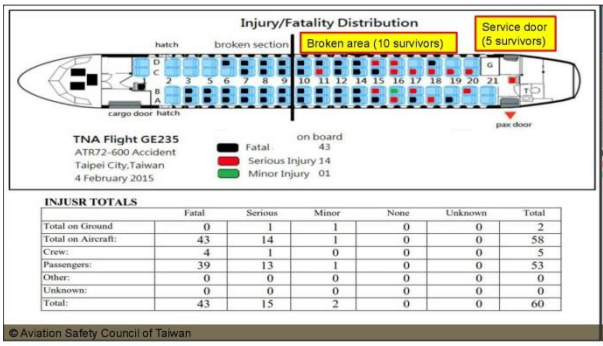


Figure 1.12-2 Recovered aircraft wreckages (1)

Figure 1.12-3 Recovered aircraft wreckages (2)


Injury/Fatality Distribution
Broken area (10 survivors)
Service door (5 survivors)
hatch
broken section
cargo door
hatch
pax door
TNA Flight GE235
ATR72-600 Accident
Taipei City,Taiwan
4 February 2015
on board
Fatal 43
Serious Injury 14
Minor Injury 01
INJUSR TOTALS
Fatal Serious Minor None Unknown Total
Total on Ground: 0 1 1 0 0 2
Total on Aircraft: 43 14 1 0 0 58
Crew: 4 1 0 0 0 5
Passengers: 39 13 1 0 0 53
Other: 0 0 0 0 0 0
Unknown: 0 0 0 0 0 0
Total: 43 15 2 0 0 60
© Aviation Safety Council of Taiwan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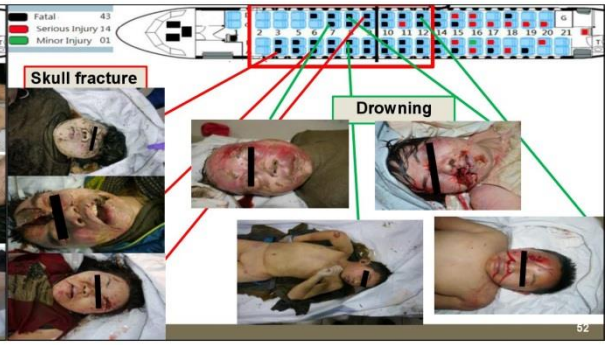
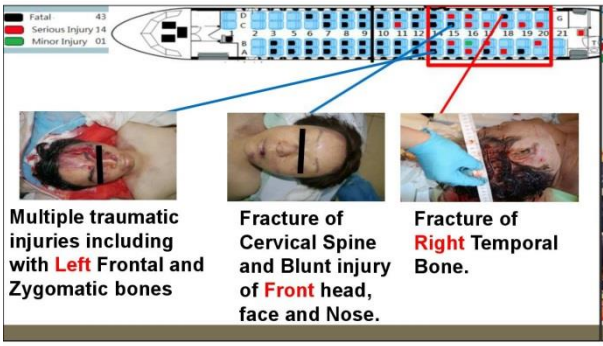
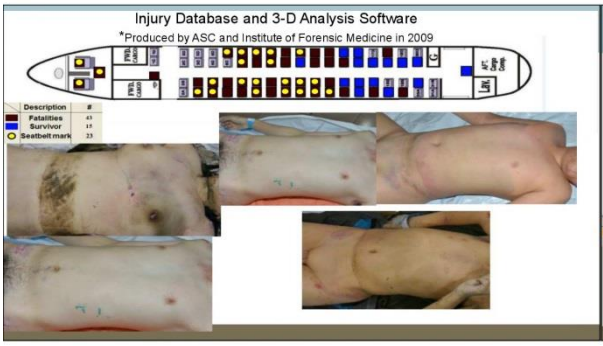
Institute of Forensic Medicine, Ministry of Justice
Fatal 43
Serious Injury 14
Minor Injury 01
hatch
broken section
broken area
Service Door
cargo door
hatch
pax door
Fuselage Side
Door Side
© Aviation Safety Council of Taiwan
50

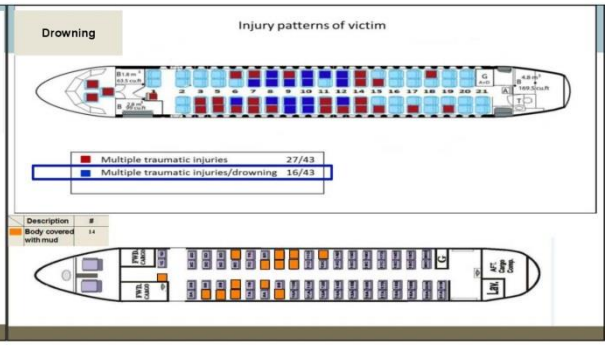

Fatal 43
Serious Injury 14
Minor Injury 01
1 CaptainA
2 Captain B
3 First Officer


Fatal 43
Serious Injury 14
Minor Injury 01
Skull fracture
Drowning
52


Fatal 43
Serious Injury 14
Minor Injury 01
Multiple traumatic injuries including with Left Frontal and Zygomatic bones
Fracture of Cervical Spine and Blunt injury of Front head, face and Nose.
Fracture of Right Temporal Bone.


Survivors
Serious Injury 14
Minor Injury 01
Service Door
54


Injury Database and 3-D Analysis Software
*Produced by ASC and Institute of Forensic Medicine in 2009
Description #
Fatalities 43
Survivor 15
Seatbelt mark 23


Drowning
Injury patterns of victim
Multiple traumatic injuries 27/43
Multiple traumatic injuries/drowning 16/43
Description #
Body covered with mud 14


Description
#
Skulll trauma
21
Description
#
Skull fracture
15
Description
#
Extremity fractures
30

3、壁報展示(共 2 張)

Surveillance and Epidemiological Study of Illicit Drug-Related Fatalities in Taiwan（2001-2015）壁報展示

Surveillance and Epidemiological Study of Illicit Drug-Related Fatalities in Taiwan (2001-2015)

HSIAO-TING CHEN[1], JU-HUI CHUNG[1], CHIH-HSIN PAN[1], BO-YUAN TSENG[1], HSIAO-FAN YAN[1] , HUI CHI CHENG[2], KAI-PING SHAW[1]

[1] Dept. of Forensic Pathology, Institute of Forensic Medicine, Ministry of Justice, Taipei, Taiwan (ROC).
[2] Dept. of Pathology, National Defense Medical Center, Taipei, Taiwan (ROC).

INTRODUCTION

Over the past decades, drug abuse has been a major epidemiological concern throughout the world. The annual prevalence of illicit drug use rose from 5.2% (2013) to 5.3% (2015) [1,2]. The burgeoning types of NPS also brings up new challenges.

The purpose of this study is to understand the characteristics of illicit drugs-related cases by analyzing toxicological profiles correlated with epidemiological data including age and manners of death. Due to serious social implications, the legalized authority has begun developing strategies to cope with the newly-developed illicit drugs and multifarious pattern of illicit drug abusers, in order to accentuate anti-drug legislation.

These studies not only imply a prospective survey and surveillance for the new fangled-illicit drugs but also demonstrate the tragic increase in illicit-drug abusers. These results will play a crucial role when the government as it begins to strategize anti-drug campaigns.

The surveillance of illicit drug abuse patterns in Taiwan has shown them to become multifarious. In addition to Methamphetamine and heroin, new psychoactive substances (NPS) abusers have become the major category of illicit drug-related cases. Because of this, new strategies need to be implemented by the government to address this problem.

METHOD

Substance-related fatalities

- Out of a total of 26655 medico-legal autopsy cases, 5236 (19.6%) substance abuse-related cases were collected from Institute of Forensic Medicine in Taiwan during 2001-2015.

Forensic toxicology analysis

- Results were conducted by The Ministry of Justice Poison chemical group of the Institute of Forensic Medicine using gas chromatography mass spectrometry (GC-MS).
- Deceased's blood, urine and tissue fluids were monitored for qualitative and quantitative chemical analysis.
- If the deceased was hospitalized after the accident for more than 24 hours, its blood alcohol concentrations were collected, based on hospital laboratory results.

Manner of Death

- Concluded by medical examiners.
- Conclusion based on scene investigation, background review, medical history, autopsy report, toxicological study and other profiles.

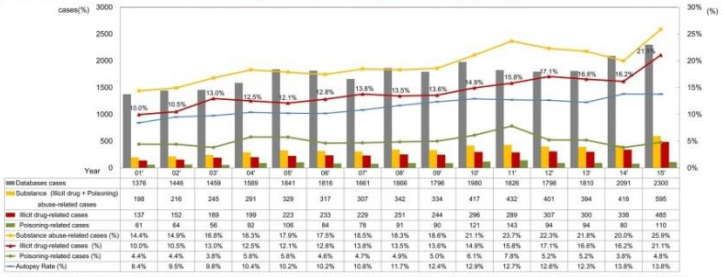
Statistical analysis

- Excel (Microsoft) was used for data analysis.
- Statistical analysis for epidemiological purpose of this study was also conducted.

New Psychoactive Substances (NPS)

- Defined according to UNODC.
- Exclusion of traditional illicit drug such as heroin and amphetamine.

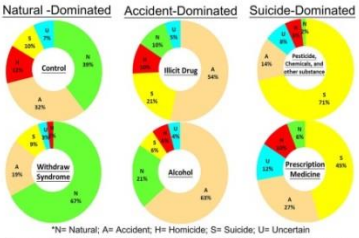
RESULTS & DISCUSSION



	01'	02'	03'	04'	05'	06'	07'	08'	09'	10'	11'	12'	13'	14'	15'
Databases cases	1376	1446	1459	1589	1841	1816	1661	1866	1796	1980	1826	1798	1810	2091	2300
Substance (Illicit drug + Poisoning) abuse-related cases	198	216	245	291	329	317	307	342	334	417	432	401	394	418	595
Illicit drug-related cases	137	152	169	199	223	233	229	251	244	296	289	307	300	338	485
Poisoning-related cases	61	64	56	92	106	84	78	91	90	121	143	94	94	80	110
Substance abuse-related cases (%)	14.4%	14.9%	16.8%	18.3%	17.9%	17.5%	18.5%	18.3%	18.6%	21.1%	23.7%	22.3%	21.8%	20.0%	25.9%
Illicit drug-related cases (%)	10.0%	10.5%	13.0%	12.5%	12.1%	12.8%	13.8%	13.5%	13.6%	14.9%	15.8%	17.1%	16.6%	16.2%	21.1%
Poisoning-related cases (%)	4.4%	4.4%	3.8%	5.8%	5.8%	4.6%	4.7%	4.9%	5.0%	6.1%	7.8%	5.2%	5.2%	3.8%	4.8%
Autopsy Rate (%)	8.4%	9.5%	9.8%	10.4%	10.2%	10.2%	10.8%	11.7%	12.4%	12.9%	12.7%	12.6%	12.3%	13.8%	13.8%

Figure 1. Break down of Medico-Legal Autopsy Cases Collected from Institute of Forensic Medicine in Taiwan (2001-2015)

- A retrospective study of 5236 (19.6%) substance abuse-related fatalities (3872 cases of illicit drugs-related and 1364 cases of alcohol-related) collected from 26655 medico-legal autopsy cases during 2001-2015.
- Illicit drug related cases takes up 10.0% (2001) to 21.1(2015) of database cases.



*N= Natural; A= Accident; H= Homicide; S= Suicide; U= Uncertain

Figure 2. Manners of Death of Psychoactive Substance-Related Fatalities in Taiwan (2001-2015)

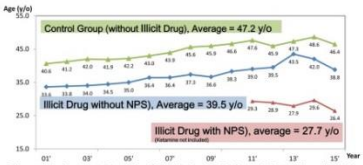
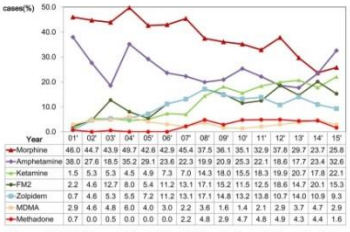


Figure 3. Age at Death of Illicit Drug-Related Fatalities (2001-2015)



	01'	02'	03'	04'	05'	06'	07'	08'	09'	10'	11'	12'	13'	14'	15'
Morphine	46.0	44.7	43.9	49.7	42.6	42.9	45.4	37.5	36.1	35.1	32.9	37.6	29.7	23.7	25.8
Amphetamine	38.0	27.6	18.5	35.2	29.1	23.6	22.3	19.9	20.9	25.3	22.1	18.6	17.7	23.4	32.6
Ketamine	1.5	5.3	5.3	4.5	4.9	7.3	7.0	14.3	18.0	15.5	18.3	19.9	20.7	17.8	22.1
FM2	2.2	4.6	12.7	8.0	5.4	11.2	13.1	17.1	15.2	11.5	12.5	18.6	14.7	20.1	15.3
Zolpidem	0.7	4.6	5.3	5.5	7.2	11.2	13.1	17.1	14.8	13.2	13.8	10.7	14.0	10.9	9.3
MDMA	2.9	4.6	4.8	6.0	4.0	3.0	2.2	3.6	1.6	1.4	2.1	2.9	3.7	4.7	2.9
Methadone	0.7	0.0	0.5	0.0	0.0	0.0	2.2	4.8	2.9	4.7	4.8	4.9	4.3	4.4	1.6

Figure 4. Illicit Drug-Related Fatalities Collected from Institute of Forensic Medicine in Taiwan (2001-2015)

Illicit Drug Trend during 2001-2015:

- **Morphine and Amphetamines** : major concerns; declining.
- **Ketamine** (1) rising since 2008 (2) major NPS in Taiwan (3) age group 25-34 y/o (48%), average age = 28.8 y/o (4) used as party drug; combined with alcohol.
- **+Prescription drug**: threaten in multifarious drug abuse. Illicit drug **+ Hypnotics** (Estazolam, Clonazepam) or **Sedatives** (Trazodone, Fluoxetin) abuse have become a common pattern.
- **Propofol** (abuse of anesthetic):Peaked within 2012-2014, then classified as Schedule IV drug in 2015 and thus under controlled.

Table 1. NPS-Related Medico-Legal Autopsy Cases (2007-2015)

Year		07'	08'	09'	10'	11'	12'	13'	14'	15'	Total
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Illicit drug-related medio-legal autopsy cases		229	251	244	296	289	307	300	338	485	2739
Scheduled #	Illicit drug name										
II	MDA, MDMA	4 (1.7)	8 (3.2)	4 (1.6)	4 (1.4)	6 (2.1)	9 (2.9)	11 (3.7)	16 (4.7)	15 (3.1)	77 (2.8)
II	PMA, PMMA	6 (2.6)	3 (1.2)	--	--	--	--	1 (0.3)	7 (2.1)	41 (8.5)	58 (2.1)
II	LSD	--	--	--	--	--	--	-- LSD	1 (0.3)	--	1 (<0.1)
III	Ethylone	--	--	--	--	--	--	--	Ethylone	31 (6.4)	31 (1.1)
III	Methylone	--	--	--	--	Methylone	3 (1.0)	2 (0.7)	8 (2.4)	13 (2.7)	26 (0.9)
III	4-Chloroamphetamine	--	--	--	--	--	4-Chloroamphetamine		3 (0.9)	21 (4.3)	24 (0.9)
III	5-MeO-MiPT	--	--	--	--	--	5-MeO-MiPT	3 (1.0)	3 (0.9)	9 (1.9)	15 (0.5)
III	4-Fluoroamphetamine	--	--	--	4-Fluoroamphetamine		3 (1.0)	--	--	7 (1.4)	10 (0.4)
III	Butylone (bk-MBDB)	--	--	--	--	--	--	Butylone (bk-MBDB)		3 (0.6)	3 (0.1)
III	TFMPP	--	--	--	--	--	TFMPP	2 (0.7)	--	--	2 (0.1)
III	Mephedrone	--	--	--	--	--	--	--	Mephedrone	1 (0.2)	1 (<0.1)
III	25B-NBOMe	--	--	--	--	--	--	--	25B-NBOMe	1 (0.2)	1 (<0.1)
III	4-Chloromethcathinone (CMC)	--	--	--	--	--	--	4-Chloromethcathinone (CMC)		1 (0.2)	1 (<0.1)

CONCLUSIONS

The epidemiological study shows the evolution of illicit drug item and abuse pattern. While morphine and amphetamine-related cases are decreasing, the major pattern of abuse transfers from single drug abuse to multifarious drug abuse. NPS such as ketamine, PMA, PMMA, MDA, MDMA and synthetic cathinone brings up new challenge.

ACKNOWLEDGEMENT

- This work was supported by Ministry of Justice, project no. 106-1301-05-04-02, and Ministry of Health and Welfare, project no. FDA MOHW106-FDA-D-114-000632.

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Driving Under Influence of Psychoactive Substances-Related Casualties in Taiwan (2003-2015) 壁報展示

Driving Under Influence of Psychoactive Substances-Related Casualties in Taiwan (2003-2015)

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INTRODUCTION

Although annual alcohol-related traffic deaths exceed 9,000 in the US and 160 in Taiwan [1,2] has been declining over the last decade, but the epidemiological result of substance abuse-related traffic crashes is yet to be determined. Due to the expensive cost of toxicological tests, a delay in getting the results by emergent physician is pretty often [3]. Routinely performances of forensic autopsies with toxicological examinations of postmortem blood in at the Institute of Forensic Medicine, Ministry of Justice has becomes a crucial sample for screening alcohol and substance abuse during in traffic accidents. In western countries, drivers under the influence of an illegal drug (DUID) are often found with cannabis, benzodiazepines, cocaine, opiates and amphetamine in addition to alcohol [4,5]. In general, epidemiological research in the drugged driving area has experienced problems with toxicology sample collection and data analysis [6]. It is necessary to have precise epidemiological data from the traffic accident-related fatalities to raise public awareness and establish prevention strategies by examining the problems and documenting the prevalence of psychoactive substances-involved in motor vehicle crashes. The goals of this study are: (1) to establish the epidemiological database and gender and age (2) to determine the incidence and prevalence of drugs and/or alcohol use among motor vehicle crash (MVC) fatalities, (3) to analyze the driving under influence of drug/alcohol-related fatalities of motor vehicles, passengers, and pedestrians. (4) to observe the synergistic effect of combing various psychoactive substances endanger the traffic accident pattern.

METHOD

Epidemiological Study on Traffic Fatalities

- Out of total 24824 medico-legal autopsy cases, 3005 (12.4%) traffic-related cases were collected from Institute of Forensic Medicine in Taiwan during 2003-2015.
- The average autopsy rate over all period is 11.8%.

Forensic toxicology analysis

- Results were conducted by The Ministry of Justice Poison chemical group of the Institute of Forensic Medicine with gas chromatography mass spectrometer (GC-MS).
- Deceased's blood, urine and tissue fluids were monitored for qualitative and quantitative chemical analysis.

Driving under Illness:

- (1) age over 60 y/o, and
- (2) incapable driving ability including major disability of visual , neuromuscular function, and cerebro-vascular disease and cardio-vascular disease.
- Statistic period: 2013-2015.

Manner of Death

- Concluded by medical examiners.
- Combine with scene investigation, background review, medical history, autopsy report, toxicological study and other profiles.

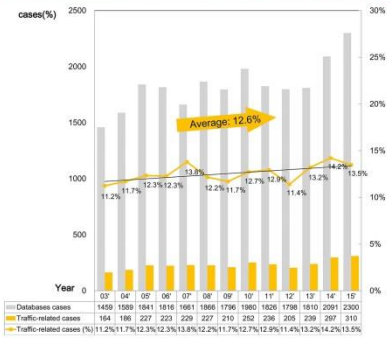
Statistical analysis

- Excel (Microsoft) were used for data analysis.
- Statistical analysis for epidemiological purpose of this study is also conducted.

Institutional review board (IRB) and ethical issue

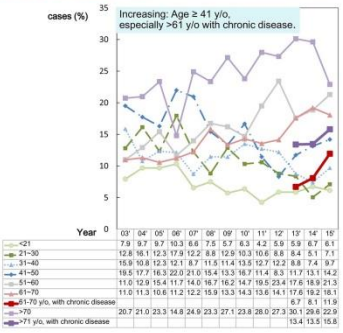
- This study was approved by the Local Ethics Committee of An-Tai Medical Care Cooperation Antai Tian-Sheng Memorial Hospital (TSMH IRB #17-035-C0).

RESULTS & DISCUSSION



	03'	04'	05'	06'	07'	08'	09'	10'	11'	12'	13'	14'	15'
Databases cases	1459	1589	1641	1816	1661	1866	1796	1980	1826	1798	1810	2091	2300
Traffic-related cases	164	186	227	223	229	227	210	252	236	205	239	297	310
Traffic-related cases (%)	11.2%	11.7%	12.3%	12.3%	13.8%	12.2%	11.7%	12.7%	12.9%	11.4%	13.2%	14.2%	13.5%

Figure 1. Relationship of Traffic-Related Cases and Forensic Autopsy Cases Collected from Institute of Forensic Medicine in Taiwan (2003-2015)



	03'	04'	05'	06'	07'	08'	09'	10'	11'	12'	13'	14'	15'
<21	7.9	9.7	9.7	10.3	6.6	7.5	5.7	6.3	4.2	5.9	5.9	6.7	6.1
21~30	12.8	16.1	12.3	17.9	12.2	8.8	12.9	10.3	10.6	8.8	8.4	5.1	7.1
31~40	15.9	10.8	12.3	12.1	8.7	11.5	11.4	13.5	12.7	12.2	8.8	7.4	9.7
41~50	19.5	17.7	16.3	22.0	21.0	15.4	13.3	16.7	11.4	8.3	11.7	13.1	14.2
51~60	11.0	12.9	15.4	11.7	14.0	16.7	16.2	14.7	19.5	23.4	17.6	18.9	21.3
61~70	11.0	11.3	10.6	11.2	12.2	15.9	13.3	14.3	13.6	14.1	17.6	19.2	18.1
61-70 y/o, with chronic disease												8.7	8.1	11.9
>70	20.7	21.0	23.3	14.8	24.9	23.3	27.1	23.8	28.0	27.3	30.1	29.8	22.9
>71 y/o, with chronic disease												13.4	13.5	15.8

Figure 2. Age Group Distribution of Traffic-Related Fatalities in Taiwan (2003-2015)

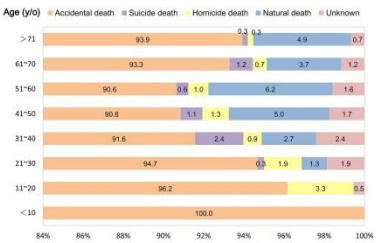
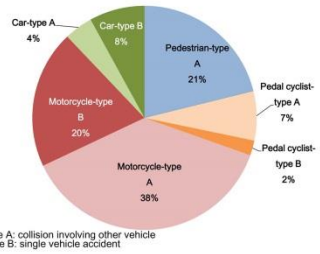
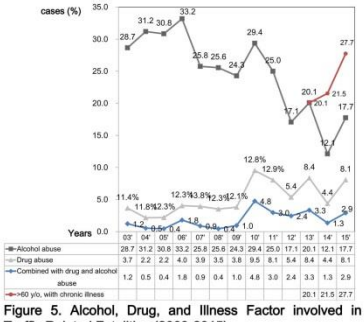


Figure 3. Manners of Death of Traffic-Related Fatalities in Taiwan (2003-2015)



*type A: collision involving other vehicle
type B: single vehicle accident

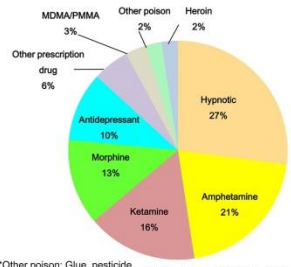
Figure 4. Vehicle Types involved in Traffic-Related Fatalities in Taiwan (2003-2015)



	03'	04'	05'	06'	07'	08'	09'	10'	11'	12'	13'	14'	15'
Alcohol abuse	28.7	31.2	30.8	33.2	25.8	25.6	24.3	29.4	25.0	17.1	20.1	12.1	17.7
Drug abuse	3.7	2.2	2.2	4.0	3.9	3.5	3.8	9.5	8.1	5.4	8.4	4.4	8.1
Combined with drug and alcohol abuse	1.2	0.5	0.4	1.8	0.9	0.4	1.0	4.8	3.0	2.4	3.3	1.3	2.9
>60 y/o, with chronic illness											20.1	21.5	27.7

Figure 5. Alcohol, Drug, and Illness Factor involved in Traffic Related Fatalities (2003-2015)

- Drug-related traffic accident cases: peaked within 2010; decreasing.
- Average prevalence over all statistic period:
  - **>60 y/o, with chronic illness** (23.4)
  - **Alcohol abuse** (22.6)
  - **Drug abuse** (5.4)
  - **Combined with drug and alcohol abuse** (1.9)



*Other poison: Glue, pesticide
*Other prescription drug: Prescription drug other than hypnotic and antidepressant (e.g., Phenytoin, Carbamazepine, Oxcarbazepine, Chlorpheniramine, Tramadol

Figure 6. Drug involved in Traffic-Related Fatalities in Taiwan (2003-2015)

- Major hypnotic involved in traffic accident: Zolpidem, Flunitrazepam, Diazepam and Mirtazapine.
- Major NPS involved in traffic accident: Ketamine, PMMA, MDMA.
- Accident involving synthetic cathinone (Methylone) were also observed.

CONCLUSIONS

In addition to hypnotic and amphetamine, NPS including ketamine, PMMA, MDMA and methylone were involved in traffic-related fatalities, highly consistent with the illicit drug abusing pattern in Taiwan. Despite the declining trend of alcohol-related traffic accident, driving under illness-related fatalities increasing in the last few years. Statistic also show motorcycle accident as the major traffic pattern in Taiwan.

ACKNOWLEDGEMENT

- This work was supported by Ministry of Justice, project no. 106-1301-05-04-02, and Ministry of Health and Welfare, project no. FDA MOHW106-FDA-D-114-000632.

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