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RESEARCH ON ETOMIDATE DRUG CONTROL, PUBLIC SAFETY, AND LEGAL REGULATIONS IN TAIWAN: CURRENT STATUS AND CHALLENGES

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ABSTRACT

The epidemic of etomidate abuse in Taiwan, which threatens not only public health and safety as well as legal agencies but also the entire country, is now one of the most serious issues facing Taiwanese society as a whole. In response to this growing issue, in late 2024 the Executive Yuan established etomidate as a Category II narcotic and enacted legislation placing the maximum penalty for trafficking to life imprisonment. Although this action will assist in addressing some of Taiwan's most serious issues, the medical community continues to be overburdened by the complexities surrounding withdrawal and inadequate infrastructure for professional medical intervention and systemic support services. The Criminal Investigation Bureau initiated Operation Nationwide as a primary task for their national law enforcement agencies in January 2025, which resulted in many arrests and the seizure of large quantities of liquid drugs. The operation revealed the presence of drugs throughout the country threatening youth and the public. With the current education systems in schools and a lack of community support to improve awareness of narcotics, we need more types of media and different types of educational strategies to increase public awareness of drug use and the risks associated with drug use in society. Law enforcement officers and health care professionals face significant stress as they carry out their responsibilities associated with enforcement and rehabilitation depending upon their need for support systems. Therefore, it is essential to develop a comprehensive social support system for these individuals. Legal and public health policy will continue to be required to meet the changing nature of the situation. The best way to balance the benefits of using etomidate for medical purposes against the potential risk of abuse is to implement an organized program that uses clinical practice to carefully evaluate and develop rules and regulations. In order for Taiwan to efficiently reduce the volume of illegal etomidate production and ensure that public health/safety is protected, integrated governance which combines the legal aspects of etomidate, medical intervention, education, and social participation must be maintained.

KEYWORDS: Etomidate Abuse, Public Safety, Regulatory Control, Medical Practice, Taiwan.

I. INTRODUCTION: THE CHALLENGE OF ETOMIDATE ABUSE AND DRUG CONTROL IN TAIWAN

Taiwan is facing an increased threat from the use of Etomidate, a drug developed for use as anaesthesia, which offers a stable form of anaesthesia with good hemodynamic properties (Janssen et al, 1975; Yelavich & Holmes, 1980; Ge et al, 2013). But the huge potential for Etomidate to be misused and lead to addiction creates widespread concern throughout society since misuse of Etomidate has been associated with irreversible brain injury and psychiatric illness, thus creating a significant public health risk.

Therefore, to address the issue of drug misuse of Etomidate in Taiwan, several legislative and regulatory initiatives should be taken to develop and enhance the control of "New Psychoactive Substances" (NPS), by creating and revising the legal framework, and additionally, improving existing legislation for effective prevention of illegal distribution of New Psychoactive Substances. Liying et al. (2024) developed and validated a method of ultra-high performance liquid chromatography coupled with tandem mass spectrometry (UHPLC-MS/MS) to detect Etomidate (informally referred to as "smoke powder") in both blood and urine along with its metabolite Etomidate acid. This research also demonstrates that new analogue derivatives of Etomidate are available in illicit markets and, consequently, will pose toxicological issues for clinical practice; however, analytic techniques for the accurate identification of such substances are currently lacking. It is essential to have effective means of detection to monitor the penetration and circulation of the illicit drug Etomidate and other NPSs. With the application of innovative new techniques to enhance the ability of law enforcement agencies to detect and trace illicit drugs.

Alongside legal/technical remediation actions; Educational community awareness regarding Drugs and New Psychoactive Substances' risks is vital for Drug Prevention. Drug Prevention efforts should include collaboration among multiple sectors and joint governance over the use and distribution of Drugs within Taiwan to help regulate and reduce abuse of increasingly popular forms of drug use and ensure both a healthy and safe Taiwan.

Etomidate is a prime example of the emergence of new psychoactive substances, which are rapidly becoming abused as a result of their potential to be used to promote illegal drug use. The illegal distribution of Etomidate in combination with

tobacco products or e-cigarette liquids, in conjunction with the inability to trace such illicit products back to their point of origin as a result of difficulty in tracking such products (due to both the illegal nature of these products and the anonymity offered to consumers), has made efforts toward regulatory control virtually impossible. Furthermore, the absence of standardized detection methods and a lack of basic research into Etomidate's toxicological effects has made it impossible to develop an effective response to Etomidate abuse. In many instances, the most significant victim of the increased abuse of Etomidate is the youth population in Taiwan; as such, the use of Etomidate has negatively impacted many facets of social order and health related to families and public safety.

In order to effectively address the challenge of establishing regulatory control over Etomidate and other emerging drugs, the government of Taiwan must take three immediate actions: There must be a comprehensive monitoring system for the new drugs introduced into the market to effectively track usage and circulation of these drugs in real-time; Legal reform with an increase in the law enforcement capacity to effectively respond to the abuse of drugs; This in conjunction with further investigation into the toxicology characteristics and patterns associated with Etomidate abuse will provide needed scientific data to support the creation of effective public policy; and an expansion of both public education and outreach to raise public awareness of the danger associated with using new drugs, and to enhance services and intervention opportunities for those individuals who are considered high risk for abusing new drugs.

Finally, it is essential that cross-sector collaboration between multiple sectors of society and the creation of stronger institutional links exist. As such, unless a collaborative response to the emergence of these new drugs is coordinated with other sectors, there will be no chance of success.

II. ETOMIDATE ABUSE, DRUG CONTROL BOTTLENECKS, AND PUBLIC SAFETY

1. Medical Use and Current Status of Abuse

(1) Diversified and Concealed Pathways of Abuse

Etomidate is a powerful anesthetic agent that has been used since the early 1970s and has been found to produce a large number of physiological responses through its ability to produce hemodynamic stability, allowing clinicians to use etomidate extensively for clinical anesthesia and in critically ill patients. Many studies have identified many physiological effects of

etomidate. For example, Fragen et al. (1984) conducted a study to investigate the effect of etomidate on the endocrine response during surgery. The authors found that during surgery, the stress of surgery will lead to an increase in the secretion of adrenal cortical hormones such as cortisol and aldosterone to maintain normal physiological conditions. In addition, Chan, Mitchell, and Shorr (2012) reported that there is a higher rate of adrenal insufficiency and death associated with using etomidate to rapidly intubate septic patients. Clinical observations also indicate that etomidate may decrease the adrenal function, thus leading to the patient's ability to respond to physiological stressors. Thus, Chan, Mitchell, and Shorr reported that in patients with sepsis who receive etomidate, the risk of adrenal suppression significantly increases and diminishes their ability to respond to physiological stressors and correlates with an increased rate of mortality.

In Taiwan, Chen et al. (2019) through their study of the adult population, that a portion of the adult population is using prescription drugs for reasons other than medical need such as sedatives and analgesics. This has created a public health issue that needs to be addressed through the implementation of interventions in the medical field and the establishment of educational outreach initiatives to reduce potential risks to the public. Chen et al. recommend that there should be stronger cross-discipline collaboration and that more effective monitoring and prevention mechanisms should be established to provide the appropriate level of public health protection. Chaoyi (2021) focuses on the design, synthesis, and preclinical pharmacology of etomidate analogues. The study noted that etomidate has favorable anesthetic induction properties but that the clinical usefulness of etomidate is limited due to the effect of etomidate on the adrenal suppression. Therefore, it would be desirable to develop safer and more efficacious analogues of etomidate.

In their study, Ho, Kuo, and Chang (2025) analyzed how clinicians could effectively identify and manage etomidate analogue withdrawal syndromes. They indicate that although etomidate is

primarily used for anesthesia induction, it can cause dependence and withdrawal syndromes. They reported that few studies have addressed this issue, and their study concludes that physicians should take into account the history of etomidate analogue use when diagnosing unexplained withdrawal syndromes and to create clinical protocols to manage these syndromes effectively. Their study bridges the gap in the literature for the toxicology and anesthesiology professions, thus providing an important reminder to medical providers regarding the risks associated with the misuse and abuse of newly emerging drugs.

To summarise, etomidate has legitimate medical applications in Anaesthesia and Critical Care and the first abuse of etomidate originated in 2021 and dramatically expanded across Eastern Asia between 2024 and 2025, becoming a major social issue. At the beginning of etomidate abuse mainly involved injection, then with time, the channels of access diversified, and the forms of etomidate abuse became increasingly complex. Illicit operators have started to include etomidate in e-liquids for electronic cigarettes, in over-the-counter (OTC) cosmetics, and to sell over the internet for further concealment of distribution channels and make detection and tracking more difficult. Persons who may have unknowingly abused illegal products containing etomidate (i.e., "forget-worry pills," "happy water") as sleep aids or stress-relievers could accidentally become drug abusers. Disguised under the guise of ordinary commercial products, these products significantly expand the population of potential abusers, particularly among adolescents with limited ability to practice discernment, and therefore pose a serious public health problem.

Etomidate abuse has been observed first in mainland China and has spread to Taiwan and other East Asian countries. Therefore, etomidate abuse poses challenges to public health and creates demands for greater policymaking and enforcement. Table 1 illustrates the ongoing crisis and demonstrates that there is an urgent need for comprehensive monitoring, regulatory reforms, and preventive education.

Table 1: Timeline of Etomidate Abuse Development.

Time Period	Region/Event	Key Features
2021 - Early signs of abuse to present	Mainland China	After synthetic cannabinoids were scheduled, illicit groups sought substitutes and began mixing etomidate into e-cigarette liquids, commonly referred to as "Up-head cigarettes."
2023 - Early 2024, spread to Taiwan and	Taiwan	At the end of 2023, the first illegal use case was detected, with etomidate found mixed into e-cigarette cartridges (commonly called "Zombie cartridges").

Hong Kong–Macau	Hong Kong, Vietnam, and other Southeast Asian regions	During the same period, numerous reports of non-medical detection emerged. Since etomidate is classified as a controlled medicine rather than a narcotic in Southeast Asian countries, criminal groups smuggled raw materials through Cambodian Chinese networks and transported them to Taiwan.
2024 – Outbreak and scheduling	Taiwan	In 2024, the Criminal Investigation Bureau uncovered Taiwan’s first “Zombie cartridge” e-cigarette manufacturing and repackaging site, showing that the drug had begun circulating domestically and rapidly became a new-generation narcotic among adolescents and students. © Abuse surged: 2,905 detections between January–October 2024, compared to 22 cases in 2023, a 132-fold increase. © August 2024: Classified as a Category III narcotic. © November 27, 2024: Upgraded to Category II narcotic due to frequent fatal drug-impaired driving incidents.
2025 – Current situation	Taiwan (and global spread)	- Etomidate and related substances (e.g., isopropyl etomidate) have become globally recognized drugs of concern. - Taipei City Police Department data: the proportion of etomidate-related drug cases doubled from 10.35% in 2024 to 29.53%.

Source: Compiled by the author; Shenzhen People’s Procuratorate (2023); Public Television Service News Network (2024); Liberty Times (2024)

Etomidate abuse was first identified in mainland China in 2021. The government of China’s regulation of synthetic cannabinoids was the catalyst for illicit actors to search for other substances to fill that void and they found a way to incorporate etomidate into e-cigarettes, dubbing it “head-high cigarettes.” By late 2023/early 2024, the illegal use and abuse of etomidate had spread to Taiwan, Hong Kong and Macau. The first case of illegal abuse of etomidate reported by Taiwanese law enforcement occurred at the end of 2023 when police found etomidate in e-cigarette cartridges commonly referred to as “zombie cartridges.” Additionally, during this same time period, law enforcement agencies in Hong Kong and the Southeast Asian nation of Vietnam also reported the presence of etomidate in their country’s illicit markets which indicates that the drug was not only being used in the respective country but was also being distributed throughout borders.

The year of 2024 represented the complete explosion of etomidate abuse in Taiwan. The Food and Drug Administration reported that between January and October of 2024, there were 2905 cases detected of etomidate abuse in the country, compared to only 22 cases reported in 2023 – an astonishing increase of over 132-fold year-on-year increase from the previous year. In response to the rapid rise in etomidate abuse, the Taiwanese government formally classified etomidate as a Category III Narcotic in August 2024. Tragically, as a result of multiple drug-related fatalities as a result of impaired driving, including a police officer from Sanzhong District and a precinct chief dragged in Tucheng, the Executive Yuan officially announced on November 27, 2024, that etomidate would be reclassified as a Category II Narcotic. Etomidate and its derivatives have quickly become an increasing

problem in the world of drug abuse and its abuse will continue at a dramatic rate for years to come. Data provided by the Taipei City Police Department shows that as of 2022, the percentage of crimes involving etomidate among all drug-specified crimes has risen from 0.25% in 2021 to over 29.99% in 2022. This pattern of abuse indicates not only that instances of abuse are still on the rise, but also that these are becoming more frequent and are indicative of a growing issue.

In response to this major problem in society, Taiwan has taken on an active role of applying flexible legislative standards to criminalize the possession of new forms of psychoactive substances (NPS), including etomidate. In this respect, innovative legislative strategies have been important in enabling the early identification of the use of new types of drugs, as well as the ability to respond proactively to the emergence of new drug trends (Feng and Li, 2020). The use of etomidate as a replacement for traditional narcotics and NPSs continues to increase in Taiwan, and includes abuse of products such as (a) vaping liquids and (b) “cigarette powders,” which are typically found in electronic cigarettes (Zhou et al., 2024). If etomidate is abused, it can lead to a number of serious health conditions, including irreversible brain injury, psychotic conditions, and potentially death (Zheng et al., 2024). The ability to detect etomidate via the combination of thermal desorption electrospray ionization (DESI) tandem mass spectrometry (MS) for the identification of etomidate in e-cigarettes supports the increase in etomidate-related abuse in Taiwan (Li et al., 2024).

A further analysis indicates that etomidate is a very short-acting sedative-hypnotic medicine and that its primary mechanism of action is the

stimulation of gamma-aminobutyric acid (GABA) activity, which makes it effective in suppressing the functioning of the central nervous system. After use of the drug has stopped some users have reported feelings of wellness or emotional attachment to the drug; these persistent desires for etomidate often develop into craving for the drug post-use. Long-term use of etomidate has been reported to result in impairment of liver and kidney functions, and causes neurological dysfunctions such as cognitive problems, memory failures and numerous Parkinsonian-like symptoms. When taken together with other medications, misuse of etomidate increases the likelihood of overdose and can also represent an immediate threat to life, as well as increase concerns such as loss of total control over the body.

In Taiwan's clinical administration of etomidate, etomidate is administered quickly upon delivery due to its fast distribution and will help maintain hemodynamic stabilization (Ding et al., 2024). To counteract the common side effects associated with etomidate during administration, studies have been completed using various-antidepressant derivatives to create new derivative forms with the hope of minimizing the side effects of etomidate and maximizing the effects of etomidate under optimal clinical circumstances (Chen et al., 2025).

(2) Youth-Oriented Abuse and Social Diffusion

The increase in the number of cases, especially among adolescents in Taiwan, suggests that drug usage is becoming more prevalent among the younger generation and that drug problems are not being addressed within the context of substance abuse. The increased speed with which information is communicated via digital communication, as well as the tendency of adolescents to seek new sources of excitement, has played a significant role in creating the phenomenon of youth abusing drugs. Illicit sources, such as those operating within the "binge-drinking" culture, have taken advantage of this growing demand for stimulants by promoting etomidate as a "cool" or "hip" drug, which has further reduced younger generations' awareness of the dangers of using etomidate.

The trend of young people abusing drugs creates a twofold problem for Taiwan. First, the abuse has severe effects on both psychological and physical growth and development. Second, the long-term effects of these drug abuses will have significant effects on future generations of Taiwanese society and their overall health. The ever-increasing

proportion of adolescents in cases of etomidate abuse indicates that adolescents in Taiwan have shifted from using drugs primarily for socializing, partying, and having fun to more frequent drug use and abuse. The continuous evolution, diversification, and increasing complexity of drug-related issues in Taiwan is exemplified by the rapid escalation in the number of adolescents abusing Etomidate. The following are some of the principal factors contributing to such deviant behaviour: A. The proliferation of online information via social media and instant messaging has diminished barriers to accessing drug-related material. B. Peer effects, wherein adolescents model their behaviour after the behaviours exhibited by friends or groups, commonly frame drug abuse as either 'experimenting' or 'just trying to fit in with the crowd'. C. The desire to experience new and stimulating things due to Psychological Need for Stimulation prompts many adolescents to explore Etomidate or another psychoactive substance based on curiosity or a desire for fast relief from stress; the adolescent has little or no awareness of the long-term health consequences of Etomidate abuse. D. Illicit operators use marketing techniques and packaging to shape the perception of Etomidate as being 'in vogue' or 'trendy', minimising its criminal drug identity and resulting in reduced vigilance among potential abusers.

The increasing prevalence of drug use amongst young people is not only affecting their personal development; it could also lead to the development of social trauma between multiple generations, which could ultimately impact both the availability of human resources for the future of Taiwan and public safety within the country. The speed at which the abuse of etomidate among young people has spread due to the advent of digital communication is unprecedented. Studies have shown that the combination of the rapid dissemination of internet information, peer imitation, and a desire to explore the unknown has all contributed to create a drug that many youth have considered a "trendy" item, which, in turn, has led to a reduction in the knowledge that young people have about the potential dangers associated with this drug. As indicated by the results of this research, the abuse of etomidate is associated with debilitating neurological and psychological problems, and therefore, both the government and society are encouraged to take proactive and preemptive actions to control the distribution of this drug, including strengthening education campaigns, improving the overall management of online content, and developing strong working relationships

between different sectors to prevent newly developed psychotropic drugs from inflicting

irreversible damage on future generations (Gao et al., 2025).

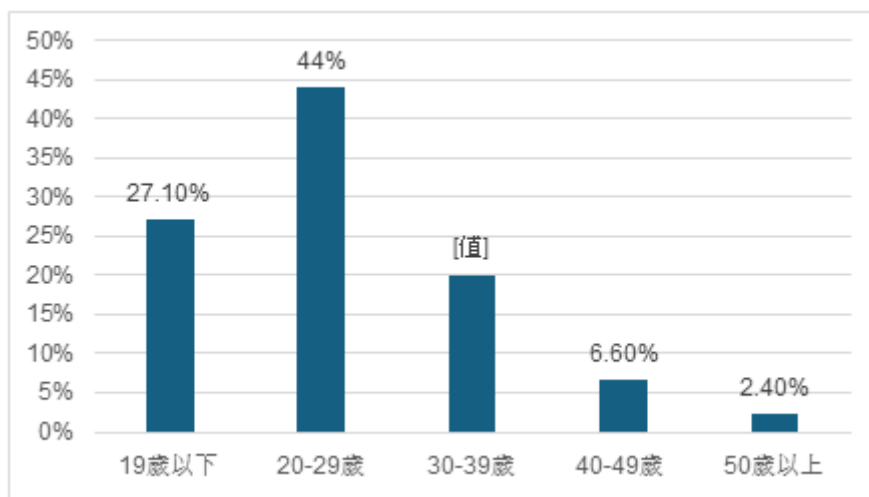


Figure 1: Age Distribution of Drug Addicts.

Source: Ministry of Health and Welfare, https://vip.udn.com/event/newmedia_etomidate; United Daily News (2025)

In summary, Taiwan's youth are entering a new drug crisis because of the rapid proliferation of etomidate. Etomidate is no longer just a nightclub drug, as it is now being abused in colleges/universities, the military, and throughout society and has integrated into everyday life where it is used in very discreetly (in many cases). Because etomidate has the potential to strip away an individual's ability to rationally control themselves almost instantly, it provides a very dangerous situation for the safety of the public. The biggest question mark in fighting against the illusive drug epidemic caused by etomidate, is whether or not the government, law enforcement, and educational institutions can respond quickly enough to stop etomidate from being distributed, and therefore see no future tragedies caused by the use of etomidate.

2. Bottlenecks in Taiwan's Etomidate Drug Control Strategies

(1) Current Status of Legal Regulation and Enforcement

Through its narcotics control framework and through the intensification of crackdowns on illegal drug trafficking to try to eliminate the available supply of drugs in the country, the Taiwanese Government has included Etomidate (a non-opioid analgesic used as a general anaesthetic) in its narcotics legislation. The Government has imposed strict penalties on offenders for illegal drug trafficking activities to deter future offenders; however, there are still significant challenges related

to enforcement due to the volatile nature of the drug market and the deceptive tactics being used by organised criminal groups. For example, some offenders exploit existing loopholes in legislation and modify their substances into forms that do not meet the regulations governing narcotics or manufacture them and transport them across borders in a manner that would allow the offender to evade domestic penalties if caught. By only relying on the suppression of criminal activity to address the problems associated with individuals who are dependent on drugs, the effectiveness of interventions for these individuals is limited. Current options for rehabilitation/counselling are inadequate and as a result, many users relapse into their cycles of substance abuse after completing prison time.

To mitigate this issue, the Taiwan Emergency Department-Based Drug Abuse Surveillance (TEDAS) program is an essential and central source of information for the monitoring of emergency department drug use (including Etomidate) and this includes the collection of data that allows for the identification of trends associated with the emergence of new psychoactive substances, which ultimately supports the development of effective-planned interventions for both individuals misusing drugs and the development of appropriate policy responses to illegal drug trafficking (Lin et al, 2022).

Taiwan's legislation regarding novel psychoactive substances (NPS) is characterized by a flexible approach to regulating these substances in such a

way as to enable quick identification and control of NPS, such as etomidate, as they emerge. In contrast to the methods used by South Korea and Japan, Taiwan's approach highlights the need for adaptive and timely policy development (Feng & Li, 2020). Another notable aspect of Taiwan's approach is how TEDAS emphasizes the role of emergency departments (EDs) in identifying and monitoring NPS usage patterns; therefore, it provides important epidemiological data and serves as the scientific foundation for developing and enforcing related regulations.

According to Hsieh Chin-Lin, a forensic officer at the Criminal Investigation Bureau, the emergence of etomidate demonstrates the speed at which new drugs become available on the market. Hsieh further explained that illicit drug manufacturers continuously modify their chemical compounds to avoid detection by law enforcement, and thus create numerous challenges for law enforcement officials. After more than 20 years of experience in forensic science, he equated the complexity of drug spectra to deciphering the "Da Vinci Code"; he demonstrated that even minor modifications in a chemical's structure may result in incorrect identification or failure to detect it. Consequently, Hsieh noted that forensic personnel have a considerable responsibility to provide scientific evidence regarding criminal prosecution, which is critical to effectively combatting drug trafficking.

The growth of etomidate is significant as it presents a substantial risk to both public safety and health and social governance. Additionally, etomidate reflects the vulnerability of young people when they are subjected to the pressures of temptation, stress, and lack of information, while at the same time highlighting the shortcomings of Taiwan's drug control policies. The main challenge with etomidate's proliferation is the fact that it continues to circulate in secret and is infiltrating nightclubs, educational institutions, and even military networks. One feature that makes etomidate a difficult substance for law enforcement and schools to respond to is its appearance as an innocuous pharmaceutical, which decreases the likelihood of detection. Furthermore, established levels of awareness among the general public about the dangers associated with etomidate are low, which restricts the effectiveness of prevention campaigns. As a result of these interrelated issues, the most pressing and complex question is: "How do we stop it before someone dies?"

(2) Limitations of Medical Intervention and Psychological Counseling

The medical community's involvement with rehabilitation for those who become dependent upon substances is vital, and however, there is presently a lack of both adequate rehabilitation programs specifically for the treatment of etomidate dependence and of adequate experience among many medical facilities in identifying and treating the new and developing category of substances such as etomidate, which all lead to poor overall outcomes regarding etomidate treatment. In addition, further development of the psychological counselling and social support systems within a community is all important for drug rehabilitation and further prevention of drug abuse; yet current counselling services, particularly those located in rural communities, do not offer sufficient coverage to reach all of those in need.

Furthermore, the long-term use of etomidate continues to pose serious risks to one's health, such as psychiatric disorders, abnormal behaviour, and even potential death. Nevertheless, the inability to use standard methods for detecting etomidate in stored biological samples creates a challenge for detection and treatment in intoxicated individuals. Current advanced analytical methodologies, such as ultra-high-performance liquid chromatography-tandem mass spectrometry, serve to create strong evidence for detection of both etomidate and its metabolites within stored biological samples, as strong tools for forensic investigation of etomidate cases. Rapid screening technologies such as surface-enhanced Raman spectroscopy provide opportunities for the on-site detection of etomidate and assist law enforcement agencies with their drug abuse reduction initiatives; together with the emerging etomidate treatment review program, which will produce detailed epidemiological data regarding drug abuse in Taiwan for use in policy-making and public health initiatives.

Despite the efforts of Taiwan's government and civil society to combat drug abuse via anti-drug campaigns, the outreach and education components for newly emerging drugs such as etomidate remain grossly inadequate. A large percentage of these campaigns continue to focus on the more traditional narcotics and do not adequately reach youth populations or address the particular pathways and methods involved with the abuse of these substances. For example, many youth mistakenly believe that some "novel ingredients" contained in e-cigarettes do not pose health risks or that some substances added to cosmetic products (i.e., illicit drugs) are

safe, effective “beauty enhancers.” Such misunderstandings significantly hinder drug prevention and education efforts.

From a medical standpoint, the abuse of etomidate presents several challenges. The first challenge is the clinical diagnosis and identification of etomidate intoxication, which can be very difficult. As noted earlier, etomidate was developed as a legal anesthetic, and because of its similarity to many of the other pharmaceuticals, many individuals abusing etomidate will mix or inject the substance making it more difficult for physicians working in either emergency or clinical environments to identify the issue. The second challenge is the complex nature of etomidate’s pharmacological properties (e.g., how it quickly produces anesthesia).

Typically, the abuse of etomidate can lead to respiratory depression, confusion and long-term neurological damage. The fact that there are currently no specific antidotes for etomidate means that medical staff will have to use supportive care to try to treat etomidate-intoxicated patients, thereby further increasing the uncertainty regarding patient outcomes.

Along with these challenges, the continued increase in etomidate abuse is placing additional strain on the medical infrastructure due to the increased demand for both emergency and long-term follow-up care and the shortages of workers and hospital beds in both of these settings. And lastly, there is tremendous confusion surrounding the lines of accountability between the medical and judicial entities. Physicians that treat etomidate abusers frequently have to deal with the additional complication of patients who attempt to hide their abuse or who refuse to provide full disclosure of their drug usage when questioned. Additionally, the physician may also have to deal with a legal obligation to report the abuse to authorities. This leaves the physician with a terrible conflict of responsibility between his or her professional ethical obligation and institutional obligation.

3. Etomidate and Public Safety Impacts

Exhaustive long-term health risk role on the use of etomidate indicates that it has substantial adverse impact/long-term consequences for both those who use it and their family and friends. The lack of knowledge surrounding its systemic toxicology indicates that more studies are needed to identify appropriate preventative and treatment mechanisms (Zheng et al., 2024). With regard to the disciplinary advancements within the forensic environment around the detection and quantification/activity of

illicit substances, the introduction of ultra-high-performance liquid chromatography mass spectrometry (UHPLC-MS/MS) techniques over the last decade has led to a dramatic improvement of analytical methods to locate/elucidate, accurately quantify the etomidate and its metabolites within samples of individual biology. These advances have provided significant practical benefit for the investigation of forensic crimes, including the ability to determine how much abuse is being perpetuated (Zhou et al. 2024)

Data from the Emergency Department (ED) also suggest a continued cause for concern regarding this issue. Data collected by TEDAS show that there continues to be a considerable increase of early presentation due to NPS of drugs into the ED with a high percentage of those cases being related to etomidate. Typically, patients present with symptoms indicative of acute danger, such as chest pain and tachycardia. These examples, coupled with the fact that consumers may unknowingly ingest etomidate in other products such as e-fluids from e-cigarettes, further complicate the possibility of recognizing and responding to the dangers associated with etomidate (Li et al., 2024; Mo et al., 2024).

Through TEDAS-based research, the scope of recognizing NPS abuse, including etomidate, has substantiated the validity of the issue as a major public health concern (Lin et al., 2022). Rapid detection and identification technologies for analyzing the use of etomidate in blood, urine, etc., will be an essential component in the development of an effective monitoring system to track patterns related to abuse and implement precautionary measures to ensure public safety (Yuan et al., 2024). Despite some progress made by Taiwan in terms of addressing NPS, this is still an ongoing and evolutionary challenge due to the global and increasing threat of drug abuse.

Many of the new drugs available on the market today, especially those derived from synthetic sources, exploit weaknesses within the current definition of “drug” as defined by law making the enforcement of laws on these substances nearly impossible for the police. Drug manufacturers are, therefore, using these loopholes in the law as a means of bringing new psychoactive drugs onto the market with minimal associated health hazards (Santos et al., 2024). The non-medical use of prescription drugs such as sedatives or hypnotics continues to be widespread in Taiwan, which indicates the extent to which drug abuse is a worldwide issue (Chen et al., 2019), so addressing this problem should include

international cooperation, as well as ongoing research to develop stronger regulatory policies and public health measures.

One of the studies conducted on the challenges to public health posed by etomidate abuse in Taiwan was that conducted by Wei and Chiu (2025), where they made recommendations for strengthening the regulatory and monitoring policies regarding this issue. Their research suggested that the non-medical use of etomidate in Taiwan has led to increased public health risks in addition to toxicological and clinical risks. The authors utilized a literature review, including case analyses, forensic toxicological, and clinical observational data, to identify the current trends and status of etomidate abuse. They presented the existing health hazards, types of illicit markets, and areas where there are gaps in the regulatory systems currently in place. Based on their review, they observed increasing numbers of emergency visits and toxicology test(s) associated with etomidate and the resulting risks of adrenal suppression and dependence. The current drug control and monitoring systems in place are inadequate to meet the challenges posed by etomidate, as well as to adequately respond to public health issues.

The use of etomidate brings with it many implications for public safety. This substance has the potential to negatively affect the social order that societies are based upon due to people using it and losing rationality in environments such as nightclubs, universities, or military areas and can therefore result in violent confrontations or mass chaos, thus putting an additional burden on the police and public safety agencies. Additionally, it can significantly reduce the capacity of society to protect against these consequences by causing military or police officers to become addicted to etomidate and have an impaired judgment while performing their duty. Therefore, if etomidate is circulating through unsupervised or underground operations, these operations may accelerate drug proliferation and make it easier for criminal organizations to obtain funds through the illegal use of etomidate, thereby increasing security threats. Finally, as the availability of etomidate increases, and as drug-related accidents involving young people occur more frequently, the public will lose trust in regard to the safety of their schools, nightclubs, and even public areas, and this will create a cycle of distrust.

In summary, etomidate is not only a health problem but is also a major threat to public safety. The continued spread of this drug should be of

concern to all levels of government, law enforcement, and society, and it is crucial that all parties come together to work toward preventing the proliferation and escalation of this issue from turning into an epidemic.

III. CASE STUDY: BACKGROUND AND HARMS OF ETOMIDATE ABUSE IN TAIWAN

1. *Impact on Social Security*

Etomidate abuse has been tremendously harmful and devastating to the community in Taiwan. It is a particularly potent form of sedative that produces both hallucinations and addiction, which is why so many etomidate users have ended up being sold as "zombie cartridges" in e-cigarette liquid. Many of these users also experience confusion, aggression, and/or self-destructive behaviours. This abuse causes more than just injury to the user's body and mind – this abuse also represents a danger to public safety.

Law enforcement has established a direct connection between the abuse of etomidate and substance-impaired driving and related acts of violence. Thus, law enforcement carries an increasing burden for public safety on behalf of the community, as public opinion about deteriorating social order continues to increase. As the number of people abusing etomidate continues to rise and there are numerous methods of selling it (i.e. online via social media as well as through unregulated e-cigarette retailers), etomidate is easily obtainable. Current legislation and law enforcement resources have had to work harder than before to keep up with this rapidly growing problem.

Etomidate was not initially considered a dangerous controlled substance, and thus traffickers were able to take advantage of this loophole to avoid responsibility, making it possible for etomidate to quickly infiltrate schools and affect the youth of Taiwan. This highlights the enormous disparity that continues to exist between updates to the law and the ability of forensic scientists to identify emerging narcotics. It also demonstrates that inter-agency cooperation and community education are necessary to help eliminate the possibility of future drug-related tragedies.

In order to respond effectively to the growing challenges that etomidate abuse poses to the society of Taiwan, the Government of Taiwan must continue to develop improved monitoring systems and also enhance the flexibility of existing laws against the abuse of narcotics to better protect both public safety

and social order. The need for more effective laws governing narcotics is particularly clear when we consider the number of drug-impaired driving accidents and deaths that have occurred recently. For example, in the year 2024 two New Taipei City police

officers were killed as a result of etomidate-impaired drivers in the districts of Sanchong and Tucheng. These two incidents not only shocked the public, but also made a renewed investigation of effective drug governance necessary.

Table 2: Overview of Police Casualties Caused by Etomidate-Impaired Driving.

Date	Location	Casualties	Description and Follow-up
July 13, 2024	Sanchong District, New Taipei City	One officer killed in the line of duty	A 26-year-old man, after consuming a "zombie cartridge," drove under the influence, speeding in the wrong direction and colliding with a police car. Officer Huang was killed instantly.
September 30, 2024	Tucheng District, New Taipei City	One precinct chief killed in the line of duty	While on duty, the officer was dragged and struck against a guardrail by a drug-impaired driver, dying at the scene. The incident shocked society.
October 2024	Public opinion and police advocacy	Two officers killed within three months	Due to two police fatalities resulting from impaired driving due to the influence of drugs, law enforcement has recommended that the medication etomidate be classified as a Category II Narcotic. Consequently, the government expedited the legislative process to amend this classification.
Early 2025	Nationwide	Multiple drug-impaired driving accidents	The Criminal Investigative Bureau conducted a specialized investigation, which discovered that there was an increasing trend of individuals being killed as a result of impaired driving due to Etomidate. As a result of this investigation, numerous arrests were made (54) and a total of 4.6 kg of e-liquid containing drugs was taken off the streets during this operation.

Source: Criminal Investigation Bureau¹

It is alarming that more and more adolescents are becoming victims of drug abuse. In 2024, the number of etomidate cases reported in New Taipei City has increased sharply from 13 in 2018 to 49 and about 20% of these cases were related to minors. Some of the signs that these individuals might experience when using drugs are different behaviours such as abnormal emotions and potential violent type behaviours like being unable to control emotional outbursts, having rigid body movements, experiencing emotional instability or having an altercation with a family member or a law enforcement agent.

As a result of etomidate and other drugs causing police officers deaths due to impaired driving, it shows how dangerous the drug can be. Therefore, society has increased demands to enforce greater controls and to regulate the drug abuse epidemic. Consequently, law enforcement agencies-initiated action by implementing the "National Drug Crackdown on Etomidate" initiative which states that drug-impairment is an "invisible killer of the roadway" and calls for increased public awareness and cooperation in preventing impaired driving.

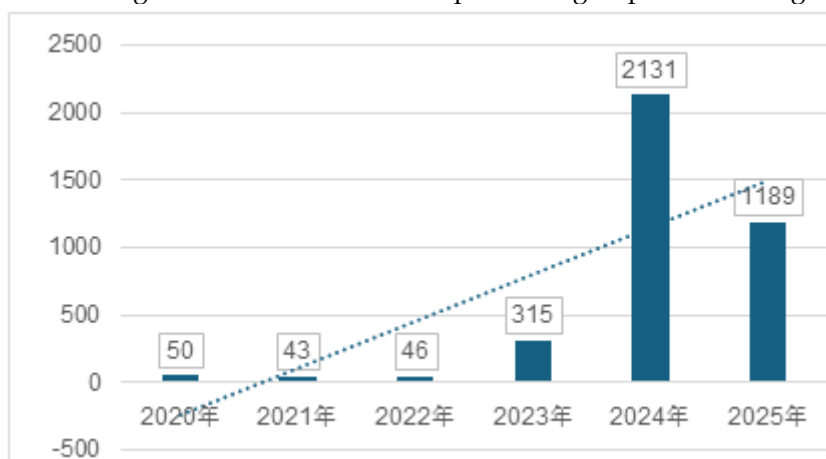


Figure 2: Statistics on the Number of Drug-Impaired Driving Cases.

Source: Criminal Investigation Bureau

Note: 2025 statistics are compiled up to March

¹ Relevant sources, compiled from the following websites. <https://news.pts.org.tw/article/705054>; <https://news.ltn.com.tw/news/society/breakingnews/4816545>; <https://www.cib.npa.gov.tw/ch/app/news/view?module=news&id=1885&serno=c242dfac-d8b3-416a-ab29-958bb3d7bd17>

As shown above, this indicator increased sharply over the course of 2023, peaked in 2024, and then fell slightly in 2025. Nevertheless, the number of etomidate-impaired drivers continues to remain elevated. This increase suggests that use of etomidate could play a substantial role in contributing to the increased incidence of drug-impaired driving, thus having a considerable negative impact on society and the safety of others. Captain Lai Kai-Chun, the Head of the Drug Enforcement Center, commented on the significance of drug-impaired driving below:

The drug-impaired driving epidemic is growing exponentially, and there will be a rapid growth in the awareness of this epidemic. Prior to the use of etomidate, drug-impaired driving was relatively uncommon. Now, because of the severe effects of etomidate on health, as well as the risk it poses to the driver and the general public, it has changed dramatically. Etomidate can affect the central nervous system, thereby leading to a loss of control. When driving while under the influence of etomidate, the driver becomes a 'human bomb' and is in effect, on the road.

Captain Lai Kai-Chun offers a perspective on how people view the drug-impaired driving phenomenon. Most people assume that drug-impaired driving will only be characterized by a decline in reaction time or impaired judgment. However, these assumptions fail to recognize that etomidate is a highly toxic substance which can provide an anesthetic effect on the central nervous system and prevent the user from functioning independently. Driving while under the influence of etomidate places the driver in a position of extreme danger not only to the driver, but also to all other drivers on the road and ultimately, to society as a whole.

2. Current Status of Legislation and Regulation

Etomidate was first recognized as an ultra-short-acting intravenous anesthetic that has sedating and

hypnotizing properties and amnestic effects but has little to no analgesic effect. However, etomidate has been abused illegally by being put into e-cigarette liquids, which has resulted in serious health complications including coma, convulsions, and confusion in users. As a result, Taiwan's Ministry of Health and Welfare and the Ministry of Justice issued amendments to existing laws on 23 August 2024; etomidate is now classified as both a controlled drug and a narcotic drug. Under the 《Pharmaceutical Affairs Act》 and the 《Controlled Drugs Act》, etomidate is classified as a controlled Category IV drug. Under the 《Narcotics Hazard Prevention Act》 beginning 1 September 2024, etomidate is classified as a Category III drug, and any person who uses etomidate illegally may face criminal sanctions.

On 28 November 2024, etomidate was reclassified as a Category II drug, and anyone who manufactures, possesses, or distributes etomidate is subject to stricter penalties than those for Category III drugs. Specifically, under Article 4(2) of the 《Narcotics Hazard Prevention Act》, anyone who manufactures, transports, or sells Category II narcotics is subject to the possibility of being sentenced to life imprisonment or a fixed-term sentence of ten years or more, in addition to a fine of up to NT\$15 million.

Furthermore, any possession or use of etomidate is considered a criminal offense and the user will be required to undergo dilatation in addition to legal liability. In addition, to increase the control of drug-impaired drivers, the Legislative Yuan passed amendments establishing that drug-impaired driving has a zero-tolerance policy, has increased the penalties and enforcement of drug-impaired driving to effectively reduce this public safety hazard.

Table 3: Legal Regulations and Management.

Time / Event	Legal Regulation	Description
August 2024	Executive Yuan Announcement	Etomidate classified as a Category III narcotic
November 2024	Decision of the Narcotics Review Committee	Upgraded to Category II narcotic, same category as methamphetamine, cannabis, and MDMA

Source: Compiled by the author

As an example, Chang (2025) conducted a qualitative study of the challenges faced by investigators when dealing with new drugs, interviewing six police officers. In this study, the study participants identified that they had not established clear definitions for these emerging substances, which many were identifying as being abused by youths, and therefore did not possess the means to determine whether or not these youths were exhibiting signs of abuse (addiction). Law

enforcement was also facing other obstacles, such as drugs being very well hidden, a degree of anonymity using the internet (e.g., online purchases), and differing views on how each country/jurisdiction would handle these types of offences.

Several of the recommendations made in this study were: Enhance the current monitoring and reporting systems of new drugs; promote cooperation across several agencies (including government); create specialised units within

police agencies that have the technical knowledge and resources required to properly deal with new drugs; expand the existing technical resources of law enforcement agencies;

and assess the current methods used to evaluate officer job performance and consider incorporating preventive-based thinking into the enforcement strategies used.

Table 4: Penalties and Fines for Category II Narcotics under the 《Narcotics Hazard Prevention Act》.

Type of Conduct	Penalty	Maximum Fine
Manufacture, transport, or trafficking	Life imprisonment or fixed-term imprisonment of at least 10 years	NT\$15,000,000
Possession with intent to sell	Fixed-term imprisonment of at least 5 years	NT\$5,000,000
Inducing others to use	Imprisonment of 1 to 7 years	NT\$1,000,000
Transferring narcotics to another person	Imprisonment of 6 months to 5 years	NT\$700,000
Simple possession	Imprisonment of up to 2 years	NT\$200,000
Use of narcotics	Imprisonment of up to 3 years	—

Source: National Laws and Regulations Database, Narcotics Hazard Prevention Act

The laws governing etomidate are very severe. If an individual is found involved in the manufacturing, transporting or trafficking of this drug, they may be sentenced to life imprisonment or a minimum of ten years in prison with a fine of not exceeding NT\$15 million. An individual caught with etomidate possessing the intent to sell will receive a minimum of five years in prison with a fine of not exceeding NT\$5 million. If an individual was to entice someone to utilize etomidate as a recreational drug, they may be punished with imprisonment for a minimum of one year and up to seven years with a fine of not exceeding NT\$1 million. In addition to the above-negotiated penalties, transferring this chemical compound to another individual can incur a penalty of six months to five years in prison with a monetary fine not exceeding NT\$700,000. On top of that, an individual caught with simple possession of etomidate may face imprisonment for a maximum of two years or a fine of no more than NT\$200,000, or face imprisonment for a maximum of three years for administering to oneself etomidate. Taiwan's zero-tolerance policy in drug-related issues is exhibited through the severe penalties and fines associated with the above-stated offences.

Finally, Wu (2025a, 2025b) has conducted additional research into the effects and threats posed by the new drug etomidate in Taiwan. This analysis shows the initial development of etomidate was as an anaesthetic for clinical use; however, of late, this anaesthesia is being abused for non-medical purposes within Taiwan and has developed into a critical issue in emerging narcotics. Using international examples and case studies on drug control, this research examined the current trends and risks of etomidate abuse in Taiwan. Wu considered the challenges of etomidate abuse within Taiwan's public health network, the judicial systems in place, and the safety of the country as well as taking a look at the international regulatory models

for the new emerging substances. The findings from this study demonstrate that the abuse of etomidate within Taiwan has affected the ability of emergency room personnel to perform their jobs, created challenges for enforcement personnel within the judicial system as well as present a risk to its constituency's safety. Relative to international counterparts, Taiwan has significant shortcomings in terms of tracking and reporting information on etomidate abuse and coordinating efforts across multiple sectors, which greatly hampers the efficiency of its prevention efforts.

In conclusion, the research supports the position that Taiwan must learn from the international experience by strengthening its regulatory frameworks, increasing its cross-sector collaboration and providing enhanced public health tracking of etomidate abuse in order to adequately reduce the threat. These findings will provide the government with valuable guidance on developing future policy efforts and supporting the implementation of etomidate abuse prevention efforts.

3. Public Health and Educational Challenges of Etomidate

Etomidate is associated with a high risk of developing an addiction, and along with this risk comes the likelihood that when users stop using etomidate, they will experience withdrawal symptoms in the form of physical and psychological manifestations which require careful management. When a patient withdraws from etomidate, his/her body may suffer from adrenal insufficiency due to being under constant stress while taking etomidate for extended periods of time; there may be electrolyte disturbances due to the body's decreased ability to regulate electrolytes and possible epidermal changes related to injury or irritation resulting in skin discoloration. Additionally, some patients may develop hypotension due to decreased blood

volume; cardiac dysrhythmia as a result of electrolyte imbalance; and/or immune suppression resulting from prolonged use of etomidate. Although a patient's withdrawal from etomidate may be physiological, a significant number of patients deal with psychological manifestations following discharge from a hospital, such as anxiety or difficulty sleeping.

All of these factors can impact a patient's daily functioning (i.e., work, learning), and relationships. Since etomidate withdrawal symptoms differ and there are potentially significant risks associated with them, treatment should involve a medical team trained in substance use disorders and addiction medicine. As part of a comprehensive approach to treatment, tapering off etomidate, receiving psychological care, nutritional support and establishing an outpatient clinic for follow-up and long-term treatment are methods of optimizing treatment gains.

Conversely, the use of electronic cigarettes has exploded amongst youth over the past several years. Many students use e-cigarettes due to desire or assumed risk as a function of misunderstanding of the risks of nicotine addiction and health risk related to e-cigarettes. As a result, efforts should be made to strengthen drug addiction prevention and health education programmes in schools by providing scientifically accurate educational programming that conveys the actual health risks associated with e-cigarettes. Schools could work with medical providers, individuals who have gone through the process of recovery and social workers to provide students with real life testimonials about drug addiction, specifically relating to e-cigarettes. Schools can empower adolescents to develop accurate concepts of healthy lifestyles and self-protective behaviours through early intervention and continued contact with the adolescent.

According to Lin Hsin-Ying, Executive Director of the Nakona Yunlin Rehabilitation Center,²

Lin Hsin-Ying stated that the increasing number of help-seeking calls indicates that etomidate has already infiltrated the adolescent population. Wang Han-Yang, Chairman of the National Education Action Alliance (NEAA), argued that control should begin with regulating e-cigarettes: Most adolescents purchase e-cigarettes and etomidate online. The government should strengthen enforcement by using DNS (Domain Name System) blocking mechanisms to comprehensively shut down drug-

and e-cigarette-related information and sales websites, thereby preventing young people from easily accessing such content.

In addition to the above discussion on etomidate infiltrating adolescent groups, attention has also been drawn to its prevalence within schools. For example, according to statements made by school disciplinary officers,³

As for why "zombie cartridges" have become popular in schools, police analysis suggests that the main reasons are their convenience of carrying, their inconspicuous appearance that does not reveal them as narcotics, and the absence of any distinctive odor, which allows users to evade police detection. In addition, the stylish and trendy design of e-cigarettes, combined with the ability to customize the liquid into fruit flavors favored by young people, has made them an instant hit.

As noted by Liu Chen-Ju, Executive Secretary of the Drug Enforcement Center in the Criminal Investigation Bureau, the growing use of zombie cartridges by drug traffickers is due, primarily, to the ease and speed of their production. Because they do not need advanced drug techniques for creation, they have become an appealing option for traffickers,⁴

In light of the increased use of E-Cigarettes and etomidate by adolescents, there is an increasing need for colleges and universities to implement campus-based prevention strategies and health education to combat these risks. The prevalence of anonymous online purchasing and disguised appearances makes it difficult to enforce laws and regulations concerning these types of drugs, and the increasing rate of drug infiltration emphasizes the need for communities to implement coordinated responses, regulatory processes, and ongoing educational outreach to mitigate risks to young people.

For law enforcement officers working on the front lines, these problems can present a multitude of challenges. Officers investigating new drug trends must quickly develop awareness of how these drugs appear and are concealed, while also encountering users who may not want to cooperate with them or may actively resist providing information. Additionally, the anonymity associated with online purchases complicates officers' ability to track down the sources of the drugs. Officers face the added challenge of balancing legal obligations, safety obligations, and personal risk while conducting enforcement actions. Many officers express feeling overwhelmed with the work they must accomplish, due to a lack of adequate manpower, inadequate equipment, and inadequate systems in place to

²<https://deptcrcc.ccu.edu.tw/index.php?option=module&lang=cht&task=pageinfo&id=2260&index=2>

³ <https://www.peopo.org/news/798793>

⁴ <https://www.twreporter.org/a/etomidate-drugtesting>

support their work. Thus, these challenges illustrate the significant obstacles faced by law enforcement officers who operate at the ground level, and emphasize the need for appropriate support systems and coordination among various agencies in order to be successful in addressing the dangers associated with Zombie Cartridges.

Because many community support systems are inadequate, many police officers continue to work in a high-risk environment over an extended period of time. Increased exposure to sudden acts of violence, the emotional toll of trauma, and the challenges presented by shift work all contribute to police officers' mental and physical stress levels. Increased access to psychological support services, as well as improved workplace safety, should be immediate priorities for police departments. One potential solution is for the government to create dedicated counselling/mentorship programs that provide police officers with regular mental evaluations and immediate assistance when they are in need of support to help release stress and minimise the accumulation of trauma.

There must also be an ongoing effort to improve duty systems and assorted equipment allocations. Improvements in scheduling practices and the implementation of enhanced protective equipment will lead to improved safety during enforcement actions, as well as improved efficiency overall. Furthermore, peer support programs should be created to promote mutual respect and understanding between officers, while family care initiatives would help officers to balance the demands of work with the needs of their families. Ultimately, only by implementing institutional safeguards and providing humane support will it be possible to create a resilient network of support for police officers that contributes to the safety and success of police work.

IV. TAIWAN'S DRUG CONTROL: ENFORCEMENT ACTIONS, LEGAL AND POLICY RESPONSES, AND MULTI-CHANNEL COOPERATION

1. Enforcement Actions

In January and February, 2025, an operation of the Criminal Investigation Bureau, "The Nationwide Etomidate Crackdown Project," resulted in over 54 arrests and seizure of approximately 4.6 kilograms of illegal-drug-laced e-liquids. This quantity of illegal-drug-laced e-liquids could be processed into over 3,000 contraband illegal-drug-laced e-liquids also called "Zombie Cartridges" and has an estimated

black market value of nearly NT\$9 million. These findings are evidence that etomidate has already created a large underground trade in Taiwan.

The "Crack Down" occurred in 16 counties/cities throughout Taiwan and demonstrated successful intercoordinated cooperation among regions with efficient enforcement outcomes. The details of the cases revealed that local communities and school-aged/adolescent children were recipients of etomidate repackaging and distribution. The operations posed potential threats to both public safety and the health of younger generations. During the investigation, police also seized equipment to manufacture and communicate, which will help law enforcement authorities understand supply chain operations for etomidate, and to assist in tracing sources of etomidate upstream, whether they be organized crime groups and/or foreign suppliers.

Overall, the results of this project demonstrated not only the necessity for immediate action concerning the etomidate abuse issue, but also the complexity of the issue required strengthening of prevention and enforcement techniques.

Additionally, on May 19, 2025, a clandestine drug manufacturing facility was discovered and raided by the New Taipei City Investigation Division of the Investigation Bureau, located within the Xinwu District of Taoyuan City, which manufactured etomidate from a precursor to etomidate, Ethyl 2-mercapto-1-(α -methylbenzyl)-5-imidazolecarboxylate (hereafter referred to as 2-mercapto etomidate) that had been imported from mainland China. This was the first time a drug factory in Taiwan was discovered to have operated using raw materials imported from mainland China.

2. Etomidate Classified as a Category II Narcotic: Legal and Policy Responses

On November 27, 2024, the Executive Yuan formally announced that Etomidate would be placed under Category II of narcotic control. Under the provisions of this Category II classification, anyone who traffics in Etomidate will face life imprisonment or an extremely long sentence with no possibility of parole; in addition, all users of Etomidate must undergo mandatory treatment and follow-up care. This action by the executive branch of government has dramatically increased deterring penalties at the criminal justice level, but it has also created a clear legal framework for the participation of both medical and social support systems in dealing with the effects of Etomidate.

As part of implementing this policy, the Ministry of Health and Welfare, in conjunction with the

implementation of this policy, developed and implemented a drug reporting system for drug use and abuse. The drug reporting system will require all medical facilities to provide increased early detection and reporting to prevent abuse and to allow for early intervention. The Ministry of Education has also begun the review and revision of school-based drug prevention materials to include the negative effects of Etomidate in teaching materials and will develop a campaign to educate and increase awareness among students regarding the harmful effects of Etomidate and drug abuse in general.

The overall response of the government has demonstrated an increased awareness of the problem of "emerging narcotics," and through collaboration between multiple ministries, Taiwan is in the process of building a network of integrated prevention efforts that include the judicial, medical, educational and community sectors.

3. Multi-Channel Cooperation in Taiwan's Governance of Etomidate Drug Control

(1) Strengthening Source Control and International Cooperation

To effectively control the dispersion of etomidate, control must originate from the source and require more stringent controls on the production and distribution of etomidate in addition to working together with increased intelligence sharing and collaboration between law enforcement authorities internationally, to improve efforts to combat cross-border drug smuggling. In order to put these efforts into place, it is necessary to set up drug-tracing systems, which require both pharmaceutical manufacturers and importers to submit detailed flow information on a regular basis, so that the information can be provided to international drug control organizations in order to prevent the entry of illegal substances.

Customs inspection operations need to be strengthened, with increased capability for technical detection and enhanced capability for targeted inspections of high-risk shipments. Additionally, the combination of all the measures mentioned above should block the importation of drugs at the source of the precursors (especially from mainland China). Regarding cooperation, nations can develop bilateral or multilateral pacts to create rapid reporting procedures and joint enforcement actions, thereby facilitating cooperation between law enforcement agencies on both sides of the border and dismantling international drug-trafficking operations. Since online drug trafficking is becoming increasingly prevalent, and as a result, it is very important to establish proactive collaboration with Interpol and

leading online marketplaces to find and monitor suspicious transactions, remove illicit content from their websites, and to ensure that the internet does not become an alternative marketplace for drug distribution.

Therefore, the only way that effective suppression of the spread of etomidate or other emerging drug will occur, is if a multi-faceted cooperative structure, a multi-pronged cooperative framework will eventually develop. Public safety and the health of society will ultimately become increasingly protected as a result of the combined use of all these various methods and tools, and as a direct result of these methods and tools.

(2) Expanding Medical Resources and Precision Rehabilitation

The government must expand support for creating specific medical treatment plans to combat the use of etomidate addiction by providing additional resources, and strengthening the training of medical professionals to provide enhanced diagnostic/therapeutic abilities in Addiction Medicine. By this effort, not only will there be better outcomes for medical facilities, but also, more addicted individuals will receive timely assistance when they need it most.

To accomplish this, a community-based network should be created to support individuals recovering from addictions through individualized long-term psychological support, and social reintegration. For example, a method of using teleconferencing for mental health consultation could support people who reside in remote areas. Additionally, businesses should create more support systems for their employees who are undergoing rehabilitation. Creating supportive work environments is necessary for fostering successful recovery of addicted individuals.

In addition, collaboration between many sectors should occur. This multi-disciplinary approach should include collaboration between health, social welfare, and education to create a diverse and comprehensive support system. Schools should establish preventive and early intervention systems for adolescents to identify at-risk behaviour and provide appropriate counselling to assist in early detection and timely intervention. In addition, the development of a national addiction database and a tracking system to gather and analyse data for a continuous improvement model for addiction rehabilitation services will further improve the quality and success rate of addiction treatment. By combining precision medicine with a community-

based approach, the success of addiction treatment can increase dramatically, while creating a stronger public health defence against the abuse of etomidate and other emerging drugs at the community level.

(3) Strengthening Preventive Education and Social Participation

To counter the abuse of etomidate, the government should implement more inventive and concentrated preemptive education campaigns geared towards different demographics (particularly youths) using a variety of media outlets to increase public awareness about the negative effects of narcotics.

Social media and Short-Video sites are useful for engaging youth because these forums are widely used and provide an outlet for Creative Opinion Leaders (KOLs) who relay the messages of anti-drug campaigns. This type of advertising aligns better with the lifestyles of youths. By utilizing such media outlets, youths will become more aware of the dangers associated with both etomidate and other narcotics becoming more vigilant toward those dangers.

There also needs to be joint participation on behalf of the educational system/families/community as a whole to create a complete system of prevention in protecting the health and future of adolescents from continued use of narcotics.

Using arts, music and sports as part of the education process will make education about drugs more fun and interactive. As a result, it will also increase the youth's feelings of connection/involvement in the educational process. Furthermore, the government can collaborate with other organizations to provide opportunities for students to learn about the dangers of drugs while participating in other forms of education, such as conducting street campaigns, providing campus tours and conducting community workshops. All these efforts will add to the overall dissemination of information about drugs and will ensure that the messages concerning drugs reach all areas of society. Additionally, for those types of people in high-risk categories, developing specific curriculum materials and early intervention strategies will enhance the ability of these people to identify, resist and avoid using drugs, allowing for an earlier point of prevention and intervention.

V. CONCLUSION AND RESEARCH LIMITATIONS

Etomidate is an opioid that represents a drug-related issue for the public; however, it will need to be dealt with using collaborative efforts from various parts of the Taiwanese public to resolve this issue as a matter

of public health. Establishing such a solution requires Taiwan's Government to pursue an all-encompassing and organized plan of action. A successfully developed plan will require cooperation from the Government, other related governmental agencies, health-care organisations, research organisations, and the general population to prevent etomidate from being abused and to retain the quality and health of the Taiwanese public through federally regulated, professionally administered, well-informed, and broadly funded utilisation of etomidate.

1. Legal and Policy Responses

The «Narcotics Hazard Prevention Act» adopted etomidate as a Noxious Substance (Category III) in Taiwan in August of 2024 but a month later, on November 27 in the same year, it was moved to Category II based on the number of fatal accidents involving drivers who were impaired by the drug. As a result of this change, law enforcement will be able to impose stiffer penalties on those who grow, sell or possess etomidate and, therefore have a stronger legal basis for conducting investigations and prosecuting cases. The «Narcotics Hazard Prevention Act» also outlines the importance of drug abuse prevention, treatment, and reintegration by creating a comprehensive "prevention-treatment-reintegration" approach to addressing substance abuse problems. The Executive Yuan and the Minister of Health and Welfare continue to work together to create an integrated approach that coordinates policing, healthcare, and education efforts into one comprehensive, multi-agency program for preventing drug abuse and its associated social costs.

2. International Cooperation and Emerging Drug Challenges

While Taiwan is to be commended for its response to etomidate abuse through both regulation and public health measures, the global problem of new psychoactive substances (NPS) calls for worldwide cooperation and an agreement about how best to control these substances by law. Despite the diversity of patterns of drug misuse and the rapid development of new psychoactive drugs, research must continue and the adaptation of interventions must be constantly reviewed to ensure that effective measures can be put into place to protect the health of the public. One of the major challenges when considering how best to regulate etomidate is balancing the medical use of the drug and the potential for its misuse. Therefore, it is critical that the medical profession can provide clear guidelines for usage and risk assessment to keep legitimate medical

applications from being diverted to illegal use. Drug monitoring systems should also be enhanced in an effort to detect and report on the emergence of new psychoactive substances in a timely manner.

3. Roles of the Medical and Academic Communities

In order to fully comprehend the implications of society regarding the consequences of social interactions, past instances of illicit substance use, etomidate specifically, and governmental policies, it will be necessary for academic researchers to perform extensive and comprehensive research studies. This data will serve as the foundation for creating new, more effective methods of multisource collaboration to address future threats posed by illicit substances, as well as collaborating to further enhance the solution-oriented approach taken through the « Narcotics Hazard Prevention Act» .

4. Medical Value and Abuse Risks of Etomidate

Etomidate has become a preferred induction agent due to its rapid onset of action and consistent hemodynamic stability, and yet, due to growing concerns over its potential for abuse and dependency, many organizations are beginning to view etomidate through the lens of public health and policy. Systems of regulation and legality continue to change in response to etomidates position as both a medication and substance of misunderstanding; therefore, complying with ANCI guidelines will help establish the proper framework for resolving the imbalance between treating patients and protecting society from substance abuse. As the expectation of

drug providers and law enforcement differ greatly between nations, therefore, differences will exist in how etomidate is classified, as well as how it is used in clinical practice, and the potential liabilities associated with it in terms of criminal acts.

5. Research Limitations and Future Challenges

The current study is limited by the limited number of etomidate abuse cases and data sources, as well as the limited availability of abuse sample tracking for policymaking purposes. To complicate matters further, a lack of sufficient cross-national comparative data makes it difficult to assess global patterns of etomidate abuse. Clinical trials generally face limitations when it comes to ethics reviews and patient safety, consequently producing limited amounts of research on chronicity and long-term effects. Additionally, the increase in the number of people abusing etomidate is progressively demonstrating negative effects on social security; however, collecting empirically supported data will continue to be extremely limited.

Thus, the medical benefits and abuse potential of etomidate must coexist. For Taiwan to effectively address the emerging drug-related issues posed by etomidate, it must establish coordinated mechanisms between law, medicine, education, and research to develop an effective and comprehensive approach to policymaking, while remaining flexible and forward-thinking. By integrating and collaborating effectively through the various roles of these domains, Taiwan will be able to effectively meet the challenges posed by etomidate, as well as provide for the public health and social security of its citizens.

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