Structure & Causes of Illegal Medicines Circulation in Indonesia

Imam Luqman Hakim[1], Yos Sunitiyoso[2]
School of Business and Management Institut Teknologi Bandung[1,2]
TK Low Center for Executive Education, Graha Irama (Indorama) 12th floor
Jl. H.R. Rasuna Said Kav 1-2 Jakarta, 12950, Indonesia
Correspondence Email: imam_hakim@sbm-itb.ac.id
ORCID ID: https://orcid.org/0000-0003-2727-3503

ARTICLE INFORMATION

ABSTRACT

The circulation of illegal medicines in Indonesia is still happening. Illegal in this case because the product does not have a distribution permit, is counterfeit, or circulated without the authority as regulated by regulations. The limitation in this study is devoted to discussing the phenomenon of the circulation of illegal medicines that have a psychoactive effect which is vulnerable to abuse, consumed for specific purposes other than medical purposes, and even without a physician's recommendation. This study aims to understand the process, structure, and determinants of the circulation of illegal medicines vulnerable to abuse in Indonesia with system dynamic approach. The data were obtained from an exploratory study which included a literature review, field observations, and in-depth interviews then made a rich picture diagram and a causal loop diagram among the determinants of the circulation of illegal medicines that are vulnerable to abuse. Furthermore, the interpretation of the complexity of the structure that is formed is carried out. The study results indicate six categories, 47 factors, and nine loops that are the determinants of the circulation of illegal medicines that are vulnerable to abuse in Indonesia. Therefore, this study can contribute to knowledge about the complex structure and main determinants of the circulation of illegal medicines vulnerable to abuse in Indonesia and support efforts to reduce this illegal activity.

Keywords: Causal Loop Diagram, Illegal Medicines, Medicines Abuse, System Dynamic

JEL Classification: H11, I18, K42

INTRODUCTION

Medicines abuse in Indonesia is still in dire condition. Based on the 2018 Indonesian National Narcotics Board research, among students, the prevalence of dizziness medicines abuse reached 15%, tramadol 4.8%, higher than narcotics such as amphetamine/methamphetamine (Shabu), which was on a 3.0% scale. In terms of law enforcement, cases of violations in the medicines sector by the Indonesian FDA have increased for three consecutive years (2018-2020), namely: 48, 80, 90 cases, wherein 2020, cases in the medicines sector are the most violated compared to commodities. The Indonesian FDA supervises others.

The medicines abused in this case are not narcotics but are prescription medicines with substances that are still needed in the medical world. Three main groups of medicines are vulnerable abused, first is the psychotropic group (based on Law Number 5 of 1997), the second is the controlled substance group (based on the Indonesian FDA number 7 of 2016), and the precursor group (Government Regulation number 44 of 2010). All medicines These medicines have activity on the central nervous system, have psychoactive effects and are capable of causing characteristic changes in mental activity and behavior, especially when used outside of the dosage recommended by the doctor. Based on the Indonesian FDA's investigation, there are two distribution channels for supplying illegal medicines consumed by abusers. The first is from the illegal route, where the medicines product is a counterfeit medicines or medicines without a distribution permit. The second is from the diversion route, where the violator has deviations in medicines distribution. From legal pharmaceutical facilities to illegal channels carried out without legal authority or violating regulations. Meanwhile, medicines abuse is an illegal act/action against the law.

Along with the development of digital technology and telecommunications, the circulation of illegal medicines is increasingly widespread. The development of websites, e-commerce, and social media, is increasingly providing opportunities for perpetrators of illegal medicines crimes to create a market in the digital world, with developing modes and ways to deal with surveillance by law enforcement officers. From the Indonesian FDA cyber patrol results, the crime of selling illegal medicines for two consecutive years (2019-2020) experienced a significant increase, namely 20,059; 44,902 links. However, efforts to screen and take down links to illegal medicines sales by authorized officers still seem unable to stem the development of perpetrators of illegal medicines trafficking online.

Despite all the efforts made to eradicate illegal medicines and reduce medicines abuse rates, including supervision of medicines import and distribution routes, law enforcement against criminals, and rehabilitation and community empowerment efforts, medicines abuse activities and illegal medicines trafficking still occur in Indonesia. Lack of understanding of the root causes of illegal medicines trafficking in Indonesia is a critical factor in the ineffectiveness of the eradication. This study aims to identify the main determinants of illegal medicines trafficking in Indonesia, uncover the main actors, and determine the structural features that make it difficult to eradicate.

LITERATURE REVIEW

Based on Galvan & Galvan (2017), the authors set two main objectives in compiling a literature review to provide a comprehensive and current overview of the topic. Second, demonstrate mastery in the area discussed. The literature review serves as the basic rationale for conducting the research and as a constraint on the extent to which achieving

this goal will contribute and be acceptable.

The literature used is in reports, studies, research from government agencies, books, and journal articles. The main criteria for selecting articles are articles that show or discuss the causes and phenomena of medicines abuse, how medicines abuse occurs in various parts of the world, the causes of illegal medicines, and policies to eradicate illegal medicines and medicines abuse. Four keywords combined: medicines abuse, illegal medicines, root causes, and structure. Articles were retrieved using various search engines, including ProQuest and Sci-hub. Articles are selected with the closest context to the topic and published in the last ten years, reflecting the state of the research.

Circulation Of Illegal Medicines That Are Vulnerable To Abuse
According to the World Health Organization (WHO), *medicines abuse* is the excessive use of a medicines and is not associated with an appropriate/acceptable medical practice (WHO, 1994). Meanwhile, according to Nawawi et al., medicines abuse uses medicines or chemical substances that are not intended for treatment or treatment, but the medicines is used for pleasure (Nawawi, 1996).

Various things cause the circulation of illegal medicines that are vulnerable to abuse, including digital media factors that shape the online market, surveillance capabilities, lack of community participation, and regulatory weaknesses (Ariesta, 2020). The 2018 National Narcotics Board research journal states that medicines abuse is also inseparable from narcotics abuse, where family role factors, social interactions, and community knowledge are influential. Setiawan (2020) mentions that cross-sectoral coordination factors affect supervisory capabilities. In addition, the compliance of business actors in the medicines sector to regulations prevents deviations from medicines distribution channels. Adisaputra (2020) stated that legal substance, law-abiding culture, and firmness in law enforcement against illegal medicines trafficking in Indonesia need to be strengthened. Indonesian FDA has made efforts to strengthen the capacity of Human Resources (HR) through Knowledge Management to effectively supervise, enforce and increase understanding and involvement of business actors, stakeholders, and the community (Evelyn et.al, 2021). However, the complex problem of illegal drugs requires other strategies in issue solving beyond the readiness of human resources for supervision.

From the literature review results, the author arranges categories as a large scope description that affects the circulation of illegal medicines that are vulnerable to abuse. Furthermore, with data from field observations and in-depth interviews, the derivative factors of each category are described, and a causal relationship structure is made into a dynamic system.
.

System Dynamic
Health-care systems are intricate. If this complexity is not considered, attempts to create better and more equal health outcomes will be hampered. Understanding and working with complexity necessitates a paradigm shift from linear, reductionist approaches to dynamic, holistic approaches that recognize the complex and interconnected relationships among health system components and its various stakeholders' perspectives, interests, and power. More specifically, in drug distribution, many stakeholders are involved with various trigger factors, causing the problem of circulating prescription drugs in unauthorized facilities to become increasingly complex. Of course, it cannot be separated from conflicts of interest, which require the use of decision-making tools (Kurniawati et al., 2021). By improving our understanding of the characteristics of complex adaptive systems and identifying how this learning might be applied to system

problems and the production of potential solutions, systems thinking helps to re-orient our perspectives. (de Savigny and Adam 2009).

The system dynamics model has been used to investigate the structure of the variables that influence customer satisfaction in several circumstances (Aryani & Siallagan, 2021). In this study, a system dynamic was built to see the relationship between variables that affect the occurrence of medicines abuse in Indonesia. Before determining the variables in the system dynamic, the author describes the problem limits using a rich picture, which presents an image to explain the situation of medicines abuse and illegal medicines trafficking that occurs in the real world of Indonesia. This rich picture represents the structure, process, involvement of actors, and issues regarding medicines abuse and illegal medicines trafficking.

Based on data analysis obtained from the literature, field observations, and in-depth interviews, the rich picture was developed into a Causal Loop Diagram (CLD). The short-term and long-term consequences of the relationship of structures, processes, and actors that are built on the rich picture are further deepened. CLD preparation is used to: Understand the system structure giving rise to the system behavior, Represent the feedback structure of systems, Capture The hypotheses about the causes of dynamics, find where unintended consequences (policy resistance), Explore the consequences of the proposed action, Recognize the impact of time delays when exploring relationships (John, S. 2000)

RESEARCH METHOD

This study uses three complementary methods to answer the research objectives: a literature review to identify determinants of illegal medicines trafficking that are vulnerable to abuse, field observations to ensure the truth of the phenomena that occur, and in-depth interviews with relevant stakeholders as a triangulation of the first two methods in order to find structures in the circulation of Illegal medicines that are vulnerable to abuse. The data obtained were analyzed. Structural diagrams of actors and causal pie charts among the determinants of illegal medicines trafficking vulnerable to abuse are created and interpreted.

RESULTS AND DISCUSSION

Field Observations
For field observations, the authors monitor the online Circulation of illegal medicines that are vulnerable to misuse in five e-commerce sites and two social media that internet users in Indonesia often use. Monitoring was carried out in October - November 2021. From the monitoring results, the author found 58 links, consisting of 52 e-commerce and two social media, which were indicated to be selling illegal medicines with active product substances such as clozapine, alprazolam, Diazepam Trihexyphenidyl, Tramadol. Online monitoring also clarifies the role of criminals using online market platforms and goods delivery services.

From the literature review data and field observations, at least six categories that the author appointed as the scope that affect the Circulation of illegal medicines that are vulnerable to abuse. The categories include: Social factors and community knowledge, Circulation of illegal narcotics, legal distribution channel barrier, illegal supporting resources, technology advances, Law enforcement
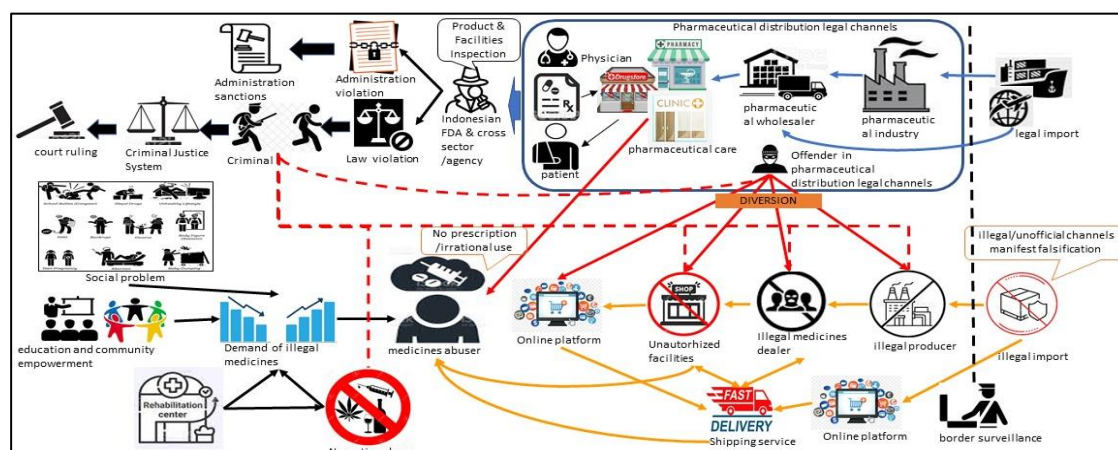
In-dept Interview

In collecting primary data using dept-interview, the author made a list of open-ended questions to guide conducting interviews. Six questions mainly seek information from respondents regarding the factors that influence the circulation of illegal medicines vulnerable to abuse and the causal relationship of the various factors explored.

The interviews were conducted semi-structured, four people face-to-face, four people via telephone, and two online meeting platforms, which were conducted in November 2021. The interview time ranges from 46 minutes to 72 minutes. The fourteen respondent institutions interviewed and their codes are: four respondents from the Indonesian FDA head office (A1-A4), two respondents from the Provincial office of the Indonesian FDA (A5-A6), one person each from Indonesian Police (A7), Association of Indonesian Express Post and Logistics Delivery Service Companies (ASPERINDO) (A8), Indonesian Cargo and Postal Security Inspection Company Association (PAPPKINDO) (A9), Indonesian E-Commerce Association (IdEA) (A10), State-owned pharmaceutical retail company (A11), National Narcotics Board (A12), Civil Society (Former narcotics and medicines abuser) (A13-A14).

Rich Picture

Figure 1. Rich Picture of Illegal Medicines Circulation that are Vulnerable to Abuse

Before determining the variables in the system dynamic, the author describes the problem limits using a rich picture, which presents an image to explain the situation of medicines abuse and illegal medicines trafficking that occurs in the real world of Indonesia. This rich picture represents the structure, process, involvement of actors, and issues regarding medicines abuse and illegal medicines trafficking in Indonesia.

There are two main channels for the availability of illegal medicines that emerged from the interviews. The first is the diversion or deviation of distribution channels from legal to illegal. The second is the distribution channels of counterfeit medicines or imported/local medicines without distribution permits. The legal route for medicinal commodities has been strictly regulated through the Government Regulation, the Minister of Health Regulation, and the Indonesian FDA Regulation. However, the presence of offenders from the side of business actors, workers, medical personnel, and pharmaceutical personnel causes the diversion route to continue. Diversion, in this case, can be in the form of finished medicines that are ready to be consumed or raw materials that can be reprocessed into counterfeit medicines or medicines without distribution authorization.

Distribution channels for counterfeit medicines or medicines without a distribution permit, four central roles were identified: suppliers of illegally imported goods (finished products and raw materials), medicines manufacturers, illegal medicines dealers, and unauthorized facilities as retailers and also identified two supporting factors used by criminals in expanding the accessibility of illegal medicines, namely the presence of an online market platform and shipping service.

Identified four central roles in distribution channels for counterfeit medicines or medicines without distribution permits: suppliers of illegally imported goods (finished products and raw materials), illegal medicines manufacturers, illegal medicines dealers, and unauthorized facilities as retailers. Also identified two supporting factors used by criminals in expanding the accessibility of illegal medicines, namely by the existence of online market platforms and delivery services

Determinants of Illegal Medicines Circulation
The structure, process, actors formed in the rich picture are transformed into factors in the form of quantities that can rise or fall, grow or decline, or be up or down. Factors are coded and organized as category derivatives. Interview data were analyzed using content analysis methods, then the number of resource references that mention factors in the interview were grouped and counted. From the analysis, obtained 47 factors as determinants of the illegal medicines circulation that are vulnerable to abuse.

Table 1. Determinant Factors of Illegal Medicines Circulation Revealed from the Interviews
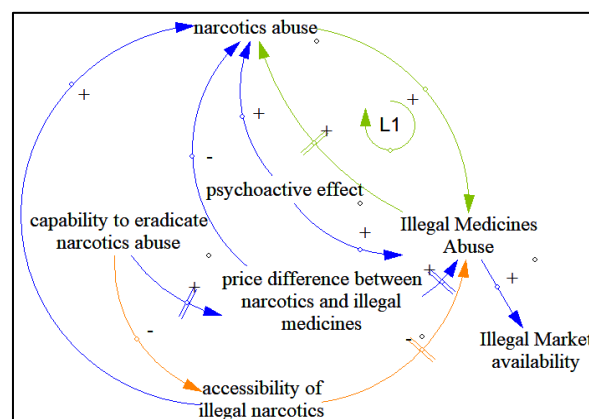
CATEGORIES & FACTOR	CODE	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	n	Ref
Social Factors and Community Knowledge (SFCK)																	
Education and Community Empowerment	SFCK 01		2				1		1				3	3	2	6	12
Rehabilitation Center Capabilities	SFCK 02												4	2	2	3	11
Family Role	SFCK 03	1	3						2				5	4	3	6	18
Public Knowledge	SFCK 04		2	2			1		1		2	2	4	2	2	9	18
Religious Belief	SFCK 05		2		1					1			2	1	2	6	9
Social Influence and Problems	SFCK 06	2	2	1	2		2		1	2	2	2	4	4	6	12	30
Self Control	SFCK 07		3				1		2				5	1	3	6	15
Illegal Medicines Abuse	SFCK 08	7	6	8	5	4	8	7	4	4	3	3	8	5	4	14	90
Illegal Narcotics Abuse (INA)																	
Capability to Eradicate Narcotics Abuse	INA 01		1			1	1	2					1			5	6
Price Difference Between Narcotics and Illegal Medicines	INA 02	2			1	3	2	2	2	2			1	2	4	10	21
Accessibility of Illegal Narcotics	INA 03		2				1		1				3	2	2	6	11
Narcotics Abuse	INA 04	2	2		2		2						5	4	5	7	22
Psychoactive Effect	INA 05	2	2	2			2		2	2		2	5	6	6	10	31
Legal Distribution Channel Barrier (LDB)																	
Supervisory Resource Availability	LDB 01	2	1	1	2		1					2	1			7	10
Institutions and Stakeholders Coordination	LDB 02	1		1	2	2			2		2					6	10
Knowledge of officers and Stakeholders	LDB 03	1	2				1		2		3	3				6	12
Supervisory Capabilities	LDB 04	1	1	2	2		1					1	5	2	3	9	18
Non-Compliance of Pharmacist, Pharmacy Owners & Workers	LDB 05	2	1	2	3	2	2			2		2	2	3	2	11	23
Administrative Violation	LDB 06	1	1	2		1	1						1			6	7
Administrative Sanctions	LDB 07	2	2	2		2	2					1				6	11
Diversion	LDB 08	3	2	5	3	4	4			2			2	2	2	10	29
Illegal Supporting Resources (ISR)																	
Entry of Illegal Goods At The Border	ISR 01	3		2	3		2									4	10
Tools and Raw Materials Availability	ISR 02	1	2		2		1									4	6
Legal & Regulatory Awareness	ISR 03	1	2	1		1	3	2		1			2	2	1	10	16
Profit Rate	ISR 04	1	2	2	2	2	2		2	2	1			3	6	11	25
Personal Interests	ISR 05	1					2						1			3	4
Financing Ability	ISR 06	1		1			1			1				2	4	6	10
Market Availability	ISR 07	1	2	1	2		2				2		2	2	2	9	16
Counterfeit Medicines Production	ISR 08	3	2	2	2		3			2				2	2	8	18
Availability of Illegal Medicines	ISR 09	2		1			1					2		2	2	6	10
Technological Advancement (TA)																	
Digital Technology Development	TA 01	2	2	2			1		3		2					6	12
Number of Online Platforms	TA 02	2	2	2	1		2				2	1			2	8	14
Number of Online Platforms Users	TA 03	2	1	2	1		2				1	1				7	10
Illegal Medicines Online Sales	TA 04	3	2	3	2		2		2		3	1	2		3	10	23
Availability of Freight Forwarding Services	TA 05	1	1				1		2		2				2	6	9
Accessibility of Illegal Medicines	TA 06	2	1	2	1		2		1		2	1	3	2	2	11	19
Law Enforcement (LE)																	
Law Enforcement Resource Availability	LE 01	1	2	2			2									4	7
CJS Coordination and Cooperation	LE 02	1	1				2		1							4	5
Conflict & Weak Regulation	LE 03	3	2	2	3	2	3		2	2	1	2	5	2	2	13	31
Officer Integrity	LE 04	2	2	2			2						5	4		6	17
Law Enforcement Capabilities	LE 05		1	2		2	2						2	2	2	7	13
Case Disclosure Tools & Technology	LE 06	2		1												2	3
Siber Patrol	LE 07	2					2									2	4
Number of Case Disclosure	LE 08		1				2						1			3	4
Case Proofing Ability	LE 09	1	2				2									3	5
Maximum Lawsuit & Court Ruling	LE 10	3	2	2	1	1	3							2	2	8	16
Number of Perpetrator	LE 11	2	2		2		3		2					6	7	7	24
																320	722

Note(s): n=number of interviewees; Ref.= number of references the interviewees mentioning the factors

Determinants of Illegal Medicines Circulation and Associations Between Factors
The literature review results are generally strengthened by in-depth interview data analysis. Forty-seven factors under six categories emerged as the main determinants of the circulation of illegal medicines vulnerable to abuse. Causal loop diagrams were developed to illustrate the relationships between factors, which are discussed in more detail in this section. Illegal Market availability (ISR07) is used as a factor that describes the widespread circulation of illegal medicines because it illustrates the great demand from medicines abusers and the supply of accessibility of illegal medicines. From the type of loop coverage formed, two loops involve factors from single categories. Furthermore, seven loops involving factors from multicategories.

Illegal Narcotics Abuse (INA). Narcotics abuse cannot be separated from the factor of medicines abuse. As stated by government officials (A12), "narcotics abusers tend to use multi drugs, to get complimentary benefits, for example, the use of the narcotic stimulant *methamphetamine* which causes abusers to stay awake for days, when they want to stop the effects, they tend to use medicines *benzodiazepines* derivate that have a suppressant or sedative effect. A former narcotics abuser (A13) confessed that: "At first I abused medicines contains *Tramadol* and *trihexyphenidyl* when I was a student, due to a friend's invitation, and the price was affordable, that is where I got to know the euphoric effect, and the older I got, the more I wanted to feel more sensations by trying the *methamphetamine* class and marijuana (cannabis)". Narcotics abuse tends to increase medicines abuse as a temporary substitute or complement to certain effects. Interestingly, there is positive feedback that medicines abuse in the early stages can be an entry point for someone to become a narcotics abuser in the future. Loop L1 in Figure-2 shows the relationship between narcotics abuse (INA04) and Illegal medicines abuse (SFCK08), with the type of loop reinforcing. An increase in one factor has the potential to increase the incidence of both factors in the future exponentially.
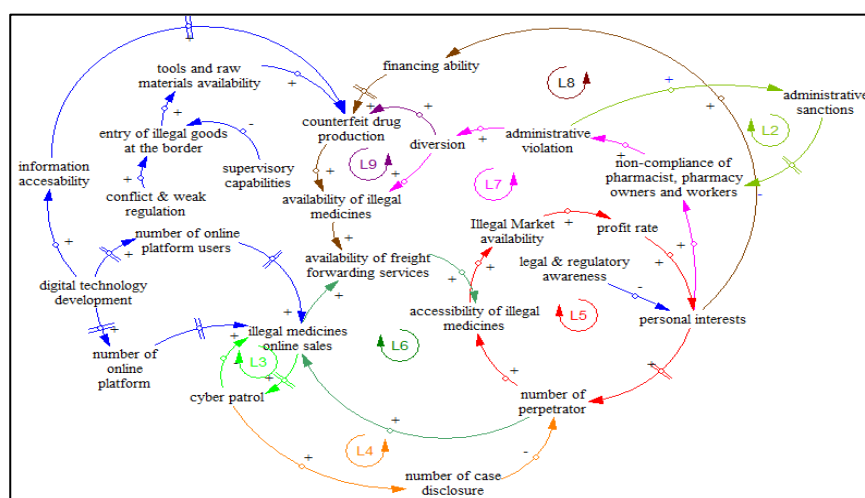
Figure 2. Loop L-1 in the category of Illegal Narcotics Abuse

Legal Distribution Channel Barrier (LDB). Weak barriers in the distribution of illegal medicines cause a diversion. The government official (A3) stated that "supervisory capability is important in keeping all pharmaceutical businesses in compliance with regulations, cross-sectoral coordination including with local government officials needs to be improved, especially since the Indonesian FDA's supervisory resources are still lacking." In the LDB category, there is Loop L2 with the type of diminishing loop seen in Figure-3. The non-compliance of pharmacists, pharmacy owners & workers in the legal channels of medicines distribution is the main cause that results in violation of regulations
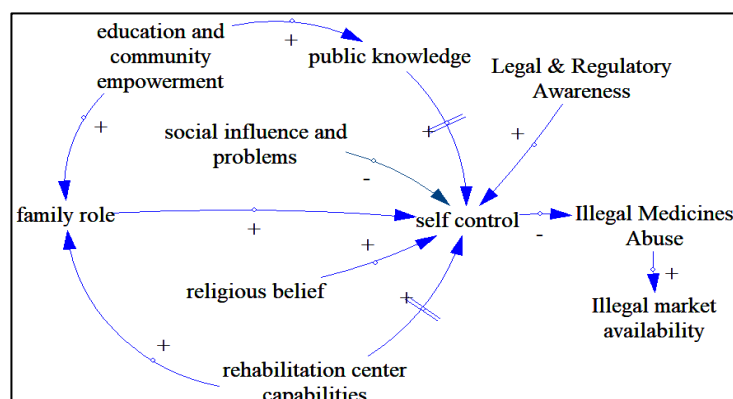
(known as administrative violations in the field of medicines distribution) which risk increasing the incidence of diversion. The government official (A4) said that "diversion must be strictly monitored not only from the pharmaceutical retail side but from the import of raw materials or finished products to the destruction of unused medicines residues." From Figure-3, it can be seen that L2 coincides with L7 in influencing the circulation of illegal medicines that are vulnerable to abuse. It can also be seen that diversion in the form of finished products forms an L7 loop, and diversion in the form of raw materials or other materials that can be reprocessed causes the diversion to become the input for the occurrence of an L9 loop.

Figure 3. Loop L3 to L8 with multi-category linkage

Social Factors and Community Knowledge (SFCK). This category affects the incidence of medicines abuse and narcotics abuse, where the main outcome is about strengthening self-control so as to create strong individuals in refusing medicines and narcotic abuse. The government official (A12) stated: "In addition to providing detoxification therapy for narcotics and medicines abusers, the main role of rehabilitation is to change the mindset of abusers to be able to recognize their own strengths, realize that narcotics and illegal medicines are not the solution, rehabilitation restores cognitive function, social function, strengthens understanding through education, including increasing the role of the family in creating a conducive atmosphere".

Figure 4. Causal Loop Diagram in the Category of Social Factors and Community Knowledge
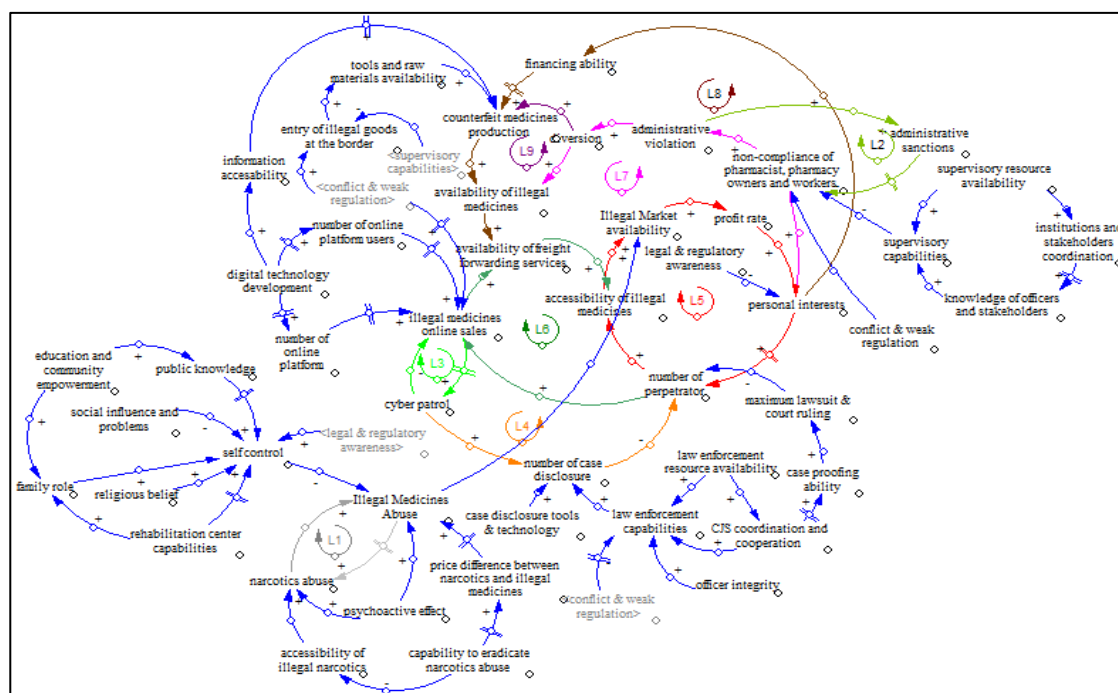
Illegal Supporting Resources (ISR). This category explains the phenomenon of the existence of counterfeit medicines and medicines without distribution permits in the illegal market. The government official (A1) stated: "since the last two years, cases of illegal medicines trafficking handled by the Indonesian FDA have obtained evidence of illegal medicines products that are allegedly fake, with packaging that resembles the original product. This indicates that the fake medicines manufacturer exists, and remains to be traced to the source". Indonesia has a long and open sea border area and is not matched by the capabilities of the state apparatus in guarding the border. Moreover, Indonesia has a long history of narcotics and prohibited goods smuggling, human smuggling, weapons smuggling, piracy at sea, theft of natural resources, and separatist actions (Jamilah., 2020). This, of course, also increases the risk of smuggling illegal raw materials for medicines. Apart from the border that is not guarded by the state apparatus, A2 also stated that the risk of illegal import of goods also still haunts the border lane, which is actually under the supervision of the state apparatus, by falsifying the manifest or description of the goods, in this case, the ability to detect or supervise at the border is a key factor. Figure-3 shows that the ISR category has the most factors that form a collaboration loop with other categories. There are five reinforcing loops, from L5 to L9 involving the components of the ISR category. This causes the ISR factor to be of special concern in terms of intervention measures so that illegal medicines trafficking does not increase in the future.

Technological Advancement (TA). The author's direct observation of the online sale of illegal medicines in e-commerce and social media confirms the findings of the role of digital technology in creating an illegal online market. The ease of marketing products and transacting with buyers is the reason that was explored in the author's interview with a former medicines abuser (A14) who also sold illegal medicines online. A1 confirms, "Online transactions were detected by the perpetrator in ordering raw materials for illegal medicines through a global e-commerce platform, detected because it was written in the manifest clearly stating the name of the medicines, the question is, what about counterfeiting the manifest? However, the contents turned out to be the raw material for *tramadol.*" Technological developments have indeed caused changes in market patterns and consumer behavior. In this case, regulatory and supervisory factors in the form of cyber patrols have become an obstacle to preventing the circulation of illegal medicines online. From figure-3, it can be seen that TA forms an L6 loop with loop reinforcing type. In addition, there is an L3 loop that shows that cyber patrol is a critical factor that must be strengthened in reducing the number of illegal medicines online sales.

Law Enforcement (LE). One of the efforts to eradicate the crime of illegal medicines trafficking is to strengthen the legal structure and legal substance. From the penal route, it focuses on the repressive nature after a violation of the law occurs. This requires strengthening regulations and strengthening the capacity of law enforcement officers (Adisaputra, 2020). Law enforcement officials (A7) explained: "Currently, criminal sanctions for illegal medicines crimes are still too light compared to narcotics crimes, even though the damage to health and state resilience can be comparable to narcotics crimes, it needs to be reviewed again, especially if the court's decision only gives a verdict. Several months". In figure-5 loop L4, it can be seen that in reducing the perpetrator, repressive efforts in disclosing cases are indeed important, but no less important is to provide a deterrent effect to the perpetrator by seeking maximum lawsuit & court rulings. In this case, the input factors described in the LE category need to be maximized.

Figure 5. Interrelationship among the determinant factors of Illegal Medicines Circulation

CONCLUSION

From the results of the study, it is known that circulation of illegal medicines is caused by six main categories: (1) Social Factors and Community Knowledge; (2) Illegal Narcotics Abuse; (3) Legal Distribution Channel Barrier; (4) Illegal Supporting Resources; (5) Technological Advancement; (6) Law Enforcement. The study also revealed 47 factors as determinants of the circulation of illegal medicines. Their relationship is illustrated in a causal loop diagram developed by interpreting interview data and field observations. From the results of the causal loop diagram, nine loops are generated as closed loops of causal and feedback relationships, which can be used as attention in looking at the dominant factors that strengthen the circulation of illegal medicines that are vulnerable to abuse in Indonesia.

Of the nine loops formed, the Illegal Supporting Resources (ISR) category is the category that has the most influence in forming a causal feedback relationship, followed by the Technological Advancement (TA) category as the second most influential category in forming loops. Factors in these two categories can be a priority for attention in determining policies to control the circulation of illegal medicines. Three small loops involve a few factors, and this can be represented as the least effortless intervention but effectively produces a beneficial impact.

Based on the system thinking approach that was formed, there are recommendations in efforts to eradicate illegal medicines circulation that are vulnerable to abuse: (1) Strengthening cooperation with cross-sectors engaged in eradicating illegal narcotics, both preventive and repressive efforts; (2) Strengthening regulations and supervision in eradicating the online circulation of illegal medicines; (3) Strengthening border control and prevention of cross-sector joint diversion in preventing resources supporting counterfeit medicines and medicines without distribution permits; (4) Strengthening laws, regulations, and law enforcement to eradicate crime upstream and provide a maximum

deterrent effect against criminals.

LIMITATION
Limitations of medicines in this study are substances still used in medicines, but in implementation in the field, there are many cases of abuse and illegal distribution. These medicines categories include classes 3 and 4 psychotropics, certain prescription medicines classes, and precursors medicines. This research is an exploratory study that focuses on the structure, process, and determinants of the circulation of illegal medicines. Further studies are needed to assess the relationship between variables and measure the strength of the relationship between the determinants to finally find the theoretical implications.

ACKNOWLEDGMENT
We acknowledge the support received from the Deputy for Law Enforcement – Indonesian FDA for providing the Data. We also thank you to the respondents who have agreed to be interviewed, and for the School of Business and Management, Institut Teknologi Bandung.

DECLARATION OF CONFLICTING INTERESTS
The authors declare no conflicts of interest in preparing this article

REFFERENCES

Adisaputra, H. (2020). Criminal Law Enforcement In Managing Illegal Drug Trafficking. Thesis. Master Study Program of Legal Sciences. Faculty Of Law, University of Mataram. Mataram

Ariesta, E. (2020). Analysis Of Drugs And Certain Medicines Circulation Through Online Media. *Indonesia Private Law Review*, *1*(2), 65-76.

Aryani, R. P., & Siallagan, M. (2021, November). Causal Loop Diagram for Better Understanding of Customer Satisfaction in The Indonesian Public Service. In *Journal of International Conference Proceedings (JICP)* (Vol. 4, No. 2, pp. 76-88).

De Savigny, D., & Adam, T. (Eds.). (2009). *Systems thinking for health systems strengthening*. World Health Organization.

Evelyn, T. Y., Sushandoyo, D., & Dewi, E. F. (2021, November). Knowledge Management Approach in Law Enforcement Division of Indonesian Food and Drug Authority to Improve Organizational Performance. In *Journal of International Conference Proceedings (JICP)* (Vol. 4, No. 2, pp. 89-97).

Galvan, J.L. and Galvan, M.C. (2017), Writing Literature Review: A Guide for Students of the Social and Behavioral Sciences, 7th ed., Routledge, New York, NY

Indonesian FDA. (2021). Indonesian FDA Annual Report 2020 (Online). Available at. https://www.pom.go.id/new/admin/dat/20211108/FINAL_BRIEF_SUMMARY_LAPTAH_2020_-_28.10_.21_.pdf [Accessed 2021]

Indonesian FDA. (2020). Indonesian FDA Annual Report 2019 (Online). Available at. https://www.pom.go.id/new/admin/dat/20200817/Laporan_Tahunan_2019_Badan_Pengawas_Obat_dan_Makanan.pdf [Accessed 2021]

Indonesian FDA. (2019). Indonesian FDA Annual Report 2018 (Online). Available at. https://www.pom.go.id/new/admin/dat/20191212/LAPTAH-BPOM-2018.pdf [Accessed 2021]

Indonesian National Narcotics Board. (2019). Prevalence survey 2018. Data and Information Research Center (Online). available at https://ppid.bnn.go.id/konten/unggahan/2020/10/Survei-Prevalensi-2018.pdf [Accessed 2021]

Jamilah, M. (2020). The Indonesian Government's Strategy in Tackling the Threat of Narcotics Smuggling in the Maritime Border Area of Rupat Island Year of Study 2010-2016. Riau University. JOM FISIP Vol. 7: second edition.

John, S. (2000). Business dynamics: systems thinking and modeling for a complex world. *Irwin McGrawHill.*

Kurniawati, D., Kusumawati, D., & Arifah, M. (2019). Developing a Decision Support System with Dynamic Criteria for The Best Employee Assessment. *Journal of International Conference Proceedings*, *2*(2), 60–68. https://doi.org/10.32535/jicp.v2i2.603

Nawawi, A. (1996). Save the Nation's Young Generation from the Danger of Narcotics Abuse. Jakarta: BP Dharma Bakti

World Health Organization. (1994). *Lexicon of alcohol and drug terms.* World Health Organization.