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COMPARATIVE STUDY OF LEGAL RESPONSIBILITY OF B3 WASTE PRODUCERS IN MEDICAL B3 WASTE MANAGEMENT CROWDED IN HOSPITALS UNDER THE LAW INDONESIA AND SOUTH KOREAN LAW

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Abstract

This study uses a normative legal research type, while the nature of the research used in this writing is descriptive, analytical to analyze and describe the comparative legal responsibility of B3 waste producers in solid medical B3 waste management in hospitals in Indonesia and South Korea. The regulation of the legal responsibility of B3 waste producers in the management of solid medical B3 waste in hospitals in Indonesia is regulated in Law No. 32 of 2009 which states that everyone who produces B3 waste is obliged to manage the waste they produce, including in this case health service facilities that produce medical B3 waste. Medical B3 waste management activities include Reduction and sorting, Storage, Transportation, Processing, Burial and/or Landfill activities of B3 Waste. The management of solid medical B3 waste in hospitals in South Korea was regulated by the Medical Law under the Ministry of Health and Welfare until 1999. The Ministry of Environment announced several regulations for the definition, segregation, packaging, tracking, and final disposal of medical waste. Medical B3 waste management in Korea and Indonesia has similarities in legal, technical and operational aspects. This is one of them because Korea and Indonesia adhere to the same legal system, namely the continental European legal system (civil law).

keywords: medical waste; incineration; waste management legal certainty; constitutional court decision; default.

INTRODUCTION

Efforts to improve the quality of human life in the health sector, is a very broad and comprehensive effort, the effort includes improving public health both physical and non-physical. This is in accordance with the definition of health given by the *World Health Organization* (WHO) in 2012, as follows:

"*Health is a state of complete physical, mental and social well-being and not merely the absence of diseases or infirmity*" (Patz et al., 2012). *("Suatu keadaan fisik, mental, dan sosial kesejahteraan dan bukan hanya ketiadaan penyakit atau kelemahan").*

Meanwhile, according to Law Number 36 of 2009 concerning Health, it states:

"Health is a state of health, both physically, mentally, spiritually and socially that allows everyone to live a productive life socially and economically" (Agustina, 2016).

Hospitals as a means of health improvement and can also be used as educational institutions for health workers and research. Health services carried out by the hospital are in the form of healing activities for patients and restoring the condition of disability and soul. Hospital activities certainly produce various kinds of waste in the form of liquid, solid and gaseous objects. Not only that, the process of activities in the hospital can affect the social, cultural environment and in carrying out these efforts can use technology that is estimated to have great potential for the environment.

Waste produced by hospitals can endanger public health, namely waste in the form of viruses and germs originating from the Virology and Microbiology Laboratory which until now there is no antidote so it is difficult to detect. Liquid waste and solid waste originating from hospitals are a medium for spreading disturbances or diseases for officers, sufferers and the community. These disorders can be in the form of air pollution, water pollution, soil, food and beverage pollution. This pollution on environmental health can have a major impact on humans.

Hospitals as a means of health improvement efforts turned out to have a positive and negative impact on the surrounding environment. From its various activities, based on the Decree of the Minister of Health of the Republic of Indonesia Number 1204 / Menkes / SK / X / 2004 concerning Hospital Environmental Health Requirements states that hospital waste is all waste produced from hospitals in solid, liquid and gas forms. This can have consequences for the need for hospital waste management as part of hospital environmental health activities that aim to protect the community from the dangers of environmental pollution sourced from hospital waste (Rudge et al., 2012).

Government Regulation Number 101 of 2014 concerning Management of Hazardous and Toxic Waste (B3) has stipulated that waste from the activities of hospitals and clinical laboratories is included in the list of B3 Waste. Article 1 point 1 of Government Regulation Number 101 of 2014 explains B3 Waste, whose definition is:

"Hazardous and Toxic Substances hereinafter abbreviated as B3 are substances, energy, and/or other components that due to their nature, concentration, and/or amount, either directly or indirectly, can pollute and/or damage the environment, and/or endanger the environment, health, and survival of humans and other living things."

Then it is strengthened by Article 1 number 3 which reads:

"*Hazardous and Toxic Waste, hereinafter referred to as B3 Waste, is the remainder of a business and/or activity containing B3."*

In addition to medical solid waste, hospitals also produce non-medical solid waste. Based on Permenkes No. 1204 of 2004 concerning hospital environmental health requirements, it is stated that non-medical solid waste in hospitals which is solid waste generated from activities in hospitals outside of medical originating from offices, parks and yards that are reused if there is technology.

Based on Government Regulation No. 18 of 1999 concerning the management of hazardous and toxic waste, hospital solid waste is classified into toxic and hazardous waste that can potentially cause infectious diseases (infectious waste). Therefore, more attention is needed in managing solid waste in this hospital more seriously.

The medical waste management process carried out by some hospitals has not been in accordance with the regulations set by the Government, the medical waste management process has been regulated in Government Regulation Number 101 of 2014 concerning Hazardous and Toxic Waste Management. In the process of medical waste management, the Government, Provincial Regional Governments and Regency / City Governments supervise every person, business entity both legal and unincorporated that produces hazardous and toxic waste (B3), waste collectors, transporters, utilizers, processors and / or landfillers of B3 waste, and everyone who dumps (disposal) B3 waste.

From the data of 578 hospitals that carry out B3 waste management of health service facilities in accordance with standards, it is known that there are as many as 518 hospitals that have waste treatment cooperation with third parties, dominated by hospitals in Java Island (55%), followed by Sumatra Island (27%) (Noor, 2020)

Reflecting on one of the developed countries in Asia, South Korea, all medical waste entities .(*Radio Frequency Identification*) (Yoon et al., 2022). Currently, about 90,000 disposal facilities, 210 transporters, and 14 incinerators use RFID medical waste management systems for real-time updates of medical waste disposal, transportation, and processing details. In Korea, RFID medical waste management system, which enables real-time management of all processes involved in disposing, transporting, and processing medical waste, has been in use since 2008.

In this case, hospitals, which are none other than legal entities whose business activities are only engaged in hospitals, play an important role as parties who directly carry out production activities and produce B3 waste, should be burdened with the obligation to carry out the management of B3 waste. Article 88 of the PPLH Law basically stipulates that:

> "Any person whose actions, businesses, and/or activities use B3, produce and/or manage B3 waste, and/or that pose a serious threat to the environment are solely responsible for losses incurred without the need to prove an element of guilt."

The concept of absolute responsibility in Article 88 of the PPLH Law becomes interesting regarding the clarity of the purpose of the concept of *absolute responsibility a quo* is a *voluntary Corporate Social Responsibility* or an obligation as implied in its mention as absolute responsibility. Absolute responsibility, also called *strict liability*, is attached to the term in criminal law, but in its

description there is an element of loss that is intertwined with absolute responsibility. The perspective of civil law or business civil law becomes very interesting to assess the relationship between absolute responsibility and loss as referred to in Article 88 of the PPLH Law.

METHODS

The type of research used is normative legal research or library research, meaning that this research is based on literature sources to discuss problems that have been formulated, which are implemented in laws and regulations, books, previous books and scientific works, and other supporting data related to this research theme. The nature of the research used in this writing is descriptive analytical, namely the nature of research used to describe or describe a condition or situation that is ongoing or occurs with the aim of research so that it is possible to obtain information and things that are ideal for later analysis based on legal theory or applicable laws and regulations (Efendi et al., 2016).

The source of data in this study is books or documentation related to this research and when viewed in terms of the importance of data, through normative research methods, the data used is Secondary Legal Material, which is obtained by conducting a literature study, namely studying, understanding books, articles, scientific journals, literature that has something to do with the title of the study, and the writings of experts or scholars who have something to do with the object of research. (Abdullah, 2015)

In this journal, the secondary legal materials used are laws and regulations relating to the main issues raised and official state documents (Moleong, 2021). The primary legal materials used are:

1. Law Number 32 of 2009 concerning Environmental Protection and Management
2. Law Number 11 of 2021 concerning Job Creation
3. Government Regulation Number 22 of 2022 concerning the Implementation of Environmental Protection and Management
4. Regulation of the Minister of Environment Number 56 of 2016 concerning Waste Management of B3 Fasyankes
5. Regulation of the Minister of Environment and Forestry Number 6 of 2021 concerning Procedures and Requirements for Hazardous and Toxic Waste Management
6. Regulation of the Minister of Environment and Forestry Number 19 of 2021 concerning B3 Waste Management and Non-B3i Waste.

While Tertiary Legal Material is material that provides instructions and explanations to primary legal material and secondary legal material. That is either in the form of general dictionaries, legal dictionaries, large dictionaries Indonesian, legal encyclopedias, the internet (official site), and so on.

In this writing, the legal data obtained were collected by the literature study method. Literature studies in this study are carried out by tracing related materials both in books, laws and regulations, journals, research results, dictionaries, and material searches from the internet.

Data analysis used in legal writing uses the method of thinking deductive data analysts, which stems from basic principles. Through this reasoning construction, the author draws conclusions from general things to specific things. The use of this deduction method stems from the submission of a major premise, then a minor premise is submitted. Then, from these two premises a conclusion is drawn or conclusion (Marzuki & Sh, 2020).

RESULTS AND DISCUSSION

A. REGULATION REGARDING THE LEGAL RESPONSIBILITY OF B3 WASTE PRODUCERS IN THE MANAGEMENT OF SOLID MEDICAL B3 WASTE IN HOSPITALS BASED ON SOUTH KOREAN LAW AND INDONESIAN LAW

1. Management of Solid Medical B3 Waste in Hospitals Based on South Korean Law

Initially, in South Korea, medical waste was regulated by the Medical Care and Welfare Act, under the responsibility of the Korean Ministry of Health, until 2000. Medical waste is often mixed with municipal solid waste (MSW) and disposed of in municipal waste dumps or improper treatment facilities. However, information about the handling and treatment of medical waste in medical institutions is very limited and not widely known. Under the growing challenges of medical waste management, Korea continues to amend the Waste Control Act, under the responsibility of the Korean Ministry of Environment, to strengthen medical waste management from the point of production to its final destination. Medical waste is classified as designated waste (or hazardous waste) and is subject to hazardous waste regulations under the Waste Control Act.

The Korean Ministry of Environment has revealed several regulations on the definition, separation, packaging, tracking, and disposal of medical waste. According to the law, medical waste is defined as solid waste generated from medical facilities and laboratories operated by hospitals and considered potentially harmful to health.

Under the legal umbrella of South Korea's Waste Control Act, waste is specifically classified into six broad categories. It is noteworthy that the term "medical waste" is often used interchangeably with other terms such as "hospital waste" and "infectious waste worldwide." In a broader definition, hospital waste refers to any waste produced by a hospital, including infectious and non-infectious waste, hazardous waste and chemicals, and non-hazardous waste.

In Korea, agencies that dispose of medical waste must establish separate locations to transport and store waste off-site until it is handled and must disinfect it at least once a week (Jang et al., 2006).

Although Korea's current medical waste management system can be said to be very advanced, there are still some things that are considered not optimal about the risk of medical waste. Since 2008, South Korea's Ministry of Environment has devoted extensive efforts to reform laws and systems and provided on-site guidance for creating new systems. Nevertheless, nowadays it is very important to reach a social consensus for medical waste management because medical waste production is growing rapidly every year, and the capacity of incinerators dedicated to medical waste treatment is almost full. Three approaches to overcome this situation: the first is to reduce the amount of medical waste generated, the second is to secure sufficient capacity for incinerators dedicated to medical waste as soon as possible, and the third is to diversify medical waste treatment methods. Among these, only the second approach is currently applied. It would be difficult to keep up with the acceleration of medical waste production only through this approach; Given that incinerators are gradually degenerating, it is difficult to present them as a fundamental solution. Therefore, it is necessary to consider simultaneously methods for reducing the amount of medical waste generated and diversifying treatment methods. Even among the previously examined countries, opinions vary about the extent to which the scope of medical waste requiring special management should be expanded and what treatment methods should be applied to such waste. Thus, the three approaches mentioned above require a comprehensive study.

Treatment using municipal waste incinerators may be considered if residues after sterilization and milling are considered safe or relatively safe through risk assessment. Current regulations require that residues after sterilization and milling be burned at designated waste incineration facilities; However, authorities should review the use of municipal waste incinerators if necessary, after assessing the risk and economic feasibility. Since general medical waste has a lower risk than infectious and hazardous medical waste, the government may consider allowing treatment in incinerators other than those devoted to medical waste, provided special sealed containers are used. Since general medical waste comprises about 80% of medical waste in Korea, in practice, it would be better to apply this approach only to some common types of medical waste experimentally. In addition, in addition to the type of medical waste, measures that apply different standards depending on certain conditions (for example, when the amount of waste produced exceeds the incineration capacity) or the type of disposal facility may also be considered. However, for such a policy, it is important to gather opinions from relevant stakeholders and adequately communicate the risks involved.

2. Management of Solid Medical B3 Waste in Hospitals Based on Indonesian Law

Medical waste management in hospitals includes solid, liquid, sharp waste and hazardous materials (B3), all of which must be managed properly and correctly.

Hospital environmental health efforts aim to create a hospital environment both *in door and* outdoor that is safe, comfortable, and healthy for patients, workers, visitors and the community around the hospital, the incidence of environmental pollution and health problems

caused by the hospital can be reduced as little as possible or if possible eliminated. Waste management can be defined as an action carried out on waste starting from the collection stage at the source, transportation, storage and the final treatment stage which means disposal or destruction.

The first action that must be taken before carrying out waste management from preventive measures in the form of volume reduction or danger from waste released into the environment. Or waste minimization. Some minimization efforts include several actions such as efforts to reduce at source, waste utilization, recycling, waste treatment, and disposal of processing waste.

Meanwhile, the appropriate management of medical waste handling has been regulated in order and detail in the Regulation of the Minister of Environment and Forestry No.:P.56 / MENLHK-SETJE / 2015 concerning procedures and technical requirements for hazardous and toxic waste management from health service facilities.

Management of medical waste, both in the form of solid, liquid and gas, arising in health care facilities refers to the Regulation of the Minister of Environment and Forestry No. 56 of 2015 concerning (hereinafter referred to as PMLH 56/2015).

B. COMPARISON OF LEGAL RESPONSIBILITIES OF SOLID B3 WASTE MANAGEMENT IN HOSPITALS BASED ON SOUTH KOREAN LAW AND INDONESIAN LAW

Government Regulation of the Republic of Indonesia Number 74 of 2001 concerning the Management of Hazardous and Toxic Substances, in Article 1 paragraph 2 states that B3 waste management is an activity that produces, transports, distributes, stores, uses and / or disposes of B3. Article 4 states that everyone who carries out B3 management activities must prevent pollution and / or environmental damage.

The difficulty of obtaining permission to self-manage the waste produced was complained by the hospital. So that fasyankes collaborates with Medical Waste Processing Companies. Cooperation with other parties causes hospitals to be unable to supervise waste processing handed over to Business Entities. Fasyankes can only monitor through the B3 Waste Management Performance Reporting Application (Siraja) made by the Ministry of Environment and Forestry (Jang et al., 2006).. Based on Article 59 of PPLH Law No. 32/2009 concerning Environmental Protection and Management that everyone who produces Hazardous and Toxic Material (B3) waste is obliged to manage the waste they produce and in the event that everyone is unable to carry out their own waste management, the management is handed over to other parties who have permits in accordance with the provisions of laws and regulations. The above is also strengthened by Article 32 paragraph 1 of the Government Regulation of the Republic of Indonesia Number 101 of 2014 concerning Management of Hazardous and Toxic Waste.

In the theory of environmental management that essentially the purpose of environmental management is to aim to reduce the risks that can be caused to the

environment, human health and other living things.of course hospitals as producers of B3 Medical waste must really carry out procedures in accordance with existing regulatory provisions, this is certainly in accordance with *Reflexive law theory* trying to reduce the complexity and diversity of society through extensive legislation. Reflexive law theory aims to direct patterns of behavior and encourage self-regulation (Hess, 1999).

Meanwhile, referring to the implementation of the mandate in the Reflexive Law Theory, on a broad scale efforts to manage and protect the hospital environment should be carried out systematically and integratedly on the preservation of environmental functions and for the prevention of pollution or environmental damage. Environmental management and protection efforts include planning, utilization, maintenance control, supervision and law enforcement (Article 1 point 2 of Law Number 32 of 2009 concerning Environmental Protection and Management). The mandate of the article means that there is a correlation between the state, the form of lawmaking in the form of policy (policy making), and a responsible environmental governance system. In many cases in the environmental field that have emerged indicate that there is actually a "black-and-white" (contrasting) between what has been stated in the regulation as a manifestation of negra concern, people's aspirations manifested in representative institutions (DPD / DPRD), and the efforts of the judicial institution as the last guard in law enforcement (l*aw enforcement*).

a. Responsibility of Indonesian Hospitals to Manage Medical B3 Waste

The Hospital has principles and objectives regulated in Law Number 44 of 2009 concerning Hospitals in Article 3 letter b, namely: providing protection for the safety of patients, the community, the hospital environment and human resources in the hospital. So that it is clearly regulated in the Hospital Law, it is mandatory to provide protection to the safety of patients, the community and the hospital environment by managing the B3 medical waste it produces in accordance with established regulations.

In accordance with PP Number 74 of 2001, B3 waste needs to be managed in accordance with existing regulations so that environmental management in hospitals must be carried out consistently. In addition, human resources who understand the problems and management of the hospital environment are very important to achieve good environmental performance (Hess, 1999).

The concept of absolute responsibility for any person whose actions, business, and/or activities use B3, produce and/or manage B3 waste, and/or who pose a serious threat to the environment are absolutely responsible for losses incurred without the need to prove an element of guilt. This concept is very important in its implementation to entangle environmental pollution actors with B3 waste, considering that requests for compensation to business people can be forced to apply without being preceded by proving elements of guilt. The article provides flexibility for law enforcement in requesting compensation for environmental pollution due to B3 waste (Santosa, 2017).

Hospital as a corporation which is an association or organization engaged in the economy, the corporation is a legal entity (*rechtspersoon*) and is equated with humans (*natuurlijke person)* as legal subjects or persons, corporations as carrying legal rights and obligations, corporations have their own assets separate from the assets of the people incorporated in them, corporations have legal authority, corporations can held legally accountable, so that it can be prosecuted before the court (Ardiana & Doni, 2023). Hospitals must have the following permits: Environmental Permit, Environmental Protection and Management Permit, HO Permit, Waste Management Business License, Wastewater Utilization Permit, and Wastewater Disposal Permit. Because the function of the permit itself is to protect the environment from sources of pollution / destruction derived from business results. Because the Corporation is closely related to civil matters. Environmental compensation and restoration is carried out in the following ways: Every person responsible for a business and/or activity that commits unlawful acts in the form of pollution and/or destruction of the environment that causes losses to other people or the environment must pay compensation and/or take certain actions. The court may prescribe the payment of forced money every day of delay in the execution of a court decision (Nuraini et al., 2022).

Management of Hazardous and Toxic Waste from Health service facilities, Article 5 Management of B3 Waste arising from health facilities as referred to in Article 3 includes stages: reduction and sorting of medical waste, storage of B3 waste, transportation of B3 waste, treatment of B3 medical waste, burial of B3 waste waste and landfill of B3 waste. Permits are needed according to these requirements, which are difficult for hospitals to meet because the investment is high enough so that the management is collaborated with the B3 medical waste management (other parties) who already have operational permits. Number 18 of 2009 concerning Procedures for Licensing Hazardous and Toxic Waste Management, Article 2 Paragraph (1) The types of B3 waste management activities that must be completed with permits consist of activities: transportation; temporary storage; Collection; utilization; Processing; and hoarding.

Civil law scholars tend to use the term "liability" in translating the term "*aansprakelijkheid or liability*", to distinguish it from the term "*verantwoodelijkheid or responsibility*" better known as criminal law. The term liability has been developing since the seventies, to distinguish the term "responsibility" known in constitutional law, administrative law and criminal law.

In the context of civil law, *strict liability* is one type of civil *liability*. According to Article 88 of the UUPPLH which applies absolute responsibility, it is necessary for an accountability to be carried out without proving an element of guilt and compensation arises after the act is committed. In terms of providing compensation as a form of liability, B3 waste processing companies as polluters can be determined to a certain extent.

Civil liability in the context of environmental law enforcement is a civil law instrument in order to obtain compensation and costs of environmental recovery due to pollution and/or environmental damage caused. In the explanation of Article 88 it is clear that this UUPPLH actually characterizes the main characteristic of strict liability, where in its regulation there is a clause that

explains that in the immediate emergence of responsibility at the time of the deed, so it does not need to be associated with the element of guilt. It is hoped that this law can exist in the framework of law enforcement in Indonesia, especially in the management of environmental law dimensions (Wulandari & Wahyuningsih, 2021)

Environmental law enforcement accompanied by the right to claim compensation for environmental pollution and destruction is based on the provisions of Article 1365 Burgerlijk Wetboek. However, in its application, obstacles were found, especially regarding the problem of the burden of proof. The main difficulty faced by victims of pollution as plaintiffs is proving the elements contained in Article 1365 BW, especially the element of error (schuld) and the element of clause relationship containing the principle of responsibility based on error (*schuld* aansprakelijkheid), and the problem of burden of proof (bewijslast or burden of proof) which according to Article 1865 BW / Article 163 HIR Article 283 R.Bg. is the obligation of the plaintiff. The issue of the burden of proof mentioned above, the application of the principle of *strict liability* has also not been maximized because the provisions in Article 88 of the UUPPLH itself also only limit environmental pollution containing B3 waste (Riswanti et al., 2013).

Civil responsibility in the context of implementing environmental laws and regulations is a civil law tool to obtain compensation and costs for environmental recovery due to environmental pollution and/or destruction. In the explanation of Article 88, it is explained that this UUPPLH actually characterizes the main characteristics of strict liability, where the regulation contains a clause explaining that in the immediate emergence of responsibility at the time of action, there is no need to associate it with the element of guilt. Environmental degradation is undeniably a major problem, which is one of the reasons why strict responsibility must be upheld, given its impact poses a major threat to society. This law is expected to be present in the framework of law enforcement in Indonesia, especially in the legal component of environmental management.

b. Medical B3 Waste Management Activities in South Korea

In Korea, medical waste has been regulated by the Medical Law under the Ministry of Health and Welfare until 1999. Waste is often mixed with domestic solid waste (*Municipal Solid Waste*) and is usually disposed of in municipal landfills or treatment facilities that are not in accordance with their designation. In addition, information on the handling and disposal of medical waste from health institutions is very limited and cannot be accessed by information. Faced with the problem of medical waste management, the National Assembly of Korea modified the Waste Management Act in 1999 to better control the management of medical waste from the starting point of the limbaj generated to its final destination. The Korean Ministry *of Environment* is responsible for implementing the law. Medical waste is classified as hazardous waste and is subject to hazardous waste management regulations under the Waste Management Act. The Ministry of *Environment* announced several regulations for the definition, segregation, packaging, tracking, and final disposal of medical waste.

The primary option for medical waste disposal from most healthcare facilities is to pay a licensed hauler to transport the waste to a medical waste incineration facility. In South Korea, incineration has become a traditional treatment method for handling medical waste that usually contains infectious and hazardous materials. It has several advantages when used to treat medical waste, including reduction of waste volume, sterilization and detoxification of waste materials, and recovery of heat or electricity during incineration. However, incineration also has some disadvantages, including potential emissions of toxic substances into the surrounding area, high operating and maintenance costs, and ash disposal requirements.

Industrial waste is further divided into general industrial waste, construction waste and certain waste. Certain wastes are defined as B3 waste containing hazardous materials, such as polychlorinated biphenyl (PCBs), asbestos and heavy metals. The total amount of waste generated per year in Korea continued to increase from 2005 to 2017, with an increase rate of 3.4%. In particular, the amount of hazardous waste generated in Korea has increased significantly, with an annual increase rate of 6.1% from 2005 to 2017. The total amount of waste generated in Korea in 2017 was 429,531 tons per day, of which 62,881 tons per day (14.6%) were landfilled or incinerated. About 56% of landfill or incinerated waste can be recycled. The total amount of waste recycling in Korea is 366,650 tons per day, and the recycling rate is high at 85.4%. The reason why the waste recycling rate in Korea is so high is because it only takes into account the primary waste that goes into the recycling facility, without considering the secondary waste from the recycling process (Choi et al., 2019).

The generation of hazardous waste in Korea is described in Table 3 above. In 2017, the amount of hazardous waste generated in Korea was 14,905 tons per day, which is about 1.7 times that of 2005. The main types of hazardous waste are acid waste, oil waste, organic solvent waste and others, which account for about 85% of hazardous waste generation. How B3 waste treatment is presented in Figure 1. The share of recycling and incineration of B3 waste decreased slightly in 2017 compared to 2005, but the share of landfill increased slightly.

Because B3 waste management must cover the entire process, from waste generation to final treatment, further management of B3 waste must be carried out using the following five principles:

1) Proper B3 waste management;
2) Regulatory compliance;
3) Ease of user understanding;
4) Diversity of processing methods; and
5) Utilization of existing B3 waste management system.

Five concepts of advanced hazardous waste management should be proposed based on the five principles above for all B3 waste management processes, from waste generation to final treatment. The five concepts above are called Sustainable B3 Waste Treatment in South Korea

CONCLUSION

Regulation of the legal responsibility of B3 waste producers in the management of solid medical B3 waste in hospitals in Indonesia can be found in Law No. 32 of 2009 concerning Environmental Protection and Management, Government Regulation No. 22 of 2021 concerning the Implementation of Environmental Protection and Management, Regulation of the Minister of Environment and Forestry No. 56 of 2015 concerning Procedures and Technical Requirements for Hazardous and Toxic Waste Management from Health Service Facilities and Minister of Health Regulation Number 18 of 2020 concerning Meds Waste Management of Area-Based Health Service Facilities, which essentially mandates everyone who produces B3 waste, including medical waste produced by health service facilities which include community health centers (puskesmas), health service clinics or similar and hospitals, then B3 waste producers are required to carry out B3 waste management. Medical B3 waste management activities include Reduction and sorting, Storage, Transportation, Processing, Burial and/or Landfill activities of B3 Waste. In the event that B3 waste producers cannot and or are able to carry out B3 waste management, this activity can be handed over to third parties who already have permits in accordance with the activities carried out in the series of B3 waste management.

The management of solid medical B3 waste in hospitals in South Korea was regulated by the Medical Law under the Ministry of Health and Welfare until 1999. The National Assembly of Korea modified the Waste Management Act in 1999 to better control the management of medical waste from the starting point of the limbaj generated to its final destination. The Korean Ministry of Environment is responsible for implementing the law. Medical waste is classified as hazardous waste and is subject to hazardous waste management regulations under the Waste Management Act. The Ministry of Environment announced several regulations for the definition, segregation, packaging, tracking, and final disposal of medical waste. Under the Act, medical waste is defined as any form of solid waste generated by medical care facilities and laboratory facilities that operate within a hospital environment and are considered potentially hazardous to health. Since medical waste is designated as hazardous waste, a manifest system is required for part of medical waste management. A uniform hazardous waste manifest system is in place to better track and manage hazardous waste. The manifest form contains information about the producer, transporter, and final treatment facility of medical B3 waste, as well as the characterization of the B3 waste transported. The manifest consists of six copies (or four copies for small size hospitals) the form is initially filled out and signed by the generator before being transported.

The Sustainable Concept of B3 Waste Management in Korea is carried out using the following five principles: 1) Proper B3 waste management; 2) Regulatory compliance; 3) Ease of user understanding; 4) Diversity of processing methods; and 5) Utilization of existing B3 waste management systems. These five principles are carried out for all B3 waste management processes, from the time the waste is generated to the final treatment.

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