Criminal Liability for Medical Waste Management That Endangers Public Health

Eka Yuniarti, T. Riza Zarzani N, Irsyam Risdawati

Abstract

Medical waste from hospitals and community health centres contains infectious material and sharps, and when it is left unmanaged it endangers waste workers, scavengers and nearby residents. This study analyses criminal liability for medical waste management that endangers public health, using penal policy at the formulation, application and execution stages. It applies normative legal research with statutory, conceptual and case approaches, supported by secondary data from the Ministry of Environment (KLH/BPLH), the Ministry of Health, the World Health Organization and press reports of five incidents in 2024–2026. In 2025, 135,793 of 146,751 health facilities (92.53%) did not report medical hazardous waste through the SPEED system, and 130,199.16 of 190,656.61 tonnes of potential waste (68.29%) were unreported or of unclear management. Criminal liability for unpermitted hazardous-waste management is reported to have been removed from Law No. 32 of 2009, and if Article II(5) of Law No. 1 of 2026 applies to the remaining provisions, the maximum fine in Articles 103 and 104 would fall from IDR 3 billion to IDR 50 million (98.33%). None of the five incidents reports a conviction, and the one sentence found, six months and IDR 1 million, equals 16.67% of the maximum prison term and 0.03% of the maximum fine. The study concludes that liability should follow the chain from waste generator to contractor and be combined with reporting and treatment-capacity measures.

Keywords*: criminal liability; medical waste; hazardous and toxic waste; penal policy; public health*

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3rd International Conference Epicentrum of Economic Global Framework (ICEEGLOF)
Theme: Cross-Sector and Cross-Disciplinary Strategies for Achieving the SDGS
https://proceeding.pancabudi.ac.id/index.php/ICEEGLOF

Introduction

Medical waste is a by-product of diagnosis, treatment and immunisation, and part of it can injure or infect people who never entered a health facility. The World Health Organization (WHO) estimates that about 15% of health-care waste is hazardous, and that a single needle-stick from a needle used on an infected source patient carries infection risks of 30% for hepatitis B, 1.8% for hepatitis C and 0.3% for HIV [1]. In 2010, unsafe injections caused up to 33,800 new HIV infections, 1.7 million hepatitis B infections and 315,000 hepatitis C infections [1]. Burning chlorine-containing waste in open fires or low-temperature incinerators can generate dioxins and furans, which WHO describes as human carcinogens [1]. Those who carry these risks are waste workers, scavengers and nearby residents, not only the facility that produced the waste.

Indonesian data show that this chain is poorly documented. In 2025 the Ministry of Environment (KLH/BPLH) counted 146,751 health facilities (*fasyankes*), of which only 10,958 reported their medical hazardous and toxic (B3) waste through the SPEED electronic reporting system. The other 135,793 (92.53%) did not. Of 190,656.61 tonnes of potential medical B3 waste, 60,457.45 tonnes (31.71%) were reported and 130,199.16 tonnes (68.29%) were unreported or of unclear management [2]. The Ministry names three obstacles: limited understanding of the duty to report, manual manifests in waste transport, and expired pharmaceutical waste that is not fully recorded [3].

The gap shows in the field. In November 2024 police in Banjar, South Kalimantan, seized 322 boxes and bags of medical waste, part of it burned and ready to be buried on a vacant lot [4], [5]. In April 2025 medical waste mixed with household waste was found in a residential area of Karawang, West Java [6]. In June 2025 police in Pekanbaru found about four tonnes of medical B3 waste in a warehouse, about two tonnes of it buried [7]. In October 2025 hazardous medical waste was dumped on a vacant lot in Serang [8], and in May 2026 expired intravenous cannulas were found in a drainage ditch in Malang [9].

The criminal law framework has also changed. Law No. 32 of 2009 on Environmental Protection and Management (the Environmental Law) has been amended by Law No. 11 of 2020, Government Regulation in Lieu of Law No. 2 of 2022 and Law No. 6 of 2023 [10]. A criminal-law commentator reports that Law No. 6 of 2023 removed Article 102, which had made it a crime to manage B3 waste without a permit [11], and a 2026 study finds that the response to unpermitted B3 management has shifted from criminal to administrative sanctions [12]. The new Criminal Code (Law No. 1 of 2023) has applied since 2 January 2026 [13], [14], and Law No. 1 of 2026 on the Adjustment of Criminal Penalties adjusts penalties in laws outside the Code [15]. It is therefore unclear what criminal liability remains for those who mishandle medical waste.

Earlier studies cover parts of the problem. Efendi et al. apply the precautionary principle to medical waste and propose combining administrative sanctions, fines and criminal sanctions [16]. Etnneji and Rahayu analyse a Surabaya District Court decision on unpermitted B3 dumping by a company and conclude that the sanction was too light [17]. Sinaga and Berutu find that outsourcing companies that manage medical waste for private hospitals are not explicitly recognised as legal subjects in environmental criminal law [18]. The first two predate the new Criminal Code and Law No. 1 of 2026, and none of the three, judging by its abstract, draws on national reporting data. This paper adds a three-stage penal-policy analysis, national SPEED data and field incidents from 2024–2026, and simple proportionality measures.

The research questions are: (1) how criminal liability for medical waste management has been formulated after the 2020–2023 amendments, the new Criminal Code and Law No. 1 of 2026; (2) what national data and field incidents show about how that liability is applied; and (3) what the findings imply for public health and for policy. The aim is to answer these questions and to propose policy recommendations.

Literature Review

2.1 Penal policy and its three stages

Barda Nawawi Arief describes penal policy as the effort to produce, make and formulate good criminal legislation, and Sudarto as choosing the means that best meet the requirements of justice and efficiency [19]. It forms part of crime-prevention policy as a whole, which uses both penal and non-penal means [20]. Drawing on Bassiouni, Priamsari distinguishes a formulation stage (legislative), an application stage (judicial) and an execution stage (administrative) [20]. Tanjung and Adriani use the same penal and non-penal distinction for cybercrime: penal measures include criminalising specific acts, harmonising national with international law and imposing sanctions, whereas non-penal measures include prevention policies outside criminal law, public awareness, partnership with the private sector and institutional networks [21]. In his study of narcotics, Tanjung argues for integrated action that covers prevention, repression, therapy and rehabilitation and also addresses the roots of trafficking [22]. This paper uses the three stages as its analytical frame and the penal and non-penal distinction to read the responses to medical waste.

2.2 Medical waste as hazardous waste and the generator's duty

Article 59(1) of the Environmental Law requires every person who generates B3 waste to manage it [23], and medical waste from health facilities is handled within the B3 regime [2]. A 2026 circular letter of the Director General of Advanced Health cites the Health Law (Law No. 17 of 2023), the Environmental Law as last amended by Law No. 6 of 2023, Government Regulation No. 22 of 2021, Minister of Health Regulation No. 18 of 2020 and Minister of Environment and Forestry Regulation No. 6 of 2021 as its legal bases. It asks hospitals to report B3 waste electronically through SPEED at least once every six months, with full compliance targeted by 31 December 2026 [24]. WHO recommends minimising waste, favouring non-incineration treatment where feasible, and strengthening oversight and regulation [1].

2.3 Criminal liability of individuals and corporations

The new Criminal Code makes a person liable only for acts committed intentionally or negligently, and negligence is punishable only where expressly provided (Article 36) [13]. Corporations become subjects of crime (Articles 45–49 and 118–124) [13], [14], [25], and Article 187 extends the general rules of Book One to offences defined in other laws unless a law provides otherwise [26]. The Environmental Law already provides that when an environmental crime is committed by or for a business entity, prosecution and sanctions may fall on the entity and/or on the person who gave the order or led the activity (Article 116) [23]. For medical waste the difficulty is the chain of actors. The hospital generates the waste, but a contractor often transports and processes it. Sinaga and Berutu find that outsourcing companies are not explicitly recognised as legal subjects, that hospitals' contractual oversight is weak and that proving corporate fault is difficult [18].

Research Methodology

This is normative legal research with statutory, conceptual and case approaches. The primary legal materials are Law No. 32 of 2009 as amended, Law No. 18 of 2008 on Waste Management, Law No. 1 of 2023 and Law No. 1 of 2026. The secondary materials are journal articles and legal commentary, including studies by Tanjung and co-authors on the politics of lawmaking and on penal policy [21], [22], [27], [28]. Secondary empirical data come from KLH/BPLH (SPEED, 2025), a 2026 circular letter of the Ministry of Health, a 2019 press briefing of the Ministry of Health and the Indonesian Hospital Association reported by Universitas Gadjah Mada, and WHO. The cases are the publicly reported incidents between November 2024 and May 2026 that were found by purposive search, plus one earlier judgment (Langsa District Court, 2013) described in legal commentary.

The analysis is descriptive and qualitative, with three simple measures, all calculated by the authors. The reporting share is the reported amount divided by the total. The sentencing

ratio is the sentence imposed divided by the statutory maximum. The change in maximum fine is the maximum after adjustment minus the maximum before, divided by the maximum before.

The study has limits. The empirical data come from a ministry website, a circular letter, a university news page and press reports, and the incidents are allegations: no 2024–2026 report describes a conviction, and the presumption of innocence applies to those named. 'Potential' waste is an estimate, and estimates differ: a secondary source quoting the Ministry of Health gives 294 tonnes a day for 2024, or about 107,310 tonnes a year, against 190,656.61 tonnes in the 2025 SPEED estimate [29]. Statutory texts were read on Pasal.id, which shows the original text of Law No. 32 of 2009 and states that the per-article effects of the 2020–2023 amendments are not yet mapped and that no consolidated version exists [23]. It could not be confirmed whether Law No. 1 of 2026 lists the Environmental Law or Law No. 18 of 2008, so every adjusted figure in Tables 1 and 4 is the authors' inference from Article II(5). Only one sentence is available, and it comes from legal commentary rather than from the judgment itself [30].

Results and Discussion

4.1 Formulation stage: layered provisions and a shrinking criminal core

Table 1 lists the provisions that can reach mishandled medical waste. The generator's duty is in Article 59(1), and Article 103 punishes a generator that does not manage its B3 waste, originally with 1–3 years' imprisonment and a fine of IDR 1–3 billion [23]. Article 104 punishes dumping waste into environmental media without a permit, with up to 3 years and up to IDR 3 billion [23]. It is the article cited in the Banjar case and applied in a 2013 judgment [30], [31]. Article 98 punishes intentionally causing air, water or soil quality standards to be exceeded (3–10 years and IDR 3–10 billion), and 4–12 years and IDR 4–12 billion if people are injured or health is endangered [23]. The Banjar suspect was charged under it in the alternative [31]. Outside the Environmental Law, Article 40 of Law No. 18 of 2008 punishes waste managers who intentionally and unlawfully disregard standards in a way that can endanger public health (4–10 years, and 5–15 years if death or serious injury results, with a fine of IDR 100 million to 5 billion) [32]. Hukumonline treats it as applicable to a community health centre that does not manage its waste properly [30].

Table 1. Provisions that can reach mishandled medical waste

Provision	Conduct	Penalty in the statute	If Art. II(5), Law 1/2026 applies
Arts. 59(1) and 103, Environmental Law	Generator of B3 waste does not manage it	Prison 1–3 years **and** fine IDR 1–3 billion	Up to 3 years **and/or** category III (IDR 50 million); no minimum
Art. 102, Environmental Law	Managing B3 waste without the permit required by Art. 59(4)	Prison 1–3 years **and** fine IDR 1–3 billion; reported removed by Law 6/2023	Not applicable (removed)
Arts. 60 and 104, Environmental Law	Dumping waste into environmental media without a permit	Prison up to 3 years **and** fine up to IDR 3 billion	Up to 3 years **and/or** category III (IDR 50 million)
Art. 98(1)–(2), Environmental Law	Intentionally causing quality standards to be exceeded; (2) if people are injured or health is endangered	(1) 3–10 years **and** IDR 3–10 billion; (2) 4–12 years **and** IDR 4–12 billion	(1) up to 10 years **and/or** category VI (IDR 2 billion); (2) up to 12 years **and/or** category VII (IDR 5 billion); no minimum
Art. 40(1)–(2), Law 18/2008	Waste manager intentionally and unlawfully disregards standards, endangering public health; (2) if death or serious injury results	(1) 4–10 years **and** IDR 100 million–5 billion; (2) 5–15 years **and** IDR 100 million–5 billion	(1) up to 10 years **and/or** category VI (IDR 2 billion); (2) up to 15 years **and/or** category VII (IDR 5 billion); no minimum

Provision	Conduct	Penalty in the statute	If Art. II(5), Law 1/2026 applies
Art. 116, Environmental Law; Arts. 45–49 and 118–124, Criminal Code	Crime committed by or for a business entity	Prosecution of the entity and/or the person who ordered or led the act	Not examined

Note: the last column is the authors' inference from Art. II(5) of Law No. 1 of 2026, not a confirmed reading. Category III = IDR 50 million, VI = IDR 2 billion, VII = IDR 5 billion. Source: [11], [13]–[15], [23], [25], [32]–[34].

The most consequential change is the removal of Article 102, which punished managing B3 waste without the permit required by Article 59(4) with 1–3 years and IDR 1–3 billion [23]. A commentator reports that Law No. 6 of 2023 removed it to make doing business easier, so that the state can no longer hold anyone criminally liable for unpermitted B3 management [11]. A 2026 study finds that administrative sanctions have become the primary instrument and criminal sanctions the *ultimum remedium* [12]. This matters for medical waste because Article 102 was aimed at the actor in the middle of the chain, the contractor that transports, stores or processes the waste. In Pekanbaru, for instance, the company at the warehouse reportedly held only a recommendation and not a full permit after about a year of operation [7]. On the provisions reviewed, such a firm can now be reached criminally only if its conduct also meets another offence, such as dumping (Article 104), exceeding quality standards (Article 98) or breaching Article 40 of Law No. 18 of 2008. This is the authors' reading, and the per-article effect of the 2022–2023 amendments could not be checked against a consolidated text [23].

The change came through the omnibus route. Tanjung and Arminsyah argue that an opaque lawmaking process with little public participation weakens the legitimacy of the Omnibus Law, and that provisions giving the government broad authority to change regulations without strict legislative procedures put workers' and environmental rights at risk [27]. Tanjung, Syahnan and Syahputra examined Government Regulation in Lieu of Law No. 2 of 2022 itself. They concluded that it met the compelling-urgency requirement of Article 22(1) of the 1945 Constitution, but noted concerns about subjectivity and possible abuse of power in its issuance, and argued that approval by the House of Representatives should involve wider stakeholders and greater transparency [28]. Neither study addresses Article 102 or medical waste, but their concern applies. A decision to decriminalise unpermitted hazardous-waste management travelled inside a very large package, which makes its public-health consequences hard to weigh separately. The commentary describes the aim of the removal as easing business [11].

Law No. 1 of 2026 adds a second layer. According to Hukumonline it removes minimum special penalties in laws outside the Criminal Code, with exceptions for terrorism, corruption and money laundering [34]. Its Article II turns fines in those laws into fine categories (category III is IDR 50 million, VI is IDR 2 billion and VII is IDR 5 billion [33]), ties the category in paragraph (5) to the maximum prison term, from category II for up to one year to category VIII above fifteen years, and turns cumulative penalties into cumulative-alternative ones [15]. If paragraph (5) applies mechanically to the provisions in Table 1, the last column follows. The maximum fine in Articles 103 and 104 would fall from IDR 3 billion to IDR 50 million (98.33%), in Article 98(1) from IDR 10 billion to IDR 2 billion (80.00%), in Article 98(2) from IDR 12 billion to IDR 5 billion (58.33%), and in Article 40(1) of Law No. 18 of 2008 from IDR 5 billion to IDR 2 billion (60.00%). The minimum penalties of Articles 98, 103 and 40 would disappear, and a judge could impose a fine without imprisonment. This is an inference, not a finding, and it needs checking against the Attachment to Law No. 1 of 2026.

4.2 Application stage: a reporting gap and thin enforcement

Table 2 and Figure 1 show that in 2025 only 7.47% of health facilities reported their medical B3 waste through SPEED, and that the reported tonnage was 31.71% of the potential

waste, so that 68.29% was unaccounted for [2]. The share of waste reported is higher than the share of facilities reporting, which suggests that the facilities that do report are the larger generators: about 5.52 tonnes per reporting facility, against an implied 0.96 tonnes per non-reporting facility (authors' calculation). The sources do not say so, and the point should be tested with facility-level data.

Table 2. Medical waste reporting and treatment capacity

Indicator	Value	Source
Health facilities (*fasyankes*), 2025	146,751	[2]
Reporting medical B3 waste via SPEED	10,958 (7.47%)	[2]
Not reporting via SPEED	135,793 (92.53%)	[2]
Potential medical B3 waste, 2025	190,656.61 t	[2]
Reported via SPEED, Jan.–Dec. 2025	60,457.45 t (31.71%)	[2]
Not reported or unclear management	130,199.16 t (68.29%)	[2]
Hospitals and community health centres, 2019	2,820 and 9,884	[35]
Medical waste generated, 2019	about 290 t per day	[35]
Licensed treatment services (capacity)	10 (about 170 t per day)	[35]
Hospital-owned incinerators (capacity)	87 (about 60 t per day)	[35]

Note: percentages calculated by the authors. The 2019 source reports total capacity of about 220 t per day and an unmanaged gap of about 74 t per day, but its components (170 + 60) sum to 230 t per day, so the gap is approximate. The 2019 and 2025 figures use different methods and are not comparable.

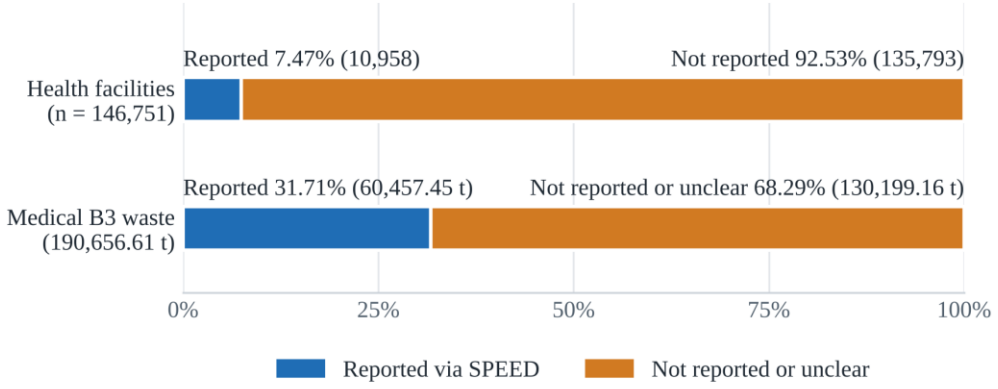


Figure 1. Share of health facilities and of medical B3 waste reported through SPEED, 2025. Source: [2]; percentages calculated by the authors.

The gap is not only non-compliance. A 2019 briefing by the Ministry of Health and the Indonesian Hospital Association reported that 2,820 hospitals and 9,884 community health centres generated about 290 tonnes of medical waste a day, that there were only 10 licensed treatment services (about 170 tonnes a day) and 87 hospital incinerators (about 60 tonnes a day), and that the licensed processors were concentrated on Java [35]. In 2026 the Ministry of Health's Director of Environmental Health still cited limited processing capacity and uneven services across regions [3]. A facility that cannot reach a licensed processor faces a duty it may not be able to meet, which is a reason for criminal sanctions to follow fault rather than status.

Table 3 summarises five incidents reported since November 2024 and one earlier judgment. Four patterns emerge. First, the reported response is investigation, summons or warning letters, and no report describes a conviction. Second, in four of the five incidents no suspect is named. In Banjar the named suspect is an employee of a company handling the waste, and the reports do not say whether the company or any source hospital is under investigation [31]. Third, the source of the waste is often unidentified (Serang, Malang) or only alleged (Karawang, where two private hospitals and a contractor whose landfill permit had expired are

suspected) [6]. Fourth, the waste has been burned, buried or mixed with household waste, and WHO links open burning to dioxin emissions [1].

Table 3. Reported medical waste incidents and judgment

Incident	Facts reported	Legal response reported
Banjar, South Kalimantan (Nov. 2024)	322 boxes and bags of medical waste on a vacant lot and in a house, including syringes, infusion bottles and blood bags; part burned and ready to bury; source hospitals in South and Central Kalimantan	Employee of a waste company detained as suspect; charged under Art. 104 and/or Art. 98(1); no report on the company or hospitals [4], [5], [31]
Karawang, West Java (Apr. 2025)	Medical waste (syringes, bottles, infusion sets) mixed with household waste in a residential area, about three small trucks; two private hospitals and a contractor suspected	Warning letters from an environmental NGO citing Arts. 103, 104 and 109; agency summoned both hospitals; no criminal case reported [6]
Pekanbaru, Riau (Jun. 2025)	About 4 t of medical B3 waste in a warehouse, about 2 t buried and 2 t stored; company held a recommendation, not a full permit	Police investigation; no suspect named [7]
Serang, Banten (Oct. 2025)	Hazardous medical waste dumped on a vacant lot near a cemetery from two trucks; volume and source unknown	Police investigation; no suspect named [8]
Malang, East Java (May 2026)	Expired intravenous cannulas in sealed packaging in a drainage ditch; source unknown	Mayor and police to pursue charges; city regulation cited; no suspect identified [9]
Langsa District Court (2013)	Hospital's handling of medical waste	Art. 104 applied; 6 months' prison and fine of IDR 1 million [30]

Note: reports describe allegations unless stated; no 2024–2026 report describes a conviction. Sources as cited in the table.

The supervision gap is not new. In 2016, after used vaccine packaging was found in a fake-vaccine case, the secretary of the Bekasi Health Office said that private hospitals destroy medical waste through agreements with third-party contractors without involving the local government, and called for revising the procedure [36]. That is the same generator-to-contractor chain that the Karawang case exposes.

The only sentence found is a 2013 judgment of the Langsa District Court (No. 163/Pid.B/2013/PN-Lgs), which applied Article 104 to a hospital's handling of medical waste and imposed six months' imprisonment and a fine of IDR 1 million [30]. Against the maximum of 36 months and IDR 3 billion, that is 16.67% of the prison term and 0.03% of the fine (Table 4). If the illustrative adjusted maximum of IDR 50 million applied, the same fine would be 2.00% of the maximum. A single old judgment cannot show a pattern, but Etnneji and Rahayu reach a similar view of a Surabaya decision on corporate B3 dumping, which they consider too light [17].

Table 4. Proportionality measures

Measure	Calculation	Result (%)
Sentence imposed (Langsa, 2013) against maximum prison term	6 months : 36 months	16.67
Fine imposed against maximum fine of Art. 104	IDR 1 million : IDR 3,000 million	0.03
Fine imposed against illustrative adjusted maximum	IDR 1 million : IDR 50 million	2.00
Change in maximum fine, Arts. 103 and 104	IDR 3,000 million to IDR 50 million	−98.33
Change in maximum fine, Art. 98(1)	IDR 10,000 million to IDR 2,000 million	−80.00
Change in maximum fine, Art. 98(2)	IDR 12,000 million to IDR 5,000 million	−58.33
Change in maximum fine, Art. 40(1), Law 18/2008	IDR 5,000 million to IDR 2,000 million	−60.00
Change in maximum fine, Art. 40(2), Law 18/2008	IDR 5,000 million to IDR 5,000 million	0.00

Note: the third row and the rows on changes in maximum fines depend on the unconfirmed application of Art. II(5) of Law No. 1 of 2026 and are the authors' inference. Source: [15], [23], [30], [32], [33]; calculations by the authors.

4.3 Execution stage and non-penal measures

Most of the visible response is non-penal and administrative. The 2026 circular requires hospitals to report B3 waste electronically at least every six months, with full compliance targeted by 31 December 2026 [24], and KLH/BPLH held technical guidance on SPEED reporting in August 2026 [2]. KLH/BPLH itself names manual manifests and unrecorded expired pharmaceutical waste as gaps [3]. These measures resemble the non-penal measures that Tanjung and Adriani describe (prevention, awareness, partnership and institutional networks) [21], and the integrated approach of prevention together with repression that Tanjung argues for in narcotics policy [22]. They address the data gap, but the sources reviewed report no public record of the administrative sanctions imposed on facilities that fail to report, and the capacity problem outside Java remains. Without both, the reporting duty may stay a paper obligation. The Karawang case shows the limit of non-penal tools: warning letters and a summons were the only reported responses to waste mixed with household waste in a residential area [6].

4.4 Implications for public health and policy

First, liability should follow the chain from generator to contractor. Article 116 and the corporate provisions of the new Criminal Code allow prosecution of the entity and of the person who ordered or led the act [13], [23]. With Article 102 gone and outsourcing firms not clearly recognised as legal subjects [18], the contractor is the weak link. A narrow offence for unpermitted management of medical waste, or an express duty on hospitals to verify and record their contractor's permit and manifest, would close that gap. Second, the criminal sanction should be kept for conduct that creates exposure, such as dumping, burning and burying near people, as in Karawang, while facilities that lack access to treatment are first given capacity and guidance. Third, penalty ceilings and sentencing should be reviewed together: the one sentence found was 0.03% of the maximum fine, and the adjusted ceiling, if it applies, is 98.33% lower. Fourth, SPEED reporting should be linked to electronic manifests, and administrative sanctions and case outcomes should be published, so that the effect of the policy can be evaluated. Fifth, the precautionary principle [16] and WHO's preference for non-incineration treatment [1] point to investment in treatment capacity outside Java.

Conclusion

First, at the formulation stage, criminal liability for medical waste now rests on Articles 103, 104 and 98 of the Environmental Law and on Article 40 of Law No. 18 of 2008. Unpermitted B3 management, the offence aimed at contractors, is reported to have been removed (Article 102), and if Article II(5) of Law No. 1 of 2026 applies, the maximum fine in Articles 103 and 104 falls by 98.33%, from IDR 3 billion to IDR 50 million.

Second, at the application stage, 92.53% of health facilities and 68.29% of potential medical B3 waste fell outside SPEED reporting in 2025. None of the five incidents from 2024–2026 reports a conviction, a suspect is named in only one, and the one sentence found equals 16.67% of the maximum prison term and 0.03% of the maximum fine. At the execution stage, the response is mainly reporting and guidance, which is necessary but does not by itself protect people near dumped waste.

Third, as recommendations, the authors propose (1) closing the contractor gap through a narrow offence or an express verification duty for hospitals; (2) reserving criminal sanctions for conduct that exposes people to harm and supporting facilities that lack treatment access; (3) reviewing ceilings and sentencing together; (4) linking SPEED to electronic manifests and publishing sanction and case data; and (5) investing in treatment capacity outside Java.

Further research should read the Attachment to Law No. 1 of 2026 and the consolidated Environmental Law to confirm the adjusted penalties, obtain full judgments from the Supreme Court decision directory, and use facility-level SPEED data to test whether larger generators account for most of the reported tonnage.

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