

Legal Construction of Corporate Liability for Occupational Diseases: The Principles of Causality, Burden of Proof, and Effectiveness of Remedies in the Indonesian Legal System

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ABSTRACT

This study examines the legal construction of corporate liability in Indonesia for chronic occupational diseases with long latency periods, particularly those related to exposure to industrial chemicals. The analysis shows that the Indonesian legal system affirms corporate liability not only in civil law through compensation mechanisms, but also in criminal law with the recognition of corporations as legal entities in the new Criminal Code. The principle of causality and the complex burden of proof are balanced by the application of strict liability, reversal of the burden of proof, and normative corporate obligations as stipulated in the Civil Code, the Manpower Act, the Health Act, the Environmental Act, and Social Security Agency regulations. The effectiveness of legal remedies is reflected in the combination of social security, civil lawsuits, and administrative sanctions that not only provide adequate compensation for victims but also create a deterrent effect for companies. The latest regulations strengthen the position of workers through OSH standards and more stringent legal instruments, bringing the Indonesian legal system closer to the goal of substantive justice in occupational health protection.

INTRODUCTION

Global industrialization has brought about economic progress alongside complex health risks for the workforce. Workers in various sectors such as manufacturing, mining, agriculture, and the chemical industry are frequently exposed to a variety of chemicals inherent in production processes. This exposure is not always acute or immediately visible; it can be chronic, accumulating slowly in the body over many years before clinical manifestations appear. The quality of human resources and worker performance are heavily influenced by adequate health and safety conditions (Darmawan et al., 2020). Chronic diseases caused by such exposure such as cancer from asbestos or benzene, neurological disorders from organic solvents, or chronic obstructive pulmonary disease (COPD) from industrial dust impose a heavy long-term health burden on both individuals and society. Decades of development in toxicology and occupational epidemiology have clarified the causal relationship between specific exposures

and certain diseases. Seminal research, such as that conducted by the World Health Organization (WHO) through the International Agency for Research on Cancer (IARC), systematically classifies carcinogenic substances based on the strength of scientific evidence (Goldsmith, 2022). These findings place a significant moral and legal responsibility on entities that utilize hazardous substances in their operations.

The industrial relationship between workers and employers is legally complex, involving dimensions of power, economic dependence, and special obligations inherent to the party in control of the workplace. Employers possess authority over process design, the selection of raw materials, the implementation of control technologies, and the provision of personal protective equipment (Ab Naafs, 2018). Consequently, the laws in many countries have developed the doctrine of an employer's duty to ensure occupational health and safety. This duty is proactive, not reactive. Its philosophical foundation is that workers trade their labor and time, not their health and lives.

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Regarding chemical exposure, this duty translates into the obligation to recognize hazards, assess risks, and implement a hierarchy of controls to eliminate or minimize exposure to levels considered safe.

The concept of corporate liability in modern law has evolved beyond mere civil liability based on contracts or individual negligence (Bedoya-Marrugo & Vega-Gómez, 2023). As a legal entity, a corporation is considered to have the capacity to act and make decisions, and thus, can be held directly accountable for its actions or omissions. Human resource management based on total quality management emphasizes the importance of clear standards in every aspect of a company's operations, including OHS (Arifin et al., 2022). In the realm of occupational health, this liability includes the failure to meet safety standards established by law. These standards are often manifested in the form of Threshold Limit Values (TLVs) for the concentration of chemicals in the workplace air (Costa et al., 2017). However, setting standards alone is insufficient. Critical legal questions arise when diseases emerge after years of exposure, even when a company claims to have complied with the standards applicable at that time. This has sparked discourse regarding corporate responsibility for known risks (the duty to warn), the obligation to continuously update knowledge about hazards, and the potential for strict liability for inherently dangerous activities.

This situation is further complicated by the characteristics of chronic occupational diseases, which feature long latency periods. The time span between initial exposure and disease diagnosis can reach decades (Orazulike, 2016). This characteristic creates three interrelated legal problems: first, the difficulty of proving a causal link between exposure at a specific workplace and the subsequent disease; second, the issue of the statute of limitations (*prescription*) for a worker's right to sue, given that the disease is only discovered years after the violation occurred; and third, the challenge of identifying the liable party, especially if the company where the worker was exposed has closed, changed its name, or been acquired. These three issues are often major barriers for workers seeking compensation and justice, demanding a responsive and adaptive legal regime.

Therefore, this literature review aims to examine the legal construction of corporate liability regarding industrial chemical exposure causing chronic diseases. The study focuses on how legal systems, particularly in Indonesia,

which is undergoing rapid industrialization, regulate, interpret, and enforce such liability. The analysis involves exploring principles of civil law (particularly tort and product liability), administrative law (OHS standards and their sanctions), and the possibility of applying corporate criminal liability. By mapping the existing legal framework and identifying its gaps and challenges, this research is expected to contribute to the development of policies and practices that better protect worker health in the long term.

The first issue that arises is the scientific and legal difficulty in proving a causal link between specific exposures and a worker's chronic disease. Diseases like cancer or chronic lung disease are often multifactorial, potentially caused by a combination of genetic factors, lifestyle, and environmental exposures outside of work. To establish an adequate causal relationship in legal proceedings, evidence is required to show that workplace exposure substantially increased the risk of the disease. The distribution of the six main factors that increase organizational effectiveness demonstrates that a robust management system, including OHS, is a key determinant of a company's success (Darmawan, 2024). This proof requires expert testimony from toxicologists, epidemiologists, and occupational physicians who can reconstruct a worker's exposure history and connect it to the disease's pathogenesis. This process is expensive, highly technical, and often unaffordable for individual workers. Furthermore, the absence of adequate exposure monitoring records from companies makes such reconstruction extremely difficult. In many cases, diseases are diagnosed long after the exposure has ceased, and data concerning past workplace environmental conditions may have been lost or may never have existed at all.

Second, there is a tension between compliance with administrative standards and substantive legal liability. A company may be declared to have administratively complied with the applicable Threshold Limit Values (TLVs) based on periodic measurement results. However, compliance with TLVs does not automatically exempt a company from legal liability if workers still contract diseases. TLVs are often established based on technical-economic considerations and may not fully protect all individuals, especially those with genetic vulnerabilities or those exposed to a combination of chemical substances. Moreover, scientific knowledge regarding the hazards of a

substance continues to evolve. A substance considered safe a decade ago might be classified as a carcinogen today. A difficult legal question is whether a company has a continuing duty to follow the latest scientific developments and update its control measures, even if official regulatory standards have not yet been revised. Failure to do so could be considered negligence.

Third, existing compensation mechanisms, particularly through social security programs such as Social Security Agency for Employment, are often inadequate for chronic diseases with long latency periods. Traditional insurance schemes are usually designed for workplace accidents with a clear time of occurrence or occupational diseases where the causal relationship is more direct and recognized in disease lists. The design and implementation of cross-functional training to improve team collaboration demonstrates that a structured approach is needed to address complex issues such as occupational diseases (Fared & Darmawan, 2021). For chronic diseases like asbestos-related cancer, the process of recognition as an occupational disease can be highly convoluted, requiring complex administrative and medical proof. Furthermore, the compensation provided may not be commensurate with long-term medical costs, permanent loss of work capacity, and the suffering experienced. Civil litigation outside of insurance schemes, while potentially offering greater compensation, faces all the aforementioned obstacles of proof and litigation costs, making it a difficult option for most workers to access.

The importance of this review is driven by Indonesia's demographic and economic realities. As a nation with a continuously growing industrial sector and a massive workforce, the potential for exposure to hazardous chemicals in the workplace is vast. Many industries, including textiles, leather tanning, electronics manufacturing, and mineral processing, utilize chemicals classified as carcinogens or chronic toxins. Without a strong and enforceable legal framework of liability, there will be an externalization of health costs from companies to workers, their families, and the public health system. The socioeconomic costs of these chronic occupational diseases are immense, encompassing loss of productivity, financial burdens on hospitals, and poverty resulting from the loss of primary breadwinners. Critical academic study can provide a foundation for policies that encourage the internalization of

these costs by companies, thereby creating economic incentives for primary prevention.

Advances in science and technology open both new opportunities and challenges. Biomonitoring and genetics methods now allow for the early detection of biological effects of chemical exposure, even before clinical symptoms appear. Progress in exposure modelling allows for more accurate historical reconstruction. These developments have significant legal implications. They can strengthen evidentiary tools for workers but also raise new ethical and legal questions about a company's duty to conduct proactive health surveillance and preventive actions based on these new findings. Studying how legal systems can accommodate and leverage these scientific advances is an essential step to ensuring the law remains relevant and effective in protecting workers.

At the global level, there is a growing trend of awareness and demands for environmental and health justice. Major cases, such as lawsuits against asbestos companies in various countries, have shown that corporations can be held legally and financially accountable for the long-term health impacts of their products and operations. This trend is beginning to influence global supply chains, with multinational corporations implementing stricter occupational health and safety standards for their suppliers. Indonesia, as part of the global supply chain, needs a strong and equivalent domestic legal system to effectively protect its workers and ensure that such high standards are genuinely applied. Examining the construction and effectiveness of corporate liability law becomes vital to positioning Indonesia in the global conversation regarding ethical and sustainable business practices.

This research aims to analyze the legal construction of corporate liability for workers' chronic diseases caused by industrial chemical exposure. The first objective is to examine the regulation of such liability in civil law (through the doctrine of tort and product liability) and corporate criminal law. The second objective is to study the application of principles of causal relationship and the allocation of the burden of proof in legal proceedings, taking into account the characteristics of long-latency diseases and scientific advancements. The third objective is to evaluate the effectiveness of various remedial mechanisms available including the employment social security program, civil lawsuits for damages, and OHS administrative sanctions in

restoring victim losses and preventing similar violations. Theoretically, this study seeks to contribute to the development of corporate liability doctrines related to occupational health in developing nations. Practically, this synthesis is expected to serve as a basis for recommendations for policymakers, legal practitioners, and labor unions to strengthen the system of protection and law enforcement for workers vulnerable to long-term health risks.

RESEARCH METHOD

This research is a normative legal literature study with a qualitative approach that focuses on document analysis. The research is designed to examine, synthesize, and interpret the legal framework governing corporate liability regarding occupational health, specifically for chronic diseases resulting from chemical exposure. The primary data sources consist of primary and secondary legal materials. Primary legal materials include relevant Indonesian legislation, such as the Labor Law, the Occupational Health and Safety (OHS) Law, the Limited Liability Companies Law, the Environmental Law, and their implementing regulations that govern Threshold Limit Values (TLVs) for chemical substances and oversight procedures. Secondary legal materials include monographs, reputable international peer-reviewed journal articles, research reports from institutions such as the International Labour Organization (ILO), and relevant court rulings (if available and accessible). Data collection was conducted through systematic searches in academic databases, legal repositories, and digital libraries.

The data analysis technique used is qualitative content analysis with a legal interpretive approach. This method was chosen for its ability to identify normative patterns, extract meaning from regulatory texts, and build a deep understanding of a legal regime. The analysis process follows the stages described by methodology experts such as Mayring (2014) and Schreier (2012).

The validity and reliability of the synthesis in this research are maintained through several key strategies. First, source triangulation was performed by comparing interpretations from various types of documents, such as regulations, academic literature, and court rulings. Second, the analytical process was carried out explicitly and is documented, allowing for an audit trail of the logic path employed. Furthermore, this research applies

legal interpretation methods, including grammatical, systematic, and teleological interpretation, to understand the intent and purpose of the norms being examined. Through this systematic and critical methodological approach, the research aims to produce a comprehensive and analytical review of the strengths and weaknesses of the existing legal framework, while providing a solid foundation for future policy development recommendations regarding the protection of workers from long-term health risks.

RESULT AND DISCUSSION

The Legal Framework for Corporate Liability for Chronic Illnesses Resulting from Exposure to Industrial Chemicals

Corporate liability for occupational diseases reflects the integration of civil and criminal regimes within Indonesian law. The legal construction of corporate liability for workers' chronic diseases resulting from chemical exposure in Indonesia is built upon two major foundations: civil law, which focuses on loss recovery, and criminal law, which aims to impose sanctions and deter future offenses (Muthaqin, 2023). In civil law, the core doctrine applied is the tort of "unlawful acts" as stipulated in Article 1365 of the Indonesian Civil Code. This article establishes that any unlawful act that causes damage to another party obligates the perpetrator to provide compensation. Legal protection for patients against medical malpractice is also relevant in the context of corporate liability for worker health, as both concern the fulfillment of the right to health (Lethy et al., 2023). When a company, as an employer, fails to fulfill its legal obligation to provide a safe and healthy workplace, that failure can be categorized as an unlawful act. This failure may be concrete, such as a lack of adequate ventilation for chemical vapors, failure to provide appropriate personal protective equipment, or failure to perform routine monitoring of hazardous substance concentrations in the air. If such failure can be linked to the emergence of chronic diseases like cancer or pulmonary fibrosis in workers, the elements of loss and causal relationship are satisfied. A worker diagnosed with an occupational disease based on a doctor's certificate is entitled to work accident benefits even after the employment relationship has ended (Wijayanti et al., 2021). Claims for damages can include medical expenses, lost wages, and compensation for mental suffering and diminished quality of life. Through this

construction, the law affirms the company's obligation to guarantee workplace safety and restore workers' losses.

The principle of strict liability in environmental law expands the scope of protection for workers exposed to hazardous substances. Furthermore, the company's civil liability is strengthened by Law Number 32 of 2009 concerning Environmental Protection and Management. This law introduces the principle of *strict liability* in Article 88. This principle is a significant breakthrough because it exempts the victim from the burden of proving the element of "fault" on the part of the company. It is sufficient to prove that the company's business activities involving hazardous and toxic substances (B3) have caused environmental pollution or damage, which subsequently resulted in harm to human health. Patient satisfaction with the quality of health services at health center shows that aspects of service quality and safety heavily influence trust levels, including in occupational health services (Darmawan et al., 2022). Regarding chronic occupational diseases, this principle is highly relevant. A worker exposed to arsenic from industrial waste who suffers from skin cancer does not need to prove that the company was negligent in managing its waste; it is enough to show that the arsenic exposure originated from the company's activities and that the disease was caused by the arsenic (Wahyudi & Latumahina, 2023). Although the application of *strict liability* is more common in environmental pollution cases impacting the wider public, this principle can be analogized to cases of exposure within a factory as a polluted work environment, strengthening the legal position of workers. By applying the *strict liability* analogy, workers obtain stronger legal protection against occupational diseases.

Corporate criminal liability in Indonesian law shows an important shift toward institutional accountability. In criminal law, the construction of corporate liability has undergone significant development. Law Number 32 of 2009 concerning Environmental Protection and Management explicitly recognizes corporations as subjects of environmental crime (Albariansyah et al., 2022). Article 116 of the law states that environmental crimes can be committed by, for, or on behalf of a corporation. Challenges and changes in national health development from the perspectives of law, service access, and infectious disease management require serious attention from all parties (Harianto et al., 2024). If an industrial activity causes

pollution that results in illness, the corporation can be subject to criminal sanctions in the form of fines, which can be increased by one-third. More firmly, Law Number 1 of 2023 concerning the Criminal Code (the "New KUHP") in Articles 46 through 51 specifically regulates corporate criminal liability. The New KUHP states that a corporation can be held criminally liable if the criminal act is committed by management, persons based on employment relationships, or other individuals acting on behalf of the corporation. Corporations can be subject to primary penalties in the form of fines and additional penalties such as license revocation or permanent closure of the company. This construction is crucial for chronic occupational diseases as it directly targets the entity that possesses the resources and authority to alter hazardous work systems. Criminal law affirms that corporations cannot hide from responsibility for the health impacts on their workers.

Employment regulations establish the specification of obligations that serve as the basis for assessing whether a legal violation has occurred. Law Number 13 of 2003 concerning Manpower, as amended, affirms the employer's obligation to ensure occupational safety and health. Article 86 paragraph (1) states that every worker/laborer has the right to protection for their occupational safety and health. Studies on the falsification of health certificates from the perspective of criminal law and professional ethics indicate that patient protection requires firm law enforcement against various forms of violation (Hartika et al., 2023). Occupational Health and Safety (OHS) encompasses all efforts to protect workers by controlling the work environment and applying principles of sanitation and hygiene, aiming to create a safe and healthy workplace while minimizing the risk of accidents and diseases (Iraningtyas et al., 2022). The implementation of these obligations is further regulated in detail through Government and Ministerial Regulations. Minister of Manpower Regulation Number 5 of 2018 concerning Occupational Safety and Health in the Work Environment, for example, requires employers to identify hazards, assess risks, and implement risk controls, including those related to chemical hazards. This regulation also mandates the establishment of Threshold Limit Values (TLVs) for chemical substances in the workplace. Failure to meet these specific administrative obligations is not merely an administrative violation leading to minor sanctions (Listiyani & Nopliardy, 2022). In

civil or criminal lawsuits, compliance with technical regulations serves as evidence of the expected "standard of care." Non-compliance automatically becomes strong evidence of negligence or a breach of legal duty, facilitating the proof of the "unlawful act" element under Article 1365 of the Civil Code or the "fault" element in criminal law. Thus, OHS regulations function as a legal benchmark that strengthens the worker's position in disputes.

The Health Law adds a criminal dimension to the protection of workers from exposure to hazardous substances. Law Number 36 of 2009 concerning Health also provides an additional perspective. This law guarantees everyone's right to health, including health in the work environment. Article 164 of the Health Law states that everyone is obligated to respect the rights of others in efforts to obtain a healthy environment. Patient satisfaction based on service quality and the location of health facilities shows that accessibility and service quality are key determinants of public trust (Mardikaningsih, 2022). Furthermore, Article 190 paragraph (1) threatens imprisonment for anyone who intentionally commits an act that results in risks to health. Although this article is more general, its application to industrial chemical exposure cases is possible. If a company is known to have intentionally concealed information about the hazards of a chemical substance, or intentionally failed to take control measures despite being aware of the risks, then the element of intent (*dolus*) can be satisfied. The criminal law construction of the Health Law complements the Environmental Law and the New Criminal Code, creating a network of criminal norms that can ensnare companies from various angles: as environmental polluters, as perpetrators of general criminal acts endangering health, and as corporate subjects that can be punished (Malau & Syahrin, 2020). This network of criminal norms ensures that companies can be prosecuted from health, environmental, and corporate perspectives.

Social security schemes add a layer of protection for workers beyond civil litigation mechanisms. The social security system via Law Number 24 of 2011 concerning the Social Security Administering Body and Government Regulation Number 44 of 2015 provides a different type of protective layer. The Work Accident Security and Death Security schemes managed by Social Security Agency for Employment aim to provide rapid compensation to workers who experience

work accidents or occupational diseases, including chronic illnesses. The legal rights of patients, including those who are underprivileged, must be guaranteed protection in every health service provided (Noor et al., 2023). This compensation is "no-fault," meaning it is provided without the need to prove the company's negligence. However, according to the law, accepting compensation from Social Security Agency does not extinguish the company's civil liability if negligence is proven. Article 20 paragraph (2) of Law Number 3 of 1992 concerning Workers' Social Security (the previous basis) states that accepting compensation does not reduce a worker's right to sue an employer based on applicable laws and regulations (Wahyudi & Latumahina, 2023). Thus, legal construction creates two parallel remedial paths: the rapid social administrative path through Social Security Agency, and the civil (or criminal) litigation path that demands full corporate accountability for its faults. These two remedial paths ensure that workers obtain immediate compensation while maintaining the space to demand corporate accountability.

Coherence between legal regimes remains the primary challenge in the construction of corporate liability in Indonesia. The challenge in this legal construction lies in its coherence and implementation. Although corporate liability is normatively regulated in various laws, there is often overlapping and ambiguity regarding which law constitutes the *lex specialis*. Regulations on medical product advertising and patient protection as health service consumers also require attention within a broader legal framework (Sahidu et al., 2023). However, the legal framework for corporate criminal liability in Indonesia is still relatively new and untested, facing various enforcement challenges, including limited resources and the capacity of law enforcement agencies (Sari, 2023). For example, when a worker suffers from cancer due to benzene exposure, the potential legal bases that can be utilized include: Article 1365 of the Civil Code (unlawful acts), the Environmental Law (strict liability), the Manpower Law (breach of OHS obligations), the Health Law (endangering health), and the New Criminal Code (corporate crime). Workers and their legal counsel must strategically choose the legal basis that is strongest and most appropriate for the evidence they possess. On the other hand, courts may face difficulties in integrating these various legal regimes into a single, comprehensive

ruling. Inter-agency coordination is also an issue; reports of OHS violations to the manpower office are not necessarily forwarded as criminal reports to the police, so the potential for corporate criminal sanctions is often not realized (Dawali et al., 2022). Regulatory fragmentation and weak institutional coordination make the enforcement of corporate liability less than optimal.

The new Criminal Code (KUHP Baru) introduces an important breakthrough in the regulation of corporate criminal liability in Indonesia. Notwithstanding the aforementioned complexities, the recent developments regarding corporate criminal liability in the new Criminal Code mark a significant step forward. The recognition of corporations as full criminal subjects, with sanctions capable of affecting their very existence (such as license revocation), carries the potential for a deterrent effect far greater than mere administrative fines or individual civil lawsuits. The legal rights of persons with disabilities in accessing healthcare services demonstrate that clear and accessible information is a vital element of an inclusive health system (Subiakso et al., 2023). These sanctions threaten the reputation and business continuity of a corporation, and it is hoped that they will encourage more serious investment in the prevention of long-term health risks (Puspitasari et al., 2022). However, their effectiveness can only be measured after consistent application by law enforcement and the judiciary in concrete cases of chronic occupational diseases. The deterrent effect of corporate criminal liability only becomes tangible when law enforcement is consistent in cases of occupational disease.

The overall legal framework demonstrates a multidimensional approach to corporate liability for occupational diseases. Taking into account the entire exposition above, it can be concluded that the legal construction of corporate liability for workers' chronic diseases resulting from industrial chemical exposure in Indonesia is multidimensional and relatively comprehensive. This construction is built upon the principle of civil compensation centered on the victim (Article 1365 of the Civil Code, *strict liability* under the Environmental Law), reinforced by specific normative and administrative obligations within labor and health laws, and crowned by the recognition of corporate criminal liability in the Environmental Law and the new Criminal Code. This framework places a heavy legal burden on companies to proactively manage chemical risks in

the workplace. However, the strength of this normative construction still needs to be tested and refined through consistent application, good inter-agency coordination, and the capacity building of law enforcement and the judiciary in handling the technical and medical complexities of chronic occupational disease cases. The effectiveness of this framework depends on the consistency of application and the coordination of law enforcement agencies.

Proof and Causal Link in Legal Claims for Work-Related Chronic Illnesses

Proving civil liability in cases of occupational disease faces significant challenges regarding causality. Proving fault in civil terms is difficult because it requires first establishing a cause-and-effect relationship (causality) between the actions, fault, and the victim's loss (Sodikin, 2023). The application of causal principles and the burden of proof in legal disputes involving chronic occupational diseases with long latency periods is one of the most complex aspects of corporate liability law. Under conventional civil law based on Article 1365 of the Indonesian Civil Code, the burden of proof lies entirely with the plaintiff – in this case, the worker or their heirs. They must cumulatively prove three things: the existence of an unlawful act (corporate negligence), the existence of a loss (the chronic disease), and a direct and uninterrupted causal link between the two (Chamdani et al., 2022). Social support plays an important role in reducing anxiety, for example in pregnant women before childbirth, showing that psychological aspects must also be considered in health recovery (Issalillah & Khayru, 2022). For diseases with long latency, such as asbestos-related cancer or heavy metal poisoning, proving this causal link becomes an extraordinary scientific and forensic challenge. Workers must demonstrate that specific workplace exposure, rather than other risk factors such as smoking, diet, or environmental exposure outside of work, is the primary or substantial contributor to their illness. This requires accurate reconstruction of exposure history, which is often impossible due to the absence of past workplace environmental monitoring records. The lack of exposure records makes proving causality in long-latency cases nearly impossible.

The *strict liability* principle in the Environmental Law alleviates the burden of proof for workers in cases of occupational disease. Law Number 32 of 2009 concerning Environmental

Protection and Management introduces an approach that significantly lightens this burden through the principle of *strict liability* in Article 88. Although the law is more directly aimed at environmental pollution affecting the broader public, this principle has strong resonance with occupational health. Factors such as advanced age and stress determinants also need attention in public health policies (Issalillah & Aisyah, 2022). The essence is a paradigm shift from proving fault to proving the existence of high-risk activities and damages. Workers only need to prove that the company operates a business using hazardous and toxic substances (B3) and that the worker suffers from a disease scientifically known to be caused by such substances. The company then bears the burden of proving that it has taken all possible steps to prevent exposure or that the disease was caused entirely by other factors (Listiyani & Nopliardy, 2022). This principle acknowledges the information and resource imbalance between workers and companies, as well as the inherently dangerous nature of certain activities. This paradigm strengthens the worker's position by shifting the burden of proof onto the company.

The *strict liability* principle influences evidentiary practices even when rarely applied directly to employment cases. In judicial practice, although the *strict liability* principle from the Environmental Law is not often used directly for individual employment relationships, it influences how judges weigh evidence and allocate the burden of proof. Judges may apply the doctrine of *res ipsa loquitur* (the facts speak for themselves) or various forms of reversing the burden of proof as a matter of procedural justice. Parameters for mineral water safe for health show that environmental quality standards are essential to prevent health impacts (Issalillah et al., 2022). For example, if it is proven that a company has no exposure monitoring system or provides no adequate personal protective equipment despite using hazardous chemicals, this systemic negligence can create a presumption that the emerging disease is linked to that exposure. The burden then shifts to the company to rebut that presumption with strong evidence, such as the worker's personal medical records showing congenital conditions or a more dominant history of other exposures (Listiyani & Nopliardy, 2022). This approach balances the positions of workers and companies through presumption and reversal mechanisms.

Administrative obligations in OHS regulations

can function as tools to assist in proving causality. Legislative regulations in the employment sector have created obligations that, if breached, can indirectly facilitate the proof of a causal link. Ministry of Manpower Regulation Number 5 of 2018 concerning Occupational Safety and Health in the Work Environment requires companies to have comprehensive OHS programs, including chemical hazard identification, risk assessment, technical and administrative controls, and worker health monitoring. Patient satisfaction with public health service quality shows that complete and integrated information is key to public trust (Khayru & Issalillah, 2022). Non-compliance with these specific administrative obligations, such as never measuring silica dust concentrations in the workplace, can serve as evidence that the company was unaware of the risks faced by workers. This ignorance itself constitutes negligence. In legal proceedings, the plaintiff can argue that because the company failed to monitor, no data exists to deny the link between exposure and the disease (Handayani, 2022). In other words, the company's failure to document becomes evidence that favors the worker's position. Failure to document ultimately strengthens the worker's position in proving a causal link.

The standard of proof in corporate criminal cases demands more than just a factual link; it requires the element of fault. For corporate criminal cases under Law Number 1 of 2023 concerning the Criminal Code (the "New KUHP") or the Environmental Law, the standard for proving a causal link is higher because it must satisfy the element of fault (*dolus* or *culpa*) beyond a mere factual relationship. The public prosecutor must prove that the company, through its organs or persons acting on its behalf, did or failed to do something with intent or negligence that resulted in the disease. Improving access to health services through telemedicine shows the importance of innovation in reaching society across various regions (Khayru & Issalillah, 2022). Proving the causal link here requires very solid expert testimony to demonstrate that the disease would not have occurred, or was highly unlikely to have occurred, without the workplace exposure. Epidemiologists can provide evidence of a significant increase in relative risk among workers at that company compared to the general population. Toxicologists can explain the biological mechanism of how specific chemicals cause the disease (Mashudi & Basid, 2024). Although difficult, this burden can be met if

company health data exists showing a trend of similar diseases among exposed workers, or if there is evidence that the company intentionally concealed information about the hazards of the chemicals used. Proving corporate criminal liability depends on the strength of expert evidence and consistent health data.

Social Security Agency for Employment provides an administrative path of proof that is simpler for workers. The social security system via Social Security Agency for Employment offers a different and more streamlined path of proof. The process for recognizing an occupational disease by Social Security Agency is guided by a established list of diseases and their relationship with the job or risk factors in the workplace. This procedure is more administrative and often relies on the opinion of Social Security Agency medical advisory physicians. The burden of proof for workers in this pathway is lighter; they do not need to prove company negligence, only that they worked in a place with a certain exposure potential and suffer from a listed disease. The legal implications and challenges of using medical records as evidence in the Indonesian judicial system show that procedural and evidentiary aspects play a key role in health law enforcement (Ustani et al., 2024). This mechanism can actually serve as useful initial evidence in civil lawsuits. A decision or acknowledgement from Social Security Agency that a disease is an occupational disease can be submitted in court as *prima facie* evidence regarding the causal link between the job and the disease, which must then be rebutted by the company with stronger evidence (Handayani, 2022). Social Security Agency recognition can serve as initial evidence that strengthens a worker's position in court.

Time issues and the loss of evidence are major obstacles in proving occupational disease cases. The greatest constraint in proof, applicable to all legal paths, is the issue of time and lost evidence. A latency period that can reach 20 or 30 years means that workplace conditions, control technologies, and even company ownership may have changed completely. Environmental monitoring documents, chemical purchase data, and worker medical records may have been lost or destroyed in accordance with company archiving policies. In this situation, courts can accept indirect evidence and testimony. Consumer protection and the legal liability of business actors in the sale of medicine above the highest retail price at pharmacies show that supervision and compliance

with regulations are essential in protecting consumers (Baktiasih & Mardikaningsih, 2024). Testimony from coworkers who experienced similar exposure, former managers, or experts who can reconstruct the working conditions of similar industries in a certain era can be evidence that is taken into account. Judges are given broad authority to assess the strength of evidence based on their conviction, and in cases of chronic disease, that conviction can be built from a mosaic of imperfect evidence that nevertheless shows a consistent pattern (Handayani, 2022). In conditions of limited evidence, judges can build their conviction from a consistent pattern of indirect evidence.

The concept of causality in occupational disease is now understood as an adequate multifactorial relationship. Therefore, the construction of the causal relationship in chronic occupational diseases is no longer viewed as a single, linear, and direct cause-effect relationship, but is often considered an adequate relationship or a contributing cause. The doctrine of *adequate causation* assesses whether an act of negligence, reasonably according to common life experience, can result in the consequences that occurred. Consumer protection in the health sector, including the legal liability of pharmacists, also requires strict supervision from the government (Setiawan et al., 2023). If a company is known to use carcinogens without controls, it is adequate and foreseeable that over time workers will suffer from cancer. This is in line with the development of modern toxicology, which recognizes a multifactorial causality model for chronic diseases, where workplace exposure contributes alongside other factors. A judge does not need to ensure that such exposure is the sole cause; it is sufficient that the exposure materially increases the risk and provides a real contribution to the emergence of the disease. This legal approach, as discussed in literature on liability law and legal epidemiology, is essential for addressing the justice gap in latent disease cases (Marchant & Lindor, 2012). The court's acceptance of the concepts of *contributory cause* and *increased risk*, as analyzed by Goldberg and Zipursky (2016), re-represents the standard of proof to be more in line with the medical reality of industrial diseases. This multifactorial approach aligns legal standards with the medical reality of chronic occupational diseases.

The evolution of the law regarding the proof of causality demonstrates a new, fairer direction for workers. Overall, the application of causal

relationship principles and the burden of proof in chronic occupational disease disputes in Indonesia shows an evolution toward a more equitable and realistic approach. The law is no longer rigidly applying conventional rules of proof that are impossible for victims to satisfy. Through the interpretation of the *strict liability* principle from the Environmental Law, the application of the doctrine of reversing the burden of proof, the utilization of breaches in administrative OHS obligations as evidence of negligence, and the acceptance of indirect evidence and the doctrine of adequate causation, the legal system strives to bridge the evidentiary gap created by the characteristics of latent diseases. The regulation of royalties in franchise businesses and their legal implications shows that aspects of justice and legal certainty are essential in every agreement, including in industrial relations (Putra & Wibowo, 2023).

This approach reflects the recognition that legal liability must be proportional to the ability to control risks and the access to information, where companies are always in a superior position compared to individual workers who face health consequences years later. In conclusion, although challenges in proof remain, the legal framework provides a set of interpretive tools that allow judges to reach substantive justice verdicts by considering scientific realities and the inequality of the parties' positions in industrial relations. This legal framework provides judges with interpretive instruments to achieve substantive justice in cases of latent diseases.

The Effectiveness of Legal Remedies for Workers Exposed to Industrial Chemicals

The effectiveness of legal remedies for occupational diseases can be examined through three main pathways. The accurate identification of work-related injuries or diseases is crucial to understanding Occupational Health and Safety (OHS) issues and designing effective prevention programs (Kyung et al., 2023). The effectiveness of legal remedy mechanisms in providing compensation to victims of occupational diseases and creating a deterrent effect for companies can be analyzed through the three primary pathways available within the Indonesian legal system: social security, civil litigation, and administrative sanctions. Each of these instruments possesses different characteristics, legal foundations, and implications in the effort to achieve the goals of worker compensation and corporate-level

violation prevention. Evaluating their effectiveness requires an examination of the operationalization of these three mechanisms, their interconnections, and the challenges faced in practical implementation. Analyzing these three pathways is essential to assess the balance between worker compensation and corporate deterrence.

Social Security Agency for Employment serves as the first line of protection for workers who experience work accidents or occupational diseases. The social security system, regulated through Law Number 24 of 2011 concerning the Social Security Agency and its derivatives, such as Government Regulation Number 44 of 2015 concerning the Implementation of Work Accident Security and Death Security Programs, serves as the first line of protection. This mechanism is managed by Social Security Agency for Employment and provides compensation in the form of medical expenses, rehabilitation, permanent disability benefits, and death benefits. Studies on the falsification of health certificates from the perspective of criminal law and professional ethics indicate that patient protection requires firm law enforcement against various forms of violation (Hartika et al., 2023). The primary advantage of this mechanism lies in its relatively rapid and procedural nature, as it does not require proof of corporate fault. This program provides basic financial assistance security to affected workers. However, the compensation provided is limited and standardized based on specific formulas, such as a percentage of wages with a maximum ceiling. This results in benefits that are often insufficient to cover real long-term economic losses, particularly in cases of chronic diseases that lead to the loss of permanent work capacity or require ongoing care. The limited nature of Social Security Agency compensation means that financial protection for workers with chronic illnesses remains less than fully adequate.

The limitations of social security compensation open up space for workers to pursue civil litigation. When workers are given the choice between filing a civil lawsuit or using the workers' compensation system to resolve occupational disease cases (Bent, 2023), the limitations of social security compensation open a path for victims to pursue civil litigation. The primary legal basis for this is Article 1365 of the Indonesian Civil Code regarding unlawful acts. Through civil litigation, victims can claim broader damages, covering material losses not fully covered by Social Security Agency, future loss of income, and immaterial

losses such as psychological suffering. This basis is reinforced by the existence of Law Number 6 of 2023 concerning the Enactment of the Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation into Law, which contains firm provisions regarding the employer's obligation to implement occupational health and safety norms. Negligence in fulfilling this obligation can serve as a strong basis for proving the element of fault in a tort lawsuit. Civil litigation provides an opportunity for broader compensation while simultaneously affirming the employer's OHS obligations.

Civil litigation offers greater compensation, but its effectiveness is hindered by the complexity of proof. Nevertheless, the effectiveness of civil litigation as a remedial tool is often hindered by the complexity of proving causal relationships. In cases of occupational diseases such as pneumoconiosis or cancer caused by industrial chemical exposure, the long latency period complicates the direct tracing between workplace exposure and disease manifestation. The litigation process, which consumes both time and high costs, also becomes a substantive barrier for workers, especially those who have been economically impacted by their illness (Solicha & Wijayanti, 2020). Patient intentions to visit hospitals are influenced by various factors, including viral marketing and word of mouth, indicating the importance of reputation and public trust (Taufik et al., 2022). Therefore, although the potential for compensation is greater and capable of providing a deterrent effect to companies due to the threat of significant financial liability, access to justice through this pathway is not yet fully optimal for the average worker. Civil litigation remains difficult for workers to reach due to the high burden of proof and associated costs.

Administrative sanctions reflect the state's role in supervising and prosecuting corporate violations. Meanwhile, administrative sanctions operate in a different realm: enforcement by public authorities against violating companies. The foundational regulations for imposing these sanctions are Law Number 13 of 2003 concerning Manpower, specifically the articles governing labor supervision and sanctions for violations of labor norms. Law Number 36 of 2009 concerning Health also mandates the supervision of occupational health conditions, and Law Number 32 of 2009 concerning Environmental Protection and Management provides for sanctions against

business activities that pollute the environment and endanger public health, including workers. The intent to purchase medical and environmentally friendly products is influenced by green consumer behavior, environmental concern, and recycling behavior (Fachrurazi et al., 2022). Administrative sanctions can range from warnings and administrative fines to the temporary suspension of part or all production equipment, and even the revocation of business licenses (Angie, 2023). These administrative instruments serve as direct controls over corporate compliance with OHS and environmental norms.

Administrative mechanisms are notable for their proactive nature in preventing corporate violations. The power of administrative mechanisms lies in their capacity to be activated directly by regulatory authorities, without relying on the initiative of complaints from injured individuals. This proactive aspect is essential for the preventive function of law enforcement. Sanction instruments such as temporary or permanent operational shutdown orders, as well as business license revocation, possess significant deterrent power because they directly jeopardize a corporation's operational continuity and profitability. Literature on regulatory enforcement, such as that examined by Gunningham (2014) in the context of environmental regulation, emphasizes that the threat to a "social license to operate" is often more persuasive than mere financial fines. The responsive and rapid nature of these administrative actions allows for early intervention to stop ongoing violations, an advantage compared to protracted civil or criminal litigation processes. However, the primary character of this administrative mechanism also contains a fundamental limitation. Administrative sanctions are essentially aimed at improving compliance with legal norms and stopping the offender's behavior, as explained by Ogus (2014) in his analysis of regulatory sanction design. Their function is forward-looking and directed at the perpetrator, not backward-looking to restore the losses of third parties. Consequently, the effectiveness of this tool in providing restitution or compensation to individual victims is very limited. A worker who suffers health impairment due to a violation of safety standards will not receive direct financial compensation from a factory closure order issued by labor inspectors. The recovery of

the victim's condition, in this framework, remains dependent on other mechanisms such as social insurance systems or civil lawsuits for damages. Therefore, while vital for creating a safer working environment through compliance pressure, the regime of administrative sanctions operates in a realm separate from compensatory justice for those who have suffered losses. Administrative sanctions are effective as compliance pressure but do not provide direct compensation for victims.

The synergy of three legal mechanisms forms a layered protection for workers. The interaction between these three mechanisms should ideally form a layered protection system. A worker suffering from an occupational disease should be able to immediately receive care through the Social Security Agency Work Accident Security program. Simultaneously, the government, through labor inspectors, can conduct inspections and impose administrative sanctions if violations of safety standards are found. Then, the victim can file a civil lawsuit to obtain full compensation for losses not covered by the Social Security Agency scheme. Coordination between Social Security Agency administrative data, inspection findings from the Ministry of Manpower, and evidence in court becomes a deciding factor in realizing this synergy (Solicha & Wijayanti, 2020). Cross-mechanism coordination is the key to the effectiveness of legal protection for workers.

The Job Creation Law influences the regulatory framework by emphasizing the simplification of licensing and administrative sanctions. In its development, the Job Creation Law has influenced this regulatory framework. The law introduces the simplification of licensing and the strengthening of administrative sanctions, including for violations in the fields of Manpower and Health. On one hand, this may streamline administrative enforcement. However, it must be noted that its effectiveness depends heavily on the capacity and consistency of supervisory officials in carrying out their duties. If supervision is weak and administrative sanctions are rarely imposed to their maximum extent, the expected deterrent effect will vanish. Implementing regulations such as Minister of Manpower Regulation Number 5 of 2018 concerning Occupational Safety and Health in the Work Environment serve as vital technical instruments to measure corporate compliance. The effectiveness of the Job Creation Law depends on consistent supervision and technical instruments such as Permenaker No. 5/2018.

Restorative justice places civil litigation as the

primary instrument for ensuring companies bear all costs of externalities resulting from their negligence. From a restorative justice perspective, civil lawsuits remain a key instrument to ensure companies bear the full costs of the externalities caused by their negligence. To address the constraints of proof, the application of the principle of *strict liability* as regulated in Article 88 of the Environmental Law can serve as a valuable precedent. This principle, if applied by analogy in certain occupational disease cases, would reverse the burden of proof, whereby the company must prove that its activities did not cause the disease. The transformation of healthcare services through artificial intelligence shows that technological innovation can help improve the quality and accessibility of healthcare services (Khayru, 2022). This approach would significantly enhance the victim's bargaining position and make civil litigation more effective as a means of compensation and deterrence. The analogy of applying *strict liability* strengthens the effectiveness of civil litigation as both compensation and a deterrent.

Normatively, the Indonesian legal framework is adequate, but implementation faces serious challenges. A normative evaluation shows that the Indonesian legal framework is theoretically adequate. However, implementation challenges remain significant. In terms of social security, the coverage of participation is not yet universal, and the value of compensation is limited, which reduces its protective power. On the civil side, access to legal aid and the duration of judicial proceedings are obstacles. On the administrative side, the limited number of inspectors and the potential for political or economic interference can weaken the enforcement of sanctions. The impact of social inequality on public health also needs to be analyzed to find appropriate policy solutions (Nalin et al., 2022). Therefore, increasing effectiveness does not lie solely in adding regulations, but in institutional strengthening, increasing resource allocation for supervision, and legal education for workers regarding their rights. Institutional strengthening, resources, and legal education are keys to the effectiveness of worker protection.

Data integration and institutional coordination are keys to the effectiveness of monitoring systems and legal remedies. A large-scale national monitoring system managed by a Bureau of Labor Statistics (BLS) is essential to

document the number, rates, and trends of workplace accidents and fatalities at national and state levels (Socias-Morales et al., 2023). Future efforts must be directed toward data integration and institutional coordination. Data from Social Security Agency regarding occupational disease claims must be easily accessible to labor inspectors as a trigger for surprise inspections. Conversely, the results of inspections and administrative sanction decisions must be usable as supporting evidence in civil lawsuits. The establishment of a more specialized and rapid industrial relations court is also needed. Thus, legal remedy mechanisms can function as a mutually reinforcing cycle, where adequate compensation is provided to victims and companies receive a clear legal signal that negligence will result in serious financial and operational consequences. The synergy of monitoring, supervision, and judicial proceedings creates a cycle of protection that strengthens justice for workers.

The effectiveness of legal remedies depends on the synergy of the three main pillars of worker protection. In conclusion, the effectiveness of remedy mechanisms in providing compensation and a deterrent effect is the result of the dynamics between these three pillars. No single mechanism standing alone can optimally achieve both goals. Social security provides basic assistance but is insufficient for full recovery. Civil litigation has the potential to provide full recovery but faces procedural constraints. Administrative sanctions suppress corporate behavior but do not restore the victim's losses. Legal guarantees for children's rights in education and health are also an important part of community protection as a whole (Hariani et al., 2021). Strong synergy, supported by consistent law enforcement and high political commitment, is a prerequisite for the legal system to genuinely protect workers from the risk of occupational diseases while encouraging the creation of a culture of prevention in the business world. Only through synergy and political commitment can the legal system realize substantive protection for workers.

CONCLUSION

Indonesian legal construction affirms that companies are not only civilly liable for worker losses but can also be held criminally accountable if negligence or intent in managing industrial chemicals leads to chronic illness. Recent regulations strengthen the worker's position

through Occupational Health and Safety (OHS) standards, the *strict liability* principle, and the recognition of corporations as criminal subjects in the new Criminal Code.

The principles of causal relationships and the burden of proof in cases of chronic occupational diseases with long latency periods are operationalized through a combination of the Civil Code, the new Criminal Code, the Manpower Law, the Health Law, the Environmental Law, and Social Security Agency regulations. The heavy burden of proof placed on workers is balanced by the application of the *strict liability* principle, the reversal of the burden of proof, and the normative obligations of companies, ensuring that legal protection remains effective even when diseases appear after a long latency period.

The effectiveness of legal remedy mechanisms in Indonesia lies in the combination of social security, civil litigation, and administrative sanctions. Together, these three elements provide adequate compensation for victims while creating a deterrent effect for companies. Recent regulations strengthen the worker's position and emphasize corporate responsibility, bringing the Indonesian legal system closer to the goal of substantive justice in occupational health protection.

To enhance the effectiveness of legal protection for workers, strengthening coordination between institutions such as Social Security Agency, the Ministry of Manpower, the Ministry of Environment, and law enforcement agencies is essential to ensure that remedy mechanisms function synergistically. The government needs to expand the application of the *strict liability* principle and the reversal of the burden of proof in latent disease cases so that workers are not burdened by the difficulty of proving causality. On the other hand, companies must internalize OHS standards as part of sustainable corporate governance, rather than treating them merely as formal obligations. The implication of strengthening these regulations is the creation of a higher culture of legal compliance, an improvement in the quality of the work environment, and the realization of substantive justice for workers who become victims of occupational diseases. Thus, the Indonesian legal system functions not only as a repressive instrument but also as a preventive mechanism that encourages companies to be more socially and legally responsible.

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