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# Artificial Intellegence and Medicine: Proposed Model of Indonesian Criminal Liability

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**Abstract.** Artificial intelligence (hereinafter AI) employed since 1956, began to develop for about last twenty years. In its existence, AI has taken a place almost in all areas where technology applied, and AI comes as main factor and support system for rapid technological advancement. Moreover, AI acts as robot doctors to review thousands of the medical record in order to provide faster treatments with superior outcomes. However, the challenges in the use of AI is vary and distinct. The challenges include legal responsibility of unethical, misconduct and malpractice by AI doctor. The study aims at analyzing the used of AI in medicine which can further be used for diagnosis, treatment and regular Medicare. Furthermore, the study analyzes the legal responsibility caused by AI doctor based on the existence of Indonesian criminal law. The research used normative legal research with statute approach. While, the data collected through library research and data used in this research is secondary data which consist of primary legal material, secondary legal material and tertiary legal material. Furthermore, the data analyze through descriptive qualitatively. The results of this study showed that to respond the current massive development of AI, the provision on Health law 2009 supports the used any technology in medicine. Afterwards, the harmful act by AI doctors shall be charged by the provision of Indonesian criminal law. Specifically, the author argued that doctor or other related parties which controlled and assisted the AI are most proper party may subjected to the legal responsibility in the use of AI doctor.

## INTRODUCTION

Artificial Intelligence (AI) begun to expand into the health sector. The future of 'standard' medical treatment, in which a patient sees a computer before visiting a doctor, may be closer implemented than people expect. With AI developments, it looks that the days of misdiagnosis and treating symptoms rather than the real cause of health problems are coming to an end. Through the increasing data captured in clinics and stored in electronic medical records as a result of common testing and medical imaging enables for more artificial intelligence and data-driven medicine applications [1]. AI used to refer as developed of technologies that influence human abilities, improvements, and decisions in tasks that were previously thought to be completely dependent on human experience.

AI in healthcare has remarked a lot of promise in terms of advancing medical knowledge and creating optimal yet cost-effective healthcare solutions. Identification of individuals at high risk for a disease, improved diagnosis and matching of appropriate customized treatment, and out-of-hospital monitoring of therapy response are all predicted clinical outcomes. Despite the anticipated benefits of Health AI, it also raises significant ethical concerns [2]. Therefore, it has been noted that students and medical physicians are under-trained in the field. Indicated the necessity for AI education in order to gain more confidence in working with AI in the future.

The possible of AI errors is unavoidable, it is life in such area of medical terms such as unethical, misconduct, malpractice and mistreatment. AI in the health sector performs better when it composed of great sources of training data in applications and predictive accuracy [3]. Consider the availability of LIZA, a robot doctor which was designed for a simple computer program capable of simulating a psychotherapeutic interview's question and response conversation. Similarly, created the PARRY program, which imitated a person with paranoid

schizophrenia [4]. Furthermore, AI in Indonesia confined to detection and monitoring. However, radiological examinations, such as Magnetic Resonance Imaging (MRI), are where AI is used in health care. A Machine Learning (ML) Model System may predict coronary heart disease using imaging or ECG data, helping to minimize unnecessary cardiac catheterization and referral for acute coronary syndromes, as well as better detect arrhythmias and ECG abnormalities. [5].

The important of the discussion is related to the liability took a part on another crucial aspect of medical practice. According to reports, opinions on legal responsibility for diagnostic errors caused by AI were split between those who believed the platform vendor and health care provider should be held equally liable and those who believed responsibility should remain primarily with the human, with only a minority believing the platform vendor should be primarily liable.

Health services primarily attempt to prevent and treat disease which further based on individual relationships between doctors and patients. As a result of the relationship, medical actions taken by doctors often result in harm to patients infringing on both the code of ethics and applicable health laws

## METHOD

The research used normative legal research with statute approach. While, the data collected through library research and data used in this research is secondary data which consist of primary legal material, secondary legal material and tertiary legal material. Primary legal material consists of relevant laws and regulation to the topic. The Secondary legal material in this study used journals, books and others related legal materials. Tertiary legal material consists of dictionary and encyclopedia. Furthermore, the data analyze through descriptive qualitatively

## RESULT AND DISCUSSION

### The Practices of AI and Possible Misconducts in Medicine

In accordance with the national strategy, the Ministry of Communication and Information has prepared strategic initiatives to support the use of artificial intelligence (AI). "As an accelerator, facilitator, and controller of Indonesia's digital transformation, the Ministry of Communication and Information will, of course, continue to contribute to increasing the use and adoption of AI technology in a prudent, provident, and trustworthy manner, and in accordance with the national identity"[6].

The types of AI can be known as divided as follows [7,8]:

a. Artificial Narrow Intelligence (ANI) called as Narrow AI or Weak AI. This artificial intelligence which concentrates on a single restricted task and has a limited range of abilities.
b. Artificial General Intelligence (AGI), commonly known as "strong" AI. AGI, according to the majority of experts, express as an autonomous machine's ability to execute any cognitive task that a human can.
c. Artificial Super Intelligence (ASI) this is when things start to become a little theoretical and a little frightening. AI technology that will correlate and then transcend the human mind is referred to as ASI. To be classified as an ASI, the technology would have to surpass humans in every way possible. These AI objects would be capable of not only carrying out duties, but also of having emotions and relationships.

Regardless of the several benefits of AI in terms of health access, now a days government have begun to create technical systems that use the Internet and Information and Communication Technology (ICT) to access information on public services, including public health services. During the Covid-19 crisis, the regime anticipates the access to public health will be maintained through the use of information and communication technologies and telemedicine. Telemedicine is a broad phrase that refers to medical activities taking place over a long distance. Telemedicine is a communication method that can be used to give information and medical services to a large number of people. Communication technology or an online health service will be used to provide a health service between a doctor and a patient.

The Indonesian government is now spending to accelerate the development and application of technology in the health sector. One of them is through promoting the existence of eleven health startups which provide telemedicine and drug delivery services to patients. Apart from the involvement of the start-up in this pandemic, the Ministry of Health also uses the *PeduliLindungi* application to educate the public about the importance of the Covid-19 vaccination. In addition, as one of the biggest WhatsApp users, Indonesia is the first country to employ WhatsApp

technology in order facilitate the registration of Covid-19 vaccine recipients. WhatsApp has made it easier offered vaccination information by the availability of chatbot [9].

By issuing Circular Letter of ministry of health Number HK.02.01/MENKES/303/2020 on the implementation of health services through the use of technology, the Minister of Health has demonstrated the commitment at continuing to provide health services to the public in general as well as in the event of a pandemic. As a consequence, the government used telemedicine to illustrate the necessity of technology-based health services. The telemedicine services are divided into four categories for instance radiology, ultrasound, electrocardiography, and consultation, further defined as follows [10]:

    a. Tele-radiology converts images into diagnoses linked communication over the internet which used by radiologists for rapid treatment;

    b. Tele-ultrasound is used to diagnose pregnant women and to connect with specialized obstetricians in order to expedite recommendations;

    c. ECG data are forwarded to a heart disease specialist for a speedy diagnosis. Tele-ecg is a health assessment of the electrical activity of the heart aimed at analyzing the workings of the heart.

    d. Tele-Consultation connects patients with experts for online consultations, allowing clinicians to learn more about the patient's condition and make treatment recommendations.

Some risks and obstacles emerge, such as the risk of patient injury due to system faults, the risk of patient data privacy, ethical concerns, and the provision of legal liability for AI [11]. AI which is given input data, such as an MRI brain scan, and trained on a huge data set can identify a "complex underlying pattern in the data" and provide an output, such as a tumor classification, but is unable to explain the reasoning behind it. Once faced with the possibility of medical negligence caused by AI technology, important legal problems arise.

Other conditions rely in which situation that AI system propose in the identification of breast cancer using mammography data but incorrectly diagnoses the patient, resulting in injury. Are existing tort liability concepts adequate to deal with medical malpractice emerging from the use of AI? If not, what changes to law could be needed to address AI systems that are implicated in medical malpractice?

## Liability of AI during the medical misconduct

AI is machine intelligence that "performs activities which ordinarily require human intelligence" or "works to attain goals." One of the most promising AI applications is the use of prediction algorithms in medicine. Algorithms in precision medicine guide care by predicting patient risks, making accurate diagnoses, selecting drugs, and even prioritizing patients to safeguard or assign limited health resources. But what if the treatment causes anything to go wrong? Will the physician be judged harshly for liability due to the AI misconduct?[13].

Liability for medical errors is managed mostly by negligence framework, which is the "most publicly visible legal mechanism" for ensuring high-quality care by requiring physicians to compensate patients for damage caused by their negligence.[14] "Conduct that falls below the level established by law for the protection of others against unjustifiable danger of harm," according to the legal definition of negligence [15].

It's difficult to apply the aforementioned proper liability schemes to AI technology because, as Yavar Bathaee points out, the law "is founded on legal principles that are centered on human conduct, which may not operate when applied to AI." According to Matthew Scherer, a big part of the issue originates from black-box AI's opaque nature and unpredictable outcomes. For example, how can AI creators be held tortiously accountable if they are unable to predict how AI will behave once it is unleashed into the world? Furthermore, if the legal system absolves designers of duty because AI acts are unpredictable, affected patients may have fewer options for remedy [16].

Recently, under the Indonesian Penal Code (IPC) which in line with the principle of equality before the law, any citizen involved in a criminal conduct including doctors, are liable of criminal charges. Similarly, the IPC has not yet controlled corporate criminal liability in the sense that the corporation has not been identified as the subject of a criminal act. The criminal code has been based on the belief that a crime can only be committed by humans (*naturalijk person*).

But what if artificial intelligence systems progressed to the point where they could mimic human consciousness and act in a manner akin to humans? The primary difficulty with artificial intelligence systems, according to this perspective, is attempting to impose accountability using existing legal notions. The artificial intelligence system can be thought of as a business iteration. When one considers that businesses are artificial entities that can only function through the efforts of humans, the major flaw in this analysis arises. On the other hand, highly autonomous

artificial intelligence creatures that do not require any human involvement do not require the use of human agents. What about their legal liability?

## The Doctrine of Vicarious Liability

Some recommendation improves to critically argue the liability by AI in medicine. The first solution proposed to handle the misconduct or any negligence through vicarious liability. Vicarious liability is a doctrine to balance as well as to complement the principle of no crime without fault *geen straft zonder schuld*. The doctrine of vicarious liability has been widely developed in cases committed by corporations, but this doctrine can also be used in the context of individual criminal liability. The doctrine of vicarious liability is used in cases involving other actors in an offense even though these other actors do not embody the offense.

According to Romli Atmasasmita, A person is held criminally responsible for the actions of others (the legal responsibility of one person for the wrongful acts of another). Vicarious liability, according to Barda Nawawi Arief, is the concept of a person's accountability for the mistakes of others, such as actions conducted while still in the scope of his work (the legal responsibility of one person for wrongful acts of another, as for example, when the acts are done within the scope of employment) [17].

There are two important conditions that must be met to be able to apply a criminal act with vicarious liability. These conditions are [18]:

a. There must be a relationship, such as an employment relationship between an employer and an employee or worker.
b. The criminal act committed by the worker or employee must be related to or still within the scope of his work.

Employees and affiliates of health systems, physician organizations, and physician-employers may be held accountable. Vicarious liability varies from other types of negligence in that it involves being held responsible for the actions of another person. For example, negligent credentialing implies that the hospital was negligent, whereas vicarious responsibility implies that the physician was careless but the facility was held liable. One purpose of vicarious liability is to disperse injury costs among hospitals and organizations in order to recompense a victim [19]. While, in the case of misconduct or negligence by AI refers to the doctrine it is possible to imposed the sanctions to others related parties with the AI.

## Other Model of Criminal Liability of AI: Gabriel Hallevy model and Causation

The study of AI started in the 1940s and early 1950s. Al has become an essential element of modern human existence, performing far more sophisticated functions than other commonplace instruments. Is AI becoming harmful as it becomes a part of practically every discipline of science?[20]. Moreover, Gabriel Hallevy introduced three models AI entity criminal liability [21]:

*The Perpetration-via-Another Liability Model: Artificial Intelligence Entities as Innocent Agents*

The Al entity is not considered to have any human characteristics in this first model. The Al entity is seen as a neutral party. As a result of such legal perspective, a machine is always a machine and never a human. However, as previously stated, one cannot ignore an Al entity's potential. These capabilities, according to this concept, are inadequate to label the Al entity a criminal. These abilities are similar to those of a mentally limited person, such as a child, a person who is mentally incompetent, or one who lacks a criminal state of mind to commit an offense (a child, someone with mentally ill, or someone who lacks the mental capacity to conduct a crime), and that person is criminally liable as a perpetrator-via-another. The "instrument's" behavior and mental state are used to evaluate the perpetrator's responsibility. Who is the perpetrator-via-another in the case of artificial intelligence entities? The Al software programmer is one candidate, while the user, or end-user.

*The Natural-Probable-Consequence Liability Model: Foreseeable Offenses Committed by Artificial Intelligence Entities*

The second model of criminal liability implies that programmers or users are deeply involved in the Al entity's everyday operations, but that they have no intention of committing an infringement through the Al entity. For

instance, an AI entity may commit an infraction while carrying out its daily responsibilities. The programmers or users were unaware of the crime until it had already been committed, they had no intention of committing any crime, and they did not take part in any portion of the crime's commission. However, this idea must be applied in a way that distinguishes AI algorithms (such as programs for conducting criminal plans). For the latter group of programs, crimes, particularly mens rea that require knowledge, cannot be prosecuted (though it turns out there are 'rational people' mens rea – or by employing strict liability).

*The Direct Liability Model: Artificial Intelligence Entities as being Tantamount to Human Offenders*

The third paradigm is that the AI entity is not reliant on a single programmer or user. The third model concentrates on the AI entity. As previously stated, the external factor (*actus reus*) and the internal element (*mens rea*) of a single violation make up the majority of criminal responsibility. Anyone who is found guilty of both components of a given offense is judged criminally responsible for that offense. There are no other elements that must be met in order to impose criminal liability. Then, the presence of these characteristics in a specific entity must be demonstrated in order to impose criminal liability on that entity.

These three models can be used independently, and in most cases, a coordinated combining of them (all or some) is required to complete the criminal liability legal structure [22]. A criminal court can impose them under the criminal law system if all of the prerequisites are met. Natural persons, legal entities, and AI robots could all be considered lawful subjects. Rapid growth of technology should followed by the existance of legal solution or at least the law can adjust toward the development of AI that which possibly in the near future we will have artificial super intelligence.

Because AI is typically built for the benefit of mankind, the issue of a planned and independent 'AI Crime' is uncommon. If an AI program is designed exclusively for the goal of committing a crime, the person who created it should be held accountable. However, because of the tremendous complexity of AI crime without human control, the debate over criminal *mens rea* (intention element) and *actus reus* (activity aspect) should be treated separately [23].

In addition, to find out the accountability for AI, the study was carried out through causation. It means that a new crime can be held criminally responsible if there is a consequence of the crime. Causation (cause-and-effect) is a relationship or process between two or more events or circumstances where one factor causes another [24].

Furthermore, prosecution for the death of the person who inflicted mild injury to the victim, who was hit by a car on the way to the hospital, can be justified, as can criminal responsibility of the developer for acts performed by AI. [25]. It seems appropriate to present one of the definitions of cause-and-effect relationship to ensure the constructiveness and validity of following reasoning in the affected situation: Causation, which is a relationship between phenomena in which one or more interacting phenomena (cause) naturally generate another phenomenon, is one sort of determinative interaction (effect) [26].

## CONCLUSION

Artificial intelligence (AI) is widely employed in health care as generally applied in many sector of science. However, the liability for potential medical errors or neglects by AI doesn't clearly regulate under the penal code. In response of significant challenges of AI liability, the aforementioned discussion proposed modifications to the current law or the creation of new legal doctrines such as vicarious liability, hallevy models and causation.

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