The Value, Risks and Legal Regulation Path of Artificial Intelligence Algorithms in Public Health Events

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Abstract: In the response to public health events, AI algorithms based on medical big data have generated value in many ways: AI based on medical big data can not only improve the accuracy of diagnosis, alleviate the difficulties of medical staff shortage, but also reduce the risk of medical workers contracting diseases. The use of this technology has also given rise to a number of risks, such as infringement of patients' personal information, unclear delineation of liability and risk, etc. In response to these shortcomings, relevant legal regulation paths have been constructed to better resolve the problems in the use of technology and to strongly protect the legitimate rights and interests of citizens.

Keywords: Public Health Events; Artificial Intelligence; Algorithms; Legal Regulation Path

1. Relevant concepts clarified

Artificial intelligence is actually a branch of computer science that has been widely present in people's lives and exists in a variety of manifestations, including fingerprint recognition technology, face recognition technology, robots, etc. The term “algorithm” was originally derived from a systematic work on algebra by a Persian mathematician in the ninth century AD. As the study of the subject has progressed, it can be understood simply as a programmed operation that produces a result through a formula. In the field of AI，an algorithm is primarily a computational method used in computer science using a well-defined set of steps for achieving a goal and solving a problem, a coded procedure for transforming input data into a desired output based on a pattern of operations specified by a code.[1]

2. The value of artificial intelligence algorithms in public health events

Since the announcement of the epidemic in 2019, the number of confirmed cases in China has quickly surpassed the number of SARS cases and is still increasing. The sudden public health outbreak has left most hospitals in Hubei Province with a severe lack of medical resources, making it difficult for many critical patients to be treated in the first place. Big data, AI algorithms have played a key role in easing the tension.

AI algorithms in epidemic management alleviate the scarcity of medical resources and rationalize the

dispatch of medical resources. Currently, AI products that assist doctors in diagnosis based on medical big numbers algorithms become a top priority for improving medical efficiency. In the face of such sudden major public health events, using sensors to digitize the human body, medical artificial intelligence can not only intervene in advance in human health and reduce the incidence of disease. Currently, the most typical application of AI-enabled scenarios in the medical field is medical image analysis. [2]

In epidemic management, AI reduces or even circumvents the risk of medical personnel being infected. The use of artificial intelligence to diagnose diseases can not only greatly improve the accuracy of diagnosis and alleviate the dilemma of insufficient medical staff, but also prevent and reduce the risk of cross-infection between doctors and patients to the greatest extent possible. How to deal with "human-to-human" virus transmission is not only a difficult task to prevent and control the epidemic, but also a key to protecting the lives and health of medical personnel. In medical practice, medical staff, as close contacts of the virus, are obviously at high risk of infection. The use of artificial intelligence not only reduces the risk of direct contact between medical staff and patients, but also plays an important role in alleviating the strain on medical resources.

Based on big data, AI algorithms are used to conduct analysis to predict outbreaks and prevent them before they happen. In the process of epidemic management, big data can not only analyze the flow trajectory of people to achieve timely tracking of confirmed cases and suspected cases. In epidemic governance, it is common to see health codes, trip codes and small programs for self-testing close contacts to monitor the trend of personnel movement in real time, so that potential risks can be more accurately grasped and better prevention and control of epidemics.

3. Risks of artificial intelligence algorithms under public health events

The emergence of artificial intelligence is relatively short. AI belongs to the national strategic innovation field of the 14th Five-Year Plan, China has also introduced a series of related industries to support and encourage its continuous innovation and development. However, some unforeseen problems can occur during the use of artificial intelligence algorithms in public health events.

3.1 Lack of legal regulation on personal information protection

China has extensively used information technologies such as big data and AI in this public health event to carry out joint prevention and control of the new crown pneumonia epidemic. However, these digital technologies, while carrying out scientific, effective and precise anti-epidemic efforts, have also greatly increased the risk of illegal collection and disclosure of personal information. Therefore, how to legally protect personal information that has been illegally compromised during public health events has become an urgent issue to be addressed. The enacted Civil Code has been a major source of information on personal information. Article 1034 of the newly enacted Civil Code states that personal information of natural person is protected by law. However, the legislation on personal information in artificial intelligence algorithms is extremely lacking.

3.2 Unclear delineation of liability determination risk

AI agorithm-derived decisions are not infallible, the application of medical AI algorithms can cause torts to occur. When an infringement occurs, the question of who is responsible for the malfunction that leads to an inaccurate or delayed diagnosis requires a legal answer. The Civil Code has provisions on product liability, which is generally strict liability, with the producer bearing the legal burden of compensating others for damages even if the defendant is not at fault.[3] However, for liability in AI algorithms, the operation of the algorithm originates from the designer, it is not fair for the producer to bear the burden. In addition to this, the state law on AI in algorithms does not have detailed allocation of liability issues.

3.3 Patients' right to know is compromised

The discriminatory nature of data collection and the flaws or defects in the algorithms can lead to inequality or discrimination. The algorithms are manipulated by people, which inherently brings a certain amount of bias and autonomy. The algorithm's designers have certain value judgments and may design algorithms with their positions. Then, the "algorithmic black box" contains many procedures that are not accessible to ordinary people and whose operation is generally difficult to explain to the designer. In the medical context they may prevent patients from being informed in a timely manner, so the patient's right to know is violated.

4. The legal path construction of artificial intelligence algorithms under public health events

4.1 Improving the legislative system for the protection of personal information in public health artificial intelligence algorithms

The protection of personal information should be clearer, from the process of information collection to the process of use and finally to the process of storage. First, in the process of information collection, it is necessary to clarify the type and range of personal information collected and the scope of information and region, minimize the collection of sensitive personal information, protect the patient's privacy. Second, in the process of information use, personal sharing can reduce this inefficient use, such as the EU's General Data Protection Regulation, which emphasizes data sharing between countries and businesses. [4] So we can learn from other countries' regulations. Finally, we should improve the standard of personal medical information storage, strictly punish the act of information leakage, and strengthen people's awareness of the protection of personal medical information.

4.2 Clarify the mechanism for dividing responsibilities under public health AI algorithms

Strict liability is applied in our product liability law, where the producer is liable. However, in the public health AI algorithm, it is unfair for the producer to bear the responsibility. Therefore, the responsibility of public health AI algorithms is divided into three main areas: algorithm designers, producers, and users. It's necessary to strengthen the supervision of the algorithm designer. The dilemma of

accountability for algorithm designers mainly refers to the avoidance of algorithm discrimination and algorithm black box problems. The algorithm designers have the obligation to disclose the operation of the algorithm. And the producer applies to the product fault principle may affect the development of AI, the producer can bear part of the responsibility. In the Civil Code, medical tort is determined by whether the medical party has any fault and the medical party's duty of reasonable care. Therefore, medical institutions should assume reasonable responsibility for their own work beyond the results of the algorithm.

4.3 Strengthening the legislative protection of patients' right to information

In the face of medical AI in the age of algorithms, the informed consent right of patients should be further derived from the professionalism of algorithms. This has to be regulated from the designers, producers, and users of the algorithms. Designers should clearly inform the potential risks or uncontrollable factors, try to avoid the risks. The state has issued corresponding laws and regulations to strictly stipulate the responsibility of producers to producers, and users of medical institutions should use it appropriately and inform patients about the use of artificial intelligence in a timely manner. But if it is not possible to get comprehensible answers about the safety and reliability of the medical AI algorithm, so the patient will have the right to refuse to use the medical AI.

5. Summary

In the age of intelligence, the impact of algorithms on human life has become more and more obvious. For AI and future rule of law research, we should accurately grasp the scenario characteristics and principles of algorithm regulation. [5] No matter in the application of public health artificial intelligence algorithm or other aspects, the specific system construction of algorithm regulation must be problem-oriented, so as to connect the algorithm principle with the scene of human life, better protect human rights and interests.

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