



Bioethics in *China's Biosecurity Law*: forms, effects, and unsettled issues

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ABSTRACT

The Biosecurity Law has laid down a regulatory framework on bioethics in China, from raising awareness through education, requiring researchers to conform to ethical principles and conduct ethical reviews on biomedical research, to giving special attention to human genetic resources. The law constructively leaves a wide range of discretion to medical institutions and professionals in ethical decision-making, adaptive to the biotechnology-ethics-regulation dynamics. This regulatory strategy poses crucial institutional challenges in its implementation, particularly on how to safeguard institutional review boards (IRB), a core mechanism in the governance, to effectively protect human subjects but not unnecessarily hinder the progress of biomedical research. Further measures need to clarify important issues on the IRB-based governance, including legal status of the IRB review decision, potential liabilities, and protections of the IRB members.

KEYWORDS: China's biosecurity law, bioethics, adaptive governance, IRB, liabilities

I. INTRODUCTION

In later November 2018 when Dr. He Jiankui and collaborators revealed that two genome-edited babies were born in Shenzhen, the world was shocked and disturbed.¹ The process involved application of genome editing tool CRISPR-Cas9 to disable

1 Henry T. Greely, *CRISPR'd Babies: Human Germline Genome Editing in the 'He Jiankui Affair'*, JOURNAL OF LAW AND THE BIOSCIENCES 111–183 (2019).

the CCR5 gene in human embryos to achieve immunity to HIV virus in two babies, as previous scientific results have linked the CCR5 gene to the HIV infection.² The experiment was immediately condemned by scientific community as well as general public, for engaging in the reckless use of heritable genome editing that is unapproved by regulatory agency and 'not morally or ethically defensible'³ because that tool remains 'too uncertain and the risks too great to permit clinical trials' at this time.⁴ The employer of Dr. He, Southern University of Science and Technology in China (SUSTech), disassociated itself from He's clinical trials, claiming that it did not give ethical approval for the experiment, and had terminated He's employment contract.⁵ He was later alleged to use undue inducement of the parents in the trials and incomplete informed consent regarding alternative method of preventing HIV infection and unforeseen off-target effects on the babies with their gene edited. On Dec. 30, 2019, the Nanshan District People's Court of Shenzhen ruled that He's misconduct constituted illegal medical practice. He and collaborators were fined, sentenced to prison, and banned for life from performing human-assisted reproduction and applying public funding for research in China.⁶

The case provoked intensive discussions on bioethics around the use of emerging biotechnologies among scientists and the general public in China and worldwide.⁷ Responding to the potential risks and concerns arising from the advances of biotechnologies in the life sciences, China started the process to draft and implement *China Biosecurity Law* (CBL) in 2019.⁸ The recent outbreak of COVID-19 has further sustained the concerns and pushed the Chinese government to speed up the deliberation of this legislature, along with a substantial set of regulatory policies on biosecurity and biosafety in China. On Oct. 17, 2020, the Standing Committee of the PRC National People's Congress passed the CBL and it will become effective on April 15, 2021. The CBL establishes a comprehensive legislative framework on biosecurity and biosafety in China. It covers the following eight biosecurity issues: the risk prevention and control system; epidemic control of infectious diseases; research, development, and application of biological technology; security management of pathogenic microbials laboratories; security management of human genetic resources and biological resources; countermeasure for microbial resistance; prevention of bioterrorism and threats of biological

2 Lucia Lopalco, *CCR5: From Natural Resistance to a New Anti-HIV Strategy*, Feb. 2(2) *VIRUSES* 574–600 (2020).

3 Marilyn Marchione, *Chinese researcher claims first gene-edited babies*, ASSOCIATE PRESS, Nov. 26, 2018; Sheldon Krinsky, *The ways in which He Jiankui violated ethics*, 37 *NATURE BIOTECHNOLOGY*, Jan. 2019, 18–19; Landon J Getz, Graham Dellaire, *Back to Basics: Application of the Principles of Bioethics to Heritable Genome*, *SCIENCE AND ENGINEERING ETHICS* (June 2020); Akshat Rathi and Echo Huang, *More than 100 Chinese scientists have condemned the CRISPR baby experiment as 'crazy'*, QUARTZ, Nov. 26, 2018.

4 On Human Genome Editing II: Statement by the Organizing Committee of the Second International Summit on Human Genome Editing, Nov. 29, 2018.

5 *SUSTech Terminated Employment Contract with He Jiankui*, Jan. 21, 2019. <http://scitech.people.com.cn/n1/2019/0121/c1007-30582640.html> (last visited on April 26, 2021).

6 Xinhua News: *He Jianhui jailed for illegal human embryo gene-editing*, Dec. 30, 2019.

7 Henry T. Greely, *CRISPR'd babies: human germline genome editing in the 'He Jiankui affair'*, *J LAW AND THE BIOSCIENCES*, 111–183 (2019).

8 Fangzhong Wang, Weiwen Zhang, *Synthetic biology: Recent progress, biosafety and biosecurity concerns, and possible solutions*, 1 *JOURNAL OF BIOSAFETY AND BIOSECURITY* 22–30 (2019); Amy Gutmann, *The Ethics of Synthetic Biology: Guiding Principles of Emerging Technologies*, 41 *HASTINGS CENTER REPORT* 17–22 (2011).

weapons; and biosecurity capacity building.⁹ It is the first law that solely dedicates to biosecurity and biosafety in China. One of the central conundrums in making the law is how to balance the potential benefits that may accrue and potential risks that may arise from emerging biotechnologies, including bioethical issues which often are embodied with diverse or even incompatible attitudes and interests.

This article first analyzes the regulatory strategies in the CBL that attempts to strike a delicate balance on the potential benefits and potential risks from biotechnologies toward health sciences under uncertainty. Part II of the article illustrates the four main provisions in the CBL that have laid down the regulatory framework, adaptive to the complex and ever-changing features of bioethics. Part III interprets the practical effects and liabilities for violations of these provisions on bioethics according to the CBL and related laws, regulations, and guidelines. Part IV explores the challenges that this adaptive strategy poses on medical institutions and professionals in the implementation of the CBL, particularly on the operation of IRBs, a core mechanism in the governance, by focusing on two unsettled issues: the legal status of an IRB's review decision, potential liabilities, and protections of the IRB's members, based upon reflections on the pivotal He Jianhui case that spur this legislative action.

II. BIOETHICS IN CHINA'S BIOSECURITY LAW

Bioethics has emerged and blossomed as an effort to address ethical issues arising from the advances of biomedical sciences shortly after World War II.¹⁰ The UNESCO defines it as 'ethical issues related to medicine, life sciences, and associated technologies as applied to human beings, taking into account their social, legal, and environmental dimensions.'¹¹ The definition indicates that bioethics is a complex interplay of various different disciplines. In addition, it is fast moving, closely linked to scientific progress with the most fundamental and sensitive issues that individuals, families, and communities might be confronted in real-life situations, such as the value of human life and how we want to live.¹² The features often render resolutions to bioethical issues that otherwise are difficult to make from a rational point of view. Some bioethical issues are deeply embedded with the history and religion of particular cultures, and often too controversial to build a cross-culture consensus,¹³ or to be resolved only by the passage of time.

The CBL aims to safeguard human and environment health, protect biological resources, and promote the development of biotechnologies in an ethically responsible

9 The full text of the CBL (in Chinese) is available at <http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml> (last visited on April 26, 2021).

10 Michele Goodwin & Allison Whelan, *Law, Bioethics, and Biotechnology*, in INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL & BEHAVIORAL SCIENCES, 2nd ed., Vol. 13, (James D. Wright, ed, 2015); George P. Smith II, *Applying Bioethics in the 21st Century: Principlism and Situationism*, 30 JOURNAL OF CONTEMPORARY HEALTH LAW & POLICY 37 (2013).

11 UNESCO, Universal Declaration on Bioethics and Human Rights (2005), Article 1(1).

12 Barry S. Collier, *Ethics of Human Genome Editing*, 70 ANNUAL REVIEW OF MEDICINE 289–305 (2019). <https://www.annualreviews.org/doi/pdf/10.1146/annurev-med-112717-094629> (last visited on April 26, 2021).

13 Heikki Saxen, *A Cultural Giant—An Interpretation of Bioethics in Light of Its Intellectual and Cultural History*, Academic Dissertation in University of Tampere, Finland (2017).

manner.¹⁴ To that end, the CBL was formulated under three guiding principles: risk prevention, prudent development, and whole process management. Regarding ethical issues arising from activities in the area, the CBL creates a regulatory framework of bioethics governance in China. Among 85 articles in 10 chapters in the CBL, 4 articles in 3 chapters were articulated to directly address bioethical issues from the following four forms:

II.A. Bioethical awareness-raising

Bioethics concerns about all individuals' fundamental rights and welfare in a society. The Chinese legislators recognize education as a means to foster a greater bioethical awareness among the public and professionals. While sensational or headline-grabbing ethical controversies are rare, issues of privacy, autonomy, confidentiality, and informed consent confront them on a daily basis. To overcome the ignorance and suspicion upon biomedical advances, relevant institutions must begin to take the responsibility to cultivate ethical awareness of the public and professionals, and improve their capability to address these issues in various real-life situations. Thus, Article 7 in Chapter 2 (biosecurity risks prevention and control system) of the CBL requires that all research institutions, enterprises, and universities shall incorporate biosecurity laws, regulations, and knowledge into educational and training programs, to raise the awareness of students and professionals to be prudently vigilant on bioethical issues.

II.B. Ethical principles in biomedical research

Along with the awareness arising, Article 33 in Chapter 4 (Safety of biotechnology research, development, and application) of the CBL requires that those engaged in research, development, and application of biotechnology should 'conform to ethical principles.'¹⁵ The use of the open-ended phrase 'ethical principles' without an expected definition or a precise enumeration of what they may conclude leaves room for constructive interpretation in lined with the dynamic changes of the biotechnological innovation. Obviously, this provision is subject to cross-textual interpretation, through incorporating with related laws, regulations, and guidance in this field. For instance, National Health Commission and China Hospital Association have jointly issued the *Guidance for the Establishment of Ethical Review Committee of Clinical Research Involving Human Subjects in 2019* (the Guidance 2019),¹⁶ which is highly consistent with international and domestic general ethical standards, especially the Declaration of Helsinki (2013),¹⁷ and International Ethical Guidance for Health-Related Research Involving Humans (2016).¹⁸

14 CBL, Article 1.

15 CBL, Article 33.

16 The Guidance for the Establishment of Ethical Review Committee of Clinical Research Involving Humans Subjects (2019), issued by National Health Commission and China Hospital Association, <http://www.cha.org.cn/plus/view.php?aid=15896> (last visited on April 26, 2021).

17 Adopted by the 18th World Medical Association General Assembly, Helsinki, Finland, June 1964, and amended in 2013. <https://jamanetwork.com/journals/jama/fullarticle/1760318>.

18 International ethical guidelines for health-related research involving humans (2016), <https://cioms.ch/publications/product/international-ethical-guidelines-for-health-related-research-involving-humans/> (last visited on April 26, 2021).

The Guidance 2019 highlights that rights and welfare of human subjects shall outweigh the scientific and social values from a research program to avoid greater than the minimum risks.¹⁹ More specifically, it recognizes the following six guiding ethical principles in the review of biomedical research involving human subjects in China:

- (1) Strictly implement the procedure of informed consent, prevent the use of deception, improper inducement, coercion (including disguised coercion) and other improper means to recruit human subjects, and allow them to withdraw their consent to participate in the study at any stage of the study without unfair treatment.
- (2) The safety, health, and rights of human subjects must be considered more important than the acquisition of scientific knowledge and the overall benefits of society, so as to maximize the benefits of human subjects and avoid greater than the minimum risks as far as possible.
- (3) The human subjects shall be exempted from the economic burden due to the benefits in the course of the study.
- (4) Ensure that the human subjects receive timely and free treatment and compensation in the case when they are injured directly related to participating in the study.
- (5) Special protection should be granted to vulnerable groups such as human subjects who lose or lack the ability to protect their own rights and interests, desperate patients who suffer from serious diseases and have no effective treatment, and people with low socio-economic status and low education level.
- (6) To carry out biomedical clinical research, the ethical review must be conducted.

Where not necessarily exhaustive, these ethical principles indicate the key messages about protecting human subjects in the biomedical research. They are subject to further development. These ethical principles may be incorporated into Article 33 to handle ethical issues from biomedical research in practice, and more other ethical principles, formed or will be formed, may be incorporated into the CBL through this provision when needed.

II.C. Institutional ethical review

Following the above open-ended provision on ethical principles, Article 38 within the Chapter 4 stipulates that the ethical review is necessary to all biomedical research. It also requires that such research should be carried out in medical institutions with qualified facilities.²⁰ Institutional review boards (IRBs) are designed to be the core mechanism to protect human subjects' rights and welfare in the research.

19 The Guideline 2019, Section 4, Article 2 (2).

20 CBL, Article 38.

After the He Jiankui case, the National Health Commission and Chinese Hospital Associations jointly issued the *Guidance for the Establishment of Ethics Review Committee for Clinical Research Involving Human Subjects* in 2019 that has caused a sudden proliferation of IRBs in China, as more than 5800 IRBs have been registered at Chinese Clinical Trial Registry by Feb. 15, 2021.²¹ They are expected to enhance the protections of human subjects in biomedical research over the status quo, but the overall social and political impact of this professional self-governance remains to be seen in China. A recent study on the IRBs' performance in 48 major medical institutions in Shenzhen indicated that they were not well functioned as expected yet. In the study, over half of researchers in these institutions did not receive any ethical training, and they were lack of awareness for the protections of human subjects in their research design; the ethical review standards adopted by the IRBs were inconsistent and ineffective; and members of the IRBs with suitable qualifications were overloaded and few could be assigned to continuing reviews for approved research. This study reflects the challenges that the IRBs currently face in China, which undermine their credibility to the parties involved in the biomedical research.

Recognizing the need for reform, National Health Commission and China Hospital Association issued the *Guidance 2019* that set forth detailed requirements of the operation of the IRBs in medical institutions in China. It illustrates the different roles of researchers, IRBs, and their affiliated medical institutions in protecting human subjects in the biomedical research. According to the *Guidance 2019*, researchers are primarily responsible for the protections of human subjects in their research. They must minimize the avoidable risks, provide accurate information about all relevant clinical circumstances and potential risks to human subjects, and receive valid informed consent from all participants. More importantly, they must obtain the approval from an IRB before their research is carried out.²²

The main responsibility of the IRBs is to protect human subjects in the biomedical research. They are designated with a wide range of authorities on approving, requiring modifications of, or disapproving a research with different risk levels in accordance with the relevant laws and regulations. In determining whether to approve a research protocol, each IRB is required to evaluate varied factors, including whether human subjects' rights are protected in the informed consent procedure, whether the recruitment of human subjects involves deception, improper inducement and coercion (including disguised coercion), and whether human subjects are allowed to withdraw their consent to participate in the research at any stage of the study without being treated unfairly.²³ The IRB can suspend or terminate the research that has been approved or conduct a follow-up review after approval when it deems necessary.²⁴ The IRB must be composed of members with multi-disciplinary professional backgrounds, including experts in medicine, ethics, law, and other fields. It must have at least a member who does not belong to the institution and is not closely related to the project researchers to avoid conflict interests (the same member can meet both requirements). The numbers in an

21 Chinese Clinical Trial Registry, <http://www.chictr.org.cn/searchprojen.aspx> (last visited on April 26, 2021).

22 The *Guideline 2019*, Preamble.

23 The *Guideline 2019*, Section 4, Article 2 (1).

24 The *Guideline 2019*, Section 3, Article 1–4.

IRB must not be fewer than 7. If necessary, experts in special fields can be employed as independent consultants.²⁵

The Guidance 2019 requires that a medical institution shall establish an IRB that directly subordinates to it as an independent administrative branch.²⁶ The institution is responsible to organize and provide necessary support to the operation of its IRB, including providing human resources, office space and other facilities, funding and training to the IRB's members.²⁷ While must avoid unduly administrative intervention to the IRB's review work to ensure the independence of their judgments, the institution ultimately undertakes supervision responsibility for all clinical research carried out in its own institution. It may authorize another internal branch to supervise the IRB, including solving complains about the protections of human subjects in the research carried out in the institution.²⁸ This intertwined relationship between the IRB and its affiliated medical institution creates new layers of complexity to the conduct of ethical reviews.

II.D. Ethics on human genetic resources

Chapter 6 of the CBL specifically addresses human genetic resources and biological resources security. Article 53 in the Chapter requires that collection, preservation, utilization, and provision of China's human genetic resources must conform to ethical principles and must not endanger public health, national security, and social public interests.²⁹ After the He Jiankui case in 2018, the China's State Council immediately issued *Regulations of the PRC on the Administration of Human Genetic Resources* in 2019 (the Regulations 2019), illustrating the requirements on human genetic resources in more details.³⁰ For instances, Article 22 of the Regulations states that the use of China's human genetic resources for international cooperation in scientific research should go through the ethical review of the countries (regions) where the parties are located.³¹

Under special circumstances, when transporting or mailing human genetic resources materials out of China for international scientific cooperation, the ethical review must be conducted and the exporting certificate of human genetic resources materials shall be obtained from the Ministry of Science and Technology of the PRC.³²

Based upon the four provisions, the CBL consolidates the prior regulations and ethical guidelines into its over-arching strategic framework of bioethics in China. The language of the provisions in the framework is couched in general terms, with the overall tone of being highly respectful to professional self-compliance within the framework, including leaving a wide range of discretion to the IRBs in reviewing, approving, or disapproving research in their affiliated medical institutions. This law-

25 The Guideline 2019, Section 2, Article 1.

26 The Guideline 2019, Section 2, Article 1 (2).

27 The Guideline 2019, Section 1, Article 3 (2).

28 The Guideline 2019, Section 2, Article 3(1)–(3).

29 CBL, Article 53.

30 Regulations of the People Republic of China on the Administration of Human Genetic Resources (The Regulations 2019), Order of the State Council of the P.R.C., No.717, May 2019. The Regulations amended the Interim Measures for the management of Human Genetic Resources, issued by the State Council, June 19, 1998.

31 The Regulations 2019, Article 22.

32 The Regulations 2019, Article 27.

making strategy is adaptive to the ever-changing features of bioethics in biomedical research. The CBL is expected to function as 'a lever for moving human behavior' in this field.³³ Further measures are necessary to incentivize professional self-compliance to achieve the regulatory goal.

III. PRACTICAL EFFECTS AND LIABILITIES

The CBL purports to push biomedical research to a higher ethical standard. While it is textually indeterminant or open-ended of what conformity consists of on bioethics in this field, it imposes key responsibilities on medical institutions and professionals (particularly in the IRBs) to ensure such activities are conducted in an ethically responsible manner. The Law would have far-reaching practical effects on the conduct of biomedical research involving human subjects in China.

According to the CBL, medical institutions and professionals may face criminal, administrative, or civil liabilities for a violation of its provisions. The most severe consequences are reserved for such a violation that constitutes a crime. Article 70 of the CBL stipulates that criminal liability shall be imposed for a violation of the CBL that constitutes a crime.³⁴ Article 81 opens a window to incorporate other laws and regulations for liabilities that are not illustrated in the CBL. It states that where there is no liability in the CBL for a violation of this Law, other relevant laws, and regulations shall apply.³⁵ Notably, the newly enacted *China Civil Code* (2020) and the *Measures for the Ethical Review of Biomedical Research Involving Human 2016* (the *Measures 2016*) have a strong bearing on the protection of bioethics.

The *China Civil Code* recognizes human dignity as the premier value in that it unites all other values underlying express or implicit rights owned to individuals, throughout life and especially at its end-stage.³⁶ This recognition is widely viewed as 'the most luminous point' in the whole *China Civil Code*.³⁷ Human dignity is a general principle to which all other principles on bioethics are grounded, such as autonomy, beneficence, non-maleficence, and justice.³⁸ As a moral term, it suggests how an individual or group should or should not be treated within a society.³⁹ As a normative standard, it is understandably elusive, with its precise meanings only being defined within a context of specific factual or situational setting.⁴⁰ Article 1008 of the *China Civil Code* requires that clinical experiments for new drugs and medical devices or treatment methods must be approved by ethical review committee,⁴¹ and Article 1009 requires that biomedical research concerning human genes and human embryos, among others, must be carried

33 Owen D. Jones, *Law and Biology: Toward an Integrated Model of Human Behavior*, 8 JOURNAL OF CONTEMPORARY LEGAL ISSUES 167 (1997).

34 CBL, Article 70.

35 CBL, Article 81.

36 Civil Code of the PRC, Article 1002, issued on May 28, 2020, and enter into force on Jan. 1, 2021, Article 990.

37 Lixin Yang, *Understand the Civil Code of PRC*, BEIJING DAILY, June 22, 2020.

38 CHARLES FOSTER, *HUMAN DIGNITY IN BIOETHICS AND LAW*, Hart Publishing (2011).

39 FIONA RANDALL AND ROBIN DOWNIE, *END OF LIFE CHOICES: CONSENSUS AND CONTROVERSY* 178 (2010).

40 George P. Smith, *Human dignity as a normative standard or as a global health care decision-making?* 42 NORTH CAROLINE JOURNAL OF INTERNATIONAL LAW 275 (2017).

41 Civil Code of the PRC, Article 1008.

out 'without endangering human health, violating ethical principles, or damaging public interests.'⁴² These provisions directly create a cause of action for a violation of such ethical requirements, and human dignity serves as a basic principle that competing conflicts shall be resolved in favor of protecting the dignity of personhood.

The Measures 2016 specifically regulates activities of ethical reviews in the biomedical research. It illustrates the illegal acts on ethical reviews and correspondingly administrative measures to researchers, IRBs, and their affiliated medical institutions.⁴³ For researchers, if they carry out experiments without approvals from the IRBs, failure to timely report to the IRBs about occurring of adverse consequences in the research, or violating the requirements for informed consent, they shall be ordered to correct with a warning or public notification.⁴⁴ For medical institutions that establishes the IRBs, they have the responsibility to ensure the composition of the IRBs or qualification of the IRBs' members satisfied with the requirements, which includes to establish rules or procedures of the IRBs review work; to confirm the proper execution of the ethical principles and related regulations in ethical reviews; not to leak the research planning, private information of human subjects or opinions of the IRBs in review; or not to file as required. If the abovementioned requirements not met, the medical institutions shall be ordered to correct with a warning or public notification, and those in charge of the institutions or the IRBs will be punished according to laws.⁴⁵

Article 49 further states that, if any medical institutions or individuals whose violation of the provisions in the Measures 2016 causes damage to a person, or property of others, they shall bear civil or criminal liability according to laws.⁴⁶ The Measures 2016 do not clarify whether this provision creates a negligent liability for a medical institution and its IRBs, and if it does, what kind of duty of care that its member should undertake in ethical reviews. This issue is crucial for the effectiveness of the IRB-based governance and will be further discussed in the next section IV.2(2).

IV. HE JIANKUI CASE REVISITED AND UNSETTLED ISSUES ON IRB-BASED GOVERNANCE

A central conundrum in regulating biomedical research is how to balance the potential benefits and risks in the course of interactions of all parties involved. The regulatory framework on bioethics laid down in the CBL is necessary to be flexible to accommodate the rapid progress in this field. This regulatory strategy, however, inevitably poses crucial challenges for relevant medical institutions and professionals in implementing the somehow indeterminate and open-ended normative standards laid down in the CBL. They must learn to grasp the trend of bioethics as a cumulative result of the biotechnology-ethics-regulation dynamics, to be well positioned to make decisions that are ethically defensible without unnecessarily hindering the progress of biomedical research. This is an uneasy task, particularly for the research that is ethically challenging and common standards are not well established. For instance, the ethical standards of

42 Civil Code of the PRC, Article 1009.

43 Measures for the Ethical Review of Biomedical Research Involving Human issued by National Health and Family Planning Commission, Order No.11, Oct. 12, 2016.

44 The Measures 2016, Article 47.

45 The Measures 2016, Article 46.

46 The Measures 2016, Article 49.

germline genome editing implemented by IRBs in a given therapy would constantly change as the trade-off between the potential benefits and risks change associated with the evolving biomedical technologies.⁴⁷

Adoptive to the ever-changing features of biomedical technologies, the CBL leaves a wide range of discretion for medical institutions and professionals (particularly in the IRBs) in dealing with relevant ethical issues in practice. However, like any other professional committees, the IRBs could be marred by self-serving biases, corruption, and compromise that may condone terrible acts and undermine the viability of the IRB-based governance on bioethics. From He Jiankui case, we have seen them occurred.

IV.A. He Jianhui case revisited

In the past, laws and regulations in China are lagging behind in solving ethical controversies arising from the fast-changing biomedical technologies. When He and collaborators were on trial during 2018–2019, the most relevant ethical standards on human embryos gene editing in China is articulated in *the Ethical Guiding Principles for Human Embryonic-stem-cell Research*, jointly issued by China Ministry of Science & Technology and Ministry of Public Health in 2003.⁴⁸ It states that gene editing on human embryos may be carried out only for research purposes, but the cultivation period of *in vitro* fertilized human embryos shall not exceed 14 days from the beginning of fertilization or nuclear transfer,⁴⁹ which is also a generally accepted regulatory rules in the standards issued by NIH and other agencies.⁵⁰ He and collaborators clearly violated this 14-day rule. However, the *Ethical Guiding Principles* as a part of medical ethics in China did not have the force of law. Another relevant regulation is *the Interim Measures for the Administration of Human Genetic Resources*, issued by the State Council in 1998, which regulates the collection, preservation, utilization, and external provision of human genetic resources, but it does not cover the misconduct as He did.⁵¹

When clear laws and regulations on ethical controversies are absent in lawsuits, they normally have to be framed, or recast as issues of interpretation of existing law, *stare decisis* or treated as a compelling reason for judicial abstention.⁵² In He Jiankui case, due to the absence of laws and regulations that directly address gene manipulation, the Nanshan District People's Court in Shenzhen chose to frame He's misconduct as illegal medical practice according to Article 336 in the Criminal Law of PRC (2017), which stipulates that:

Whoever, without obtaining the qualification for practicing medicine, unlawfully practices medicine, if the circumstances are serious, shall be sentenced to fixed-term imprisonment of not more than three years, criminal detention or public surveillance

47 Matthew P. Hirakawa et al, *Gene editing and CRISPR in the clinic: current and future perspectives*, BIOSCIENCE REPORT 40 (2020), <https://doi.org/10.1042/BSR20200127>; Robert Ranisch, Hans-Joerg Ehni, *Fading red lines? Bioethics of germline genome editing*, 34 BIOETHICS 3–6 (2020).

48 Ethical Guiding Principles for Human Embryonic-stem-cell Research, No. 450 (2003), Ministry of Science and Technology and the Ministry of Public Health.

49 Ethical Guiding Principles for the Research of Human Embryonic Stem Cell, Article 6 (1).

50 Insoo Hynn, Amy Wilkerson and Josephine Johnston, *Revisit the 14-day rule*, 533 NATURE, 171 (2016).

51 Interim Measures for the Administration of Human Genetic Resources (1998), by the General Office of the State Council on June 10, 1998.

52 Richard A. Posner, *The Problematics of Moral and Legal Theory*, 111 HARVARD LAW REVIEW 1637, 1698 (1998).

and shall also, or shall only, be fined; if severe harm is caused to the health of the person seeking medical service, he shall be sentenced to fixed-term imprisonment of not less than three years but not more than 10 years and shall also be fined; if death is caused, he shall be sentenced to fixed-term imprisonment of not less than 10 years and shall also be fined.⁵³

The Supreme People's Court of the PRC has interpreted 'illegal medical practice' in this provision as referring to 'the action taken by a person who has not obtained a medical license but engaged in medical activities without authorization.'⁵⁴ Since neither He nor his collaborators had a medical license when they conducted the assisted-reproduction clinical trial without authorization, and the clinical trial could be framed as a kind of medical activity, they had knowingly violated this provision, upon which they were convicted.

Although the judgment was unsatisfactory to many who concerned about the case,⁵⁵ the court could not provide better legally supported resolution to He's misconduct in 2019. According to the enforceable laws in 2019, there was no specific criminal offence on gene manipulation applicable to He's case. One of the most widely accepted principle of the rule of law is 'no crime without law', which means that a person should not be held guilty of any criminal offence on account of an act or omission that did not constitute a criminal offence under relevant law at the time when it was committed. The principle prohibits courts from punishing any misconduct without enforceable law. The case reflected an urgent need to make new laws to deal with the challenges brought up by the application of the cutting-edging biotechnologies. Nowadays, the CBL and the Regulations 2019 fill in this legal gap, offering a channel to pursue liabilities for ethical violations arisen from gene editing on human embryos. As shown above, the CBL imposes criminal liability to a violation of its provisions that constitutes a crime. More specially, the Regulations 2019 states that if the collection, preservation, utilization, and external provision of human genetic resources in China have not passed the ethical review, or collecting China's human genetic resources without the prior informed consent of the human genetic resources providers, or obtaining the consent of the human genetic resources providers by means of concealment, misleading, and deception, the Departments of Science and Technology of the PRC shall order them to stop carrying out relevant activities, confiscate the illegally collected and preserved human genetic resources and illegal income, and impose a fine.⁵⁶ Article 44 further stipulates that '[t]hose who violate the provisions of these regulations and infringe upon the legitimate rights and interests of others shall bear civil liability according to law; those who constitute a crime shall be investigated for criminal responsibility according to law.'⁵⁷

53 Criminal Law of the PRC (revised in 2017).

54 Interpretations on the crime of illegal medicine practice issued by the Supreme People's Court of PRC, No.5, April 28, 2008.

55 Ruipeng Lei and Renong Qiu, *Chinese Bioethicists: He Jiankui's Crime is More than Illegal Medical Practice*, THE HASTING CENTER (January 14, 2020), <https://www.thehastingscenter.org/chinese-bioethicists-he-jiankui-crime-is-more-than-illegal-medical-practice/> (last visited on April 26, 2021).

56 CBL, Article 39(1)-(2).

57 CBL, Article 44.

IV.B. Unsettled issues on the IRB-based governance

Compared to He and collaborators' liabilities in the case, much less attention has been paid to the ineffective ethical review involving human subjects in the research. The ethical review document on He's CCR5 genome-editing research released online showed that it was signed on Mar. 7, 2017 by all seven members of the IRB at Shenzhen Harmonicare Women and Children's Hospital where He's trial was located, in which they unanimously concluded that the research was 'in line with ethical standards and agreed to carry out.'⁵⁸ A later investigation conducted by the Guangdong Health Commission found that He and his collaborators faked the review document, and misled doctors into unknowingly implanting gene-edited embryos into two women, whose informed consent was also considered invalid by ethicists.⁵⁹ This high-profile case raised interesting questions regarding the IRB-based governance on bioethics in China. What the legal status of the IRB's review decision in the case? Could the IRB's review decision affect or make He and collaborators immune from liabilities, if it were not faked? Could the IRB members be sued individually, or the IRB be sued as an entity for their initial approval or failure to continuing oversight of the research? In He Jiankui case, the Court in Shenzhen did not address these questions in its judgment, which was consistent with a general and prudent policy that judges often not take sides on moral issues when they do not have to. Given the centrality of IRBs in the regulatory framework on bioethics laid down by the CBL, these questions merit further considerations.

1. Legal status of an IRB's review decision

Ideally, '[g]ood ethics committees begin where the law ends.'⁶⁰ In the regulatory framework on bioethics that the CBL has laid down, medical institutions and professionals in the IRBs have a wide range of discretion in copying with ethical issues in practice. The IRBs' review decisions would affect rights and welfare of human subjects in the research considerably, but the legal status of the IRB's review decisions is not clearly articulated either in the CBL or related regulations.

To some extent, legislators have ambivalent attitude towards this issue. On one hand, they delegate the IRBs with wide authorities to independently review, approve and monitor research, and render each of them to act as an enforcing agent to protect human subjects in biomedical research carried out in the medical institution. The IRBs could be best understood as acting certain public function according to the CBL and related regulations, rather than merely as a subordinate unit of its medical institution. Thus, An IRB review decision could be determinative and legally binding to all parties in the research.

On the other hand, members of an IRB generally have expertise to make review decisions on biomedical research within its medical institutions, but they are not equipped with legal expertise and public accountability to adjudicate the rights and

58 He's IRB Application Form on CCR5 Gene-editing Research, March 2017. See Former ethics committee member of Shenzhen Hemei Women's and Pediatric Hospital: the signature of the examination application may be forged [Chinese], wxn.qq.com (last visited on April 26, 2021).

59 Xinhua News: Preliminary investigation of "gene editing baby incident" in Guangdong Province, Jan. 21, 2019.

60 George J. Annas, *Ethics Committees: From Ethical Comfort to Ethical Cover*, HASTINGS CENTER REPORT, May-June 1991, 20-21.

welfare of human subjects closely interlinked with ethical issues in the research. When recognizing the gatekeeping function of the IRB to the protection of human subjects in the regulatory framework on bioethics, the CBL and related regulations seemingly do not impose on its members either the obligation or the authority to become amateur judges in order to perform that role, nor officially treat an IRB's review decision as being equivalent to a court's judgment or an administrative agency's decision. Nevertheless, an IRB's review decision should be subject to scrutiny by courts or administrative agencies. They would value it above other evidence offered, or prefer to investigate ethical issues independently in the research, even in the presence of the IRB's review decision. As in the U.S., courts may exercise 'a deferential standard of review' to an IRB's decision to determine whether there has been an abuse of discretion according to laws and regulations.⁶¹ Under this 'abuse of discretion' standard, an IRB's decision is reasonable 'if it is the result of a deliberate, principled reasoning process and if it is supported by substantial evidence,' upon which a reasoning mind would accept as sufficient to support a particular conclusion.⁶² In He Jiankui case, the Court in Shenzhen entirely dismissed the IRB's review decision, and announced its own judgment of He's misconduct as 'had knowingly violated the country's regulations and ethical principles to practice gene editing in assisted reproductive medicine.'⁶³ This might be because the authenticity of the IRB's approval was challenged, although no detailed information was released about the allegedly forged document.⁶⁴ In any event, it is worth noting how the Chinese courts would deal with an IRB's review decision in future cases.

In addition, China is considering to establish a national science and technology ethics committee to supervise and coordinate national-wide ethics reviews.⁶⁵ Composed of members from diverse backgrounds, it is expected to be competent in mediating review disputes from all IRBs at the lower levels. This committee would provide an alternative path to divert caseload from courts on the IRBs' review disputes.

2. Potential liabilities and protections of the IRB members

Another interesting issue arisen from He Jiankui case is what type of liability regime could be most appropriate to an IRB members to ensure their diligent and conscientious review work, without undermining the viability of the IRB-based governance?⁶⁶ As shown above, under the regulatory framework on bioethics in the CBL, an IRB has wide-range of authorities in reviewing, approving, or disapproving the research carried out in its medical institution, and most of the review work performed by the IRB members would be viewed as discretionary. How to protect the IRB members who perform in good faith in their review work? Should the medical institution have insurance policies to cover the IRB members who are acting within the scope of their

61 Judith Hendrick, *Legal Aspect of Clinical Ethics Committee*, J MEDICAL ETHICS, 50–53 (2001).

62 *Bernstein v. Capitalcare, Inc.*, 70 F.3d 783, 788 (4th Cir.1995).

63 Xinhua News: He Jiankui jailed for illegal human embryo gene-editing, 30 Dec. 2019, http://www.xinhua.net.com/english/2019-12/30/c_138666754.htm (assessed Feb. 15, 2021).

64 Former ethics committee member of Shenzhen Hemei Women's and Pediatric Hospital: the signature of the examination application may be forged [Chinese], wxn.qq.com (last visited on April 26, 2021).

65 CCTV News: Establishing National Science and Technology Ethics Committee, <http://m.news.cctv.com/2019/07/26/ARTIjgtDRJqLcUmEO4EgQ54k190726.shtml> (last visited on April 26, 2021).

66 Sharona Hoffman & Jessica Wilen Berg, *The Suitability of IRB Liability*, 67 UNIVERSITY OF PITTSBURG LAW REVIEW 365 (2005).

duty, or laws and regulations should provide them with additional affirmative defenses to lawsuits against their review work as discussed by professionals in the U.S.⁶⁷ If there are no such safeguards for the IRB members, threats of lawsuits will have a chilling effect on the behavior of the IRB members. They would take defensive tactics as responses to minimize their legal risks, including withholding approval from risky research that might otherwise be approved, requiring researchers to submit additional documents or increasing oversight activities that might otherwise be unnecessary, all of which may have a detrimental impact on the progress of biomedical research.

The CBL and related regulations place much emphasis on liabilities regarding the abuse of power by an IRB members and show less concerns about an appropriate balance between their liabilities and protections. The current ambiguity on the liability regime could deter those who consider becoming IRBs' members in the future or hasten the resignation of those already in place, because of the fear that such tasks will expose them to individual liabilities.⁶⁸ This issue is an on-going concern about the effectiveness of the IRB-based governance in China.

When the IRBs are delegated with such wide range of authorities in the regulatory framework on bioethics, it is risky to lay blind faith in the IRBs without taking into account those aforementioned issues.⁶⁹ More empirical evidence of the IRBs performance in China is needed for further measures to ensure that the IRBs themselves act in an ethical and effective manner.

V. CONCLUSION

Taking into consideration that emerging biotechnologies constantly push the boundaries of ethical standards and moral acceptance, the CBL employs an adaptive framework of bioethical governance in China, based upon the facts that it cannot anticipate and address all of the possible scenarios in bioethics from biomedical research. However, such an adaptive approach poses unique challenges to the medical institutions in the implementation of the CBL, particularly the operation of IRBs. As the core mechanism to protect human subjects in biomedical research, the IRBs may either facilitate or impede the implementation of the CBL that could influence the progress of biomedical research in China. At present, some important issues on the operation of the IRBs are not clearly articulated. More measures need to be taken to (i) clarify the legal status of the IRB review decision, and (ii) to balance the liabilities and protections of the IRB members to ensure that they conduct the review in an ethical and effective manner.

As a response to biosecurity and biosafety issues in China, the CBL reflects a trend towards using law to regulate the bioethical issues in this field. For reasons identified above, we would like to see that the CBL could not only function as a coordinator with other existing laws and regulations on biosecurity and biosafety, but also substantially strengthen China's capacity to participate in the global governance on biosecurity and biosafety.

67 David B. Resnik, *Liability for Institutional Review Board*, 25 J LEGAL MEDICINE 131–184 (2004).

68 Steven Shavell, *Strict Liability versus Negligence*, 9 THE J LEGAL STUDIES 1–25 (1980).

69 Sharona Hoffman, *Continued Concern: Human Subject Protection, the Institutional Review Board, and Continuing Review*, 68 TENNESSEE LAW REVIEW 725 (2001).

Biosecurity and biosafety have become an important part of national and world security. While each nation ultimately has the authority to regulate activities under its jurisdiction, many issues arisen from biomedical research are shared among all nations. The international community should strive to harmonize or establish norms acceptable to all of them, in order to discourage unacceptable activities in this field while advancing human health and welfare.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.