

Ethics, equality and artificial intelligence

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Abstract

Artificial intelligence brings profound changes to society, whether social, economic, or cultural, with important repercussions on universally shared ethical principles such as freedom, privacy, equality, and non-discrimination, especially in the health sector. While its development can generate economic growth, it can also exacerbate the vulnerability of various groups, such as women, older adults, or people with disabilities, as a result of misinformation or algorithmic biases. This article analyzes the most relevant existing legal instruments that frame artificial intelligence as a tool for promoting equality and general inclusion and concludes that holistic strategies must be promoted to put the opportunities generated by it ahead of the risks.

Keywords: Bioethics. Ethics. Artificial intelligence. Human Rights. Public nondiscrimination policies.

Resumo

Ética, igualdade e inteligência artificial

A inteligência artificial traz profundas alterações à sociedade, sejam sociais, econômicas ou culturais, com importantes repercussões em princípios éticos universalmente partilhados, como liberdade, privacidade, igualdade e não discriminação, em especial no setor da saúde. Se por um lado seu desenvolvimento pode gerar crescimento econômico, por outro pode agravar a vulnerabilidade de diversos grupos, como mulheres, idosos ou pessoas com deficiência, em decorrência de desinformação ou de vieses algorítmicos. O artigo analisa os mais relevantes instrumentos legais existentes que enquadram a inteligência artificial como ferramenta de fomento de igualdade e de inclusão geral e conclui que é preciso promover estratégias holísticas para colocar as oportunidades geradas por ela à frente dos riscos.

Palavras-chave: Bioética. Ética. Inteligência artificial. Direitos humanos. Políticas públicas antidiscriminatórias.

Resumen

Ética, igualdad e inteligencia artificial

La inteligencia artificial conlleva profundos cambios en la sociedad, ya sean sociales, económicos o culturales, con importantes repercusiones en principios éticos universalmente compartidos, como la libertad, la privacidad, la igualdad y la no discriminación, especialmente en el sector salud. Si, por un lado, su desarrollo puede generar crecimiento económico, por otro, puede agravar la vulnerabilidad de diversos grupos, como las mujeres, las personas mayores o las personas con discapacidad, a consecuencia de la desinformación o los sesgos algorítmicos. Este artículo analiza los instrumentos legales más relevantes y que enmarcan la inteligencia artificial como herramienta para promover la igualdad y la inclusión general, y concluye que es necesario promover estrategias holísticas para anteponer las oportunidades que genera a los riesgos.

Palabras clave: Bioética. Ética. Inteligencia artificial. Derechos humanos. Políticas públicas antidiscriminación.

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Artificial intelligence (AI) has revolutionized everyday life by automating tasks, increasing productivity, and introducing new ways of working—albeit while also eliminating certain jobs—with tremendous potential for economic growth. In medicine and other health care professions, this evolution is also anticipated. This is no different from past technological revolutions: the First Industrial Revolution, around the eighteenth century, with the introduction of machines to replace manual labor; the Second Industrial Revolution, in the nineteenth century, with scientific advances such as the telegraph and electrification; the Third Industrial Revolution, in the twentieth century, with the transition of industries to information technologies, especially computers and the internet; and, finally, the Fourth Industrial Revolution, which we are currently experiencing, with rapid technological advances. Any such revolution caused profound transformations in societies and demanded that people and entities adapted to a new reality.

However, specific measures are necessary to counterbalance the potential negative effects of AI on society, as, depending on the measures created, it can either create or intensify inequalities or foster inclusion. It is essential to turn AI systems into inclusion tools, which is achieved by acting on the creative side, from the creation to the implementation of the system base, and on the citizen side, from the youngest to the oldest, who need to understand how AI works and is implemented. Therefore, it is crucial to invest in education and training for new technologies and thus address risks to the population, such as disinformation. Literacy in artificial intelligence, especially in generative artificial intelligence (GenAI), is essential.

In fact, disinformation is considered the major short-term threat to any society and can jeopardize a country's democratic process by causing mistrust and polarization and undermining fundamental human rights such as the right to health. For example, the European Union saw an almost 1,000% increase in measles cases between 2023 and 2024 due to disinformation on the benefits of vaccination. In medicine, disinformation can have a dramatic effect by inducing patients to diagnoses and treatments with no scientific proof. This phenomenon—albeit not novel—

is exacerbated by the rapid exchange of information provided by the new technologies, namely social networks. If AI can generate fake content that no one perceives as fake, how can one trust the information transmitted by communication media?

Thus, national and international legislation becomes fundamental to establish the minimum ethical guidelines and requirements that AI systems must comply with so the population is protected. However, the legislation needs to be properly implemented and monitored so potential transgressions are more easily detected. The rapid technological progression also requires the legislation to keep pace, which can be particularly difficult; however, there must be constant adaptation, and cybercrime punishment must be reviewed with a view to safeguarding people.

Initially, this article lists the negative effects of the progress of artificial intelligence; then, it addresses its potential, including as a driver of inclusion considering universal bioethical principles; and, finally, it discusses the legislation introduced in this context, both nationally and internationally, focusing on Portugal and Brazil and on the ethical principles specific to AI, which should always be preponderant.

Generative artificial intelligence as a driver of inclusion

Technological revolutions give rise to transformations in societies at the most diverse levels, with both positive and negative repercussions, whose weight depends on the measures implemented. If, on the one hand, inequalities and social exclusion can be intensified, on the other hand, equality can be attained in various spheres. The case of new digital technologies—namely artificial intelligence—is no different; however, AI engenders new negative effects that must be prevented, which are visible in the social, economic, political and cultural fields and affect the entire population. Newfield¹ mentions six potential issues associated with AI systems:

1. social biases (mainly related to ethnicity and gender);

2. opacity (users are unaware of how results are generated);
3. coercion (algorithms and data are controlled by creators and platforms, not users);
4. systemic privacy violations (AI relies on access to big data, often from diverse sources and which may contain personal information);
5. absence of academic freedom as to research in companies (commercial objectives can influence results);
6. the term “intelligence” distorts the actual status and effects of these systems (there is potential for misuse and the systems themselves indicate that they have flaws).

Therefore, it is necessary to consider the socioeconomic changes that the most diverse segments of the population can undergo. AI-enabled automation will lead to the replacement of certain tasks and increase productivity, with significant economic growth expected. It is recognized that AI will render a number of jobs obsolete and revolutionize most, if not all, of the economic sectors, as in previous technological revolutions. In more advanced economies, an impact on about 60% of jobs is expected and, in emerging markets and less advanced economies, the impact will be less significant, 40% and 26%, respectively². Women are also estimated to be more affected than men—about 21% of women—as their jobs are more susceptible to such impacts, such as jobs in the health care and education sectors, or administrative work³.

Moreover, cognitive skills could be impacted, as, *while generative artificial intelligence can improve worker efficiency, it can inhibit critical engagement with work and potentially lead to long-term over-reliance on the tool and impaired skills for independent problem-solving. Higher confidence in GenAI's capacity to perform a task is related to less effort as to critical thinking*⁴. Furthermore, it should be noted the potential social exclusion of the older population, since, as a rule, the younger generations exhibit greater aptitude to follow and adapt to rapid technological evolution. Whether in social interactions or access to services, older people may face increased difficulty—and even

segregation—as interactions become more technological, especially those who live in areas without internet or with deficiencies in this service.

The latest digital transformation has engendered another major risk to society: the rapid transmission of false information, also known as disinformation and misinformation. It is necessary to distinguish disinformation from misinformation. Both refer to false information; however, the first is not necessarily intended to deceive, whereas the latter is intended to manipulate. Thus, throughout the text, the term “disinformation” will be used to refer to false information, since the reasons behind its transmission are not known.

In fact, currently there has been increasingly more disinformation, generated with the consumption and immediate spread of information in communication media, namely social media, with potential to undermine democratic systems. This is no novelty, since misinformation campaigns constituted a technique widely adopted by the United States of America and the Soviet Union during the Cold War⁵. Still, facilitated propagation of false content—whether intentional or not—makes the manipulation process more dangerous than ever. And social media are extremely important in the democratic system to hold accountable and criticize the political system, a power with which comes the responsibility for demystifying potential false information and help the population to distinguish the truth. Technology is not deleterious in itself; it is the way people use it that can cause harm.

The World Economic Forum, in its 2024 *Global Risk Report*⁶, identified disinformation and misinformation as the major short-term (two-year) risk to humanity, emphasizing three aspects:

1. Over the next two years, misinformation and disinformation could radically disrupt electoral processes in several economies.
2. A growing distrust in information, as well as in social media and governments as sources, will deepen the polarization in opinions—a vicious cycle that could trigger civil unrest and possibly confrontation.

3. There is a risk of repression and erosion of rights as authorities crack down on the proliferation of false information, and risks arising from inaction.

Nevertheless, the potential of new information and communication technologies (ICT), driven by AI, are also vast and can constitute a means of inclusion, especially for women⁷⁻⁹. In fact, access to education has become simpler thanks to the availability of a range of resources to expand knowledge, from online courses to distance learning programs¹⁰. There is also increased possibility of economic empowerment through the creation and development of businesses on digital platforms and online markets, which create new employment opportunities and facilitate work-life balance, particularly for women, who traditionally assume greater responsibility for home and child care. Flexibility at work—for example, with remote work—gave them greater balance.

In addition, new digital tools enable greater political involvement and participation, especially social media platforms, which can create viral content, that is, that reaches a large part of the population. As for health and wellbeing, ICTs can significantly contribute toward improving women's access to health care and provide greater well-being-related self-care.

Obviously, this requires the mitigation of harmful effects, both on the user's side and on the side of the creator of the technology itself. Firstly, considering the recipient of the content, it is necessary not to leave out any generation, from the youngest to the oldest. Educating about AI, its risks and potential is key. This should occur at school, in order to make young people aware of the new reality, but also in education for older people, who may not have as much ability to deal with new technologies. Lifelong learning is indispensable to provide new skills and thus facilitate adaptation to the new reality. For example, there are online games that didactically encourage the use of AI, such as "bad news", which *exposes the manipulation tactics and techniques that are used to deceive people and build followers (...) playing creates cognitive resistance against common forms of manipulation that the user may find online*¹¹ and which is used

by some countries in the European Union to teach young people to detect fake news.

In Portugal, a pilot project was created in schools to foster the teaching of programming, robotics and other subjects related to artificial intelligence¹². In Brazil, there are schools that already successfully use AI in various pedagogical activities, but unequal access to technology between schools with more and less resources (for example, with regard to technological infrastructure) hinders the dissemination of the potential of AI among students¹³.

In the specific case of women, there is still a large gap regarding the existence and participation in the STEM fields (science, technology, engineering and mathematics), that is, those more related to technologies. As inequalities already exist in the original design of new technologies, the very pieces of software are expected to present gender biases and not be as sensitive in this regard as they could be if more women were involved in their design and development. Therefore, it is necessary to attract more women to these scientific fields. In fact, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has been alerting to this fact and has developed a series of recommendations to incorporate the gender perspective into AI, especially to *establish a basic understanding of the imperatives of gender equality and how AI, as a socio-technical system, can reinforce or challenge inequality. (...) Ensuring that gender equality is understood in terms of addressing harms by increasing the visibility of AI's gender implications and fostering positive applications of AI and beneficial impacts on women's empowerment*¹⁴.

Generative AI can be a tool to drive women inclusion in the STEM areas due to its interdisciplinary application, ease of use and social benefits; according to the United Nations, *through specific policies and initiatives geared toward improving women participation and leadership in GenAI—such as mentoring programs, equitable financing and advocacy for gender-inclusive political reforms—significant progress can be made towards achieving the objectives of Sustainable Development Goal 5 (SDG)*¹⁵,

that is, to achieve gender equality and empower all women and girls¹⁶.

Although there is a focus on women here, it has to be mentioned that other minority groups and especially vulnerable groups may suffer inequalities in this context. As previously demonstrated, all citizens—regardless of certain characteristics, such as gender, ethnicity, disability, age or place of origin—can make a valid contribution to society if properly integrated into the social and productive fabric¹⁷. Apropos, this is in line with the international doctrine of human rights that most civilized countries have adopted^{18,19}.

It is noted the enormous interdependence between the classic principles of bioethics—respect for autonomy, beneficence, non-maleficence and justice—and the implementation of an inclusive and trustworthy artificial intelligence. Bioethics respects life and love for the vital phenomenon. If human dignity is the pillar of modern bioethics, the protection of other forms of life, including the environment and biodiversity, must also be highlighted. The very concept of inclusion should be revisited considering these principles, because a society can only be inclusive in the future if it is economically and environmentally sustainable.

On the other hand, true inclusion, that is, the inclusion of all in a modern and advanced society, presupposes individual freedom. In health care, the exercise of autonomy is manifested, for example, in informed consent. Inclusion without autonomy is meaningless, and autonomy without inclusion is inconsequential. In turn, beneficence and the correlative non-maleficence are the moral foundation of human action. The full inclusion of women, older adults, people with disabilities, and others in society must stem from good intention and human and solidarity motivations, rather than just from a social contract. Whether established by law or convention, it is always more utilitarian than benevolent.

In turn, the complex bioethical principle of justice finds in inclusion its broadest expression²⁰. The ethics of justice is the ethics of equal opportunity. That is, equality in bioethics is to

ensure everyone effective social and economic opportunities to develop individual talents, hence it is deduced that there is only true equality of opportunity if access to health care, education, vocational training or social protection in old age and disease is accompanied, in the contemporary digital society, by genuine digital inclusion. From a bioethical point of view, equality of opportunities is an instrument for self-fulfillment; or, in the view of Amartya Sen²¹, for the development of the full potential of the human person, of their most advanced capacities, which can only be expressed in an economic and social environment that promotes inclusion.

When stated that AI systems must be more inclusive, it refers to inclusion of all people, regardless of gender, social class, ethnicity, type of disability, among others, because any AI system that is not inclusive can be quite harmful, and *the most serious impacts include material damage to users of these systems, whether unjustified bad credit ratings, reduced education and employment opportunities, inaccurate medical diagnoses, or unjustified criminal detentions*²².

In fact, it has been found that certain AI systems, as they are based on data that carry biases of origin, even if unintentional, perpetuate and even intensify the inequalities present. This is what happened, for example, at the company Amazon, which used an AI system to recruit new employees in order to automate the process and pre-select them and ended up discriminating against female candidates, as the tool:

*was designed based on the standards of resumes sent to the company in the last ten years. In the vast majority, these resumes were from men, as is the case in most of the technology industry, and thus male candidates were considered naturally more suitable for the jobs. A simple mention of the term women in the resume was penalized by the tool and reduced the chances for the job*²³.

That is, as the system learned to make basic distinctions without considering why, the discriminations felt in the past were exponentiated in the present. Therefore, the human being must be at the center of the

ethical principles of AI and integrated in all phases of the process of designing and developing these systems, so there is true respect for the human person, regardless of specific characteristics.

Rise of legislation on artificial intelligence

Now addressing the side of the creators of the technology itself or of content—for example, of AI-generated videos and images or conversation chatbots in health care—it is necessary that they follow the guidelines established in the national and international regulations so there is greater transparency and accountability. At the European Union (EU) level, the Artificial Intelligence Regulation was created in 2024—the first international regulation in this field—which is based on the risk that a given AI system creates for people and society. That is, if it goes against EU values, this system will not be allowed. The new law established that people:

who use an AI system to generate or manipulate image, audio or video content whose considerable similarity to real people, objects, places, entities or events may lead a person to mistakenly believe that they are authentic or true [deep fakes] must also clearly and perceptibly reveal that the content has been artificially created or manipulated, identifying the AI results as such and disclosing their artificial origin²⁴.

Such rule is quite relevant, given the proliferation of deep fakes, with incredibly negative effects on the lives of the people they impersonate. There are several famous individuals, such as artists and politicians, who have suffered this type of attack, and it is often extremely difficult to distinguish whether the content is real or fictional.

Hence the importance of platforms having means to detect if content was created artificially, because, if there is malicious intent by the creator, no principles will be respected. Thus, there is currently the development of software that detects false content, but it will also be necessary to follow the advances in the aspect

of content creators, that is, technologies on both sides must be consistent. Surprisingly, some deep fakes occur in medicine; there are documented cases of deliberate CT or MRI image alteration with real impact on people's health and life.

In 2024, Brazil saw the approval of Bill 2,338, of 2023²⁵, which regulates AI and provides for a risk-based assessment of AI systems. This document establishes:

the human being as the principle “of all things,” in the centrality of decisions [and] prohibits the evaluation of personality traits and behavioral characteristics to predict the commitment of crimes. It prevents the classification of individuals based on their social behavior or personality to determine, illegitimately and disproportionately, access to goods, services and public policies²⁶.

As for artificially generated content, it is quite clear as to the non-instigation of damage and the verification of its authenticity and origin.

The consequences of not regulating AI systems are immense, which has been proven by recent cybercrimes, especially those against women, with a higher occurrence of *image-based sexual violence, colloquially known as revenge porn²⁷*. This is the case of sexual deep fakes, which, depending on the country and its gender relations (for example, if they are more or less conservative), can have disastrous repercussions for women, such as job loss, family disown, and subsequent mental health problems.

The European Union (EU) Directive 1,385/2024²⁸, on combating violence against women and domestic violence, criminalizes this type of digital crime. In Brazil, a bill was approved in 2024 to punish digital violence against women, which will be inserted in the Maria da Penha Law—Law 11,340/2006²⁹—which aims to eliminate domestic and family violence against women³⁰. The advances observed in legislative matters show the importance of keeping consistency with technological progress. Therefore, it is necessary to properly implement and monitor the laws to identify potential transgressions.

In an attempt to enhance the ethical principles specifically applied in a trustworthy AI,

the European Commission, in 2019, created the independent High-Level Expert Group on Artificial Intelligence³¹, which set out seven essential ethical criteria:

1. human agency and supervision;
2. technical robustness and security;
3. data privacy and good governance;
4. transparency;
5. diversity, non-discrimination and justice;
6. social and environmental well-being;
7. accountability.

The general application criteria are intended to ensure that AI is designed and applied in a way that promotes diversity, non-discrimination and fair distribution of the burdens and benefits of its use. The World Health Organization (WHO) also addressed the importance of ethical and inclusive governance of artificial intelligence³², now specifically in health care, emphasizing the need to:

1. protect autonomy;
2. promote human well-being, human security and the public interest;
3. ensure transparency, explainability and intelligibility;
4. promote responsibility and accountability;
5. ensure inclusion and equity;
6. promote responsive and sustainable artificial intelligence.

The first international treaty at the level of the Council of Europe was created in 2024—the Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law—which is legally binding and open to countries outside Europe. It specifies the ethical principles that all AI systems must follow in the respective life cycle³³:

1. human dignity and individual autonomy;
2. equality and non-discrimination;
3. respect for privacy and protection of personal data;
4. transparency and supervision;
5. responsibility and accountability;
6. reliability;
7. safe innovation.

It is noted that there is a well-founded concern of different international bodies to

ensure the reliability of AI and human control and supervision, as well as to ensure diversity and inclusion by promoting digital access and literacy for vulnerable groups, traditionally excluded, or at least disregarded, now with the generational aggravating factor. That is, it is important, from now on, to combat the “generational dividend” by including all generations and avoiding intersectionalities that aggravate exclusion.

However, there is growing notion that the simple enunciation of these and other principles is not enough³⁴. It is necessary, on the one hand, to promote intense education and training campaigns on AI and other digital skills in all age groups and social strata, and, on the other hand, to implement specific national and international regulation, including legislation that ethically frames artificial intelligence. For example, by ensuring “epistemic equality,” that is, that AI systems will not be developed in a way that favors certain ethical perspectives or knowledge systems to the detriment of others.

There must also be constant evolution of legislation and public policies so they remain consistent with technological developments and there is no discrepancy between the progress achieved—with the potential dangers that result from it—and measures to defend the human being. The punishment of discriminatory acts and digital crimes is fundamental to curb inhuman and excessive acts resulting from the use of AI systems.

These technologies should also be considered as to the positive aspect, that is, their contribution toward addressing inequality and exclusion. For example, people with disabilities can and should find in this broad set of technological innovations—which includes AI or biomechanical synthesis—the tools they need for becoming integrated into the social mainstream³⁵. In fact, technologies have always been an essential resource for overcoming a series of deficiencies and thus providing greater and better expression of personal identity and individual autonomy. Mechanical or electronic devices enable overcoming organic or functional disabilities manifested internally or externally in the human

body, but with major therapeutic value and enormous social inclusion³⁶.

In a medical or rehabilitation context, AI associated with this type of technology can be a factor that promotes inclusion and equality³⁷. It is not necessarily a matter of achieving a posthuman future long desired by humanity, but of generalizing and democratizing access to modern technological developments such as digital assistants, speech-to-text software, sign language avatars, advanced prosthetic limbs, sophisticated exoskeletons, or mental health support³⁸. All these developments promote equality and inclusion through a unique symbiosis and innovative design and enable new individual performance by attenuating different disabilities.

However, it is noted that, as for inclusion and equality, there are important intersectional risks that not only aggravate, but even potentiate inequalities³⁹, which can be exponentiated by AI if not detected and corrected. That is, the combination of already existing inequalities based on gender, ethnicity or disability may intensify previously existing vulnerabilities⁴⁰. In summary, and as noted by Francis Fukuyama, *humans have been prepared by the evolutionary process to be social creatures that naturally seek to integrate into an atmosphere of communal relationships*⁴¹.

AI should serve to deepen solidarity and social inclusion, not the opposite. In medicine and health care—where AI is especially sensitive—six additional ethical principles must be systematically considered for artificial intelligence to be considered trustworthy and, above all, for it to be under human supervision and in compliance with the Sustainable Development Goals: fairness, universality, traceability, usability, robustness and explainability^{42,43}. Only thus can every person be assured the legitimate right to an open future⁴⁴.

Final considerations

Artificial intelligence has immense potential, but its achievement so it benefits humanity and does not become predictable risks requires a concerted strategy to address various aspects,

from design to use, and thus make AI a true driver of general inclusion in the digital society and in access to health care. However, the challenge of creating specific mechanisms is complex and requires the involvement of several partners, especially in medicine, from government agencies to private companies. Training programs, access to digital resources for all people, implementation and monitoring of legislation are examples of measures that need to be implemented so inequality is not intensified in the new digital world, including in access to health care.

In fact, AI has potential to promote economic development and social well-being and translate into full human development for all citizens, in all societies. To this end, universal bioethical principles must be respected, especially in the design and implementation of the various artificial intelligence systems. Human presence (human in the loop) at all levels of AI implementation is the guarantee of respect for human dignity as a central pillar of contemporary bioethics, as well as for the inalienable principles of equality, non-discrimination, accountability and privacy, in addition to an autonomy that contributes toward people's self-actualization—rather than alienation. Equality means that every person should have access to digital inclusion, with no discrimination based on age, gender, income, disability or other condition. Autonomy implies that AI reinforces individual freedom, thus, in health care, enabling better-informed choices.

In health care, exercising the universal right of access to quality services implies that the main ethical and social threats identified in the generalization of AI—such as algorithmic biases, digital exclusion, intersectional risks, disinformation, and systematic privacy violations—are instantly detected, so the right to health is a reality and AI contributes toward its effective enjoyment. Using artificial intelligence to optimize hospital management and thus translate it into efficiency gains in resource allocation may be another means to improve access to health care and contribute toward inclusion.

However, all this potential of AI requires national and international regulatory frameworks to harmonize practices and promote citizen well-being. The European Union, through the Artificial Intelligence Regulation, approved in 2024, seeks to ensure that ethical and bioethical principles are not violated. To this end, risks in the use of AI are stratified into levels of operation, and individual privacy and personal data protection deserve special consideration in this legal instrument. Brazil follows the same line of action through Bill 2,338/2023, under analysis in Congress, which establishes ethical guidelines for AI development and application. These and other legal instruments seek to emphasize not only traditional bioethical principles, but also specific principles of a trustworthy AI, such as fairness, universality,

traceability, usability, robustness, accountability and the necessary explainability of how AI makes decisions and reaches conclusions.

In summary, for AI to be deemed trustworthy and an instrument for full human development, several aspects must be taken into account. For example, it should be considered that AI impacts all domains of human activity and influences all Sustainable Development Goals, which are closely related to bioethical principles; or that only with the collaboration of all agents involved can AI truly be a tool to help humans; and, finally, that equality as an intrinsic bioethical value can and must be achieved, so each individual, whether or not using AI, develops their capacities and achieves their full potential, thus accomplishing maximum self-actualization.

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Both authors contributed equally to the conception, development, writing and critical review of the manuscript, approved the final version and take on responsibility for the integrity of the content.

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