Algorithmic Opacity And Artificial Intelligence: A Legal Analysis From The Gender Perspective

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Abstract
This study analyzes the challenges posed to law, in particular to women's rights, by the algorithms produced by the rise of artificial intelligence tools, products, services and applications. The research problem is aimed at examining the impact that these systems generate for women's rights. The main objective is to determine whether the application of algorithmic biases generated by artificial intelligence constitutes some type of act of discrimination that violates the principle of equality and non-discrimination and how to mitigate the damage. The methodology used involves a hermeneutical design with a qualitative approach that does not use instruments as it is a dogmatic research. The results obtained confirmed the hypothesis that the exponential proliferation of products and services mediated by artificial intelligence generate biases that affect women's right to equality and that the regulatory framework is still insufficient despite progress in this regard. It is concluded that the existence of regulatory protection in the country and in the international regulatory system is necessary in order to avoid situations of defenselessness in the protection of women's fundamental rights as a result of artificial intelligence algorithms.

Keywords
Gender perspective, Artificial intelligence, algorithmic opacity, algorithmic transparency, women.

INTRODUCTION

The promises offered by the digital age seemed simple and very striking: technologies, tools and applications that would expand freedoms, improve access to information, facilitate inclusion, build a diverse model of citizenship, promote and guarantee new forms of political and social participation. But those promises, in practice, have been full of paradoxes and contradictions. There, where there should be more autonomy, it is possible to find greater control; where there should be inclusion, new forms of discrimination proliferated; Where neutrality was promised, deep biases emerged.

The exponential expansion of artificial intelligence systems in decisions that affect fundamental rights – especially for women, but not exclusively with respect to them – raises questions about substantial equality and non-discrimination. This study addresses this problem from a legal and gender perspective, focusing the analysis on the way in which AI algorithms operate as opaque regulatory structures that distribute opportunities and burdens in a differentiated way according to gender. The research problem is aimed at examining the impact that these systems generate for women's rights and determining whether the application of algorithmic biases constitutes acts of discrimination that violate the principle of equality enshrined in the Constitution.

The main objective is to identify the mechanisms by which algorithmic opacity makes it impossible to detect discriminatory patterns and to establish whether the international and Colombian regulatory framework offers sufficient protection against this emerging form of discrimination. The methodology used supposes a hermeneutical design with a qualitative approach that does not use instruments as it is a dogmatic research oriented to documentary, normative and jurisprudential analysis. The systematic interpretation of international normative instruments, documents of multilateral organizations and Colombian jurisprudential precedents is used, specifically the Constitutional Court ruling T-067 of 2025.

The analysis is structured in four sections: the first examines the relationship between algorithms and gender discrimination, identifying specific manifestations of bias in emotion recognition systems, virtual assistants and job selection processes; the second discusses the fundamental principles of AI and the four main sources of algorithmic biases ---training, design, proxy variables, and evaluation data---; the third develops the concept of algorithmic opacity and its contrast with the imperative of transparency as a right derived from access to information; and the fourth examines judgment T-067 of 2025 as a transformative precedent in terms of algorithmic transparency, analysing its implications from a gender perspective although the decision does not explicitly address this dimension. The hypothesis that guides the study argues that the proliferation of AI-mediated products and services generates biases that affect women's right to equality due to the underrepresentation of women in technological design, the opacity of algorithms that makes it impossible for citizens to control them, and the absence of robust regulatory frameworks that incorporate mandatory gender impact assessments.

1. Algorithms and women

Doctrine has proven that algorithms are far from neutral and, on the contrary, reproduce and amplify structural biases. It is possible to prove that the searches carried out on the internet are not a reflection of reality but amplify inequalities. When looking for images or information about some occupations, professions or trades, the results privilege male representations that reinforce stereotypes to the detriment of women and their possibilities of inclusion or consideration in some sectors of the market. We begin to talk about the so-called algorithmic

discrimination.(Martínez Navarro, 2025)(Guilbeault, Delecourt, & Desikan, 2025)(Lousada Arochena, 2024)

This circumstance, among others, occurs with emotion recognition systems that allow inferring or distinguishing emotions from a person's biometric data and that are widely used in various spaces. Since the 90's, research on automatic recognition of emotions has been initiated because, as Muñoz Ruíz points out, there are three possibilities of emotional expression that are considered suitable for automated detection. The first of them is facial emotion, the second is speech and the rest, multimodal emotion (a combination of the first two). The analysis of them, and especially of the former, constitutes an essential source of information against which the legal system offers some protection measures. For example, the European Union's Artificial Intelligence Regulation (RIA) (2024/1689), of 13 June 2024, introduces this concept to establish some protection mechanisms.(2024)

Several studies have proven that these technologies tend to classify women as "happy" or "emotional" and men as "serious" or "determined". This circumstance, for practical purposes, means that, based on the biometric data[4] It is possible to make inferences about a person that condition expression and restrict it so that people, especially women, avoid being classified as "sensitive", "incapable of handling pressure", "uncooperative". Recital 18 of the RIA already points out that emotions can be classified as "happiness, sadness, indignation, surprise, disgust, haste, enthusiasm, shame, contempt, satisfaction and amusement", but physical states such as tiredness or pain "that may have an impact on the manifestation or expression of emotions" are excluded and neither does it consider the detection of expressions or movements that can be considered obvious as "expressions basic facials, such as a frown or smile; gestures such as the movement of hands, arms or head, or characteristics of a person's voice, such as a raised voice or a whisper".(Parlamento Europeo; Consejo de la Unión Europea, 2024)

Just to consider a circumstance in this regard, the voice assistants Siri, Alexa, Cortana and Google assistant opt for female voices because people perceive women or female voices as more helpful and pleasant. The choice was not a matter left to chance. A circumstance that constitutes a mechanism that perpetuates the role of women as caregivers or assistants. A role that has not traditionally been assigned to the male gender. The roles and functions that have been socially assigned to women are usually subordinate and receive less recognition than someone of the male gender. Notwithstanding this issue, women represent just over half of the world's population. A percentage that has historically been excluded from science, technology and certain trades and occupations. (Vilà Calvo, 2021)(Coromina, 2024)

And an additional problem is generated when these perceptions are mediated by biased algorithms that generate a substantial impact on aspects such as equal access to employment, a dignified life and justice. Society is facing an explosion of data in the face of which emotionality plays a significant role that forces us to think about a fairer and more inclusive AI, especially in the face of historically marginalized communities or groups such as women. And one of the most relevant issues, which needs to be reviewed, are gender biases. When artificial intelligence is used, its products, as previously warned, are not targets. As it happens with the decisions made by human beings that are not totally objective, nor informed because beliefs, prejudices, previous experiences play a fundamental role in the behavior and

[4] The RIA points out that biometric data generate automated recognition of physical, physiological or behavioral physical characteristics. That is to say, the face, the voice, the intonation, the way of walking among many others are data of this type. In a strict sense, each human being is a mine of biometric data that feeds artificial intelligence systems. The question, among others, is how to obtain effective protection of this data? Today, it is possible to speak of the right to image and the right to voice as autonomous rights (Trujillo Cabrera, 2024)

deliberative process of people. And, AI algorithms are programmed by humans with this feature. The question could then be thought of in terms of: how to guarantee the non-reproduction of biases – conscious or unconscious – in programming?(Morais da Rosa & Guasque, 2024)(Corvalán, 2018)(Kahnmena & Tversky, 1979)

2. Biased algorithms

The necessary revision of algorithms requires mentioning the four basic principles of AI: doing good (beneficence), doing no evil (nonmaleficence), human action (respect for the self-determination of subjects) and justice. That's why transparency is essential to preach trust in AI. When there is transparency, Cotino Hueso points out, it is possible to control errors and discrimination in addition to public and private algorithmic biases. (Cotino Hueso, 2023)(2022)

When talking about artificial intelligence, it is imperative to turn to algorithms that allow you to discover patterns in data, make decisions and solve problems based on a set of instructions. The various AI models work from algorithms that generate answers thanks to a programming process of the technological tool. The point at this point is that algorithms can lead to decisions that, at times, promote or perpetuate inequality and discrimination. And they can cause bias for four fundamental aspects: biased training data, biased algorithm design, biased proxy data, and biased evaluation data. It should be borne in mind at this point that algorithms are mostly designed by men (programmers, developers and operators). Biases can be diverse and due to issues of gender, race, sexual orientation, sex, among others, generating serious effects for the affected groups or groups. In the case that is of interest for this article, gender bias will be the one in which further analysis will be made. (Felzmann, Fosch-Villaronga, Lutz, & Tamò-Larrieux, 2020)(Jonker & Roger, s.f)

When these biases are present, there are substantial effects on the fundamental principles of AI, taking into account the effects that their concurrence generates. For example, when talking about the data with which algorithms are trained and enriched, an overrepresentation of men is noticed. As de Ortíz de Zárate Alcarazo warns, in the case of facial recognition systems, while white men, by 2014, were recognized with 100% effectiveness, the percentage was reduced to 35% in the case of racialized women. And this seems to be due to the fact that in the process of training the system the data came mostly from images – photographs and videos – of white men. (2023)

Another example is the technical personnel selection system implemented by Amazon, through an AI system, in 2018 and subsequently suspended because most of those selected were men. Such a circumstance from the outset is not condemnable, the problem lies in the fact that the tool had been trained with the CVs of people who had participated in previous selection processes and who were mostly men due to the fact that, in the technology sector, there is a majority presence of them. This circumstance discriminated against women. (Araya Paz, 2021)(Morales Ramírez, 2023)

It should be noted that the underrepresentation of women in the design and programming of AI tools, product applications, and services is the main cause of gender bias. This condition – underrepresentation – is also due to the fact that women make less use of the Internet because, as Sandra Harding points out, there is a profoundly androcentric vision in the traditional division of leisure time vs. work. Added to this is the issue that women are not equal to each other, so bias is intensified by ignoring race subdivisions and minimizing the inclusion of a broader representation of phenotypic and demographic representation in image data. In addition, it is essential to guarantee the active participation of women in the design and control of these technologies. It is not enough to superficially investigate social organizations, it is

necessary to incorporate the experience of diverse women – rural, urban, indigenous, Afro-descendant, with disabilities – in all phases of the technological cycle. This circumstance reduces the possibilities of discrimination and underrepresentation.(1996)(Buolamwini & Gebru, 2018)(Toupin, 2023)

3. Opacity, black boxes, and algorithmic transparency

A considerable factor in the analysis of these issues lies in the problem of opacity. As de Luis García points out, one of the main issues with AI is the opacity of algorithms. This refers to the absence of transparency of the same, the absence of information, clarity regarding it, of the programming, etc. that allowed to arrive at a certain result. The problem is that if people are unaware of the process, they cannot challenge it properly. Algorithmic black boxes then emerge in which it is possible to know results but the criteria, processes or path are unknown because they are invisible to the user. Or, on some occasions they are usually visible but the technicality is so complex that understanding is impossible for a large percentage of the population. We then speak of explainability. And, in addition, due to regulatory provisions, it is not possible to access this information due to copyright or derivatives of industrial property -such as trade secrets-, contractual restrictions, among others. The above is opposed to white box systems in which explainability emerges as a property or characteristic of the system that allows an explanation of its actions to be generated with understanding by people. (2023) (Pérez-Ugena & María, 2024)(Azuaje Pirela, 2023)(Barbiero, y otros, 2022)

Such opacity generates a detriment of basic fundamental rights. In the case of women, they may notice how a subsidy or credit is denied to them by an institution without knowing why or why they were not chosen for a job. And, not knowing why, they do not have the tools to challenge the decision or access reparation. They also don't know the process behind the decision, which, in many cases, could be biased by the algorithm.

It is here that the notion of algorithmic transparency emerges as a right that derives from access to information. And it is not a theoretical claim, but a guarantee that is increasingly recognized in legal systems. It has been proven that the construction of an adequate regulatory framework is not limited to the response to current or present technological developments – a regulation focused in the form of rules or implementation mandates – it requires a regulation defined through principles – optimization mandates – and values that guide the development of AI. And these general principles must emphasize values such as transparency, non-discrimination, protection of personal data and human dignity. A regulatory system in which the approach is not punitive or punitive but preventive, mitgatory, explainable and transparent. With regard to transparency, its concurrence must be a fundamental aspect that allows the prevention, correction and adjustment of biases. Hence the need for regulation. (Concha Camacho, 2024) (Nemitz, 2018)(Ordeñana Sierra & Vera Pinto, 2025) (Boix Palop, 2020)

The Recommendation on the Ethics of Artificial Intelligence adopted by UNESCO on 23 November 2021 places algorithmic transparency as a structural element to ensure that the use of automated systems does not result in infringements of fundamental rights. This approach goes beyond the informative conception of transparency and projects it as a requirement of intelligibility and control, aimed at allowing decisions mediated by algorithms to be understood, evaluated and subjected to legal scrutiny. Information is not enough if it involves such a degree of complexity or unintelligibility that makes it impossible for individuals to understand the process and its dynamics. The central concern is that systems based on machine learning operate from statistical patterns that can incorporate historical distortions and persistent inequalities, which, if not identified, tend to reproduce silently and systematically resulting in discrimination. In this context, transparency becomes a necessary condition for

detecting and correcting unjustified differentiated treatment, especially those that affect traditionally vulnerable groups. From this perspective, UNESCO raises the need to incorporate human oversight mechanisms, preventive impact analyses and clear institutional responsibilities, so that the use of artificial intelligence does not replace normative deliberation or displace the centrality of human dignity. Algorithmic transparency is therefore not understood as an accessory element, but as an indispensable instrument that makes it possible to ensure that technological innovation remains compatible with the principles of equality, justice and effective protection of rights.

Subsequently, in 2023 and within the framework of the G7, the so-called "Hiroshima AI Process" was produced, from which the "Hiroshima Code of Conduct" was derived, which incorporates a pragmatic approach to the international governance of artificial intelligence by placing transparency as a functional element for the protection of rights and the reduction of systemic risks. The difference is that this process conceives transparency as an operational practice that requires developers and providers of advanced systems to report in an understandable way on the capabilities, limits and possible impacts of their models. Openness about the operation and risks associated with AI is not only intended to generate public trust, but also to enable effective forms of social, technical and legal control. He then understands the need to generate processes that involve various sectors and, consequently, empower AI algorithms. In particular, the emphasis on early identification of risks and continuous evaluation of systems seeks to prevent implicit biases in data or models from translating into persistent discriminatory treatment. From this perspective, transparency is articulated with responsibility, insofar as it allows decisions to be attributed, failures to be detected and corrections to be demanded before the damage is consolidated. The Hiroshima Process proposes governance based on accessible information, human oversight and constant review, aimed at ensuring that the deployment of artificial intelligence does not harm principles of equality and justice, but is subordinated to them.(Habuka & Socol de la Osa, 2025)

In 2023, the European Parliament, together with the Council and the European Commission, issued the European Declaration on Digital Rights and Principles for the Digital Decade. It proposes an understanding of technological transformation in which the person is not an input of the digital system, but its center and reason for being. From this perspective, artificial intelligence and algorithmic systems must be developed and used in a manner compatible with human dignity, equality and effective respect for fundamental rights. The document is based on the premise that the digital environment is not neutral and that automated decisions can generate significant impacts on freedoms, opportunities and life expectancies.

For this reason, the Declaration underlines the need for people to retain the ability to understand, choose and control over technologies that influence their behaviour or access to goods and services. This approach is especially relevant in the face of the risks of bias and algorithmic discrimination that occur when systems reproduce pre-existing inequalities. By reaffirming the centrality of transparency, accountability and human oversight, the Declaration sets up a framework that seeks to prevent technological efficiency from imposing itself on material justice. In this sense, the European text offers a normative and ethical guide to guide the design and use of AI towards socially legitimate ends, ensuring that digital innovation remains subordinate to the protection of rights and equal treatment in increasingly automated contexts (Álvarez Robles, 2024)

Finally, in the European framework, the Artificial Intelligence Regulation -2024/1689-, of June 13, represents a change with respect to the way in which the law addresses the power asymmetries inherent in algorithmic systems. While traditionally the legal system understood

discrimination as an act carried out by identifiable human agents, this norm implicitly recognizes that algorithms operate as opaque normative structures that operate as distributors of opportunities and burdens in a differentiated way, depending, on occasion, on gender. The regulation sets out a mandate for algorithmic transparency that should be interpreted not as a simple procedural requirement for technical documentation, but as a substantive imperative aimed at dismantling the traditional forms of exclusion that perpetuate gender subordination. Article 10 of the AI Act sets out specific requirements for data governance and management, including the obligation to examine training data for potential bias. In this regard, Xenidis points out that transformative positive action measures are necessary to address structural algorithmic discrimination, given that AI systems frequently reflect male-dominated norms due to biases in training data. However, the Regulation experiences tension with respect to the principle of protection of sensitive personal data and the mandate of the need to process information on gender to detect and correct systemic biases. (Xenidis, 2021) (Pfeiffer, y otros, 2023)(Lütz, 2024) (2021)

The absence of specific provisions on gender equality in the articles of this normative provision, beyond general mentions in recitals, contrasts with the obligation in Article 10(3) that training, validation and testing datasets have appropriate statistical properties in relation to the persons or groups of people on whom the high-risk AI system is intended to be used, without specifying gender-disaggregated criteria of representativeness (Regulation (EU) 2024/1689, art. 10(3)). This article expressly states that "training, validation and testing datasets shall be relevant, sufficiently representative and, to the greatest extent possible, error-free and complete in view of their intended purpose. They shall also have appropriate statistical properties, for example, where appropriate, with regard to the persons or groups of persons for whom the high-risk AI system is intended to be used." The wording raises the need for data to be representative (which, in a generic way, means reducing the underrepresentation of women's data) but restricts it to high-risk AI systems (Chapter III Section I Article 6).

In the case of Colombia, the regulatory framework is still incipient. And, a fundamental issue must be taken into account: according to the National Administrative Department of Statistics (DANE), by 2024 only 65% of households have an internet connection and the situation worsens in the rural sector where only 59.6% have a connection. Despite the low percentage, it is important to think about the need for regulation, taking into account that more than 51% of the Colombian population are women. Three bills have been presented that have not been approved as a law of the Republic on artificial intelligence, so the regulation has been produced through principles that have not necessarily been considered for this type of problem, so the adaptation of them occurs through interpretation exercises by the authorities with competences related to the subject. (Ministerio de salud y protección social, 2024)(Alvaréz García & Tahiri Moreno, 2023)

4. Judgment T-067 of 2025 and algorithmic transparency

Ruling T-067 of 2025 of the Constitutional Court of Colombia is a milestone regarding algorithmic transparency in the country. The decision recognizes the fundamental right of access to the source code of state applications, establishing that the automated decision systems developed by the State are subject to citizen control and scrutiny, taking into account that data that may affect fundamental rights is processed (Constitutional Court of Colombia, 2025) and is also financed with public resources. This is a clear demarcation with respect to other types of AI products or systems in which they do not concur. And although the decision focuses on the particular analysis of a citizen's access to the CoronApp application developed during the COVID-19 pandemic to track public health data, the ruling merits special analysis

from a gender perspective. The Constitutional Court identifies algorithmic opacity as a barrier to the effective exercise of the right of access to public information and orders the disclosure of the source code of this application by specifying that such opacity constitutes an obstacle to democratic control - a fundamental principle of a social state of law - and accountability - typical of a democratic state. (Moncayo-Vives, Ros-Medina, & Mayor Balsas, 2025)

And although the decision does not focus particularly on gender discrimination, the analysis of the ratio decidendi allows a look at the perspective of material equality, taking into account that algorithmic opacity makes it difficult and, at times, impossible to detect discriminatory biases. This situation disproportionately affects women in contexts where automated systems mediate decisions about access to health, subsidies, financial services, and social protection. The Court determined that the state entities (National Institute of Health, Ministry of Health and Social Protection and the National Digital Agency) did not satisfactorily comply with the argumentative burden of demonstrating that disclosing the source code would generate present, real, probable and specific damage that exceeds the benefit of publishing the information -Article 28 Law 1712 of 2014. To resolve the case, the Court applies a test in which it prioritizes the maximum disclosure of public information over systems that process data of millions of citizens. This evidentiary standard is essential to identify indirect algorithmic discrimination. A phenomenon that is not based on intentional unequal treatment but on the very structure of the system and its input data, discrimination that remains invisible without external audit mechanisms that examine both the source code and the training datasets from a gender perspective. It is clear that, however, artificial intelligence systems do not intend to generate discrimination, and that is where citizen control can contribute to processes of accompaniment and surveillance that detect and allow the correction of those circumstances.(Coddou Mc Manus, Germán Ortiz, & Tabares Soto, 2025)(Manrique Molina, 2025)

The principle of algorithmic transparency recognized by the Court requires an interpretation that goes beyond the simple procedural guarantee of technical publicity. It should be noted as a substantive imperative to overcome perspectives of exclusion embedded in automated systems, considering that gender biases in artificial intelligence operate through multiple circumstances: training data that reflect historical patterns of discrimination, algorithmic design dominated by male gazes, and the absence of diversity in development teams that makes it difficult to detect bias during the design and design phases. machine learning. The opacity that the Court identifies as a violation of the right of access to information is manifested in what the specialized literature calls black box algorithms, systems in which it is impossible to know how data are processed and certain decisions are reached that concretize the so-called algorithmic epistemic injustice that systematically marginalizes the experiences of women in the design and operation of state technological tools.(West, Kraut, & Chew, 2019)(Perdomo Reyes, 2024)

The ruling also presents a significant limitation by not expressly establishing the obligation to carry out gender impact assessments and measurements prior to the deployment of products or services that incorporate state algorithmic systems. The control must not only be prior but concurrent, ex ante and ex post to the implementation of the service or product. The decision orders the entities to design guidelines that allow the principle of algorithmic transparency to be regulated in all public entities. This structural mandate must necessarily incorporate criteria of non-discrimination on the basis of gender in order to materialize the equality recognized in articles 13 and 43 of the Political Constitution.(Vestri, 2021)

The precedent defined by the Court requires adequate articulation with the Colombian regulatory framework for the protection of women against discrimination. In particular, Law 1257 of 2008, which establishes rules for awareness, prevention and punishment of forms of violence and discrimination against women, imposes on the State the obligation to adopt specific measures to eliminate discrimination in all areas, including that generated by algorithmic systems that reproduce and amplify pre-existing inequalities. Algorithmic transparency, recognized by jurisprudence, must transcend the simple availability of the source code to incorporate three complementary dimensions: explainability —so that anyone can understand why an algorithm decided something—, interpretability —which empowers external experts to audit computational logic and reproduce results—, and accountability — which guarantees effective ways to challenge discriminatory automated decisions. As the specialized doctrine points out, the disclosure of the source code is only the starting point, being essential to establish public registries of algorithms that include information on training data, potential discriminatory impact and monitoring mechanisms specifically designed to detect gender bias. (Lopera Vélez & Estrada Jaramillo, 2015)(Cotino Hueso, 2022)(Gutiérrez David, 2021)

The issue, in any case, points to the review of the effectiveness of the ruling as an instrument to address algorithmic gender discrimination. This will depend on how Colombian courts and judges understand in a broad – and not restrictive – way the principle of transparency towards the requirement of audits with a gender perspective. As previously contemplated, many algorithmic systems do not fail accidentally—or intentionally—but do so because they were not designed with the experiences of those who have historically been excluded in mind. And in the case of Colombia, the analysis is broad and includes, among others, women in contexts of special vulnerability such as workers in the informal sector, rural women with limited access to digital services, migrant women, and indigenous and Afro-descendant women who experience intersectional discrimination amplified by automated systems without effective citizen control mechanisms. (Danesi, 2022)

Judgment T-067/2025 opens the possibility that future judicial decisions order not only the disclosure of source codes but also the implementation of fundamental rights impact assessments with a differential gender approach, periodic audits of biases carried out by independent bodies, and effective redress mechanisms for people affected by algorithmic discrimination, thus transforming the transparency mandate into an effective tool for the Material equality between women and men in the digital age. The ruling discussed not only the security of an application, but also the need for any automated state system to be audited by society: real and effective possibilities of citizen control so that they can know and understand the algorithm. An ethical artificial intelligence is required that, in accordance with the principles previously mentioned, advocates for equal opportunities and eliminates biases. An AI that can withstand public scrutiny.(Cantero Gambito & Bosoer, 2025)(Aparicio Gómez & Aparicio Gómez, 2024)

The Colombian case is illustrative of something deeper: without transparency, algorithms perpetuate invisible inequalities and prejudices. In the case of women, for the specific case of the health sector (taking into account that the CoronApp application corresponded to this sector) numerous studies have proven that medical models are usually trained with predominantly male data. This circumstance means that symptoms of diseases in women – cardiovascular, autoimmune, among others – are underdiagnosed. This circumstance highlights a fundamental fact in medical practice (which can be extended to all other sectors that work with AI tools): the need for control, accompaniment and validation of results and

the process by a human. Algorithmic bias in medicine is not a technical error, it is a reflection of the experience of invisible generations of women in science. And if the State and the entities that provide health or social assistance services use these models without any control or oversight, they contribute to the reproduction of structural discrimination.(Boenza Nuin, Puertas Sanz, Rodrígurz-Vila, Condés Moreno, & Bonis sanz, 2023)(Rusell, 2019)(Perdomo Reyes, 2024)

This is where the role of the State and the regulator is decisive. The voluntary ethics of companies in the technology sector cannot be trusted. Although there are advances in corporate social responsibility, the path still needs adjustments. Clear obligations are required: mandatory external audits, publication of gender-disaggregated equity metrics, sanctions for discriminatory systems and, above all, accessible redress mechanisms. It is not only about protecting data, but also about guaranteeing substantive rights: health, safety, equality. In Latin America, except for specific advances such as Colombian jurisprudence, a robust regulatory framework is still required that contemplates the intersection between algorithmic transparency and gender.(Concha-Ramirez & Navarrete-Ortiz, 2023)

CONCLUSIONS

The analysis contained in the article confirms the hypothesis raised. The abundance of AI products and services generates structural biases that materialize forms of algorithmic discrimination and affect women's right to equality. It has been proven that algorithms are not neutral but on the contrary reproduce and perpetuate pre-existing inequalities due to four fundamental circumstances: training data that overrepresents male experiences, algorithmic design dominated by androcentric perspectives, absence of diversity in development teams and technical opacity that makes citizen scrutiny and effective challenge of automated decisions impossible.

Algorithmic opacity identified as a structural obstacle is not only a technical challenge but also a barrier that minimizes – and sometimes nullifies – women's experiences in the design and operation of technological tools, generating algorithmic epistemic injustice. In this context, algorithmic transparency constitutes a guarantee of technical publicity and a substantive mandate aimed at dismantling exclusion architectures incorporated in automated systems. It is necessary to incorporate three complementary dimensions in order to achieve the objective described: explainability, which allows anyone to understand why an algorithm decided a certain action, interpretability that empowers external experts to audit computational logic, and accountability that guarantees effective ways to challenge discriminatory decisions.

The analysis of the international regulatory framework – particularly Regulation (EU) 2024/1689, the UNESCO Recommendation on the Ethics of AI, the Hiroshima Code of Conduct and the European Declaration on Digital Rights and Principles – shows important progress in the recognition of algorithmic transparency as a fundamental right and in the requirement of human oversight over automated systems. although tensions, unresolved, persist between the protection of sensitive personal data and the need to process information on gender to detect and correct systemic biases. In the Colombian case, Judgment T-067 of 2025 constitutes a transformative precedent by recognizing the fundamental right of access to the source code of state applications and establishing that algorithmic opacity violates the right of access to public information, although the decision has limitations as it does not expressly establish the obligation to carry out gender impact assessments before the deployment of state algorithmic systems.

Although progress has been made, regulatory development needs to overcome existing difficulties. The effectiveness of these regulatory frameworks will be conditioned by how judicial operators interpret the principle of transparency extensively towards the requirement of mandatory audits that detect discrimination amplified by automated systems, transforming the transparency mandate into an effective tool for material equality between women and men in the digital age.

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