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Health Impact Assessment (HIA): analyses and challenges to Brazilian Health Surveillance

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Abstract *This study aims to discuss the Health Impact Assessment (HIA), pointing out the main initiatives of the health sector, challenges and perspectives for its implementation in Brazil. HIA is a methodology recommended by the WHO and is widely used in several countries, but with few initiatives in Brazil. Health issues in the context of large projects are commonly conducted on a timely basis within the environmental licensing processes, unlike HIA, which proposes an integrated approach, with the involvement of social stakeholders in the territory since the beginning of the project. This is an analytical and exploratory research and, thus, a systematic review on the subject was carried out, as well as a survey of government documents on the main initiatives already conducted by the Ministry of Health within Environmental Health Surveillance in the environmental licensing processes of large projects. We sought to analyze the main conceptual frameworks, pointing out possibilities for their implementation in Brazil, as well as new perspectives for Health Surveillance in this area, allowing the health variable to be evaluated during several interventions of a policy, program or project.*

Key words *Health impact assessment, Environmental licensing, Large projects, Social determinants*

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Introduction

Since the 1970s, there has been a lack of health-related aspects during environmental assessments of major development projects in the global context. In this context, following intensive campaigns by the World Health Organization (WHO) through programs such as "Health for All in the 21st Century" and, most recently, the "Healthy Cities Network" strategy, the Health Impact Assessment (HIA) has gained greater visibility as an intersectoral action tool to promote health and reduce inequalities, and is apprehended by several countries[1].

Proposed by the WHO, HIA is an effective methodology to identify the positive and negative impacts of an intervention in the territory, whether policy, plan, program or project[2,3]. Not overlapping with other evaluations, HIA facilitates the assessment of the health variable during the different interventions, providing a new evaluation perspective that was not previously taken into account by decision-makers.

While adopted almost two decades ago – since the Gothenburg Consensus in 1999 – HIA continues to cause a stir among different public and private sectors, as well as academics and civil society organizations. A research conducted by Balby[4] pointed out a significant number of publications – scientific papers, manuals, guides, books – and international conferences on the issue. It is also worth mentioning that, in 2011, the Society of Practitioners of Health Impact Assessment (SOPHIA) was established to gather the professionals involved in the practice of HIA[4].

Researchers and scholars, also known as HIA "practitioners", maintain that, due to its predictive, multidisciplinary, intersectoral and participatory nature, with a focus on social inequalities, this methodology aids decision-making, and aims to maximize health gains through an intervention[3,5,6]. It is therefore assumed that the HIA is capable of optimizing the conditions and quality of life of a given population that will undergo some type of intervention in its territory, improving the health situation in local communities and thus ensuring the sustainability of a project[5,6].

Thus, HIA encompasses the identification, prediction and evaluation of the expected changes in health risks – which may be either negative or positive, individual or collective – caused by a policy, plan, program or development project that affects a population[2].

In Brazil, the adopted Environmental Impact Assessment (EIA) model is not sufficient to reflect the health impacts of a given population during the implementation of projects[7,8]. At the same time, identifying the socio-environmental and health impacts of large enterprises is complex and is a major challenge.

Thus, this analytical and exploratory study aims to discuss the Health Impact Assessment (HIA), pointing out possibilities for its application in Brazil, and in the future allow the health variable to be evaluated during the several interventions of a policy, program or project. Therefore, we sought to analyze the main conceptual frameworks, as well as the initiatives of the Brazilian health sector, the challenges faced and new perspectives for action in the field of health surveillance in this area.

Health Impact Assessment (HIA) in the international context and its interface with other assessment methodologies

For the first time, WHO defined HIA as a "combination of procedures, methods and tools to assess a proposed policy, plan or program regarding its potential health impacts and the occurrence of these impacts on the population"[2]. This definition was a milestone for HIA, when it was launched by WHO in 1999 in the Gothenburg Consensus document, during the seminar "Health impact assessment: from theory to practice" prepared by the European Centre for Health Policy (ECHP) in Gothenburg, Sweden[2].

The International Association for Impact Assessment (IAIA)[9] says that HIA guiding principles are based on the Gothenburg Consensus, which values democracy, equity, sustainable development, ethical use of evidence and a global approach to health. It is also relevant to reinforce the need for HIA to assess the effects on the social determinants of health[9].

Based on commitments made by the European Union (EU), the HIA methodology was applied in the development of public policies of EU countries, originally called European Policy Health Impact Assessment Methodology or EPHIA methodology. It aimed to inform and influence the process of elaborating a policy, program or project, taking into account its implications on health inequities[3].

According to Abrahams et al[3], this method adopts the basic reference of the "social health model", which extrapolates the lack of disease and addresses the physical, mental, social and spiritual well-being of people. To this end, it recognizes that health and well-being are affect-

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ed by complex interactions between social and economic factors, physical development and individual behavior, as well as hereditary factors. The analysis of health inequities is one of the key principles of this methodology, in which the existence of individuals and groups of people with better or worse conditions of health is pointed out, emphasizing current inequalities. This factor reflects the differentiated exposure to health risks associated with factors such as socioeconomic, ethnic and gender conditions, over the lifetime of individuals[3].

According to Winkler[6], while it is one of HIA's advantages, the Social Determinants of Health (SDH) approach is a complex task because it involves individual, social, environmental, economic and institutional factors[6]. As shown in the figure below, when HIA is carried out, such as increased disease burden in developing countries, health determinants can have a decisive influence on the effect of a policy, program or project evaluation.

Thus, the commitment to integrate the different bodies and institutions responsible for policies, programs and projects is fundamental, in order to select the main determinants, through the most relevant and accessible data and information for analyzing health inequalities and, consequently, reduced inequities[6].

In this regard, the discussion paper for the World Conference on Social Determinants of Health (WCSDH)[10], held in Brazil in 2011, corroborates this argument because it considered that most of the burden of disease occurs due to the conditions under which people are born, live, grow, work and age. Therefore, this set of conditions called "social determinants of health", in which the environmental, cultural, economic, political and social determinants of health are summarized is of paramount importance to evaluate the conditions related to this aspect in a given population[10].

It is worth mentioning that, in 2013, Helsinki hosted the 8th World Conference on Health Promotion, which indicated, among its main objectives, the implementation of the "Health in All Policies"[11]. This intersectoral approach aims to integrate health in all policies across all sectors so that health and health systems are systematically incorporated into decision-making. Its main characteristics build on human rights and social justice as a focus on the formulation, implementation and evaluation of policies[11].

In this context, HIA is also cited as one of the components of this strategy, in order to achieve better health outcomes by reducing inequalities identified in this area. Such an approach, which includes health in the context of other social policies – such as transportation, housing, education, the environment, agriculture – is a significant influence on health determinants[12].

According to studies submitted by the York Health Economics Consortium (YHEC)[13], HIA can be integrated with other forms of impact assessment to determine, based on evidence, the impact on health determinants likely to be affected by a policy, plan or program. Such integration would be beneficial in providing information and guidance to professionals who are unaware of the health impacts caused by potentially polluting enterprises[13].

Noble and Bronson[14] argue that the inclusion of health impacts in the Environmental Impact Assessment (EIA) of projects has received greater attention from health professionals and institutions, including WHO and Health Canada, in recognition of the need and benefits of an approach to health in the Environmental Impact Assessment (EIA)[14].

A Canadian experience in mining projects has allowed us to conclude how the processes that assess the impacts of the respective projects have not given proper importance to the issue of human health. The study identified learning opportunities to move towards a more inclusive approach to health in EIA, as highlighted by Noble and Bronson[14]. Authors say that integrating health into environmental impact assessments requires a number of considerations, such as assessing the effects of projects on health, based on the recognition that human health, well-being and the environment are inseparable. In this aspect, social and health repercussions should be considered with the same scientific rigor that is given to the biophysical factors during the evaluation of environmental impacts[14].

From this perspective, some authors dialogue towards the integration of HIA and EIA, enabling a new category of analysis, aimed at promoting better living and health conditions to the population in the area covered by a project[5]. However, Bhatia and Wernham[5] affirm that this integration relies on some requirements:

- *A project proponent who recognizes the EIA as a regulatory strategy available to public health;*
- *A responsive agency that conducts EIA;*
- *Involvement of public health institutions;*
- *The complementary objectives between community stakeholders and health professionals; and*
- *Collaboration between institutions responsi-*

ble for EIA, affected public health institutions and stakeholders, as well as guidelines, resources and training for the integrated HIA-EIA practice.

In a lecture delivered at the National School of Public Health (ENSP), according to Professor Mirko Winkler[15], HIA proposes, in its design, the systematization of information, incorporating scientific evidence, with an eye toward identified problems and the expected health impacts. Therefore, it is a technical and political tool that supports decision-makers. It is worth mentioning that one of the most important aspects of this methodology is its integrated approach, with the participation of social stakeholders in the territory since the beginning of the project around problems that may arise with the new development [15].

Health Impact Assessment (HIA) in Brazil: advances and challenges

The HIA model became the object of study in Brazil, based on the experiences reported by other countries, through "HIA practitioners"[3-6]. From this perspective, the search for new tools and methodologies that can assess health impacts is evidenced as a prerogative of the health sector, reinforcing its role in social policies in order to ensure more effective institutional arrangements and response capacity.

In Brazil, few studies show the health variable in prior evaluations (*ex ante*) of the impacts related to a policy, plan or project. Participation in retrospective (*ex post*) studies, that is, in evaluations during or after the implementation of a project[4] is more common. This corroborates the analysis of large enterprises, in which the evaluation of the health variable is used especially in specific projects or programs – as is the case of malaria-related disease – during environmental impact assessments[7,8].

In this regard, during environmental impact assessments, under the jurisdiction of a sector with a strong institutional role, socio-environmental and human health-related aspects are not always considered in the environmental licensing processes of projects[8,16]. This fact demonstrates the gap arising from the lack of articulation between sectoral public policies in the face of the socio-environmental impacts generated by large projects[8].

Environmental studies as a requirement for the implementation of potentially polluting projects have in fact been inefficient in pointing out the impacts and the lack of health risks inherent to these projects and were limited primarily to biophysical aspects. Research on this topic points out that the poor insertion of health aspects during the EIA stems from the lack of coordination between the different sectors and specific legislation or tools[7,17].

Despite the lack of institutional, technical and political mechanisms, several instances of the health sector concentrate efforts to introduce the proper aspects of this area in the environmental licensing processes of large projects[7]. From this perspective, environmental health has fulfilled its role of systematically monitoring processes related to large projects, proposing tools and methodologies to evaluate health impacts that may contribute to the establishment of territories with adequate environmental and social sustainability[18].

Aiming at defining the guidelines that strengthen the participation of the health sector in these processes, and at the same time proposing to carry out studies to implement the HIA methodology in Brazil, the Ministry of Health, through the Environmental Health and Worker Health Department (DSAST) of the Secretariat of Health Surveillance (SVS) has been carrying out some initiatives, as highlighted in the table below (Chart 1).

In addition to contributing to environmental health in the country, these initiatives collaborated to bring professionals from both sectors closer in the environmental licensing of large projects, integrating government agendas for the inclusion of health in plans and projects, and at the same time setting HIA within the scope of the Brazilian health sector[7].

Based on international experiences and the various actions, the discussion on the HIA methodology acquired a broader scope within the SUS, with the elaboration of the document: "*Health Impact Assessment - HIA: Methodology adapted for application in Brazil*[26]". This is the most current reference nowadays, published by the Ministry of Health with the purpose of inducing the development of specific activities for the adaptation and development of HIA in the country. This publication aimed to contribute to the improvement of the health and environmental policy and to act as a guide for the ongoing environmental policy, since it is configured as a proposal document that "will address the health sector's performance in environmental licensing processes"[26].

It is also worth noting that this document's importance is recognized as the first report in the

Chart 1. Initiatives of the health sector in the environmental licensing processes of large projects and actions for the strengthening of HIA in Brazil.

Main initiatives		Objectives
Workshops and Seminars	*First. Workshop on the Evaluation of Projects through the Unified Health System (SUS)*[19] – Held by the Environmental Health Surveillance Coordination/SVS/MS, in 2005.	Strengthening the health sector in the environmental licensing processes of large projects in the discussion of the Health Risk Assessment resulting from Undertakings.
	First Meeting on environmental licensing of projects based on the experiences of the federal, state and municipal spheres, within Environmental Health Surveillance – Held by the Environmental Health Surveillance Coordination/SVS/ MS, in 2007.	Strengthening the health sector in the processes of environmental licensing of large projects for the construction of guidelines for Environmental Health Surveillance.
	Seminar on Environmental Health and Worker Health and their interfaces with the Growth Acceleration Program (PAC) 20 – Held by the Ministry of Health (MS) and the Brazilian Association of Collective Health (ABRASCO) - Held by the Environmental Health Surveillance Coordination/SVS/MS in 2007.	Strengthening the health sector to address PAC works.
	Workshop on Health Impact Assessment (HIA) – Held by the Environmental Health Surveillance Coordination/SVS/MS in partnership with ABRASCO and WHO, University of Liverpool and Canada Collaborators in 2008.	Launching bases for the operationalization of HIA in the Brazilian health sector.
	First Brazilian Seminar on Health Impact Assessment (HIA) and performance of the health sector in Environmental Licensing – Held by the Environmental Health and Worker Health Department/ SVS/MS in 2013.	Strengthening HIA in the health sector for integration in the project's environmental licensing
Normative instruments	*Term of Technical Cooperation between Ministries of Health and Environment – Signed in 2001.*	Strengthening and combining actions to benefit the health of the population and the integrity of the environment.
	Interministerial Ordinance Nº 822, of April 30, 2008, which establishes guidelines for cooperation between the Ministry of Health and the Ministry of Environment, aiming at the integration and implementation of common actions and the consolidation of the bilateral agenda[21].	Strengthening cooperation actions between health and environmental sectors.
	Ordinance Nº 2.241, of September 2009, which establishes the Environmental Health and Licensing Technical Group, with the purpose of structuring the participation of the health sector in the environmental licensing processes of projects[22].	Strengthening the health sector in the project's environmental licensing processes
	Interministerial Ordinance Nº 419 of October 26, 2011, which regulates the performance of bodies and entities of the federal public administration involved in environmental licensing[23].	Establishing mechanisms to streamline bodies involved in the project's environmental licensing processes
	Ordinance No. 1, January 2014, which establishes guidelines, procedures, flows and competence for the elaboration of the Malaria Control Plan (PACM) for the environmental licensing of projects[24].	Strengthening the National Malaria Control Program in the project's environmental licensing processes
Institutional meetings	*Participation of the Ministry of Health in the environmental licensing processes of the BR-163 Highway Cuiabá-Santarém, of the Rio de Janeiro Hydroelectric Power Plants (Santo Antônio and Jirau), HPP Belo Monte and the São Francisco Transposition Project (PISF) – 2006 to 2012.*	Strengthening the health sector in the project's environmental licensing processes integrating governmental agendas.
	Representing the health sector in the Management Committee of the Sustainable Regional Development Plan of the Xingu (CGDEX), established by Decree Nº 7.340, of October 2, 2010[25] – Participation in the Technical Chamber of Health, between 2010 and 2015.	Subsidize decisions and monitor health planning actions in the Xingu Region, where the Belo Monte Hydroelectric Plant is located.
Institutional document	*Elaboration of the document Health Impact Assessment (HIA): Methodology adapted for implementation in Brazil*[26] – Performed by the Environmental Health and Worker Health Department/ SVS/MS in 2014.	Strengthen HIA in Brazil within the health sector.

Source: Adapted from Silveira[7,19-26].

country that advocates the relevance of health impacts, mainly due to the construction and implementation of large projects[7]. Thus, the causal interrelationships between environmental impacts and the possible effects on human health are undergoing a reorientation to include health in the Environmental Impact Assessment (EIA), aiming at strengthening actions that instigate companies to mitigate and compensate for impacts on the health of the population.

Since it is a tool that allows estimating the impacts caused by a health policy, plan or programs, and especially estimating social inequities, the HIA methodology in Brazil is currently conceived from its integration with the EIA[26].

It should also be noted that current regulations for development projects anchored only in the EIA might be insufficient for more comprehensive assessments such as HIA[7,8]. This peculiarity turns out to be a weakness because, in most cases, strategic decisions have already been made, with little scope for alternatives with lower health risks[4]. Furthermore, it is considered that it is difficult to proceed with the evaluation or monitoring of health recommendations in the environmental impact assessments following the conclusion of the licensing process. Hence, HIA is a fragile methodological tool to "minimize negative impacts and maximize positive impacts in different social, economic and geographical contexts", as explained in the document published by the Ministry of Health[26].

The document *Health Impact Assessment - HIA: Methodology adapted for application in Brazil*[26] could introduce in its conception, according to our understanding, in addition to the EIA, the Strategic Environmental Assessment (SEA). The latter is a tool that enables "analytical and participatory approaches that integrate environmental considerations into plans, policies and programs, assessing interconnections with economic and social considerations"[27]. Predictive impact assessments are essential to support the policy formulation phase and, in the case of Strategic Environmental Assessment (SEA), are shown as a decision-supporting tool. They apply to policies, plans or programs in the design phase, rather than in the evaluation during the implementation phase, as is the case with EIA[28].

According to the Organization for Economic Cooperation and Development (OECD)[27], while being at the highest level of decision-making, policies tend to have more flexible propositions than projects, since they generally have well-defined specifications and standards. This statement is evident in the EIA, through the Environmental Impact Study (EIS), which is mandatory in the environmental licensing processes of specific projects. In this regard, a broader discussion is required, which will direct the methodological approach towards integrating HIA into other assessments, such as EIA and SEA, including as a strategy for strengthening sectoral policies, especially in the implementation phase of a given project.

However, HIA should not be seen as a tool to replace the EIA in the licensing processes, but it could be configured as a complementary tool. However, the environmental sector, which is responsible for analyzing health issues in these processes, is not manned with technical staff capable of doing the task, which hinders the analyses that are sometimes challenged by the control bodies due to the lack of effective response of the project's conditionants[7,8]. Thus, until new methodologies are built and institutionally accepted within the scope of public policies, the few opportunities for inclusion of the health-related elements in the environmental licensing processes of large projects should continue.

For most HIA "practitioners" in the international setting[3, 5,6], the HIA is applied to public policies as a planning tool, with the proposition of specific health actions with a view to improving the quality of life of the populations of the affected areas by predicting possible risks. However, one of the principles of the HIA conceptual model is the incorporation of social determinants, which gives greater scope for its evaluation.

In this regard, we point out the relevance of specifying the social determinants of health in the document published by the Ministry of Health. Thus, the tool would become more robust considering the complexity and interdependence of socioeconomic factors and conflicts arising from their interaction with the environment and, essentially, with the social determinants of health, as Winkler[6] points out. According to this author, when the HIA is considered in the analysis of a policy, a program or a project, social determinants are the key points for identifying the impacts on vulnerable groups in a differentiated way, evidencing inequalities and inequities in health[6].

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Final considerations

While there are studies that point out ways to apply HIA in Brazil, research institutions should be interested in this methodology. In addition, it is important to sensitize health professionals toward proposing and disseminating the importance of the tool since there is no availability of HIA training in the country, and health institutions should propose a line of technical staff education and training to work in this field[15].

According to research carried out on HIA, this methodology has advantages and limitations[4]. Therefore, it must meet certain prerequisites, such as: the main reasons for adopting HIA; the context of the proposal; type of institutions responsible for costs and decision-making; availability of trained evaluators; methods and tools used in the evaluation; participation of stakeholders; human and financial resources, among other factors[4].

The same research points out that one of the weaknesses of HIA in projects submitted to environmental licensing analysis in Brazil follows a predefined scope by the entrepreneur and the environmental agency and is to be negotiated between the parties. In this case, this does not meet one of HIA's premises, that is, inclusion of the affected parties in the process. The research also indicates ways to overcome this limitation, towards greater involvement of health agencies in defining the scope of the Environmental Impact Assessment (EIA), in order to allow integration between health and environment from the onset of the process[4].

Despite the initiative of the Ministry of Health, through the field of environmental health surveillance – which has a timely participation in these processes – the proposed new analysis methodology such as HIA appears shyly before the importance of the connection of development projects with public health and environmental policies[7,8,16]. Therefore, the advancement of this initiative in the scope of public policies in Brazil requires a methodological-scientific work with the support of research institutions and a political support so that the initiative of the Ministry of Health is implemented systematically in Brazil.

While there is mention in the normative reference about the importance of the participation of the health sector in the planning of development projects, there is still no specific legislation that regulates the systematic participation of the health sector in environmental licensing processes. The exception is found in procedures related to malaria endemic areas[7,8,16].

In Brazil, the Environmental Impact Assessment (EIA) is inadequate to cover the main health problems in the territory through the implementation of large enterprises, in which environmental licenses only have a purely registry-like role, proving fragile to cover more comprehensive actions from the viewpoint of social and environmental sustainability[7,8]. Thus, despite recognizing the positive and negative impacts in certain areas, the health impacts are measurable and cannot remain invisible in Brazilian legislation, even in the face of reformulations to the environmental licensing process in the country[29].

Thus, the Health Impact Assessment (HIA) and its application in Brazil is a challenge. First, because it is a new object of study to be explored, and there is no significant number of research on the subject. Second, there is a contradiction between the interests involved in the country's development and the impacts resulting from this process[7,8,29]. The project's proponent, often the public authority, claims to have sufficient evaluation tools – such as licensing, for example – and any proposed new evaluation tools can be received as a "hindrance" to development.

Therefore, HIA should be considered as an important mechanism and of systematic use by decision-makers within the scope of public policies, in order to point out preventively ways to efficiently mitigate and compensate for socio-environmental and health impacts. However, there are difficulties in the introduction of new evaluation tools in the face of the impacts often identified in large projects, as was observed in the case of hydroelectric plants[7]. The main hurdle is that government sectors still address HIA as yet another "bureaucratic tool" obstructing infrastructure projects in the country, rather than an essential measure of human health and environmental protection.

Considering that health inequalities stem not only from multiple economic, environmental and lifestyle factors, but also from the problems related to access to healthcare, "it is essential that reduced inequalities be considered as a fundamental priority at all levels of a political action, thus pursuing the 'health in all policies' strategy and conducting effective impact assessments that take into account the results in terms of equity in health"[30].

Finally, this analysis aims to contribute to mechanisms such as HIA that can subsidize the area of health surveillance in Brazil, given that

the established development policies stem from diverse interests outside the region and, when implemented, de-structure the logic of local organization, increasing environmental and social conflicts in the area, reflecting on the health and quality of life of the various communities.

Collaborations

M Silveira worked on the design, data collection, analysis and writing, and ALD Fenner participated in the critical review and final writing.

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