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REVIEW

The Brazilian health economic-industrial complex perspective: health as a strategic option for BRICS development*

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ABSTRACT

The Health Economic-Industrial Complex (HEIC) is recognized as a fundamental pillar for the Welfare State, essential for ensuring universal health access and reducing the vulnerability of Brazil's Unified Health System. This paper argues that the HEIC must be positioned as a key vector in the national development strategy, linking the reconstruction of Brazil's economy with social development, science, technology, innovation, and environmental sustainability. These strategies collectively work towards building a dynamic, just, and democratic Brazil. Furthermore, it presents how Brazil, under Lula Presidency, incorporated HEIC in a set of public policies aiming to strengthen the production and innovation in health to increase the Brazilian Health System resilience and increase health access to Brazilian population. Furthermore, the paper explores how the principles of the HEIC can be adapted to the BRICS context. By leveraging this model, BRICS nations can address global health disparities and enhance their capacity to produce vaccines, treatments,

[1] Gadelha CAG, Gimenez DM, Cassiolato JE, eds. Saúde é Desenvolvimento: O Complexo Econômico-Industrial da Saúde como Opção Estratégica Nacional. Rio de Janeiro: Fiocruz – Centro de Estudos Estratégicos Antonio Ivo de Carvalho; 2022. ISBN: 978-65-87063-21-8. (in Portuguese).

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diagnostics, and other critical health technologies. Ultimately, this paper advocates for the bold reimagining of the HEIC as a transformative force in BRICS countries capable of driving structural changes in both national and global health landscapes, promoting a healthier, more equitable, and sustainable society.
Key Words: Health Policy; Global Health; Sustainable Development; Technological Innovation; Health Economics

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The economy at the service of life

Health can – and should – become a new vector for Brazil's development in the 21st century. It has the potential to address economic, social, and environmental challenges. In the past, the focus was on steel, oil, and automobiles. Today, however, the Health Economic-Industrial Complex (HEIC) emerges as a strategic bet for the country. It offers a pathway to resume growth and overcome social regression and structural dependency.

The painful experience of the COVID-19 pandemic, which resulted in the loss of over 680,000 lives, highlighted the limited way in which the relationship between the economy and society has been treated in the national debate. The Unified Health System (in Portuguese: Sistema Único de Saúde, SUS) and the Welfare State have proven to be valuable societal achievements that can solidify as a great opportunity for Brazil's development, going beyond compensatory measures.

In its bicentennial of independence in 2022, Brazil was under immense socio-economic pressure. The economy did not grow, the environment was increasingly degraded, the state was disorganized, and the basic needs of the population were not met. This situation brought back the challenge of thinking about how to build a national project that promotes economic growth, equity – both social and regional, and environmental sustainability.

Lula's third term presidency (since 2023) is reconstructing the Brazil he had left in his second term that ended in 2010. The scenario left by Bolsonaro's presidency (2019-2022) was devastating. Amid a context of profound global transformations, Brazil was engulfed in an intense economic, social, and environmental crisis. In a country that once ranked among the six most important economies in the world, hunger skyrocketed to 33.1 million people by 2022 [1], with unemployment figures around 10 million[2].

Furthermore, the increasing precariousness and underemployment affected a growing number of families. These were the most visible consequences of the low economic dynamism and the sharp deindustrialization of the Brazilian economy. This economic decline was accompanied by the advance of deforestation, ecosystem contamination, and biodiversity loss.

In 2023, 24.4 million people in Brazil were lifted out of hunger, marking a significant achievement in the country's ongoing battle against food insecurity. This milestone reflects the success of targeted social policies

[2] Instituto Brasileiro de Geografia e Estatística (IBGE). PNAD Contínua. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística (IBGE) website. Published 2022. Accessed August 15, 2024. (in Portuguese). https://www.ibge.gov.br/en/home-eng.html?lang=en-GB

and programs implemented by the Brazilian government, which focus on reducing poverty and ensuring that the basic needs of the most vulnerable populations are met. These efforts are part of a broader strategy to rebuild social welfare systems and restore dignity to millions of Brazilians, reinforcing the nation's commitment to eradicating hunger and promoting inclusive development[3].

This article proposes that the economy should support the material conditions necessary for sustaining life, both for people and the planet. To improve the quality of life, the national productive system must have the technical and scientific capacity to meet society's demands. Development and innovation drive the structural changes needed to guarantee universal access to social rights and ensure environmental sustainability.

Putting the economy at the service of life allow us to overcome the false dichotomy between the social, environmental, and economic dimensions. It directs the economy towards generating income, investments, and qualified jobs to support a prosperous, just, and democratic society. A sustainable society, committed to well-being, is only possible with a national economic and material base that supports this vision of a democratic society.

This perspective concretely guided the formulation of an agenda to support public policies for the development of the HEIC, integrating the national economic system with the organization of the SUS and Welfare system. The goal is to contribute to a national development project that simultaneously pursues economic dynamism, environmental sustainability, and social well-being, while engaging in global processes grounded in sovereignty, solidarity, and the right to life for different peoples and regions.

As we move forward in this article, the subsequent sections will delve deeper into the role of the HEIC in driving Brazil's development strategy. The next section will explore the significant social, economic, and environmental transformations shaping the global and national contexts; furthermore, how these impact Brazil's SUS. We will examine the critical role of the state in fostering innovation and economic resilience within the HEIC by discussing policy proposals that align with Brazil's long-term development goals. Lastly, we will expand the discussion to a broader international perspective, highlighting how the principles of the HEIC can be integrated into the BRICS framework to address global health disparities and promote equitable access to health technologies across member states.

Health Amid Social, Economic, and Environmental Transformations

Brazil and the world are undergoing a series of transformations that could significantly impact health. These transformations include demographic and epidemiological shifts, the fourth industrial and technological revolution, growing globalization and financialization, and the risk of economic stagnation. Additionally, changes in the labor market, climate change, and biodiversity loss are also contributing factors. In the context of a crisis in the international economic system and escalating geopolitical tensions, these changes have deepened social and territorial inequalities, as well as economic and technological asymmetries. Furthermore, they have profoundly impacted health systems, leading to unavoidable effects on the SUS.

[3] 24.4 milhões de pessoas saem da situação de fome no Brasil em 2023. Ministério do Desenvolvimento e Assistência Social, Família e Combate à Fome (MDS) website. Published April 25, 2024. Updated April 25, 2024. Accessed August 15, 2024. (in Portuguese). https://www.gov.br/mds/pt-br/noticias-e-conteudos/desenvolvimento-social/noticias-desenvolvimento-social/24-4-milhoes-de-pessoas-saem-da-situacao-de-fome-no-brasil-em-2023

In the coming decades, according to the IBGE[4], the country will undergo profound demographic and epidemiological changes. In around twenty years, the population is expected to reach around 230 million inhabitants, and the number of people over 60 years old will increase from 25 million to 50 million, representing more than 21% of the population. Within this group, the population over 80 years old will reach nearly 9 million people.

The increase in population longevity represents significant societal achievements, but it also brings about social, technological, and economic challenges that inevitably project future commitments for the state. The demographic transition will result in increased demand on the welfare system, especially in the healthcare systems, in a country where the population already faces serious issues related to nutrition, housing, sanitation, employment, transportation, and access to basic citizenship rights.

Epidemiological complexity will deepen in the coming decades, with the increasing prevalence of chronic diseases in the overall disease burden. However, this will not be a linear transition, as communicable diseases, external causes, and health emergencies will continue to exert pressure on the SUS [2, 3]. These trends together create a scenario of growing epidemiological complexity, reshaping the demand for healthcare attention, promotion, and prevention in the 21st century[5].

The profound demographic and epidemiological changes are occurring in parallel with the advancement of the fourth industrial and technological revolution. The use of biotechnology, artificial intelligence, big data, genetic editing, additive manufacturing, nanotechnology, and the Internet of Things forms a block of innovations that decisively impact the health field, bringing both significant threats and potential opportunities.

The recent global technological transformations, driven by the Fourth Industrial Revolution, have deepened the economic and technological asymmetries between nations, highlighting the persistence of the center-periphery pattern. In the field of health, these changes present significant challenges to the sustainability of SUS. The increasing external dependency of the HEIC reflects a structural vulnerability that could undermine the country's ability to ensure a universal, equitable, and comprehensive health system – as envisioned by the principles of SUS.

Given this scenario, it is crucial to understand how the dissemination and direction of technical progress in health, influenced by global economic and geopolitical factors, directly affect Brazil's ability to develop effective public policies for universal access to health. The analysis of technological asymmetries reveals that nations dominating the global technological standard also exert geopolitical dominance that extends to social policies – particularly health policies. Therefore, overcoming these structural barriers is essential for advancing SUS and building a resilient and sustainable health system in the Brazilian context [4].

The interconnectedness enabled by 4.0 technologies involves the incorporation of new fields of knowledge and sectors of activity within the HEIC, driven by an intense movement of automation based on networks of intelligent machines. The spread of digital technologies has led to the blurring of boundaries between sectors and fields of knowledge, causing a radical shift in the systemic nature of the economic space and capital accumulation in health.

[4] Instituto Brasileiro de Geografia e Estatística (IBGE). Projeções da população: Brasil e unidades da federação: revisão 2018. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística (IBGE) website. Published 2018. Accessed August 15, 2024. (in Portuguese). https://www.ibge.gov.br/estatisticas/sociais/populacao/9109-projecao-da-populacao.html?edicao=21830&t=publicacoes

[5] Lima NT, Gadelha C. Non-communicable diseases: a challenge for global cooperation. SDG Action website. Published June 14, 2021. Accessed August 15, 2024. https://sdg-action.org/non-communicable-diseases-a-challenge-for-global-cooperation/

New technological possibilities for health promotion, prevention, and protection highlight a true cross-cutting process of "creative destruction" in the health field, posing a significant challenge for the SUS to be solidified as a universal system. In the realm of work and employment in health, activities related to the HEIC, particularly care, and attention services will continue to be major generators of qualified jobs. However, new occupations will emerge, and the existing ones will be transformed, what will incorporate new skills. The training of health professionals will need to become increasingly interdisciplinary, with a particular focus on equipping them to operate new digital technologies that enhance attention and humanized care in health services.

The recent set of transformations also decisively impacts the world of science, technology, and innovation in health (ST&I in health). The widespread diffusion of 4.0 revolution technologies opens the possibility for new forms of knowledge production, rooted in trans disciplinarity and oriented towards the challenges of health and sustainability, reinforcing the centrality of ST&I to the economy, well-being, and sustainability. At the same time, the challenge of funding basic research activities, which are fundamental for the advancement of scientific knowledge, remains.

Understanding the challenges posed by this set of social and technological transformations on the SUS and HEIC – in a realistic and pragmatic way – requires considering the concrete context in which they occur. On the international stage, the geopolitical context is one of climate emergency, the deterioration of the global cooperation environment, deepening financialization, the expansion of the power of large transnational corporations, in addition to increasing inequalities, asymmetries, and inequities.

The escalating tensions between blocs led by the U.S., China, and Russia point to the emergence of a multipolar international order, particularly after the COVID-19 pandemic. In the international economy, we see an unprecedented deepening of the power of financial institutions alongside the rise and expansion of digital monopolies. This trend is evident in the market concentration among giant companies – like Google, Amazon, Facebook, and Microsoft –, and in the fact that just three investment fund management institutions – BlackRock, Vanguard, and State Street – are the largest individual shareholders in approximately 90% of the world's top 500 companies.

This movement significantly impacts health. Health-related activities, including primary care, have become crucial expansion fronts for large global corporations, manifesting a process where industrial logic invades all productive spheres – including services – in line with the perspective that has guided the development of the HEIC since its inception.

In this context, the dominance of scientific, technological, and innovation capabilities is intensifying. Approximately 88% of health-related patents come from just ten countries. The U.S. and China alone account around 53% of health patents under the Patent Cooperation Treaty and 44% of health 4.0 patent families. This asymmetry in the production of scientific knowledge and technological innovations in health, coupled with a weakened productive base, tends to translate into inequities in access to healthcare, as evidenced during the pandemic [5], updating the perspective for the contemporary context of technological transformation and the challenges faced by universal health systems and Brazil's SUS.

In the COVID-19 Pandemic, the Secretary-General of the United Nations stated that "the global political and economic system is not delivering vital global public goods: public health, climate action, sustainable de-

Table. Main ongoing transformations and their impacts on the health field

Transformations	Impacts on the Health Field
Demographic transition and health needs	The situation of epidemiological complexity will deepen. Longevity and aging of the population with increasing weight of chronic diseases in the burden of disease and strong presence of communicable diseases and external causes.
Revolution 4.0	Radicalization of the systemic health space and the introduction of innovations open challenges and opportunities for the organization of health systems and for universal access.
Financialization	Risk of the R&D strategy moving away from welfare, dismantling the innovation of universal, equitable, and integral access. Increasing tension between the collective and individual dimensions of health.
Conglomeration	The large concentration and centralization of capital in economic conglomerates translate into little diversity and high asymmetry in the production and innovation base for health.
Science, Technology, and Innovation in Health	Centrality of ST&I to respond to health challenges. Global discussion on new forms of scientific production focused on social and sustainability challenges.
Transformations in the World of Work	Health will remain as a great front for generating quality jobs. Potential for substantial transformation in health occupations, requiring more interdisciplinary training, including that of professionals from other areas to work in health.
Increased geopolitical disputes and appreciation of the territory	Health as a factor of sovereignty. Regional, national, and local productive and innovation capacity in critical areas, such as health, gains relevance.
Climate change	Intense climate events, emergence of new pathogens and other effects of climate change should put health systems in a state of permanent health crisis.
Growth of inequalities, asymmetries and inequities	Increased hunger, precariousness, climate injustice intensifies health vulnerabilities (social determinants of health). Asymmetry in knowledge, productive capacity and innovation become inequities in access to health.

velopment, peace"[6]. Despite multilateral access mechanisms like the Covax Facility being crucial for ensuring vaccination in low-income countries, the technological-industrial asymmetry has resulted in a disproportion in the very right to life, as highlighted in an editorial by the journal Lancet [6]. By the end of 2021, while countries with productive capacity like Brazil and the European Union had fully vaccinated more than 70% of their populations, low-income countries without health production capacity had vaccinated less than 5% of their populations [7].

"Inequality defines the era we live in" [4]. While the richest 1% captured 38% of the global wealth growth over the past 25 years and accounted for 15% of global carbon emissions between 1990 and 2015, the poorest 50% received only 2% of the wealth[7] and contributed to just 7% of emissions[8]. Economic inequalities are closely linked with social vulnerability and climate injustice, each one influencing and being influenced by the others.

Amid the growing inequalities, an environmental consciousness is emerging and solidifying. The signing of the Paris Agreement and the launch of the Sustainable Development Goals demonstrate how global economic, social, and political actors are moving to address the "contradictory dynamic between the expansion and accumulation of capital and the system's inherent tendency to generate asymmetries, exclusion, inequality, loss of social legitimacy, and unsustainability" [8].

The transformations presented, summarized in Table, pose significant challenges for the realization of universal health access in Brazil. If these global movements are not understood and integrated into the field of so-

[6] Guterres A. Encarar a pandemia da desigualdade. Um novo contrato social para uma nova era. Conferência Anual da Fundação Nelson Mandela, Nova York. Naciones Unidas website. Published July 18, 2020. Accessed August 15, 2024. (in Portuguese). https://www.un.org/es/coronavirus/articles/tackling-inequality-new-social-contract-new-era

[7] World Inequality Lab (WIR). World Inequality Report 2022. World Inequality Lab website. Published 2022. Accessed August 15, 2024. https://wir2022.wid.world/

[8] Oxfam. Confronting Carbon Inequality: Putting Climate Justice at the Heart of the COVID-19. Recovery. Oxfam website. Published September 21, 2020. Accessed August 15, 2024. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621052/mb-confronting-carbon-inequality-210920-en.pdf

cial policies and development, the result will be the perpetuation of a compensatory pattern of public policies, while the reality escapes a strategic, structural, and efficient approach that harnesses the opportunities of the new technological paradigms in progress.

Analyzing the cited trends is essential not only to forecast the future of health, but also to guide present actions in development policies. Brazil's ability to respond to the challenges in health and the SUS requires reflection and the construction of a "new state" that places the economy in the service of life, equipped with the capacity to promote economic, social, and environmental development.

The National State will continue to play a fundamental role. It is necessary to analyze the historical-structural process that shaped past policies and contextualize it to understand the degree of freedom and the capacity to execute structural policies in the present. Institutional arrangements and instruments should be considered to articulate measures that: stimulate investment; design economic subsidies for strategic projects; create and participate in national companies; actively and assertively use purchasing power by treating the domestic market as a national asset and a control of foreign capital entry; among others.

The National State must be capable of formulating and implementing systemic and structural policies – contextualized and coordinated across various territorial scales – to address the different territories and regions of the country. The sociocultural and environmental diversity present in Brazil is a potential source of diverse knowledge and solutions for national problems.

The most challenging step is to adopt a perspective that captures the interdependent nature of production and societal organization models with the environment. Strengthening the SUS, as it becomes a national challenge, can mobilize the utopian energies necessary to support the construction of a Welfare State in Brazil [9, 10].

The economic dimension of productive transformation is crucial for achieving this goal. The reconstruction of a technology-intensive national economy and industry should be viewed as a central aspect to ensure that accessing social rights does not remain a privilege for a minority, whether by providing the material support for universal health access or through the economic dynamism that this project generates.

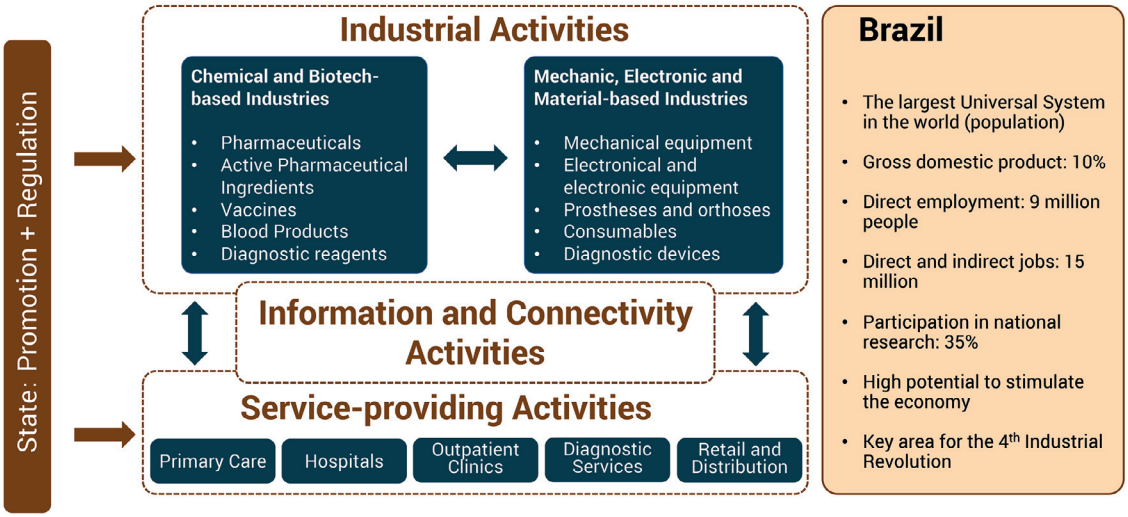
The next section presents how the perspective of the HEIC, which places the economy in the service of life, can underpin a process of structural change that promotes economic dynamism, social inclusion, and environmental sustainability amidst the challenges and opportunities generated by contemporary transformations.

The Perspective of the Health Economic-Industrial Complex

The 1988 Federal Constitution approved a significant expansion of social rights in Brazil, particularly relevant being the universalization of the SUS, which importance was highlighted during the COVID-19 pandemic. The successful public actions in defense of life – especially the immunization of the population – increased the perception of the social value of public institutions such as SUS, the largest universal health system in the world. However, there is still much progress to be made to ensure universal, comprehensive, and equitable access for all Brazilians.

The perspective being advocated, which has been developed at Fiocruz over the past twenty years, highlights the analytical and political interdependence between the economic, social, and environmental dimensions of development [8, 11, 12].

FIG. Contemporary Morphology of the Health Economic-Industrial Complex: A Systemic Approach in Health Production and Technology



According to the conception of one of Brazil's greatest social thinkers, Celso Furtado, development is a process of structural change in which the introduction of innovations transforms the productive and technological base to meet the growing needs of society [13]. Without productive transformation and technological innovation, access to citizenship rights will remain restricted to a privileged minority of the population. The scientific and technological base, along with economic and productive autonomy, are pivotal to ensure access to essential rights, as evidenced in the context of the pandemic.

In the research program of the HEIC, health is viewed as a clear and prominent space for the reproduction of capitalist dynamics in its tense articulation with life, politics, and society, overcoming fragmented and sectorized views that sometimes treat it as an externality (or merely as human capital), or as a specific and insulated field of social policies. The COVID-19 pandemic underscored the importance of treating health as a space for development – economic, social, and environmental –, overcoming false and linear dichotomies between these spheres.

The morphology of HEIC presented below (fig.) represents a systemic approach to health production and technology, integrating various industrial and service-providing activities under the coordinated promotion and regulation of the state. This complex includes industries based on chemicals, biotechnology, mechanics, electronics, and materials, which produce a wide range of essential health products such as pharmaceuticals, active pharmaceutical ingredients, vaccines, blood products, and diagnostic reagents. These industries are interlinked with service activities, including primary care, hospitals, outpatient clinics, diagnostic services, and retail and distribution networks, all of which are supported by advanced information and connectivity systems.

Brazil has the largest universal health system in the world and a powerful productive and innovative health system that mobilizes about 10% of the gross domestic product; furthermore, the health system represents one-third of the scientific and research effort and is strongly aligned with 4.0 technologies. It is also a privileged space for generating investment, income, and jobs, accounting for approximately 10% of occupations [14] and 25 million direct and indirect jobs [5].

However, the development of the HEIC has not kept pace with the growing health needs of Brazilian society. The commitment to ensuring universal, comprehensive, and equitable access in a country of continental dimensions creates a demand proportional to the challenge of guaranteeing health promotion, prevention, and care on a national scale, which far exceeds the installed national productive and technological capacity.

The analysis of the evolution of health trade relations in Brazil highlights a structural trend of increasing mismatch between the health needs of the population and the productive base that supports them. This reality, however, does not arise spontaneously in the country. On the contrary, it is a result of a passive and subordinate integration into the international geopolitical landscape, which dynamics lock peripheral countries in a path of dependence in the process of generating and use of knowledge. Inequality and capitalist polarization manifest in the formation (or reaffirmation) of an essentially asymmetric and unequal global order.

As emphasized in the tradition of Latin American social thought, economic and social backwardness are interconnected. This idea is now recognized by many schools of thought, including Harvard's complexity school and the neo-Schumpeterian approach. Economic and social backwardness can be understood as distinct dimensions of the same problem: underdevelopment. This issue manifests internationally as asymmetries between countries and nationally as structural heterogeneities.

The reproduction of a primary-exporting and poorly diversified economic structure limits growth potential and makes social policies vulnerable to external relations. External constraints are structural, with the balance of payments being the major expression of dependence and technological backwardness [15]. On the other hand, this simultaneously reflects in chronic labor market issues and the vulnerability of social policy, confining the social sphere to its compensatory functions, without the capacity to become a dynamic element.

Although the economy may experience growth cycles – as seen during the industrialization periods of the 20th century and more recently in the 2000s – the structural problems related to technological and productive dependence persistently manifest, exacerbating the condition of economic and social vulnerability.

The pandemic crisis made this perspective clearer in the health field. The fragility of the national productive-technological base became evident during this time. This fragility resulted from the deindustrialization process and the pronounced re-primarization of the Brazilian economy over the past five years. The shortage of basic products highlighted the unsustainability of this position of dependence.

It is unsustainable not only from an economic development standpoint, but also as a matter of sovereignty and health security. The insufficiency of the productive-technological base, resulting from the specialization of production in lower value-added products, explains the country's difficulty in overcoming the technological asymmetry in relation to the global economy; besides that, it is reflected in the inequality and segmentation of access to health goods and services, creating objective obstacles to the expansion of SUS. In other words, the possibility of "consuming without producing" is not compatible with a democratic society where social rights are shared by all.

This discussion must be expanded to consider the development of the economic, productive, and technological base in health – the Health Economic-Industrial Complex – as a structural factor for the sustainability of SUS and for transforming the prevailing development pattern in the country.

From the perspective of the HEIC, the intentionality of agents, the actions of society, and the role of the state have a decisive weight in transforming the pre-existing conditions. Without this, the productive system and social structure may remain locked in the past. It is not merely about understanding that economic growth and income distribution contribute to social policies or that these are functional to economic development through the provision of externalities. Rather, it is about considering how capitalist dynamics reproduce within welfare systems, conditioning public policies.

Considering Brazil's continental dimensions and the strength of its domestic market to drive diversification and the internalization of dynamic productive sectors, the decisive question arises: what economic, industrial, social, and political base simultaneously conditions the establishment of dense welfare and technological development structures?

A new type of development is necessary, one that is dynamic and strongly oriented toward social equity and environmental sustainability. To achieve this, countercyclical and compensatory policies are necessary, but insufficient. Considering the current crisis and challenges, profound structural transformations are required to create space for the expansive forces that are currently severely restrained, to the detriment of the vast human improvement possibilities offered by scientific and technological advances.

Health as a Vector for Brazil's Development in the 21st Century

Health is a universal right of citizenship, enshrined in the Brazilian Constitution, while also is a central arena for economic interests and the exercise of global geopolitical power. To face the SUS challenges as a universal system, a bold project and a new set of public development policies tailored to the challenges of the current historical moment is necessary.

In the face of the profound transformations underway, a universal, equitable, and comprehensive system requires an increasingly sophisticated productive and technological base that can address all aspects of care and serve the entire population. The systemic nature of health production and access demands public policies that consider the interdependence between social, industrial, environmental, and ST&I policies, as well as the construction of new instruments to coordinate the multiple interests present in the health sector.

It is the coordination by the state that strategically guides the development of the HEIC, regulating the private sector, strategically engaging where the market competes in high technology and high-value products, and where the market has no immediate interest – despite public interest.

There is a need to move towards a dynamic, systemic, and strategic vision that captures the opportunities for national development by articulating social demand with the domestic market and leveraging the economic power of SUS.

Development entails a profound transformation of the productive structure which, when oriented toward universal access in a country as vast as Brazil, can become a major front for development. Caring for people, reflected in the expansion and qualification of healthcare, can become a driving force for the expansion of industrial and service sectors, allowing for the densification of the productive fabric and aligning the productive-technological structure with the social demand for health. Given the scale of SUS, these new areas of activity, being intensive in qualified labor and following sustainable technological pathways, have the poten-

tial to be at the core of development policies, promoting spillovers and structural changes.

It is within this dimension that the development of the HEIC emerges as a crucial space for a profound change in the national development pattern. When strengthened with production, technology, science, and innovation, generating income and qualified jobs, SUS can serve as a platform with the scale and dynamism needed to sustain long-term development in Brazil. The great strategic challenge is precisely to enable an articulated expansion and transformation of the entire health productive system; simultaneously, it's necessary to meet the expansion of universal actions and services, and the development of the national productive and innovation potential.

Well-being, caring for people, and caring for the environment can be the key to sustaining structural changes in Brazilian society. The Brazilian state and SUS institutions must build the capacity to act in a complex, systemic, and strategic manner, oriented towards the needs of the population.

Theoretical and political formulations based on narrow views see the Welfare State as an expense. These views contribute to the chronic underfunding of the SUS and to a merely compensatory perspective of its role. The SUS is a powerful universal system that operates from basic care to high-tech procedures. It runs programs that are internationally recognized, developing and producing knowledge, products, and services for the entire Brazilian population.

Among countries with universal health systems, Brazil has the lowest proportion of public funding for health actions. While in European countries at least 70% of these actions are funded by national governments, in Brazil, public health spending is around 40%. It is both possible and desirable to overcome this contradiction by promoting the expansion of public funding through actions that strengthen national production and enable a virtuous arrangement for the development of the HEIC aimed at universal access.

It is time for boldness, to take the risks of new approaches, and, progressively and collectively, to seek a vision that provides the foundation for a new development project that incorporates a profound change in the state's mode of operation. This is the essential condition for society not to be misled by one-size-fits-all solutions and to – once again – embrace utopias and transformative energies with a view to build a dynamic, just, and democratic country.

Health can and should lead this great front of transformation, which requires expanding the paradigms to treat the health sector as a strategic bet for the country in driving structural changes. Just as oil, steel, and automobiles were engines of development in the 20th century, health has the potential to be one of the vectors of expansion in the 21st century in Brazil, embodying a model of society capable of addressing climate change, the need for income and job growth, innovation, and the strengthening of national production. To achieve this, it is essential breaking conceptual paradigms, daring to take risks, embracing diversity and contradiction at all levels, and integrating different areas of knowledge and public policies.

Health Economic-Industrial Complex in action: Driving Healthcare Transformation in Brazil

The Brazilian Government, since the beginning of Lula administration, adopted the HEIC perspective that Health is Development. The Ministry of Health has been engaging with multiple institutions and actors, public

and private, to revisit policies of previous administrations, recreate and improve the health industrial and innovation policy, adapting to the old and the new challenges of the XXI century.

For this purpose, President Lula launched, in September 2023, the National Strategy for the Development of the HEIC. The Strategy aims to guide public and private investments in local production and innovation in health to reduce vulnerability and expand access to the Unified Health System (SUS). It is based on the diagnosis that the development of productive capacity in health in Brazil to meet the health needs of the population constitutes an engine of national development, generating investment opportunities, income generation and the creation of quality jobs. On the launch of the strategy, President Lula declared: "What is happening today is the realization of a dream that we have been dreaming for a long time. It is more than a program to create a health industry, we are creating a country ... Brazil decided to become a great nation by defining sovereignty as a country that prioritizes the quality of life."

The Matrix of productive and technological challenges in health is the main guide of the National Strategy for the Development of HEIC, signaling to society and the group of economic agents involved in production and innovation in health the strategic challenges to improve the resilience of the SUS and expand access to health in Brazil. The matrix is presented in two blocks:

1. SUS preparedness for health emergencies, including those associated with climate change, and
2. SUS critical diseases and conditions.

The strategy encompasses five structuring programs: Partnerships for Productive Development Program (Programa de Desenvolvimento Produtivo, PDP, in Portuguese); Local Development and Innovation Program (Programa de Desenvolvimento e Inovação Local, PDIL, in Portuguese); Program for Preparation in Vaccines, Serums and Blood Products; Production and Technological Development Program for Neglected Populations and Diseases; and Program for the Expansion and Modernization of the Infrastructure of the Economic-Industrial Health Complex.

Each program involves different areas, actors, and instruments to achieve the objective of expanding national production, facing the challenges of the SUS, and expanding Brazil's sovereignty in the development and production of inputs, medicines, vaccines, and other health products, aiming to promote universal access to health.

Among the main advances are the updating of the regulatory framework of the Partnerships for PDP and the creation of the PDIL. The PDPs were a successful example of public-private partnerships between public laboratories and private companies to expand access to strategic products for the SUS and strengthen the Brazilian HEIC. The Ministry of Health of Brazil guarantees access to the public market to the partnership for 5 to 10 years, provided there is a technological transfer of the product in question from the private partner to the public. The PDIL, on the other hand, is the new program created to use the purchasing power of the State to foster the development of innovations and productions in health in the Brazilian territory.

The Strategy for the Development of the Economic-Industrial Health Complex is articulated with the New Industry Brazil, the new Brazilian industrial policy, which seeks to drive the country's neo-industrialization and ecological transformation. The strengthening of HEIC to reduce the SUS's vulnerabilities and increase health access is one of the six missions stablished by the new Brazilian industrial policy.

To fulfill this mission, the New Industry Brazil set the mobilizing targets to domestically produce 50% of the country's needs in medicines, vac-

cines, medical equipment, and other health technologies by 2026, and 70% of health needs by 2033. These goals emphasize the importance of enhancing Brazil's productive capacity to support the SUS and ensure health sovereignty.

The adoption of the HEIC perspective contributed to improving expectations and confidence in the private and public sector, resulting in the largest public investment in Brazilian HEIC in the history. These Investments are facilitated through the PAC (Programa de Aceleração do Crescimento in Portuguese) HEIC, which focus on reconstructing Brazil's infrastructure to health technology production and innovation.

To coordinate this set of initiatives, the Brazilian government recreated the Executive Group of the HEIC, an interministerial governance group led by the Ministry of Health, with the participation of public and private entities and civil society. The executive group is the locus for the institutional coordination of HEIC policies, articulating with the different actors and institutions related to innovation and production in health, including regulatory and financing institutions.

These initiatives position the HEIC as a key driver of sustainable development, with the potential to generate high-quality jobs, foster innovation, reduce territorial inequalities and increase Brazil's global competitiveness.

Health Economic-Industrial Complex approach: A Strategic Opportunity for BRICS

The adoption of HEIC perspective, that posits that health is development, presents a compelling model to BRICS nations to address the disparities in global health technology access. The BRICS countries – with their unique combination of emerging economies – have the potention to lead a transformative movement of local production and R&D in health technologies. By integrating the principles of HEIC perspective, considering the specificities of each BRICS countries, can enhance their collective capacity to produce vaccines, treatments, diagnostics, and other essential health technologies, thereby reducing their dependence on external sources and ensuring greater health sovereignty.

Brazil's experience in coordinating public policies based on the HEIC perspective offers valuable insights that can be adapted to the BRICS context. By focusing on the development of local and regional production capacities, the BRICS nations can collectively strengthen their health systems, ensuring that even the most vulnerable populations within their borders have access to critical health technologies. This approach aligns with the broader objectives of BRICS to promote equitable and sustainable development across member states.

The BRICS countries, known for their scientific and technological advancements, can use the HEIC perspective to bridge the innovation gap between developed and developing nations. Moreover, by fostering cooperation in research and development and promoting technology cooperation among member states, BRICS can enhance their collective capacity to respond to global health emergencies. This collaboration would not only improve health outcomes, but also would drive economic growth by creating jobs, stimulating local industries, and fostering innovation within the BRICS countries.

Final considerations

The strengthening of the HEIC should be recognized as a fundamental pillar for Brazil’s development, ensuring universal health access, and re-

ducing the vulnerabilities of the Unified Health System (SUS). As the BRICS countries seek to address disparities in global health technology access, they can adopt the principles of the Brazilian experience, enhancing their capacity to produce vaccines, treatments, diagnostics, and other health technologies, reducing dependence on external sources and ensuring greater health sovereignty. This approach not only strengthens the health systems within BRICS nations, but also fosters economic growth by stimulating local industries and driving innovation.

By fostering cooperation in research, development, and technology transfer, BRICS can collectively respond to global health emergencies. This collaboration not only improves health outcomes, but also positions BRICS as a more influential force in global health governance, challenging existing inequities and advocating for equitable access to health technologies on a global scale.

In conclusion, adopting the HEIC perspective that health is a vector of development, can promote a transformative agenda that builds a dynamic, just, and democratic future, ensuring health equity and sustainable development for all.

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