One Health as a strategic approach to promote equitable access to food

Revisión

Una Salud como enfoque estratégico para promover el acceso equitativo a los alimentos

A abordagem Uma Só Saúde como estratégia para promover o acesso equitativo aos alimentos

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Abstract

In recent decades, the One Health perspective has emerged as a transdisciplinary framework suitable for generating knowledge and making decisions aimed at promoting global health in its broadest sense. The world's population is growing at an annual rate of 1.1 %, with the largest share occurring in developing countries. Estimates show that feeding the planet's projected population in 2050 will require a 70 % increase in food production compared to early 21st-century levels. Currently, around 800 million people are undernourished, while approximately half of the world's population, mostly in low-income countries, lacks access to one or more essential nutrients. The response to this need must be addressed under a challenging global change context, in an environment increasingly impacted by the intensification of production systems, among other factors. While the One Health approach is considered a natural framework for addressing issues such as antimicrobial resistance or the management of emerging zoonoses, it can also provide a useful framework for generating knowledge and making decisions aimed at meeting the food needs of the world's population. The present narrative review seeks to originally substantiate the need to value the analytical and policy dimensions of One Health to help promote fair access for the inhabitants of the planet to sufficient and healthy food, a basic human need that shapes the health of people throughout their lives across the globe.

Keywords: Food, Nutrition, Health, Equitable Access, One Health, Public Policy.

Resumen

En las últimas décadas, la perspectiva Una Salud ha emergido como un marco transdisciplinario idóneo para generar conocimiento y tomar decisiones orientadas a promover la salud global en su sentido más amplio. La población mundial crece a una tasa anual del 1,1 %, en mayor proporción en los países en desarrollo. Se estima que alimentar a la población proyectada del planeta en 2050 requerirá un aumento del 70 % en la producción de alimentos en comparación con los niveles de principios del siglo XXI. En la actualidad, alrededor de 800 millones de personas sufren desnutrición, mientras que aproximadamente la mitad de la población mundial, sobre todo en países de bajos ingresos, carece de acceso a uno o más nutrientes esenciales. La respuesta a esta necesidad debe abordarse en un contexto complejo de cambio global, en un entorno cada vez más afectado por la intensificación de los sistemas de producción, entre otros factores. Si bien el enfoque de Una Salud se considera un marco natural para abordar problemas como la resistencia a los antimicrobianos o la gestión de zoonosis emergentes, también puede proporcionar un enfoque útil para generar conocimiento y tomar decisiones orientadas a satisfacer las necesidades alimentarias de la población mundial. La presente revisión narrativa busca fundamentar la necesidad de valorar las dimensiones analíticas y políticas de Una Salud para promover el acceso equitativo de los habitantes del planeta a una alimentación suficiente y saludable, una necesidad humana básica que define la salud de las personas a lo largo de su vida en todo el mundo.

Palabras clave: Alimentación, Nutrición, Salud, Acceso Equitativo, Una Salud, Políticas públicas.

Resumo

Nas últimas décadas, a perspectiva de Uma Só Saúde emergiu como uma estrutura transdisciplinar adequada para gerar conhecimento e tomar decisões com o objetivo de promover a saúde global em seu sentido mais amplo. A população mundial cresce a uma taxa anual de 1,1 %, com a maior parte concentrada em países em desenvolvimento. Estimativas mostram que alimentar a população mundial projetada para 2050 exigirá um aumento de 70 % na produção de alimentos em comparação com os níveis do início do século XXI. Atualmente, cerca de 800 milhões de pessoas sofrem de subnutrição, enquanto aproximadamente metade da população mundial, principalmente em países pobres, não tem acesso a um ou mais nutrientes essenciais. A resposta a essa necessidade deve ser abordada em um contexto desafiador de mudanças globais, em um ambiente cada vez mais impactado pela intensificação dos sistemas de produção, entre outros fatores. Embora a

abordagem de Uma Só Saúde seja considerada uma estrutura natural para abordar questões como a resistência antimicrobiana ou o manejo de zoonoses emergentes, ela também pode fornecer uma estrutura útil para gerar conhecimento e tomar decisões com o objetivo de atender às necessidades alimentares da população mundial. A presente revisão narrativa busca fundamentar, de forma original, a necessidade de valorizar as dimensões analíticas e políticas da Uma Só Saúde para promover o acesso equitativo dos habitantes do planeta a alimentos suficientes e saudáveis, uma necessidade humana básica que molda a saúde das pessoas ao longo de suas vidas em todo o mundo.

Palabras-chave: Alimentação, Nutrição, Saúde, Acesso Equitativo, Uma Só Saúde, Políticas Públicas.

Introduction

The One Health perspective is based on an integrative approach, with the main objective of optimizing outcomes in health management in the broadest sense. This way of understanding health promotion strategies is based on recognising that the health of humans, domestic and wild animals, and the environment, does not involve isolated compartments, but is closely and interdependently connected (Lee & Brumme, 2013).

In recent decades, this transdisciplinary perspective has undergone significant conceptual expansion in professional, management, and academic settings and has been formally adopted as a framework for action by major global health organizations, such as the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), the World Organization for Animal Health (WOAH, formerly OIE), and the United Nations Environment Program (UNEP) (WHO, 2022).

Although the institutional need to analyse health problems and challenges under this perspective arose as a response to the health crisis associated with global change in the early 2000s (triggered by highly pathogenic avian influenza (HPAI) outbreaks), the consolidation of this framework for thought and action is the result of a historical process that can be traced back, for example, to about five centuries BC, when Hippocrates already proposed an interdependence between environmental conditions, climate, health and the prevalence of diseases (Falagas et al., 2010).

The historical background that has led to the modern formal One Health framework demonstrates that health issues cannot be limited to the physiopathological bases of diseases and subsequent therapies. The One Health approach can help reconceptualize health management within a scenario of global change, understood as the accelerated environmental changes of the last hundred years associated with population growth and human activity. The current global health situation is highly complex and, in this context, it is essential to consider the consequences of the COVID-19 pandemic, which deepened the health crisis our planet is experiencing today (Zunino, 2024).

When considering the challenges that can be addressed from a One Health perspective, one often thinks, for example, of the emergence and re-emergence of zoonotic pathogens or the increase in bacterial resistance to antimicrobials (Brown et al., 2024). However, the One Health approach is beginning to address other problems that significantly challenge global health and require in-depth reflection involving diverse knowledge and disciplines. One of the subjects not naturally associated with the issues to be addressed from a One Health approach is the production, quality, and equitable access to food worldwide (Ibáñez et al., 2025).

The available literature on the opportunity to address the problem of inequitable access to food from a One Health perspective is practically nonexistent. This article aims to propose and justify the need to bring this topic to the forefront of relevance, as it is essential when considering the fields of reflection and action from the One Health perspective. The study was conducted as a narrative and conceptual review integrating evidence from human health, animal health, environmental science, nutrition, and policy disciplines under the One Health framework. The review aims to synthesize existing knowledge to explore how One Health can be operationalized to promote equitable access to healthy food at local, regional, and global levels.

Equitable access to healthy food

The world's population is growing at an annual rate of 1.1 %, with the largest share of its growth (approximately 90 %) occurring in developing countries. More than half of the human population lives in large cities; by 2050, that proportion is projected to exceed 70 % (currently, about 55 % of the world's population lives in big cities). Moreover, approximately one billion people live in critical peri-urban environments in large cities in developing countries, where the fastest-growing human populations are expected to occur (United Nations [UN], 2017).

Projections show that feeding a global population estimated at 9.7 billion people in 2050 will require a 70 % increase in food production compared to early 21st century levels (Ehrlich & Harte, 2015). Currently, around 800 million people are undernourished while approximately half of the world's population (mostly in poor countries) lacks access to one or more essential nutrients (Myers et al, 2014; Tilman & Clark, 2014).

According to the latest report on "The State of Food Security and Nutrition in the World" published jointly by five United Nations agencies (FAO, IFAD, WHO, WFP and UNICEF), around 733 million people suffered from hunger in 2023, equivalent to one in 11 people in the world and one in five in Africa (FAO, International Fund for Agricultural Development [IFAD] et al., 2023). Therefore, it is clear that humanity is facing an unfair distribution and access to food, so active policies must be adopted to address this situation. Equitable access to food means that all people have the opportunity to obtain nutritious and safe food in adequate

quantities, with respect for the communities' cultures. Even with adequate calories available, diets are often less than ideal, increasing the prevalence of various diseases (Ehrlich & Harte, 2015).

In Uruguay, for example, a high-income country that stands out in the context of South America for its high Gross Domestic Product per capita and whose economy is based on agricultural production, it is estimated that fruit and vegetable consumption is half of the minimum consumption recommended by the FAO (Gómez Perazzoli, 2019).

The WHO World Health Report estimated that insufficient fruit and vegetable intake causes 19 % of gastrointestinal cancer and 31 % of ischemic heart disease cases, resulting in 2.7 million deaths annually worldwide (5 % of the total) (Duthie et al., 2018).

Globally, the situation regarding fruit and vegetable intake shows similar trends (Gómez Perazolli, 2019). The WHO and FAO have prosed a wide range of policies involving governments, the production sector, the media, educational programs, and consumers, among others, although the results have been limited (WHO & FAO, 2005).

Recently, the Nutrition, Child Development and Health Survey carried out by the Ministry of Social Development in coordination with the Ministry of Public Health and the National Institute of Statistics of Uruguay, revealed that 41.6 % of Uruguayan children have a body mass index higher than expected for their age, and 14.1 % are overweight and obese, a problem that prevails and is increasing in society (Instituto Nacional de Estadística [INE], 2025).

Furthermore, the global food demand scenario is highly vulnerable and subjected to the various vicissitudes that humanity faces. For example, the COVID-19 pandemic had a severe impact on different aspects of global development (including food supply and demand) (Maqbool et al., 2024). According to the United Nations World Food Programme, trade barriers imposed by some countries to safeguard national food security, coupled with an economic slowdown, significantly contributed to the increase in global hunger (World Food Programme, 2020).

Diseases associated with agriculture

Years ago, John McDermott and Delia Grace proposed the category of "agricultural associated" diseases (McDermott & Grace, 2012) According to both authors, these diseases include any condition related to agri-food value chains. Although this concept has not been operationalised so far, concrete variables and indicators could be used to measure the impact of these diseases on global health.

This category also refers to diseases influenced by ecosystem changes driven by food production and changes associated with the expansion of agroecosystems into natural ecosystems. Zoonoses associated with domestic and peridomestic animals, as well as

diseases that, although not currently regularly transmitted from animals to humans, originally derive from animals (e.g. HIV/AIDS, SARS, COVID-19) are also included.

Climate change has crucially influenced the prevalence of diseases that affect productive animal species, particularly those mediated by vectors (Abbasi, 2025). Due to global temperature increase and changes in humidity and precipitation patterns, vectors have broadened their distribution and remain active for longer periods throughout the year. Moreover, the effects of some vectors, like ticks, can also be severely detrimental, for instance in cattle, beyond their role in pathogens transmission (Frisch, 1999).

Several authors have proposed that the most important driver in the emergence and re-emergence of human pathogens, and in particular those associated with zoonoses, is the change in land use and agricultural practices, due to the increase in the extension and intensification of production systems (Jones et al, 2013; Woolhouse & Gowtage-Sequeria, 2005). It is currently considered that environmental deterioration has significantly influenced the occurrence patterns of numerous zoonoses such as avian influenza, leptospirosis, leishmaniasis, hantavirus or rabies, among many others (Guterres & Sampaio de Lemos, 2018; Slenning, 2010).

In the research and development plan for priority diseases of the World Health Organization (WHO Research and Development Blueprint) (Mehand et al., 2018) a series of high-priority potentially pandemic diseases are listed (Jonkmans et al., 2021). All of these diseases are caused by zoonotic RNA viruses, in which vectors and domestic and wild animals play fundamental roles in their cycles and spread, facilitated by environmental degradation and the consequent disruption of animal-human interactions. According to the OIE, 60 % of known infectious diseases and 75 % of emerging or re-emerging infectious diseases can be considered zoonoses (Caballero Gómez et al., 2024; Marano & Pappaioanou, 2004).

In addition to the problem of zoonoses and their impact on public health, it is important to consider that production losses due to diseases affecting food-producing animals, including non-communicable animal diseases to humans, would exceed 20 % (World Organisation for Animal Health [OIE], 2009). This loss generates a significant impact on global health due to limitations in the supply and access to food, increasing nutritional deficiencies that can affect large sectors of the world's population, particularly the most vulnerable ones (Costlow et al., 2025).

This category of diseases proposed by McDermott and Grace could also include those associated with antimicrobial-resistant microorganisms. According to different prediction models, by 2050, some 10 million people will die from causes associated with antimicrobial resistance, surpassing deaths from cancer worldwide (Naddaf, 2024; O'Neill, 2016).

One of the main links between intensive animal production and the increase in antimicrobial resistance is the widespread use of growth promoters. Growth promoters are

antimicrobial agents administered sub-therapeutically to food-producing animals with the intention of maintaining health and increasing productivity (Etienne et al., 2025). Since 2000, meat production has stabilized in high-income countries, but has grown by 68 %, 64 %, and 40 % in Asia, Africa, and South America, respectively. Nowadays, the increasing demand for animal protein is the most notable food trend of our time (Van Boeckel et al., 2019). This transition to protein-rich diets in these regions has been associated with the expansion of intensive animal production systems, where antimicrobials are commonly used.

Currently, approximately 73 % of all antimicrobials sold worldwide are used in food-producing animals, including their utilization as growth promoters. Although the association between the use of growth promoters and the increase in infections related to antimicrobial-resistant microorganisms in both animals and humans remains controversial, there is strong evidence supporting this relationship (Paul et al., 2022).

Although WOAH members committed to banning the use of high-priority antimicrobials for humans as growth promoters in 2026, about 25 % of the countries still report using these drugs for growth promotion. Most of these countries have not carried out any risk analysis or developed any regulatory framework (WOAH, 2025).

The use of antimicrobials in animal health and food production has a significant impact on human medicine and environmental management. Antibiotic Stewardship Programmes (ASPs) are implemented to improve patient's safety and enhance the outcomes of therapeutic measures, prevent antibiotic resistance, and reduce harm caused by the misuse or overuse of these drugs. In general, these programs have proven useful in achieving their objectives, although they must be continuously monitored to optimize their results. Furthermore, the results have been shown to be heterogeneous, as their implementation and results recording is more difficult in low- and middle-income countries (Zay et al., 2023).

Non-communicable diseases

The planet is currently experiencing another "silent" pandemic attributed to non-communicable diseases (NCDs), which are those diseases that are not contagious and currently constitute the leading cause of death and disability worldwide, accounting for more than 40 million deaths annually, approximately 74 % of the total. They are characterized by their non-contagious nature, multiple risk factors, long latency periods, prolonged temporal evolution, associated functional impairment or disability, and low probability of cure (Piovani et al., 2022). This category includes cardiovascular diseases, chronic respiratory diseases, diabetes mellitus, obesity, and neurodegenerative diseases, among others. The One Health framework has generally overlooked NCDs. However, a new understanding of the pathogenesis of these disorders paves the way for a One Health approach to address these problems.

Here too, it is important to ponder the economic and political dimensions of this approach. NCDs predominantly affect low- and middle-income countries and the most underprivileged social sectors of all nations (Lago-Peñas et al., 2021). Of all deaths caused by NCDs, a quarter occur in high-income countries, while the remaining three-quarters occur in low- and middle-income countries, where most of the world's population resides. Furthermore, 17 million people die each year from NCDs before reaching the age of 70, and the vast majority (86 %) of these premature deaths occur in low- and middle-income countries (Piovani et al., 2022).

The wide variety of risk factors associated with these disorders are generally linked to a Western industrialized lifestyle that includes unhealthy diets based on processed foods high in fat and sugar and artificially supplemented with sweeteners, emulsifiers, or preservatives (Srour et al., 2022). However, other factors strongly influence the prevalence of NCDs, including environmental pollutants, overuse of disinfectants, antiseptics and antibiotics, urbanization, stress and sedentary lifestyle, increased cesarean births and formula-based neonatal feeding, among others. All these factors have in common that they affect the acquisition of microbiotas and their interaction with the host along time. In recent decades, the relevant role of the human microbiome in maintaining organism homeostasis has been recognised. Numerous functions have been attributed to these microbial communities, including the prevention of the onset of chronic non-communicable diseases (Bäumler & Sperandio, 2016; Fan & Pedersen, 2021). In this context, significant changes in the composition and functions of the intestinal microbiota have been associated with a substantial increase in the prevalence of chronic diseases such as diabetes, obesity, asthma, and other respiratory diseases, allergies, inflammatory bowel diseases, and diseases linked to mental health and the nervous system, among others (Huang et al., 2023; Schoultz et al., 2025; Sonnenburg & Sonnenburg, 2019).

We are currently facing an opportunity to integrate different topics such as dietary transitions, microbiome disruption, and the industrialization of food systems under a One Health perspective. One Health policies or interventions to address the challenge of the increasing prevalence of NCDs could include urban planning, changes in intensive food production systems, programmes to promote healthy and sustainable diets, control of environmental pollutants, and improvement of waste management (e.g., hospitals and farms), among other issues.

Food safety

The growing demand for food, population growth especially in urban centers, poor hygiene in food manufacturing and storage conditions, intensification of production systems, and the increase and globalisation of trade are some of the causes that have led to the

emergence of foodborne diseases, particularly in developing countries (Grace, 2023).

Every year, some 600 million people worldwide become ill from eating contaminated food, and around 420,000 die (Pires et al., 2021). In particular, foodborne diseases account for at least four percent of the disease burden in low-income countries. Diarrhea is one of the three leading infectious diseases in most poor countries and is estimated to cause the death of 1.4 million children each year. Between 33 % and 90 % of diarrhea cases are attributed to food-related causes (McDermott & Grace, 2012).

On the other hand, climate change has augmented the risk of foodborne diseases, directly (e.g., by increasing the multiplication rates of microorganisms or even by modifying their gene expression patterns) and indirectly (e.g., through water shortage or contact with contaminated water) (Dietrich et al., 2023; Leddin, 2024).

Food safety not only involves microbial contamination, but also other problems related to the intensification of food production systems, like the presence of insecticides, acaricides or antimicrobial compounds residues, among others (Ehrlich & Ehrlich, 2013; Githaka et al., 2022). The intensification of crop-based food systems has also increased health risks related to the presence of pesticides, mycotoxins or other compounds (Kumar et al., 2018).

Particularly in developing countries, the goal of policymakers has traditionally been based on the objective of maximising production without taking into account the social, sanitary and environmental economic consequences of the hyper-intensification of production systems (Bengtsson et al., 2018).

Food safety also needs to be addressed as a bridge between equity, environment, and health governance, not only seen as a technical but a social justice and policy issue within the One Health perspective. Numerous pieces of evidence indicate that low- and middle-income countries are the most affected by foodborne illnesses, most of them being the result of consuming fresh and perishable foods sold in informal markets (Grace, 2015).

The role of One Health

Nutrition is a basic need that ensures human survival. Throughout history, the daily struggle for food has shaped the lives of humankind. For much of the world's population, this situation remains unchanged, and millions continue to suffer from hunger and medical conditions caused by insufficient nutrition or inadequate diets (Alt et al., 2022).

The causes and drivers of inequalities in fair access to healthy food are interconnected in a complex web. Therefore, the challenge of elucidating these constraints and proposing alternatives requires an integrated response at local, national, and global scales that integrates the capacities of multiple actors. In this context, the One Health perspective offers an ideal framework for reflection and action to achieve equitable access to food and adequate nutrition globally (Nabarro & Wannous, 2014).

The United Nations has explicitly stated that it is essential to consider the One Health approach to achieving the related Sustainable Development Goals (SDGs). Several SDGs naturally link the One Health perspective with the challenge of addressing limitations on equitable access to food, like SDG 1 (No Poverty), SDG 2 (food security and agricultural production), SDG 3 (Good Health and Well-Being), SDG 6 (clean water and sanitation), SDG 11 (Sustainable cities and communities), SDG 13 (climate action), SDG 14 (life below water), and SDG 15 (life on land) (Food and Agriculture Organization of the United Nations , United Nations Environment Programme, World Health Organization, & Worl Organisation for Animal Healt [FAO, UNEP WHO, WOAH], 2023).

It is essential nowadays to generate novel knowledge about strategies for increasing food production in response to global population growth and needs, taking into account potential environmental impacts, in the current context of global change (Zambrano & González-Salazar, 2025). To achieve this goal, it is also crucial to link and harmonise different perspectives. As McDermott and Grace argue, rather than analysing trade-offs between agricultural benefits and risks, the agricultural sector focuses on productivity, while the health sector focuses on disease management (McDermott & Grace, 2012). Also, when access to food is under debate, views such as “insufficient food” versus “unequally distributed food” are opposed, often leading to a sterile argument if other dimensions of the problem are not taken into account (Harte, 1996).

To address the need for fair access to healthy food, various disciplines must be involved in a complementary manner, with One Health providing a suitable platform for action. Furthermore, the social sciences face the challenge of generating alternatives and proposals to make access to food fairer and more equitable. This discussion involves the economic sciences and local, national, and global policies to achieve this goal, promoting the design of evidence-based public policies.

It is essential that the knowledge generated within the One Health perspective is translated into concrete results and public policies without delay (Zunino, 2024). Otherwise, there is a serious risk of progressively eroding the conceptual framework of One Health, reducing it to a mere slogan devoid of meaning.

Conclusions

The One Health approach has emerged in recent decades as an alternative framework for promoting global health. There are key issues where this approach is particularly well-suited for analysis and solutions, such as the increasing resistance of microorganisms to antimicrobials or the management of zoonotic diseases (Zunino, 2018). However, there are other critically important subjects to health in its broadest sense that could be addressed within the One Health framework, a field of knowledge that has been little explored until now.

In particular, equitable access to healthy food provides an opportunity for analysis, knowledge generation, and evidence-based public policy design, where diverse forms of knowledge can converge in a transdisciplinary manner to promote it. This challenge for global health disproportionately affects the poor and underdeveloped sectors of the world's population. It is imperative that addressing this challenge within the One Health approach leads to concrete results, as orientated policies. In this regard, equity must be adopted as a guiding principle, ensuring that vulnerable populations have access to sufficient, nutritious, and culturally acceptable food. This will require the design of integrated regulatory frameworks that consider food security, environmental sustainability, and animal and human health. Otherwise, this framework risks becoming hollow and generating frustration due to unmet expectations.

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Competing Interests

The author declares that he has no competing interests.

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Author’s Contributions

PZ: Conceived the idea, collected and analysed the literature, and wrote and approved the final manuscript.

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