


Environmental impacts and respiratory effects: Emergence of public policies for global health

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ABSTRACT

The study aimed to analyze environmental impacts and respiratory effects from the perspective of emergency public health policies. This is a theoretical essay of a reflective nature. The proposed reflections were supported by relevant international and national literature. It points to environmental impacts as a challenge in the scope of public health, causing vulnerabilities to diseases, economic and social inequalities, to cause inequities regarding the health condition of a population. It highlights the emergence of public health policies that can expand attention and care for respiratory diseases, to understand health in its broader sense.

Keywords: Environmental health, Respiratory diseases, Public policy, Health.

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INTRODUCTION

Some of the main sources of contamination in the modern world are air pollutants, which can be released by natural sources, such as gases, produced in the process of decomposition of organic matter, as well as by artificial sources, such as factory waste, which are directly related to environmental air and water pollution (SANTOS, 2021).

According to Arbex (2012), the effects of pollutants on health can be manifested at different times of exposure to these agents, being subject to chronicity. In addition, these manifestations can be aggravated in different ways, especially in more susceptible groups, such as children, the elderly, those with pre-existing chronic diseases, and those with genetic susceptibility. (ARBEX, 2012)

The reality of Brazil, with particularities related to the dimensions and peculiarities in ecology, shows fragility due to the rapid movement of modernization and adaptation to the world market since the 1980s, lacking policies and environmental security to pave this transition (RIGOTTO, 2007).

The relationship between health and the environment is an intrinsic determinant of public health issues (DIAS, 2018). Thus, started in 1970 and currently, approaches beyond the traditional health system, which understand the environment as an influencing factor in the physical, mental and social well-being of human beings, have been consolidated (RANGEL, 2015).

Along the way, the United Nations (UN) developed the 2030 Agenda encompassing 17 Sustainable Development Goals, the third of which is dedicated to health with the purpose of actions related to the well-being of the population. The purpose of the Agenda includes the reduction of deaths and illnesses from "hazardous chemicals, contamination and pollution of air and soil water" by the year 2030 (UN, 2023). These recommended actions for nations are directly related to health and disease indicators in various territories, as well as exposing the need for local scientific development, obeying specific demands (SILVA, 2019).

Some associated factors may cooperate as indicators of disease, such as climate and allergenic agents, however, the association with air pollutants causes acute and chronic illness in exposed populations, generating a public health emergency (JENEROWICZ, 2012) that, despite the demand being public knowledge, does not enjoy the significant support to minimize certain impacts that is within the reach of the civilian population (FERNANDES, 2009).

Thus, improving the management of health services and obtaining knowledge about diseases caused by environmental impacts are the result of the discussion of factors in the context of Public Health. These factors involve the government, human resources, physical resources, information, and technology, thus providing the consideration of budgetary aspects for investments in public policies aimed at global health (RANGEL, 2015).



In view of the above, the following question arises: how the literature has been discussing environmental impacts and respiratory effects from the perspective of the emergence of public health policies. Thus, the objective is to analyze the environmental impacts and respiratory effects from the perspective of the emergence of public health policies.

METHOD

It is a theoretical essay of a reflexive nature, based on the discursive formulation of the theme and supported by the national and international scientific literature and critical analysis of the authors. It is emphasized that the reflections to be made resulted from the interpretations of the literature and also from the reflective impressions of the authors. The presentation of the explanations and reflections to be made will take place in the form of a guiding axis on the theme, coming from interpretations of the literature and also reflective impressions of the authors. In addition, as there was no interaction of direct/applied research, the need to submit the study to ethical procedures was excluded.

RESULTS AND DISCUSSION

The productive processes inaugurated with the economic activities caused by the capitalist system have been determinant for the environmental impacts. However, it is from the nineteenth century, with the universalization of capitalism, that such processes began to provoke intense socio-ecological transformations of scale (MIRANDA, 2012).

These changes gained prominence, especially after World War II, with the intensification of the pace of production and consumption. Worldwide, between 1950 and 1970, manufacturing output quadrupled; The number of grains per hectare doubled between 1950 and 1980, and the fishing industry tripled its catches. In 1940, four million tons of chemical fertilizers were consumed, and in 1990, 150 million. Approximately 10 million chemical substances have been produced since 1900 and, between 1940 and 1982, the production of synthetic substances increased 350-fold (MIRANDA, 2012).

With the growing industrialization and, especially, with the increase in the number of vehicles in circulation in recent decades, the problem has worsened, emerging the need for urgent measures that are capable of reducing the risk to health. Available data reveal that there is no threshold below which there is no increase in health risk, so the challenge is to reduce air pollution levels as much as possible (FERNANDES, 2009).

Thus, the impact of this model on health points to the need to look beyond the traditional health model, since it is necessary to reflect on the mechanisms that concern the health object. It points out that it understands the need for discussions about the relationship between health and the



environment as a challenge in the context of public health, considering vulnerabilities to diseases, economic and social and environmental exposure and their effects on the health of the population (RANGEL, 2015).

In this context, it is necessary to understand that the relationship between health and the environment transcends the perspective of a biological care, emerging the need to reproduce a vision that seeks to incorporate knowledge related to aspects related to the process health-DISEASE (ALVES, 2022). Therefore, the understanding of the relationship between health and the environment involves different and diverse themes, which provides a basis for the expanded conceptualization of health (DIAS, 2018).

Thus, the significant increase in emissions of air pollutants, and air quality has become a public health problem. The trend of migration of the population to the urban environment has increased exposure to air pollutants, which has contributed to higher morbidity and mortality due to causes related to this exposure, such as respiratory diseases (MAIO, 2013; HELIDÉN, 2021).

It is estimated that air pollution globally is responsible for about 5 million deaths in 2017, 70% of them due to outdoor ambient air pollution. Ambient air pollution plus indoor air pollution ranks fifth among the five most relevant risk factors for death in the world (GBD, 2017).

In view of the data, it is observed that in recent decades there has been a significant increase in the prevalence of chronic respiratory diseases such as asthma and allergic rhinitis, which coincides with the growing process of industrialization, the increase in vehicular traffic and migration to urban areas, especially in Western countries (GUO; JENEROWICZ, 2012).

In Brazil, data indicate that about 102 thousand deaths are associated with ambient air pollution in 2015, corresponding to the ninth risk factor for deaths (COHEN, 2017). The effects of air pollution on health are considered to be short-term or long-term, depending on the length of exposure to pollutants (SERPA, 2022).

A study involving 112 U.S. cities found a 1.68% increase in mortality from respiratory diseases for every 10 $\mu\text{g}/\text{m}^3$ increase in the concentration of Particulate Matter (PM) PM 2.5 (ZANOBETTI, 2009). A systematic review and meta-analysis of 110 time-series studies conducted in various regions of the world revealed a 1.51% increase in mortality from respiratory diseases associated with each 10 $\mu\text{g}/\text{m}^3$ increase in PM 2.5 concentration (ZANOBETTI, 2014).

The effects of chronic exposure have been associated with increased overall mortality from respiratory diseases, increased incidence of asthma and chronic obstructive pulmonary disease (COPD), increased incidence and mortality from lung cancer, reduced lung function and lung disease, and increased lung function (CHEN, 2015; THURSTON, 2017). This effect has led to an increase in the number of emergency room visits, hospital admissions, and deaths, especially individuals with chronic respiratory diseases, children, and the elderly (SANTOS, 2021).



Studies show an association between environmental pollution and increased exacerbated incidence of rhinitis. Authors suggest that genetic factors alone do not seem to be sufficient to justify the observed increase in the prevalence and exacerbation of allergic diseases, especially eczema, rhinitis and asthma. Exposure to PM10 and PM2.5 appears to have a major impact on the increase in the prevalence of these diseases, especially in vulnerable groups, such as the elderly, children and adolescents (BRANDT, 2015).

Exposure to pollutants such as PM, NO₂, ozone, and carbon, as well as to vehicular traffic, is associated with a higher number of exacerbations, hospitalizations, and deaths in asthmatic patients (6,20). A study conducted in Hubei province, China, with 4,454 individuals who died from asthma between 2013 and 2018 found a 7%, 9%, and 11% increase in mortality associated with PM2.5, O₃, and NO₂, respectively (LIU, 2019).

Since the 1990s, epidemiological studies have shown an association between air pollution and acute respiratory events in individuals with COPD, with an increase in the number of exacerbations, emergency room visits, hospitalizations, and deaths (LI, 2016). A cohort study conducted in Norway involving 57,000 individuals found an 8% increase in the incidence of COPD associated with a 5.8 µg/m³ increase in NO₂ concentration (ANDERSEN, 2011).

That said, the need for public policies that can understand the importance of investigating determinants and conditioning factors of health, through multidisciplinary actions, from the perspective of health-promoting practices, in the focus of the conception of the health-disease process in its plurality, emerged.

At this juncture, from the recognition of the social determinants of health, sustainable development dialogues with the concept of health from the conception that it is configured as a social production of interaction between subjects. In this sense, in order to achieve dignity in the next 15 years, the United Nations (UN) presented the post-2015 development agenda with the 17 Sustainable Development Goals (SDGs) guiding actions until 2030. These objectives mirror the social factors that most afflict the community and favor the triggering of the health-disease process, weakening the social relations of the territory (UN, 2023).

The SDGs reinforce the multilateral commitment to eradicate a set of social problems that still afflict humanity, through the understanding of social determinants that favor the triggering of health-promoting practices (UN, 2023; SILVA, 2019), addressing diverse themes such as poverty eradication, food security and agriculture, health, education, gender equality, reduction of inequalities, energy, water and sanitation, sustainable production and consumption patterns, climate change, sustainable cities, protection and sustainable use of oceans and terrestrial ecosystems, inclusive economic growth, infrastructure and industrialization, governance and means of implementation (VEIGA, 2015; OLIVEIRA, 2018).



The SDGs come from a diagnosis where the growing technological advancement will have made it possible to improve the conditions of existence of large layers of the world's population, simultaneously it will have caused a tendency towards environmental decline and destruction that puts at risk the basis of support of the world economy and the future of humanity itself, reinforcing that if the trend is not reversed, social achievements of the last decades may be at risk (GUERRA, 2017).

Nassi-Calò (2023), points out that the SDGs, while encouraging countries to seek and eliminate basic problems, assist other problems that require immediate attention and a new round of public policies at the local, regional, and global levels. The elimination of social inequality has become a means to achieve results in more complex problems, such as climate change and the economic, social and environmental consequences, thus realizing the idea of sustainable development in a world with thinking centered on the accumulation of capital.

In this context, SDG 11 deals with the development of cities, as an adequate locus for the projection of new possibilities of coexistence that allow, in an egalitarian way, a model of city that can start from the use of new technologies to create humanized spaces for inclusion and realization of human rights (STANGHERLIN, 2021).

The comprehension of the territory as a space of organization, values and cultures becomes essential for the organization and development of health practices, since it is in this locus that the interaction of economic processes and social policies of fundamental rights occurs. Thus, enhancing the expansion of the communities' vision for the future and the critical transformation of their consciousness, imposing a new way of thinking about the world to transform their bad conditions in favor of life (RIGOTTO; AUGUSTO, 2006).

The recognition of the territory is a basic step for the characterization of the population and its health problems, as well as for the evaluation of the impact of the services on the health levels of this population (RANGEL, 2015). In addition, it is necessary to have public policies that produce positive results in terms of environmental problems, that promote appropriate techniques, in accordance with the local practice, thus allowing quality in the health of the community.

In view of the above, it can be inferred that the understanding of the relationship between health and the environment enables a view of the health problems of a collectivity, from the perspective of the social determinants of health that interfere in the health-disease process. It was observed that in recent years the impacts caused by the capitalist model have led to negative impacts on the health condition of the population, requiring practices and actions to combat global concerns for health quality.



FINAL THOUGHTS

It is believed that the development of prevention and care practices aimed at reducing the occurrence of allergic respiratory diseases caused by air pollutants contributes to the improvement of health indicators. It is understood that the problem of respiratory diseases has caused changes in the profile of illness, which makes it necessary to ensure efforts to improve the health of the community. Therefore, attention and care for respiratory diseases should be based on a more comprehensive and broader view of the concept of health-disease, with a focus on prevention and health promotion.

Thus, it is necessary to have public policies that aim to understand the set of dynamic variables related to the needs of individuals and collectives, in a perspective of apprehending health as a result of various social, political and economic sectors.



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