

Environmental surveillance in health in Brazil's Unified Health System

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Abstract

The incorporation of environmental surveillance in the field of public health policies is a relatively recent demand in Brazil. One of the major challenges in environmental health surveillance is defining its object and the specificity of its practice. The expanded concept of exposure, treated as a set of complex relations between a society and the environment, and not as a personal attribute, is central to the definition of indicators and should guide the practice of environmental surveillance in the health sector. Among the difficulties encountered in applying this concept within the Brazilian Health System, is the need to restructure health surveillance activities and to form multidisciplinary teams capable of dialoguing with other sectors. Furthermore, information systems capable of aiding in health situation analysis and decision making must be constructed. Taking this into consideration, a review of the object and concepts of environmental health surveillance was undertaken and the challenges with respect to its implementation in the Brazilian Health System were identified.

INTRODUCTION

The global environmental crisis has obliged all sectors of society to revise concepts and values, expliciting conflicts of interest and evincing the unsustainability of the current model of development. The environmental crisis is also a crisis in knowledge. Environmental knowledge, as an alternative to the crisis, entails recognizing the complexity of the relations between society and environment.¹³

The signs of the deterioration of the environment on a planetary scale are evident. The destruction of ecosystems, the increasing contamination of the atmosphere, the soil and the water, as well as global warming are examples of the impacts of human activity on the environment. These problems are exacerbated in local situations in which the sources of risks deriving from past or present productive processes,

such as the inadequate disposal of industrial residues, the contamination of sources of water, and adverse living and/or working conditions. Frequently, these problems interact with vulnerable population groups. The co-existence of the effects of industrialization and urbanization with secular problems resulting from lack of sanitation are frequently cited when describing Brazilian environmental problems.⁸ Due to this conjunction of factors Brazil, as well as some other countries in development, has become singular in the configuration of health risks deriving from adverse environmental conditions. On the other hand, this situation demands studying and intervening upon new issues and dealing with old issues according to a new integrative perspective.

The health sector has been urged to participate more actively in this debate^{2,10,15} due to its traditional role in caring for people and populations affected by en-

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environmental risks (such as intoxication by chemical products, traffic accidents, diseases transmitted by vectors) as well as to the growing acknowledgement of activities related to health prevention and promotion. This tendency has indicated the need to surpass the current model of sanitary surveillance based on diseases and to incorporate the theme of the environment in public health practices.

Accordingly, a review of the literature was conducted, focusing on the object and concepts of environmental health surveillance and the challenges to be met upon its implementation within the *Sistema Único de Saúde (SUS)* [Brazil's Unified Health System] were identified.

EXPOSURE AS AN OBJECT OF ENVIRONMENTAL SURVEILLANCE IN HEALTH

Despite the fact that it is frequently utilized in epidemiology, the concept of exposure is treated in a vague manner in the majority of basic texts within the discipline. Operationally, exposure may be defined as a relation between the environment (external) and the individual (internal), as well as the capacity to react to adverse conditions. The scheme of analysis that relates risk factors to their effects on health, by measuring associations between pairs of variables collected on the individual level, doubtlessly contributes to corroborate causal hypotheses regarding impairments to health by diverse chemical substances. These schemes are based on the separation of those exposed and not exposed to these risk factors into subpopulations. Among the noteworthy criticisms that this model of analysis has received are that it does not take into consideration possible gradations and synergetic actions between forms of exposure, that may direct the results toward a false inversion of the tendency and the magnitude of the risks.⁹ The strategy of dichotomizing exposure impoverishes studies concerning the relation between health conditions and environment. The idea of "zero exposure" to chemical substances is one of the unfeasible goals of environmental and occupational surveillance programs due to the global dispersion of both natural and industrial substances.¹ In several other cases, such as global warming, exposure should be considered universal since comparative data is lacking.¹⁴

Furthermore, these models do not consider the interactions between risk factors and the sociospatial macro-determinants, thus producing decontextualized analysis. Large part of the public health actions occur on the collective level, that cannot be captured by individual based studies.⁶ Some authors have proposed a separation between the (immediate) causes

of health problems and their (structural) context, as a strategy for revealing the determinants of these problems/issues.² The process of producing diseases is determined and conditioned by diverse environmental, cultural and social factors, operating in space and time, on risk conditions and populations at risk. The spatial organization acquired historically by society makes the circulation of pathogenic agents viable by establishing a link, that unites populational groups with social characteristics that may magnify adverse effects, on one hand, and, on the other, sources of contamination, locations in which vectors proliferate and other factors. Society imposes logic according to which materials and populations function and are situated in space, both in terms of production and reproduction. The example of health workers is perhaps the most evident in which the position of the individual in the workplace is strongly related to the function he/she performs and to the entire structure of production.⁴ This set of variables, that cannot be dissociated, determines the risk conditions to which workers are submitted. These conditions are not so evident in the so-called general environment, that is, in the place where a population lives, circulates and consumes. In this case, health surveillance should investigate the set of environmental factors that intervene upon the population and the social relations that structure these factors. In short, these relations are complex and historically constructed, being mediated by social, economic and cultural factors. Breilh⁵ suggests that the category *exposure* be substituted by research on *imposure*, since these situations are rarely voluntary, being produced by the organization of social production and reproduction itself.

Some conceptual models have been proposed for the analysis of environmental risks to health. Noteworthy among these are: the association, proposed by Thacker et al¹⁷ (1996), between sources of risk and diseases; the relation between pressure-state-response, suggested by the Organization for Economic Cooperation and Development (OECD); and the model for constructing environmental indicators elaborated by Corvalan et al⁷ (1997). All these models emphasize the role of social and environmental macro-determinants of health outcomes, situating exposure as a central event in determining the diseases. The concern with contextualizing health risks that these authors have in common indicates that there is something beyond exposure or that precedes it,¹⁷ or else that exposure is, of itself, a complex process involving diverse risk factors that intervene on different levels of determination.⁶ The object of environmental surveillance in health is, therefore, exposure, displacing the traditional focus on surveillance of diseases to surveillance of the collective risk factors.

Environmental surveillance in health is based on the recognition of the relation between risks and their adverse effects on health.¹⁷ In order to study the relation between environment and health, one of the primordial tasks is to select indicators for these levels of manifestation of environmental issues. These components should be combined so as to define an efficacious strategy for preventing or reducing the impact of environmental problems on health. A model interlinking these components is shown on Figure 1, in which the events that should be monitored by environmental surveillance actions stand out.

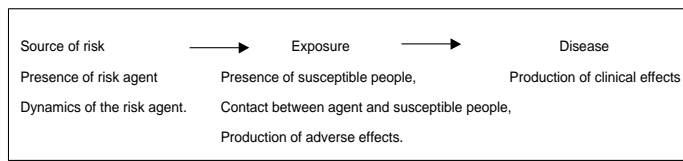


Figure 1 - Process of development of environmental risks (adapted from Thacker et al,¹⁷ 1996).



Figure 2 - Model for the construction of indicators of health and environment (Corvalán et al,⁷ 1997).

By uniting the processes that unleash environmental risks, a sequence of methodological steps that permit a global analysis of health risks may be established. The World Health Organization's proposal for the methodological development of indicators is based on a model disseminated by OECD. Its adaptation to health and environment management is directed towards attending the specificities of this area, making it possible to analyze issues related to health and linked to environmental issues. In this way it is possible to define indicators, organized according to the scheme enunciated by Corvalán et al,⁷ indicating five levels in which environmental risks may be evaluated (see Figure 2).

The objective of adopting this conceptual model, denominated DPSEEA (driving force, pressure, state, exposure, effect and action), is to provide an instrument for understanding the integrated and comprehensive relations between health and environment that may be of help in adopting the set of promotion and prevention actions to be developed. The model systematizes the principal phases in the process of generation, exposure and effects of environmental risks, as well as the principal actions of control, prevention and promotion that may be developed. This model reveals the need to integrate the analysis of the effects of environmental risks on the health of populations, with the development and implementation of decision-making processes, public policies and practices of risk management. The model also indicates the need to integrate the various policies related to development with the social, health and intersectoral necessities, since the actions in these phases necessarily involve different levels and sectors of the government and of society.

The *driving forces* represent the more general characteristics of the model of development adopted by society and produce activities and sources of risks to

health, conditioning the environment and its repercussions on health. For example, they favor the proliferation of pollution activities or the existence of more vulnerable social groups. *Pressure* corresponds to the characteristics of the principal sources of pressure on the environment and on populations, such as the emission of pollutants or the maintenance of environments that are propitious for the proliferation of vectors. They are associated to the characteristics of the occupation and exploitation of the environment, such as deforestation, urban growth and industrial production, that are sources of pollution or that generate other direct factors of environmental degradation. *State* refers to the condition and quality of the environment that are constantly changing, depending on the pressures which it receives. It includes not only the levels of pollution by biological and non-biological factors, but also natural risks such as those associated with floods, inundations and draughts, that may be aggravated by human activities.

Exposure involves the direct relation between the immediate environment and specific population groups. In the case of chemical substances, *exposure* includes the dose absorbed by the organism and by the affected organs. As to transmissible diseases, exposure corresponds to the process whereby people are infected. Finally, *health effects* may manifest themselves in exposed populations and may vary according to the type, magnitude, and intensity, depending on the level and duration of exposure, age, genetic factors and others. The indicators of each of these levels form an interacting set of means through which it is possible to evaluate and monitor adverse environmental conditions, that is a system of indicators.³ This model was adapted for surveillance of the quality of water for consumption by the old *Centro Nacional de Epidemiologia* [National Center of Epidemiology]. Water contamination itself should be considered not only as a cause of health effects, but also as a consequence of social and environmental processes, forming a chain of

events related to sanitation that are monitored by means of specific indicators.

A direct and linear association between these different levels of risk indicators cannot be expected. For example, the locations near sources of emission of contaminants do not always present greater contamination. Likewise, populations that inhabit the more contaminated areas may not be the most affected by contamination. The area of influence of a polluting activity may vary according to the chemical form in which a contaminant is emitted and the local conditions of transportation of this substance. For example, a local regime of winds may affect the distance that a contaminant will be transported and where it will accumulate. In some cases, such as the accident at Minamata, Japan, the victims of intoxication by mercury lived dozens of kilometers from the source of emission.

It is up to the environmental surveillance to examine this set of indicators and analyze the specific contexts in which risks occur according to the relation between them. The lack of relations among the indicators, instead of being a negative result is, above all, a clue for identifying patterns of protection or of exacerbation of risks.

The development and perfection of specific indicators for quality of life associated to those of the quality of the air, of water, of the level of noise, and others, as well as the systematization, diffusion and dissemination of information in an agile way should be integrated into the actions of environmental surveillance in health. An integrated approach considers the indicators as interdependent elements, since, in practice, they refer to a dynamic reality in which diverse aspects interact.³ Another aspect to be considered is the construction of methodologies that integrate indicators in the constitution of a system of information. These methodologies should be capable of being, simultaneously, sufficiently broad so as to include a great diversity of problems and well delimited so as to make it possible to compare the results.

IMPLEMENTATION OF ENVIRONMENTAL SURVEILLANCE IN HEALTH IN BRAZIL

Several of the programs, plans and practices proposed by the health sector involve environmental aspects. Historically, among the health interventions of an environmental nature, sanitary actions have concentrated greater interest within the sector. The relation between health and water supply of adequate

quality and quantity, as well as its respective destiny after usage (sewage system), is well known. This relation mobilized and still mobilizes, the health sector in the direction of the so called sanitary practices, that, when systematized, constitute the thematic area of sanitation.

Sanitation has been previously defined as “a way of life, quality of living expressed in terms of the conditions of salubrity, such as clean houses, commerce and industries (...) [and] since it is a way of life, it should be nourished by knowledge and should grow like an ideal (...) within human relations”.^{*} Man’s interventions on the environment by means of the construction of water supply systems, collection and treatment of sewage, drainage in flood areas, among others, is the most complete form of expression of sanitation. In this sense, the concept of sanitation is reduced to building sanitation works, and in sectors which permit a rapid return of capital investment by means of taxes. This also explains the concentration of this type of investment within urban areas with the greatest population density in Brazil. Addressing public sanitation outside of this paradigm, still sounds like an utopia, even at present, when a vast literature and experiences indicate the viability of the so-called non-structural interventions. These interventions are centered on the adoption of new behavior in health, allying appropriate technological standards with the economic and sociocultural conditions of the beneficiaries.^{**}

Participation of the health sector in sanitation actions has oscillated throughout history. The classic sanitation manual “*Manual de Saneamento*”, edited in 1947 by the extinct *Fundação Serviços de Saúde Pública (FSESP)*, provides subsidies so that the health professional him/herself may guide the construction of water supply systems, cesspools and sewage systems, among other activities which are typical of so-called basic sanitation (water supply, collection and treatment of sewage and garbage). Although they are the result of public policies within the health sector, the *Serviços Autônomos de Água e Esgotos (SAAE)* [Autonomous Services of Water and Sewage] should develop the “best relations” with the *Unidades Sanitárias* [Sanitation Units], guaranteeing an adequate performance of the previously defined roles. The Sanitary Unit should be responsible for seeing to it that the water supply system effectively attains its goal in terms of establishments connected to it, by means of well-known strategies of persuasion and coercion, via sanitary inspection. The role of the SAAE would be to extend the water supply and sew-

*Fundação Serviços Especiais de Saúde Pública (FSESP). Manual de saneamento. 2ª ed. Rio de Janeiro; 1981.

**Quitério LAD. Educação e participação em ações de saneamento no reassentamento Fazenda Laranjeiras [dissertação de mestrado]. São Paulo: Faculdade de Saúde Pública da Universidade de São Paulo; 1995.

age systems, for which funding, via tax returns, is a fundamental component.

Extension of the water supply and sewage systems propitiated by the *Plano Nacional de Saneamento (Planasa)* [National Sanitation Plan] during the seventies and until the mid-eighties, occurred, notably, in large urban centers, by means of the organization of state enterprises. It determined that sanitation actions occupied a specific place within the public administrations' organograms. Thereby, these actions – to be understood as sanitary works or constructions – were defined in the midst of the planning of the sanitation enterprises, following their own criteria and, frequently, these made no reference whatsoever to health.

Apparently, it was this dissociation between sanitation and health that mobilized the health sector when regulating article 200 of the Federal Constitution. A provision in paragraph II, article 6 of Law N° 8.080/90, stipulates that participation in the formulation of sanitation policies and execution of actions in this area are included within the field of action of the Brazilian Unified Health System. In concrete terms however, the goals of sanitation, including the technology, the dimensions and location of sanitary works still follows the logic of the enterprises involved, with few exceptions. Within the health sector, in turn, a gradual displacement may be observed leading away from actions that are closer to the execution of constructions and towards environmental surveillance activities. Surveillance of the quality of the water for human consumption is an emblematic example of the role of quality auditing that the health sector begins to play in the early '90s.

If, with respect to the theme of basic sanitation, the role of SUS, the Brazilian Unified Health System has been recognized within the scope of actions of sanitary surveillance, the same does not occur when the issue at hand is air pollution (contamination and noise) or pollution of the soil (by hazardous waste), recurring issues in Brazilian academic research in the nineties. Monitoring the quality of the air is within the scope of the *Sistema Nacional de Meio Ambiente (SISNAMA)* [National System of the Environment] and the state institutions of environmental control are the major executors of policies in this area.

The health sector could extend epidemiological surveillance to diseases with etiologies associated to those contaminants. Initiatives in this direction never advanced towards their absorption as routines by the local and state health systems and, even if they had, the question of what to do with the results obtained would remain. As to the issue of water for human con-

sumption, there is a sanitation company legally responsible for its treatment and distribution and, therefore, it may be audited by the SUS. However, as to the issues of contaminated air and soil, those responsible are, in the majority of the situations, distributed in different levels of the chain of production, and their auditing is the incumbency of institutions extra-SUS (The *Agências Estaduais de Controle da Poluição* [State Agencies for Pollution Control], for example).

The model that makes it possible to visualize the health sector within this setting is the one recommended by health promotion, which establishes that training and mediation are fundamental strategies to be utilized in the defense of health. Defense of health is understood as the struggle towards the promotion of political, economic, sociocultural and environmental factors that are more and more favorable to health. Training presupposes that individuals are apt to study, learn and control the determinant factors regarding their health. Finally, the comprehension that health is effectuated within a context involving multiple actors and interests determines the need for mediation among them. In this sense, health should be seen less as a compartment of public administration and more as a presupposition when formulating policies, plans, programs and projects. Participation of civil society in this process is fundamental in order to guarantee priority, continuity and transparency in public policies.

The incorporation of environmental surveillance in the field of public health policies is a relatively recent demand in Brazil. Among the difficulties encountered in accomplishing this goal are the need to restructure surveillance actions within the State and Municipal Departments of Health and the formation of multi-disciplinary teams capable of dialoguing with other sectors. Reference has also been made to the need to build information systems capable of aiding in the analysis of health situations and in the decision-making process. Because it is an area of interface between different disciplines and sectors, the role of SUS in environmental control has been brought up in the discussion of Law No 8.080/90 that includes, within the field of action of SUS, the "collaboration in the protection of the environment", as well as the control of water for human consumption and of toxic and radioactive substances. Within the sphere of SUS, the incorporation of programs of environmental surveillance is being implemented, on the federal level, by the creation, in 1999, of the *Coordenação Geral de Vigilância Ambiental (CGVAM)* [General Coordination of Environmental Surveillance] that is responsible for implementing the *Sistema Nacional de Vigilância Ambiental em Saúde (SNVA)* [National System of Environmental Health Surveillance]. In some

States, environmental surveillance departments and programs were created.

The need to establish channels of dialogue among the different spheres of government prevails for, according to the logic of decentralization, municipalities or, the sanitary districts within these, are co-responsible for implementing the programs. The *Sistema Nacional de Vigilância Ambiental em Saúde (SINVAS)* [National System of Environmental Health Surveillance] was regulated by the *Instrução Normativa* [Normative Instruction] N° 1 of the Ministry of Health, on the 25th of September, 2001, that defined competencies on the Federal, State and Municipal levels. However, this system has acquired different institutional configurations at each of these levels of government. In the State and Municipal health departments, environmental health surveillance has either been situated within the departments of epidemiology or sanitary surveillance or, alternatively, in autonomous departments. Within the primary health care network, the role played by health agents of the *Programas de Saúde da Família* [Family Health Care Program] and of those responsible for the control of endemic diseases may guarantee the system's necessary capillarity.

On the other hand, the health sector is responsible for the systematic control of environmental factors that may result in risks, which include, among others, the quality of the water and of the air. However, the health sector still does not dispose of information or of technological instruments to exercise this surveillance. Environmental health surveillance is defined by SUS as "a set of actions that provide knowledge and the detection of any change in the determinant and conditioning factors of the environment that interfere with human health, with the objective of recommending and adopting measures of prevention and control of risk factors and of the diseases and injuries related to the environmental variable".¹⁰

Interinstitutional articulation is an alternative to the gaps or superimpositions of attributions involving the health and environmental sectors. In order to be effective, a program surveilling the quality of water for example, should count on laboratorial infrastructure, means for notifying and investigating water related diseases, instruments to protect water sources, legal coercive mechanisms to be utilized against the sanitation companies, instruments for the inspection of the water supply systems, for data collection and analysis, among others. A program of this breadth presupposes an institutional articulation among the institutions of environmental control, departments of sanitary and epidemiological surveillance, as well as agencies of urban planning, sanitation

and water resources. The first initiatives directed towards the implementation of this program began in 1986 and took place only in some Brazilian States, with different degrees development depending on the local infrastructure and capacity of inter-institutional articulation.

The culture of the health sector itself constitutes another obstacle, for, historically, it has been directed towards the surveillance of diseases. Despite the incentives established by means of induced projects (*Vigisus*, for example), by financial instruments (*Programação Pactuada Integrada*, for example) and programs (*PACS/PSF*, for example) that promote the effort to surpass SUS's assistance based model,¹⁶ some problems have been confronted in the effective implementation of the actions of environmental surveillance as a practice of the health sector. Surveillance *in* health is constituted by phases of collection, analysis and systematic interpretation of data on health events that affect the population.¹⁷ Surveillance *of* health has a broader conception, besides the simple analysis of the situation or the institutional integration between sanitary surveillance and epidemiology. It encompasses: intervention in health problems; emphasis on problems that demand attention and continuous follow up; operationalization of the concept of risk; articulation of actions involving promotion, prevention and assistance; intersectoral operations; actions involving the territory; and intervention as to the form of operations.¹⁶ Enlarging the field of operation of health surveillance is part of the process of decentralization and territorialization of these actions.

Finally, the technicians and researchers operating in this interface are still in need of instruments that make it possible to analyze data on both the environment and health in conjunction. In order to become cognizant of the health conditions of a population in greater detail, it is necessary to work with means that make it possible to observe the unequal distribution of risk situations and health problems, with environmental, socioeconomic and demographic data, promoting the integration of this data. In this way, it is essential that the information be contextualized in time and space, providing elements for the construction of an explicative chain of the health problems and increasing the capacity to orient specific intersectoral actions.

ADDRESSING SANITATION WITH THE INSTRUMENTS OF ENVIRONMENTAL HEALTH SURVEILLANCE

According to the aforesaid, one of the most outstanding examples of the interaction between health and

environment is given by sanitation. The process of urbanization of the peripheral countries has had a double role of granting greater access to diverse public services and, on the other hand, promoting an increment in the interactions between infectious agents and populations. This increases the risk of becoming ill and of dying among the population groups who do not have access to these services. Protecting health is invariably cited as one of the beneficial consequences of sanitation. The epidemiological corroboration of this relation is, however, difficult to verify due to the large number of intervening variables in the process of determining diseases. A population's risks of infection and of becoming ill are related to its conditions of habitation, its habits, the concentration and types of pathogenic agents ingested and the susceptibility and general state of health of the population.¹¹

Despite the theoretical and technical relations between water resources, sanitation and health, these sectors are managed by a great diversity of federal, state and municipal institutions. Thus, information on these themes has been collected by instruments and data systems of each of these institutions. This, in turn, hampers an integrated analysis of the data on the quantity and quality of water, as well as access of the population to this resource and regarding its state of health.

The selection of diseases that best represent adverse environmental conditions and their classification according to the mechanisms of transmission in which water is involved constitutes the first phase in the elaboration of epidemiological indicators for sanitation.¹¹ Due to its diverse characteristics of infectivity, pathogenicity and virulence, the diseases transmitted through water may be detected with greater or lesser efficiency by the health information systems. For this reason, the construction of epidemiological indicators for sanitation may be affected by the representativity of the available data.

The water supplied to a population may be a vehicle for the rapid dissemination of infectious agents, causing outbreaks, principally when the supply system distributes water disrespecting the bacteriological standards of potability (repeated presence of coliforms). This indicator is highly sensitive for fecal contamination in countries with temperate climates, but may be subject, in tropical countries, to the interference of the presence of animals, temperature and high concentration of nutrients in the water.¹² Even in the absence of coliforms, some viruses may be found in the water supply systems, such as hepatitis A. The quantitative indicators of coverage of the water supply systems are also insufficient for evaluating the

protection of a given population and the satisfaction of the needs of basic sanitation. These indicators do not take into consideration intermittence in the supply of water, which constitutes a health risk for the affected communities.

Health information systems have undergone an undeniable improvement in quality, primordially throughout the nineties in Brazil. Simple computer systems have also facilitated and universalized access to and analysis of data. However, data on environmental conditions are frequently collected and organized in an unsystematic manner. The components of the systems of water supply (type of water source, treatment station and sample sites) are being registered by the *Sistema de Informação do Programa de Vigilância da Qualidade da Água para Consumo Humano (Sisagua)* [Information System of the Program of Surveillance of the Quality of Water for Human Consumption], under the responsibility of the *Secretaria de Vigilância em Saúde do Ministério da Saúde (SVS/MS)* [Department of Health Surveillance of the Ministry of Health]. The *Sisagua* makes it possible to retrieve data on water supply and periodically produces reports on the functioning of the system and the quality of the water, including alternative solutions of supply. The *Agência Nacional de Águas (ANA)* [National Agency of Waters] maintains a program that monitors the quality of water by means of monitoring posts situated in the largest Brazilian rivers, making it possible to utilize this information in an integrated system.

Other data besides the information collected by the systems mentioned above may be incorporated into the analysis of living conditions and urban infrastructure on the local level. In this case, some data may be sought in the organs and entities of restricted operation, such as, for example, the local sanitation agencies, whose data is not included in the large information systems, with national coverage.

FINAL CONSIDERATIONS

The incorporation of Environmental Health Surveillance involves some more general processes that have occurred within the Brazilian health system, such as the decentralization of health actions and the restructuring of the field of surveillance in health. On the other hand, a more precise delimitation of environmental health surveillance's object of work and its differentiation with respect to traditional areas of collective health, such as sanitary and epidemiological surveillance, will be necessary. In this article, exposure is emphasized as a specific object of environmental health surveillance that should not be treated as a personal attribute, but as a set of complex relations between

society and the environment. This effort also presupposes the enlargement of environmental actions coordinated by the health sector, which has maintained itself as a partner of other sectors, particularly in sanitation actions. This effort also presupposes an increment in environmental actions coordinated by the health sector, which has maintained itself as a partner of other sectors, particularly with respect to sanitation actions. Environmental surveillance in health also extends its sphere of activities to biological factors represented by vectors, hosts, reservoirs, and venomous animals, as well as non biological factors such as water, air, soil, environmental contaminants, natural disasters and accidents with dangerous products.¹⁰

This new field of activities within the health sector is still lacking instruments of evaluation and control. Among the methodologies proposed for environmental health surveillance, the role of mapping and risk assessment is noteworthy as well as the incorporation of the epidemiological approach for environmental issues.

The conceptual model of surveillance of risk situations is based on the understanding that issues pertinent to the relations between health and environment are an integral part of complex systems, requiring interdisciplinary and transdisciplinary approaches and articulations,¹⁵ words of command of health promotion. Adopting this perspective implies recognizing and confronting the complexity inherent to the process of production in health, a demand of the current stage in which societies simultaneously face the need to guarantee the permanence and democratization of the environmental conditions favorable to life already conquered in the successive stages of development and to demand the correction or mitigation of the unfavorable consequences of this same development. Engaged in the task of consolidating the Brazilian Unified Health System, Environmental Health Surveillance should emerge having intersectorality and interdisciplinarity as presuppositions and humility as its attitude.

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