

Popular Health Surveillance: Emancipatory struggle for life against agribusiness in Chapada do Apodi-CE

Vigilância Popular em Saúde: luta emancipatória pela vida ante o agronegócio na Chapada do Apodi-CE

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ABSTRACT This article discusses Popular Health Surveillance (PHS) as an emancipatory strategy for fighting and defending life against agribusiness in Chapada do Apodi, Ceará. This is an action research with representatives from academia, social movements, entities, community organizations and workers of the Unified Health System. A territorial workshop was carried out whose material produced was evaluated by content analysis aided by the Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires (IRaMuTeQ) software. The workshop highlighted the need to strengthen the community struggle in the territory for life, involving the problem of pesticides and the role of women. Community organization allies itself with the work of popular movements, showing that associations are fundamental and strategic points in the articulations of communities for claiming rights, through productive backyards, for example. Indicators of PHS associated with the impacts of agribusiness were observed, such as the high mortality of bees. Faced with the expansion of agribusiness in the region, PHS can continue to be an important action in promoting healthier and more sustainable territories in Chapada do Apodi.

KEYWORDS Public health surveillance. Community participation. Rural health. Pesticides. Community-based participatory research.

RESUMO Este artigo discute a Vigilância Popular em Saúde (VPS) como estratégia emancipatória de luta e defesa da vida ante o agronegócio na Chapada do Apodi, no Ceará. Trata-se de uma pesquisa-ação com representantes da academia, dos movimentos sociais, de entidades, organizações comunitárias e trabalhadores do Sistema Único de Saúde. Foi realizada uma oficina territorial cujo material produzido foi avaliado pela análise de conteúdo auxiliado pelo software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires (IRaMuTeQ). A oficina destacou a necessidade de fortalecimento da luta comunitária no território pela vida, envolvendo o problema dos agrotóxicos e o papel das mulheres. A organização comunitária alia-se à atuação dos movimentos populares, evidenciando que as associações são pontos fundamentais e estratégicos nas articulações das comunidades para a reivindicação de direitos, por meio de quintais produtivos, por exemplo. Foram observados indicadores de VPS associados aos impactos do agronegócio, como a elevada mortalidade de abelhas. Diante da expansão do agronegócio na região, a VPS pode continuar sendo uma importante ação na promoção de territórios mais saudáveis e sustentáveis na Chapada do Apodi.

PALAVRAS-CHAVE Vigilância em saúde pública. Participação da comunidade. Saúde da população rural. Agrotóxicos. Pesquisa participativa baseada na comunidade.

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Introduction

In contexts of conflict related to the environment, the fight for health has become a mobilizer of communities when it comes to defending their rights, one of its strategies being Popular Health Surveillance (PHS)¹⁻³. The expansion of agribusiness in Brazil has made the country one of the largest consumers of pesticides in the world, which has resulted in impacts on health and the environment in several territories, threatening the way of life and of peasants and the agroecological mode of production⁴. This process has been studied by several researchers in Chapada do Apodi, a place where these threats are intensely present and where there is peasant resistance in the face of the expansion of agribusiness.

The territory of Chapada do Apodi, located on the border of the states of Ceará and Rio Grande do Norte, has naturally fertile soils and an abundance of groundwater due to the presence of the Jandaíra and Açú aquifers. Occupied for decades by peasants with and without land, as well as by large scale landowners (latifúndia), since the 1990s, Chapada do Apodi has been densely exploited by agribusiness companies. Through an incisive action of the State, corporations specialized in the production and export of fruits were territorialized in Chapada do Apodi^{5,6}, resulting in an accelerated expansion of latifúndia, monoculture, intensive use of pesticides and the intensification of water and land concentration, further aggravating conflicts and conflictualities.

The amount of harm⁷ resulting from the action of agribusiness in Chapada do Apodi implied: intensification of disputes and conflicts over land and water; deforestation and loss of biodiversity; exploitation and coercion of workers; soil and water poisoning; depletion of the productive capacity of the land; water injustice; fencing, fragmentation and expropriation of peasant communities; increased incidence of health problems, including cancer of varied kind and congenital malformation;

the murder of environmentalist and activist Zé Maria do Tomé; deaths from chemical poisoning as in the cases of Vanderlei Matos and Valderi Rodrigues, among other environmental injustices and human rights violations recorded in several studies^{5,8-13}.

Such contexts of conflict have forged, in this territory, powerful articulations between social movements, such as the Movimento 21 de Abril (M21), which bears in its name the date of Zé Maria do Tomé's murder, and the Landless Rural Workers Movement (MST); civil society organizations, such as Caritas Diocesana de Limoeiro do Norte; and academia, in the figure of research groups and graduate programs linked, above all, to the State University of Ceará (UECE) and the Federal University of Ceará (UFC). As a result of the incisive action of these articulations there was the creation of the first Reference Center for Occupational Health and Environment in Brazil, Ceresta Zé Maria do Tomé, in addition the passing of the first state act forbidding the aerial spraying of pesticides, Law No. 16.820/2019, known as the Zé Maria do Tomé Law¹⁴.

Regarding the specific case of Chapada do Apodi, in the municipality of Tabuleiro do Norte, since 2020, peasant communities have denounced the health and environmental damage resulting from the activity of an agribusiness company specialized in the production of transgenic cotton and of, in the off-season, soybean, corn and sorghum crops. It is a company that owns about 30 thousand hectares in Chapada do Apodi and that promotes environmental injustice and violation of human rights in ways such as surrounding communities with fences, deforesting native areas of the Caatinga biome, expanding cotton monoculture, concentrating land and water, using pesticides intensively, disseminating transgenic seeds, limiting the productive capacities of peasants, whose way of life is centered on agroecological production combined with strategies for coexistence with the semi-arid region¹⁵.

In view of this, a resistance network was formed around the peasant communities of Tabuleiro do Norte in the face of the impacts of the expansion of agribusiness in the region, this way strengthening mobilization and the will to denounce environmental injustice and human rights violations. This articulation took place through the active participation of local community associations, supported by civil society organizations, such as *Cáritas*, *Fundação de Educação e Defesa do Meio Ambiente do Jaguaribe (FEMAJE)* and *Associação Escola Família Agrícola Jaguaribana (AEFAJA)*. Other parties involved in this support network are social movements such as M21; legal institutions, represented by the *Frei Tito de Alencar Office of Human Rights and Popular Legal Advice*; and academic and action research collectives linked to the *Oswaldo Cruz Foundation of the State of Ceará – FIOCRUZ Ceará (Participatory Nucleus in Health and Ecology of Knowledges)* and universities, such as *UECE*, *UFC* and the *Federal University of Rio Grande do Norte*. Other collectives from academia related to this research are: *Field, Land and Territory Research and Articulation Group (NATERRA)*; *Field Education Studies Laboratory (LECAMPO)*; *Semiarid Territories Research Group (SEMIAR)*; *Center for Studies on Memory and Territorial Conflicts (COMTER)*; *Work, Environment and Health Center (TRAMAS)* and *Work, Environment, Health and Subjectivities Center (TRASSUS)*.

In their work based on this network, the communities of Tabuleiro do Norte create resistance and illuminate other possible worlds¹⁶ for Chapada do Apodi, with their PHS related to pesticides being a strong instrument for mobilization, articulation and resistance. The expression ‘Popular Surveillance’ is recent¹⁷, although part of its foundations comes from experiences taken place in the 1980s in the field of occupational health^{18,19}. The theoretical-methodological systematization of this more contemporary process aims at reorienting the way how the health services provided by the Unified Health System work

(SUS), which includes their training processes, given that a more dialogic and effective health surveillance is paramount to guaranteeing the human right to health.

According to Porto²⁰, the limits of the biomedical and productivist model in the organization of a verticalized and poorly dialogical health system hindered advances in the conception of social participation in collective health beyond social control. Although important in the strategies of participation and democratic management of the SUS, in the exercise of citizenship and in working in networks with society, collective health maintained, until recently, the discussion of knowledge production and surveillance actions as attributes of specialist professionals. An important exception, in addition to workers’ health, has been the development of a popular health education based mainly on the contributions by Freire²¹, Brandão²² and Valla²³.

Certain initiatives in Brazil have used the term ‘popular health surveillance’ to name their practices when the protagonism of communities and social movements is seen as evident. This may involve different degrees of action by State, academia and specialists, provided that they recognize the importance of popular knowledge and are involved in participatory processes of a dialogical nature. Among the numerous experiences carried out in the past 20 years that helped in the construction of this concept, we can highlight the studies that contributed to postpone the attempts to explore uranium and phosphate from the mine located in the municipality of Santa Quitéria, Ceará^{17,24}; the processes of monitoring the impacts of *Siderúrgica do Atlântico (TKCSA)* in Santa Cruz, Rio de Janeiro²⁵, and uranium mining in Caetité, Bahia²⁶; the research by the *Observatório de Saúde das Populações do Campo, da Floresta e das Águas (Health Observatory for Rural Population, Forest and Water)* and the *Participatório em Saúde*²⁷ e *Ecologia de Saberes (Participative Initiative in Health and Ecology of Knowledge Bases)* linked to *FIOCRUZ Ceará*²⁸.

The term PHS has also been used in the context of discussing pedagogy on water by the Joaquim Venâncio Polytechnic School of Health (EPSJV) of FIOCRUZ; in pedagogy on territory⁷; in the works developed by the Territorial Laboratory of Manguinhos FIOCRUZ in favelas (shanty towns) in Rio de Janeiro²⁹ and, during the COVID-19 pandemic, in debates promoted by FIOCRUZ with popular movements and organized civil society entities, members of the academia and the SUS (Unified Health System)¹.

As a practice, PHS presents itself in participatory actions highlighting both what promotes and threatens life in the territories, pointing to new spaces, collective struggles and perspectives to transform health conditions. As a knowledge, it is developed through the dialogues and experiences of the population as a producer of knowledge and important information that enable the decision-making processes as well as provide direction to the actions for the territorialization of health³.

During the COVID-19 pandemic, the PHS gained notorious visibility³⁰, especially when it became the only effective surveillance action in the face of the State's insufficiency to implement public policies. It uses innovative strategies, which include using social networks to highlight scenarios of violation of rights, developing popular barriers, creating popular and academia observatories as well as popular committees created at the initiative of indigenous people, quilombolas (traditional African-descendant communities), fishermen and peasants with the purpose of defending their territories and life¹. More recently, the proposal of Popular Health, Environment and Work Surveillance (PHEWS), with a centrality in workers' health and in health and environment, has emerged².

In Latin America, several proposals have been formulated in the last 20 years in order to systematize concepts, methods and actions around PHS. Among them, popular surveillance¹⁷, civil surveillance, participatory monitoring³¹, surveillance articulated³² with the

conception of an emancipatory health promotion^{20,33}, and the proposition of popular health and environmental surveillance in the context of COVID-19 stand out¹. All these efforts aim to incorporate various theoretical and methodological frameworks, actors, social movements and populations in order to allow a surveillance based on dialogue and on the articulation of a knowledge that permeates a practice carried out with democratic values towards a justice that may be sustainable and focused on the social, health, environmental and cognitive dimensions³³.

In view of this, this article seeks to present the results of a research on the role of PHS as an emancipatory strategy of struggle and defense of life against agribusiness in Chapada do Apodi.

Methodology

It is an action research³⁴ – integrated by academia, social movements, entities, community organizations and SUS (Unified Health System) Workers – that constitutes a web of knowledge and practices led by the Participatory Initiative in Health and Ecology of Knowledge Bases of FIOCRUZ Ceará²⁸. After carrying out an integrative review of PHEWS², criteria were developed to define an experience of popular surveillance, namely: popular protagonism in the defense of life; use of social technologies to monitor and produce data in a participatory manner; desirable articulation between academia and SUS.

Once an electronic form was used to create a national inventory of experiences, ten experiences ended up being selected: five from Ceará and five from other states from each region of Brazil.

Having been registered in the inventory by entities *Cáritas Diocesana* of Limoeiro do Norte and M21, the 'Popular Health Surveillance in the Jaguaribe Valley' experience was then selected for analysis and monitoring in the territory, where the communities of Chapada

do Apodi, in the municipality of Tabuleiro do Norte-CE, carry out a PHS and, along with the ‘Community that Sustains Agriculture (CSA) – My Backyard in Your Basket’ initiative, carried out under the advice of Cáritas.

Field research was then done at Chapada do Apodi in June 2022 so as to recognize the territory and reflect on relevant aspects of the experience (*table 1*). Through a workshop,

the concepts and practices of PHS were discussed in the view of the subjects of the territory, which then led to elaborating an action plan based on the questions found in *table 2*, focused on the problems of the territory.

The reports and discussions resulting from the engagement of the workshop participants were systematized, recorded, transcribed and analyzed.

Table 1. Word cloud from the synthesis of the reflection on the experience of popular health surveillance in the territorial workshop in the rural communities of Tabuleiro do Norte, Ceará, in Chapada do Apodi

Knowledge	
Tracks	Questions
1	Why and for what reason do we carry out the experience?
2	Who is doing the experiment and for whom it is being done?
3	With whom do we carry out the experiment? How is the relationship with SUS and the academia?
4	How do we do the experience and how do we communicate?
5	How we organize ourselves and how does this experience relate to struggles for social transformation?

Source: Prepared by the authors.

Table 2. Guiding questions for the construction of the action plan of the popular health surveillance experience in the territorial workshop in the rural communities of Tabuleiro do Norte, Ceará, in Chapada do Apodi

What were the main difficulties faced?
How were these difficulties overcome or could have been?
What have been the main achievements so far?
What can be done by the community and the public authorities to help consolidate experiences in the territories?
What can be done to expand and continue these experiences in other territories?

Source: Prepared by the authors.

Data analysis

To support Bardin’s content analysis³⁵, the following software was used: Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires (IRaMuTeQ) version 0.7 alpha 2 developed by Ratinaud in 2009. This free software is anchored in the R 3.5.1 software, allowing the processing and statistical analysis of the texts produced.

The transcribed information was submitted to IRaMuTeQ through a single file properly configured in text format (.txt), called ‘corpus’. In this study, an action research was carried out making use of the territorial workshop technique. The ‘corpus’ of it was formed by reflecting on all the information about the Chapada do Apodi experience that was gathered by the participants during the trails (*table 1*), which was later written on cards.

In the analysis of textual content, two techniques provided by IRaMuTeQ software were used: the similarity tree and the word cloud. This analysis highlights in a graphical representation the number of times a word is cited, as well as how it connects in terms of meaning.

Ethical aspects

The research followed the ethical assumptions related to research involving human beings, according to Resolution No. 466/2012 of the National Health Council³⁶, and was approved by the Research Ethics Committee of the Gonzaga Mota Messejana District Hospital with Certificate of Presentation of Ethical Appreciation – CAAE No. 47591021.9.0000.8145 and opinion No. 4.839.292.

Results and discussion

The PHS, which farmers and other rural workers carry out in the territory, allows us to anticipate signs of agribusiness threats, pointing out ways to effectively affect the way how the environmental conflict may physically affect these subjects, that is, the health-disease process that leads to cancers and congenital malformations, to give an example³⁷. Such signals appearing in the territory have been called PHS indicators and stood out in the territory recongnition activity carried out among the communities of Chapada do Apodi, Tabuleiro do Norte.

These were changes in the territory reported by the community that were associated with the velocity of installation of agribusiness enterprises that end up surrounding areas previously used for beekeeping and animal husbandry in land either owned or not, such as wire and wood fencing moving over the road to the extent of decreasing its width, followed by carrying deforestation by making use of the method named by the community as ‘the big chain’: a chain stretched between two

tractors moving forward to crush the native vegetation and use its remains as fertilizer, in a noisy process heard from far away. The intense use of pesticides is made clear by the strong odor of poison coming from houses neighboring the plantations and by the increase in bee mortality and reduction in honey production resulting from it. All this is carried out with a labor force foreign to the territory, which contributes to the local reduction in job offer. As a consequence, families end up being deterritorialized and induced to sell their land to agribusiness companies.

The agroecological production practiced by these communities is one of the main proposals serving as an alternative to agribusiness in their territory. By means of it autonomy and environmental sustainability can be achieved and preserved, this being a way to resist forms of social and economic marginalization altogether³⁸. Thus, while communities monitor the impacts of agribusiness by making use of social technologies contextualized by the experience in the territory and, therefore, simplified for these subjects, they also build strategies of resistance, existence and affirmation of their way of life that are expressed by the indicators of good living, such as the initiative of agroecological productive backyards, an example of coexistence with the semi-arid region.

The territorial workshop was attended by 51 participants, 39 of whom completed the socioeconomic identification form, with more than 60% of them being female and almost 70% coming from Tabuleiro do Norte-CE. More than 40% of them were aged between 25 and 45, and 46%, between 46 and 60. More than 60% of the participants were married; almost 70% identified themselves as being brown or black and approximately 80% had children. About 44% had elementary school education, either complete or incomplete; 18% had high school education, either complete or incomplete; and 36% had completed higher education or graduate school. Regarding occupation, about 44% of them were farmers

and/or beekeepers; 21% were from entities that worked in social movements; about 23% were SUS professionals, the vast majority of them being Community Health Agents (CHA); and 10% were from academia and/or worked as civil servants with postgraduate degrees. Finally, more than 40% were part of associations or unions or of the CSA initiative; in

addition, Caritas, AEF AJA and social movements such as MST and M21 were mentioned. In this territorial workshop held in the communities of Chapada do Apodi, the highlight was the need to strengthen the community struggle for life in the territory, involving the problem of pesticides and the role of women, as can be seen in the word cloud (figure 1).

Figure 1. Word cloud based on the summary of the reflection on the experience of popular health surveillance in the territorial workshop in the rural communities of Tabuleiro do Norte, Ceará, in Chapada do Apodi



Source: Prepared by the authors.

The PHS is marked by popular protagonism in the defense of life^{1,2}. This centrality can also be observed in the word cloud, in which ‘communal’ is the most cited word when reflecting about the PHS experience, articulated with the need to strengthen this struggle for territory in defense of life.

The PHS does not aim to replace the role of

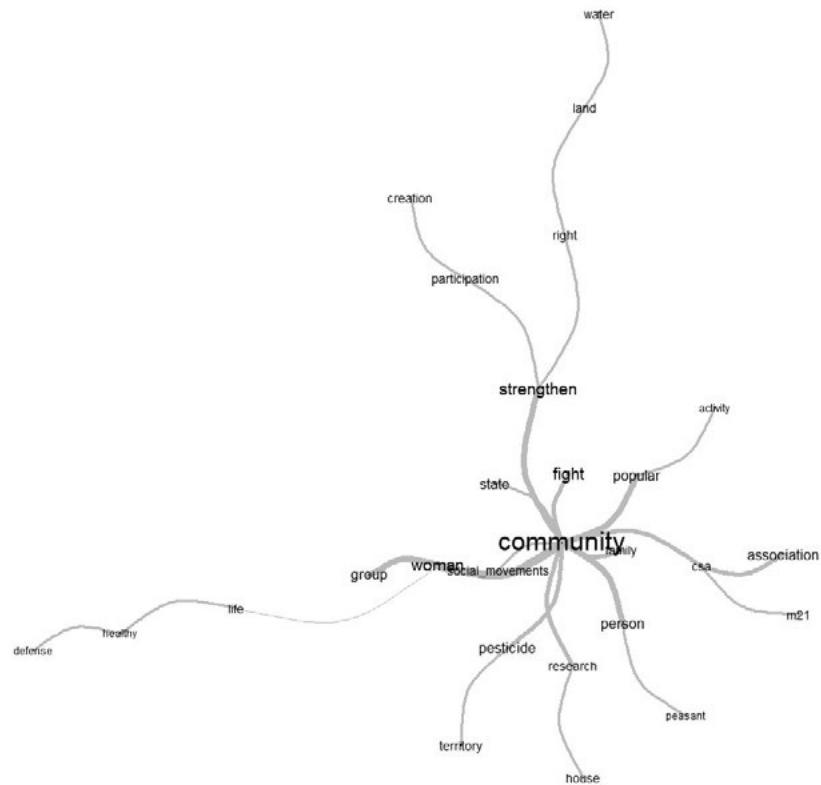
the State, but to be the expression of the need for greater participation of social movements and communities in surveillance, as highlighted in the National Health Surveillance Policy³⁹. However, since 2016, due to a political context that threatened indigenous people, *quilombolas*, fishing communities or favela residents, this surveillance came to be a

participatory process of awareness raising and call to action regarding the need to guarantee the right to health, a balanced environment and the defense of life¹.

In this unequal correlation of forces, in which the State usually allies itself with the interests of agribusiness corporations, the organization and the community struggle for the

territory are elements that gain a centrality that the PHS strategy seeks to enhance. The similarity tree reflecting on the PHS experience, like the word cloud, shows the centrality of community organization and its direct relationship with the defense of the territory through popular participation (*figure 2*).

Figure 2. Similarity tree based on the synthesis of reflection on the experience of popular health surveillance in the territorial workshop in the rural communities of Tabuleiro do Norte, Ceará, in Chapada do Apodi



Source: Prepared by the authors.

The similarity tree provides the identification of two categories of analysis: community organization and defense of the territory/way of life.

Initially, it is noteworthy that the word 'communal', which appears centrally in *figure 2*, brings the idea of community organization,

which shows itself as a great power in the defense of the territory and in the PHS process. The community/communal organization is allied to the action of popular movements in the region, showing that associations are fundamental and strategic points in the

articulations of communities to claim their rights, where initiatives such as the CSA are created with the support from social organizations and movements, such as Caritas and M21, who have worked at AEF AJA in the development of the CSA.

Defending the territory and the way of life related to it has as one of its pillars in strengthening female protagonism, shown when women establish themselves as a group in defense of a healthy way of life. Right is conquered through the struggle in defense of water and land. The similarity tree points to the relevance of 'social networks' in this process, which may be expanding the 'participation' of different actors, such as the youth of those territories. Communication is a key factor in the struggle as a whole and in the enhancement of PHS. This was made more evident during the COVID-19 pandemic, when there was a need to reinvent strategies to denounce the expansion of agribusiness in the region. In this process, the participation of the youth was extremely relevant. They are the ones who are closer to digital tools and make them their own, in a process of appropriation and approximation, establishing an important dialogue with other generations in the workshop. These visibility and communication strategies have been fundamental to mobilize public opinion in order to have it positioned in favor of demands such as the defense of the Zé Maria do Tomé Law.

Regarding the role played by the State, the Single Health System, by means of the 'home visits' carried out by its personell and the assistance thus provided, is an element leading to its identification. In the territorial workshop, there was an important presence of CSA, having a relevant influence on this response. The absence of elements that refer to health surveillance may suggest the precarious performance of institutional surveillance in this territory. The figure of the State, brought in the term 'state', as an institution, arises in

the context of the search for support from this entity, such as in state hearings or the need for visibility in this context, but also in the context of the relevance of the fight for the defense of the Zé Maria do Tomé State Law that prohibits the aerial spraying of pesticides in Ceará, which is an important achievement coming from M21's struggle. This can highlight the difference between the State, co-opted by agribusiness and that is purposely omitted and evoked in debates, and public policies in defense of life that are achievements from the social struggle.

In the construction of the action plan, as remarked by the participantes, the main difficulties faced were the lack of government commitment to public policies for the territory, especially regarding to access to water and protection against the impacts of agribusiness. Another difficulty is to involve more workers in the struggle, as fear and disbelief have increased the challenge to promote greater popular organization.

According to participants, the way to overcome these difficulties would be: political training workshops aiming at engaging the community, denunciation, and guaranteeing community action through information.

Among the achievements resulting from the workshop so far, the participants highlighted the organization of the population, the existence of more people sensitive to the struggles of Chapada do Apodi, the participation of the people in the demonstrations and the collective support coming from groups such as M21, Caritas, AEF AJA, CERESTA, CSA, Camp Zé Maria do Tomé. Other achievements were the approval of the Zé Maria do Tomé Law and the progress made regarding housing, electrification, and vegetable and agroecological production. At the end of the workshop, priority actions were defined for the communities of Tabuleiro do Norte, which are summarized in *table 3*.

Table 3. Priority actions of the action plan for popular health surveillance of the territorial workshop in rural communities of Tabuleiro do Norte, Ceará, in Chapada do Apodi

Monitoring of family health data near the company's plantations
Pesticide analysis in the water pipeline; soil, air and insect analysis
Creation of popular communication tools and strengthening of existing networks and initiatives
Campaign to prevent them from selling their land
Holding the government accountable for environmental inspection
Struggle: access to water and land; how to demand supervision and guarantee of permanence in the territory, from the public agency supervision, and to strengthen the 'Pesticides Kill' campaign
Occupation of spaces of social control (municipal councils; propose guidelines; commission monitor the plateau)

Source: Prepared by the authors.

The academia, by being provoked by social movements and affected communities to investigate the magnitude of the impacts of agribusiness, has sought to contribute to the struggles and the affirmation of the way of life in these territories, an instrument for that being the PHS initiatives². The use of the ecology of knowledge bases⁴⁰ allows to build a bridge between the health practices that are born in the territories themselves, considering the State's insufficiency to focus on the conventional actions and understandings of the institutional health model implemented by SUS, and to seek an effective construction of health surveillance knowledge and practices that respect and stimulate community participation. Thus, new conceptual and methodological bases have supported new ways of doing and conceiving surveillance, by incorporating different kinds of knowledge and different dimensions, such as those involving economic, social, cultural, ethical and gender issues.

These challenges for practicing science were clearly expressed in the Action Plan proposed by the community. Challenges end up being intersectoral and interdisciplinary, bringing to the academy the need to break paradigms of modern science still based on positivism⁴¹.

The process of identifying the so called qualitative indicators of PHS seeks to enable more dialogue with the SUS and to, at the same time, generate more engagement, dissemination of ideas, in a movement of expansion in order to allow such information to be transformed into public policies with a strong popular protagonism and insertion, as is the case of the Zé Maria do Tomé Law, as well as in the territorialized strategies and participatory methods developed by the autonomous PHS processes themselves when taking place in the communities.

Final considerations

Historically, rural populations are vulnerable to development projects such as those involving agribusiness, which greatly affects the health of these populations, their ways of life and the environment where they live and work. These populations developed PHS practices on the impacts caused by these projects. One of the questions raised from this study is: how can popular surveillance contribute to strengthening participatory processes in SUS health surveillance so that the knowledge produced by these populations and their needs are recognized and valued to the extent of pointing out

which actions could be more effective in each context and in a more democratic and dialogical perspective?

The experience of popular surveillance in Chapada do Apodi represents one of the most emblematic and powerful examples of this type of surveillance. More recently, the Federal Supreme Court deemed the Zé Maria do Tomé Law constitutional. This achievement, born in these territories, now inspires other initiatives throughout the country. This community struggle conquered an important public health protection policy, as these communities could be affected by aerial spraying of pesticides. However, given the expansion of agribusiness in the region, PHS can continue to be an important action to defend health and life in the territory. The possibility of an example pedagogy can inspire other experiences that need innovative strategies to face production processes that put profit above the protection of health and the environment. In this sense, PHS proved to be an important strategy to promote healthier and more sustainable territories in Chapada do Apodi.

Collaborators

Carneiro FF (0000-0002-6625-9715)* contributed to the conception, design and coordination of the work, data collection, analysis and interpretation, writing and final approval of the manuscript. Diógenes SS (0000-0001-8584-3936)* and Araújo RF (0009-0001-1507-397X)* contributed to the conception and design of the work, data collection, analysis and interpretation, writing and final approval of the manuscript. Xavier AM (0009-0000-0147-8629)* contributed to the conception, design of the work, data collection, writing and final approval of the manuscript. Cavalcante LV (0000-0002-3970-6655)* contributed to the conception and design of the work, writing and final approval of the manuscript. Maia AS (0009-0009-5964-4082)* contributed to the writing and final approval of the manuscript. Teixeira ACA (0000-0003-2851-5260)* contributed to the conception and design of the work, data collection, analysis and interpretation, final writing and final approval of the manuscript. ■

References

1. Carneiro FF, Pessoa VM. Iniciativas de organização comunitária e Covid-19: esboços para uma vigilância popular da saúde e do ambiente. *Trab Educ Saúde*. 2020;18(3):e00298130. DOI: <https://doi.org/10.1590/1981-7746-sol00298>
2. Silva LRC, Diógenes SS, Meneses MN, et al. Vigilância Popular da Saúde, Ambiente e Trabalho (VP-SAT): uma revisão integrativa da literatura. *Ciência saúde coletiva*. 2023;28(9):2565-2582. DOI: <https://doi.org/10.1590/1413-81232023289.13142022>
3. Meneses MN, Quadros JD, Marques GP, et al. Práticas de vigilância popular em saúde no Brasil: revisão de escopo. *Ciência saúde coletiva*. 2023;28(9):2553-2564. DOI: <https://doi.org/10.1590/1413-81232023289.13542022>
4. Carneiro FF, Augusto LGS, Rigotto RM, et al., organizadores. *Dossiê Abrasco: um alerta sobre os impactos dos agrotóxicos na saúde*. Rio de Janeiro, São Paulo: EPSJV/Fiocruz, Expressão Popular; 2015.

*Orcid (Open Researcher and Contributor ID).

5. Cavalcante LV. As firmas tomaram conta de tudo: território, agronegócio e questão agrária. Curitiba: Editora CRV; 2020.
6. Cavalcante LV. Entre fazendas e firmas: agronegócio da fruticultura e concentração fundiária no Baixo Jaguaribe/CE. RCT. 2023;18(49):216-240. DOI: <https://doi.org/10.14393/RCT184967055>
7. Rigotto RM, Leão FAF, Melo RD. A pedagogia do território: desobediências epistêmicas e insurgências acadêmicas na práxis do Núcleo Tramas. In: Rigotto RM, Aguiar ACP, Ribeiro LAD, organizadores. Tramas para a justiça ambiental: diálogo de saberes e práxis emancipatórias. Fortaleza: Edições UFC; 2018. p. 345-396.
8. Marinho AMCP. Contextos e contornos da modernização agrícola em municípios do Baixo Jaguaribe/CE - o espelho do (des)envolvimento e seus reflexos na saúde, trabalho e ambiente [tese]. São Paulo: Universidade de São Paulo; 2010. 245 f.
9. Freitas BMC. Marcas da modernização da agricultura no território do Perímetro Irrigado Jaguaribe-Apodi: uma face da atual reestruturação socioespacial do Ceará [dissertação]. Fortaleza: Universidade Estadual do Ceará; 2010. 181 f.
10. Rigotto RM, organizadora. Agrotóxicos, trabalho e saúde: vulnerabilidade e resistência no contexto da modernização agrícola no Baixo Jaguaribe/CE. Fortaleza: Edições UFC; 2011.
11. Silva MLV. Gritos, silêncios e sementes: as repercussões do processo de des-reterritorialização empreendido pela modernização agrícola sobre o ambiente, o trabalho e a saúde de mulheres camponesas na Chapada do Apodi/CE [dissertação]. Fortaleza: Universidade Federal do Ceará; 2014. 364 f.
12. Diógenes SS. (In)visibilização das causas de câncer na zona rural do município de Limoeiro do Norte-CE: a vulnerabilização das comunidades rurais e os riscos dos usos dos agrotóxicos [dissertação]. Fortaleza: Universidade Federal do Ceará; 2017. 186 f.
13. Aguiar ACP. Malformações congênitas, puberdade precoce e agrotóxicos: uma herança maldita do agronegócio para a Chapada do Apodi (CE) [dissertação]. Fortaleza: Faculdade de Medicina, Universidade Federal do Ceará; 2017. 199 f.
14. Ceará (BR). Lei nº 16.820, de 8 de janeiro de 2019. Inclui dispositivo na Lei Estadual nº 12.228, de 9 de dezembro de 1993, que dispõe sobre o uso, a produção, o consumo, o comércio e o armazenamento dos agrotóxicos, seus componentes e afins bem como sobre a fiscalização do uso de consumo do comércio, do armazenamento e do transporte interno desses produtos. Diário Oficial do Estado do Ceará. 9 Jan 2019.
15. Cavalcante LV. Um novo mal anunciado: a territorialização do agronegócio do algodão transgênico no Ceará. Rev Pegada. 2021;22(3):145-169. DOI: <https://doi.org/10.33026/peg.v22i3.8846>
16. Krenak A. Ideias para adiar o fim do mundo. 2. ed. São Paulo: Companhia das Letras; 2020.
17. Alves PA. Vigilância popular da saúde: cartografia dos riscos e vulnerabilidades socioambientais no contexto de implantação da mineração de urânio e fosfato no Ceará [dissertação]. Fortaleza: Universidade Federal do Ceará; 2013.
18. Oddone I, Marri G, Gloria S. Ambiente de Trabalho: a luta dos trabalhadores pela saúde. São Paulo: Hucitec; 1986.
19. Machado JMH. Alternativas e Processos de Vigilância em Saúde do Trabalhador: a heterogeneidade da intervenção [tese]. Rio de Janeiro: Escola Nacional de Saúde Pública Sergio Arouca, Fundação Oswaldo Cruz; 1996.
20. Porto MFS. Pode a Vigilância em Saúde ser emancipatória? Um pensamento alternativo de alternativas em tempos de crise. Ciênc saúde coletiva. 2017;22(10):3149-3159. DOI: <https://doi.org/10.1590/1413-812320172210.16612017>

21. Freire P. Política e educação: ensaios. 5. ed. São Paulo: Cortez; 2001.
22. Brandão CR, Streck DR, organizadores. Pesquisa Participante: o saber da partilha. São Paulo: Ideias & Letras; 2006.
23. Valla VV. Participação popular e saúde: a questão da capacitação técnica no Brasil. In: Valla VV, Stotz EM, organizadores. Participação Popular, Educação e Saúde: teoria e prática. Rio de Janeiro: Relume Dumará; 1993.
24. Rigotto RM. Contested Knowledges in the Environmental Conflict over Uranium and Phosphate Mining in Ceará – Brazil. *Vibrant*. 2017;14(2):e142184. DOI: <https://doi.org/10.1590/1809-43412017v14n2p184>
25. Porto MFS, Menezes MAC, Dias AP, et al. Avaliação dos Impactos Socioambientais e de Saúde em Santa Cruz Decorrentes da Instalação e Operação da Empresa TKCSA. Rio de Janeiro: Fiocruz; 2011.
26. Porto MFS, Finamore R, Chareyron B. Justiça ambiental e mineração de Urânio em Caetité/BA: avaliação crítica da gestão ambiental e dos impactos à saúde da população. Relatório. Rio de Janeiro: Fundação Oswaldo Cruz; 2014.
27. Carneiro FF, Pessoa VM, Teixeira ACA, organizadores. Campo, Floresta e Águas: tecendo práticas e saberes de saúde. v. 1. Brasília, DF: Editora UnB; 2017.
28. Fundação Oswaldo Cruz. Participatório em Saúde e Ecologia de Saberes [Internet]. Eusébio: Fiocruz Ceará [data desconhecida] [acesso em 2023 jun 14]. Disponível em <https://ceara.fiocruz.br/participatorio/inicio/>.
29. Porto MFS, Cunha MB, Pivetta F, et al. Comunidades ampliadas de pesquisa ação como dispositivos para uma promoção emancipatória da saúde: bases conceituais e metodológicas. *Ciênc saúde coletiva*. 2016;21(6):1747-1756.
30. Corrêa HR, Segall-Corrêa AM. *Lockdown* ou vigilância participativa em saúde? Lições da Covid-19. *Saúde debate*. 2020;44(124):5-10. DOI: <https://doi.org/10.1590/0103-1104202012400>
31. Sevalho G. Apontamentos críticos para o desenvolvimento da vigilância civil da saúde. *Physis*. 2016;26(2):611-632. DOI: <https://doi.org/10.1590/S0103-73312016000200014>
32. Breilh J. De la vigilancia convencional al monitoreo participativo. *Ciênc saúde coletiva*. 2003;8(4):937-951. DOI: <https://doi.org/10.1590/S1413-81232003000400016>
33. Porto MFS. Crise das utopias e as quatro justiças: ecologias, epistemologias e emancipação social para reinventar a saúde coletiva. *Ciênc saúde coletiva*. 2019;24(9):4449-4458. DOI: <https://doi.org/10.1590/1413-812320182412.25292019>.
34. Thiollent M. Metodologia da pesquisa-ação. 16. ed. São Paulo: Cortez; 2008.
35. Bardin L. Análise de conteúdo. Traduzido por Luís Antero Reto, Augusto Pinheiro. São Paulo: Edições 70; 2011.
36. Ministério da Saúde (BR), Conselho Nacional de Saúde. Resolução nº 466, de 12 de dezembro de 2012. Dispõe sobre diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Diário Oficial da União. 13 Jun 2013.
37. Rigotto RM, Aguiar ACP, Pontes AGV, et al. Desvelando as tramas entre saúde, trabalho e ambiente nos conflitos ambientais: aportes epistemológicos, teóricos e metodológicos. In: Rigotto RM, Aguiar ACP, Ribeiro LAD, organizadoras. Tramas para a justiça ambiental: diálogo de saberes e práxis emancipatórias. Fortaleza: Edições UFC; 2018. p. 163-214.
38. Silva MR. O modo de vida camponês e a agricultura familiar no Brasil: conceitos e debates contemporâneos. *Rev Cient Multid Núcleo Conhecimento* [Internet]. 2020 [acesso em 2023 jun 14];9(5):65-74. Disponível em: <https://www.nucleodoconhecimento.com.br/ciencias-sociais/modo-de-vida>.

39. Ministério da Saúde (BR). Conselho Nacional de Saúde. Resolução MS/CNS nº 588, de 12 de julho de 2018. Fica instituída a Política Nacional de Vigilância em Saúde (PNSV), aprovada por meio desta resolução. Diário Oficial da União. 13 Ago 2018.
40. Santos BS, Meneses MP. Epistemologias do Sul. Coimbra: Almedina; 2009.
41. Morin E. Introdução ao pensamento complexo. 4. ed. Porto Alegre: Sulina; 2011. 120 p.

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