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# Workshop for priority-setting in Aedes aegypti control interventions in Latin America and the Caribbean: a policy dialogue

## Taller de priorización de intervenciones para el control del mosquito Aedes aegypti en Latinoamérica y el Caribe: diálogo de políticas

## *Workshop* de priorização de intervenções para o controle do mosquito *Aedes aegypti* na América Latina e no Caribe: diálogo de políticas

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**Abstract**

*This article presents the results of a dialogue between decision-makers and experts in Latin America and the Caribbean on priority-setting for interventions and studies on* Aedes aegypti *control. The article is part of a project that included a systematic review of mosquito control strategies and a qualitative study with key informants from the region. Using a collective deliberative process assisted by the results of the above-mentioned projects, a list of priorities was developed by consensus for the implementation of vector control strategies and the development of key regional research lines. It was agreed that the best strategy is integrated vector management, divided into: (a) chemical control; (b) biological control; (c) environmental management; (d) community participation; and (e) integrated surveillance. The workshop highlighted the crucial role of government leadership and inter-sector coordination between government agencies and civil society stakeholders. The proposed priorities for research lines were:* Ae. aegypti *vector competence and associated factors; community components of interventions; incorporation of technology into vector control and monitoring; most efficient modalities of integrated surveillance; entomological indicators with the best predictive capacity; and resistance to insecticides. The policy dialogue methodology allowed validating and enriching the results of other levels of research, besides establishing priorities for regional research and control strategies.*

Aedes aegypti*; Environmental Administration; Public Policy*

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## Introduction

This report presents the results of a policy dialogue, a dialogue of decision-makers and health experts from countries of Latin America and the Caribbean who advise or influence policies for priority-setting in interventions and studies for *Aedes aegypti* control in the region. A policy dialogue involves persons from different interest groups focusing on a mutually targeted theme, considering the different perspectives to it. By facilitating the consideration of diverse perspectives, policy dialogue becomes a powerful tool that enriches decision-making processes and contributes to the implementation of evidence-based policies with expert consensus [1].

In this policy dialogue workshop, the decision-makers and experts participated in different group activities with the objective of reaching a consensus on the best vector control strategies and priority research lines at the regional level.

The work was conducted in March 2018, coordinated by the Institute for Clinical and Health Effectiveness (IECS) of Argentina, and is part of a project that began in 2015 and that included a systematic review of the effectiveness of health interventions for *Ae. aegypti* control in Latin America and the Caribbean [2], as well as a qualitative study that interviewed 18 experts from 9 countries in the region. The aim of this qualitative study was to identify factors that prevent or facilitate the implementation of vector control interventions, from the perspective of program administrators and regional reference persons [3].

## Methodology

The workshop opened with an introduction of the objectives of policy dialogue and with a round of introductions by the 11 participants, representing seven countries and the Pan American Health Organization (PAHO) (see Supplementary Material 1 for more details: http://cadernos.ensp.fiocruz.br/site/public_site/arquivo/suppl-1-e000929-18-ingl_5696.pdf). The IECS team, which organized the workshop, began by presenting the results of a systematic literature review and a qualitative study of interventions for *Ae. aegypti* control in Latin America and the Caribbean [2,3]. A summary of the evidence from the two studies had been distributed to the 11 participants several days in advance, with the aim of leveling the information based on which the group work would be done [4]. Having presented the results of the systematic review and the qualitative study, a dialogue was launched with and among the participants, who raised questions and observations aimed at clarifying and/or validating the two studies' results. The group also shared reflections on the applicability of the findings in Latin America and the Caribbean.

Next, deliberative group brainstorming sessions were held, dividing the participants such that each group would include representatives of all the sectors that had been convened for the activity: civil society institutions, government agencies, academic institutions, and an international health agency (PAHO). The division of the groups was also designed to reflect the diversity of countries, participants' gender, and type of expertise (clinical/healthcare experience, participation in health programs, or research on *Ae. aegypti*).

After explaining to the participants how the group brainstorming sessions would function, everyone agreed to participate voluntarily and confidentially in the proposed group dynamics. Both the group sessions and the plenaries, in which everyone participated, were digitally recorded in audio, which allowed an immediate and detailed analysis of the information that emerged in the activities. The first group brainstorm focused on "priority-setting for regional strategies", proposing as trigger questions: "what?", "how?", and "why?". The groups were set up (group A and group B). Each group included a moderator and a member of the IECS organizing team, who made a written record of each contribution. Participants received a basic list of the principal vector control strategies (Supplementary Material 2: http://cadernos.ensp.fiocruz.br/site/public_site/arquivo/suppl-2-e-00092918-ingl_5162.pdf). In each group, participants were expected to debate and reach a consensus on: (a) three control strategies considered priorities as a whole and the best combination of strategies for the region; (b) why these three strategies were considered priorities; (c) ways of carrying out these strategies; and (d) potential obstacles and facilitators for each strategy. After this, all the members

participated in a plenary, where the synthesis of the group work was presented by a group member who acted as the "spokesperson".

The second brainstorm in the workshop, a plenary discussion, focused on "strategies to reduce information gaps", centered on setting priorities for future research lines. All the contributions by participants in the plenary meeting were classified as: priority research themes; methodologies for addressing such studies; and collaboration among the stakeholders to carry them out.

The meeting concluded with a group activity in which the participants gave their opinions on the policy dialogue methodology. The written record and taped audio from each group discussion allowed subsequent reconstruction of the main positions and arguments used by participants, as well as the thematic analysis in this report.

## Findings

### Discussion of the studies' results

The dialogue with experts allowed enriching the results of the evidence presented: the literature review and qualitative study on barriers and facilitators for implementation of vector control strategies. Participants agreed that the governments of the region's countries do not prioritize preventive strategies for *Ae. aegypti* control. Consequently, the existing interventions are largely in reaction to outbreaks or epidemics. They further highlighted that it is not common to measure the interventions' impact. They underscored the scarce information on critical points such as the effectiveness of different vector control strategies in the region and the low quality of the available evidence, as reported in the systematic review. The participants also felt that urgent care for persons affected by the *Ae. aegypti* mosquito often exceeds the health systems' capacity, so that quality studies are not performed with adequate technical and financial support from each country's health authorities.

### Group discussion on "priority-setting for regional strategies: what? how? and why?"

Box 1 summarizes the work of this group as to the priorities in vector control strategies for *Ae. aegypti*. The box describes the selected strategies (by group consensus), analyzes the reasons for their selection, and outlines how to implement the consensual strategies. Figure 1 shows a graph of the work by group of discussion of the studies' results, summarizing the discussion and consensuses reached as to priorities in vector control strategies.

Both groups displayed a striking consensus that the strategy for implementation should be integrated, in keeping with integrated vector management strategies [5]. This can be broken down into: (a) chemical control; (b) biological control; (c) environmental management; (d) community participation; and (e) integrated surveillance (which includes entomological and epidemiological surveillance). These strategies should also be aligned with the PAHO integrated management strategy for dengue control [6], which includes three major pillars: (a) surveillance, (b) patient care and (c) communication. Inter-sector coordination and cross-cutting decision-making were considered essential for the effectiveness of a truly integrated strategy.

The above-mentioned strategies do not assume a hierarchy of importance in the order they were listed. A chronological order was suggested for the interventions: with epidemiological surveillance necessarily "going after" (the vector), because it implies that cases already exist, while entomological surveillance allows taking measures to "get ahead" of the cases.

In terms of ways to implement integrated measures, the participants highlighted some key elements: (a) training human resources, designed according to the target areas for the intervention; (b) supervision and evaluation of the human resources participating in the activities; (c) passage of laws and other regulations that facilitate the interventions (e.g., solid waste management); (d) inter-sector collaboration in health (with agriculture and livestock, the economy, education, justice, etc.); and (e) monitoring resistance to insecticides. The group underscored the importance of interventions that are sustainable over time.

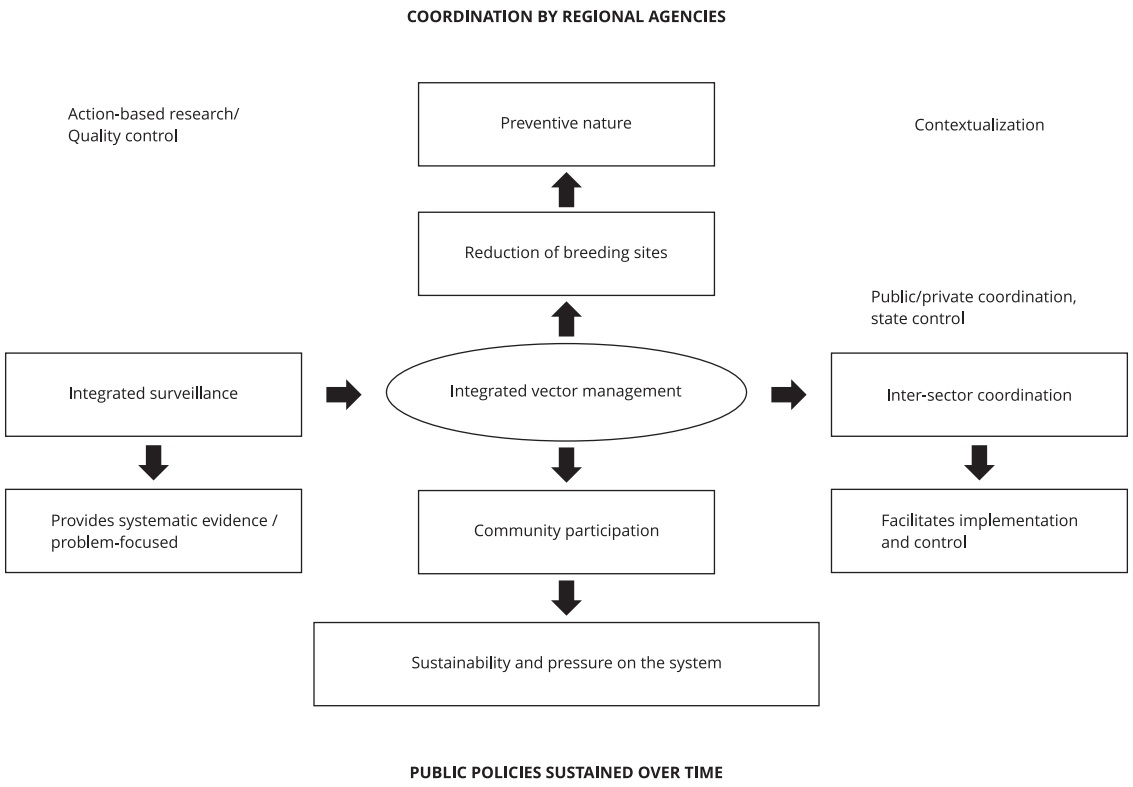
**Box 1**

Priority regional intervention strategies.

| WHAT (strategies) | WHY (reasons) | HOW (ways) |
|---|---|---|
| Entomological surveillance | To measure and select control measures | House-to-house visits/According to local conditions/For decision-making/Information at the local and central levels |
| Epidemiological surveillance | To identify the most appropriate interventions | Integrated vector control/Monitoring insecticide resistance |
| Vector control with community participation | To interrupt viral transmission | Guided by qualitative/behavioral studies |
| Trained human resources/Inter-sector coordination/Supervision and evaluation | | |

**Figure 1**

Priorities in regional intervention strategies.



The central aspects of the priority strategies included the state's functioning/governance (continuity of the programs, government leadership, role of regional agencies) and key contexts and strategies (community participation, differential impact assessment for each strategy, and innovation in chemical control strategies).

The workshop also highlighted the need for job stability in the vector control programs' directors and technical teams in each country, since frequent turnover of personnel (due to political changes) leads to discontinuities in the programs and their achievements, as well as loss of accumulated scientific knowledge.

Concerning integrated strategies, the participants in the policy dialogue emphasized the importance of the government's leadership role and inter-sector coordination between government agencies (health ministries, waste management services, etc.) and civil society actors. They felt that the states sometimes act as bureaucratic obstacles to the establishment of effective vector control measures and highlighted the vital linkage between nongovernmental actors to control and empower the interventions that have proven most effective in a given country.

The absence of national and municipal vector control legislation was also identified as a major obstacle. For example, they mentioned that hospitals cannot dispose of scrap metal registered as part of their property, and that there are veritable "cemeteries" of old vehicles blocked from removal by court orders. Meanwhile, in countries with laws that allow dealing with these issues, vector control is facilitated.

The two obstacles mentioned repeatedly to explain the failures of vector control were: lack of political determination by governments (e.g., to achieve adequate solid waste removal) and the inability to involve communities in the interventions (e.g., to achieve sustainable behavior changes related to household water storage).

Another critical line in vector control was the role of regional agencies. Participants mentioned PAHO's insufficient strength to perform its regional leadership role and questions concerning implementation of its guidelines, as well as its vertical institutional structure, considered insufficiently dynamic to incorporate rapid changes at the local level in relation to *Ae. aegypti* in the target areas for interventions.

The scenarios in the region can differ considerably as to the presence of *Ae. aegypti*. Some regions suffer from problematic structural conditions (lack of running water supply, solid waste removal, and sewage systems, etc.) which require policy decisions that should come ahead of specific vector control policies. One participant pointed out: "*What good are mosquito nets without a proper analysis of the real problem, for example, the lack of running water, which can result in multiple inadequate recipients for storing water?*". It is also key to consider each country or region's environmental and climatic characteristics.

While a large share of the countries in Latin America and the Caribbean have identified the breeding sites for *Ae. aegypti* and have conducted preventive campaigns accordingly, sustained changes have not been achieved in the population's behavior to consolidate vector control. Thus, community participation was cited as a key element at several levels, and the group proposed reinforcing state policies; community control of the interventions and use of social networks to report outbreaks and/or gaps in control strategies. Although the participants all agreed on the central importance of community participation for an intervention to be effective, some mentioned the need for studies to continuously assess the implementations under way, as well as the impact of these strategies in order to optimize them in subsequent cycles of improvement.

The group cited the need to assess each strategy's differential impact, although they acknowledged the complexity of such assessment in endemic areas, where it is extremely difficult to conduct isolated interventions. This scenario hinders the design of evidence-based vector control interventions, besides complexifying risk stratification in each community in order to define "customized" prevention strategies.

Another obstacle cited by participants was lack of innovation in chemical control mechanisms. This barrier was attributed partly to private companies' interests in maintaining the *status quo* and the inertia of technical teams, who may continue to apply obsolete technologies even when promising innovations exist.

## Group discussion on "strategies to reduce information gaps"

Box 2 summarizes the main consensuses reached in the plenary on priority themes and types of research, as well as potential collaborations.

The group emphasized that studies are often conducted that do not correspond to the country's or region's real health needs. This may be due to two main factors. One the one hand, there is a "mismatch" between health researchers and decision-makers, who should play a leading role in determining health needs. On the other, the interests of private companies lead studies to impose certain vector control technologies over others, even when such studies lack sufficient evidence of effectiveness. Based on the above, it is indispensable to set research priorities based on the identification of health needs, as well as to transmit the evidence and raise the awareness of vector control program directors. The group also emphasized that strengthening the countries' structural capacity to monitor the vector and assess the strategies to control it may be even more important than to incorporate new vector control technologies.

One of the key points was the need for behavioral, sociological, and anthropological studies to provide a basis for the programs' efforts, focused on the community in order to achieve behavioral

**Box 2**

Priorities for future lines of research.

| Priority research themes | Type of research | Collaborations |
|---|---|---|
| - Explain and predict the vectorial capacity of *Aedes aegypti* and associated factors.<br><br>- In the community component, identify:<br>• Population's acceptance (or lack thereof) of different vector control interventions ("what we use").<br>• Success or failure of given forms of community participation (which ones are successful?).<br>• Motivation of the persons involved, to orient subsequent studies and vector control strategies.<br><br>- Measure the interventions' sustainability.<br><br>- Analyze the ways the technology is incorporated into vector control and monitoring.<br><br>- Study the most efficient ways to conduct integrated surveillance.<br><br>- Build entomological indicators with good predictive capacity.<br><br>- Design new vector control models.<br><br>- Establish health research priorities (which may differ between countries). | - Mixed qualitative-quantitative designs (e.g., including a survey to determine how many people used a given method and focus groups to know how they used it).<br><br>- Systematic search of primary research on behavior (e.g., behavioral economics).<br><br>- Qualitative research (sociological and anthropological) on community participation.<br><br>- Formative research (for the actions to be acceptable to the population).<br><br>- Implementation research.<br><br>- Research for action (for example, to incorporate new technologies).<br><br>- Cost-benefit studies on the interventions.<br><br>- Predictive models for transmission periods. | - Shaping a research network.<br><br>- Shaping interdisciplinary groups.<br><br>- Agreements with universities and health institutions.<br><br>- Alliance with Pan American Health Organization (PAHO) as a facilitator of access to research funds.<br><br>- Possible funders:<br>• Special Programme for Research and Training in Tropical Diseases (TDR).<br>• Bill & Melinda Gates Foundation.<br>• National governments.<br>• Wellcome Trust.<br>• National Institutes of Health (NIH, USA). |

changes, for example in relation to mosquito breeding sites. This type of study would allow reaching the specific populations more effectively, so it would have to be included more often in studies on vector control effectiveness. If the community is not convinced that a given intervention is valid, it would be useless, since the community would not implement it. There is thus a striking lack of studies focusing on how the community views different interventions in order to weigh their importance and feasibility. In short, various participants agreed in emphasizing the importance of qualitative research on the vector control issue, especially as regards community strategies, which the group unanimously viewed as priorities.

They also emphasized the need to study the most efficient ways to conduct integrated surveillance, to design new entomological indicators with better predictive capacity, and to develop new vector control models, always alert to setting research priorities at the local level.

## Discussion

Participatory approaches have gained growing recognition in the last decade, becoming the center of good policy-making processes [7]. Policy dialogue is known as one of the most interactive and innovative models for policy-making or effective joint planning and implementation of programs applied in different contexts. It is necessary to create deliberative groups with broad groups of program decision-makers and health and clinical experts representing diverse realities. Recent efforts have insisted on the influence of context, as in its methodology, to achieve participation and inclusion [8]. Furthermore, the World Health Organization (WHO) emphasizes "policy dialogues" as a key tool for designing health policies worldwide [9]. The policy dialogue on *Ae. aegypti* in Latin America and the Caribbean allowed reinforcing the notion that entomological surveillance, together with epidemiological surveillance, should be included to measure and select the vector control measures in all the affected countries in the region. A good example is the clinical trials conducted in Cuba, in which the point of departure was the entomological and epidemiological surveillance data collected by the National Vector Control Program to design integrated, multidisciplinary strategies focused on solving the problems that were identified [10,11,12].

Community participation is also an essential mechanism for interrupting vector-borne transmission, and it was one of the points cited most often by participants, coinciding with the evidence presented at the start of the workshop. This power strategy focuses on promoting behavior changes in individuals, families, and communities, not only increasing their knowledge on the risks of acquiring arbovirus infections, but also empowering them to become involved in caring for their own health and contributing to the improvement of their surroundings and support for their families and communities. All the existing evidence in the region was identified and summarized in the systematic review on the effectiveness of health interventions for controlling *Ae. aegypti* in Latin America and the Caribbean [2], as well as in the complementary qualitative study from the perspective of the regional program directors and reference persons [3].

Concerning research, the group suggested the need to conduct more and better studies on priority themes for the region. For example, they highlighted the need to rely on ethnographic studies by which to base program changes focused on the community itself in order to achieve the necessary behavior changes.

The scientific literature emphasizes that a policy dialogue is only as good as its process. The barriers that have been identified for conducting policy dialogues include the way the information is presented and the adequacy of the evidence for the contexts in which they are applied during policy-making processes [13].

There are precedents in the region. On September 7-9, 2010, representatives of health ministries, industry, and academic institutions participated in the first policy dialogue and inter-sector exchange in relation to the problem of *Ae. aegypti* control in the Americas [14]. The central themes were: (1) description of the prevailing situation with dengue and *Ae. aegypti* in the region, (2) regional strategies and initiatives, (3) tools for surveillance and control of mosquito populations, (4) community participation, and (5) identification of what works and does not work from the countries' perspectives. The conclusions of this first policy dialogue were consistent with those obtained and described in

our meeting, held nearly eight years later. For example, both meetings identified the lack of effective predictive indicators (entomological, environmental, social); insufficient human resources; the geographic extent of the areas with insecticide resistance (partly due to their incorrect application) and the need to systematically evaluate and supervise *Ae. aegypti* control activities, besides developing new control tools and optimizing the existing ones. They emphasized that channels for communication and cooperation should be established to integrate the different sectors and countries involved in the search for solutions to control *Ae. aegypti*, a goal that apparently has not been fully achieved according to the conclusions of the policy dialogue we led.

In this sense, a limitation to the policy dialogue we developed was the fact that it was unable to include more actors from countries of the region. Yet the dialogue had various strengths. It was preceded by a rigorous mixed-methods study, including a systematic review and a qualitative study [2,3], the evidence from which was summarized for the decision-makers [4], and it adopted a validated methodology [15]. The participants were particularly emphatic on this point, having exceeded previous experiences. The meeting's participatory dynamic was facilitated by the experience acquired by the IECS group in previous projects with decision-making dialogues at the Latin American level and focusing on tobacco control (Instituto de Efectividad Clínica y Sanitaria. Tabaquismo en países de Latinoamérica. https://www.iecs.org.ar/tabaco/, accessed on 05/May/2018). Finally, the fact that it was possible to systematically record all the interactions in the dialogue ensured the information's reproducibility and minimized the occurrence of interpretative biases in relation to more fragmented records.

## Conclusion

The "policy dialogue" methodology allowed sharing, validating, and enriching the results of previous stages of the research in the context of which it was convened. This work dynamic oriented future lines that would allow offering more consistent evidence on *Ae. aegypti* in Latin America and the Caribbean. Thus proposed, the dialogue between decision-makers and experts was based on two major lines of priorities for the region: vector control strategies and a research agenda, which allows joining efforts, enhancing capacities, and orienting resources towards these priorities for intervention and research. The participants and the PAHO representative gave a positive assessment to the initiative and committed to proceeding with the proposals and, insofar as possible, establishing an active network of collaboration and communication to facilitate the objective.

This collective, deliberative, and collaborative methodology can enrich the implementation of strategies and result in an efficient way of triangulating research techniques and strategies to obtain more solid results and broader consensuses, in this case on priorities in the field of *Ae. aegypti* control in Latin America and the Caribbean.

## Contributors

A. Ciapponi and A. Bardach participated in the conception of the project and elaboration of the manuscript. A. Alcaraz, M. Belizán, D. Jones, M. Comolli and S. D. Ruvinsky collaborated in the elaboration of the manuscript.

## Additional informations

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## Resumen

*Este trabajo presenta los resultados de un diálogo entre tomadores de decisión y expertos de América Latina y el Caribe sobre la priorización de intervenciones e investigaciones para el control del mosquito* Aedes aegypti*. Forma parte de un proyecto que comprendió una revisión sistemática sobre estrategias control del mosquito y un estudio cualitativo con informantes clave de la región. Mediante un proceso deliberativo en instancias colectivas, asistido por los resultados de los mencionados proyectos, se elaboró un listado consensuado de prioridades de implementación de estrategias de control vectorial y de desarrollo regional de líneas clave de investigación. Se convino en que la mejor estrategia es el manejo integrado de vectores o Estrategia de Gestión Integrada, desagregada en: (a) control químico; (b) control biológico; (c) manejo ambiental; (d) participación comunitaria; y (e) vigilancia integrada. Se destacó el fundamental e indelegable rol de rectoría del estado y la coordinación intersectorial entre agencias estatales y con actores de la sociedad civil. Se propuso priorizar como líneas de investigación: la capacidad vectorial del* Ae. aegypti *y factores asociados; componentes comunitarios de las intervenciones; la incorporación de tecnología al control vectorial y al monitoreo; los modos más eficientes de vigilancia integrada; indicadores entomológicos con mejor capacidad predictiva y resistencia a insecticidas. La metodología del diálogo de políticas permitió validar y enriquecer los resultados de otras instancias de investigación, y permitió establecer prioridades sobre investigación y estrategias para el control regional.*



Aedes aegypti*; Administración Ambiental; Política Pública*



## Resumo

*Este trabalho apresenta os resultados de um diálogo entre tomadores de decisão e expertos da América Latina e do Caribe sobre a priorização de intervenções e pesquisas para o controle do mosquito* Aedes aegypti*. Faz parte de um projeto que compreendeu uma revisão sistemática sobre estratégias e controle do mosquito e um estudo qualitativo com informantes chave da região. Através de um processo deliberativo em instâncias coletivas, assistido pelos resultados dos mencionados projetos, foi elaborada uma listagem consensuada de prioridades de implementação de estratégias de controle vetorial e de desenvolvimento regional de linhas essenciais de pesquisa. Foi acordado que a melhor estratégia é a gestão integrada de vetores ou Estratégia de Gestão Integrada, desagregada em: (a) controle químico; (b) controle biológico; (c) gestão ambiental; (d) participação comunitária; (e) vigilância integrada. Foi destacado o rol fundamental e indelegável da direção do estado e a coordenação intersetorial entre agências estaduais com atores da sociedade civil. Foi proposto priorizar como linhas de pesquisa: a capacidade vetorial do* Ae. aegypti *e fatores associados; componentes comunitários das intervenções; a incorporação de tecnologia para o controle vetorial e para o monitoramento; modos mais eficientes de vigilância integrada; indicadores entomológicos com melhor capacidade preditiva e resistência a pesticidas. A metodologia do diálogo de políticas permitiu validar e enriquecer os resultados de outras áreas de pesquisa, possibilitou estabelecer prioridades a propósito da pesquisa, além de estratégias para o controle regional.*



Aedes aegypti*; Administração Ambiental; Política Pública*

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