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ANALYSIS OF PREVENTIVE MANAGEMENT TO ARBOVIRUSES THROUGH GLOBAL HEALTH PROGRAMS: A SCOPING REVIEW

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ABSTRACT

Background: Arboviruses are diseases with increasing worldwide spread, there are more countries that are considered endemic areas every year, it is of vital importance that the governmental, social and academic sectors join forces for the control and future eradication of arthropod-borne viruses. **Objective:** To identify and map the existing literature that is related with the approach and the execution of health programs associated with arboviral type vector-borne diseases. **Material and methods:** A scoping review was carried out to identify and map existing literature either quantitative or qualitative focused on analysis, evaluation and modifications of health programs associated with vector-borne diseases of the arboviral type. **Results:** The search resulted in a total of 485 articles, of which 45 met the inclusion criteria, at the end of the rapid reading 25 articles were found that correspond to the background described in this investigation. **Conclusions:** After the review process, it is necessary to emphasize that research and action in the field of program evaluation should be strengthened. A scoping review then allows us to broaden the point of view on the subject we wish to investigate, granting the necessary background that justifies the consequent decision making and providing the possibility of having a greater structural context to be able to adapt to the environment in which it is desired influence.

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INTRODUCTION

The fight against the mosquito, vector of malaria, dengue, Zika and Chikungunya, among others, is an essential component in the prevention of these diseases, since it has been shown that vector control applied with a sufficiently wide coverage can reduce or even stop the transmission of disease (1).

The vector control must be carried out through a comprehensive approach to improve its effectiveness, its profitability, its sustainability and its viability from an environmental point of view. To establish these strategies and know the factors that may compromise their effectiveness, it is necessary to apply permanent entomological surveillance and collect updated information on the monitoring and evaluation of interventions.

In the Americas about 500 million people live at risk of getting dengue (1), so it is of vital importance that the governmental, social and academic sectors join forces for the control and future eradication of diseases caused by arthropod-borne

viruses. Uncontrolled or planned urbanization, the lack of basic services in the communities and environmental management, in addition to climate change, are some of the factors that contribute to the problem continuing to grow despite the efforts of the countries.

"Controlling the *Aedes aegypti* mosquito, the disease main transmitter, is a great regional and global challenge" said the director of the Department of Communicable Diseases and Health Analysis of PAHO / WHO, Marcos Espinal (1), "All sectors of government, communities and families must work together to combat the vector and control this disease that knows no boundaries or limits, and affects all people equally, therefore it is not only a problem that concerns the health sector".

Vector control is the only way to prevent the spread of diseases, for which it is necessary the active participation of the population, combined to the efforts of the public health system and other sectors, such as those responsible for public works and services, examples of this are aqueducts and communals.

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Through health programs, designed by the corresponding leaders in the field of public health, the measures considered necessary for the control and eradication of diseases in the population are taken, but it should be noted that although decisions are made with a detailed prior analysis and with high responsibility, the measures do not always fit the population properly or the impact they generate is not what was expected, so, strategies must be strengthened through a process of adapting health policies to the corresponding community. The policies and programs require a periodic evaluation process and possible rethinking.

Throughout the world there is a growing interest in the objective evaluation of public health work. Evaluation is a characteristic of human behavior; every decision is usually preceded by an evaluation process, however, this whole process requires a high degree of responsibility and will, especially when it comes to the health of the population, which is one of the highest priorities of the nations.

The objective of this scoping review is the identification and mapping of the existing literature that is related between the approach and the execution of health programs of arboviral type vector-borne diseases, as well as their evaluation and association with public health policies in the global context.

MATERIAL AND METHODS

The scoping review was carried out during the period from October to November of the year 2018. During the process, the existing literature on analysis, evaluation and modifications of health programs associated with arboviruses was identified and mapped.

The criteria for the selection of references were the following: The search will be global in a geographical matter, so all the countries that have done research on the subject apply for this study; add research articles containing the keywords to work with the help of tools such as booleans; location of adequate reports to the research topic, with related and usable information containing the established search keywords; Add research written in Spanish and English languages; Obtaining data and information with a temporality of up to 15 years prior to the current date, given that in the matter of arboviruses the updates are permanent and very frequent; The search for evidence, published reports, magazines, in order to relate the results and identify their differences.

The keywords were obtained through search indexes such as: PubMed and Bireme, for the identification of the words in English and Spanish respectively (see table 1).

Table 1 Keywords for the search of empirical articles

Keywords in English	
Vector transmitted diseases	Health program
Arboviruses	Health planning
Infectious disease	Health policy
Keywords in spanish	
Enfermedades Transmitidas Por Vector	Programas De Salud
Arbovirus	Planeación en salud
Enfermedad infecciosa	Políticas públicas en salud

The following inputs and processes required for the search were considered as a search strategy: An adequate space for this research was allocated, with enough workspace (computer and data storage methods such as USB sticks and external hard

drives were required). From that point on, it was decided to start with the search taking into account that the information must be kept continuously, to avoid the loss of data in the event of any damage, it was also saved in the cloud and email.

The process of identifying relevant studies for research, went through all the databases to which the University of Guadalajara has access, complementing with search interfaces (like Google scholar). The keywords in English and Spanish were used with their combinations and the use of booleans. A quick reading of the literature obtained was carried out with a focus on the objectives, methodology and results to identify if it is relevant to the research.

A registry of the search strategies was prepared, the literature search results were exported and organized in a computer folder with easy access for the research team. The folder had the name of the database where the search was performed. An Excel spreadsheet was created with the name "Health policies scoping review", the spreadsheet worked as a database, where the search results were recorded (dates, numbers, records). The tabs located in the spreadsheet placed the databases consulted with their respective search records. Duplicates were removed, final documents were counted and backup copies were made whenever new information was available.

The search resulted in a total of 485 articles, of which 45 met the inclusion criteria, at the end of the rapid reading, 25 articles were found that correspond to the background described in this investigation (see figure 1)

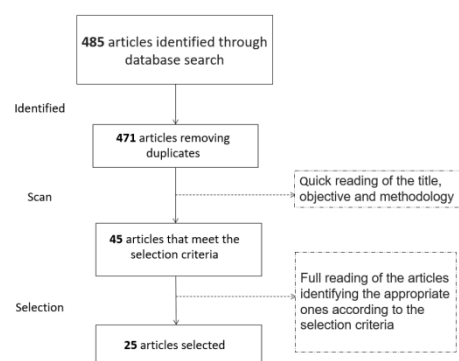


Figure 1 Flowchart of the article selection process

For the systematization, the data were extracted from the articles and categorized by type of study, location, design, population or sample, dependent variables, independent variables, type of intervention performed, method of data collection and analysis. Finally, the references in terms of temporality covered from 2002 to 2018.

RESULTS

4 topics that determined the investigation were: Interventions that include programs for the control of arbovirus diseases, Actions and strategies for the control of vector-borne diseases, policies of the programs used for the control of arbovirus diseases and use of worldwide vector programs.

The vector control programs are created to achieve and maintain the health conditions of the population, and their main objective is to achieve the highest control of the mosquito population, seeking to reduce the population potentially harmful to people's health. Programs aimed at combating and

eliminating vectors should focus on the use of mosquito nets treated with long-lasting insecticides or indoor fumigation with residual insecticides, guaranteeing the best quality and wide coverage of these interventions. All strategies are carried out in homes, premises and specifically in health, education and tourism institutions throughout the year, aimed at preventing the formation and reproduction of hatcheries, as well as destroying those found (1).

Interventions that include programs for the control of vector-borne diseases

17 of the 25 articles include interventions with a control program. Of these 17 articles, 6 interventions were carried out in the vector control programs (2,3,4,5,6,7), 6 interventions in entomological control programs (2,4,7,8,9,10,11), 3 interventions in epidemiological control programs (12,13,14), and two cases of joint interventions were found, one of them with interventions in entomological / vector control programs (4) and the other with interventions in entomological / epidemiological control programs (14).

6 of the 25 articles include the use of vector surveillance programs such as clean yard campaigns and recycling campaigns; 3 (2,9,15) of the 6 articles mentions the findings were that recycling campaigns were the programs used mainly for vector control. 2 (8,9) of the 6 articles Clean yard campaigns are listed as other programs used for vector control, almost in the same proportion as recycling campaigns; and finally, there was one article that mentions the use of joint program of clean yard and larval control (9).

17 of the 25 articles used some type of intervention for vector control. According to the review, the most used educational interventions for vector control are the promotion and prevention of disease strategies, highlighted by 7 articles (9,3,11,4,14,16,17), followed directly by interventions aimed at knowledge of the disease described in 6 (18,19,12,20,21,22). Campaigns for vector control are also used, although to a lesser extent than those mentioned above through a behavioral intervention expressed in 2 articles and promotion and prevention education (2,3).

In 11 of the 25 articles, an evaluation of surveillance and vector intervention measures is carried out, showing as significant results 10, and mentioning in 1 article non-significant results to the evaluation (19).

10 of the 25 articles show the acquisition of "Empowerment" in the community after the use of vector-borne disease control programs, 8 of the 10 articles refer to empowerment in the rural community and 1 of the 10 articles in the urban community (2).

Actions and strategies for the control of vector-borne diseases

16 of the 25 articles include strategies and techniques for the prevention of vector-borne diseases. 7 of the 16 articles, used campaigns as a strategy (9,4,17,23,13,24,7), 5 used brigades (8,3,11,16,5), 3 community work (10,3,15) and one of them a joint effort involving brigade and community work (3).

12 of the 25 articles mention some actions for the decrease of the vector habitat. About the action that was most carried out in the articles analyzed: 3 of the articles show that it was the cleaning of hatcheries (12,24,7), secondarily 2 articles with the action "handling containers" (4,9), other action was the "larval

control" described in 2 articles (11,17). Finally, other actions were carried out such as the placement of mosquito nets and pupa traps (10), a combined strategy of cleaning of hatcheries/larval control (24), 2 articles (11,17) also mention the use of combined actions such as pupa traps/larval control.

18 of the 25 articles mention actions for disease control in different instances, 8 of the 18 articles mention measures taken by health systems channeled towards the general population, 3 of the 18 articles are oriented towards Systems of health (12,24,5), 3 others oriented the actions towards the health systems together with the health personnel, 2 articles are oriented towards the sick population (23,13), 1 article directs actions to health personnel and finally (20), 1 mentions an effort oriented towards the general population and health personnel as a total.

Policies of the programs used to control vector-borne diseases

In 12 articles of the 25 that make up the review, the implementation of public policies for the regulation of vector programs is mentioned (2,18,3,12,16,17,13,25,26,21,14).

Use of worldwide vector programs

8 of the 25 articles reviewed, correspond to research carried out in Asia (18,3,27,4,23,13,21,28), 6 in South America (9,19,10,11,26,22), 3 in North America (8,12,17), 3 in Central America and Caribbean (2,20,27), 2 en África (15,7), 2 in Oceania and there was a joint effort article between North America and Central and Caribbean America (14). It should be noted that the type of research of interest for this review, usually occurs in greater proportion in countries where arbovirus diseases are considered endemic or have had a recent outbreak or epidemic.

CONCLUSIONS

The spread of Arbovirus diseases is increasing worldwide, there are more countries considered endemic areas every year, and the measures to control this situation seem to be far from infallible, so the strategies have to continue in force, through permanent epidemiological surveillance and the so-called "vector control", and with as many sectors as possible involved, prioritizing the common interest of reducing the impact on the health of the population.

From an academic perspective, it is important to support the vision of institutions such as the World Health Organization, which aims to fight tirelessly against all the adversities that endanger the health of the community, and that is why we carry out studies evaluating if the measures locally taken provide valuable information that can be used to reform the decisions made by the appropriate instances for application in the community.

Evaluative research is a systematic means of empirical learning, of improving programs, services, technologies and guiding the distribution of human and financial resources. It constitutes a process that consists in the determination and application of criteria and norms with the purpose of making a judgment on the different components of what you want to evaluate, both at its conception, as its execution, as well as the stages of the planning process that are prior to programming (2).

After the review process, it is necessary to emphasize that the field of research and action in terms of program evaluation should be strengthened in all geographic regions that have health effects on the population, which despite being a mandatory cyclical process, may require an intermediate intervention during its period of validity, so greater support should be given to the resources and current mechanisms for information and monitoring. The evaluation is essential for the good planning and execution of the programs, as well as to provide a better direction and to be able to determine how correct the decisions were taken when implementing those programs (27).

Research like this helps provide information for professionals and decision makers in the health sector, likewise should encourage professionals to strengthen their regional policies and foster collaboration between countries to formulate new strategies through the experience of the environments in which the effectiveness of the actions taken has been proven.

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