



CHALLENGES FOR THE CONTROL AND PREVENTION OF THE AEDES AEGYPTI MOSQUITO

DESAFIOS PARA O CONTROLE E PREVENÇÃO DO MOSQUITO AEDES AEGYPTI DESAFÍOS PARA EL CONTROL Y PREVENCIÓN DEL MOSQUITO AEDES AEGYPTI

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ABSTRACT

Objective: to identify the challenges faced by community health agents and agents to combat endemic diseases in the prevention and control of the spread of the *Aedes aegypti* mosquito. **Method:** a qualitative study carried out with 12 community health agents and seven agents to combat endemic diseases. The data were produced from a semi-structured interview and analyzed using the Collective Subject Discourse technique. **Results:** it was verified that the greatest difficulties faced by these agents are the neglect, lack of commitment and awareness of the community, besides the management, that is not presented in an effective way in the process. **Conclusion:** it is proposed, therefore, a greater effectiveness of the actions of health education with the population, investment in permanent education and public management awareness. **Descriptors:** Prevention and Control; Community Participation; Public Health; Dengue Virus; Zika Virus; Chikungunya Virus.

RESUMO

Objetivo: identificar os desafios enfrentados pelos agentes comunitários de saúde e agentes de combate a endemias na prevenção e controle da disseminação do mosquito *Aedes aegypti*. **Método:** estudo qualitativo realizado com 12 agentes comunitários de saúde e sete agentes de combate a endemias. Os dados foram produzidos a partir de entrevista semiestruturada e analisados com a técnica do Discurso do Sujeito Coletivo. **Resultados:** verificou-se que as maiores dificuldades enfrentadas por estes agentes são o descaso, a falta de compromisso e a conscientização da comunidade, além da gestão, que não se apresenta de modo efetivo no processo. **Conclusão:** propõe-se, assim, uma maior efetivação das ações de educação em saúde junto à população, investimento em educação permanente e sensibilização da gestão pública. **Descritores:** Prevenção e controle; Participação da Comunidade; Saúde Pública; Vírus da Dengue; Zika Vírus; Vírus Chikungunya.

RESUMEN

Objetivo: identificar los desafíos enfrentados por los agentes comunitarios de salud y agentes de combate a endemias en la prevención y control de la diseminación del mosquito *Aedes aegypti*. **Método:** estudio cualitativo, realizado con 12 agentes comunitarios de salud y siete agentes de combate a endemias. Los datos fueron producidos a partir de entrevista semiestruturada y analizados con la técnica del Discurso del Sujeto Colectivo. **Resultados:** se verificó que las mayores dificultades enfrentadas por estos agentes son el descuido, la falta de compromiso y la concientización de la comunidad, además de la gestión, que no se presenta de modo efectivo en el proceso. **Conclusión:** se propone, así una mayor efectividad de las acciones de educación en salud junto a la población, inversión en educación permanente y sensibilización de la gestión pública. **Descriptor:** Prevención y Control; Participación de la Comunidad; Salud Pública; Virus del Dengue; Virus Zika; Virus Chikungunya.

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INTRODUCTION

Aedes aegypti is not native to the Americas and was inserted in Brazil from Africa, possibly, in the early nineteenth century, where it found a satisfactory environment for its survival and reproduction, being eradicated from the country in 1957 and reintroduced in 1967 and again eliminated in 1973.^{1,2}

The mosquito *Aedes aegypti* is able to transmit, in addition to dengue, other arboviruses such as chikungunya, Zika and yellow fever. These are viral diseases that spread rapidly in the world, being the most important arboviruses that affects the human being, being a serious public health problem. Such diseases occur and spread, especially, in tropical and subtropical countries, where environmental conditions favor the development and proliferation of the mosquito.³⁻⁵

According to the National Dengue Control Program (NDCP), established in 2002, the main strategy for prevention and control of the *Aedes aegypti* mosquito is vector control, with actions based on application of larvicides and insecticides, cleaning efforts and encouragement of the involvement of the through education and mobilization campaigns.⁶

The manual of the Endemic Combat Agents - ECA recommends some recommendations to the population, such as: avoiding the use of dishes in pots of plants so that it does not accumulate water, if used sand should be put in the plates. It is necessary that any container with water exposed to mosquitoes be washed periodically for the removal of eggs, as a water fountain for animals. Tanks with filters, tanks, and others must be capped. Pools should have treated water, the gutters and slabs of the houses should be clean, and the reservoirs, well capped, to prevent the build-up of still water.⁷

There are several works of the public agencies focused on mosquito control, such as the work of Community Health Agents (CHA) and Endemic Combat Agents (ECA), and the development of a vaccine against the various types of diseases transmitted by *Aedes aegypti*, but the help and awareness of the population are of fundamental importance for the reduction or even the eradication of the transmitter³. The CHA and ECA, in partnership with the population, are responsible for promoting the mechanical and chemical control of the vector, whose actions are focused on detecting, destroying or properly

allocating natural or artificial water reservoirs that can serve as a deposit for *Aedes aegypti* eggs.⁸

In the face of so many policies, announcements, campaigns and work carried out by CHA and ECA, the greatest difficulty in combating the mosquito is precisely in its prevention, and vector control still faces external and internal elements to hinder its control and / or its eradication. With this, it is necessary that people understand the necessity and importance of fulfilling their role in this fight, not only to understand how to perform preventive actions, but to practice it, therefore, it is noted that even practicing these actions for some time, still exists an increase in vector proliferation.⁹

Thus, it is important to discuss more and more about mosquito prevention and control, as this is still considered a public health problem. According to the Ministry of Health, "preventive measures and guidance of the health-related community end up directly involving the villagers so that they become aware of and acquire the necessary knowledge to deal with the problem".¹⁰ Unfortunately, many people fail to do their part, because they believe that the prevention role and the execution of mosquito control activities must be carried out exclusively by the public authorities.

It is believed that the issue in question is of paramount importance, both socially, and professionally and academically, since it will enable a broader knowledge on the subject, thus contributing, to the expansion of the skills and abilities of health professionals and society, thus, allowing to carry out an adequate articulation and a mobilization for the prevention and control of the disease, resulting in reduction of financial costs and damages to health.

OBJECTIVE

- Identify the challenges faced by community health agents and agents to combat endemic diseases in the prevention and control of *Aedes aegypti*.

METHOD

A qualitative, descriptive and exploratory study, carried out with agents to combat endemic diseases and community health agents in a medium-sized city in the southwest of Bahia (BA), Brazil. 12 community health agents were interviewed, who work in the family health units and seven endemic combat agents, that work in the epidemiological surveillance team for the

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control of endemics and the spread of the *Aedes aegypti* mosquito. The inclusion criteria were: effective professionals, who worked more than two years in the function and who were active during the data collection.

The collection was done through a semi-structured interview, recorded, using a script containing sociodemographic and objective issues on the subject. The production of data occurred during the week, during the working hours of the teams, in May 2017.

The research complied with the ethical and legal precepts required, and was approved by the Research Ethics Committee (REC) of the Higher Education Maintaining Institute of Bahia (HI) with CAAE nº 1.965.897 and all participants signed the Free and Informed Consent Form.

Data analysis was performed through the use of the Collective Subject Discourse method, which is a method of data analysis that allows expressing the thought of a collectivity through a single speech that represents the whole speech, which allows an analysis the situation experienced by the interviewees, expressing a collective reality.¹¹

RESULTS

Among the 12 community health agents interviewed, 100% are female, in the age group from 30 to 50, with an average of ten years of work in the area and a high school diploma. Among the seven agents to combat endemics, 71.4 % were male, 28.6% female, between 30 to 40 years of age, with an average of seven years of full secondary education. Both categories have an effective working relationship.

Central ideas emerged, from the speeches, that allowed the construction of four collective discourses that present the challenges encountered daily by the community health agents - CHA and the Endemic Combat Agents - ECA in the search for the *Aedes Aegypti* mosquito.

Central ideas emerged from the speeches that allowed the construction of four collective discourses that present the challenges encountered daily by the community health agents (CHA) and the Endemic Combat Agents (ECA) in the search for the mosquito *Aedes Aegypti*.

DSC 01 - Commitment from the community

"Our challenge is the lack of commitment from the community, we work with prevention and guidance, but the community does not use these guidelines to prevent the mosquito. The challenge

is this, we guide the population, but they do not do what we guide, if we come back days later, everything continues the same way. There is in fact a lack of contribution from the community itself, the community has to help us without it our work does not work. "

The above speech describes an important problem faced by professionals who seek to control the *Aedes aegypti* mosquito, making evident the lack or total absence of commitment and responsibility of the society in the face of a public health problem that has plagued the country for decades.

DSC - Lack of knowledge of the population

*"The biggest challenge I would say is that it is still related to the educational issue of the population, because there are many people who despise our work, do not understand that the disease exists that is a real thing, believe that mosquitoes are equal to all others, harmless, which do not transmit disease, that disease is a myth. I know people who talk like this: ah this does not exist no, this is illusion, this is a lie. A good part of the population still thinks that there is only the *muriçoca*, that has always existed and that have never been cause of these diseases, especially of those with less education, the question that still makes our work very difficult is that they do not know about the disease and learn. The work is educational, it is a great challenge for the population today, in general, the residents need to be shocked to start to become aware ".*

In the discourse, it is well known that the lack of knowledge of the population greatly impairs the development of prevention and control activities. The beliefs and myths, are factors that negatively, interfere, in the teams' performance, making it impossible, and, most of the time, limiting the effectiveness of the teams. plans drawn up and drawn up by the Ministry of Health, Municipal Secretariats and health professionals, who need the community so that the actions are carried out.

DSC 03 - Problems with public management

"The public power could also be cleaning the areas that do not have construction, because cleaning the streets and vacant lots is difficult to happen here, we need the city to clean the streets so that we do not collect so much garbage, both mosquito breeding and same junk, especially now in this rainy season, needs to be collected daily. Here in our community even the trash only goes 3x a week, which could be spent every day. We have the garbage collection, but it does not happen every day. "

The collective presented evidences that many management problems are also impediments to the effectiveness of the actions directed to the control of the

mosquito of the mosquito and, consequently, of the diseases related to it.

Irregular garbage collection, street cleaning and vacant lots, especially, in the outlying districts, is one of the aggravating factors, as it is known that the accumulation of garbage in backyards and streets contributes to the proliferation of the mosquito and, consequently, the spread of diseases.

DSC 04 - Community Resistance

"Guidance has, but the population is tough, it happens on television, we do our job, we help the staff when they are doing the cleaning, the mutirões in the neighborhoods, but they do not adhere daily. There is a waiting room here at the station too, encouraging, giving leaflets, plus there are some who look, do not give a shit, throw them on the floor or give the children a play. This is also the biggest difficulty we encounter, they do not have control, they do not care what we talk about. Many know what to do, but they simply do not and most of the time the community does not, she knows the risks, they do not help, they will only care when it happens to them or to someone in their own family. Some residents do not allow agents to enter their homes to get the job done. "

The collective corroborates with speeches already presented, making clear that the community does not perceive itself responsible for the mosquito fight and the lack of knowledge lack adherence to the actions.

The results allow to identify numerous factors that are related to mosquito control, from a vicious cycle, of bad community habits, lack of knowledge and often, awareness and management problems.

DISCUSSION

The discourse of the collective subject of community health agents and endemic combat agents involved in the process of prevention and control of the *Aedes aegypti* mosquito demonstrates the innumerable factors that hinder the effectiveness of the proposed actions.

The lack of commitment of the community is a challenge encountered by them daily in the exercise of their duties as expressed in speech 01. Studies show that the problems most cited by professionals working with the *Aedes aegypti* mosquito are the lack of education and awareness of the population, since effective actions against mosquito-related diseases require the support of society to be effective and, in practice, participation does not occur.^{6,10}

The speech 02 expresses another important problem related to the control of the endemic

diseases that need the support of the population for control: the lack of knowledge. In this perspective, one can ask why the lack of knowledge, because it is possible to identify numerous campaigns and actions aimed at clarifying the risk of these pathologies and the respective control measures.

In this sense, it is necessary to rethink the tools of social awareness when health education is sought, because despite the efforts of the competent authorities to solve this problem, the actions do not have the desired effect, and, thus, the problem to be solved remains, even if actions are taken that seek to overcome the problem.⁶

The results allow us to perceive that the management also has a portion of guilt, an affirmation that can be verified in speech 03, and it is possible to perceive that simple actions, such as daily garbage collection and the cleaning of vacant lots, situations that are known to reduce proliferation of the mosquito, are still neglected by the public authorities.¹²

The Ministry of Health describes the responsibilities of primary health care professionals. Among them the development of educational activities focused on health promotion, disease and illness prevention, and health surveillance, through home visits and educational actions individual and collective at home and in the community.¹¹ However, discourse 04 shows us that although these actions are happening, the population does not commit to the cause, having resistance to adhere to the control measures that are oriented.

Thus, the study shows that community participation is a decisive factor for success in mosquito control, through the implementation of control and prevention measures. Yet, the discourses demonstrate a community that rejects the orientations passed by agents responsible for the development of work, an unbelieving population facing the disease, which resists the work of the agents in their homes, and the guidelines they receive are absorbed at that specific moment and are not effective in the long run.

Aedes mosquito-related diseases have a strong social participation component, and the adoption of educational approaches presupposes behavioral changes driven by the knowledge transmitted to the population about vector control measures and characteristics of the disease, and by building partnerships with management public and commercial entities, as well as other actions

outside the health sector, such as education and urban planning.¹³

It is unquestionable to say how important is the role of public management in this framework, in carrying out its activities. The irregular collection in the peripheral districts was highlighted as one of the aggravating factors, a problem that generates the accumulation of garbage in the houses and, consequently, the proliferation of the vector. The proliferation of the A.A. mosquito stems from the combination of several factors that create an environment conducive to the development of the vector: the increasingly accelerated process of urbanization, associated with the current way of life, with numerous population displacements; the lack of urban planning; mosquito resistance to insecticides; the accumulation of waste and the increase in the production of waste.¹⁴

In this perspective, an inert, inoperative, time-consuming, bureaucratic and inefficient public power is not allowed in the face of a disease that has its seriousness recognized by international organizations, even, highlighted by the World Health Organization. The Public Administration needs to propose effective measures, mainly, prevention, containing the epidemic.¹⁴ Despite the difficulty in eliminating the disease, mainly due to the rapid spread of the transmitting mosquito, prevention is the main weapon against the epidemic, leading to efficient public policies.¹⁵

It was observed that, in more peripheral neighborhoods, adherence to prevention is linked to the lack of other services, such as garbage collection. It was verified that the population considers the control and prevention of dengue as a service of minor importance, which compromises and discredits the work of the agents. And, in contrast the agents see in the population the lack of commitment and responsibility.

CONCLUSION

It was verified that the health agents have, as main impediment in the attributions of their functions, the neglect, lack of commitment and the awareness of the community. The barriers that impede the development and success of health promotion and prevention actions are imposed by the community, which has often been disbelieving and has revealed a lack of knowledge and education in a generalized way that directly influences the final result. The community, the orientation to health education are key elements for reducing the incidence and reduction of dengue cases.

Thus, it is proposed, to increase the effectiveness of health education actions among the population. A greater investment in continuing education with a lecture in schools, churches, since there is a deficiency in this link between the community and public management. The measures need to be reviewed and adapted according to the needs of each locality, especially in front of a population that is resistant and incredulous in the face of a picture with no prospects for improvements.

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REFERENCES

- Costa CA, Alves ES, Alves JMP, Mariano MAF, Amorim LT. Public politics of health for prevention and dedution of dengue incidence in São Luís de Montes Belos - GO. Rev Facul Montes Belos [Internet]. 2011 Sept [cited 2017 June 20];4(1):1-16. Available from: revista.fmb.edu.br/index.php/fmb/article/download/36/32
1. Kraemer MUG, Sinka ME, Duda KA, Mylne AQN, Shearer FM, Barker CM, et al. The global distribution of the arbovirus vectors *Aedes aegypti* and *Ae. albopictus*. eLIFE. 2015 June;4:e08347. Doi: <https://doi.org/10.7554/eLife.08347.001>
 2. França LS, Vieira SNS, Lima JJP, Souza FS. Cardim SQ. Health education and the fight against dengue: an experience report. J Nurs UFPE on line [Internet]. 2017 May [cited 2017 Aug 16]; 11(Suppl.5): 2227-30. Available from: <http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/11163>
 3. Marcondes CB, Ximenes MFFM. Zika virus in Brazil and the danger of infestation by *Aedes (Stegomyia) mosquitoes*. Rev Soc Bras Med Trop. 2015 Jan/Feb;49(1):4-10. Doi: <http://dx.doi.org/10.1590/0037-8682-0220-2015>
 4. Kantor IN. Dengue, Zika and Chikungunya. Medicina (B Aires). 2016 Feb;76(2):93-7. PMID: 26942903
 5. Oliveira GLA, Nery CR, Diniz MCP, Schall VT. Dengue prevention and control in the vision of health agents - challenges and perspectives. In: II Congresso Online - Gestão, Educação e Promoção da Saúde, 2013. Anais do II Congresso Online - Gestão, Educação e Promoção da Saúde [Internet]. São Paulo: Instituto Pantex de Pesquisa; 2013 [cited 2017

Jul 05]. Available from: http://www.convibra.com.br/upload/paper/2013/58/2013_58_7768.pdf

6. Ministério da Educação (BR), Instituto Federal do Paraná. Manual do ACE - Agente de Combate a Endemias [Internet]. Curitiba: IFPR; 2012 [cited 2017 June 20];1:21-9. Available from: http://www.jequitiba.mg.gov.br/novo_site/transparencia/processoseletivo/2015/20151222092110.pdf

7. Zara ALSA, Santos SM, Fernandes-Oliveira ES, Carvalho RG, Coelho GE. Aedes aegypti control strategies: a review. Epidemiol Serv Saúde [Internet]. 2016 Apr/June [cited 2017 Aug 16]; 25(2): 391-404. Available from:

http://www.scielo.br/scielo.php?script=sci_arttext&pid=S2237-6222016000200391&lng=en

8. Rodrigues AKF. O papel da comunidade e dos agentes de combate de endemias no controle do Aedes aegypti [Internet]. Vitória da Conquista: Faculdade Independente do Nordeste; 2016 [cited 2017 Aug 16]. Available from:

https://issuu.com/biblioteca.fainor/docs/artigo_ana_karine

9. Nunes FP. Controle do mosquito Aedes aegypti e fungos entomopatogênicos: possibilidades de inserção de temas de biologia para ensino médio num contexto regional [monograph] [Internet]. Instituto Federal Fluminense; 2015 [cited 2017 July 05]. Available from:

<http://bd.centro.iff.edu.br/xmlui/bitstream/handle/123456789/528/monografia%20completa.pdf?sequence=1&isAllowed=y>

10. Figueiredo MZA, Chiari BM, Goulart BNG. Discourse of Collective Subject: a brief introduction to a qualitativequantitative research tool. Distúrb Comum [Internet]. 2013 Apr [cited 2017 Aug 16];25(1):129-36. Available from:

<https://revistas.pucsp.br/index.php/dic/articula/view/14931>

11. Cesarino MB, Dibo MR, Ianni AMZ, Vicentini ME, Ferraz AA, Chiaravalloti Neto F. The difficult interface between vector control and primary care: insertion of dengue fever vector control agents into health teams at the primary health centers in São José do Rio Preto, São Paulo, Brazil. Saúde Soc. 2014; 23(3):1018-32. Doi:

<http://dx.doi.org/10.1590/S0104-12902014000300023>

12. Ministério da Saúde (BR), Gabinete do Ministro. Portaria nº 2.488 de 21 de outubro de 2011. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de

diretrizes e normas para a organização da Atenção Básica, para a Estratégia Saúde da Família (ESF) e o Programa de Agentes Comunitários de Saúde (PACS). Available from:

http://bvsmms.saude.gov.br/bvs/saudelegis/gm/2011/prt2488_21_10_2011.html

13. Silva IB, Mallmann DG, Vasconcelos EMR. Strategies to combat dengue through health education: an integrative review. Saúde (Santa Maria). 2015 July/Dec;41(2):27-34. Doi: <http://dx.doi.org/10.5902/2236583410955>

14. Maniero VC, Santos MO, Ribeiro RL, Oliveira PAC, Silva TB, Moleri AB, et al. Dengue, chikungunya e zika vírus no brasil: situação epidemiológica, aspectos clínicos e medidas preventivas. Almanaque multidisciplinar de pesquisa [Internet]. 2016 [cited 2017 Aug 18];1(1):118-45.

15. Janini TC. Responsabilidade Civil do Estado nas Epidemias de Dengue. Rev Jurídica Unicuitiba. [Internet]. 2016 [cited 2017 Aug 18];1(42):439-61. Available from: <http://revista.unicuitiba.edu.br/index.php/RevJur/article/view/1516>

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