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Longitudinal study of Thai people media exposure, knowledge, and behavior on dengue fever prevention and control

Smith Boonchutima^{a,*}, Kirati Kachentawa^b, Manasanun Limpavithayakul^c,
Anan Prachansri^c

^a Chulalongkorn University, Thailand

^b National Institute of Development Administration, Thailand

^c Ministry of Public Health, Thailand

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ABSTRACT

Dengue hemorrhagic fever is transmitted through a bite by a dengue -infected *Aedes aegypti* mosquito. It was first reported in the mid -20th century in Thailand, and since then its epidemiology has been of great concern and has spread all across the country. The alarming incidence of dengue posed a serious threat to human health in all major cities of Thailand.

This study was aimed at identifying the level of awareness of dengue fever in Thai population knowledge for prevention and control, and most importantly contribution of media in educating masses for dengue control measures. It is longitudinal in nature and was conducted in 25 provinces of Thailand during 2013–2015. Approximately 7772 respondents participated in this study, with the selection of provinces based on considerations like population, prevalence and demography. A pre-tested structured questionnaire was used to collect information relevant to study participants' demographic profile, pre-existing knowledge about dengue fever and its reinforcement through media, and population attitudes toward prevention and control.

Over the period of three years, a positive trend was revealed relevant to the contribution of media in educating and reminding the Thai population of dengue, without any uniformity or powerful campaigns. Based on the results drawn from this study, we conclude that despite the measures undertaken to prevent dengue fever, there is insufficient media exposure. An interdisciplinary approach involving the community participation, media, and government is needed to overcome dengue threat in Thailand.

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Introduction

Dengue hemorrhagic fever is caused by a virus transmitted by the mosquito *Aedes aegypti* causing significant morbidity and mortality all over the world. It has been estimated that almost 390 million individuals globally face this infection [1]. Currently, there is no effective vaccine or antiviral available to combat this infection except controlling the vector (mosquito) involved in the transmission of this infection [2]. As such, major attention has been paid to multi-pronged approaches involving integrated vector management strategies [3,4]. It has been recommended that countries prone to dengue spread should also have media campaigns tailored

for dengue control through enhancing the community perception and behavior [4–6].

Thailand, a dengue-prone region, was reported in 2015 as having dengue infections that exceeded 140,000. The projected situation for the year 2016 is grim [7]. Since the very first discovery of dengue in Thailand in the year 1949, there has been several sporadic outbreaks off and on challenging the overall public health system of the country, however, the worst outbreak occurred in 1987 with 174,285 cases being reported [8]. The dengue fever is ranked as one of the most prevalent communicable diseases in Thailand and leading causes of sickness among children [9]. Since its first discovery, over the past six decades, the country has been struggling through various measures for overcoming this infection. A clinical trial involving 4000 Thai children between the ages of 4 and 11 were subjected to vaccine administration in the year 2012 in collaboration with Sanofi Pasteur, the manufacturer of this vaccine and promising results provided a hope for saving people from dengue, however, still its implementation is on the way [10–12].

* Corresponding author.

E-mail addresses: Smith.b@chula.ac.th, smith.boon@gmail.com (S. Boonchutima), Laterrepolka2011@gmail.com (K. Kachentawa), tmdpc7@gmail.com (M. Limpavithayakul), anandp126@yahoo.co.th (A. Prachansri).

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In the absence of an effective antiviral and availability of good vaccine, mosquito (vector) control activities have been the primary method used to prevent the spread of the infection across the country. The vector control programs were carried out concurrently with health and educational activities for creating awareness among the population. Eight Thai ministries such as the education, and health joined hands to expand the awareness program in schools, ensuring that school going children have enough knowledge to protect them from dengue virus through avoiding mosquito bites. Such interventions used by Thailand government against dengue virus have been creating awareness through health education; getting rid of mosquito breeding sites; and the provision of immediate medical care. However, in spite of all these efforts dengue still poses a mega threat to the country [7].

Earlier days, the Thai Government National Plan for the Prevention and Control of Dengue Hemorrhagic Fever emphasized on the following measures for overcoming dengue issue [13].

- i. Improvement of the environment at home and in the community in order to render it unfit for the breeding of *Aedes* mosquitoes.
- ii. Human development – This will include education, information and communication activities aimed at raising the awareness of the people to be conscious about the danger of dengue and to prevent themselves from possible exposure to the disease. The plan will also emphasize the creation of a public norm of controlling the environment and destroying the breeding sites of *Aedes* mosquitoes.
- iii. Development of technology to promote dengue prevention and medical care for dengue patients. This plan will emphasize measures to build people's capacity to take proper care of the sick persons at home and to build up responsive medical and health manpower to provide effective treatment for dengue patients.

Infectious disease experts also suggested a community-based approach to the prevention and control of dengue in Thailand and other countries [14]. Relatively, this approach is cost-effective and most efficient intervention in the long term. Community-Based Empowerment Programs (CBEP) in the past had been used across Thailand to increase society participation through collaboration. The CBEP involved members of the community coming together and brainstorming. These programs were meant to enhance the learning experience among the members of a community, foster a better understanding of dengue and coming up with collaborative efforts in eradicating the dengue virus in the community. The CBEPs from different zones carried out monthly meetings to discuss the findings and the way forward. The effectiveness of the community-based programs was evaluated regularly with conclusive thoughts that these endeavors had made some strides in eliminating the virus, but still needed more community participation and involvement of other stakeholders to make the programs more efficient [15].

Several factors contribute to the spread of the dengue virus, which have made the preventive measures difficult to implement or rather insufficient to contain the virus. There has been a societal change as a result of population increase in Thailand in the past couple of decades; constant movement of the populace, especially in the capital, Bangkok, and other major cities. Urbanization in Thailand has been uncontrollable leading to scarcity of resources, especially in the major cities leading to poor water management system that has increased the breeding sites of mosquitoes. The rural and also some urban areas are still struggling with the problem of piped water, causing the residents to store water in containers which are the main breeding site for *A. aegypti* mosquitoes. The mass movement of the population in different regions in

Thailand has led to the transfer of the virus from high endemic areas to low endemic areas.

Among several other strategies, knowledge about the dengue-spreading mosquito and its control is a critical factor in controlling the infection [5,16–18]. Furthermore, a reiteration of certain facts like dengue control measures and methodologies through media are supposed to be effective methodologies. In the backdrop of lingering dengue issue in Thailand, we firmly believe that knowledge imparted through the media relevant to dengue control will significantly help to overcome the infection. As such, this specific study was designed to evaluate the public basic knowledge relevant to dengue and media role in providing information through reiterative messages associated with dengue. Our study provides important information relevant to strengthening dengue control measures knowledge through continued media campaigns.

Methods

This longitudinal study utilized a descriptive cross-sectional research design. The study was initiated in January 2013 and concluded in December 2015. The study was approved by the Research Ethics Committee of the Department of Disease Control. No identifier or respondent information was stored and hence declared exempt. To participate in this study, volunteers must be fifteen years of age or above and have no record of mental illness. Before administering the questionnaire, a study description written at the layman level was provided to consenting individuals. Upon reading, the individuals willing to participate were asked to fill up a questionnaire. This well-structured questionnaire collected data about the general perception of dengue fever and awareness programs on the media relevant to prevention and control from 25 provinces of Thailand. The 24 provinces were selected with two provinces each from the 12 Offices of Disease Control, which are branches of the Department of Disease Control, selected based on the highest and lowest prevalence rate. The 25th province selected in the sample was Bangkok since it is the Capital city of Thailand. Throughout the research, different respondents were used to collect data, with volunteers taking approximately 10 min to fill the questionnaire. Four sections of the questionnaire used to collect information include:

- i. Demographic profile.
- ii. Knowledge about dengue fever.
- iii. Awareness about prevention.
- iv. Control measures.

Questions relevant to demographic profile include gender, age, education level, occupation, and income. Concerning media exposure, we asked the participants to provide information relevant to their experience in watching the programs relevant to dengue in five-time frames including, every day, more than three times per week, once a week, once a month or never saw the dengue relevant programs on the TV. The media exposure, in this context, was interpreted as the frequency of an individual to get exposed to the message related to dengue in the media or other means of communication. This follows a section on three questions in True/False setup relevant to mosquito breeding, dengue disease, and preventive measures. The logical flow of questionnaire culminated as a part of the action by the study participants associated with destroying breeding sites of the mosquito responsible for transmitting dengue.

Results

This longitudinal study spans over three years, starting in the year 2013 and concluding in 2015. Participants of the study were

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