

# Dengue Elimination and Control Program of one City in the Philippines

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**Abstract** – This study aimed to determine the Dengue Elimination and Control Program in Batangas City. Specifically, it determined the progress of the program from national and local government; it also determined the level of acceptance of the community people of programs with regard to dengue. The descriptive and historical method of research was utilized. Weighted mean was used to assess the practices in compliance to the program and level of acceptance of the respondents toward the variable being investigated. The sample of the study consisted of 205 community people and 35 health care workers in the Top 20 Barangays which had the most number of cases from year 2011-2014. Thus, the results revealed that as to the practices of compliance of the community, it has been observed that they comply. However, it was found out that they fully complied to throwing, turn over, or empty any container that may accumulate rain water. Through the implemented program that was highly accepted by the people, a devised action plan is made to strengthen the implementation of Dengue Elimination and Control Program. For data analysis, the researcher used statistical tools: frequency, percentage and weighted mean.

**Keywords** – Dengue Elimination, Control Program

## INTRODUCTION

The Philippines is a tropical country, where rainy season became synonymous to “dengue outbreak season.” The Department of Health (DOH) declare the dengue cases in January to the first week of June, affecting more than 42,000 Filipinos, with a total of 193 deaths. On the other hand, reported cases in Metro Manila and its nearby provinces are lesser, while more than 100 percent of incidents from the Western part Visayas and partly from Mindanao were noted [1].

Dengue Fever (DF) known to be a mosquito-borne viral infection, results to an extreme flu-like illness, if not given the proper attention and abrupt treatment, high chances are lethal complications. Dengue is passed

through nibbles of *Aedes aegypti* and *Aedes albopictus* mosquito contaminated for a standout among the four dengue infection serotypes. It is a febrile ailment, which influences all age groups with its manifestations showing up 3-14 times after those infective nibbles. Transmission of the virus is not directly from person-to another; indicative evidence ranges from mild fever that will lead to an incapacitating secondary fever with extreme headache, backache, muscle and joint torments, retro-orbital pain, as well as a generalized rash. Infection with a dengue virus serotype can result to a severe form of clinical manifestations like hemorrhagic shock. The first confirmed epidemic case of dengue fever recorded in the Philippines was in 1953-1994. Since then, several strategies have already been made to control the spread and increasing incidence of dengue. In the recent years, significant numbers of dengue cases were declared in the country. The National Epidemiology Center of the Philippines reports a sum of 132,046 dengue cases from January to October 13, 2012, this is 24.92 percent higher compared to the same time frame in 2011. Of the total cases, 20.42% originated from the National Capitol Region (NCR), with topmost contributors coming from Quezon City (7,754 cases), Manila (4,379 cases) and Caloocan City (2,967 cases). Next to NCR, are Regions III and IV-A registered with the most number of cases, which were 15.79 percent and 15.66 percent to the overall figure [2].

In an industrialized city, surrounded by water like Batangas City, dengue is one of the common and prone diseases. Dengue cases in Batangas City from 2014 have higher incidence rates than in other years. The highest incidence rate is 31.1 percent that occurred in Banaba. The least incidence rate is 9.58% that occurred in Brgy. Dalig.

The government through the Department of Health came up with several programs that will help fight the battle against dengue. In this study four among implemented programs such as; ABKD, 40'clock habit, 4S Kontra Dengue and Use of Ovitrap were utilized to

evaluate the healthcare providers and community people level of acceptance and compliance among the said programs.

Despite the program implementation statistics showed an increasing trend, it is in this context that this study was done.

### OBJECTIVES OF THE STUDY

The study aimed to determine the Dengue Elimination and Control Program in Batangas City. Specifically, it assessed the progress of Dengue Elimination and Control Program in the local government. Secondly, it identified the practices in compliance of the programs as well as the level of acceptance of the community people. Lastly, the devised action plan to strengthen the implementation of Dengue Elimination and Control Program has been proposed.

### Theoretical Framework

Goal Attainment Theory of Imogene King has been the guide for the conduct of this study. It is presented the conceptual system, from which a theory of Goal attainment has been derived. This conceptual system consists of three parts: personal, interpersonal, and social. A person described as an individual who has the capacity to think, know, make choices, and select alternative courses of action. Individuals are open system in transaction with the environment and differ in needs, wants, and goals [3].

As for health, it is profound that it is a dynamic state in the life cycle; illness is interference in the life cycle. Health implies continuous adjustment to stress in the internal and external environment through optimum use of one's resources to achieve maximum potential for daily living. Imogene King also identified that environment is the balance between internal and external interaction. It is an understanding of the ways that human beings interact with environment to maintain health. The spread of dengue-infected mosquitoes results in the spread of the diseases in humans itself due to population growth, poor urban planning where there is overcrowding resulting to poor sanitation and limited water resources. Environmental pollution greatly affects the state of health of man since it can give rise to different and primarily on of it, is Dengue.

This theory is related to this study because it focuses on the community people, the health care workers, the environment and how they interact with each other. The goal of the health care workers is to prevent the community people from being sick using their environment. They conduct and implement different

programs for the people to follow. Human beings and the environment are a central focus of nursing researches. The way that human beings come to understand their environment begins with the awareness of the whole and then move to focus on parts and finally returning to whole part again, which involve understanding. Having an environment that is free from the breeding sites of the dengue-infected mosquitoes is an ideal place to dwell in. The theory emphasizes that people should be responsible for the cleanliness of the environment to prevent dengue.

### Conceptual Paradigm



**Figure 1. Dengue Elimination and Control Program in Batangas City**

Figure 1 shows the Dengue Elimination and Control Program in Batangas City. It shows the progress of implementation of program in the local government, through the incidence rate of dengue from 2011-2014. Practices in compliance with the programs and level of acceptance of the community people were also evaluated by healthcare providers and community people. Finally, an action plan to strengthen the implementation of the program will be devised.

### METHODS

This chapter presents the methods and procedure used in the study, this include research design, sampling procedure, data gathering procedure, instrument used in data gathering and statistical treatment of data.

#### Research Design

The researchers used descriptive and ex post facto method of research. Descriptive research involves collection of data to test hypothesis or to answer question. The goal is the acquisition of factual, accurate and systemic data that can be used in averages, frequency and similar statistical calculations. We used this to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred [4].

#### Participants

The participants of this study were residents and healthcare workers of the Top 20 barangays in Batangas City, which had the most number of Dengue cases of

2014. The data were taken from the Batangas City Health. The sample of the study consisted of 205 community people and 35 healthcare workers, considering the number of cases that they have had. In addition, the respondents were selected using stratified proportional allocation.

### Data Gathering Instrument

The researchers used a self-made questionnaire to gather facts and essential data. It was adopted and then modified from the existing program with regards to dengue.

The questionnaire was composed of three parts. The first was on practices in compliance to Dengue Elimination and Control Program for health care providers, second to it were practices in compliance to Dengue Elimination and Control Program for community people, and the third was on the level of acceptance of the community people and dengue fever.

The instrument was stated in English and Filipino questions so that respondents can easily comprehend with each item and can give the corresponding ratings.

### Data Gathering Procedure

The researchers gathered the needed information from books and other materials and developed the sets of questionnaires for every survey.

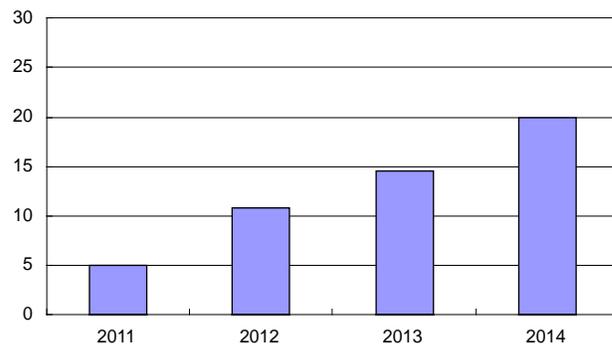
Through the help of City Health Office, we could gather the data from Top 20 barangays, which had the most number of dengue cases from 2011-2015 in Batangas City.

After the instrument has been approved, the researchers handed letter to the authority, has been noted and approved by their research adviser and college dean. Then, the researchers reproduced copies of questionnaires and distributed personally to every participant. Before the respondents accomplished the questionnaire, the researchers explained the purpose and importance of the study. All questions and directions were explained to them to obtain valid data. Respondents were encouraged to answer the questions honestly and were assured that everything would be kept with utmost confidentiality.

### Analysis

After the retrieval of the questionnaires, data were tallied, tabulated, analyzed and interpreted to see the results of the study. For data analysis, the researchers used statistical tools: frequency, percentage and weighted mean.

## RESULTS AND DISCUSSION



**Figure 1. Progress of Dengue Cases in Batangas City from 2011-2014**

Figure 1 shows the occurrence of dengue cases in Batangas City from 2011 to 2014. The World Health Organization rates dengue as the most dominant mosquito-borne viral sickness in the world as its occurrence brings expanded 30-fold in the previous fifty years. New research demonstrates how climate change, bringing hotter and wetter weather, will be making a more perfect home to these disease-spreading pests.

The Table 1 shows that in 2011, the incidence rate is 4.97 percent. This explains that the occurrence is at risk but is still manageable. Dengue and other mosquito-borne diseases may be prevented if collective efforts are put together and start action within the homes through the 4S campaign. “4S” stands for search and destroy mosquito breeding places; use self-protection measures; seek early consultation for fever lasting more than two days and say no to indiscriminate fogging.

In 2012, the rate is 10.86 percent. The number of dengue cases remains on a steady rise and health officials declared an outbreak of the mosquito-borne disease. The government should order a massive cleanup in the city, using fogging and misting pesticides from the Department of Health (DOH), to stop dengue-carrying mosquitoes from breeding.

In 2013, the rate is 14.6 percent. If you look at the trends by year, it is still under the alert threshold based on our four-year average. But compared to last year, it already increased by 4 percent. We expect the cases will increase because of the rain and floods. But we can do something to prevent that from happening. Get rid of sources of water where dengue mosquitoes could lay their eggs. Let us keep our surroundings clean.

In 2014, the occurrence shoot up to 19.9 percent. This express alarm because of over 50 percent increase in dengue fever cases in the city. The declaration, however,

should not be a cause for panic but should instead be an impetus for the city to take measures that will protect themselves from the deadly mosquito-borne disease. The purpose of these measures was mainly to raise public awareness over the surge of dengue cases in the city. It was also meant to encourage the residents to have a massive clean-up of areas identified as breeding grounds of *Aedes aegypti* mosquitoes (DOH).

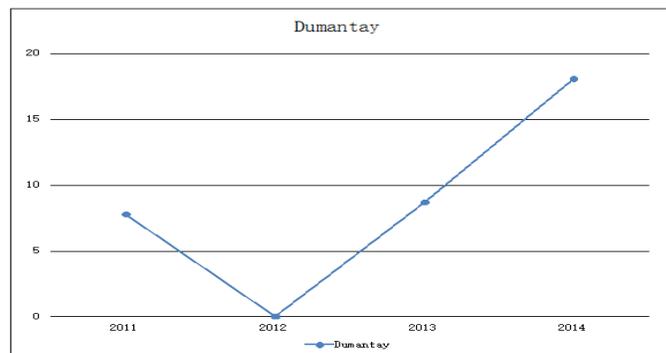
Every year, the rate of Dengue in Batangas City increases though there are different programs given to implement and to prevent the disease in the city. It seems the cooperation and awareness of the program among residents are not established. According to residents, they do not usually follow what is instructed, instead, they do what they want and what they know that may help in eliminating dengue. The resident thought that their knowledge is enough to contribute to the environment.

The climbing frequency about dengue sickness might have a chance to be identified with a developing population, expanding urbanization, upgrades on surveillance, and the restricted victory from claiming vector control measures. Holes in the epidemiological data accessible in the Philippines throughout 2011–2014 incorporate far reaching national and territorial information that portray those extent about extreme dengue disease, including hospitalizations and mortality, and occurrence information for every 100,000 number. A greater amount far reaching information need aid additional necessary for age, serotype, once both national and territorial levels. The information introduced empower the perception for epidemiological characteristics, both inside and crosswise over a considerable length of time. Such appraisals are key toward national and territorial levels will move forward both preparedness and reaction exercises identifying with dengue malady outbreaks.

Interview revealed that residents do not follow what is instructions. Instead, they do what they want and what they know that may help in eliminating dengue. The only solution to decrease the rate is to conduct seminars with the community people to help them understand more, and to encourage them to cooperate with the government to have a clean and dengue-free city.

Figure 2 shows that Dumantay has increasing number of dengue cases from the year 2011-2014. It became the top 1 barangay in Batangas City, which of the highest incidence rates from the year 2014. This may be due to lack of implementation of the dengue programs in their place. Considering the Dumantay is a rural area, there are many trees and houses closed to each other. The

respondents mentioned that health care providers were not conducting dengue control programs frequently. Interviews showed that most of community people were not familiar or do not have any idea about the dengue control programs.



**Figure 2. Top 1 Barangay in Batangas City with the Most Number of Dengue Cases from Year 2011-2014**

Many governments are already doing a lot to fight dengue. Current efforts focus on prevention, such as using insecticides or reducing potential egg-laying habitats for dengue mosquitoes. In 2012, the DOH issued a strategy for the control of dengue, with specific objectives to reduce mortality by 50 percent (2020), reduce morbidity by 25 percent (2020) and to estimate the true burden of the disease (2015).

The strategy relies on five technical elements: diagnosis and case management; integrated surveillance and outbreak preparedness; sustainable vector control; future vaccine implementation; and research. For this to be achieved, nations and organizations must work together in implementing a cross-border, a sustainable approach to controlling the burden of dengue (DOH).

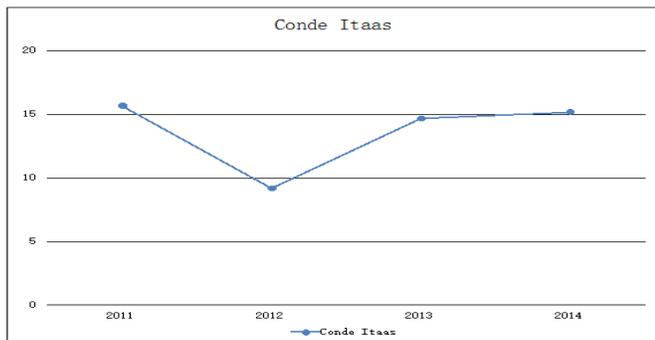
Conde Itaas was high since the beginning of its existence. However, dengue programs were not practiced in this place based upon interview made in the community. Most of them do not have ideas about the control programs. Aside from being in rural area, barangay officials and health workers lack in implementing these kinds of programs.

Only 51 percent of healthcare workers interviewed had been trained. 69 percent of trained healthcare workers expressed understanding of the control programs. Most of the respondents (77 percent) had a positive attitude that this approach was better in managing dengue cases especially with the reality of resource constraint in the health facilities.

The main challenges identified in the implementation of these dengue control programs are low initial training

coverage among health care workers, lack of essential drugs and supplies, lack of onsite mentoring and lack of refresher courses and regular supportive supervision.

Supporting the healthcare workers through training, onsite mentoring, supportive supervision and strengthening the healthcare system through increasing access to essential medicines, vaccines, strengthening supply chain management, increasing healthcare financing, improving leadership and management were the major interventions that could assist in dengue implementation (DOH).



**Figure 3. Top 2 Barangay in Batangas City with the Most Number of Dengue Cases from year 2011-2014**

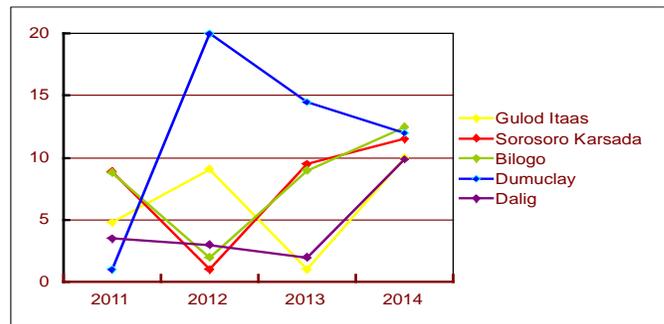
Supporting the healthcare workers through training, onsite mentoring, supportive supervision and strengthening the healthcare system through increasing access to essential medicines, vaccines, strengthening supply chain management, increasing healthcare financing, improving leadership and management were the major interventions that could assist in dengue implementation (DOH).

The next table shows the next top 5 barangays who had increased dengue cases from the past years. Gulod Itaas has an incidence rate of 10 percent. This barangay is rich in Buli trees, which can be a breeding area for mosquitoes.

Sorosoro Karsada shows that dengue fever in this populated area is high, and urban areas still substantially contribute to dengue cases in this barangay. Aside from that, they also lack in access to water. Improving water supply and vector control in areas with a human population density critical for dengue transmission could increase the effectiveness of control efforts.

Upon interview, the community people said that health workers were doing their job effectively when it comes to dengue control. However, people got the disease from those who came or work to urban areas. And since this place is abundant to trees which is one of

the vector's habitat, dengue easily spreads to their place. The officials do not stop their perseverance in doing their job on how to help their barangay rise again.



**Figure 4. Top 3-7 Barangays in Batangas City with the Most Number of Dengue Cases from year 2011-2014**

Dumuclay is also a rural type area. Their environment was abundant to trees and houses were far from each other. Maybe the officials and health workers were having difficulties on how to instruct the community people regarding the dengue control programs. Upon interview, the officials have their daily schedule. Their barangay hall was closing early and no one is left to entertain inquiries. Some areas in this barangay also lack access to tap water.

In the past three years, there is a good implementation of the programs in barangay Dalig. However, the lack of access to water prompted the residents to store water every morning to use for their entire daily living, which can be a breeding site for mosquitoes if not covered properly. Dengue occurs almost exclusively in areas with limited access to tap water, where water storage vessels provide breeding sites for the mosquitoes causing dengue fever.

Poor performance of service providers leads to inaccessibility of care and inappropriate care, which thus contribute to reduced health outcomes as people are not using services or are mistreated due to harmful practices. Importance of the workforce in performing services are by stating that health workers' number, quality and type of professionalism determine output and productivity, that they manage the other resources, that a large part of the health budget is spent on health workers and that they greatly influence progress. Poor performance results from too few staff, or from staff not providing care according to standards and not being responsive to the needs of the community and patients. Most performance problems can be attributed to unclear expectations, skills deficit, resource or equipment shortages or a lack of motivation.

Environmental management seeks to change the environment to prevent or minimize vector propagation and human contact with the vector-pathogen by destroying, altering, removing, or recycling non-essential containers that provide egg/ larval/ pupal habitats. Such actions should be the mainstay of dengue vector control [5].

Improvements in, and maintenance of, urban infrastructure and basic services contribute to the reduction in available larval habitats since large *Ae. aegypti* populations are often associated with poor water supply and inadequate sanitation and waste disposal services [5].

Improving water supplies is a fundamental method of controlling *Aedes* vectors, especially *Ae. aegypti*. Water piped to households is preferable to water drawn from wells, communal standpipes, rooftop catchments (rain water harvesting) and other water-storage systems [5].

Table 1 presents the practices in compliance with Dengue Elimination and Control Program with regard 4S

Kontra Dengue. The over-all composite mean of 3.27 indicates that the respondents complied with 4S Kontra Dengue. Composite mean of 3.32 from Health care providers and 3.23 coming from these community still an indicative of compliance with the said program.

And among the practices on 4S Kontra Dengue, throwing, turn over, or empty any container that may accumulate rain water since it obtained the highest weighted mean score of 3.65 from the community people and 3.84 from healthcare providers. Residents are aware that this practice can eliminate the breeding area of mosquitos that carry dengue virus.

According to the article of Bayer [6], the first step to prevent dengue is within the homes. The fight against dengue can be won right in every backyard. Everyone must adhere to looking for the breeding sites of dengue-carrying mosquitoes and execute methodical search and destroy activities to eradicate them.

Two hours after sunrise and two hours before sunset because these are the peak biting time of mosquitoes.

**Table 1. Practices in Compliance with Dengue Elimination and Control Program with Regard to 4S KONTRA DENGUE**

	Community			Healthcare Provider			Over-all		
	WM	VI	R	WM	VI	R	WM	VI	R
1. Throw, turn over, or empty any container that may accumulate rain water.	3.65	FC	1	3.84	FC	1	3.75	FC	1
2. Change water and clean flower vases every week.	3.35	C	3	3.78	FC	2	3.57	FC	2
3. Place a tight lid on container used for water storage.	3.30	C	4	3.66	FC	4	3.48	C	3
4. Check that there are no larvae (kiti-kiti) in stored water.	3.44	C	2	3.47	C	5	3.45	C	4
5. Avoid plant that could accumulate rain water.	3.22	C	6	3.25	C	7	3.24	C	7
6. Use screen doors and windows.	2.88	C	10	2.59	C	10	2.74	C	10
7. Wear long sleeve shirts, long pants, closed shoes to avoid mosquito bites at dusk and dawn.	3.28	C	5	3.28	C	6	3.28	C	6
8. Use mosquito repellents.	3.01	C	8	3.06	C	8	3.04	C	8
9. Visit the nearest health center/hospital if family member has fever for two days duration and rashes on skin.	3.15	C	7	3.66	FC	3	3.40	C	5
10. Say yes to fogging only during outbreaks.	2.99	C	9	2.63	C	9	2.81	C	9
<b>Composite Mean</b>	<b>3.23</b>	<b>C</b>		<b>3.32</b>	<b>C</b>		<b>3.27</b>	<b>C</b>	

Legend: 3.50 – 4.00 = Fully Complied (FC); 2.50 – 3.49 = Complied (C); 1.50 – 2.49 = Slightly Complied; 1.00 – 1.49 = Not Complied

It should not be done if there is rain or if the wind is strong because you will not be able to target the mosquitoes. Indiscriminate fogging might cause mosquitoes to develop resistance to insecticide [7].”

The ranked tenth on the practices of compliance with regard to dengue elimination for the 4S Kontra Dengue Program is the use of screen doors and windows. Mostly houses are built without screened doors and windows because they are costly, however people can reduce the risk of mosquitoes entering their homes by keeping their doors and windows closed.

“People can reduce the risk of mosquitoes entering their homes by using window and door screens or by keeping their doors and windows closed. *Aedes aegypti* typically bite people during the day, so wearing long pants and long-sleeved shirts can reduce mosquito bites when spending time outdoors. In addition, mosquito repellents can be applied to exposed skin and clothing to lower the risk of mosquito bites [8].”

However, potable water must be supplied reliably so that water-storage containers that serve as larval habitats – such as drums, overhead or ground tanks and concrete jars – are not necessary. The installation of reliable piped water supplies to houses should be accompanied by a communication strategy that discourages traditional storage practices [5].

A reliable and regular street cleansing system that removes discarded water-bearing containers and cleans drains to ensure they do not become stagnant and breed mosquitoes will both help and reduce larval habitats of *Ae. aegypti* and remove the origin of other urban pests [5].

Table 2 shows the practices in compliance with Dengue Elimination and Control Program with regard to 4 O’clock Habit versus dengue. The overall composite mean of 3.33 is an indication that the respondents complied with 4 O’clock Habit versus dengue to fight the battle against dengue.

“Listen to instructions from local authorities, community leaders, or supervisors at work for collaborative activities was at the top ranking, with an overall weighted mean of 3.49 among respondents. Community people have always been encouraged to listen to their respective barangay officials, especially now that they have become fully involved in the implementation of the campaign. Barangay officials are the frontlines in the advocacy of the government not just about health but also for other vital programs for the people.

**Table 2. Practices in Compliance to Dengue Elimination and Control Program with Regard to 4 O’Clock Habit Versus Dengue**

	Community			Healthcare Provider			Over-all		
	W M	V I	R	W M	VI R	R	W M	V I	R
<b>1. STOP</b> what I am doing and dedicate a few minutes for mosquito control	3.18	C	3	3.22	C	3	3.20	C	3
<b>2. LOOK</b> on areas where larvae breed such as stagnant water and destroy it if found	3.22	C	2	3.41	C	2	3.32	C	2
<b>3. LISTEN</b> to instructions from local authorities, community leaders, or supervisors at work for collaborative activities	3.44	C	1	3.53	F C	1	3.49	C	1
<b>Composite Mean</b>	<b>3.28</b>	<b>C</b>		<b>3.39</b>	<b>C</b>		<b>3.33</b>	<b>C</b>	

Legend: 3.50 – 4.00 = Fully Complied (FC); 2.50 – 3.49 = Complied (C); 1.50 – 2.49 = Slightly Complied; 1.00 – 1.49 = Not Complied

Dengue can happen to everyone regardless of social standing urging everybody including the media to join in the campaign and do their share. Every community must actively listen to their respective barangay officials especially now that they have become fully involved in the implementation of the campaign. Barangay officials should be the upfronts in the advocacy of the government not just about health but also other essential programs for the people [1].

Looking for areas where larvae breed such as stagnant water and destroying it is the second ranked practice, with weighted mean of 3.32. Both respondents do this because they know that mosquitoes breed in water. In addition, they know that the first line of defense to lower dengue infections is the control of mosquito population. Transmission of dengue requires mosquitoes as vectors, the spread of dengue can be limited by reducing the mosquitoes carrying the virus. Larval control would

seem to be the best approach to mosquito control as it eliminates mosquitoes before they reach the stage where they can transmit the virus. However, larval habitats may be small, widely dispersed, and transient. The larvae develop within a few days, escaping their aquatic environment before it dries out.”

With regard to 4 o'clock habit versus dengue program practices the least complied is the stopping on whatever they are doing and dedicate a few minutes for mosquito control, with a weighted mean of 3.20 because of a busy working schedule, and sometimes inability to pause for a while from what they are doing.

In the program ABKD (Aksyon Barangay Kontra Dengue) the highest in rank was searching and destroying for the possible breeding areas, with an overall weighted mean of 3.42. This practice also ranked first for the community people in compliance, with a weighted mean of 3.37 while for the health care providers this practice ranked second. Based on the observation and evaluation of the healthcare provider, people are complying with this practice because they can understand the importance of being vigilant to the cleanliness of the surrounding to be free from a mosquito-harboring area. Dr. Winston De La Haye said, “We continue to see an increase in mosquito breeding and because fogging only kills about 30 per cent of adult mosquitoes, it is crucial that we consistently search for and destroy mosquito-breeding sites.”

**Table 3. Practice in Compliance with Dengue Elimination and Control Program with regard to ABKD (Aksyon Barangay Kontra Dengue)**

	Community			Healthcare Provider			Over-all		
	W M	V I	R	W M	VI C	R	W M	V I	R
1. Search and destroy for the possible breeding areas.	3.37	C	1	3.47	C	2	3.42	C	1
2. Use self-protective measures by wearing long sleeves and socks.	3.27	C	2	3.16	C	3	3.21	C	3
3. Seek for early consultation by visiting nearest health center.	3.14	C	3	3.50	F C	1	3.32	C	2
4. Say no to indiscriminate fogging.	3.11	C	4	3.00	C	4	3.05	C	4
<b>Composite Mean</b>	<b>3.22</b>	<b>C</b>		<b>3.28</b>	<b>C</b>		<b>3.25</b>	<b>C</b>	

Legend: 3.50 – 4.00 = Fully Complied (FC); 2.50 – 3.49 = Complied (C); 1.50 – 2.49 = Slightly Complied; 1.00 – 1.49 = Not Complied

Seek for early consultation by visiting nearest health center ranked second in the overall, with a weighted mean of 3.32, which indicates compliance to the practice. For the healthcare providers, this practice ranked first with a weighted mean of 3.50 and shows full compliance because they are the health promoters who strongly advise the community to seek health consultation, not just because one is ill but above all to achieve optimum wellness. It will not only be beneficial to all medical practitioners who promote health and prevention of illness and disease but also to all people in the society because it will make them more responsible and knowledgeable. The community people ranked this practice as third, with a weighted mean of 3.14, because a clear majority of the community people have stated that they only rush to seek for consultation when a family member or the person himself/herself is too ill and can no longer bear the illness and pain.

Use self-protective measures by wearing long sleeves and socks ranked third in the overall, with a weighted mean of 3.21, the same with the healthcare provider's ranking, with a weighted mean of 3.16, and reveals compliance among them. Healthcare providers accepted the fact that each program is as if made step by step, that after promoting the importance of seeking health-related consultation, they advise the community to search and destroy. After so, it is vital to use self-protective measures by wearing long sleeves and socks, which are not dark colored and will not attract mosquitoes. However, for the community people this practice ranked second, with a weighted mean of 3.27. They have instilled in their thinking that after hearing and learning what the providers have implemented next to it is self-care.

According to UA&P News Desk, while operations are being conducted to make the campus safe, everyone is also expected to apply self-protection measures. And this is especially true because not all the mosquitoes are exterminated when the misting activity happens. One of these self-protection measures is wearing ankle-length pants and long-sleeved clothing. Another effective means is the use of an insect repellent that can be sprayed on the clothes or applied on exposed skin.

There are several self-initiating measures used as a tool for reduction in homes and community. Proper clothing which lessens the skin's exposure during daylight hours when mosquitoes are most progressive, sustains some protection from the bites of dengue vectors and is strongly recommended during outbreaks. The use of repellents may be applied to exposed skin or to clothing. Remember to always read the labels for

instructions of use of repellents on skin and if adverse effects are noticed, please refer to the nearest health center as per advice by WHO.

On the other hand, the last in rank with an overall weighted mean of 3.05 was saying no to indiscriminate fogging. Everyone in every barangay is careful about avoiding the risky measures that aggravates the spread of dengue and how it may affect many people in a careless way. The respondents are certain that fogging is used to kill adult mosquitoes infected with the virus to immediately stop transmission in accordance to DOH advice.

From the interview conducted by Faye Tobias on Radyo Singko, Dr. Eric Tayag said indiscriminate fogging could only harm, rather than save people in the long run. He cited four main reasons. First, fogging kills only the adult mosquitoes that carry the potentially fatal dengue, and not the eggs. Second, fogging is mostly done outside homes and buildings, as people often disdain admitting the local government fogging teams inside; hence, the impact is quite limited. Third, the fogging has the unintended effect of practically “herding” the dengue carriers into particular places where they could still pose a menace, as the fogging simply shoos them away. He also warned against the risk of building up resistance in the mosquito vectors.

Table 4 presents the result, use of Ovitrap and Tepok Lamok and Dengue Sapok had an overall weighted mean of 3.28, with a verbal interpretation of compliance from both respondents.

The highest in the overall rank was items that collect rainwater or to store water (plastic containers, drums, buckets, pails, tires) should be covered or properly

discarded with an overall weighted mean of 3.43 and a verbal interpretation of complied. While this practice ranked second among community, with a weighted mean of 3.30 with a verbal interpretation of complied, the same goes to the health care providers who ranked this practice as second as well, with the weighted mean of 3.56 among healthcare providers, with a verbal interpretation of fully complied. The difference of 0.26 between the community and healthcare providers, had been observed that not everyone from the community adheres to the practice but only those who had been severely affected by the disease.

Keeping window and door screens closed reduces the risk of mosquitoes coming indoors ranked first among the community, with a weighted mean of 3.37 and a verbal interpretation of complied, while this ranked fifth among the healthcare providers, with a weighted mean of 3.47 and was interpreted as complied. For the community people, they see this as an essential practice and is given the proper attention. They are making it a point that windows and door screens are free from holes Healthcare providers are aware that if there are stagnant flow, mosquitoes linger to such places and lay their eggs. If bedrooms are not with screened windows or air-conditioned, they use mosquito nets.

Keeping the gutters clean of leaves and debris that might hinder water flow ranked first for the health care provider with a weighted mean of 3.59 and signifies full compliance although this ranked third among the community people and indicates compliance. Healthcare providers are aware that if there are stagnant flow, mosquitoes linger to such places and lay their eggs.

**Table 4. Practices in Compliance with Dengue Elimination and Control Program with Regard to Use of Ovitrap and Tepok Lamok and Dengue Sapok**

	Community			Healthcare Provider			Over-all		
	WM	VI	R	WM	VI	R	WM	VI	R
1. Using ovitrap (black container that attracts mosquitoes and where mosquitoes land and lay their eggs) given by the city government officials	2.73	C	6	2.78	C	6	2.75	C	6
2. Items that collect rainwater or to store water (plastic containers, drums, buckets, pails, tires) should be covered or properly discarded.	3.30	C	2	3.56	FC	2	3.43	C	1
3. Pet and animal watering containers and flower vases should be emptied and cleaned at least once a week.	3.11	C	5	3.53	FC	3	3.32	C	5
4. Keep window and door screens closed reduces the risk of mosquitoes coming indoors.	3.37	C	1	3.47	C	5	3.42	C	2.5
5. Keep the gutters clean of leaves and debris that might hinder water flow.	3.25	C	3	3.59	FC	1	3.42	C	2.5
6. Proper application of mosquito repellents on exposed skin and clothing decreases the risk of mosquito bites.	3.22	C	4	3.50	FC	4	3.36	C	4
<b>Composite Mean</b>	<b>3.16</b>	<b>C</b>		<b>3.41</b>	<b>C</b>		<b>3.28</b>	<b>C</b>	

Legend: 3.50 – 4.00 = Fully Complied (FC); 2.50 – 3.49 = Complied (C); 1.50 – 2.49 = Slightly Complied; 1.00 – 1.49 = Not Complied

Dengue season should be synonymous to bayanihan season when communities work together to prevent this epidemic from spreading.

Keep your family safe with increased awareness on how to recognize dengue, how to control the mosquito that transmits and being responsible for keeping our homes free of water containers where mosquitoes can lay their eggs [1].

Fourth in the overall ranking from both respondents was, proper application of mosquito repellents on exposed skin and clothing decreases the risk of mosquito bites with an overall weighted mean of 3.36 with a verbal interpretation of complied. Not everyone can afford to buy and knows how to properly use mosquito repellents. Also, considering the fact that there are other health-related issues, which contraindicates the use of mosquito repellents.

Clothing that minimizes skin exposure during daylight hours when mosquitoes are most active affords some protection from the bites of dengue vectors and is encouraged particularly during outbreaks. Repellents may be applied to exposed skin or to clothing. The use of repellents must be in strict accordance with label instructions.

Pet and animal watering containers and flower vases should be emptied and cleaned at least once a week ranked fifth in the overall, with a weighted mean of 3.32 and indicates compliance. This practice ranked for the community while it ranked third among healthcare providers. Not all of the respondents are animal owners like pigs, cows, chickens, goats, and carabao, neither that not everyone has flower vases in their house. Thus both respondents perceive that pet and animal watering containers and vases with fresh flowers should be emptied and cleaned to remove eggs at least once a week, as this will eliminate the mosquito eggs and larvae and reduce the number of mosquitoes present in these areas.

On the other hand, using ovitrap (black container that attracts mosquitoes and where mosquitoes land and lay their eggs) given by the city government officials with an overall weighted mean of 2.75 got the lowest rank. The healthcare providers have mentioned that not all barangays are given out ovitrap. They know about it but it is mostly given to the barangays with a very high incidence rate of dengue case. As for the community people, not all claimed to know about it.

Another method of reducing *Aedes aegypti* is to use ovitraps. These black devices which are cylindrical containers filled with water. The top of the ovitrap is fitted with a circular wire mesh and a floatation ring that floats on the surface of the water in the container. Above

the mesh, two paddles are mounted. To *Aedes aegypti*, ovitraps appear to be ideal locations to lay their eggs. The female lays its eggs on the paddles. The eggs then fall beneath the mesh, where the mosquitoes develop through the immature larval and pupal stages. When the adult mosquitoes emerge, however, they are trapped beneath the mesh and are unable to escape from the ovitrap. Some ovitraps have been adapted to include sticky surfaces that entrap adult mosquitoes, and others include the use of a pesticide on the device. Ovitrap can be also used for mosquito surveillance. When sufficient numbers of ovitraps are used and frequently maintained, the vector population can be diminished. One successful example is in Singapore, where ovitraps were used to eliminate mosquitoes at the international airport. Traps have limitations — they require constant supervision and monitoring to prevent them from becoming productive breeding habitats.

**Table 5. Indicators of Compliance to Dengue Elimination and Control Program of the Community People**

Through implemented Dengue and Elimination and Control Programs I....	Weighted Mean	Verbal Interpretation	Rank
1. am motivated to become well	3.74	Always	1
2. changed my degree of lifestyle	3.51	Always	4
3. perceived severity of health care problems	3.51	Always	5.5
4. placed value on reducing threats of illness	3.58	Always	2
5. gained understanding and performed specific behaviors towards it	3.57	Always	3
6. learned the degree of the illness itself and regimens	3.47	Often	7.5
7. believe that prescribed regimen helped	3.47	Often	7.5
8. Observed the cultural heritage, beliefs, or practices have supported with the regimen.	3.37	Often	9
9. noticed the degree of satisfaction and type of relationship with health care providers	3.51	Always	5.5
<b>Composite Mean</b>	<b>3.53</b>	<b>Always</b>	

Legend: 3.50 – 4.00 = Always; 2.50 – 3.49 = Seldom; 1.50 – 2.49 = Often; 1.00 – 1.49 = Never

Table 5 presents the indicators of compliance to Dengue Elimination and Control Program of the community people with the overall composite mean of 3.53, with the verbal interpretation of always.

The highest rank was the item “I am motivated to become well”, with the weighted mean of 3.74, verbally interpreted as always. This result indicates the community people are willing and wanted to have a better environment and become healthy individuals in order to prevent the occurrence of the disease.

Luistro [9] said that they had been spreading awareness about dengue in their firm resolve to prevent this disease from continuing to inflict damage on the lives of the people, especially the young children. But they know these are not enough, the community should also pool their efforts and resources to free young children from this disease that can be prevented and controlled.

Second highest rank was item “I placed value on reducing threats of illness”, with the weighted mean of 3.58, and verbally interpreted as always. To reduce dengue infections is to control the dengue populations. The community people practical and recommended environmental management strategy is to eliminate unnecessary container habitats that collect water in which mosquitoes lay their eggs. With the community is placing value to reduce threats of dengue outbreak.”

The environmental management initiatives can also include major changes in a community, such as installing water systems with direct connections to residences and replacing wells and other water-storage containers, which can be mosquito-breeding habitats. Smaller-scale environmental changes can also be effective. For example, mosquito populations can be reduced when all members of a community clear blocked gutters and street drains and keep their yards free of containers with standing water. Any open containers should be emptied and cleaned each week to eliminate mosquito eggs and larva [8].

The last three lowest ranks are items that observed the cultural heritage, beliefs, or practices have supported with the regimen with the verbal interpreted as often and with the weighted mean of 3.37. e. These efforts can reduce the number of mosquitoes living in an area.”

The item number 6, which is learned the degree of the illness itself and regimens, and item number 7 which believe that prescribed regimen helped ranked at 7.5.

This suggests that proactive health education via appropriated mass media and community clean-up campaigns should strengthen and encourage community participation, and specifically address mosquito larvae in

overlooked places, such as flower vases and ant traps, in people's own homes. Thus, government can maximize the potential use of these educational and health institutions by providing adequate support like information, education and communication (IECs) materials and other visual aids that may effectively communicate dengue preventive measures.

Honduran Red Cross Choloma branch Council President, Hector Escobar, point out the solid partnership with the health authorities to implement the threat of dengue is that, “Public health is supporting us by providing the chemicals so that we can fumigate and we respond with some specialized teams and our volunteers who are ready to provide the service. We have worked together with them and have been mutually supportive. There is no duplication of efforts. They go one way and we go another, because if we are not organized, we will duplicate efforts”.

“The DOH promoted top officials and leaders of the country’s public schools, churches, public markets, and communities to rule search and destroy activities in their areas of jurisdiction to prevent dengue. Barangay officials, through the “Liga Ng Mga Barangay”, were also proposed to actively initiate government’s anti-dengue campaign by designating a part of its budget for dengue prevention and control. At the launch ceremonies held in Caloocan City, “Dengue is everybody’s concern, but with our concerted efforts, dengue can be controlled starting today.” According to Ona (2013), everything has been fulfilled by government to decrease the strike that dengue brings to the country. This is not inactivity on the part of government. What may truly be needed is for people to change their behaviors and practice the recommended cost-effective measures to prevent.

Table 6 presents the Action Plan to strengthen the implementation of dengue elimination and control program in the city

An action plan containing dengue innovation is made to strengthen the implementation of Dengue Elimination and Control Program. This will help the community people and health care providers as we all walk the fight against the spread of dengue.

This plan was developed to improve the compliance of Batanguenos to different dengue elimination and control programs in Batangas City, with three factors that affect the compliance of respondents. Each factor provides an approach for action plan to the enhancement of their compliance. This will also allow a better collaboration and coordination of healthcare providers and community people.

**Table 6. Action Plan to Strengthen the Implementation of Dengue Elimination and Control Program**

Indicators	Methodologies	Persons Involved	Expected Outcomes
Insufficient knowledge and understanding on different Dengue Elimination and Control Programs	Conduct reorientation about the different extent of implementation of practices	Local Authorities Medical team -Medical Officer -Rural Health Nurse -Barangay Health Worker	Respondents will convey understanding and have adequate information regarding the different Dengue Elimination and Control Programs implemented by DOH. People will show interest and participate actively in different practices and lastly people will be motivated to comply with the different programs thus non-compliance will be lessened.
Extent of Implementation of different Dengue Elimination and Control programs	Continuous implementation of the programs Evaluation of knowledge, skills and attitude of government officials	Community People  Local Authorities	
Resistance of some residents to new environmental programs Lack of motivation and encouragement from public office	Disseminate information on the sanction to non-compliance to programs Appoint community volunteers who will guard on the compliance of community people Give recognition to family/community that practice the program	Local Authorities	

The proposed plan of action was grounded to attain the objectives that are focused on the identification of incidences, compliance and acceptance of community people, and different management that will strength the implementation of Dengue Elimination and Control Program.

### CONCLUSIONS AND RECOMMENDATION

The occurrence of dengue is still increasing from time to time. Insufficient knowledge and understanding of different dengue elimination and control programs affect the practices of residents. The compliance as well as the acceptance of the community people and healthcare providers contribute to the occurrence of dengue in Batangas City.

The healthcare workers together with the barangay officials may conduct more seminars or lectures regarding the continuous practice of these programs. Barangay officials should continue to advocate the governments programs especially with regard to health. The officials of each barangay as well as the health care worker should empower and continuously encourage the residents to practice the preventive and control measure for dengue. The community people must continuously support these programs, since, this disease can be controlled right from their backyard. The proposed plan of action to strengthen the implementation of Dengue Elimination and Control Program should be utilized.

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