Evaluating Information Known About the West Nile Virus in a College Area

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Abstract: Staying informed about current disease outbreaks is vital for the health of individuals. As emerging diseases and viruses are evolving, the need to be informed on any type of diseases can help prevent and slow down an outbreak. An important step in understand any disease is to learn information regarding the disease. A study was conducted in a public college area to evaluate the information known about the West Nile Virus and understanding factors that could have a role in influencing the knowledge known. Understanding West Nile Virus is important in a population because this disease can be transmitted by common mosquito *Culex pipiens* (Diptera: Culicidae) and be critical to an individual's health. A hypothesis stated the college area knows a small amount of knowledge concerning West Nile Virus. An online survey was used to conduct this study and was sent out to students enrolled at Texas A&M University. Survey was then spread out to random individuals to develop a variety of results. Survey's questionnaire included information on age, gender, education level, college major, and West Nile Virus inquiry. From the data collected, a large percentage of individuals correctly answered questions pertaining to West Nile Virus. The large percentage of correct answers lead the study to evaluate on possible factors that could have influenced the decisions of the individuals. Focused factors such as educational level, location of current residency was among the main factors looked into for understand the infectious disease of West Nile Virus.

Keywords: West Nile Virus, infectious disease, health, mosquitoes, *Culex pipiens*

As the United States progresses into a developed country, the awareness of emerging and infectious disease has declined due to a rise in population being more concern with the many and different type of chronic impairments (Doblecki-Lewis 2016). Chronic impairments such as congestive heart failure, diabetes, and lung disease. These conditions are brought up due to the individual's health lifestyle rather than by an infection. However, many different populations around the world are at risk from infectious diseases particularly vector borne diseases such as West Nile Virus.

A typical misinformed information about the West Nile Virus is that a major mosquito, *Culex pipiens,* is involved in the transmission (WHO 2011). All the mosquitos belonging to *Culex* genus have also been described to be potential carriers of the virus (WHO 2016). This major mosquito is extremely prevalent in most of North America, Africa, Europe, Asia, Australia and all of South America (Campbell 2002). Being a common and widespread insect allows the adaption to a multitude of different habitats and allows the spread of West Nile to be effective. A common misconception about

mosquitoes is that they all are the same, when in reality is not. Along with this, many people are not aware with the information relating to the reproduction, feeding, and origin mosquitoes have on a certain area. More in depth, people do not understand how *C. pipiens* transmits West Nile Virus and how this disease affects a human population. This lack of knowledge is concerning because of how greatly it affects the public (Mitchell 2008). People often start worrying of an infectiousness disease until it is too late. The quicker and earlier people are aware of transmission, symptoms, and general important information on a vector borne disease the better protection a population will perform.

This experimental study aims to evaluate a population in order to understand what factors could influence the knowledge known pertaining West Nile Virus. Comparing the knowledge known to the factors involved could help understand why people are not well informed on important diseases. Data collected from this experiment will analyze a common variables, educational level and location that allows a population to be either well informed or misinformed on diseases particularly West Nile Virus. Lastly, a self-report survey will supply the subjects to necessary precautions and prevention methods to protect against West Nile Virus. This study will promote the expansion of information relating to West Nile Virus and create a conscious community. Further research is need on how or what drives people to be informed on infectious diseases.

Materials and Methods

The study was conducted using an internet-based survey that took a few minutes to complete where a phone or computer was needed. The survey included multiple choice questions, true or false, and short answer responses. Survey was expanded to roughly 100 people where the survey dispersion began inside a classroom filled with students. After reaching 100 people the population data was described as random. From each person gender, education level, area of living, and ages were kept different to display unbiased data. Questions implemented were designed to gather data on the knowledge known about West Nile Virus and to gather data how different variables could reason to knowing this knowledge. Survey was kept anonymous in which no names were recorded and contacted. Once survey was completed, the gather data was analyzed in a pie chart. Pie chart data helped to determine a trend within the displayed variable. Through the use of statistics with percentages the presence of a correlation between a variable to the knowledge of West Nile Virus was made.

Results

From the data collected of a total of 112 responses a pie chart was used to provide percentages on different variables. Variables such as gender, age, education level, and location of residency were evaluated. Looking through these variables would help provide a comparison with the amount of knowledge known on West Nile Virus. Towards the end of the survey, questionnaire dealing with the transmission, facts, symptoms, and treatment also helped evaluate the knowledge known. Looking at each variable independently, the study hoped to find a data that could link about knowing about West Nile Virus. Education level helped best with comparing the amount of questions answered correctly on West Nile Virus. Inspecting every variable, the most prevalent gender was females who took the survey, coming at 71% (Figure 1). It was not an equal number of females and males who took survey and therefore this variable was not further used to compare data on

questionnaire. The variable dealing with ages was also broken down into many gaps. The top and main age bracket consisted of 92.9% 18-27 years old (Figure 2). With education level, the survey recorded that 57.1% of the people who took this survey had a small amount college education (Figure 3). The location of residency variable concluded from the survey said the majority of people resided in Texas and most specifically in Bryan/College Station. This factor was important since the survey was initially spread from the university.

The survey included questions of true or false statements as well as multiple choice. First question asked was describing or rating how much information the surveyor knew. Half of the responses stated that their knowledge about mosquitoes was average (50%), and 33.9% said they know very little about it (Fig. 4). This was important because it laid foundation to if the person knows about mosquitoes, then the person would also be aware of the disease's mosquitoes can transmit. Going to next question asked was concerning a true or false statement. The individual had a 50 to 50 chance of getting it correct. Taking into account the surveyor was honest, 66.1% answered true that West Nile Virus was not prevalent or widespread in the United States (Figure 5). 87.5% answered that th bite of infected mosquitoes is the reason people get West Nile Virus (Figure 7). This factor was important since a large percentage of people answered this transmission question correctly.

Going into the symptoms West Nile Virus bring, the survey asked if this disease brings no symptoms or mild symptoms. A large percentage of 65.2% answered there are no symptoms brought in with West Nile Virus (Fig. 6). Many responses recorded for the prevention or protection against West Nile Virus were bug spray and mosquitoes spray.

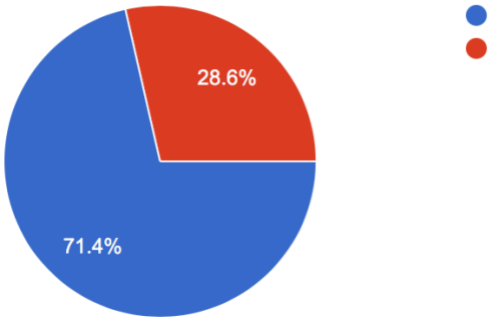

Fig. 1. Survey responses from a question "What is your gender?"

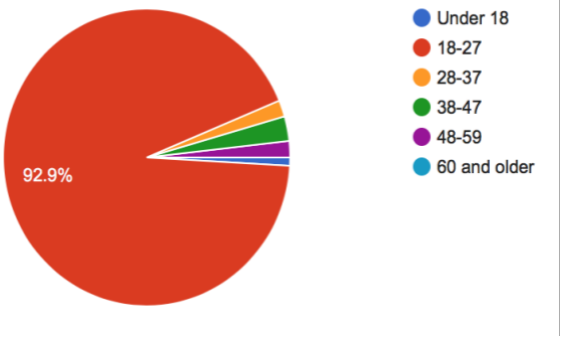

Fig. 2. Survey responses from a question "What is your age?"

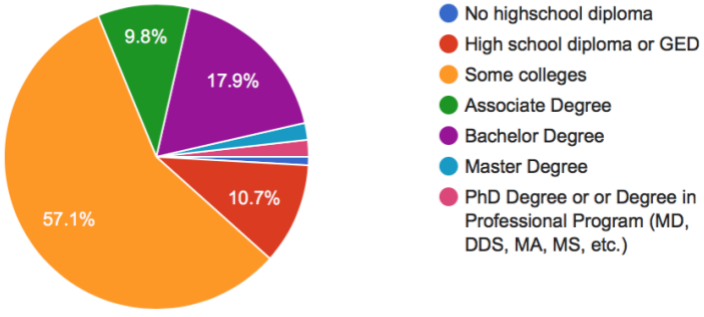

Fig. 3. Survey responses from a question "What is your education level?"

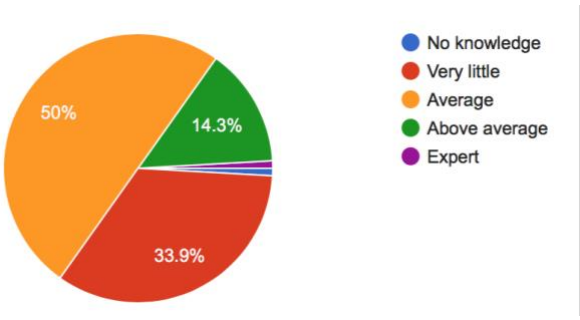

Fig. 4. Survey responses from a question "How would you rate your knowledge about mosquitoes?"

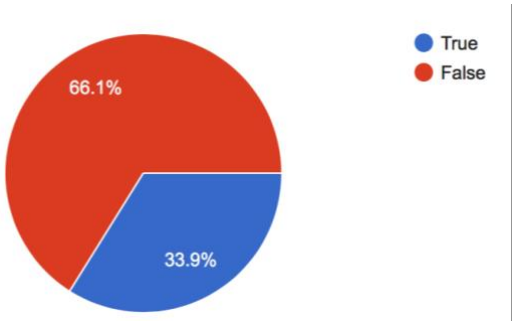

Fig. 5. Survey responses from a True/False question "West Nile Virus is not prevalent or widespread in the United States."

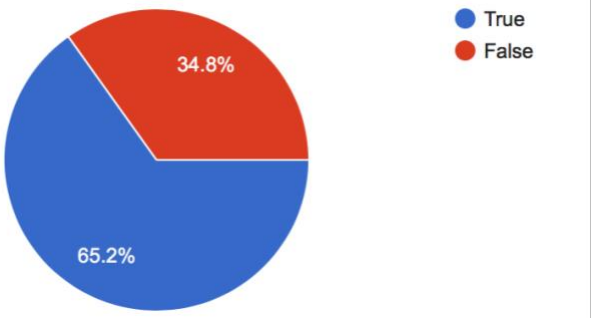

Fig. 6. Survey responses from a True/False question "People who get West Nile Virus usually have no symptoms or mild symptoms."

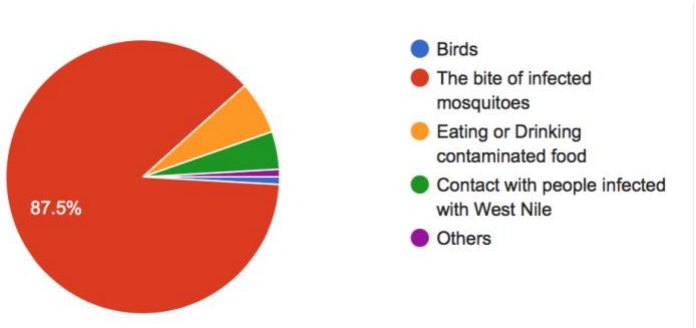

Fig. 7. Survey responses from a question "How do you think most people get West Nile Virus?"

Discussion

From the conducted study, the goal was to evaluate many factors that helped correlate a limit with the knowledge known concerning West Nile Virus. After data was collected from the survey study it showed that there was no correlation that there is a large limit into knowing knowledge about West Nile Virus. This surprising revelation lead to a change in the original goal. The focus of the study now was to identify why there is a decent amount of knowledge known regarding West Nile Virus. The most important factors that were observed were education level/ college major and location of residency. These two factors would great influence on why the surveyors answered questions correctly on West Nile Virus.

With the data collected, gender and age were not looked into or accounted for. These two factors were excluded due to the large ratio-percentage of females to males. There was no proper correlation and the known facts about West Nile Virus. In addition, there is no plausible conclusion that would provide a sound argument to why one gender knows more information than the other gender. Age was not looked into due to large percentage of surveyors were from 18-27 years old (Figure 2). For education level or major this factor resulted with the highest

number of people with advance education correlated to why an individual knew knowledge on the West Nile subject. This explained that the more you were educated, the more you were aware of how fatal West Nile Virus is. Major played a role in influencing why people had a high percentage of correct answers.

Location was viable to this correlation was due to the West Nile outbreak of 2012 that occurred in Texas. The majority of people who took the survey labeled their location in Texas and specifically the College Station area. This was the largest statewide outbreak in the history of Texas with 1,868 cases and 89 deaths (Martinez et al. 2017). The outbreak of West Nile in 2012 was broadcasted and having coverage done everywhere from TV to radio in Texas. This widespread media coverage made individuals be more aware and staying alert with West Nile Virus (Murray et al. 2012). With these large outbreaks happening so recently, it is normal that Texas residents would have a general understanding of this disease and on their transmission status. Keeping the residents alert and aware of new information will aid in better protection against the disease. Typically, individuals and healthcare providers do not want the cycle to continue so teaching the public of these diseases with transmission, origin, and symptoms helps stop the repeat of a cycle or another emerging disease.

Further research is needed to advance and strengthen the information regarding this study. It has been recognized that the number of reported cases for West Nile increase every three years (Nolan et al. 2013). It is concluded that in the future new or evolved outbreaks will occur and again the population has to be well informed. Testing and evaluation on how well the people know of the newest disease outbreaks will then deal a lot with the education level and location of residency. It is believed that a widespread of media coverage that raises the attention of the listeners is the best way to inform the general public. A study that could determine the most ideal way to reach out and provide entomological information regarding infectious diseases would improve the overall knowledge of the general public and further improve public health.

Limitations to this study include the amount of bias and under representation the survey brought within each individual. Since the survey was sent to as many people as possible; peers, professors, relatives, and other random people received this survey. Even when age and college education was taken into account, the bias of an individual lying is possible due to the lack of compensation of time and effort. Additionally, age groups were underrepresented in which there was a larger age group of 18-27 than any other age group. The data presented can still be useful in providing an insight into the knowledge of those who do not encounter medical or entomological issues on a daily basis. In summary the results conducted from this study found education level and recent new coverage such as in a geographic region were most relevant into knowing why the people in that area were up and on current knowledge on West Nile Virus.

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