IS ORANGE COUNTY READY FOR ZIKA?

IT TAKES A VILLAGE TO HANDLE MOSQUITO-BORNE VIRUSES

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SUMMARY

For a decade Orange County has been a national hot spot for serious mosquito-borne illnesses like West Nile virus (WNV). With limited resources, the Orange County Mosquito and Vector Control District (VCD) has been fighting an uphill battle to find and control the many kinds of mosquitoes that carry these potentially deadly diseases. The outbreak of Zika virus in Brazil in 2015, with its severe consequences for unborn babies, has put mosquito control in the headlines and on the agendas of many government entities worldwide, including those in Orange County.

This report identifies the difficulties with containment and treatment of mosquito-borne viruses in Orange County. The public needs to understand its important role as a partner in controlling mosquitoes in our environment and the urgent need to do so. County government entities must cooperate to protect lives through effective outreach and mosquito control measures.

In recent years the VCD has shifted to being more proactive than reactive to mosquito-borne illnesses and has expanded its toolbox for identifying and controlling the vectors that contribute to these illnesses. To become more effective, the district will need to stay focused on proactive communications with its partners, as well as proactive monitoring and eradication of mosquitoes throughout the county. They will need the help of their Board of Trustees, the Orange County Board of Supervisors, the Health Care Agency (HCA), Orange County cities, and the public in order to succeed.

REASON FOR THE STUDY

The Grand Jury was motivated to examine VCD and HCA operations by media reports and reported cases of WNV in Orange County, as well as the imminent threat of an outbreak of Zika virus, as occurred in Florida in 2016. We questioned how county government communicates information about mosquito-borne illnesses to the public; whether efforts in communications, monitoring and controlling mosquitoes and their habitats have been proactive or reactive; and how the effectiveness of their efforts are measured. The Grand Jury was also concerned with the apparent lack of public awareness of the severity of mosquito-borne illnesses and their long term effects, especially those of WNV.

METHOD OF STUDY

The Grand Jury met multiple times with staff and management of both the VCD and HCA. The VCD is an independent special district responsible for vector control throughout Orange County. It is not under the control of the County Board of Supervisors but has an independent Board of Trustees and its own headquarters. We toured the VCD facility and familiarized ourselves with the tools and methods used to control vectors in Orange County. We conducted independent internet and news media research of mosquito-borne illnesses and mosquito eradication methods. The Grand Jury evaluated information from other government entities, including the Centers for Disease Control and the World Health Organization, on the diagnosis and prognosis of mosquito-borne viral illnesses. Historical data provided by the VCD was evaluated and used to determine the likelihood of accurate predictions of future mosquito-borne illness outbreak areas and its attendant severity. We reviewed external communications used by both VCD and HCA and examined measures of their effectiveness. We also investigated and evaluated the interaction of

the VCD with the HCA regarding communications and outreach to the public and with medical and other professionals dealing with the diagnosis and treatment of vector-borne illnesses.

BACKGROUND AND FACTS

The mission of the VCD is to provide the citizens of Orange County with the highest level of protection from vectors and vector-borne diseases. A vector is an animal or insect that can transmit disease to the human population. This includes rodents, livestock, wild animals, and insects such as fleas, ticks, fire ants and mosquitos. The district has an active disease identification and treatment program in place for all vectors of concern in the county.

The HCA, among its other responsibilities, is tasked with monitoring and promoting the prevention of communicable diseases, including those transmitted via vectors. Pertinent to this mission, the agency is specifically responsible for communicating with medical professionals and is guided by strict regulations surrounding the handling of patient information. Assistance by the public in controlling vectors and protecting against vector-borne diseases are critical to the success of the VCD and HCA. Both Orange County entities have active in-person and media public outreach programs conveying the dangers of mosquito-borne illnesses and means of infection prevention.

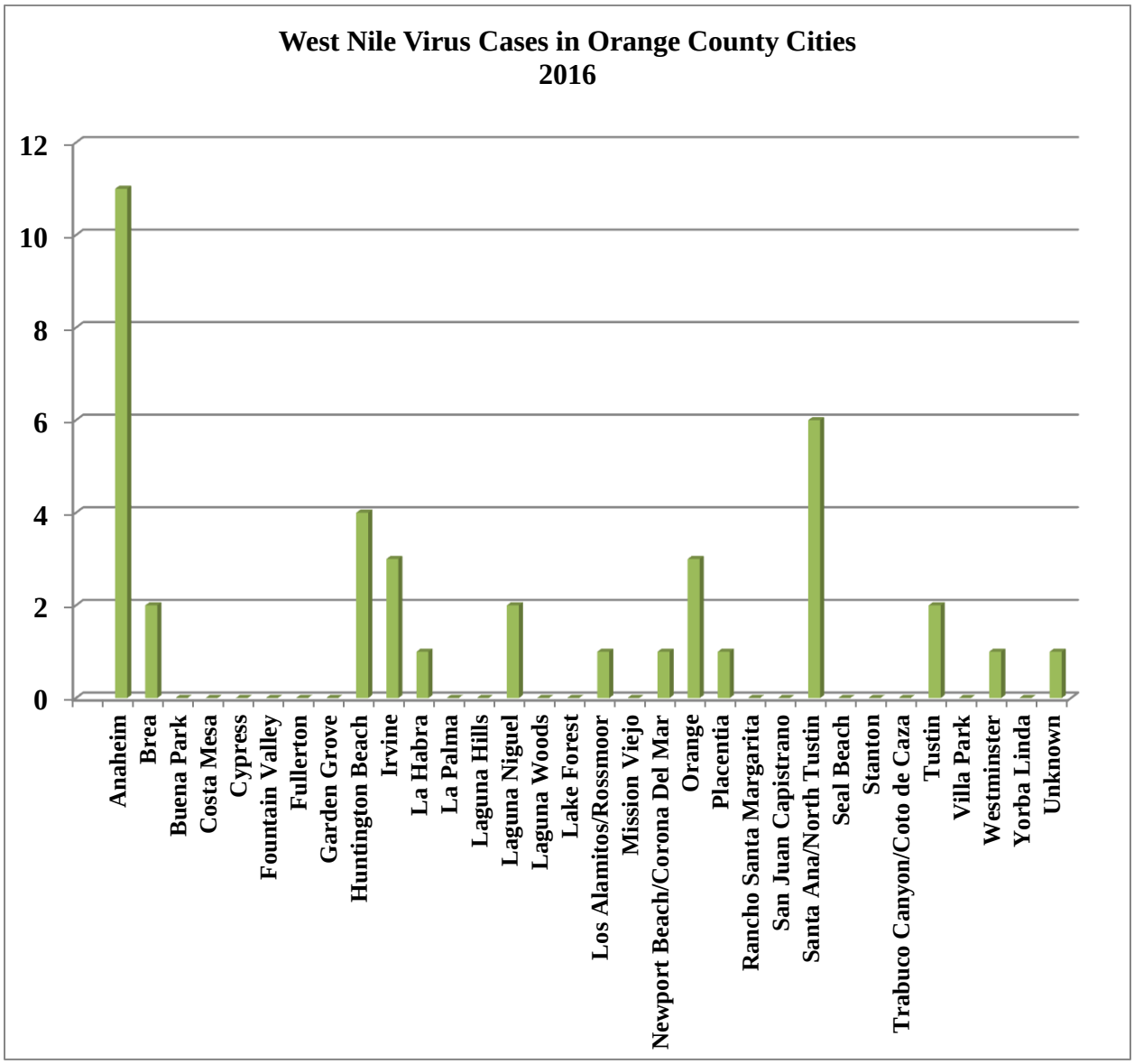
The focus of this investigation was on the spread of mosquito-borne diseases, particularly the West Nile and Zika viruses. In the past three years the county has identified over 400 cases of WNV, as well as 24 introduced cases (original infections occurring outside the county) of Zika virus in 2016 (see Table 1 and Figure 1). The mosquito problem is a seasonal one requiring year-round preparation and advanced planning year-round.

Table 1

West Nile Virus Infections and Deaths in Orange County

	2014	2015	2016
Infections	282	97	38
Deaths	7	8	1
Total	289	105	39

Figure 1



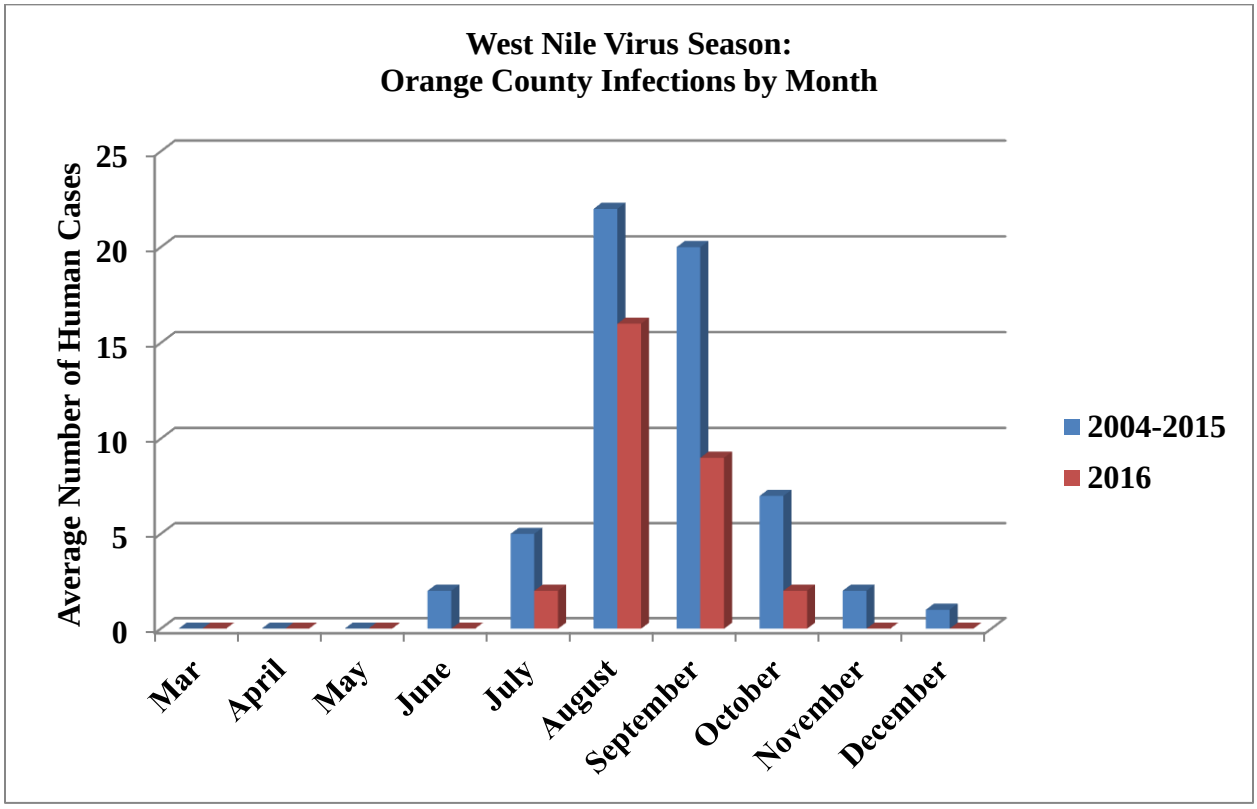
Orange County Factors Contributing to Mosquito-borne Illness

Mosquito Habitat and Flight Patterns

Mosquitoes must have standing water to breed. Moving water is unlikely to sustain breeding mosquitoes. The amount of water needed can be very small. Typical residential mosquito breeding grounds include flower pots, plant saucers, buckets and even plants that hold water in their foliage. Untended swimming pools, underground storm drains, and flood control channels are also fertile mosquito breeding grounds. The presence of backyard pools and water features is

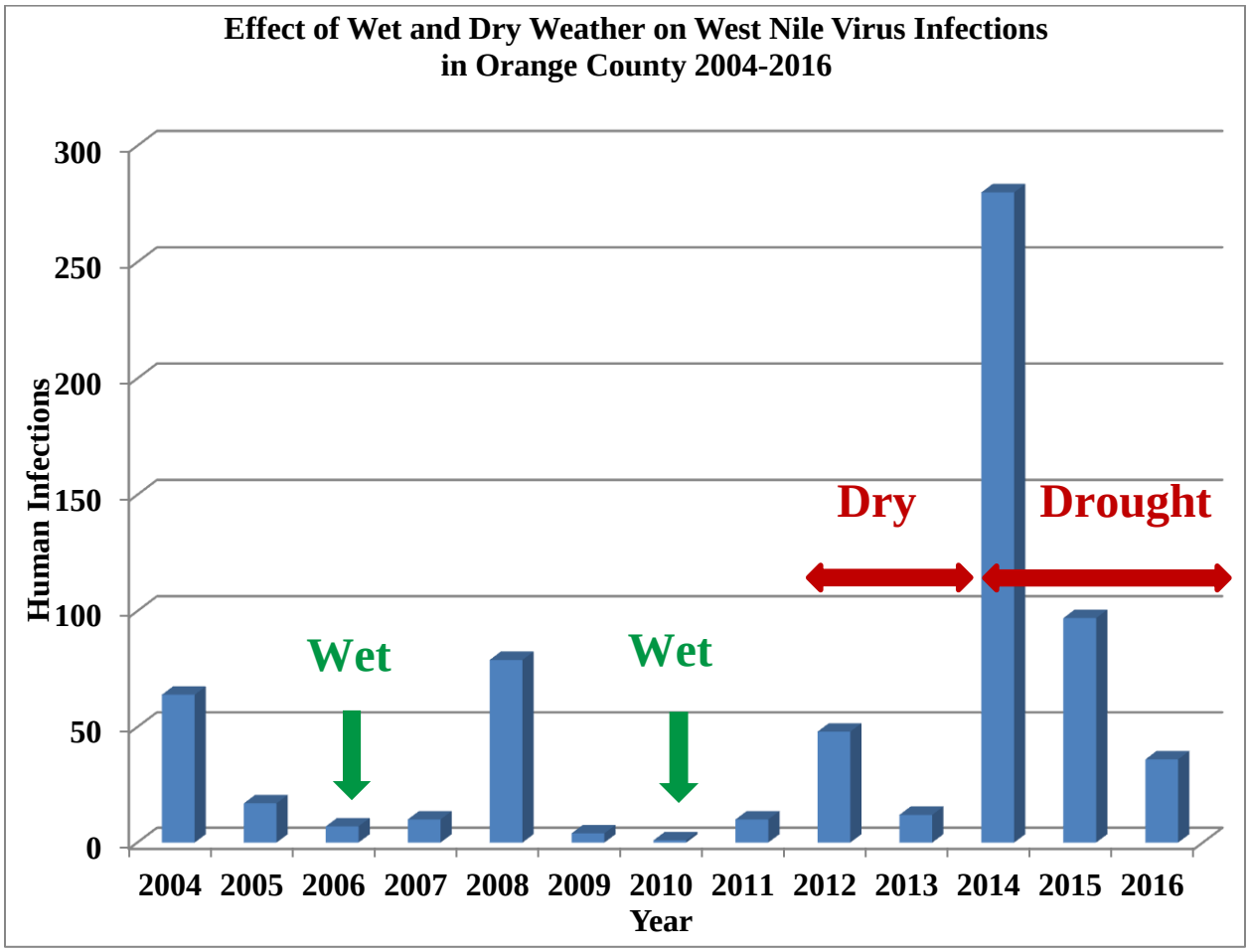
extensive in Orange County. Most adult mosquitoes can live their whole lives within one backyard and fly only short distances in their lifetime. Orange County mosquitoes that transmit disease are active in the daytime and prefer temperatures above 70 degrees. Mosquito control is largely a seasonal concern, as mosquito breeding slows down—but does not cease—in the winter (see Figure 2).

Figure 2



The county's aging storm drain infrastructure has been identified as a significant mosquito breeding ground. Evaluation of storm drains in some Orange County cities reveals large drain areas of relatively flat elevation with minimal drainage flow. Light steady rainfall followed by a pattern of warm weather has been found to prime storm drains with the perfect conditions (warm weather with standing water) for mosquito breeding. The VCD has found that drought conditions have not dampened breeding activity (see Figure 3). Many of the county's storm drains are compromised and require repair or replacement, as they allow seepage and other water intrusion. Vast mosquito breeding areas are hiding underground in many areas of Orange County.

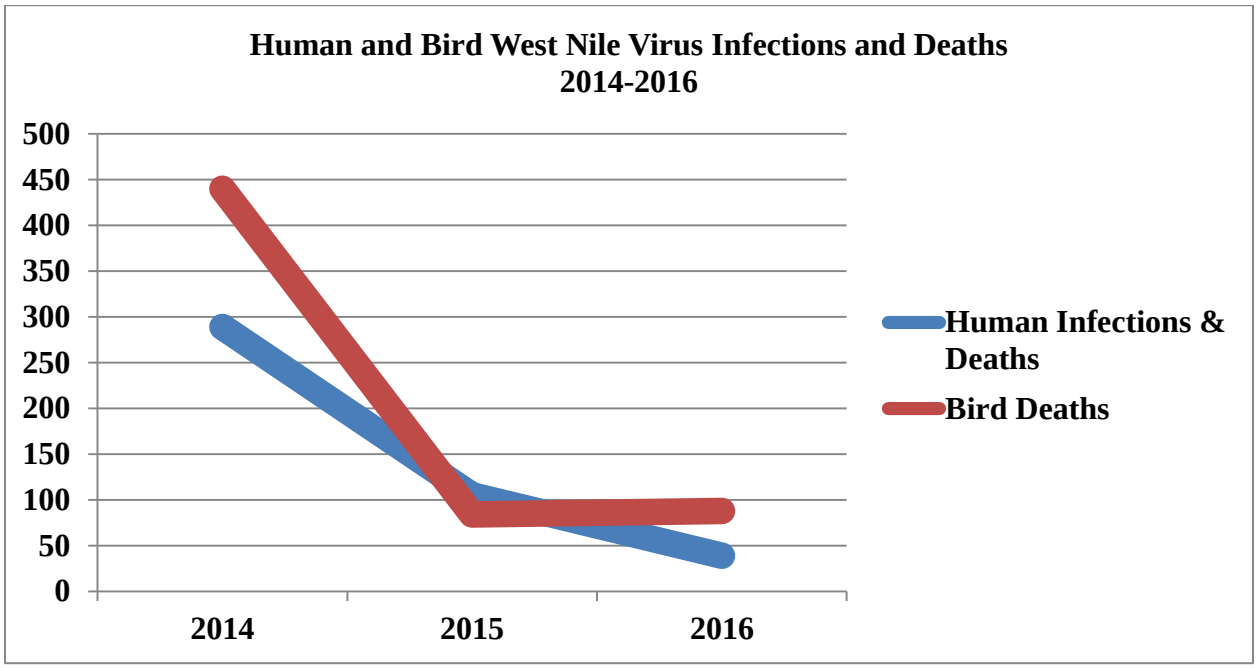
Figure 3



Mosquito Life Cycles

It only takes a week from egg to adult mosquito, though eggs can remain dormant for years awaiting the right conditions to hatch. Most mosquito-borne viruses can be found in wild birds, forming a cycle of infection with mosquitoes, separate from the cycle of infection between mosquitoes and humans. Dead birds, therefore, can be a harbinger of active disease (see Figure 4).

Figure 4



Disease-Carrying Mosquitoes

There are currently 23 mosquito species in Orange County, a number of which carry disease. These include the black-and-white striped Yellow Fever and Asian Tiger mosquitoes (*Aedes* species) that transmit Zika virus and several *Culex* species that transmit WNV.

Topography

Because water collects more readily in flat areas than hilly ones, North Orange County (Santa Ana, Anaheim, La Habra, parts of Fullerton, etc.) has more mosquito breeding grounds and therefore more related illnesses than South County. Flat areas also harbor more underground storm drains that collect standing water.

Beliefs and Attitudes of Residents

Southern California is known for sunshine and beaches, not wet and humid conditions or nuisance mosquitoes. Most people never receive (or notice) any mosquito bites throughout their Orange County residency. As a result, residents tend to dismiss alarms regarding mosquito-borne illnesses and calls-to-action regarding protection from potentially dangerous mosquito bites.

Globalization and Trade

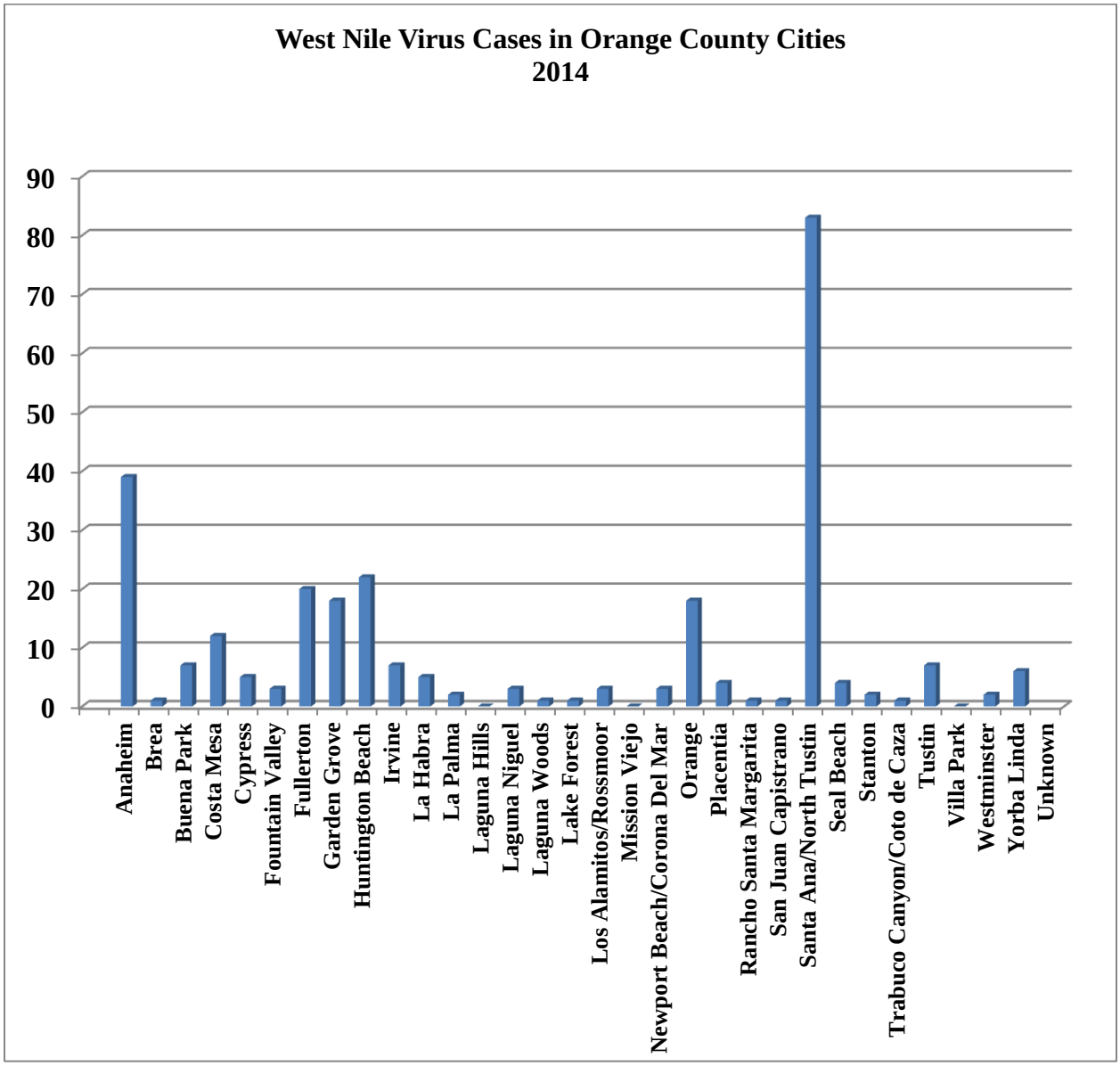
In this age of global travel and trade, vectors and infection travel great distances with ease and alarming speed. The Asian Tiger (Zika) mosquito's transfer to the U.S. is known to have been via a tire shipment in the 1980s (Saulny, 1999), and later was introduced separately into California in a bamboo shipment (University of California, Riverside, 2016).

West Nile Virus

The immediate concern of the VCD is WNV, a deadly virus with significant health impacts. WNV illness can manifest itself in three different ways: (1) In 70%-80% of those infected, there are no symptoms; (2) About 1 in 5 infected people will develop a fever with other nonspecific symptoms like headaches, body aches, joint pains, vomiting, diarrhea or rash; and (3) The most serious WNV infection occurs in 1% of infected people, particularly among vulnerable populations (e.g., those with complicated medical problems) and those over 60, manifesting in neurological illness. This neurological illness (encephalitis or meningitis) affects the brain and similar tissues, takes weeks or months to resolve, and may cause long-lasting complications or death (Centers for Disease Control, 2015). The more severe cases of WNV are primarily identified by medical specialists, such as infectious disease doctors and neurologists, and in research laboratories, including those of state and federal agencies.

Orange County has been important in the history of WNV in the United States. Researchers at the University of California, Irvine, first identified the virus from a 1999 New York City outbreak sample (Roehrig, 2013). WNV began to appear in Orange County in 2004. In 2014, Orange County was ground zero in the nation for WNV illness, with 289 confirmed cases and 7 deaths (see Figure 5). According to the VCD, a mosquito infection rate ("positive") of 5% in area trap collection is considered an epidemic. Some 2014 VCD traps had a 30% positive rate for WNV (see Appendix A).

Figure 5



Zika Virus

The spread of Zika virus, and the 2016 outbreak in Florida, have caused alarm across the nation. The U.S. Congress allocated $1.1 billion to fight the spread and effects of the virus (Kodjak, 2016). A big concern, particularly of vector control, health care agencies and epidemiologists, has been the lack of knowledge about the short and long term effects of Zika. Information about the virus is constantly being updated, making it difficult to accurately alert the public to the definitive health risks.

Zika virus is spread mainly through the bite of two *Aedes* mosquito species, which have been found in many areas of Orange County, including Buena Park, Huntington Beach, Mission Viejo, Orange and Costa Mesa. The virus was first thought to cause only mild symptoms like a fever and rash, but in 2016 Zika was linked to severe birth defects including babies born with microcephaly (abnormally small heads) and a rare neurological illness, Guillain-Barre syndrome, that can cause death or temporary paralysis. It has also been reported that evidence of microcephaly can appear many months after birth, suggesting that other cognitive or physiological impairments in babies may not be detected until even later in their development (Belluck, 2016). These possibilities are being monitored by health agencies and researchers worldwide.

The VCD expressed concern that dominant patterns of *Aedes* behavior and life cycle relative to other coexisting mosquito populations predicts geographical expansion of their territory at the expense of other mosquitoes. If the spread of the Zika mosquito follows the predicted path, this disease will likely be of major concern in 5-8 years. If left unchecked, the sole limiting factor may be the local range of the mosquito, which is about 1,500 feet.

Recent international health agency bulletins have noted that this virus can be spread through human fluids, as well as through the more common mosquito-bite introduction. There is conclusive evidence that the Zika virus can be transmitted through sexual contact (D'Ortenaio, 2016). It is not clear how long the virus remains in the body. Initial indications suggested viral RNA can be present for up to 2 weeks, but there are now reports that elements of the virus may persist in the human body for months. There are reports of Zika virus in vaginal fluid for weeks and seminal fluid for more than six months after the first symptoms of infection (Fox, 2016) (Centers for Disease Control, 2016). Human virus carriers potentially extend the range and time of transmission of Zika virus considerably. Orange County has not yet confirmed any cases of local transmission of the virus, but it is likely just a matter of time until this happens.

A recent media release illustrates a call to behavioral change directed at Florida residents during the 2016 Zika outbreak there: "*People who recently traveled from a region affected by the outbreak…are encouraged to reduce the potential for the spread of the virus…by minimizing contact with vulnerable populations…These mosquitoes are found in areas that collect and hold water around homes in places like tin cans, old tires, buckets, unused plastic swimming pools… It's also important to remove or refresh water in bird baths and pet dishes at least every week. Controlling these mosquitoes is really a community effort…We need all residents to look around their homes to see how they can help lower the risk of contact with these mosquitoes by eliminating unnecessary standing water.*" (Proudfit, 2016)

Other Mosquito-Borne Illnesses

In addition to WNV and Zika, cases of other mosquito-borne illness in Orange County include chikungunya, dengue fever, St. Louis encephalitis and yellow fever. Most cause a mild infection with fever and other minor symptoms. Although rarely lethal, all can cause severe and disabling symptoms to develop, especially in vulnerable people. Chikungunya, dengue fever and yellow fever are transmitted to people by *Aedes* mosquitoes, as is Zika virus. Like WNV, St. Louis encephalitis is transmitted by *Culex* mosquitoes and maintained in a cycle with wild birds. Only

yellow fever has a vaccine for the prevention of the infection. Protection against mosquito bites is the most important preventive measure for these and other mosquito-borne illnesses.

For generations, in much of the world, malaria has been—and still is—a scourge. We have seen new mosquito-borne illnesses with serious consequences appear with regularity and spread quickly across the globe. Late in 2016, there was news of an outbreak of a new mosquito-borne virus similar to chikungunya called Mayaro. More than 100,000 cases of Mayaro virus were confirmed in the Americas in September, 2016 (Sohn, 2016).

Mosquito Control Measures

Control of disease-carrying vectors, including mosquitoes, is a primary responsibility of the VCD. Their arsenal includes measures for attacking both larval and adult stages of the mosquito life cycle. They have had success with chemical and biological control of immature mosquitoes in backyard pools, fountains and other larger bodies of stagnant water. Mosquito fish that prey on mosquito larvae, an example of biological control, can be provided to homeowners free of charge.

The most basic control measures for mosquitoes, however, are homeowner activities. In addition to maintaining water features and any other potential breeding grounds around their property, residents can ensure window screens are intact and personal space is protected from mosquitoes with appropriate clothing and effective repellant.

The most controversial measure is aerial spraying. The current state of chemical warfare against mosquitoes is far advanced from the days of DDT. The amounts of chemical active ingredient used are very small and many studies have shown the newer chemicals to be harmless to humans, pets and the environment. The VCD has refined their most commonly used spraying technique to allow targeted application in small areas using backpacks. They analyze sophisticated environmental monitoring to maximize effect while minimizing side effects. The district reports that aerial spraying on a larger scale is relatively cheap and has been very effective elsewhere, including Northern California and other areas of the nation and the globe. Truck-mounted spraying is used sparingly not only because of public opposition, but because mosquitoes can build resistance to the insecticide. Aerial spraying remains a viable mosquito control measure in the VCD toolkit.

The largely undisturbed underground mosquito breeding grounds in the county, the aging storm drains, are being addressed aggressively. The VCD recently hired additional personnel to promote the mapping of the storm drains across Orange County and to work with the cities on corrective infrastructure and mosquito eradication measures. According to the district, prior to the hire only one city was mapping storm drains. Mapping is essential to developing proper remediation and treatment methods to enable seasonal eradication of the larva. This can be a costly and time consuming task.

Collection of Mosquito Population Data

The VCD collects longitudinal data on all vectors in OC. This data is used to identify and target areas for treatment and education. The district uses approximately 100 mosquito traps placed throughout the County to collect live samples for evaluation in their lab. They are able to increase sample sites in a targeted area when laboratory analyses show trigger levels of infected mosquitoes. Coupled with data from models that take a number of factors into consideration, this effort allows the district to refine their predictions of outbreak severity and focus eradication or control efforts more effectively in "hot spots" of mosquito and illness activity (see Appendix B).

These procedures for monitoring mosquito populations do not always succeed. In 2016 an outbreak of WNV in La Habra surprised the VCD, resulting in reactive responses. Unfortunately, the outbreak resulted in the first 2016 WNV death in the county. Traps were redeployed from other areas and strike teams were sent into the active neighborhoods to inspect backyards, educate residents on protection and eradication measures, and control mosquito populations.

The VCD also educates the public about indicators of disease in infected birds. They advocate reporting dead birds, and will collect them from any part of the county for laboratory analysis to detect WNV. The district also educates people that birds commonly do not fly into windows; birds that die from this should be reported to and collected by the VCD.

Revenue Sources

The VCD has three primary sources of income, Ad Valorem property taxes and two benefit assessments, Assessment District No. 1 and Assessment District No. 2. Together, these sources account for 94% of VCD's 2016-2017 revenues.

Assessment District No. 2 (AD2) is the largest source of revenues at $5.6 million. Known as the Mosquito, Fire Ant, and Disease Control Assessment, the AD2's maximum authorized assessment per Single Family Equivalent (SFE) is governed by a 2004 voter-approved maximum base rate of $5.42 SFE for that year. The ballot measure included an annual adjustment going forward of no more than 3%, based on the Consumer Price Index for the Los Angeles area. The current maximum authorized rate is $7.10 per SFE.

Since its inception, AD2 has been consistently levied below the maximum authorized level. For this year, the actual rate requested was $6.72 per SFE. The increase was budgeted to support VCD's mosquito response and strike teams, a new position to address storm drain mosquito control, and pesticides for the latter effort. While the $6.72 per SFE represents an increase over the $6.02 per SFE in the 2015-2016 budget, it remains below the maximum authorized levy. If the VCD Board of Trustees had authorized the maximum allowed levy for 2016-2017, it would have generated an additional $316,000 for the VCD.

Communications

Because many important mosquito control measures are under the control of members of the public, education is critical. Unfortunately, Orange County residents maintain entrenched beliefs that are counter to healthy behaviors that protect individuals and the public from mosquito-borne diseases, but concerted education efforts in other health risk arenas, such as tobacco smoking, have worked over time. Both the VCD and HCA realize the importance of communications and have active outreach efforts in place.

Given the small staff dedicated to communications, the VCD is to be commended for fostering a culture of public service in its multifaceted communications and outreach plan. In recent years, the VCD has annually conducted over 50 public outreach events and produced more than 150 media publications in multiple languages. District members also make 20-30 public presentations per year. In 2016, over 50,000 Orange County homes were visited by 80 teams going door-to-door. More than 30,000 informational flyers, posters and bulletins, many multilingual, were made available to the public, and in 2016 there were over 65,000 visits to the VCD website, which is updated weekly. The district redesigned their brochures in 2016, added universal literacy materials, created an email notification system and initiated an interpretive exhibit at the Santa Ana Zoo. A new vector exhibit at the Discovery Cube, including a teach-the-teacher program, was implemented in August 2016. The Inspector Training Course guides Cube visitors through a competitive hunt to find and eliminate mosquitoes and other backyard vectors.

The VCD works closely with the HCA, especially during mosquito season, communicating updates to the agency's health professionals and those responsible for communications regarding mosquito activity in the county, particularly in the northern part of the county. HCA's communication efforts are focused on medical professionals, using opt-in alerts about a wide range of health risks, as doctors and health care providers are an important first line of defense against the spread of infectious diseases.

Communications about patient illnesses are governed by strict guidelines. When Orange County cases of WNV or other mosquito-borne illnesses are reported, HCA is triggered to take action to prevent the spread of disease within parameters set by the 1996 U.S. Health Insurance Portability and Accountability Act (HIPAA). Working closely together, the HCA and VCD are guided by memoranda of understanding (MOUs), deciding together on actions to protect public health while maintaining patient privacy. VCD deploys teams to neighborhoods of concern, canvassing the area on foot with verbal and written communications about mosquito control measures and gathering evidence of mosquito infestation for targeted eradication activities. HCA, meanwhile, becomes more active in treatment and education efforts with medical personnel.

Being effective at community education is an important stated goal of both agencies. In 2014, VCD measured their outreach effectiveness by piggy-backing on a countywide voter telephone survey of approximately 500 residents. The three pertinent questions addressed several vectors, including mosquitoes. Results showed that only about half of Orange County residents are aware that VCD is available to help control backyard mosquitoes, despite the fact that almost

80% have contacted the district for help of some type. The VCD has also gathered online data to measure website activity levels.

CONCLUSION

The key to successful intervention in mosquito-borne virus control is proactive communication with, and education of, the public. The VCD has the tools to identify "hot spots" of vector outbreak and are doing their part in maintaining and using an array of eradication measures. The effective, early and immediate sharing of mosquito population information with the public and medical professionals is crucial. The VCD has been more reactive to vector outbreaks in the past, but is now moving towards being proactive. They have the personnel and tools in place to maintain communication with the public at the current levels. However, increases in personnel or refocusing existing personnel into areas of communication and education will aid the district in being more proactive and expanding their reach. The district has an experienced and well-equipped lab to identify disease agents. Increasing the number of mosquito traps and lab personnel will enable the VCD to determine the presence of a virus more quickly.

Mosquitoes are equal-opportunity vectors. While focus on historical areas of infection is a good use of resources, the La Habra surprise outbreak points out the weakness of this approach. With the expected growth, development and demographic shifts in South Orange County, historically a low risk area, it behooves VCD to be proactively vigilant across the county.

In recent years the VCD has expanded its toolbox for identifying and controlling the vectors. To become more effective, the district and its partners at the HCA need to stay focused on proactive communications. In addition, the VCD must be proactive in monitoring and eradicating mosquitoes, but will need the help of their Board of Trustees, the County Board of Supervisors, the HCA, Orange County cities, and the public to succeed.

FINDINGS

In accordance with California Penal Code Sections §933 and §933.05, the 2016-2017 Grand Jury requires (or, as noted, requests) responses from each agency affected by the findings presented in this section. The responses are to be submitted to the Presiding Judge of the Superior Court.

Based on its investigation titled "Is Orange County Ready for Zika? It Takes a Village to Handle Mosquito-Borne Viruses," the 2016-2017 Orange County Grand Jury has arrived at 9 principal findings, as follows:

F.1. The VCD and HCA have primarily responded to vector outbreaks in a reactive manner in the past. The VCD wants to be more proactive in the future.

F.2. The VCD relies on the public to help identify new sources of infestation. This cooperation is essential for future success.

F.3. The VCD uses multiple media, including print materials, their website, email and social media, as well as in-person activities, as part of their outreach efforts. The HCA focuses on print and opt-in email alerts and bulletins to medical professionals.

F.4. The presence of undocumented storm drains in Orange County cities makes control of mosquito vectors more difficult.

F.5 Communication about vector diseases directed to treatment facilities such as private and public clinics, hospitals, nursing homes and doctor offices has not translated into timely and effective public education about the prevention and avoidance of infectious diseases.

F. 6. Mosquito control and education efforts in the county are concentrated on historical areas of infestation and illness in North County.

F. 7. The VCD Board of Trustees' spending authorization has not been sufficient to accomplish VCD's current goals.

F. 8. In delineating responsibilities of each agency, the existing MOUs between VCD and HCA do not adequately promote effective communications about mosquito-borne diseases and their remediation to the public, including medical professionals and their patients.

F.9. Despite significant scientific and experiential evidence that aerial spraying is effective and safe, the regional public and the VCD Board of Trustees are reluctant to support the use of aerial spraying when recommended by VCD.

Penal Code §933 and §933.05 require governing bodies and elected officials to which a report is directed to respond to findings and recommendations. Responses are requested from departments of local agencies and their non-elected department heads.

RECOMMENDATIONS

In accordance with California Penal Code Sections §933 and §933.05, the 2016-2017 Grand Jury requires (or, as noted, requests) responses from each agency affected by the recommendations presented in this section. The responses are to be submitted to the Presiding Judge of the Superior Court.

Based on its investigation titled "Is Orange County Ready for Zika? It Takes a Village to Handle Mosquito-Borne Viruses," the 2016-2017 Orange County Grand Jury makes the following 9 recommendations:

R.1. VCD must continue to prioritize its funding allocations for communicating with the public. To increase this effort, the Grand Jury recommends that the district ask their Board of Trustees to authorize maximizing the District 2 assessment for the benefit of VCD by June 30, 2017. These funds should be used first by the VCD for more proactive outreach efforts throughout the county.

R.2. The Grand Jury recommends that efforts focusing on early education information of school children be expanded in content and reach by December 30, 2017.

R.3. Getting information to vulnerable populations (seniors, the chronically ill, pregnant women, etc.) is critical. The Grand Jury recommends that detailed plans for implementing new or expanded programs targeting vulnerable populations all over the county should be in place by VCD and HCA by June 30, 2017, for implementation no later than March 31, 2018.

R.4. The Grand Jury recommends that the VCD provide the Orange County Board of Supervisors with a ranked list of cities that represent primary concern for storm drain mosquito infestation, as soon as possible to facilitate remediation efforts by the next mosquito season, but no later than June 30, 2017.

R. 5. The Grand Jury recommends that, by June 30, 2017, the Orange County Board of Supervisors notify each city of concern in their Supervisorial Districts that their storm drains represent significant sources of mosquito breeding grounds.

R. 6. The Grand Jury recommends that the Orange County Board of Supervisors advise cities of concern to schedule by September 30, 2017, and fund by December 31, 2017, thorough mapping of storm drains within city limits, as well as assessment of the condition and need for storm drain repairs. The Grand Jury recommends the Board of Supervisors financially support this effort.

R.7. The VCD must work with HCA to expand efforts to proactively reach clinics, nursing homes and medical agencies with communications that will protect patients from mosquito-borne illnesses. The Grand Jury recommends that the MOU between the VCA and the HCA regarding such communications be updated by June 30, 2017.

R. 8. The HCA should be more active in communicating with medical professionals using targeted and opt-out alerts and bulletins, as well as instituting measures of effectiveness in these targeted messages. Where possible, they should take advantage of mobile technology to immediately reach physicians and others in the health care trenches earlier in the cycle of mosquito infestation, even before illness is reported. An HCA Communications Plan that addresses these issues should be completed by June 30, 2017, and implemented by December 31, 2017.

R. 9. The VCD needs new, valid and reliable qualitative and quantitative measures of outreach effectiveness to guide their communications program and make best use of their resources. This element should be added to the VCD Communications Plan by June 30, 2017, and implemented by March 30, 2018.

REQUIRED RESPONSES

The *California Penal Code* §933 requires the governing body of any public agency which the Grand Jury has reviewed, and about which it has issued a final report, to comment to the Presiding Judge of the Superior Court on the findings and recommendations pertaining to matters under the control of the governing body. Such comment shall be made no later than 90 days after the Grand Jury publishes its report (filed with the Clerk of the Court). Additionally, in the

case of a report containing findings and recommendations pertaining to a department or agency headed by an elected County official (e.g. District Attorney, Sheriff, etc.), such elected County official shall comment on the findings and recommendations pertaining to the matters under that elected official's control within 60 days to the Presiding Judge with an information copy sent to the Board of Supervisors.

Furthermore, California Penal Code Section §933.05 (a), (b), (c), details, as follows, the manner in which such comment(s) are to be made:

(a) As to each Grand Jury finding, the responding person or entity shall indicate one of the following:

(1) The respondent agrees with the finding;

(2) The respondent disagrees wholly or partially with the finding, in which case the response shall specify the portion of the finding that is disputed and shall include an explanation of the reasons therefore.

(b) As to each Grand Jury recommendation, the responding person or entity shall report one of the following actions:

(1) The recommendation has been implemented, with a summary regarding the implemented action;

(2) The recommendation has not yet been implemented, but will be implemented in the future, with a time frame for implementation;

(3) The recommendation requires further analysis, with an explanation and the scope and parameters of an analysis or study, and a time frame for the matter to be prepared for discussion by the officer or head of the agency or department being investigated or reviewed, including the governing body of the public agency when applicable. This time frame shall not exceed six months from the date of publication of the Grand Jury report;

(4) The recommendation will not be implemented because it is not warranted or is not reasonable, with an explanation therefore.

(c) If a finding or recommendation of the Grand Jury addresses budgetary or personnel matters of a county agency or department headed by an elected officer, both the agency or department head and the Board of Supervisors shall respond if requested by the Grand Jury, but the response of the Board of Supervisors shall address only those budgetary /or personnel matters over which it has some decision making authority. The response of the elected agency or department head shall address all aspects of the findings or recommendations affecting his or her agency or department.

Comments to the Presiding Judge of the Superior Court in compliance with Penal Code section §933.05 are required or requested from:

Responses Required:

Responses are required from the following governing bodies within 90 days of the date of publication of this report**:**

Board of Trustees, Orange County Mosquito and Vector Control District (Findings 1-9; Recommendations 1 - 4, 7, 9).

Orange County Board of Supervisors (Recommendations 4-6, 8).

Responses Requested:

Responses are requested from the following agency within 90 days of the date of publication of this report:
Orange County Health Care Agency (Findings 1, 3, 5, 8; Recommendations 3, 7-8).

REFERENCES

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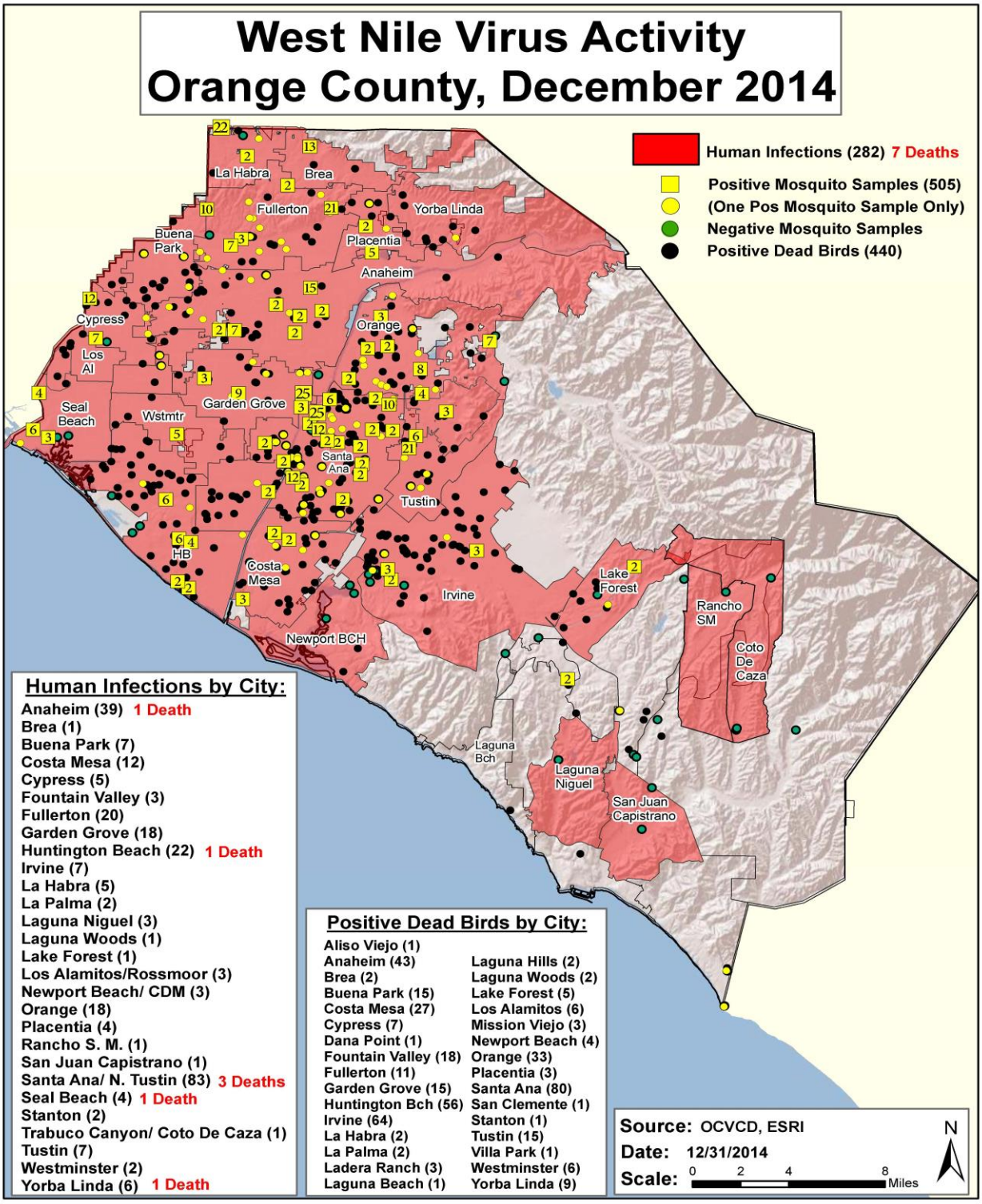
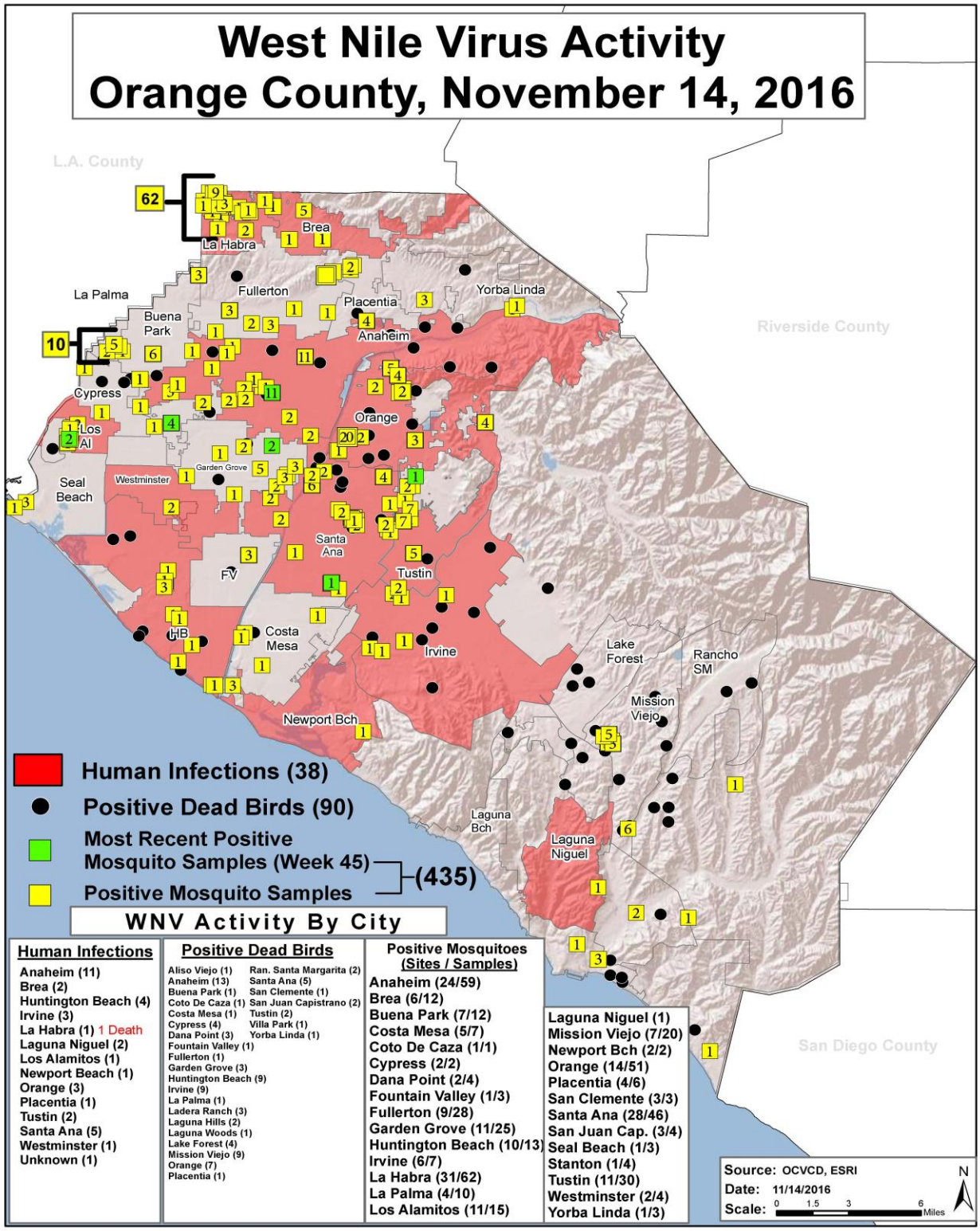
APPENDICES

Appendix A



Source: http://www.ocvector.org/Maps/2014_update_map.jpg

Appendix B



Source: http://www.ocvector.org/Maps/2016_update_map.jpg