MINUTES OF BOARD OF HEALTH MEETING

December 6, 2017

Call to Order: Meeting was called to order by Chair Kraft at 6:00 p.m.

Board of Health Members Present: Chair Kraft, Supervisor Peer, Supervisor Bostwick (left at 7:00pm), Dr. Meyers, Mr. Gresens, Ms. Wade, Supervisor Garrett, Dr. Winter, Dr. Somaraju

Board of Health Members Absent:

Staff Members Present: Marie-Noel Sandoval – Health Officer; Dave Pluymers – Assistant Director; Rick Wietersen – Environmental Health Director; Michelle Bailey – Nursing Supervisor; Kelly Klingensmith – Community Health Education Coordinator; Molly Polk – Account Clerk; Jessica Turner – Administrative Secretary ; Jo Ames – Public Health Nurse; Hillary Harrie – Public Health Nurse; and Mark Seymour – Sanitarian II

Others Present: Coral Swanson – League of Women Voters

Adopt Agenda

Dr. Meyers made a motion to adopt the agenda. Ms. Wade seconded the motion. MOTION APPROVED.

Approval of Minutes – 11/1/17

Mr. Bostwick made a motion to approve the minutes of the 11/1/17 Board of Health meeting. Mr. Gresens seconded the motion. MOTION APPROVED.

Citizen Participation

Ms. Swanson introduced herself to the Board and explained her involvement with the League of Women Voters.

New Business

Dr. Somaraju introduced herself to the Board.

Administrative Division

Review of Payments

The Board reviewed the Health Department's November 2017 payments in the amount of $22,750.34. Chair Kraft asked about the copy paper and whether or not it could be ordered through Office Pro to obtain the county deal. Office Pro is the current copy paper vendor for the department.

Transfer of Funds over $5,000

None at this time.

Health Department Report

In the News

Ms. Sandoval shared the Wisconsin County Association Report with the Board and distributed copies. There were three topics covered on Public Health in the report. Sixty-one resolutions were brought forth at the 2016 conference, with four being from Rock County. Of these four, three were health related.

Ms. Sandoval also shared a report from the newspaper regarding a drug resistant strain causing diarrhea with two cases in Rock County.

The Janesville Gazette published a front page article, the Sunday after Thanksgiving, on the Food Desert in Rock County and obesity. Ms. Sandoval shared that Public Health is doing the following to address these issues: Beloit and Comprehensive Plans, collaborative efforts with Rock County Trails, HEAR (Health Equity Alliance of Rock County) has established obesity and food availability objectives and collaboration with UW Madison School of Public Health and Master's Students.

Ms. Sandoval shared ACE (Adverse Childhood Experiences) Articles – Adverse Childhood Experiences with the board. The ACE scores are determined by an eight question survey and are linked to adult experiences and behaviors. A handout was presented on how ACEs are identified and measured. The Health Department is partnering with Janesville Mobilizing for Change and working on establishing more trauma-informed community support. On February 28th, at the all staff meeting for the Health Department, there will be a training on ACEs and the Board is welcome to attend. The training will be held from 9:30am-11:00am and will be facilitated by Janesville Mobilizing for Change. Ms. Sandoval will e-mail the Board with a reminder, closer to the date.

1. Supervisor Garrett suggested inviting the Human Services Board members as well, as she felt there would be an interest. Followed by a suggestion by Supervisor Peer to use the Behavioral Health Redesign as a resource for these efforts.
2. Dr. Somaraju asked how behavioral issues and mental health issues are differentiated. Ms. Sandoval stated that the training is more of an awareness of the overall issues to work towards intervention and prevention in Public Health.
    a. Ms. Klingensmith shared that ACEs are affecting multiple issues in Rock County (i.e. Obesity)
        i. Three areas are being looked at to improve upon these scores:
            1. Protective Factors Training
            2. Prevention Efforts (evidence based practice)
            3. Create Trauma-Informed community (The training that will be provided at the all-staff meeting is a part of this effort.)
    b. Mr. Pluymers reiterated Kelly's comments and believes there's an opportunity to work closer with Human Services and becoming more aware of ACEs will assist in that.

c. Chair Kraft shared that Janesville was contacted by the National Fitness Campaign to build a Fitness Court. This includes a $10,000 Grant and SSM Health offered to contribute $40,000. The entire project has an estimated cost of $100,000. The court would be downtown Janesville and Chair Kraft forwarded the information on to Ms. Klingensmith. Ms. Klingensmith will be attending the meetings for this project with Abby Diehl (Health Educator at the Health Department).

3. Ms. Klingensmith discussed the YRBS (Youth Risk Behavior Survey) coordination effort in Rock County. They are working on standardize data collection and passive consent from parents for students to take part in the survey.
4. The Rock County Public Health Department will be partnering with HealthNet to obtain a Vista Volunteer in February. The Vista Volunteer will be house at the Beloit office and will be with the department for a year. This individual will gather and compile data on the opioid issue in Rock County.

Surveillance

Ms. Sandoval stated that this area has been fairly quiet. She stated that there was one case of influenza in a 62 year-old individual, as well as one hospitalization due to the flu.

Community Events/Outreach

Mr. Wietersen gave an update on the Nitrate Workgroup. They are working on getting at the issue of nitrate in the groundwater. The group is focused in on developing one or more nitrate best management field demonstrations. They have narrowed testing sites down to three areas in county (from 10). These test sites will cover several hundred to 2,000 acres of farm land. The next step is to define areas closer and then work with land owners to get participation to implement best management practices (more nitrate friendly). It is their hope that these best management practices will them be used to demonstrate to agricultural growers. Supervisor Garrett asked about incentives for land owners. Mr. Wietersen acknowledged that there is risk in farmers changing practices. There are funds ("insurance") available from the county, due to the power line monies that are available, for those potential losses. This is not an issue that happened overnight and it cannot be corrected overnight either. There was a recent extension of the workgroup to 2020, from the end of this year. There is a minimum five-year window to look at the best management practices and the workgroup will give periodic updates to the Board.

Supervisor Bostwick feels that there is a good timeline right now and that the buy-in from the land owners is going to be important.

Mr. Gresens shared concern about the buy-in, due to his history with the agriculture industry growing up.

Mr. Wietersen shared that incentives will be a big part of this and feels the workgroup includes some very influential agricultural community members from Rock County.

Chair Kraft informed the Board that Rock County will not be using nitrates in fertilizer moving forward and a contract was just recently signed to finalize this decision.

Ms. Sandoval shared that the current community outreach emphasizes handwashing, to keep foodborne and communicable diseases at bay.

Ms. Klingensmith updated on the HEAR (Health Equity Alliance of Rock County) Committee. The committee is still currently meeting as a large group, but the CHIP (Community Health Improvement Plan) workgroups will begin in January. A reminder to join these workgroups will be sent, if you are interested. The meeting on December 13th will include a presentation by MPH students from Madison. They will be presenting on some of the literature review that they have done and some recommendations that they have. Ms. Klingensmith feels that things are starting to come full circle and there are plans to get started on priorities right away.

An invite to join the steering committee for the WI Healthiest State Summit will be sent out in the near future.

Mr. Wietersen updated the Board on the lead testing that is taking place in schools. The Health Department received a $10,000 grant to perform lead water testing at schools. Letters were sent out to all the elementary schools and Head Start, for a total of 49 letters and the plan is to test about 20 schools. 12 schools in the county have been tested and preliminary information is now in. Some lead issues have been found and follow-up testing is being completed. The goal is to sample eight additional schools over the next month. RCPHD will be meeting with the schools to discuss the results and possible actions they will need to take. A customized plan will be created for each school. Samples are being taken from an average of ten locations per school, all being accessible places for drinking water. Locations are categorized by the type of faucet and one of each category is being tested.

Dr. Somaraju asked if all schools have a common drinking supply. Mr. Wietersen informed the Board that there is one supply coming in and it is the municipal water. Samples are taken as a "first draw," meaning the water sits in the faucet for six-eight hours (overnight). This means that the lead that is showing up is actually from the faucet/plumbing, rather than the municipal supply. After the "first draw" sample, if lead levels appear high, a "flush" sample is taken (water is run for 30 seconds before sampling) to rule out piping issues. A sample is also taken from the closest faucet to the municipal water supply. – Common Drinking Supply?

Ms. Sandoval feels that this effort is enabling us to be at the forefront rather than waiting for an issue to occur and is hopeful that schools will follow through with any recommended interventions.

Dr. Somaraju questioned who will change the faucets.
Mr. Wietersen informed the Board that the schools will be responsible for these efforts, but that RCPHD will help with creating a short-term plan and implanting any long-term plan ideas. There is also grant money allocated to complete follow-up testing.

The notification of parents was discussed. The schools will be responsible for notifying parents. A template will be provided to them and the notification will most likely come in the form of a letter from the school/district.

Mr. Gresens inquired about the testing that is taking place at Edgerton Schools.
Mr. Wietersen shared that the lead exceedance in the routine municipal testing prompted the Edgerton School District to obtain a consultant to complete their own testing. He believes they are being proactive by testing schools on their own. There is a hope that Rock County efforts will lead to other areas/states doing some of the same testing.
Supervisor Peer emphasized that he is glad this isn't an "I got ya," but rather a "we want to help." Followed by a discussion about the importance of knowing the issues and being able to correct them. This is a very positive effort. Mr. Wietersen also came across some grants that schools could apply for, if a lead issue is found. These grants are found on the state and national levels for replacing plumbing and a list will be distributed to the necessary schools, enabling the efforts to continue to be proactive.
Dr. Somaraju suggested involving community stakeholders, as well, to possibly sponsor any corrective actions that are necessary.

Mr. Wietersen will provide more updates on the progress at the next Board Meeting.

Ms. Sandoval shared that the department is tightening up on their immunization appointment screening process. There is a small amount of funding available for uninsured and under insured and an effort is being put in place to try to push insured individuals to their provider. We want people to have a medical home. We will continue to see them when there are capacity issues, but we need to save funding for those most in need.

Personnel

We have an epidemiologist position. There are currently 17 applications and the hope is to hire early in the New Year.

The Nursing Supervisor position in the Beloit Office was re-opened until January 5th.

Three interviews were held this week for a Part Time (0.4) Sanitarian position and an offer is in process.

An AHEC Intern application was submitted and was oriented around Health Equity. Health Equity was added as a 2018 MCH Grant Objective.

The All-Staff Retreat was held on November 13th. Only two employees couldn't attend. 97% of attendees rated the retreat "good" to "excellent" and felt it brought value. 60% really liked the group art activity. 30% favored the Emotional Intelligence workshop. 100% want to have another one next year.

Ms. Sandoval asked that suggestions for topics of interest for the upcoming year be sent to her, so they can be added to the calendar. Dr. Somaraju suggested a topic on current infectious diseases to educate the Board Members in a non-medical way, so they can share the information with the community.

Budget

Ms. Sandoval shared that the 2018 Public Health budget was approved as presented.
Rock County was among 75 applicants for the Generations Grant, but did not receive the award. The FDA Grant also was not awarded to Rock County. However, an application is in process for a $3000 FDA Grant. RCPHD was awarded the Prescription Drug Grant.

Discussion and Possible Action on Youth Risk Behavior Survey Issue Paper

The YRBS (Youth Risk Behavior Survey) presentation, from last month, by Ms. Klingensmith is in the agenda packet for this month.
Chair Kraft asked if the committee would get to see the questions that will be asked on the survey and a list of questions was passed around.
Ms. Klingensmith shared that the YRBS coalition met on Monday and the questions were decided on at that time. There were guidance counselors from the schools present at that meeting. There were originally 110 questions, which have been cut down to 89. The survey usually takes students about 20 minutes or less to complete and is completed at the Middle School and High Schools. Many of the questions that were chosen are required by guarantors and Ms. Klingensmith let the committee know that Public Health could support the questions. The survey is completed electronically and time is set aside for the students to complete it. There is hope to get the survey down to 50 questions by 2020.
The issue of what was being done with the results of the survey and the accountability piece were discussed. It is felt that Superintendents need to be talking about this and people need to be held responsible and that this is a public relations/accountability issue. Ms. Klingensmith felt this was something that should have been done a long time ago to build the accountability piece. This enables us to monitor the health of the population and

builds a role and structure to build in accountability aspects and educate the public on what the Health Department is and what we do. We are here to help, not to chastise. RCPHD is able to provide technical expertise and connections with other schools. These collaborative efforts are being well received. It is much easier to change kids than adults and the grant funding and prevention efforts are assisting in making that possible.
Mr. Pluymers feels we can prove to be a great partner for the schools. Doing the survey is one thing, but the data analysis is the bigger challenge and that is something that we can offer. Schools have been eager to accept this offer.
The questions on the survey are not open-ended. They are a combination of multiple choice, yes/no and scales. The YRBS Issue Paper was presented for signatures from the Board with the hope of having signatures right away. The group is excited that the BOH is on board and eager to reach out to schools with the opportunity. The survey is scheduled to go live from January 1st-April 15th and Ms. Klingensmith is looking to see if schools can still get on board after the start date. There has been some apprehension from schools due to media and bad press, but it was suggested that the pros be discussed with these outlets before they get ahold of the negative. We need to educate the media and having a reporter at the Gazette that we have worked closely with in the past will help with that. Schools are overwhelmed, but by taking a positive approach and trying to provide as many tools as possible, there is hope that more schools will be on board, working with the solution-based group. Schools use either an active or a passive consent for the survey. Active consent means the parents have to opt-in (Yes, I want my child to take the survey). Passive consent means the parents have to opt-out (No, I do not want my child to take the survey).
Ms. Sandoval provided the Board with a Passive Consent example. There was some concern from the Board that the survey seemed very negative and depressing. Ms. Klingensmith shared that there is data that shows that the survey does not encourage kids to participate in risky behavior. The survey was created by the Centers for Disease Control (CDC) and is intended to measure risk behaviors in youth. Mr. Pluymers stated that most of the questions are required by grants and summarized the Issue Paper for the Board. Ms. Wade made a motion to approve the Issue Paper. Ms. Meyers seconded that motion. The Board of Health members all signed the Issue Paper in support of broad and uniform application of the YRBS, in Rock County-based school districts.

Ms. Klingensmith explained to the Board that RCPHD would like to use this to strengthen the relationship with schools, so they will look to us as a resource/support. The survey is completed during advisory group and completed every other year, to measure long-term outcomes.

WCA Handouts
Ms. Garrett distributed handouts to the Board and shared that at the end of September, 12 people from the county went to the WCA Convention, in LaCrosse. This is an annual event and very informative. Ms. Garrett wanted to share three things and give the Board access to some of the material that is received at these conferences.

The first topic Ms. Garrett discussed was medication assisted treatment and support, feeling it is important for us all to know that we are trying to treat individuals who have opioid dependence with medications and suggested that this possibly be a future agenda item. There are only a couple people in the county that are able to prescribe these medications and that is not enough, as we have an epidemic in Rock County. Ms. Klingensmith shared that she is meeting with Sauk County on Friday morning to talk to them about what they're doing and share Community Conversations/HEAR work. She feels that their strategies can be replicated and successful here, in Rock County.

It was discussed that there is concern that suing has not taken place with pharmaceutical companies who have made billions off the opioid epidemic. Rock County developed a resolution around October 12th, that the

County Board voted on, agreed and signed. Chair Kraft informed the Board that a consortium has been made and law firms have been secured, out of Ohio, to work together. Ms. Garrett emphasized that it is important that we keep ourselves aware and direct any monies to the people and children that are directly affected by this crisis.

Mosquito Study Report
Mr. Seymour gave the Board a summary of the attached handout and mosquito surveillance program.

Asthma Grant Report
Jo and Hillary presented a PowerPoint Presentation on the Asthma Control and Prevention Program (see attached).

Communications and Announcements

Adjournment

Mr. Gresens made a motion to adjourn the meeting. Dr. Somaraju seconded the motion. MOTION APPROVED. Meeting adjourned at 8:23p.m.

Respectfully Submitted,

Molly Polk, Recorder
Not Official Until Approved by the Board of Health

Rock County Board of Health
Issue Paper – Youth Risk Behavior Survey (YRBS)

December 6, 2017

Introduction to the YRBS

According to the Centers for Disease Control and Prevention (CDC), the Youth Risk Behavior Survey (YRBS) monitors six types of health-risk behaviors that contribute to the leading causes of death and disability among youth and young adults. The YRBS is a national school-based system that, from 1991 through 2015, was used to survey more than 3.8 million high school students. According to the Wisconsin Department of Public Instruction (DPI), the YRBS is a local school-based survey of middle and high school students administered every one to two years.

Data from the YRBS can be used to raise awareness of important health issues, to influence societal norms and perceptions, to show the potential need for programmatic funding, and to capture the need for prevention programs for school-aged youth. The YRBS is the primary source of data and information regarding youth health choices and behaviors.

Issue in Rock County

Since its inception in 1990, the YRBS has not been uniformly used or applied in Rock County. As a result, survey data have not been available or have been inconsistent among school districts. In addition, the Rock County Public Health Department (RCPHD) has not had access to the YRBS data.

When shared, data from a broadly and consistently applied YRBS could allow districts to better understand health-risk behaviors, to compare and contrast findings among districts, and to apply for grant and other funding for targeted programs. Shared data would also allow the RCPHD to more effectively consult with schools, to obtain funding, and to better design intervention programs.

The Rock County Board of Health (BOH) seeks and recommends broad and uniform use of the YRBS across the eight Rock County-based school districts. In addition, the BOH recommends sharing of aggregate county-wide YRBS data with partners including, but not limited to: Rock County-based school districts, prevention coalitions, RCPHD, and with other community organizations working to improve health outcomes for youth and young adults in Rock County.

Discussion

The lack of a broadly and consistently applied YRBS across the Rock County-based schools districts has resulted in incomplete and inconsistent local data on youth health behaviors, attitudes and perceptions, and protective factors. There has been no ability to compare data across school districts. In addition, there has been limited ability to compare Rock County's schools to other counties or school districts in the state.

In Wisconsin, the DPI provides significant support of and infrastructure for the YRBS, at no cost. In Rock County, Janesville Mobilizing for Change (JM4C) will provide local technical assistance for administering the survey. Both JM4C and the RCPHD will evaluate, analyze and visualize local YRBS data for use by the school districts, JM4C and its fellow prevention coalitions, the RCPHD, and other community partners who may benefit from better understanding youth health-risk behaviors. Parallel and collaborative programming among those organizations should result in improved health outcomes for Rock County's youth and young adults.

Because the YRBS system can collect data on multiple risk behaviors at the school district, county, or Cooperative Educational Service Agency (CESA) level, a uniformly applied YRBS will reduce the number of school-based surveys and will decrease the burden placed on schools, staff, and students.

Recommendation

The Rock County Board of Health recommends uniform application and use of the YRBS across all Rock County-based school districts. That uniform application and use of the survey should include:

- All districts participate in the survey every two years,
- Default passive consent for students to participate in the survey,
- Consistent number of school grades participate as recommended by Rock County's YRBS Workgroup,
- Each school district use the question clusters recommended by Rock County's YRBS Workgroup,
- Same survey time window used by all districts.

In addition, county-wide YRBS data should be shared with all Rock County-based school districts, with the prevention coalitions, with the Rock County Public Health Department, and with other community organizations who may use the data to improve the efficiency and effectiveness of their programs.

Signatures

Respectfully submitted,

BOARD OF HEALTH

Sandra Kraft, Chair

Louis Peer, Vice Chair

Linda Garrett

Richard Bostwick

Dr. Kaitlyn Meyers, DVM, MPH

Vijaya Somaraju, MD

Dr. Connie Winter, DDS

Judith Wade, WHNP

Eric Gresens, R.Ph.

Updated 6/21/2017

WISCONSIN: ZIKA SUMMARY AND RESPONSE

ZIKA FAST FACTS

- Zika cases in Wisconsin are only associated with travel to affected areas, or sexual contact with a traveler to an affected area. This is true for most reported cases in the United States.
- The *Aedes* species of mosquitoes that are known to transmit Zika have not been identified in Wisconsin.
- Around 80 percent of people who are infected with Zika have no symptoms. Those who do develop symptoms commonly report one or more of the following: rash, fever, joint pain, red eyes, muscle pain, headache, and sensitivity to light.
- Sexual transmission can occur through sexual contact with a person who traveled to or lives in an area with Zika, even if the person does not have symptoms.

HOW MANY CASES OF ZIKA ARE THERE?

Wisconsin Zika Cases

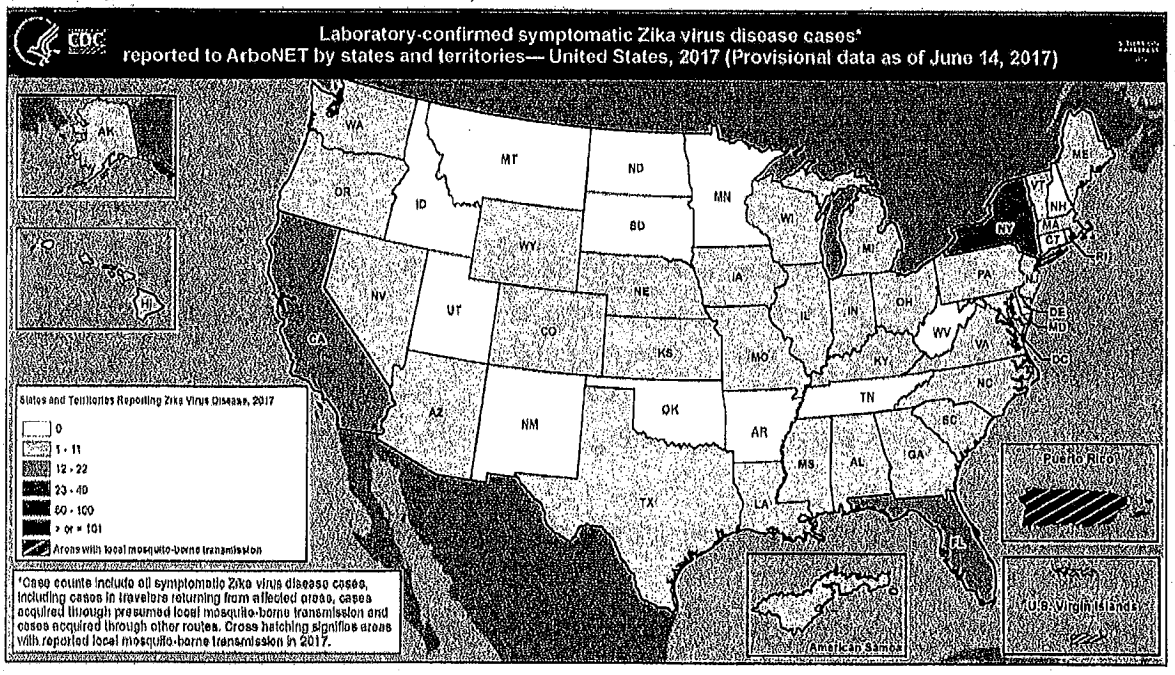
WI Travel-Associated Zika Cases (updated 6/21/2017)		
	2016	2017
Confirmed Zika virus cases	63	4
Probable* Zika virus cases	0	0
Undetermined Flavivirus, confirmed	1	1
Completed testing total	1,062	622
* Probable cases have presumptive positive laboratory results without confirmatory CDC test results.		

U.S. Zika Cases

U.S. Zika Cases reported (updated 6/14/2017)		
	2016	2017
Locally acquired, mosquito-borne cases	224 (FL = 218, TX = 6)	0
Travel-associated cases	4,830	135
Total cases*	5,102	136
Figures in this table do not include cases in the U.S. territories. *Total cases include additional routes of infection such as sexual transmission, laboratory exposure, and person-to-person though unknown route. Total cases do not include congenital infections.		

2017 Zika cases reported in the U.S.

(Laboratory confirmed cases 1/1/2017–6/14/2017)



Information in this document will be updated monthly. Updates are indicated in pink.

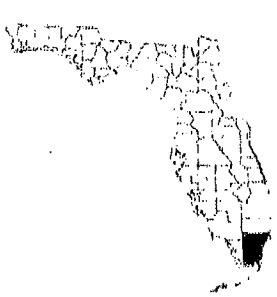
QUESTIONS? Please call or email us!
Phone: 608-261-9002
Email: dhsdphbcd@dhs.wisconsin.gov

BUREAU OF COMMUNICABLE DISEASES
https://www.dhs.wisconsin.gov/zika
Wisconsin Department of Health Services | Division of Public Health

HOW IS THE DEPARTMENT OF HEALTH SERVICES (DHS) RESPONDING TO ZIKA?

Testing qualifying Wisconsin residents for Zika virus infection:

- DHS is providing fee-exempt Zika testing for symptomatic persons and asymptomatic pregnant women with an epidemiological link to International locations with ongoing local Zika transmission.
- DHS is also currently approving Zika testing for symptomatic persons and asymptomatic pregnant women with an epidemiological link to Cameron County, Texas, on or after October 29, 2016, or an epidemiological link to Miami-Dade County, Florida, on or after June 15, 2016.
- DHS is not currently performing Zika testing on asymptomatic patients for purposes of preconception screening: DHS laboratory testing Zika webpage.



Miami-Dade County, Florida

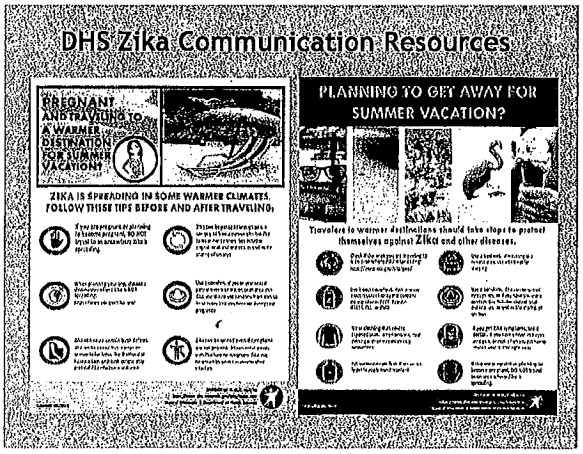
Cameron County, Texas

Tracking the clinical care and outcomes for pregnancies in Wisconsin affected by Zika virus:

- DHS' participation in the U.S. Zika Pregnancy Registry contributes to national data on pregnancy and infant outcomes following laboratory evidence of Zika virus infection during pregnancy.
- These data inform recommendations for clinical care and plans for services for affected Wisconsin families.

Trapping and monitoring mosquito populations in Wisconsin:

In partnership with the University of Wisconsin-Madison Medical Entomology Lab and local health departments, DHS is trapping and monitoring mosquito populations, but has yet to find the *Aedes* species of mosquitoes that are known to transmit Zika virus.



Advising travelers of risks and means of protection when planning travel to Zika-affected areas:

- New DHS communication resources regarding travel are available on the DHS website in English and Spanish.
- Pregnant women are advised to avoid any nonessential travel to Zika-affected areas.

Educating the public about Zika virus:

- DHS uses both Twitter and Facebook to provide Zika virus and travel updates to the general public.
- DHS updates the Zika website weekly with Wisconsin case counts.

Coordinating the response with partners, including local health departments and health care providers:

- Zika Concept of Operations (ConOps) detailing Wisconsin's response to Zika virus
- DHS' Zika webcast for health care providers

FIND OUT MORE ABOUT HOW DHS IS RESPONDING TO ZIKA:

https://www.dhs.wisconsin.gov/zika/response.htm

QUESTIONS? Please call or email us:
Phone: 608-261-9003
Email: dhsdphbcd@dhs.wisconsin.gov
P-01810 (06/2017)

BUREAU OF COMMUNICABLE DISEASES
https://www.dhs.wisconsin.gov/zika/
Wisconsin Department of Health Services | Division of Public Health

WHAT IS NEW?

- *Aedes albopictus*, one species of mosquito that is capable of transmitting Zika, has been identified in Wisconsin during July 2017. There is no evidence of Zika-infected mosquitoes in Wisconsin.
- There is still no evidence of local transmission of Zika in Wisconsin. Wisconsin residents at risk for Zika virus infection are people who have traveled or had sexual contact with someone who traveled to locations with active Zika virus transmission.
- The Florida Department of Health and the Texas Department of State Health Services have identified certain areas in Florida and Texas where Zika is being spread by local mosquitoes. For more detailed information on local transmission and travel advisories, see The Centers for Disease Control's (CDC) Zika Virus Update for Florida and Texas.

Wisconsin Travel-Related Zika Virus
Updated December 6, 2017

	2016	2017
Confirmed Cases	63	9
Probable Cases*	0	1
Undetermined Flavivirus, Confirmed	1	1
Total Tested	1062	935

* Probable cases have presumptive positive laboratory results without confirmatory CDC testing.

Case numbers are updated weekly

common name: Asian tiger mosquito
scientific name: *Aedes albopictus* (Skuse) (Insecta: Diptera: Culicidae)

Introduction (Back to Top)

The Asian tiger mosquito, *Aedes albopictus* (Skuse), was first documented in the United States in Texas in 1985 (Sprenger and Wuithiranyagool 1986). A year later, the Asian tiger mosquito was found in Florida at a tire dump site near Jacksonville (O'Meara 1997). Since that time, this species has spread rapidly throughout the eastern states, including all of Florida's 67 counties (O'Meara 1997).

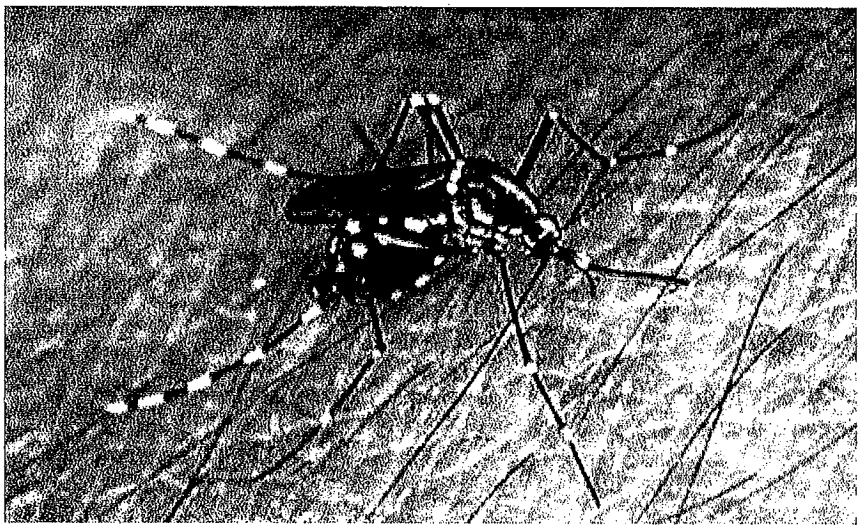


Figure 1. Adult Asian tiger mosquito, *Aedes albopictus* (Skuse). Photograph by J.L. Castner, University of Florida.

The arrival of *Aedes albopictus* has been correlated with the decline in the abundance and distribution of the yellow fever mosquito, *Aedes aegypti* (Linnaeus). There are a number of possible explanations for the competitive exclusion of *Ae. aegypti* by *Ae. albopictus*. The decline is likely due to a combination of (a) sterility of offspring from interspecific matings; (b) reduced fitness of *Ae. aegypti* from parasites brought in with *Ae. albopictus* and; (c) superiority of *Ae. albopictus* in larval resource competition (Lounibos 2002). The distribution of *Ae. aegypti* currently is limited to the southeastern quadrant of the U.S., and small areas in New York and Arizona (Darsie and Ward 2005).

Aedes albopictus is a competent vector of many viruses including dengue fever (CDC 2001) and Eastern equine encephalitis virus (Mitchell et al. 1992). Its life cycle is closely associated with human habitat, and it breeds in containers with standing water, often tires or other containers. It is a daytime feeder and can be found in shady areas where it rests in shrubs near the ground (Koehler and Castner 1997). *Aedes albopictus* feeding peaks in the early morning and late afternoon; it is an opportunistic and aggressive biter with a wide host range including man, domestic and wild animals (Hawley 1988).

Distribution (Back to Top)

The distribution of *Aedes albopictus* is subtropical, with a temperate distribution in North America, and in the United States has expanded rapidly over the past few years. This species was first documented in Texas in 1985 and is currently established in 866 counties in 26 states (CDC 2001).

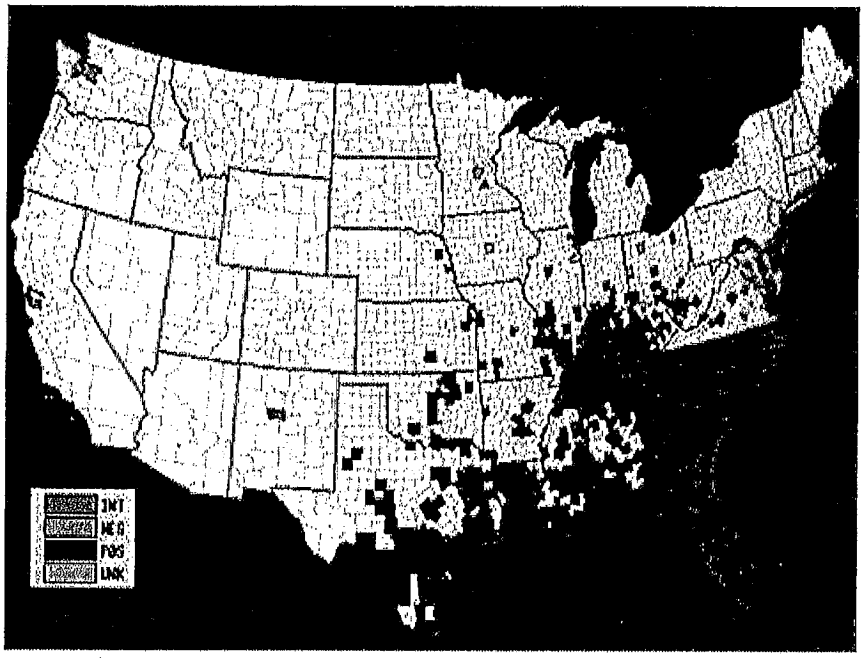


Figure 2. Center for Disease Control recorded distribution of *Aedes albopictus* (Skuse), the Asian tiger mosquito, in the United States, by county, 2000. Reviewed 10 November 2003). For possible updates see: http://www.cdc.gov/ncidod/dvbid/arbor/albopic_97_sm.htm.

The worldwide distribution includes most of Asia and covers tropical and subtropical regions worldwide with introductions into the Caribbean (Morbidity and Mortality Weekly Report 1989). Endemic to Asia and the Pacific islands, the range has greatly expanded to include North and South America, Africa and Europe (O'Meara 1997).

Description (Back to Top)

Adult *Aedes albopictus* are easily recognized by the bold black shiny scales and distinct silver white scales on the palpus and tarsi (Hawley 1988). The scutum (back) is black with a distinguishing white stripe down the center beginning at the dorsal surface of the head and continuing along the thorax. It is a medium-sized mosquito (approximately 2.0 to 10.0 mm, males are on average 20% smaller than females). Differences in morphology between male and female include the antennae of the male are plumous and mouthparts are modified for nectar feeding. The abdominal tergites are covered in dark scales. Legs are black with white basal scales on each tarsal segment. The abdomen narrows into a point characteristic of the genus *Aedes*. Field identification is very easy because of these distinct features.

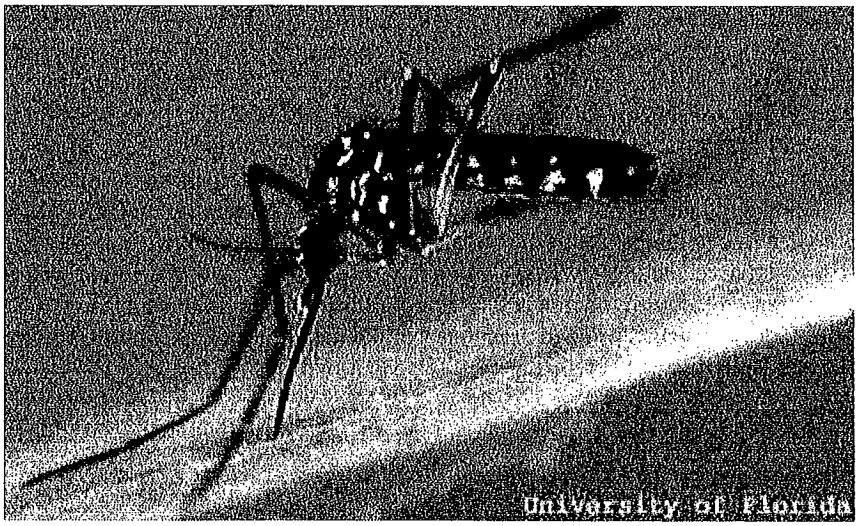


Figure 3. Adult Asian tiger mosquito, *Aedes albopictus* (Skuse). Photograph by Michele M. Cutwa, University of Florida.

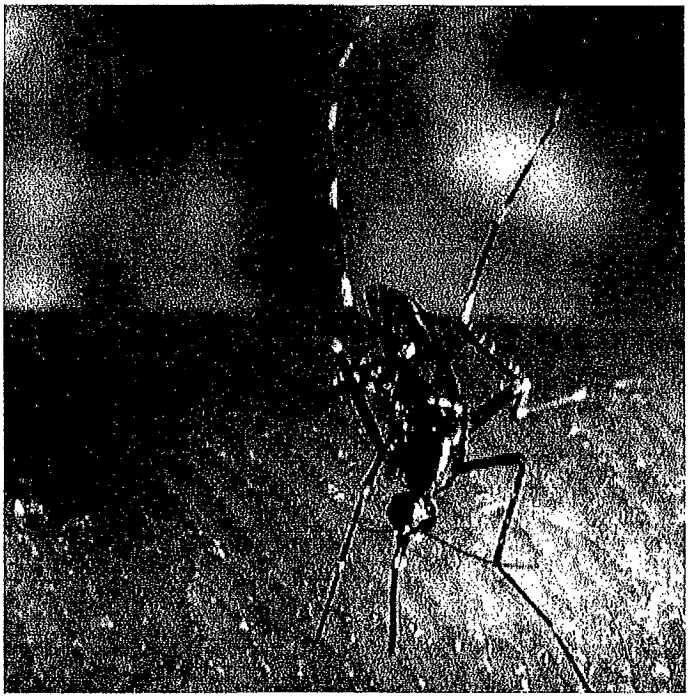


Figure 4. Adult Asian tiger mosquito, *Aedes albopictus* (Skuse), dorsal view showing white dorsal stripe. Photograph by James Gathany, Centers for Disease Control Public Health Image Library.

For a pictorial key (that includes the larval, pupal and adult stage for many common Florida mosquitoes) to identify *Ae. albopictus* and other mosquitoes of Florida, see: http://fmel.ifas.ufl.edu/key/.

Life Cycle (Back to Top)

Aedes albopictus overwinter in the egg stage in temperate climates (Lyon and Berry 2000) but are active throughout the year in tropical and subtropical habitats. Eggs are laid singly on the sides of

water-holding containers such as tires, animal watering dishes, birdbaths, flowerpots and natural holes in vegetation (Hawley 1988). They are black and oval with a length of 0.5 mm. Eggs can withstand desiccation up to one year. Larval emergence occurs after rainfall raises the water level in the containers. The eggs may require several submersions before hatching (Hawley 1988). Additionally, oxygen (O_2) tension greatly affects egg hatch (Hawley 1988). A number of studies have shown low O_2 tension stimulates the hatching of *Aedes albopictus* eggs and is a more important factor than flooding or temperature on inducing egg hatch (Hawley 1988). Development is temperature dependent, but the larvae usually pupate after five to ten days and the pupal stage lasts two days (Hawley 1988). Larvae, also called wigglers, are active feeders. They feed on fine particulate organic matter in the water. The larvae use a breathing siphon to acquire oxygen and must periodically come to the surface to do so. The larvae develop through four instars prior to pupation. Unlike many other insects, the pupae of mosquitoes are active and short-lived. They do not feed but can move about.

For more information see the Public Health Pesticide Applicator Training Manual - Mosquitoes.

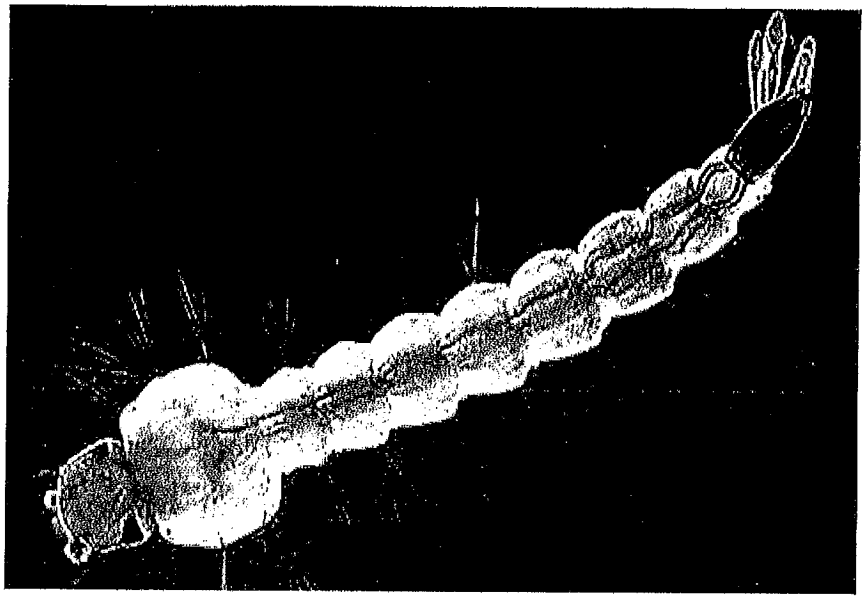


Figure 5. Larva of the Asian tiger mosquito, *Aedes albopictus* (Skuse). Photograph by Michele M. Cutwa, University of Florida.

Figure 6. Pupa of the Asian tiger mosquito, *Aedes albopictus* (Skuse). Photograph by Michele M. Cutwa, University of Florida.

Medical Significance (Back to Top)

Aedes albopictus is known to be a competent laboratory vector of more than 30 viruses. Of these 30 only a few are known to affect humans; they are eastern equine encephalitis (EEE), Cache Valley virus, dengue, St. Louis and LaCrosse encephalitis viruses (CDC 2001, Hawley 1988). Despite being featured as the ferocious tiger mosquito (ABC news 2001) it has not been found to be a significant health concern and is in fact a less efficient vector than other *Aedes* mosquitoes. *Aedes albopictus* has been implicated in the transmission of dengue, but this is not a major vector.

Aedes aegypti is the most competent vector of dengue virus (Gulber 1998). The Asian tiger mosquito is considered a maintenance vector and occasionally is involved with dengue transmission in Asia (CDC 2001). Dengue virus was isolated from collections of *Ae. albopictus* in Mexico after an epidemic (Lounibos 2002). Despite occasional viral isolations, there is no evidence that this mosquito is a public health threat in the United States. There is one isolated incidence in Polk County, Florida where *Ae. albopictus* was implicated in the transmission of eastern equine encephalitis in 1991 (Moore and Mitchell 1997). More recently there was an isolation of La Crosse virus found in field collected *Ae. albopictus* in North Carolina (Gerhardt et al. 2001). The implications of these findings are that this mosquito should be monitored for disease activity, but at this time should not be considered a public health threat.

Surveillance and Management of *Aedes albopictus* (Back to Top)

After entering the United States almost twenty years ago, *Aedes albopictus* has spread throughout much of the eastern states. The mosquito was most likely transported along highways and other major

roadways in shipments of used tires imported from other countries for retreading. On January 1988, the U.S. Public Health Service required all used tires entering the U.S. from known endemic countries be dry, clean and treated with fumigants (Moore and Mitchell 1997). Surveillance for *Ae. albopictus* was initiated in 1986 and this species continues to be monitored by public health agencies (Morbidity and Mortality Weekly Report 1989).

Management of adult populations is more complicated than for other species due to insecticide tolerance to malathion, temephos and bediocarb (Morbidity and Mortality Weekly Report 1987). In many suburban areas, complaints to health departments are more frequently due to *Ae. albopictus* than in former years when *Ae. aegypti* was the most commonly reported nuisance mosquito (Morbidity and Mortality Weekly Report 1989). Source reduction is an effective way for people in the community to manage the populations of many mosquitoes, especially container breeding species such as the Asian tiger. The removal of mosquito breeding habitat can be an effective method for mosquito control (Dame and Fasulo 2003).

Eliminate any standing water on the property, change pet watering dishes, overflow dishes for potted plants, and bird bath water frequently. Do not allow water to accumulate in tires, flower pots, buckets, rain barrels, gutters etc. Use personal protection to avoid mosquito bites. Long sleeves and insect repellent such as DEET will reduce exposure to bites. The Asian tiger mosquito is a day biter with feeding peaks early morning and late afternoon, so by limiting outdoor activities during crepuscular periods (dawn and dusk) when mosquitoes are generally most active, bites can be avoided.

Mosquito management publications
Use and application of DEET repellent

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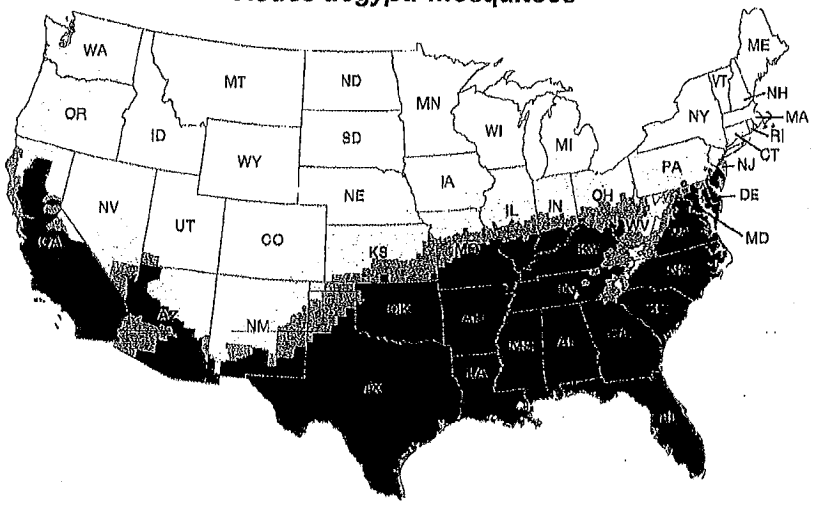
Photographs: Michele M. Cutwa and James L. Castner, University of Florida; James Gathany, and the Center for Disease Control Public Health Image Library
Web Design: Don Wasik, Jane Medley
Publication Number: EENY-319
Publication Date: April 2004. Latest revision: October 2011. Reviewed: July 2014.

Featured Creatures Editor and Coordinator: Jennifer L. Gillett-Kaufman, University of Florida

CDC's Response to **Zika**

ESTIMATED range of *Aedes aegypti* and *Aedes albopictus* in the United States, 2017*

Aedes aegypti mosquitoes

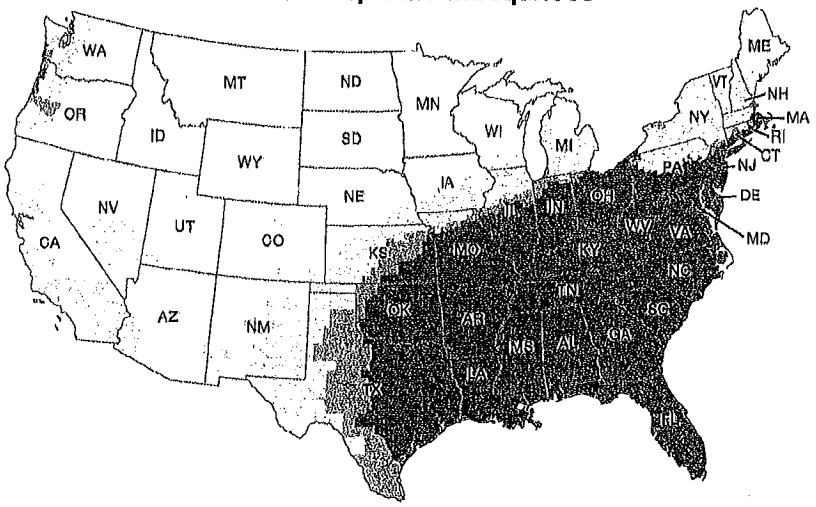


Mosquitoes' ability to live and reproduce

very unlikely | unlikely | likely | very likely

***Aedes aegypti* mosquitoes are more likely to spread Zika, dengue, chikungunya, and other viruses than other types of mosquitoes such as *Ae. albopictus* mosquitoes.**

Aedes albopictus mosquitoes



Mosquitoes' ability to live and reproduce

very unlikely | unlikely | likely | very likely

These maps DO NOT show

- Exact locations or numbers of mosquitoes living in an area
- Risk or likelihood that these mosquitoes will spread viruses

These maps show

- CDC's best estimate of the potential range of *Ae. aegypti* and *Ae. albopictus* in the United States
- Areas where mosquitoes are or have been previously found

* CDC has updated the estimated range maps for *Ae. aegypti* and *Ae. albopictus* mosquitoes by using a model that predicts possible geographic ranges for these mosquitoes in the contiguous United States. The model used county-level records, historical records, and suitable climate variables to predict the likelihood (very low, low, moderate, or high) that these mosquitoes could survive and reproduce if introduced to an area during the months when mosquitoes are locally active. Maps are not meant to represent risk for spread of any specific disease. (See Johnson TL et al. Modeling the environmental suitability for *Aedes (Stegomyia) aegypti* and *Aedes (Stegomyia) albopictus* (Diptera: Culicidae) in the contiguous United States. *Jrl Med Entomol.* Sept. 2017;[ahead of print].)

CS264451-F
September 20, 2017

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

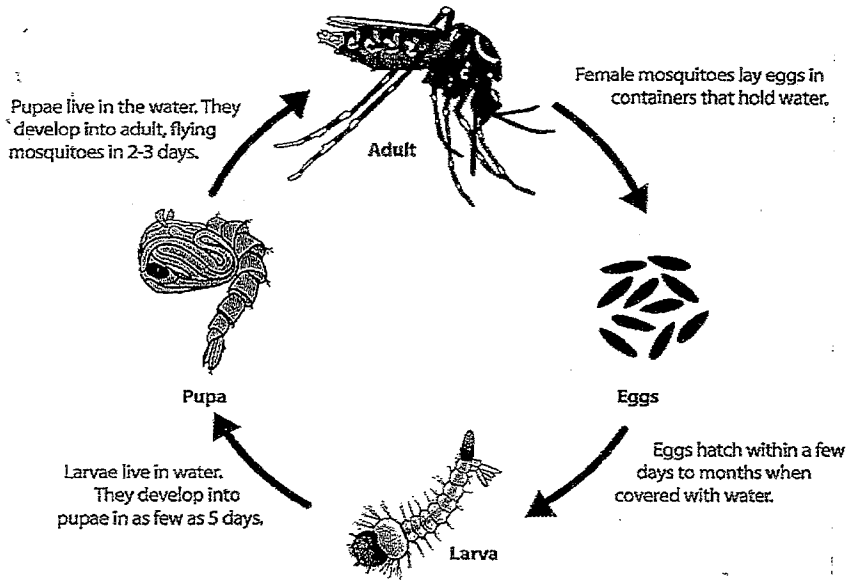
Summary of Rock County mosquito trap results

2016 Ovitrap survey for Aedes albopictus: no Ae. albopictus found. Only Ae. triseriatus.

WEDSS	Location	City	Address	Zip Code	County	Date of Trap P	Date Collect	Date Receive	No. of Eggs	No. Eggs	No. 4th In	Species
2016-Rock-S. Park Ave	S. Park Ave.	Beloit	2386 S. Park Ave	53511	Rock	6/13/2016	6/20/2016	6/24/2016	0			
2016-Rock-John Paul Rd	John Paul Rd.	Milton	64 N. John Paul Rd	53563	Rock	6/12/2016	6/20/2016	6/24/2016	24			Ae. triseriatus
2016-Rock-E County Rd	E. County Rd S	Beloit	3531 E. County Rd S	53511	Rock	6/22/2016	6/27/2016	7/7/2016	459			Ae. triseriatus
2016-Rock-John Paul Rd	John Paul Rd.	Milton	64 N. John Paul Rd	53563	Rock	6/27/2016	7/5/2016	7/11/2016	89			Ae. triseriatus
2016-Rock-E County Rd	E. County Rd S	Beloit	3531 E. County Rd S	53511	Rock	6/27/2016	7/6/2016	7/11/2016	64			Ae. triseriatus
2016-Rock-N Heritage Ridge	N. Heritage Ridge	Edgerton	11815 N. Heritage Ridg	53534	Rock	7/1/2016	7/20/2016		0			
2016-Rock-E County Rd	E. County Rd S	Beloit	3531 E. County Rd S	53511	Rock	7/6/2016	7/22/2016		33			Ae. triseriatus
2016-Rock-S. Park Ave	S. Park Ave.	Beloit	2386 S. Park Ave	53511	Rock	7/25/2016	8/25/2016	9/6/2016	0			

Mosquito Life Cycle

All mosquitoes need water to complete their life cycle. It takes about 10 to 14 days for mosquitoes to complete their life cycle. A mosquito goes through four distinct stages: egg, larva, pupa, and adult. This life cycle from birth to death is about a month long.



Mosquito-Borne Diseases

Mosquitoes cause more human suffering than any other organism -- over one million people worldwide die from mosquito-borne diseases every year. Not only can mosquitoes carry diseases that afflict humans, they also transmit several diseases and parasites that dogs and horses are very susceptible to. These include dog heartworm, West Nile virus (WNV) and Eastern equine encephalitis (EEE). In addition, mosquito bites can cause severe skin irritation through an allergic reaction to the mosquito's saliva - this is what causes the red bump and itching. Mosquito vectored diseases include protozoan diseases, i.e., malaria, filarial diseases such as dog heartworm, and viruses such as dengue, encephalitis and yellow fever. CDC Travelers' Health provides information on travel to destinations where human-borne diseases might be a problem.

Malaria

Malaria is an ancient disease. In all likelihood originating in Africa, it has been described by the Chinese as far back as 2700BC and the Sumerians from 1700 BC. The malaria parasite (plasmodium) is transmitted by female Anopheles mosquitoes. The term malaria is attributed to Horace Walpole in a letter from Italy in 1740 and is derived from the Italian 'mal-aria" or "bad air" because it was thought to come on the wind from swamps and rivers. Scientists conducted much research on the disease during the 1880s and early 1900s. Approximately 40% of the world's population is susceptible to malaria, mostly in the tropical and sub-tropical areas of the world. It was by and large eradicated in the temperate area of the world during the 20th century with the advent of DDT and other organochlorine and organophosphate mosquito control insecticides. An elevated standard of living, including the use of air conditioners and window screens, along with public health interventions have largely remanded malaria transmission to tropical areas. Nonetheless, it can still be found in northern Europe.

More than one million deaths and 300 - 500 million cases are still reported annually in the world. It is reported that malaria kills one child every 40 seconds. In the United States malaria affected colonization along the eastern shore and wasn't effectively controlled until the 1940s when mosquito control organization instituted Anopheles control programs. A resurgence occurred during the 1960s and early 70s in the United States due to returning military personnel from Vietnam. Minor outbreaks of locally-acquired malaria occur sporadically in the United States, but have been quickly controlled by aggressive mosquito control measures. The influx of illegal immigrants in addition to returning tourists may provide for infrequent outbreaks in the future.

Anopheles quadrimaculatus and Anopheles freeborni have been the primary vector of the Plasmodium vivax (protozoa) in the United States (Foote and Cook 1959).

Antimalarial drugs have been available for more than 50 years and recently scientists in Britain and the United States have cracked the code of the malaria parasite genome, a step that may help boost the campaign against the disease. In the meantime, active case detection

Top

Chikungunya

Chikungunya virus is a pathogen transmitted by mosquitoes, and has established itself in the Caribbean (approximately 350,000 suspected cases in the Western Hemisphere since December 2013). It has now resulted in 2 cases of locally-transmitted Chikungunya virus in Florida in July of 2014. As of July 22, 2014, 497 travel-related cases have been found in 35 states, Puerto Rico and the U.S. Virgin Islands. The occurrence of locally-transmitted cases causes public health officials fear to its spread and establishment in states bordering the Caribbean. The name "Chikungunya" is attributed to the Kimakonde (a Mozambique dialect) word meaning "that which bends up", which describes the primary symptom -- excruciating joint pain. Although rarely fatal, the symptoms are debilitating and may persist for several weeks. There is no vaccine and primary treatment is limited to pain medication.

The mosquito species that transmit this disease are the Asian Tiger Mosquito (*Aedes albopictus*) and the Yellow Fever Mosquito (*Aedes aegypti*). Genetically, it appears that viral strain currently spreading throughout the Americas is more easily transmitted by *Ae. aegypti*. Both species lay their eggs in containers such as cans, discarded tires and other items that hold water close to human habitation, but *Ae. aegypti* is more geographically confined to the southeastern United States. Traditional mosquito methods of truck-mounted and aerial sprays are ineffective in controlling these mosquitoes. Removal of water-bearing containers and sanitation are key preventive strategies.

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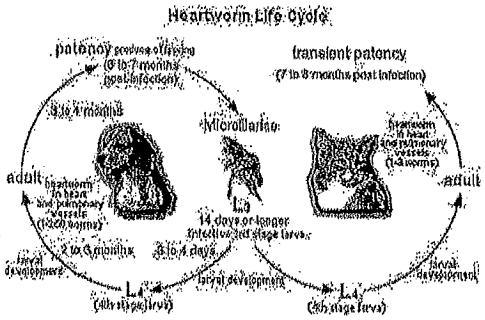
Dog Heartworm (*Dirofilaria immitis*)

Dog heartworm (Dirofilaria immitis) can be a life-threatening disease for canines. The disease is caused by a roundworm. Dogs and sometimes other animals such as cats, foxes and raccoons are infected with the worm through the bite of a mosquito carrying the larvae of the worm.



It is dependent on both the mammal and the mosquito to fulfill its life cycle. The young worms (called microfilaria) circulate in the blood stream of the dog. These worms must infect a mosquito in order to complete their lifecycle. Mosquitoes become infected when they blood feed on the sick dog. Once inside the mosquito the microfilaria leave the gut of the mosquito and live in the body of the insect, where they develop for 2-3 weeks. After transforming twice in one mosquito the third stage infective larvae move to the mosquito's mouthparts, where they will be able to infect an animal. When the mosquito blood feeds, the infective larvae are deposited on the surface of the victim's skin. The larvae enter the skin through the wound caused by the mosquito bite. The worms burrow into the skin where they remain for 3-4 months. If the worms have infected an unsuitable host such as a human, the worms usually die. The disease in dogs and cats cannot be eliminated but it can be controlled or prevented with pills and/or injections. Some risk is present when treating dogs infected with heartworms but death is rare; still prevention is best. Of course good residual mosquito control practices reduce the threat of mosquito transmission. Until the late sixties, the disease was restricted to southern and eastern coastal regions of the United States. Now, however, cases have been reported in all 50 states and in several provinces of Canada.

Arthropod-borne viruses (arboviruses) are the most diverse, numerous and serious diseases transmitted to susceptible vertebrate hosts by mosquitoes and other blood-feeding arthropods. Arboviral encephalitides are

primarily zoonotic, being maintained in complex life cycles involving a nonhuman primary vertebrate host and a primary arthropod vector. These cycles usually remain undetected until humans encroach on a natural focus, or the virus escapes this focus via a secondary vector or vertebrate host as the result of some ecologic change. Humans and domestic animals can develop clinical illness but usually are "dead-end" hosts because they do not produce significant viremia, and do not contribute to the transmission cycle. There are several virus agents of encephalitis in the United States: West Nile virus (WN), eastern equine encephalitis (EEE), western equine encephalitis (WEE), St. Louis encephalitis (SLE), La Crosse (LAC) encephalitis, dengue and yellow fever all of which are transmitted by mosquitoes. Another virus, Powassan, is a minor cause of encephalitis in the northern United States, and is transmitted by ticks. A new Powassan-like virus has recently been isolated from deer ticks. Encephalitis is global, in Asia, for example, about 50,000 cases of Japanese encephalitis (JE) are reported annually.

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Dengue

Dengue is a serious arboviral disease of the Americas, Asia and Africa. Although it has a low mortality, dengue has very uncomfortable symptoms and has become more serious, both in frequency and mortality, in recent years. *Aedes aegypti* and *Ae. albopictus* are the vectors of dengue. These mosquitoes prefer to lay their eggs in containers close to human habitations and are not well-controlled by standard spraying techniques. The spread of dengue throughout the world can be directly attributed to the proliferation and adaptation of these mosquitoes. Over the last 16 years dengue has become more common, for example; in south Texas 55 cases were reported in 1999 causing one death. More recently, Hawaii recorded 85 cases of dengue during 2001 and the Florida Keys reported over 20 cases in 2010. In 2004 Venezuela has reported more than 11,600 cases classic dengue fever and over 700 cases of DHF. Indonesia dengue outbreak has caused over 600 deaths and more than 54,000 cases. In 1999, Laredo and Nuevo Laredo had an outbreak of almost a 100 cases.

In 2010, Puerto Rico experienced its largest outbreak, with 21,000 cases reported. In 2009, Florida reported the first cases of local dengue transmission in 75 years, within Old Town, Key West. A serosurvey of residents suggested an infection rate of 5%, indicating serious risk of transmission. Despite thorough control efforts carried out by the county and state in early 2010, by the end of 2010, Florida had reported an additional 65 locally acquired dengue cases. All the cases were in Key West, except two cases in two more northerly counties.

Top

Yellow fever

Yellow fever, which has a 400-year history, at present occurs only in tropical areas of Africa and the Americas. It has both an urban and jungle cycle. It is a rare illness of travelers anymore because most countries have regulations and requirements for yellow fever vaccination that must be met prior to entering the country (http://www.cdc.gov/ncidod/dvbid/yellowfever/index.htm). Every year about 200,000 cases occur with 30,000 deaths in 33 countries. It does not occur in Asia. Over the past decade it has become more prevalent. In 2002 one fatal yellow fever death occurred in the United States in an unvaccinated traveler returning from a fishing trip to the Amazon. In May 2003, 178 cases and 27 deaths caused by yellow fever were reported in southern Sudan. In the Americas 226 cases of jungle yellow fever have been reported with 99 deaths (ProMed 12-22-03).

Top

Eastern Equine Encephalitis (EEE)

Eastern Equine Encephalitis (EEE) is spread to horses and humans by infected mosquitoes. It is among the most serious of a group of mosquito-borne arboviruses that can affect the central nervous system and cause severe complications and even death. EEE is found in freshwater hardwood swampland in the Atlantic and Gulf Coast states in the eastern part of North America, Central and South America, and the Caribbean. It has a complex life cycle involving birds and a specific type of mosquitoes including several *Culex* species and *Culiseta melanura*. These mosquitoes feed on infected birds and become carriers of the disease and then feed on humans, horses and other mammals. EEE cannot be transmitted from humans or other mammals because the viremia presented in the disease is not sufficient to further transmission. Thus, humans and other animals are known as "dead-end hosts." Symptoms may range from none at all to a mild flu-like illness with fever, headache, and sore throat. More serious infections of the central nervous system lead to a sudden fever and severe headache followed quickly by seizures and coma. About half of these patients die from the disease. Of those who survive, many suffer permanent brain damage and require lifetime institutional care. There is no specific treatment. A vaccine is available for horses, but not humans.

Top

St. Louis Encephalitis (SLE)

St. Louis Encephalitis (SLE) is transmitted from birds to man and other mammals by infected mosquitoes (mainly some Culex species). SLE is found throughout the United States, but most often along the Gulf of Mexico, especially Florida. Major SLE epidemics occurred in Florida in 1959, 1961, 1962, 1977, and 1990. The elderly and very young are more susceptible than those between 20 and 50. During the period 1964-1998 [35 years] a total of 4478 confirmed cases of SLE were recorded in the United States Symptoms are similar to those seen in EEE and like EEE, there is no vaccine. Mississippi's first case of St. Louis Encephalitis since 1994 was confirmed in June 2003. Previously the last outbreak of SLE in Mississippi was in 1975 with over 300 reported cases. It was the first confirmed mosquito-borne virus in the United States in 2003. It turned up in October 2003 in California Riverside County in sentinel chickens. The last [SLE] human case in California occurred in 1997. In Louisiana in 2003 there was a fatal St Louis Encephalitis case previously listed as a West Nile caused death.

Top

LaCrosse Encephalitis (LAC)

LaCrosse encephalitis (LAC) is much less widespread than EEE or SLE, but approximately 90 cases occur per year occurs in all 13 states east of the Mississippi, particularly in the Appalachian region. It was reported first in 1963 in LaCrosse, Wisconsin and the vector is thought to be a specific type of woodland mosquito (*Aedes triseriatus*) called the tree-hole mosquito, with small mammals the usual warm-blooded host. Infrequent fatalities occur in children younger than 16. It is not transmissible from human to human. There is no vaccine for LaCrosse encephalitis.

Top

Western Equine Encephalitis (WEE)

Western Equine Encephalitis (WEE) was first recognized in 1930 in a horse in California. It is found west of the Mississippi including parts of Canada and Mexico. The primary vector is *Culex tarsalis* and birds are the most important vertebrate hosts with small mammals playing a minor role. Unlike LAC it is nonspecific in humans and since 1964 fewer than 1000 cases have been reported As with EEE a vaccine is available for horses against WEE but not for humans. In Arizona 3 counties have been found with sentinel chicken flocks seroconverting to WEE.

Top

West Nile virus (WNV)

West Nile virus (WNV) emerged from its origins in 1937 in Africa (Uganda) into Europe, the Middle East, west and central Asia and associated islands. It is a Flavivirus (family Flaviviridae) with more than 70 identified viruses. Serologically, it is a Japanese encephalitis virus antigenic complex similar to St. Louis, Japanese and Murray Valley encephalitis viruses. Similar to other encephalitises, it is cycled between birds and mosquitoes and transmitted to mammals (including horses) and man by infected mosquitoes. WNV might be described in one of four illnesses: West Nile Fever might be the least severe in characterized by fever, headach, tireness and aches or a rash. Sort of like the "flu". This might last a few days or several weeks. At least 63% of patients report symptoms lasting over 30 days, with the median being 60 days. The other types are grouped as "neuroinvasive disease" which affects the nervous system; West Nile encephalitis which affects the brain and West Nile meningitis (meningoencephalitis) which is an inflammation of the brain and membrane around it. (CDC)

It first appeared in North America in 1999 in New York (Cornell Environmental Risk Analysis Program) with 62 confirmed cases and 7 human deaths. Nine horses died in New York in 1999. In 2001, 66 human cases (10 deaths) were reported in 10 states. It occurred in birds or horses in 27 states and Washington D.C., Canada and the Caribbean. There were 733 horse cases in 2001 with Florida reporting 66% of the cases; approximately 33% were fatal. In 2001 more than 1.4 million mosquitoes were tested for WNV. In the United States (2004) over 43 species of mosquitoes have tested positive for WNV transmission, the Culex pipiens group seems the most common species associated with infecting

people and horses. Currently, 65 mosquito and 300 bird species have tested positive in the United States for this virus.

During 2002, the number of areas reporting WNV grew to 44 states and 5 Canadian provinces. The only states not reporting WNV were Alaska, Arizona, Hawaii, Nevada, Oregon and Utah that year. Intrauterine transmission (CDC MMWR) and laboratory infections (CDC MMWR) were reported for the first time. In all over 3800 human cases with 232 fatalities in 39 states and Washington DC were recorded. More than 24,350 horse cases of WNV were confirmed or reported in 2002. There is a vaccine for horses. Even alligators (CDC-EID) were found infected in Georgia.

The first confirmed 2003 WNV infection was in South Carolina on July 7th, 2003. South Dakota confirmed a WNV infection in a dog. The final CDC report list 9858 cases. Nebraska had 1942, Colorado 2947 and Idaho only one (CDC) . In Florida there were 94 human cases with most occuring in the panhandle. Bay county, FL reported 14 cases and one death. Of the more than 9858 cases, 6829 were West Nile Fever (the milder form), 2863 were neuroinvasive (the more severe form) and 166 clinically unspecified. There were over 4200 positive dead birds reported in 39 states and 4500 plus infections in horses in 40 states with more than 425 of these in Colorado. West Nile was reported in 1377 sentinel chicken flocks from 15 states. In Florida 1173 seroconversions to WNV were reported from 34 counties. More than 1950 positive mosquito pools were reported from 32 states and New York City.

In Canada (01-12-04) WNV was been confirmed in 9 Provinces. At least 10 human deaths and more than 1220 cases have been confirmed. Canada reported over 445 presumed or confirmed horse cases in 6 Provinces with over 180 in Alberta Province. Five Provinces have reported positive mosquito pools (>575) with over 290 from Manitoba. Canada confirmed over 1600 positive dead birds from 12000 tests.
Mexico (December 2003) has tested over 590 citizens in 25 states. Six have tested positive with three with the more severe form of WNV. Mexico horse data shows 2475 had positive WN returns in 29 states. Of more than 18000 birds tested 117 were positive. The Pan American Health Organization (PAHO).

Arizona and New Mexico reported the first human cases of WNV on May 26, 2004 and a week later confirmed a total of 7 cases. South Dakota reported it's first case on June 8, 2004. In 2003 South Dakota had 14 deaths and over human cases reported. Wyoming and Florida (http://www.heraldtribune.com/) has joined the list recently. Alabama, Arizona, Texas and Virginia have reported WN V infections in horses. WNV seroconversions have been reported in 64 sentinel chicken flocks from 4 states (Arizona, California, Florida, and Louisiana), and 58 WNV-positive mosquito pools have been reported from 6 states (Arizona, California, Illinois, Indiana, Louisiana, and Pennsylvania).

As of 2014, there have been 36,437 cases of WNV reported to CDC. Of these, 15,774 have resulted in meningitis/encephalitis and 1538 were fatal. CDC estimates that there have been at least 1.6 million infections (82% are asymptomatic) and over 350,000 cases of West Nile Fever, but the disease is grossly under reported due to its similarity to other viral infections.

Canada's 1st dead bird (a blue jay) from West Nile virus in 2004 was confirmed in Ontario in May 2004. West Nile virus was confirmed in 2 birds in Puerto Rico near the former US Roosevelt Roads Navy Base (southeastern Puerto Rico).

Britain's Health Protection Agency has started its annual surveillance program for possible human cases of West Nile virus infection. The program, which has been used for the last three years, operates during the summer, when there is West Nile virus activity in other countries. The UK has had no reported WNV, but are developing a West Nile Virus Contingency Plan.
Top

Zika Virus

Zika virus has emerged from its origins in central Africa and has rapidly spread to the South Pacific and western hemisphere. A Flavivirus related to West Nile, Yellow Fever, St Louis and the equine encephalitides, Zika was first discovered in macaque monkeys in 1947 in the Zika Forest region of Uganda. Since its discovery in 2014 off the coast of South America, Zika cases have been found in 35 countries in the Americas.

As of 28 April, 2016, there have been 426 reported cases of Zika virus due to travel to endemic areas. However, local transmission within the continental United States has, as yet, not been reported. In US Territories in the Caribbean, a total of 599 cases have been reported, with 596 being locally acquired, primarily in Puerto Rico and the US Virgin Islands.

Although in rare cases Zika can be spread through sexual contact with an infected person, it is usually transmitted through the bit of an infected Aedes agypti or Aedes albopictus mosquito. The illness is usually quite mild, with fever, rash, conjunctivitis and joint pain lasting a few days to several weeks or months. Often patients are not sick enough to seek medical treatment so a great many cases are not reported. It is thought that one attack confers immunity. However, cases of microcephaly, a congenital defect of cranium and brain size resulting in profound neurological defects in newborns usually resulting in death have been been positively identified as being caused by Zika infection. An autoimmune condition called Guillain-Barré syndrome, causing damage to nerve cells resulting in muscle weakness and, on occasion, paralysis and death has been linked to Zika infection.

The mosquito vectors of Zika virus are peridomestic, preferring to lay their eggs above the waterline of containers, treeholes, creases in tarpaulins and other vessels that may contain water. Aedes aegypti, in particular, will lay eggs in a series of containers after feeding. Both Aedes agypti and Aedes albopictus will feed day or night when a potential host comes within their limited flight ranges. Aedes agypti has more of a tendency to enter and stay within houses if conditions are proper. This species is exceedingly skittish, often leaving its host prior to taking a full blood meal when the host moves. Both mosquitoes also seem to prefer feeding on the host's lower extremities.

Traditional outdoor ULV sprays are ineffective against Aedes agypti, it being difficult to obtain contact with the spray droplets in flight due to its cryptic habits. Some success with ULV sprays has been obtained against Aedes albopictus in urban areas, while suburban areas remain refractory. The primary means of controlling both species is to eliminate their oviposition habitats by removing water bearing containers or emptying them and scrubbing the insides to remove eggs deposited above the waterline. Personal protective measures such as application of EPA-registered repellents and wearing of long-sleeved shirts and long pants are also effective measures.

When traveling to areas endemic for Zika in the Caribbean, it is also recommended to stay in hotels with air conditioning and window and door screens to keep mosquitoes outside. If available, it is advised to sleep under mosquito bed nets.
Top

American Mosquito Control Association®
1120 Route 73, Suite 200
Mount Laurel, NJ 08054
856-439-9222 | amca@mosquito.org

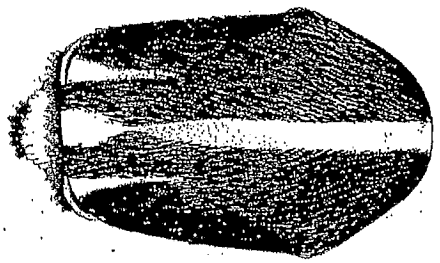


Fig. 89. Dorsal view of scutum: *Ae. albopictus*

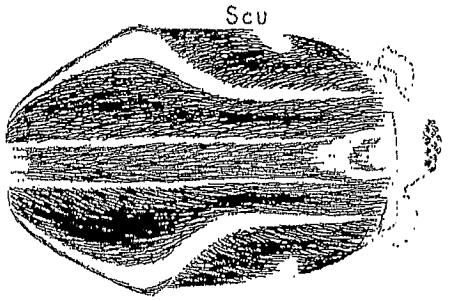


Fig. 72. Dorsal view of scutum: *Ae. aegypti*

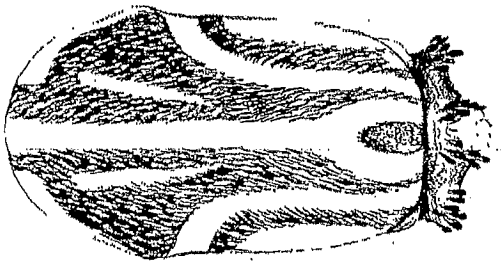


Fig. 69. Dorsal view of scutum: *Oc. j. japonicus*

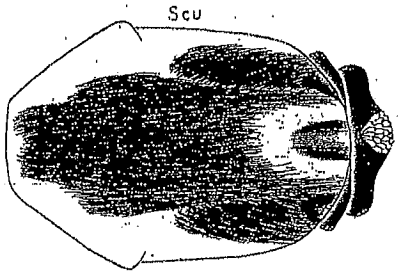


Fig. 192: Dorsal view of thorax: *Oc. triseriatus*

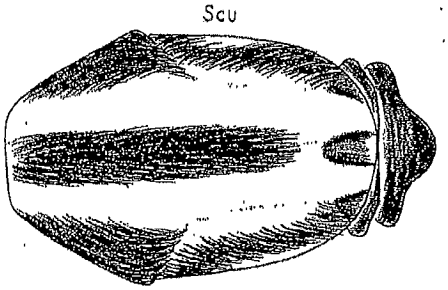


Fig. 202. Dorsal view of scutum: *Oc. trivittatus*

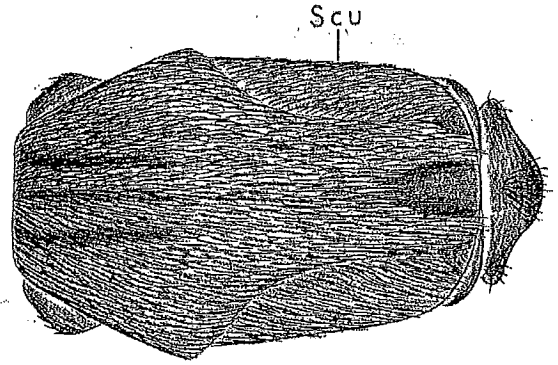


Fig. 44. Dorsal view of thorax: *Cx. pipiens*

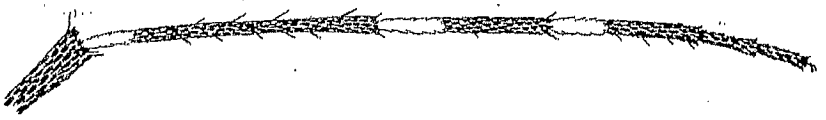


Fig. 71. Hindtarsomeres: *Oc. j. japonicus*

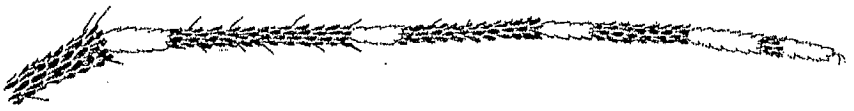


Fig. 74. Hindtarsomeres: *Ae. aegypti*

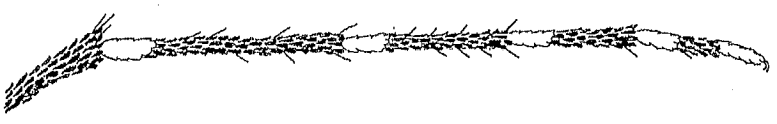


Fig. 84. Hindleg: *Ae. albopictus*

MARK SEYMOUR

From: Susan Paskewitz <smpaskew@wisc.edu>
Sent: Wednesday, October 25, 2017 10:08 AM
To: MARK SEYMOUR; Muganda, Christine P - DHS; Osborn, Rebecca A - DHS; Thomas Richards
Subject: Re: Rock Co. Report for 2017
Attachments: Rock County Summary 2017.docx

Hi Mark:

I'm attaching the report for the ovitrap results for Rock County. We found Aedes japonicus, the Asian bush mosquito, and Aedes triseriatus (the treehole mosquito) in your traps. As you may know, we did find the Asian tiger mosquito, Aedes albopictus, at two other locations in the state (Monona in Dane County and New Berlin in Waukesha County). Your results were reassuring because we feel that the southern edge of the state is the most likely place where the tiger mosquitoes could overwinter.

There have been some studies of Aedes japonicus because it is an invasive species as well. This mosquito has dramatically expanded in Wisconsin since the first records back in the mid 2000's. Aedes japonicus is a competent vector for some viruses in the lab and has been found infected with West Nile virus and La Crosse encaphalitis virus in the wild. It isn't clear whether it will play an important role in transmission of any of these pathogens to humans but we are monitoring the distribution and incidence of La Crosse human cases in particular.
Interestingly, the incidence of LAC seems to be going down and there is one hypothesis that competition between Aedes japonicus and the normal LAC vector (Aedes triseriatus) may be happening.

Thanks again for your participation. Given that we did find the Asian tiger this year, we will likely be back asking for your help next year.

--
Susan Paskewitz
Professor and Chair, Entomology
Director, CDC Upper Midwestern Regional
Center of Excellence for Vector-Borne Disease Department of Entomology University of Wisconsin
608-262-1696

Rock County Summary

- UW Medical Entomology Lab received 418 egg sticks over the course of summer 2017.
- 69 sticks had mosquito eggs, totaling 3035 individuals.
- Eggs were unable to be reared on three occasions.
- No Asian tiger mosquitoes (*Aedes albopictus*) were found; all mosquito eggs were *Aedes japonicus*, an invasive mosquito, or *Aedes triseriatus*, a native tree hole mosquito.

Location	Date	Sticks with Eggs	No. of Eggs	Species
North Newville Rd Janesville	6/21/2017	1	9	*Aedes japonicus*
	6/28/2017	2	28	*Aedes japonicus*
	7/5/2017	1	18	*Aedes japonicus*
	7/13/2017	4	104	*Aedes japonicus*
	7/24/2017	4	142	*Aedes triseriatus* and *Aedes japonicus*
	8/1/2017	1	51	*No Hatch*
	8/8/2017	0	0	
	8/16/2017	0	0	
	8/23/2017	0	0	
	8/31/2017	0	0	
	9/7/2017	0	0	
	9/13/2017	0	0	
	9/21/2017	0	0	
	9/29/2017	0	0	
S Crosby Ave Janesville	6/21/2017	2	38	*No Hatch*
	6/28/2017	6	251	*Aedes japonicus*
	7/5/2017	4	109	*Aedes japonicus*
	7/13/2017	7	330	*Aedes triseriatus* and *Aedes japonicus*
	7/24/2017	2	312	*Aedes japonicus*
	8/1/2017	6	277	*Aedes japonicus*
	8/8/2017	4	55	*Aedes japonicus*
	8/16/2017	4	344	*Aedes triseriatus* and *Aedes japonicus*
	8/23/2017	5	345	*Aedes japonicus*
	8/31/2017	3	344	*Aedes japonicus*
	9/7/2017	2	27	*Aedes japonicus*
	9/13/2017	1	8	*No Hatch*
	9/21/2017	4	33	*Aedes japonicus*
	9/29/2017	3	129	*Aedes japonicus*
W B R Townline Rd. Beloit	6/21/2017	0	0	
	6/28/2017	0	0	
	7/5/2017	0	0	
	7/13/2017	0	0	

7/24/2017	0	0	
8/1/2017	0	0	
8/8/2017	0	0	
8/16/2017	1	55	*Aedes triseriatus*
8/23/2017	1	12	*Aedes japonicus*
8/31/2017	0	0	
9/7/2017	0	0	
9/13/2017	0	0	
9/21/2017	1	14	*Aedes japonicus*
9/29/2017	0	0	
TOTALS:	69	3035	

Rock County Public Health Department

July 11 thru September 28, 2017 Mosquito Surveillance Program Summary

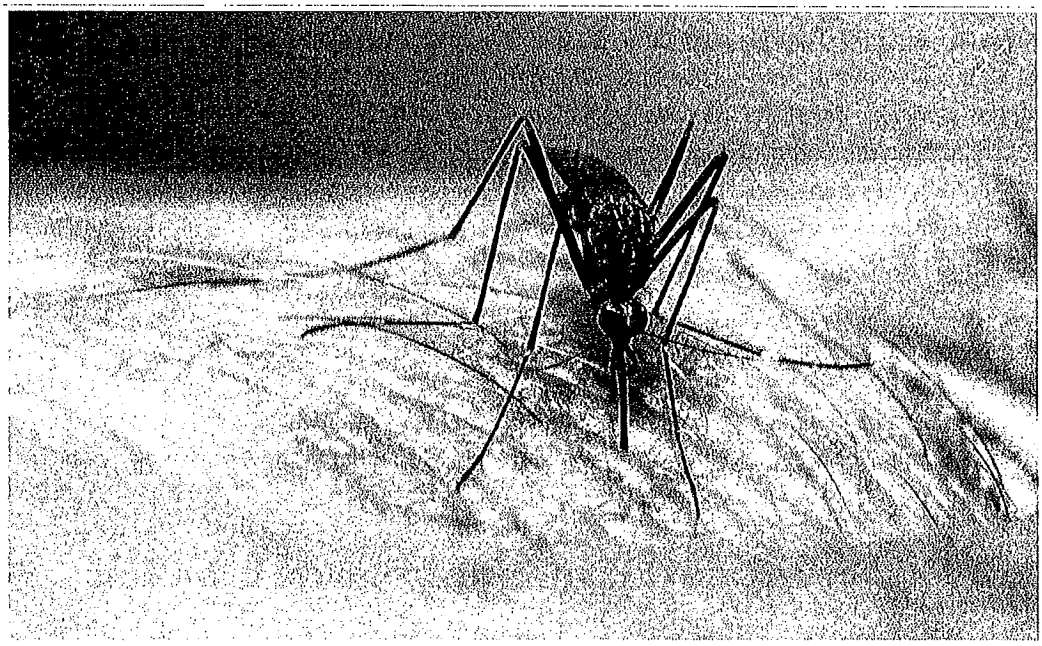
- RCPHD used 4 methods for collecting mosquitoes:
  - Ovitrap – used to collect the eggs of mosquitoes that prefer clean water.
  - Gravid Trap – used to collect adult female mosquitoes that prefer stagnant water.
  - Manual – used to collect adult female mosquitoes looking for blood meal.
  - Dipper – used to collect mosquito larvae in containers/ponds.
- Ovitrap Method:
  - Collected from 3 different locations, each had 3 sample sites.
  - Collected a total 73 egg sticks.
  - Eggs were found on approximately 38% of the egg sticks, totaling 1389 individual eggs.
  - Success rate for hatching larvae from eggs was 57%, 16 of 28 egg sticks hatched.
- Gravid Trap Method:
  - Collected from 2 different locations, each had 1 sample site.
  - Collection time period was from just before sunset 1 day to just after sunrise the next.
  - Collected a total of 16 adult female mosquitoes.
- Manual Method:
  - Collected from 3 different locations.
  - Collection time period was random throughout the sampling period, usually in the morning or late afternoon.
  - Collected a total of 7 adult female mosquitoes
- Dipper Method:
  - Collected from the 3 locations UW Medical Entomology Lab designated for their surveillance program.
  - N Newville Rd. and S Crosby Ave. sites, collected from tires.
  - WBR Townline Rd. site, collected from a pond.
  - Larvae were present in high numbers in the tires and pond.
- After Action Review of RCPHD 2017 Mosquitoes Surveillance Program:
  - Results of our surveillance program support UW's findings that the majority of the mosquitoes collected were the invasive species Aedes japonicus, replacing the Aedes triseriatus found in 2016.
  - Work with UW to improve our hatch rates from our Ovitraps.
  - RCPHD should continue partnering with UW and running their own surveillance program to gain a better understanding of our mosquito population and the potential health hazards they pose in Rock County.

Species Found In Rock County	Vector For:
Aedes japonicus	Minor: West Nile Virus St. Louis Encephalitis Virus Eastern Equine Encephalitis Virus
Aedes trivittatus	Dog Heartworm
Aedes triseriatus	Primary: La Crosse Encephalitis Minor: West Nile Virus
Culex pipiens	West Nile Virus St. Louis Encephalitis Virus

Location	Type of Trap	Date Collected	Number Sample Sites	Sticks with Eggs	Number of Eggs	Number of Adults	Species
US HWY 51 N, J'ville	Gravid Trap	08/01/17	1			4	Cx. pipiens Ae. trivittatus Ae. japonicus
	Gravid Trap	08/08/17	1			3	Cx. pipiens Ae. trivittatus Ae. japonicus
	Manual	08/23/17				3	Ae. trivittaus
Shopiere Lane, Beloit	Gravid Trap	07/31/17	1			5	Cx. pipiens Ae. trivittatus
	Gravid Trap	08/08/17	1			2	Ae. trivittatus Ae. japonicus
	Gravid Trap	09/26/17	1			1	Cx. pipiens
	Gravid Trap	09/01/17				1	Cx. pipiens
	Manual	08/17/17				3	Ae. trivittaus
	Ovitrap	07/11/17	3	1	26		Ae. triseriatus
	Ovitrap	07/18/17	3	1	23		didn't hatch
	Ovitrap	07/25/17	3	1	12		didn't hatch
	Ovitrap	07/31/17	3	1	7		didn't hatch
	Ovitrap	08/07/17	3	1	18		didn't hatch
	Ovitrap	08/14/17	3	1	150		didn't hatch
	Ovitrap	08/21/17	3	2	58		didn't hatch
	Ovitrap	08/29/17	3	0			
	Ovitrap	09/29/17	4	1	25		didn't hatch
	Ovitrap	09/05/17	3	1	4		didn't hatch
N. Juniper Dr, J'ville	Ovitrap	07/27/17	3	2	39		didn't hatch
	Ovitrap	08/03/17	3	3	505		Ae. japonicus
	Ovitrap	08/09/17	3	3	350+		sent to UW
	Ovitrap	08/16/17	3	1	27		didn't hatch
	Ovitrap	08/23/17	3	1	70		Ae. japonicus
	Ovitrap	08/29/17	3	0			Ae. japonicus larvae in cups
	Ovitrap	9/13/17	3	0			Ae. japonicus larvae in cups
	Ovitrap	9/20/2017	3	0			Ae. japonicus larvae in cups
	Ovitrap	09/27/17	3	3	119		Ae. japonicus
	Ovitrap	10/04/17	3	2	104		Ae. japonicus
	Ovitrap	09/06/17	3	1	19		Ae. japonicus larvae in cups
W. River Oaks Rd, J'ville	Manual	9/15/2017				1	Anopheles
	Ovitrap	08/12/17	3	1	150		Ae. japonicus
	Ovitrap	08/21/17	3	1	33		Ae. japonicus
N. Newville Rd, J'ville	Dipper	08/28/17					Ae. japonicus larvae from tires
S. Crosby Ave, J'ville	Dipper	08/28/17					Ae. japonicus larvae from tires
WBR Townline Rd, Beloit	Dipper	08/28/17					Cx. pipiens larvae from pond

European Centre for Disease Prevention and Control

Aedes japonicus - Factsheet for experts



SPECIES NAME/CLASSIFICATION: *Aedes japonicus japonicus* (Theobald)

COMMON NAMES: East Asian bush or rock pool mosquito

SYNONYMS AND OTHER NAMES IN USE: *Ochlerotatus japonicus japonicus* [22], *Hulecoeteomyia japonica japonica* [23]

Hazard associated with mosquito species

Current issues:

Invasive species/Global dispersion

Aedes japonicus has become the third invasive mosquito species to be reported in Europe. Its geographical expansion has been facilitated by human activities such as the international trade in used tyres. It is now listed as one of the top 100 invasive species by the Invasive Species Specialist Group [1]. Its distribution in central Europe is also expanding.

Ecological plasticity

The success of the invasion of *Ae. japonicus*, particularly in the US, has been due to a number of factors including its ability to withstand long distance dispersal and winter temperatures in temperate regions, and its high tolerance to organic concentrations in a number of natural and artificial containers [2]. *Aedes japonicus* has less specialised requirements for aquatic habitats, compared to *Ae. albopictus*, and this could facilitate furtherspread of this species [3].

Biting and disease risk

In Japan and Korea, its normal native range, *Ae. japonicus* is not considered an important disease vector [3]. There is a concern however that this species may become a pest problem or be involved in the transmission of North American arboviruses such as West Nile virus [4]. *Aedes japonicus* colonises urbanised environments [5] and females are active during the day [6], increasing the potential contact this species could have with humans which in turn may result in disease transmission. More recently, this species has shown vector competence for the transmission of dengue and chikungunya, both of which have been recently reported in Europe [7].

Geographical distribution

Aedes japonicus has been reported in Austria, Belgium, Canada, China, France, Germany, Korea, Japan, New Zealand, the Netherlands, Russia, Switzerland, Slovenia Taiwan and the US.

Brief history of spread and european distribution

Pathways

Aedes japonicus is endemic to Korea, Japan, Taiwan, southern China and Russia [8] and has since spread to a number of other countries (see above). This spread has occurred since the 1990s and like other invasive mosquito species, *Ae. japonicus* has relocated to new geographical areas via the movement of infested tyres. It was first reported outside its native range in New Zealand, where it was introduced via the used tyre trade [9]. Once introduced to the United States, the Standard-bred horse trade may have been contributed to expansion there, as early collection sites in New York and New Jersey were associated with trailers and Standard-bred horse breeding areas [10].

Timeline of initial movements

Aedes japonicus established in the United States in the 1990s [11] after which it rapidly spread throughout eastern and northern America and southern Canada [12]. It was reported in New York state, New Jersey and Connecticut in 1998, Connecticut, Ohio and Pennsylvania in 1999, Maryland, Massachusetts and Virginia in 2000 and Quebec, Canada in 2000 [3]. It

has since spread to 31 states including Hawaii, Iowa, Wisconsin and Minnesota [2, 13, 14]. Its spread in the US may be due to multiple introductions and at least two abundant genetic forms are present [15, 16]. This species was intercepted on several occasions in ports of New Zealand (1993, 1998, and 1999) through the importation of used tyres from Japan [2, 17].

Initial importations and spread in Europe

Aedes japonicus was first reported in Europe in 2000 when it was detected in Normandy (Orne) in northern France [3], where it was later eliminated [5]. It was then reported in 2002 in Belgium at a tyre depot and presence as adults and larvae was confirmed in 2007 and 2008. It was most likely introduced through the trade of tyres and the population was thought to be established at the company site but does not appear to be spreading [2]. It was detected in Switzerland in 2008 following reports of a biting nuisance and subsequent surveys revealed a 1,400km colonised zone including an area in Germany. This was the first detection of invasive mosquitospreading in central Europe [5]. No obvious route of introduction was identified in this study but it is suspected that the species has been present here for some time. Adult *Ae. japonicus* were then found in Southern Germany during 2011, following intensified surveillance [18]. This resulted in surveillance expanding to cover the entire federal state of Baden-Württemberg where a reduction in the colonised areas compared to 2010 was reported (possibly due to a dry spring during 2011). However, a large, newly infested area was also reported from the city of Stuttgart to the Swabian Mountains [9]. Entomological surveys carried out during 2012 in North Rhine-Westphalia also revealed the presence of an established population in the west of the country [19]. *Aedes japonicus* were then reported further north in southern Lower Saxony and northeastern North Rhine-Westphalia during spring 2013 [20]. It was detected in 2012 and 2013 in Lelystad, the Netherlands (personal communication M. Braks).

Possible future expansion

It is suggested that *Ae. japonicus* may expand beyond its current geographical distribution [5] but there is still a lack of information available on this invasive mosquito species [21].

Entomology

- **SPECIES NAME/CLASSIFICATION:** *Aedes japonicus japonicus* (Theobald)
- **COMMON NAMES:** East Asian bush or rock pool mosquito
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Morphological characters and similar species

Adults of *Ae. japonicus* are relatively large and show a black and white pattern due to the presence of white scale patches on a black background on the legs and other parts of the body. Some indigenous mosquitoes also show such contrasts (more brownish and yellowish) but in that case less obvious. However *Ae. japonicus* could be mixed up with other invasive (*Ae. aegypti, Ae. albopictus, Ae. koreicus*) or indigenous species (*Ae. cretinus*, restricted to Greece and Turkey), and the main diagnostic character is the presence of several lines of

yellowish scales on a black background on the scutum (dorsal part of the thorax). The three other described subspecies differ in tibia ornamentation and are restricted to parts of South-eastern Asia [8]. A DNA-based rapid assay has been developed in order to distinguish this species from other similar invasive species [13].

Larvae of *Ae. japonicus* appear brownish-yellow or darker, with a slender appearance and long siphon. The head capsule has no bright areas on the dorsal side. Eyes and mouthparts are not distinctly visible via the naked eye [19].

Life history (inc. details of overwintering stage)

Diapausing tendencies

Aedes japonicus can produce freeze and desiccation-resistant eggs [11] that can remain dormant over winter and hatch once environmental conditions become favourable. This allows for the species to be transported in infested containers [24]. Larvae also overwinter in its native range, in New Jersey and North Carolina [25]. During studies in Belgium in 2008, larval sampling during early spring confirmed that this species can overwinter as diapausing eggs in Northern Europe [2]. In parts of Asia, *Ae. japonicus* overwinters as eggs such as in north eastern Japan but as larvae in other areas such as south western Japan [3]. No larvae were found however during winter sampling in Belgium [2].

Seasonal abundance

In North America, larvae and biting adults have been collected between May–November in Connecticut [26] and May–October in New York State [15]. Larvae of *Ae. japonicus* have also been shown to be the dominant species within rock pools during the early to mid-summer months when temperatures are lower [10] and also during spring and fall collections in the United States [27]. In Switzerland, eggs were found until October during field studies in 2008 [5] and data from North American studies suggests *Ae. japonicus* remains active through early autumn in northern temperate zones [14].

Voltinism: (generations per season)

Reported to be multivoltine in Connecticut and southern Japan [26].

Host preferences (e.g. birds, mammals, humans)

This species preferentially feeds on mammalian hosts [6] . Studies inNew Yorkshowed *Ae. japonicus* fed solely on humans and mammals [28]. Analysis of blood meals from specimens collected in Connecticut showed human, deer and eastern chipmunks as hosts [29]. Analyses of blood meals from specimens collected in New Jersey also showed a preference for mammalian blood feeding; 52% were found to have fed on White tailed deer and 36% were found to have fed on humans. No samples were found positive for avian or reptilian blood [12], however there is evidence of bird biting under laboratory conditions [30].

Aquatic/terrestrial habitats

Aedes japonicus can develop in a large range of both natural and artificial aquatic container habitats including rock pools, tyres, bird baths, milk cartons, buckets and tree holes [26]. In North America their preference is for rock pools [2, 21] but those with relatively low summer temperatures [11] or shaded [25]. Elsewhere in the United States and Japan, larvae have been found in various aquatic habitats with varying sunlight, elevation, detrital content, and within both urban and rural settings [31].The distribution of this species is reported to overlap with that of *Ae. triseriatus* in North America and an overlap in aquatic habitat use has been reported [10, 32] . An overlap in habitat use has also been reported for *Ae. atropalpus*, which like *Ae. triseriatus*, may actually be outcompeted by *Ae. japonicus* in the United States, particularly in tyre sites [33]. The use of the same habitats as *Ae. albopictus* has also been reported, although highest abundances of each species differs seasonally [25]. Sampling conducted across a wide area in northern Switzerland showed a preference for plastic vases in cemeteries, but fountains, rain water casks and catch basins were also colonised [5]. Sampling in Germany revealed the presence of larvae in a variety of containers including flower vases, flower-pot saucers, watering cans and paddling pools [19].

In its native range, *Ae. japonicus* colonise tree-hole habitats but this has not often been reported for newly established areas in the United States or Europe [27].

Biting/resting habits (endo/exophily, endo/exophagy, biting periodicity)

Adults are often found in forested areas [26] being active during the daytime and crepuscular hours [6]. This species is an aggressive biter and will readily bite humans outside and occasionally inside houses [3]. Adult females were collected indoors whilst attempting to bite people in Germany during 2012 [19].

Environmental thresholds/constraints/development criteria

There is limited information on environmental thresholds constraining the distribution of *Ae. japonicus*. Although this species is said to be increasing in abundance in some areas of the US compared to native species, it was found that habitats with water temperature over 30 oC did not yield any *Ae. japonicus* [11]. This could be a limiting factor for future spread in southern Europe. Although *Ae. albopictus* has been shown to be superior to *Ae. japonicus* in competing for food resources in larval habitats in the US (particularly in artificial container habitats), higher overwintering survival and earlier hatching means *Ae. japonicus* is able to exploit larval habitats before *Ae. albopictus* [25, 34] . Competition with larvae of other *Aedes* species may affect *Ae. japonicus* adult longevity, but exploitation of multiple aquatic habitats lessens the impact this may have on the success of *Ae. japonicus* in new habitats [32]. It is also suggested that this species is outcompeting *Ae. atropalpus* in some areas of the United States due to shorter larval development periods [27].

Epidemiology and transmission of pathogens

Known Vector Status (In Field, Experimental Transmission)

This mosquito has been found positive for West Nile virus on a number of occasions in the US [6, 26] and laboratory studies show it is a competent vector of West Nile virus [4]. Laboratory studies have also shown *Ae. japonicus* to be a competent carrier of Japanese encephalitis virus [35], La Crosse virus [36] and a moderately effective vector of Saint Louis encephalitis virus [30], Eastern equine encephalitis virus [37], Chikungunya virus and Dengue virus [7] and Rift Valley fever [38] .

Role as Enzootic or Bridge Vector

In North America this mosquito feeds on white-tailed deer, which are known reservoir hosts for a number of pathogens including Jamestown Canyon virus, Cache Valley virus and Potosi virus [29]. *Aedes japonicus* may also act as a possible bridge vector of Eastern equine encephalitis virus, La Crosse virus, and West Nile virus, with field-collected *Ae. japonicus* being frequently found in the United States [19]. Dunphy *et al.* [14] suggests that it is a likely bridge vector for La Crosse virus given that (a) its established range coincides with regions where the primary vector is also present and hence the virus amplification will be occurring, and (b) laboratory studies have shown it to be competent. La Crosse virus has also been isolated from field collected *Ae. japonicus*. One pool of *Ae. japonicus* collected in Eastern Tennessee during 2010 tested positive by PCR [39]. This represents the first report of natural infection in this mosquito species. Further studies are required to assess host preferences of this mosquito within the endemic area [14]. *Aedes japonicus* have also been shown to be competent vectors of both chikungunya virus and dengue, both of which have been recently reported in Europe [7].

Its role in the transmission of the above mentioned viruses in natural conditions is unclear [2]. The propensity of this mosquito to feed on humans, as demonstrated in a recent study using human landing catches in Belgium [2], highlights the importance of establishing the role(s) *Ae. japonicus* might play in disease transmission. However, as of yet, there are limited reports of this species being a nuisance, especially when compared to *Ae. albopictus* [7].

Public health (control/ interventions)

Surveillance

Specific surveillance programmes in Europe have been associated with *Ae. japonicus*. Firstly a survey of used tyres importers in France and Belgium led to the discovery of this species in both countries, and appears a useful method of determining the introduction and presence in the country. Then in Belgium, a 'nationwide' survey (MODIRISK) has completed the knowledge of it distribution and relative abundance. In 2012, a surveillance study at import sites (EXOSURV), including the infested area, provided updated information on the local spread of the species in Belgium. Finally an extensive specific study in Switzerland has mapped the distribution and spread throughout and around the colonised region.

In 2013, a control campaign was funded in Belgium to eliminate the species seen its limited

distribution around the initial import site, actions were taken between April–October 2013.

Appropriate Sampling Strategy (aquatic larval sampling, adult traps)

Various techniques have been used. For example, Versteirt *et al* [2] used CO2 baited traps, CDC gravid traps and human landing catches to collect adult specimens in Belgium, with human landing catches at sunset the most successful way of collecting blood-seeking females. Nets, sieves and small dippers were used for larval collection.

Light traps, grass infusion baited gravid traps, CO2 CDC traps and encephalitis virus surveillance traps were used to collect specimens in New Jersey [12] and ovitraps have also been widely used [36]. Andreadis *et al* [26] found that grass-infused gravid traps and CO2 light traps were the most successful, with little success with ovitraps. Dunphy *et al* [14] also found gravid traps to be successful for collecting *Ae. japonicus* and these were also used by Falco *et al.*, [15] in New York. Anderson et al. [40] used CDC miniature light traps baited with CO2 plus TrapTech Mosquito Lure as an effective method to collect *Ae. japonicus* under field conditons.

Species Specific Control Methods e.g. insecticide, public health education etc

There is no specific guidance on control of this mosquito species, although much of the guidance for other container breeding species, like *Ae. albopictus* would be equally applicable. As in the case of source reduction at cemeteries, specific guidance can be provided on a case-by-case basis.

Current Nuisance Biting/Vector Issues in Europe

A biting nuisance reported in Switzerland led to the identification of this mosquito species here in 2008 [5].

Existing Public Health Awareness and Education Materials

CDC advice for travellers on protection against mosquitoes, ticks and other arthropods (http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/protection-against-mosquitoes-ticks-insects-arthropods.aspx)

CDC Information on Aedes japonicus (http://www.cdc.gov/ncidod/dvbid/arbor/japonicus.htm)

National travel health network and centre provides information on how to avoid insect bites (including mosquito bites) (http://www.nathnac.org/pro/factsheets/iba.htm)

Key areas of uncertainty

- Not a well studied invasive mosquito species compared to other species such as *Ae. albopictus* [21].

- Host feeding preferences in the wild are unknown [26], only a few blood meals were analysed so far [29]. Host feeding preferences in areas where this mosquito could act as a vector for West Nile virus (and other arboviruses) need to be researched.
- Need to establish if this mosquito feeds on birds in the field since birds are viewed as the principle reservoir for West Nile virus. Shown to feed on White-tailed deer in New Jersey and deer in New Jersey have been found serologically positive for West Nile virus infection but it is not known if they sustain high enough viral titre to pass the virus on [12].

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mosquitoes (https://ecdc.europa.eu/en/search?f%5B0%5D=diseases%3A449)

Page last updated 19 Aug 2014

Rock County's Asthma Control and Prevention Program

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12/6/17

Public Health

What is Asthma

- **Asthma** is a chronic inflammatory disease characterized by intermittent wheezing, chest tightness, and shortness of breath that can limit an individual's ability to bring oxygen into the lungs, making breathing difficult.

- While **asthma** cannot be cured, it can be controlled by self-management strategies such as the regular use of controller medications, receiving an annual influenza immunization, and avoiding exposure to triggers such as cigarette smoke.

Public Health

The Burden of Asthma in Wisconsin

ASTHMA IS COMMON

MORE THAN **HALF A MILLION** WISCONSINITES

1 IN 10 ADULTS

1 IN 13 CHILDREN

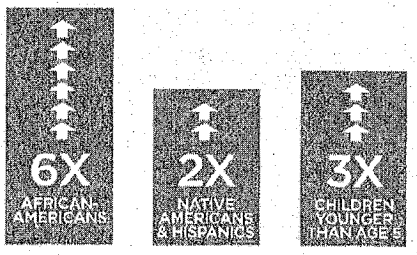
Public Health

Source: Wisconsin Department of Health Services (2017)

The Burden of Asthma in Wisconsin

ASTHMA IS DEADLY

EMERGENCY DEPARTMENT VISIT
& HOSPITALIZATION RATES



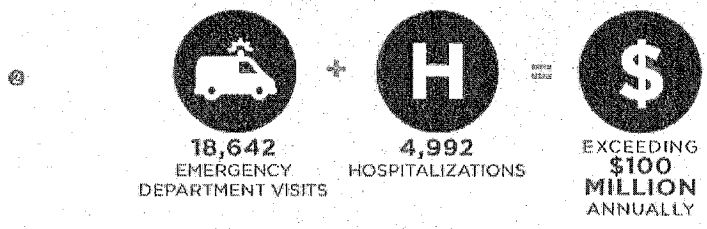
1 PERSON DIES EVERY 5 DAYS

Public Health

Source: Wisconsin Department of Health Services (2017)

The Burden of Asthma in Wisconsin

ASTHMA IS EXPENSIVE

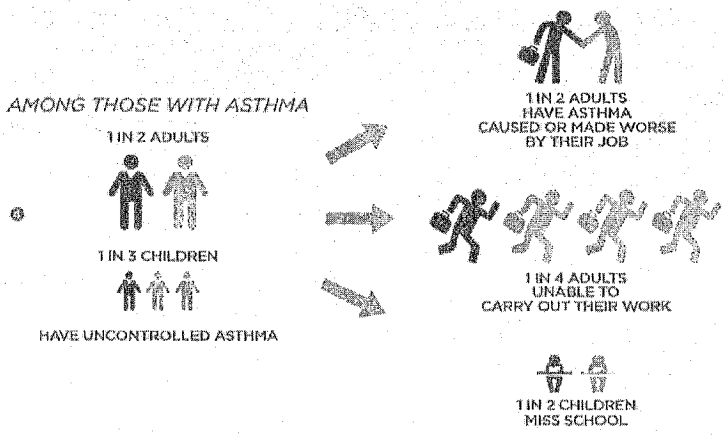


Public Health

Source: Wisconsin Department of Health Services (2017)

The Burden of Asthma in Wisconsin

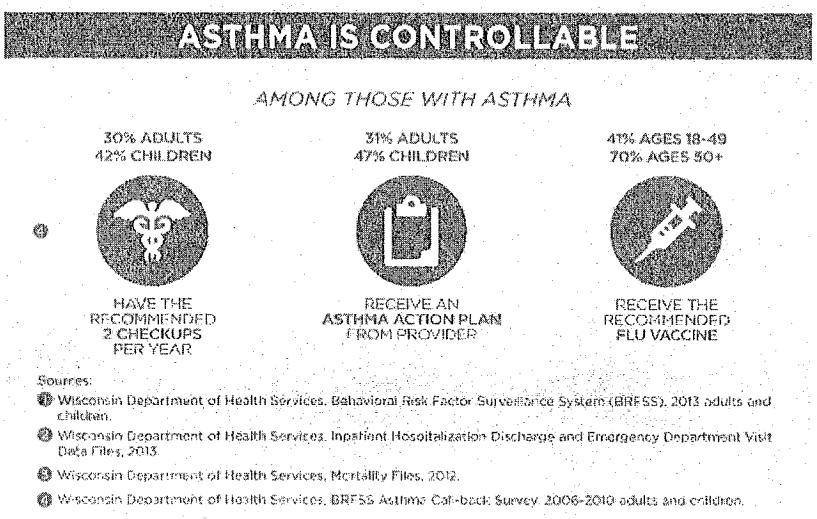
ASTHMA IS DISRUPTIVE



Public Health

Source: Wisconsin Department of Health Services (2017)

Asthma in Wisconsin



Source: Wisconsin Department of Health Services (2017)

Public Health

Asthma Disparities in Wisconsin

Black Wisconsinites have a rate of asthma-related hospitalizations **six times higher** than white Wisconsinites.

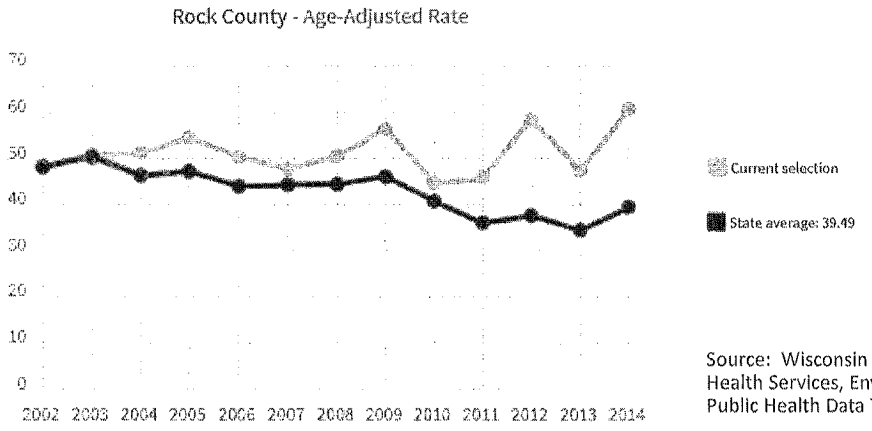
American Indian/Alaska native Wisconsinites have a rate of asthma-related hospitalizations **1.8 times** higher than white Wisconsinites.

In 2014, Hispanic Wisconsinites had an asthma-related hospitalization rate **1.6 times** higher than non-Hispanic Wisconsinites.

Source: Wisconsin Department of Health Services, P-01727 (01/2017)

Public Health

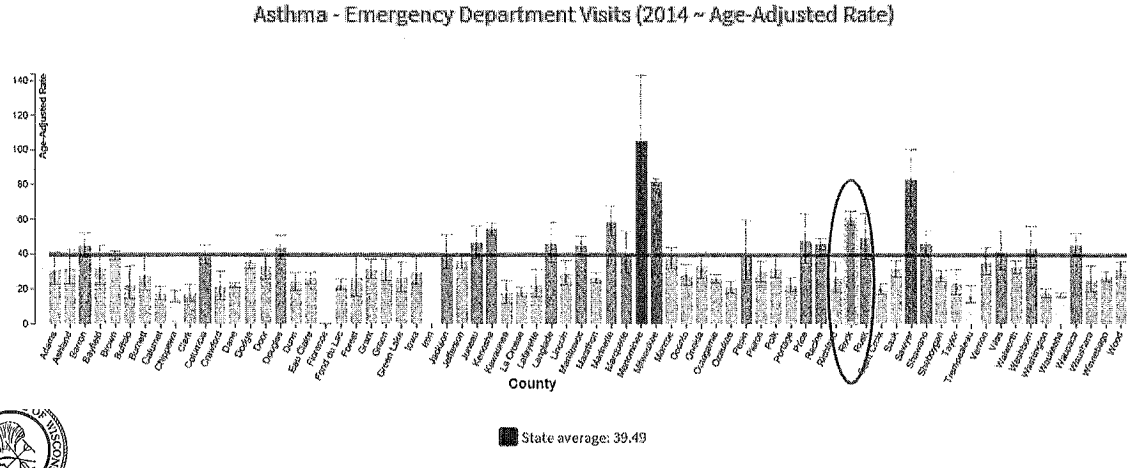
Age Adjust Asthma Rate



Public Health

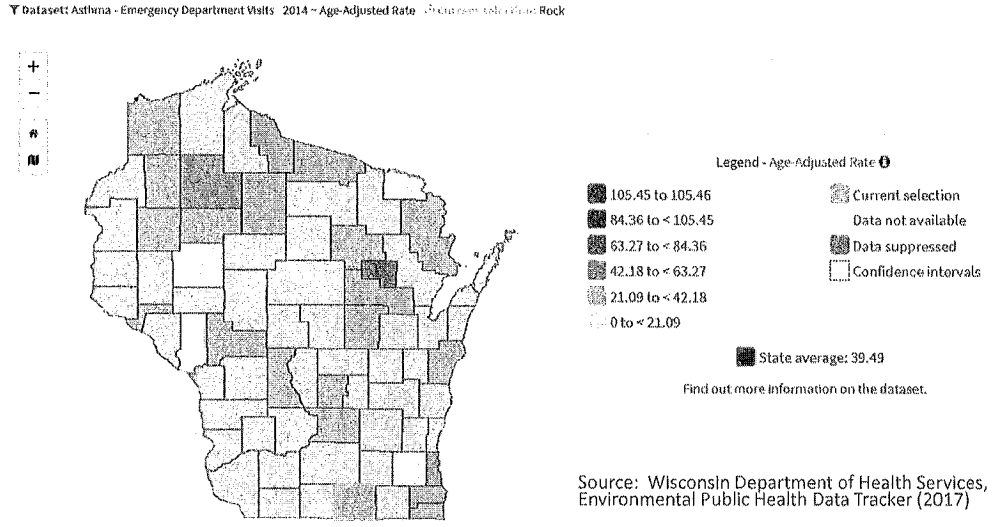
Source: Wisconsin Department of Health Services, Environmental Public Health Data Tracker (2017)

Age Adjusted Asthma Rate



Public Health

Asthma in Rock County



Public Health

Source: Wisconsin Department of Health Services, Environmental Public Health Data Tracker (2017)

Asthma Rates in Rock County

County	Asthma E.D. Visits (2014 Age Adjusted Rate)
Menominee	105.5
Milwaukee	81.6
Sawyer	83.0
Rock	60.8
Dane	22.1
Walworth	32.5
Green	30.7
Kenosha	54.4
Racine	45.9

Public Health

Source: Wisconsin Department of Health Services, Environmental Public Health Data Tracker (2017)

Rock County Asthma E.D. Visits

(2016 Emergency Department Visits by Hospital)

Hospital	% Emergency Department Visits in 2016
Beloit Memorial Hospital	40.1%
Mercy Health System	35.6%
St. Mary's Janesville Hospital	17.6%
Other (Outside Rock County)	6.7%

Public Health

Rock County Asthma Hospitalizations

(2016 Percent Hospitalizations by Hospital)

Hospital	% Hospitalizations in 2016
Beloit Memorial Hospital	40.3%
Mercy Health System	25.0%
St. Mary's Janesville Hospital	12.5%
Univ. of Wisconsin Hospital	15.3%
Other (Outside Rock County)	6.9%

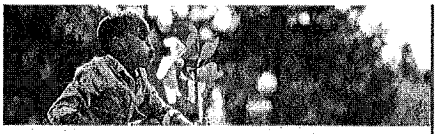
Public Health

Rock County's Asthma Care Program

- Kenosha, Milwaukee, Sawyer, and **Rock** Counties currently receive funding for Asthma Care Programs. **Rock** County was added during the program's second year due to high emergency department and hospitalization rates.
- Training for **RCPHD** staff began in the late Spring and Summer of 2016.
- After promoting **Rock** County's Asthma Care Program to hospitals and clinics in late 2016, the RCPHD began receiving referrals in January 2017.
- **Rock** County's funding:
  - Year 01 (9/1/2015 – 8/31/2016) = $4,836 (For staff training only.)
  - Year 02 (9/1/2016 – 8/31/2017) = $23,000
  - Year 03 (9/1/2017 – 8/31/2018) = $25,000

Public Health

Rock County's Asthma Care Program



Wisconsin's Asthma Care Program

Home-Based Environmental Asthma Program

ASTHMA CARE HOME PROGRAM CAN IMPROVE ASTHMA CONTROL

- Free program provides asthma self-management education and a home environmental walkthrough to people with poorly controlled asthma.
- Includes two in-home sessions.
- Program goal is to reduce missed school or work days, urgent care visits, emergency department visits, and hospitalizations due to asthma.

ASTHMA SELF-MANAGEMENT EDUCATION

- Provided by a trained asthma educator.
- Includes topics such as:
  - Proper inhaler use
  - Asthma medications and devices
  - Early warning signs
  - Common asthma triggers
- Ensures participants have an up-to-date asthma action plan.
- Includes three and six month follow-up calls.

WHO WOULD BENEFIT?

Anyone who struggles with asthma symptoms and has any of the following due to asthma:

- Missed school or work days
- Emergency department visits
- Hospitalizations
- Urgent care visits

HOME ENVIRONMENTAL WALKTHROUGH

- Asthma triggers play a role in increasing the risk of an asthma attack.
- Common asthma triggers include:

Smoke Mold Pet Dander Dust Mites Pests

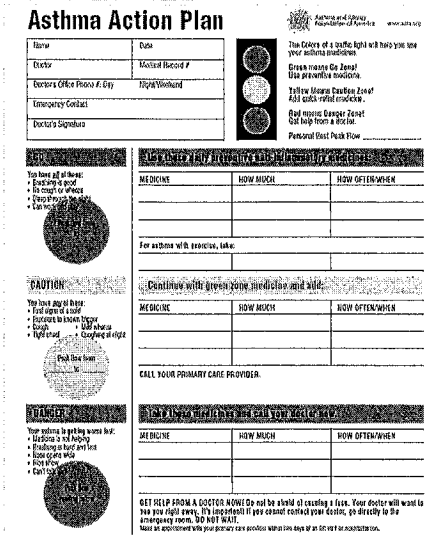
- Trained staff identify asthma triggers in the home.
- Recommendations are provided to help reduce identified asthma triggers.
- Free asthma trigger reduction items may be provided.

Public Health

- A free program available to anyone in Rock County regardless of age or insurance status
- Provides asthma self-management education and home environmental walk-through
- PHNs coordinate with EHSs for Healthy Homes visits when needed
- PHNs provide case management for families that includes communication with the Primary Care Provider and asthma specialists
- Continued contact with families includes follow-up phone calls at 2 weeks, 3 months and 6 months

First Home Visit

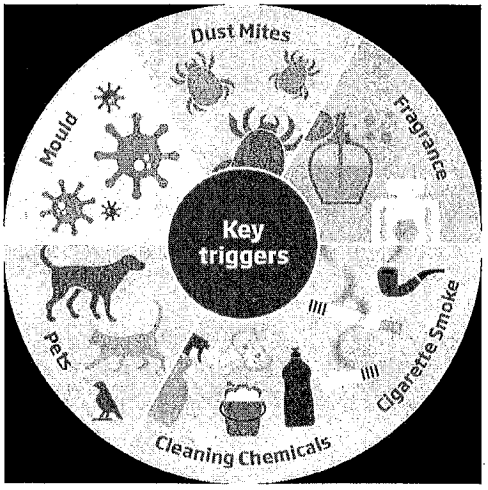
- PHNs assess asthma history, control, medications and triggers.
- Education is provided regarding proper medication use, common asthma triggers, and early warning signs.
- The patient's PCP status is discussed, as well as Asthma Action Plans and referrals to specialists.



Public Health

Second Home Visit

- A home walk through is provided by a PHN, as well as an EHS if needed
- Recommendations to reduce asthma triggers are provided
- Items to help reduce problem areas may be available
- Previously provided items include mattress and pillow covers, HEPA filtered vacuums, asthma safe cleaning products and pest control kits



Public Health

Referrals

Referral Source	Number of Referrals
Beloit Health System	1
Beloit Area Community Health Center	3
Head Start/Early Head Start	3
Self Referral	1
Mercy Health System	3

Public Health

Intended Outcomes

To reduce missed school or work days, urgent care visits, emergency department visits, and hospitalizations due to asthma.

Public Health

Thank You

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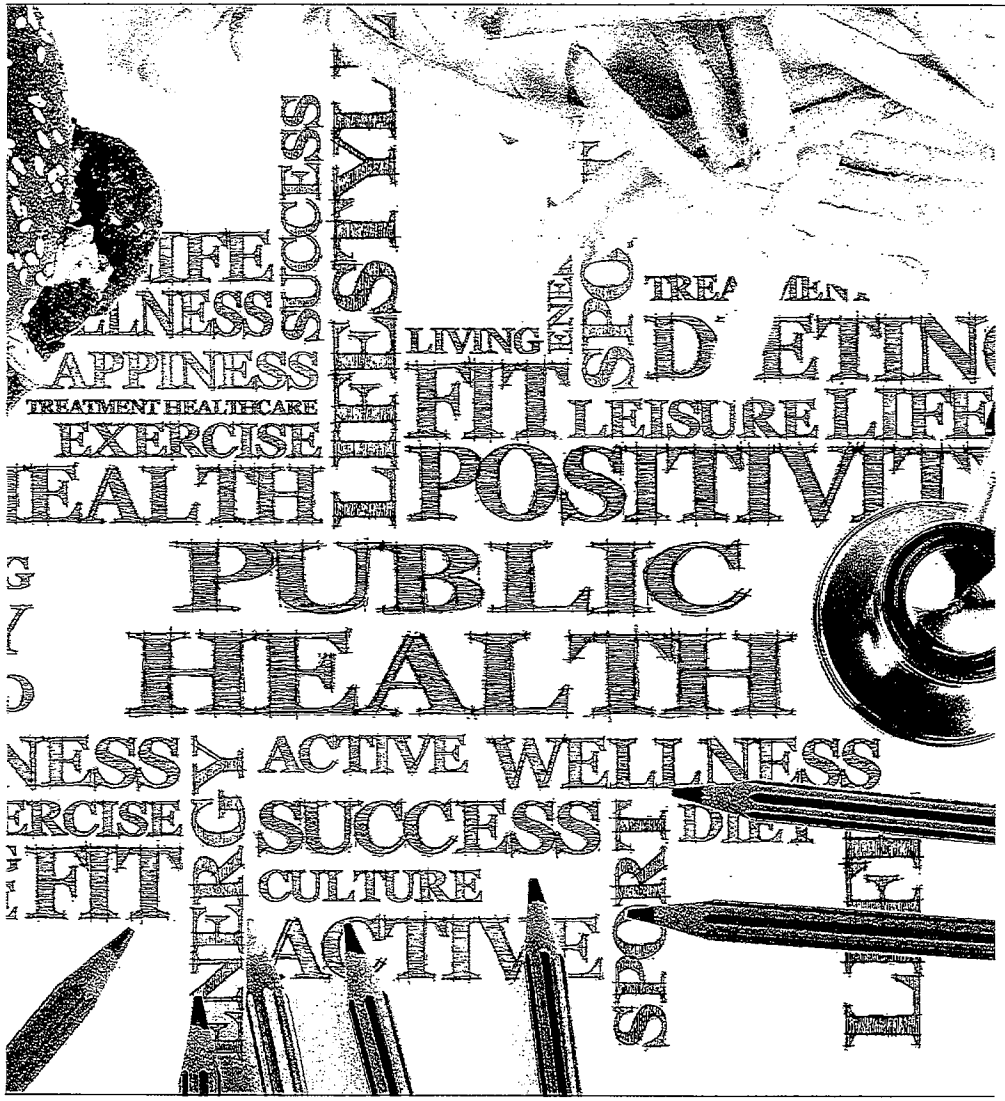
Public Health

www.wicounties.org November 2017

WISCONSIN COUNTIES

ALSO INSIDE: *2017-19 STATE BIENNIAL BUDGET SUMMARY*



COMMUNITY HEALTH

Making Our Communities Healthy Places to Live, Work & Play

Sara Jesse, Project Manager
Wisconsin Association of Local Health Departments and Boards

Health is everyone's business. It enhances our individual quality of life and impacts educational attainment, worksite productivity and costs, and the economy in general. Many community stakeholders care about and are invested in improving the health of their communities. While each may have a different organizational mission and even different reasons for addressing health improvement, they share the same goal: making the community a healthy place to live, learn, work, and play.

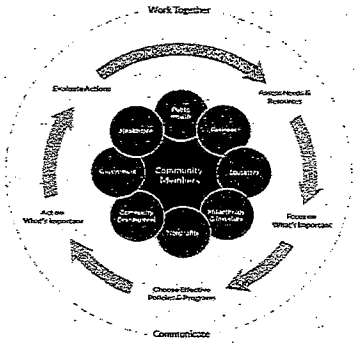
What Makes a Community Healthy

Ideally, in any given community, organizations will collaborate on community health improvement, first working together to forge a shared understanding of what shapes health and how to improve it. While it is often health outcomes that capture our attention and motivate initiatives for change, it is important to focus efforts on all of the factors that drive those outcomes, as is depicted in Diagram 1 on page 18. That is where the greatest opportunity lies for real change.

How a Community Can Become Healthier

Models of community health improvement are quite similar, describing a continuous cycle of assessment, implementation, and evaluation. As Model 1 depicts above, they emphasize intentional steps in working together to leverage the greatest impact:

Model 1



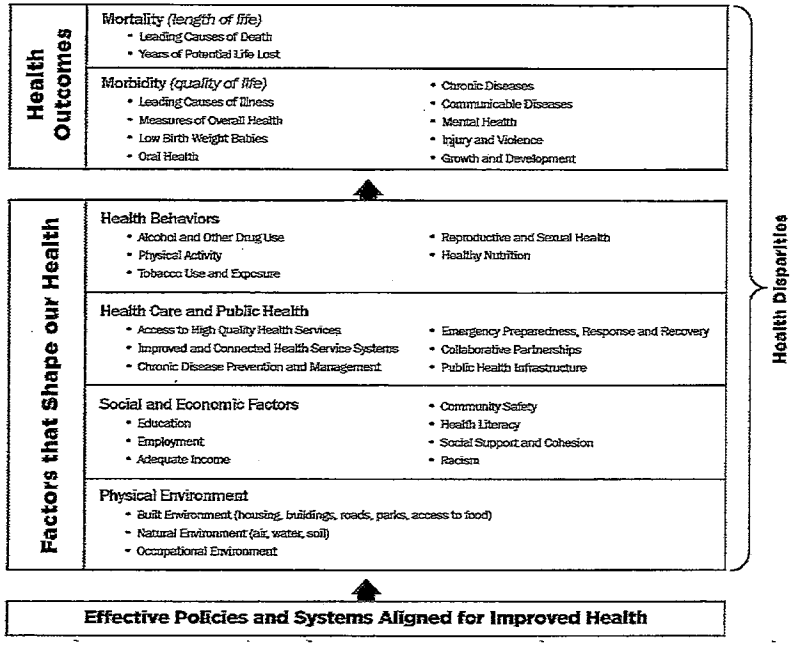
Source: Action Cycle©, County Health Rankings and Roadmaps, 2015

- **Assess Needs & Resources**
  Collect and analyze community health data. Include information on health disparities, the underlying determinants of health, and community needs, assets and resources as identified by stakeholders and community members.
- **Focus on What is Important**
  Identify a set of priority community health issues to address, aligning them where possible with state and national priorities.

continues

- **Choose Effective Policies & Programs**
  Engage partners to plan and implement multi-level approaches to change that are evidence-informed and include policy strategies.
- **Act on What is Important**
  Develop a detailed action plan and track progress to maintain momentum.
- **Evaluate Actions**
  Monitor both the process and the outcomes of efforts and revise the action plan based on evaluation results.
- **Work Together & Communicate**
  Throughout the process, report on progress often, include broad participation from the community, and actively involve stakeholders, such as hospitals, public health, tribes, businesses, elected officials, faith communities, education, clinics, health care providers, law enforcement, human services organizations, community advocacy organizations, funders, concerned citizens, and others.

Diagram 1



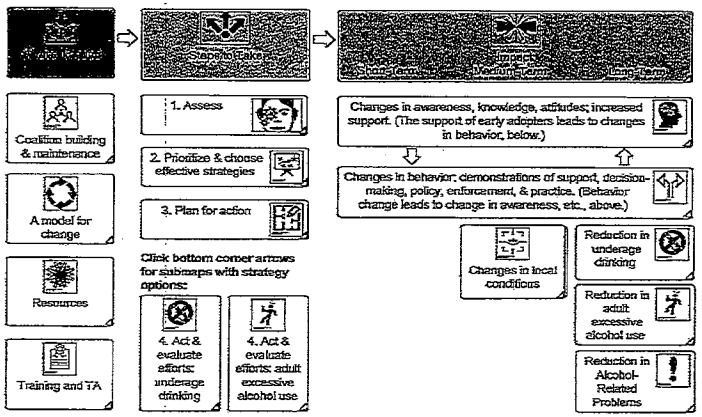
Source: Improving the Health of Local Communities: The Wisconsin Way, CHIPP Infrastructure Improvement Project, 2014

Diagram 2

Strategy Map for Preventing and Reducing Alcohol Misuse, CHIA 2016

Overall Map

For more detail, click on the arrow in the bottom right corner of a step. (Right click on the arrow to open it in a new window or tab.) Use "Show Contents," upper right of screen, for navigation. Scroll down for more information.



Source: The first page of the Strategy Map for Preventing and Reducing Alcohol Misuse, CHIA

Tools & Resources for Community Health Improvement

About 20 tools to support Wisconsin communities in their health improvement efforts are available on a website managed by the Wisconsin Association of Local Health Departments and Boards (WALHDAB): *www.wicommunityhealth.org*. To access the tools directly, visit the *Table of Resources* under the *Resources by Stage* tab. The tools were created by two projects: the CHIPP (Community Health Improvement Plans and Processes) Infrastructure Improvement Project (2011-2014); and Community Health Improvement in Action (CHIA, 2014-2017). Both were community-academic partnerships between WALHDAB, the University of Wisconsin Population Health Institute, and many other partners, with funding provided by the University of Wisconsin School of Medicine and Public Health from the Wisconsin Partnership Program (WPP). The tools on the website include:

- ***The Wisconsin Guidebook on Improving the Health of Local Communities***
  A comprehensive, step-by-step guide to the health improvement process. For each stage of effort, the Guidebook provides checklists, state and national guidelines, and links to related resources.
- **The *Strategy Map for Preventing & Reducing Alcohol Misuse* (Diagram 2)**
  An online visual guide to the community health improvement process with comprehen-

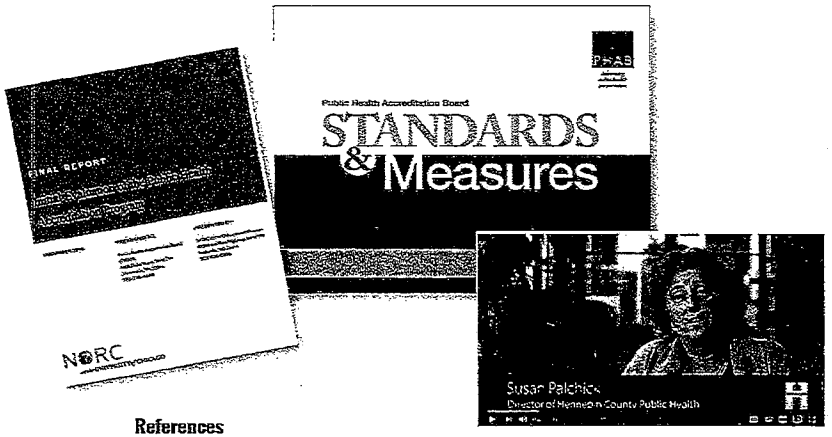
continues on page 25

- **Staff Morale & Visibility.**
  The recognition of excellence brought on by meeting accreditation standards has positively impacted staff morale and enhanced the visibility of the health departments.
- **Improved Ability to Compete for Grants & Other Funding.**
  Some accredited health departments report that going through the accreditation process provided them with better materials and information to apply for and receive grants that fund various community-specific initiatives.

For communities that are working on achieving STAR certification, public health department accreditation counts as one of the measures in that application.

Interested in learning more?

All of PHAB's materials for accreditation are available on its website, *www.phaboard.org*. These materials have been designed to help health departments prepare for accreditation. PHAB will also respond to specific questions or requests for webinars or conference speakers. PHAB's phone number is 703-778-4549. State and local health officials, health department staff, boards of health, and others who are interested in a valuable, accountable, effective public health system are encouraged to learn more. To receive updates on the national public health accreditation program, sign up for the PHAB e-newsletter from the PHAB website.



References

- *www.phaboard.org*
- *www.phaboard.org/accreditation-process/public-health-department-standards-and-measures*
- *www.starcommunities.org*
- *www.phaboard.org/wp-content/uploads/PHAB-Final-Report_December-2016.pdf*
- *www.phaboard.org/accreditation-works-new-video-available*

COMMUNITY HEALTH CONTINUED FROM PAGE 19

sive links to resources. While the Strategy Map focuses on alcohol misuse, it can be used for other health focus areas as a template for designing a community logic model, assessing local conditions, and evaluating efforts.

- **Tools for collecting and assessing secondary and primary data**
  These tools include lists of recommended indicators and the *Sample Dashboard for Measuring the Progress and Impact of Alcohol-Related Initiatives*, an Excel template that helps organize and present data in a way that is easy to read, track, and understand. (Though the sample dashboard presents alcohol-related data, as a template, this tool can be used with any health focus area and with any indicators.)
- **Resources for engaging stakeholders**
  These resources include recruiting, sustaining engagement, and establishing a common knowledge base.
- **Pick Lists**
  Pick lists of evidence-based strategies– along with resources for implementation and sample objectives– for priority areas frequently chosen by local communities: *Objectives with Focus: A Pick List of Sample Objectives for Effective Implementation* covers the topics of mental health, oral health, and physical activity and nutrition, and *Pick List of Alcohol-Related Strategies*.
- **Templates**
  Templates for creating an implementation plan and sharing plans and updates with the community in the form of fact sheets and a template PowerPoint presentation.

In addition to these resources, the website *www.wicommunityhealth.org* includes: archived webinars on community health improvement topics (under the Education and Events tab); models and standards for agencies required to conduct community health improvement; and links to other resources for each stage of the health improvement cycle in general and for alcohol-related work in particular.

It is our hope that these tools, based on the best evidence available, provide a shared framework to help local and state partners in Wisconsin proactively and strategically act to measurably improve the health status of their communities. Working together, community leaders and members can have a significant impact in creating healthy places to live, learn, work, and play.