Vector-Borne Disease Section Update

Lyme Disease Advisory Committee Conference Call
November 7, 2017

Nikki Johnson, CHES®  Melissa Yoshimizu, PhD
Vector-Borne Disease Section  Vector-Borne Disease Section
1. Public health education & projects
2. Surveillance and activities
3. Current projects/goals
Target Population Outreach

- General Public
- Medical Community
- Local Agencies
General Public

Owner opens door to let me out.

There are ticks out there.
CDPH has a New Website

https://www.cdph.ca.gov/Pages/CDPHHome.aspx
The easiest way to “search” for something is to type it in to the right of the magnifying glass.
Links to Lyme Disease Related Webpages

- Lyme Disease Advisory Committee webpage:
  - https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Lyme-Disease-Advisory-Committee.aspx

- Lyme Disease webpage:
  - https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/LymeDisease.aspx
CDPH Social Media
Facebook and Twitter

- March - November 2017
YouTube Videos

- March - November 2017
The Western Blacklegged Tick Surveillance and Identification

Protect Yourself from Ticks Where You Work

California Work Place Tick Bite Prevention

Video Playback Location

VIEWER METRICS
The Western Blacklegged Tick Surveillance and Identification

~713 views
~4077 views since November 2013
The Western Blacklegged Tick Surveillance and Identification, cont.

Viewers by Gender

- Male: 62%
- Female: 38%

Viewers by Age (in years)

- 18-24: 15%
- 25-34: 22%
- 35-44: 16%
- 45-54: 5.8%
- 55-64: 5.5%
- 65+: 15%
California Work Place Tick Bite Prevention

~194 views
~1265 views since November 2013
California Work Place Tick Bite Prevention, cont.

Viewers by Gender
- Male: 68%
- Female: 32%

Viewers by Age
- 18-24: 33%
- 25-34: 26%
- 35-44: 24%
- 45-54: 13%
- 55-64: 2.3%
- 65+: 1.8%
Protect Yourself from Ticks Where You Work

~129 views
~950 views since July 2013
Protect Yourself from Ticks Where You Work, cont.

Viewers by Gender

- Male: 58%
- Female: 42%

Viewers by Age

- 18-24: 37%
- 25-34: 16%
- 35-44: 14%
- 45-54: 22%
- 55-64: 8%
- 65+: 2%
Public Education Materials Distribution

To include:
- General Public
- Occupational Health
- Medical Community
- Local Agencies
## Public Education Materials Distribution

### Shipped Education Materials
March - November 2017

<table>
<thead>
<tr>
<th>Prevent Tick Bites - Prevent Disease Brochure</th>
<th>Tick ID Wallet Cards</th>
<th>Lyme Disease in CA Brochure</th>
<th>Flash drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Spanish</td>
<td>English</td>
<td>Spanish</td>
</tr>
<tr>
<td>5,815</td>
<td>830</td>
<td>12,630</td>
<td>4,148</td>
</tr>
</tbody>
</table>
Public Education Materials Distribution by Tom Dwyer USFS Volunteer #13

USFS Visitor Centers receiving tick wallet ID cards

- Chantry Flats - visitor center, picnic area (heavily used year-round).
- Chilao - visitor center, picnic & camping area (seasonal)
- Mt Baldy - visitor center (seasonal)
- Grassy Hollow - visitor center & nature center
Public Education Materials Distribution
by Tom Dwyer USFS Volunteer #13
USFS Volunteer Groups receiving tick wallet ID cards

- Altadena Crest Restoration Group
- Angeles Fire Lookouts
- Concern Off Road Bicycle Assoc. (CORBA)
- Bear Canyon Trail Crew
- JPL Trail Builders
- Mt. Wilson Bicycling Assoc.
- Restoration Legacy Crew
- Sierra Club (our area)
- Several Boy Scouts groups
- Scenic Mt Lowe Committee
- California Trail User Coalition
Public Education Materials Distribution

By Jen Griffin, GS Troop 33720, Fremont
receiving tick wallet ID cards

A Shout out!
Presentations

- Title: Emerging Tickborne Diseases
- Presenter: Kerry Padgett, Ph.D., Supervising Public Health Biologist, VBDS
- Audience: The Council of State and Territorial Epidemiologists (CSTE) via webinar
- When: May 3, 2017
Close to Home by John McPherson

With ticks worse than ever this year, Debra safeguarded the kids with aluminum foil bodysuits.
Your Guide to Insect Repellents

Prevent insect bites - prevent disease.

Repellents will keep mosquitoes and ticks from biting you. This will reduce your chance of getting a disease like West Nile virus, Zika virus, or Lyme disease.

Insect repellents registered by the Environmental Protection Agency (EPA) are safe and effective to use, even for pregnant and breastfeeding women, when used as directed by the label instructions.

Do:
- Read and follow label directions before applying repellent
- Use only enough repellent to cover your clothes and exposed skin
- Apply sunscreen first if you are going outdoors, then apply repellent
- Apply repellent for children—spray on your own hands first and then put it on the child
- Wash your clothes and bathe after using insect repellent and returning indoors

Don’t:
- Spray or apply repellent near your eyes, nose, mouth, ears, or on open cuts
- Spray insect repellent under clothing
- Use insect repellent on babies younger than 2 months
- Use OLE or PMD on children under the age of 3 years

The California Department of Public Health recommends using EPA-registered insect repellents that contain one of the following active ingredients:

> DEET
> Picaridin
> IR3535
> Oil of Lemon Eucalyptus (OLE)
> Para-methane-diol (PMD)

Look for one of these ingredients on the front or back of repellent containers. Products with a higher percentage of an active ingredient will work longer to protect you.

LEARN MORE AT: www.epa.gov/insect-repellents
Insect Repellent Fact Sheet

What is Insect Repellent?
Insect repellents are products used to prevent insects from biting you. The most common repellents are sprayed on your skin or clothes to keep insects off you. The U.S. Centers for Disease Control and Prevention (CDC) strongly suggests using an insect repellent registered by the Environmental Protection Agency (EPA) to prevent mosquito and tick bites. The EPA registers skin-applied repellents that are safe and effective to use when applied properly, including for children and pregnant women. The California Department of Public Health (CDPH) suggests using EPA-registered repellents with one of the following active ingredients because they provide longer-lasting protection against insect bites:

- DEET
- Picaridin
- IR3535
- Oil of Lemon Eucalyptus (CLE)
- Para-methane-diol (PMD)

Repellents that have a higher percentage of an active ingredient will work longer to keep insects from biting you. Look for one of these active ingredients on the front or back of the insect repellent container and for information on the typical length of time the product will repel either mosquitoes or ticks.

Why Use Insect Repellent?
EPA-registered insect repellent, when used as directed by the product label, will help keep insects from biting you and protect against diseases like West Nile virus, Zika virus, and Lyme disease.

EPA-registered repellents are both safe AND effective to use when used as directed. Unregistered products may be considered by the EPA as safe to use, but they have not been tested to see how well they work to prevent insect bites. Unregistered products that are safe, but may not prevent against insect bites, include:

- Citronella oil
- Peppermint oil
- Soybean, cedar, and geranium oils

DOs and DON'Ts of Insect Repellent Use

DO:
- Read and follow label directions before applying repellent.
- Apply repellent to your face or your child’s face by first spraying the product into your hands and then applying. Wash your hands before eating or drinking.
- Use if you are pregnant or breastfeeding; EPA-registered repellents are safe to use.
- If you are going outdoors in the sun, apply sunscreen first, wait 15 – 20 minutes, then apply repellent over the sunscreen.
- Reapply repellent if you get wet, will be outdoors for a long time, or if insects begin to bite.
- Be sure to use the most effective repellent to avoid bites from different types of insects. Products are available that protect against tick bites, mosquito bites, or both.
- Wash your clothes and bathe after using insect repellent and returning indoors.

DON'T:
- Spray or apply repellent near your eyes, nose, mouth, ears, or on open cuts.
- Spray or apply repellent under clothing.
- Use insect repellent on babies younger than 2 months.
- Use oil of lemon eucalyptus or para-methane-diol on children under the age of 3 years.
- Allow children to apply insect repellent themselves.

Where Can I Buy Repellent with EPA-registered Ingredients?
Insect repellents can be found in most stores selling personal, home, and garden supplies. Common brand names of EPA-registered insect repellents include: OFF!, BugX, Cutter, and Guard Wipes.

Note: CDPH does not endorse any specific brand name products.

Resources
To find an insect repellent that is right for you, use the online EPA insect repellent search tool (https://www.epa.gov/insect-repellents/find-insect-repellent-right-you). For more information, visit the EPA’s repellent website (https://www.epa.gov/insect-repellents/regulation-skin-applied-repellents) and the CDC’s repellent information webpage (https://www.cdc.gov/westnile/fao/repellent.html).

September 2017
LYME DISEASE IN CALIFORNIA

WHAT IS LYME DISEASE?
Lyme disease is caused by a spiral-shaped bacterium called Borrelia burgdorferi which is transmitted by the bite of an infected blacklegged tick. Lyme disease is named for Old Lyme, Connecticut, where the disease was described in 1975. It occurs worldwide where blacklegged ticks are found, including in California.

WHAT ARE THE SYMPTOMS OF LYME DISEASE?
Early signs and symptoms occur soon after the bite of an infected tick and may include:
- An expanding rash called erythema migrans, or EM, and/or flu-like symptoms (fever, headache, fatigue, nausea, and swollen lymph nodes)
- Ticks feed by attaching their mouthparts into the skin and taking a blood meal. Because ticks are small, some people do not notice that they have been bitten.

WESTERN BLACKLEGGED TICK AND LYME DISEASE ECOLOGY
Ticks have three life stages shown from left to right: larvae, nymph, and adult (male and female). Ticks feed by inserting their mouthparts into the skin and taking a blood meal. Because ticks are small, some people do not notice that they have been bitten.

Lyme disease is most common in areas where blacklegged ticks are found. Only nymphs and adult females of the western blacklegged tick can transmit the Lyme bacteria to humans. Nymphs can pose a greater risk of transmitting Lyme disease bacteria to humans compared to adult ticks because they are tiny and difficult to see (2-3 mm in length) and may be missed by careful inspection.

In addition, in some areas of California, studies show that a higher percentage of nymphs (average 2.1%, range 0.6-5.1%) carry the Lyme disease bacteria compared to adult ticks (average 1.2%, range 0.0-10.8%).

Nymphs are found in leaf litter and on rocks, logs, tree trunks, or fence rails under trees in woodland areas or other shaded natural areas. Adults are found on the tops of grasses and shrubs, often along trails. Ticks do not jump or fly. Ticks climb on to people when people brush against them such as along a trail edge.

Before going into areas where ticks live:
- Tread clothing, socks, and shoes/boots with permethrin according to label directions.
- Permethrin kills ticks.
- Pack a pair of tweezers to remove any attached ticks.

How can Lyme disease be prevented?

Removing a tick shortly after it attaches (less than 24 hours) can prevent transmission of Lyme disease and other tick-borne diseases.

To safely remove an attached tick:
- Use tweezers to grasp the tick as close to your skin as possible.
- Pull the tick straight out using a firm, steady motion: do not jerk the tick.
- Do not twist, move, or burn an attached tick; these are not effective methods for tick removal.

Tick bites are seen to remove attached ticks (photo enlarged to show detail)
- Wash your hands and the bite site with soap and water after the tick is removed.
- Apply an antiseptic to the bite site.
- Painful redness that persists less than 24 hours after a tick bite that does not expand is likely a local allergic reaction to the tick's saliva.
- An infection can occur where the tick was attached. If redness or pain develops at the tick bite site, consult your healthcare provider.

Additional information can be obtained by contacting the California Department of Public Health:
Published by the State of California Department of Public Health Vector Borne Diseases Section
Sacramento, CA (916) 552-9730
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Lyme disease ecology in a changing world: Consensus, uncertainty and critical gaps for improving control Jun 2017 Philosophical Transactions of The Royal Society B Biological Sciences

- Authors: A. Marm Kilpatrick, Andrew D. M. Dobson, Taal Levi, Daniel J. Salkeld, Andrea Swei, Howard S. Ginsberg, Anne Kjemtrup, Kerry A. Padgett, Per M. Jensen, Durland Fish, Nick H. Ogden and Maria A. Diuk-Wasser

Molecular surveillance for Bartonella, Borrelia, and Rickettsia species in ticks from Desert Bighorn Sheep (Ovis Canadensis) and Mule Deer (Odocoileus hemionus) in Southern California. Journal of Wildlife Diseases, in press

- Author(s): Billeter SA, Osikowicz LM, Burns JE, Konde L, Gonzales BJ, Hu R, Kosoy MY
SURVEILLANCE AND TESTING
Number of Reported Lyme Disease Cases, 2007-2016
County Incidence of Reported Lyme Disease Cases, 2007-2016

Reported confirmed cases per 100,000 person-years, 2007-2016*

<table>
<thead>
<tr>
<th>County</th>
<th>Cases per 100,000 person-years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mendocino</td>
<td>4.1</td>
</tr>
<tr>
<td>Humboldt</td>
<td>3.7  ≥ 3.0</td>
</tr>
<tr>
<td>Trinity</td>
<td>3.6</td>
</tr>
<tr>
<td>Sierra</td>
<td>3.1</td>
</tr>
<tr>
<td>Nevada</td>
<td>2.2  2.0 – 2.9</td>
</tr>
<tr>
<td>Mariposa</td>
<td>2.2</td>
</tr>
<tr>
<td>Santa Cruz</td>
<td>2.1</td>
</tr>
<tr>
<td>Sonoma</td>
<td>1.8</td>
</tr>
<tr>
<td>Amador</td>
<td>1.6</td>
</tr>
<tr>
<td>Mono</td>
<td>1.4  1.0 – 1.9</td>
</tr>
<tr>
<td>Marín</td>
<td>1.3</td>
</tr>
<tr>
<td>Others</td>
<td>≥0.1  0.1 – 0.9</td>
</tr>
<tr>
<td>No cases reported</td>
<td></td>
</tr>
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</table>

*Though Lyme disease cases have been reported in nearly every county, cases are reported based on the county of residence, not necessarily the county of infection.
Ixodes pacificus tested for
Borrelia spp.
Table: 10/2016 to 9/2017
Maps: Positives to date

<table>
<thead>
<tr>
<th>County</th>
<th>Total tested</th>
<th>B. burgdorferi s.l. positive (%)</th>
<th>B. miyamotai positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adults</td>
<td>Nymphs</td>
<td>Adults</td>
</tr>
<tr>
<td>Alameda</td>
<td>171</td>
<td>7</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td>Colusa</td>
<td>79</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>El Dorado</td>
<td>214</td>
<td>303</td>
<td>2 (0.9)</td>
</tr>
<tr>
<td>Humboldt</td>
<td>80</td>
<td>5</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madera</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marin</td>
<td>2</td>
<td>70</td>
<td>3 (4.3)</td>
</tr>
<tr>
<td>Mariposa</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monterey</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Napa</td>
<td>114</td>
<td>147</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>Orange</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placer</td>
<td>90</td>
<td>1</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td>San Bernardino</td>
<td>183</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santa Clara</td>
<td>1</td>
<td></td>
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<tr>
<td>Santa Cruz</td>
<td>486</td>
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<td></td>
</tr>
<tr>
<td>Sierra</td>
<td>11</td>
<td></td>
<td>1 (9.1)</td>
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<tr>
<td>Solano</td>
<td>20</td>
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<tr>
<td>Sonoma</td>
<td>62</td>
<td>66</td>
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<tr>
<td>Stanislaus</td>
<td>94</td>
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</tr>
<tr>
<td>Sutter</td>
<td>21</td>
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<td></td>
</tr>
<tr>
<td>Tuolumne</td>
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<td></td>
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</tr>
<tr>
<td>Ventura</td>
<td>120</td>
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<tr>
<td>Yuba</td>
<td>221</td>
<td>2</td>
<td>7 (3.2)</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>2064</strong></td>
<td><strong>603</strong></td>
<td><strong>14 (0.7)</strong></td>
</tr>
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</table>
Current projects/goals

- Focus on collecting and testing *Ixodes pacificus* nymphs and larvae
- Enhance surveillance and testing from low sampled areas
- Continue to enhance in-house tick testing capabilities
  - *Borrelia* speciation and distribution
- Investigate tick-borne diseases
Acknowledgements

- Vector-Borne Disease Section staff
- Infectious Diseases Branch staff