

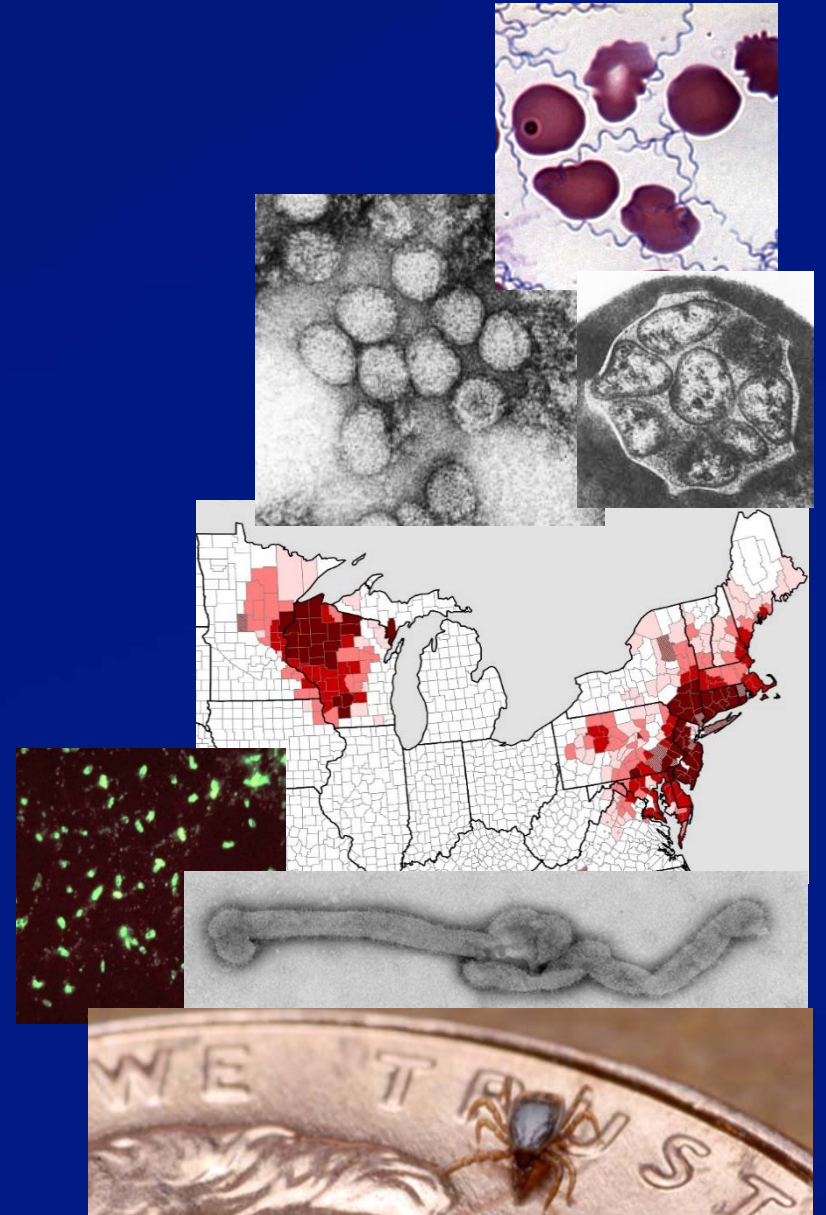
# Integrated Tick Management Funding, Collaborations, and Federal Initiatives



C. Ben Beard, Ph.D.  
Chief, Bacterial Diseases Branch  
CDC – Division of Vector-Borne Diseases

# Outline

- The nature of the challenge
- Available funding
- Partners
- Initiatives



# County-Scale Distribution of *Ixodes scapularis* and *Ixodes pacificus* (Acari: Ixodidae) in the Continental United States

Rebecca J. Eisen,<sup>1</sup> Lars Eisen, and Charles B. Beard

*Journal of Medical Entomology*, 2016, 1–38

doi: 10.1093/jme/tjv237

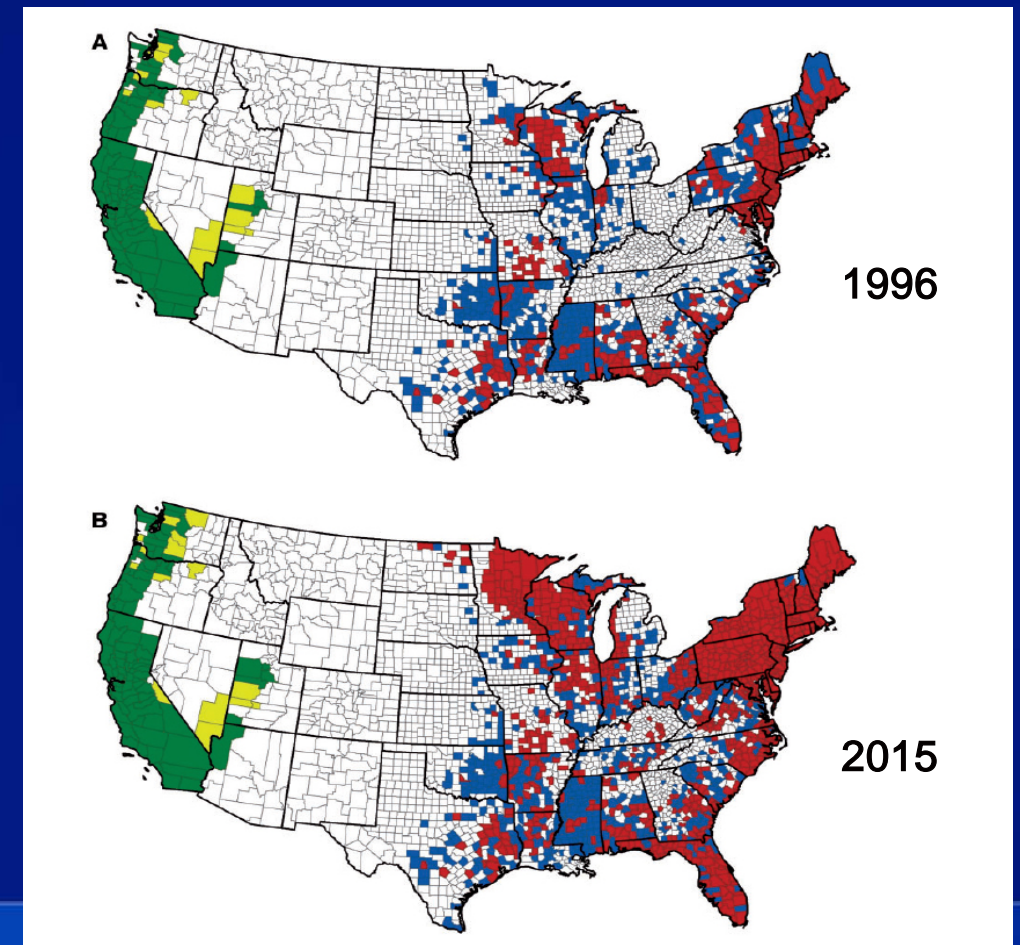
Research article

OXFORD

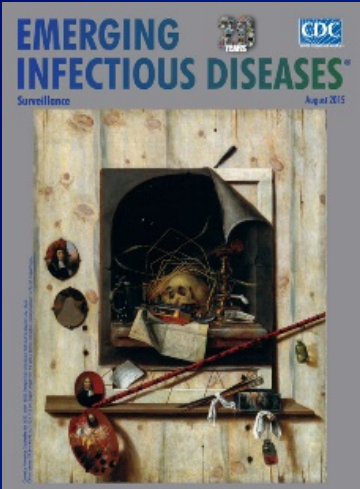


From 1996 – 2015...

- *I. scapularis* or *I. pacificus* now found in 49.2% of counties in 43 states
- Marks a 44.7% increase in the number of positive counties
- The number of counties where *I. scapularis* now established has more than doubled in the last 20 years







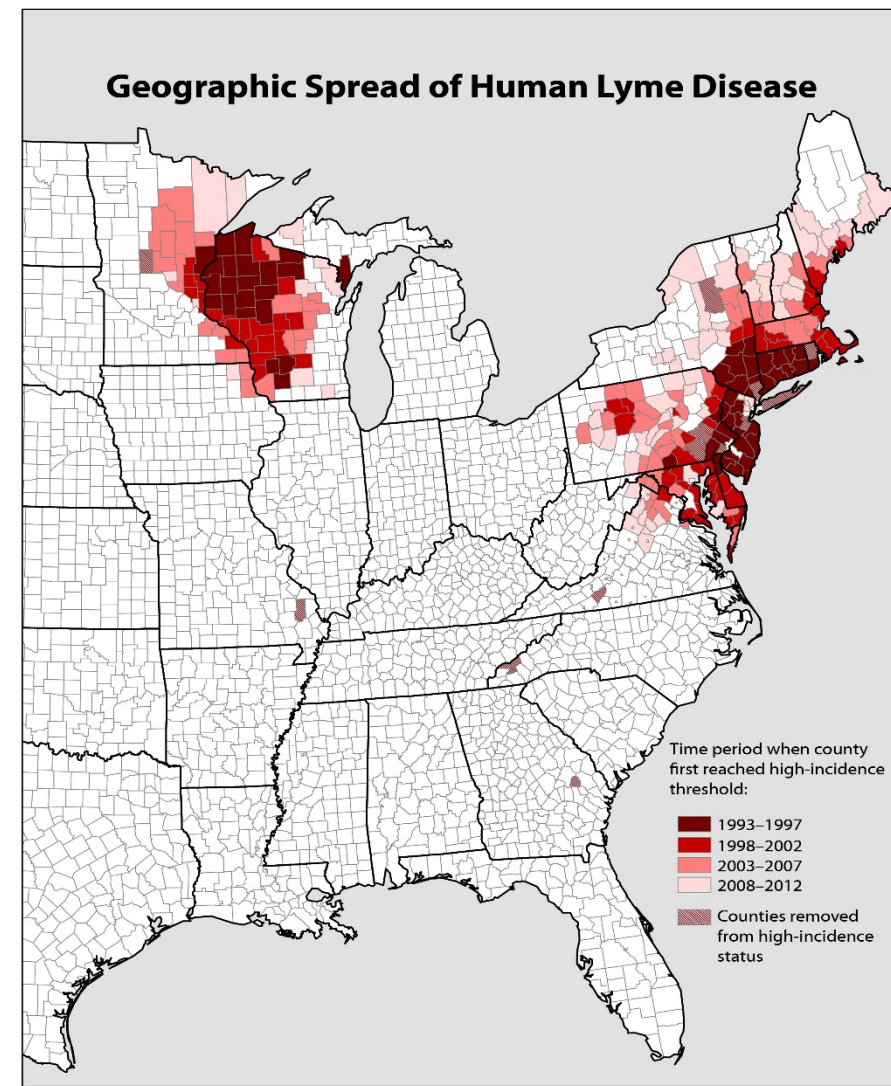
# Geographic Distribution and Expansion of Human Lyme Disease, United States

Kiersten J. Kugeler, Grace M. Farley,  
Joseph D. Forrester, Paul S. Mead

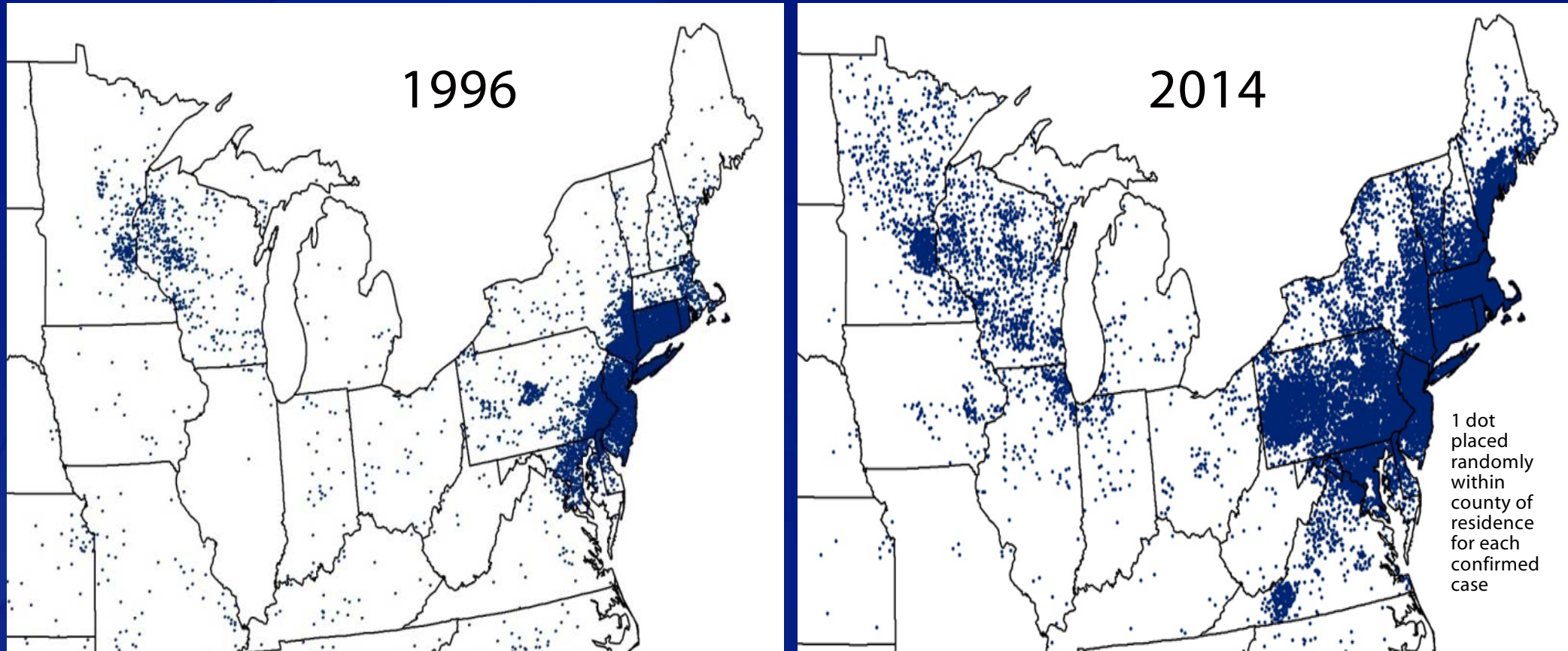
*Emerging Infectious Diseases* Vol. 21, No. 8, August 2015;  
DOI: <http://dx.doi.org/10.3201/eid2108.141878>

From 1993 – 2012...

- Number of high incidence counties in the northeastern U.S. increased by >320%
- Number of high incidence counties in the north-central U.S. increased by H 250%



# Lyme Disease U.S. Case Distribution – 18 year Trend





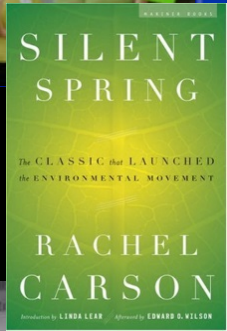
# Reported Cases of Vector-Borne Diseases in the U.S., 2014

Diseases	2014 Cases	Median (range) 2004-2014
Tick-borne		
Lyme disease	33,461	30,831 (19,804 – 38,468)
Spotted Fever Rickettsioses	3,647	2,288 (1,713 – 4,470)
Anaplasmosis/ Ehrlichiosis	4,488	2,267 (875 – 4,551)
Babesiosis*	1,759	1,444 (940 – 1,792)
Tularemia	180	137 (93 – 203)
Powassan virus disease	8	7 (1-16)
Mosquito-borne		
West Nile virus infection	2,205	2,205 (712 – 5,673)
Malaria*	1,653	1,494 (1,255 – 1,773)
Dengue*	677	677 (254 – 843)
California serogroup viruses	96	80 (55 – 137)
Eastern Equine Encephalitis	8	8 (4 – 21)
St. Louis encephalitis	6	10 (1-13)
Flea-borne		
Plague	10	4 (2 – 17)

\*Dengue and malaria cases are primarily imported. Babesiosis and Dengue have only been notifiable since 2011 and 2009, respectively. Median and range values encompass cases reported from 2011 to 2014 for Babesiosis and 2010 to 2014 for dengue.

# Lyme Disease in the U.S. – Current State of Affairs

- The case numbers are higher than they have ever been
- The geographic case distribution is more extensive than ever in the past
- There is significant polarization among key stakeholders
- There is currently no *'magic bullet'* that is effective for disease prevention and control
- Fewer scientists (entomologists in particular) specializing in TBDs
- Less research being conducted on TBDs
- Less general interest and awareness in the academic community
- Tick control is largely seen as a responsibility of individual homeowners with limited public support or participation



## Battle Lines Drawn In Bitter Lyme Wars



# CDC's Previous National Lyme Disease prevention goal



## 14-8. Reduce Lyme disease.

Target: 9.7 new cases per 100,000 population in endemic States.

Baseline: 17.4 new cases of Lyme disease per 100,000 population were reported in 1992–96.

Target setting method: 44 percent improvement. (Better than the best will be used when data are available.)

Data source: National Notifiable Disease Surveillance System (NNDSS), CDC, EPO.

Intervention strategy: National vaccine campaign (LYMErix™)



# Lyme Disease Strategic Priorities

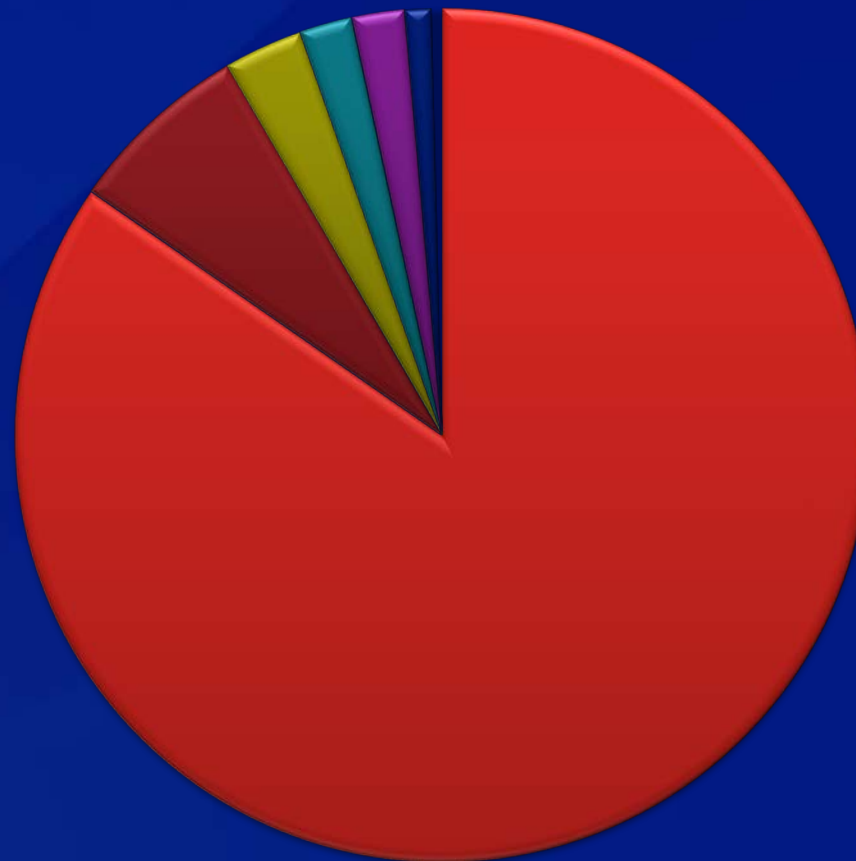
Goal: To reduce the incidence of Lyme disease human cases in the U.S. using evidence-based prevention tools and approaches (Re-establish *Healthy People* Goal)

## Strategy:

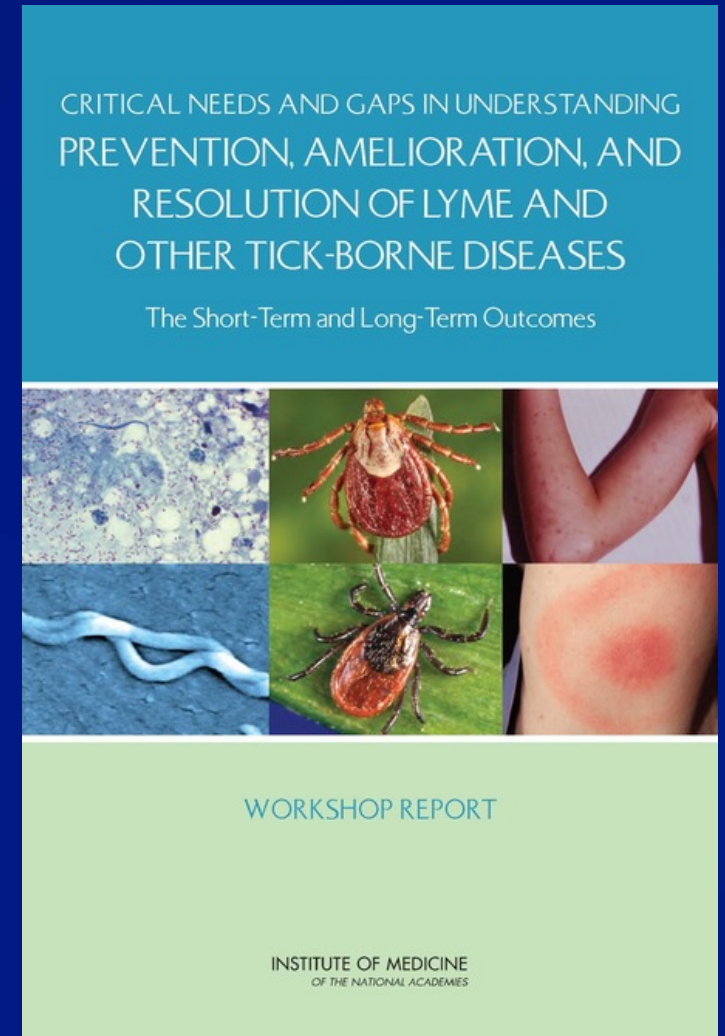
- Strengthen national surveillance and understanding disease risk and burden
- Identify, develop and evaluate prevention and control practices
- Improve early and accurate diagnosis and treatment
- Identify, characterize, and prevent illness caused by new *Borrelia* species
- Collaborate with key partners to promote the use of effective prevention tools and strategies

# Funding Allocation for Tick-borne Disease Studies by Agency, 2006-2010

Agency	5-year Total
NIH/NIAID	\$312,762,626
CDC	\$27,865,186
NIH/NIAMS	\$10,620,407
USDA/ARS	\$7,181,000
NSF	\$6,287,196
NIH/NINDS	\$2,593,865
US Army PHC	\$475,500
USDA/NWRC	\$318,000
<b>Total</b>	<b>\$368,103,780</b>



■ NIH/NIAID 
 ■ CDC 
 ■ NIH/NIAMS 
 ■ USDA/ARS 
 ■ NSF 
 ■ NIH/NINDS 
 ■ US Army Public Hlth Com 
 ■ USDA/NWRC



# Annual Funding for Tick-borne Disease Studies by Agency/Organization

CRITICAL NEEDS AND GAPS IN UNDERSTANDING  
PREVENTION, AMELIORATION, AND  
RESOLUTION OF LYME AND  
OTHER TICK-BORNE DISEASES  
The Short-Term and Long-Term Outcomes



WORKSHOP REPORT

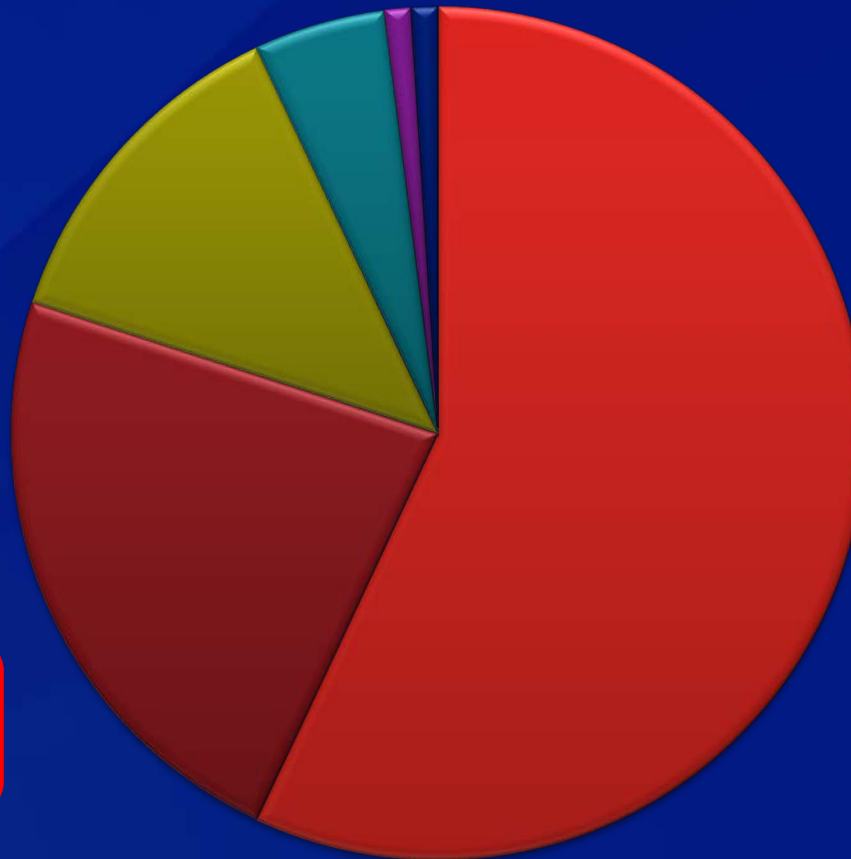
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Agency/Org (#)	2006	2007	2008	2009	2010	Average
NIH-NIAID (404)	\$91,765,324	\$83,686,260	\$63,747,787	\$73,563,255	-- (not available)	\$62,552,525
CDC (19)	\$5,706,765	\$5,631,765	\$5,614,765	\$1,226,765	\$9,685,126	\$5,573,037
NIH-NIAMS (15)	\$2,051,376	\$2,579,209	\$2,758,608	\$3,231,214	--(not available)	\$2,655,102
USDA-ARS (5)	\$1,424,000	\$1,428,000	\$1,447,000	\$1,376,000	\$1,506,000	\$1,436,200
NSF (5)	\$390,196	\$1,093,733	\$1,436,180	\$2,990,954	\$376,133	\$1,256,439
NIH-NINDS (4)	\$662,366	\$458,834	\$654,163	\$220,625	\$597,877	\$518,776
US Army PHC (1)	\$237,750	\$237,750	\$243,500	\$232,000	\$237,750	\$237,750
USDA-NWRC (2)	--	--	--	--	\$318,000	\$318,000
YEARLY TOTAL	\$102,000,027	\$94,877,801	\$75,902,003	\$82,840,813	\$12,483,136	\$73,620,756

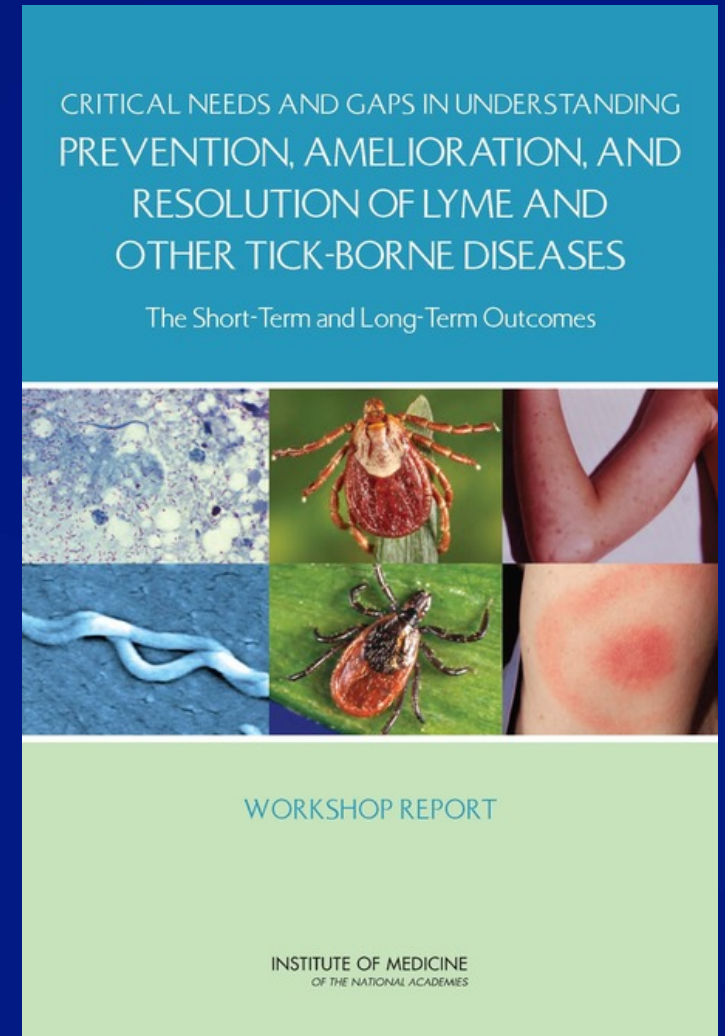


# Funding Allocation for Tick-borne Disease Studies by Study Type, 2006-2010

Focus Area	Percent of Total Allocation
Microbiological	57%
Prevention/ Education	23%
Combination	13%
Treatment	5%
Environment	1%
Surveillance	1%

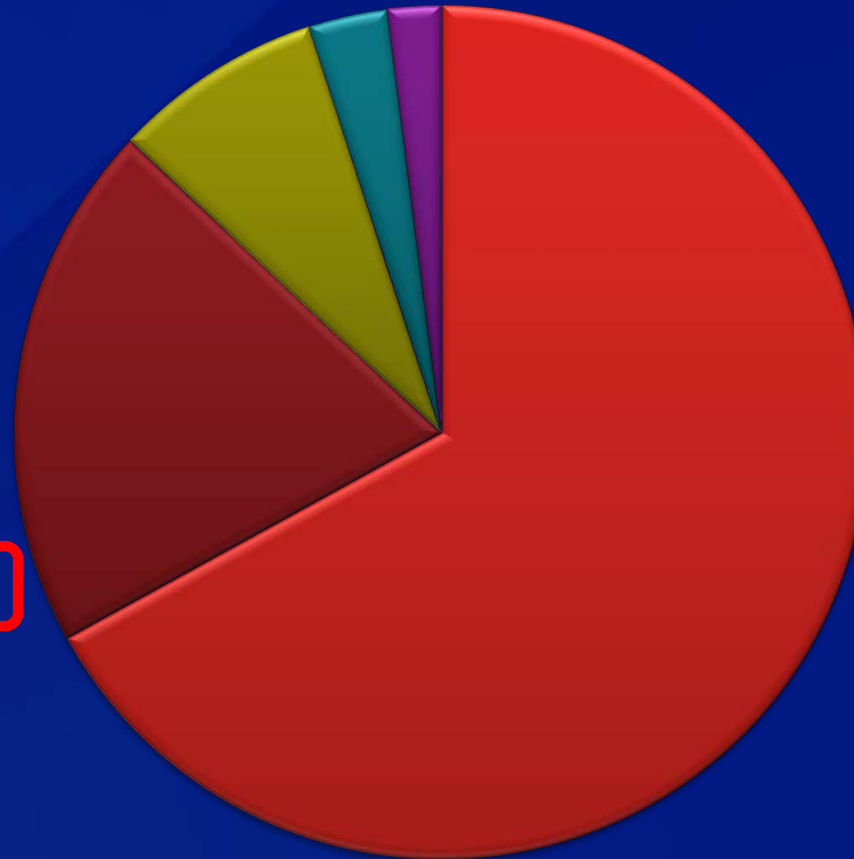


■ Microbiological ■ Prevention/Education ■ Combination ■ Treatment ■ Environmental ■ Surveillance



# Funding Allocation for Tick-borne Disease Studies by Study Type, 2006-2010

Focus Area	Percent of Total Allocation
Pathogen	67%
Clinical impact	20%
Inclusive	8%
Tick	3%
Host	2%



■ Pathogen ■ Clinical impact ■ Inclusive ■ Tick ■ Host

CRITICAL NEEDS AND GAPS IN UNDERSTANDING  
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The Short-Term and Long-Term Outcomes

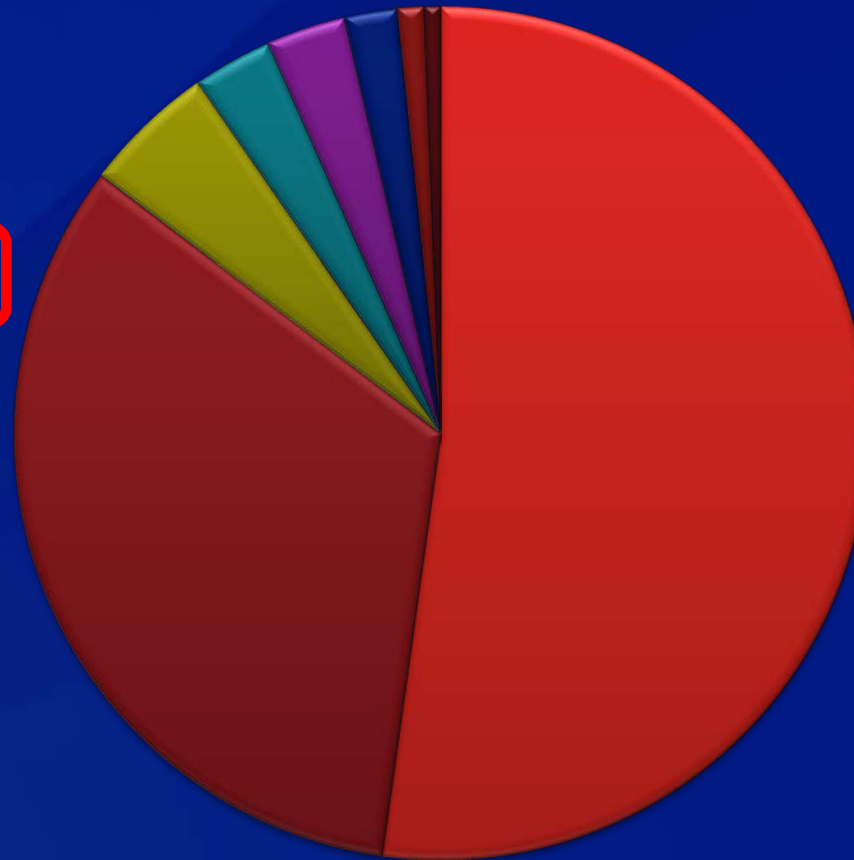


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# Funding Allocation for Tick-borne Disease Studies by Pathogen, 2006-2010

Pathogen	Percent of Total Allocation
<i>Francisella</i>	52%
<i>Borrelia</i>	33%
<i>Flavivirus</i>	5%
<i>Ehrlichia</i>	3%
<i>Rickettsia</i>	3%
Combination	2%
<i>Babesia</i>	1%
<i>Nairovirus</i>	.6%



■ *Francisella* ■ *Borrelia* ■ *Flavivirus* ■ *Ehrlichia* ■ *Rickettsia* ■ *Combination* ■ *Babesia* ■ *Nairovirus*

CRITICAL NEEDS AND GAPS IN UNDERSTANDING  
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The Short-Term and Long-Term Outcomes



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# Federal TBD IPM Working Group

## Participating agencies

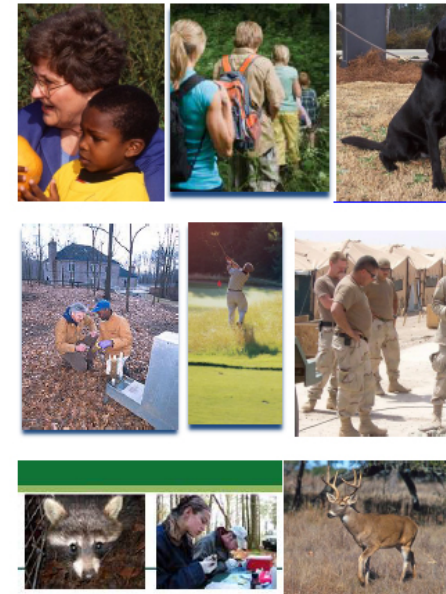
(In alphabetical order)

- Centers for Disease Control and Prevention
- Department of Defense
- Environmental Protection Agency
- National Institutes for Health
- National Park Service
- National Science Foundation
- US Geological Survey
- US Department of Agriculture

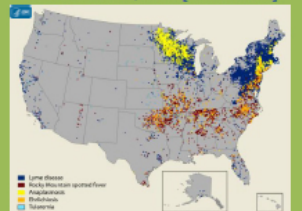


2013

Federal Initiative: Tick-Borne Disease  
Integrated Pest Management White Paper



Distribution of tick-borne diseases in  
the United State, 2010 [Source: CDC]



# Other Partners

- Professional and academic societies
- Non-federal Lyme disease funding organizations (NGOs)
- Private foundations
- Public health agencies and organizations
- Patient advocacy/support groups
- Industry partners
- Others



# Funding Initiatives?

- New federal FOAs
  - NIH/NIAID
  - DoD/CDMRP
- Private foundations
- Other Lyme disease NGOs

## Tick-Borne Disease



### NEWS RELEASE

*Released: April 25, 2016*

Defense Health Program  
Department of Defense Tick-Borne Disease Research Program  
Funding Opportunities for Fiscal Year 2016

**The Fiscal Year 2016 (FY16) Defense Appropriations Act provides \$5 million (M) to the Department of Defense Tick-Borne Disease Research Program (TBDRP) to support innovative and impactful research that addresses fundamental issues and gaps in tick-borne diseases.** As directed by the Office of the Assistant Secretary of Defense for Health Affairs, the Defense Health Agency, Research, Development, and Acquisition (DHA RDA) Directorate manages the Defense Health Program (DHP) Research, Development, Test, and Evaluation (RDT&E) appropriation. The managing agent for the anticipated Program Announcements/Funding Opportunities is the Congressionally Directed Medical Research Programs (CDMRP).



# Why are there not more funding initiatives for TBD IPM?

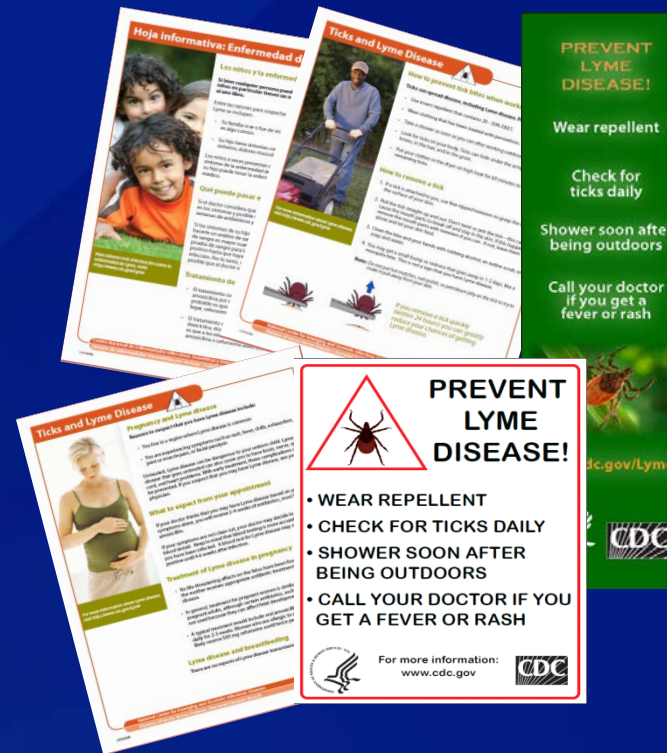
- A. It has not yet been demonstrated to be effective
- B. Better tools are needed
- C. A strong case has not yet been made based on the cost-savings associated with effective prevention
- D. All the above

# Conclusions

- Tick-borne diseases in humans are increasing in numbers and distribution in the U.S.
- Safe and effective prevention tools are badly needed
- Effective prevention requires cooperation and collaboration involving multiple partners
- Greater emphasis must be placed on a national strategy or plan AND on the cost savings associated with disease prevention



# Thank you for your time and interest!



Acknowledgments: Numerous staff of CDC's Division of Vector-Borne Diseases

The findings and conclusions in this report have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy