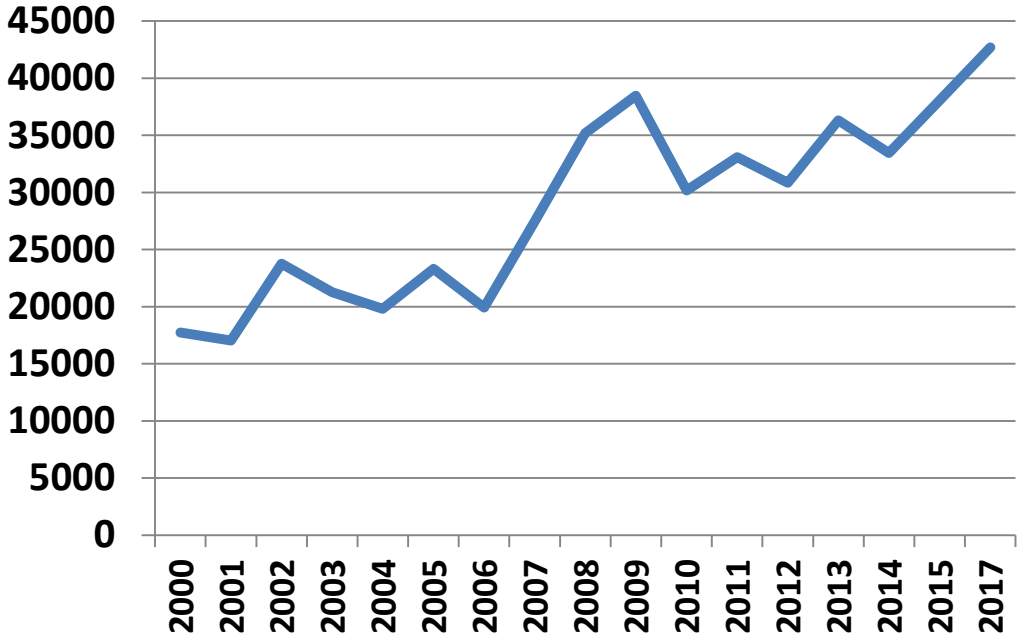
Mary Beth Pfeiffer

LYME

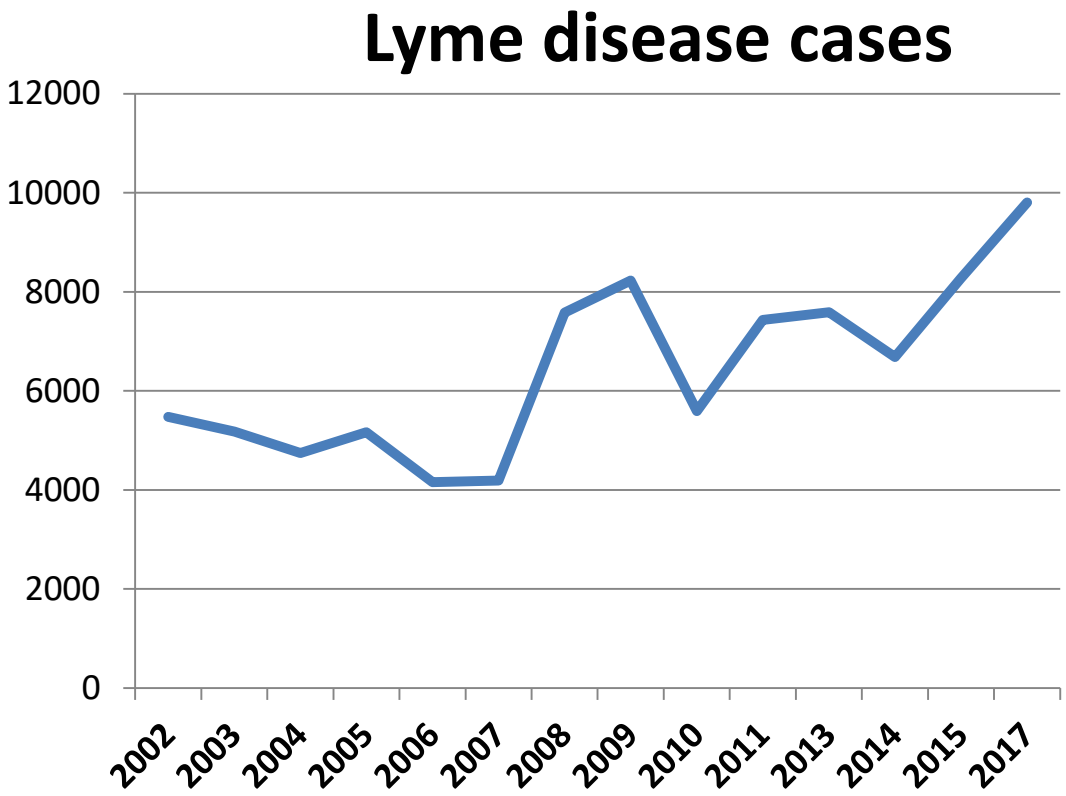
The First Epidemic of Climate Change

First, the problem

Lyme is soaring
In the US



…And in New York

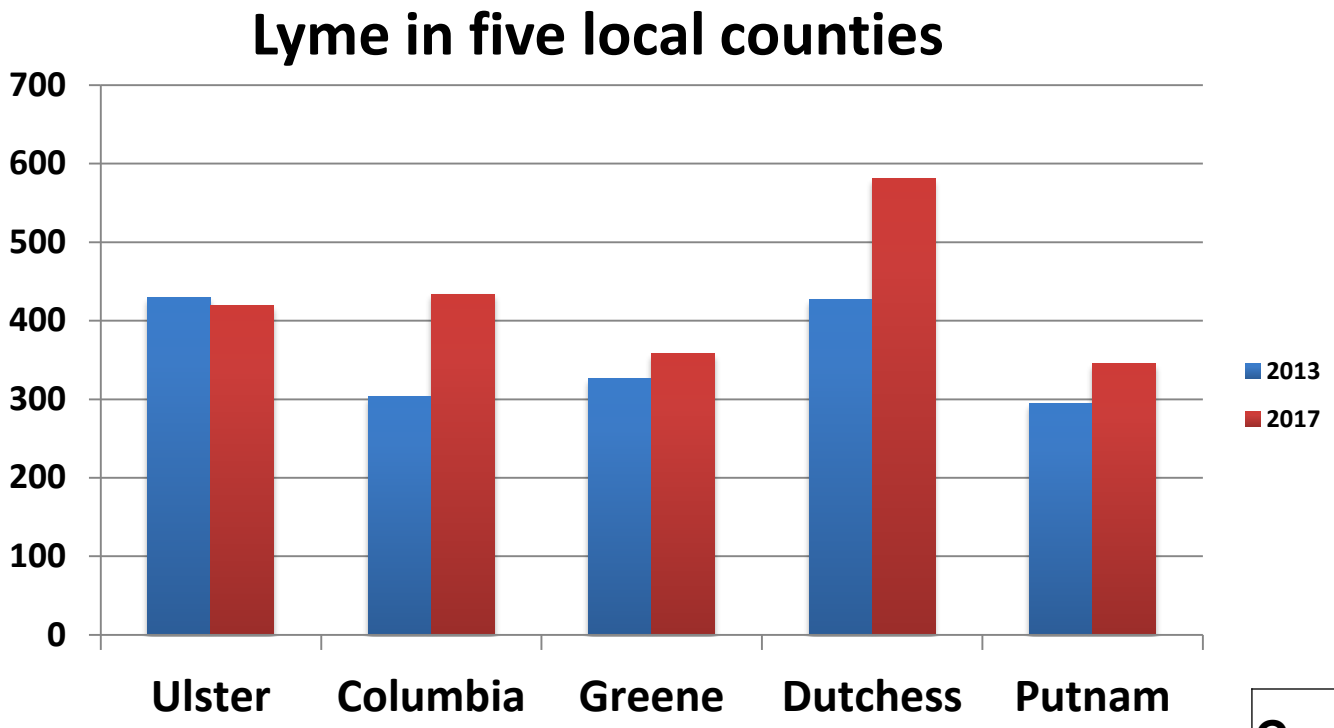


UP 32% from 2016 to 2017

Now multiply by ~10: 100,000/2017

Source: www.health.ny.gov/statistics/diseases/communicable/

We have a problem



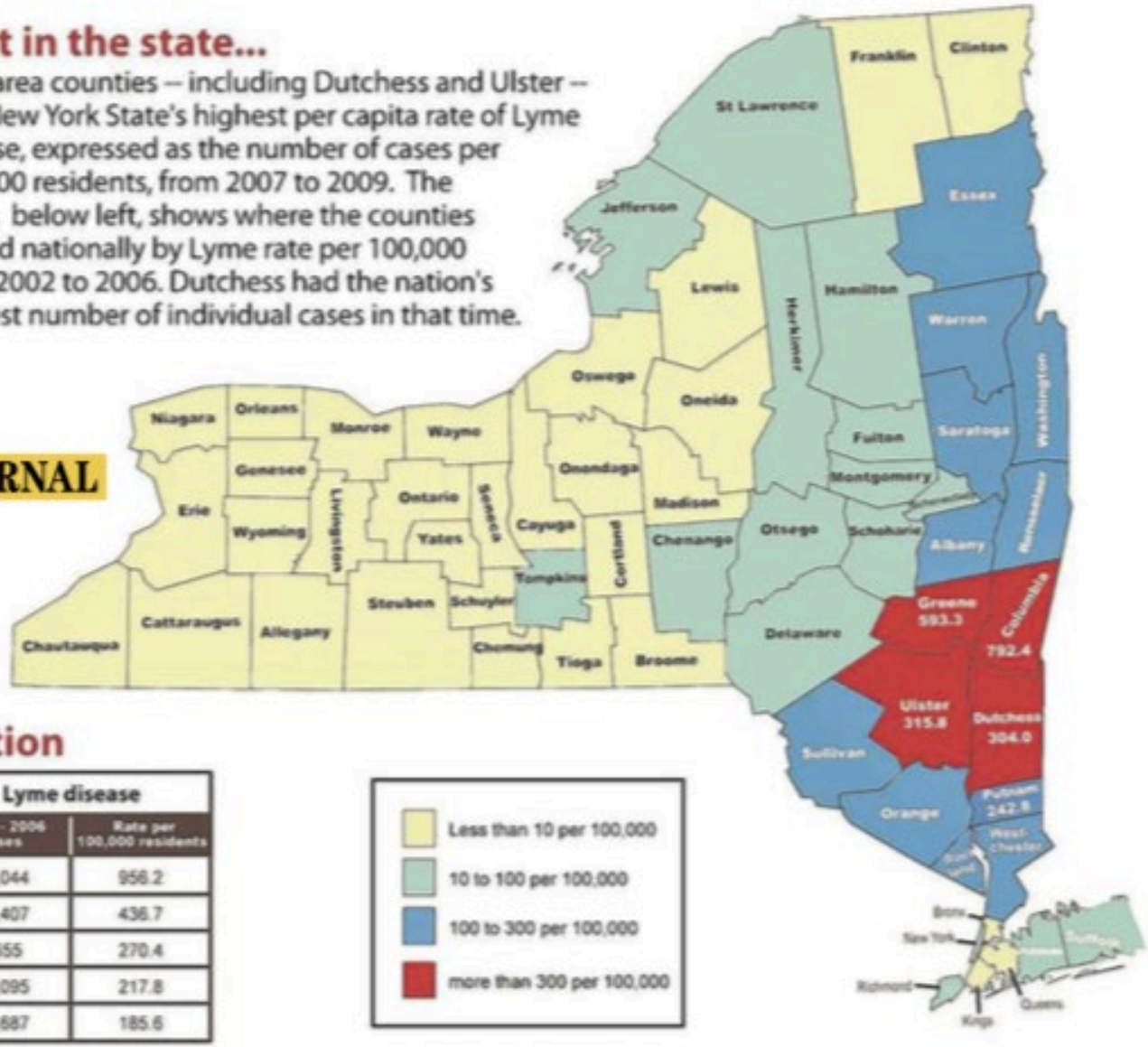
*Physician fatigue may depress reporting; official figures are based on extrapolations of a sample.

County	2017
Columbia	434
Dutchess	581
Greene	358
Putnam	346
Ulster	419

A scourge of ticks

First in the state...

Four area counties -- including Dutchess and Ulster -- had New York State's highest per capita rate of Lyme disease, expressed as the number of cases per 100,000 residents, from 2007 to 2009. The chart, below left, shows where the counties ranked nationally by Lyme rate per 100,000 from 2002 to 2006. Dutchess had the nation's highest number of individual cases in that time.



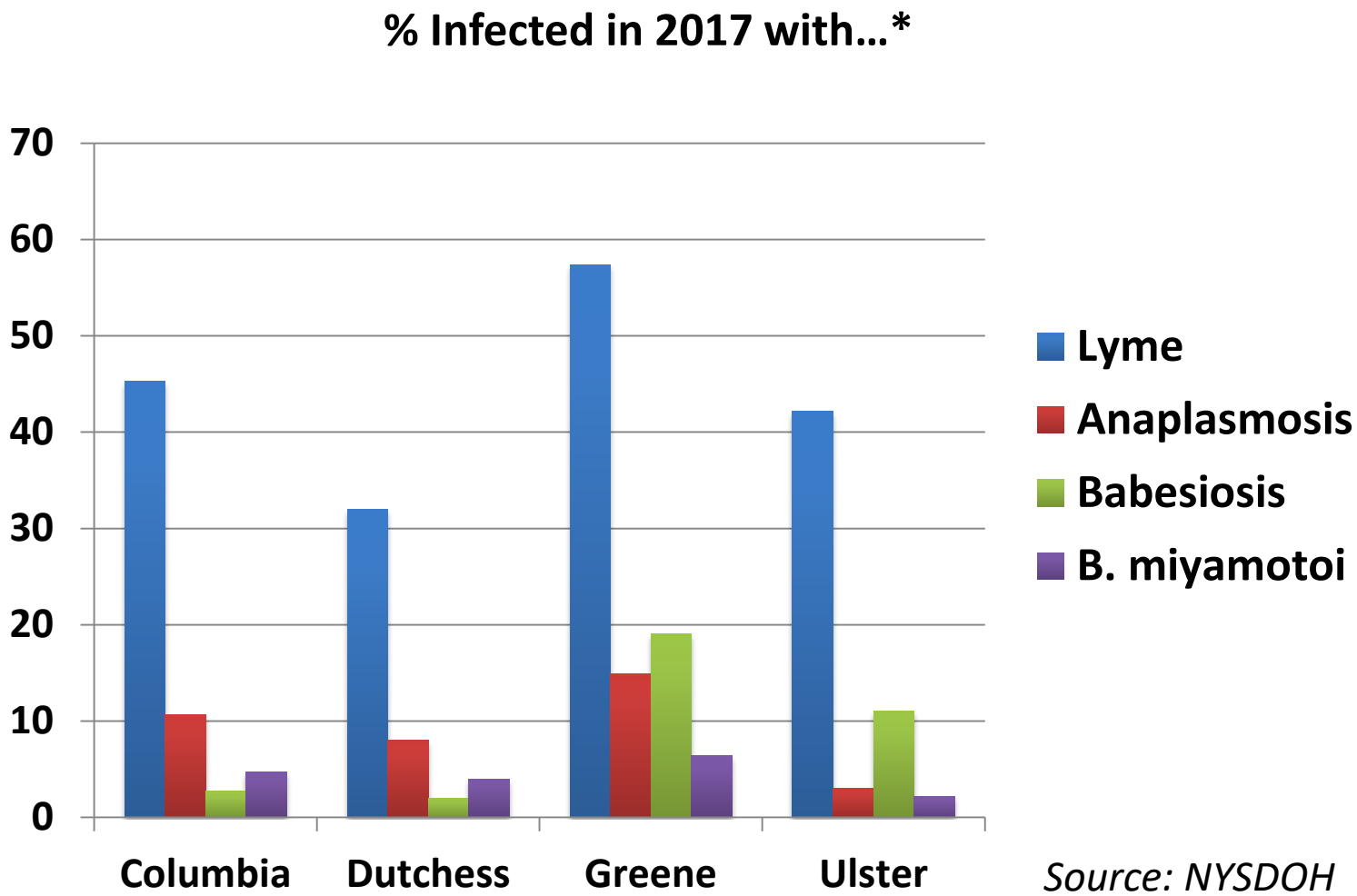
N EXCLUSIVE JOURNAL
PECIAL REPORT

...and the nation

U.S. Rank	County	Lyme disease	
		2002 - 2006 cases	Rate per 100,000 residents
1	Columbia	3,044	956.2
2	Dutchess	6,407	436.7
3	Greene	655	270.4
6	Putnam	1,095	217.8
8	Ulster	1,687	185.6

*Latest available national ranking

What's in Mid-Hudson ticks

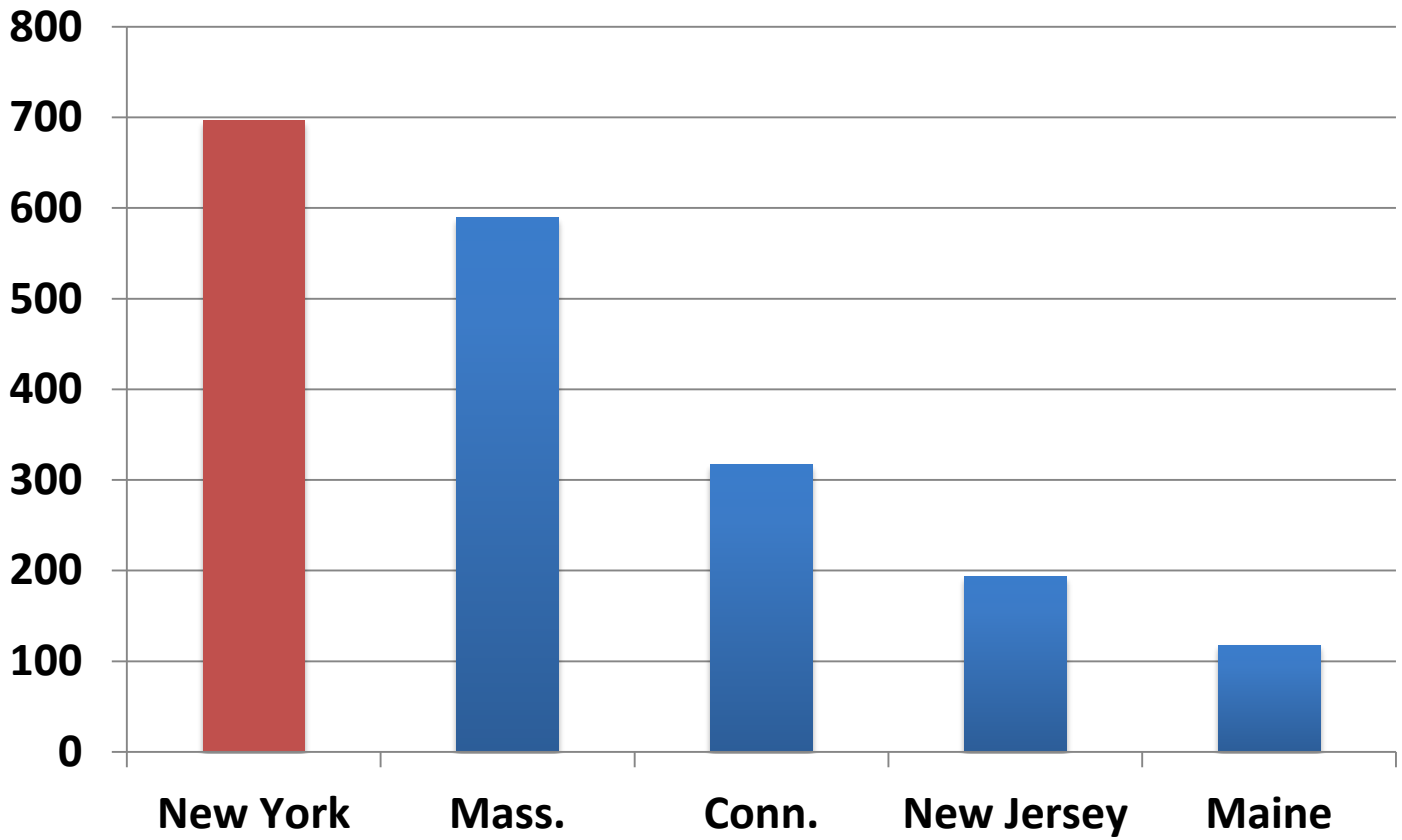


Source: NYSDOH

*2016 Dutchess
MUCH higher: 64% Lyme,
15% A., 18% Bab

Note: 430 tested of 1632 ticks found at 16 sites; no data for Putnam.
Columbia: highest population density -- 156 vs 68 for Greene, 40s for D&U

New York: #1 in US Babesiosis



Source: CDC, 2017 data

ALSO Found in Ticks

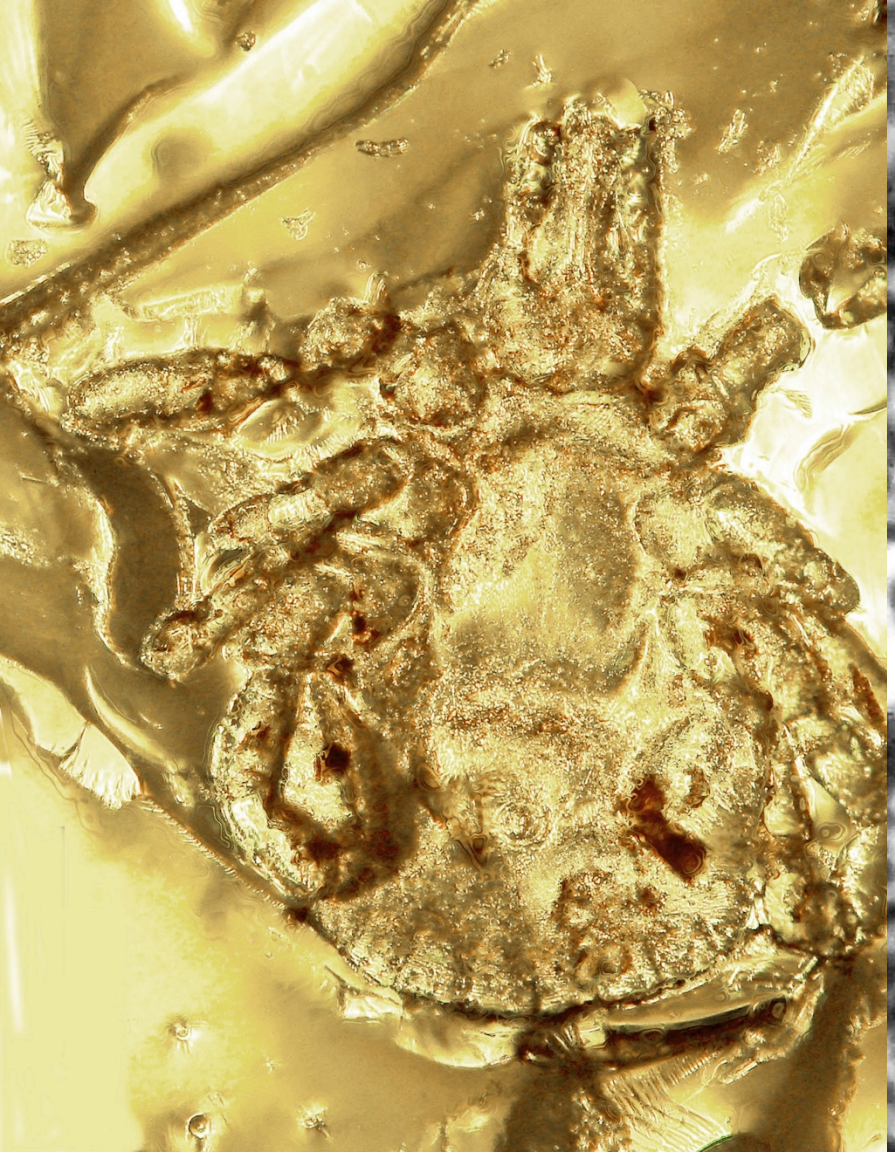
500 ticks tested from NYS and CT

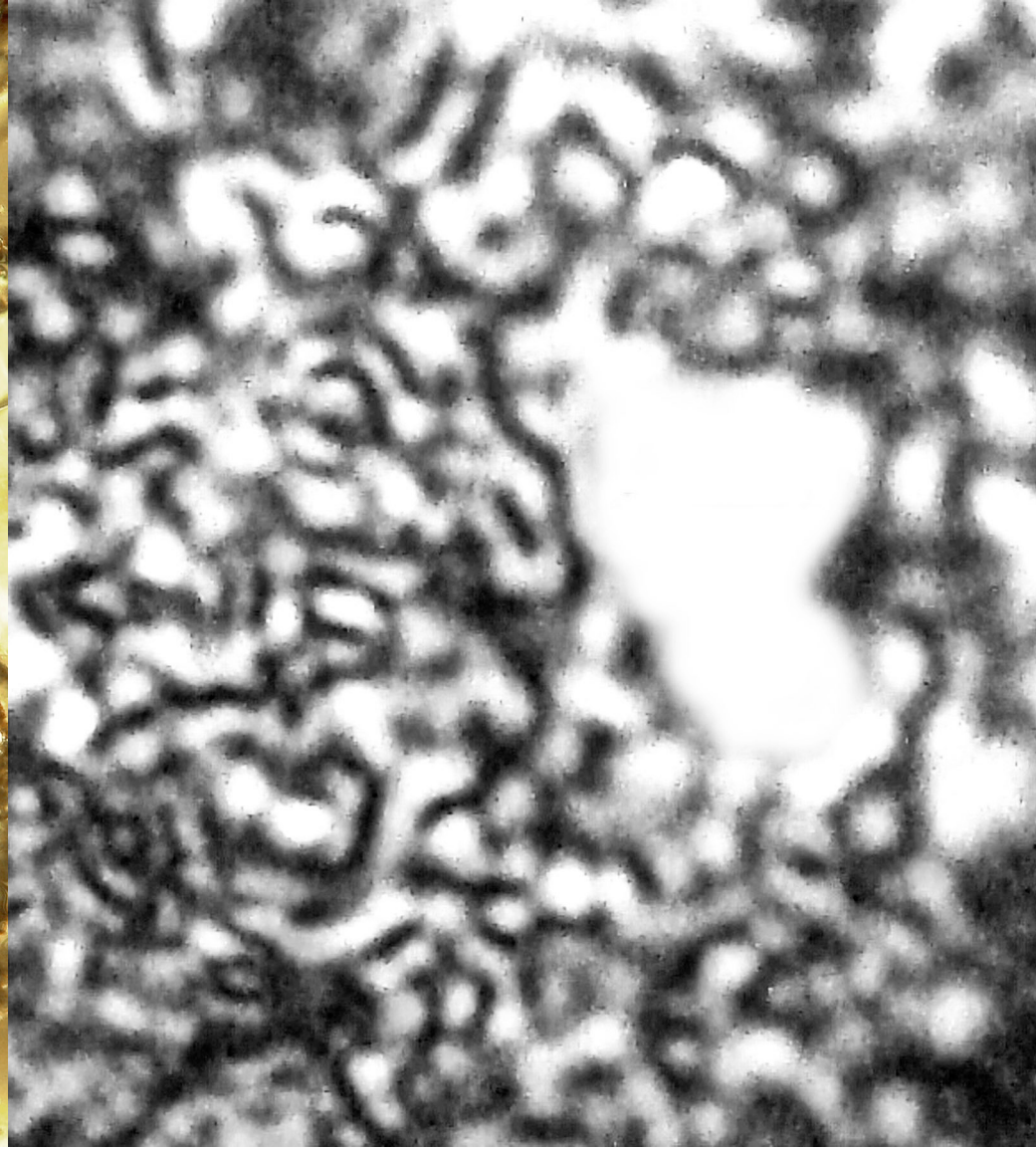
- **Lyme** in 56%
- **Anaplasmosis** 11%, **Babesiosis** 8%, ***B. miyamotoi*** 5%.
- **Powassan** virus in 3.6%.
- **Filarial nematode** in 14% of adults.
- **Fourteen** viruses.*

*South Bay virus (22%) and blacklegged tick phlebovirus 1 and 2 (73%).

Source: Tokarz et al April 2019

The **first** epidemic of climate change
Really?





Provided by George Poinar

Driving an epidemic

- NYS: 4° warmer in winter
- Ticks, mice are thriving*
- Fewer predators
- Birds move ticks

***Don't blame deer**

A Perfect Storm

- Climate
- Deer
- Mice
- Cut-up forests
- Ticks
- Pathogens

Courtesy Cary Institute of Ecosystem Studies

This Epidemic is…

Worldwide

Climate driven

Underestimated

Not under control

Killarney National Park
Ireland

James Pembroke Photography

Germany

MAIRIE DE PARIS
Tiques, chenilles, aoûtats, frelons…
avec les beaux jours, les insectes sont de retour
Attention aux tiques
Les tiques sont des parasites qui se nourrissent de sang et qui peuvent transmettre des maladies à l'homme, notamment la maladie de Lyme.
Comment les repérer ?
Les tiques sont des acariens visibles à l'œil nu, mesurant entre 1 et 3 mm. On les trouve dans les bois ou les herbes hautes. Lorsqu'elles piquent, elles restent fixées à la peau pendant plusieurs jours. Leur piqûre peut être indolore : il faut donc s'inspecter soigneusement le corps au retour de chaque promenade.
Que faire en cas de piqûre ?
C'est pendant la piqûre que la tique risque de transmettre ses maladies. Il est indispensable de la retirer le plus tôt possible avec un tire-tique (disponible en pharmacie). Ne vous grattez pas, afin de ne pas l'écraser ni la casser !
Après une piqûre ou en cas de doute (apparition de rougeurs, douleurs, fièvre, maux de tête notamment), consultez un professionnel de santé !

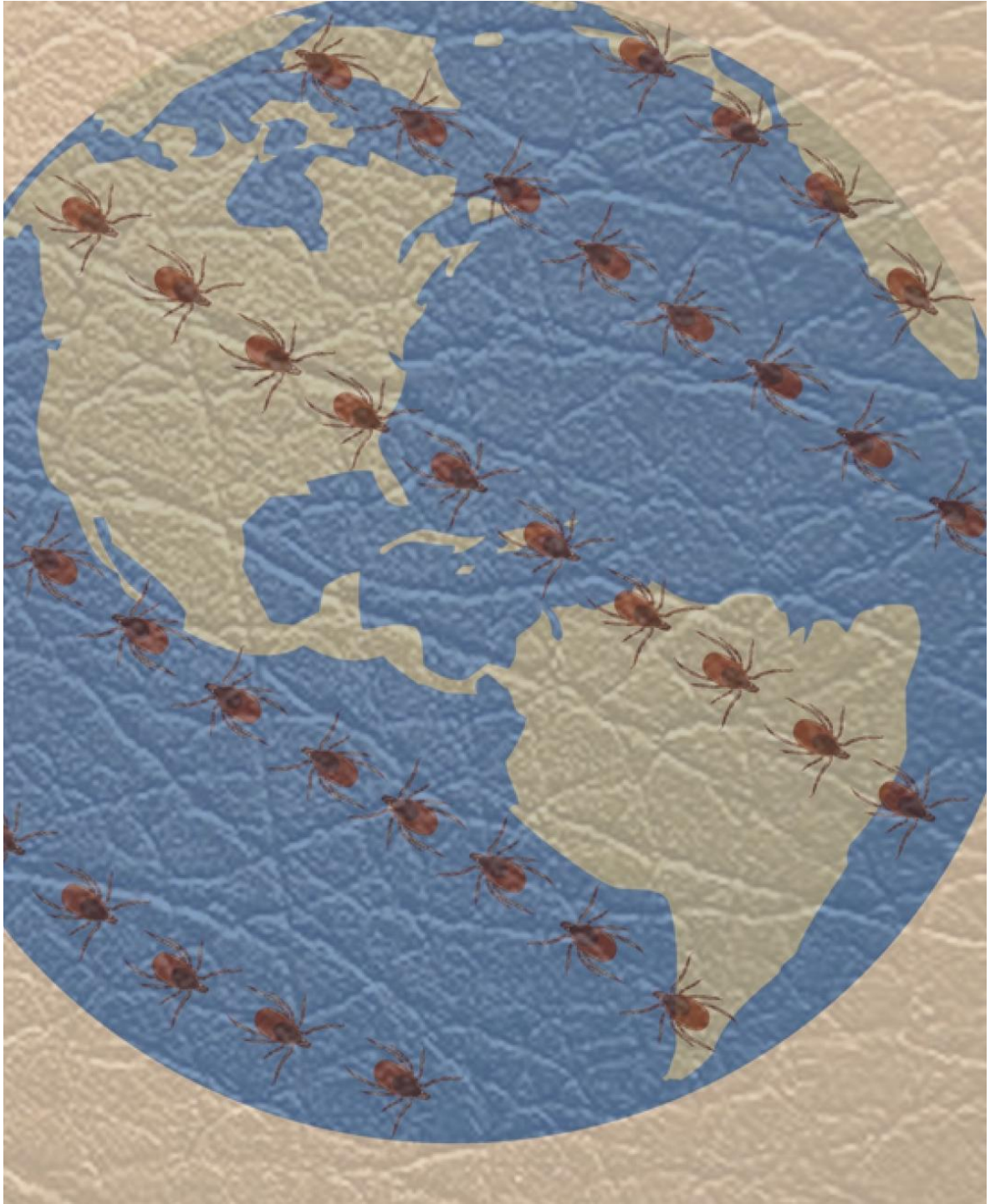
France

Netherlands

‘Under-diagnosis of early Lyme disease and physical damage at an advanced stage are a huge problem.’

--Dou, 2015, study of 800 residents in China

Australia



‘Macabre as a Stephen King horror novel, except…’

-- Garth Ehrlich

Graphic by Toni Miraldi

About me

*30+ years

* Many stories

*Objective

*No vested interest

jhkeepsie Journa
A GANNETT COMPANY

What I looked for in stories*

- Incompetence or worse
- Injustice
- Waste of money

*I didn’t expect this in Lyme disease.

Really?

Highest Lyme rates

Forget ticks.
Or patients.

Focus on antibiotics.
Doctors.

Doctors trying to help.

NO SMALL THING | DOCTORS & LYME DISEASE | PART 2

ANTIBIOTICS FUEL DEBATE OVER LYME

5 doctors targeted; chronic treatment at issue

By Mary Beth Pfeiffer
Poughkeepsie Journal

Enemy No. 1 in the war on Lyme disease is a tiny tick that has put the mid-Hudson Valley at the epicenter of a global health threat.

But the prime target of some is not an army of arachnids, as ticks are known. Instead, in this bull's-eye is a handful of doctors — doctors who dispense long-term antibiotics for the illness. At least five, including two in Dutchess County, are under investigation by state licensing officials, the Poughkeepsie Journal has exclusively learned.

While officials contend they do not investigate physicians "simply because 'traditional' treatment protocols (two to four weeks of antibiotics) are not followed," the medications are at the heart of a vitriolic and far-reaching debate over how best to care for advanced Lyme disease, according to interviews with scientists, physicians, patients and their advocates.

The disagreement has marked the disease as a political and scientific quagmire, these people said. Most

Dina Rosado, 44, of Highland receives her daily intravenous antibiotic treatment for Lyme disease at Vassar Brothers Medical Center, Poughkeepsie. Without it, "I don't know what condition I would be in," she said.
SPENCER AINSLEY/POUGHKEEPSIE JOURNAL

A scourge of ticks

LYME DISEASE
in New York State...

ABOUT THIS SERIES

This is part 2 in a Poughkeepsie Journal series on Lyme disease. In three months of research, the Journal spoke to scientists,

Lyme Disease Myths

#1: The test works

#2: Antibiotics cure

Bad numbers, bad test*

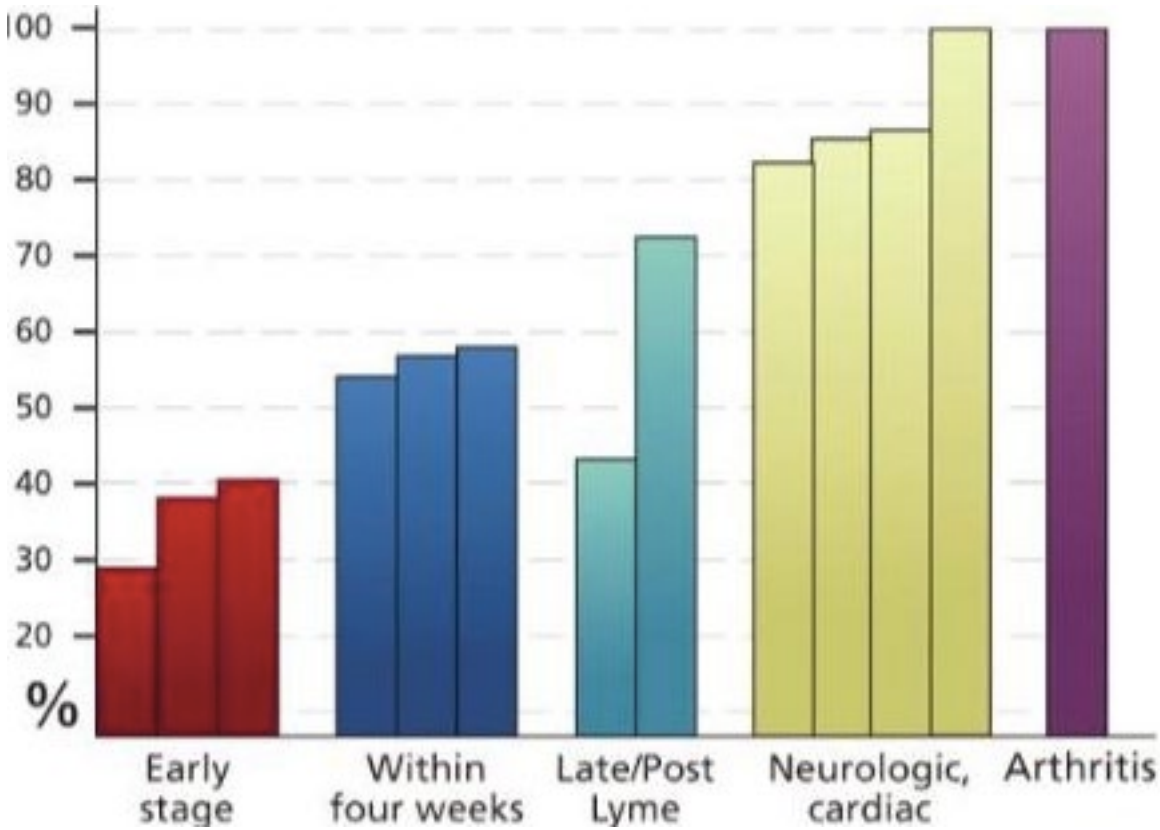
Acute: 30-40%

Convalescent: 26-61%

Early disseminated: 73-88%

Late disseminated: 95-100% But…*

*Poor studies…



Source: CDC Tutorial for physicians wwwnc.cdc.gov/eid/syn/en/article/22/7/15-1694.htm

Why This Matters

Q. Okay. So what's the significance to you as a treating doctor of the fact that the antibody test was negative for Lyme?

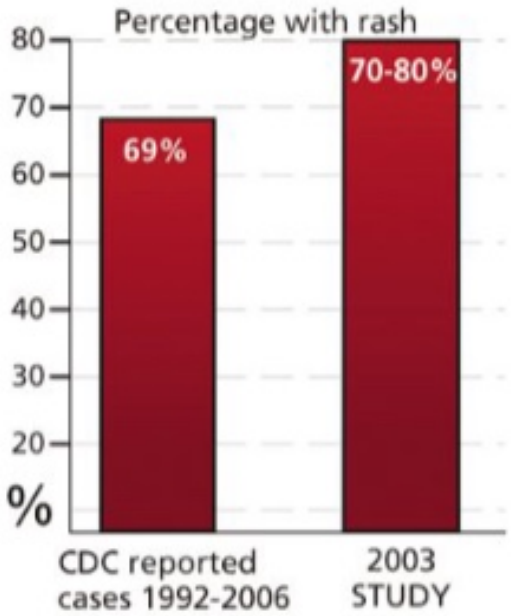
A. That he didn't have Lyme at that time.

Joseph Elone, 17

But you have the rash…

WHAT IF THERE IS NO RASH?

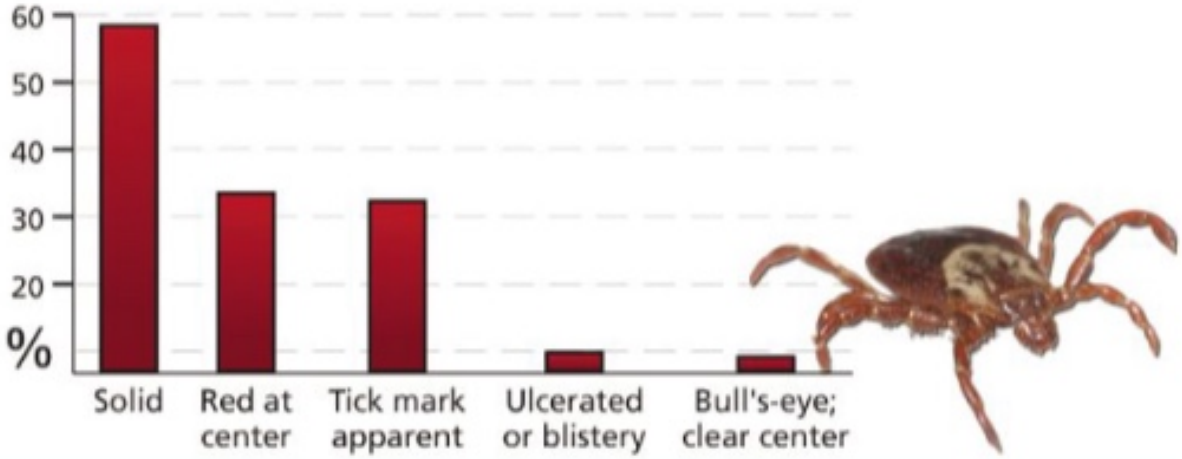
Early stage Lyme can be diagnosed without a test if there is a rash. However, some people do not get the rash.



The negative test of a patient who was positive on the first tier but scored four of the five bands needed for a positive reading on the second.

WHAT IF THE RASH ISN'T TYPICAL OF LYME?

Only a minority of rashes are the classic bull's-eye.



CDC Tutorial: "In the absence of EM, all other manifestations of Lyme disease require serologic analysis to confirm the diagnosis."

Don’t wait

This nasty spirochete:

- Disables ‘germinal centers’
- Sends false signals
- Shape shifts
- Goes dormant
- Persists

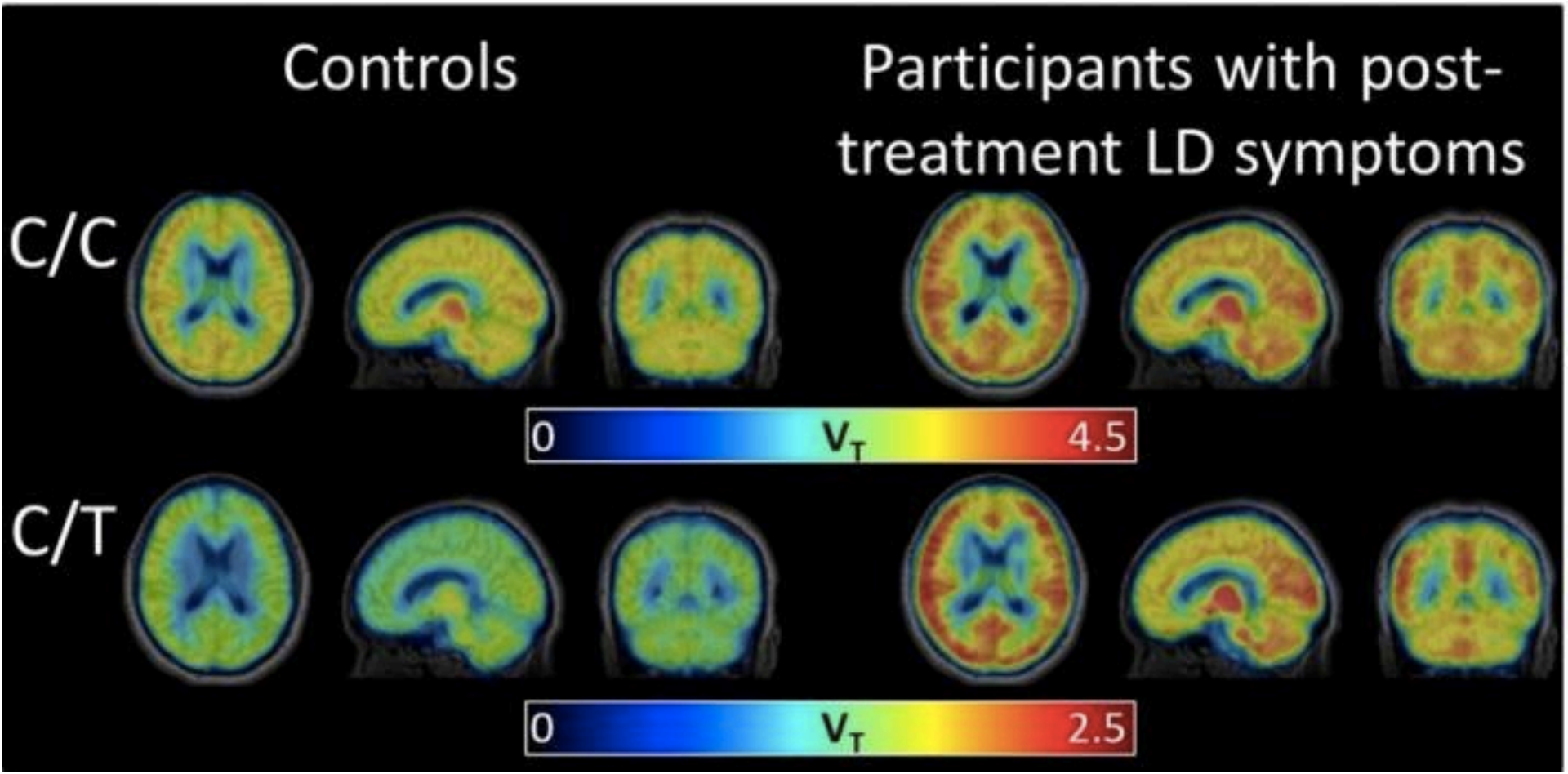
“Borrelia is a really, really interesting microorganism. It has a huge brain. It outsmarts people.”

After treatment…

'Approximately 10 to 20% of patients treated with… 2-4 week course of antibiotics will have lingering symptoms of fatigue, pain, or joint and muscle aches.' *--- CDC*

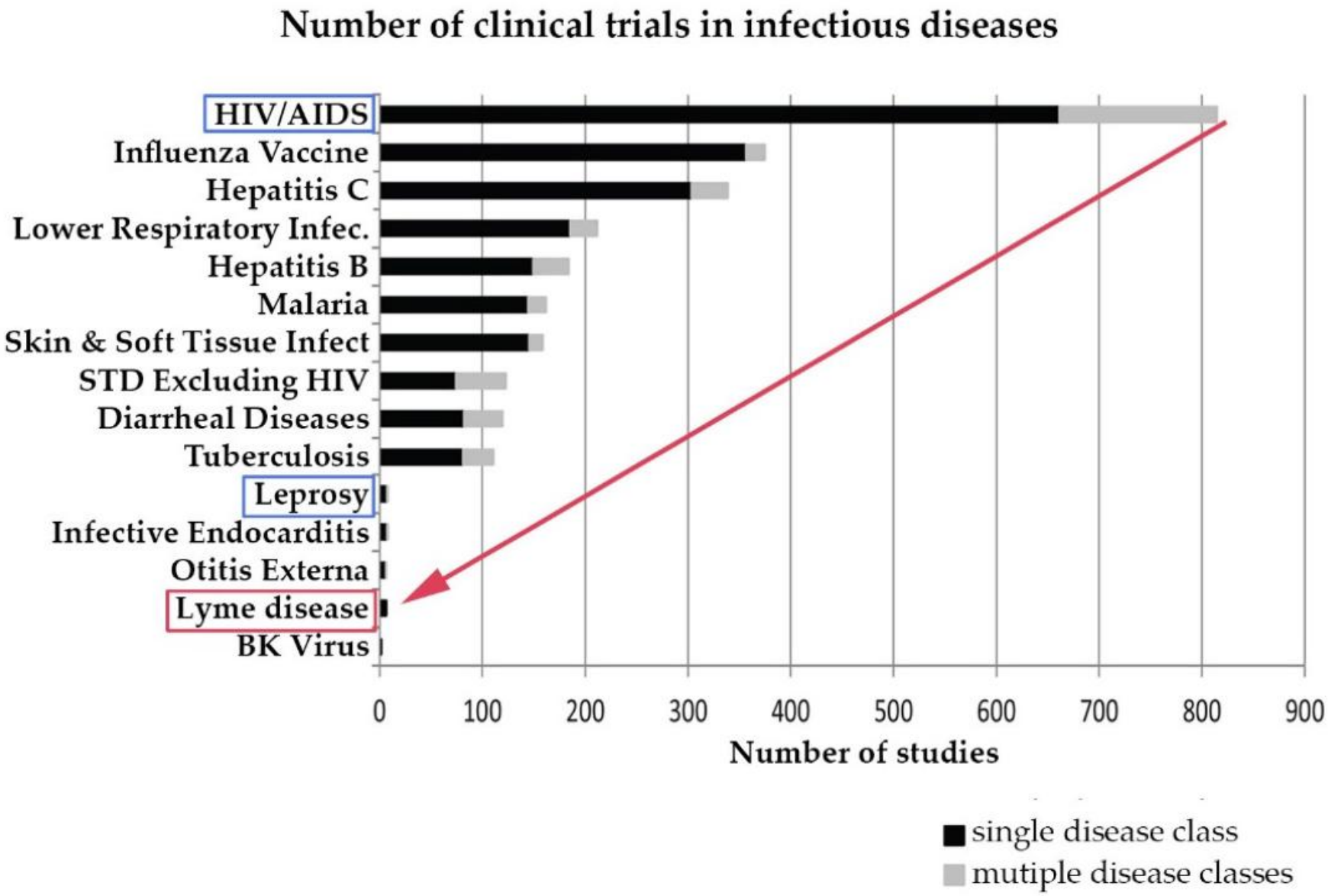
- That's 42,000-84,000 in 2017
- That's among EARLY treated
- Late-treated damage: 'severe'

The damage is real

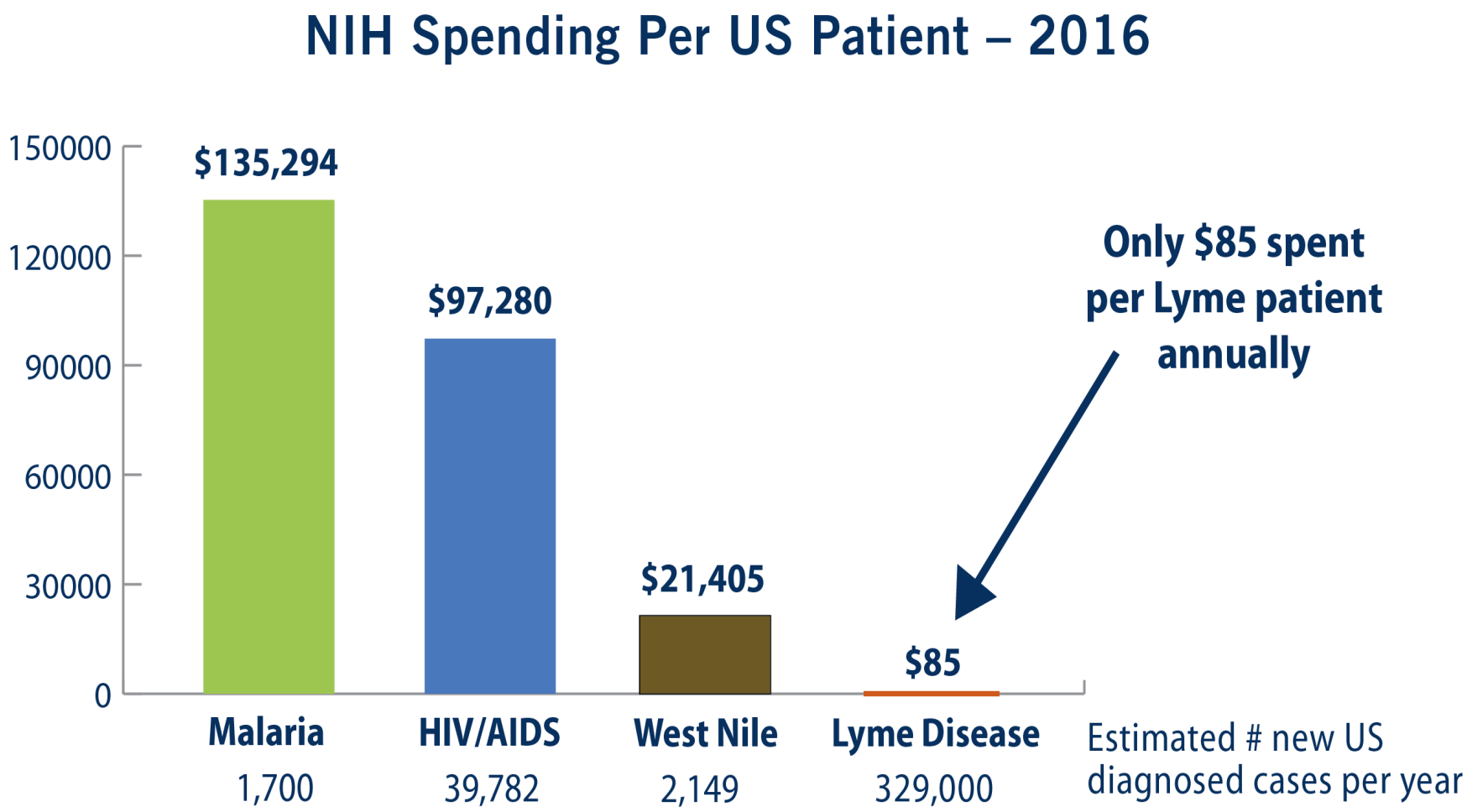


Source: Journal of Neuroinflammation, 2018
Johns Hopkins study

Upshot of the Myths



Little $ or research



Bay Area Lyme Foundation

Antibiotics aren’t the answer.

What is?

Recognition. Research.

*A new test for quick DX.
*Treatments that may cure.
*Control of ticks.

Teach children

Be vigilant.

Consider permethrin
Check yourself
Avoid tall weeds
Put clothes in dryer for 15 minutes

Advocate for yourself
Educate yourself
Do not let infections fester

Mary Beth Pfeiffer

LYME

The First Epidemic of Climate Change

Progress

The New Global Face of Lyme

ICD10 Codes		ICD11 Codes	
A69.2	Lyme Disease	1C1G	Lyme borreliosis
M01.2	Arthritis due to Lyme	1C1G.0	Early cutaneous Lyme borreliosis
G01	Meningitis due to Lyme	1C1G.1	Disseminated Lyme borreliosis
G63.0	Polyneuropathy due to Lyme	1C1G.10	Lyme Neuroborreliosis
		1C1G.11	Lyme Carditis
		1C1G.12	Ophthalmic Lyme borreliosis
		1C1G.13	Lyme arthritis
		1C1G.14	Late cutaneous Lyme borreliosis
		1C1G.1Y	Other specified disseminated Lyme borreliosis
		1C1G.1Z	Disseminated Lyme borreliosis, unspecified
		1C1G.2	Congenital Lyme borreliosis
		1C1GY	Other specified Lyme borreliosis
		6D85.Y	Dementia due to Lyme Disease
		9C20.1	Infectious panuveitis in Lyme disease
		9B66.1	Infectious intermediate uveitis in Lyme disease
		8A45.0Y	Central Nervous System demyelination due to Lyme borreliosis

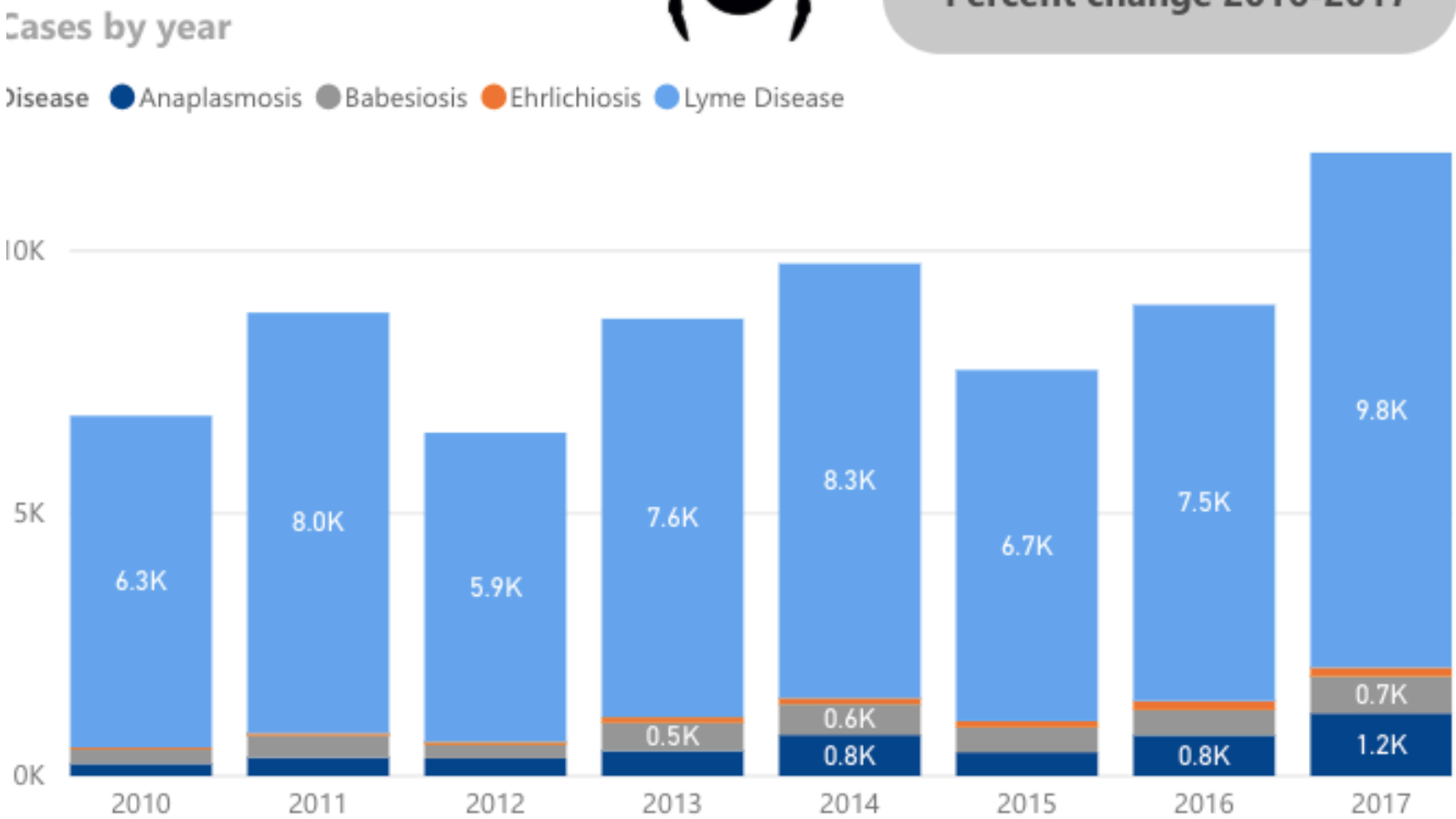
Courtesy Jenna Luthe-Thayer

Tick-borne diseases on the rise

- Anaplasmosis
- Babesiosis
- Ehrlichiosis
- Lyme Disease

32%

Percent change 2016-2017



Source: New York Department of Health, annual communicable disease report

Owning up

The test has ‘shortcomings…
cannot distinguish active or past infection.
reliable methods lacking…’

Clinical Infectious Diseases

VIEWPOINTS

IDSA Infectious Diseases Society of America | hivma hiv medicine association | OXFORD

EMBARGOED UNTIL 1:05 AM ET THURSDAY OCTOBER 11 2018

Direct Diagnostic Tests for Lyme Disease

Steven E. Schutzer,[1] Barbara A. Body,[2,a] Jeff Boyle,[3] Bernard M. Branson,[4] Raymond J. Dattwyler,[5] Erol Fikrig,[6] Noel J. Gerald,[7] Maria Gomes-Solecki,[8] Martin Kintrup,[9] Michel Ledizet,[10] Andrew E. Levin,[11] Michael Lewinski,[12] Lance A. Liotta,[13] Adriana Marques,[14] Paul S. Mead,[15] Emmanuel F. Mongodin,[16] Segaran Pillai,[17] Prasad Rao,[7] William H. Robinson,[18] Kristian M. Roth,[7] Martin E. Schriefer,[15] Thomas Slezak,[19] Jessica L. Snyder,[20] Allen C. Steere,[21] Jan Witkowski,[22] Susan J. Wong,[23] and John A. Branda[24]

[1]Department of Medicine, Rutgers New Jersey Medical School, Newark; [2]Laboratory Corporation of America, Burlington, North Carolina; [3]Qiagen, Inc., Germantown, Maryland; [4]Scientific Affairs, LLC, Atlanta, Georgia; [5]Department of Microbiology/Immunology, New York Medical College, Valhalla; [6]Department of Internal Medicine, Yale University School of Medicine, New Haven, Connecticut; [7]Office of In Vitro Diagnostics and Radiological Health, Food and Drug Administration, Department of Health and Human Services, Silver Spring, Maryland; [8]Department of Microbiology, Immunology and Biochemistry, University of Tennessee Health Science Center, Memphis; [9]Viramed Biotech AG, Planegg, Germany; [10]L2 Diagnostics, LLC, New Haven, Connecticut; [11]Kephera Diagnostics, Wellesley, Massachusetts; [12]Roche Diagnostics, Pleasanton, California; [13]Center for Applied Proteomics and Molecular Medicine, College of Science, George Mason University, Manassas, Virginia; [14]Clinical Studies Unit, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland; [15]Division of Vector-Borne Diseases, Centers for Disease Control and Prevention, Fort Collins, Colorado; [16]Department of Microbiology and Immunology, University of Maryland School of Medicine, Baltimore; [17]Office of Laboratory Science and Safety, US Food and Drug Administration, Department of Health and Human Services, Silver Spring, Maryland; [18]Department of Medicine, Stanford University School of Medicine, California; [19]Lawrence Livermore National Laboratory, California; [20]T2 Biosystems, Inc., Lexington, Massachusetts; [21]Department of Medicine, Massachusetts General Hospital and Harvard Medical School, Boston; [22]Cold Spring Harbor Laboratory, New York; [23]Wadsworth Center, New York State Department of Health, Albany; and [24]Department of Pathology, Massachusetts General Hospital and Harvard Medical School, Boston

Borrelia burgdorferi was discovered to be the cause of Lyme disease in 1983, leading to seroassays. The 1994 serodiagnostic testing