

Anaplasmosis (HGA) and Lyme Disease Co-infection*:2009-2013

Massachusetts Department of Public Health

*Co-infection = patient with confirmed/probable Lyme disease + laboratory evidence of *A. phagocytophilum* infection.
Symptomatic co-infection = patient with confirmed/probable case status for both Lyme disease and anaplasmosis

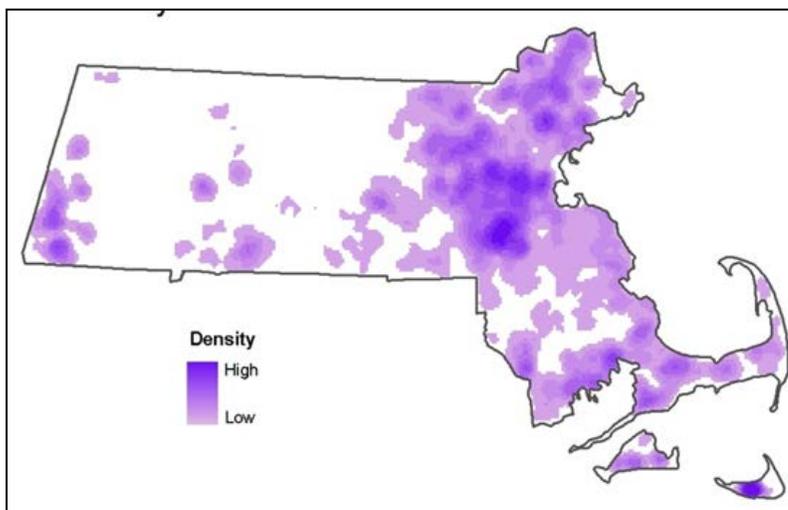
2009-2013 Surveillance Highlights

- Between 2009 and 2013, there were 24,687 confirmed and probable cases of Lyme disease and 1,170 confirmed and probable cases of HGA reported in Massachusetts.
- There were 226 *Borrelia burgdorferi*/*Anaplasma phagocytophilum* co-infections identified in Massachusetts; 70 of these met the case definition for both diseases (symptomatic co-infection).
- The highest incidence rates of *B. burgdorferi*/*A. phagocytophilum* co-infection occurred in Dukes and Nantucket counties (22 per 100,000 residents) and Berkshire County (11 per 100,000 residents).
- A majority of *B. burgdorferi*/*A. phagocytophilum* co-infections occurred in June and July.
- Patients with Lyme disease and HGA symptomatic co-infection were more likely to be reported with joint pain, palpitations, fatigue, chills and/or sweats, abdominal pain, and paresthesias and/or cognitive impairment than patients with either Lyme disease or HGA alone.
- Patients with Lyme disease and HGA symptomatic co-infection were not more likely to be hospitalized than patients with HGA alone.
- 13% of HGA cases in children less than 10 years old, and 11% of adults over 80 years old with HGA had Lyme disease symptomatic co-infection.
- 72% of *B. burgdorferi*/*A. phagocytophilum* co-infections occurred in 40 - 79 year olds.
- 5% of cases 40 years and older with confirmed or probable HGA had Lyme disease symptomatic co-infection; 0.5% of cases in this age group with confirmed or probable Lyme disease had HGA symptomatic co-infection.

MAP: Reported anaplasmosis cases overlaid on reported Lyme disease cases to demonstrate areas with higher risk of co-infection. (NOTE: these cases are reported by city/town of residence, not necessarily place of exposure).

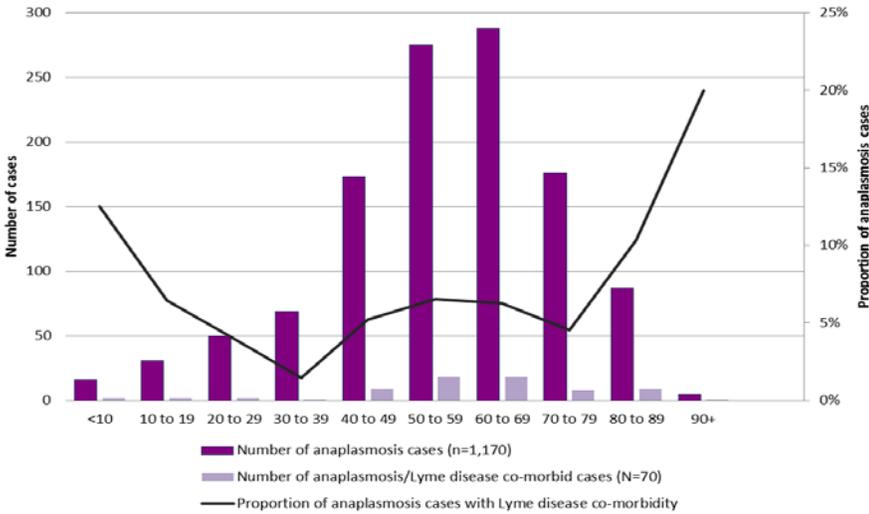
COMPARE TO

TABLE: Actual counts and incidence rates of patients with confirmed or probable Lyme disease and laboratory evidence of *A. phagocytophilum* infection.



County	<i>B. burgdorferi</i> / <i>A. phagocytophilum</i> co-infection (N=220)	Co-Infection 5 year incidence rate (per 100,000)
Barnstable	8	4
Berkshire	15	11
Bristol	35	6
Dukes and Nantucket	6	22
Essex	44	6
Franklin	5	7
Hampden	6	1
Hampshire	1	1
Middlesex	46	3
Norfolk	18	3
Plymouth	17	3
Suffolk	8	1
Worcester	11	1

Figure 2: Number of confirmed and probable cases of HGA and cases of Lyme disease and symptomatic co-infection in Massachusetts by age: 2009-2013



- The greatest proportion of HGA cases with Lyme disease symptomatic co-infection occurred in children less than 10 years (13%) and adults over 80 years (11%).
- A large number of *B. burgdorferi/A. phagocytophilum* symptomatic co-infection cases occurred in the 40-79 year age range.
- 6% of patients 40 years and older with confirmed or probable HGA had Lyme disease symptomatic co-infection. Only 0.5% of patients in this age group with confirmed or probable Lyme disease had HGA symptomatic co-infection.

Table 3: Percent of particular reported signs and symptoms among probable and confirmed cases of Lyme disease, HGA, and Lyme disease/HGA symptomatic co-infection reported in Massachusetts: 2009-2013

	Lyme (n=24,687)	HGA (n=1,170)	Lyme/HGA Symptomatic co-infection (N=70)
Sign or Symptom	Percent	Percent	Percent
Rheumatologic	55	57	89
Arthritis	23	0	14
Joint pain	43	55	69
Neck pain	14	3	10
Cardiac	2	0	9
Palpitations	1	0	7
Fatigue	36	8	64
Fever	29	96	91
Chills	19	20	54
Sweats	11	6	29
Headache	25	52	71
Abdominal pain	0	0	21
Neurological	14	0	21
Paresthesia	5	0	14
Cognitive Impairment	5	0	13
Rash	59	4	36

- Reported signs and symptoms of Lyme disease include arthritis; cardiac abnormalities such as arrhythmia, AV block and palpitations; neurological (auditory impairment, Bell’s palsy, lymphocytic meningitis, paresthesia, radiculoneuropathy, and visual and cognitive impairment); rash (including erythema migrans); and headache.
- Reported signs and symptoms of HGA include gastrointestinal illness, headache, fatigue, fever, joint pain, and muscle aches.
- Reported cases with Lyme disease and HGA symptomatic co-infection were more likely to report joint pain, palpitations, fatigue, chills and/or sweats, abdominal pain, paresthesia and cognitive impairment than patients with either Lyme disease or HGA alone (p<0.05 for each of these signs or symptoms).