

Allegheny County
Health Department

Lyme disease surveillance in Allegheny County, PA

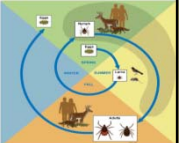
2015 Northeast Epidemiology Conference

Jennifer Fiddner, MPH
Allegheny County Health Department
Pittsburgh PA

Allegheny County
Health Department

Lyme disease




- Vector-borne disease caused by spirochete *Borrelia burgdorferi*
- Transmitted by blacklegged ticks *I. scapularis* and *I. pacificus*
- Birds & small mammals are reservoirs
- Deer support tick populations
 - “deer tick”



Allegheny County
Health Department

Lyme disease

- Early symptoms
 - Erythema migrans/ “bull’s-eye rash”
 - Flu-like symptoms
 - Swollen lymph nodes
- Late symptoms
 - Arthritis
 - Neurological: Bell’s palsy/other cranial neuritis, meningitis, vision problems, other
 - Cardiac: heart block

Allegheny County
Health Department

Lyme disease surveillance

- Nationally notifiable since 1991
- Case definition updates in 1995, 1996, 2008 & 2011
- Confirmed case
 - A case of EM with a known exposure OR positive lab test
 - A case with at least one late symptom and positive lab test
- Probable case definition added in 2008
 - Any other case of physician-diagnosed Lyme disease with positive lab test

Allegheny County Health Department

Laboratory criteria for diagnosis

- Positive culture for *B. burgdorferi*, OR
- Two-tier testing:
 - Positive IgM when ≤ 30 days from symptom onset
 - Positive IgG at any point during illness
- Single-tier IgG immunoblot seropositivity
- CSF antibody positive for *B. burgdorferi* by EIA or IFA, if CSF titer > serum

Allegheny County Health Department

Lyme disease surveillance: challenges

- Time and staff constraints
- Underreporting
- Case residence vs. case exposure

Allegheny County Health Department

Reported cases of Lyme disease

Reported Cases of Lyme Disease -- United States, 2001

1 dot placed randomly within county of residence for each reported case

Reported Cases of Lyme Disease -- United States, 2013

1 dot placed randomly within county of residence for each confirmed case

Source: CDC Lyme stats
<http://www.cdc.gov/lyme/stats/>

Allegheny County Health Department

Lyme diseases cases in Allegheny County 2004-2008

- < 30 confirmed cases per year
- Many had travel history

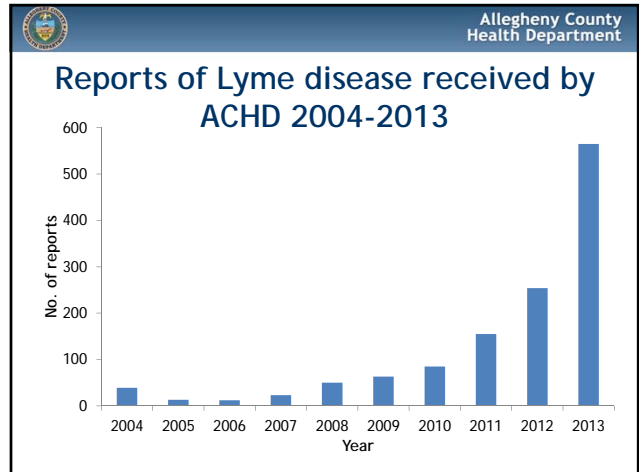




Allegheny County
Health Department

Lyme diseases cases in Allegheny County 2009-2013

- Number of reports began to rise
- Health department did not have resources to contact providers
- Cases could not be confirmed
- Anecdotal evidence of increasing burden of disease
- Official case count still <35 per year



Allegheny County
Health Department

Objectives of 2014 Lyme surveillance

- Assess burden of disease
- Describe characteristics of cases
- Develop plan for estimating burden of disease with limited follow-up

Allegheny County
Health Department

Protocol

Collect clinical info on all lab reports with help of student interns/volunteers, admin assistant and AmeriCorps member

- Fax one-page data collection form to providers
- Call providers who do not respond to fax
- Call patients if cannot reach provider
- Enter information into PA-NEDSS
- Allow PA DOH algorithm to classify cases

Allegheny County Health Department

Results

I. Burden of disease

- 1455 individuals reported from labs or providers
- 96 providers could not be reached
- Final case classification -> 822 cases (conf/prob)
 - 756 confirmed
 - 66 probable

Allegheny County Health Department

Symptoms reported by 2014 cases

- EM (65%)
- Arthritis/joint swelling (43%)
- Bell's Palsy or other cranial neuritis (8%)
- Radiculoneuropathy (4%)
- Lymphocytic meningitis (2%)
- 2nd or 3rd degree AV block (0.8%)
- Encephalitis/Encephalomyelitis (0.6%)

Allegheny County Health Department

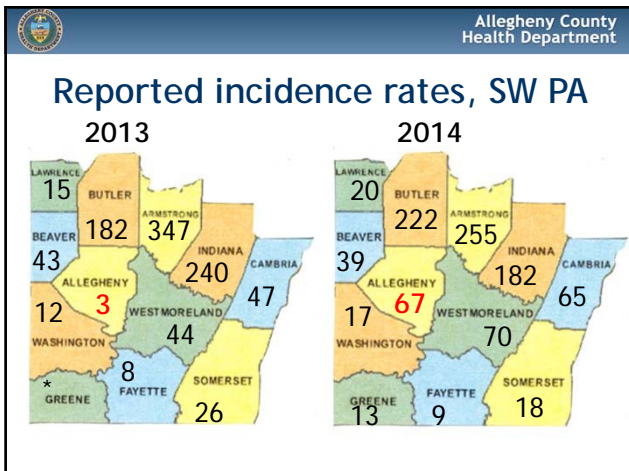
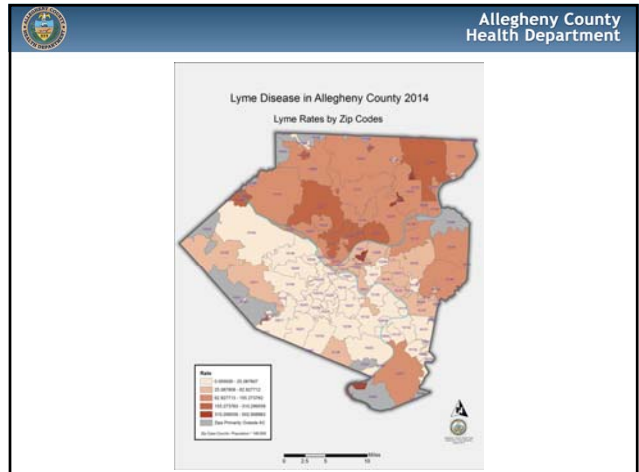
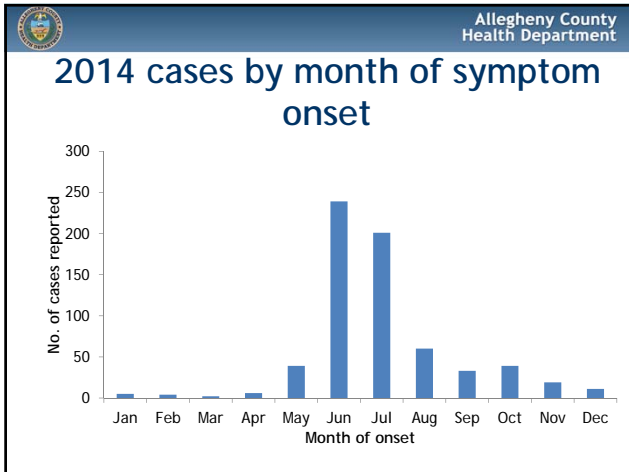
II. Characteristics of cases, Allegheny County, 2014 (N=822)

Gender	Percentage
Male	58%
Female	42%

Allegheny County Health Department

2014 cases by age group and sex


Age group	Male	Female
0-4	15	20
5-9	62	30
10-14	30	28
15-19	25	15
20-24	20	10
25-29	22	12
30-34	23	13
35-39	26	14
40-44	29	15
45-49	21	18
50-54	35	25
55-59	38	48
60-64	42	42
65-69	22	20
70-74	28	18
75-79	18	12
80-84	10	12
85+	5	5



Alleghey County Health Department

III. Estimating number of cases

- NY verified that random sampling provides good estimate of case counts
- MN adopted sampling methodology
- ACHD random sample of 2014 cases yielded estimated case count not significantly different from complete case count



Allegheny County
Health Department

Conclusions

- Dramatic increase in number of Lyme disease reports in Allegheny County
- Number of confirmed cases depends on local health department capacity
- Case characteristics similar to national profile
- 20% random sampling is reasonable method to estimate case counts



Allegheny County
Health Department

Acknowledgements

- ACHD
 - Vivian Liang
 - Carol Szeg
- GSPH
 - Xirun Chen
 - Lynda Jones
 - Kristin Komazec
 - Katie Krancevich
 - Jennifer Bowling
- Bates
 - Alison Simmons