Geographic and Seasonal Characterization of Tick Populations in Maryland

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Background

• Mandated reporting of human tick-borne disease

• No statewide program for tick surveillance
  – geographic distribution and seasonality of tick species not systematically characterized

• Opportunity recognized to compile and analyze data already being collected by the Maryland Department of Agriculture (MDA) through its Tick Identification Program
MDA Tick Identification Program

- MDA entomologist identifies ticks by MD residents
- Submitter provides the following:
  - Demographic information
  - Geographic location (town) of the tick encounter
  - Date of collection
  - The host (human, pet, or other)
  - Anatomic site of attachment
MDA Tick Identification Program

• Entomologist identifies the following:
  – type of tick
  – life stage of the tick
  – degree of engorgement

• Reports have been stored in paper format at MDA
  – data have not been systematically characterized

• Submitted ticks not tested for pathogens
Ticks of Public Health Importance in Maryland

- *Ixodes scapularis*
  - Lyme disease
  - Anaplasmosis
  - Babesiosis

- *Amblyomma americanum*
  - Ehrlichiosis

- *Dermacentor variabilis*
  - Rocky Mountain spotted fever
  - Tularemia

PHASE Objectives

• Purpose:
  
  – Characterize tick submission data collected by MDA
  
  – Complement human tick-borne disease surveillance
  
  – Create electronic data base for prospective use
Methods

• Literature search and review

• Designed and developed Microsoft Access database
  – Entered data from 2009 – 2011

• Analyzed Data
  – Described frequency of submissions
  – Assessed trends of submissions according to month and life stage by year
  – Assessed distributions of submissions by Maryland jurisdiction by year
Ticks Submitted for Identification to the MDA by Tick Species and Year, Maryland, 2009-2011 (total number of submissions = 501)

- American Dog Tick - Dermacentor variabilis
- Black-legged Deer Tick - Ixodes scapularis
- Lone Star Tick - Amblyoma americanum
Blacklegged adult ticks by month and year of submission, Maryland, 2009-2011
Blacklegged tick nymphs by month and year of submission, Maryland, 2009-2011
Lone Star adult ticks by month and year of submission, Maryland, 2009-2011
Lone Star tick nymphs by month and year of submission, Maryland, 2009-2011
Limitations and Challenges

• Convenience sample

• Variability in how forms were completed

• Missing Data

• Mapping does not demonstrate intensity of host-tick encounters
Public Health Impact and Practice

• Addressed knowledge gap
  – potential for development of public health activities

• Maryland DHMH has increased awareness of distribution and seasonality
  – Aids in public health activity development
  – Educational campaigns and/or environmental modification

• Electronic capture mechanism

• Fostered interagency relationships
Public Health Impact and Practice

• Professional Development
  – Developed and designed database
  – Conducting descriptive epidemiological analysis
  – Geographic Information Systems
  – Applied lessons learned from course work to real world public health problems
  – Critical thinking and leadership skills
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Questions?
References


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