Lyme Borreliosis Population Survey of a single ZIP Code in Cecil County, Maryland

Introduction
The 2003 Lyme borreliosis case incidence reported to the Centers for Disease Control and Prevention (CDC) for Cecil County, MD was 59 cases/100,000 population (0.059%).\(^1\) Contiguous Chester County, PA had a 2003 incidence of 209 cases/100,000 population (0.21%).\(^2\) High case numbers were documented in the previously reported 2004 survey of Pocopson Township in Southern Chester County located ca. 16 miles Northeast of Cecil County.\(^3\)

The Cecil County Lyme and Associated Diseases Support Group and the Lyme Disease Association of Southeastern Pennsylvania, Inc. (LDASEPA) conducted this 2005 pilot study of patient reported Lyme borreliosis case numbers and treatment results to demonstrate the need for a statistically-valid population survey to determine the true rate of Lyme borreliosis infection in Cecil and Chester Counties. The Cecil and Pocopson surveyed sites are geographically proximate and topographically and ecologically analogous (Fig. 1).

Materials and Methods
Names and addresses of residents in the Cecil County, MD, 21921 ZIP Code were obtained from the District 34B State Legislative office and verified with current voting records. Of the 1000 survey cards mailed, 74 were returned as undeliverable.

The survey card included survey background, instruction, and returnable data portions (Fig. 2).

![Figure 1](image-url) Relative locations of Pocopson Township and the 21921 ZIP code area of Cecil County.

Results and Discussion
A total of 244 survey cards were returned representing 244 households with 660 individuals. The rate of return was 26.3% of all (926) valid addresses. The age range was 4 months to 92 years with a mean age of 42.8 years (1.4% did not report age). Age distribution of residents reporting a diagnosis with Lyme borreliosis is shown in Figure 3. Gender breakdown was 47.6% female, 50.5% male, and 1.9% not reported.

![Figure 3](image-url) Age distribution of residents reporting a diagnosis with Lyme disease

Incidence
- Of the 660 individuals, 103 (15.6%) reported they have or had been diagnosed with Lyme borreliosis
- Of the 244 households, 84 (34.4%) had a member diagnosed with Lyme borreliosis now or in the past
- Of the 84 households reporting Lyme borreliosis, 16 (19%) had more than one member currently, or in the past, diagnosed with Lyme borreliosis
Patient and physician information

- While 103 individuals reported a diagnosis with Lyme borreliosis only 100 individuals reported being treated. Of these 100, 23 (23%) reported they still experienced symptoms
- Twenty-nine individuals (29%) were treated by a Maryland physician, 75 (75%) were treated by a non-Maryland physician, and 4 (4%) were treated by Maryland and non-Maryland physicians
- Twenty-six (89.7%) of individuals treated by Maryland physicians reported successful treatment and 69 (92%) of individuals treated by non-Maryland physicians reported successful treatment
- Of the 95 individuals reporting successful treatment, 15 (15.8%) reported they still experienced symptoms
- Twelve (12%) individuals reported more than 1 treatment cycle

The previous Pocopson study established a high rate of infection in Southern Chester County. This identical study in Cecil County, only a few miles distant, indicates a lower rate (Table 1, Figure 4).

Table 1. Comparison of Lyme disease survey results for Cecil County, Maryland and Pocopson Township, Chester County, Pennsylvania.

<table>
<thead>
<tr>
<th>Survey site</th>
<th>Diagnosed with Lyme disease</th>
<th>Still have post-treatment Lyme disease symptoms</th>
<th>Suspect have Lyme disease</th>
<th>Households with member(s) diagnosed with Lyme disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pocopson Township</td>
<td>217 (21.6%)</td>
<td>68 (31.3%)</td>
<td>21 (2.1%)</td>
<td>164 (47.8%)</td>
</tr>
<tr>
<td>Cecil County</td>
<td>103 (15.6%)</td>
<td>23 (23%)</td>
<td>9 (1.4%)</td>
<td>84 (34.4%)</td>
</tr>
</tbody>
</table>

As these two sites have analogous topographical and ecological characteristics, we conclude the lower reporting for Cecil County is due to a lack of public and physician awareness. It is more likely that the actual rates are probably much closer or the same. It is biologically inconceivable that the intimate etiological relationship among deer, *Ixodes* ticks, *Borrelia burgdorferi*, and humans ceases at the Cecil County and Chester County border.

As data among the public, physicians, and Health Department in Cecil County were not collected on year of infection or duration of infection it is not possible to draw valid conclusions about infection rate of Lyme disease. However, these findings should raise concern for Lyme disease among the public, physicians, and the Health Department in Cecil County.

References


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