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INTRODUCTION

- Lyme Disease (LD) is a multisystemic illness caused by the spirochete *Borrelia burgdorferi* and is transmitted to humans through the bite of infected ticks.
- The CDC reports that LD is the fastest growing vector-borne infectious disease in the U.S. In 2013, it was the fifth most commonly reported Nationally Notifiable disease, up from seventh in 2012, with 27,203 confirmed and 9,104 probable cases.¹
- Although the number of LD cases reported has grown exponentially since national surveillance started in 1982,² real-world incidence of LD is poorly understood and likely underreported.
- Published treatment guidelines specify short-course antibiotic treatment for early LD lasting 10 to 28 days,³ though there are conflicting recommendations and little is known about real-world treatment patterns or potential regional variation in those treatment patterns.

OBJECTIVE

- The objective of this study was to estimate LD incidence among commercially insured patients in the U.S. from 2010 through 2013. A secondary objective was to describe initial LD treatment choices and duration of therapy.

METHODS

- This was a retrospective observational study using the Truven Health MarketScan® Commercial and Medicare Supplemental Databases from 2010 through 2013.
 - These databases are comprised of the medical and pharmacy administrative claims for commercially insured patients and their dependents in the U.S. On average, approximately 32 million patients had continuous health plan enrollment during each of the study calendar years.
- Incident cases were defined as the presence of a non-ancillary healthcare claim with an LD diagnosis (ICD-9-CM 088.81) in the calendar year among patients with continuous medical and pharmacy benefits for the full calendar year. Incidence was calculated separately for each of the four study years (i.e., 2010, 2011, 2012, and 2013).

METHODS (CONT'D)

- Patients with a diagnosis of a non-LD infection during the week before or after the LD diagnosis were excluded from the treatment patterns analysis to ensure that treatment was truly due to LD.
- Secondary analysis outcomes were the portion of patients receiving antibiotics within 14 days after a LD diagnosis, as well as types and duration of antibiotic use.

RESULTS

- The incidence of LD was 0.68 per 1,000 person-years in 2010, increasing to 0.84 in 2011, 0.83 in 2012, and 0.96 in 2013 (Figure 1).
- Consistent with national reporting, there was variation in incidence rates by geographic region (Figure 2).
 - Incidence rates were highest in New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), increasing from 3.89 per 1,000 person-years in 2010 to 4.94 per 1,000 person-years in 2013.
- The mean age of LD patients was 42.5 years and approximately one-half (52.7%) were female, though this varied somewhat by age group, with the youngest patients more likely to be male than female (Figure 3).
- The proportion of patients treated with antibiotics within 14 days of an LD diagnosis increased from 49.7% in 2010 to 54.8% in 2013.
 - Antibiotic type was consistent across study years (Figure 4), and newly diagnosed LD patients were primarily treated with antibiotics included in published treatment guidelines (doxycycline, amoxicillin, cefuroxime, azithromycin).
 - Few patients were treated with ciprofloxacin, which is not mentioned in guidelines.
- The average duration of antibiotic therapy was 37.1 days (standard deviation [SD]=43.2 days) and there was a slight decrease in duration of antibiotic therapy from 2010 to 2013, ranging from 38.5 days (SD=44.1 days) in 2010, to 35.3 days (SD=41.6 days) in 2013, (P<0.001); however, the median duration of therapy was consistently 21 days for each calendar year.
 - Duration of therapy varied substantially by geographic region (Figure 5).

RESULTS (CONT'D)

Figure 1. Lyme Disease Incidence by Year: All U.S. Regions

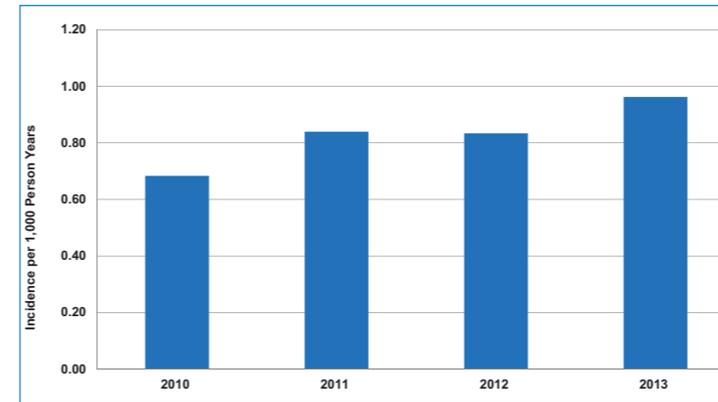


Figure 2. Regional Variation in Lyme Disease Incidence

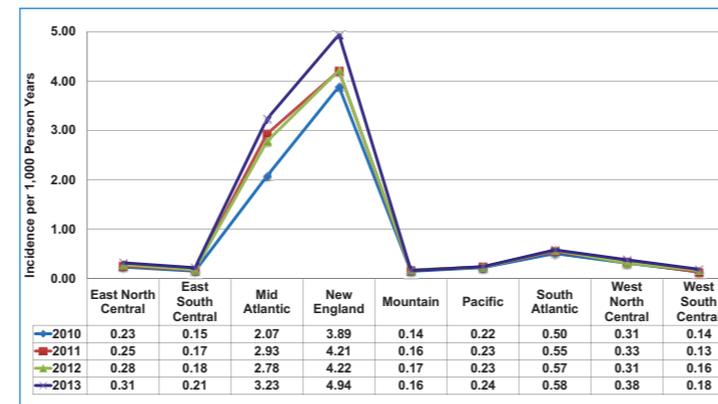


Figure 4. Types of Antibiotic Treatment for Lyme Disease by Year

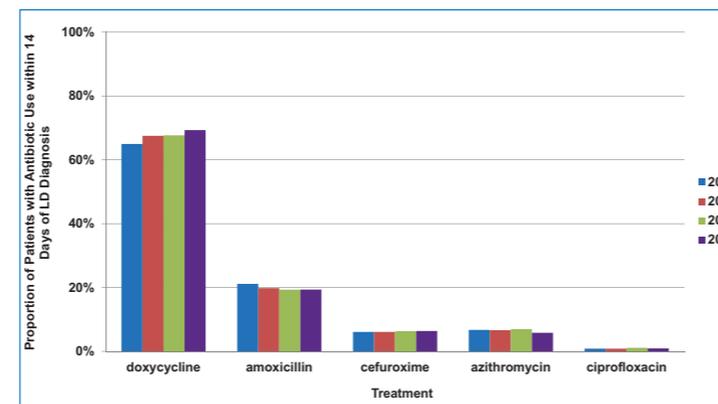


Figure 3. Overall Study Demographics of Incident Population

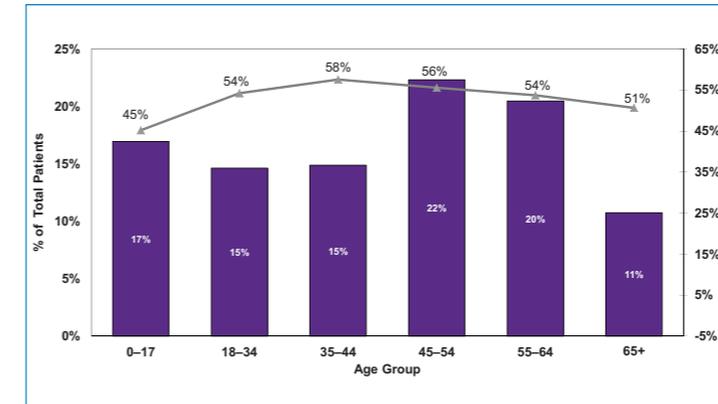
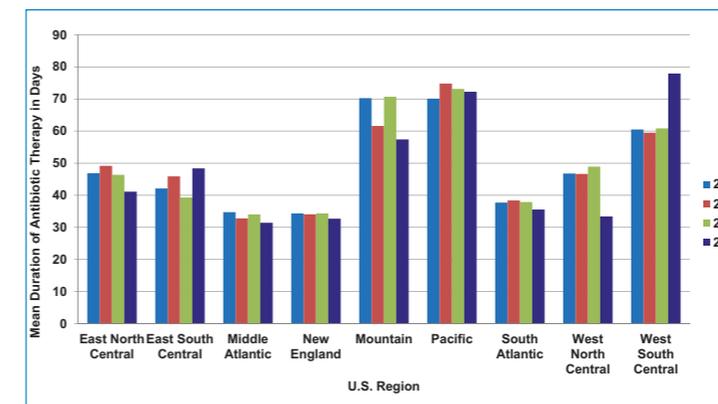


Figure 5. Regional Variation in Duration of Antibiotic Therapy by Year



LIMITATIONS

- The data source used in this analysis comprises data from commercially insured patients and their dependents and therefore may not be representative of patients with other types of insurance or the uninsured.
- This analysis measures the incidence of LD using an administrative claims database, which only captures LD cases that generate a health insurance claim with the appropriate diagnosis code. As a result, this analysis likely underestimates the true incidence of LD as it does not include undiagnosed or misdiagnosed LD cases.

CONCLUSION

- While the incidence of LD appears to be increasing over time, initial treatment patterns remain largely unchanged. Results from this study will enhance understanding of LD epidemiology and treatment.

REFERENCES

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