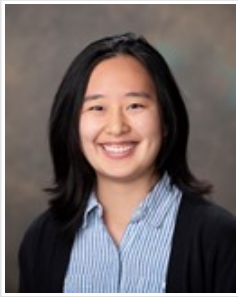# Lyme Disease Incidence in Central and Northern Wisconsin, 2003-2018

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Background: Lyme disease is the most commonly occurring vector-borne disease in the United States and is endemic to Wisconsin. While Lyme disease reports have risen nationally, Wisconsin and other high incidence states have reported stable or declining cases counts within the last decade. We estimated the annual incidence of Lyme disease from 2003-2018 within the Marshfield Epidemiologic Study Area (MESA), a defined geographic region where nearly all residents (>90%) receive care from the Marshfield Clinic Health System (MCHS).

Methods: Lyme disease cases were identified by incident ICD diagnosis codes in the Electronic Health Record (EHR). Crude incidence rates (IRs) were stratified by demographic characteristics. A repeated-measures Generalized Estimating Equation (GEE) with a Poisson distribution was employed to estimate Lyme disease incidence rates by MESA region (North or Central) and year, adjusted for age and sex. Crude and adjusted incidence rates (IRs) were calculated per 100,000 person-years.

Results: From 2003-2018, 2,021 Lyme disease cases were identified among MESA residents. Crude IRs were higher in males (IR=178.8) than females (IR=131.7). A bimodal age distribution was observed in Lyme disease incidence, with the highest crude IRs in ages 0-9 and 70-79 (IR>220). Adjusted IRs were higher in MESA North (IR=238.5) than MESA Central (IR=103.9). No temporal trends were observed in either MESA region.

Conclusions: The bimodal age distribution and higher IR in males is consistent with previous studies. Lyme disease incidence in MESA has remained stable over time.