

# Tick abundance and *Borellia* prevalence in urban and peri-urban green spaces of Bonn, Germany

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Lyme disease is the most common vector-borne disease in Europe and its vector, *Ixodes ricinus* is expanding its habitat range. Although the risk of tick-borne diseases is associated with rural forested areas, urban green spaces can also harbor tick populations. Due to the high number of visitors to urban green spaces and low risk awareness, it is hypothesized that the tick-borne disease risk in urban and peri-urban green spaces is relatively high. Following a Planetary Health and One Health approach a multidimensional assessment of environmental and social factors was conducted. A continuum from rural forests via urban forests to urban parks were systematically sampled for ticks over a period of one year. The tick species and development stage were determined by microscopy, and pathogen prevalence was assessed by PCR analysis. In total 3,594 ticks were sampled from the seven collection sites. The highest abundance was observed in the rural forest and the lowest in the urban park. *Borellia* prevalence ranged from 14.2% to 23.2% in the urban forests compared to an average *Borellia* prevalence of 16% in the rural forest. The in-field survey revealed that green space users have some risk awareness, however, correct preventive measures are rarely practiced. Although the tick data show a lower tick abundance in urban areas, the poor preventive measures and awareness induce human health risks. Among the study participants 26.2% reported being bitten by a tick within the past 12 months and 10.98% reported being diagnosed with a tick-borne disease in the past.

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