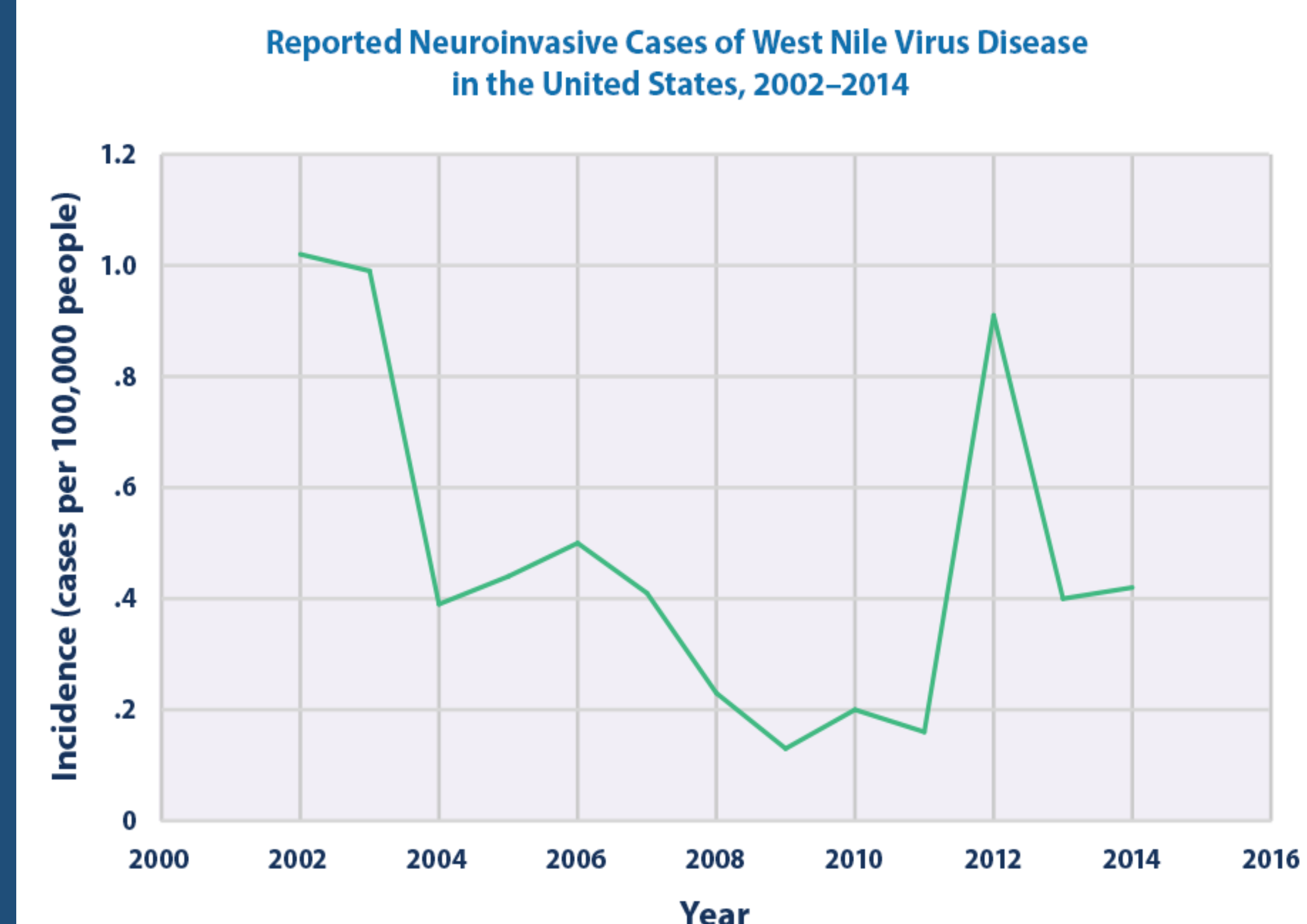
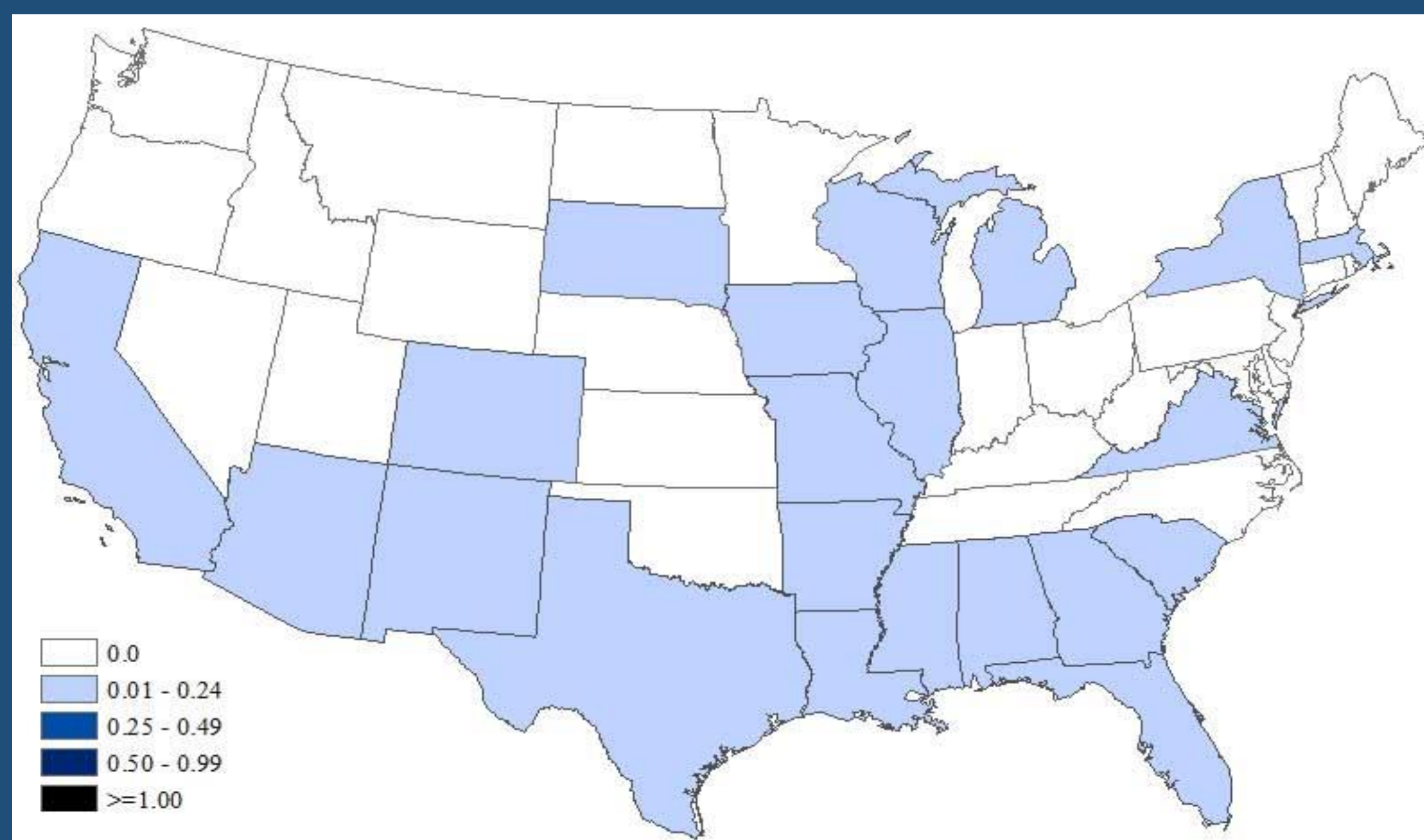


INTRODUCTION

Lyme disease (LD) is a tick-borne illness caused by *Borrelia burgdorferi*. Bannwarth syndrome (BWS) is a neuroinvasive form of disseminated LD. BWS is characterized by painful radiculoneuropathy, varied motor weakness, facial weakness and cerebrospinal fluid pleocytosis.

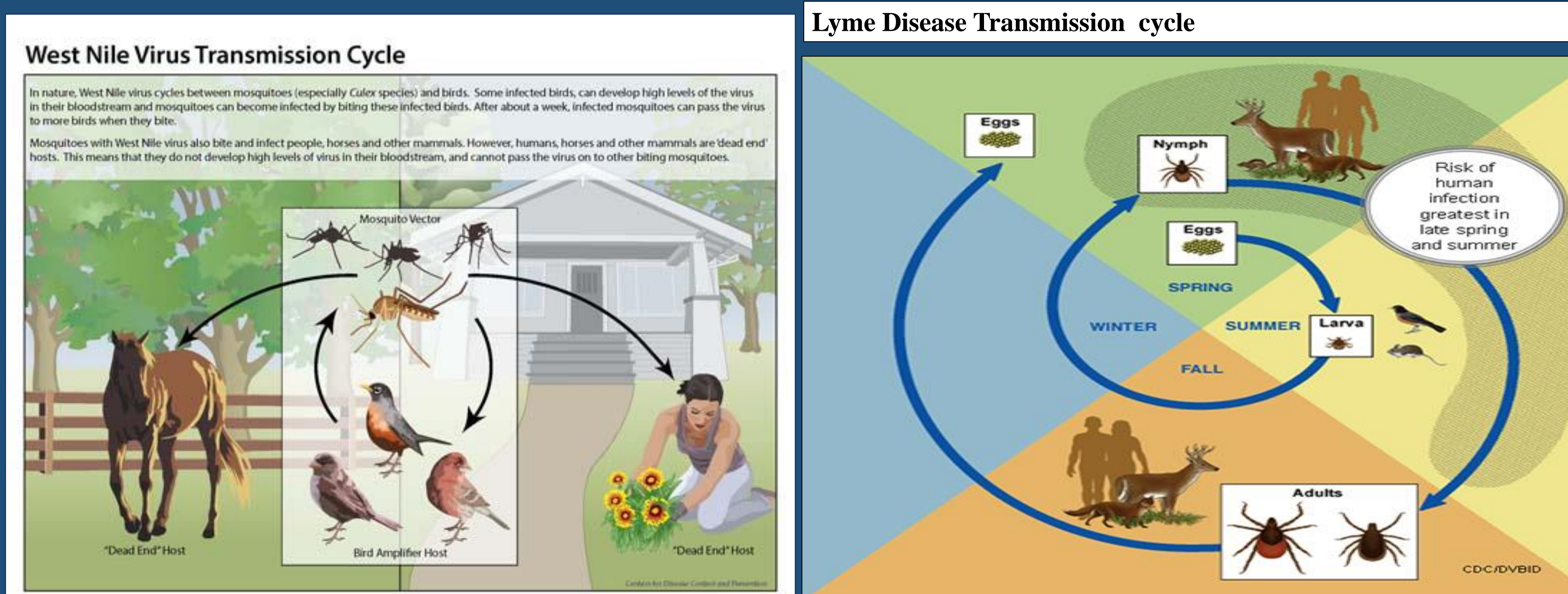
West Nile virus (WNV) is a mosquito-borne virus. It can lead to neuroinvasive disease (meningitis, encephalitis, acute flaccid paralysis). Coinfection of LD and viral infections are uncommon. We report a case of BWS co-infection with WNV.



Data source: CDC (Centers for Disease Control and Prevention). 2016. West Nile virus statistics and maps. www.cdc.gov/westnile/statsmaps/index.html. Accessed January 2016.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

TRANSMISSION CYCLE



CLINICAL PRESENTATION

31-year-old female with history of gastric bypass surgery who presented with erythematous multiple skin rash and headache over a week duration. Noted to have erythema migrans and neck rigidity on physical examination. Clinical course developed radiculoneuritis, left foot drop and Left Bells palsy.

Serologies: Lyme IgG and IgM positive, *B.burgdorferi* antibody IgM by western blot positive HSV 1/HSV 2 IgM-nonreactive. HIV screen negative, EBV antibody IgG and IgM nonreactive, *T.pallidum* nonreactive.

CSF: 89% lymphocytes, positive IgM WNV, cryptococcal antigen negative, bacterial antigen negative, HSV negative

MRI of the spine: Diffuse enhancement of the nerve roots of the cauda equina

Hospital Course: Our patient had Bannwarth features (commonly reported in Europe). Tested Positive for both LD and WNV. Patient received 2 weeks course of IV ceftriaxone, supportive and physical therapy with improvement of symptoms.



Erythema migrans; Source: CDC.gov



Facial nerve palsy NEJM



Sagittal view MRI lumbar spine: Nerve root enhancement

DISCUSSION

Neuroinvasive LD account for 10-15% of LD cases. Neuroinvasive WNV develop in less than 1% of cases with a 10% fatality rate. Reasons for coinfection of LD and WNV remains unclear.

Seasonal peak of Lyme disease ranges from May through September, overlapping with that of mosquito borne illnesses such as WNV. At present, the U.S. Environmental Protection Agency list WNV as an indicator of climate change. Higher temperatures foster the population growth of disease-carrying mosquitoes, as well as decrease interval between blood meals shortening the virus's incubation time.

Our patient presented within this season and patient could have been bitten by WNV borne mosquito. WNV-borne mosquito has been known to prefer human hosts.

A second hypothesis for co-infection results from experiments on *Ixodid* and *Argasid* tick species which has revealed that these vectors do not only carry bacteria but other viruses including WNV. Theoretically the patient could have acquired both *Borrelia burgdorferi* and WNV from the same tick bite.

CONCLUSION

Neuroinvasive LD and WNV co-infection is uncommon. Climate change affects incidence of vector borne illnesses. One should have high index of suspicion of Co-infection if treatment of vector borne disease like LD is protracting.

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