Epidemiology of Tick-Borne Encephalitis (TBE): A Traveler´s Perspective

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BACKGROUND

- Tick-borne Encephalitis (TBE) is a central nervous system (CNS) infection caused by the TBE virus (TBEV), transmitted by ticks or by ingestion of unpasteurized dairy products.[1]
- Non-CNS manifestations of TBE infection range from psychiatric symptoms to severe headache and bowel disease.
- Persisting sequelae occur in up to 50% of patients and case fatality rates range from 0.4– 6% (up to 20% in Russia).[2]
- There is no specific treatment, but prevention exists.[3]
- TBE risk areas are defined by the European Centers for Disease Control (ECDC) as any area where the risk of infection with TBEV is greater than zero.[4]
- TBE risk was previously confined to the “TBE Belt” of central Europe, Russia and parts of Asia.[5] Though, recent evidence suggests that TBEV is circulating more broadly and “risk areas” extend north, south, and west.[6]
- Updated evidence on TBEV endemicity and geographic expansion is critical to inform travelers on the risk of TBE.

OBJECTIVE

- We aimed to summarize the latest evidence on the distribution of TBEV as of 2019

METHODS

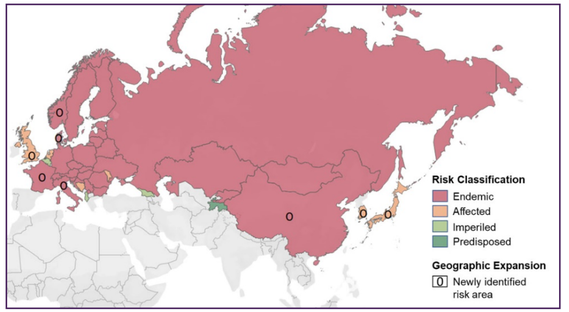
- Reports of TBEV isolation, TBE case counts (current and historical), surveillance and reporting status, and TBE vaccine uptake were obtained from local expert solicitation and supplemented by a non-systematic literature review.
- Country risk status was then classified as suggested by the ECDC for arbovirus infections:
  - **Predisposed** – favorable environment conditions including competent ticks present
  - **Imperiled** – TBEV isolated
  - **Affected** – sporadic autochthonous cases
  - **Endemic** – annually autochthonous cases

RESULTS

- TBE virus circulation has now been documented across the EurAsian continent (Figure 1)
- As of the end 2019, TBE risk was classified across 39 countries (Figure 2) with most countries considered endemic (N=29) followed by affected (N=6), imperiled (N=3), and predisposed (N=1)
- Eight countries had newly identified TBE risk areas: China, Denmark, France, Italy, Japan, Norway, South Korea and the United Kingdom
- Misclassification is likely as some countries have no licensed test, infrequent or non-routine testing practices, incomplete testing and/or underreporting

Figure 1: Map of Europe and Asia Highlighting Areas with TBEV Circulation

Figure 2: Map of Countries by TBE Risk Classification*



*Risk classification specific to at-risk regions within highlighted countries[5]

CONCLUSIONS

- Including newly identified countries with circulating TBEV, TBE-risk areas are now reaching from the United Kingdom, Norway and France in the west, Northern Italy in the south to Central/Eastern Europe and China and Japan in the east.
- TBE-incidences vary by country and by region, but the impact of each of the following on risk classification remains unclear: under-reporting, lack of testing, and increasing or decreasing preventive measures including vaccine uptake.
- The risk of TBE by country continues to evolve and is unpredictable due to significant annual variations in case numbers; prevention measures should be considered for any person traveling or residing in a recognized TBE “risk area” (i.e. disease risk >0)

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DISCLOSURES

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