

Tick Borne Encephalitis: The DoD Experience

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- TBE has been recognized as a public health and force health protection threat since the 1970's for US Service Members and beneficiaries residing in or traveling to Europe
- TBE risk for military families living in host nations is estimated to be similar to other residents
- There may be locations or activities that place certain individuals or units at increased risk

- The permanent Service Member populations stationed within EUCOM can be at risk of TBE.



- Eastern Europe adds additional temporary force members who rotate approximately every 9 months
- Germany is the country in which the greatest number of Service Members and beneficiaries are stationed who might be at risk of TBE
- TBE became notifiable disease in Germany in 2001 and majority of cases are reported from southern states of Baden-Wurttemberg and Bavaria, both which contain US military installations
- Military personnel may engage in activities which place them at higher risk for contact with tick vectors to include field exercises, outdoor work, and recreational activities such as hiking or camping

■ TBE risk assessments

- Conducted internally by HQ USEUCOM Counter Biothreats Cell
 - deemed moderate bio-threat: elevated concern and potential threat
- Conducted externally by the National Center for Medical Intelligence

■ The need for TBE vaccination is supported by:

- US European Command
- US Special Operations Command
- The Joint Chiefs of Staff



Landstuhl Germany Mar 3, 2020. Photo courtesy of the DoD.

- An FDA approved vaccine in combination with personal protective measures will assure the best available protection for our troops and their families



Hohenfels Germany Sept 26, 2019. Photo courtesy of the DoD.

- NATO nations offer Service Members either of the two European Union European Medicines Agency (EMA) approved vaccines
- The FDA has not approved these vaccines for use by U.S Service Members
 - Vaccine is offered on a voluntary basis
 - Service Members must first obtain a referral and then obtain vaccine from host country Tricare provider
 - Difficult to track overall uptake

Tick-borne Encephalitis Surveillance in U.S. Military Service Members and Beneficiaries, 2006–2018

James D. Mancuso, MD, DrPH (COL, MC, USA); Sara Bazaco, PhD, MPH; Shauna Stahlman, PhD, MPH; Shawn S. Clausen, MD, MPH (CDR, MC, USN); Angelia A. Cost, PhD, ScM

- Limited literature available on TBE among US military Service Members
- Mancuso et al, published a review of TBE among US Service members from 2006-2018 in November 2019
- Since this publication, only 1 other case known to DoD

Reference: Mancuso JD, Bazaco S, Stahlman S, Clausen SS, Cost AA. Tick-borne encephalitis surveillance in U.S. military service members and beneficiaries, 2006-2018. *MSMR*. 2019 Nov;26(11):4-10. PMID: 31804845.

A Review of Case Definitions from the ECDC

■ Confirmed Case Definition

■ **Clinical Criteria:**

Any person with symptoms of inflammation of the CNS (e.g. meningitis, meningo- encephalitis, encephalomyelitis, encephalo-radiculitis)

AND at least 1 of the following **lab findings**:

- TBE specific IgM AND IgG antibodies in blood
- TBE specific IgM antibodies in CSF
- Seroconversion or four fold increase of TBE-specific antibodies in paired serum samples
- Detection of TBE viral nucleic acid in a clinical specimen
- Isolation of TBE virus from clinical specimen

■ Probable Case Definition

■ **Clinical Criteria:**

Any person with symptoms of inflammation of the CNS (e.g. meningitis, meningo- encephalitis, encephalomyelitis, encephalo-radiculitis)

AND the following **lab finding**:

- Detection of TBE-specific IgM-antibodies in a serum sample

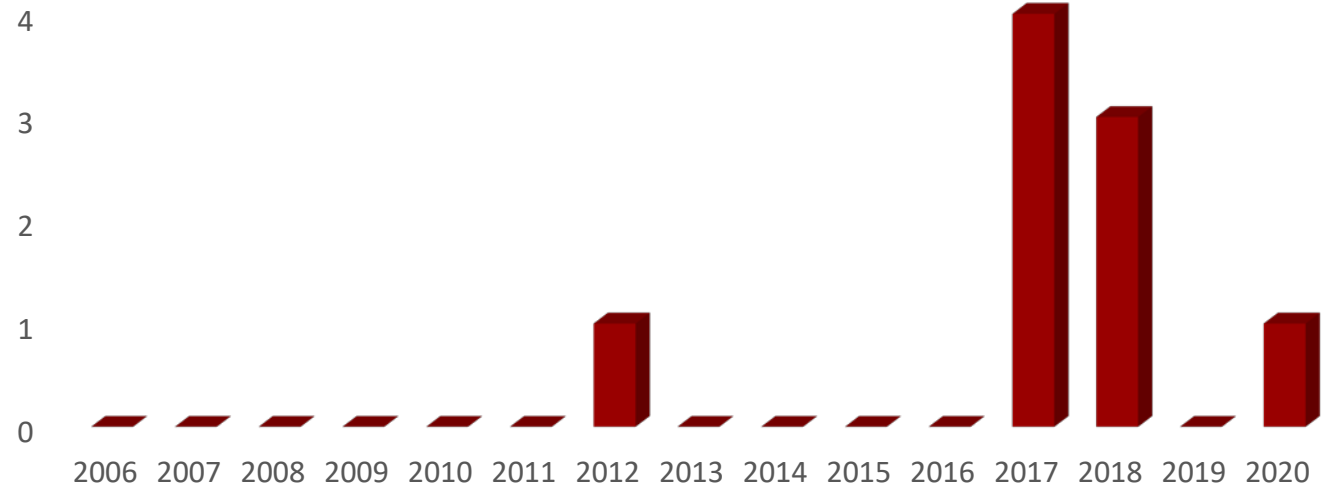
Reference: <https://www.ecdc.europa.eu/en/tick-borne-encephalitis/facts/factsheet> (accessed 11 Jan 2021)

- 9 individuals met the case definition between 2006 - 2020
 - 5 confirmed
 - 4 probable

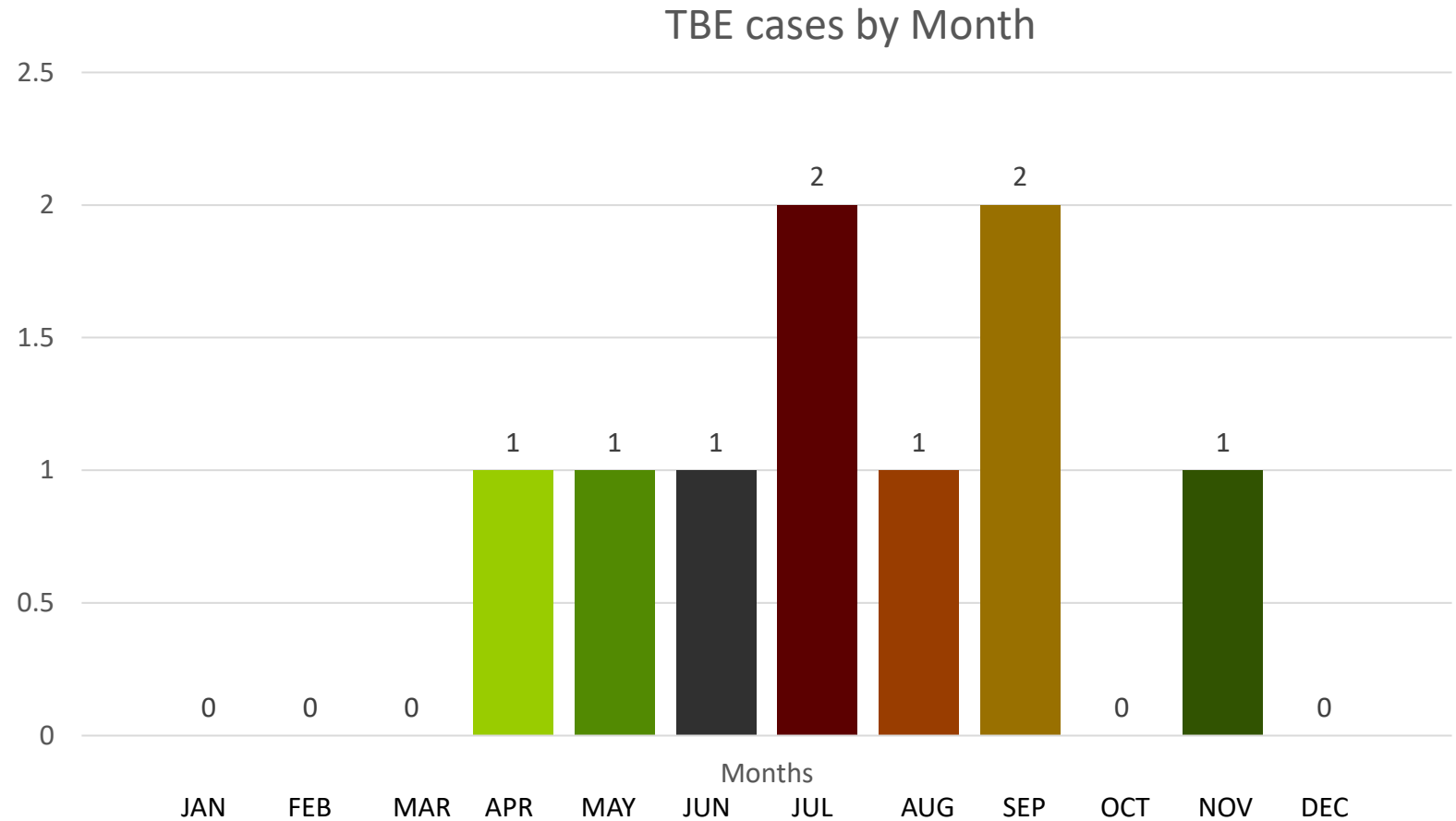
- All patients had neurologic illness consistent with the case definition:
 - All had fever
 - Other symptoms variably included weakness, mental status changes, nausea, headache, vomiting, diarrhea and neck stiffness
- Many patients had sequelae lasting from days to years:
 - “Decline in memory/difficulty concentrating > 1 year”
 - “Fatigue, attention/concentration issues x 5 months”
 - “Fatigue, headache, visual disturbances x 1 month”
 - “Reduced psychomotor function and headaches x 10 days”

Annual Case Occurrence

Among the 9 cases, one occurred in 2012 and the remaining 8 cases have occurred since 2017



Between 2006-2020
events occurred from
APR-NOV throughout
typical tick season



DoD Cases by Location

Events occurred only in Germany:

- Baden-Wurttemberg
- Bavaria

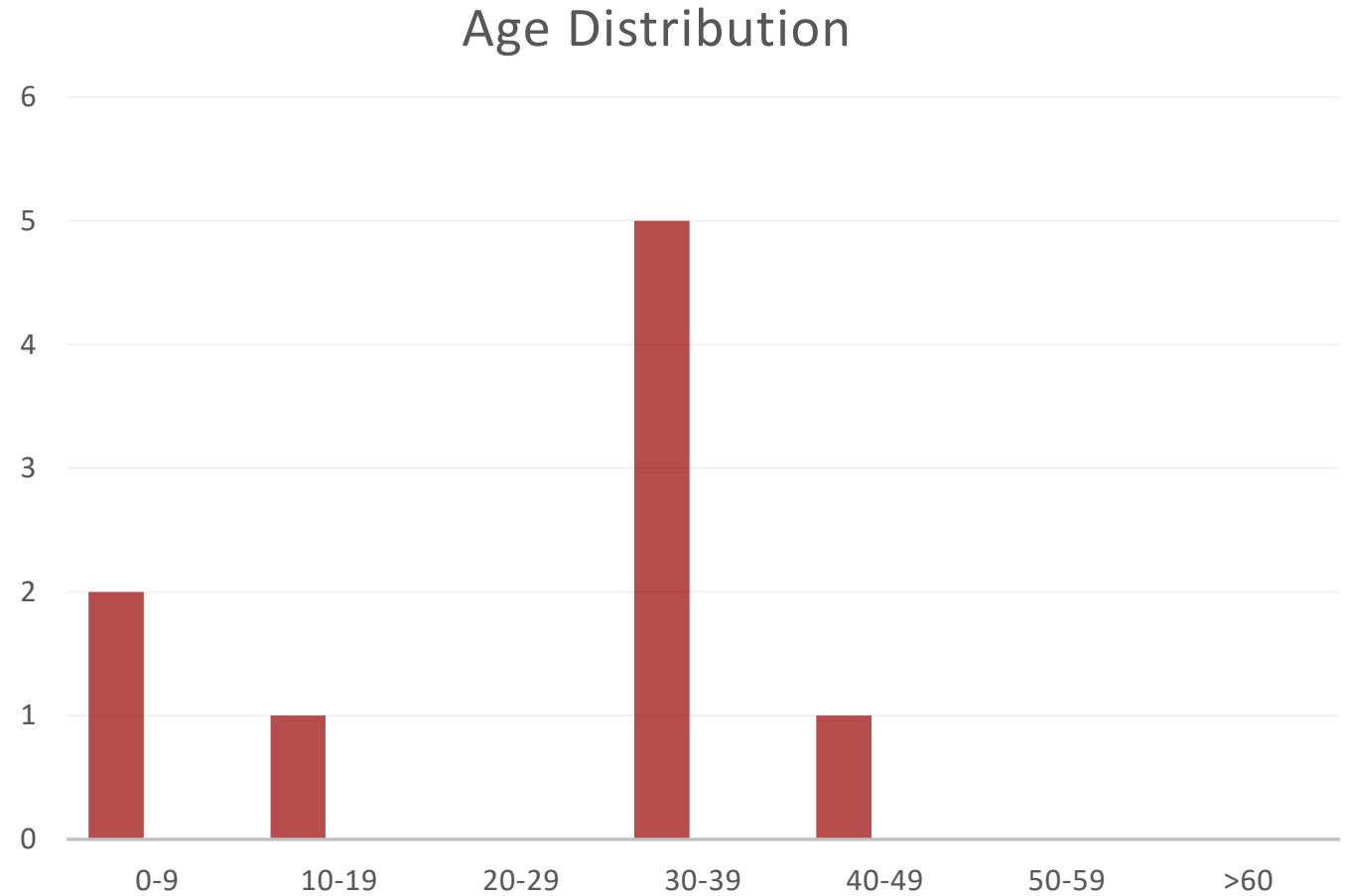


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Demographics

■ Age

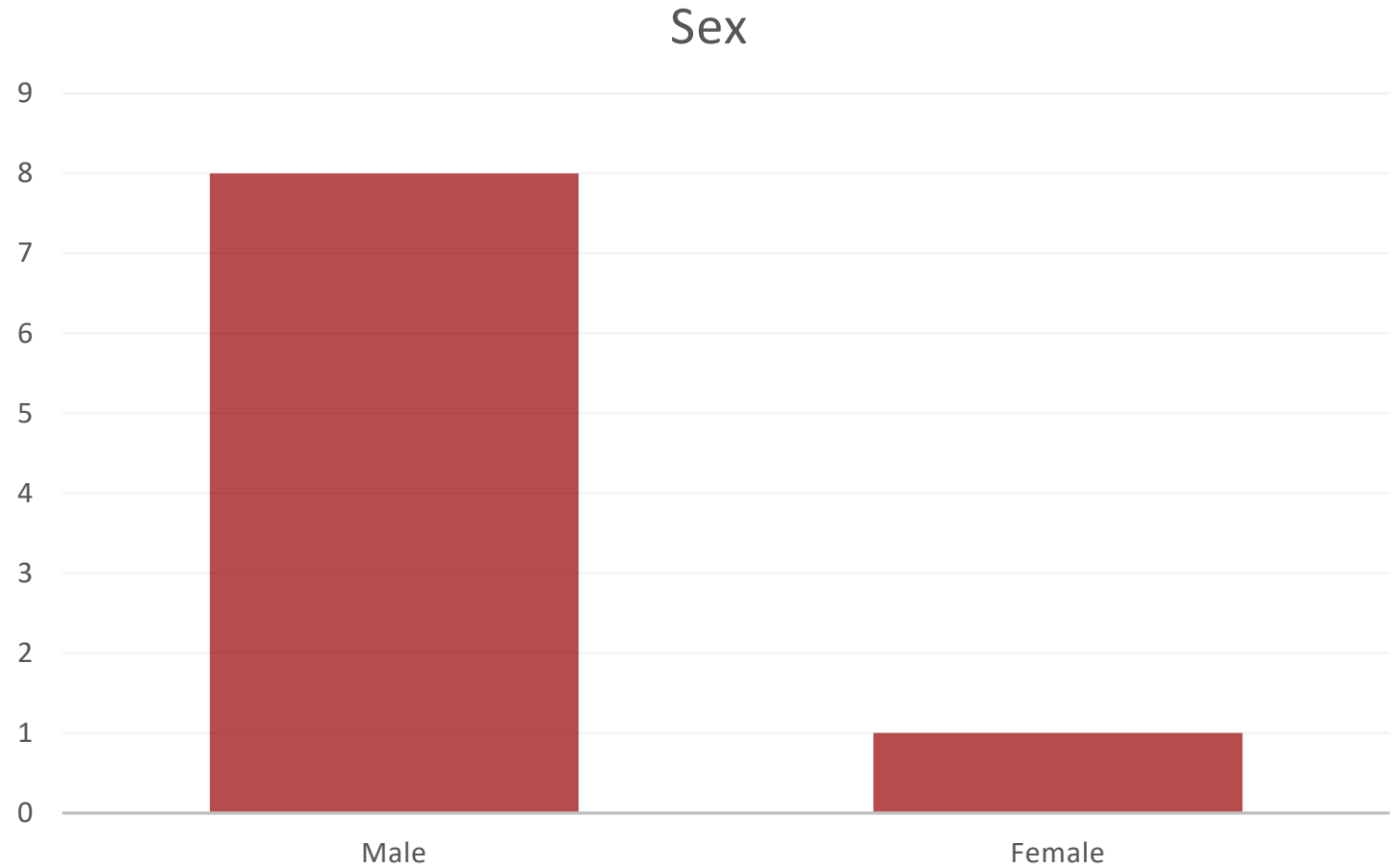
- Range 2-47 years
- Median 33 years



Demographics

■ Sex

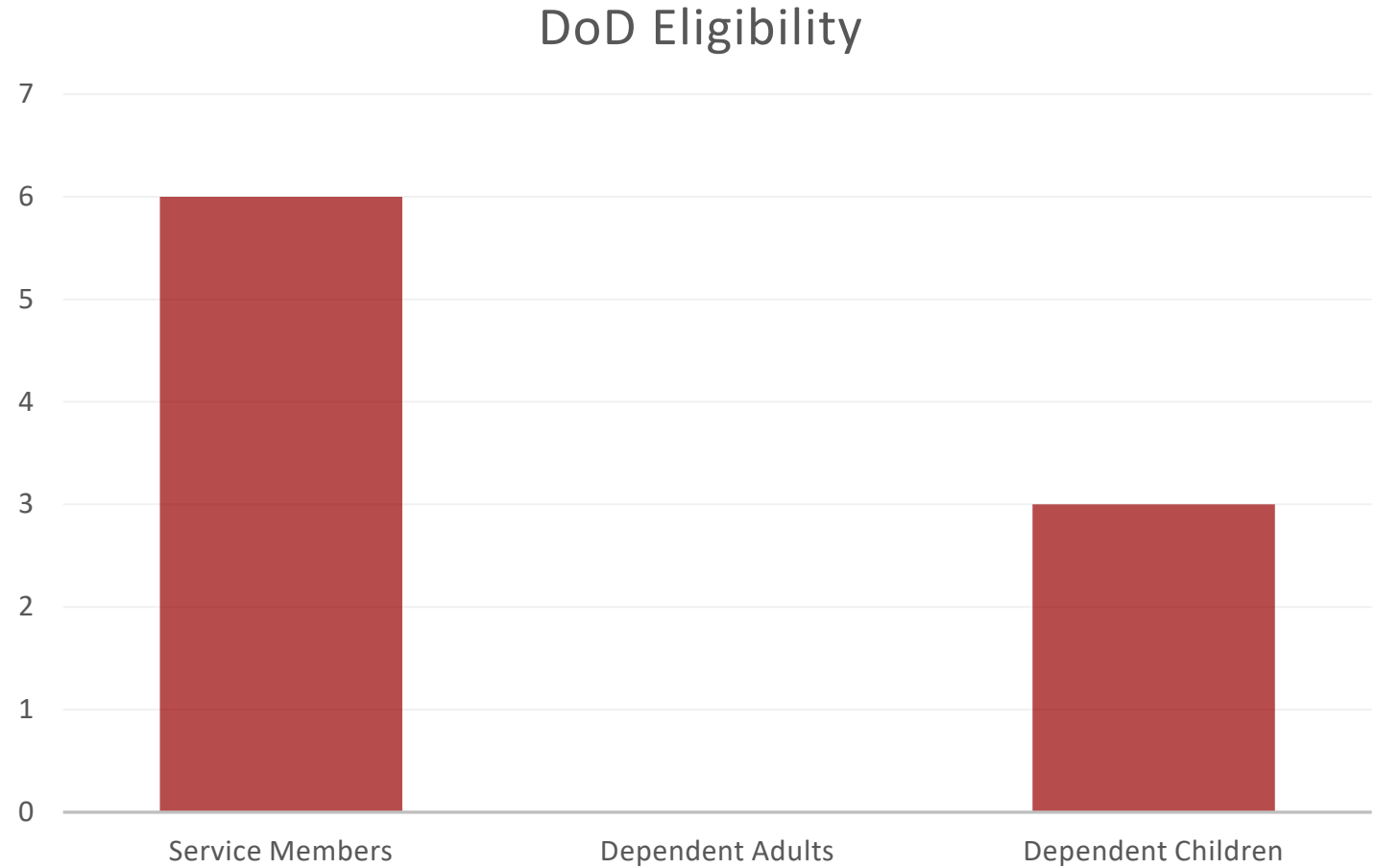
- Males 8
- Females 1



DoD Cases by Eligibility

DoD eligibility

- Service Members 6
- Dependent adults 0
- Dependent children 3



DoD Cases by Travel Status

Travel Status:

- Residents 9
- Temporary travelers 0

No cases had any record or prior TBE vaccine dose receipt.

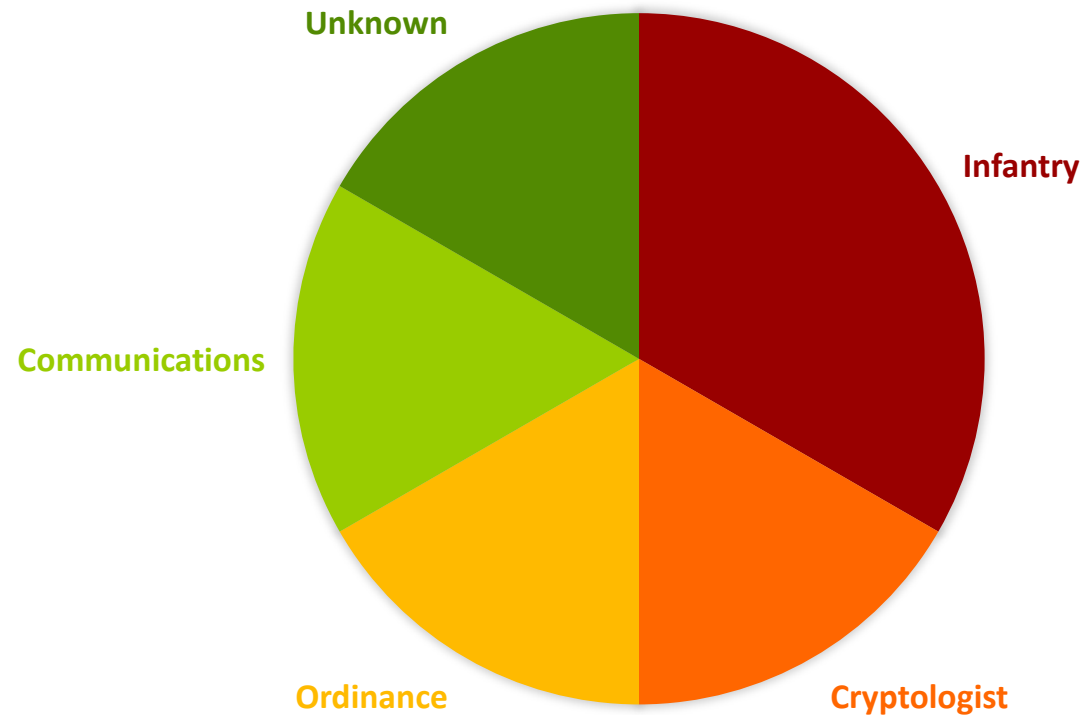


DoD Cases by Occupation

Military Specialties:

- Infantry 2
- Cryptologist 1
- Explosive ordinance disposal 1
- Communications 1
- Unknown 1

MILITARY SPECIALTY



Conclusions

- TBE has been documented in the DoD population living in endemic areas
- TBE is a public health and force health protection concern for US Service Members and beneficiaries residing in or traveling to Europe
- TBE immunization opportunities for DoD may be insufficient without FDA approved vaccine





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