



# NAVY ENVIRONMENTAL HEALTH CENTER

## Tick-borne Infections Reported in the Naval Disease Reporting System

Navy Preventive Medicine Reports

June 2007

*BUMEDINST 6220.12A requires that specific medical events, of significance to public health or force health protection, be reported using the Naval Disease Reporting System (NDRS). Included in the list of reportable medical events are several tick-borne infections, including Lyme disease (LD), Rocky Mountain Spotted Fever (RMSF), ehrlichiosis, and tularemia. Proper implementation of personal and environmental control measures can effectively prevent tick-borne infections.*

*We reviewed NDRS for trends in reporting of these tick-borne infections. When possible, we retained for analysis only one event per unique patient. The analysis included only those cases which had some evidence of laboratory confirmation. Results reflect reports from 1996 through early June 2007.*

---

### **Results**

**Rocky Mountain Spotted Fever (RMSF):**  
We identified 35 unique case reports of RMSF that had evidence of laboratory confirmation. Of these, 22 were among active duty (AD) personnel. Of the 22 AD personnel, 21 were male and 1 was female; 12 cases were among Marine Corps (MC) personnel and 10 among Navy. The age at onset (for AD and other beneficiaries) ranged from 13-62 years.

**Lyme Disease (LD):**  
There were 237 unique reports of LD with evidence of laboratory confirmation. Age ranged from 2-82. Half of the reports were among AD personnel. Of these, 103 (88%) were male and 14 were female. Seventy of the cases were in MC personnel, 41 in Navy, and 6 among other services.

Among AD cases, 51 (44%) were reported from Camp Lejeune, 9 (8%) from Groton, 8 (7%) from Quantico, and the rest were from a variety of other UICs (Figure 1). For non-AD cases,

(39%) were reported by Groton, 20 cases (17%) from Camp Lejeune, and the rest were from a variety of other UICs (Figure 2).

### **Ehrlichiosis and tularemia:**

There was one report of ehrlichiosis, one report of babesiosis, and no reports of tularemia reported in NDRS.

### **Discussion**

More than half of all LD reports come from either Groton or Camp Lejeune. The data suggest that in areas where LD is highly endemic (northeast, including Groton), exposure may be largely due to activities outside of work, whereas in areas where LD is not yet endemic (outside of the northeast, including Camp Lejeune), exposure may be largely due to field training activities. This is evidenced by the fact that 84% of cases reported by Groton were among non-AD beneficiaries, whereas 72% of cases from Camp Lejeune were among AD personnel (of which 94% were Marines). It is worth noting that CDC estimates of LD incidence by state for 2005 reported

an incidence of 52 per 100,000 in Connecticut, and 0.6 per 100,000 in North Carolina.

([http://www.cdc.gov/ncidod/dvbid/lyme/ld\\_rptdLymeCasesbyState.htm](http://www.cdc.gov/ncidod/dvbid/lyme/ld_rptdLymeCasesbyState.htm))

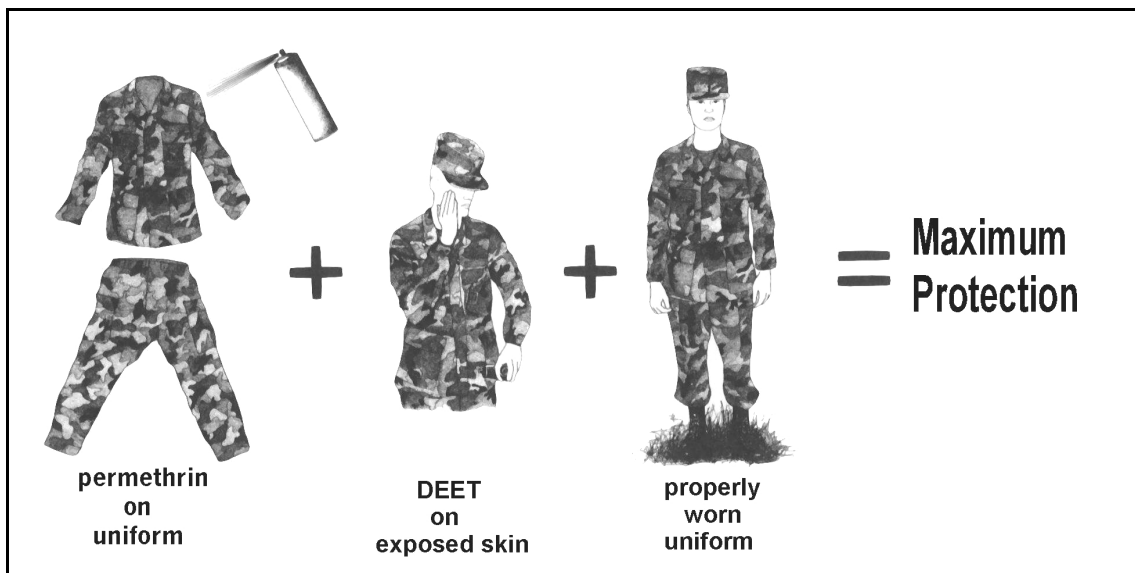
**Limitations of NDRS data**

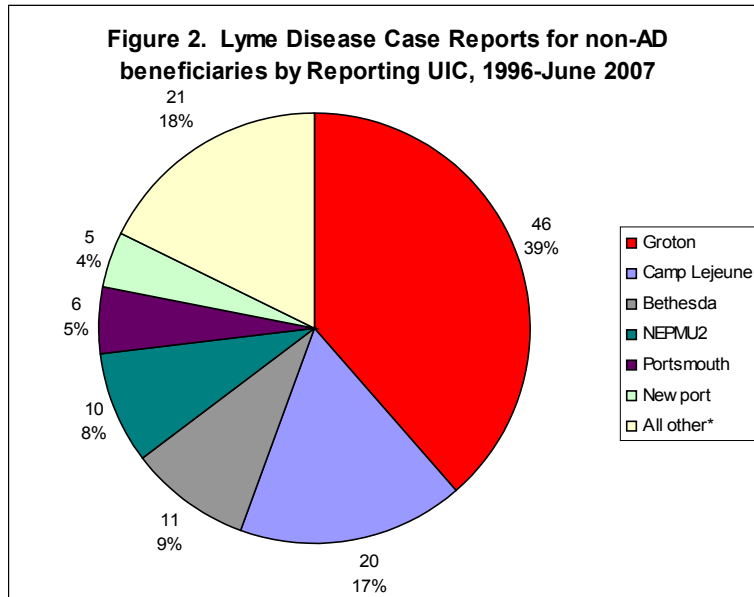
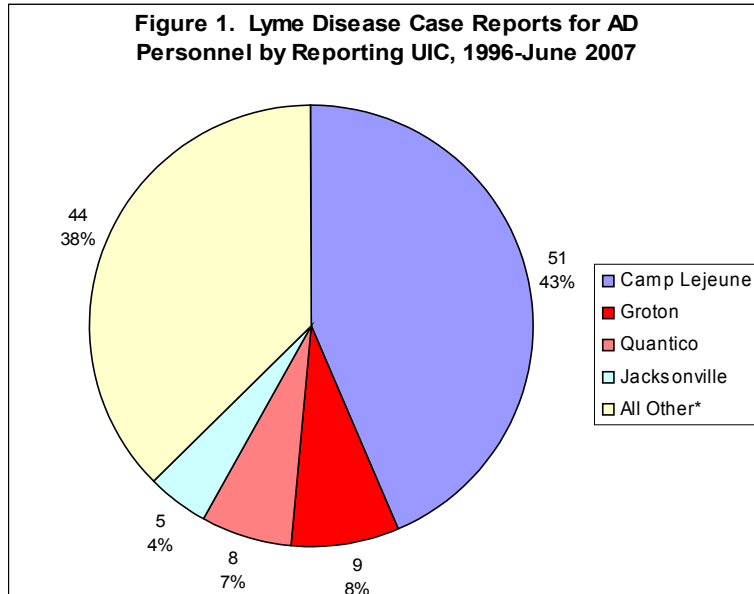
Several limitations of NDRS must be noted. Although these tick-borne infections analyzed here are required to be reported under BUMDEDINST 6220.12A, NDRS is a passive surveillance system and under-reporting is a known issue. Additionally, comparisons across reporting sites and across time should be made with caution because different reporters may have higher or lower thresholds for submitting a report, denominator data are not available, and rates cannot be calculated. Finally, case details are limited and we cannot easily differentiate between old and new infections or suspected and confirmed cases.

**Prevention**

This evidence indicates a strong possibility that Marines at Camp LeJeune are being exposed while doing work related functions, most likely field training. Repellents are the most effective way to prevent any tick-borne disease. However, repellents will only be effective if used correctly. Uniforms must be worn with sleeves down when in the field. Uniforms must be treated with permethrin. Deet must be applied to exposed skin. The DoD manual on repellent usage can be found at [http://afpmb.org/coweb/guidance\\_targets/ppms/TG36/TG36.htm](http://afpmb.org/coweb/guidance_targets/ppms/TG36/TG36.htm)

Tick control can be effective in reducing the number of ticks as much as 90 percent in heavy use training areas. Complete guidance is available at <http://afpmb.org/pubs/tims/TG26/TG26.pdf>. Removing vegetation and creating a mulch barrier will prevent ticks from entering localized areas, like yards or bivouacs. Repellents must be part of an overall prevention strategy because tick control efforts can only be conducted on small portions of large training facilities.





\*All other includes UICs that reported 5 or fewer cases



*If you have additional questions or think you would like more information, contact:*

**Navy Environmental Health Center**  
 620 John Paul Jones Circle, Portsmouth, VA 23708  
 Phone: 757.953.0700 Fax: 757.953.0688  
 Visit us at: [www-nehc.med.navy.mil/prevmed](http://www-nehc.med.navy.mil/prevmed)

**NEPMU 2: Norfolk, VA**  
 1887 Powhatan Street  
 Norfolk, VA 23511-3394  
 Com: (757) 444-7671, DSN (564)

**NEPMU 5: San Diego, CA**  
 3235 Albacore Alley,  
 San Diego, CA 92136-5199;  
 Com: (619) 556-7070, DSN  
 (526)

**NEPMU 6: Pearl Harbor, HI**  
 1215 North Road, Pearl Harbor, HI  
 Com: 808-473-0555,  
 DSN 315-473-0555