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NAVAL MEDICAL SURVEILLANCE REPORT

N M S R

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Data in the NMSR are provisional, based on reports and other sources of data available to the Navy Environmental Health Center. Notifiable conditions are classified by date of report. Only cases submitted as confirmed are included.

From the Preventive Medicine Director

WOW! Would be my best characterization of the many activities for the past few months, with so many things happening and the world so changed since I became the Director of Preventive Medicine. The Navy Environmental Health Center (NEHC) and the Navy Environmental and Preventive Medicine Units (NEPMUs) have been involved in the response to the anthrax threat, with numerous Navy unique process limitations. For example, the potential for exposure in the confined shipboard environment from a letter containing anthrax has been a challenge. Check out our website to see some of the efforts of the NEHC PM personnel. Special thanks to Ms. Becky Washburn for her efforts to make that website reflect current concepts in that rapidly evolving response.

We are anticipating the upcoming release of SAMS 8.02, which incorporates the Naval Disease Reporting System (NDRS) within the program. Special thanks to Ms. Lea Gilchrist and CDR Malakooti for their many efforts with that program. I attended the SAMS Configuration Control Board Meeting 29-30 November 2001 in San Diego, and that program continues to mature and increase in capability. Behind the scenes, progress continues on the web portal through Navy Medical Information Management Center (NMIMC) to enhance the medical event reporting and other medical events. Pending that program, NEHC has been working with Commander Fifth Fleet (C5F) to enhance Disease, Non-Battle Injury (DNBI) reporting. Special thanks to LT Sikes and CAPT Hinkson on the United States Naval Forces Central Command and C5F staff for their support and assistance. As we mature that reporting and analysis process, we hope to expand to other numbered fleets and Marine Expeditionary Forces. That work has been complimented by efforts of CAPT Brawley and CDR Rendin with the Rapidly Deployable Surveillance System (RDSS) that has been implemented by Naval Medical Center (NMC) Portsmouth for surveillance of clinics in the Tidewater area. The threat of biological and chemical terrorism has expanded our value of medical surveillance.

We released the Ten Year Analysis of Reportable Diseases (1990-1999), though most of the work was accomplished by CDR Rendin and CDR Murphy before their departure. That analysis provides the background for preventive medicine professionals to help focus efforts on numerous infectious diseases that affect our populations. We are working to expand surveillance on areas including injuries and medical boards. CAPT McGinnis' work in this edition compares malaria cases in active duty Navy and Marine Corps personnel as identified in the DMED and NDRS. His findings on the lack of consistency in the reporting justify more work, and the subject was presented at the Navy Epidemiology Board meeting of 5-7 December 2001. We have several other reviews going on with our present databases, including NDRS, to provide feedback to fleet and clinic personnel with insights to allow them

Naval Medical Surveillance Report

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Views and opinions expressed are not necessarily those of the Department of the Navy

to enhance Force Health Protection. On the personnel side, we were saddened with the departure of CDR Murphy, who was dragged kicking and screaming to the Naval Health Research Center (NHRC), San Diego. We celebrate the arrival of Ms. Tamara Telfair, our new database manager. She is a welcome addition and is already busy analyzing trends in tuberculosis in our Navy and Marine Corps populations. We also welcome Mr. Bob Odette, a familiar name to many of our more senior personnel, who returns to support Navy Medicine in the civil service workforce.

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We look forward to the arrival of additional enlisted staff in January 2002 which will bring us back to our normal enlisted staffing and take some of the extra work off HMC Wiley and HM1 Corbin.

We are looking forward to our move to Portsmouth, scheduled for 11 February 2002, followed by the Workshop in March 2002, so the next few months will be busy for the staff. We look forward to seeing you at the workshop, and providing tours of our new spaces at the hospital complex.

West Nile Virus Summary, 2001

CDR Michael Mann, MSC, USN
Medical Entomology Department Head, Navy Environmental Health Center

West Nile Virus (WNV) increased in range and rate during 2001, and is well established in bird populations in the eastern United States. Twelve eastern states reported WNV in 2000. In 2001, 27 states, almost the entire eastern half of the United States, detected WNV. The virus moved southward along bird flyways, and was seen early in the season in Georgia and Florida. Westward movement through the summer of 2001 reached the states just west of the Mississippi River.

Infection increased significantly in wild birds (6,403) and horses (556). Infections causing human illness occurred from mid-July to approximately mid-November, with most infections occurring between mid-August and late September. By mid-December, 55 human cases, including five fatal cases, were reported from nine states. Additionally, one human case was reported on Cayman Island in the Caribbean.

No human cases were reported from any military installation. Evidence strongly indicates that our young healthy active duty population is at little risk. For 39 cases for which specific age was reported, the mean was 64.6 (range 38-89). However, two were under 40 and six were in their 40's. Of the five fatal cases, two victims were 44 and 45 years old. Though there may have been complicating factors in the cases, it is clear that younger adults are occasionally affected.

In July 2001, the Assistant Secretary of Defense directed each Service to develop a plan for WNV surveillance and prevention. As in 2000, Naval installations in the eastern states were asked to increase awareness in medical treatment facilities, and educate personnel regarding minimizing exposure to mosquitoes. Bases were asked to submit mosquito collection data, illness in horses, and sick or dead birds to the Navy Environmental Health Center via Navy Disease Vector Ecology and Control Center (NDVECC), Jacksonville, FL. NEHC submitted five medical SITREPs for WNV which are available on the NEHC-PM website.

Fourteen of 41 Naval installations in the eastern states conducted enhanced mosquito surveillance programs, and submitted mosquitoes to U.S. Army Center for Health Promotion and Preventive Medicine-North (USACHPPM-North), or to local or state laboratories for virus testing. No positive mosquitoes were identified from Naval installations. Infected birds were found on four bases. Army reported similar results from extensive collecting and testing of mosquitoes and birds. Additionally, horses on Army installations were confirmed WNV positive.

Active mosquito, bird, and human case surveillance will be necessary again in 2002. Entomologists from NDVECC Jacksonville or Navy Environmental and Preventive Medicine Unit Two will be available to help evaluate surveillance plans and recommend specific mosquito collection strategies that are selective for the *Culex* species most likely to be infective. In the southern states, virus transmission is likely through most of the year, and surveillance on installations in the Deep South should continue through the much longer season of mosquito activity.

Active Duty US Navy and Marine Corps Malaria Surveillance: A comparison of the Defense Medical Epidemiological Database and the Naval Disease Reporting System for 1997-2000

CAPT James McGinnis, MSC, USN, CDR Mark Malakooti, MC, USN
CDR Michael Mann, MSC, USN
Preventive Medicine Directorate, Navy Environmental Health Center

Introduction

Malaria has been a militarily significant disease dating to the early Greco-Roman period, and designated as reportable within the Department of Defense[1]. Recently military operations have continued to demonstrate concerns from malaria. In 1993, there were 106 malaria cases reported in U.S. Marines returning from Somalia; 88% of the cases for which data were available were attributable to incomplete or noncompliant chemoprophylaxis regimes.[2] Between May and July 1996, 5 confirmed cases of falciparum malaria occurred among U.S. Navy personnel participating in Operation Assured Response in Liberia and Sierra Leone in West Africa.[2] Malaria is a mosquito-borne parasitic infection in humans caused by one or more of these four species of *Plasmodium*, *P. falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*. *Anopheles* species mosquitoes are the insect vectors of this disease. There are approximately 300-500 million cases of malaria occurring around the globe annually, and an estimated 1.5-2.7 million persons die of malaria each year.[1]

Background

The Naval Disease Reporting System (NDRS) is a Microsoft ACCESS™- based program for submitting Medical Event Reports in the Navy and Marine Corps that has been used since 1996. The program allows for submitting information on reportable diseases at the medical treatment facility/operational medical department level, and electronic transfer of the information in a password-protected file to the supporting Navy Environmental and Preventive Medicine Unit, and from there to the Navy Environmental Health Center (NEHC), Norfolk, VA. From NEHC the data are sent to Army Medical Surveillance Activity (AMSA), which is the central Department of Defense (DoD) repository for reportable disease data. Guidance for NDRS is provided in BUMEDINST 6220.12A, the Deployment Health Surveillance Technical Manual, the Joint Chiefs of Staff Deployment Health Surveillance and Readiness memo, and the AMSA Tri-Service Reportable Events publication.[3,4,5,6] The Defense Medical Epidemiological Database (DMED) system is maintained and distributed for remote access by the AMSA at the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). The database provides a user-friendly interface through client-server computer technology, which allows users to perform queries about diseases and injury rates and relative burdens of disease in DoD active duty populations. The system also uses inputs from the Standard Ambulatory Data Record (SADR), which compiles data from the Ambulatory Data System (ADS) and the Composite Health Care System (CHCS). Navy and Marine Corps data are included in the database along with Army and Air Force statistics. More Navy and Marine Corps first time ambulatory cases are captured from the ADS than are available through passive reporting in the NDRS, and so the total case numbers are larger for Navy and Marine Corps in DMED. Demographic data and deployment experience of all active duty and reserve component service members are available in DMED to be queried and printed out as reports.[7]

Study Design and Data Collection

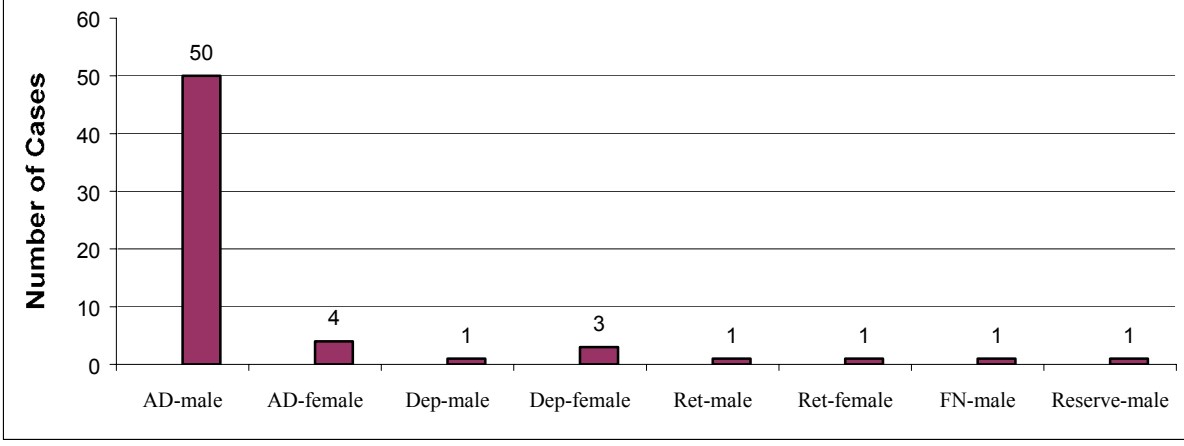
We chose to analyze the reported cases of malaria within the Navy Disease Reporting System (NDRS) and then compare them with information from the Defense Medical Epidemiological Database (DMED). Malaria is a fairly unusual disease that should trigger appropriate reporting.

We queried the NDRS and DMED data systems for malaria cases in active duty Sailors and Marines for the period 1997-2000, since these were the most recent years with complete data. The DMED frequency counts and rates per 100,000 active duty Sailors and Marines were accessed by service and by year from 1997 to 2000. Similarly, the NDRS was queried for malaria cases, and frequency counts of malaria cases in active duty, retired and dependent personnel of the Navy and Marine Corps were obtained. We chose to perform this analysis using descriptive methodologies rather than detailed statistical analysis since DMED and NDRS are passive reporting systems with multiple potential biases.

Results

The NDRS database recorded sixty-two (62) cases of malaria in Navy and Marine Corps active duty, retirees and dependents for 1997 to 2000. Figure 1 shows the distribution of these cases by status.

Figure 1: NDRS Navy and Marine Corps Malaria Cases by Status 1997-2000

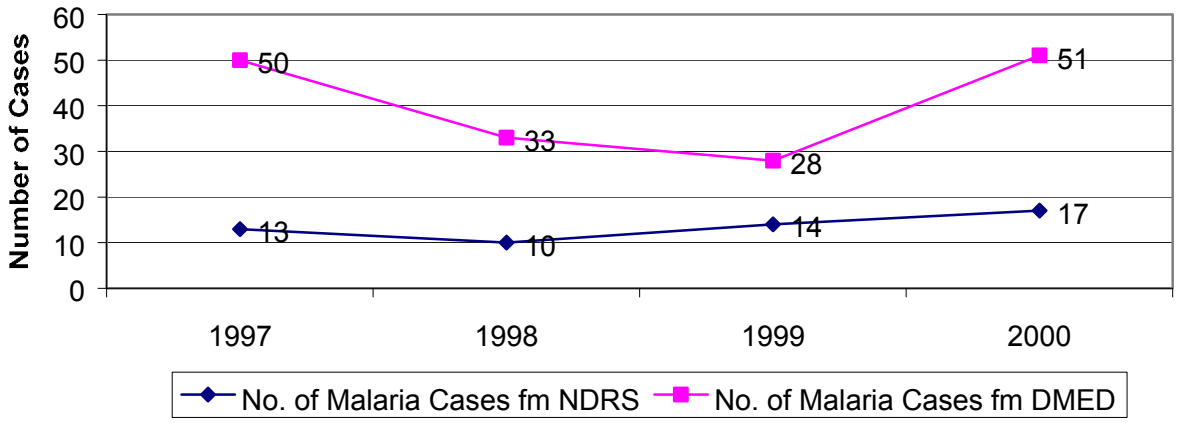


Key: NDRS = Naval Disease Reporting System; AD = active duty; Dep = dependent; Ret = retired; FN = foreign national.

Fifty (81%) of the total 62 NDRS malaria cases were in active duty male patients and four (7%) were active duty females, thus 54 cases of malaria were identified in the active duty Sailors and Marines. The DMED data identified 162 cases of malaria in active duty Sailors and Marines seen as first-time ambulatory care patients at Tri-Service medical treatment facilities (MTFs) around the world.

Figure 2 compares reported active duty cases for NDRS (54) and DMED (162) by year for the period.

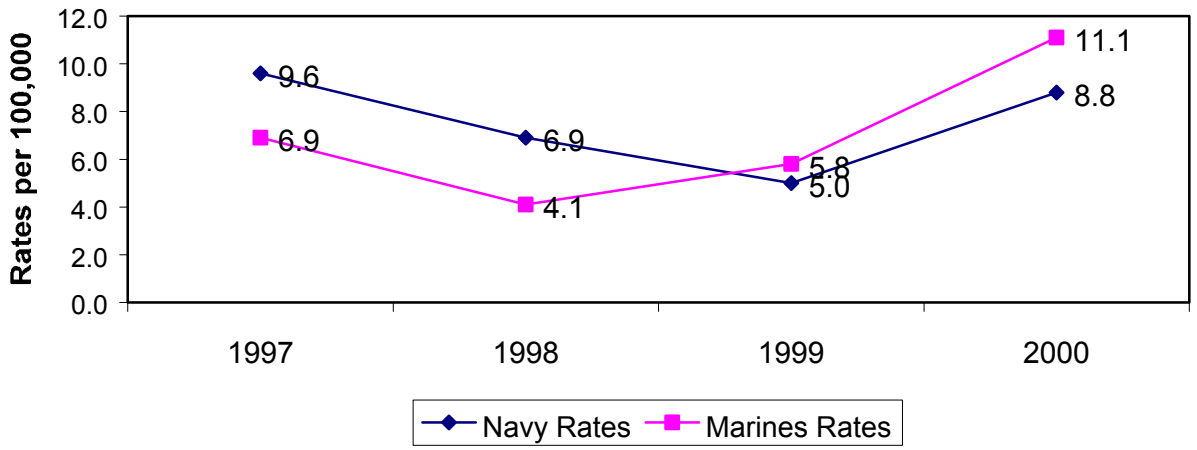
Figure 2: Navy & Marine Corps Active Duty Malaria Cases from DMED vs Active Duty Cases from NDRS for 1997 to 2000



Key: DMED = Defense Medical Epidemiological Database; NDRS = Naval Disease Reporting System

Figure 3 presents the annual case rates per 100,000 for USN and USMC for 1997-2000 obtained from the DMED database. Overall, active duty Navy personnel demonstrated a case rate of 7.6 cases per 100,000, while Marines had 7.0 cases per 100,000.

Figure 3: DMED Malaria Rates per 100,000 USN/USMC 1997-2000 by Service and Year

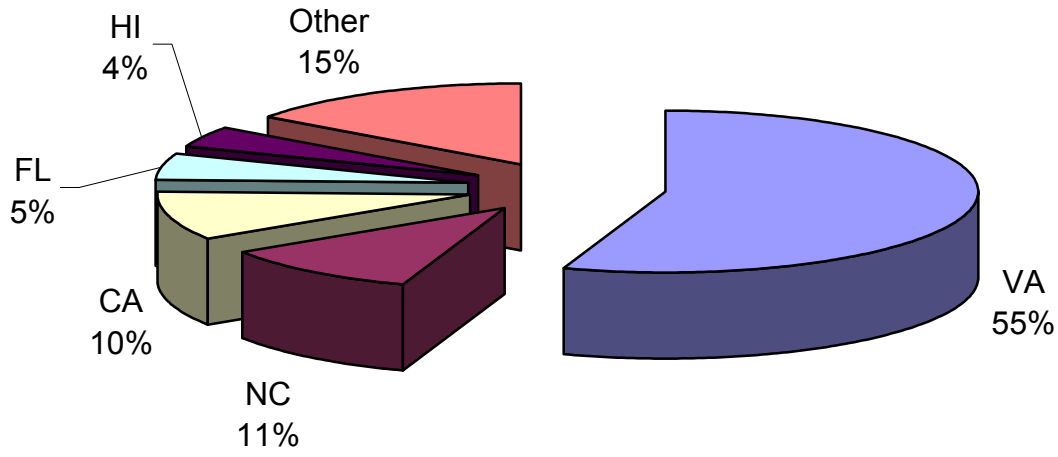


Key: DMED = Defense Medical Epidemiological Database

A total of 114 (70%) of the 162 DMED cases were seen as first-time ambulatory care patients at Tri-Service MTFs in the continental United States. Figure 4 shows the distribution of the ambulatory care visits by State where the patients were treated for malaria. The states with the largest numbers were Virginia (60), plus three (3) cases on board ships stationed in Virginia, North Carolina (12), and California (11). This distribution is expected and reflects the large concentration of Navy and Marine Corps personnel stationed in these three states. Military installations in Virginia identified fifty two (52) cases from Tidewater, eight (8) from Washington DC and three (3) from ships home ported in Norfolk.

The remaining 48 Navy and Marine Corps active duty malaria cases recorded in DMED were seen for first-time ambulatory care visits at Tri-Service overseas MTFs or aboard naval vessels grouped either in the Atlantic, the Pacific or in Central and South American waters.

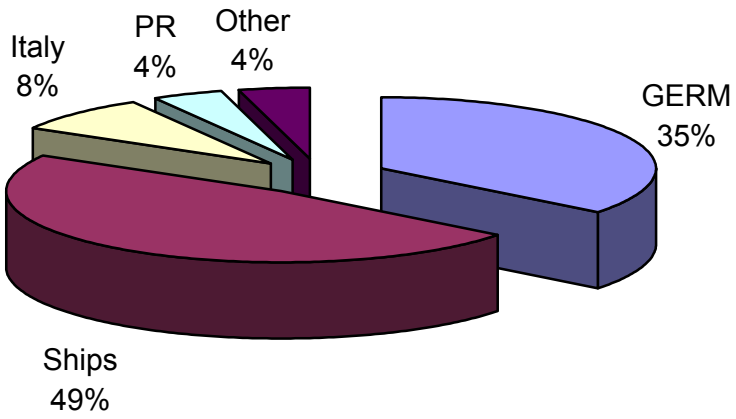
Figure 4: DMED CASES FROM CONUS (N=114)



Key: DMED = Defense Medical Epidemiological Database; CONUS = Continental United States

The distribution of these 48 cases is shown in Figure 5 (next page). The largest number of ambulatory care visits was recorded for Germany (17 cases), which is a head-quarters area for U.S. Forces, Europe. Thirteen (13) cases were listed in the DMED database for Atlantic and Mediterranean Sea Ships. Eight (8) cases were indicated for Pacific and Indian Ocean Ships and two (2) cases were for Central and South American area ships. The names and hull numbers of the individual ships were not recorded in the DMED database. One case each was shown for the United Kingdom and for a catch-all category, “Overseas Other.”

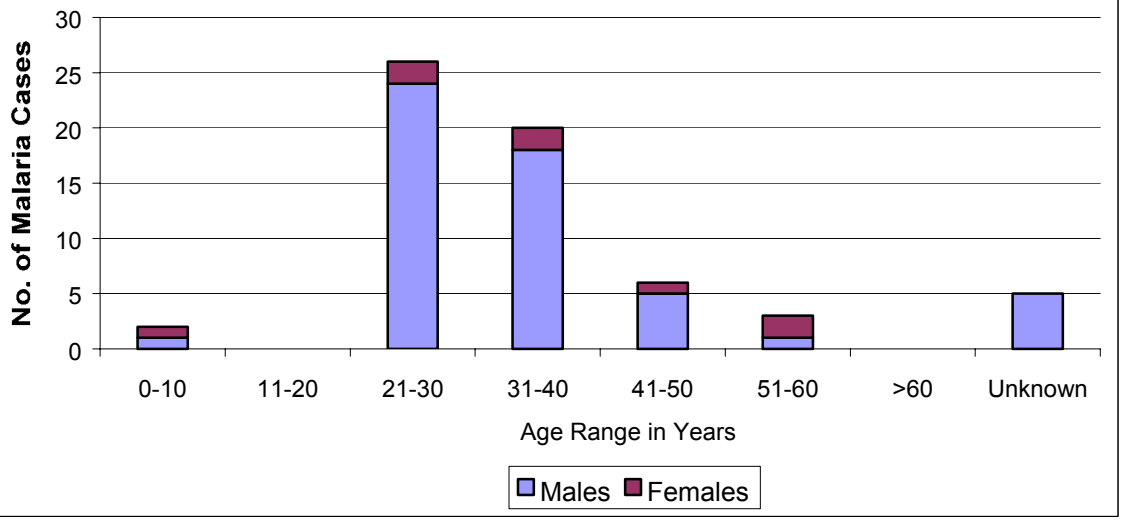
Figure 5: DMED Cases from OCONUS (N=48)



Key: DMED = Defense Medical Epidemiological Database; GERM = Germany; PR = Puerto Rico; OCONUS = Outside Continental United States

The age and gender distribution for the sixty two (62) active duty, dependent and retired NDRS cases is shown in Figure 6. 74% of patients were 21 to 40 years old.

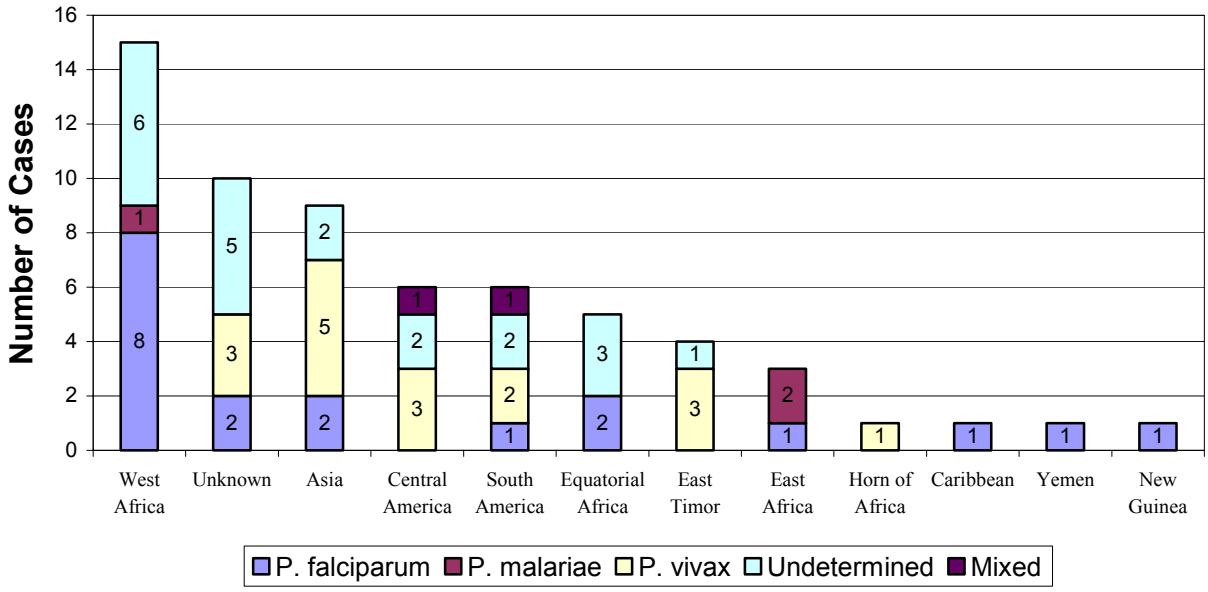
Figure 6: NDRS Navy and Marine Corps Malaria Cases by Gender & Age 1997-2000



Key: NDRS = Naval Disease Reporting System

Figure 7 demonstrates that the malaria Medical Event Reports in the NDRS recorded the probable geographical area of insect bite exposure for fifty-two (84%) of the sixty-two malaria cases. This figure also shows the identified type of *Plasmodium* species for forty-one (66%) of the sixty-two (62) NDRS malaria cases. West Africa was the exposure location for fifteen (24%) of the 62 malaria cases. *P. falciparum* was identified by laboratory analysis eight (8) times in this region. *P. malariae* was found once in patients exposed in West Africa and twice in East Africa. *P. vivax* was identified in five (5) patients exposed in Asian countries, while *P. falciparum* was found in patients only twice in Asia.

Figure 7: NDRS Navy & Marine Malaria Cases by Type & Region Where Exposed 1997-2000



Key: NDRS = Naval Disease Reporting System

The NDRS database listed 26 active duty cases who had a known location of insect bite exposure, with the type of malaria parasite identified by laboratory analysis, and where the travel history clearly identified the exposure as “on leave” or “on duty.” There were fourteen (14) *P. falciparum* cases, eight (8) on leave in Africa and six (6) on duty in Africa, Yemen, Thailand and Haiti. By contrast, there were ten (10) *P. vivax* cases, only one (1) on leave in Africa, while the other nine (9) cases were on duty in Asia, Central and South America. One (1) *P. malariae* case occurred on duty in Kenya, and there was one (1) patient with a mixed *P. falciparum* and *P. vivax* infection who was exposed on duty in Panama. The eight (8) *P. falciparum* infections occurring on leave in Liberia, Nigeria and Cameroon point out that greater emphasis should be placed on personal protective measures and on appropriate chemoprophylaxis for persons traveling on leave in western and equatorial Africa.

The presumed location of the infection was reported in a number of cases, which allowed identification of several geographical clusters. These included four

cases from Laos and Thailand from July to November 1998, and two cases from Honduras from November 1998 through March 1999 for Hurricane Mitch[8] support. However, these case reports originated after the return of the personnel, and came from different medical treatment facilities and shipboard medical departments. Thus, these clusters were unlikely to have been appreciated by the clinicians at the time to enhance treatment of the patients or prevention of further illness.

Discussion

Our review found that the reporting for the two systems was quite different, with NDRS reporting approximately one third as many cases as DMED. It is likely that both systems incompletely report cases of malaria in our Navy and Marine Corps personnel, however the degree of this underreporting cannot be established from this analysis. The sources of outpatient ambulatory care visits are different for the two databases queried for this report. The DMED version 3.3 information screen (client-server software) describes their source of ambulatory data this way, "Out-patient data for calendar years 1997-2000…are obtained from the Standard Ambulatory Data Record (SADR) which is extracted from the Ambulatory Data System (ADS) and the Composite Health Care System (CHCS) used in DoD Military Treatment Facilities worldwide." This means that the data obtained on malaria first-time outpatient visits come directly from ADS or CHCS "at the source of data input." This is similar in principle to collecting sales data at the cash-register-source for a corporate-wide computerized decision support system used by management to analyze trends in sales and marketing. The data are as correct and free of error as is possible for information collected at the time of sale, or in our case at the time of the patient's visit in the MTF. By contrast, NDRS data are filtered and interpreted through the Preventive Medicine staffs at MTFs around the world. Preventive Medicine personnel forward the Medical Event Reports based on information collected from patient interviews, patient and medical laboratory records. The NDRS patients are seen and reported only from Navy MTFs, whereas the DMED data include cases seen at Army, Air Force and Navy MTFs. This explains the larger number of cases reported in DMED compared with NDRS. For instance, Tripler Army Medical Center is the only Department of Defense military hospital in Hawaii, and Navy and Marine active duty patients seeking ambulatory care could go to this Army facility. Tripler would report its malaria cases in DMED. The record of these cases could be missed entirely and not reported by NDRS, which reports only from Navy MTFs. This underreporting does not reflect negatively on the efforts of the Navy's high quality Preventive Medicine staffs, who exert themselves to collect and report this data. Rather, it reflects differences in the DMED and NDRS reporting systems.

Similar findings could be explained by the DMED reporting from Germany, which is a referral center for Navy and Marine Corps units deployed, but where cases would likely miss reporting within NDRS. Medical is a joint function, and cross service support is the rule rather than the exception. Referral patterns for active duty personnel may be important. For instance, Sailors and Marines referred to Germany for care in Army medical treatment facilities would logically appear in DMED, but are less likely to be identified within NDRS.

Table 1 shows a summary of the number of reports by State in the Continental United States, by overseas country where Sailors and Marines are stationed, or by individual naval vessels. The number of reports for Hawaii is larger for NDRS (9) than DMED (5), because the Navy Environmental and Preventive Medicine Unit Number 6, which is located at Pearl Harbor Hawaii, is reporting Navy and Marine Corps medical events from the entire Pacific Ocean region.

TABLE 1: COMPARISON BETWEEN NDRS AND DMED REPORTING BY LOCATION FOR 1997-2000 IN CONUS, OVERSEAS AND ABOARD SHIP FOR ACTIVE DUTY SAILORS AND MARINES

STATE OR COUNTRY	NO. OF NDRS REPORTS	NO. OF DMED REPORTS
California	10	11
Washington D.C.	0	1
Florida	0	6
Georgia	0	3
Germany	0	17
Hawaii	9	5
Illinois	1	4
Italy	3	4
Japan	3	0
Massachusetts	0	1
Maryland	2	0
Maine	1	0
Mississippi	0	3
North Carolina	3	12
Puerto Rico	0	2
South Carolina	2	2
Texas	0	3
United Kingdom	0	1
United States Commissioned Ships	5	26
Virginia	15	60
Overseas, Other	0	1
TOTALS	**54**	**162**

Key: NDRS = Naval Disease Reporting System; DMED = Defense Medical Epidemiological Database; CONUS = Continental United States

Several areas of improvement in disease reporting are possible. There should be more analysis of the information by Preventive Medicine staffs at NEHC and the Navy Environmental and Preventive Medicine Units (NEPMU) and feedback to our customers. Personnel at the NEPMUs may need to review the information reported via NDRS against SADR data for supporting MTFs. More emphasis on NDRS reporting is needed within Preventive Medicine Departments at the MTFs. Webification of the medical event reporting process may also improve compliance. Preventive Medicine staffs at MTFs should consult with shipboard personnel for the diagnosis, either while deployed or in the continental United States. (Continue on page 14)

Navy Disease Reporting System (NDRS)

SUMMARY OF 2001 DATA

Tables 1 and 2 display the Medical Event Reports (MERs) received at Navy Environmental Health Center (NEHC) as of 31 Dec 2001. Interested readers may calculate rates by dividing the frequencies by estimated mid-year strength of 374,774 for USN and 172,652 for USMC. Table 1 shows active duty only. Table 2 shows non active duty beneficiaries.

Table 1. ACTIVE DUTY Reportable Medical Events, Navy & Marine Corps, Case Frequencies through December 2001

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	2	2	0	Lyme Disease	6	4	2
Anthrax*	0	0	0	Malaria (specify type) *1	3	3	0
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	29	24	5	Meningitis (aseptic, viral)	16	14	2
Bites, venomous animal	0	0	0	Meningitis (bacterial other than Meningococcus)	3	1	2
Botulism*	0	0	0	Meningococcal disease*	3	3	0
Brucellosis	0	0	0	Mumps	1	0	1
Campylobacteriosis*	13	4	9	Occupational exposure to blood borne pathogens	2	2	0
Carbon Monoxide poisoning*	0	0	0	Onchocerciasis	0	0	0
Chemical warfare agent exposure	0	0	0	Pertussis*	0	0	0
Chlamydia	2288	1715	573	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	6	1	5
Coccidioidomycosis	14	11	3	Poliomyelitis*	0	0	0
Cold injuries	0	0	0	Psittacosis (Ornithosis)	0	0	0
Cryptosporidiosis*	3	3	0	Q Fever*	0	0	0
Cyclospora*	0	0	0	Rabies, clinical human*	0	0	0
Dengue fever*	2	2	0	Relapsing fever	0	0	0
Diphtheria	0	0	0	Rift Valley fever	0	0	0
E. Coli 0157:H7 infection*	0	0	0	Rocky-Mountain Spotted Fever	2	1	1
Ebola*	0	0	0	Rubella*	0	0	0
Ehrlichiosis	1	0	1	Salmonellosis*	10	9	1
Encephalitis*	1	0	1	Schistosomiasis	0	0	0
Filariasis	0	0	0	Shigellosis*	3	3	0
Giardiasis	11	8	3	Smallpox*	0	0	0
Gonorrhea	604	476	128	Streptococcal disease, Group A	7	4	3
Haemophilus influenza, type b	1	0	1	Syphilis	24	18	6
Hantavirus infection*	0	0	0	Tetanus	0	0	0
Heat injuries	41	9	32	Toxic shock syndrome	0	0	0
Hemorrhagic fever*	0	0	0	Trichinosis	0	0	0
Hepatitis, A (acute, symptomatic only)	0	0	0	Trypanosomiasis	0	0	0
Hepatitis, B (acute, symptomatic only)	12	9	3	Tuberculosis, pulmonary active*	11	9	2
Hepatitis, C (acute, symptomatic only)	5	4	1	Tularemia*	0	0	0
Influenza (confirmed)	22	1	21	Typhoid fever*	0	0	0
Lead poisoning	0	0	0	Typhus*	0	0	0
Legionellosis*	1	0	1	Urethritis (non gonococcal)	253	143	110
Leishmaniasis	0	0	0	Varicella	18	12	6
Leprosy (Hansen's disease)	0	0	0	West Nile	0	0	0
Leptospirosis*	0	0	0	Yellow fever	0	0	0
Listeriosis	1	0	1				

*Reportable within 24 hours

Table 1. BENEFICIARIES Reportable Medical Events, Navy & Marine Corps, Case Frequencies through December 2001

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	2	1	1	Lyme Disease	11	11	0
Anthrax*	0	0	0	Malaria	0	0	0
Biological warfare agent exposure	0	0	0	Measles*	1	0	1
Bites, rabies vaccine & human rabies IG	97	89	8	Meningitis (aseptic, viral)	16	13	3
Bites, venomous animal	4	0	4	Meningitis (bacterial other than Meningococcus)	8	8	0
Botulism*	0	0	0	Meningococcal disease*	1	1	0
Brucellosis	2	1	1	Mumps	1	1	0
Campylobacteriosis*	11	5	6	Occupational exposure to blood borne pathogens	0	0	0
Carbon Monoxide poisoning*	0	0	0	Onchocerciasis	0	0	0
Chemical warfare agent exposure	0	0	0	Pertussis*	6	6	0
Chlamydia	704	626	88	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	2	1	1
Coccidioidomycosis	10	9	1	Poliomyelitis	0	0	0
Cold injuries	0	0	0	Psittacosis (Ornithosis)	0	0	0
Cryptosporidiosis*	1	1	0	Q Fever*	0	0	0
Cyclospora*	0	0	0	Rabies, clinical human*	0	0	0
Dengue fever*	2	2	0	Relapsing fever	0	0	0
Diphtheria	0	0	0	Rift Valley fever	0	0	0
E. Coli 0157:H7 infection*	0	0	0	Rocky-Mountain Spotted Fever	0	0	0
Ebola*	0	0	0	Rubella*	3	3	0
Ehrlichiosis	0	0	0	Salmonellosis*	81	60	21
Encephalitis*	0	0	0	Schistosomiasis	0	0	0
Filariasis	0	0	0	Shigellosis*	8	8	0
Giardiasis	34	30	4	Smallpox*	0	0	0
Gonorrhea	125	101	24	Streptococcal disease, Group A	23	17	6
Haemophilus influenza, type b	0	0	0	Syphilis	15	13	2
Hantavirus infection*	0	0	0	Tetanus	0	0	0
Heat injuries	0	0	0	Toxic shock syndrome	0	0	0
Hemorrhagic fever*	0	0	0	Trichinosis	0	0	0
Hepatitis, A (acute, symptomatic only)	3	1	2	Trypanosomiasis	0	0	0
Hepatitis, B (acute, symptomatic only)	5	3	2	Tuberculosis, pulmonary active*	15	12	3
Hepatitis, C (acute, symptomatic only)	7	6	1	Tularemia*	0	0	0
Influenza (confirmed)	4	4	0	Typhoid fever*	1	1	0
Lead poisoning	0	0	0	Typhus*	0	0	0
Legionellosis*	0	0	0	Urethritis (non gonococcal)	1	1	0
Leishmaniasis	0	0	0	Varicella	0	0	0
Leprosy (Hansen's disease)	0	0	0	West Nile	0	0	0
Leptospirosis*	0	0	0	Yellow fever*	0	0	0
Listeriosis	0	0	0				

*Reportable within 24 hours

(Continue from page 11)

Malaria is a preventable disease if appropriate chemoprophylaxis and personal protective measures (PPMs) are applied, but lapses in malaria discipline frequently occur. No drug is 100% effective, and PPMs are a vital component of malaria prevention. PPMs and recommended medications to protect Sailors and Marines against malaria are published in the Navy Medical Department Pocket Guide to Malaria Prevention and Control.[9] Chemoprophylaxis recommendations for different areas of the world are available in the Health Information for International Travel 2001-2002 from the Centers for Disease Control, Atlanta, GA[10] and at the CDC web site http://www.cdc.gov/travel .

Conclusions

Review of malaria cases identified in active duty Sailors and Marines during the period 1997 to 2000 found 162 cases from DMED and 54 from NDRS. DMED data suggest that the overall rates of malaria infection for the active duty personnel reported were 7.6 cases per 100,000 Sailors and 7.0 cases per 100,000 Marines. A subset of these cases was reported in the NDRS. The NDRS data also include small numbers of dependents and retired service members. Most of the NDRS cases occurred in active duty males in the age range 21 to 40 years old. The most frequent location of exposure for *P. falciparum* malaria was in Africa, while *P. vivax* malaria exposures occurred most often in Asian and Central America.

Malaria is a disease preventable by simple, well-known interventions, but these require constant reinforcement by medical personnel to be effective. Recommendations for personal protective measures and chemoprophylaxis medications are made by the Centers for Disease Control (CDC) of the U.S. Public Health Service, and are available in both U.S. Navy and CDC publications.

REFERENCES:
1. MacArthur, J.R., et al., "Malaria Surveillance – United States, 1997," Morbidity and Mortality Weekly Report, Centers for Disease Control and Prevention, Atlanta, GA, March 30, 2001/Vol. 50/No. SS-1, pp. 25-42
2. Orndorff G, Hendrick B., "Five Cases of *Plasmodium falciparum* Malaria in Active Duty Navy Personnel Participating in Operation Assured Response," Military Medicine, Vol. 162, No. 12, December 1997, pages 820-823
3. BUMEDINST 6220.12A, Medical Events Reports, 21 Oct 1998
4. Navy Environmental Health Center Technical Manual NEHC-TM PM 6490.1, Implementing Guidance for Deployment Health Surveillance, September 2000
5. Joint Chiefs of Staff Deployment Health Surveillance and Readiness memo MCM-251-98 of 4 Dec 1998
6. Army Medical Surveillance Activity publications, Tri-Service Reportable Events, version 1.0, July 1998
7. Brady, Jeff, "Information About DMED," Naval Medical Surveillance Report, Navy Environmental Health Center, Norfolk, VA, April-June 2001, Vol. 4, No. 2, p. 13
8. "1998 Hurricane Activity for the North Atlantic, Caribbean Sea and Gulf of Mexico," NOAA National Weather Service, U.S. Department of Commerce, November 30, 1998, at http://www.outlook.noaa.gov/98hurricanes/hilites.html .
9. Technical Manual NEHC-TM6250.98-2 (August 1998), Navy Medical Department Pocket Guide to Malaria Prevention and Control, Navy Environmental Health Center, Norfolk, VA
10. Health Information for International Travel 2001-2002 from Centers for Disease Control, Atlanta, GA at http://www.cdc.gov/travel/yellowbook.pdf.

An Investigation of an Increased Positive Tuberculin Skin Testing Reaction Rate in a Deployable Marine Unit

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Introduction

Tuberculosis control, covered in BUMEDINST 6224.8, remains an important focus of Navy Medicine. In 2000, there were 454,568 tested personnel in the Navy and Marines with 25 active tuberculosis (TB) cases and more than 4,600 tuberculin skin test (TST) converters[1]. Early identification of TB infection using the Mantoux method remains the Navy's primary means of identifying TB to prevent long-term morbidity and mortality from active TB. Annual testing is required for personnel in high-risk environments like ships or overseas deployments.

Report of an Outbreak and Investigation

In October 2001, a General Medical Officer (GMO) with a Marine unit of 750 members noted 14 positive TST conversions between 10-15 mm after a 250-man detachment returned from an overseas deployment to a high-risk country in June 2001. The GMO conducted an initial investigation focusing on those that deployed and circles of contacts for TST converters. The GMO noted the following: Approximately half of the converters had not deployed, and converters tended to work in one of a few areas (Building A, Command Post, Supply Company or Motor Transport). No converter reported symptoms of fevers, night sweats, weight loss, cough, hemoptysis, or contact with suspected active TB cases. All chest X-rays were normal. No active case was found. The only regular civilian contact for the unit was the short duration presence of construction contractors in Building A. Other base medical units and clinics denied increased TST conversion rates. Not having identified a source for the increased conversion rate, the GMO requested assistance from the local Preventive Medicine Unit (PMU).

The Preventive Medicine Unit (PMU) Epidemiology Department asked the following questions: How many personnel are assigned to the unit, and where do they work? What is the unit's past TST history? What do the records show as TST dates, results, and PPD brand/lot number? What is the compliance for chemoprophylaxis of past converters? What is the unit's travel history?

Initial data acquisition was complicated by a virus contamination of the electronic TST records kept in the SNAPS Automated Medical System (SAMS). The unit's administrative department provided an electronic spreadsheet personnel roster with name, rank, and work centers. The roster was matched to the clinic TST logbook for the previous year for analysis. The number of TSTs performed with dates and results of TSTs were entered onto the electronic roster for each service member. Data acquisition was also complicated due to the recent transfer of the assigned Preventive Medicine Technician (PMT). On November 1st, 2001 a new PMT arrived to assume PMT duties.

Because initial analysis did not clarify the source of the TST conversions, it was decided to recommend a mass screening of the entire unit including the recent TST conversions. To prepare for this evolution, the new PMT conducted individualized training for the Hospital Corpsmen (HM) who would be placing the TSTs. The assigned HM's were re-instructed in administration and reading of Mantoux testing. Command support was obtained for a unit formation on Friday, November 16th with TST readings schedule for Monday November 19th. Approximately 250 of 750 Marines were

unavailable for testing or were converters prior to this recent increased conversion rate and therefore exempted from testing. Aventis Pasteur Tubersol purified protein derivative (PPD) was used prior to the mass screening (Lot C0835AA for the entire base) and during the mass screening (Lot C0940AA).

Results

The unit in question reported 89 old converters and a less than 1% TST conversion rate in 2000. There was confusion as to the number of assigned personnel with the electronic roster noting 849 assigned personnel and the morning report roster (said to be accurate) noting 722 assigned personnel. The new PMT felt the excess personnel were transfers not yet deleted from the administration databases. Not all work centers listed in the unit roster correlated with actual work sites. A list of personnel who returned from deployment in June was unavailable. About half of the positive TSTs did not deploy.

The manually written logbook noted 21 TSTs with ≥ 10 mm reaction between November 1, 2000 and October 31st of 2001. This equates to an annual conversion rate of 3.3% (21/(722 - 89 past positives)). There were 10 non-positives with greater than zero TSTs. Readings of 43 mm and 31 mm were noted, but no reliable informants were available to confirm the readings. Most conversions (17) occurred between September 7th and October 30th 2001. By work center clusters, conversions were noted in the Command Post (7), supply (5), building A (4), and maintenance (2). Retesting on November 16th of 500 Marines showed all without induration or only one with erythema. Most of the recent converters were included in the mass screening.

To overcome the failure of SAMS, the logbook was used for analysis prior to the mass screening. Logbook problems found included: Critical readings that were difficult to read or of unclear meaning, an initially reported TST conversion not found in the log, contradictory readings on the same members, and many placed TSTs not being read (263 of 704 placed TSTs).

There were two additional observations. First, the new PMT noted identical vials (except for label) of tuberculin and influenza/Tetanus Diphtheria products stored in the refrigerator. This can be seen in figures 1 and 2. Second, documentation of follow-up and completion of therapy for past converters was inadequate.

Discussion

Tuberculosis in the U.S. has been decreasing for many years with a case rate of 53 (per 100,000) and a mortality rate of 12.4 in 1953 that decreased to 6.4 and 0.3 respectively in 1999 [2]. Unfortunately, American military forces operate in areas of high TB prevalence and are instructed to monitor closely for TB infection using BUMEDINST 6224.8. New reactor identification in the Navy has averaged approximately 1.4% annually with 4,647 new reactors in 2000. The percentage of conversions for units supported by this PMU was higher at 2.65%[1]. The Marine unit in this report is based in a state with a case rate of 11.47 in 2000, the 2nd highest rate in the country. The national rate is 5.8 [3]. By comparison, rates in countries routinely visited by U.S. Forces can be in the range of 26.3 (Thailand) and 596.7 (Djibouti) [4].

The Mantoux TST is known to have sensitivity and specificity limitations, but lacking a better screening test, remains the standard for most screening programs. Factors such as prevalence, technique, cut-off points, and amount of tuberculin actually used are but some of the issues that contribute to reliability problems with this test. Given this point, it is not surprising that reports of false positive TSTs are a common problem for TB screening programs such as the Navy's. Sensitivity and Specificity can be quite variable with the Mantoux TST. In optimal situations, sensitivity can approach 100%. In situations with high prevalence of infection with mycobacterium other than tuberculosis or history of Bacille Calmette-Guerin (BCG) vaccinations, specificity will be relatively poor. Most guidelines attempt to improve sensitivity and specificity by varying the size of the TST called positive based upon risk factors or exposure. Those with close contacts with a known active TB case are typically advised to use 5 mm as a positive cutoff. A cutoff of 10 mm is used for those persons originating from high prevalence countries or institutionalized persons. These two factors generally apply to shipboard personnel and deployable units. For those with low risk, the 15 mm cutoff is advised [5].

There are a number of reasons to account for false positives. [5, 6, 7] They include inter/intra-reader variability, errors of administration, contamination of the PPD, excessive dosing of PPD, a history of vaccination with BCG, and infection with mycobacterium other than tuberculosis (MOTT). It is unclear from this

investigation why this unit experienced what is now believed to have been an epidemic of false positives. Many of the unit's medical personnel were experienced, and it is likely those personnel were seeing real induration. Less experienced TST readers may have heard about an increased number of positives and interpreted erythema for induration. The similarity of the tuberculin vials to other vaccines may also have resulted in accidental administration of vaccine instead of PPD with a resulting abnormal positive reaction.

Conclusion

False positive TST rates occur with sufficient frequency that most Preventive Medicine Personnel have some experience with the problem. Because of the danger of missing an active case, it is imperative that medical personnel examine such episodes closely. In this event, there were a number of reasons to accept accuracy of the second test. First, it is unlikely a true positive would revert to a false negative since the recent positives were not yet on INH. Second, all conversions were asymptomatic and had unremarkable chest X-ray findings. Third, the lack of a work-center focus, lack of common travel history, lack of a common contact history, and low percentage of positives working in enclosed spaces combine to suggest that a mass infection was of low probability. Fourth, with heightened command interest, new PPD material, pre-testing training, and close supervision of testing, the reliability of the mass screening is enhanced compared to the earlier testing. Finally, the similarity of the unit's experience compared to other units on the base who had no change in conversion rates makes accepting the initial positives difficult without some as yet unidentified defining difference. Although the second test is being accepted as accurate, the danger in missing a true positive necessitates a heightened index of suspicion by this unit in future surveillance.

The failure of this unit's electronic medical databases highlights the need to regularly archive important databases. The lack of an accurate backup created a great degree of work for the new PMT and introduced a level of uncertainty into assessing the unit's TB infection status. The ability to obtain data from a logbook is helpful, but complicated if there are errors of data entry. Quality control must be maintained if a paper log is to provide backup data.

Risk communication is an important responsibility of a unit's medical department. In units with poor compliance for TST readings and INH utilization, command support must be enlisted early on to prevent long-term morbidity and mortality from inadequately diagnosed or treated TB infection.

Acknowledgements

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References

1. Malakooti M, Corbin I., "Annual TB Report for CY-2000, " Naval Medical Surveillance Report, Navy Environmental Health Center (NEHC), Norfolk, VA, Jul-Sep 01, pp. 22-35
2. Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS), "Tuberculosis Cases and Case Rates per 100,000 Population, Deaths and Death Rates per 100,000 Population: United States 1953-2000," Table 1. (http://www.cdc.gov/nchstp/tb/surv/surv2000/content/ table1.htm)
3. CDC National Center for Health Statistics (NCHS), "Tuberculosis Cases and Case Rates per 100,000 Population: States, 2000 and 1999," Table 15. (http://www.cdc.gov/nchstp/tb/surv/surv2000/content/table15.htm)
4. World Health Organization (WHO), "Global Tuberculosis Control: WHO Report 2000," Geneva Switzerland, WHO/CDS/TB/2000.275 (http://www.who.int/gtb/publications/globrep00/PDF/GTBR2000full.pdf)
5. Centers for Disease Control and Prevention, "Essential Components of a Tuberculosis Prevention and Control Program; and Screening for Tuberculosis," and Tuberculosis Infection in High-Risk Populations: Recommendations of the Advisory Council for the Elimination of Tuberculosis," MMWR 1995; 44(No. RR-11):18-34.
6. Grabau JC, Burrows DJ, Kern ML, "A Pseudo-Outbreak of Purified Protein Derivative Skin-Test Conversions Caused by Inappropriate Testing Materials," Infection Control and Hospital Epidemiology, 1998; 19(10):738-9
7. Villaarino ME, Burman W, Wang YC, Lundergan L, Catanzaro A, Bock N, Jones C, Nolan C, "Comparable Specificity of 2 Commercial Tuberculin Reagents in Persons at Low Risk for Tuberculous Infection," JAMA. 1999;281:169-171.

Figure 1. Similar Vials in Unit Refrigerator Influenza Vaccine, Tetanus Diphtheria Vaccine and Tubersol PPD All products are Aventis Pasteur.

Figure 2. Aventis Pasteur Tubersol Purified Protein Derivative

Navy Surveillance of Pediatric Blood Lead Levels (1995 – 2001)

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Introduction

Lead poisoning is a preventable childhood disease. Children are more vulnerable to lead exposure because they have higher hand-to-mouth activity, increased lead absorption, and more susceptible nervous systems than adults. The most common source of lead exposure for children is lead-based paint and lead-contaminated dust in homes.[1]

The Navy has been proactive in preventing pediatric lead poisoning. In 1994, Bureau of Medicine and Surgery (BUMED) instituted both universal and targeted screening for Navy and Marine Corps beneficiaries.[2] In 1995, based on a Department of Defense (DoD) report that revealed a low overall prevalence of pediatric lead poisoning, BUMED suspended universal screening of Navy and Marine Corps children living in low risk communities, both on and off base.[3] Currently, 36 commands have suspended universal screening. Of note, the Navy implemented the Centers for Disease Control and Prevention (CDC) Lead Screening Guidelines (1997) two-years before the recommendations were officially published.[4]

Not only has the Navy established targeted screening for Navy and Marine Corps beneficiaries, but Naval Facilities and Engineering Command guidance in 1992 began lead based paint surveys in Navy and Marine Corps housing and related structures from 1993 through 1997.[5] These surveys were done in compliance with the Residential Lead-Based Paint Hazard Reduction Act as mandated by Congress in 1992.[6]

The Navy has a two-pronged approach utilizing (1) primary preventive measures and (2) secondary preventive measures. Primary preventive measures include evaluating and controlling residential lead-based paint hazards, lead education, and anticipatory guidance by health-care providers. Secondary preventive measures include pediatric blood lead screening and follow-up care for children with elevated blood lead levels (BLLs).

Despite the effectiveness of the Navy lead poisoning prevention program, a re-evaluation of the Navy's program is warranted to assess whether there may be more cost-effective alternatives to protect the health of Navy and Marine Corps dependents. This report summarizes data compiled from the Navy Environmental Health Center (NAVENVIRHLTHCEN) pediatric blood lead database.

Methods

BUMEDINST 6200.14 requires two types of screening, (1) universal and (2) targeted. Universal screening involves obtaining BLLs on all children at the time of the 12-month well child visit. Targeted screening, through use of a questionnaire, is required for (1) all children 6 years of age and younger and (2) children at the time of the 12-month well child visit, with annual updates (discontinued at age 7). [2]

Health care providers classify children as low risk or high risk, based on their answers to the questionnaire. If an individual answered "no" to all questions, he or she was classified as low risk. If an individual answered "yes" to at least one question, he or she was classified as high risk. A "don't know" answer requires classification based on the health care provider's judgment.[2] All children considered high risk are to have a capillary or venous BLL.

The Navy has three proficiency testing laboratories for blood lead levels as follows:

Navy Environmental Preventive Medicine Unit #2 (NEPMU-2) in Norfolk VA, Navy Environmental Preventive Medicine Unit #5 (NEPMU-5) in San Diego CA, and Navy Environmental Preventive Medicine Unit #6 (NEPMU-6) in Pearl Harbor HI. The NEPMU-2 lab performs analysis on adult BLLs, not pediatric BLLs. The NEPMU-5 lab used to perform analysis on pediatric BLLs from Bremerton, WA. The NEPMU-6 lab performs pediatric blood lead analysis for the following medical treatment facilities (MTF): Naval Hospitals in Yokosuka and Okinawa Japan, Naval Medical Clinic Pearl Harbor, HI and Branch Medical Clinic Sasebo, Japan. Various contractor laboratories collect BLLs for the majority of MTFs.

The 1995 BUMED Message suspended universal screening[3]. Health care providers no longer needed to take BLLs on children at the time of the 12-month well-child visit. However, all commands were required to continue using the questionnaire (targeted screening).[3] Therefore, the NAVENVIRHLTHCEN pediatric blood lead database contains targeted screening data from commands, after the suspension of universal screening.

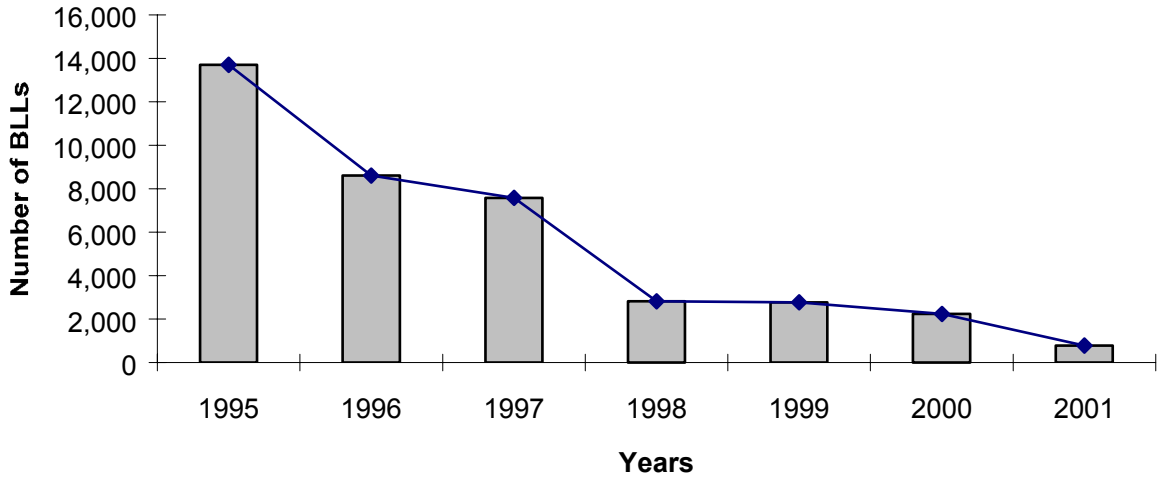
The pediatric blood lead database consists of BLLs from Navy and Marine Corps dependents. The preventive medicine department (or corollary) of each MTF serves as the medical point of contact for program coordination. They also serve as the central source for data collection for each MTF. The preventive medicine department (or corollary) sends paper reports of pediatric blood lead results to NAVENVIRHLTHCEN. The NAVENVIRHLTHCEN maintains the central database and conducts annual data analyses that are sent to BUMED for review.

Results

An elevated BLL is defined as a single blood lead test $\geq$ 10 micrograms per deciliter (µg/dL). In this study, in order to estimate the proportion of children with elevated BLLs, among those tested, the number of children with elevated levels was divided by the total number of children tested.

The BLLs were reported from 62 commands inside the continental United States and outside (CONUS and OCONUS). The pediatric lead poisoning prevention database consists of 38,502 BLLs (1995-2001). There are decreasing numbers of reported BLLs over this six-year period [See Figure 1].

Figure 1. Trend of Reported Blood Lead Levels (BLLs) from 1995 through 2001

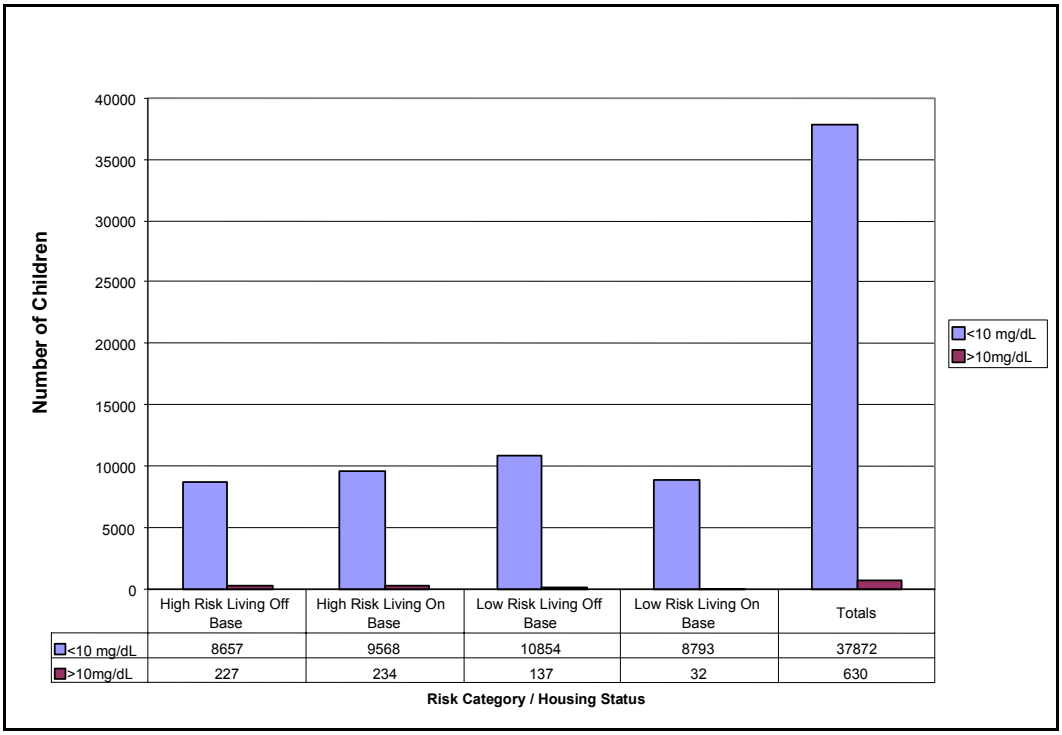


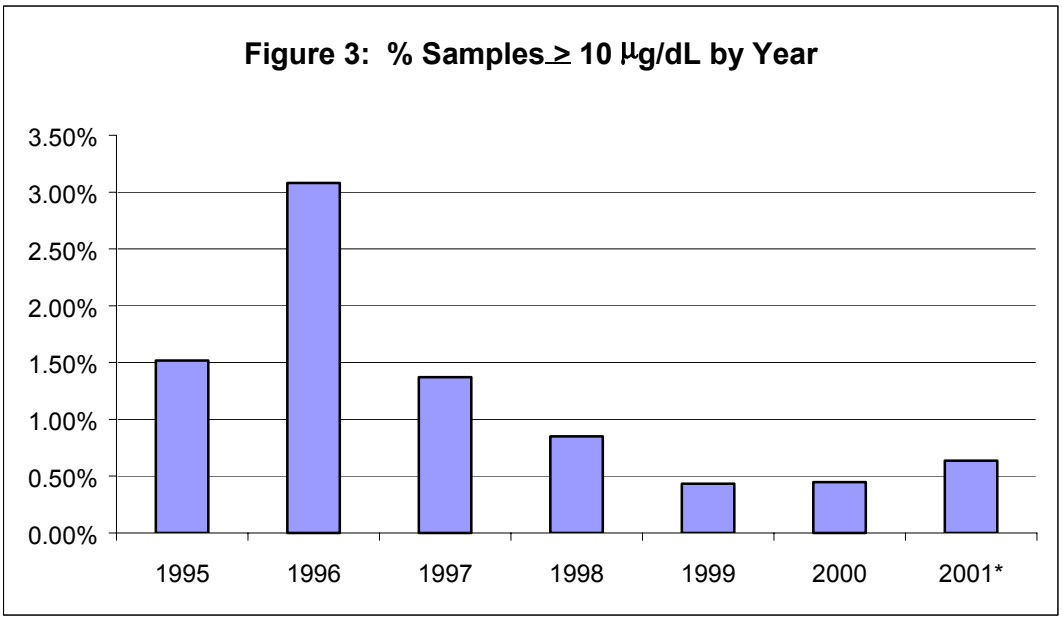
The proportion of children tested with BLLs ≥ 10 µg/dL is 1.6%. The proportion of high-risk children living on base with elevated BLLs is 2. 4%. The proportion of high-risk children living off base with elevated BLLs is 2. 5%. The proportion of low-risk children living on base with elevated BLLs is <1%. The proportion of low-risk children living off base with elevated BLLs is 1.3% [See Table 1 and Figure 2]. The rate for elevated serum lead levels decreased over the reporting period (see Figure 3).

Table 1 Total Number of Children with BLLs <10 µg/dL and ≥10 µg/dL

	High Risk/ Off Base	High Risk / On Base	Low Risk / Off Base	Low Risk / On Base	Totals
<10 µg/dL	8657 (97.5%)	9568 (97.6%)	10,854 (98.7%)	8793 (99.6%)	37,872 (98.4%)
≥10 µg/dL	227 (2.5%)	234 (2.4%)	137 (1.3%)	32 (0.4%)	630 (1.6%)
Totals	8884	9802	10,991	8825	38,502

Figure 2 - BLLS for High and Low Risk Children Living On & Off Base





Discussion and Conclusion

The decreasing trend in the number of BLLs can be attributed to the replacement of universal screening with targeted screening and MTF closures. It can also be attributed to effective primary preventive measures, such as lead hazard evaluation and control, anticipatory guidance from health care providers and education. Furthermore, the increased wages of Navy and Marine Corps members may have contributed to the downward trend (i.e. improved nutritional status and living conditions of dependents). The Navy has made tremendous strides in reducing pediatric lead poisoning in the Navy and Marine Corps communities. The Navy's lead screening program serves as a model for other organizations.

Despite its successes, the Navy pediatric lead poisoning program can be improved. The Navy pediatric lead database revealed that approximately 2% of children have elevated BLLs (living in government housing and living off base). Targeted screening should be reserved for those communities that are high risk. Based on the most recent CDC guidelines, the Navy can choose to use alternative methods. Therefore, targeted screening may be replaced with a more cost-effective alternative. The CDC guidelines recommend periodic focused surveys, routine reviews of BLL lab data, and public health alerts about newly identified sources of lead exposure. The CDC also emphasizes that a BLL should be performed whenever a parent or health-care provider suspects a child is at risk for lead exposure.[4]

Additional recommendations include using a centralized laboratory for BLLs. A BUMED phone survey by MED-243 of 20 Navy hospitals and clinics revealed variations in the cost per pediatric lead test ranging from $7 to $32.[7] The laboratory technique used to measure BLLs must have a high degree of accuracy. Therefore, the centralized laboratory should participate in a proficiency-testing program in order to reduce misclassification (both false-negative and false-positive findings) of lead exposure. If a centralized laboratory is utilized, NAVENVIRHLTHCEN could perform periodic surveys on the reported BLLs.

Limitations in this report include: no true prevalence data secondary to missing

reports, a limited sample size, decreased reliability (various laboratories reporting data), and the questionable validity of the questionnaires.

Even with these limitations, these results indicate that the Navy's comprehensive approach to lead exposure has effectively decreased the number of lead poisoned children. Reducing lead exposure in Navy and Marine Corps beneficiaries is one step towards a healthy and fit Navy family.

References

1. Rom, W.N., ed., Environmental & Occupational Medicine, 3rd ed., Lippincott-Raven Publishers, Hagerstown, 1998.
2. BUMEDINST 6200.14 of 6 Jul 94
3. BUMED message R021930Z Sep 95
4. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials, Nov 97.
5. Office of the Secretary of Defense Memorandum, "Lead-Based Paint (LBP) – Assessment of Risk in Children, and Control of Hazards in DoD Housing and Related Structures," of 24 Nov 92.
6. Residential Lead-Based Paint Hazard Reduction Act of 1992 (Public Law 102-550)
7. BUMED letter of 11 Jun 93

ANTHRAX VACCINE IMMUNIZATION PROGRAM (AVIP)

ANTHRAX VACCINE ADVERSE EVENT REPORTING SYSTEM (VAERS) UPDATE

Table 1 displays the total Anthrax VAERS reports submitted through 28 December 2001. The source of this data is the Army Medical Surveillance Activity (AMSA).

Table 1. Cumulative Data (date 28 Aug 1998 - 28 Dec 2001)

Service	VAERS Report Required		Classification				
			Local Reaction			Systemic Reaction	Cum. Totals
	Yes	No	Mild	Moderate	Severe		
USA	13	106	14	23	13	69	119
USN	4	69	6	7	8	52	73
USAF	30	419	31	49	30	339	449
USMC	2	26	1	6	2	19	28
USCG	0	1	0	1	0	0	1
Excludes 4 ODS/DS VAERS Reports on Anthrax and Non-DoD Reports							

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