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NAVAL MEDICAL SURVEILLANCE REPORT

NMSR

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From the Population Health Director

CAPT, Bruce K Bohnker, MC, USN (FS)

Autumn has passed from Norfolk and winter is upon us, though it is usually mild here in Tidewater. The Population Health (PH) Directorate has continued to change while furthering our function in enhancing medical surveillance. On the personnel side, we welcome several new additions to NEHC and the Directorate. LT Bradley Killenbeck, MSC, USNR is the incoming Environmental Health Department Head, succeeding LT Rohini Suraj, who will transfer at the end of January 2003 to the staff of the US Marine Forces, Atlantic (MARFORLANT), here in Norfolk. HMC (SW/AW) Christine Cardoza, USN, from the Navy Environmental and Preventive Medicine Unit No. 2 (NEPMU-2), will be working with the Health Promotion team. Two new staff Epidemiologists: Ms. Anuli Ajene, MPH and Ms. Wendi Suesz, MPH came to us via the prestigious Oak Ridge Institute for Science and Education (ORISE) program. They will be working on two important projects: Laboratory Surveillance and Medical Event Reporting.

We will soon be losing our staff Entomologist, CDR Michael Mann, who is retiring to Mississippi in February. LCDR Gary Tetreault, MSC, USN, from NEPMU-2 will succeed him. We were invited to the retirement ceremony of CDR Robert Rendin, MSC, USN, former Preventive Medicine Director and recently assigned to the Naval Medical Center (NMC) Portsmouth VA. We have been informed that CAPT David Hiland, MC, USN (COMNAVAIRLANT Force Medical Officer) will be our next NEHC Commanding Officer, and CAPT Diana Novak, MSC, USN, (Officer-In-Charge, NEPMU-2) will assume duties as Executive Officer. The change of command will likely be in June 2003.

Several issues that have loomed large for the Directorate staff concern infectious diseases. Preparations for the Smallpox Vaccination Program (SVP) have been in the forefront, with “near real-time” information posted in the Smallpox section of our website, thanks to Ms. Becky Washburn and Ms. Dee Savage (NEHC Webmaster). I had the opportunity to attend the Department of Defense (DoD) Smallpox Conference in Alexandria, VA and the Association of Military Surgeons of the United States (AMSUS) meeting in Louisville, KY which focused on Smallpox and the DoD Smallpox Response Plan dated 30 September 2002 (available as a .pdf file at: www.smallpox.army.mil/media/pdf/DODSpoxPlan.pdf). We continue to work on that issue with the NAVADMIN fleet implementation messages re-

Navy Medical Surveillance Report

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leased just last week. I expect that Smallpox will continue to be a front-burner program for quite a while. According to the plan, the Vaccine Adverse Event Reporting System will be routed through NEHC, so we will be supporting that effort also. The second infectious disease of interest was an epidemiological investigation into a community-based outbreak of Methicillin-resistant *Staphylococcus aureus* (MRSA). CDR Mark Malakooti, led the response team with representatives from NEPMU-2 (including LCDR Byron Connor, MC, USN) and NMC Portsmouth (LCDR Adam Armstrong, MC, USN). We continue to track that outbreak and find community-based outbreaks of MRSA to be an expanding problem. We also tracked outbreaks of respiratory diseases in San Diego, with the NEPMU-5 team providing the onsite assistance. Finally, shipboard outbreaks of gastroenteritis from Norwalk-like viruses have been noted around the globe. Some appeared in the Fifth Fleet Area of Responsibility (AOR), while other outbreaks were noted in the Atlantic and Pacific fleets. It was impressive to see the CNN TV news coverage of those Navy ship-related outbreaks, and multiple news reports from the cruise ship industry recently have sparked interest in the area. We also finished the West Nile Virus surveillance program for CY2002, with LT Fredrick Stell, MSC, USNR and LT James English, MSC, USNR from the Disease Vector and Ecology and Control, Jacksonville, FL (DVECCJAX) putting a nice summary in the January-February 2003 edition of Navy Medicine.

Our Directorate hosted the Navy Epidemiology Board meeting in December 2002, which discussed many of the infectious disease conditions along with multiple other areas of interest. We have been working on expanded medical surveillance through coordination with the Space and Naval Warfare Systems Command (SPAWAR) SNAP Automated Medical System (SAMS) Configuration Control Board and the Naval Health Research Center (NHRC), and may be able to expand our medical surveillance efforts further.

Ms. Lynn Klanchar, Ms. Sally Vickers, and the Health Promotion (HP) team have been working to update the annual NEHC Command Excellence in Health Promotion Awards by incorporating more metrics and data analyses. Established in 1995, the award recognizes Navy and Marine Corps commands that have implemented successful population-based HP programs. A total of 34 commands received the Year 2002 Command Excellence in HP Award: 26 Gold Star, 5 Silver Eagle and 3 Bronze Anchor awards.

CAPT Jim McGinnis, Workshop Director, has been working hard to put all the parts together for the NEHC's 43rd Occupational Health and Preventive Medicine Workshop, which will be in San Diego, 8-16 May 2003. We expect to have many interesting, educational and informative presentations, including a session on Smallpox. Please put that on your schedule as it will be another exceptional conference.

Finally, recent news events have suggested that our mission of "filling those muddy boots" with fit and healthy Sailors and Marines continues to be very important. We wish good health and safety to those men and women who are defending our great Nation in many far off lands.

Editor's Note: Since I wrote this and due to Operational issues, the workshop has been postponed. We look forward to the Workshop next year.

Community-Acquired Methicillin-Resistant *Staphylococcus aureus* Investigation at a Recruit Training Base and Naval Hospital, November 2002

CDR Mark Malakooti, MC, USN, Navy Environmental Health Center, Portsmouth, VA
LCDR Byron Conner, MC, USN, LT Craig Zinderman, MC, USNR,
Navy Environmental and Preventive Medicine Unit No.2, Norfolk, VA

Background

In October 2002, healthcare providers at a Naval Hospital noticed increasing numbers of methicillin-resistant *Staphylococcus aureus* (MRSA) skin and soft tissue infections diagnosed in recruits from a nearby recruit training base (RTB). The Naval Hospital requested Preventive Medicine assistance in determining "the source" of the infections, and personnel from Navy Environmental and Preventive Medicine Unit No. 2 (NEPMU-2), Navy Environmental Health Center (NEHC), and Naval Medical Center Portsmouth conducted an outbreak investigation.

Investigation

To establish the existence of an outbreak, the following case definition was developed: an individual with any skin or soft tissue infection with a laboratory confirmed MRSA culture from the site of infection.

Laboratory data from the military's Composite Health Care System (CHCS) were analyzed to determine the number of recruits with positive MRSA laboratory culture results between October 2000 and December 2002. Cellulitis and abscess diagnoses occurring between October 2000 and September 2002 were also obtained from CHCS. In addition, medical records of 23 recruits diagnosed with MRSA were reviewed.

During the investigation, interviews were conducted with:

a. Director and health-care providers at the Branch Medical Clinic (BMC), RTB.

b. Executive Officer (XO), Infection Control Officer, Lab personnel, and Management Information Department personnel at Naval Hospital.

c. Health-care providers in the Orthopedics, Family Practice, and Internal Medicine Departments at Naval Hospital.

d. The Commanding Officer, XO, Infection Control Officer and select staff members of Naval Dental Clinic, RTB. Several recruits were interviewed while in the BMC RTB.

To identify MRSA carriers and to establish the prevalence of MRSA colonization, staff personnel were tested for nasal colonization. Nasal swabs were collected from non-recruit personnel who had physical contact with recruits including drill instructors, medical personnel, laboratory personnel, and other ancillary staff.

Findings

Figure 1 shows the distribution of MRSA cases among recruits as identified by laboratory results at the Naval Hospital. The number of cases in this outbreak of community-acquired MRSA is the largest from a reported outbreak to date. Figure 2 shows the distribution of recruit outpatient and inpatient visits coded as cellulitis or abscess at the BMC and Naval Hospital.

Nasal swabs were obtained from 874 non-recruit personnel; 24 (2.7%) were colonized with MRSA. The treatment recommended for these carriers is outlined in the next section.

Figure 1. MRSA Cases in Recruits, RTB

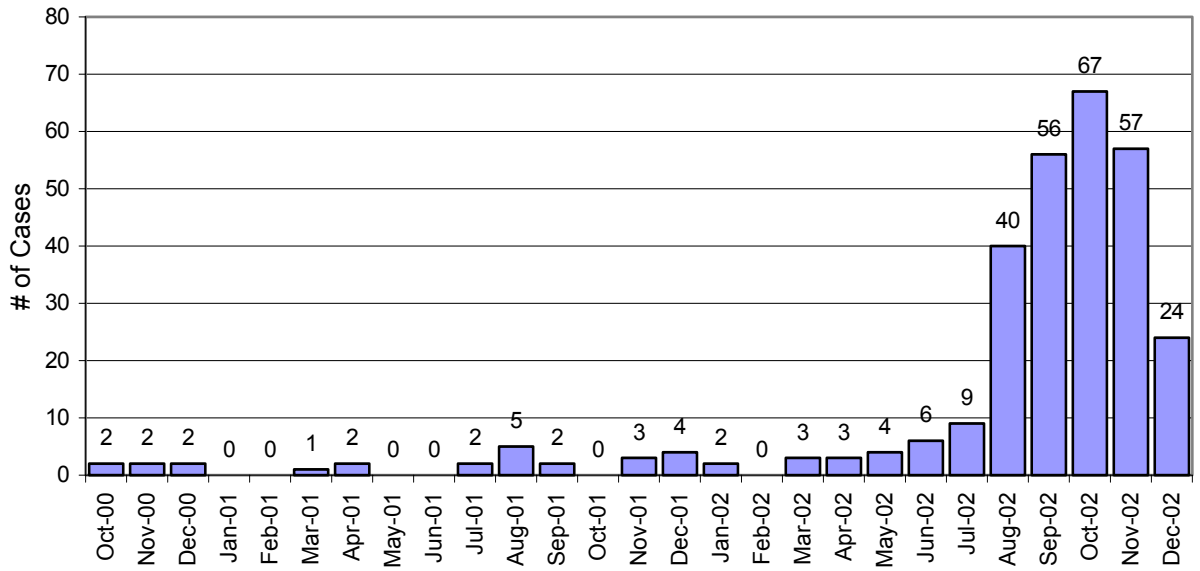
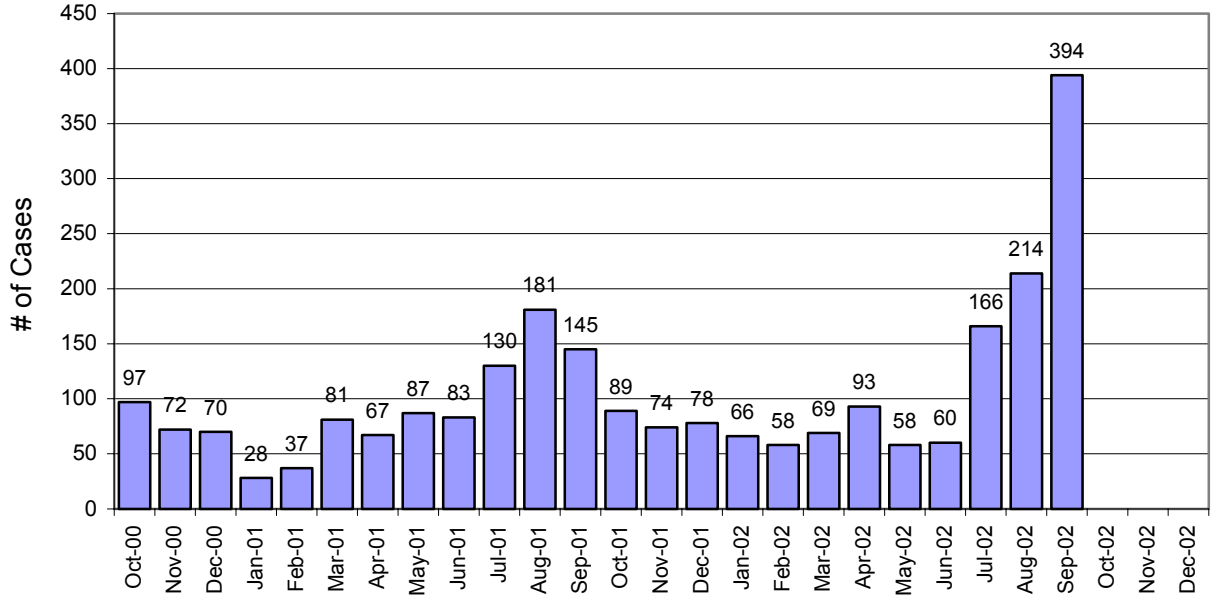


Figure 2. Cellulitis and Abscess Diagnoses, BMC and Naval Hospital



For 70 of the recruit MRSA cases, location of training at time of diagnosis was analyzed. Increases in MRSA cases were noted shortly after two field-training evolutions. However, increases in cases seen after field evolutions may be due to increased reporting by recruits to the clinic when they are in garrison versus in the field.

Control Measures

To stop the outbreak of MRSA in recruits, the following control measures were recommended:

Hygiene and Education

a. Ensure recruits diligently practice hand hygiene. Ensure drill instructors enforce hygiene measures. Consider focusing hygiene efforts on field training evolutions. Future recommendations may include Hibiclens soap and/or alcohol gels.

b. Raise awareness among residents and staff of high density living environments. Educate recruits about modes of *S. aureus* transmission, and importance of proper hygiene and frequent handwashing. Educate recruits on signs and symptoms of infected wounds/abrasions and the importance of immediately reporting such lesions.

Diagnosis and Treatment

a. *Treatment of MRSA infections*: In any setting where MRSA infections are known to be occurring, all wound infections and abscesses should be cultured. Infections known or suspected to be MRSA should be treated with the following outpatient regimen: Rifampin 600 mg once a day for 10-14 days and Minocin 100 mg twice a day for 10-14 days, OR Rifampin 600 mg once a day for 10-14 days and Septra DS twice a day for 10-14 days. Also administer Mupirocin 2% nasal ointment twice a day for 10 days, and Hibiclens washings to cover the body from the neck down daily for 5 days. Additional time on this antibiotic regimen may be required, subject to clinical judgment. Consult Infectious Disease department with questions.

b. *Treatment of Cellulitis*: Mild cellulitis may be treated initially with standard antibiotics such as dicloxacillin. If lesions are suspected to be MRSA or if initial treatment fails, consider outpatient treatment with the above regimen. Fluoroquinolones such as levofloxacin or ciprofloxacin are not recommended as treatment for MRSA infections.

c. *MRSA carriage eradication*: If eradication of nasal carriage is desired for individuals who are found to be carriers but do not have active infection, use the same regimen as above (dual abx/mupirocin/ Hibiclens).

d. Encourage providers to incise and drain abscesses.

e. Provide clean and adequate dressings for all wounds or abrasions. Ensure medical providers change dressings as frequently as needed.

f. Ensure sites with environmental samples positive for MRSA are thoroughly cleaned with bleach solution or similar agent and then sampled again.

Establish Increased Surveillance for Cases

a. Increase awareness of MRSA among providers to improve diagnosis and laboratory identification.

b. Establish a clear case definition of MRSA infection: “any skin or soft tissue infection with a culture positive for MRSA from the site of infection.” Infections in individuals who have a MRSA positive nasal culture are not confirmed MRSA infections.

c. Encourage providers to have a high index of suspicion for MRSA.

d. Demographic information about laboratory positive cultures (date, location, etc.)

should be collected and forwarded to Preventive Medicine personnel in a timely manner (i.e. weekly).

Additional Considerations

a. Alcohol-based hand sanitizers
b. Routine use of Hibiclens
c. Establishment of a centralized Navy/ Marine Corps trainee health office

Lost Duty Time Among Active Duty Navy and Marine Corps

Wendi Suesz, MPH, Navy Environmental Health Center, Portsmouth, VA
Barbara Nagaraj, MPH, Army Medical Surveillance Activity, Washington, DC

Identification and evaluation of obstacles to medical readiness are critical for understanding the health needs of the Navy and Marine Corps and implementing effective interventions. Consequently, an analysis of lost and light duty days is important to determine their impact on force readiness. Following is an overview of lost and light duty resulting from all medical causes in the Navy and Marine Corps during 2001.

The Defense Medical Surveillance System (DMSS), operated by the Army Medical Surveillance Activity (AMSA), contains data on medical events, both inpatient and outpatient visits, occurring throughout the Department of Defense. AMSA uses this data to produce monthly installation specific reports on lost duty due to all causes including injuries. The monthly reports summarize frequencies, rates, and trends of hospitalizations and clinic visits. These reports can be found on the AMSA website (www://amsa.army.mil/AMSA/amsa_home.htm).

In this analysis, lost duty days are those events that resulted in hospitalizations or sick in quarters dispositions while light duty are those events that resulted in a return to duty with limitations. Figure 1 illustrates the trends in lost duty days resulting from hospitalization during 2001. Figure 2 shows the number of clinic visits resulting in quarters during 2001. Finally, Figure 3 reveals a slight reduction over the year in the number of clinic visits resulting in light duty.

Tables 1, 2, and 3 show the major diagnostic categories resulting in hospitalization, quarters, and light duty respectively. The top three causes of hospitalization are the same for both the Navy and Marine Corps although the order varies slightly. They are pregnancy complications, mental disorders, and injury and poisoning. The three most frequent categories resulting in quarters are respiratory system, infectious and parasitic diseases, and digestive system, in that order for both Navy and Marine Corps. The three most frequent diagnostic categories resulting in light duty are musculoskeletal system, injury and poisoning, and other contact with health services.

(*Caution should be taken when interpreting the outpatient data as experts have expressed concern over accuracy of ICD-9-CM coding in the ambulatory data records*).

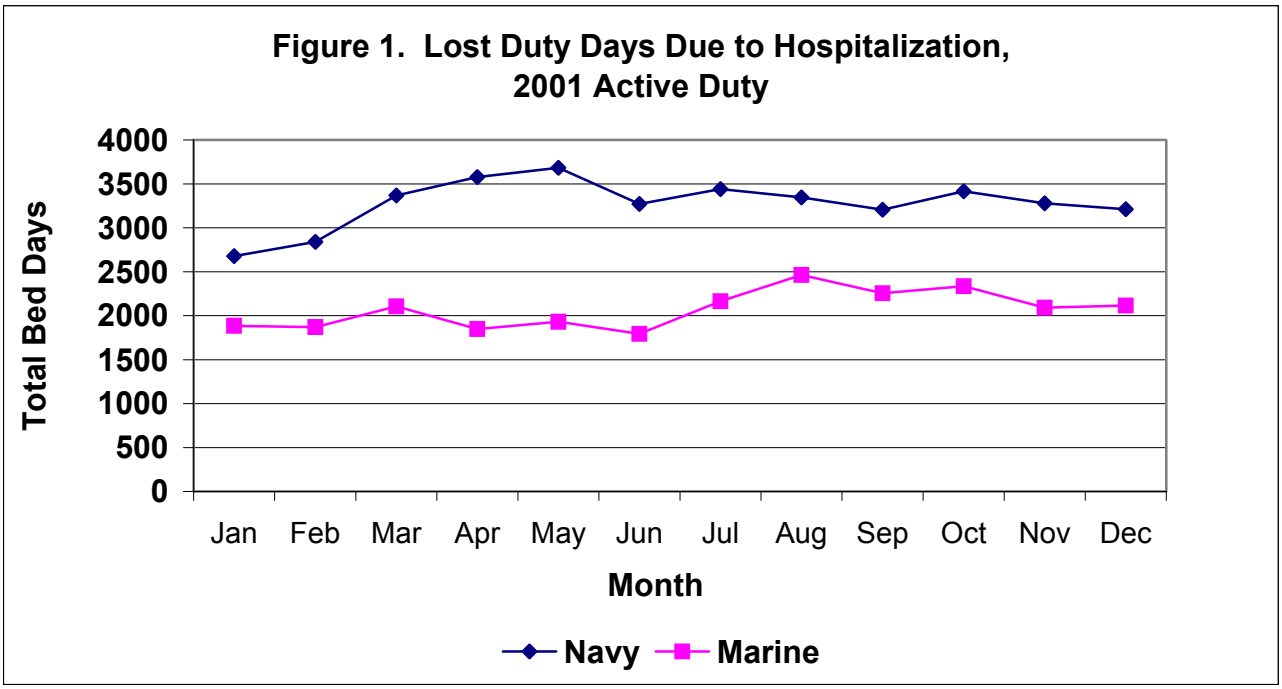


Table 1. Hospitalizations (Bed Bays) by Major Diagnostic Categories, 2001 Active Duty Navy and Marine Corps.

Navy			Marine Corps		
Category	Total # of bed days	% of all bed days	Category	Total # of bed days	% of all bed days
All Causes	39315	100%	All Causes	24857	100%
Pregnancy complications	11398	29.0%	Injury and poisoning	5019	20.2%
Mental disorder	8496	21.6%	Mental disorder	4981	20.0%
Injury and poisoning	4320	11.0%	Pregnancy complications	3635	14.6%
Digestive system	2681	6.8%	Digestive system	1999	8.0%
Musculoskeletal system	2453	6.2%	Musculoskeletal system	1884	7.6%
Other contact with health services	1519	3.9%	Respiratory system	1401	5.6%
Respiratory system	1437	3.7%	Other contact with health services	965	3.9%
Neoplasms	1348	3.4%	Skin diseases	962	3.9%
Ill-defined conditions	1135	2.9%	Neoplasms	801	3.2%
Genitourinary system	1036	2.6%	Ill-defined conditions	762	3.1%
Circulatory system	1021	2.6%	Nervous system	691	2.8%
Infectious and parasitic diseases	726	1.8%	Circulatory system	492	2.0%
Skin diseases	593	1.5%	Genitourinary system	456	1.8%
Nervous system	554	1.4%	Infectious and parasitic diseases	448	1.8%
Endocrine, nutrition, and immunity	293	0.7%	Endocrine, nutrition, and immunity	159	0.6%
Hematologic disorders	193	0.5%	Hematologic disorders	133	0.5%
Congenital anomalies	112	0.3%	Congenital anomalies	69	0.3%

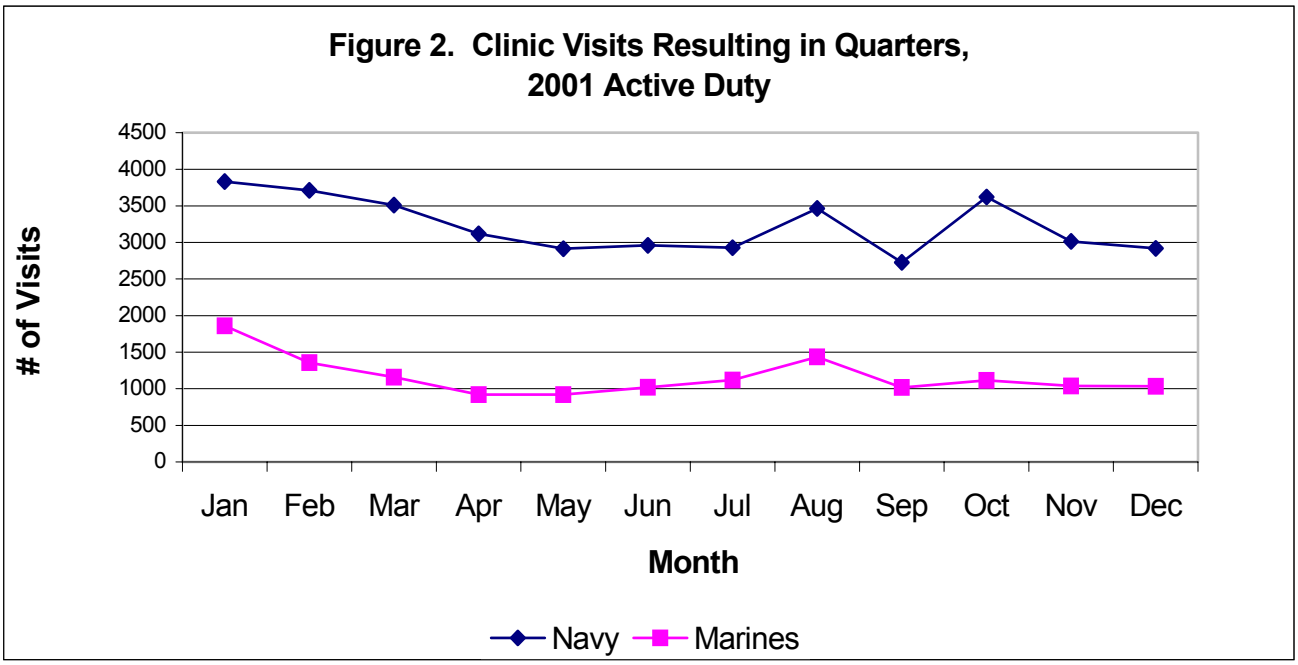


Table 2. Clinic Visits Resulting in Quarters by Major Diagnostic Categories, 2001 Active Duty Navy and Marine Corps.

Navy			Marine Corps		
Category	Total # of all visits	% of all visits	Category	Total # of all visits	% of all visits
All Causes	38723	100%	All Causes	13991	100%
Respiratory system	12047	31.1%	Respiratory system	4267	30.5%
Infectious and parasitic diseases	9658	24.9%	Infectious and parasitic diseases	2103	15.0%
Digestive system	3662	9.5%	Digestive system	1905	13.6%
Ill-defined conditions	3379	8.7%	Injury and poisoning	1380	9.9%
Injury and poisoning	2314	6.0%	Ill-defined conditions	998	7.1%
Musculoskeletal system	1860	4.8%	Skin diseases	838	6.0%
Nervous system	1609	4.2%	Nervous system	680	4.9%
Other contact with health services	1227	3.2%	Other contact with health services	522	3.7%
Skin diseases	859	2.2%	Musculoskeletal system	520	3.7%
Genitourinary system	760	2.0%	Genitourinary system	282	2.0%
Mental disorder	564	1.5%	Endocrine, nutrition, and immunity	210	1.5%
Endocrine, nutrition, and immunity	352	0.9%	Mental disorder	151	1.1%
Pregnancy complications	193	0.5%	Circulatory system	65	0.5%
Circulatory system	156	0.4%	Pregnancy complications	40	0.3%
Neoplasms	33	0.1%	Neoplasms	17	0.1%
Hematologic disorders	32	0.1%	Hematologic disorders	7	0.1%
Congenital anomalies	18	0.0%	Congenital anomalies	6	0.0%

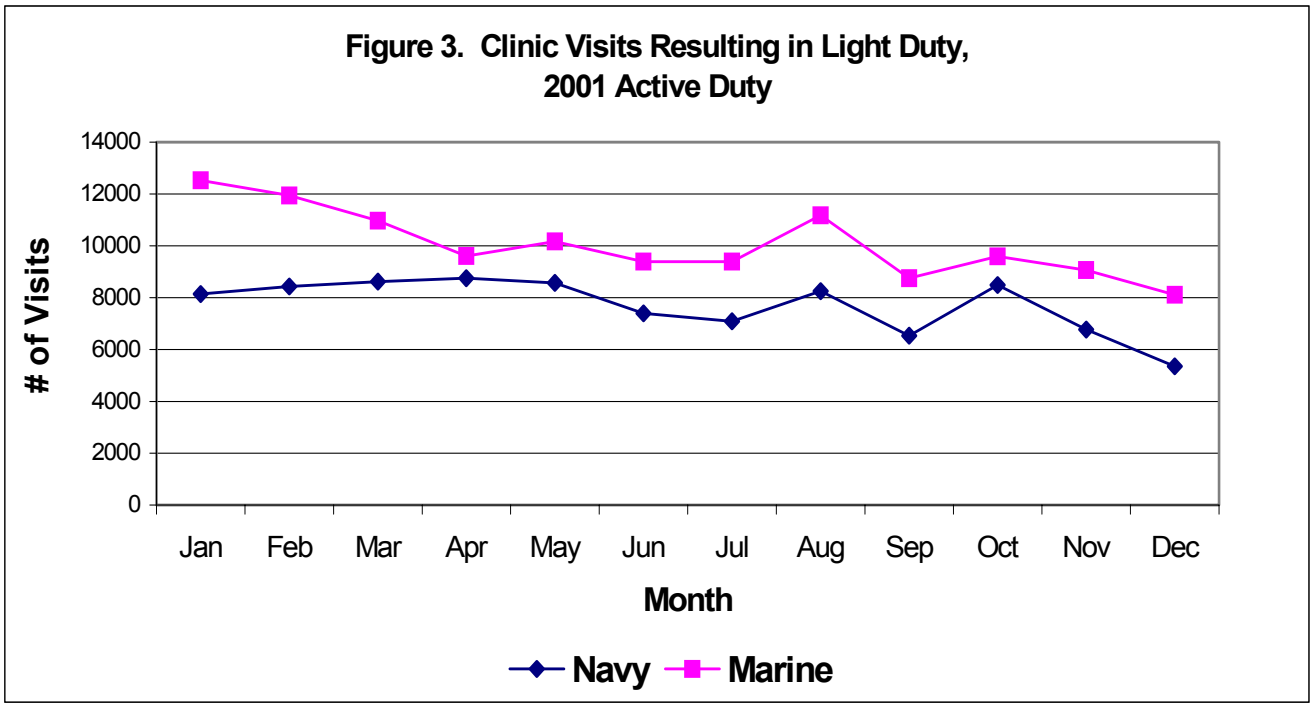


Table 3. Clinic Visits Resulting in Light Duty by Major Diagnostic Categories, 2001 Active Duty Navy and Marine Corps.

Navy			Marine Corps		
Category	Total # of all visits	% of all visits	Category	Total # of all visits	% of all visits
All Causes	92402	100%	All Causes	120697	100%
Musculoskeletal system	25171	27.2%	Other contact with health services	38564	32.0%
Injury and poisoning	22273	24.1%	Injury and poisoning	30428	25.2%
Other contact with health services	12048	13.0%	Musculoskeletal system	30315	25.1%
Respiratory system	8704	9.4%	Respiratory system	5886	4.9%
Mental disorder	6782	7.3%	Mental disorder	3624	3.0%
Infectious and parasitic diseases	4478	4.8%	Skin diseases	3117	2.6%
Nervous system	3534	3.8%	Ill-defined conditions	2092	1.7%
Ill-defined conditions	2369	2.6%	Infectious and parasitic diseases	1769	1.5%
Skin diseases	2130	2.3%	Nervous system	1575	1.3%
Digestive system	1718	1.9%	Digestive system	1233	1.0%
Genitourinary system	949	1.0%	Genitourinary system	867	0.7%
Circulatory system	711	0.8%	Circulatory system	363	0.3%
Endocrine, nutrition, and immunity	528	0.6%	Neoplasms	259	0.2%
Congenital anomalies	367	0.4%	Congenital anomalies	231	0.2%
Neoplasms	341	0.4%	Endocrine, nutrition, and immunity	188	0.2%
Pregnancy complications	191	0.2%	Hematologic disorders	95	0.1%
Hematologic disorders	108	0.1%	Pregnancy complications	91	0.1%

2002 Reportable Medical Event Trends, Navy and Marine Corps

Wendi Suesz, MPH
Navy Environmental Health Center, Portsmouth, VA

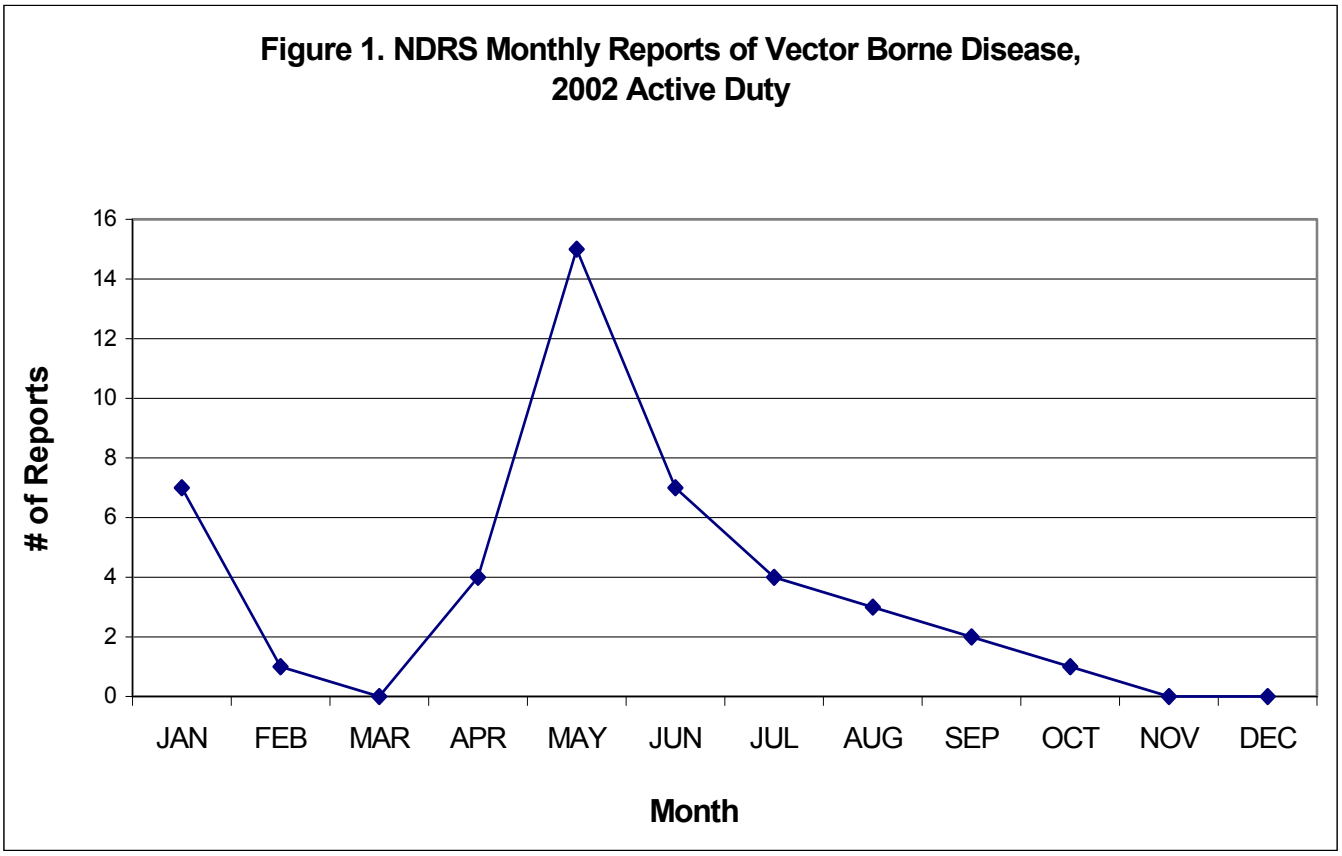
One of the objectives for the use of the Naval Disease Reporting System (NDRS), per BUMEDINST 6220.12A, is to "systematically tabulate and analyze Medical Event Reports (MERs) to examine Navy and Marine Corps trends and demographic parameters important in the epidemiology of reportable medical events." The numbers and trends for selected reportable diseases are presented here.

Following is an analysis of data from NDRS for calendar year (CY) 2002 received at NEHC. For the purpose of this analysis, subgroups of active duty (AD) and beneficiaries were used, where the term beneficiary includes all non-active duty recipients of care including dependents and retirees. Denominators for estimating rates among AD for each month can be found on the Department of Defense website www.dior.whs.mil/mmid/military/miltop.htm.

There were 44 total cases of vector borne disease in 2002. Figure 1 shows the trend of vector borne disease over the year. The large peak in May is an outbreak of Lyme disease in the Marine Corps. In this analysis, vector borne disease reporting categories include mosquito and tick borne viral encephalitis, filariasis, any mosquito or tick borne hemorrhagic fever, leishmaniasis, Dengue Fever, Lyme disease, malaria, plague, Rocky Mountain spotted fever, trypanosomiasis, tularemia, typhus, yellow fever, and hantavirus.

Continued on page 14

Figure 1. NDRS Monthly Reports of Vector Borne Disease, 2002 Active Duty



NAVAL DISEASE REPORTING SYSTEM (NDRS)

Summary Of 2002 Data

Tables 1 and 2 display the Medical Event Reports (MERs) received at Navy Environmental Health Center (NEHC). Interested readers may calculate rates among Active Duty by dividing the

Table 1. ACTIVE DUTY Reportable Medical Events, Navy & Marine Corps, Case Frequencies, 01 Jan – 31 Dec 2002

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	1	0	1	Lyme Disease	21	6	15
Anthrax*	0	0	0	Malaria (specify type) *	4	2	2
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	13	7	6	Meningitis (aseptic, viral)	29	18	11
Bites, venomous animal	7	4	3	Meningitis (bacterial other than Meningococcus)	0	0	0
Botulism*	0	0	0	Meningococcal disease*	1	1	0
Brucellosis	0	0	0	Mumps	0	0	0
Campylobacteriosis*	11	7	4	Occupational exposure to blood borne pathogens	7	7	0
Carbon Monoxide poisoning*	0	0	0	Onchocerciasis	0	0	0
Chemical warfare agent exposure	0	0	0	Pertussis*	2	0	2
Chlamydia	2317	1406	911	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	5	0	5
Coccidioidomycosis	8	6	2	Poliomyelitis*	0	0	0
Cold injuries	1	1	0	Psittacosis (Ornithosis)	0	0	0
Cryptosporidiosis*	0	0	0	Q Fever*	0	0	0
Cyclospora*	0	0	0	Rabies, clinical human*	0	0	0
Dengue fever*	0	0	0	Relapsing fever	0	0	0
Diphtheria	0	0	0	Rift Valley fever	0	0	0
E. Coli 0157:H7 infection*	2	0	2	Rocky-Mountain Spotted Fever	1	1	0
Ehrlichiosis	0	0	0	Rubella*	0	0	0
Encephalitis*	1	1	0	Salmonellosis*	14	5	9
Filariasis	1	0	1	Schistosomiasis	1	1	0
Giardiasis	6	4	2	Shigellosis*	5	5	0
Gonorrhea	552	370	182	Smallpox*	0	0	0
Haemophilus influenza, type b	0	0	0	Streptococcal disease, Group A	15	2	13
Hantavirus infection*	0	0	0	Syphilis	14	13	1
Heat injuries	279	10	269	Tetanus	0	0	0
Hemorrhagic fever*	0	0	0	Toxic shock syndrome	0	0	0
Hepatitis, A (acute, symptomatic only)	0	0	0	Trichinosis	0	0	0
Hepatitis, B (acute, symptomatic only)	8	4	4	Trypanosomiasis	0	0	0
Hepatitis, C (acute, symptomatic only)	3	3	0	Tuberculosis, pulmonary active*	7	7	0
Influenza (confirmed)	3	3	0	Tularemia*	0	0	0
Lead poisoning	0	0	0	Typhoid fever*	0	0	0
Legionellosis*	0	0	0	Typhus*	4	0	4
Leishmaniasis	0	0	0	Urethritis (non gonococcal)	136	66	70
Leprosy (Hansen's disease)	0	0	0	Varicella	7	3	4
Leptospirosis*	0	0	0	Yellow fever	0	0	0
Listeriosis	0	0	0				

* Reportable with 24 hours

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

frequencies by estimated mid-year strength of 384,576 for USN and 173,385 for USMC. Table 1 shows active duty only. Table 2 shows non active duty beneficiaries.

Table 2. BENEFICIARIES Reportable Medical Events, Navy & Marine Corps, Case Frequencies, 01 Jan –31 Dec 2002

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	0	0	0	Lyme Disease	3	3	0
Anthrax*	0	0	0	Malaria (specify type) *	1	1	0
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	28	25	3	Meningitis (aseptic, viral)	26	18	8
Bites, venomous animal	1	0	1	Meningitis (bacterial other than Meningococcus)	1	1	0
Botulism*	0	0	0	Meningococcal disease*	3	3	0
Brucellosis	0	0	0	Mumps	1	0	1
Campylobacteriosis*	9	8	1	Occupational exposure to blood borne pathogens	1	0	1
Carbon Monoxide poisoning*	7	5	2	Onchocerciasis	0	0	0
Chemical warfare agent exposure	0	0	0	Pertussis*	7	0	7
Chlamydia	741	517	224	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	8	7	1
Coccidioidomycosis	12	12	0	Poliomyelitis*	0	0	0
Cold injuries	0	0	0	Psittacosis (Ornithosis)	0	0	0
Cryptosporidiosis*	1	1	0	Q Fever*	1	0	1
Cyclospora*	0	0	0	Rabies, clinical human*	0	0	0
Dengue fever*	1	1	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	1	1	0
Ehrlichiosis	0	0	0	Rubella*	0	0	0
Encephalitis*	0	0	0	Salmonellosis*	40	24	16
Filariasis	0	0	0	Schistosomiasis	0	0	0
Giardiasis	8	6	2	Shigellosis*	21	20	1
Gonorrhea	103	83	20	Smallpox*	0	0	0
Haemophilus influenza, type b	1	1	0	Streptococcal disease, Group A	16	10	6
Hantavirus infection*	0	0	0	Syphilis	7	4	3
Heat injuries	6	1	5	Tetanus	0	0	0
Hemorrhagic fever*	0	0	0	Toxic shock syndrome	0	0	0
Hepatitis, A (acute, symptomatic only)	2	1	1	Trichinosis	0	0	0
Hepatitis, B (acute, symptomatic only)	4	3	1	Trypanosomiasis	0	0	0
Hepatitis, C (acute, symptomatic only)	4	3	1	Tuberculosis, pulmonary active*	8	7	1
Influenza (confirmed)	31	31	0	Tularemia*	0	0	0
Lead poisoning	1	1	0	Typhoid fever*	0	0	0
Legionellosis*	0	0	0	Typhus*	0	0	0
Leishmaniasis	0	0	0	Urethritis (non gonococcal)	4	1	3
Leprosy (Hansen's disease)	0	0	0	Yellow fever*	0	0	0
Leptospirosis*	0	0	0				
Listeriosis	0	0	0				

* Reportable with 24 hours

Continued from page 11

Figure 2 shows the monthly reports of food and water borne illnesses for both beneficiaries and active duty individuals. There were 53 total cases among AD and 102 cases among beneficiaries. The peaks in August and October are largely composed of salmonella cases. Food and water borne illnesses include salmonellosis, shigellosis, other food poisoning, giardiasis, *E. coli* 0157:H7, other *E. coli*, cholera, botulism, amebiasis, campylobacteriosis, cryptosporidiosis, cyclosporiasis, trichinosis, hepatitis A, and listeriosis.

Figure 3 presents the trend of monthly reports from Naval aircraft carriers; there were 403 MERs for CY 2002.

Figure 4 shows the monthly reports for the Marine Corps, both active duty and beneficiaries. There were 1817 total MERs among AD Marine Corps and 382 MERs among the beneficiaries.

Analyzing and providing feedback regarding NDRS is an essential part of the prevention process both to understand the scope of the health problems we face and to continue to improve the reporting system. The information presented here is intended to provide a context in which to interpret surveillance data and to provide further information on the epidemiology of selected diseases and populations.

Editor's Note: These numbers may not reflect data reported in the "NDRS Summary of 2002 Data tables" due to differences in evaluation dates.

Figure 2. NDRS Monthly Reports of Food Borne & Water Borne Illnesses, 2002

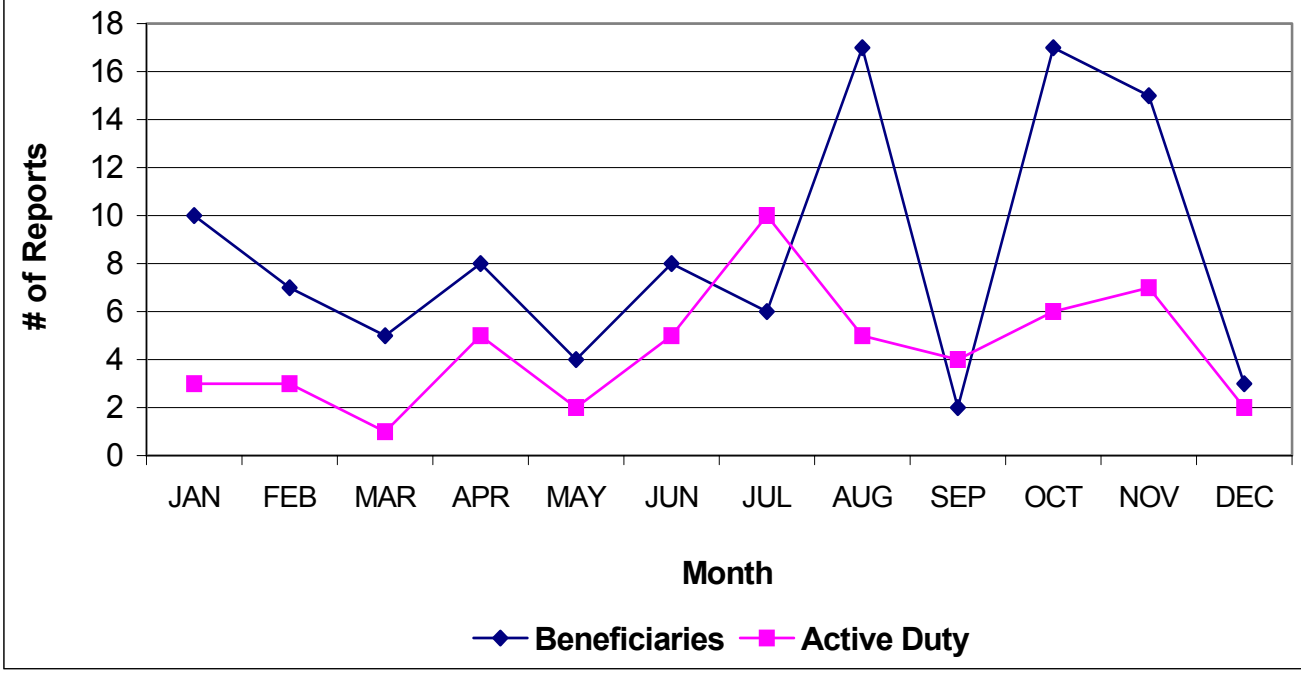


Figure 3. NDRS Monthly Reports for Aircraft Carriers, 2002

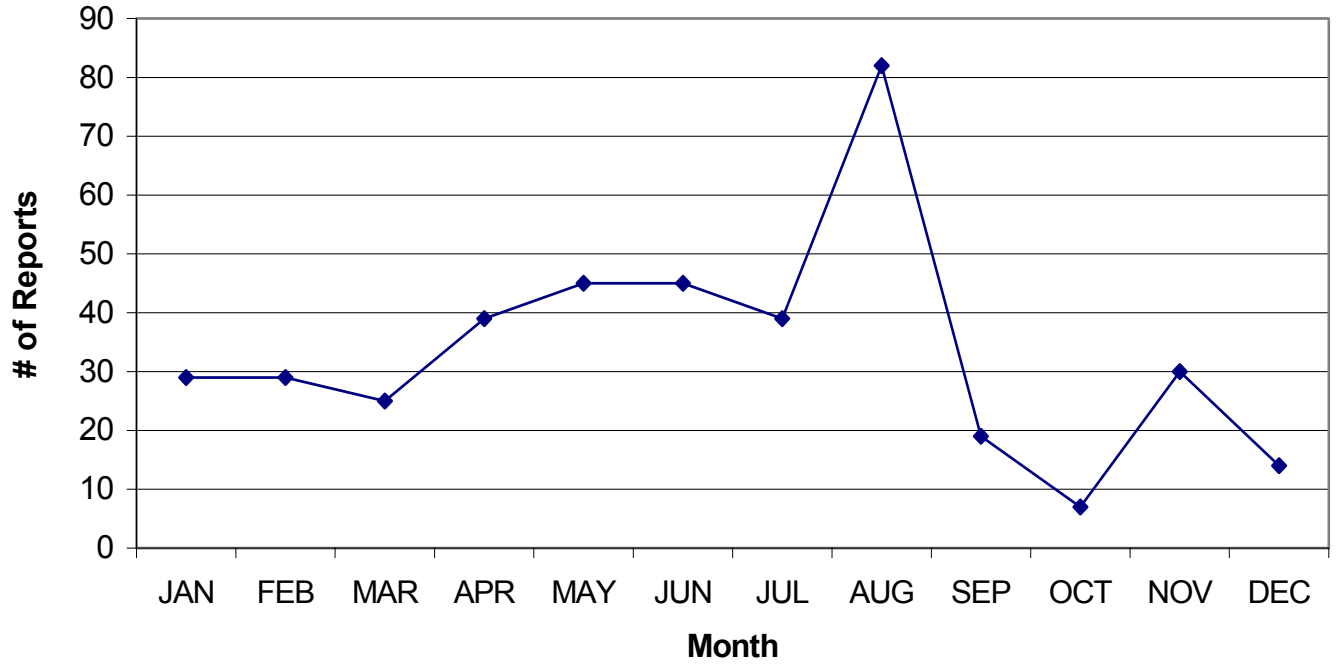
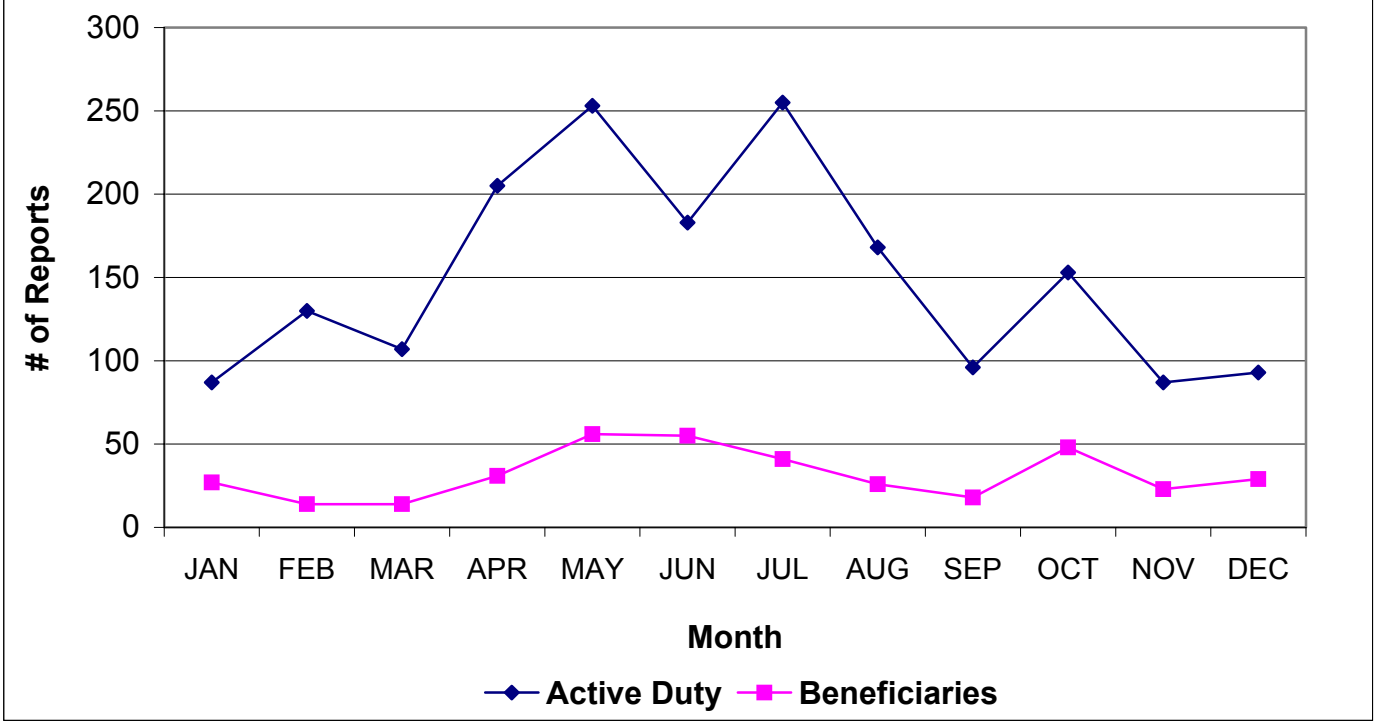


Figure 4. NDRS Monthly Reports for Marine Corps, 2002



Review of Completeness of Reporting of Hospitalized Notifiable Events Among Active Duty Personnel in the Department of Navy, 2001

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Introduction

Tracking diseases that are a significant burden to Force Health Protection is a cornerstone of Navy Preventive Medicine. Reportable medical events (RMEs) are of particular concern because of the potential for disease spread and outbreak occurrence, and the possibility that appropriate action can prevent more disease. In addition, with ongoing deployments, there is the potential to introduce nonendemic disease into the US after exposure to endemic areas. For these reasons, completeness of reporting is of the utmost concern.

A recent study published by the Army Medical Surveillance Activity (AMSA) suggests that completeness of reporting of hospitalized medical events for active duty personnel treated in Navy Medical Treatment Facilities (MTFs) is low.[1] This prompted an investigation to look at reporting practices by Navy MTFs and to validate the reporting process.

Background

The Navy Environmental Health Center Population Health Directorate (NEHC-PH) is responsible for tracking RMEs for the Department of Navy. Field Preventive Medicine Technicians (PMTs) and Environmental Health Officers (EHOs) track RMEs in their respective clinic or MTF as guided by BUMED Instruction 6220.12A. RMEs are then reported electronically via the Naval Disease Reporting System (NDRS) to the appropriate Navy Environmental and Preventive Medicine Unit (NEPMU).[2] The four NEPMUs track reportable events occurring in their geographic Area of Responsibility (AOR) and provide consultative assistance and outbreak response as necessary. Every month, these reports are electronically sent from the NEPMU to NEHC for overall tracking, guidance, and response oversight. AMSA then collects this information from NEHC as well as from the other services for overall DoD collation of RMEs (Figure 1).[3]

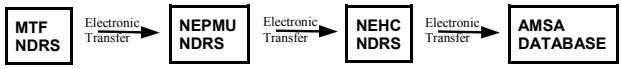


Figure 1. NDRS chain of reporting

The study conducted by AMSA showed the Navy had 13% completeness of reporting for hospitalized RMEs in 2001.[1] AMSA compared reportable events received by NEHC to Standard Inpatient Data Records (SIDR) discharge diagnoses for calendar year 2001. In the past, it was believed that lack of reporting by Navy providers was the cause of low completeness rates. However, drop in Navy completeness of reporting rates since 1999 (after which Y2K upgrades, *Windows 2000* upgrades, and placement of virus filters occurred) suggests other factors.

In 1997, the Navy introduced NDRS to its PMTs for electronic reporting of medical events. Completeness of reporting increased from 1997 to 1999.[1] With year 2000 upgrades to computer systems as well as security upgrades to comply with privacy and confidentiality initiatives in the military, the ability of NDRS to perform optimally decreased. At the same time, completeness of reporting appeared to decrease from 1999 to 2001.[1] This preliminary investigation was conducted to see if data loss played a significant role in low completeness of reporting of RMEs in the Navy.

Methodology

A list of inpatient records and diagnoses for RMEs occurring in the year 2001 among active duty personnel in Navy MTFs was requested from AMSA. A column in this list also indicates whether AMSA counted the case as reported or not reported for their study. From this list, each NEPMU and Navy MTF was then given a line listing of inpatient records in their AOR. Records from the inpatient line listing were compared to the NDRS databases at NEHC, each NEPMU, and each MTF.

Distribution of completeness of reporting by MTF and by disease was then calculated. A case was counted as reported if the hospitalized RME was reported through the NDRS at the MTF, cognizant NEPMU, or NEHC. Differences in completeness of reporting in the NDRS database at AMSA and NDRS databases through the Navy reporting chain (including MTF, NEPMU, and NEHC) for each MTF were then analyzed for possible cause. Distribution of completeness of reporting at each step in the reporting chain is also reported here to show data loss trends.

Data was analyzed using Microsoft Excel. A total of 161 records were received from AMSA. Two cases were excluded from analysis because they were duplicates. The final analysis contained 159 cases of hospitalized reportable events.

Results/Discussion

Table 1 shows the completeness of reporting of hospitalized RMEs as indicated by NDRS at AMSA and NDRS at sites in the reporting chain for each Navy MTF. NDRS at AMSA shows the Navy has reported only 12% of RMEs in 2001. However, according to NDRS databases at each MTF, NEPMU, and NEHC, 42% of hospitalized RMEs were actually reported. This discrepancy is mostly seen with data originating from 3 MTFs: Camp Lejeune, Great Lakes, and Okinawa. A recent investigation with Okinawa and NEPMU-6 indicates major problems with data transmission from Okinawa to NEPMU-6. Initial findings show that virus filters placed at the Exchange Servers by the Management Information Department at Naval Hospital Okinawa quarantine NDRS data files, thus blocking transmission to NEPMU-6.

Table 1. Completeness[a] of Reporting of Hospitalized Notifiable Events in AMSA Database and in All NDRS Sites by MTF, 2001 Active Duty Cases.

Location[b]	Hospitalized Cases	AMSA		NDRS, all sites in reporting chain[c]	
		Reported Cases	% Reported	Reported Cases	% Reported
29 Palms	10	1	10	1	10
Agana	2	0	0	0	0
Beaufort	8	0	0	2	25
Bethesda	8	1	13	3	38
Bremerton	1	0	0	0	0
Camp Lejeune	44	2	5	20	45
Cherry Point	2	0	0	0	0
Great Lakes	15	5	33	13	87
Jacksonville	1	0	0	0	0
Lemoore	3	1	33	1	33
Newport	2	0	0	0	0
Okinawa	15	3	20	15	100
Pensacola	4	1	25	1	25
Portsmouth	15	2	13	5	33
Rota	2	0	0	1	50
San Diego	25	3	12	5	20
Sigonella	1	0	0	0	0
Yokosuka	1	0	0	0	0
Total	159	19	12	67	42

[a] Completeness is the percent of hospitalized reportable cases that were reported through the Naval Disease Reporting System (NDRS).
[b] Locations with no reportable hospitalizations for 2001 were excluded from this table.
[c] NDRS at all sites in the reporting chain includes the hospitalized reportable cases that were reported by the MTF or NEPMU or NEHC through the Naval Disease Reporting System (NDRS).

Table 2 shows the distribution of completeness of reporting by RME diagnosis. The majority of completeness of reporting discrepancies occurred with heat injuries and varicella. Overall completeness of reporting for urgent RMEs was 48% when taking into account all NDRS sites in the reporting chain (versus 24% in the AMSA database).

Table 2. Completeness[a] of Reporting of Hospitalized Notifiable Events in AMSA Database and in NDRS for all Navy Echelons by Disease, 2001 Active Duty Cases.

Reportable Event[b]	Hospitalized Cases	AMSA		NDRS, all sites in reporting chain[c]	
		Reported Cases	% Reported	Reported Cases	% Reported
Carbon Monoxide poisoning[d]	2	0	0	0	0
Coccidioidomycosis	1	1	100	1	100
Giardiasis	1	0	0	0	0
Gonorrhea	4	0	0	3	75
Heat injury	73	4	5	29	40
Hepatitis A	1	0	0	0	0
Hepatitis B	4	1	25	2	50
Influenza	6	0	0	1	17
Legionellosis[d]	1	0	0	0	0
Lyme Disease	1	0	0	0	0
Malaria[d]	6	1	17	2	33
Meningococcal disease[d]	3	2	67	3	100
Pneumococcal pneumonia	15	0	0	3	20
Rheumatic fever	1	1	100	1	100
Salmonellosis[d]	3	0	0	1	33
Syphilis	1	0	0	1	100
Tuberculosis, pulmonary[d]	6	2	33	4	67
Varicella	30	7	23	16	53
Total	159	19	12	67	42

[a] Completeness is the percent of hospitalized reportable cases that were reported through the Naval Disease Reporting System (NDRS).
[b] Reportable diseases and conditions with no hospitalizations for 2001 were excluded from this table.
[c] NDRS at all sites in the reporting chain includes the hospitalized reportable cases that were reported by the MTF or NEPMU or NEHC through the Naval Disease Reporting System (NDRS).
[d] Medical event required to be reported within 24 hours (urgent).

Table 3 shows the distribution of completeness of reporting at each stage in the chain of reporting from MTF to NEPMU to NEHC and to AMSA. Data is electronically transmitted from one site to another. It is apparent that a significant amount of data is being lost from MTF to NEPMU. Also, while MTFs are entering the majority of reported cases into NDRS database (53 out of 67 reported cases), a number of cases (14 cases) are entered by the NEPMU or NEHC. This may be due to the following reasons: (1) MTF preventive medicine departments may report urgent RMEs by phone to the NEPMU, and NEPMU then enters the RME into NDRS as a courtesy; (2) MTFs may report via paper or email to NEPMU (or NEPMU report via paper or email to NEHC) because of temporary problems with NDRS.

Table 3. Completeness[a] of Reporting of Hospitalized Notifiable Events through the NDRS Chain of Reporting, 2001 Active Duty Cases.

NDRS chain of reporting	Hospitalized Cases	Reported Cases	% Reported
NDRS at all MTFs	159	53	33
NDRS at all NEPMUs	159	36	23
NDRS at NEHC	159	33	21
DATABASE at AMSA	159	19	12
NDRS, all sites in the reporting chain[b]	159	67	42

[a] Completeness is the percent of hospitalized reportable cases that were reported through the Naval Disease Reporting System (NDRS).

[b] NDRS at all sites in the reporting chain includes hospitalized reportable cases that were reported by the MTF or NEPMU or NEHC through the Naval Disease Reporting System (NDRS).

Table 4 identifies the MTFs whose completeness of reporting was different than that indicated in the database at AMSA. An attempt was made to identify specific discrepancies in the data reporting process.

Table 4. MTFs with Discrepant Completeness of Reporting Results[a] and Associated Observations for Possible Intervention

Location	AMSA	NDRS, all sites in reporting chain[b]	Quantitative/Qualitative Observation
	% Reported (# reported/ # hospitalized)	% Reported (# reported/ # hospitalized)	
Beaufort	0 (0/8)	25 (2/8)	Not due to data transfer in the chain of reporting. These two cases are in NEHC NDRS, however it appears they are not in AMSA NDRS. Needs follow-up with AMSA.
Bethesda	13 (1/8)	38 (3/8)	For one case, problem with data transfer from MTF to NEPMU. For another case, the data was received at NEPMU and NEHC from the MTF, however, it appears they are not in AMSA NDRS. Needs follow-up with MTF and AMSA.
Camp Lejeune	5 (2/44)	45 (20/44)	Major data loss from MTF to NEPMU. This MTF has expressed concerns about data integrity in the past. Needs follow-up.
Great Lakes	33 (5/15)	87 (13/15)	Not due to data transfer through NDRS chain of reporting. All but one of these cases are in NEHC NDRS, however, it appears they are not in AMSA NDRS. Needs follow-up with AMSA.
Okinawa	20 (3/15)	100 (15/15)	Major data loss from MTF to NEPMU. NEHC is working on this. Problem appears to be Exchange Server at MTF thinking NDRS files are viruses and subsequently placing them in quarantine.
Rota	0 (0/2)	50 (1/2)	This case was reported through the mail, never got to NEPMU.
San Diego	12 (3/25)	20 (5/25)	Data loss during transfer from MTF to NEPMU; NEPMU5 and NEHC are working on this. Problem appears to be Exchange Server at MTF thinking NDRS files are viruses and subsequently placing them in quarantine.

[a] More detail on completeness of reporting results can be found in Tables 1 and 3

[b] NDRS at all sites in the reporting chain includes the hospitalized reportable cases that were reported by the MTF or NEPMU or NEHC

Conclusions

Completeness of reporting is essential to ensure quick and adequate response to disease threats among our active duty population. For 2001 hospitalized RMEs, completeness of reporting appears low for the Navy when assessed using events reported to AMSA, the triservice agent for collation of reportable events. However, this study substantiates that 42% of hospitalized RMEs were actually reported in 2001 to preventive medicine personnel within the NDRS system. Additionally, a significant amount of data is lost during electronic transfer in the chain of reporting. This problem appears multifaceted, involving data transfer errors, NDRS errors, and operator errors throughout the reporting chain.

It is recommended that NEHC work with the specific NEPMUs and MTFs in Table 4 that show data loss problems. NEHC should also work with AMSA to clearly understand the data discrepancies shown in Table 4. Possible solutions to minimizing data loss in NDRS include: Web-enabled data transmission or FTP transmission from MTF directly to NEHC.[4] More information and guidance on these options can be found on NEHC's NDRS website at www-nehc.med.navy.mil/prevmed/epi/ndrs.htm. However, with the current reporting system, data loss would continue to present problems in the future given increased security concerns, upgrades in virus filters, and upgrades in software that may be incompatible with NDRS. Therefore, it is recommended that NEHC consider developing a central

data warehouse to which Navy MTFs can report directly, eliminating the chain of reporting within the Navy (MTF to NEPMU to NEHC). Data from the central data warehouse could be accessed by MTF, NEPMU, or NEHC as appropriate. Data could also be forwarded to AMSA directly from the data warehouse. In addition, NEHC should explore reporting tools and pathways that would facilitate reporting to this central warehouse and remove the possibility of data loss. These pathways should include underutilized resources throughout the Military Health System that automatically collect diagnosis information from physician visits and laboratory results.

Acknowledgements

Many thanks to the preventive medicine staff at the NEPMUs and MTFs for participating in this assessment and providing timely feedback. Special thanks to the Army Medical Surveillance Activity for providing the data necessary for us to conduct this assessment.

References

1. "Completeness of Reporting of Hospitalized Notifiable Conditions, Active Duty Servicemembers, US Naval Medical Treatment Facilities, 1998-2001". Medical Surveillance Monthly Report. 2002; 8(5): 27-30.
2. BUMED Instruction 6220.12A. Medical Event Reports. 21 OCT 98.
3. Tri-Service Reportable Events Guidelines and Case Definitions. Version 1.0. July 1998.
4. Gilchrist, L. "Options for Electronic Reporting of Medical Events". Naval Medical Surveillance Report. 2002; 5(3): 16-17.

Anthrax Vaccine Immunization Program (AVIP)

Anthrax Vaccine Adverse Event Reporting System (VAERS) Update

Table 1 displays the total Anthrax VAERS reports submitted through 27 December 2002. The source of this data is the Army Medical Surveillance Activity (AMSA).

Two new reports (one from the Army and one from the Air Force) were submitted this quarter.

Table 1. Cumulative Data (date 28 Aug 1998 – 27 Dec 2002)

Service	VAERS Report Required		Classification				
			Local Reaction			Systemic Reaction	Cum. Totals
	Yes	No	Mild	Moderate	Severe		
USA	14	106	14	23	13	70	120
USN	4	69	6	7	8	52	73
USAF	30	425	31	51	30	343	455
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

Vaccine Adverse Event Reporting System

HM1(AW) Isaiah Corbin, USN, CDR Mark A. Malakooti, MC, USN
Navy Environmental Health Center, Portsmouth, VA

The Vaccine Adverse Event Reporting System (VAERS) is a cooperative program for vaccine safety of the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA). It is a post-marketing surveillance program that collects information about adverse events (possible side effects) occurring after the administration of US licensed vaccines. Each report provides potentially valuable information used for ongoing evaluation of vaccine safety, in addition to the already extensive data gathered during testing prior to vaccine production approval. The CDC and FDA monitor VAERS data and conduct analyses to identify potential new vaccine safety concerns. These findings may contribute to improving knowledge of immunization risks and benefits, identifying opportunities to revise precautions and contraindications, and developing safer vaccines.

VAERS encourages the reporting of any clinically significant adverse event that occurs after the administration of any vaccine licensed in the United States. It is a passive reporting system requiring submission of a VAERS report form (Figure 1). Physicians, other healthcare workers, or patients themselves can submit VAERS forms, and are encouraged to report significant adverse events even if unsure whether a vaccine caused the event.

Along with other vaccines, the Department of Defense (DoD) Anthrax Vaccine Immunization Program (AVIP) and the Smallpox Vaccine Program (SVP), both require conscientious reporting of adverse events after vaccination. Data since the start of AVIP, in 1998, show the vaccine to be well-tolerated with rare incidence of any serious side-effects. Current and complete adverse-event data as it applies to the SVP, resuming after 15 years, is also of critical interest to the DoD, CDC, and FDA. The CNO's message of 10JAN03 "SVP Medical Guidance", discusses VAERS reporting, lists VAERS references, and states "…if in doubt, submit a VAERS-1" (www-nehc.med.navy.mil/prevmed/epi/CNO10Jan03.txt).

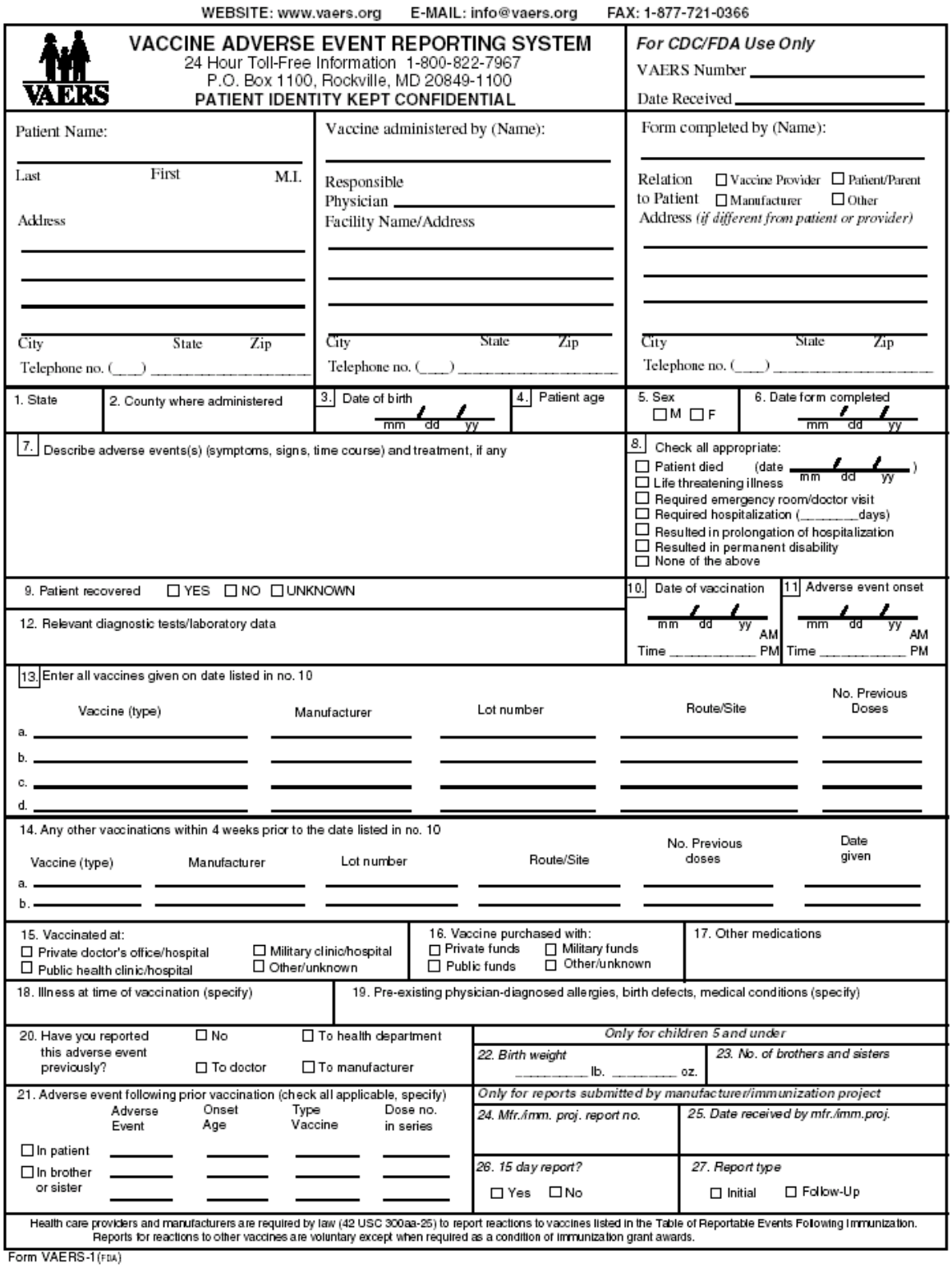
Per BUMEDINST 6230.15, submission of a VAERS form is mandatory if a vaccine recipient experiences loss of duty for 24 hours or more, or is hospitalized. Additionally, a form must be submitted if contamination of a vaccine lot is suspected. In case of a VAERS report on Navy or Marine Corps personnel, in addition to the CDC, a copy of the form (indicating patient's social security number and branch of service) should be sent to the Navy Environmental Health Center (NEHC, ATTN: Population Health/Epidemiology) within 72 hours by:

a. Fax: (757)953-0685 OR DSN 377-0685 (please call ahead of time to ensure proper personnel are awaiting the fax)
b. Email: ESSENCE@NEHC.MED.NAVY.MIL
c. Phone, followed by hard copy Tel: (757) 953-0700 OR DSN 377-0700
d. Message
e. NDRS

NDRS (Navy Disease Reporting System 3.0) can be used to create the VAERS in a computer-generated CDC form, and to produce a summary list of all such incidents. An adverse event after vaccination is on the Tri-Services list of Reportable Medical Events, and NDRS can be used to transmit the Medical Event Report to NEHC.

Accurate and complete reporting of post vaccination events contributes to the safety of our military forces. Information about the VAERS program can be obtained from the VAERS website at www.vaers.org or by calling the VAERS information line at (800) 822-7967. For military guidance please contact the cognizant NEPMU, or Navy Environmental Health Center (Population Health Directorate/Epidemiology) at (757) 953-0700.

Figure 1. Vaccine Adverse Event Report Form



WEBSITE: www.vaers.org E-MAIL: info@vaers.org FAX: 1-877-721-0366

VACCINE ADVERSE EVENT REPORTING SYSTEM
24 Hour Toll-Free Information 1-800-822-7967
P.O. Box 1100, Rockville, MD 20849-1100
PATIENT IDENTITY KEPT CONFIDENTIAL

For CDC/FDA Use Only
VAERS Number _____
Date Received _____

Patient Name: Last First M.I.
Address
City State Zip
Telephone no. (___) _____

Vaccine administered by (Name):
Responsible Physician _____
Facility Name/Address
City State Zip
Telephone no. (___) _____

Form completed by (Name):
Relation to Patient ☐ Vaccine Provider ☐ Patient/Parent ☐ Manufacturer ☐ Other
Address *(if different from patient or provider)*
City State Zip
Telephone no. (___) _____

1. State | 2. County where administered | 3. Date of birth mm dd yy | 4. Patient age | 5. Sex ☐ M ☐ F | 6. Date form completed mm dd yy

7. Describe adverse events(s) (symptoms, signs, time course) and treatment, if any

8. Check all appropriate:
☐ Patient died (date mm dd yy)
☐ Life threatening illness
☐ Required emergency room/doctor visit
☐ Required hospitalization (_____days)
☐ Resulted in prolongation of hospitalization
☐ Resulted in permanent disability
☐ None of the above

9. Patient recovered ☐ YES ☐ NO ☐ UNKNOWN

10. Date of vaccination mm dd yy Time _____ AM PM

11. Adverse event onset mm dd yy Time _____ AM PM

12. Relevant diagnostic tests/laboratory data

13. Enter all vaccines given on date listed in no. 10

	Vaccine (type)	Manufacturer	Lot number	Route/Site	No. Previous Doses
a.					
b.					
c.					
d.					

14. Any other vaccinations within 4 weeks prior to the date listed in no. 10

	Vaccine (type)	Manufacturer	Lot number	Route/Site	No. Previous doses	Date given
a.						
b.						

15. Vaccinated at:
☐ Private doctor's office/hospital ☐ Military clinic/hospital
☐ Public health clinic/hospital ☐ Other/unknown

16. Vaccine purchased with:
☐ Private funds ☐ Military funds
☐ Public funds ☐ Other/unknown

17. Other medications

18. Illness at time of vaccination (specify)

19. Pre-existing physician-diagnosed allergies, birth defects, medical conditions (specify)

20. Have you reported this adverse event previously? ☐ No ☐ To health department ☐ To doctor ☐ To manufacturer

Only for children 5 and under
22. Birth weight _____ lb. _____ oz.
23. No. of brothers and sisters

21. Adverse event following prior vaccination (check all applicable, specify)

	Adverse Event	Onset Age	Type Vaccine	Dose no. in series
☐ In patient				
☐ In brother or sister				

Only for reports submitted by manufacturer/immunization project
24. Mfr./imm. proj. report no.
25. Date received by mfr./imm.proj.
26. 15 day report? ☐ Yes ☐ No
27. Report type ☐ Initial ☐ Follow-Up

Health care providers and manufacturers are required by law (42 USC 300aa-25) to report reactions to vaccines listed in the Table of Reportable Events Following Immunization. Reports for reactions to other vaccines are voluntary except when required as a condition of immunization grant awards.

Form VAERS-1 (FDA)

DEPARTMENT OF THE NAVY
Commanding Officer
Navy Environmental Health Center
620 John Paul Jones Circle Suite 1100
Portsmouth, VA 23708-2103

Official Business