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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)

Spring has turned to summer in Tidewater, and personnel turnover is well underway. At the top, we have a new Navy Surgeon General, VADM Don Arthur taking charge on 04 August 2004. Our command master chief, HMCM Sampson, has retired, and has been replaced with HMCM Dana Godwin. HMCM Godwin was HM1 PMT who checked into USS FORRESTAL (AVT 59) as I left in July 1992 from my Senior Medical Officer tour. He brings a wealth of fleet preventive medicine experiences to NEHC. CAPT Ben Mitchell has joined the Population Health team, and CDR Jim Lamar checks in later in July. Ms Lynn Klanchar from HP leaves in August as she is cycled off by her Prince Charming to live in Richmond, Virginia. CDR Mark Malakooti has transferred to NEPMU2 and will likely be in Iraq by the time this is published. LCDR Killenbeck in EH was selected for a six month tour in the Mid-East and will be sorely missed.

NEHC Population Health has been busy with a number of projects. The US Army Force Health Protection Conference in August is a major effort, with numerous presentations and posters sessions. I will be presenting on the "Navy Medicine's Top Ten Plus One Preventable Diseases and Injuries" and "Get Moving Navy", along with a number of other NEHC-PH staff members. It promises to be an excellent meeting on Force

Health Protection, and Albuquerque NM is a delightful city to visit.

Several other conferences and meetings have been notable. In May I attended the Armed Forces Epidemiology Board in Frederick MD, which is always a good meeting to have some visibility on interest items at that level. The Navy Epidemiology Board met in June, with a number of excellent presentations and recommendations. That group includes epidemiologists from the NEPMUs and Marine Expeditionary Forces. I attended a meeting at BUPERS in July on updating the current PRT instruction, which includes epidemiological analysis of the Physical Readiness Information Management System (PRIMS). I expect changes will be apparent in that program and the processes that the Navy handles obesity related issues, maybe even before this edition of the NMSR is published. CAPT Mitchell will attend a meeting on the SAMS/TMIP implementation in San Diego. Those programs will expand our medical surveillance capabilities and continue to be of great interest to NEHC-PH. It appears that the implementation of CHCS II is having difficulties, which has the potential to affect some of our medical surveillance initiatives. The NEHC EPICENTER continues to expand capabilities and surveillance support, and we have been informed to expect funding in FY06 as planned.

Naval Medical Surveillance Report

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We have continued work on the pilot site for "Get Moving Navy" with Oceana-Dam Neck IN MOTION. We have also briefed Commander Fleet Forces Command on proposals for enhancing fitness and nutrition across the fleet, with follow-on briefing scheduled for various other commands around Tidewater.

The NEHC conference is scheduled for 12-18 February 2005 in Virginia Beach. Abstracts for speakers are due by 01 September 2004, so the schedule may already be completed by the time you are reading this. It promises to be an excellent conference, so please mark your calendar now. Also it is not too early to begin thinking about the award nominations for the conference. More information is available on the NEHC website.

I have been writing this column for 3 years now. As part of the DNBI analysis for CJTF Haiti which

is included in this edition, I reviewed some of the earlier editions of the NMSR. I wanted to compliment Asha Riego de Dios for her many efforts as editor, as well as Ms. Becky Washburn and Ms. Nancy Branch for their many contributions. I think the product has continued to improve in terms of size and appropriateness of the materials presented. A number of manuscripts that first appeared in the NMSRs have been refined and accepted in peer reviewed journals, a sign of the quality of our authors and the level of work they are doing. We continue to solicit inputs from authors in the fleet and MTFs.

Finally we continue to support our medical personnel who are deployed supporting the Global War on Terrorism. As the President has clearly stated, we are in this for the long haul, with sustainment being a critical word.

Cholera Versus Non-O1 *V. cholerae*

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Introduction

Cholera can be one of the most dramatic diseases known to man and is probably one of the best-understood diseases of epidemic nature. Often referred to as the "first global disease,"¹ it led to the establishment of the International Quarantine Commission², renowned for crystallizing modern methods of infectious-disease epidemiology. We are presently in the midst of the seventh documented pandemic since 1817. This seventh pandemic began in Indonesia in 1961 and over 100 countries have reported cases since. In 2001, a total of 184,311 cases were reported to the World Health Organization (WHO)¹ by 58 countries.

John Snow halted the cholera epidemic in London in the late 1840s by breaking the handle of the

Broad Street Pump. In his 1849 ground breaking report, *On the Mode of Communication of Cholera*, John Snow established a relationship between cholera and water, laying the foundation for present infectious disease epidemiology.^{2,3}

Disease Reporting

Cholera has been a reportable disease since the inception of disease morbidity and mortality reporting. Even now, under International Health Regulations, cholera is one of three diseases requiring notification to WHO.¹ Unfortunately, most of the morbidity caused by *V. cholerae* manifests as diarrhea, vomiting, and muscle cramps, symptoms which commonly occur in travelers around the world and are consistent with other diseases. Most areas prone to cholera epidemics, have poor sanitation and/or poor water treatment, and

are the least able to confirm cases by lab methods. It is estimated that 75% of people with *V. cholerae* infections are asymptomatic. Approximately 20% develop diarrheal illness and 2-5% present with typical cholera symptoms of severe watery diarrhea, vomiting, and dehydration, which when left untreated, can easily lead to hypovolemic shock.⁴ WHO estimates that only 5-10% of actual cases worldwide are reported to them.^{1,4}

Disease Transmission and Reservoir

As originally reported in 1849, the usual mode of cholera transmission is through contaminated water. It can also be transmitted through contaminated food. Poor sanitation increases the risk of transmission. While human beings are one of the reservoirs of pathogenic *V. cholerae*, direct person-to-person transmission is very rare. The organism is excreted in the feces of infected persons, with the fecal matter acting as the main infectious source.

Vibrios are one of the most common bacteria in the world, are found in both salt and fresh water habitats, and are associated with aquatic animals.^{3,5,6} Proliferation of *V. cholerae* is limited under low temperatures, however, they can survive freezing. WHO reports survival of *V. cholerae* for up to 10 days on various foodstuffs at temperatures of 41-50°F⁷. The organism is sensitive to low pH as well as drying, making dried or acidic foods (pH <4.6) an almost risk-free venture.⁷ It is thought that cholera virtually disappeared from the USA (with few exceptions) because of the overall good sanitation conditions that exist.

Taxonomy and Lab Analysis

Vibrio cholerae, the causative agent of cholera, is the most important of the *Vibrios*, as it can be pathogenic in humans. It affects the small intestine of humans by secreting an enterotoxin. The enterotoxin acts on the mucosal epithelium causing the sudden onset of excess diarrhea that is typically associated with cholera. In ex-

treme cases, if untreated, cholera can be one of the most fatal diseases known, causing death in 2-4 hours from fluid and electrolyte loss.^{2,6}

Diagnosis of "cholera" is based on laboratory confirmation of *Vibrio cholerae* serogroup O1 or O139. Because of similarities in the DNA base composition, numerical taxonomy, and other identification methods, non-O1 *V. cholerae* are included in the taxospecies and genospecies of *V. cholerae*. However, the pathogenic and epidemic capabilities of the various serotypes are very different. Epidemics have only been reportedly caused by serogroup O1 or O139. Serogroups other than O1 or O139 are referred to as nonagglutinable (NAG) cholera, "non-cholera", or non-O1 *V. cholerae*.³ In tropical lesser-developed countries, about 2-3% of diarrheal illnesses are associated with non-O1 *V. cholerae*, and are typically associated with ingestion of raw or undercooked seafood.⁵ Non-O1 *V. cholerae* are not usually associated with widespread cases in any location, and thus aren't typically referred to as "cholera".^{2,3}

Cholera belongs to the taxogenic family Vibrionaceae and is distinguished from the similar taxogenic family Enterobacteriaceae by being oxidase-positive and motile by means of a polar flagella. The genus *Vibrio* are Gram-negative rods, either straight or curved. They are capable of respiratory and fermentative metabolism.⁶

Vibrios grow poorly, if at all, on the usual enteric diagnostic media (e.g. MacConkey agar or eosin-methylene blue agar). Typically, cholera will produce distinctive yellow colonies on thiosulfate-citrate-bile salts-sucrose (TCBS) agar. Confirmation can occur by a rapid slide agglutination test with specific antiserum. Non-agglutinable, or non-O1 *Vibrios* require additional tests, such as oxidase, decarboxylases (i.e. lysine, ornithine, arginine) and the deoxycholate "string test".^{4,6}

Prevention and Treatment

Preventive measures of cholera include: having an adequate/safe supply of water, good personal hygiene, proper food preparation and handling, safe/hygienic disposal of human feces in areas where cholera exists. The key medical treatment of cholera is fluid replenishment. Rehydration is crucial to avoid death from loss of essential electrolytes. Given proper sanitation methods, cholera is usually a self-limiting disease that normally runs its course within a week. However, *V. cholerae* bacteria can live in feces for extended periods of time after resolution of symptoms. Appropriate antibiotics can help reduce the duration of *Vibrio* excretion and shorten the duration of diarrhea. With prompt rehydration, case-fatality rates are reduced to ~1%.^{4,5}

Since 1974, Guam has had 23 sporadic incidents resulting in 26 confirmed and 20 unconfirmed cases of O1 *V. cholerae* reported by the Guam Department of Public Health and Social Services. From 1974-1986, five different incidents of non-O1 *V. cholerae* are thought to have resulted in 16 cases of nonagglutinable (NAG) vibrios (or non-O1 *V. cholerae*) on Guam.

Case Report

On 9 May 2004, a male civil mariner serving aboard a military supply ship arrived on Guam. He departed the ship at 0800 after eating breakfast aboard. Between 1230-1300 the patient ate BBQ and shrimp kelaguen prepared by a family member, and at about 2040 he had seafood buffet (including lobster, oysters, scallops, imitation crab meat, and shrimp) at a hotel restaurant.

Around 2300 that evening the patient began feeling ill, between then and 0900 the next morning, he experienced severe abdominal pain, seven bouts of diarrhea progressing from dark green-brown to clear, gas and nausea, but no fever or vomiting. Upon examination he exhibited abdominal tenderness and hyperactive bowel sounds. Patient's stool was positive for occult blood and his WBC count was 17,300. He was given 30 mg ketorolac, normal saline IV, and transferred to the ER at 1142. At the ER he was given 2 mg morphine, 200 mg gatifloxacin and ibuprofen and released at 1315 with prescrip-

tions for ibuprofen and loperamide. The patient was asymptomatic on 13 May and went underway with his ship.

On 14 May laboratory results indicated presumptive *Vibrio cholerae* (oxidase positive, VITEK 97% *V. cholerae*, yellow colonies on TCBS agar, curved gram negative rods, positive string test) from the patient stool specimen. This isolate was referred to the Guam Public Health Laboratory and later to the Centers for Disease Control and Prevention (CDC). No known contacts of the patient became ill. Syndromatic surveillance at Guam's civilian hospital did not show an increase in the number of community gastrointestinal illnesses. Navy Environmental and Preventive Medicine Unit No. 6 (NEPMU6) had to ship O1 antisera to USNH-GUAM, as there was none on Guam at the time of the incident. The sample was nonagglutinable with O1 antisera. Results from Guam Public Health and CDC have not returned to date.

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Disease Non-Battle Injury (DNBI) Surveillance for Commander Joint Task Force (CJTF) Haiti (2004)

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Introduction

Force Health Protection is a cornerstone of Department of Defense medical readiness. An important component of Force Health Protection is ongoing medical surveillance of personnel deployed. This is usually performed through syndromic surveillance of "Disease, Non-Battle Injuries" (DNBI) in 16 categories guided by the Joint Chiefs of Staff (JCS).¹ That guidance includes suggested reference rates for those DNBI categories. Ongoing assessment of DNBI rates is an important responsibility of the Joint Task Force Surgeon and Combatant Command Surgeon. This assessment should include review of historical data from deployments to similar locations from the medical literature. Several previous authors have reported DNBI analysis for troops in Bosnia, South America, East Timor, and Haiti.²⁻⁵ We have previously reported DNBI rates for afloat forces assigned to the US Fifth Fleet,⁶ and wanted to continue our analysis of available DNBI information. Much of that information has migrated to the higher security classification that limits dissemination in the medical literature, so opportunities to present operational DNBI information from unclassified sources are important.

Haiti, a poor country that occupies half of the island of Hispanola in the Caribbean Sea, has a long history of political and economic instability that has led to US military involvement. Medical surveillance for US military forces was performed in 1994, though aggregate information is not available,⁷ and was reported for multi-national forces in Haiti in 1995.⁴ Several military authors have reported on medical topics from Haiti including dengue fever and humanitarian relief missions.^{8,9} In the spring of 2004, US troops returned to Haiti, under a US Marine Corps-based joint command structure from Camp Lejeune NC.

Methods

The Navy Environmental Health Center, Portsmouth, VA serves as the Navy Medical Surveillance Hub. We received DNBI reports from the Surgeon's Office of the Commander Joint Task Force (CJTF) Haiti, as part of overall surveillance for Surgeon's Office of the US Southern Command in Miami, FL. These reports were submitted in an unclassified Microsoft EXCEL® spreadsheet and were aggregated in a format similar to Commander Fifth Fleet.⁶ The information was compared to standard rates and historical information. Statistical calculations were completed using EPI-INFO 6.04.¹⁰ Rates are reported as percentage of visits per person-week (visits per 100 person-weeks).

Results

Table 1 presents the summary and categorical DNBI information for the deployment with 908 first visits during the 17938 person-weeks of observation. That indicates an overall DNBI rate of 5.1% (5.1 visits per 100 person-weeks; 95% Confidence Interval = 4.7% to 5.4%), which is above the Chairman Joint Chief of Staff (CJCS) suggested reference rate of 4.0%. Rates for dermatology (1%), respiratory (0.8%) and other medical surgical (0.9%) were above CJCS standards, while work injuries (0.6%) and recreational injuries (0.8%) were below CJCS guidance. One case of malaria was reported during the deployment. Figure 1 compares the overall and selected categorical DNBI rates with suggested reference rates. Figure 2 presents information on the 1079 days of limited duty during the period (6.01 days per 100 person-weeks). Injuries from recreation (39%) and work (36%) were leading causes of lost work-days.

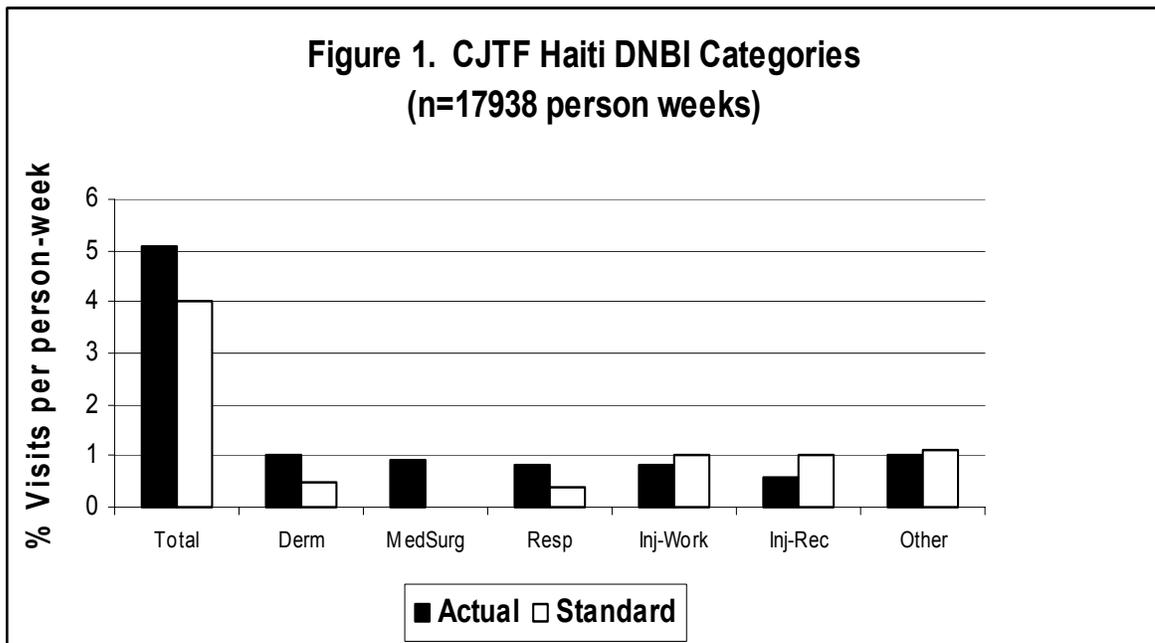
Discussion

This analysis found an overall DNBI rate of 5.1% for military operations in Haiti in 2004, which is above the CJCS suggested reference rate of

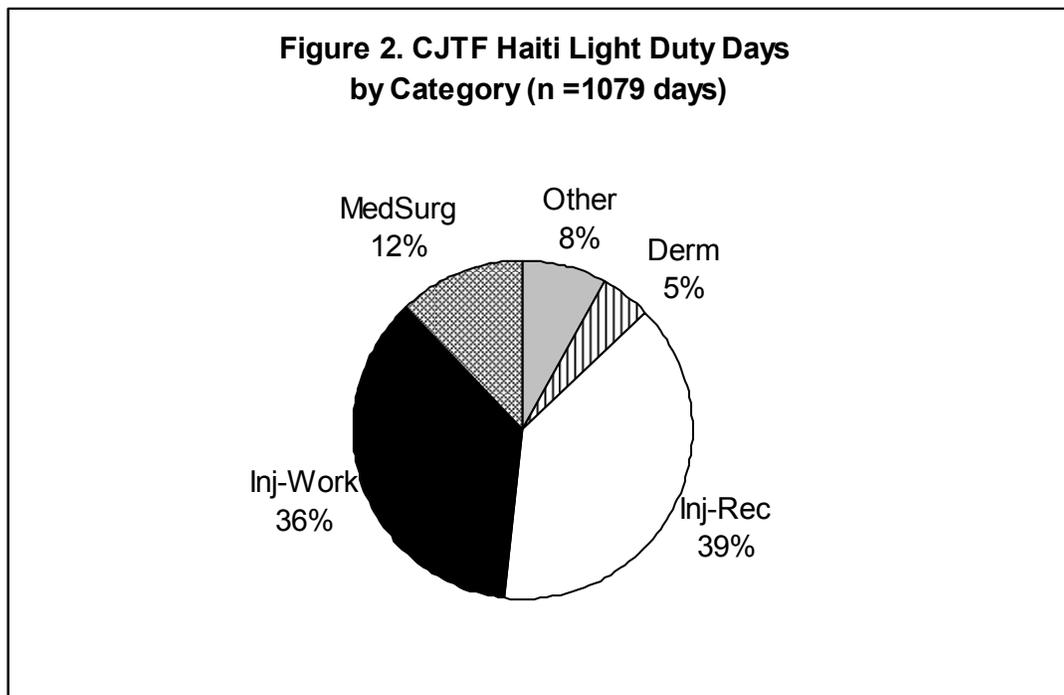
Table 1: DNBI Results from CJTF Haiti (2004)

Unit/Command:	Total Person Weeks: 17938				Female Person Weeks: 451	
Dates Covered:	21-Mar-04		Through			12-Jun-04
CATEGORY	INITIAL VISITS	RATE	SUGGESTED REFERENCE RATE	LIGHT DUTY DAYS	LOST WORK DAYS	ADMITS (# of persons)
Combat/Operational Stress Reactions	12	0.1%	0.1%	0	1	1
Dermatologic	180	1.0%	0.5%	51	1	2
GI, Infectious	61	0.3%	0.5%	11	9	0
Gynecologic	0	0.0%	0.5%	0	0	0
Heat/Cold	15	0.1%	0.5%	0	5	0
Injury, Recreational/Sports	101	0.6%	1.0%	418	7	2
Injury, MVA	5	0.0%	1.0%	26	0	0
Injury, Work/Training	140	0.8%	1.0%	391	2	3
Injury, Other	46	0.3%	1.0%	34	3	1
Ophthalmologic	22	0.1%	0.1%	11	1	0
Psychiatric, Mental Disorders	4	0.0%	0.1%	0	0	1
Respiratory	151	0.8%	0.4%	6	7	0
STDs	1	0.0%	0.5%	0	0	0
Fever, Unexplained	1	0.0%	0.0%	0	2	1
All Other, Medical/Surgical	169	0.9%		131	11	3
TOTAL DNBI	908	5.1%	4.0%	1079	49	14
Dental	70	N/A		0	0	0
Misc/Admin/Follow-up	300	N/A		146	3	0
Malaria	1	0.0%		0	3	0
Dengue	0	0.0%		0	0	0

Figure 1. CJTF Haiti DNBI Categories (n=17938 person weeks)



**Figure 2. CJTF Haiti Light Duty Days
by Category (n =1079 days)**



4.0%. The observed rate was lower than previous reports of 9.2% to 13.0% DNBI rate reported by Gambel *et al* in multi-national troops in Haiti.⁴ It was lower than the 7.1% reported for US troops in Bosnia in 1996, and 8.1% per week for those forces in 1997, as reported by Campbell.³ It was comparable to 5.4% per week reported for troops in East Timor by Yund.⁵ It was slightly higher than 4.1% per week reported by Taylor *et al* for peace-keeping operations in South America.² This variability in observed DNBI rates is discussed in the CJCS guidance. The rates are considered approximate with recommendations that they should be used as a rough guide.¹ The current reporting process does not provide for reporting of medevac/casevac cases by DNBI category, which would be an interesting addition to current guidance.

The CJTF Haiti rates for DNBI categories are generally consistent with the literature. Orthopedic injury rates of 2-3% were reported by Taylor *et al* and Yund.^{2,5} Campbell reported on the importance of injuries, respiratory infections, and dermatological conditions for troops serving in Kosovo and Bosnia.³ Gambel reported dermatology rates of 1.3 - 2.2% per week, and respiratory rates of 0.9% to 2.2% per week, using data from Haiti.⁴

Yund noted slightly higher rates for dermatology of 0.5% to 2.5% and respiratory of 2.0 - 3.0% per week from East Timor data.⁵

The surveillance provides an additional insight into deployment related medical conditions. Infectious etiologies are prominently considered during deployment medical planning, while this data suggests that injuries are the leading causes of lost work days in the deployed situation. This is not to minimize the threat from infectious etiologies under deployed conditions, but to note that injuries should be considered as well. Potential injuries from recreation and work-related causes need to be included in deployment planning. CJTF surgeons should be monitoring injuries and provide appropriate preventive medicine strategies to the CJTF commanders.

Conclusions

Medical surveillance for US troops in Haiti in 2004 found an overall DNBI rate of 5.1%. It is lower than previous reports in Haiti, though comparable to reports from other operations. Injuries from recreation and work were leading causes of lost work days during the deployment.

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A Case of Fatal Pneumonia in an Active Duty Healthcare Worker

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Respiratory diseases pose a significant threat to US service members and their families stationed overseas.¹ As illustrated by the emergence of Severe Acute Respiratory Syndrome (SARS) in 2002-2003, and the spread of avian influenza throughout Asia in 2003-2004, those stationed within the Pacific Command (PACOM) area of responsibility (AOR) are at risk from emerging infectious agents causing febrile respiratory illness (FRI). The vast majority of FRI cases will not be due to an emerging infectious agent, however, and the Centers for Disease Control and Prevention (CDC) have published guidelines for diagnosis, control, and surveillance for SARS-CoV in patients presenting with community acquired illness.²

In early April 2004, the Navy Environmental and Preventive Medicine Unit No. 6 (NEPMU 6) in Pearl Harbor, HI, investigated a fatal case of pneumonia in a health care worker at a Navy Military Treatment Facility (MTF). This report summarizes the case investigation, and highlights important

considerations for clinicians and preventive medicine personnel stationed in the forward-deployed environment.

Case Report

On April 6, 2004, an active duty Intensive Care Unit (ICU) nurse at a Navy MTF was admitted to the hospital for pneumonia. He presented with cough, shortness of breath, mild chest pain and a fever > 100.4 °F (38°C). A chest radiograph revealed mild bilateral infiltrates. The patient was admitted to the hospital under airborne isolation precautions and treated with IV antibiotics. His condition rapidly worsened and he was moved to the ICU and placed on mechanical ventilation the following day. A subsequent chest radiograph revealed a marked worsening of his pulmonary infiltrates. A transthoracic echocardiogram was normal. On April 10th, the patient experienced multiorgan failure, and respiratory support was withdrawn. He had a travel history significant for travel

(Continue on page 12)

NAVAL DISEASE REPORTING SYSTEM (NDRS)**Summary of 2004 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 – 30 Jun 2004

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	0	0	0	Lyme Disease	3	1	2
Anthrax*	0	0	0	Malaria (specify type) *	5	4	1
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	26	14	12	Meningitis (aseptic, viral)	10	5	5
Bites, venomous animal	1	0	1	Meningitis (bacterial other than Meningococcus)	0	0	0
Botulism*	0	0	0	Meningococcal disease*	0	0	0
Brucellosis	0	0	0	Mumps	0	0	0
Campylobacteriosis*	5	4	1	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*	0	0	0
Chlamydia	912	573	339	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	0	0	0
Coccidioidomycosis	6	6	0	Poliomyelitis*	0	0	0
Cold injuries	0	0	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	Rheumatic fever	0	0	0
E. Coli 0157:H7 infection*	0	0	0	Rift Valley fever	0	0	0
Ehrlichiosis	1	0	1	Rocky-Mountain Spotted Fever	3	0	3
Encephalitis*	0	0	0	Rubella*	0	0	0
Filariasis	0	0	0	Salmonellosis*	5	4	1
Giardiasis	5	3	2	Schistosomiasis	0	0	0
Gonorrhea	159	104	55	Shigellosis*	0	0	0
Haemophilus influenza, type b	0	0	0	Smallpox*	0	0	0
Hantavirus infection*	0	0	0	Streptococcal disease, Group A	3	2	1
Heat injuries	35	3	32	Syphilis	11	7	4
Hemorrhagic fever*	0	0	0	Tetanus	0	0	0
Hepatitis, A (acute, symptomatic only)	1	1	0	Toxic shock syndrome	0	0	0
Hepatitis, B (acute, symptomatic only)	1	1	0	Trichinosis	0	0	0
Hepatitis, C (acute, symptomatic only)	2	1	1	Trypanosomiasis	0	0	0
Influenza (confirmed)	0	0	0	Tuberculosis, pulmonary active*	4	2	2
Lead poisoning	0	0	0	Tularemia*	0	0	0
Legionellosis*	1	1	0	Typhoid fever*	0	0	0
Leishmaniasis	4	3	1	Typhus*	0	0	0
Leprosy (Hansen's disease)	0	0	0	Urethritis (non gonococcal)	84	8	76
Leptospirosis*	0	0	0	Varicella	2	1	1
Listeriosis	0	0	0	Yellow fever	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 377,369 for USN and 175,616 for USMC. Table

1 shows Active Duty only. Table 2 shows non-Active Duty Beneficiaries.

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	0	0	0	Lyme Disease	1	0	1
Anthrax*	0	0	0	Malaria (specify type) *	0	0	0
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	43	6	37	Meningitis (aseptic, viral)	11	8	3
Bites, venomous animal	0	0	0	Meningitis (bacterial other than Meningococcus)	3	3	0
Botulism*	0	0	0	Meningococcal disease*	1	1	0
Brucellosis	0	0	0	Mumps	1	0	1
Campylobacteriosis*	2	2	0	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*	0	0	0
Chlamydia	188	127	61	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	0	0	0
Coccidioidomycosis	2	2	0	Poliomyelitis*	0	0	0
Cold injuries	0	0	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*	0	0	0	Rocky-Mountain Spotted Fever	1	0	1
Ehrlichiosis	0	0	0	Rubella*	0	0	0
Encephalitis*	0	0	0	Salmonellosis*	13	9	4
Filariasis	0	0	0	Schistosomiasis	0	0	0
Giardiasis	0	0	0	Shigellosis*	3	1	2
Gonorrhea	20	14	6	Smallpox*	0	0	0
Haemophilus influenza, type b	2	1	1	Streptococcal disease, Group A	13	11	2
Hantavirus infection*	0	0	0	Syphilis	3	3	0
Heat injuries	3	3	0	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)	0	0	0	Trypanosomiasis	0	0	0
Hepatitis, C (acute, symptomatic only)	2	2	0	Tuberculosis, pulmonary active*	5	5	0
Influenza (confirmed)	6	5	1	Tularemia*	0	0	0
Lead poisoning	0	0	0	Typhoid fever*	0	0	0
Legionellosis*	0	0	0	Typhus*	0	0	0
Leishmaniasis	0	0	0	Urethritis (non gonococcal)	0	0	0
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 9)

to Hong Kong from March 1st through 4th, and Australia from March 4th through 11th and was apparently well upon his return. He had no known ill contacts, or exposure to animal markets or poultry farms anywhere in Asia.

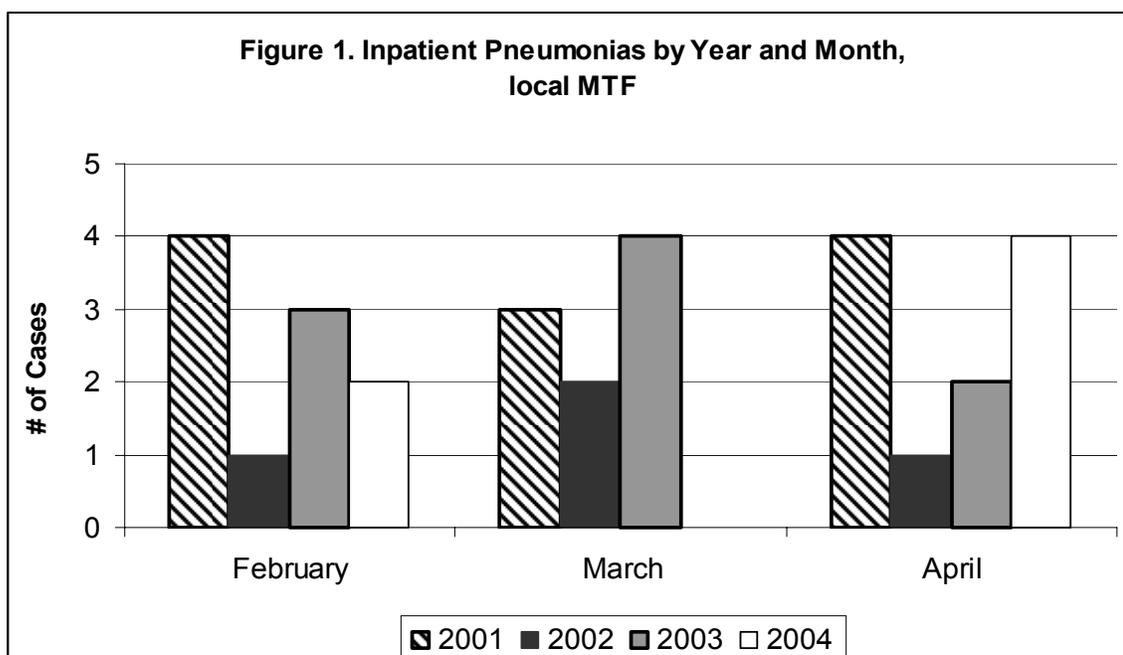
Epidemiologic Investigation

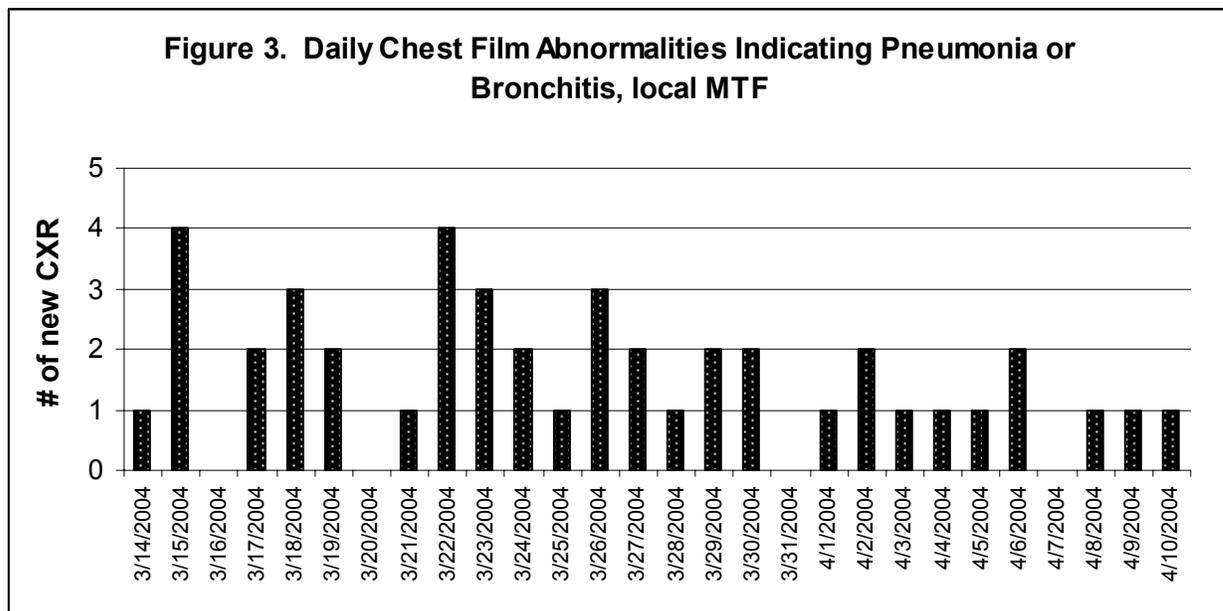
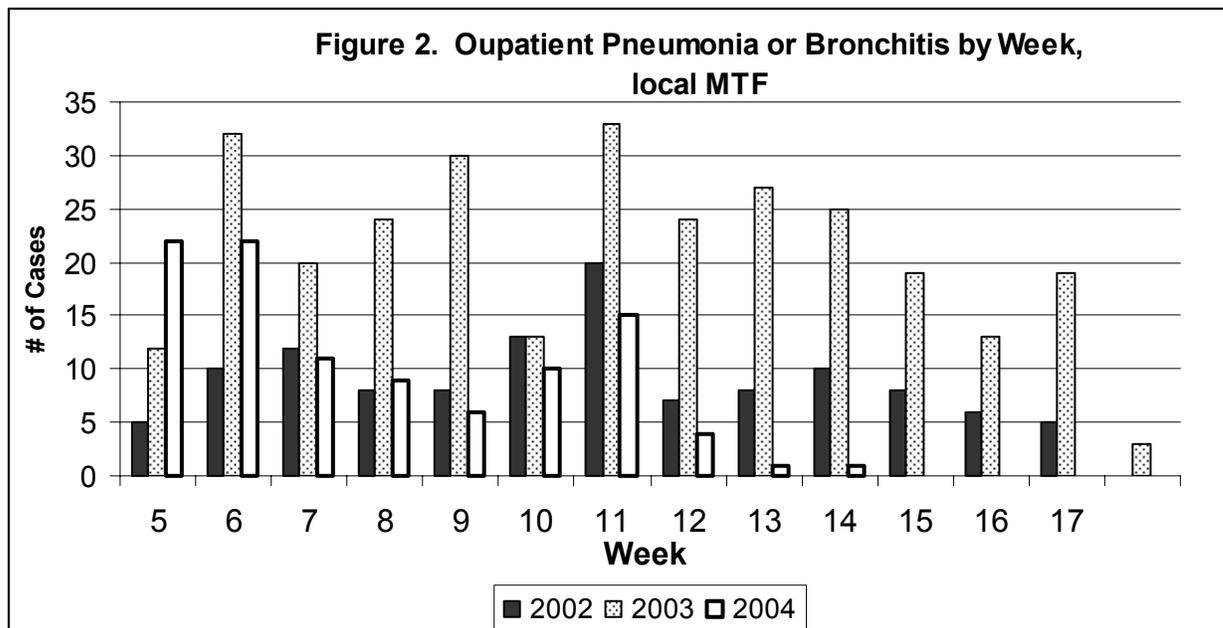
Nasopharyngeal swabs submitted for viral culture for common respiratory viruses including influenza, parainfluenza, adenovirus, and respiratory syncytial virus were negative. Studies for mycoplasma, legionella, echovirus, human metapneumovirus, coronavirus (OC43E and 229E), *S. pneumoniae*, *C. pneumoniae*, and *N. meningitidis* were also negative. All bacterial cultures were negative. The patient had positive serology for parainfluenza II and III, and coxsackievirus A9 and B4.

Prior to becoming ill, the patient had cared for two other patients with pneumonia. The first, a 34 y/o female was admitted to the surgery service on April 1st with a four day history of fever and abdominal pain. She had no history of recent travel. She was taken to surgery for exploratory laparoscopy (negative finding), experienced respiratory failure immediately after extubation, was reintubated, and found to have bi-

lateral pneumonias. She was extubated the following day and discharged on April 8th after responding to antibiotics, and with a diagnosis of aspiration pneumonia. The second was a 52 y/o female, who was admitted to the ICU on April 4th with a diagnosis of left lower lobe pneumonia. She had been to Tokyo and stayed in a U.S. Military hotel March 27th - 28th. She responded to antibiotic therapy and was discharged on April 9th. A third pneumonia patient was admitted to the MTF on April 10th. He responded to antibiotic therapy and was discharged on April 10th. The etiologic agents responsible for these three pneumonias were not identified.

All four patients' recent contacts were queried regarding recent travel history to Hong Kong, China, or Taiwan, and asked about recent illnesses. Ships and tenant commands were contacted about recent pneumonia cases revealing one patient who had been treated for pneumonia as an outpatient, and who had recovered fully. The base schools and daycare facilities were contacted in an attempt to find children who were recently absent due to illness. Any person identified via the contact tracing and case-finding activities as having cough, myalgias, fever, or any other respiratory symptom, or other health concerns were offered an evaluation by a provider in the Ambulatory Care





Clinic. There were fifteen such evaluations, none of which resulted in the diagnosis of pneumonia or any other febrile respiratory illness.

Pneumonia admissions at the MTF for the months of February, March and April 2004 were compared to those of the three previous years (fig. 1). Outpatient diagnoses of pneumonia and bronchitis (ICD-9 480-487 and 466, 490-491 respectively) were similarly compared with previous years (fig. 2). The number of new chest radio-

graphs, with findings suggestive of possible pneumonia or bronchitis, were determined for the previous 30 days (fig. 3). The DoD GEIS influenza surveillance system was queried to determine background influenza-like illness (ILI) activity for the Pacific Rim region, as well as for the Naval base at the MTF, and the nearby Air Force base (AFB). This showed a small increase in ILI activity for the region, and the AFB, but not for the Naval base (data not shown).

Discussion

This case of fatal pneumonia in an active duty healthcare worker, while likely the result of a common respiratory pathogen, illustrates a number of important issues relevant to the preparation and response for emerging febrile respiratory pathogens. While the etiology of the patient's pneumonia remains unproven, it is plausible that he may have contracted his illness from one of the two previous pneumonia patients that he cared for. Notwithstanding the fact that these two patients responded to antibiotics, suggesting a bacterial etiology for their pneumonias, and the ICU nurse did not, suggesting a viral pathogen, the previous two patients may have had a coinfection with a respiratory virus. Alternatively, it seems likely that the ICU nurse did not contract his illness from the second patient due to the relatively short time period between contact with the patient and onset of his illness. Likewise, patient one was diagnosed with aspiration pneumonia, a noncontagious condition, making this an unlikely source of the ICU nurse's infection as well.

Additionally, the ICU nurse had a history of travel to Hong Kong prior to his becoming ill. While initially alarming, the fact that he left Hong Kong 35 days prior to the onset of illness makes it unlikely that he contracted a respiratory infection while there. The CDC guidance for considering the diagnosis of SARS-CoV infection in patients with a travel history to Hong Kong states that the travel should have occurred within 10 days of onset of symptoms. This, combined with the lack of exposure to others with recent travel to China, Taiwan or Hong Kong, made SARS-CoV an unlikely diagnosis in this patient.

There was also no evidence of an increase in respiratory infections in the local area. Inpatient and outpatient diagnoses of pneumonia and bronchitis were not increased over past levels. The inpatient census for pneumonia for April 2004 had reached a total of four within the first 10 days of the month. This was as high as the maximum value for any similar month in recent history, suggesting that the overall rate of pneumonias may have been high in early April 2004. The fact that March 2004 had no patients admit-

ted for pneumonia, as well as the failure of intense case-finding activities to identify new cases seem to suggest otherwise, and the four pneumonias seen in early April likely represented random temporal clustering.

The data available do not support an outbreak of pneumonia in the local Naval community. There was no strong evidence that any of the four pneumonia cases shared a common exposure.

Infectious agents responsible for pneumonias often go undiagnosed. In a recent Streptococcal pneumonia outbreak at the Marine Corps Recruit Depot in San Diego, nearly 40% of the infectious agents were unidentified, despite comprehensive diagnostic measures.³ This underscores the need for prompt isolation, and strict infection control practices, as well as the rapid notification of public health personnel when a cluster of febrile respiratory illnesses is suspected in the healthcare or operational setting. It also highlights the importance for healthcare personnel to be familiar with the CDC's recommendations on evaluation of patients who present with community acquired illness.

Acknowledgements

The author thanks the preventive medicine staff of the Navy MTF reported here, as well as the staff of the Naval Health Research Center.

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Population Health Navigator (PHN)

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Navy Medicine continually strives to improve the quality of health care delivery while maintaining cost-competitiveness.¹⁻⁴ Appropriate tools are required to support commands in their Population Health efforts and to assess and monitor the health status of their populations. Population Health Navigator (PHN) is a new web-based tool that has been selected by BUMED as the medical informatics tool to be utilized by MTFs. In addition to assisting with population health and process improvement efforts, PHN allows MTFs to assess data quality, enrollment management, demand forecasting, utilization of services, and the quality of healthcare provided to beneficiary populations.

Developed by the US Air Force, PHN is a Tri-Service web-based medical informatics tool that allows easy access to standardized metrics and predefined queries for 14 clinical preventive services, diseases and conditions. The modules include: asthma, beta-blocker use following myocardial infarction, cardiovascular risk factors, breast cancer screening, cervical cancer screening, depression, diabetes, hypertension, and low back pain. The data presented in PHN is obtained from Defense Enrollment Eligibility Reporting System (DEERS), M2, Pharmacy Data Transaction Service (PDTs) and Composite Health Care System (CHCS) and reflects inpatient and outpatient care, from both military and network treatment facilities. By collating data centrally, PHN provides the ability to track individuals who seek medical care from different medical institutions.

PHN provides dual functionality. First, PHN allows commands to measure the quality of healthcare provided to beneficiaries by providing HEDIS (Health Plan Employer Data and Information Set) metrics. HEDIS metrics are nationally-recognized standards, published by the National Committee for Quality Assurance (NCQA)

and used by large healthcare organizations to measure and compare their clinical performance.

Secondly, PHN delivers patient-level information in easy-to-use action lists. Depending on the module, data includes demographic information, utilization data, laboratory results, pharmacy information, and radiological studies. Within the program, any of the fields can be sorted including those for providers, primary care manager, clinic type and clinic location. Action lists can be manipulated either directly in the program or downloaded into spreadsheets and databases to assist with patient tracking, data registries and disease management. Data can also be exported into statistical programs for more elaborate analyses.

Based on the readily available data and standardized methodology in the PHN program, the Navy Medicine Business Plan has initially established 4 clinical quality metrics for monitoring MTF clinical performance (Table 1).⁵ These metrics were chosen because they are characteristic of preventive, acute and chronic care conditions seen at most MTFs across Navy Medicine. Although commands are able to use other medical informatics programs (e.g., SQL servers, local databases), BUMED's clinical quality metrics are obtained from the HEDIS metrics as reported in the PHN.

To complement the PHN program, the PHN metric dashboard has been created. Figures 1-4 show the graphic dashboard display for the initial 4 clinical quality metrics. These graphs allow comparison with other MTFs, Navy Medicine averages, and national HEDIS benchmarks. It includes drill-down capability to the level of the individual clinic and also displays enrollment denominators. The dashboards will be updated quarterly and are available at <https://dataquality.med.navy.mil/reconcile/pophealth/>. These, along with other Population Health tools are also available as a

resource kit on Navy Medicine Online (<https://navymedicine.med.navy.mil/med.cfm?selTab=Toolkits>).

Additional information and assistance is available on the NEHC PHN webpage at http://www.nehc.med.navy.mil/hp/ph_navigator/index.htm or by calling NEHC directly (POC LCDR Annette M. Von Thun, vonthuna@nehc.med.navy.mil, telephone: 757-953-0970). In order to obtain an account for the PHN, MTF-designated personnel should contact Ms. Elizabeth Ruschmeier at emruschmeier@us.med.navy.mil or telephone: 202-762-3139.

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Table 1. Current BUMED Clinical Metrics

For diabetic patients age 18-75, hemoglobin A1C of less than or equal to 9.5%.
For diabetic patients age 18-75, LDL cholesterol less than 130 mg/dl.
For asthmatic patients age 5-56, use of long-term medications.
For women age 52-69, current mammogram in the previous 24 months.

Figure 1.

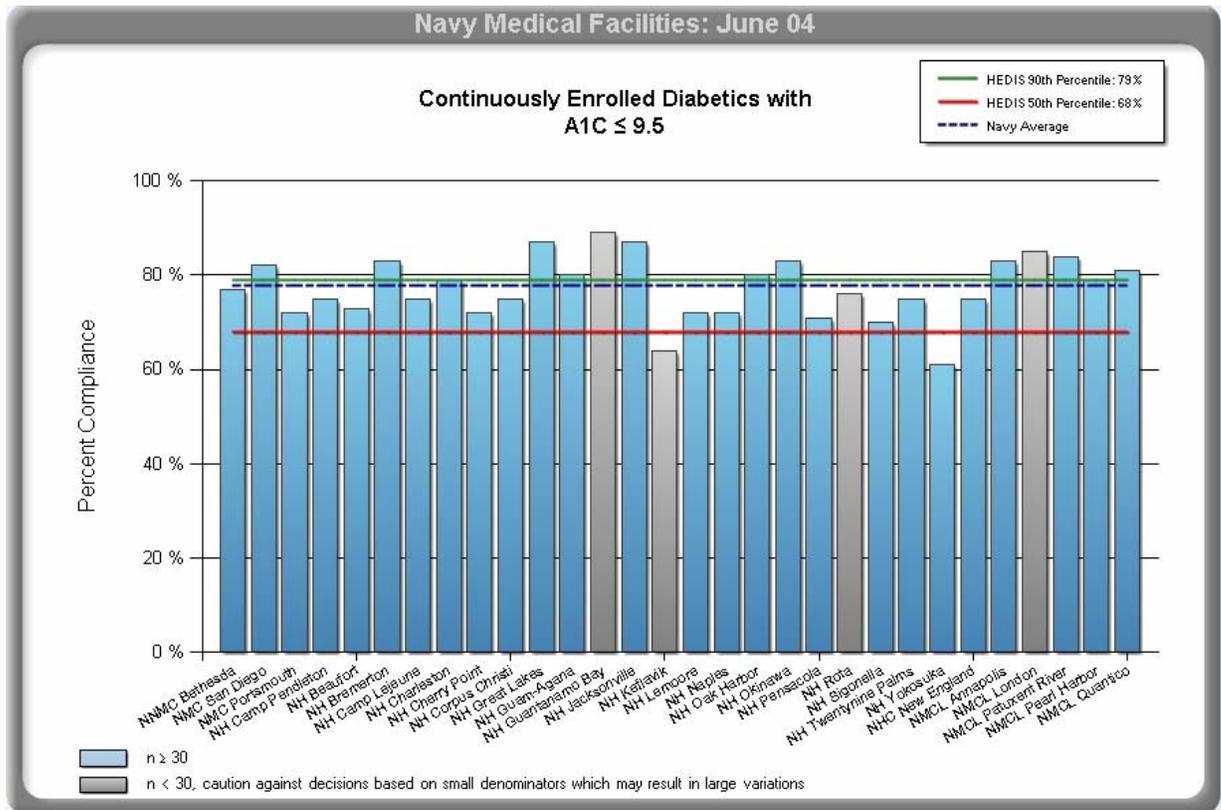


Figure 2.

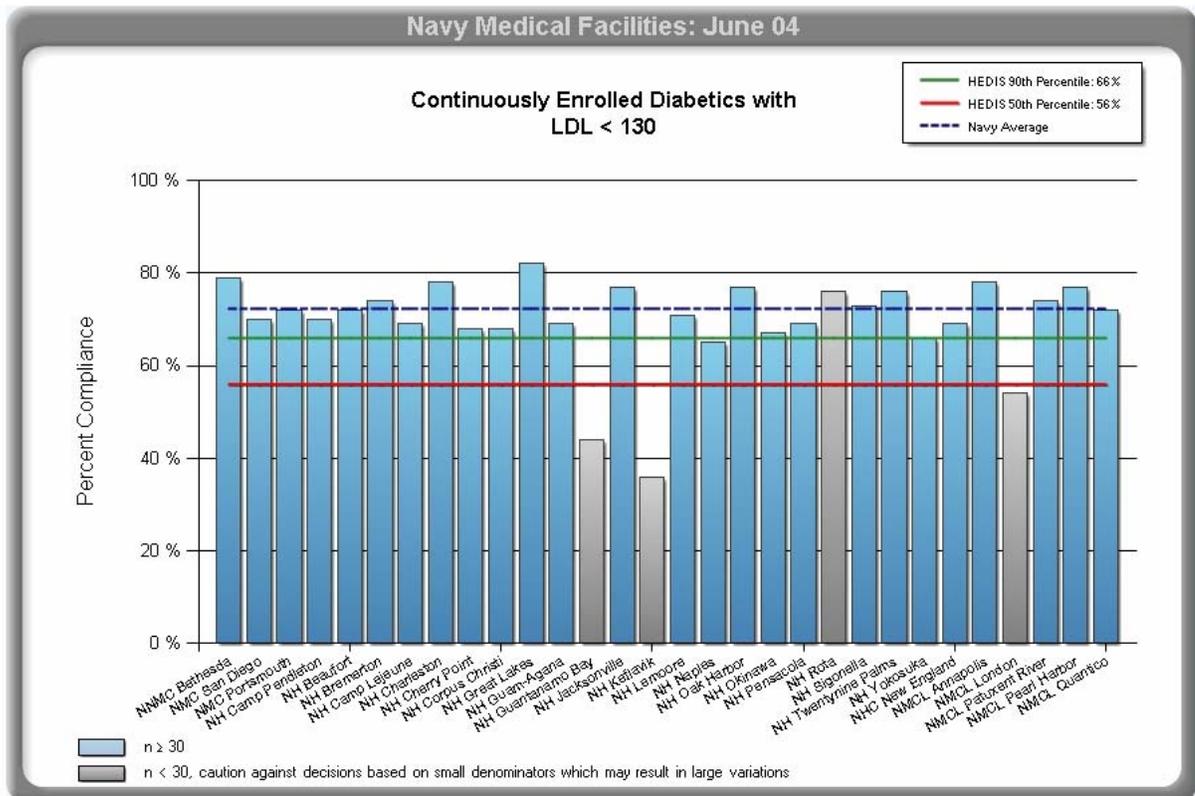


Figure 3.

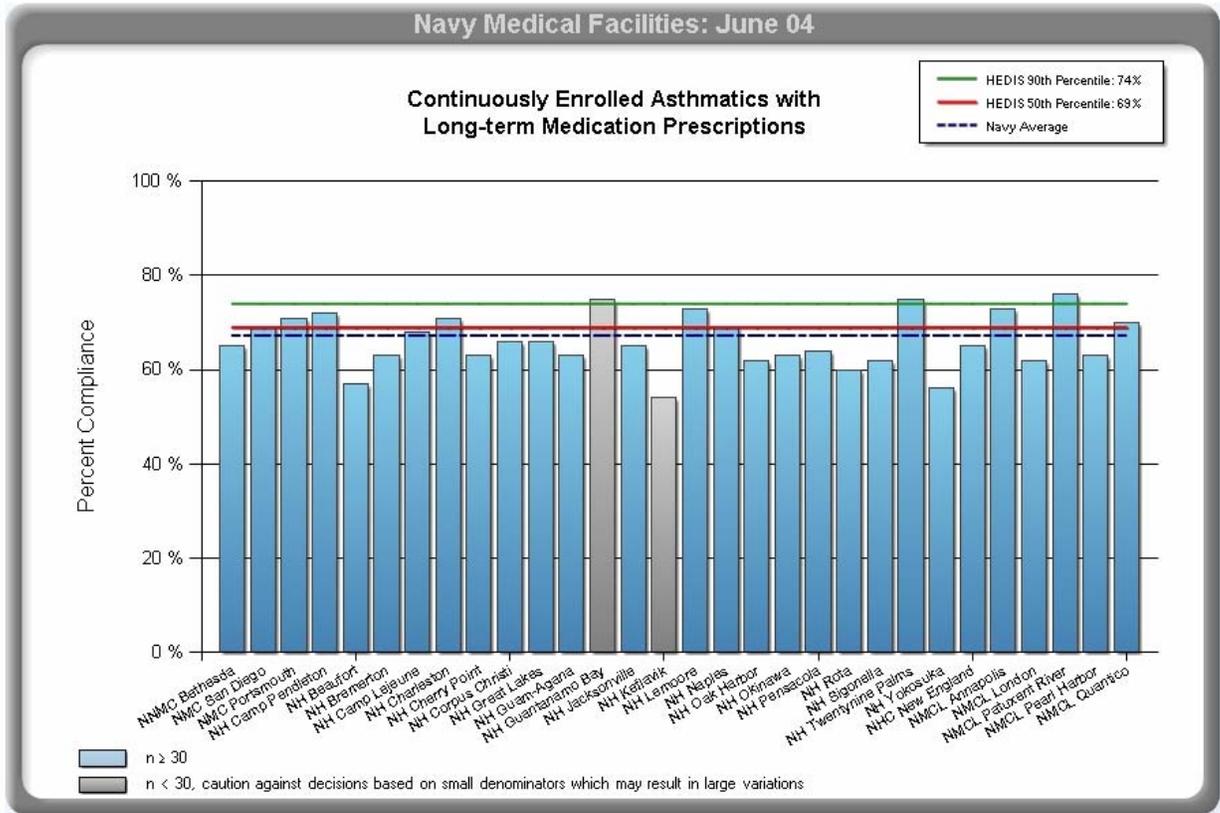
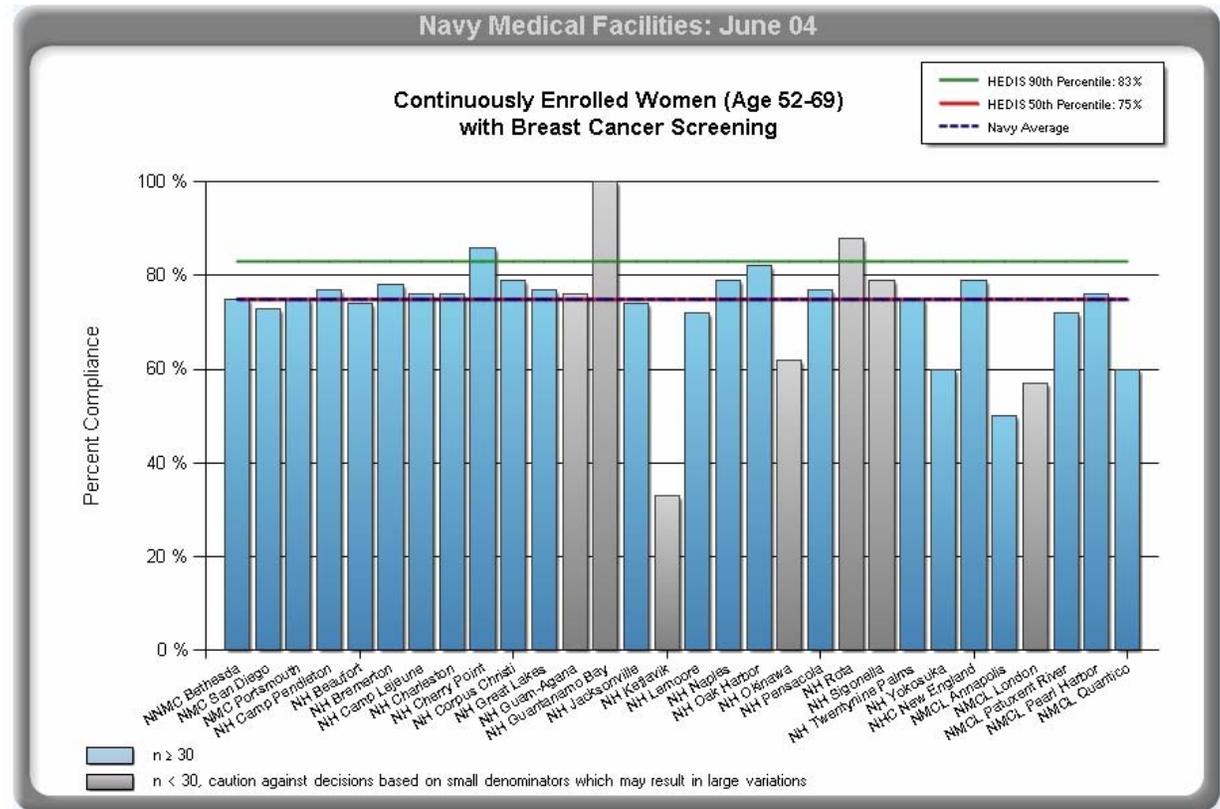


Figure 4.



Vaccine Adverse Event Reporting System (VAERS) Update

Table 1 displays the total Anthrax VAERS reports submitted by each service to the Army Medical Surveillance Activity through 30 June 2004 in support of the Anthrax Vaccine Immunization Program. Reactions are classified per DoD Memorandum 15 October 1999, Policy for Reporting Adverse Events Associated with the Anthrax Vaccine. Table 2 displays all VAERS re-

ports, by vaccine type, submitted to NEHC through 30 June 2004. Reactions are classified using adverse event guidelines of the Centers for Disease Control and Prevention. Table 1 includes active duty personnel only while table 2 includes Navy and Marine Corps active duty and beneficiaries.

Table 1. Anthrax Vaccine Immunization Program VAERS Cumulative Data by Service, Active Duty Members (28 Aug 1998 - 30 Jun 2004)

Service	Classification				Cum. Totals
	Local Reaction			Systemic Reaction	
	Mild	Moderate	Severe		
USA	29	35	14	83	161
USN	9	21	11	70	111
USAF	37	79	58	410	584
USMC	1	13	3	20	37
USCG	0	1	0	0	1

*Excludes 4 VAERS Reports on Anthrax and Non-DoD Reports

Table 2. Navy and Marine Corps VAERS Cumulative Data by Vaccine Type, Active Duty and Beneficiaries (01 Dec 2002 - 30 Jun 2004)

Vaccination/Event	Classification		Cum. Totals
	Serious*	Non-Serious*	
Anthrax	1	41	42
Smallpox	9	95	104
Anthrax + Smallpox	3	9	12
Other	1	21	22
Cum. Totals	14	166	180

* CDC defines serious adverse events as death, life-threatening illness, hospitalization or prolongation of hospitalization, or permanent disability. A non-serious adverse event then includes any other adverse event reported (<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5201a1.htm>)

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