Fleet Public Health

Navy Environmental Health Center

Volume 6, No. 1

January, 2001

NEPMU-7
Sigonella, IT

Inside this Issue:

	Page
"To Barge or Not to Barge"	1
From the SEL	2
From the OIC: **Preventive Medicine and Force Health Protection**	3
Medical/Dental Civic Action Program for Samoa	4
Medflag 00-02 Mauritania	5
Viral Gastroenteritis Study Expanding to Atlantic Fleet	7
Epidemiology at NEPMU-7	7
Complexities of Malaria Control in São Tomé/Principe	8
Sustainable Malaria Control in the Republic of Suriname	10
NEPMU-2's FDL Augments 2nd Medical Battalion during Exercise ROVING SANDS	12
Initiatives in Food Service	13
Dances With Mosquitoes	14
Hail & Farewell	15

"To Barge or Not to Barge"

Frequently, here at NEPMU-7, we get questions concerning whether it is acceptable to obtain potable water from port barges throughout the Mediterranean, Gulf, and European regions. Generally speaking, the answer is, "yes." You, the inspecting Medical Department Representative (MDR) must conduct all the standard steps in accordance with NAVMED P-5010-6, to draw sound conclusions when making an acceptance determination. When results of your preliminary testing fail to meet standards, you can recommend rejection of the product. This usually results in your suddenly being made to feel like the bad guy, or having wasted someone's time. However, think of it this way, 'greatest good for the greatest number,' and Fleet health comes first!

Potable water at sea and around foreign ports is a scarce commodity. Let's face it. Depending on the necessity, you may feel a need to accept a shipment that is questionable in meeting minimum standards. Anyone, who has experienced reduced water rations underway for over a week will appreciate your efforts. In addition to the P-5010 reasons for rejection, you should always consider the potential for biological or chemical agent contamination. For regions with an active terrorist threat, or when you're concerned/suspicious about such, you should seek guidance from a higher authority concerning the security of the product/service.

FYI, when it comes to barges and potable water, contrary to "general rumor control," the lowest bidder does not necessarily get the contract. There is a real-time official office that directly arranges and evaluates the availability of supplies and logistics support to deployed forces. The U. S. Naval Regional Contracting Center (NRCC) covers all continents. The command is staffed with highly trained professionals making periodic physical visits to various sites and working with local husbanding agents to procure the best services within all regions. Your water service is paid for and must be delivered as stated by contract. However, just like in the preventive medicine business, they can't be everywhere, all the time, and there *may* be deliveries that fall short of our expectations. Your vigilance remains the 'eyes and ears' of the Fleet, providing medical checks and balances.

As of last year, potable water must be chlorinated and free of any contamination, rendering it consumable. Barges delivering potable water should be sole use only, appear clean, and be in good working order. Should your FAC check not meet the requirements, the product *may* still be acceptable. If you are satisfied with the clarity, color, and organoleptic qualities, you may accept the water. However, isolate it from ship's potable water, then batch chlorinate it to 2.0 ppm, or separately distribute it through the distillation plant on board. In 48-72 hours, if the original bacteriological tests are positive for coliforms, you will have proactively performed corrective action.

(Continued on page 4)

From the S.E.L.

Happy Birthday fellow Preventive Medicine Technicians (PMTs). We are now 50 years old. The first Environmental Sanitation Technician class convened on November 1st, 1950 at Oakland Naval Hospital, Oakland, CA. The name officially changed to Preventive Medicine Technician School in 1963 and began classes at its present site, Naval School of Health Sciences, San Diego, CA October, 1994.

Often we are asked, "What does a PMT do?" or the question I get a kick out of hearing, "You folks are never in your office, what exactly are you doing, skating?" I recently reviewed the Navy Enlisted Classifications for the time period of March 1984 – Jan 2000. Listed are at least 39 functions that PMTs are responsible for performing, depending on the duty station. How do we compare with the other services? Well, in some cases, those 39 functions are separated into specialties. While recently deployed with another branch of the service, I was asked repeatedly which area of Preventive Medicine I specialize in and received a look of astonishment when I replied that each PMT is trained and responsible for doing it all. Later, when I was applying a dressing to a slightly injured soldier, I was told I should have asked a medic to do that, and had to explain that each PMT is also a Hospital Corpsman. I must admit, it filled my heart with pride to see how well PMT's were trained, compared to the specialties in other services.

While sitting here contemplating the rich history of PMTs and the excellent service that our NEC has provided over the years to the fleet, I feel so fortunate to have been a part of the school's noble past, both as student and instructor. As we observe our past accomplishments, dating back to every operation since the Korean War, we can all hold our heads up high with pride. We can carry on the great tradition that our NEC has maintained for so long. It is extremely probable that even as you read this, there are PMT's deployed on each continent, diligently doing what we do best: protecting people.

Well, I know you must go out now and perform one of the 39 functions mentioned earlier. So "Happy Birthday" again. Let me leave you with a Navy Preventive Medicine trivia question: Name the only PMT that taught at both of the PMT school locations, Oakland and San Diego? (See the answer below.)

HMC (FMF) Jimmie Mayweather
SEL

NEXT ISSUE: APRIL 2001
Your articles are due, ***via your chain of command*** by **22 FEBRUARY 2000** to:

OFFICER IN CHARGE
ATTN B. ZIMMER
NAVENPVNTMEDU FIVE
3235 ALBACORE ALLEY
SAN DIEGO CA 92136-5199
E-mail: bszimmer@nepmu5.med.navy.mil

Fleet Public Health Available in Full Color!

Simply send an e-mail to:

Nepmu5@nepmu5.med.navy.mil

And sign up for e-mail delivery.
Give address from label, if receiving, and your e-mail delivery address.
OR…
View it on line at:
http://www-nehc.med.navy.mil

Fleet Public Health
Vol. 6, No. 1, January, 2001

Fleet Public Health is published quarterly by NEPMU-2 (April), NEPMU-5 (July), NEPMU-6 (October), NEPMU-7 (January). Responses comments and suggestions for articles of timely interest are solicited. Send correspondence to the appropriate editor for your area.

NEPMU-2
1887 POWHATAN STREET
NORFOLK, VA 23511-3394
Officer in Charge
D.C. Fulton, CAPT, MC, USN
Editor: E. Gomez, LT, MSC, USN

Phone: (757)444-7671, DSN: 564-7671
FAX: (757)444-1191, DSN: 564-1191
E-mail: gomeze@nepmu2.med.navy.mil
NAVENPVNTMEDU TWO NORFOLK VA

NEPMU-5
3235 ALBACORE ALLEY
SAN DIEGO, CA 92136-5199
Officer in Charge
J. E. Tueller, CAPT, MC, USN
Publishing Editor: Ms. B. S. Zimmer

Phone: (619)556-7070, DSN 526-7070
FAX: (619)556-7071, DSN 526-7071
Website: http://www.nosc.mil/usn/nepmu5
E-mail: nepmu5@nepmu5.med.navy.mil
NAVENPVNTMEDU FIVE SAN DIEGO CA

NEPMU-6
1215 NORTH ROAD
PEARL HARBOR, HI 96860-4477
Officer in Charge
H. James Beecham III, CAPT, MC, USN
Editor: Mr. Bart Landis

Phone: (808)473-0555, DSN (315)473-0555
FAX: (808)473-2754, DSN (315)473-2754
Website: http://www.nepmu6.med.navy.mil
E-mail: nepmu6@nepmu6.med.navy.mil
NAVENPVNTMEDU SIX PEARL HARBOR HI

NEPMU-7 SIGONELLA
PSC 824 BOX 2760
FPO AE 09623-2760
Officer in Charge
Charles B. Rhodes, CDR, MSC, USN
Editor: Karen S. Corson, LT, MSC, USNR

Phone: 011-39-095-56-4101, DSN 624-4101
FAX: 011-39-095-56-4100
E-mail: sig1pmu@sig10.med.navy.mil
NAVENPVNTMEDU SEVEN SIGONELLA IT

From the OIC:

Preventive Medicine and Force Health Protection

Today's world continues to challenge our military forces through numerous deployments with high-tempo operations supporting global commitments. Both extended peacekeeping and operations other than war, military or humanitarian, thinly stretch our military's ability to provide the necessary support for mission success. We are also charged with having to maintain readiness for two potential simultaneous major regional contingencies with fewer active duty and reserve personnel to staff the ships, aircraft, ground ground forces, and combat/operational support units. Thus, the availability and effort of every active duty, reservist, and civilian workforce member in the U .S. military is vital.

Navy Preventive Medicine has always played a significant role in protecting the health of sailors and marines throughout the world. The traditional preventive medicine programs and efforts of our Preventive Medicine Technicians and Officers have been enhancing health for years. Our vector-bome disease control efforts, communicable and infectious disease prevention, epidemiology, basic field sanitation, environmental health, and Navy occupational safety and health programs have prevented countless cases of disease and non-battle injuries. Yet, today our efforts alone are not enough to ensure the CINCs and the Operational Commanders we support that their forces are benefiting from maximum force health protection. Traditional Navy preventive medicine efforts must be provided in concert with all other facets of Navy health services.

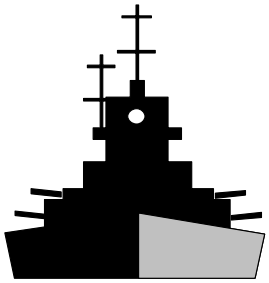
Since Operation DESERT STORM, a profound change towards a total health service support system has occurred. The ever-escalating costs of clinical health services, the Gulf War Syndrome, and the recognition of the major role of health maintenance and preventive medicine in the provision of Force Health Protection, have all resulted in Navy Medicine emphasizing preventive health and health maintenance. Currently, we witness aggressive and robust health promotion and wellness programs working alongside our clinical and preventive medicine efforts. Simultaneously traditional and preventive medicine for our fighting forces further protects their health and prevents disease and injury while in homeport or deployed. Other force health protection programs such as ground, fleet, and flight operations safety also do their part in preventing injuries and keeping people on the job. For those that do fall victim to disease or injury, one of the world's premier clinical health care systems is standing by to provide first-rate care for the individual and return them to duty as soon as possible. This dynamic mix of capability yields comprehensive health services support. The end result is Force Health Protection.

Today, those of us working in the Navy Environmental and Preventive Medicine Units, Disease Vector Ecology and Control Centers, and other traditional preventive medicine units ashore and afloat are part of a robust service-wide health service support system. No single part of this system can succeed without the others if we are to ensure that we are truly providing maximum Force Health Protection.

We must continuously look beyond the limits of our own professional areas of expertise and classic methodologies, and ask ourselves several questions. First, how can we better fit in with health promotion efforts, safety, occupational health programs, and clinical health care systems. Second, how can we better educate and help traditional health service professionals understand the importance of this team concept in providing seamless health services throughout the entire spectrum of military service? Our traditional medicine colleagues must likewise ask, how can we better support prevention? Whether it is a Family Practice physician routinely using "Putting Prevention into Practice" concepts or a shipboard safety petty officer working alongside the Preventive Medicine Technician to increase overall preventive health success, the time for commitment to total Force Health Protection is now!

Today, we are no longer just PMTs, EHOs, Epi Docs, and the like. Today, we are a team of Navy Force Health professionals. Our TEAM is ready, willing, and able to protect and preserve the health of all we serve anywhere, anytime.

CDR Charles B. Rhodes MSC USN
OIC, NEPMU-7



Medical/Dental Civic Action Program for Samoa

Last June, CINCPACFLT tasked Navy Environmental and Preventive Medicine Unit 6 (NEPMU-6) to deploy one Preventive Medicine Technician to Samoa (formerly known as Western Samoa), as part of a Navy medical team for a Medical/Dental Civic Action Program (MED/DEN CAP). Samoa is an independent nation in the South Pacific Ocean, about one-half of the way from Hawaii to New Zealand. The CINCPACFLT MED/DEN CAP provided humanitarian assistance on the main islands of Upolu and Savaii, whose populations total about 180,0000. As the NEPMU-6 representative, I conducted preventive medicine training for resident nursing and public health personnel in Apia, the capital city, located on Upolu. The classes covered epidemiology, personal hygiene, sexually transmitted diseases, food service sanitation, water sanitation, and vector control. The Samoans had a great interest in addressing health and sanitation issues, and were looking to improve their health standards and sanitation.

A Preventive Medicine Technician discusses personal hygiene with his students during the Food Service Sanitation class, taught as part of the MED/DEN CAP Team in Samoa. (Photo by CDR Stephen Serkies, 21st Dental Company, MCBH-Kaneohe Bay)

In line with this, the Samoan health care staff and I discussed public health awareness, as this was an issue of concern. For example, local custom allows uncared-for dogs to roam the hospital hallways, frequently making close contact with the staff and patients. We discussed the health hazard this presented, and decided that one remedy would be to install low fences and gates, to keep the dogs out. Another item discussed was the fashion of not wearing footwear on a regular basis. In the moist tropical environment, this greatly increases the risk of contracting a fungal infection of the foot. Such infections were common. The staff agreed that it would be a good idea to promote the wearing of sandals or shoes, to protect the feet from cuts and scrapes, and to help avoid contact with unsanitary soil.

Finally, there was the issue of following safety procedures and the wearing of personal protective equipment (PPE) when handling and applying insecticides. This was, and is, a very important issue, as Samoa has no water treatment facility, and most of their water comes from the village wells and underground springs. Before embarking onto the inter-island ferry, all vehicles must be sprayed with insecticide to prevent the spreading of insects and insect-vectored diseases between the islands. If not carefully monitored, this vehicle spraying program could be detrimental to the island water supply and the health of the residents.

Although Western Samoa currently lacks the financial resources to develop an aggressive public health awareness campaign, they are committed to public health and will be as pro-active as their resources allow. It was personally and professionally gratifying to join the CINCPACFLT MED/DEN CAP and assist this developing country with their preventive medicine program.

HM1 Michael Purvis

"To Barge or Not to Barge"

(Continued from page 1)

Basic considerations in the shipboard potable water business include; (1) get to know your ship's 'waterking.' (This individual works for the Engineering Division and their primary job is to make, treat, store, and maintain all potable water operations); (2) recommend filling all potable water tanks prior to making port calls; (3) conduct your testing/evaluation from the barge *before* you connect it to your ship's potable water hoses; (4) if the barge is filled pierside, go to the pier and conduct the inspection before they taxi to the ship. Always ensure that purchased potable water from foreign ports is isolated pending bacteriological testing. When dire emergency situations arise, remember the capability of the ship's distillation plant. It is designed to make potable water from bacteriologically contaminated sea water, provided the specific procedures set forth in Chapter 531 of Naval Ships' Technical Manual are followed. Remember, if you have a medical question, all of the NEPMUs are here to support you, and we are only an email/phone call away. 'Keep on barging,' and have a fine Fleet health day.

HM1 Michael Richardson

MEDFLAG 00-02
Mauritania

Would you volunteer to do a humanitarian exercise where there is uncertain water, stifling heat (> 100 F at midday), and weather that could flood your camp or whip you with unpredictable rain and sand storms? I volunteered. Although conditions were challenging, I found the exercise worthwhile. The American Embassy in the Islamic Republic of Mauritania and the Headquarters, United States European Command (USEUCOM) agreed to conduct a joint medical training exercise for sharing medical treatment procedures, building military-to-military cooperation, and providing cooperative medical assistance to the rural populace. This exercise, MEDFLAG 00-02, was from 12-28 September 2000. During the exercise the Task Force provided field sanitation training to the Mauritania military, medical training and assistance with ophthalmologic and dental care for the people of Aleg, a city 300 km inland from the capital of Nouakchott, and veterinary care to the camels of the 7th Military Region.

The Task Force was "combined" because it included a medical officer from the Royal Dutch Navy, two veterinarians from the Royal Army Veterinary Corps (UK), and a veterinarian and medical administration officer from the German Army (Bundeswehr Sanitaetsdienst). The Task Force was "joint" because it was comprised of 34 U.S. Army personnel (veterinarians, veterinary technicians, dentists, dental technicians, preventive medicine specialists, one preventive medicine officer, eye techs, one ophthalmologist, and support personnel), two U.S. Air Force personnel (one ophthalmologist and one eye tech), and seven U.S. Navy personnel (two dental officers, two dental techs, two preventive medicine techs, and one preventive medicine officer).

Mauritania is in northwestern Africa between Senegal and Western Sahara. One side borders the North Atlantic Ocean and the other side the Sahara desert. Mauritania's climate is generally hot and arid. In Nouakchott, average daytime temperatures reach 85 F (29 C) in the winter and well over 100 F (38 C) in the summer. Members of USEUCOM, US Army Europe (USAREUR), the 30th Medical Brigade, and the 100th Medical Detachment (VS HQ) conducted initial planning conferences and postponed the exercise from June to September because of extreme heat. Despite moving the exercise back 3 months, during the deployment in Aleg the high temperatures were regularly over 100 F with a high of 115 F. In Aleg our crew lived in tents with an occasional fan. One tent had been set up with an air-conditioning unit as a "break room" from the mid-day heat. Although the air-conditioning unit worked the first day, it was broken the rest of the time in Aleg. Our ophthalmologists and dentists set up clinics in a school building and a tent, while our preventive medicine team instructed twenty Mauritanian medics in a school classroom. Everyone took a long break between noon and 1600 each day, as a respite from the heat.

The school which was used as an ophthalmology clinic and dental clinic.

During our week in Aleg, the ophthalmologists were able to remove 81 cataracts and distribute 498 pairs of eyeglasses, the dentists extracted teeth from 545 patients (some of whom had more than one tooth extracted) and the veterinarians treated 197 camels.

Because of the heat, it was crucial to have safe water from an approved source. Taking enough potable water for the entire two-week mission had been discussed but was not chosen as an option. Unfortunately, after being asked to participate in the exercise in July, both Army and Navy preventive medicine personnel tried to join the final preplanning site visit in late July, but none were included. Although both the Task Force Commander and Deputy Commander reassured me, the Task Force Surgeon, that the Mauritanian bottled water tested fine, our preventive medicine team discovered that the locally purchased bottled water was not the same bottled water that had been tested on previous site visits. Unfortunately, this was discovered after the main body of the Task Force had been drinking this water. Fortunately, the Colilert testing of the bottled water was negative for coliforms. Our preventive medicine team also learned that biological testing of the bulk water source had not been conducted and the bulk water site had never been inspected. Though this water tested positive for coliforms,

A Preventive Medicine Tech. teaches pesticide spraying (with water) to the Mauritanian medics.

(Continued on page 6)

MEDFLAG 00-02 Mauritania

(Continued from page 5)

we had enough calcium hypochlorite to disinfect this water for hygiene purposes (showering, handwashing, etc.) Though preventive medicine had requested a potable water bull or buffalo to disinfect the bulk water and initially been told that it would not be provided, a water tank was locally procured after our arrival in Aleg. In spite of our good fortune regarding water, I made sure to write up an after action review to emphasize that knowledgeable Preventive Medicine personnel who can test water sites (both bulk and bottled water) need to be included in pre-planning and site visits.

With a Combined Task Force, one potential problem is medical evacuation. As we were leaving Aleg for Nouakchott on 25 September, I was told that one of our German Army officers was ill. His condition worsened on the several-hours-long vehicular journey to Nouakchott and by 1500 that afternoon, it was evident that he needed to be medically evacuated back to Germany. Multiple phone calls were made. The easiest call was getting an American surgeon in Landstuhl to agree to accept the patient in Germany. The hard part was getting the patient to Germany. Because the patient was a German national, Theatre Patients Movement Requirements Center (TPMRC) was initially resistant to either using US Air Force assets or giving approval for a commercial flight until we made it clear that we were responsible for the medical needs of this patient as he was a Task Force member. The other German Army officer on the Task Force was well-connected, and by midnight I learned that the Germans would send a med-evac plane to pick up the patient. The patient's condition worsened, requiring emergency surgery for an acute abdomen between 0300-0345 that night, which the Royal Dutch Navy doctor and I were able to observe. The German med-evac plane arrived within eight hours after surgery, with a surgeon and anesthesiologist aboard, ready to take the patient back to Germany.

The German Army officer's illness was the most serious illness during the MEDFLAG. There was no evidence of food-borne or water-borne illness among Task Force members. Credit for this can be attributed to the Task Force Commander's decision to keep all members on bottled water and MREs. There were a few members who developed blisters from blister beetles and heat rash. Our most serious heat-related casualty was a dentist who wasn't feeling well, but perked up after getting intravenous fluids.

Locally procured water tank used for bulk water in Mauritania

Fortunately, our Task Force stayed mostly healthy during the MEDFLAG. Hundreds of Mauritanians can now see better and eat with less pain than before our visit. A few hundred camels are also in better shape. And the twenty Mauritanian medics that our Preventive Medicine team taught know more about water testing, waterborne diseases, pesticide spraying for vector control, and how to prevent AIDS and other sexually transmitted diseases with condoms.

HMC Mayweather and CDR Sylvia Young teaching STD prevention to the Mauritanian medics.

In spite of many challenges, a lot of good came out of this MEDFLAG. Combined and joint participation allowed all individuals the opportunity to see how other services and countries conduct operations and work together toward a common objective. The medical personnel in this MEDFLAG were able to successfully provide care and training in a challenging field environment and are better prepared and trained for future contingency operations and support in difficult environments.

CDR Sylvia Young

Viral Gastroenteritis Study Expanding to Atlantic Fleet

A program to determine etiology and epidemiology of viral gastroenteritis outbreaks aboard Navy ships is expanding this year to include the Atlantic Fleet. Previously, the few outbreaks that have been studied were usually caused by strains of Human Caliciviruses (HuCV), such as Norwalk Virus. With most Navy episodes, nothing was done to learn about the causative strains, how they spread, or where they hide out on the ships. This made for little headway in devising countermeasures.

During the past two years, all eleven active "big decks" (LHA/D, CV/N) in the Pacific have been enrolled in a new study, based out of NEPMU-5, to rectify the situation. Each ship is given a pre-positioned box (actually 2 boxes) which contains enough supplies to collect stool, vomitus, and paired sera from 100 symptomatic cases. The ship simply stores the boxes until an outbreak occurs, then can choose to participate in the specimen collection. The ship can begin to collect specimens themselves and call the study team from NEPMU-5 to finish the job and confirm the presence of HuCV aboard ship (as was done with the USS PELELIU and USS CONSTELLATION last year). Alternatively, they can collect all the necessary specimens themselves (as the USS STENNIS had to do this year, as there was no travel money for the lab team). So far, four enrolled ships have reported outbreaks. The PELELIU and CONSTELLATION had almost simultaneous outbreaks beginning after port visits to Southeast Asia and continuing all the way into the Persian Gulf. These were investigated while in the Gulf by the NEPMU-5 team, which ran a capture antibody enzyme immunassay (EIA) and reverse transcriptase polymerase chain reaction (RT-PCR) to demonstrate the outbreaks were caused by different Genogroup I strains. The STENNIS experienced an outbreak in the open Pacific shortly after leaving San Diego. Those specimens were positive for a Genogroup II strain. The USS KITTY HAWK also reported a small outbreak that ended before reaching the number of cases needed to begin the study.

This year, funding from the DoD Global Emerging Infections System (GEIS) resumed, and the project was enlarged to include NEPMU-2 in Norfolk, VA, and the Naval Medical Research Unit 2 (NAMRU-2) in Jakarta, Indonesia. NEPMU-2 will coordinate the enrollment and response to outbreaks in the Atlantic Fleet "big decks" as they deploy to the Mediterranean Sea and Persian Gulf. The reference laboratory which developed these assays is headed by Dr. Jason Jiang, at the Center for Pediatric Research, Eastern Virginia, Medical School, also in Norfolk. They have worked with the Navy on recent Atlantic outbreaks, such as on the USS SARATOGA and USS EISENHOWER. NAMRU-2 also has recent experience in detecting HuCV from the USS INDEPENDENCE and USS GERMANTOWN outbreaks a few years ago, and expressed interest in collaborating with NEPMU-5. LCDR Scott Thornton, NEPMU-5, remains the Principal Investigator and POC for Pacific ships. Associate Investigator at NAMRU-2 is LCDR Tony Oyofo, MSC, USN. The POC for Atlantic Fleet ships is LT Eduardo Gomez-Saladin, Head, Biodetection Department, NEPMU-2, 1887 Powhatan St., NORFOLK, VA 23511, Tel.: (757) 444-7671, x3035 (office) x 3037 (lab) Fax: (757) 444-1191 DSN: (564)

by
Scott Thornton, LCDR, MSC, USN
Microbiologist
Principal Investigator

Eduardo Gomez-Saladin, LT, MSC, USN
Microbiologist
Associate Investigator

Epidemiology at NEPMU-7

At NEPMU-7, the Epidemiology Department is currently staffed by three epidemiologists and a preventive medicine technician. One of our epidemiologists will soon be stationed at the World Health Organization (WHO) in Geneva. While there, he will help conduct global surveillance of emerging infectious diseases. He will also serve as the Navy's medical liaison officer for health issues of common concern and interest to both the Navy and the WHO. Our AOR covers all of Europe, Africa, and the Middle East, including the Persian Gulf region, making up 120 countries altogether. We are responsible for all ground and afloat forces stationed or deployed throughout our AOR.

Our mission is to provide preventive medicine, country-specific disease recommendations, consultations on travel health, unusual disease occurrences, malaria chemoprophylaxis, and immunization principles and procedures. We also gather medical intelligence information, morbidity and mortality surveillance, and do onsite epidemiologic investigations of disease outbreaks.

We maintain vigilant surveillance of these areas utilizing the WHO, the Centers for Disease Control and Prevention (CDC), Program for Monitoring Emerging Diseases

(Continued on page 11)

Complexities of Malaria Control in São Tomé/Principe

Historically, malaria is considered to be mankind's #1 morbid, mortal disease. In this day and age when we in the United States no longer consider malaria a major problem, a large portion of the world still lives every day with this history. While largely successful in developed countries, the post-World War II, worldwide malaria eradication program was officially ended in 1972, when it was shown to have failed in many developing countries. Numerous problems contributed to the collapse of the program including politics, wars, decreases in funding, collapse of local infrastructure, parasite and mosquito resistance to antimalarial drugs and insecticides respectively, and other factors. Since the 1970s, malaria has undergone a tremendous resurgence and continues to plague areas containing roughly half the world population, and killing an estimated 2,000,000 people annually. Most are children under the age of 2 years. A large proportion of these deaths occurs in sub-Saharan Africa.

Modern concepts of malaria eradication and control began to be developed around the turn of the century, following the discoveries by Laveran, Ross, and Grassi. These three men and their coworkers discovered the causative organism, elucidated most of its life cycle, and in the process, discovered how the disease was transmitted to humans by mosquitoes of the genus *Anopheles*. Their research provided the keys by which Col. William Crawford Gorgas was successful in greatly reducing malaria in the Panama Canal Zone in the early 1900s. His methods were primarily hygienic and designed to destroy mosquito breeding sites. Though his prime target was another mosquito-vectored disease, yellow fever, his methods were partly applicable to both diseases. With the discovery in the 1930s of the insecticide DDT, another major tool in the fight against malaria was cheaply developed and produced, and use of this chemical provided the major weapon of the World Health Organization (WHO) effort following the Second World War. During this period, the major thrust was again vector control. Additionally, the development of good antimalarial drugs, especially chloroquine, made a direct attack on the parasite in the human population possible.

With further refinements in our knowledge of the disease and current developments in vector control, case management, chemotherapy and prophylaxis, and laboratory diagnosis, current thinking is that an effective program for control of malaria can be based on four pillars—attack on the vector, attack on the parasite, establishment of a control infrastructure, and establishment of an on-going malaria education program for all members of the community. Of these, the most important is the latter, since without it any effort at control will ultimately fail.

While eradication is no longer considered a reachable objective in many countries, much research and work has gone into what is now considered a more practical goal of reducing and controlling malaria in areas where it remains a major cause of morbidity and mortality. The WHO's "Roll Back Malaria" program in Africa is one example. It is this program which provided the impetus for the island country of São Tomé/Principe (STP) to request help from the United States military, via the government of Portugal and the U. S. State Department. Several years of studies conducted by Portuguese researchers from the laboratory of Dr. Virgilio do Rosario in Lisbon indicate that approximately half of the population of STP can be shown to be infected, most asymptomatically, at any given time. Though all four species of *Plasmodium* coexist there, the primary species is the most deadly—*P. falciparum*—and malaria is the primary cause of morbidity and mortality, especially for infants and young children. Chloroquine resistance is thought to be high, but is not well characterized. One study at the national hospital in São Tomé showed 90% of *P. falciparum* isolates to be resistant to this drug. However, this study was likely biased by selecting for only those cases severe enough to be referred to the hospital and those where community treatment with chloroquine had previously been tried and had failed. Resistance to other drugs, such as mefloquine, has also been documented, but much work needs to be done to provide a true picture of this problem.

Although the basic concept of malaria control is simple, the actual practice can be quite complicated, even in a small island republic like STP. STP in some respects could be considered an ideal "laboratory" for testing current theories about control. It is a small, relatively isolated population. The island group lies in the Gulf of Guinea, far enough from mainland Africa that the mosquito population is unaffected by new mosquitoes migrating in from neighbor countries. Studies by the Do Rosario group have shown that only one species of vector—*Anopheles gambiae*—is important. As previously mentioned, much basic research has already been done to characterize the malaria picture in STP. Finally, there is already a very good recent history of a failed malaria control program there, which provides valuable information about the form future efforts should take.

In the 1980s, a concerted effort was made to decrease the amount of malaria in STP by aggressive vector control, case management, and active identification and treatment of asymptomatic carriers. By 1986, the program had apparently reached a successful conclusion, since the percentage of infected individuals had fallen to below 1%, and clinical malaria had become exceedingly rare. Unfortunately, at this point the program lost impetus as efforts and money were shifted to other seemingly more pressing medical priorities.

(Continued on page 9)

Complexities of Malaria Control in São Tomé/Principe

(Continued from page 8)

The control infrastructure quickly dissolved, and no meaningful education campaign was carried out to ensure that people in the local communities would continue to do what was necessary to avoid infection. Shortly, the vector densities increased and along with that so did transmission of the parasite, which had never been completely eliminated. Today, the malaria situation in STP is worse than ever.

In the summer of 2000, a team consisting of myself (microbiologist and team leader), LCDR Steve Presley (entomologist), and LCDR Mark Malakooti (preventive medicine physician) was formed and met with medical representatives of STP in Lisbon and at STP to begin working out details of a comprehensive future control program for that nation. We returned to the island again in September of the same year to help develop a strategic plan for the island to be presented to WHO as a part of the local "Roll Back Malaria" program. Results of these meetings are instructive in terms of the complexities one can expect to encounter in the development and implementation of a program for malaria control in the modern world.

Malaria, unfortunately, is not simply a problem for vector control and medical personnel. It is also a major political problem with impacts both in terms of human suffering and economic development of a country. On the surface, it would seem that there would be no good reason not to pursue an aggressive campaign against the disease on all fronts. Of course, surface appearances can be deceptive, and that is certainly the case in point here. In a sense, STP is the victim of its own success. As mentioned, its earlier control program succeeded in greatly reducing the amount of disease in the community. But, there was a cost involved. Once the amount of transmission on the islands was reduced, people who had been infected with the parasite all their lives, and who had become, in effect, immune to suffering its ill effects, began to lose this immunity very rapidly. With the resurgence of the parasite, persons who had previously carried it asymptomatically now began to suffer from clinically significant malaria, and a number of them died because of it. Also, certain politicians looking for political gain attempted to place blame for the deaths on domiciliary spraying of DDT, further complicating the matter. With this experience as a backdrop, there is presently a lot of resistance both to treatment of asymptomatic carriers and to spraying with insecticides, especially inside houses. One of the great "Catch 22" dilemmas of malaria control is perfectly illustrated here. It leads to great reluctance on the part of the medical establishment to treat asymptomatic individuals, even though they remain a reservoir for the parasite. The conundrum is that any successful control program must eventually deal with this problem.

Knowing that without outside help, the STP would not have the assets to continue any program which was begun, the question is, how does one deal with these issues and yet still formulate an effective program for malaria control? A question that the local medical officials were strongly concerned with was, "What happens once the U.S. military's involvement is finished?" The answer is not simple and likely varies from one country to the next. In the case of STP, it was necessary first to be sensitive to these problems and secondly to attempt to form partnerships with other agencies that have a long-term, vested interest in STP (the Portuguese government, WHO, UNDP, France, and the European Community, to name a few), as well as the Republic of STP to ensure that an on-going commitment to malaria control can be maintained. Once this was done, it was relatively easy to agree on a multi-faceted program with all of the elements previously mentioned.

In summary, malaria in any given country develops characteristics unique to that particular country. Although many of the methods of control will apply everywhere, any program for control must be tailored to the specific country involved. It must always be kept in mind that malaria is much more than a medical problem. It is a problem that crosses all barriers of society, and this makes it a huge political problem as well. We, as the "outside experts," should never expect to eliminate the disease by ourselves, but must remain aware that it is the endemic country that must either maintain a program or suffer dire consequences. In the case of many areas of the world without the resources to do this, foundation of long-term partnerships is crucial. In the final analysis it is a country's national commitment that determines the eventual success or failure. Malaria control, once started, must continue "forever."

CDR Harvey Adkins

Sustainable Malaria Control in the Republic of Suriname

In March and June 2000, the Navy Disease Vector Ecology and Control Center Jacksonville (NDVECC) took part in a humanitarian assistance project in the Republic of Suriname, South America, at the request of United States Southern Command (USSOUTHCOM), to assist the country with malaria control efforts. These first two missions were led by CDR Joe Conlon (retired) from NDVECC, and included entomologists LCDR Gary Tetreault, LT Ray Platt, and LTJG Carl Doud. In September, LTJG Doud led the final mission with HM2 Alan Phillips from NDVECC and LT Frederick Stell from the Navy Environmental Preventive Medicine Unit No. 2 (NEPMU-2). The goal of the project was to establish a sustainable program of malaria control that integrated classroom training, equipment calibration, and field application of pesticides, and could be managed by the Surinamese government with assistance from residents in the interior.

The Republic of Suriname is located on the Caribbean coast of South America between Guyana and French Guiana. Originally a Dutch colony, Suriname obtained independence in 1975. The country's population of 440,000 is made up of many diverse ethnic groups: East Indians or Hindustani (37%), Afro-Surinamese or Creole (31%), Indonesians (15%), Maroons (10%), Amerindians (3%), and Europeans (1%). About 90% of these people live in the capital of Paramaribo and several smaller towns along the coast. The interior of Suriname contains vast areas of savannah and rain forest where many small Amerindian and Maroon villages are located and where most cases of malaria are reported. Amerindians are the original inhabitants of Suriname, and Maroons are the direct descendants of West Africans.

***Fig. 1: Anopheles darlingi**, the principal malaria vector in Suriname. (Photo courtesy of Dr. Marcelo de Campos Fereira, University of Sao Paulo, Brazil.)*

Like most tropical countries, Suriname's climate fluctuates between rainy and dry, with a long rainy season from April to July and a short one from December to January. In 1996, the Pan-American Health Organization (PAHO) reported over 11,000 cases of malaria in Suriname, mostly in the interior in children under five years old. Also, most cases occur during the rainy seasons and are primarily caused by the mosquito *Anopheles darlingi* (Fig. 1), which has a population bloom during those months. The behavior of *An. darlingi* and its close association with man make it a very effective vector for malaria. It breeds in shallow depressions in the soil, which are filled with water during the rainy season (Fig. 2) and is anthropophilic (literally means "loving man") and endophilic ("loving indoors"). Therefore, it commonly enters huts and rests on the interior walls, where it freely bites the inhabitants during the night if they do not sleep under bednets. Insecticide treatments are most effective when applied to interior hut walls during the emergence season. Other mosquitoes such as *Anopheles aquasalis* transmit malaria and are found in the interior. But they primarily feed on animals and are not an important vector for humans.

***Fig. 2:** An entomologist indicates a woodland depression where **An. darlingi** breed during the rainy season.*

Cases of malaria have been increasing in the interior, particularly in villages along the Upper-Saramaca River, since it is a major route of transportation from the interior to the cities. Government workers from the Bureau of Gezondheid (BOG), or Bureau of Public Health, have concentrated recent control efforts in this region and believe that malaria is being brought into populated areas by gold miners and loggers, who spend a few nights in the villages on their way to the city and generally do not use chemo prophylaxis. Village residents may contract malaria there and bring it into the cities when they travel to work.

The BOG Division of Vector Control is responsible for developing a malaria control program and has developed a sustainable program with three main goals: (1) To enable communities to maintain effective vector control by providing education and encouraging participation, (2) To provide insecticide-treated bednets to village residents and education on how to use them, and (3) To perform residual insecticide application to the interiors of village huts.

Funding from USSOUTHCOM supported the humanitarian mission to Suriname by providing logistical support

(Continued on page 11)

Sustainable Malaria Control in the Republic of Suriname

(Continued from page 10)

to NDVECC personnel and enabling them to purchase training equipment such as backpack sprayers , mosquito surveillance equipment, microscopes, tools, tents, bednets, and spare parts. In June, CDR Conlon (ret.) and LT Platt presented basic instruction to the BOG workers in mosquito biology, behavior and sampling methods for adults and larvae. During the following visit in September, LT Stell trained a second group of technicians who were new to the project while LTJG Doud and HM2 Phillips provided training in proper equipment maintenance, trouble-shooting, and calibration (Fig. 3). The teams also accompanied BOG personnel into the interior to provide additional training in on-site application of pesticides and to identify breeding sites of *An. darlingi*.

Fig. 3: *Medical Entomologists train BOG workers to calibrate and repair pesticide equipment.*

Fig. 4: *Maroon village of Commisariskondre.*

NDVECC and the BOG began control efforts in the interior during a five-day mission based in the village of Commisariskondre (Fig. 4), a Maroon community of the Matawai tribe with about 100 members. Bednets were made by the villagers from material brought by NDVECC and were treated with permethrin, using assistance from village residents. Village huts were also treated by the control team with help from the Medical Mission, an independently funded non-government organization that provides clinical surveillance and therapeutic control to inhabitants of the interior. Huts were treated with lambda-cyhalothrin wettable powder (Demand Pesttab), applied with a backpack sprayer. Community education was provided to Commisariskondre during interviews to assess the use of bednets. Villagers were questioned as to the tendency to use bednets during peak biting times, whether they had enough nets, and whether their children always slept under them. It was determined that not everyone used bednets at all times, especially when it was very hot or if they fell asleep outdoors.

The follow-up visit conducted last September also assessed the efficacy and longevity of control efforts performed in Commisariskondre. Bioassays were performed by exposing mosquitoes contained in small cages to the treated surfaces of interior hut walls and bednet material to measure the residual activity of the lambda-cyhalothrin. 100% mortality was recorded in huts that had been treated in June. Also, BOG personnel made tentative plans to expand the program to other areas. If this happens, they plan to target the Amerindian village of Pikin Saron, since cases of malaria caused by both *Plasmodium falciparum* and *P. vivax* have been reported there and it is a major crossroads for travelers. Although the most visible outcome of this project was reduction of malaria risk in the interior, it also provided highly valuable training to both United States Navy preventive medicine personnel and the Surinamese government.

LT Frederick M. Stell, MSC, USNR
Medical Entomologist

LTJG Carl W. Doud, MSC, USNR
Medical Entomologist

Epidemiology at NEPMU-7

(Continued from page 7)

(ProMED), local media, local health departments (when available), as well as the Naval Disease Reporting System (NDRS) and Disease Non-Battle Injury (DNBI) reports.

During October, we maintained surveillance on 12 different diseases: Rift Valley Fever, Ebola Hemorrhagic Fever, Cholera, Legionellosis, Yellow Fever, Typhoid Fever, Rabies-human, Creuzfeld-Jacob Disease (new variant), West Nile Virus-human & horses, Anthrax-human, and Salmonella typhimurium-DT204. These diseases occurred throughout our AOR, including Guinea, Saudi Arabia, Yemen, Russia, Uganda, United Kingdom, Poland, Belarus, South Africa, Malawi, Pakistan, Italy (Sardinia), Kenya, France, Spain, Kazakstan, Germany and Denmark.
We also fielded 14 telephone consults from within our AOR and from those preparing to deploy to our AOR.

Epidemiology is here to assist; do not forget we are just a telephone call or mouse click away.

HM1 Michael McIlroy

NEPMU-2's FDL Augments 2nd Medical Battalion During Exercise ROVING SANDS 2000

The Forward Deployed Laboratory (FDL) from Navy Environmental and Preventive Medicine Unit Number 2 (NEPMU-2) deployed to Camp Lejeune, NC to participate in Exercise Roving Sands (AKA Purple Dragon/Purple Caduceus) during June 2000. The team, led by microbiologist LT Eduardo Gomez, MSC, USNR, (NEPMU-2) also consisted of an environmental health officer, an entomologist, and three preventive medicine technicians (PMTs): HM2 Robert Yett, HM3 Mathew Snyder, and HM3 Lacey Sanders, all from NEPMU-2. A fourth PMT, HM2 Margaret Whalen, from the Navy Disease Vector Ecology and Control Center, Jacksonville, was also present. The team augmented the preventive medicine section of 2nd Medical Battalion, 2nd FSSG, Camp Lejeune, NC, under the command of CAPT James Need, MSC, USN.

Participating personnel alongside the FDL tent during exercise ROVING SANDS.

The exercise was located in and around Camp Lejeune, North Carolina, involved over 1,000 troops and lasted about two weeks. This joint international exercise involved U.S. Navy, Marine Corps, Army, and Air Force elements, a Canadian Medical Battalion, and an Army National Guard Unit from Puerto Rico. The military events included beach landings and assaults. Navy Medicine's primary role surrounded the Purple Caduceus component and was one of the main areas in the overall exercise. The emphasis of Purple Caduceus included echelon one and two levels of care as well as casualty movement through the various echelons of care. This included exercises with a Navy hospital ship, USNS COMFORT (TAH-20).

The purpose of the Preventive Medicine team was twofold: (1) to deploy the FDL and test the equipment in field conditions and (2) to survey tick-borne and mosquito-borne pathogens in Camp Lejeune. Preventive Medicine tasks were performed mostly by organic assets of the 2nd Medical Battalion. The Entomology component, headed by LT Frederick Stell, MSC, USN (NEPMU-2), was set up for collection of ticks and mosquitoes in the exercise area, mostly in the landing zones and bivouac sites. The microbiology component was set up for detection of West Nile Virus in mosquitoes and for tick-born pathogens, including *Ehrlichia* sp. (Ehrlichiosis), *Babesia* sp. (Babesiosis), *Borrelia* sp. (Lyme Disease), and *Rickettsia* sp. (Rocky Mountain Spotted Fever).

Over 700 mosquitoes and 400 ticks were collected and processed for further analysis utilizing PCR technology.

Hard at work in the FDL. From left to right:

Two mosquitoes species were prevalent: *Aedes taeniorhynchus* and *Aedes solicitans,* both being considered weak vectors for the West Nile Virus. The prevalent tick species at Camp were the Lone Star tick, *Amblyomma americanum* and the American dog tick, *Dermacentor variabilis*. Lone Star ticks are suspected of transmitting several *Ehrlichia* species as well as a controversial variety of Lyme disease referred to as Southern Lyme disease. *Dermacentor variabilis* is known to transmit *R. rickettsii* and is also suspected of transmitting *Ehrlichia* spp. DNA was extracted from all specimens collected in the field and Polymerase Chain Reaction (PCR) testing was begun on site. In addition, quantitative real-time PCR and ELISA capabilities were demonstrated in the deployed laboratory. All ticks and mosquitoes tested were negative.

This deployment was a "beta" test of the FDL as it transitions to the Forward Deployed Preventive Medicine Unit concept (expected to become reality after 2004), and provided invaluable insight into the possible logistical challenges facing future deployments in real world scenarios. Transportation, voltage requirements, equipment resilience in the field, weather protection, dust protection, specimen cold chain, and reagent cold storage are all issues that had to be addressed. The challenges are expected to be much more significant when and if the lab is deployed to a remote location.

Eduardo Gomez-Saladin, Ph.D.
LT MSC USNR

Initiatives in Food Service

Over the past two years, Naval Supply Systems Command has been working on a series of Food Service Initiatives to evaluate the advantages and disadvantages of utilizing advanced foods in the Navy. They identified emerging technologies in the private sector, such as cook/chill, cook/freeze, and shelf-stable food products, that would reduce preparation, cooking and cleanup times. Once inserted into the menu, these items were evaluated for acceptability, cost, storage requirements, and workload impact. Initial testing at Naval Station Mayport was followed by afloat testing on board USS *Rainier* (AOE 7) and USS *McFaul* (DDG 74). Test results demonstrated that these food products could improve Quality of Life (QOL) and reduce workload. However, these food products were not the only recent improvements in the food service industry.

In addition to advanced foods, several other revolutionary initiatives were in various phases of testing across the fleet. USS *Harry S. Truman* (CVN 75) successfully implemented self-service serving lines. USS *John C. Stennis* (CVN 74) replaced traditional food service equipment with state-of-the-art equipment in an entire galley. USS *Fitzgerald* (DDG 62) reduced in-port evening galley watch personnel through use of entrees prepared in advance. As individual successes came to light, it was apparent significant benefit might be recognized by implementing an entire suite of food service initiatives on one platform and measuring not only the individual results, but also the synergistic benefits.

Born was the concept of the Single Ship Prototype ... the integration of multiple food service initiatives on board one ship. Discussions with the fleet identified USS *Tarawa* (LHA 1) as a potential platform. *Tarawa* personnel agreed and the Single Ship Prototype became a reality. The test commenced Oct. 1, 1999, and is managed by NAVSUP. A cooperative team of professionals from the fleet, NAVSUP, Naval Sea Systems Command, Navy Food Management Teams, and industry has identified 13 separate initiatives for implementation on USS *Tarawa*. Many of these initiatives are already in progress, and empirical data are being collected.

Many of the initiatives are being tested on a Single Ship Prototype, or individually in the fleet. These initiatives are being incorporated into the paradigm of the Food Service operation of the future that is being developed by the Afloat Supply Department of the Future (ASDOF) working group. Several proven efforts have been adopted by ASDOF as the cornerstones for how we will conduct food service operations on minimally manned and technologically advanced platforms of the future. A few examples of these initiatives are:

Advanced Food Technology

Description: Advanced foods are defined as precooked or pre-prepared bulk menu items such as precooked bacon, premade lasagna, and frozen bread dough.

Benefits: Studies have demonstrated advanced foods improve customer satisfaction, provide significant labor savings and a consistently higher quality food product, increase variety, and reduce risk of food contamination and food waste. Challenges include an increased demand for refrigerated storage, plastics/paper waste due to packaging, and food cost.

Implementation: Advanced foods will use existing food service equipment installed afloat. Replacement of existing convenience foods such as canned soups, frozen/canned vegetables, canned fruits, and cake mixes with advanced foods does not improve product quality or save significant amounts of labor. It is neither feasible nor desirable to expect 100 percent usage of advanced foods. Based on USS *Rainier's* prototype, approximately 40 percent of the food served afloat should be advanced foods to optimize labor savings given refrigerated space constraints. Currently, 16 percent of food consumed afloat is an advanced food. Efforts are ongoing with food suppliers, managed by the Defense Supply Center Philadelphia, to provide an increased range and depth of advanced foods. Thirty-eight of 206 food items stocked by replenishment ships are advanced foods; additional items are under review for inclusion.

Self-Service Serving Lines

Description: Self-service feeding style is defined as allowing Sailors to serve themselves from the serving line. Additional hot and cold food serving stations, located on the mess decks, provide separate serving stations and reduce congestion at the main serving line. FSAs restock these stations and ensure proper sanitation is maintained.

Small ships have limited space for additional serving stations, so this style of feeding is primarily recommended for aircraft carriers and amphibious warfare ships. Although Sailors enjoy the self-service concept with it's faster lines and increased variety, the self-service feeding style is a significant departure from the standard paradigm currently in place. The potential exists to exceed the daily food allowance and/or degrade sanitation on the serving line; however, proper education of the crew, coupled with attentive management, has been shown to mitigate these risks.

Benefits: Studies have demonstrated the advantages of self-service feeding style include improved customer satisfaction, labor savings, and a consistently faster throughput of

(Continued on page 14)

Dances with Mosquitoes (*Anopheles gambiae*)

When you think of malaria in Africa, the mosquito *Anopheles gambiae* usually comes to mind, although there are several other important vectors. In medical entomology texts it is usually the biology of *An. gambiae* that is discussed in relation to malaria transmission, perhaps because they appear to be everywhere in Africa. It is in many ways the classic malaria vector: highly adaptive, exceedingly anthrophilic, stealthy, and very efficient at transmitting the parasite.

Anopheles gambiae is a member of the genera Anopheles and females can be crudely but quickly identified by the presence of non-bushy antennae, long palps with three white bands, and four small white bands on the tarsal segments of the hind legs. For those who need a quick refresher on mosquito anatomy; the antennae are the "feeler things" which originate from between the eyes, the palps are the "feeler things" which originate right next to the thing that bites you, the proboscis. Males have bushy antennae, which look like paintbrushes; female antennae are merely feathery. The culicine mosquitoes, including such favorites as *Aedes aegypti* and *Culex pipiens*, have short palps which resemble nubs to the naked eye. As for legs, there are six and in this case the back pair are important. The last five small leg segments are the tarsi, and those are the ones with the white bands. One other thing that helps a lot in identifying *Anopheles gambiae*, in an area where they are the primary vector, is that they are usually the most common Anopheline biter of humans, which leads us to how to catch them.

Anopheles mosquitoes are not the same as the backyard *Aedes* that shows up to wreck the summer picnic. They are quiet, stealthy, and often arrive at night rather than at dusk. They are not real hip on visiting light traps, and when they bite they don't drill into your skin to announce their pres-

(Continued on page 15)

Initiatives in Food service

(Continued from page 13)

patrons. The amount of time Sailors spend waiting in a traditional serving line on board an aircraft carrier is 15 to 25 minutes. Use of self-service serving lines reduces waiting time by 10 to 20 minutes. Challenges associated with this proposal include required serving line design modifications and, as mentioned above, potential increase in food waste and degraded sanitation.

Implementation: Many ships can support the self-service feeding style after minor design changes. Design modifications on aircraft carriers require raising of countertops on the main serving line and relocating the sneeze shields. Plastic dome covers are required for serving pans in order to maintain sanitation standards.

Pre-Prepared Individual Dinner Entrees

Description: These meals are defined as high quality, brand name "heat and serve" meals that include an entrée and vegetables. A salad bar, fruit bar, soup dispenser and dessert bar supplement these meals. Employment of this feeding strategy during evening meals while in port reduces food service workload by 26 percent while providing an increased variety of menu options and improving nutrition.

While in port, the food service operation prepares evening meals for the duty section and crewmembers that live on board. In port, the typical aircraft carrier feeds 350 to 400 personnel each evening and employs seven mess management specialists (MSs) and eight FSAs. This feeding strategy would cut the numbers to three MSs and four FSAs. A destroyer feeds fewer than 50 crewmembers with two MSs and five FSAs. These numbers can be cut to one each, using pre-prepared meals.

Benefits: Studies have demonstrated use of pre-prepared individual dinner meals while in port provide significant labor savings while maintaining or improving variety and customer satisfaction.

Implementation: Subsistence prime vendors for CONUS have been provided listings of candidate pre-prepared individual dinner meals and are incorporating these items into the food service catalogs. Routine pier-side deliveries will eliminate concern over limited refrigerated storage space. Prior to entering port, ships will place an order for pre-prepared meals. These items will be delivered to the ship at whatever frequency the ship specifies and will be consumed while in port and discontinued once the ship is underway.

In Summary...

The examples cited above represent the initial set of reengineering initiatives. The cooperative efforts of the fleet, NAVSUP and NAVSEA will continue to move afloat food service forward at a rapid pace. For further information regarding these initiatives, please contact LT Gene Garland, MSC, USN, NEPMU2, Norfolk VA , Comm. (757) 444-7671 x3015, DSN 564-7671 x3015, E-mail garlande@nepmu2.med.navy.mil

LT Gene Garland, MSC, USN

Hail & Farewell

Welcome Aboard!	Fair Winds & Following Seas!
NEPMU-2:	**NEPMU-2:**
NEPMU-5:	**NEPMU-5:**
NEPMU-6:	**NEPMU-6:**
NEPMU-7:	**NEPMU-7:**

Dances with Mosquitoes (*Anopheles gambiae*)

(Continued from page 14)

ence. The best way to catch them is to sit down at night, with an aspirator, bare a leg, and wait. If you bare it they will come. Another very effective way to catch them is by aspirating them out of resting places. *Anopheles gambiae* like to rest in human dwellings (as with all things biological there are some exceptions to this), and little huts and shacks which dot the African landscape are usually a great place to collect them. Shine a flashlight up into the spiderwebs hanging all over. The little silver glints will be resting mosquitoes. Sometimes it takes a while to see them. But once you do, they will start showing up all over. Beware! There are often some rather large spiders lurking up there too. A final method is laying down white sheets on the floor of a hut or resting area and spraying the area with pyrethroid aerosol. I like D-phen myself. Even light traps can be effective, but they need to be hung inside a dwelling close to sleeping people to really have a chance of catching anything.

Anopheles gambiae tend to prefer sunlit pools as breeding sites. There are a lot of sunlit pools in Africa and they are often man-made. These pools can include: drains, brick-pits, ruts, tire-tracks, hoof-prints, as well as naturally occurring pools left by receding rivers and collections of rainwater. The absence of vegetation seems to be an important factor in the choice of an egg laying site by females. Heavy plant growth restricts access to the important marginal areas of the ponds. Rice-fields, especially when newly flooded are an important breeding site. It is important to note though, that *Anopheles gambiae* can adapt to many types of breeding sites, including open containers and wells. A small area of water can be exploited by this mosquito to produce a large number of progeny. A small area of 300 square feet in a vegetable garden is capable of producing approximately 100,000 adults a day. Larvae are capable of rapid growth, going from egg to adult in six days under optimal conditions. The duration for one generation can be as short as ten days but is often 11 or 12.

So what do you do about this highly efficient vector? Begin with the basics by making sure solid preventive measures are in place. Sleeping under a properly treated and installed bed net when *Anopheles gambiae* are active and

(Continued on page 16)

Dances with Mosquitoes (*Anopheles gambiae*)

(Continued from page 15)

feeding is the best way to keep individuals from being exposed to the mosquito. Personnel should use properly worn and treated uniforms and use DEET during biting hours. Chemopropholaxis must be taken religiously, although it also must be stressed that it is not 100% effective and basic preventive measures must be adhered to.

After the basics are in place, it's time to seek out and kill the vector. Adults will often rest on the ceiling of tents and buildings and can be killed with d-Phen or an ultra low-volume insecticide treatment, if that capability is available. Applying a residual pesticide like Demand Pestabs (Lambda-cyhalothrin) to resting areas can also be effective. Breeding sites must be found and eliminated, either by mechanical destruction or chemical treatment. *An. gambiae* will usually not travel more then a mile from where it emerges. A light oil, such as mineral oil, can be applied to the surface of large ponds with a hand-compressed sprayer if needed. The film will smother the larva. Bactimos and Abate briquettes are also handy items to pop into small ponds. Whatever method is employed, it's a whole lot easier to get them before they're grown.

LT Michael Smith

Fleet Public Health

DEPARTMENT OF THE NAVY
OFFICER IN CHARGE
NAVENPVNTMEDU FIVE
3235 ALBACORE ALLEY
SAN DIEGO CA 92136-5199
OFFICIAL BUSINESS

Your January issue!