

Medical Force Protection: Puerto Rico

Medical Force Protection countermeasures required before, during, and after deployment to the “area” are as follows:

Major Threats

Diarrhea, respiratory diseases, injuries, dengue fever, other arthropod-borne infections, sexually transmitted diseases, heat injury, and limited risk of leptospirosis and Chaga’s disease. Most of the various island water systems are supposedly safe for drinking, however, presume local water sources are not safe for drinking until cleared by US authorities.

Requirements before Deployment

1. **Before Deploying report to Medical to:**
 - a. Ensure your Immunizations are up to date, specific immunizations needed for area:
Hepatitis A, Typhoid, Yellow fever, Tetanus (Td), MMR, and Influenza.
2. **Malaria Chemoprophylaxis: Not required.**
3. **Get HIV testing if not done in the past 12 months.**
4. **Make sure you have or are issued from unit supply: DEET, permethrin, bednets/poles, sunscreen and lip balm. Treat utility uniform and bednet with permethrin.**

Requirements during Deployment

1. Consume food, water, and ice only from US-approved sources; **"Boil it, cook it, peel it, or forget it"**.
2. Involve preventive medicine personnel with troop campsite selection.
3. Practice good personal hygiene, hand-washing, and waste disposal.
4. Avoid sexual contact. If sexually active, use condoms.
5. Use DEET and other personal protective measures against insects and other arthropod-borne diseases. Personal protective measures include but are not limited to proper wear of uniform, use of bed nets, and daily “buddy checks” in tick and mite infested areas.
6. Minimize non-battle injuries by ensuring safety measures are followed. Precautions include hearing and eye protection, enough water consumption, suitable work/rest cycles, acclimatization to environment and stress management.
7. Eliminate food/waste sources that attract pests in living areas.
8. Avoid contact with animals and hazardous plants.

Requirements after Deployment

1. Receive preventive medicine debriefing after deployment.
2. Seek medical care immediately if ill, especially with fever.
3. Get HIV and PPD testing as required by your medical department or Task Force Surgeon.

**PUERTO RICO
VECTOR RISK ASSESSMENT PROFILE
(VECTRAP)**

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1. **GEOGRAPHY:** **Area** of 3500 sq.mi. **Capital City** is San Juan (pop 900,000 est.). **Terrain** is mountainous with some coastal plain. **Climate** is tropical with trade winds.

2. **VECTOR-BORNE DISEASES:**

a. **Malaria:** Puerto Rico has been malaria free since the early 1950's.

b. **Dengue fever:** Over twenty thousand cases of dengue (principally Den 2) have occurred in Puerto Rico during the latter half of 1994 and into early 1995. However, as of early 1995, no confirmed cases of dengue have been reported in U.S. military personnel. In the past, all four serotypes of the disease have been reported, as well as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS). The current risk to U.S. troops of acquiring dengue is moderate. Once acquired, dengue could cause a serious loss of combat effectiveness. From January to August 1998 there have been about 7,600 cases reported, about 2-4 times the usual transmission rate.

c. **Schistosomiasis** once was endemic, but is thought to be eradicated from most rivers and lakes since the late 1970's. *Schistosoma mansoni* was the major species thought to cause human disease in Puerto Rico. One or two rivers in the southwest may still contain small foci.

3. **DISEASE VECTOR INFORMATION:**

a. The only potential vector of malaria in Puerto Rico is the mosquito *Anopheles albimanus*. *An. albimanus* breeds in sunlit or partially shaded water collections, pools, lakes, and esteros. Marshes and swamps are of little significance. Breeding sites are generally turbid but not excessively polluted, often with *Spirogyra* algae on the surface. Breeding sites change seasonally, becoming intense and focused during the dry season. During March and April, rivers, esteros and irrigation canals reach peak breeding potential. *An. albimanus* will breed freely in water of salt content of less than 13% and has been found in water almost 40% saline.

Diurnal resting sites are variable but favor man-made structures. *An. albimanus* rests in sheltered niches between 0200- 0900, therefore ULV spraying will be ineffective during this period. During the dry season of February through April, biting activity is 1800-2100 and 0400-0500. During the rainy season this shifts to 2300-0300. It prefers to feed on ungulates, but will opportunistically feed upon humans, preferring the ankle area.

Although not a malaria vector in Puerto Rico, *An. albimanus* can be a significant pest. Sampling is best done by human biting collections. Although readily taken in light traps using ordinary light sources, CDC light traps modified for updraft and ultraviolet illumination will produce significantly larger catches under almost all circumstances.

b. Dengue fever is transmitted in its epidemic form by the mosquito *Aedes aegypti*. *Aedes mediiovittatus* maintains a higher dengue titre for a longer period than *Ae. aegypti* and is thought to play a role in interepidemic transmission. Both species are container breeders, with *Ae. mediiovittatus* preferring tire and automobile dumps. *Aedes aegypti* is a peridomestic mosquito that is diurnally (i.e., daytime) active and feeds indoors or out, often biting around the neck or ankles. It typically rests indoors after feeding. Both of these species have been reported resistant to the pesticides DDT and Dieldrin/HCH.

4. NUISANCE SPECIES:

a. Nuisance mosquito species include *Aedes sollicitans*, *Aedes taeniorhynchus*, and *Culex nigripalpus*. Canals appear to provide the prime breeding sources along with salt marshes for both species of *Aedes*.

b. *Culicoides* (biting midges) species are a significant nuisance along the coastal areas. Operations at dawn and dusk should take these pests into account.

5. DISEASE AND VECTOR CONTROL PROGRAMS:

a. Prevention and Control: The conscientious use of personal protective measures will help to reduce the risk of many vector-borne diseases. The most important personal protection measures include the use of DEET insect repellent on exposed skin, wearing permethrin-treated uniforms, and wearing these uniforms properly. The use of DEET 33% lotion (2 oz. tubes: NSN 6840-01-284-3982) during daylight and evening/night hours is recommended for protection against a variety of arthropods including mosquitoes, sand flies, other biting flies, fleas, ticks and mites. Uniforms should be treated with 0.5% permethrin aerosol clothing repellent (NSN 6840-01-278-1336), per label instructions. NOTE: This spray is only to be applied to trousers and blouse, not to socks, undergarments or covers. Reducing exposed skin (e.g., rolling shirt sleeves down, buttoning collar of blouse, blousing trousers) will provide fewer opportunities for blood-feeding insects and other arthropods. Additional protection from mosquitoes and other biting flies can be accomplished by the use of screened eating and sleeping quarters, and by limiting the amount of outside activity during the evening/night hours when possible. Bednets (insect bar [netting]: NSN 7210-00-266-9736) may be treated with permethrin for additional protection.

b. The most important element of an *Aedes aegypti* control program is SOURCE REDUCTION. Eliminating or covering all water holding containers in areas close to human habitation will greatly reduce *A. aegypti* populations. Alternatively, containers may be emptied of water at least once a week to interrupt mosquito breeding. Sand or mortar can be used to fill tree holes and rock holes near encampments. Use of pesticide aerosols in indoor resting spots such as closets and behind curtains will further reduce exposure to *A. aegypti*.

c. Expanded Vector Control Recommendations are available upon request.

6. IMPORTANT REFERENCES:

Contingency Pest Management Pocket Guide - Fourth Edition. Technical Information Memorandum (TIM) 24. Available from the Defense Pest Management Information Analysis Center (DPMIAC) (DSN: 295-7479 COMM: (301) 295-7479). Best source for information on vector control equipment, supplies, and use in contingency situations.

Control of Communicable Diseases Manual - Sixteenth Edition. 1995. Edited by A. S. Benenson. Available to government agencies through the Government Printing Office. Published by the American Public Health Association. Excellent source of information on communicable diseases.

Medical Environmental Disease Intelligence and Countermeasures - (MEDIC). September 1997. Available on CD-ROM from Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004. A comprehensive medical intelligence product that includes portions of the references listed above and a wealth of additional preventive medicine information.

Internet Sites- Additional information regarding the current status of vector-borne diseases in this and other countries may be found by subscribing to various medical information sites on the internet. At the Centers of Disease Control and Prevention home page subscriptions can be made to the Morbidity and Mortality Weekly Report(MMWR)and the Journal of Emerging Infectious Diseases. The address is www.cdc.gov. The World Health Organization Weekly Epidemiology Report (WHO-WER) can be subscribed to at www.who.int/wer. The web site for PROMED is www.promedmail.org:8080/promed/promed.folder.home.

Although PROMED is not peer reviewed, it is timely and contains potentially useful information. The CDC and WHO reports are peer reviewed. Information on venomous arthropods such as scorpions and spiders as well as snakes, fish and other land animals can be found at the International Venom and Toxin Database website at www.uq.edu.au/~ddbfr/. Information on anti-venom sources can also be found at that site. Information on Poisonings, Bites and Envenomization as well as poison control resources can be found at www.invivo.net/bg/poison2.html.