

Medical Threat Assessment - Fiji

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This paper is a medical threat assessment of the island nation of Fiji. The purpose is to summarize the most significant and pertinent threats to service members in order to reduce the incidence of disease and non-battle injury for those who may be called upon to deploy to the region. This paper will include a country overview, organic medical capabilities, deployment requirements and common health problems of servicemembers deployed to the area, medical and environmental threats, and the requirements for returning to the United States.

Classification

UNCLASSIFIED: Not cleared for public release. All data has been compiled from open public and unclassified Department of Defense sources, but some data is not cleared for public release.

Overview of the Region

The nation of Fiji is located in the Southwest Pacific Ocean approximately 1,900 miles Northeast of Australia, an area commonly referred to as Oceania or Oceanica. Made up of 332 islands, 110 of which are inhabited, the total land mass is about the size of the state of New Jersey (CIA, 2014). As of July 2014, the estimated population was 903, 207, and 52% of the people live in urban areas (CIA, 2014). The major ethnic group is iTaukei, which comprises 56% of the population, and the official languages are English and Fijian (CIA, 2014).

Geography ranges from sandy beaches to volcanic peaks, and the elevation ranges from sea level up to 4, 343 feet (CIA, 2014). The temperature in Fiji is relatively stable. July is the coldest month (low 64F/high 84F) and March is the warmest (lows 74F/high 88F). Rainfall varies, from as few as 5 days and only 2 inches in July, to as many as 19 days and 14 inches in

March (Fiji Meteorological, 2014). The wet season is November through April and is characterized by heavy but brief local showers (Tourism Fiji, 2014).

Fiji has mainly a government-run healthcare infrastructure. There are 0.43 physicians and 2.1 hospital beds for every 1,000 people (CIA, 2014). There are 5 government hospitals, two of which provide care for tuberculosis and leprosy, and one private hospital, though all are considered below the standards of U.S healthcare and therefore recommendation is that all medical emergencies should be evacuated by air to Australia, New Zealand, or back to the U.S. (U.S Department of State, 2014; WHO, 2011). The majority of health services are delivered through almost 1,100 village clinics, nursing stations, and health centers (WHO, 2011). The closest U.S. military medical facilities are in the Philippines and Hawaii.

According to the National Center for Medical Intelligence (NCMI) (2013), “the blood system is rated fair and is not considered safe for U.S personnel”. Blood is not tested for 100% of the Food and Drug Administration’s required testing though it does meet the World Health Organization’s minimum standards for HIV-1&2, Hepatitis B&C, and syphilis (NCMI, 2013).

Deployment Requirements

Within 120 days of deployment, all troops deploying for more than 30 days must be screened using a DD Form 2795 and a face-to-face encounter at a Military Treatment Facility. Dental must be a Class I or II and any necessary pre-deployment immunizations must be administered. Service member must also receive at the very least a 90-day supply of any prescription medication in addition to any necessary equipment, such as eyeglasses, ear protection, and gas mask inserts. Specific labs must be up-to-date, including G6PD, TB screening, HIV testing, and a negative pregnancy test within 30 days of deployment for all

females. Refer to Table 1 for a list of blood labs and immunizations, and to Department of Defense Instruction 6490.03 *Deployment Health* (2011) for further guidance.

Other items obtained by deploying service members include appropriate uniforms for the specific environment and other specialty items. For those deploying to Fiji, specific items include mosquito nets, DEET, and permethrin to treat uniforms. Rain gear will also be necessary.

Common Health Problems / Troop Complaints While in Fiji

The major illnesses for troops are no different than for any other travelers to Fiji, and these include Traveler's Diarrhea, Hepatitis A, STI's (mainly Hepatitis B) and Typhoid (CDC, 2014). Traveler's diarrhea is the most common travel-related issue, and all of the common health problems are covered under the section of this paper titled "Medical Threats for the Area/Region" and in Tables 3,4 and 5. Other complaints include lice, scabies, and mosquitos, so DEET and permethrin-treated uniforms are a mainstay countermeasure for deploying troops. Lower extremity injuries are common due to the sandy beaches and rugged volcanic terrain, most of which can be treated with rest and ibuprofen or acetaminophen.

Additional complaints common to deployments to any region, especially with extended military operations and occupation, include upper respiratory infections, headaches, dental issues, and emotional/psychological issues. All of these can be treated on a case-by-case basis by organic medical units, such as battalion aide stations, once they are in place.

Medical Threats for the Area/Region

There are several medical threats endemic to Fiji, and they can be classified as high, intermediate, and low-risk. While over 96% of the population has access to improved drinking water, including 100% of the urban population, bacterial diarrhea is a high-risk threat and can affect as many as 50% of travelers to the island nation (CIA, 2014; NCMI, 2014a). Effective

countermeasures include proper field sanitation, hand washing, consuming food, water, and ice only from approved sources, and proper food service sanitation (NCMI, 2014b). Quite simply, this means avoid eating and drinking on the local economy. Table 3 contains the complete list of threats from food and waterborne sources.

There are no high-risk vector borne or animal contact diseases for Fiji, though there are several intermediate-risk threats, to include Dengue Fever and Ross River Virus.

Countermeasures for vector-borne disease includes maximum compliance for the application of DEET, treatment of uniforms and bed nets with permethrin, and rolling down sleeves and blousing boots to further reduce bites (NCMI, 2014b). All information regarding these threats is found in Table 4.

Sexually transmitted infections are (STI) an additional risk to deployed servicemembers. Hepatitis B, HIV, Gonorrhea, and Chlamydia are endemic to Fiji, though Hepatitis B is the only high-risk STI threat (NCMI, 2014a). With symptoms of abdominal pain, jaundice, loss of appetite, and fatigue, Hepatitis B has a significant operational impact as affected troops may need to hospitalization for more than 7 days and are typically evacuated (NCMI, 2014a). Prevention includes vaccination prior to deployment, and education on reducing risk, including abstinence and proper use of condoms for those who elect to have contact with the local population are recommended as effective countermeasures (NCMI, 2014b). See Table 5 for a complete list of STI threats.

Fiji is also home to poisonous snakes, jellyfish, and spiders. The Banded Sea Krait is a venomous sea snake with venom 10x's more lethal than a Cobra snake, and the Box Jellyfish is the most venomous and dangerous sea creature in the world (Virtual Tourist, 2014). Obeying ocean warning signs for times when swimming is prohibited, and avoiding contact with local

animals (such as stray dogs) and areas heavily contaminated by livestock (such as barnyards) provide effective countermeasures (NCMI, 2014b). See Tables 4, 6 and 7 for all vector and animal threats.

Though tuberculosis (TB) is elevated in some areas of the Oceanic region, the incidence and threat in Fiji is low. The risk to U.S forces varies with individual exposure (NCMI, 2014a). Screening for latent TB may be warranted in those individuals who are at high risk or who have prolonged indoor contact/exposure (NCMI, 2014b). Table 8 contains all information regarding TB.

Environmental Threats for the Area/Region

Though the National Center for Medical Intelligence does not list any specific environmental risks for the nation of Fiji, it does provide an Environmental Health Risk Assessment for the Oceanic Region (NCMI, 2009). The report covers the physical environment (topography and climate) and environmental contamination (air, food, soil, and water).

The majority of the islands of Fiji are volcanic in origin, and this provides for mountainous and rugged terrain. This also contributes to significant seismic activity, as the islands of Oceania are located near the Pacific “Ring of Fire”, which is where “90 percent of the world’s earthquakes occur and half of the world’s active volcanoes are located” (NCMI, 2009). Depending on the country/island, the earthquake intensity risk ranges from strong to catastrophic, which in turn contributes to a high risk of tsunamis (NCMI, 2009). Cyclones are also an increased risk, occurring November through January during the rainy season (CIA, 2014).

Food and water contamination contribute the highest risks to humans mainly due to improper sewage handling as raw waste is often dumped into the ocean and lagoons, where it contaminates drinking water sources and seafood. Pesticides and herbicides can leach through

the soil into water tables and contribute to drinking water contamination (NCMI, 2009). Specific water and foodborne threats were addressed under the section “Medical Threats” and can be found in Table 3.

There are no major contributors to short- or long-term health risks in regards to air contamination due to the overall low level of industrialization for the entire Oceanic region. However, local risks may occur and are based on the levels of farming and power plant exhaust, in addition to the numbers of vehicles on individual nations (NCMI, 2009).

Finally, the health risk from direct contact with soil is also minimal in most areas, but is a growing problem as most solid waste landfills were improperly designed and lead has been found leaching into nearby soil and groundwater resources. Mercury contamination near mining operations is also an issue as it concentrates in food crops (NCMI, 2014). Significant soil threats are found in Table 9.

Requirements for Return from Deployment

Service members returning from Fiji are required to complete DD Form 2796, Post-Deployment Health Assessment, within 30 days before or after redeployment, and DD Form 2900, Post-Deployment Health Reassessment, is then completed 90-180 days after redeployment. The service member must meet face-to-face with a nurse or provider after completing each form so any possible deployment-related health issues can be addressed, and will also be screened for tuberculosis. Refer to Department of Defense Instruction 6490.03 *Deployment Health* (2011) for further guidance.

Summary

This paper is a summary of the most significant threats to service member deploying to Fiji. Specific countermeasures were provided to aid in decreasing the incidence of Disease Non-

Battle Injury, and dissemination of this information will aide in maintain the fighting force and accomplishing the mission.

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Table 1

Medical Requirements for Deployment

Labs	Immunizations	Medications	Medical screening and prevention
Blood Type & Rh factor	Hepatitis A	Minimum of a 90-day supply of prescribed and OTC's	Bed net: pop-up, self-supporting low-profile bed net treated with permethrin
DNA Specimen	Hepatitis B		
G6PD Deficiency	Influenza	Malaria prophylaxis: Doxycycline 100 mg tabs x 180 tabs OR Mefloquine 250 mg tabs x 17 tabs	DEET insect repellent & Permethrin treated uniforms
HIV	IPV		
Pre-Deployment Serum Specimen	JEV (at least 2 of 3 in the series)		
Pregnancy Screening	Meningococcal		Dental & Eye Exam
Sickle Cell	MMR		Neurocognitive assessment
TB Screen	Rabies (animal handlers only)		PHA/PDHA
	Tetanus-Diphtheria		Red allergy alert dog tags
	Typhoid		
	Varicella/Titer		
	Yellow Fever		

Note. Adapted from "Deployment Health", Department of Defense, 2011, retrieved November 21, 2014 from <http://www.dtic.mil/whs/directives/corres/pdf/649003p.pdf>; and "Periodic Health Assessment Requirements – DD Form 2766", Department of Defense, (2000), retrieved from <http://www.dtic.mil/whs/directives/infomgt/forms/dd/ddforms2500-2999.htm>

Table 2

Definitions of Risk (in the absence of countermeasures)

High	Intermediate	Low
Potentially high impact on operations because disease affects large percentage of personnel or cause severe illness in a smaller percentage	Intermediate impact on operations because disease affects smaller number of personnel or causes mild symptoms. Also includes diseases present at unknown levels that could degrade operations under some conditions.	Minimal impact on operations due to low likelihood of cases

Note. Adapted from "Infectious Disease Risk Assessment Database (IDRA): Oceania," National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1

Table 3

Foodborne and Waterborne Diseases

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Diarrhea - bacterial	High	Large frequent watery bowel movements, abdominal cramps, nausea, vomiting, bloody diarrhea	High (11-50%)	TX= Oral or IV therapy, salt replacement, ABX	Emphasis on proper field sanitation, hand washing, food/water/ice only from approved sources; proper food service sanitation. Avoid eating and drinking on the local economy.
Diarrheal - protozoal	Intermediate	Watery stools, fatigue, abdominal pain, nausea and vomiting, low grade fever	Small (<1%)	TX=Nitazoxanide or Trimethoprim / sulfamethoxazole. Treatment is dependent upon the species of protozoa	As above
Typhoid / Paratyphoid Fever	Intermediate	Fever, malaise, abdominal pain, diarrhea, rash, chills, confusion	Rare (<0.1%)	Typhoid vaccine before deployment. TX= IV hydration, ABX	As above
Hepatitis A	Intermediate	Flu-like symptoms, fatigue, fever, muscle aches and pains, nausea, vomiting	Rare (<0.1%)	Hepatitis A vaccine prior to deployment. TX= Monitor	As above
Leptospirosis	Intermediate	High fever, headache, chills, muscle aches, vomiting, jaundice, red eyes, abdominal pain, diarrhea, rash	Disease assessed as present, level unknown	Doxycycline prophylaxis may be considered. Dosage = 200 mg once per week.	Avoid skin contact with surface water (ie: rivers, lakes, irrigated fields)

Note. Adapted from “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://www.ncmi.cdc.gov/travel/destinations/traveler/none/fiji>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

^aDefinitions of risk are found in Table 2

Table 3 Continued

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Diarrhea - cholera	Low	Profuse watery diarrhea, vomiting, leg cramps	Rare cases (less than 0.1%)	TX= Oral or IV fluid replacement therapy, salt replacement, antibiotics	Emphasis on proper field sanitation, hand washing, food/water/ice only from approved sources; proper food service sanitation. Avoid eating and drinking on the local economy.
Brucellosis	Low	Fever, sweats, chills, fatigue, anoxeria, malaise, pain in muscles or joints	Extremely rare cases (less than 0.01%)	TX=antibiotics	As above
Hepatitis E	Low	Sudden onset of fever, fatigue, anorexia, nausea, vomiting, stomach pain, jaundice	Extremely rare cases (less than 0.01%)	TX=supportive therapy	As above

Note. Adapted from “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://www.ncmi.cdc.gov/travel/destinations/traveler/none/fiji>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

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Table 4

Vectorborne Disease

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Dengue Fever	Intermediate	Fever, headache, nausea, vomiting, eye pain, rash, joint and muscle pain, fatigue. Bleeding from the nose or gums may occur. Monitor for shock.	Sporadic, with epidemic potential (1-10%)	TX= IV therapy; monitor vital signs and hemodynamic status	Maximum compliance with DEET; permethrin-treated uniforms and bed nets; sleeves rolled down and bloused boots.
Ross River Virus	Intermediate	Rash, joint inflammation, pain, fatigue, and muscle aches	Sporadic, with epidemic potential (1-10%)	TX= Symptomatic therapy	As above
Typhus Miteborn (scrub typhus)	Intermediate	High fever, headache, myalgia	A small number of cases (less than 1%)	TX= Antibiotic (Doxycycline)	As above
Chikungunya	Intermediate	Fever, headache, fatigue, rash, muscle pain and joint swelling, nausea, vomiting,	Disease assessed as present, level unknown	TX=Oral or IV therapy, rest, symptomatic or supportive treatment.	As above

Note. Adapted from “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://wwwnc.cdc.gov/travel/destinations/traveler/none/fiji>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

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Table 5

Sexually Transmitted Disease

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Hepatitis B	High	Sudden fever, fatigue, nausea, loss of appetite, vomiting, stomach pain, jaundice	A small number of cases (less than 1%)	Vaccination is recommended TX=For acute infection treatment is supportive. Antiviral therapy for chronic infection	Education, to include abstinence and proper use of condoms
Gonorrhea and Chlamydia	Intermediate	Burning with urination, discharge	Between 1% and 50%	TX=antibiotics	As above
HIV/AIDS	Intermediate	Fever, rash, sore throat, enlarged lymph nodes	Rare cases (less than 0.1%)	TX=varies according to the stage of infection	As above

Note. Adapted from “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://wwwnc.cdc.gov/travel/destinations/traveler/none/>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrack.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

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Table 6

Disease from Animal Contact

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Q fever	Intermediate	High fevers, severe headache, malaise, chills and sweats, non productive cough, nausea, vomiting, diarrhea, abdominal and chest pain	Rare cases (less than 0.1%)	TX=antibiotics	Avoid contact with livestock, or areas heavily contaminated by livestock such as barnyards.

Note. Adapted from “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://wwwnc.cdc.gov/travel/destinations/traveler/none/fiji>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

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Table 7

Animal Threats

Animal	Symptoms	Prevention / Treatment	Countermeasures
Banded Sea Krait – venomous sea snake with venom 10x’s more lethal than a Cobra snake	Nausea and vomiting, severe headaches, muscle cramps, and muscle and joint pain. Unconsciousness may follow shortly before death	Seek immediate medical attention.	Do not swim at night; caution when around coral reefs, beaches, and rocks. Only attacks when it feels threatened.
Box Jellyfish – most venomous and dangerous sea creature in the world	Painful stings, searing hot pains, shortness of breath, dizziness, painful muscles and stomach cramps, swelling, and death.	Seek immediate medical attention. Vinegar to decrease pain	Obey beach signs when swimming is prohibited
Fiji Burrowing Snake	Neurotoxin venom causes dizziness, headaches, nausea, and possible blackouts. It attacks the nervous system and can lead to death through asphyxiation as the lungs and heart begin to slow down and soon afterwards, stop working altogether.	Seek immediate medical attention.	Anti-spider spray
Tarantula Spiders	Venom causes severe pain, rash	Seek immediate medical attention.	Avoidance; do not keep as a pet

Note. Adapted from “Biodiversity,” by Australian Government Department of the Environment, 2014, retrieved November 21, 2014 from <http://www.environment.gov.au/biodiversity>; and “Fiji Warnings and Dangers,” by Virtual Tourist, 2014, retrieved November 21, 2014 from http://www.virtualtourist.com/travel/Australia_and_Oceania/Fiji/Warnings_or_Dangers-Fiji-TG-C-1.html

Table 8

Respiratory Disease

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Tuberculosis	Low	Cough >3 weeks, chest pain, hemoptysis, fever, chills, fatigue, weight loss, night sweats	Risk of latent TB infection may be elevated for highly exposed individuals	TX= Isoniazide; other drug therapies as applicable	Screening for latent tuberculosis infection (LTBI) may be warranted per COCOM or service specific policies for personnel with history of indoor contact.

Note. Adapted from “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://wwwnc.cdc.gov/travel/destinations/traveler/none/fiji>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

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Table 9

Soil Transmitted Disease

Disease	Risk ^a	Symptoms	Incidence	Prevention / Treatment	Countermeasures
Soil-transmitted Helminths (hookworm, strongyloidiasis, cutaneous larva migrans)	Intermediate	May have gastrointestinal symptoms and signs of anemia	A small number of cases (less than 1%)	TX=various anthelmintic medications and iron	Avoid bare skin contact with soil that may be contaminated with human or animal feces.
Melioidosis	Low	Varies. Can be localized, pulmonary, bloodstream, or a disseminated infection.	Rare cases (less than 0.1%)	TX=antibiotics	Avoid bare skin contact with contaminated soil, mud, or water
Hantavirus hemorrhagic fever with renal syndrome (HFRS). Transmitted through aerosolized dust	Low	Fever, chills, fatigue, muscle aches, headaches, dizziness, abdominal pain, diarrhea, nausea, vomiting	Extremely rare cases possible	Supportive therapy	Avoid heavily rodent-infested areas, specifically where dusty conditions occur. Use masks or kerchiefs to minimize inhalation of dust. Avoid sleeping on bare ground. Reduce dust production near troop concentrations

Note. Adapted from “Environmental Health Risk Assessment: Oceania,” by National Center for Medical Intelligence, 2009, retrieved from <https://www.intelink.gov/ncmi/afmicdocument.php?id=76844>; “Health Information for Traveler’s to Fiji,” by Centers for Disease Control and Prevention, 2013, retrieved November 21, 2014 from <http://wwwnc.cdc.gov/travel/destinations/traveler/none/fiji>; “Infectious Disease Risk Assessment Database (IDRA): Oceania,” by National Center for Medical Intelligence, 2014a, retrieved November 21, 2014 from https://www.ncmi.detrick.army.mil/product/idra_db.php?co=V1; and “Oceania: Force Health Protection Recommendations,” by National Center for Medical intelligence, 2014b, retrieved November 21, 2014 from <https://www.intelink.gov/ncmi/afmicdocument.php?id=104403>

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