

Vector-borne Infectious Diseases in Uzbekistan

Dr. Michael K. Faulde

Regierungsdirektor, Zentrales Institut des Sanitätsdienstes der Bundeswehr

Laborgruppe Medizinische Zoologie

Postfach 7340

56065 Koblenz, GERMANY

Translated by TRS Translation Services, Washington, DC

Edited by Dr. Richard G. Robbins and Major Sharon L. Spradling, AFPMB, Washington, DC

Vector-borne Disease:	Incubation Period:	Agent:	Mode of Transmission/ Vector:	Epidemiology:	Remarks:
Bunya Fever		<i>Bunyavirus</i> , Bunyaviridae	Transmission: Bite from different species of <i>Haemaphysalis</i> (hard tick) Primary vector: <i>Haemaphysalis cornupunctata</i> , <i>H. sulcata</i> , <i>H. kashmirensis</i> , <i>H. spp.</i> (sheep ticks) Reservoir: Sheep	Transmission period: March-Oct. Incidence and seroprevalence: No data are available at this time Bite properties: Sheep ticks belong to the hard tick family Ixodidae and also afflict humans; they feed at one spot for several days; adults live near sheep stables, pastures, etc., where they can fast for 2 to 3 years; total life span can exceed 4 years	Preventive measures: - Avoidance of sheep stables and pastures, etc. - Search/removal of hard ticks from self and companions - Use insect repellent and permethrin-treated uniform
Issyk-Kul Fever		Issyk-Kul virus, unclassified, Bunyaviridae	Transmission: Bite from different species of hard and soft ticks as well as <i>Culicoides</i> gnats Primary vectors: Hard ticks: <i>Hyalomma anatolicum</i> , <i>H. detritum</i> , <i>H. dromedarii</i> , <i>H. marginatum</i> , <i>H. spp.</i> (sheep ticks), Soft ticks: <i>Argas</i>	Transmission period: March-Oct., with peak in July/Aug. Incidence and seroprevalence: Disease is endemic and enzootic; outbreak in southern Tajikistan from March to August 1982, seropositivity rate in humans there up to 8%; no available epidemiological data from Uzbekistan Bite properties:	Preventive measures: - Avoidance of sheep stables and pastures, etc. - Search/removal of hard ticks from self and companions - Use insect repellent and permethrin-treated uniform - For transmission by soft

			<p><i>vespertilionis</i>, <i>Argas</i> spp. Gnats: <i>Culicoides schultzei</i> Reservoir: Primarily bats</p>	<p>Hard ticks (<i>Ixodes</i> and <i>Hyalomma</i> spp.) feed at one spot for several days, life cycle is 2-4 years. Soft ticks, family Argasidae, live in animal stables (whether active or deserted), wall cracks, nests, etc., and may fast up to 4 years; they bite for short periods, mostly at night for 5 to 10 minutes, depending on the species of soft tick; severe bite reactions are possible. Gnats are small mosquito-like flies, 1-1.5mm in size, which bite at dusk and dawn as well as indoors, and occasionally occur in swarms</p>	<p>ticks and gnats in lodging or camps, use treated mosquito nets - Soft tick control of the local area by spray/aerosol of acaricide (e.g., 1-2% Propoxur)</p>
Japanese Encephalitis		<p>Japanese encephalitis virus, <i>Flavivirus</i>, Flaviviridae</p>	<p>Transmission: Bite from <i>Culex</i> and <i>Anopheles</i> mosquitoes Primary vector: <i>Culex tritaeniorrhynchus</i> (nationwide) Secondary Vector: <i>Anopheles hyrcanus</i> (only in the extreme south)</p>	<p>Transmission period: May-Oct. Incidence and seroprevalence: No known human cases from Uzbekistan to date; antibodies were detected in animal reservoirs (birds, for example) in Kazakhstan in the late 1970s; because the endemic primary vector, <i>Culex tritaeniorrhynchus</i>, occurs nationwide, JEV infections are also possible throughout the country Bite properties: Female <i>Culex</i> and <i>Anopheles</i> mosquitoes bite at dawn and dusk as well as indoors; <i>Culex</i> females overwinter in basements etc.; flight radius up to 2 km Breeding grounds:</p>	<p>Preventive measures: - Indoors: Permethrin-treated mosquito net, or insect repellent - Outdoors: Larval mosquito control; use insect repellent combined with permethrin-treated uniform</p>

				<p>For <i>Culex</i>: In urban areas, breeds in small, stagnant or polluted bodies of water (cisterns, buckets, cans, old tires, etc.)</p> <p>For <i>Anopheles hyrcanus</i>: Breeds in valley rice paddies</p>	
Crimean-Congo Hemorrhagic Fever		<p>Crimean-Congo hemorrhagic fever virus, <i>Nairovirus</i>, Bunyaviridae</p>	<p>Transmission: Bite or exposure to hard tick cell material, mostly <i>Hyalomma</i> spp.; or soft ticks in the genus <i>Ornithodoros</i></p> <p>Primary vector: <i>Hyalomma marginatum</i> (sheep tick)</p> <p>Secondary vectors: <i>H. anatolicum</i>, <i>H. detritum</i>, <i>H. dromedarii</i>, <i>H. impeltatum</i>, <i>H. schulzei</i>, <i>H. asiaticum</i></p>	<p>Transmission period: March-Oct.</p> <p>Incidence and seroprevalence: Focally endemic nationally, occurring mostly in sheep shearers; up to 40% of sheep ticks (<i>Hyalomma</i> spp.) in endemic regions carry the virus; seroprevalence in humans is unknown at this time</p> <p>Habitat: Dry areas, animal stables and trails, former pastures</p> <p>Bite properties: Hard ticks of the genus <i>Hyalomma</i> feed at one spot for several days on the same host and fall off after feeding; larvae and nymphs bite small mammals; larger nymphs and adults prefer larger mammals or humans and are not host specific; fasting adult ticks survive up to 4 years</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Avoidance of old animal stables, etc. - Use insect repellent on skin and permethrin-treated uniform (for ticks, permethrin is a more effective repellent than DEET) - Search/removal of hard ticks from self and companions - For soft tick vectors in lodging: treated mosquito nets with simultaneous soft tick control using 1-2% Propoxur (acaricide)
Sand Fly Fever (Papatasi Fever)		<p>Sand fly fever virus <i>Phlebovirus</i>, Sicilian, Naples and Karimabad serotypes</p>	<p>Transmission: Sand fly bite</p> <p>Primary vector: <i>Phlebotomus papatasi</i></p>	<p>Transmission period: April-Oct., with peaks in early June and August; transovarial transmission possible</p> <p>Incidence and seroprevalence: No epidemiological data are available at this time; urban modes of transmission exist</p>	<p>Same as cutaneous leishmaniasis (<i>L. tropica</i>)</p>

		identified		<p>Breeding grounds: See Cutaneous Leishmaniasis</p> <p>Bite properties: Same as <i>L. tropica</i> (see CL)</p>	
Sindbis Fever		Sindbis fever virus, <i>Alphavirus</i> , <i>Togaviridae</i>	<p>Transmission: Mosquito or hard tick bite</p> <p>Primary vectors: <i>Culex pipiens</i>, <i>Cx. bitaeniorhynchus</i>, <i>Cx. tritaeniorhynchus</i>; <i>Hyalomma anatolicum</i></p> <p>Reservoir: Birds</p>	<p>Transmission period: March-Oct.</p> <p>Incidence and seroprevalence: Status in Uzbekistan is uncertain and no epidemiological data are available at this time, but very likely endemic in bird reservoirs; in the 1970s, up to 4% seropositivity in birds; potential vectors are endemic nationally</p> <p>Bite properties: <i>Culex</i> mosquitoes bite at dawn and dusk and also indoors; females overwinter in basements, etc. Sheep ticks live in dry areas, animal stables and trails, and former pastures</p> <p>Breeding grounds: <i>Culex</i> mosquitoes thrive in small, stagnant or polluted bodies of water (cisterns, buckets, cans, old tires, etc.) in urban environments; hard ticks of the genus <i>Hyalomma</i> feed at one spot for several days on the same host and detach after feeding; larvae and nymphs bite small mammals; larger nymphs and adults prefer larger mammals or humans but are not host specific; fasting adult ticks survive up to 4 years</p>	<p>Preventive measures:</p> <p>- Indoors: Permethrin-treated mosquito net, insect repellent</p> <p>- Outdoors: Larval mosquito control, insect repellent combined with permethrin-treated uniform; observe proper waste disposal (water collecting in empty food containers, tires, etc.); store tires away from water</p> <p>- Search/removal of hard ticks from self and companions</p>

Isfahan Virus		Isfahan virus fever, Rhabdoviridae	Transmission: Sand fly bite Primary vector: <i>Phlebotomus papatasi</i>	Transmission period: April-Oct., with peaks in early June and in August; transovarial transmission possible Incidence and seroprevalence: Endemic but no epidemiological data are available at this time Breeding grounds: See Cutaneous Leishmaniasis Bite properties: Same as <i>L. tropica</i> (see CL)	Same as cutaneous leishmaniasis (<i>L. tropica</i>)
Karshi Virus		Karshi virus fever, <i>Flavivirus</i> , Flaviviridae	Transmission: Bite of soft tick Primary vector: <i>Ornithodoros tholozani</i>	Transmission period: April-Oct., building infestations occur year-round Incidence and seroprevalence: Endemic but seroepidemiological data are not available at this time; frequency of this relatively new disease is chiefly correlated with the proximity of animal stables to living quarters Habitat: Soft ticks live hidden in walls, cracks, animal stables, the walls of wells, and other protected areas, often up to 1 m deep Bite properties: Soft ticks bite primarily at night for 5-10 min.; due to the release of a neurotoxin, the bite is seldom noticed; life cycle may exceed 10 years, depending on species and living conditions; capable of fasting (in infectious state) for several years	Preventive measures: - Indoors: Soft tick monitoring and control with acaricide barrier spray; use treated mosquito nets - Outdoors: Use insect repellent and permethrin-treated uniform; acaricide barrier; avoidance of old animal stables, caravansaries, etc.

Syr-Darya Fever		Syr-Darya-virus, unclassified	Vector unknown , no indication found in literature; possibly <i>Aedes</i> mosquitoes, due to an association with flood waters (forest or meadow mosquitoes), or hard ticks	Transmission period: May-Oct. Incidence and seroprevalence: Epidemiological situation currently unclear in Uzbekistan, where human cases have not yet been recorded, but enzootic in southern Kazakhstan, where there was a 1972 outbreak in the flood regions of the Syr Darya and Illi rivers; Kazakh seroprevalence (early 1980s) up to 15% positive in humans, up to 16% in other mammals	Preventive measures: - Eliminate breeding grounds in camp areas - Use insect repellent and permethrin-treated uniform - Use permethrin-treated mosquito nets, pending clarification of the mode of transmission
Tahyna Fever		Tahyna fever virus, <i>Bunyavirus</i> , Bunyaviridae	Transmission: Bite from various <i>Aedes</i> mosquitoes Primary vectors: <i>Aedes vexans</i> , <i>Ae. cantans</i> , <i>Ae. sticticus</i> (forest and meadow mosquitoes); other <i>Aedes</i> spp. Reservoir: Small mammals	Transmission period: May-Oct. Incidence and seroprevalence: Endemic but no epidemiological data available at this time; also detected in the Distance metropolitan area of neighboring Tajikistan Bite properties: <i>Aedes</i> mosquitoes bite outdoors during the day and somewhat at dusk; they don't actively enter homes (exophilic, exophagic). The bite response to <i>Ae. vexans</i> is especially unpleasant. Over 200 human bites per minute have been documented during swarms. Pay attention to bite reactions. The flight radius of this species is up to 20 km Breeding grounds: Floodwater mosquitoes hatch in large quantities in spring or after heavy rains in forests (to some extent treehole breeders) and/or in meadows; overwinter-	Preventive measures: - Eliminate breeding grounds in camp areas - Use insect repellent and permethrin-treated uniform

				ing occurs in the egg stage; eggs are capable of hatching year-round	
West Nile Fever		West Nile fever virus, <i>Flavivirus</i> , Flaviviridae	<p>Transmission : Bite of <i>Culex pipiens</i> (house mosquito), possibly also other mosquito species</p> <p>Primary vector: <i>Culex pipiens</i></p> <p>Reservoir: Birds</p>	<p>Transmission period: May-Nov.</p> <p>Incidence and seroprevalence: Very likely enzootic, but no epidemiological data are available at this time; endemic in Kazakhstan in the 1970s, with a seroprevalence of 4%</p> <p>Bite properties: <i>Culex pipiens</i> bites at dawn and dusk as well as indoors (endophillic, endophagic); infectious females overwinter in buildings, cellars, and animal stables, sometimes in large numbers</p> <p>Breeding grounds: In urban areas, colonizes any available small, stagnant or polluted body of water (cisterns, buckets, cans, old tires, etc.)</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Indoors: Permethrin-treated mosquito net, and/or insect repellent - Outdoors: Larval mosquito control, insect repellent combined with permethrin-treated uniform; reduction of breeding grounds by proper waste storage/disposal
Hemorrhagic Fever with Renal Syndrome		Hantaviruses of the Seoul, Hantaan/Dobrava and Puumala genotypes, Bunyaviridae	<p>Transmission: Contact with infectious dust or aerosols (rodent excrement, rodent urine), secondarily by vectors such as hematophagous mites</p> <p>Primary vectors/reservoirs (nationwide incidence)</p> <p>- Hantaan/Dobrava serotype: <i>Apodemus sylvaticus</i> (field mouse), <i>A. agrarius</i> (striped field mouse), <i>A. flavicollis</i></p>	<p>Incidence and seroprevalence: Focally endemic; 17 official cases of HFRS reported in 1998; seroepidemiological data not available at this time; HFRS is still a serious problem in Kazakhstan and particularly in China, with more than 100,000 cases/year and incidence rates over 200/100,000. All rodent reservoirs, particularly rats, striped field mice (<i>Apodemus agrarius</i>), and prairie voles (<i>Microtus</i> spp.) are endemic nationally in Uzbekistan</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - In urban/camp areas: eradication of synanthropic rodents (rats and mice) by the combined implementation of rodenticide (poison-baiting) with structural preventive measures, including hygienic measures (optimized waste disposal, for example); cleansing of all

			(yellow-necked mouse) - Puumala serotype: <i>Clethrionomys glareolus</i> (bank vole), <i>Ondatra zibethicus</i> (muskrat)	Transmission period: Peaks in spring and fall; year-round transmission possible in synanthropic rodents (rats, Seoul serotype; occurrence uncertain) Mode of transmission: - Behavior patterns of reservoir species and their level of synanthropy combine to render disease transmission sylvatic, rural, or urban - Reservoir rodents release urine in tiny droplets (micromicturition) to mark territory; virus transmission via aerosol or dust is therefore very efficient	affected areas of rodent excrement, including upstream disinfection where necessary - In rural and sylvatic areas, use a pourable poison bait for epidemic control of prairie voles and field mice
Siberian Tick Typhus		<i>Rickettsia sibirica</i>	Transmission: Bite of hard ticks, especially sheep ticks of the genera <i>Dermacentor</i> and <i>Haemaphysalis</i> Primary vectors: <i>Dermacentor silvarum</i> and <i>D. marginatus</i> (nationwide), and <i>Haemaphysalis concinna</i> (northern 2/3 of country)	Transmission period: March-Oct., with a peak in May-June Incidence and seroprevalence: Endemic nationally; no epidemiological data for Uzbekistan are available at this time Bite properties: Sheep ticks also afflict humans; they feed at one spot for several days; adults linger near sheep stables, pastures, etc., where they can fast for 2 to 3 years; sheep ticks cannot reproduce in heated living quarters	Preventive measures: - Avoidance of sheep stables and pastures, etc. - Search/removal of hard ticks from self and companions - Use insect repellent and permethrin-treated uniform
Louse-borne Typhus, Epidemic Typhus		<i>Rickettsia prowazekii</i>	Transmission: Intake of infectious body louse material Primary vector:	Transmission period: Predominantly during the winter months of Dec.-April Incidence and seroprevalence:	Preventive measures: - In endemic and epidemic regions: - Report every case of

			<p><i>Pediculus humanus</i> (body louse)</p> <p>Reservoir: Humans (Brill-Zinsser disease)</p>	<p>Likely occurs in Uzbekistan, although epidemiological data are not available at this time</p> <p>Bite properties: Lice live in human clothing and deposit their eggs (nits) there; they reach sexual maturity 2-3 weeks after hatching. Lice require a blood meal at least every 6 days. Transmission of the agent occurs by inhalation (louse feces) or by scratching of infected louse material (crushed louse tissue) into the bite wound. A louse-borne typhus epidemic is highly dependent on the socio-economic environment (i.e., refugees, refugee camps)</p>	<p>louse infestation</p> <ul style="list-style-type: none"> - Since insecticidal powders for the mass control of body lice are no longer available NATO-wide, treatment of clothing is the only available recourse - Never “break off” body lice; this is one of the primary modes of infection (by scratching into the wound infectious louse cells under the fingernails)
Mediterranean Fever (Boutonneuse Fever)		<i>Rickettsia conorii</i>	<p>Transmission: Bite from various hard ticks</p> <p>Primary vector: <i>Rhipicephalus sanguineus</i> (brown dog tick)</p> <p>Secondary vectors: <i>Hyalomma marginatum</i>, <i>H. anatolicum</i>, <i>Rhipicephalus turanicus</i></p> <p>Reservoir: Wild rodents, dogs, other mammals</p>	<p>Transmission period: March-Nov., year-round in cases of building infestations or chronic infestations in dogs</p> <p>Incidence and seroprevalence: Present but at an unknown epidemiological level</p> <p>Bite properties: Dog ticks also afflict people; they feed at one spot for several days, after which the female lay up to 2,000 eggs in residential buildings, where the larvae hatch and attack humans as well as dogs</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Avoidance of old animal stables, etc. - Use of insect repellent and permethrin-treated uniform (permethrin is a more effective repellent than DEET) - Search/removal of hard ticks from self and companions - For infestations in housing: use treated mosquito nets with simultaneous tick control, e.g., 1-2% Propoxur

					(acaricide)
Mite-borne Typhus (Tsutsugamushi Fever)		<i>Orientia</i> (formerly <i>Rickettsia tsutsugamushi</i>)	<p>Transmission: Bite from larval red (trombiculid) mites (about 0.1mm in size)</p> <p>Primary vectors: <i>Leptotrombidium deliense</i>, <i>L. akamushi</i></p> <p>Reservoir: rodents and red mites (transovarial transmission)</p>	<p>Transmission period: April-Oct.</p> <p>Incidence and seroprevalence: Present but at an unknown epidemiological level; regional occurrence of the disease is strongly localized ("hot spots") in the country's southwest; in 1991 there were 127/100,000 cases in the Ashkabad region in neighboring Turkmenistan; northward movement has recently been observed; endemic on mountainsides up to 3,200 meters</p> <p>Bite properties: The larval mites are six-legged (but are not insects), very small (ca. 0.1mm), very fast, red to dark in color, and bite at any opportunity day or night. Bites may not be noticed for a few hours but ultimately become extremely annoying and may become secondarily infected</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Use insect repellent and permethrin-treated uniform; permethrin is a more effective repellent than skin protectants with the active ingredient DEET - Minimize exposed skin (long pants) - Strict avoidance of known red mite habitat (grassy savannahs) - Due to their small size, larval mites are very hard to see; therefore, conduct surveys by placing a sheet of white paper on the ground and counting the mites that crawl on it
Murine Typhus, Endemic Typhus Fever		<i>Rickettsia typhi</i> (formerly <i>R. mooseri</i>)	<p>Transmission: Intake of infectious rodent flea material (cellular or fecal)</p> <p>Primary vector: <i>Xenopsylla</i> spp.(rat fleas)</p> <p>Secondary vectors: <i>Ctenocephalides felis</i> (cat flea), other rodent fleas</p>	<p>Transmission period: Year round in cases of rat infestation</p> <p>Seroprevalence: Endemic in the southern 1/3 of the country; current data for Uzbekistan are not available</p> <p>Bite properties: Rat fleas are nest specific, not host specific; all animal fleas also bite humans; fleas survive</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Outdoors: Consistent eradication of rats and rodents and cleaning of buildings - Indoors: Flea control with subsequent rat and rodent control

			<p>Reservoir: Rats harboring the enzootic vector <i>Polyplax spinulosa</i> (rat louse)</p>	<p>approx. 10 days without a blood meal, up to 2 months in low temperatures; transmission of the agent occurs by inhalation or by scratching of dust containing infectious flea material (crushed fleas, flea feces) into wounds</p>	
Plague		<i>Yersinia pestis</i>	<p>Transmission: (only urban rodent plague): Fleas Primary vectors: <i>Ctenocephalides canis</i> (dog flea), <i>C. felis</i> (cat flea), <i>Pulex irritans</i> (human flea), other rodent fleas Urban reservoir: House rats (<i>Rattus rattus</i>) Sylvatic reservoirs: <i>Meriones persicus</i>, <i>M. libicus</i>, <i>M. vinogradoni</i>, various Dipodidae (gerbils), various Microtinae (meadow mice), European ground squirrel (<i>Citellus suslicus</i>), etc. The rat flea <i>Xenopsylla</i> occurs only in the extreme south; <i>X. astia</i> does <u>not</u> occur nationwide</p>	<p>Transmission period: Possibly year-round in cases of house rat infestation Incidence and seroprevalence: Enzootic rodent plague is endemic in the northwestern part of the country (northern 1/3), with sporadic human cases there; possible outbreaks were partially averted by vaccination programs; no further details on incidence and seroprevalence in humans in Uzbekistan are available Breeding grounds: Fleas are nest specific, remaining primarily in the resting places of their rodent hosts Bite properties: Rodent fleas are nest specific, not host specific; all animal fleas also bite humans; fleas survive approx. 10 days without a blood meal, up to 2 months in low temperatures (quarantine!); a plague-infected flea lives an average of 3.2 days, since fleas inject adjuvant into the wound when they bite, and plague-infected fleas experience a “blood thrombus” in the esophagus because of the co-</p>	<p>Preventive measures: - Indoors: Permethrin-treated mosquito net (flea defense), insect repellent, rat control - Outdoors: Use insect repellent and permethrin-treated uniform - In urban plague focus: First, rat flea control with nondispersive insect powder, then rat eradication using rodenticides - Flea monitoring: If more than 5 rat fleas per rat are found in a rodent plague-endemic region (accumulation on the surviving rodents), a rodent plague epidemic is to be assumed</p>

				agulase activity of <i>Y. pestis</i> ; fleas take a test bite that strongly increases the probability of transmission of the plague agent to humans	
Lyme Disease		<i>Borrelia burgdorferi</i> , s.l.	<p>Transmission: Hard tick bite</p> <p>Primary vector: <i>Ixodes</i> species</p> <p>Secondary Vector: Other <i>Ixodes</i> species</p>	<p>Transmission period: March-Oct.</p> <p>Incidence and seroprevalence: Incidence of Lyme disease in Uzbekistan is uncertain; alleged occurrence of autochthonous cases in the Fergana region; the European and Asian primary vectors, <i>Ixodes ricinus</i> and <i>I. persulcatus</i>, are not endemic nationally; confirmed cases in northern Kazakhstan; no epidemiological data on prevalence</p> <p>Bite properties: <i>Ixodes</i> species readily attack humans; all stages suck blood and are vectors (transovarial and transstadial transmission occurs); life cycle approx. 3-4 years; live predominantly on forest edges and along animal trails, where they quest from low shrubbery</p> <p>-<i>Borrelia</i> infection first occurs after a human is bitten. The pathogen then flows through the salivary glands, from which it is transmitted to the host. Therefore, ticks are infective for <i>Borrelia</i> after a minimum of 24 hrs.</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Use insect repellent and permethrin-treated uniform - Search for attached ticks on self and companions - Remove feeding hard ticks as quickly and carefully as possible in order to avoid infection
Tick-borne Relapsing Fever		<i>Borrelia persica</i>	Transmission: Bites of soft ticks or fluid from coxal	Transmission period: April-Oct., with a peak in May-June; year-round	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Indoors: Soft tick

			<p>glands of male or female <i>Ornithodoros</i> spp. Primary vector: <i>Ornithodoros tholozani</i> Reservoirs: Wild rodents</p>	<p>in cases of building infestation Incidence and seroprevalence: Endemic nationally up to the extreme north and rather highly endemic in the Fergana Valley, where incidence averages 7/100,000 per year; seroepidemiological data are not available at this time; frequency of disease is primarily associated with the proximity of animal stables and living quarters Habitat: Soft ticks hide in walls, cracks, animal stables, well walls and other protected areas, often up to 1 m deep Bite properties: Soft ticks chiefly bite at night for 5-10 min.; due to the release of a neurotoxin, the bite is unnoticed; life cycle may exceed 10 years, depending on species and living conditions; capable of fasting (in infectious state) for several years</p>	<p>monitoring and control with acaricide barrier spray; use of treated mosquito nets - Outdoors: Use insect repellent and permethrin-treated uniform; acaricide barrier; avoidance of old animal stables, caravansaries, etc.</p>
Epidemic Relapsing Fever		<i>Borrelia recurrentis</i>	<p>Transmission: By scratching of infected body louse material into wounds Primary vector: <i>Pediculus humanus</i> (body louse)</p>	<p>Transmission period: Predominantly during the winter months from Dec.-April Incidence and seroprevalence: Low-level national occurrence; seroepidemiological data are not available at this time Bite properties: Lice live in human clothing and deposit their eggs (nits)</p>	<p>Preventive measures: - In endemic and epidemic regions: - Report every case of louse infestation - Since insect powders for the mass control of body lice are no longer available NATO-wide,</p>

				there; they reach sexual maturity 2-3 weeks after hatching; they require a blood meal at least every 6 days; transmission of the agent occurs by scratching infected louse material (crushed louse tissue) into bite wounds. A louse-borne relapsing fever epidemic is highly dependent on the socio-economic environment (i.e., refugees, refugee camps)	treatment of clothing is the only recourse - Never “break off” body lice; this is one of the primary modes of infection (by scratching into the wound infectious louse cells under the fingernails)
Trachoma		<i>Chlamydia trachomatis</i>	Transmission: Approx. 75% of <i>C. trachomatis</i> cases result from passive transmission by flies	Transmission period: Primarily May-Oct. Incidence and seroprevalence: Trachoma is moderately to highly endemic, especially in urban areas Mode of transmission: Transmission chiefly (up to 75%) by contact with flies, which transfer the agent by touch or defecation	Preventive measures: - Fly and maggot control - Proper and professional disposal of organic waste, including feces; to inhibit fly infestation and reproduction: - install fly screens on all building openings - use ultraviolet light traps - use flytraps - Resistance: house flies (<i>Musca domestica</i>) are resistant to chlorpyrifos, permethrin, fenvalerate and ethofenprox
Cutaneous Leishmaniasis		<i>Leishmania major, L. minor</i>	Transmission: Sand fly bite Primary vectors: - human (anthroponotic) transmission cycle: <i>Phlebotomus caucasicus, P. sergenti</i>	Transmission period: May-Nov., with peaks in June and Sept. Incidence and seroprevalence: Focally endemic nationally; most CL cases reported from Kashkadar yinska and Bukharskaya Oblasts; officially	Preventive measures: - Indoors: Use permethrin-treated mosquito nets; move to second floor (out of range) - Outdoors: Use insect

			<p>- zoonotic transmission cycle: <i>P. papatasi</i>, <i>P. caucasicus</i> Secondary vector: <i>P. longiductus</i> Reservoirs: Wild rodents such as <i>Rhombomys opimus</i> (gerbil), <i>Meriones erythrourus</i>, <i>M. hurricanae</i>, <i>M. meridianus</i></p>	<p>200 - >2,000 cases/year; 1990 incidence rate: 6/100,000; up to 100% focal infection in gerbil populations from August to September (e.g., Tedzhen Oasis) Breeding grounds: Breeds in decaying matter, larvae develop in moist, dark places, especially in nests of reservoir rodents Bite properties: Females bite at dusk and dawn but are poor fliers, active only on windless days, when they readily enter buildings to bite (endophilic, endophagic) and regularly penetrate untreated mosquito nets due to their small size; generation time 5-7 weeks; prefer to bite in the calf region</p>	<p>repellent and permethrin-treated uniform; don't wear shorts; eliminate breeding grounds through rodent control and the removal of bushes and shrubs in camp areas (greater clearance)</p>
Visceral Leishmaniasis		<i>Leishmania infantum</i>	<p>Transmission: Sand fly bite Primary vectors: <i>Phlebotomus caucasicus</i> (nationwide), <i>P. major</i> (southern 1/4); Secondary vectors: <i>P. longiductus</i>, <i>P. smirnovi</i> Reservoir: Canidae (jackals, foxes, dogs)</p>	<p>Transmission period: April-Oct. Incidence and seroprevalence: Focally endemic nationally with sporadic cases; no epidemiological data available at this time Breeding grounds: See cutaneous leishmaniasis</p>	<p>Same as cutaneous leishmaniasis; do not keep dogs in camp areas</p>
Tularemia		<i>Francisella tularensis</i>	<p>Transmission: Bite from infectious vectors, especially hard ticks; also direct contact with infected animal</p>	<p>Transmission period: April-Sept., with peak in May/June Incidence and seroprevalence: Focally and enzootically stable in</p>	<p>Preventive measures: - Avoid contaminated water - Rat control around camp</p>

			<p>material, chiefly from rodents</p> <p>Primary vectors: Hard ticks, especially <i>Dermacentor</i> spp. (sheep ticks)</p> <p>Secondary vectors: Hematophagous, anthropophilic vectors, such as fleas, stable flies, and mosquitoes (<i>Aedes vexans</i>)</p> <p>Reservoirs: Rabbits, small rodents and other mammals</p>	<p>Uzbekistan, with sporadic confirmed human cases; current epidemiological data are not available</p> <p>Epidemiology: Enzootic foci primarily in rabbit tick biotopes (steppe region), with possible spread to rural/urban areas via infected rodents</p>	<p>areas, with subsequent surface disinfection</p> <ul style="list-style-type: none"> - Mouse control around camp areas in sylvatic environments (see Hantavirus) - Protection from ticks by use of insect repellent and permethrin-treated uniform - Search for attached ticks on self and companions - Removal of feeding hard ticks as quickly and carefully as possible
Leptospirosis		<i>Leptospira icterohaemorrhagiae</i> ; <i>Leptospira</i> spp.	<p>Transmission: Via contaminated water through active skin penetration by the bacteria, as well as through contact with infectious rodent urine and animal material</p> <p>Primary vectors: Brown rat, <i>Rattus norvegicus</i>, hogs, mice</p> <p>Secondary vectors: Other mammals</p> <p>Reservoirs: Rats, other mammals</p>	<p>Transmission period: Year-round</p> <p>Incidence and seroprevalence: Endemic nationally, no epidemiological data available at this time; in eastern Kazakhstan, an epidemic in greater Ust-Kamenogorsk began in 1998, with more than 2000 cases and >6 fatalities; 6% seroprevalence in the Pakistani military in 1989</p> <p>Mode of transmission: - Special note: micromicturition of infected synanthropic rodents, such as rats, which constantly emit urine in tiny droplets. Leptospiral reservoirs spread the agent very efficiently over large areas; therefore, after rodents</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Avoid contaminated waters - Rat control around camp areas, with subsequent surface disinfection

				have been successfully cleared from an area, disinfection of the entire area must be considered	
Malaria		<i>Plasmodium vivax</i> , <i>P. falciparum</i> , <i>P. malariae</i>	<p>Transmission: <i>Anopheles</i> mosquito bite</p> <p>Primary vectors: <i>An. pulcherrimus</i>, <i>An. superpictus</i>, <i>An. maculipennis</i> (all nationwide)</p> <p>Secondary vectors: - <i>An. hyrcanus</i>, <i>An. claviger</i>, <i>An. bifurcatus</i>, <i>An. fluviatilis</i>, <i>An. messeae</i></p>	<p>Transmission period: May-Sept.</p> <p>Incidence and seroprevalence: Uzbekistan had been malaria-free since 1961; the introduction of new vivax malaria cases began in the 1990s; 1995: 27 cases; 1996: 51 cases; 1997: 52 cases; 1998: 74 cases; 1999: 78 cases (vivax:falciparum=95%:5%); 2000: 126 cases, 46 of which were autochthonous and 3 of which were <i>P. falciparum</i>; 60% of all autochthonous cases came from the Surkhandaryn region; extreme danger of an epidemic outbreak from Tajikistan, where there has been a dramatic increase of vivax malaria since 1997, as well as introduction of falciparum malaria; official Tajik case numbers: 1993: 619; 1994: 2,411; 1995: 6,103; 1996: 16,568; 1997: 30,054; 1998: 19,292; 1999: 13,492 cases, 335 of which were <i>P. falciparum</i>; currently, a massive anti-malarial campaign is being conducted in Uzbekistan, especially with respect to the danger of introduction from Tajikistan</p> <p>Breeding grounds: A variety of standing waters in urban areas (cans,</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> - Indoors: Use permethrin-treated mosquito nets; do not use ultraviolet lamps - Outdoors: Use insect repellent and permethrin-treated uniform; minimize exposed skin - Continuous larval control and abatement in camp areas; elimination of breeding grounds - Vector resistance status: <ul style="list-style-type: none"> - DDT: <i>An. maculipennis</i>, <i>An. hyrcanus</i>, <i>An. bifurcatus</i> - No resistance in <i>An. superpictus</i> at this time

				<p>buckets, old tires, etc.) to large, slow-flowing ponds with waterplants, rivers, etc.; <i>Anopheles hyrcanus</i> and <i>An. martinius</i> are especially prevalent in rice paddies along the Syr Darya River</p> <p>Bite properties: Females bite at dawn and dusk; <i>An. superpictus</i> does not bite in enclosed areas (exophilic, exophagic); the other species actively migrate indoors and bite there (endophilic, endophagic); very small species penetrate untreated mosquito nets; flight radius 1-2 km</p>	
--	--	--	--	---	--

Endemic Venomous Animals in Uzbekistan

Venomous Animal Group:	Name:	Toxicity:	Remarks:
-------------------------------	--------------	------------------	-----------------

Poisonous Snakes, mortality rate 25- 100/100,000	<i>Naja naja oxiana</i> , spectacled or Indian cobra, oxus or brown cobra (Elapidae)	Extremely toxic	Occurs in the southern half of the country; up to 1.8 m long, primary color is yellowish, brownish, grayish or black, partial cruciform traces visible on back, two dark bands in neck region, atypical spectacled collar, but neck region is dilatable into a cobra-like hood; prefers rocky, cliffy habitats on mountainsides up to 3000 m; diurnal with maximum activity mornings and evenings; very clever and agile, raises anterior portion of body when it senses danger, does not spit over a distance; poison is primarily neurotoxic, pathology begins approx. 1 hour after bite, symptoms can worsen extremely quickly, with death from respiratory paralysis; antivenom: Centro de Estandarization de Venenos y Antivenenos, Spain; Institut d'Etat des Serums et Vaccines, Iran; Ministry of Public Health, Russia
	<i>Agkistrodon halys</i> , pit viper (Crotalidae)	Mildly toxic	Endemic in the southeastern 1/2 of the country; during the day, hides under rocks, in rodent nests and chasms; rarely bites; 60 to 80 cm long, head flat and angular, horn nail on end of tail, coloring extremely variable, from sand yellow to brown to black, often with unevenly formed horizontal stripes; inhabits varying habitats from steppes to high mountain meadows; no bite complications resulting in death reported to date
	<i>Echis multisquamatus</i> , multiscaled or Transcaspian saw-scaled viper, Central Asian	Extremely toxic	Prevalent in the steppe regions of Turkmenistan and the most dangerous poisonous snake there; very aggressive, up to 80 cm long with brownish

	sand viper (Viperidae)		base coloring and lateral light and dark zigzag stripe and black and white marks on back; emits a rattling sound when in danger; mortality rate 36%, severe injury in 30% of all bite cases, specific antivenom available (Institut d'Etat des Serums et Vaccines, Iran)
	<i>Vipera ursinii</i> , meadow viper (Viperidae)	Mildly toxic	Prevalent in entire country except the southern half, especially in humid valley lowlands; mildly aggressive; 25-50 cm long
	<i>Daboia lebetina obtusa</i> , blunt-nosed viper, Levantine viper (Viperidae)	Extremely toxic	Especially widespread in the southern 1/3 of Uzbekistan; length up to 1.7 m, wide head with small scales, eyes have vertical pupils, primary coloring fluctuates between stony gray, light gray and greenish gray to reddish gray, pattern dissolves to darker horizontal band markings; can be confused with the harmless Münzennatter; inhabits cliffy/rocky areas and mountainsides that lean toward riverbeds, rarely occurs over 2,000 m altitude; very aggressive when disturbed; mortality rate 6.6%, severe trauma/injury in 28% of bite cases, species antivenom is available
Arachnids	<i>Lycosa</i> spp., as well as other species of wolf spider	Mildly toxic	Mobile predaceous spiders, wasp-like bite, usually only localized symptoms

	Sun spiders (Solifugae)	Nontoxic	Occur in the country's steppe regions; very large (up to 10 cm) spider-like arachnids with crablike jaws but without poison glands; display pedipalps (pincers) when endangered and emit a hissing sound by rubbing jaws; will jump at humans from up to 30 cm away and bite painfully; bite has cruciform appearance and high secondary infection rate
	Scorpions in the genera <i>Mesobuthus</i> and <i>Orthochirus</i> (<i>Mesobuthus eupeus</i> , <i>Orthochirus scrobiculosus</i>), and the possible occurrence of <i>Androctonus crassicauda</i> in the extreme southern part of the country	Mildly toxic <i>Androctonus crassicauda</i> : Extremely toxic species; antivenom is available	Occur throughout the country; the venom in Uzbek species acts hemolytically, with local pain, swelling, and necrosis; systemic poisoning is generally acute; no cases of death have been recorded in Uzbekistan to date (except in the extreme south of the country); aside from <i>A. crassicauda</i> , no extremely toxic species are endemic
Centipedes	<i>Scolopendra cingulata</i> , megarian banded centipede, as well as other large species	Mildly toxic	Common in areas inhabited by humans; up to 10 cm long, some endemic species are even longer; front pair of legs transformed into jaws with poison glands; systemic symptoms are generally acute, rarely last longer than a day; bite marks from large centipedes are almost indistinguishable from those of a mid-sized viper