

# INFECTIOUS DISEASES OF GUATEMALA



Stephen Berger, MD

**gideon**   
E-BOOK SERIES

2017 Edition

Infectious Diseases of Guatemala - 2017 edition

Stephen Berger, MD

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#### **Scope of Content**

Disease designations may reflect a specific pathogen (ie, Adenovirus infection), generic pathology (Pneumonia - bacterial) or etiologic grouping (Coltivirus - Old world). Such classification reflects the clinical approach to disease allocation in the Infectious Diseases Module of the GIDEON web application. Similarly, a number of diseases which are generally diagnosed and treated outside of the field of Infectious Diseases are not included, despite the fact that a clear infectious etiology exists. Examples include Peptic ulcer, Creutzfeldt-Jakob disease, Human papillomavirus infections, etc. In contrast, a number of other entities of unknown etiology which do present to Infectious Diseases specialists have been included: Kawasaki's disease, Chronic fatigue syndrome, Kikuchi and Kimura diseases. Several minor infections having minimal relevance to the field of Infectious Diseases are not covered: Paronychia, Otitis externa, etc.

## **Introduction: The GIDEON e-book series**

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*Infectious Diseases of Guatemala* is one in a series of GIDEON [ebooks](#) which summarize the status of Infectious diseases, Drugs, Vaccines and Pathogens in every country of the world.

Chapters are arranged alphabetically, by disease name. Each section is divided into four sub-sections:

1. Descriptive epidemiology
2. Status of the disease in Guatemala
3. References

The initial items in the first section, Descriptive epidemiology, are defined as follows:

<b>Agent</b>	Classification (e.g., virus, parasite) and taxonomic designation.
<b>Reservoir</b>	Any animal, arthropod, plant, soil or substance in which an infectious agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such a manner that it can be transmitted to a susceptible host.
<b>Vector</b>	An arthropod or other living carrier which transports an infectious agent from an infected organism or reservoir to a susceptible individual or immediate surroundings.
<b>Vehicle</b>	The mode of transmission for an infectious agent. This generally implies a passive and inanimate (i.e., non-vector) mode.

A chapter outlining the routine vaccination schedule of Guatemala follows the diseases chapters.

### **Content**

There are 357 generic infectious diseases in the world today. 223 of these are endemic, or potentially endemic, to Guatemala. A number of other diseases are not relevant to Guatemala and have not been included in this book.

In addition to endemic diseases, we have included all published data regarding imported diseases and infection among expatriates from Guatemala.

### **Sources**

Data are based on the GIDEON web application ([www.gideononline.com](http://www.gideononline.com)) which relies on standard text books, peer-review journals, Health Ministry reports and ProMED, supplemented by an ongoing search of the medical literature.

The availability and quality of literature regarding specific infectious diseases vary from country to country. As such, you may find that many of the sections in this book are limited to a general discussion of the disease itself - with no data regarding Guatemala.

This is a book about the geography and epidemiology of Infection. Comprehensive and up-to-date information regarding the causes, diagnosis and treatment of each disease is available in the [GIDEON web application](#). Many of the diseases are generic. For example, such designations as Pneumonia bacterial and Urinary tract infection include a number of individual diseases. These appear under the subheading, Synonyms, listed under each disease.

### **Exploring Outbreaks and Surveys**

Outbreak and survey charts are designed to allow users to quickly scan and compare publications according to year, setting, number of cases / deaths, affected population and other parameters. Linked references are displayed where available.

Parallel charts in the [GIDEON web app](#) allow for sorting within columns. In the following example, data are displayed alphabetically by outbreak setting or region.

Years	Region	Setting	Cases	Deaths	Source	Pathogen	Years	Region	Setting	Cases	Deaths	Source	Pathogen
1990	Alberta						2013*		airplane			eggs	Heidelberg
1999	Alberta		12		pet food	infantis	1966		bar mitzvah	34		fish	Java
2004	Alberta	restaurant	31			Heidelberg	1984	Ontario	day nursery	22			typhimurium
2010 to 2011	Alberta		91		food	enteritidis	1992*	Ontario	hospital				enteritidis
1960	British Columbia		65				1997*	Montreal	hotel				enteritidis PT 8
1985 to 1986	British Columbia		13		chocolate	nima	1982	Quebec	nursery			milk	typhimurium
1995 to 1996	British Columbia		133		sprouts	Newport	1983 to 1986	Halifax	nursing home	51			Newport
2000	British Columbia		47		baked goods	enteritidis	2011	New Brunswick	nursing home	7	1		
2000	British Columbia		62		eggs		1999	Edmonton	restaurant	27			typhimurium
2005*	British Columbia				baked goods		2001	multiple sites	restaurant	12		sprouts	enteritidis PT 11b
2008	British Columbia		64				2004	Alberta	restaurant	31			Heidelberg
2011	British Columbia		8			agbeni	2005	Ontario	restaurant	81			
							2016	Toronto	restaurant	43			
							2012	Ontario	school	46		catered food	
							2007	Ontario	university	85		food	typhimurium PT 108

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**Table of Contents**


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Introduction: The GIDEON e-book series .....	3	Cytomegalovirus infection <sup>+</sup> .....	67
Acanthocephalan infections .....	8	Dengue <sup>+</sup> .....	68
Actinomycosis .....	9	Dermatophytosis .....	71
Adenovirus infection .....	10	Dientamoeba fragilis infection .....	72
Aeromonas and marine Vibrio infx. <sup>+</sup> .....	11	Diphtheria <sup>+</sup> .....	73
Amoeba - free living .....	12	Diphyllobothriasis .....	75
Amoebiasis <sup>+</sup> .....	13	Dipylidiasis .....	76
Amoebic abscess <sup>+</sup> .....	15	Dirofilariasis <sup>+</sup> .....	77
Anaplasmosis <sup>*</sup> .....	16	Eastern equine encephalitis <sup>+</sup> .....	78
Angiostrongyliasis - abdominal <sup>+</sup> .....	17	Echinococcosis - unilocular <sup>+</sup> .....	79
Animal bite-associated infection .....	18	Endocarditis - infectious .....	80
Anisakiasis .....	19	Enterobiasis <sup>+</sup> .....	81
Anthrax <sup>+</sup> .....	20	Enterovirus infection <sup>+</sup> .....	82
Ascariasis <sup>+</sup> .....	23	Epidural abscess .....	83
Aspergillosis .....	24	Erysipelas or cellulitis .....	84
Bacillary angiomatosis .....	25	Erysipeloid .....	85
Bacillus cereus food poisoning .....	26	Erythrasma .....	86
Bacterial vaginosis .....	27	Escherichia coli diarrhea <sup>+</sup> .....	87
Balantidiasis .....	28	Fascioliasis .....	89
Bartonellosis - cat borne <sup>+</sup> .....	29	Fungal infection - invasive .....	90
Bartonellosis - other systemic <sup>+</sup> .....	30	Gastroenteritis - viral <sup>+</sup> .....	91
Blastocystis hominis infection <sup>+</sup> .....	31	GB virus C infection .....	92
Borna virus encephalitis .....	32	Gianotti-Crosti syndrome .....	93
Botulism .....	33	Giardiasis <sup>+</sup> .....	94
Brain abscess .....	34	Gonococcal infection <sup>+</sup> .....	96
Brucellosis <sup>+</sup> .....	35	Granuloma inguinale .....	97
Bunyaviridae infections - misc. ....	37	Group C viral fevers <sup>+</sup> .....	98
Campylobacteriosis <sup>+</sup> .....	38	Hepatitis A <sup>+</sup> .....	99
Candidiasis <sup>+</sup> .....	39	Hepatitis B <sup>+</sup> .....	101
Chancroid <sup>+</sup> .....	40	Hepatitis C <sup>+</sup> .....	104
Chandipura and Vesicular stomatitis viruses <sup>+</sup> .....	42	Hepatitis D .....	106
Chikungunya <sup>+</sup> .....	43	Hepatitis E <sup>+</sup> .....	107
Chlamydia infections, misc. <sup>+</sup> .....	45	Herpes B infection .....	108
Chlamydomyces pneumoniae infection .....	46	Herpes simplex encephalitis .....	109
Cholecystitis and cholangitis .....	47	Herpes simplex infection <sup>+</sup> .....	110
Cholera <sup>+</sup> .....	48	Herpes zoster .....	112
Chromomycosis .....	51	Histoplasmosis <sup>+</sup> .....	113
Chronic meningococemia .....	52	HIV infection - initial illness <sup>+</sup> .....	114
Clostridial food poisoning .....	53	HIV/AIDS <sup>+</sup> .....	115
Clostridial myonecrosis .....	54	Hookworm <sup>+</sup> .....	121
Clostridium difficile colitis <sup>+</sup> .....	55	HTLV Infections .....	122
Coccidioidomycosis <sup>+</sup> .....	56	Human herpesvirus 6 infection .....	123
Common cold .....	57	Hymenolepis diminuta infection .....	124
Conjunctivitis - inclusion .....	58	Hymenolepis nana infection <sup>+</sup> .....	125
Conjunctivitis - viral <sup>+</sup> .....	59	Ilheus and Bussuquara <sup>+</sup> .....	126
Cryptococcosis <sup>+</sup> .....	60	Infection of wound, puncture, IV line, etc .....	127
Cryptosporidiosis <sup>+</sup> .....	61	Infectious mononucleosis or EBV infection .....	128
Cutaneous larva migrans .....	63	Influenza <sup>+</sup> .....	129
Cyclosporiasis <sup>+</sup> .....	64	Intestinal spirochetosis .....	130
Cysticercosis <sup>+</sup> .....	66	Intra-abdominal abscess .....	131

Intracranial venous thrombosis .....	132	Peritonitis - bacterial.....	200
Isosporiasis <sup>+</sup> .....	133	Pertussis <sup>+</sup> .....	201
Kawasaki disease .....	134	Pharyngeal and cervical space infx.....	204
Kikuchi's disease and Kimura disease .....	135	Pharyngitis - bacterial .....	205
Kingella infection .....	136	Philophthalmosis .....	206
Laryngotracheobronchitis.....	137	Pityriasis rosea.....	207
Legionellosis .....	138	Plesiomonas infection <sup>+</sup> .....	208
Leishmaniasis - cutaneous <sup>+</sup> .....	139	Pleurodynia .....	209
Leishmaniasis - mucocutaneous <sup>+</sup> .....	141	Pneumocystis pneumonia <sup>+</sup> .....	210
Leishmaniasis - visceral <sup>+</sup> .....	142	Pneumonia - bacterial .....	211
Leprosy <sup>+</sup> .....	144	Poliomyelitis and acute flaccid paralysis <sup>*</sup> .....	212
Leptospirosis <sup>+</sup> .....	147	Protothecosis and chlorellosis.....	216
Listeriosis <sup>+</sup> .....	149	Pseudocowpox .....	217
Liver abscess - bacterial .....	150	Pyodermas (impetigo, abscess, etc).....	218
Lymphocytic choriomeningitis.....	151	Pyomyositis .....	219
Lymphogranuloma venereum .....	152	Q-fever .....	220
Malaria <sup>+</sup> .....	153	Rabies <sup>+</sup> .....	221
Malignant otitis externa .....	156	Rat bite fever - spirillary.....	225
Mansonelliasis - M. ozzardi .....	157	Rat bite fever - streptobacillary .....	226
Measles <sup>+</sup> .....	158	Relapsing fever <sup>+</sup> .....	227
Melioidosis <sup>*</sup> .....	160	Respiratory syncytial virus infection <sup>+</sup> .....	228
Meningitis - aseptic (viral) <sup>+</sup> .....	161	Respiratory viruses - miscellaneous <sup>+</sup> .....	229
Meningitis - bacterial <sup>+</sup> .....	162	Reye's syndrome.....	230
Microsporidiosis.....	166	Rheumatic fever <sup>+</sup> .....	231
Molluscum contagiosum .....	167	Rhinoscleroma and ozena .....	232
Mumps <sup>+</sup> .....	168	Rhodococcus equi infection .....	233
Myalgic encephalomyelitis.....	170	Rickettsia felis infection <sup>+</sup> .....	234
Mycetoma .....	171	Rotavirus infection <sup>+</sup> .....	235
Mycobacteriosis - M. marinum .....	172	Rubella <sup>+</sup> .....	238
Mycobacteriosis - M. scrofulaceum .....	173	Salmonellosis <sup>+</sup> .....	241
Mycobacteriosis - miscellaneous nontuberculous .....	174	Sarcocystosis.....	242
Mycoplasma (miscellaneous) infection .....	175	Scabies <sup>+</sup> .....	243
Mycoplasma pneumoniae infection .....	176	Scarlet fever <sup>+</sup> .....	244
Myiasis <sup>+</sup> .....	177	Septic arthritis .....	245
Necrotizing skin/soft tissue infx. ....	178	Septicemia - bacterial <sup>+</sup> .....	246
Neutropenic typhlitis .....	179	Shigellosis <sup>+</sup> .....	247
Nocardiosis.....	180	Sinusitis.....	249
Onchocerciasis <sup>+</sup> .....	181	Smallpox <sup>*</sup> .....	250
Onchocerciasis - zoonotic .....	185	Sporotrichosis <sup>+</sup> .....	252
Orbital and eye infection <sup>+</sup> .....	186	Spotted fevers - New World <sup>*</sup> .....	253
Orf .....	187	St. Louis encephalitis <sup>+</sup> .....	254
Ornithosis.....	188	Staphylococcal food poisoning.....	255
Osteomyelitis.....	189	Staphylococcal scalded skin syndrome .....	256
Otitis media <sup>+</sup> .....	190	Streptococcus suis infection .....	257
Paragonimiasis.....	192	Strongyloidiasis <sup>+</sup> .....	258
Parainfluenza virus infection.....	193	Subdural empyema .....	259
Parvovirus B19 infection .....	194	Suppurative parotitis .....	260
Pediculosis.....	195	Syphilis <sup>+</sup> .....	261
Pentastomiasis - Linguatula .....	196	Taeniasis <sup>+</sup> .....	264
Pericarditis - bacterial .....	197	Tetanus <sup>+</sup> .....	265
Perinephric abscess .....	198	Thelaziasis .....	268
Perirectal abscess .....	199	Toxic shock syndrome.....	269

Toxocariasis.....	270	Vaccinia and cowpox.....	293
Toxoplasmosis <sup>+</sup> .....	271	Varicella <sup>+</sup> .....	294
Trachoma <sup>+</sup> .....	272	Venezuelan equine encephalitis <sup>+</sup> .....	295
Trichinosis <sup>+</sup> .....	273	Vibrio parahaemolyticus infection.....	297
Trichomoniasis <sup>+</sup> .....	274	West Nile fever <sup>+</sup> .....	298
Trichuriasis <sup>+</sup> .....	276	Western equine encephalitis <sup>*</sup> .....	299
Tropical phagedenic ulcer.....	277	Whipple's disease.....	300
Tropical sprue.....	278	Yaws <sup>+</sup> .....	301
Trypanosomiasis - American <sup>+</sup> .....	279	Yellow fever <sup>*</sup> .....	303
Tuberculosis <sup>+</sup> .....	281	Yersiniosis <sup>+</sup> .....	305
Tungiasis.....	285	Zika <sup>+</sup> .....	306
Typhoid and enteric fever <sup>+</sup> .....	286	Zygomycosis.....	307
Typhus - endemic.....	289	Vaccine Schedule and coverage.....	308
Typhus - epidemic <sup>+</sup> .....	290	About GIDEON.....	310
Urinary tract infection.....	292		

\* Not endemic. Imported, expatriate or other context reported.

+ Country specific note exists for disease

**Acanthocephalan infections**

<b>Agent</b>	PARASITE - Archiacanthocephala. Moniliformida: <i>Moniliformis moniliformis</i> , Oligacanthorhynchida: <i>Maracanthorhynchus hirudinaceus</i> .
<b>Reservoir</b>	Pig ( <i>Maracanthorhynchus</i> ), rat and fox ( <i>Moniliformis</i> ),
<b>Vector</b>	None
<b>Vehicle</b>	Insect ingestion
<b>Incubation Period</b>	Unknown - presumed 15 to 40 days
<b>Diagnostic Tests</b>	Identification of worm in stool.
<b>Typical Adult Therapy</b>	Infection is usually self-limited. <a href="#">Pyrantel pamoate</a> has been used against <i>Moniliformis moniliformis</i> - 11 mg/kg PO - repeat once in 2 weeks
<b>Typical Pediatric Therapy</b>	Infection is usually self-limited. <a href="#">Pyrantel pamoate</a> has been used against <i>Moniliformis moniliformis</i> - 11 mg/kg PO - repeat once in 2 weeks
<b>Clinical Hints</b>	Most infections are characterized by asymptomatic passage of a worm In some cases, only vague complaints such as 'periumbilical discomfort' and 'giddiness' have been described
<b>Synonyms</b>	Corynosoma, Macracanthorhynchus, Moniliform acanthocephalan, Moniliformis moniliformis. ICD9: 128.9 ICD10: B83.8



## Actinomycosis

Agent	BACTERIUM. Actinomycetes, <i>Actinomyces</i> spp. Anaerobic gram-positive bacillus
Reservoir	Human (oral, fecal and vaginal flora)
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Gram stain and bacteriological culture using strict anaerobic technique. Growth is apparent in 3-7 days.
Typical Adult Therapy	<a href="#">Ampicillin</a> 50 mg/kg/day IV X 4 to 6 weeks - then <a href="#">Amoxicillin</a> 1.5 g/d PO X 6 months. OR <a href="#">Penicillin G</a> 10 to 20 million units/day X 4 to 6w; then <a href="#">Penicillin V</a> X 6 to 12m. Alternatives: <a href="#">Doxycycline</a> , <a href="#">Ceftriaxone</a> , <a href="#">Erythromycin</a> Excision/drainage
Typical Pediatric Therapy	<a href="#">Ampicillin</a> 50 mg/kg/day IV X 4 to 6 weeks - then <a href="#">Amoxicillin</a> 20 mg/kg/day PO X 6 months. <a href="#">Penicillin G</a> 100,000 units/kg/day X 4 to 6w; then <a href="#">Penicillin V</a> 25,000 units/day X 6 to 12m. Excision/drainage
Clinical Hints	Mandibular osteomyelitis with fistulae (sulfur granules) in the setting of poor dental hygiene Pelvic abscesses in a women with intra-uterine device Fever, right lower quadrant mass and fistulae Suppurative pleuropulmonary infection with fistulae
Synonyms	Actinomyces, Aktinomykose, Lumpy jaw. ICD9: 039. ICD10: A42

**Adenovirus infection**

<b>Agent</b>	VIRUS - DNA. Adenoviridae, Adenovirus Enteric strains are classified in genus Mastadenovirus
<b>Reservoir</b>	Human, Non-human primates
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Water, Respiratory of pharyngeal acquisition
<b>Incubation Period</b>	4d - 12d
<b>Diagnostic Tests</b>	Viral culture/serology or antigen assay. Direct fluorescence of secretions. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Enteric/secretion precautions. <a href="#">Cidofovir</a> has been used in some cases. Symptomatic therapy
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Adenovirus vaccine</a>
<b>Clinical Hints</b>	Generally, an uncomplicated illness lasting 3 to 5 days - Atypical pneumonia, upper respiratory infection, tracheitis, bronchiolitis - Keratoconjunctivitis with preauricular adenopathy - Gastroenteritis or hemorrhagic cystitis
<b>Synonyms</b>	Adenovirus gastroenteritis, Epidemic keratoconjunctivitis, Pharyngoconjunctival fever. ICD9: 047.9,077.1,077.2,008.62,480.0 ICD10: A08.2,B30.1,B34.0,J12.0

**Aeromonas and marine Vibrio infx.**

<b>Agent</b>	BACTERIUM. <i>Aeromonas hydrophila</i> , <i>Vibrio vulnificus</i> , et al Facultative gram-negative bacilli
<b>Reservoir</b>	Salt or brackish water, Fish
<b>Vector</b>	None
<b>Vehicle</b>	Water, Shellfish, Contact
<b>Incubation Period</b>	Range 2d - 7d
<b>Diagnostic Tests</b>	Culture. Notify laboratory if these organisms are suspected in stool.
<b>Typical Adult Therapy</b>	Fluoroquinolone or Sulfamethoxazole / <a href="#">Trimethoprim</a> . Other antimicrobial agent as determined by susceptibility testing
<b>Typical Pediatric Therapy</b>	Sulfamethoxazole / <a href="#">Trimethoprim</a> . Or other antimicrobial agent as determined by susceptibility testing
<b>Clinical Hints</b>	Diarrhea, fever, vomiting or sepsis following marine injury or ingestion of raw oysters / contaminated fresh or brackish water Fecal leukocytes present Severe or fatal in immunosuppressed or alcoholic patients
<b>Synonyms</b>	Aeromonas, Aeromonas hydrophila, Vibrio mimicus, Vibrio vulnificus. ICD9: 005.81,027.9 ICD10: A48.8

**Aeromonas and marine Vibrio infx. in Guatemala**

**Prevalence surveys**

Years	Region	Study Group	%	Notes
2010*	Guatemala	specimens - stool	2	2% of American patients with travelers' diarrhea acquired in India, Guatemala or Mexico ( <i>Aeromonas</i> ) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

**References**

1. J Clin Microbiol 2010 Apr ;48(4):1417-9.

**Amoeba - free living**

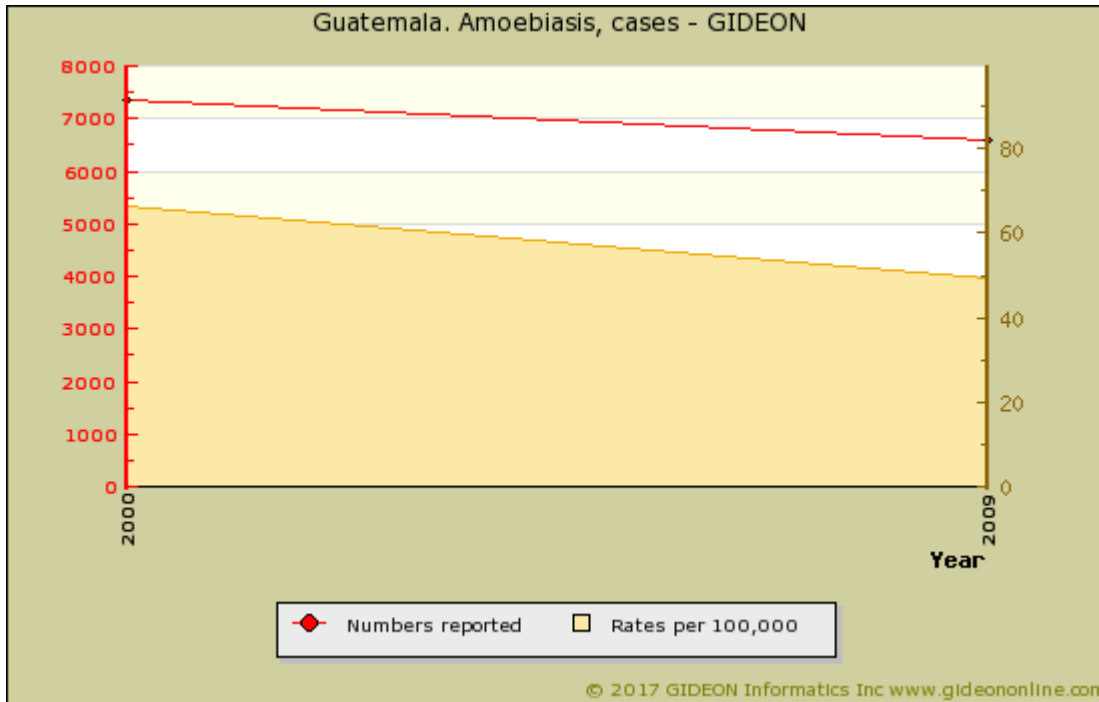
<b>Agent</b>	PARASITE - Protozoa. Centramoebida, Acanthamoebidae: <i>Acanthamoeba</i> and <i>Balamuthia</i> Schizopyrenida, Vahlkampfiidae: <i>Naegleria</i>
<b>Reservoir</b>	Water, Soil
<b>Vector</b>	None
<b>Vehicle</b>	Water (diving, swimming), Contact
<b>Incubation Period</b>	5d - 6d (range 2d - 14d) Granulomatous ? to 2m
<b>Diagnostic Tests</b>	Wet preparation. Specialized cultures. Serology available in reference centers.
<b>Typical Adult Therapy</b>	CNS <i>Naegleria</i> : Ampho. B to 1 mg/kg/d IV + 1.5 mg intrathec. X 8 days; + <a href="#">Miconazole</a> 350 mg/sq m/d IV + 10 mg intrathec. qod X 8d  <i>Acanthamoeba</i> : <a href="#">Sulfonamides</a> + <a href="#">Flucytosine</a>  <a href="#">Miltefosine</a> some cases of <i>Acanthamoeba</i> / <i>Balamuthia</i>
<b>Typical Pediatric Therapy</b>	CNS <i>Naegleria</i> : <a href="#">Amphotericin B</a> to 1 mg/kg/d IV + 1.5 mg intrathecal X 8 days; plus <a href="#">Miconazole</a> 350 mg/sq m/d IV + 10 mg intrathecal qod X 8d  <i>Acanthamoeba</i> : <a href="#">Sulfonamides</a> + <a href="#">Flucytosine</a>  <a href="#">Miltefosine</a> successful in some cases of <i>Acanth.</i> / <i>Balamuthia</i> enceph.
<b>Clinical Hints</b>	Severe, progressive meningoencephalitis ( <i>Naegleria</i> , <i>Acanthamoeba</i> or <i>Balamuthia</i> ) following swimming or diving in fresh water Keratitis ( <i>Acanthamoeba</i> ), associated with contaminated solutions used to clean contact lenses.
<b>Synonyms</b>	<i>Acanthamoben</i> , <i>Acanthamoeba</i> , <i>Allovahtkampfia</i> , Amebic keratitis, <i>Balamuthia</i> , <i>Balmuthia</i> , <i>Dictyostelium</i> , Free-living amoeba, <i>Leptomaxid amoeba</i> , <i>Naegleria</i> , <i>Paravahlkampfia</i> , Primary amebic meningoencephalitis, <i>Sappinia</i> , <i>Vahlkampfia</i> . ICD9: 136.2 ICD10: B60.1,B60.2

## Amoebiasis

<b>Agent</b>	PARASITE - Protozoa. Sarcomastigota, Entamoebidea: <i>Entamoeba histolytica</i> (must be distinguished from non-invasive, <i>Entamoeba dispar</i> )
<b>Reservoir</b>	Human
<b>Vector</b>	Fly (Musca) - occasionally
<b>Vehicle</b>	Food, Water, Sexual contact, Fly
<b>Incubation Period</b>	1w - 3w (range 3d - 90d)
<b>Diagnostic Tests</b>	Fresh stool/aspirate for microscopy. Stool antigen assay. Stool PCR. Note: serological tests usually negative.
<b>Typical Adult Therapy</b>	<b>Metronidazole</b> 750 mg PO TID X 10d  Follow with: <b>Paromomycin</b> 500 mg PO TID X 7d OR <b>Iodoquinol</b> 650 mg PO TID X 20d
<b>Typical Pediatric Therapy</b>	<b>Metronidazole</b> 15 mg/kg TID X 10d  Follow with: <b>Paromomycin</b> 10 mg/kg PO TID X 7d OR <b>Iodoquinol</b> 10 mg/kg PO TID X 20d
<b>Clinical Hints</b>	Dysentery, abdominal pain, tenesmus. Unlike shigellosis, hyperemia of the rectal mucosa and fecal pus are absent. Liver abscess and dysentery rarely coexist in a given patient.
<b>Synonyms</b>	Amebiasis, Amebiasis intestinal, Amebic colitis, Amebic dysentery, Amoebenruhr, Entamoeba bangladeshi, Entamoeba gingivalis, Entamoeba moshkovskii. ICD9: 006.0,006.1,006.2 ICD10: A06.0,A06.1,A06.2

### Amoebiasis in Guatemala

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Graph: Guatemala. Amoebiasis, cases

**Prevalence surveys**

Years	Region	Study Group	%	Notes
2004 - 2007	Palajunoj Valley	children	16.1	16.1% of school children in the Palajunoj Valley <sup>1</sup>
2008*	Santa Maria De Jesus	children	21	21% of children in urban Santa Maria de Jesus <sup>2</sup>
2009*	Highlands Region	children	19.8	19.8% of children in the Guatemalan Highlands <sup>3</sup>
2010	Highlands Region	children	0.3	0.3% of non-diarrheal stool specimens from children <sup>4</sup>

\* indicates publication year (not necessarily year of survey)

**References**

1. J Health Popul Nutr 2009 Feb ;27(1):31-40.
2. J Community Health 2009 Apr ;34(2):98-101.
3. J Infect Dev Ctries 2009 ;3(3):229-34.
4. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.

## Amoebic abscess

<b>Agent</b>	PARASITE - Protozoa. Sarcomastigota, Entamoebidea: <i>Entamoeba histolytica</i> (must be distinguished from non-invasive, <i>Entamoeba dispar</i> )
<b>Reservoir</b>	Human
<b>Vector</b>	Fly (Musca) - occasionally
<b>Vehicle</b>	Food, Water, Sexual contact, Fly
<b>Incubation Period</b>	2w - 6m (rarely years; 95% within 6m)
<b>Diagnostic Tests</b>	Imaging. Serology. Nucleic acid amplification. Note: Amoebae are usually not present in stool at this stage.
<b>Typical Adult Therapy</b>	<a href="#">Metronidazole</a> 750 mg TID X 10d OR <a href="#">Tinidazole</a> 800 mg TID X 5d
<b>Typical Pediatric Therapy</b>	<a href="#">Metronidazole</a> 15 mg/kg TID X 10d OR <a href="#">Tinidazole</a> 15 to 20 mg/kg TID X 5d
<b>Clinical Hints</b>	Fever, local pain and weight loss Concurrent amebic colitis is usually not present. Typically a single abscess in the right hepatic lobe (bacterial abscesses may be multiple)
<b>Synonyms</b>	Absceso amebiano, Amebic liver abscess. ICD9: 006.3,006.4,006.5,006.6,006.8 ICD10: A06.4,106.5,A06.7,106.8

## Amoebic abscess in Guatemala

Epidemiological data regarding Amebic abscess are included in the notes for Amebic colitis

### References

1. J Community Health 2009 Apr ;34(2):98-101.
2. J Health Popul Nutr 2009 Feb ;27(1):31-40.
3. J Infect Dev Ctries 2009 ;3(3):229-34.

## Anaplasmosis

<b>Agent</b>	BACTERIUM. Anaplasmataceae <i>Anaplasma phagocytophilum</i> . ( <i>E. phagocytophila</i> , <i>E. equi</i> "HE agent" merged into this species) Intracellular <i>Rickettsia</i> -like
<b>Reservoir</b>	Rodent, Rabbit, Deer, Tick, Primate, Cattle, Horse, Goat, Sheep
<b>Vector</b>	Tick ( <i>Ixodes scapularis</i> , <i>Ix. pacificus</i> , <i>Ix. ricinus</i> )
<b>Vehicle</b>	Blood or secretions (rare)
<b>Incubation Period</b>	Unknown; mean 8d
<b>Diagnostic Tests</b>	Intraleucocytic inclusions ('morulae') seen in blood smear. Serology. Nucleic acid amplification/
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 7 to 14 days OR <a href="#">Tetracycline</a> 500 mg PO QID X 7 to 14 days
<b>Typical Pediatric Therapy</b>	Above age 8 years: <a href="#">Doxycycline</a> 2 mg/kg PO BID X 7 to 14 days OR <a href="#">Tetracycline</a> 500 mg PO QID X 7 to 14 days OR <a href="#">Rifampin</a> 10 mg/kg/day PO
<b>Clinical Hints</b>	Fever, headache and myalgia following tick bite or exposure Arthralgia or macular rash may be present Leukopenia, thrombocytopenia or hepatic dysfunction are common Inclusions may be seen in granulocytes The case-fatality rate is 5%.
<b>Synonyms</b>	<i>Anaplasma capra</i> , <i>Anaplasma ovis</i> , <i>Anaplasma phagocytophilum</i> , <i>Anaplasma platys</i> , Anaplasmosis - human granulocytic, Ehrlichia equi, Ehrlichia ewingii, Ehrlichia microti, Ehrlichia phagocytophila, Ehrlichiosis - human granulocytic, Human granulocytic anaplasmosis, Human granulocytic ehrlichiosis. ICD9: 082.4 ICD10: B28.8

Although Anaplasmosis is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

### Anaplasmosis in Guatemala

Seropositivity toward *Anaplasma phagocytophilum* has been demonstrated in Guatemalan cattle and horses. <sup>1</sup>

#### References

1. [Vet Parasitol 2005 Jul 15;131\(1-2\):119-27.](#)



**Angiostrongyliasis - abdominal**

<b>Agent</b>	PARASITE - Nematoda. <i>Parastrongylus</i> ( <i>Angiostrongylus</i> , <i>Morerastrongylus</i> ) <i>costaricensis</i>
<b>Reservoir</b>	Cotton rat ( <i>Sigmodon</i> ), Slug
<b>Vector</b>	None
<b>Vehicle</b>	Slug, Slug excretions
<b>Incubation Period</b>	10d - 14d
<b>Diagnostic Tests</b>	Identification of ova or adults in surgical material. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Mebendazole</a> 200 to 400 mg PO tid X 10 days. OR <a href="#">Thiabendazole</a> 25 mg/kg TID (max 3g/d) X 3d. Surgery for complications
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Mimics acute appendicitis, including presence of a right lower quadrant mass Eosinophilia (uncommon in appendicitis) is prominent Patient may recall recent ingestion of slugs or vegetation (contaminated by slugs)
<b>Synonyms</b>	<i>Angiostrongylus costaricensis</i> , <i>Parastrongylus costaricensis</i> . ICD9: 128.9 ICD10: B81.3

**Angiostrongyliasis - abdominal in Guatemala**

The disease is found in both urban and rural areas with highest incidence among male children, and during the wet season.

**Notable outbreaks**

Years	Cases	Deaths	Source	Notes
1994 - 1995	22	1	mint	Outbreak associated with ingestion of raw mint <sup>1</sup>

**References**

1. [Clin Infect Dis 1998 Feb ;26\(2\):365-72.](#)

## Animal bite-associated infection

<b>Agent</b>	BACTERIUM. <i>Pasteurella multocida</i> , and other zoonotic bite pathogens
<b>Reservoir</b>	Cat, Dog, Marsupial, Other mammal, Rarely bird
<b>Vector</b>	None
<b>Vehicle</b>	Bite (cat in 60%, dog in 30%), No obvious source in 10%
<b>Incubation Period</b>	3h - 3d
<b>Diagnostic Tests</b>	Gram stain/culture. Hold specimen for 2 weeks to discount Capnocytophaga & other genera.
<b>Typical Adult Therapy</b>	Penicillin, a <a href="#">Tetracycline</a> or <a href="#">Cefuroxime</a> . Dosage and duration appropriate for nature and severity of infection
<b>Typical Pediatric Therapy</b>	Penicillin or <a href="#">Cefuroxime</a> . Dosage and duration appropriate for nature and severity of infection
<b>Clinical Hints</b>	Infection of cat- dog- or other bite wound; however, as many as 10% do not recall the bite Symptoms appear within 3 to 72 hours Systemic infection (meninges, bone, lungs, joints, etc) may occur.
<b>Synonyms</b>	Bacteroides pyogenes, Bacteroides tectus, Bergeyella zoohelcum, Bisgaard's taxon 16, Capnocytophaga canimorsus, Capnocytophaga cynodegmi, CDC EF-4, CDC NO-1, Corynebacterium kutscheri, Corynebacterium canis, Corynebacterium freiburgense, Fusobacterium canifelinum, Halomonas venusta, Kingella potus, Moraxella canis, Mycobacterium vulneris, Neisseria animaloris, Neisseria canis, Neisseria weaveri, Neisseria zoodegmatis, Pasteurella caballi, Pasteurella canis, Pasteurella dagmatis, Pasteurella multocida, Pasteurella stomatis, Psychrobacter immobilis, Staphylococcus intermedius, Vibrio harveyi. ICD9: 027.2 ICD10: A28.0

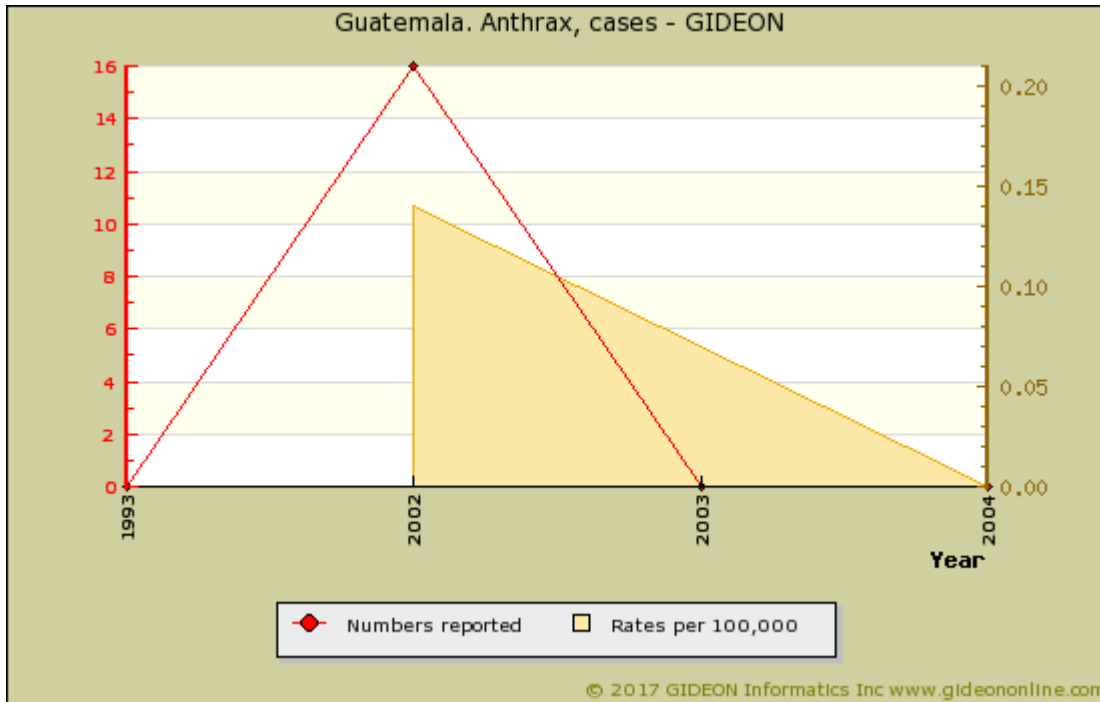
## Anisakiasis

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Anisakis simplex</i> and <i>Pseudoterranova decipiens</i>
<b>Reservoir</b>	Marine mammals Fish
<b>Vector</b>	None
<b>Vehicle</b>	Undercooked fish
<b>Incubation Period</b>	Hours - 14d
<b>Diagnostic Tests</b>	Endoscopic identification of larvae.
<b>Typical Adult Therapy</b>	Endoscopic removal of larvae; surgery for complications
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Follows ingestion of undercooked fish (e.g., sushi), squid or octopus. May present as - a generalized allergic reaction, or - acute and chronic abdominal pain, often with "peritoneal signs" or hematemesis
<b>Synonyms</b>	Anasakis, Bolbosoma, Cod worm disease, Contracecum, Eustrongylides, Herring worm disease, Hysterothylacium, Pseudoterranova, Whaleworm. ICD9: 127.1 ICD10: B81.0

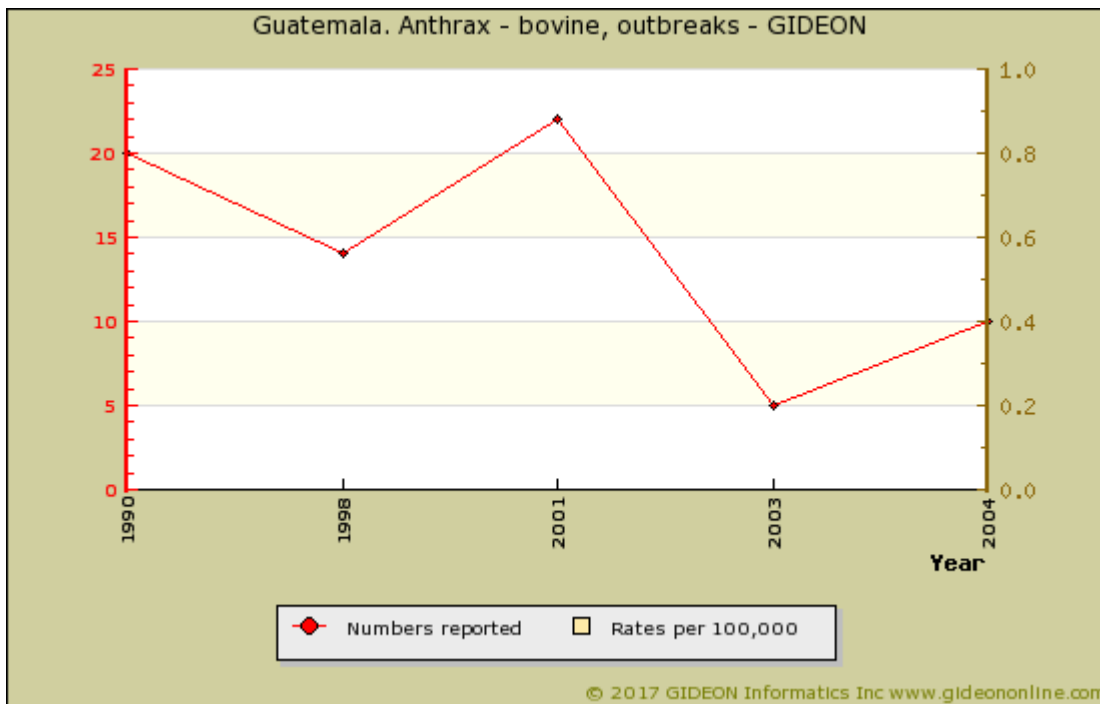
## Anthrax

<b>Agent</b>	BACTERIUM. <i>Bacillus anthracis</i> An aerobic gram positive bacillus
<b>Reservoir</b>	Soil, Goat, Cattle, Sheep, Water, Horse
<b>Vector</b>	Fly (rare)
<b>Vehicle</b>	Hair, Wool, Hides, Bone products, Air, Meat, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1d-7d; 1-12 cutaneous, 1-7 GI; 1-43 pulmonary
<b>Diagnostic Tests</b>	Bacteriological culture. Alert laboratory that organism may be present. Serology and rapid tests by Ref. Centers.
<b>Typical Adult Therapy</b>	Isolation (secretions). <a href="#">Ciprofloxacin</a> (or Penicillin if susceptible).  If systemic infection, add <a href="#">Meropenem</a> (or <a href="#">Imipenem</a> ) + <a href="#">Linezolid</a> (or <a href="#">Rifampin</a> or <a href="#">Clindamycin</a> )  Dosage/route/duration as per severity If inhalational anthrax, add Raxibacumab
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Anthrax vaccine</a>
<b>Clinical Hints</b>	Acquired from contact with large mammals or their products (meat, wool, hides, bone). Anthrax may present at dermal, pulmonary, gastrointestinal or other forms depending of site of inoculation. - Edematous skin ulcer covered by black eschar - satellite vesicles may be present - Fulminant gastroenteritis or pneumonia - Necrotizing stomatitis - Hemorrhagic meningitis.
<b>Synonyms</b>	Antrace, Antrax, Antraz, Carbunco, Carbunculo, La fievre charbonneuse, Malcharbon, Malignant pustule, Miltbrann, Miltvuur, Milzbrand, Mjaltbrand, Siberian plague, Siberian ulcer, Splenic fever, Wool-sorter's disease. ICD9: 022 ICD10: A22

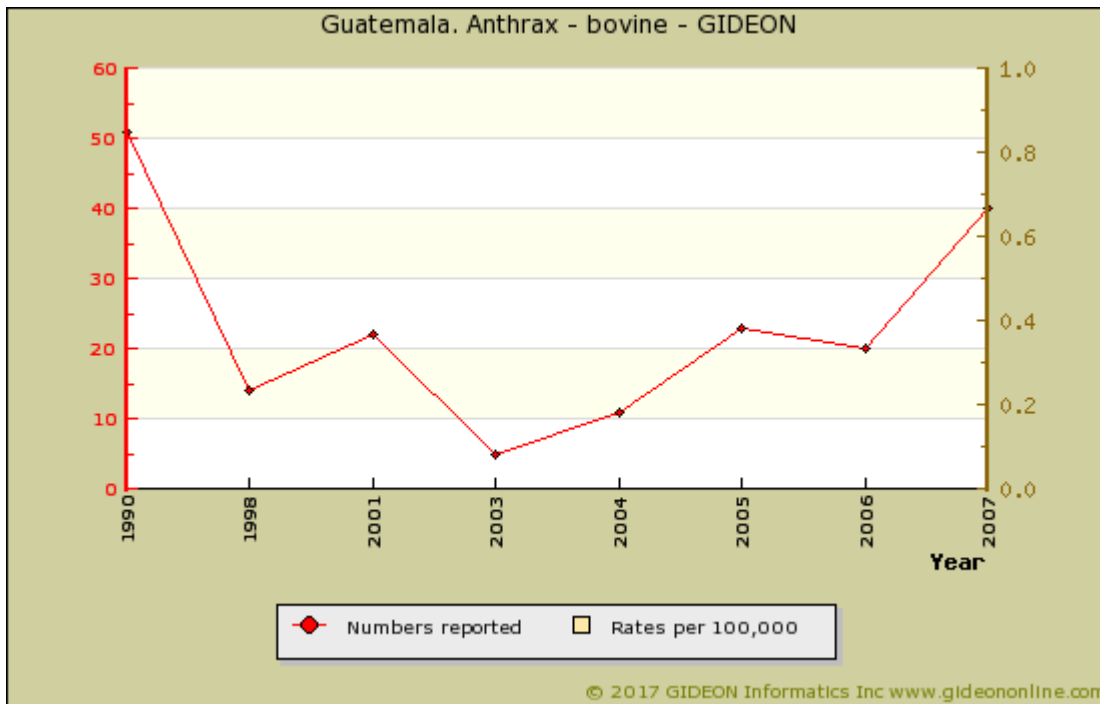
### Anthrax in Guatemala



Graph: Guatemala. Anthrax, cases



Graph: Guatemala. Anthrax - bovine, outbreaks



Graph: Guatemala. Anthrax - bovine

## Ascariasis

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Ascaris lumbricoides</i>
<b>Reservoir</b>	Human, Dog
<b>Vector</b>	None
<b>Vehicle</b>	Vegetables, Fly
<b>Incubation Period</b>	10d - 14d (range 7d - >200d)
<b>Diagnostic Tests</b>	Stool microscopy.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg X 1 dose OR <a href="#">Mebendazole</a> 100 mg BID X 3d
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 200 mg PO single dose OR <a href="#">Mebendazole</a> 100 mg BID X 3 d (> age 2).
<b>Clinical Hints</b>	Highest rates among children and in areas of crowding and poor sanitation Acute illness characterized by cough, wheezing and eosinophilia Adult worms are associated with abdominal pain (occasionally obstruction), pancreatic or biliary disease Passage of a roundworm longer than 5 cm is virtually pathognomonic
<b>Synonyms</b>	Ascaris, <i>Ascaris lumbricoides</i> , Askariasis. ICD9: 127.0 ICD10: B77

## Ascariasis in Guatemala

### Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	Santa Rosa	adults	5.7	5.7% of adults with diarrhea, in Santa Rosa <sup>1</sup>
1996*		children	91	As many as 91% of children in Highland Indian towns <sup>2</sup>
2004 - 2007	Palajunoj Valley	children	17.7	17.7% of school children in the Palajunoj Valley <sup>3</sup>
2008*	Santa Maria De Jesus	children	49	49% of children in urban Santa Maria de Jesus <sup>4</sup>
2009*		children	55.1	55.1% of children in the Guatemalan Highlands <sup>5</sup>
2010		children	15.4	15.4% of non-diarrheal stool specimens from children in the Guatemalan Highlands <sup>6</sup>
2011*	Izabal	children	52	52% of school children in Izabal Province <sup>7</sup>
1993*		general population	41	41% in rural villages <sup>8</sup>
1989*	Guatemala City	pregnant women	14.5	<sup>9</sup>

\* indicates publication year (not necessarily year of survey)

### References

1. Am J Trop Med Hyg 2011 Dec ;85(6):1141-3.
2. Pediatrics 1996 Jun ;97(6 Pt 1):871-6.
3. J Health Popul Nutr 2009 Feb ;27(1):31-40.
4. J Community Health 2009 Apr ;34(2):98-101.
5. J Infect Dev Ctries 2009 ;3(3):229-34.
6. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.
7. J Glob Infect Dis 2011 Jan ;3(1):25-31.
8. Mem Inst Oswaldo Cruz 1993 Jan-Mar;88(1):53-65.
9. Obstet Gynecol 1989 Dec ;74(6):915-20.

## Aspergillosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomycetes, Eurotiales: <i>Aspergillus</i> . A hyaline hyphomycete
<b>Reservoir</b>	Compost, Hay, Cereal, Soil
<b>Vector</b>	None
<b>Vehicle</b>	Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	3d - 21d
<b>Diagnostic Tests</b>	Fungal culture. Biopsy. Nasal culture or serologic testing may be useful in select cases.
<b>Typical Adult Therapy</b>	<a href="#">Voriconazole</a> 6 mg/kg IV Q12h, day 1; follow with 4 mg/kg IV OR <a href="#">Amphotericin B</a> - if invasive, rapidly increase to max dose 0.6 mg/kg/d and to total 2.5g. OR <a href="#">Itraconazole</a>
<b>Typical Pediatric Therapy</b>	<a href="#">Voriconazole</a> 3 to 9 mg/kg IV Q12h OR <a href="#">Amphotericin B</a> - if invasive, rapidly increase to max dose 0.6 mg/kg/d X 6w. OR <a href="#">Itraconazole</a>
<b>Clinical Hints</b>	Pulmonary "fungus ball" or adult-onset asthma Pulmonary consolidation or infected "pulmonary infarct" in the setting of immune suppression (e.g., AIDS, leukemia, etc) May progress to widespread hematogenous dissemination if not treated promptly.
<b>Synonyms</b>	Aspergillose, Aspergillus. ICD9: 117.3 ICD10: B44



## Bacillary angiomatosis

<b>Agent</b>	BACTERIUM. <i>Bartonella henselae</i> or <i>Bartonella quintana</i> . <i>Rickettsia</i> -like bacteria
<b>Reservoir</b>	Human, Tick, Cat
<b>Vector</b>	Cat flea, Tick (Ixodid)
<b>Vehicle</b>	None
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Histology with special stains. Specialized culture techniques. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<b>Clarithromycin</b> 500 mg BID X 3 months Alternatives <b>Azithromycin</b> 250 mg QD <b>Ciprofloxacin</b> 500 mg BID OR <b>Doxycycline</b> 100 mg BID <b>Erythromycin</b> 500 mg po QID
<b>Typical Pediatric Therapy</b>	<b>Clarithromycin</b> 7.5 mg/kg PO BID X 8 months. OR <b>Gentamicin</b> 2 mg/kg IMq12h
<b>Clinical Hints</b>	Hemangiomas papules and nodules of skin, spleen, liver (peliosis hepatis), bone or other tissues Virtually all cases occur in the setting of AIDS or other immune deficiency Rare instances are reported following tick bite in immune-competent individuals.
<b>Synonyms</b>	Bacillary peliosis, Peliosis hepatis. ICD9: 757.32,083.8 ICD10: K76.4,A44.0

## Bacillus cereus food poisoning

<b>Agent</b>	BACTERIUM. <i>Bacillus cereus</i> (toxin). An aerobic gram-positive bacillus
<b>Reservoir</b>	Soil, Processed & dried foods
<b>Vector</b>	None
<b>Vehicle</b>	Food
<b>Incubation Period</b>	2h - 9h (range 1h - 24h)
<b>Diagnostic Tests</b>	No practical test available. Isolation of organism from suspect food.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Usually follows ingestion of rice or other vegetables Vomiting within 1 to 6 hours and/or diarrhea within 6 to 24 hours Fecal leukocytes are not seen
<b>Synonyms</b>	Bacillus cytotoxicus. ICD9: 005.89 ICD10: A05.4

## Bacterial vaginosis

Agent	BACTERIUM. <i>Gardnerella vaginalis</i> (facultative gram-negative bacillus), <i>Mobiluncus curtisii</i> , <i>Mobiluncus mulieris</i> , <i>Prevotella</i> , et al
Reservoir	Human
Vector	None
Vehicle	Sexual contact, Normal flora in 14% (girls) to 70% (women)
Incubation Period	Unknown
Diagnostic Tests	Identification of "clue cells" or positive KOH test in vaginal discharge. Culture.
Typical Adult Therapy	<a href="#">Metronidazole</a> 500 mg BID X 7d OR <a href="#">Tinidazole</a> 2 g PO daily X 3d OR <a href="#">Clindamycin</a> 300 mg BID X 7d + intravaginal <a href="#">Clindamycin</a> or <a href="#">Metronidazole</a> ? Also treat sexual partner
Typical Pediatric Therapy	<a href="#">Metronidazole</a> 7.5 mg/kg BID X 7d
Clinical Hints	Thin vaginal discharge - "fishy" odor when mixed with KOH Mild to moderate pruritis Urethritis may be present in sexual partner.
Synonyms	Gardnerella, Gardnerella vaginalis, Mobiluncus. ICD9: 041.89,616,10,099.8 ICD10: N76.1

## Balantidiasis

<b>Agent</b>	PARASITE - Protozoa. Ciliate (Ciliophora), Litostomatea: <i>Balantidium coli</i>
<b>Reservoir</b>	Pig, Non-human primate, Rodent
<b>Vector</b>	None
<b>Vehicle</b>	Water, Food
<b>Incubation Period</b>	1d - 7d (range 1d - 60d)
<b>Diagnostic Tests</b>	Microscopy of stool or colonic aspirates.
<b>Typical Adult Therapy</b>	<a href="#">Tetracycline</a> 500 mg QID X 10d. OR <a href="#">Metronidazole</a> 750 mg TID X 5d. OR <a href="#">Iodoquinol</a> 650 mg TID X 20d
<b>Typical Pediatric Therapy</b>	Age >= 8 years: <a href="#">Tetracycline</a> 10 mg/kg QID (max 2g/d) X 10d. Age <8 yrs, <a href="#">Metronidazole</a> 15 mg/kg TID X 5d; or <a href="#">Iodoquinol</a> 13 mg/kg TID X 20d
<b>Clinical Hints</b>	The disease is most common in pig-raising areas Dysentery, often with vomiting Mimics intestinal amebiasis Symptoms may persist for one to four weeks, and may recur.
<b>Synonyms</b>	Balantidiose, Balantidiosis, Balantidium coli, Balantidosis, Balindosis, Ciliary dysentery. ICD9: 007.0 ICD10: A07.0

## Bartonellosis - cat borne

<b>Agent</b>	BACTERIUM. <i>Afipia felis</i> , <i>Bartonella henselae</i> , <i>Bartonella clarridgeiae</i> , <i>Bartonella grahamii</i> , et al. A facultative gram-negative coccobacillus
<b>Reservoir</b>	Cat, Possibly tick
<b>Vector</b>	Cat flea ( <i>Ctenocephalides</i> )
<b>Vehicle</b>	Cat scratch, Plant matter (thorn, etc)
<b>Incubation Period</b>	3d - 14d
<b>Diagnostic Tests</b>	Visualization of organisms on Warthin Starry stain. Culture. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Aspiration of nodes as necessary. <b>Azithromycin</b> 500 mg day 1, then 250 daily X 4 days Alternatives: <b>Clarithromycin</b> , <b>Ciprofloxacin</b> , Sulfamethoxazole/trimethoprim
<b>Typical Pediatric Therapy</b>	Aspiration of nodes as necessary. <b>Azithromycin</b> 10 mg/kg day 1, then 5 mg/kg daily X 4 days
<b>Clinical Hints</b>	Tender suppurative regional adenopathy following a cat scratch (usually kitten) Fever present in 25% Systemic infection (liver, brain, endocardium, bone, etc) occasionally encountered Most cases resolve within 6 weeks.
<b>Synonyms</b>	<i>Afipia felis</i> , <i>Bartonella clarridgeiae</i> , <i>Bartonella grahamii</i> , <i>Bartonella henselae</i> , <i>Bartonella koehlerae</i> , Cat scratch disease, Debre's syndrome, Foshay-Mollaret cat-scratch fever, Katszenkratz-Krankheit, Petzetakis' syndrome, SENLAT. ICD9: 078.3 ICD10: A28.1

### Bartonellosis - cat borne in Guatemala

#### Prevalence surveys

Years	Study Group	%	Notes
2015*	various	22.4-33.8	33.8% of cats and 22.4% of cat fleas - including <i>Bartonella henselae</i> and <i>B. clarridgeiae</i> <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. J Vector Ecol 2015 Dec ;40(2):327-32.

## Bartonellosis - other systemic

Agent	BACTERIUM. <i>Bartonella quintana</i> , <i>B. koehlerae</i> , <i>B. elizabethae</i> , <i>B. tamiae</i> , <i>B. washoensis</i> , etc A fastidious gram-negative coccobacillus
Reservoir	Human, Louse, Rat Cat Dog Sheep
Vector	Louse ( <i>Pediculus</i> ) Flea ( <i>Ctenocephalides</i> , <i>Pulex</i> ), Mite ( <i>Dermanyssus</i> )
Vehicle	Wound or eye contact with secretions/louse feces
Incubation Period	9d - 25d (range 4d - 35d)
Diagnostic Tests	Serology. Culture. Nucleic acid amplification.
Typical Adult Therapy	<a href="#">Doxycycline</a> 100 mg PO BID X 3 to 5 days (if endocarditis, add <a href="#">Gentamicin</a> 3 mg/kg daily X 28 days) Alternatives: <a href="#">Clarithromycin</a> , <a href="#">Azithromycin</a> , <a href="#">Gentamicin</a> , Fluoroquinolone ( <a href="#">Levofloxacin</a> , <a href="#">Trovafoxacin</a> , <a href="#">Pefloxacin</a> , <a href="#">Sparfloxacin</a> or <a href="#">Moxifloxacin</a> )
Typical Pediatric Therapy	<a href="#">Erythromycin</a> 10 mg/kg PO QID X 3 to 5 days. OR <a href="#">Gentamicin</a> 2 mg/kg IM q12h. Alternatives: <a href="#">Clarithromycin</a> , <a href="#">Azithromycin</a>
Clinical Hints	Often associated with poor hygiene and crowding Headache, myalgias, shin pain, macular rash and splenomegaly Endocarditis and bacteremia in some cases Relapse is common
Synonyms	<i>Bartonella alsatica</i> , <i>Bartonella bovis</i> , <i>Bartonella capreoli</i> , <i>Bartonella doshiae</i> , <i>Bartonella elizabethae</i> , <i>Bartonella melophagi</i> , <i>Bartonella quintana</i> , <i>Bartonella rochalimae</i> , <i>Bartonella schoenbuchensis</i> , <i>Bartonella tamiae</i> , <i>Bartonella tribocorum</i> , <i>Bartonella vinsonii</i> , <i>Bartonella vinsonii berkhoffii</i> , <i>Bartonella volans</i> , <i>Bartonella washoensis</i> , <i>Candidatus Bartonella mayotimonensis</i> , <i>Candidatus Bartonella merieuxii</i> , <i>Candidatus Bartonella rochalimae</i> , Five day fever, His-Werner disease, Meuse fever, Quintan fever, Quintana fever, Shank fever, Shin fever, Shinbone fever, Trench fever, Volhynian fever. ICD9: 083.1 ICD10: A44.0,A44.8,A79.0

## Bartonellosis - other systemic in Guatemala

### Prevalence surveys

Years	Region	Study Group	%	Notes
2009	Southern Region	bats	33	33% of bats (southern region, <i>Bartonella</i> spp) <sup>1</sup>

### References

1. [Emerg Infect Dis 2011 Jul ;17\(7\):1269-72.](#)

## Blastocystis hominis infection

<b>Agent</b>	PARASITE - Protozoa. Chromista, Bigyra, Blastocystea: <i>Blastocystis hominis</i> . (taxonomic status remains uncertain)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Water
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Stool microscopy. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Nitazoxanide</a> 500 mg BID X 3 d. OR <a href="#">Metronidazole</a> 750 mg TID X 10d. OR <a href="#">Iodoquinol</a> 650 mg TID X 20 d. OR Sulfamethoxazole / <a href="#">Trimethoprim</a>
<b>Typical Pediatric Therapy</b>	<a href="#">Nitazoxanide</a> - Age 1 to 3 years: 5 ml (100 mg) PO Q12h X 3 days - Age 4 to 11 years: 10 mg (200 mg) PO Q12h X 3 days; OR <a href="#">Metronidazole</a> 15 mg/kg/d X 10d. Sulfamethoxazole / <a href="#">Trimethoprim</a>
<b>Clinical Hints</b>	The precise role of this organism in disease is controversial Diarrhea and flatulence, usually without fever The illness is similar to giardiasis Increased risk among immune-suppressed patients;
<b>Synonyms</b>	Apoi, Blastocystiose, Blastocystis hominis, Zierdt-Garavelli disease. ICD9: 007.8 ICD10: A07.8

### Blastocystis hominis infection in Guatemala

The rate of infection among Peace Corps volunteers was 65 per 100 person years. <sup>1</sup>

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2004 - 2007	Palajunoj Valley	children	2.8	2.8% of school children in the Palajunoj Valley <sup>2</sup>
2010	Highlands Region	children	2.4	2.4% of non-diarrheal stool specimens from children in the Guatemalan Highlands <sup>3</sup>

#### References

1. J Clin Microbiol 2001 Jan ;39(1):34-42.
2. J Health Popul Nutr 2009 Feb ;27(1):31-40.
3. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.

## Borna virus encephalitis

<b>Agent</b>	VIRUS - RNA Mononegavirales Bornavirus
<b>Reservoir</b>	Squirrel, Horse, Sheep
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Metagenomic analysis of brain tissue and cerebrospinal fluid Culture on specialized cell lines Serology
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	May follow animal (horse, squirrel) contact Borna virus infection is generally subclinical Manifested in some cases by mood disorders or possibly schizophrenia Overt and fatal encephalitis has been reported, with fever, gait disturbance and ocular palsy
<b>Synonyms</b>	Borna disease, Heated head disease, Sad horse disease, Staggering disease of cats, Variegated squirrel 1 bornavirus, VSBV-1. ICD9: 323.9 ICD10: A83.9



Botulism	
Agent	BACTERIUM. <i>Clostridium botulinum</i> . An anaerobic gram-positive bacillus
Reservoir	Soil, Animal, Fish
Vector	None
Vehicle	Food, Soil (contamination of wound or injected drug)
Incubation Period	1d - 2d
Diagnostic Tests	Electrophysiologic (EMG) pattern. Isolation of organism from food (occ. from infant stomach). Mouse toxin assay
Typical Adult Therapy	Heptavalent (types A-G) or trivalent (types A, B, E) antitoxin (following test dose) 10 ml in 100 ml saline over 30 min Additional 10 ml at 2 and 4 hours if necessary. Respiratory support
Typical Pediatric Therapy	As for adult
Vaccine	<a href="#">Botulism antitoxin</a>
Clinical Hints	Clinical manifestations similar to those of atropine poisoning: dysarthria, diplopia, dilated pupils, dry mouth, constipation, flaccid paralysis, etc Onset approximately 36 hrs after ingestion of poorly-preserved food Botulism may follow contaminated injection (ie, illicit drug) or other wound Infant botulism associated with infant formula containing honey contaminated by bacterial spores
Synonyms	Botulisme, Botulismo, Botulismus, Kerner's disease. ICD9: 005.1 ICD10: A05.1

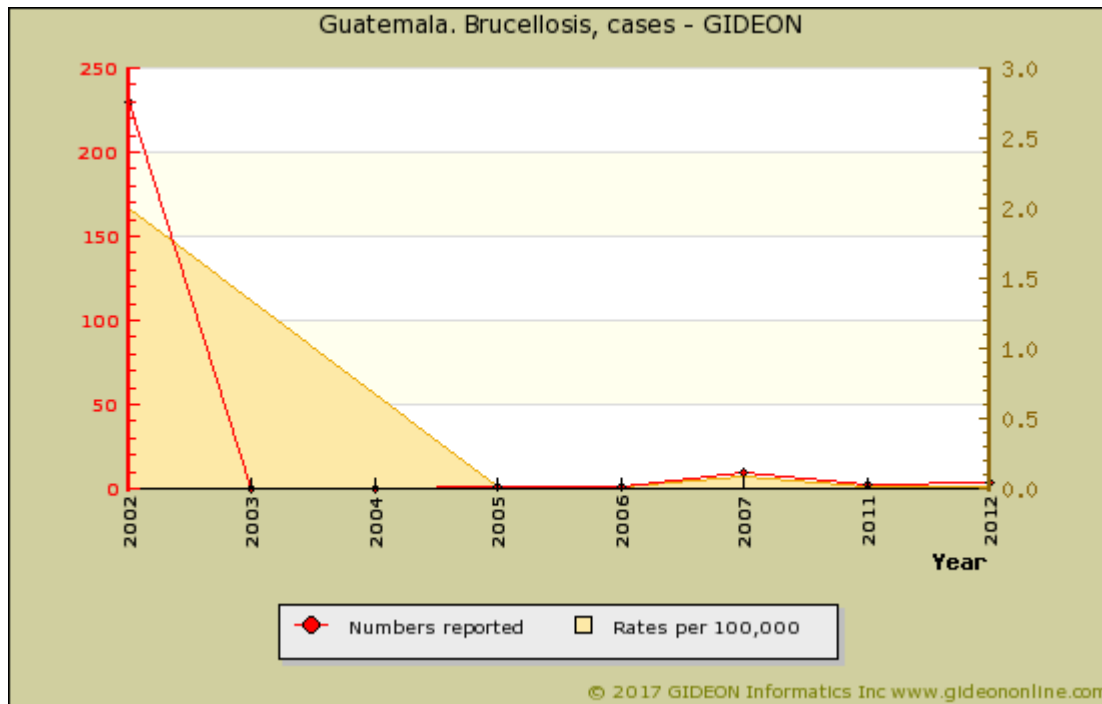
**Brain abscess**

<b>Agent</b>	BACTERIUM OR FUNGUS. Mixed oral anaerobes / streptococci, <i>Staphylococcus aureus</i> (from endocarditis), etc.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	None
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Imaging techniques (CT, scan, etc).
<b>Typical Adult Therapy</b>	Antibiotic(s) appropriate to likely pathogens + drainage Typical empiric therapy: Intravenous <b>Ceftriaxone</b> 2 gm + <b>Metronidazole</b> 15 mg/kg, Q12h
<b>Typical Pediatric Therapy</b>	Typical empiric therapy: Intravenous <b>Ceftriaxone</b> 50 mg/kg + <b>Metronidazole</b> 15 mg/kg IV, Q12h
<b>Clinical Hints</b>	Headache, vomiting and focal neurological signs Often associated with chronic sinusitis or otitis media, pleural or heart valve infection Patients are often afebrile.
<b>Synonyms</b>	Ascesso cerebrale, Cerebral abscess. ICD9: 324.0 ICD10: G06.0

Brucellosis	
Agent	BACTERIUM. <i>Brucella abortus</i> , <i>Brucella melitensis</i> , <i>Brucella suis</i> , <i>Brucella canis</i> An aerobic gram-negative bacillus
Reservoir	Pig, Cattle, Sheep, Goat, Dog, Coyote, Caribou
Vector	None
Vehicle	Food, Air, Dairy products, Animal excretions, Breastfeeding
Incubation Period	10d - 14d (range 5d - 60d)
Diagnostic Tests	Culture of blood or bone marrow. Serology. Note: Alert laboratory to possibility of Brucella.
Typical Adult Therapy	<a href="#">Doxycycline</a> 100 mg BID + <a href="#">Rifampin</a> 600 mg BID X 6 weeks. Alternatives <a href="#">Tetracycline</a> + <a href="#">Gentamicin</a>
Typical Pediatric Therapy	<a href="#">Rifampin</a> 20 mg/kg/day (maximum 600 mg) plus: >age 8 years: <a href="#">Doxycycline</a> 2 mg/kg BID PO X 6w age < 8 years Sulfamethoxazole/trimethoprim 4/20 mg/kg BID X 4 to 6w Add <a href="#">Gentamicin</a> if severe
Clinical Hints	Prolonged fever, hepatosplenomegaly, lymphadenopathy, arthritis, osteomyelitis or chronic multisystem infection Follows ingestion of unpasteurized dairy products, contact with farm animals or meat processing
Synonyms	Bang's disease, Bangsche Krankheit, Brucella, Brucellemia, Brucellosis, Brucellose, Brucellosen, Brucellosi, Brucelose, Brucelosis, Cyprus fever, Febris melitensis, Febris sudoralis, Febris undulans, Fievre caprine, Gibraltar fever, Goat fever, Malta fever, Maltafieber, Melitococcosis, Neapolitan fever, Rock fever, Typhomalarial fever, Undulant fever. ICD9: 023 ICD10: A23

## Brucellosis in Guatemala

Human disease in this country is due to *Brucella abortus*, *B. suis* and *B. melitensis*. <sup>1</sup>



Graph: Guatemala. Brucellosis, cases

**References**

1. [Vet Microbiol 2002 Dec 20;90\(1-4\):31-8.](#)

**Bunyaviridae infections - misc.**

<b>Agent</b>	VIRUS - RNA. Bunyaviridae, Orthobunyavirus. Over 30 strains have been associated with human disease (see Synonyms)
<b>Reservoir</b>	Rat, Bird, Marsupial, Chipmunk, Cattle, Sheep, Horse, Bat
<b>Vector</b>	Mosquito (exceptions: Shuni is transmitted by culicoid flies; Bhanja, Tamdy, Wanowrie and Zirqa by ticks)
<b>Vehicle</b>	None
<b>Incubation Period</b>	3d - 12d
<b>Diagnostic Tests</b>	Serology and virus isolation. Nucleic acid amplification. Biosafety level 2 or 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Abrupt onset of fever, chills, headache; photophobia, rash arthralgia or myalgia Vomiting, diarrhea or cough may be present Meningitis or myocarditis may occur with Bwamba virus Illness resolves within two-to-seven days
<b>Synonyms</b>	Avalon, Bangui, Batai, Bhanja, Bunyamwera, Bwamba, Cache Valley, Calovo, Catu, Fort Sherman, Garissa, Germiston, Guama, Hartland virus, Ilesha, Ingwavuma, Issyk-Kul, Kairi, Lumbo, Ngari, Northway, Nyando, Pongola, Shokwe, Shuni, Tacaiuma, Tamdy, Tataguine, Tensaw, Wanowrie, Wyeomyia, Zirqa. ICD9: 066.3 ICD10: A93.8

## Campylobacteriosis

<b>Agent</b>	BACTERIUM. <i>Campylobacter jejuni</i> subsp <i>jejuni</i> , et al A microaerophilic gram-negative bacillus
<b>Reservoir</b>	Human, Mammal, Bird
<b>Vector</b>	None
<b>Vehicle</b>	Water, Food
<b>Incubation Period</b>	2d - 4d (range 1d - 10d)
<b>Diagnostic Tests</b>	Stool (rarely blood, CSF) culture. Nucleic acid amplification. Alert laboratory when these organisms are suspected.
<b>Typical Adult Therapy</b>	Stool precautions. <a href="#">Azithromycin</a> 500 mg QD X 3 days Alternatives <a href="#">Erythromycin</a> , Fluoroquinolone ( <a href="#">Ciprofloxacin</a> , <a href="#">Levofloxacin</a> , <a href="#">Trovafoxacin</a> , <a href="#">Pefloxacin</a> , <a href="#">Sparfloxacin</a> or <a href="#">Moxifloxacin</a> ), <a href="#">Gentamicin</a>
<b>Typical Pediatric Therapy</b>	Stool precautions. <a href="#">Azithromycin</a> 10 mg/kg QD X 3 days Alternatives - <a href="#">Erythromycin</a> , <a href="#">Gentamicin</a>
<b>Clinical Hints</b>	Febrile diarrhea or dysentery Vomiting or bloody stool often noted Severe abdominal pain may mimic appendicitis Disease is most common among children and lasts for one-to-four days
<b>Synonyms</b>	Campylobacter. ICD9: 008.43 ICD10: A04.5

## Campylobacteriosis in Guatemala

### Prevalence surveys

Years	Region	Study Group	%	Notes
1994*		children	12.1	12.1% of diarrhea among children below age 5 years <sup>1</sup>
2009*		children	30.8	30.8% of children in the Guatemalan Highlands <sup>2</sup>
2008 - 2012	multiple locations	patients	6	6.0% of patients with acute diarrhea in Santa Rosa and Quetzaltenango Departments <sup>3</sup>
2010*	multiple locations	travelers	9	9% of American patients with travelers' diarrhea acquired in India, Guatemala or Mexico <sup>4</sup>

\* indicates publication year (not necessarily year of survey)

### References

1. [Pediatr Infect Dis J 1994 Mar ;13\(3\):216-23.](#)
2. [J Infect Dev Ctries 2009 ;3\(3\):229-34.](#)
3. [J Epidemiol Glob Health 2014 Mar ;4\(1\):51-9.](#)
4. [J Clin Microbiol 2010 Apr ;48\(4\):1417-9.](#)

## Candidiasis

<b>Agent</b>	FUNGUS - Yeast. Ascomycota, Hemiascomycetes, Saccharomycetales. <i>Candida albicans</i> , and other species.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Catheter
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture. Serology and assays for cell-specific antigens are performed in some centers,
<b>Typical Adult Therapy</b>	Topical, oral, systemic antifungal agent depending on clinical presentation and species (in Drugs module, scroll through upper left box)
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Dermal erythema with satellite pustules "Cheesy" mucosal discharge Candidemia in the setting of intravenous catheter or endocarditis Severe, widespread or intractable disease should suggest the possibility of underlying diabetes, AIDS or other form of immune suppression.
<b>Synonyms</b>	Candida, Candida-Mykosen, Candidiase, Candidiasi, Candidose, Monilia, Moniliasis, Salmonella, Thrush. ICD9: 112 ICD10: B37

### Candidiasis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
1991 - 1992	Guatemala City	patients - HIV/AIDS	13	13.0% of HIV-positive outpatients (esophageal infection) <sup>1</sup>

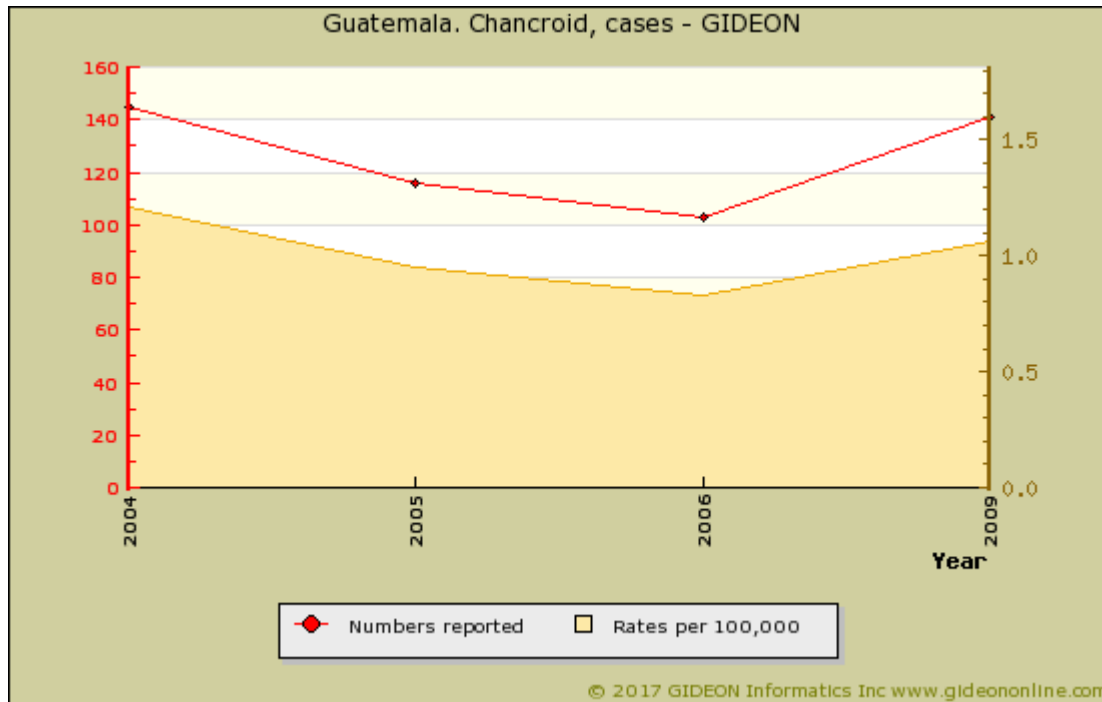
#### References

1. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.

## Chancroid

Agent	BACTERIUM. <i>Haemophilus ducreyi</i> . A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Sexual contact
Incubation Period	3d - 10d (2d - 21d)
Diagnostic Tests	Culture (inform laboratory when this diagnosis is suspected). Fluorescent staining under development
Typical Adult Therapy	<a href="#">Azithromycin</a> 1.0 g PO X 1 dose. OR <a href="#">Ceftriaxone</a> 250 mg IM X 1 dose. OR <a href="#">Ciprofloxacin</a> 500 mg PO BID X 3 days OR <a href="#">Erythromycin</a> 500 mg PO TID X 7d.
Typical Pediatric Therapy	<a href="#">Azithromycin</a> 12 mg/kg PO X 1 dose OR <a href="#">Erythromycin</a> 10 mg/kg PO TID X 7d. OR <a href="#">Ceftriaxone</a> 10 mg/kg IM X 1
Clinical Hints	Soft, painful and tender chancre on erythematous base Regional lymphadenopathy - generally unilateral and painful Onset three-to-ten days following sexual exposure
Synonyms	Blot sjanker, Chancre mou, Chancro blando, Haemophilus ducreyi, Nkumunye, Soft chancre, Ulcera mole, Ulcus molle, Weeke sjanker, Weicher Schanker. ICD9: 099.0 ICD10: A57

### Chancroid in Guatemala



Graph: Guatemala. Chancroid, cases



**Prevalence surveys**

Years	Study Group	%	Notes
1991	patients - STD	16.8	16.8% of street children attending a STD clinic <sup>1</sup>
1992*	patients - STD	13.3	13.3% of patients in an STD clinic <sup>2</sup>

\* indicates publication year (not necessarily year of survey)

**References**

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1. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:48-51.](#)
2. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:14-8.](#)

## Chandipura and Vesicular stomatitis viruses

<b>Agent</b>	VIRUS - RNA. Mononegavirales Rhabdoviridae, Vesiculovirus: Chandipura virus Vesicular stomatitis virus
<b>Reservoir</b>	Horse, Cattle, Pig
<b>Vector</b>	Sandfly
<b>Vehicle</b>	Aerosol from animal, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2d - 6d (range 1d - 8d)
<b>Diagnostic Tests</b>	Viral culture (blood). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Vesicular stomatitis: - Myalgia, headache, conjunctivitis, oral and digital - Often follows animal contact - Infection resolves within one week - No fatality or residua Chandipura virus: - Fever, myalgia, arthralgia, vomiting and diarrhea - Severe encephalitis, often in the setting of outbreaks - Reported case-fatality rate is 47%
<b>Synonyms</b>	Alagoas, Calchaqui, Chandipura, Cocal, Epidemic stroke, Indiana, Isfahan, LeDantec, Ledantavirus, Piry, Vesicular stomatitis. ICD9: 066.8 ICD10: A93.8

### Chandipura and Vesicular stomatitis viruses in Guatemala

Seropositive bats were identified during 1983 to 1984. <sup>1</sup>

Vesicular stomatitis New Jersey was isolated from a mosquito (*Culex nigripalpus*) in 1970. <sup>2</sup>

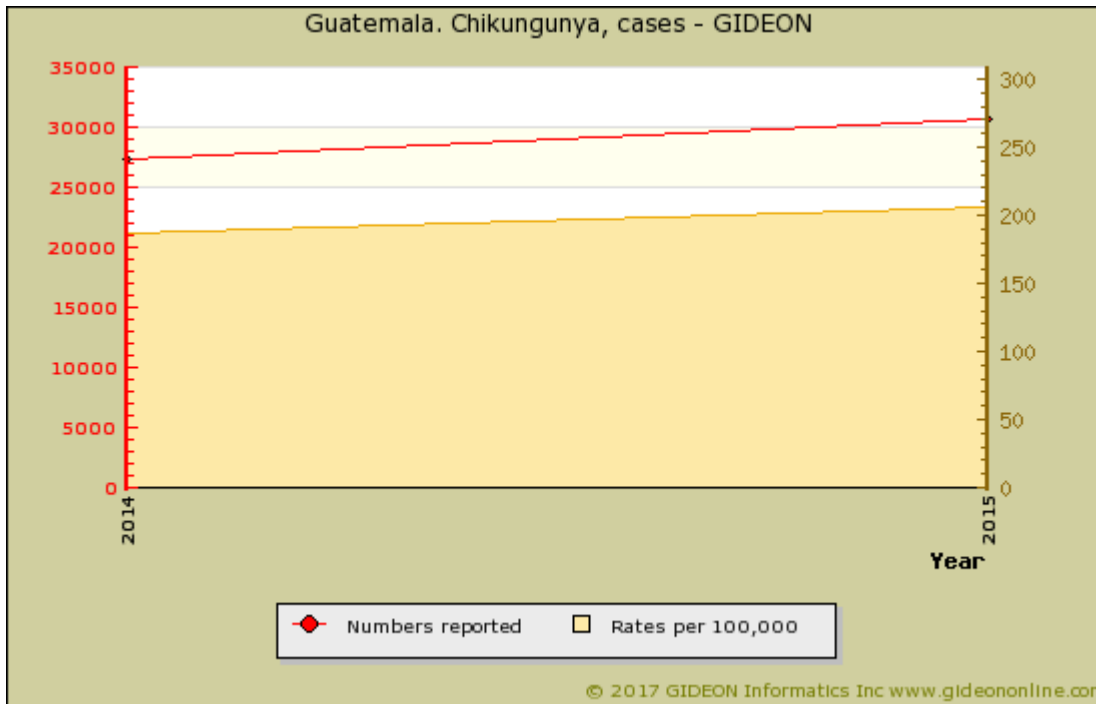
#### References

1. J Wildl Dis 1995 Jan ;31(1):1-9.
2. J Virol 1988 Feb ;62(2):572-9.

## Chikungunya

<b>Agent</b>	VIRUS - RNA. Togaviridae, Alphavirus: Chikungunya virus. Related Semliki Forest and Me Tri viruses are found in Africa & Asia
<b>Reservoir</b>	Non-human primate
<b>Vector</b>	Mosquito ( <i>Aedes</i> spp.; <i>Ae. fuscifer-taylori</i> group in Africa)
<b>Vehicle</b>	None
<b>Incubation Period</b>	2d - 12d
<b>Diagnostic Tests</b>	Viral culture (blood). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Abrupt onset of fever, leukopenia, myalgia and prominent bilateral joint pain A maculopapular rash appears on 2nd to 5th days in greater than 50% of cases Fever resolves within 7 days, but joint pain may persist for months
<b>Synonyms</b>	Buggy Creek, Getah, Kidenga pepo, Knuckle fever, Me Tri, Semliki Forest. ICD9: 062.8,066.3 ICD10: A92.1

### Chikungunya in Guatemala



Graph: Guatemala. Chikungunya, cases

#### Notable outbreaks

Years	Cases	Deaths	Notes
2014	27,343	5	<a href="#">1</a> <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> <a href="#">6</a> <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a> <a href="#">11</a>
2015	26,183		26,183 cases to October <a href="#">12</a> <a href="#">13</a> <a href="#">14</a> <a href="#">15</a>
2016	4,859	0	Cases to November <a href="#">16</a> <a href="#">17</a> <a href="#">18</a> <a href="#">19</a> <a href="#">20</a> <a href="#">21</a>

**References**

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1. ProMED <promedmail.org> archive: 20140625.2563740
2. ProMED <promedmail.org> archive: 20141020.2881135
3. ProMED <promedmail.org> archive: 20141130.2998621
4. ProMED <promedmail.org> archive: 20141229.3059493
5. ProMED <promedmail.org> archive: 20150108.3079983
6. ProMED <promedmail.org> archive: 20150203.3138263
7. ProMED <promedmail.org> archive: 20150426.3323827
8. ProMED <promedmail.org> archive: 20150511.3354217
9. ProMED <promedmail.org> archive: 20150519.3370866
10. ProMED <promedmail.org> archive: 20150621.3454514
11. ProMED <promedmail.org> archive: 20151118.3799623
12. ProMED <promedmail.org> archive: 20150519.3370866
13. ProMED <promedmail.org> archive: 20150530.3396435
14. ProMED <promedmail.org> archive: 20150621.3454514
15. ProMED <promedmail.org> archive: 20151026.3745528
16. ProMED <promedmail.org> archive: 20160217.4027484
17. ProMED <promedmail.org> archive: 20160320.4106646
18. ProMED <promedmail.org> archive: 20160427.4186163
19. ProMED <promedmail.org> archive: 20160614.4285787
20. ProMED <promedmail.org> archive: 20160702.4323117
21. ProMED <promedmail.org> archive: 20161201.4667167

**Chlamydia infections, misc.**

<b>Agent</b>	BACTERIUM. Chlamydiaceae, <a href="#">Chlamydiae</a> , <i>Chlamydia trachomatis</i> ; <i>Simkania negevensis</i> ; <i>Waddlia chondrophila</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual contact
<b>Incubation Period</b>	5d - 10d
<b>Diagnostic Tests</b>	Microscopy and immunomicroscopy of secretions. Serology. Tissue culture. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg BID X 7d. OR <a href="#">Azithromycin</a> 1g as single dose OR <a href="#">Levofloxacin</a> 500 mg daily X 7 days OR <a href="#">Ofloxacin</a> 300 mg BID X 7 days
<b>Typical Pediatric Therapy</b>	Weight <45 kg: <a href="#">Erythromycin</a> 12.5 mg/kg QID X 14d Weight >=45 kg, but age <8 years: <a href="#">Azithromycin</a> 1 g as single dose Age >= 8 years: <a href="#">Azithromycin</a> 1 g as single dose OR <a href="#">Doxycycline</a> 100 mg BID X 7 d
<b>Clinical Hints</b>	Thin, scant penile discharge Cervicitis, with overt pelvic inflammatory disease in some cases Conjunctivitis or neonatal pneumonia Concurrent gonorrhea may be present.
<b>Synonyms</b>	Bedsonia, Chlamydia suis, Chlamydia trachomatis, Chlamydien-Urethritis, Chlamydien-Zervizitis, Chlamydophila, Inclusion blenorrhoea, Non-gonococcal urethritis, Nonspecific urethritis, Parachlamydia, Parachlamydia acanthamoebae, Prachlamydia, Protochlamydia, Protochlamydia naegleriophila, Rhabdochlamydia, Simkania negevensis, Waddlia chondrophila. ICD9: 099.41,099.5 ICD10: A56,A55

**Chlamydia infections, misc. in Guatemala**

**Prevalence surveys**

Years	Region	Study Group	%	Notes
2007 - 2011		sex workers	0-14.3	0% to 14.3% of CSW visiting VICITS clinics <sup>1</sup>
2011*	Escuintla	sex workers - client	5.5	5.5% of male clients of CSW in Escuintla <sup>2</sup>

\* indicates publication year (not necessarily year of survey)

**References**

1. [PLoS One 2014 ;9\(8\):e103455.](#)
2. [Sex Transm Dis 2011 Aug ;38\(8\):735-42.](#)

## Chlamydophila pneumoniae infection

<b>Agent</b>	BACTERIUM. Chlamydiaceae, <a href="#">Chlamydiae</a> , <i>Chlamydophila (Chlamydia) pneumoniae</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	7d - 28d
<b>Diagnostic Tests</b>	Direct fluorescence of sputum. Serology and culture in specialized laboratories. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Respiratory isolation. <a href="#">Azithromycin</a> 500 mg day 1, then 0.25 g daily X 4 days OR <a href="#">Levofloxacin</a> 750 mg po BID X 7d. OR Alternatives: <a href="#">Doxycycline</a> 100 mg BID X 7d. <a href="#">Erythromycin</a> 500 mg QID X 10d. <a href="#">Clarithromycin</a> 0.5 g BID X 7d
<b>Typical Pediatric Therapy</b>	Respiratory isolation <a href="#">Azithromycin</a> 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5
<b>Clinical Hints</b>	Atypical pneumonia, often associated with pharyngitis and myalgia Consider this diagnosis when Mycoplasma, Legionella and influenza are discounted.
<b>Synonyms</b>	Chlamydia pneumoniae, Chlamydia TWAR, Chlamydophila pneumoniae, TWAR. ICD9: 078.88 ICD10: J16.0

## Cholecystitis and cholangitis

<b>Agent</b>	BACTERIUM. <i>Escherichia coli</i> , <i>Klebsiella pneumoniae</i> , enterococci, et al.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Roentgenograms/imaging (cholecystogram, ultrasound, CT, etc).
<b>Typical Adult Therapy</b>	Antibiotics and surgical intervention as required
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, chills and right upper quadrant abdominal pain; Often "female, fat and forty" May be associated with gallstones or pancreatitis, or present as "fever of unknown origin"
<b>Synonyms</b>	Acute cholecystitis, Angiocholite, Ascending cholangitis, Cholangitis, Cholecystite, Cholecystitis, Cholezystitis, Colangite, Colangitis, Colecistite, Gall bladder. ICD9: 575.0,576.1 ICD10: K81,K83.0

Cholera	
Agent	BACTERIUM. <i>Vibrio cholerae</i> A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Water, Fecal-oral, Seafood (oyster, ceviche), Vegetables, Fly
Incubation Period	1d - 5d (range 9h - 6d)
Diagnostic Tests	Stool culture. Advise laboratory when this organism is suspected.
Typical Adult Therapy	Stool precautions. Doxycycline 100 mg BID X 5d, or Fluoroquinolone ( <a href="#">Levofloxacin</a> , <a href="#">Trovafoxacin</a> , <a href="#">Pefloxacin</a> , <a href="#">Sparfloxacin</a> or <a href="#">Moxifloxacin</a> ), or <a href="#">Azithromycin</a> Fluids (g/l): NaCl 3.5, NaHCO3 2.5, KCl 1.5, glucose 20
Typical Pediatric Therapy	Stool precautions. Age >=8 years: <a href="#">Doxycycline</a> 2 mg/kg BID X 5d. Age <8 years: Sulfamethoxazole / <a href="#">Trimethoprim</a> Fluids (g/l): NaCl 3.5, NaHCO3 2.5, KCl 1.5, glucose 20
Vaccines	<a href="#">Cholera - injectable vaccine</a> <a href="#">Cholera - oral vaccine</a>
Clinical Hints	Massive, painless diarrhea and dehydration Occasionally vomiting Apathy or altered consciousness are common Rapid progression to acidosis, electrolyte imbalance and shock Fever is uncommon.
Synonyms	Colera, Kolera. ICD9: 001 ICD10: A00

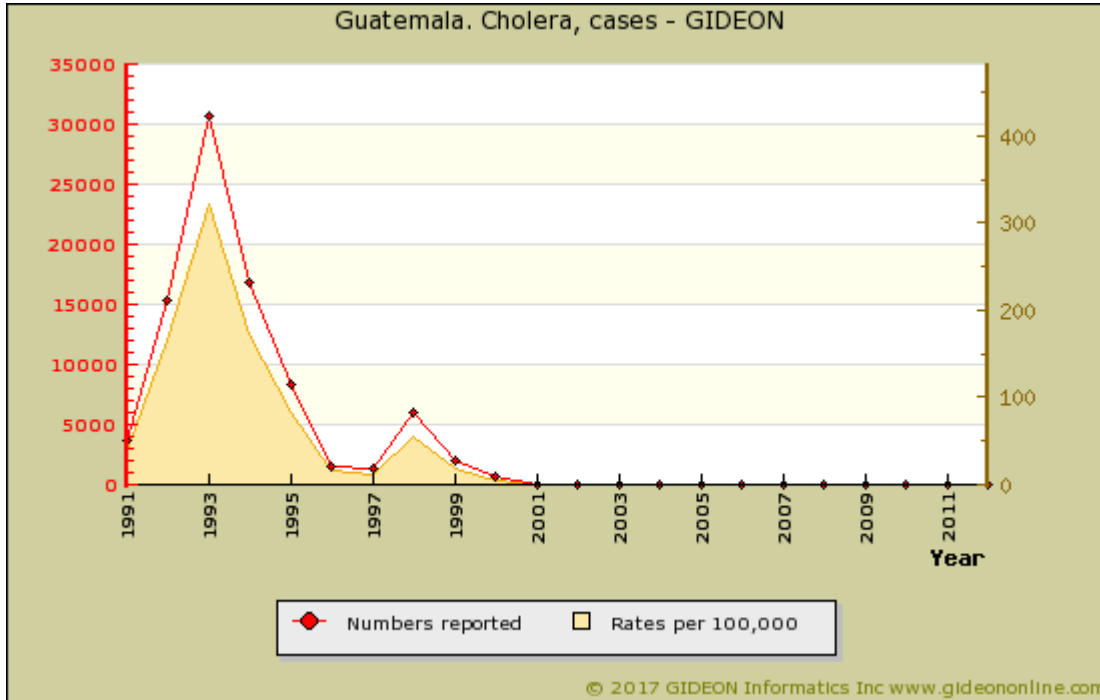
## Cholera in Guatemala

In recent years cholera has been reported from: <sup>1</sup> <sup>2</sup>

Alta Verapaz Department  
Baja Verapaz Department  
Chimaltenango Department  
Chiquimula Department  
El Progreso Department  
Escuintla Department  
Guatemala Department  
Huehuetenango Department  
Izabal Department  
Jalapa Department  
Jutiapa Department  
Peten Department  
Quetzaltenango Department  
Quiche Department  
Retalhuleu Department  
Sacatepequez Department  
San Marcos Department  
Santa Rosa Department  
Solola Department  
Suchitepequez Department  
Totonicapan Department  
Zacapa Department

Alta Verapaz Department was removed from the WHO "Infected Areas List" as of August 2001.





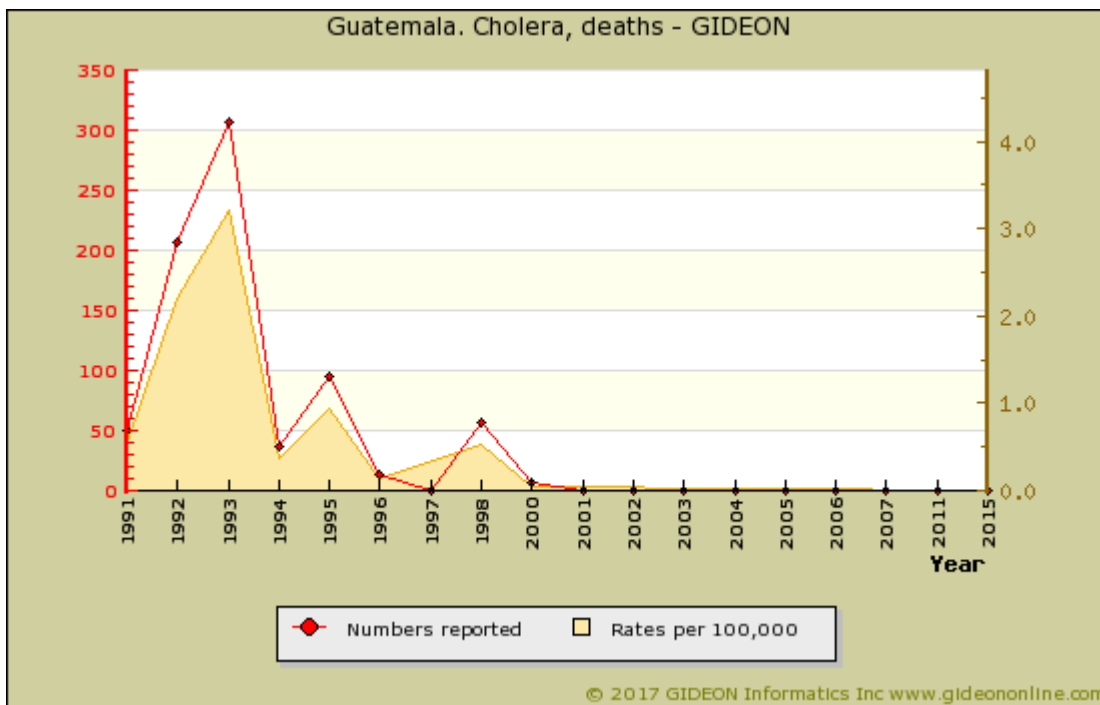
Graph: Guatemala. Cholera, cases

Notes:

1. 65 cases (4 fatal) were reported in Escuintla and Quiche departments during December 10, 1999 to January 20, 2000.

Individual years:

1995 - Highest rates in El Progreso



Graph: Guatemala. Cholera, deaths

Notable outbreaks

Years	Setting	Cases	Deaths	Notes
1991 - 1993		49,673	563	<a href="#">3</a>
1996*	hospital	4		<a href="#">4</a>

\* indicates publication year (not necessarily year of outbreak)

**References**

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1. [Wkly Epidemiol Rec 2002 Mar 8;77\(10\):78-80.](#)
2. [Wkly Epidemiol Rec 2002 Aug 2;77\(31\):267-8.](#)
3. [Epidemiol Infect 1996 Apr ;116\(2\):121-6.](#)
4. [Infect Control Hosp Epidemiol 1996 Jun ;17\(6\):371-2.](#)

## Chromomycosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomycetes, Chaetothyriales. Dematiaceous molds: <i>Phialophora</i> , <i>Cladophialophora</i> , <i>Fonsecaea</i> , <i>Rhinocladiella</i>
<b>Reservoir</b>	Wood, Soil, Vegetation
<b>Vector</b>	None
<b>Vehicle</b>	Minor trauma
<b>Incubation Period</b>	14d - 90d
<b>Diagnostic Tests</b>	Biopsy and fungal culture.
<b>Typical Adult Therapy</b>	<a href="#">Itraconazole</a> 100 mg PO QID X (up to) 18 m. OR (for late disease) <a href="#">Flucytosine</a> 25 mg/kg QID X 4m. OR <a href="#">Posaconazole</a> 400 mg PO BID <a href="#">Terbinafine</a> has been used in some cases. Local heat; excision as necessary
<b>Typical Pediatric Therapy</b>	<a href="#">Itraconazole</a> 1 mg/kg PO BID X (up to) 18 m. OR <a href="#">Ketoconazole</a> (if age >2) 5 mg/kg/d X 3 to 6m. Local heat; excision as necessary
<b>Clinical Hints</b>	Violaceous, verrucous, slowly-growing papule(s) or nodules Most commonly on lower extremities Usually follows direct contact with plant matter in tropical regions
<b>Synonyms</b>	Chromoblastomycosis, Chromomykose, Phoma insulana, Veronaea, Verrucous dermatitis. ICD9: 117.2 ICD10: B43.0

**Chronic meningococemia**

<b>Agent</b>	BACTERIUM. <i>Neisseria meningitidis</i> An aerobic gram-negative coccus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Infected secretions
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Blood culture. Test patient for complement component deficiency.
<b>Typical Adult Therapy</b>	Intravenous <b>Penicillin G</b> 20 million units daily X 7 days
<b>Typical Pediatric Therapy</b>	Intravenous <b>Penicillin G</b> 200,000 units daily X 7 days
<b>Clinical Hints</b>	Recurrent episodes of low-grade fever, rash, arthralgia and arthritis May persist for months Rash is distal and prominent near joints and may be maculopapular, petechial or pustular In some cases, associated with complement component-deficiency
<b>Synonyms</b>	Meningococemia, chronic. ICD9: 036.2 ICD10: A39.3

## Clostridial food poisoning

<b>Agent</b>	BACTERIUM. <i>Clostridium perfringens</i> An anaerobic gram-positive bacillus
<b>Reservoir</b>	Soil, Human, Pig, Cattle, Fish, Poultry
<b>Vector</b>	None
<b>Vehicle</b>	Food
<b>Incubation Period</b>	8h - 14h (range 5h - 24h)
<b>Diagnostic Tests</b>	Laboratory diagnosis is usually not practical. Attempt culture of food for C. perfringens.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Abdominal pain and watery diarrhea Usually no fever or vomiting Onset 8 to 14 hours after ingestion of meat, fish or gravy Fecal leukocytes not seen Most cases resolve within 24 hours.
<b>Synonyms</b>	

**Clostridial myonecrosis**

<b>Agent</b>	BACTERIUM. <i>Clostridium perfringens</i> An anaerobic gram-positive bacillus
<b>Reservoir</b>	Soil, Human
<b>Vector</b>	None
<b>Vehicle</b>	Soil, Trauma
<b>Incubation Period</b>	6h - 3d
<b>Diagnostic Tests</b>	Gram stain of exudate. Wound and blood cultures. Presence of gas in tissue (not specific).
<b>Typical Adult Therapy</b>	Prompt, aggressive debridement. <b>Penicillin G</b> 3 million units IV Q3h + <b>Clindamycin</b> 900 mg IV Q8h. Hyperbaric oxygen
<b>Typical Pediatric Therapy</b>	Prompt, aggressive debridement. <b>Penicillin G</b> 50,000 units/kg IV Q3h + <b>Clindamycin</b> 10 mg/kg IV Q6h. Hyperbaric oxygen
<b>Vaccine</b>	<b>Gas gangrene antitoxin</b>
<b>Clinical Hints</b>	Rapidly progressive tender and foul-smelling infection of muscle Local gas present - crepitus or visible on X-ray Hypotension, intravascular hemolysis and obtundation
<b>Synonyms</b>	Anaerobic myonecrosis, Clostridial gangrene, Gas gangrene. ICD9: 040.0 ICD10: A48.0

## Clostridium difficile colitis

<b>Agent</b>	BACTERIUM. <i>Clostridium difficile</i> An anaerobic gram-positive bacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Assay of stool for C. difficile toxin.
<b>Typical Adult Therapy</b>	<a href="#">Metronidazole</a> 500 mg PO TID X 10d. OR <a href="#">Vancomycin</a> 125 mg (oral preparation) QID X 10d OR <a href="#">Fidaxomicin</a> 200 mg PO BID X 10d  Fecal transplantation (PO or by enema) has been effective in some cases.
<b>Typical Pediatric Therapy</b>	<a href="#">Vancomycin</a> 2 mg/kg (oral preparation) QID X 10d
<b>Clinical Hints</b>	Fever, leukocytosis and abdominal pain Mucoïd or bloody diarrhea during or following antibiotic therapy Fecal leucocytes are seen Suspect this diagnosis even when mild diarrhea follows antibiotic intake
<b>Synonyms</b>	Klebsiella oxytoca colitis, Pseudomembranous colitis. ICD9: 008.45 ICD10: A04.7

### Clostridium difficile colitis in Guatemala

#### Notable outbreaks

Years	Region	Setting	Cases	Notes
2013	Guatemala City	hospital	80 <sup>1</sup>	

#### References

1. ProMED <promedmail.org> archive: 20130314.1586131

## Coccidioidomycosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomyces, Onygenales: <i>Coccidioides immitis</i> (also <i>Coccidioides posadasii</i> ) A dimorphic fungus
<b>Reservoir</b>	Soil
<b>Vector</b>	None
<b>Vehicle</b>	Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	10d - 14d (range 7d - 28d)
<b>Diagnostic Tests</b>	Culture of sputum, CSF, biopsy etc for fungi. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	(Non-meningitic) <a href="#">Fluconazole</a> 500 mg PO daily. OR <a href="#">Itraconazole</a> 200 mg PO BID X 1y. OR <a href="#">Amphotericin B</a> 0.4 mg/kg/d X 6w, then 0.8 mg/kg qod
<b>Typical Pediatric Therapy</b>	(Non-meningitic) <a href="#">Fluconazole</a> 8 mg/kg/day PO or IV OR <a href="#">Ketoconazole</a> 5 mg/kg/d X 1y, OR <a href="#">Amphotericin B</a> 0.4 mg/kg/d X 6w, then 0.8 mg/kg qod
<b>Clinical Hints</b>	Cough, chest pain and myalgia Eosinophilia, erythema nodosum or headache in many cases Extrapulmonary infection (bone, skin, genitourinary, etc) is occasionally encountered
<b>Synonyms</b>	California disease, <i>Coccidioides immitis</i> , <i>Coccidioides posadasii</i> , Coccidioidomykose, Desert rheumatism, Posada's disease, Valley fever. ICD9: 114 ICD10: B38

### Coccidioidomycosis in Guatemala

The disease is common in the in Montagua Valley.



**Common cold**

<b>Agent</b>	VIRUS - RNA. Picornaviridae. Rhinoviruses, Coronavirus, et al.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1d - 3d
<b>Diagnostic Tests</b>	Viral culture and serology are available, but not practical.
<b>Typical Adult Therapy</b>	Supportive; <a href="#">Pleconaril</a> under investigation
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Nasal obstruction or discharge, cough and sore throat are common Fever above 38 C is common in children, but unusual in adults Illness typically persists for one week, occasionally two
<b>Synonyms</b>	Acute coryza, Raffreddore. ICD9: 079,460 ICD10: J00

## Conjunctivitis - inclusion

<b>Agent</b>	BACTERIUM. <a href="#">Chlamydiae</a> , <i>Chlamydia trachomatis</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Infected secretions, Sexual contact, Water (swimming pools)
<b>Incubation Period</b>	5d - 12d
<b>Diagnostic Tests</b>	Demonstration of chlamydiae on direct fluorescence or culture of exudate.
<b>Typical Adult Therapy</b>	Secretion precautions. Topical <a href="#">Erythromycin</a> . <a href="#">Erythromycin</a> 250 mg PO QID. X 14 days OR <a href="#">Doxycycline</a> 100 mg PO BID X 14 days
<b>Typical Pediatric Therapy</b>	Secretion precautions. Topical <a href="#">Erythromycin</a> . <a href="#">Azithromycin</a> 1 g PO as single dose. Alternative If age >8 years, <a href="#">Doxycycline</a> 100 mg PO BID X 7 days.
<b>Clinical Hints</b>	Ocular foreign body sensation, photophobia and discharge Illness can persist for months, to as long as 2 years;
<b>Synonyms</b>	Inclusion conjunctivitis, Paratrachoma. ICD9: 077.0 ICD10: P39.1,A74.0

## Conjunctivitis - viral

<b>Agent</b>	VIRUS. Picornavirus, Adenovirus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Contact
<b>Incubation Period</b>	1d - 3d
<b>Diagnostic Tests</b>	Viral isolation is available but rarely practical.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Watery discharge, generalized conjunctival injection and mild pruritus May be associated with an upper respiratory infection.
<b>Synonyms</b>	Apollo conjunctivitis, Apollo eye, Congiuntivite virale, Hemorrhagic conjunctivitis, Viral conjunctivitis. ICD9: 077.1,077.2,077.3,077.4,077.8,372.0 ICD10: B30,B30.3,H10

### Conjunctivitis - viral in Guatemala

#### Notable outbreaks

Years	Cases	Notes
2003	2,269	Disease rate was 18 per 100,000 population

## Cryptococcosis

<b>Agent</b>	FUNGUS - Yeast. Basidiomycota, Hymenomyces, Sporidiales: <i>Cryptococcus neoformans</i> and other species
<b>Reservoir</b>	Pigeon, Soil
<b>Vector</b>	None
<b>Vehicle</b>	Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Fungal culture and stains. Latex test for fungal antigen in CSF and serum. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Amphotericin B</a> 0.3 mg/kg/d X 6w (+/- <a href="#">Flucytosine</a> ); then 0.8 mg/kg qod X 8w. OR <a href="#">Fluconazole</a> 200 mg/d
<b>Typical Pediatric Therapy</b>	<a href="#">Amphotericin B</a> 0.3 mg/kg/d X 6w (+/- <a href="#">Flucytosine</a> ); then 0.8 mg/kg qod X 8w. OR <a href="#">Fluconazole</a> 3 mg/kg/d
<b>Clinical Hints</b>	Chronic lymphocytic meningitis or pneumonia in an immune-suppressed patient Meningitis may be subclinical, or "wax and wane" Nuchal rigidity is absent or minimal; Bone, skin, adrenals, liver, prostate and other sites may be infected hematogenously
<b>Synonyms</b>	Busse-Buschke disease, Cryptococcus, European blastomycosis, Torulosis. ICD9: 117.5,321.0 ICD10: B45

### Cryptococcosis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
1991 - 1992	Guatemala City	patients - HIV/AIDS	6.5	6.5% of HIV-positive outpatients (extrapulmonary infection) <sup>1</sup>

#### References

1. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.

## Cryptosporidiosis

<b>Agent</b>	PARASITE - Protozoa. Apicomplexa, Eimeriida: <i>Cryptosporidium hominis</i> and <i>C. parvum</i> (rarely <i>C. muris</i> , <i>C. felis</i> , <i>C. meleagridis</i> , et al).
<b>Reservoir</b>	Mammal (over 150 species)
<b>Vector</b>	None
<b>Vehicle</b>	Water, Feces, Oysters, Fly
<b>Incubation Period</b>	5d - 10d (range 2d - 14d)
<b>Diagnostic Tests</b>	Stool/duodenal aspirate for acid-fast, direct fluorescence staining, or antigen assay. Nucleic acid amplification
<b>Typical Adult Therapy</b>	Stool precautions. <b>Nitazoxanide</b> 500 mg PO BID X 3 days
<b>Typical Pediatric Therapy</b>	Stool precautions. <b>Nitazoxanide</b> : 1 to 3 years: 100 mg PO BID X 3 days 4 to 11 years: 200 mg PO BID X 3 days >12 years: 500 mg PO BID X 3 days
<b>Clinical Hints</b>	Watery diarrhea, vomiting, abdominal pain Self-limited disease in healthy subjects Immunosuppressed (e.g., AIDS) patient experience a chronic and wasting illness, which may be associated with pulmonary disease
<b>Synonyms</b>	<i>Cryptosporidium</i> , <i>Cryptosporidium andersoni</i> , <i>Cryptosporidium chipmunk</i> genotype, <i>Cryptosporidium cunulicus</i> , <i>Cryptosporidium fayeri</i> , <i>Cryptosporidium felis</i> , <i>Cryptosporidium hedgehog</i> genotype, <i>Cryptosporidium hominis</i> , <i>Cryptosporidium meleagridis</i> , <i>Cryptosporidium parvum</i> , <i>Cryptosporidium pestis</i> , <i>Cryptosporidium suis</i> , <i>Cryptosporidium tyzzeri</i> , <i>Cryptosporidium ubiquitum</i> , <i>Cryptosporidium viatorum</i> , Kryptosporidiose. ICD9: 007.4 ICD10: A07.2

### Cryptosporidiosis in Guatemala

Infection rates peak during the rainy season.

#### Prevalence surveys

Years	Region	Study Group	%	Notes
1985 - 1986	Guatemala City	children	15.4	15.4% of infants in the area of Guatemala City <sup>1</sup>
2010		children	0.5	0.5% of non-diarrheal stool specimens from children in the Guatemalan Highlands <sup>2</sup>
2004*	Lake Atitlan	general population	32	32% of individuals in the area of Lake Atitlan <sup>3</sup>
1997 - 1998	Guatemala City	patients	0.9-1.9	1.9% of outpatients with diarrhea, and 0.9% of those without diarrhea <sup>4</sup>
2011*	Santa Rosa	patients	0.8	0.8% of adults with diarrhea, in Santa Rosa <sup>5</sup>
2011*	Guatemala City	patients - HIV/AIDS	5.59	5.59% of patients with HIV/AIDS
1991 - 1992	Guatemala City	patients - HIV/AIDS	14.1	14.1% of HIV-positive outpatients <sup>6</sup>

\* indicates publication year (not necessarily year of survey)

#### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1999	San Juan Sacatepequez	children	27-73	27% of children in San Juan Sacatepequez, ages 6 to 12 months are seropositive; 53% ages 13 to 18 months; 70% ages 19 to 24 months; 67% ages 25 to 30 months; 73% ages 31 to 36 months (1999) <sup>7</sup>

The rate of infection among Peace Corps volunteers was 17 per 100 person years. <sup>8</sup>

#### References

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1. J Clin Microbiol 1988 Jan ;26(1):88-91.
2. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.
3. Braz J Infect Dis 2004 Aug ;8(4):319-23.
4. Am J Trop Med Hyg 2000 Nov-Dec;63(5-6):231-5.
5. Am J Trop Med Hyg 2011 Dec ;85(6):1141-3.
6. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.
7. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.
8. J Clin Microbiol 2001 Jan ;39(1):34-42.

## Cutaneous larva migrans

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Ancylostoma braziliense</i> , <i>A. caninum</i> , <i>Bunostomum phlebotomum</i> , <i>Strongyloides myopotami</i>
<b>Reservoir</b>	Cat, Dog, Cattle
<b>Vector</b>	None
<b>Vehicle</b>	Soil, Contact
<b>Incubation Period</b>	2d - 3d (range 1d - 30d)
<b>Diagnostic Tests</b>	Biopsy is usually not helpful.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 200 mg BID X 3d OR <a href="#">Ivermectin</a> 200 micrograms/kg as single dose. OR <a href="#">Thiabendazole</a> topical, and oral 25 mg/kg BID X 5d (max 3g).
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 2.5 mg/kg BID X 3d OR <a href="#">Ivermectin</a> 200 micrograms/kg once OR <a href="#">Thiabendazole</a> topical, and oral 25 mg/kg BID X 5d (max 3g).
<b>Clinical Hints</b>	Erythematous, serpiginous, intensely pruritic and advancing lesion(s) or bullae Usually involves the feet Follows contact with moist sand or beach May recur or persist for months.
<b>Synonyms</b>	Creeping eruption, Pelodera, Plumber's itch. ICD9: 126.2,126.8,126.9 ICD10: B76.9

## Cyclosporiasis

<b>Agent</b>	PARASITE - Protozoa. Apicomplexa, Eimeriida: <i>Cyclospora cayetanensis</i>
<b>Reservoir</b>	Human, Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Water, Vegetables
<b>Incubation Period</b>	1d - 11d
<b>Diagnostic Tests</b>	Identification of organism in stool smear. Cold acid fast stains and ultraviolet microscopy may be helpful.
<b>Typical Adult Therapy</b>	Sulfamethoxazole / <b>Trimethoprim</b> 800/160 mg BID X 7d <b>Ciprofloxacin</b> 500 mg PO BID X 7 d (followed by 200 mg TIW X 2 w) has been used in sulfa-allergic patients
<b>Typical Pediatric Therapy</b>	Sulfamethoxazole / <b>Trimethoprim</b> 10/2 mg/kg BID X 7d
<b>Clinical Hints</b>	Watery diarrhea (average 6 stools daily) Abdominal pain, nausea, anorexia and fatigue May persist for up to 6 weeks (longer in AIDS patients) Most cases follow ingestion of contaminated water in underdeveloped countries Large outbreaks have been associated with ingestion of contaminated fruit
<b>Synonyms</b>	Cryptosporidium muris, Cyanobacterium-like agent, Cyclospora. ICD9: 007.5 ICD10: A07.8

### Cyclosporiasis in Guatemala

**Time and Place:**

*Cyclospora* was first identified in Guatemala in 1994.

- Disease rates peak in June and are highest among children ages 1.5 to 9 years.
- The principal vehicle for infection is untreated water.

In 1997, 1.7% of Guatemalan stool samples from day-care children and raspberry workers were found to be positive - 33% of these in asymptomatic individuals.

- 3.4% of raspberry workers were found to be infested during April 1997 to March 1998. <sup>1</sup>

**Prevalence surveys**

Years	Region	Study Group	%	Notes
1997 - 1998	Guatemala City	patients	1.5-3.6	3.6% of outpatients with diarrhea, and 1.5% of those without diarrhea <sup>2</sup>
1997 - 1998	Guatemala City	patients - HIV/AIDS	4.2	4.20% of patients with AIDS/HIV

**Notable outbreaks**

Years	Setting	Cases	Source	Population	Notes
1996 - 2000		1,400	fruit - raspberries		Outbreaks in the United States and Canada were traced to Guatemalan raspberries <sup>3 4 5 6 7 8 9 10 11 12 13 14</sup>
2000		54	fruit - raspberries		<sup>15</sup>
2004	residential facility	96	vegetable - peas		Outbreak caused by contaminated raw snow peas imported from Guatemala <sup>16 17</sup>
2006*		7		travelers	Outbreak among Spanish nationals who had traveled to Guatemala and Antigua <sup>18</sup>
2009		18	vegetable - peas		Outbreak in Sweden associated with contaminated sugar snap peas imported from Guatemala. <sup>19</sup>

\* indicates publication year (not necessarily year of outbreak)



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2. Am J Trop Med Hyg 2000 Nov-Dec;63(5-6):231-5.
3. N Engl J Med 1997 May 29;336(22):1548-56.
4. MMWR Morb Mortal Wkly Rep 1996 Jun 28;45(25):549-51.
5. JAMA 1996 Jul 17;276(3):183.
6. BMJ 1996 Jul 13;313(7049):71.
7. Public Health Rep 1999 Sep-Oct;114(5):427-38.
8. Am J Trop Med Hyg 1998 Aug ;59(2):235-42.
9. MMWR Morb Mortal Wkly Rep 1996 Jul 19;45(28):611-2.
10. J Fam Pract 1998 Sep ;47(3):231-4.
11. ProMED <promedmail.org> archive: 19970228.0464
12. N Engl J Med 1997 May 29;336(22):1548-56.
13. MMWR Morb Mortal Wkly Rep 1996 Jun 28;45(25):549-51.
14. ProMED <promedmail.org> archive: 19970228.0464
15. Emerg Infect Dis 2002 Aug ;8(8):783-8.
16. MMWR Morb Mortal Wkly Rep 2004 Sep 24;53(37):876-8.
17. ProMED <promedmail.org> archive: 20040918.2584
18. J Travel Med 2006 Nov-Dec;13(6):334-7.
19. Foodborne Pathog Dis 2010 Dec ;7(12):1585-7.

## Cysticercosis

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Taenia solium</i>
<b>Reservoir</b>	Pig, Human
<b>Vector</b>	None
<b>Vehicle</b>	Soil (contaminated by pigs), Fecal-oral, Fly
<b>Incubation Period</b>	3m - 3y
<b>Diagnostic Tests</b>	Serology (blood or CSF) and identification of parasite in biopsy material.
<b>Typical Adult Therapy</b>	<b>Albendazole</b> 400 mg PO BID X 30d. OR <b>Praziquantel</b> 30 mg/kg TID X 14d (15 to 30d for neurocysticercosis). Combination of <b>Albendazole</b> + <b>Praziquantel</b> may be superior for neurocysticercosis. Surgery as indicated  Add corticosteroids if brain involved.
<b>Typical Pediatric Therapy</b>	<b>Albendazole</b> 15 mg/kg PO BID X 30d. OR <b>Praziquantel</b> 30 mg/kg TID X 14d (15 to 30d for neurocysticercosis). Combination of <b>Albendazole</b> + <b>Praziquantel</b> may be superior for neurocysticercosis. Surgery as indicated  Add corticosteroids if brain involved.
<b>Clinical Hints</b>	Cerebral, ocular or subcutaneous mass Usually no eosinophilia Calcifications noted on X-ray examination Associated with regions where pork is eaten 25% to 50% of patients have concurrent tapeworm infestation
<b>Synonyms</b>	<i>Taenia crassiceps</i> , <i>Taenia martis</i> . ICD9: 123.1 ICD10: B69

### Cysticercosis in Guatemala

The first case was reported in 1940.

Cysticercosis accounts for 8% of neurological hospitalizations.

#### Prevalence surveys

Years	Study Group	%	Notes
1996*	specimens - stool	0.3-1.6	<i>Taenia solium</i> is identified in 0.3 to 1.6% of stool examinations - 2% in Jutiapa <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

As many as 30% of the population are seropositive.

#### References

1. [Am J Trop Med Hyg 1996 Sep ;55\(3\):282-9.](#)

## Cytomegalovirus infection

<b>Agent</b>	VIRUS - DNA. Herpesviridae, Betaherpesvirinae: Human herpesvirus 5 (Cytomegalovirus)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet (respiratory), Urine, Dairy products, Tears, Stool, Sexual, contact (rare), Transplacental, Breastfeeding
<b>Incubation Period</b>	3w - 5w (range 2w - 12w)
<b>Diagnostic Tests</b>	Viral culture (blood, CSF, urine, tissue). Serology. Direct viral microscopy. Nucleic acid amplification
<b>Typical Adult Therapy</b>	(Most cases self-limited). <a href="#">Ganciclovir</a> 5 mg/kg q12h IV X 2 to 3w. OR <a href="#">Foscarnet</a> 90 mg/kg Q12h IV OR <a href="#">Cidofovir</a> 5 mg/kg IV weekly
<b>Typical Pediatric Therapy</b>	(Most cases self-limited) <a href="#">Ganciclovir</a> 5 mg/kg q12h IV X 2 to 3w
<b>Vaccine</b>	<a href="#">Cytomegalovirus immunoglobulin</a>
<b>Clinical Hints</b>	Heterophile-negative "mononucleosis" Mild pharyngitis, without exudate Variable degree of lymphadenopathy and splenomegaly Retinitis in AIDS patients Pneumonia in setting of immune suppression Congenital infection characterized by multisystem disease in newborns
<b>Synonyms</b>	Cytomegalovirus, Zytomegalie. ICD9: 078.5 ICD10: B25

## Cytomegalovirus infection in Guatemala

### Prevalence surveys

Years	Region	Study Group	%	Notes
1991 - 1992	Guatemala City	patients - HIV/AIDS	4.3	4.3% of HIV-positive outpatients <sup>1</sup>

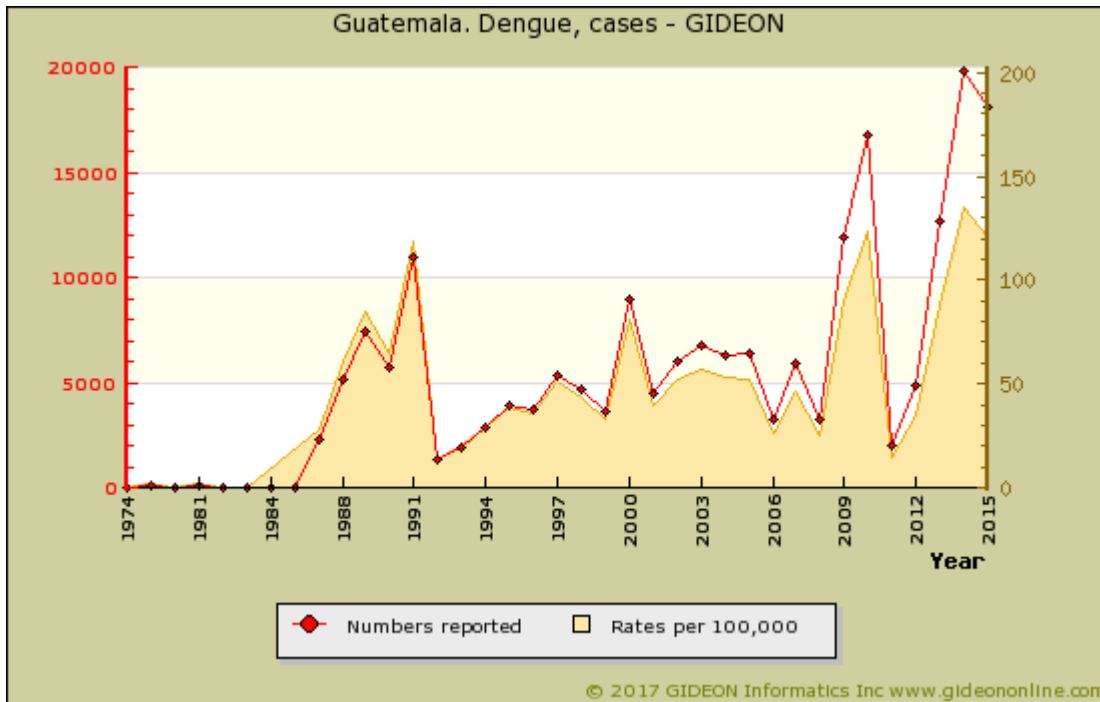
### References

1. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.](#)

## Dengue

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Flavivirus: Dengue virus
<b>Reservoir</b>	Human, Mosquito, Monkey (in Malaysia and Africa)
<b>Vector</b>	Mosquito - <i>Stegomyia (Aedes) aegypti</i> , <i>S. albopictus</i> , <i>S. polynesiensis</i> , <i>S. scutellaris</i>
<b>Vehicle</b>	Blood, Breastfeeding
<b>Incubation Period</b>	5d - 8d (range 2d - 15d)
<b>Diagnostic Tests</b>	Viral isolation (blood). Serology. Nucleic acid amplification.  Biosafety level 2.
<b>Typical Adult Therapy</b>	Supportive; IV fluids to maintain blood pressure and reverse hemoconcentration
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Dengue vaccine</a>
<b>Clinical Hints</b>	Headache, myalgia, arthralgia Relative bradycardia, leukopenia and macular rash Severe dengue (DHF or dengue-shock syndrome) defined as dengue with thrombocytopenia, hemoconcentration and hypotension.
<b>Synonyms</b>	Bouquet fever, Break-bone fever, Dandy fever, Date fever, Dengue Fieber, Duengero, Giraffe fever, Petechial fever, Polka fever. ICD9: 061 ICD10: A90,A91

### Dengue in Guatemala



Graph: Guatemala. Dengue, cases

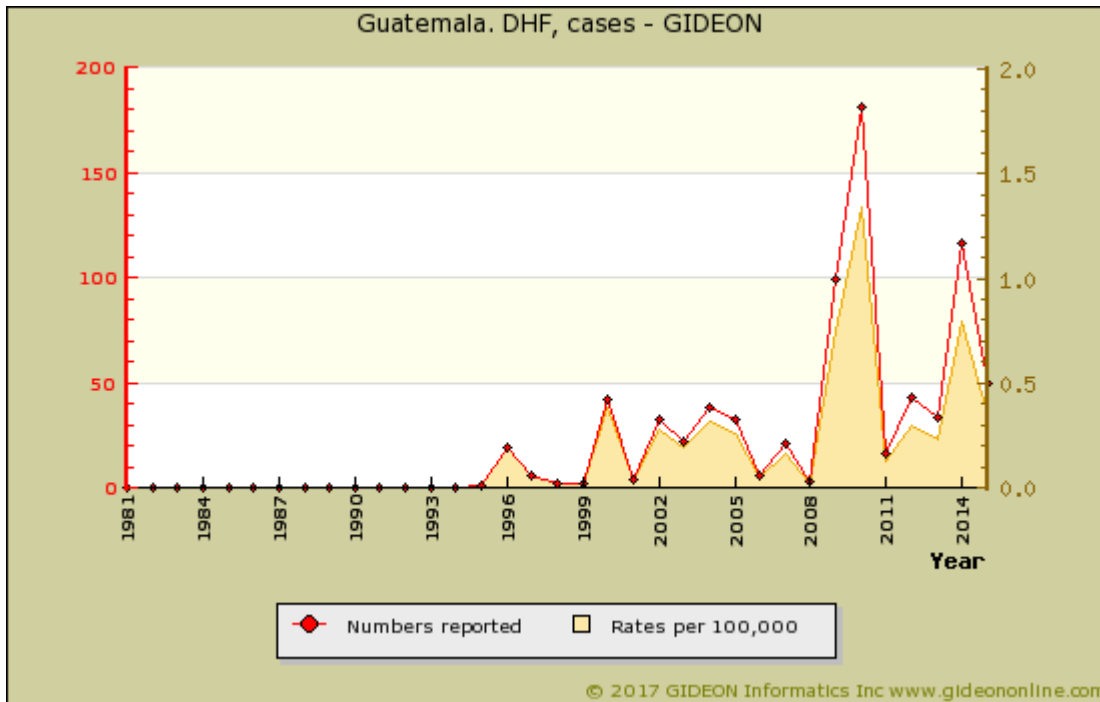
Notes:

Individual years:

1978 - Cases reported during an epidemic in Escuintla.

1988 - 30 outbreaks were registered.

2000 - Most cases reported in Zacapa, Santa Rosa, Escuintla and El Progreso.

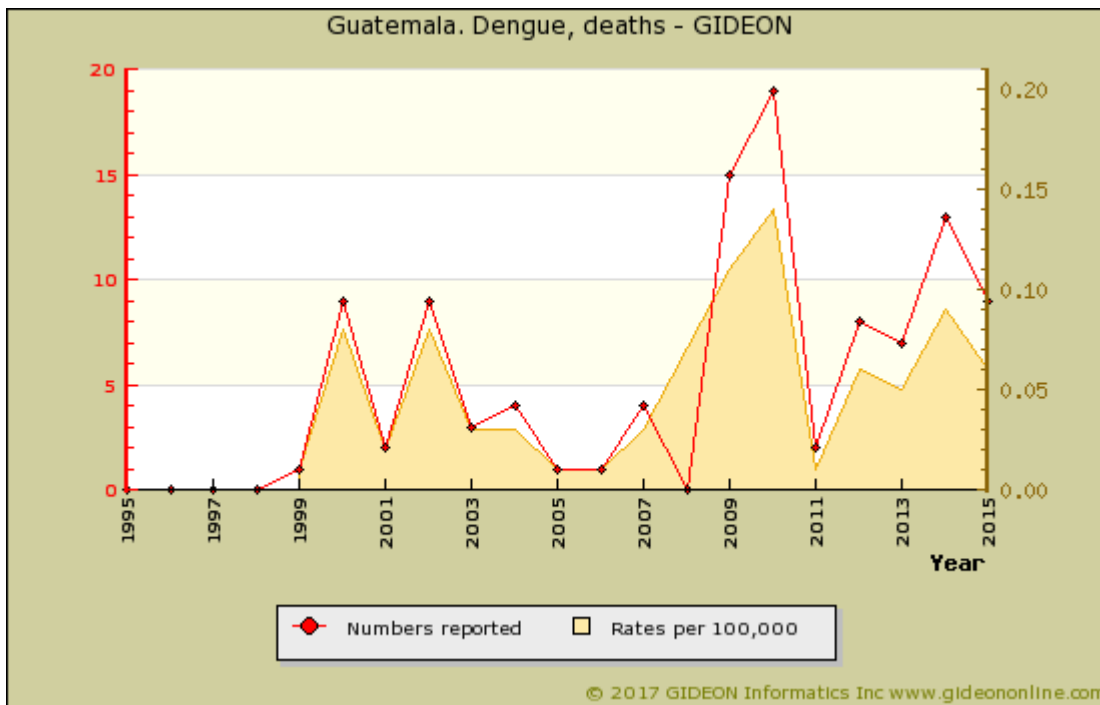


Graph: Guatemala. DHF, cases

Notes:

Individual years:

1995 - case in Escuintla.



Graph: Guatemala. Dengue, deaths

Following an eradication campaign during 1948 to 1959, the country was declared free of *Stegomyia (Aedes) aegypti* in 1959.

- *S. aegypti* reappeared in 1972, in Escuintla.

*Aedes albopictus* was discovered for the first time in Guatemala in 1995. <sup>1</sup>

- As of 2003, *Stegomyia (Aedes) albopictus* was present in ten American countries: Brazil, the Cayman Islands <sup>2</sup>, the Dominican Republic, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Trinidad and the United States.

**Notable outbreaks**

Years	Region	Cases	Deaths	Notes
1996 - 1998				Outbreak reported - additional details unavailable. <sup>3</sup>
2009	Izabal	115	2	<sup>4</sup>
2010		11,873	25	<sup>5 6 7 8</sup>
2012		2,081	5	<sup>9 10 11</sup>
2013				<sup>12 13 14</sup>
2014		7,274	5	<sup>15 16 17 18</sup>
2015		18,058	9	<sup>19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34</sup>
2016		15,753	1	Cases to November <sup>35 36 37 38 39 40 41 42</sup>

**References**

1. J Am Mosq Control Assoc 1996 Sep ;12(3 Pt 1):503-6.
2. Am J Trop Med Hyg 2003 Jul ;69(1):105-14.
3. Arch Virol 2001 Jul ;146(7):1381-90.
4. ProMED <promedmail.org> archive: 20090921.3322
5. ProMED <promedmail.org> archive: 20100517.1620
6. ProMED <promedmail.org> archive: 20100719.2429
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23. ProMED <promedmail.org> archive: 20150510.3352790
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39. ProMED <promedmail.org> archive: 20160703.4323211
40. ProMED <promedmail.org> archive: 20160712.4338859
41. ProMED <promedmail.org> archive: 20160822.4432070
42. ProMED <promedmail.org> archive: 20161209.4680856

## Dermatophytosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomyces, Onygenales: <i>Epidermophyton</i> , <i>Microsporum</i> , <i>Trichophyton</i> , <i>Trichosporon</i> spp., <i>Arthroderma</i> , et al
<b>Reservoir</b>	Human, Dog, Cat, Rabbit, Marsupial, Other mammal
<b>Vector</b>	None
<b>Vehicle</b>	Contaminated soil/flooring, Animal Contact
<b>Incubation Period</b>	2w - 38w
<b>Diagnostic Tests</b>	Fungal culture and microscopy of skin, hair or nails. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Skin - topical Clotrimazole, <a href="#">Miconazole</a> , etc. Hair/nails - <a href="#">Terbinafine</a> , <a href="#">Griseofulvin</a> , <a href="#">Itraconazole</a> or <a href="#">Fluconazole</a> PO
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Erythematous, circinate, scaling or dyschromic lesions of skin, hair or nails Pruritus, secondary infection or regional lymphadenopathy may be present
<b>Synonyms</b>	Arthroderma, DermatOMICOSE, DermatomyCOSE, DermatomyCOsIS, Dermatomykose, Dermatomykosen, Emericella, Favus, Granuloma trichophyticum, Gruby's disease, Kodamaea, Leukonychia trichophytica, Microsporum, Natrassia, Onychocola, Onychomycosis, Pityriasis versicolor, Ringworm, Saint Aignan's disease, Scopulariopsis, Scytalidium, Tinea, Tinea barbae, Tinea capitis, Tinea corporis, Tinea cruris, Tinea favosa, Tinea imbricata, Tinea manum, Tinea pedis, Tinea unguinum, Tokelau ringworm, Triadelphia pulvinata, Trichomycosis, Trichophytosis, Trichophytosis gladiatorum. ICD9: 110,111 ICD10: B35,B36

## Dientamoeba fragilis infection

<b>Agent</b>	PARASITE - Protozoa. Metamonada, Parabasala, Trichomonadea. Flagellate: <i>Dientamoeba fragilis</i>
<b>Reservoir</b>	Human, Gorilla, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral (ingestion of pinworm ova)
<b>Incubation Period</b>	8d - 25d
<b>Diagnostic Tests</b>	Identification of trophozoites in stool. Nucleic acid amplification. Alert laboratory if this diagnosis is suspected.
<b>Typical Adult Therapy</b>	Stool precautions. <a href="#">Iodoquinol</a> 650 mg PO TID X 20d. OR <a href="#">Tetracycline</a> 500 mg QID X 10d. OR <a href="#">Paromomycin</a> 10 mg/kg TID X 7d OR <a href="#">Metronidazole</a> 750 mg PO TID X 10d
<b>Typical Pediatric Therapy</b>	Stool precautions. <a href="#">Iodoquinol</a> 13 mg/kg PO TID X 20d. OR (age >8) <a href="#">Tetracycline</a> 10 mg/kg QID X 10d OR <a href="#">Paromomycin</a> 10 mg/kg TID X 7d OR <a href="#">Metronidazole</a> 15 mg/kg PO TID X 10d
<b>Clinical Hints</b>	Abdominal pain with watery or mucous diarrhea Eosinophilia may be present Concurrent enterobiasis (pinworm) is common Infestation may persist for more than one year
<b>Synonyms</b>	



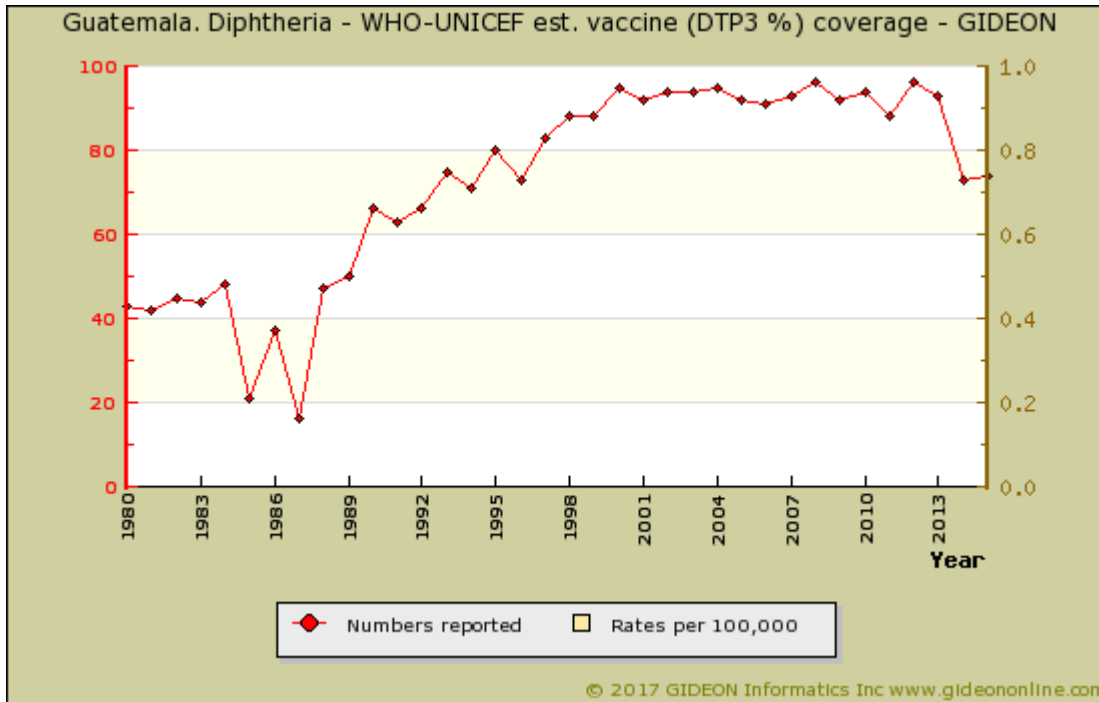
## Diphtheria

<b>Agent</b>	BACTERIUM. <i>Corynebacterium diphtheriae</i> A facultative gram-positive bacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Contact, Dairy products, Clothing
<b>Incubation Period</b>	2d - 5d (range 1d - 10d)
<b>Diagnostic Tests</b>	Culture on special media. Advise laboratory when this diagnosis is suspected.
<b>Typical Adult Therapy</b>	Respiratory isolation. Equine antitoxin 20,000 to 80,000 units IM. (first perform scratch test) <a href="#">Erythromycin</a> 500 mg QID (or Penicillin preparation) X 14d
<b>Typical Pediatric Therapy</b>	Respiratory isolation. Equine antitoxin 1,000 units/kg IM. (first perform scratch test) <a href="#">Erythromycin</a> 10 mg/kg QID (or penicillin preparation) X 14d
<b>Vaccines</b>	<a href="#">Diphtheria antitoxin</a> <a href="#">Diphtheria vaccine</a> <a href="#">DTP vaccine</a> <a href="#">DT vaccine</a> <a href="#">DTaP vaccine</a> <a href="#">Td vaccine</a>
<b>Clinical Hints</b>	Pharyngeal membrane with cervical edema and lymphadenopathy "Punched out" skin ulcers with membrane Myocarditis or neuropathy (foot/wrist drop) may appear weeks following initial infection
<b>Synonyms</b>	<i>Corynebacterium diphtheriae</i> , Difteri, Difteria, Difterie, Difterite, Diphterie. ICD9: 032 ICD10: A36

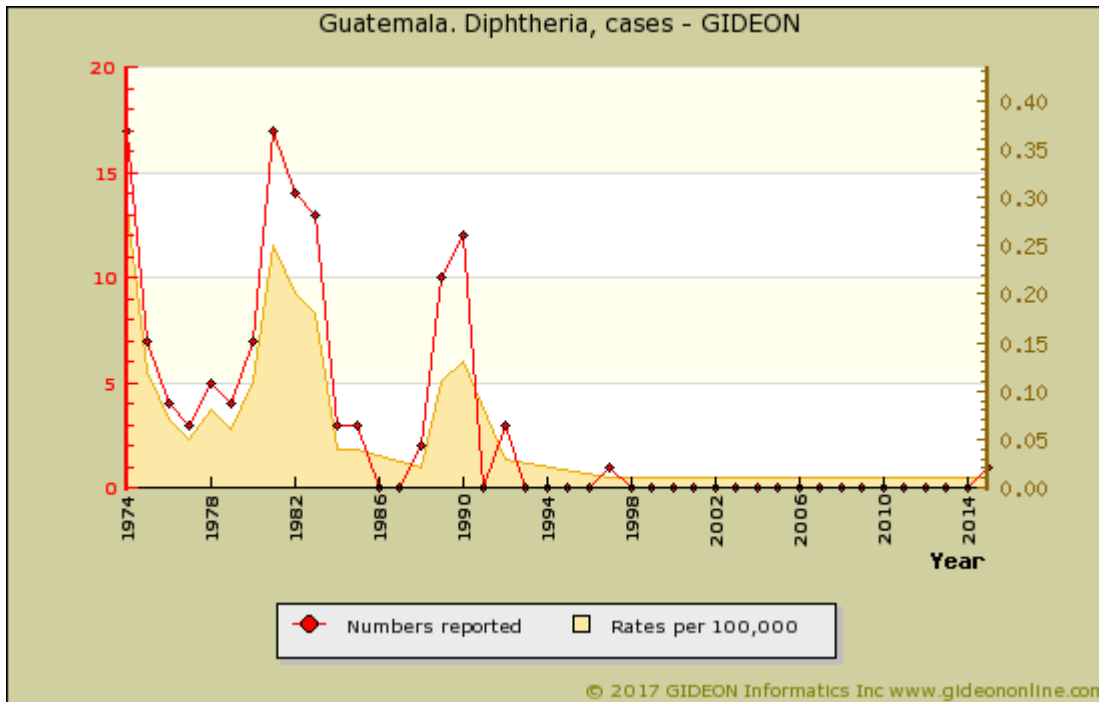
### Diphtheria in Guatemala

#### Vaccine Schedule:

BCG - < 1 year  
 DTwP - 18 months; 4 years  
 DTwPHibHepB - 2,4,6 months  
 HepB - birth and 3 doses for adults in risk groups  
 IPV - NA  
 MMR - 12-23 months  
 OPV - 2,4,6,18 months; 4 years  
 Pneumo conj - 2,4 months; 1 year  
 Rotavirus - 2,4 months  
 Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



Graph: Guatemala. Diphtheria - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Guatemala. Diphtheria, cases

## Diphyllobothriasis

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Pseudophyllidea, Diphylobothriidae: <i>Diphyllobothrium latum</i> , et al
<b>Reservoir</b>	Human, Dog, Bear, Fish-eating mammal
<b>Vector</b>	None
<b>Vehicle</b>	Fresh-water fish - notably (for <i>D. latum</i> ) perch, burbot and pike
<b>Incubation Period</b>	4w - 6w (range 2w - 2y)
<b>Diagnostic Tests</b>	Identification of ova or proglottids in feces.
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 10 mg/kg PO as single dose OR <a href="#">Niclosamide</a> 2 g PO once
<b>Typical Pediatric Therapy</b>	<a href="#">Praziquantel</a> 10 mg/kg PO as single dose OR <a href="#">Niclosamide</a> 50 mg/kg PO once
<b>Clinical Hints</b>	Abdominal pain, diarrhea and flatulence Vitamin B12 deficiency is noted in 0.02% of patients Rare instances of intestinal obstruction have been described Worm may survive for decades in the human intestine
<b>Synonyms</b>	Adenocephalus pacificus, Bandwurm [Diphyllobothrium], Bothriocephalus acheilognathi, Bothriocephalus latus, Broad fish tapeworm, Diphyllobothrium cordatum, Diphyllobothrium dalliae, Diphyllobothrium dendriticum, Diphyllobothrium klebanovskii, Diphyllobothrium latum, Diphyllobothrium nihonkaiense, Diphyllobothrium stemmacephalum, Diphyllobothrium ursi, Diplogonoporiasis, Fish tapeworm. ICD9: 123.4 ICD10: B70.0

## Dipylidiasis

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Dipylidiidae: <i>Dipylidium caninum</i>
<b>Reservoir</b>	Dog, Cat
<b>Vector</b>	None
<b>Vehicle</b>	Ingested flea ( <i>Ctenocephalides</i> spp.)
<b>Incubation Period</b>	21d - 28d
<b>Diagnostic Tests</b>	Identification of proglottids in feces.
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 10 mg/kg PO as single dose OR <a href="#">Niclosamide</a> 2 g PO once
<b>Typical Pediatric Therapy</b>	<a href="#">Praziquantel</a> 10 mg/kg PO as single dose OR <a href="#">Niclosamide</a> 50 mg/kg PO once
<b>Clinical Hints</b>	Diarrhea, abdominal distention and restlessness (in children) Eosinophilia present in some cases Proglottids may migrate out of the anus
<b>Synonyms</b>	Cucumber tapeworm, <i>Dipylidium caninum</i> , Dog tapeworm, Double-pored dog tapeworm. ICD9: 123.8 ICD10: B71.1

## Dirofilariasis

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Dirofilaria (Nochtiella) immitis</i> (pulmonary); <i>D. tenuis</i> & <i>D. repens</i> (subcutaneous infection) & <i>D. ursi</i>
<b>Reservoir</b>	Mammal, Dog, Wild carnivore ( <i>D. tenuis</i> in raccoons; <i>D. ursi</i> in bears)
<b>Vector</b>	Mosquito
<b>Vehicle</b>	None
<b>Incubation Period</b>	60d - 90d
<b>Diagnostic Tests</b>	Identification of parasite in tissue. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Not available; excision is often diagnostic and curative
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Most patients are asymptomatic Cough and chest pain in some cases Solitary pulmonary coin lesion seen on imaging Multiple tender subcutaneous nodules may be present Eosinophilia is usually absent
<b>Synonyms</b>	Candidatus <i>Dirofilaria hongkongensis</i> , Dirofilariosis, Dirofilaria, Dog heartworm, <i>Filaria conjunctivae</i> , Loaina. ICD9: 125.6 ICD10: B74.8

### Dirofilariasis in Guatemala

#### Seroprevalence surveys

Years	Region	Study Group	Notes
2005*	Peten	felines	0% of stray cats ( <i>Felis domesticus</i> ) and captive margays ( <i>Leopardus wiedii</i> ) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. [J Zoo Wildl Med 2005 Mar ;36\(1\):121-3.](#)

## Eastern equine encephalitis

Agent	VIRUS - RNA. Togaviridae, Alphavirus: Eastern equine encephalitis virus
Reservoir	Wild bird, Horse, Cattle, Pig
Vector	Mosquito ( <i>Aedes</i> , <i>Culiseta</i> )
Vehicle	None
Incubation Period	7d - 10d (range 5d - 15d)
Diagnostic Tests	Viral culture (brain tissue, CSF, serum). Serology. Nucleic acid amplification.  Biosafety level 2.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	<a href="#">Eastern equine encephalitis vaccine</a>
Clinical Hints	infection is most common during summer in temperate areas. Headache, fever, seizures, coma and leukocytosis Neurological sequelae in 40% Case-fatality rates may approach 70%
Synonyms	EEE, Madariaga virus. ICD9: 062.2 ICD10: A83.2

### Eastern equine encephalitis in Guatemala

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Seropositive bats were identified during 1983 to 1984. <sup>1</sup>

#### References

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1. [J Wildl Dis 1995 Jan ;31\(1\):1-9.](#)

**Echinococcosis - unilocular**

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Echinococcus granulosus</i> , <i>Echinococcus canadensis</i>
<b>Reservoir</b>	Dog, Wolf, Dingo, Sheep, Horse, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Soil, Dog feces, Fly
<b>Incubation Period</b>	1y - 20y
<b>Diagnostic Tests</b>	Serology. Identification of parasite in surgical specimens.
<b>Typical Adult Therapy</b>	<b>Albendazole</b> 400 mg BID X 28d. Repeat X 3, with 2 week hiatus between cycles. <b>Praziquantel</b> has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) is also used
<b>Typical Pediatric Therapy</b>	<b>Albendazole</b> 10 mg/kg/day X 28d. Repeat X 3, with 2 week hiatus between cycles. <b>Praziquantel</b> has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) also used
<b>Clinical Hints</b>	Calcified hepatic cyst or mass lesions in lungs and other organs Brain and lung involvement are common in pediatric cases
<b>Synonyms</b>	<i>Echinococcus canadensis</i> , <i>Echinococcus granulosus</i> , <i>Echinococcus orteppi</i> , Hydatid cyst, Unilocular echinococcosis. ICD9: 122.0,122.1,122.2,122.3,122.4 ICD10: B67.0,B67.1,B67.2,B67.3,B67.4

**Echinococcosis - unilocular in Guatemala**

15 cases were reported in 2002.

In 1976, echinococcosis was reported in 150 cattle and 2,300 swine.

**Endocarditis - infectious**

<b>Agent</b>	BACTERIUM OR FUNGUS. viridans streptococci, <i>Staphylococcus aureus</i> , enterococci, <i>Candida albicans</i> , et al.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Blood culture, clinical findings, ultrasonography of heart valves.
<b>Typical Adult Therapy</b>	Bactericidal antibiotic appropriate to species
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Consider in any patient with prolonged and unexplained fever, Multisystem disease and a preexisting cardiac valvular lesion may be present Manifestations include skin lesions, hematuria, neurological symptoms, single or multiple abscesses or bone, brain, lung (etc)
<b>Synonyms</b>	Bacterial endocarditis, Endocardite, Endocarditis, Endokarditis, Fungal endocarditis, Infectious endocarditis, S.B.E.. ICD9: 421 ICD10: I33



## Enterobiasis

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Enterobius vermicularis</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Air, Clothing, Sexual contact
<b>Incubation Period</b>	14d - 42d
<b>Diagnostic Tests</b>	Apply scotch tape to anal verge in a.m. & paste onto glass slide for microscopy.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg PO as single dose - repeat in 2w. OR <a href="#">Mebendazole</a> 100 mg PO as single dose - repeat in 2w. OR <a href="#">Pyrantel pamoate</a> 11 mg/kg (max 1g) PO as single dose; or
<b>Typical Pediatric Therapy</b>	<a href="#">Mebendazole</a> 100 mg PO as single dose (>age 2) - repeat in 2w. OR <a href="#">Pyrantel pamoate</a> 11 mg/kg (max 1g) PO X 1
<b>Clinical Hints</b>	Nocturnal anal pruritus Occasionally presents with vaginitis or abdominal pain Eosinophilia is rarely, if ever, encountered
<b>Synonyms</b>	Enterobio, Enterobius vermicularis, Oxyuriasis, Oxyuris, Pinworm, Seatworm. ICD9: 127.4 ICD10: B80

### Enterobiasis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Highlands Region	children	0.1	0.1% of non-diarrheal stool specimens from children in the Guatemalan Highlands <sup>1</sup>

#### References

1. [Am J Trop Med Hyg 2013 Jan ;88\(1\):167-71.](#)

## Enterovirus infection

<b>Agent</b>	VIRUS - RNA. Picornaviridae: Coxsackievirus, ECHO virus, Enterovirus, Parechovirus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Fecal-oral, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2d-7d
<b>Diagnostic Tests</b>	Viral culture (stool, pharynx, CSF). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive. <a href="#">Pleconaril</a> 200 to 400 mg PO TID X 7d has been used for severe infections
<b>Typical Pediatric Therapy</b>	Supportive. <a href="#">Pleconaril</a> 5 mg/kg PO BID has been used for severe infections
<b>Clinical Hints</b>	Summer-to-autumn sore throat Specific forms present with conjunctivitis, chest pain, macular or vesicular rash, meningitis, myopericarditis, etc.
<b>Synonyms</b>	Boston exanthem [Coxsackie. A 16], Coxsackie, Coxsackievirus, ECHO, Echovirus, Enteroviruses, Hand, foot and mouth disease, Hand-foot-and-mouth disease, Herpangina [Coxsackievirus A], HEV 68, HPeVs, Human Enterovirus 68, Human Parechovirus, Ljungan virus, Myocarditis, enteroviral, Parechovirus, Pericarditis, enteroviral. ICD9: 049,079.2,008.67,074.0,074.8,074.3,070.4,078.89 ICD10: A88.0,A87.0,B08.4,B08.5,B08.8,B30.3,B34.1

### Enterovirus infection in Guatemala

#### Notable outbreaks

Years	Setting	Notes
1961*	closed institution	<a href="#">1</a> <a href="#">2</a>

\* indicates publication year (not necessarily year of outbreak)

#### References

1. Rev Col Med Guatem 1961 Jun ;12:102-8.
2. Rev Col Med Guatem 1961 Jun ;12:102-8.

## Epidural abscess

<b>Agent</b>	BACTERIUM. <i>Staphylococcus aureus</i> , facultative gram negative bacilli, etc
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Imaging (CT scan, MRI). Gram-stain and culture of blood or pus.
<b>Typical Adult Therapy</b>	Intravenous antibiotic(s) appropriate to identified or suspected pathogens. Drainage as indicated
<b>Typical Pediatric Therapy</b>	Intravenous antibiotic(s) appropriate to identified or suspected pathogen. Drainage as indicated
<b>Clinical Hints</b>	Frontal bone abscess; or spinal cord compression with signs of infection Often in setting of injecting drug abuse or preexisting staphylococcal infection
<b>Synonyms</b>	

## Erysipelas or cellulitis

<b>Agent</b>	BACTERIUM. Erysipelas: <i>Streptococcus pyogenes</i> Cellulitis: <i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , occasionally others
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	1d - 7d
<b>Diagnostic Tests</b>	Clinical diagnosis is usually sufficient. Aspiration of lesion for smear and culture may be helpful in some cases.
<b>Typical Adult Therapy</b>	Antibiotic directed at likely pathogens (Group A Streptococcus and Staphylococcus aureus)
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Erysipelas is well-circumscribed, tender, edematous (peau d'orange), warm and painful Cellulitis is less painful, flat and without a distinct border
<b>Synonyms</b>	Cellulite, Cellulitis, Celulite, Celulitis, Erisipela, Erysipelas, St. Anthony's fire (erysipelas), St. Francis' fire (erysipelas), Zellulitis. ICD9: 035,681,682 ICD10: A46,L03

**Erysipeloid**

<b>Agent</b>	BACTERIUM. <i>Erysipelothrix rhusiopathiae</i> A facultative gram-positive bacillus
<b>Reservoir</b>	Mammal, Bird, Fish
<b>Vector</b>	None
<b>Vehicle</b>	Contact with meat (mammal, poultry or fish)
<b>Incubation Period</b>	1d - 4d
<b>Diagnostic Tests</b>	Culture.
<b>Typical Adult Therapy</b>	Oral therapy for 10 days: <a href="#">Penicillin V</a> , <a href="#">Ampicillin</a> , third-generation cephalosporin, Fluoroquinolone ( <a href="#">Levofloxacin</a> , <a href="#">Trovaflaxacin</a> , <a href="#">Pefloxacin</a> , <a href="#">Sparfloxacin</a> or <a href="#">Moxifloxacin</a> ), <a href="#">Erythromycin</a> , <a href="#">Clindamycin</a> or <a href="#">Tetracycline</a> are generally adequate
<b>Typical Pediatric Therapy</b>	Oral therapy for 10 days: <a href="#">Penicillin V</a> , <a href="#">Ampicillin</a> , third-generation cephalosporin or <a href="#">Erythromycin</a> , <a href="#">Clindamycin</a> are generally adequate
<b>Clinical Hints</b>	Typically follows contact with raw animal or fish products Annular erythema or "target lesion" on hand Fever is present in only 10% of cases. Local pain and swelling, without discharge
<b>Synonyms</b>	Erysipelothrix rhusiopathiae, Rutlauf. ICD9: 027.1 ICD10: A26

**Erythrasma**

<b>Agent</b>	BACTERIUM. <i>Corynebacterium minutissimum</i> A facultative gram-positive bacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Coral fluorescence of skin lesion under Wood's lamp. Culture (alert lab regarding diagnosis).
<b>Typical Adult Therapy</b>	<a href="#">Erythromycin</a> 250 mg PO QID X 14d. Topical <a href="#">Clindamycin</a> 2% and topical <a href="#">Fusidic acid</a> have also been used
<b>Typical Pediatric Therapy</b>	<a href="#">Erythromycin</a> 10 mg/kg PO QID X 14d. Topical <a href="#">Clindamycin</a> 2% and topical <a href="#">Fusidic acid</a> have also been used
<b>Clinical Hints</b>	Pruritic, scaling, slowly-progressive red-brown patch Usually affects the groin - occasionally in toe webs Common in obese or diabetic males Coral fluorescence under Wood's light.
<b>Synonyms</b>	<i>Corynebacterium minutissimum</i> , Eritrasma. ICD9: 039.0 ICD10: L08.1

## Escherichia coli diarrhea

<b>Agent</b>	BACTERIUM. <i>Escherichia coli</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Human, Mammal
<b>Vector</b>	None
<b>Vehicle</b>	Food, Water, Fecal-oral
<b>Incubation Period</b>	1d - 3d (range 12h - 10d)
<b>Diagnostic Tests</b>	Stool culture. Request characterization of E. coli isolates.
<b>Typical Adult Therapy</b>	Supportive therapy. If EHEC, avoid anti-motility drugs and antimicrobial agents. Plasma exchange may be effective in HUS  Note that antimicrobial agents may increase risk for hemolytic-uremic syndrome when used in cases of E. coli O157:H7 infection
<b>Typical Pediatric Therapy</b>	Supportive therapy. If EHEC, avoid anti-motility drugs and antimicrobial agents. Plasma exchange may be effective in HUS  Note that antimicrobial agents may increase risk for hemolytic-uremic syndrome when used in cases of E. coli O157:H7 infection
<b>Clinical Hints</b>	Watery diarrhea or dysentery Common among travelers and infants Hemorrhagic colitis and hemolytic uremic syndrome are associated with type O157, and occasionally other strains
<b>Synonyms</b>	DAEC (Diffusely Adherent E. coli), E. coli diarrhea, EAEC (Enteroadherent E. coli), EAggEC (Enteroggregative E. coli), EHEC (Enterohemorrhagic E. coli), EIEC (Enteroinvasive E. coli), EPEC (Enteropathogenic E. coli), Escherichia albertii, ETEC (Enterotoxigenic E. coli), Hemolytisch-uramisches Syndrom, Hemolytic Uremic Syndrome, HUS. ICD9: 008.0 ICD10: A04.0,A04.1,A04.2,A04.3,A04.4

### Escherichia coli diarrhea in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2010*	multiple locations	travelers	10-51	ST-ETEC was identified in 51% of American patients with travelers' diarrhea acquired in India, Guatemala or Mexico, and LT-ETEC 10%, and both in 3% <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

#### Seroprevalence surveys

Years	Region	Study Group	%	Notes
	San Juan	children	48	48% of children in San Juan Sacatepequez, ages 6 to 12 months are seropositive toward enterotoxigenic <i>E. coli</i>
1999	San Juan Sacatepequez	children	77	77% of children in San Juan Sacatepequez, ages 25 to 30 months <sup>2</sup>
1999	San Juan Sacatepequez	children	80	80% of children in San Juan Sacatepequez, ages 19 to 24 months <sup>3</sup>
1999	San Juan Sacatepequez	children	81	81% of children in San Juan Sacatepequez, ages 13 to 18 months <sup>4</sup>
1999	San Juan Sacatepequez	children	83	83% of children in San Juan Sacatepequez, ages 31 to 36 months <sup>5</sup>

### References

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1. J Clin Microbiol 2010 Apr ;48(4):1417-9.
2. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.
3. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.
4. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.
5. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.



Fascioliasis	
Agent	PARASITE - Platyhelminthes, Trematoda. Echinostomatida, Fasciolidae: <i>Fasciola hepatica</i> or <i>Fasciola gigantica</i>
Reservoir	Sheep, Cattle, Snail ( <i>Lymnaea</i> , <i>Galba</i> , <i>Fossaria</i> )
Vector	None
Vehicle	Food, Aquatic plants, Watercress ( <i>Nasturtium officinale</i> )
Incubation Period	2w - 3m
Diagnostic Tests	Identification of ova in stool or duodenal aspirates (adult parasite in tissue). Serology. PCR. CT scan.
Typical Adult Therapy	<a href="#">Triclabendazole</a> 10 mg/kg PO X 2 doses. OR <a href="#">Bithionol</a> 50 mg/kg every other day X 10 doses OR <a href="#">Nitazoxanide</a> 500 mg PO BID X 7d
Typical Pediatric Therapy	<a href="#">Triclabendazole</a> 10 mg/kg PO X 2 doses. OR <a href="#">Bithionol</a> 50 mg/kg every other day X 10 doses OR <a href="#">Nitazoxanide</a> : Age 1 to 3y 100 mg BID X 7 d Age 4 to 11y 200 mg BID X 7d
Clinical Hints	Fever, hepatomegaly, cholangitis, jaundice and eosinophilia Urticaria occasionally observed during the acute illness Parasite may survive more than 10 years in the biliary tract
Synonyms	Eurytrema, <i>Fasciola gigantica</i> , <i>Fasciola hepatica</i> , Hepatic distomiasis, Lederegelbefall, Sheep liver fluke. ICD9: 121.3 ICD10: B663.

**Fungal infection - invasive**

<b>Agent</b>	FUNGUS. Various (major syndromes such as Candidiasis, Blastomycosis, etc are discussed separately in this module)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture of blood, urine, biopsy material. Serum antigen or antibody assay in some cases.
<b>Typical Adult Therapy</b>	Antifungal agent(s) directed at known or likely pathogen
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	A fungal etiology should be suspected in any patient with evidence of severe local or multisystem infection, particularly in the setting of immune suppression.
<b>Synonyms</b>	Acremonium, Acrophialophora, Adiaspiromycosis, Allescheriasis, Alternaria, Arthrographis kalrae, Athopsis, Aureobasidium, Bipolaris, Blastobotrys proliferans, Chaetomium, Chrysosporium, Cladophialophora, Cladosporium, Curvularia, Cyphellophora, Dactylaria, Debaryomyces, Dreschslera, Emmonsia, Exophiala, Exserohilum, Fonsecaea, Fungal meningitis, Fungal sepsis, Fusarium, Geosmithia, Geosmithia argillacea, Geotrichosis, Graphium, Hansenula, Haplomycosis, Hendersonula, Humicola, Hyalophycomycosis, Kluyveromyces, Lasiodiplodia, Lasiodiplodia, Lecythophora, Magnusiomyces, Malassezia furfur, Monascus, Monosporiosis, Mycoentrospora, Neocosmospora vasinfecta, Neosartorya hiratsukae, Neosartorya udagawae, Ochroconis, Oidiodendron, Paecilomyces, Paraconiothyrium, Pestalotiopsis, Phaeoacremonium, Phaeohyphomycosis, Phialemoniopsis, Phialophora, Phoma, Pichia, Pseudallescheria, Pseudallescheriasis, Pseudochaetosphaeronema martinelli, Purpureocillium, Pyrenochaeta, Ramichloridium, Rhinocladiella, Rhytidhysterium, Saccharomyces, Saprochaete, Sarcopodium, Sarocladium, Scedosporium, Septicemia - fungal, Taeniolella, Thielavia, Trichoderma, Truncatella, Ulocladium, Veronacea, Verruconis, Wallemia. ICD9: 117.6,117.8,117.9,118 ICD10: B43.1,B43.2,B43.8,B48.2,B48.3,B48.7,B48.8

## Gastroenteritis - viral

<b>Agent</b>	VIRUS - RNA Calicivirus (Norwalk, Hawaii, Sapporo, Snow Mountain, Norovirus); Torovirus; or Astrovirus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Food, Water, Shellfish, Vegetables
<b>Incubation Period</b>	Norwalk 1d - 2d; Astrovirus 3d - 4d
<b>Diagnostic Tests</b>	Demonstration of virus (electron microscopy or stool antigen analysis). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions; supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Vomiting (less common with Astrovirus) and abdominal pain Loose, watery diarrhea lasting 1 to 3 days Fecal leucocytes not present Fever in 50%; and headache or myalgia in some cases.
<b>Synonyms</b>	Aichi, Astroviridae, Astrovirus, Bufavirus, Calicivirus gastroenteritis, Chiba, Cosavirus, Cyclovirus, Diarrhea, Gastroenterite virale, Hawaii agent gastroenteritis, Klassevirus, Mexico virus, Mini-reovirus, Minireovirus, Norovirus gastroenteritis, Norwalk agent gastroenteritis, Norwalk-like, Parkville virus gastroenteritis, Picobirnavirus, Recovirus, Roskilde disease, Saffold Cardiovirus, Salivirus, Salivirus, Sapovirus, Sapporo, Sapporo-like, Snow Mountain, SRSV gastroenteritis, STL polyomavirus, STLPyV, Toronto virus, Torovirus, Tusavirus, Vinterkraksjuka, Viral gastroenteritis, Winter vomiting disease. ICD9: 008.8,008.69,008.62,008.63,008.64,008.65,008.66,008.67 ICD10: A08.1,A08.2,A08.3,A08.4

### Gastroenteritis - viral in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2007 - 2010	multiple locations	patients	14	Noroviruses were found in 14% of patients with diarrhea in Santa Rosa and Quetzaltenango <sup>1</sup>
2010*		travelers	17	Noroviruses were found in 17.0% of foreign travelers with diarrhea <sup>2</sup>

\* indicates publication year (not necessarily year of survey)

#### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1999	San Juan Sacatepequez	children	27-94	27% of children in San Juan Sacatepequez, ages 6 to 12 months are seropositive toward Norwalk virus; 61% ages 13 to 18 months; 83% ages 19 to 24 months; 94% ages 25 to 20 months; 94% ages 31 to 36 months <sup>3</sup>

#### Notable outbreaks

Years	Setting	Cases	Source	Pathogen	Notes
2009	resort	119	water	Norovirus	<sup>4</sup>

#### References

1. J Med Virol 2013 Jul ;85(7):1293-8.
2. J Clin Microbiol 2010 May ;48(5):1673-6.
3. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.
4. J Clin Virol 2012 Sep ;55(1):8-11.

**GB virus C infection**

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Pegivirus GB virus C (Hepatitis G virus)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Vertical transmission, Sexual contact suspected
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive. Alpha interferon has been shown to ? transiently eliminate the carrier state
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Acute or chronic hepatitis acquired from blood (needles, etc) Clinically milder than hepatitis C Most cases limited elevation of hepatic enzyme levels, without jaundice Viremia has been documented for as long as 10 years
<b>Synonyms</b>	Epatite G, GBV-C, Hepatitis G, Hepatitis GB, HPgV, HPgV-2, Human Pegivirus. ICD9: 070,59 ICD10: B17.8

## Gianotti-Crosti syndrome

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Clinical features and skin biopsy findings.
<b>Typical Adult Therapy</b>	None
<b>Typical Pediatric Therapy</b>	None
<b>Clinical Hints</b>	<p>History of recent viral illness or vaccination</p> <p>Generalized skin eruption involving the extremities, face and buttocks</p> <p>Lymphadenopathy of the axillae and inguinal region</p> <p>Anicteric hepatitis may occur</p> <p>Illness resolves in 15 to 42 days</p> <p>Rare outbreaks have been reported</p>
<b>Synonyms</b>	<p>Acrodermatitis papulosa infantilis, Papular acrodermatitis of childhood, Papulovesicular acrolocated syndrome.</p> <p>ICD9: 693.0</p> <p>ICD10: L27.8</p>

Giardiasis	
Agent	PARASITE - Protozoa. Sarcostigophora, Metamonada, Treponadea. Flagellate: <i>Giardia lamblia</i> ( <i>G. intestinalis</i> , <i>G. duodenalis</i> )
Reservoir	Human, Beaver, Muskrat, Dog, Cat, Carnivores, Sheep, Goat, Horse, Cattle
Vector	None
Vehicle	Food, Water, Fecal-oral, Fly
Incubation Period	1w - 3w (range 3d - 6w)
Diagnostic Tests	String test (gelatin capsule containing string). Stool microscopy or antigen assay. Nucleic acid amplification.
Typical Adult Therapy	<b>Tinidazole</b> 2 g PO X1. OR <b>Nitazoxanide</b> 500 mg PO BID X 3d Alternatives: <b>Metronidazole</b> 250 mg PO TID X 5d. OR <b>Furazolidone</b> 100 mg PO QID X 7d. OR <b>Paromomycin</b> 10 mg/kg PO TID X 7d OR <b>Quinacrine</b> 100 mg PO TID X 5d
Typical Pediatric Therapy	<b>Tinidazole</b> 50 mg PO X 1 (maximum 2g). OR <b>Nitazoxanide</b> : Age 1 to 3y 100 mg BID X 7 d Age 4 to 11y 200 mg BID X 7d Alternatives: <b>Metronidazole</b> 5 mg/kg PO TID X 5d. OR <b>Furazolidone</b> 1.5 mg/kg QID X 7d
Clinical Hints	Foul smelling, bulky diarrhea, nausea and flatulence Upper abdominal pain is common Illness may "wax and wane" Weight loss and low-grade fever are common Severe or intractable infection may suggest underlying IgA deficiency
Synonyms	Beaver fever, <i>Giardia duodenalis</i> , <i>Giardia intestinalis</i> , <i>Giardia lamblia</i> , Lambliosis. ICD9: 007.1 ICD10: A07.1

### Giardiasis in Guatemala

A study published in 1986 stated that all children in Guatemala had at least one *Giardia* infection, with prevalence and incidence rates reaching 20.2% and 5.3%, respectively by the end of the third year. <sup>1</sup>

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2004 - 2007		children	10.9	10.9% of school children in the Palajunoj Valley <sup>2</sup>
2008*	Santa Maria De Jesus	children	15	15% of children in urban Santa Maria de Jesus <sup>3</sup>
2009*		children	21.5	21.5% of children in the Guatemalan Highlands <sup>4</sup>
2010		children	8.4	8.4% of non-diarrheal stool specimens from children in the Guatemalan Highlands <sup>5</sup>
2013*		children	43.7	43.7% of children attending daycare centers <sup>6</sup>
2011*	Santa Rosa	patients	5.4	5.4% of adults with diarrhea, in Santa Rosa <sup>7</sup>

\* indicates publication year (not necessarily year of survey)

**References**

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1. Am J Clin Nutr 1986 Mar ;43(3):395-405.
2. J Health Popul Nutr 2009 Feb ;27(1):31-40.
3. J Community Health 2009 Apr ;34(2):98-101.
4. J Infect Dev Ctries 2009 ;3(3):229-34.
5. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.
6. J Health Popul Nutr 2013 Jun ;31(2):290-3.
7. Am J Trop Med Hyg 2011 Dec ;85(6):1141-3.

## Gonococcal infection

<b>Agent</b>	BACTERIUM. <i>Neisseria gonorrhoeae</i> An aerobic gram-negative coccus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual, contact, Childbirth, Exudates, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2d - 7d
<b>Diagnostic Tests</b>	Smear (male), culture. Consult laboratory for proper acquisition & transport. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Ceftriaxone</a> 250 mg IM X 1. PLUS <a href="#">Azithromycin</a> 1 g PO as single dose.
<b>Typical Pediatric Therapy</b>	Weight <=45 kg: <a href="#">Ceftriaxone</a> 25 - 50 mg/kg IM or IV X 1 (max. 125 mg IM) Weight >45 kg: as for adult. PLUS <a href="#">Azithromycin</a>
<b>Clinical Hints</b>	Copious urethral discharge (male) or cervicitis beginning 2 to 7 days after sexual exposure Pelvic inflammatory disease Systemic disease associated with fever, painful pustules and suppurative arthritis (primarily encountered in postmenstrual females)
<b>Synonyms</b>	Blennorrhagie, Blenorrhagia, Gonococemia, Gonore, Gonorre, Gonorrea, Gonorrhoea, Gonorrhoe, Gonorrhoe, Gonorrhoe, Infeccion gonococica, Infeccoes gonococicas, Neisseria gonorrhoeae. ICD9: 098 ICD10: A54

### Gonococcal infection in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
1991		children	49.6	49.6% of street children attending a STD clinic <sup>1</sup>
1992*		patients - STD	21	21.0% of patients in an STD clinic <sup>2</sup>
2011*	Escuintla	sex workers	0.8	0.8% of male clients of CSW in Escuintla <sup>3</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:48-51.](#)
2. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:14-8.](#)
3. [Sex Transm Dis 2011 Aug ;38\(8\):735-42.](#)



## Granuloma inguinale

<b>Agent</b>	BACTERIUM. <i>Klebsiella granulomatis</i> (formerly <i>Calymmatobacterium granulomatis</i> ) A gram-negative bacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual, contact, Direct contact
<b>Incubation Period</b>	7d - 30d (range 3d - 1 year)
<b>Diagnostic Tests</b>	Identification of organism in stained smears. Culture in specialized laboratories (HEp-2 cells).
<b>Typical Adult Therapy</b>	<a href="#">Azithromycin</a> 1 g weekly X 3 w. Alternatives: <a href="#">Doxycycline</a> 100 mg BID PO X 3w. Sulfamethoxazole / <a href="#">Trimethoprim</a> 800/160 mg BID X 3w <a href="#">Erythromycin</a> 500 mg QID X 3w.
<b>Typical Pediatric Therapy</b>	<a href="#">Azithromycin</a> 10 mg / kg po day 1; then 250 mg / kg daily days 2 to 5 Alternatives: Sulfamethoxazole / <a href="#">Trimethoprim</a> , <a href="#">Erythromycin</a> or Doxycycline
<b>Clinical Hints</b>	Slowly expanding, ulcerating skin nodule with friable base Usually painless May be complicated by edema or secondary infection Rarely spreads to bone or joints
<b>Synonyms</b>	<i>Calymmatobacterium granulomatis</i> , Donovanosis, Granuloma genitoinguinale, Granuloma inguinale tropicum, Granuloma venereum, Sixth venereal disease. ICD9: 099.2 ICD10: A58

## Group C viral fevers

Agent	VIRUS - RNA. Bunyaviridae, Orthobunyavirus. At least 10 human pathogens described
Reservoir	Rodent, Marsupial, Bat
Vector	Mosquito ( <i>Culex</i> , <i>Aedes</i> , <i>Limatus</i> , <i>Wyeomyia</i> , <i>Coquillettia</i> , <i>Mansonia</i> and <i>Psorophora</i> spp)
Vehicle	None
Incubation Period	3d - 12d
Diagnostic Tests	Viral culture (blood). Serology.  Biosafety level 2.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	Self limited febrile illness Myalgia, photophobia and conjunctivitis are common Acquired while working or residing in forested areas.
Synonyms	Apeu, Caraparu, Itaqui, Itaya, Madrid, Marituba, Murutucu, Nepuyo, Oriboca, Ossa, Restan. ICD9: 066.3 ICD10: A92.8

### Group C viral fevers in Guatemala

A single case of human infection by Nepuyo virus was documented in 1972. <sup>1</sup>

Nepuyo virus has been isolated from *Culex taeniopus* on the Pacific coast (1977 to 1980). <sup>2</sup>

- The virus has also been recovered from sentinel hamsters in the Caribbean lowlands (1968 to 1980). <sup>3</sup>

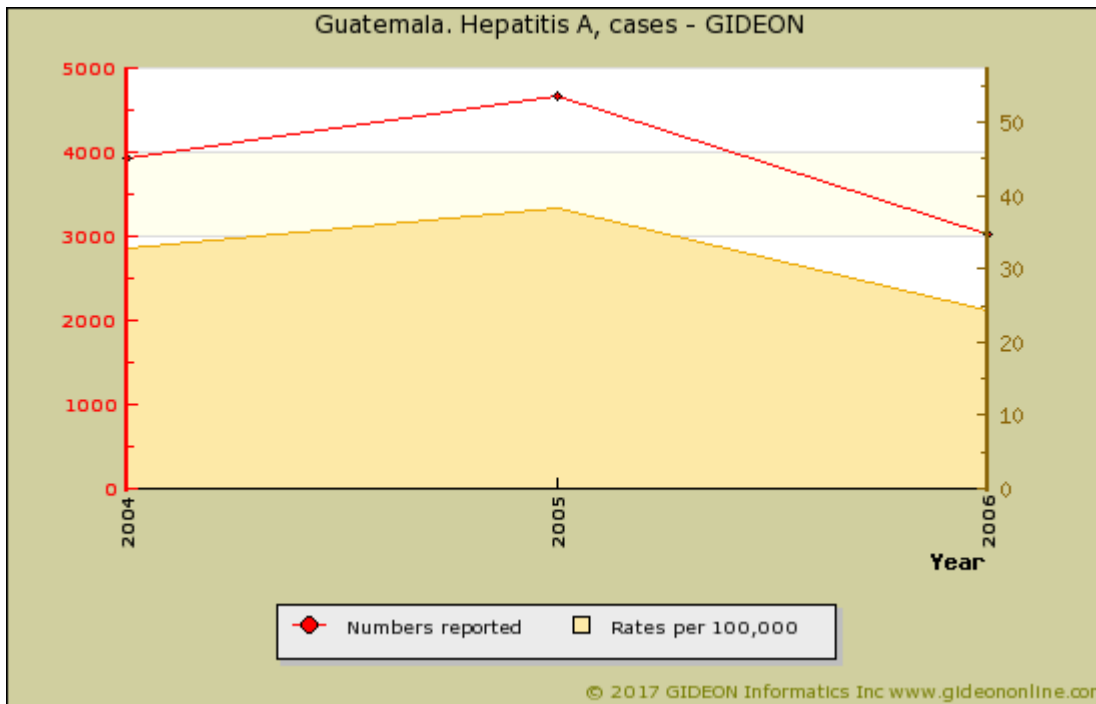
#### References

1. Am J Trop Med Hyg 1976 Jan ;25(1):151-62.
2. Am J Trop Med Hyg 1986 Jul ;35(4):851-9.
3. Am J Trop Med Hyg 1985 Jul ;34(4):790-8.

## Hepatitis A

<b>Agent</b>	VIRUS - RNA. Picornaviridae, Hepatovirus: Hepatitis A virus
<b>Reservoir</b>	Human, Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Food, Water, Milk, Fly, Breastfeeding
<b>Incubation Period</b>	21d - 30d (range 14d - 60d)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions; supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">Hepatitis A vaccine</a> <a href="#">Hepatitis A + Hepatitis B vaccine</a> <a href="#">Immune globulin</a>
<b>Clinical Hints</b>	Vomiting, anorexia, dark urine, light stools and jaundice Rash and arthritis occasionally encountered Fulminant disease, encephalopathy and fatal infections are rare Case-fatality rate 0.15% to 2.7%, depending on age
<b>Synonyms</b>	Botkin's disease, Epatite A, HAV, Hepatite per virus A, Infectious hepatitis, Sosuga. ICD9: 070.0 ICD10: B15.0, B15.9

### Hepatitis A in Guatemala



Graph: Guatemala. Hepatitis A, cases

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1999	San Juan Sacatepequez	children	40	40% of children in San Juan Sacatepequez, ages 6 to 12 months; 28% ages 13 to 18 months; 46% ages 19 to 24 months; 60% ages 25 to 30 months; 76% ages 31 to 36 months <sup>1</sup>

**References**

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1. Am J Trop Med Hyg 2004 Jan ;70(1):83-8.

Hepatitis B	
Agent	VIRUS - DNA. Hepadnaviridae, Orthohepadnavirus: Hepatitis B virus
Reservoir	Human Non-human primate
Vector	None
Vehicle	Blood, Infected secretions, Sexual contact, Transplacental
Incubation Period	2m - 3m (range 1m - 13m)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Needle precautions. For chronic infection: <a href="#">Peginterferon alfa-2a</a> or <a href="#">Peginterferon alfa-2b</a> OR <a href="#">Entecavir</a> OR <a href="#">Tenofovir</a>
Typical Pediatric Therapy	As for adult
Vaccines	<a href="#">Hepatitis A + Hepatitis B vaccine</a> <a href="#">Hepatitis B + Haemoph. influenzae vaccine</a> <a href="#">Hepatitis B immune globulin</a> <a href="#">Hepatitis B vaccine</a>
Clinical Hints	Vomiting and jaundice Rash or arthritis occasionally noted Fulminant and fatal infections are encountered Risk group (drug abuse, blood products, sexual transmission) Hepatic cirrhosis or hepatoma may follow years after acute illness
Synonyms	Epatite B, HBV, Hepatite per virus B, Serum hepatitis. ICD9: 070.1 ICD10: B16.2,B16.9, B16.1

## Hepatitis B in Guatemala

### Vaccine Schedule:

BCG - < 1 year

DTwP - 18 months; 4 years

DTwPHibHepB - 2,4,6 months

HepB - birth and 3 doses for adults in risk groups

IPV - NA

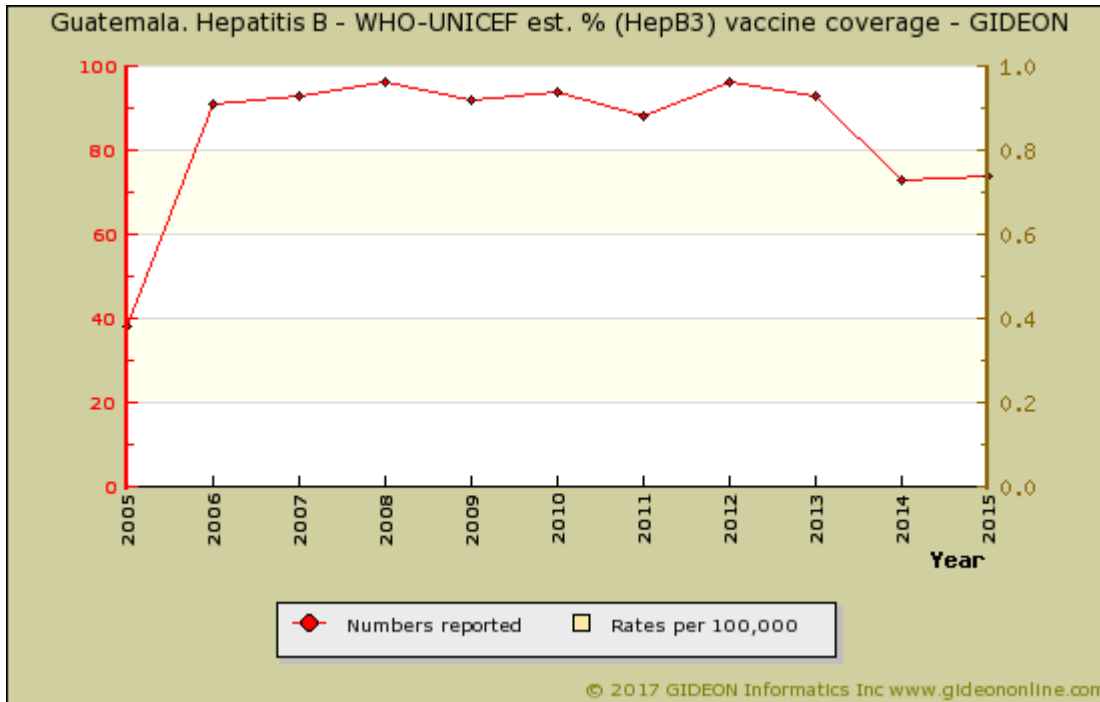
MMR - 12-23 months

OPV - 2,4,6,18 months; 4 years

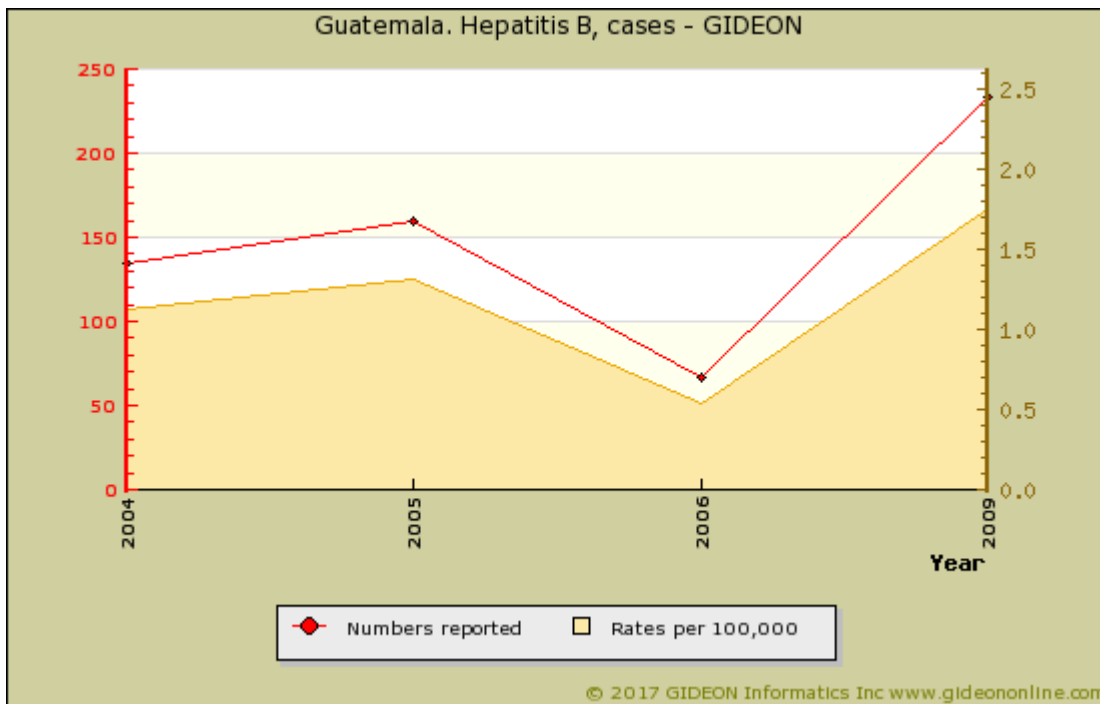
Pneumo conj - 2,4 months; 1 year

Rotavirus - 2,4 months

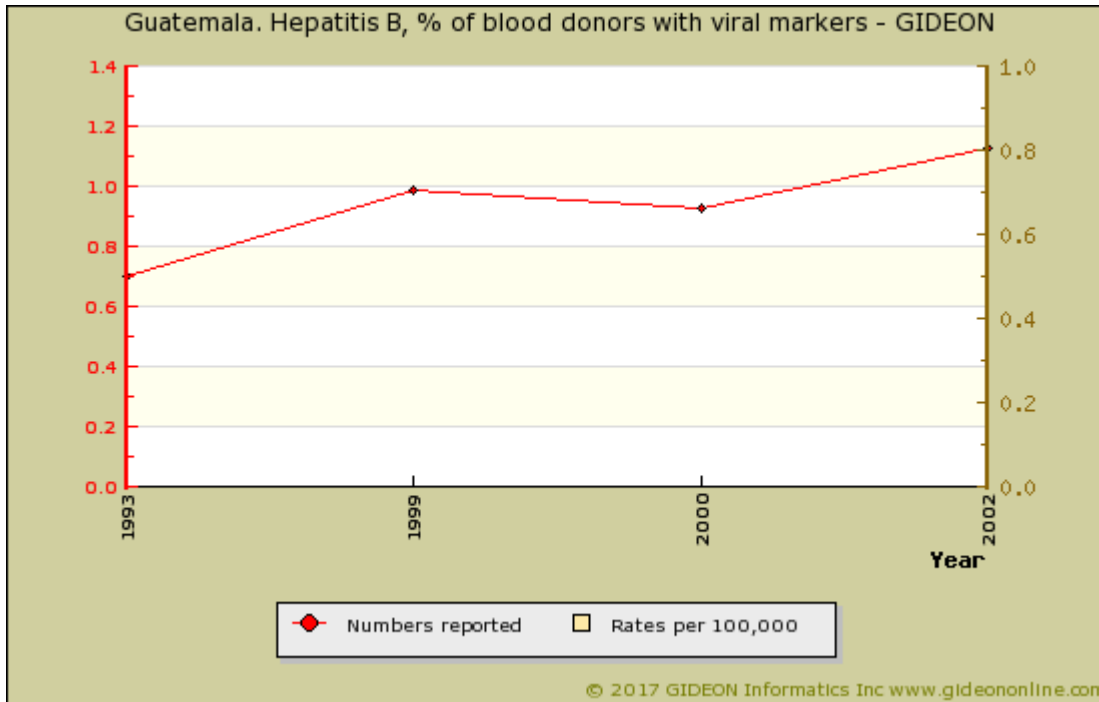
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



Graph: Guatemala. Hepatitis B - WHO-UNICEF est. % (HepB3) vaccine coverage



Graph: Guatemala. Hepatitis B, cases



Graph: Guatemala. Hepatitis B, % of blood donors with viral markers

49 cases of transfusion-acquired infection were estimated for 1993.

**HBsAg-positivity surveys**

Years	Region	Study Group	%	Notes
		general population	2.2	2.2% of the general population
2005 - 2006	Guatemala City	pregnant women	0.22	0.22% of pregnant women (Guatemala City, 2005 to 2006) <sup>1</sup>

**References**

1. J Int Assoc Physicians AIDS Care (Chic) 2010 Sep-Oct;9(5):313-7.

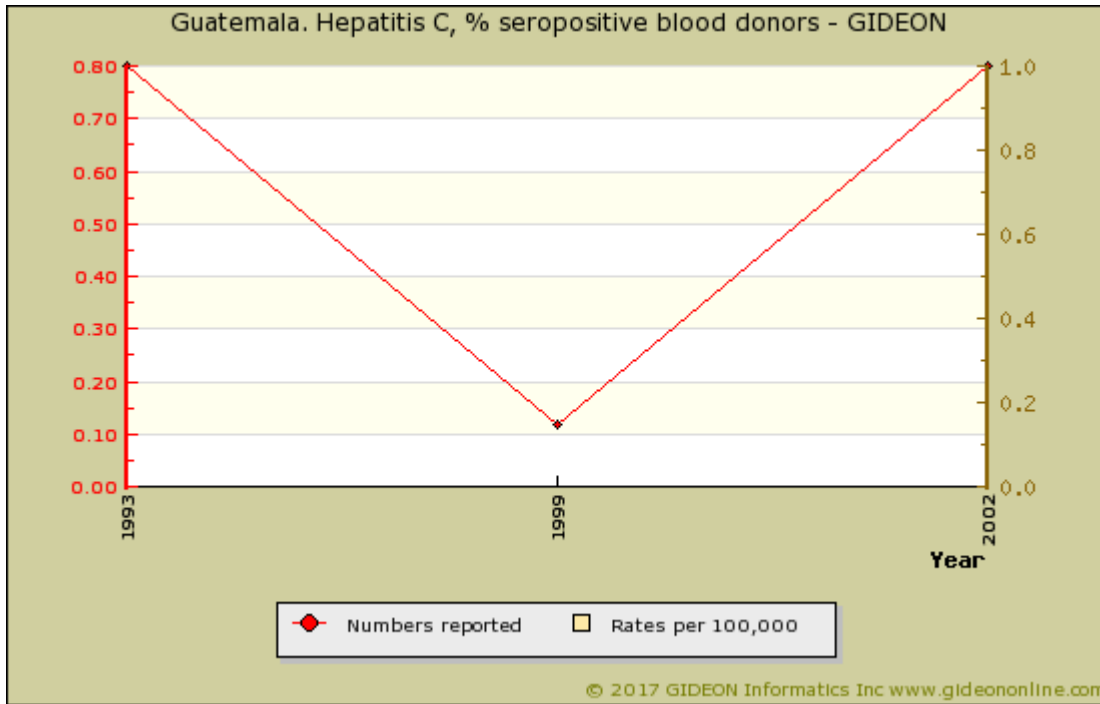
## Hepatitis C

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Hepacivirus: Hepatitis C virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Sexual contact, Transplacental
<b>Incubation Period</b>	5w - 10w (range 3w - 16w)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Needle precautions. For chronic infection: Ledipasvir / Sofusbuvir OR Ombitasvir-Paritaprevir-Ritonavir + Dasabuvir + Ribavirin OR Sofusbuvir + Simeprevir + Ribavirin  (Regimen / Duration dependent on viral genotype)
<b>Typical Pediatric Therapy</b>	Agents recommended for adult disease are not currently licensed for use in children  Peginterferon alfa-2b 3 MU/m2 SC x1 weekly AND Ribavirin 15mg/kg
<b>Clinical Hints</b>	Vomiting and jaundice May be history of transfusion or injection within preceding 1 to 4 months Chronic hepatitis and fulminant infections are encountered Hepatic cirrhosis or hepatoma may follow years after acute illness
<b>Synonyms</b>	Epatite C, HCV, Hepatite per virus C, Non-A, non-B parenteral hepatitis. ICD9: 070.2,070.3,070.44,070.51,070.54,070.7 ICD10: B17.1

### Hepatitis C in Guatemala

The nationwide carriage rate in 1997 was estimated at 0.67%.





Graph: Guatemala. Hepatitis C, % seropositive blood donors

226 cases of transfusion-acquired infection were estimated for 1993.

## Hepatitis D

<b>Agent</b>	VIRUS - RNA. Deltavirus: Hepatitis D virus - a 'satellite' virus which is encountered as infection with a co-virus (Hepatitis B)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Infected secretions, Blood, Sexual contact
<b>Incubation Period</b>	4w - 8w (range 2w - 20w)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Needle precautions; supportive <a href="#">Interferon alfa 2-a</a> has been used.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Vomiting and jaundice Biphasic course often noted Occurs as a coinfection or superinfection of hepatitis B May be chronic or fulminant (prognosis of combined hepatitis B and delta is worse than reported for hepatitis B alone).
<b>Synonyms</b>	Epatite D, Hepatitis delta. ICD9: 070.41,070.52 ICD10: B17.0

## Hepatitis E

<b>Agent</b>	VIRUS - RNA. Caliciviridae: Hepatitis E virus
<b>Reservoir</b>	Human, Rodent, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Water, Shellfish, Blood, Meat
<b>Incubation Period</b>	30d - 40d (range 10d - 70d)
<b>Diagnostic Tests</b>	Identification of virus by immune electron microscopy (stool). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions; supportive <a href="#">Ribavirin</a> has been used successfully in high-risk patients.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Hepatitis E vaccine</a>
<b>Clinical Hints</b>	Clinically similar to hepatitis A Chronic residua are rare Severe or fatal if acquired during pregnancy (10% to 24% case-fatality rate).
<b>Synonyms</b>	Epatite E, Non-A, non-B enteric hepatitis. ICD9: 070.43,070.53 ICD10: B17.2

### Hepatitis E in Guatemala

#### Seroprevalence surveys

Years	Study Group	%	Notes
1998*	military personnel	5	5% of United Nations peacekeepers (1998 publication) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. [Am J Trop Med Hyg 1998 Jun ;58\(6\):731-6.](#)

## Herpes B infection

<b>Agent</b>	VIRUS - DNA. Herpesviridae, Alphaherpesviridae, Simplexvirus: Cercopithecine herpesvirus 1 (Herpes B virus)
<b>Reservoir</b>	Monkey ( <i>Macaca species</i> and <i>Cynomolgus</i> )
<b>Vector</b>	None
<b>Vehicle</b>	Contact or bite, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	10d - 20d (range 2d - 60d)
<b>Diagnostic Tests</b>	Viral culture (skin exudates). Nucleic acid amplification.  Biosafety level 4.
<b>Typical Adult Therapy</b>	Therapy: <a href="#">Acyclovir</a> 12 mg/kg IV q8h. OR <a href="#">Ganciclovir</a> 5 mg/kg IV q12h. Follow with prolonged <a href="#">Acyclovir</a> 800 mg PO 5X daily. Postexposure prophylaxis: <a href="#">Valacyclovir</a> 1g PO q8h X 14 days. OR <a href="#">Acyclovir</a> 800 mg PO X 5 X 14 days
<b>Typical Pediatric Therapy</b>	<a href="#">Acyclovir</a> or <a href="#">Ganciclovir</a> as for adult.
<b>Clinical Hints</b>	Skin vesicles, lymphadenopathy, myalgia, singultus, major neurological signs Usually onset within one month of contact with monkey Case-fatality rates exceed 80% Permanent neurological residua are common
<b>Synonyms</b>	Cercopithecine herpesvirus 1, Herpes B, Herpesvirus simiae, Macacine herpesvirus 1. ICD9: 078.89 ICD10: B00.4

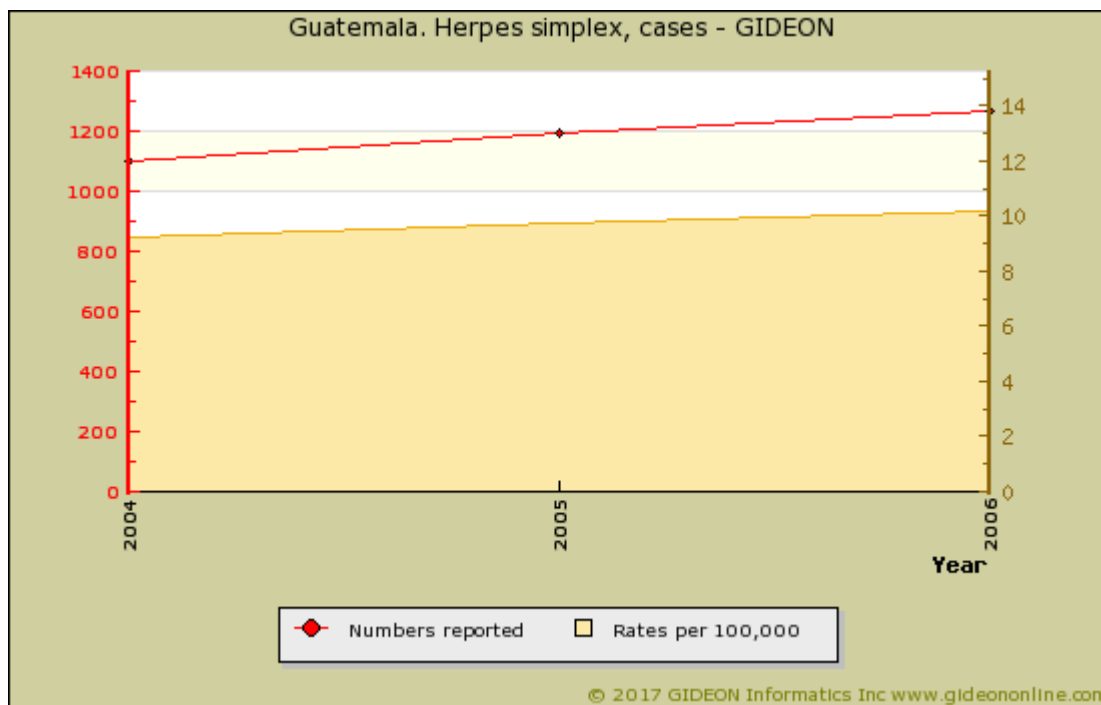
## Herpes simplex encephalitis

<b>Agent</b>	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus (usually type I)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Infected secretions, Sexual contact
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Viral culture CSF usually negative. CT brain. Compare CSF/blood antibody levels. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Acyclovir</a> 10 mg/kg IV Q8h
<b>Typical Pediatric Therapy</b>	<a href="#">Acyclovir</a> 10 mg/kg IV Q8h
<b>Clinical Hints</b>	Rapidly-progressive severe encephalitis Exanthem not evident in most cases Often unilateral, with temporal and parietal lobe predominance Permanent residua and high case-fatality rate in untreated cases
<b>Synonyms</b>	

## Herpes simplex infection

<b>Agent</b>	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus I and II
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Infected secretions, Sexual contact, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1d - 14d
<b>Diagnostic Tests</b>	Viral culture or microscopy of lesions. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Famciclovir</a> 250 mg PO TID X 7d. OR <a href="#">Valacyclovir</a> 1 g PO BID X 7d OR <a href="#">Acyclovir</a> 400 mg PO X 3 per day X 7d  Dosage and duration may vary for first vs. recurrent vs. suppressive regimens.
<b>Typical Pediatric Therapy</b>	<a href="#">Acyclovir</a> 10 mg/kg PO QID X 7 d
<b>Clinical Hints</b>	Recurring localized crops of painful vesicles on a red base Regional adenopathy often present May follow a prodrome of neuropathy or hyperesthesia
<b>Synonyms</b>	Herpes gladiatorum, Herpes rugbiorum, Herpes simplex, Scrum pox. ICD9: 054.0,054.1,054.2,054.4,054.5,054.6,054.7,054.8,054.9 ICD10: A60,B00

### Herpes simplex infection in Guatemala



Graph: Guatemala. Herpes simplex, cases

Notes:

1. Reported as "Herpes"

**Prevalence surveys**

Years	Study Group	%	Notes
1991	patients - STD	78.3	78.3% of street children attending a STD clinic (1991) <sup>1</sup>
1992*	patients - STD	13.7	13.7% of patients in an STD clinic (1992 publication) <sup>2</sup>

\* indicates publication year (not necessarily year of survey)

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
2011*	Escuintla	sex workers - client	3.4	3.4% of male clients of CSW in Escuintla (HSV-2, 2011 publication) <sup>3</sup>

\* indicates publication year (not necessarily year of survey)

**References**

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1. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:48-51.
2. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:14-8.
3. Sex Transm Dis 2011 Aug ;38(8):735-42.

## Herpes zoster

<b>Agent</b>	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Varicella-zoster virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Direct contact
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Viral culture (vesicles). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Acyclovir</a> 800 mg PO X 5 daily X 7 to 10d. OR <a href="#">Famciclovir</a> 500 PO TID. OR <a href="#">Valacyclovir</a> 1 g PO TID
<b>Typical Pediatric Therapy</b>	<a href="#">Acyclovir</a> 20 mg/kg PO QID X 7 to 10d
<b>Vaccine</b>	<a href="#">Herpes zoster vaccine</a>
<b>Clinical Hints</b>	Patients usually above age 50 Unilateral dermatomal pain, tenderness and paresthesia Rash appears after 3 to 5 days - macular, erythematous lesions which evolve into vesicles Trunk and chest wall most commonly involved, but other areas possible Recurrence is common
<b>Synonyms</b>	Fuocodi Saint'Antonio, Shingles, Zona, Zoster. ICD9: 053 ICD10: B02



## Histoplasmosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomycetes, Onygenales: <i>Histoplasma capsulatum</i> var. <i>capsulatum</i> A dimorphic fungus
<b>Reservoir</b>	Soil, Caves, Chicken roosts, Bat
<b>Vector</b>	None
<b>Vehicle</b>	Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	10d - 14d (range 5d - 25d)
<b>Diagnostic Tests</b>	Fungal culture. Serologic tests less helpful. Antigen tests currently under study. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Itraconazole</a> 200 mg daily X 9m  For severe or immunocompromised patients: Liposomal <a href="#">Amphotericin B</a> 3 to 5 mg/kg/d X 2w, followed by <a href="#">Itraconazole</a> as above
<b>Typical Pediatric Therapy</b>	<a href="#">Itraconazole</a> 2 mg/kg daily X 9 m.  For severe or immunocompromised patients: Liposomal <a href="#">Amphotericin B</a> 3 to 5 mg/kg/d X 2w, followed by <a href="#">Itraconazole</a> as above
<b>Clinical Hints</b>	Fever, cough, myalgia, pulmonary infiltrates and calcifying hilar lymphadenopathy Chronic multisystem infection is often encountered.
<b>Synonyms</b>	Darling's disease, <i>Histoplasma capsulatum</i> , Histoplasmosis, Ohio River Valley Fever, Ohio Valley disease, Reticuloendothelial cytomycosis. ICD9: 115.0 ICD10: B39.0,B39.1,B39.2,B39.3,B39.4

### Histoplasmosis in Guatemala

Sporadic cases are reported among the indigenous population <sup>1 2</sup> as well as travelers to Guatemala. <sup>3 4 5 6</sup>

#### Notable outbreaks

Years	Setting	Cases	Notes
2005*	construction site	9	Outbreak among Spanish volunteers who had worked on a construction site in Guatemala <sup>7</sup>

\* indicates publication year (not necessarily year of outbreak)

#### References

1. Clin Infect Dis 1997 Aug ;25(2):343-4.
2. Am J Trop Med Hyg 1960 Sep ;9:518-22.
3. Tidsskr Nor Laegeforen 2006 Nov 2;126(21):2838-42.
4. Ned Tijdschr Geneesk 1997 Jun 21;141(25):1242-4.
5. Rev Mal Respir 1991 ;8(5):495-7.
6. Yonsei Med J 2007 Jun 30;48(3):531-4.
7. Enferm Infecc Microbiol Clin 2005 May ;23(5):274-6.

**HIV infection - initial illness**

<b>Agent</b>	VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Semen, Sexual contact, Transplacental, Breastfeeding
<b>Incubation Period</b>	1w - 6w
<b>Diagnostic Tests</b>	HIV antibody (ELISA, Western blot). HIV or HIV antigen assays. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Antiretroviral therapy - most experts will initiate treatment even if no symptoms + normal CD4 count.
<b>Typical Pediatric Therapy</b>	Antiretroviral therapy - most experts will initiate treatment even if no symptoms + normal CD4 count.
<b>Clinical Hints</b>	Fever, diarrhea, sore throat and a mononucleosis-like illness Most common among "high risk" patients (illicit drug use, commercial sex work, men who have sex with men, etc).
<b>Synonyms</b>	HIV, HIV infection, HTLV-III infection. ICD9: 042 ICD10: B20,B21,B22,B23,B24

**HIV infection - initial illness in Guatemala**

Data and background information regarding HIV infection are included in the note for **HIV/AIDS**

**References**

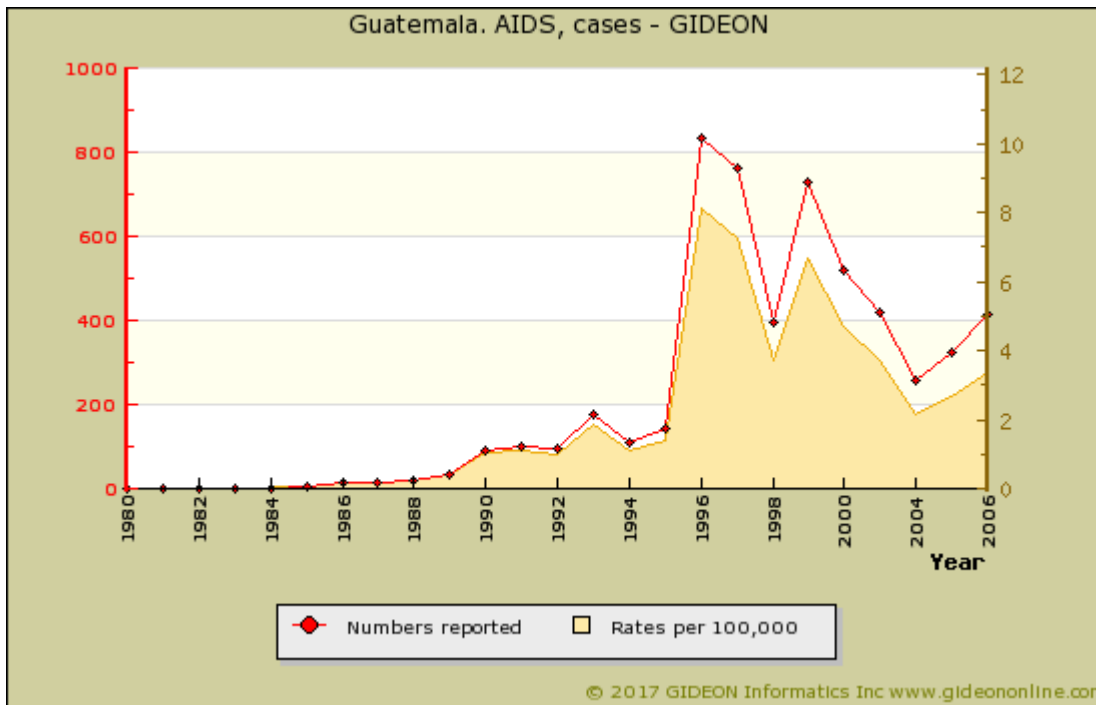
1. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:9-13.](#)
2. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.](#)
3. [Int J STD AIDS 2003 Dec ;14\(12\):810-3.](#)

## HIV/AIDS

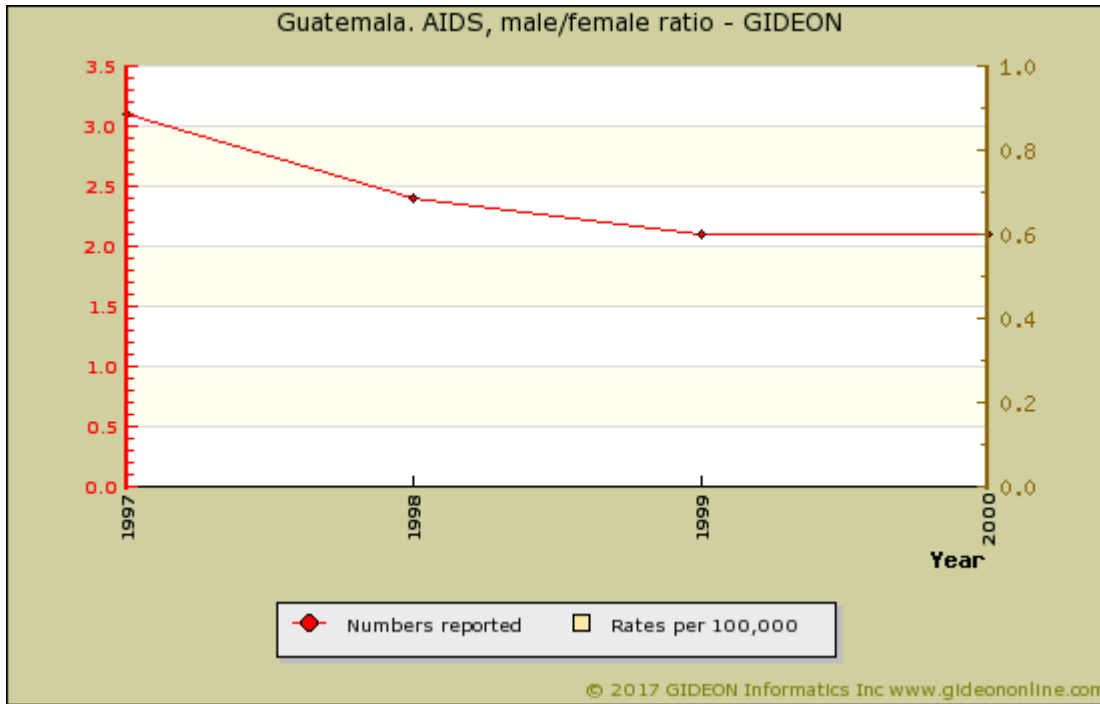
<b>Agent</b>	VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus, HIV
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Semen, Sexual, Transplacental, Breastfeeding
<b>Incubation Period</b>	2m - 10y (50% within 10y)
<b>Diagnostic Tests</b>	HIV antibody (ELISA, Western blot). Nucleic acid amplification. Tests for HIV antigen & viral load as indicated.
<b>Typical Adult Therapy</b>	Nucleoside/-nucleotide reverse transcriptase inhibitor + A Non-nucleoside reverse transcriptase inhibitor OR a Protease Inhibitor OR a Strand-transfer integrase inhibitor
<b>Typical Pediatric Therapy</b>	Regimens vary - in general: 2 Non-nucleoside reverse transcriptase inhibitors + Ritonavir / Lopinavir OR <a href="#">Nevirapine</a> OR <a href="#">Atazanavir</a>
<b>Clinical Hints</b>	Most often associated with drug abuse, blood products, men who have sex with men, hemophilia Severe and multiple episodes of infection (herpes simplex, moniliasis, candidiasis, etc) Chronic cough, diarrhea, weight loss, lymphadenopathy, retinitis, encephalitis or Kaposi's sarcoma
<b>Synonyms</b>	AIDS, ARC, Gay cancer, GRID, HIV-1, HIV-2, HIV-AIDS, SIDA, Slim disease. ICD9: 042 ICD10: B20,B21,B22,B23,B24

### HIV/AIDS in Guatemala

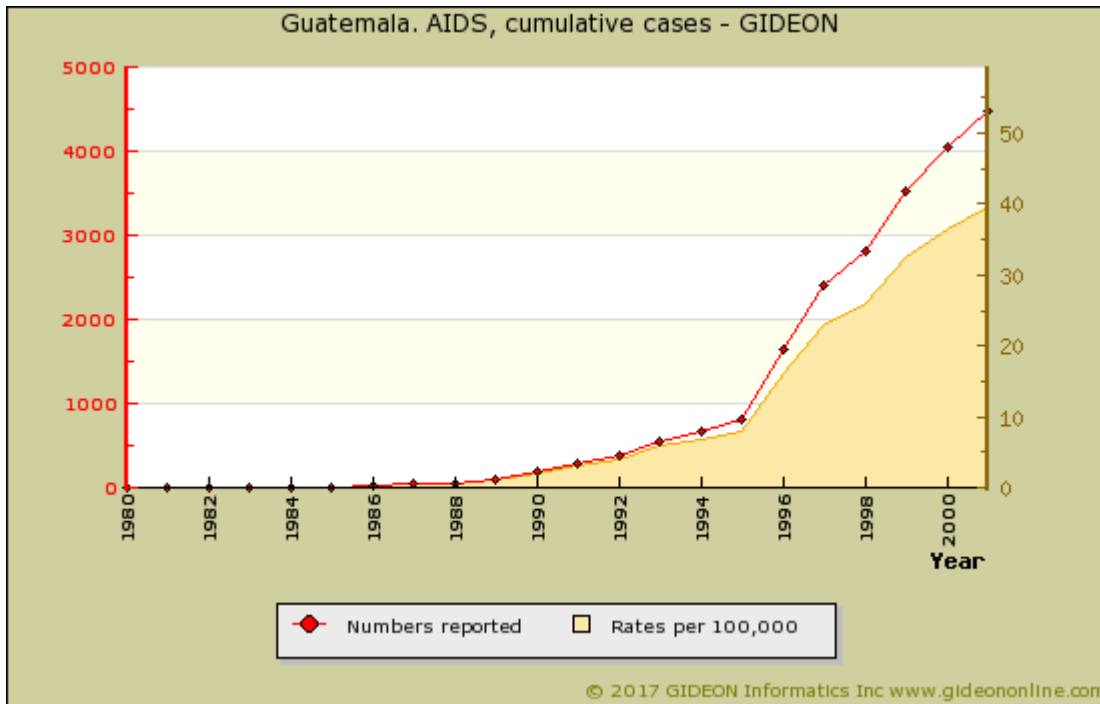
The first cases of AIDS were reported in 1984.



Graph: Guatemala. AIDS, cases



Graph: Guatemala. AIDS, male/female ratio



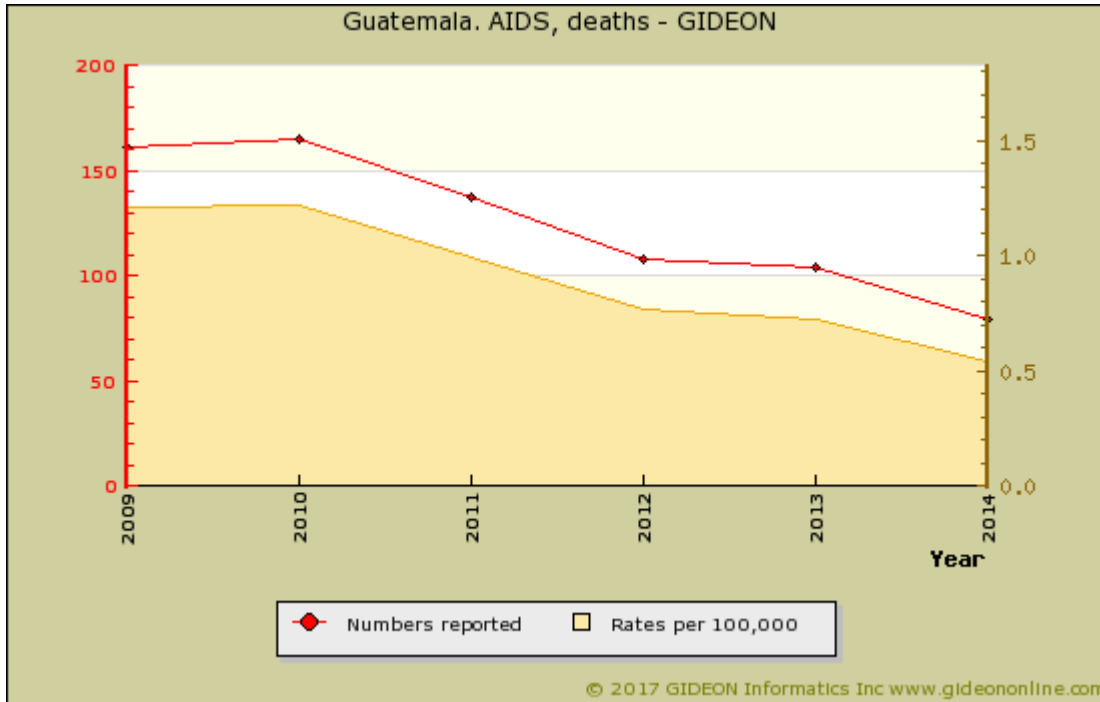
Graph: Guatemala. AIDS, cumulative cases

Notes:

1. The true number of AIDS cases to December 1997 was estimated at 9,100.

**Demography and risk factors:**

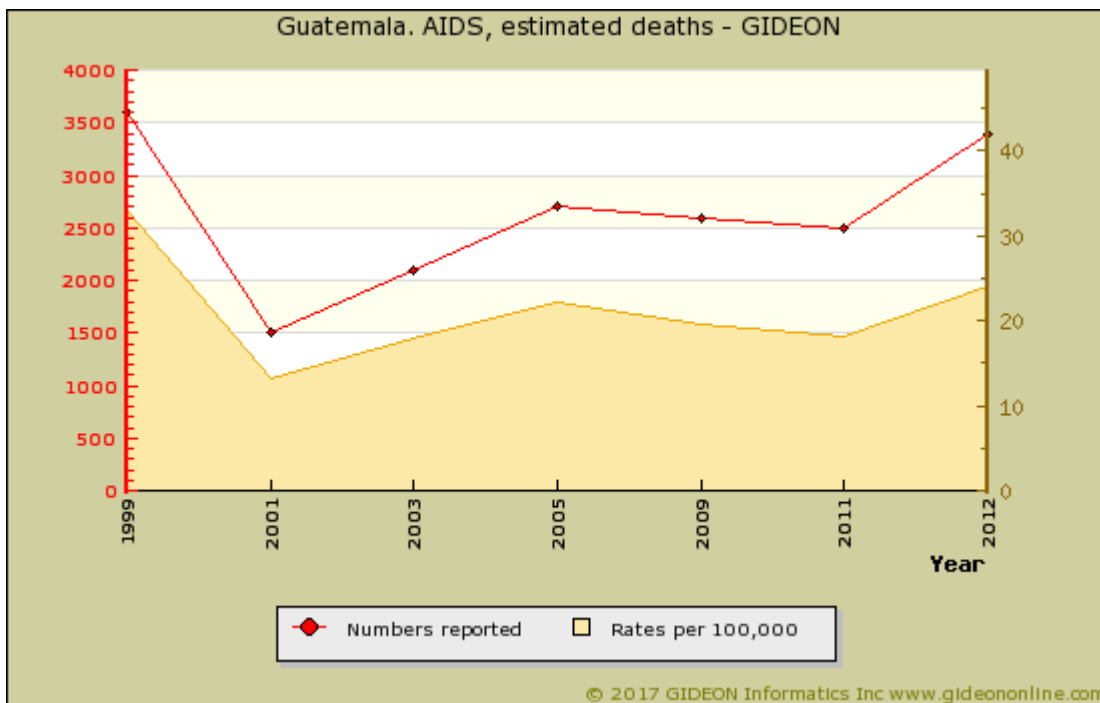
- Cases reported to May 1998: 89% ages 15 to 49; 78% males; 80% heterosexual; 14% men who have sex with men; 1% IDU; 2% transfusion or hemophilia-related; 2% mother to infant.
- Cases during 1996 to 1998: 89% ages 15 to 49; 80% males; 80% heterosexual; 15% men who have sex with men; 1% IDU; 0% transfusion/hemophilia; 2% mother to infant.
- Cases during 1997 to 2000: 86% ages 15 to 49; 70% males; 81% heterosexual; 11% men who have sex with men; 0% IDU; 2% transfusion/hemophilia; 6% mother to infant.



Graph: Guatemala. AIDS, deaths

Notes:

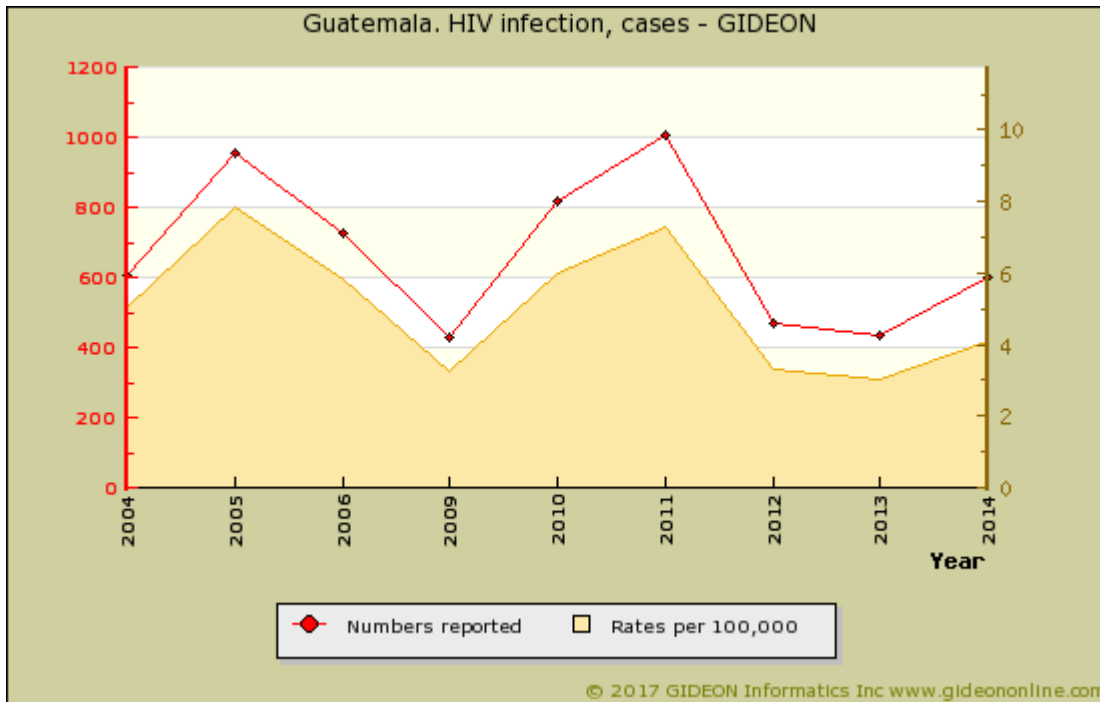
1. 690 AIDS deaths were officially reported to March 2002.



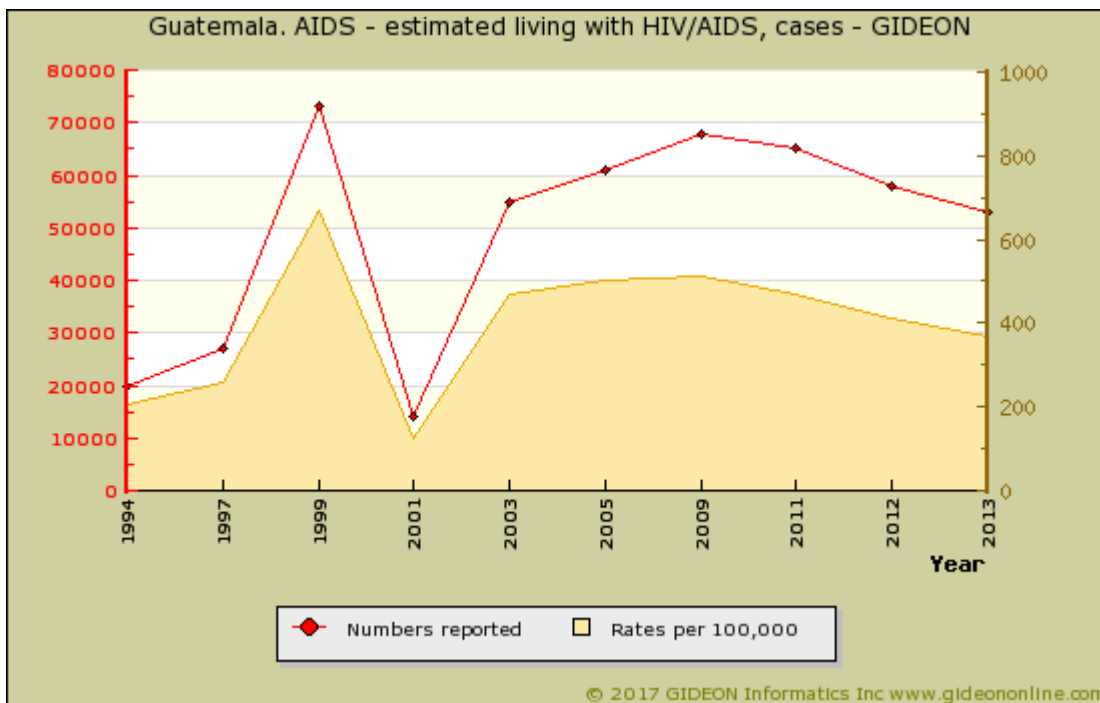
Graph: Guatemala. AIDS, estimated deaths

Notes:

1. The true number of AIDS deaths to December 1997 was estimated at 8,300.
2. 5,200 AIDS orphans were estimated to December 1999; 32,000 in 2001.



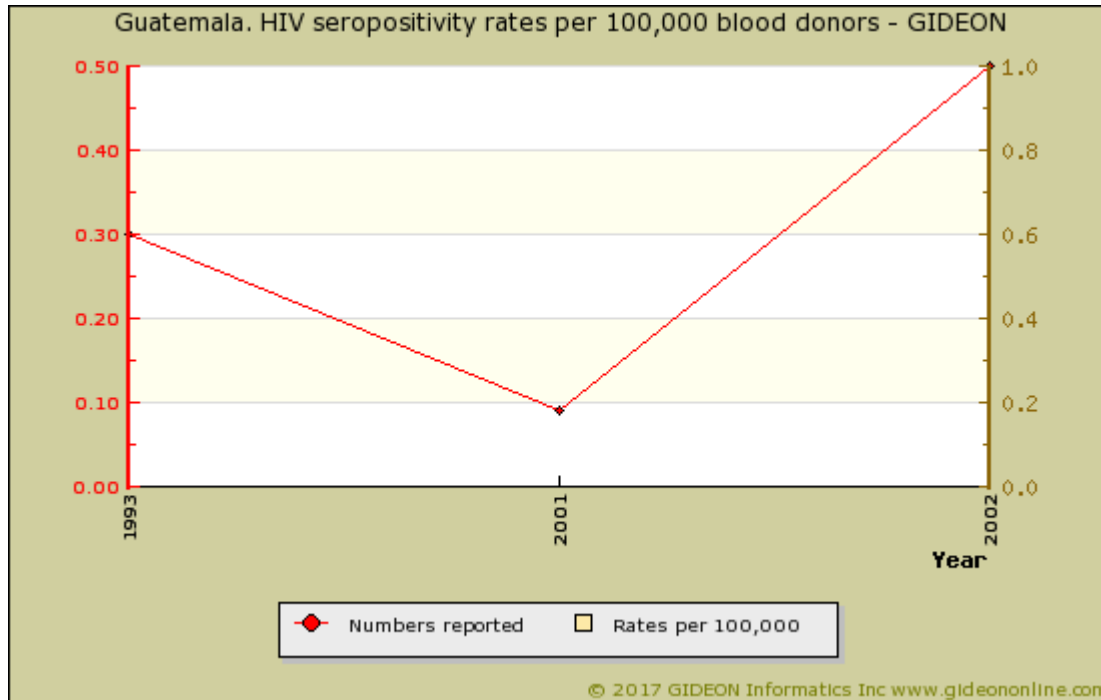
Graph: Guatemala. HIV infection, cases



Graph: Guatemala. AIDS - estimated living with HIV/AIDS, cases

Notes:

1. Figure for 1997 represents 0.52% of all adults; 1.0% in 2001; 1.1% in 2003.



Graph: Guatemala. HIV seropositivity rates per 100,000 blood donors

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
1991		military personnel	0.2	<sup>1</sup>
2005		MSM	11.5	
2006	Guatemala City	MSM	18.3	
1992*		patients - STD	0.7	<sup>2</sup>
1999		pregnant women	1.9	rural pregnant women
1999		pregnant women	2.9	urban pregnant women
2005 - 2006	Guatemala City	pregnant women	0.76	<sup>3</sup>
1989		sex workers	0.2	0.2% of urban CSW
1999		sex workers	6.8	urban CSW
2000		sex workers	2.3	
2003		sex workers	15	street-based CSW
2005		sex workers	8.7	
2006	Guatemala City	sex workers	1	
2007 - 2011		sex workers	0.4-5.8	<sup>4</sup>
2011*	Escuintla	sex workers - client	1.5	1.5% of male clients of CSW in Escuintla <sup>5</sup>

\* indicates publication year (not necessarily year of survey)

**Associated infections:**

- 25% of HIV-positive outpatients have extrapulmonary tuberculosis, 4.3% Cytomegalovirus infection, 13.0% esophageal candidiasis, 6.5% extra-pulmonary cryptococcosis, 15.2% pneumocystosis, 14.1% cryptosporidiosis, 1.0% cerebral toxoplasmosis and 1.0% extra-intestinal strongyloidiasis (Guatemala City, 1991 to 1992). <sup>6</sup>
- 8.0% of tuberculosis patients were HIV positive in 2000.
- 13.9% of AIDS patients have tuberculosis (Guatemala City, 1999 to 2000). <sup>7</sup>
- *Cryptosporidium* is found in 5.59% of patients with HIV/AIDS, *Cyclospora* 4.20%, *Isospora* 0.70% (Guatemala City).

## References

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1. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:9-13.
2. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:14-8.
3. J Int Assoc Physicians AIDS Care (Chic) 2010 Sep-Oct;9(5):313-7.
4. PLoS One 2014 ;9(8):e103455.
5. Sex Transm Dis 2011 Aug ;38(8):735-42.
6. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.
7. Int J STD AIDS 2003 Dec ;14(12):810-3.



## Hookworm

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Necator americanus</i> , <i>Ancylostoma duodenale</i> , <i>A. ceylonicum</i> (in Kolkata and the Philippines)
<b>Reservoir</b>	Human, Non-human primates
<b>Vector</b>	None
<b>Vehicle</b>	Soil, Contact
<b>Incubation Period</b>	7d - 2y
<b>Diagnostic Tests</b>	Examination of stool for ova.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg X 1 dose. OR <a href="#">Mebendazole</a> 100 mg BID X 3d. OR <a href="#">Pyrantel pamoate</a> 11 mg/kg (max 3g) X 3d
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 200 mg PO single dose OR <a href="#">Mebendazole</a> 100 mg BID X 3 d (> age 2).
<b>Clinical Hints</b>	Pruritic papules, usually on feet Later cough and wheezing Abdominal pain and progressive iron-deficiency anemia Eosinophilia is common Dyspnea and peripheral edema in heavy infections
<b>Synonyms</b>	Anchilostoma, Ancylostoma ceylanicum, Ancylostoma duodenale, Ancylostomiasis, Anquilostomiasis, Cyclodontostomum, Eosinophilis enteritis, Hakenwurmer-Befall, Miner's anemia, Necator americanus, Necator gorillae, Necatoriasis, Uncinariasis. ICD9: 126.0,126.1 ICD10: B76.0,B76.1,B76.8

## Hookworm in Guatemala

### Prevalence surveys

Years	Study Group	%	Notes
1993*	general population	50	50% in rural villages (1993 publication) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

### References

1. Mem Inst Oswaldo Cruz 1993 Jan-Mar;88(1):53-65.

## HTLV Infections

<b>Agent</b>	VIRUS - RNA Retroviridae. Deltaretrovirus Human T-lymphotrophic virus I to IV (disease limited to I and II)
<b>Reservoir</b>	Human Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Needles, Semen, Sexualcontact, Transplacental, Breastfeeding, Meat (bush-meat)
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Serology Nucleic acid amplification
<b>Typical Adult Therapy</b>	Specific therapy not available. Advanced symptomatic disease has been treated with combinations of <a href="#">Zidovudine</a> and Interferon, Cyclosporine, or anti-neoplastic agents
<b>Typical Pediatric Therapy</b>	As of adult
<b>Clinical Hints</b>	Overt disease is evident in only 1% to 5% of infections Increased susceptibility to pyodermas, sepsis, bronchiectasis Keratoconjunctivitis sicca or uveitis Late development of tropical spastic paraparesis or T-cell leukemia/lymphoma
<b>Synonyms</b>	Adult T-cell leukemia / lymphoma, HTLV-1, HTLV-1/2, HTLV-2, HTLV-4, HTLV-I, HTLV-I/II, HTLV-II, HTLV-IV, Human T-cell lymphotropic virus, Human T-lymphotropic virus, Primate T-lymphotropic virus, PTLV-1, Tropical spastic paraparesis. ICD9: 204.0,208.9 ICD10: C83,C88,G04.1

## Human herpesvirus 6 infection

<b>Agent</b>	VIRUS - DNA. Herpesviridae, Betaherpesvirinae, Roseolovirus: Herpesvirus 6 (Herpesvirus 7 is also implicated)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	10d - 15d
<b>Diagnostic Tests</b>	Viral isolation and serologic tests rarely indicated. Nucleic acid amplification has been used
<b>Typical Adult Therapy</b>	Supportive Gancyclovir has been used in unusual and severe cases.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	High fever followed by sudden defervescence and fleeting rash Most patients are below the age of 2 years Note that only 10% to 20% of Herpesvirus 6 infections are associated with a rash
<b>Synonyms</b>	Dreitagefieber, Exanthem criticum, Exanthem subitum, Herpesvirus 6, HHV-6, Pseudorubella, Roseola, Roseola infantilis, Roseola subitum, Sixth disease, Zahorsky's disease. ICD9: 057.8 ICD10: B08.2

**Hymenolepis diminuta infection**

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: <i>Hymenolepis diminuta</i>
<b>Reservoir</b>	Rodent, Various insects
<b>Vector</b>	None
<b>Vehicle</b>	Arthropod ingestion
<b>Incubation Period</b>	2w - 4w
<b>Diagnostic Tests</b>	Identification of ova in stool
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 25 mg/kg as single dose. OR <a href="#">Niclosamide</a> 2g, then 1g/d X 6d
<b>Typical Pediatric Therapy</b>	<a href="#">Praziquantel</a> 25 mg/kg as single dose. OR <a href="#">Niclosamide</a> 1g, then 0.5g/d X 6d (1.5g, then 1g for weight >34kg)
<b>Clinical Hints</b>	Nausea, abdominal pain and diarrhea Eosinophilia may be present Primarily a disease of children, in rodent-infested areas Infestation resolves spontaneously within 2 months
<b>Synonyms</b>	Hymenolepis diminuta, Mathevotaenia, Rat tapeworm. ICD9: 123.6 ICD10: B71.0

## Hymenolepis nana infection

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: <i>Hymenolepis (Rodentolepis) nana</i>
<b>Reservoir</b>	Human, Rodent (hamster)
<b>Vector</b>	None
<b>Vehicle</b>	Food, Water, Fecal-oral
<b>Incubation Period</b>	2w - 4w
<b>Diagnostic Tests</b>	Identification of ova in stool
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 25 mg/kg once. OR <a href="#">Nitazoxanide</a> 500 mg daily for 3 days OR <a href="#">Niclosamide</a> 2g/d X 1, then 1g/d X 6d
<b>Typical Pediatric Therapy</b>	<a href="#">Praziquantel</a> 25 mg/kg once. OR <a href="#">Nitazoxanide</a> 100 mg (age 1 to 3 years) to 200 mg (age 4 to 11 years) BID X 3d OR <a href="#">Niclosamide</a> 1g/d X 1, then 0.5g/d X 6d (1.5g, then 1g for weight >34kg)
<b>Clinical Hints</b>	Nausea, abdominal pain, diarrhea, irritability and weight loss Eosinophilia may be present Condition is maintained by autoinfection (worm reproduces within the intestinal lumen)
<b>Synonyms</b>	Dwarf tapeworm, <i>Hymenolepis nana</i> , <i>Rodentolepis microstoma</i> , <i>Rodentolepis nana</i> , <i>Rodentolepsiasis</i> , <i>Vampirolepis nana</i> . ICD9: 123.6 ICD10: B71.0

### Hymenolepis nana infection in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2004 - 2007	Palajunoj	children	5.4	5.4% of school children in the Palajunoj Valley (2004 to 2007) <sup>1</sup>
2011*	Izabal	children	30	30% of school children in Izabal Province (2011 publication) <sup>2</sup>
2010		specimens - stool	7.9	7.9% of non-diarrheal stool specimens from children in the Guatemalan Highlands (2010) <sup>3</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. J Health Popul Nutr 2009 Feb ;27(1):31-40.
2. J Glob Infect Dis 2011 Jan ;3(1):25-31.
3. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.

## Ilheus and Bussuquara

Agent	VIRUS - RNA. Flaviviridae, Flavivirus. Ilheus virus and Bussuquara virus
Reservoir	Wild bird
Vector	Mosquito ( <i>Aedes</i> , <i>Culex</i> , <i>Coquillettidia</i> , <i>Haemagogus</i> , <i>Psorophora</i> , <i>Sabethes</i> , <i>Trichoprosopon</i> and <i>Wyeomyia</i> spp.)
Vehicle	None
Incubation Period	Unknown
Diagnostic Tests	Viral culture (blood). Serology.  Biosafety level 4.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	Fever, headache, arthralgia and myalgia Encephalitis occasionally encountered No fatalities or complications reported to date
Synonyms	Bussuquara, Cacipacore, Ilheus. ICD9: 062.8 ICD10: A83.8

### Ilheus and Bussuquara in Guatemala

1956 - Ilheus virus was isolated from mosquitoes (*Sabethes chloropterus*) in Guatemala. <sup>1</sup>

#### References

1. [Am J Trop Med Hyg 1957 Jul ;6\(4\):686-7.](#)

**Infection of wound, puncture, IV line, etc**

<b>Agent</b>	BACTERIUM. <i>Staphylococcus aureus</i> , streptococci, facultative or aerobic gram negative bacilli, anaerobes, et al
<b>Reservoir</b>	Human, Soil, Water, Air (spores), Various animals and plants
<b>Vector</b>	None
<b>Vehicle</b>	Trauma, Water, Medications, Bandages, Autoinoculation
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Smear and culture of catheter, material from wound.
<b>Typical Adult Therapy</b>	Drainage, remove catheter, debridement and antibiotics appropriate to infecting species
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Source (ie, venous line, postoperative, marine, animal bite) may suggest species Onset within 24 hrs = group A <i>Streptococcus</i> or <i>Cl. perfringens</i> 2 to 7 days = <i>S. aureus</i> More than 7 days = gram negative bacilli Foul odor = anaerobic bacteria
<b>Synonyms</b>	Intravenous catheter infection, Line infection, Surgical wound infection, Wound infection. ICD9: 686.9,451 ICD10: T79.3,I80.0, Y95

**Infectious mononucleosis or EBV infection**

<b>Agent</b>	VIRUS - DNA. Herpesviridae. Gammaherpesvirinae, Lymphocryptovirus: Human herpesvirus 4 (Epstein Barr virus)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Saliva, Blood transfusion, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	28d - 42d
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Exudative pharyngitis Symmetrical cervical lymphadenopathy, splenomegaly and hepatic dysfunction Atypical lymphocytes and positive serology appear after 10 to 14 days Acute illness resolves in 2 to 3 weeks, but malaise and weakness may persist for months
<b>Synonyms</b>	EBV, EBV, Epstein-Barr, Febbre ghiandolare, Filatov's disease, Glandular fever, Infectious mononucleosis, Monocytic angina, Mononucleose, Mononucleosi, Mononucleosis - infectious, Mononukleose, Pfeiffer's disease. ICD9: 075 ICD10: B27.0



## Influenza

<b>Agent</b>	VIRUS - RNA. Orthomyxoviridae, Orthomyxovirus: Influenza virus
<b>Reservoir</b>	Human, Ferret, Bird, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1d - 3d
<b>Diagnostic Tests</b>	Viral culture (respiratory secretions). Serology. Nucleic acid amplification techniques are available.
<b>Typical Adult Therapy</b>	Respiratory precautions. Influenza A or B: <a href="#">Oseltamivir</a> 75 mg PO BID X 5d OR Zanamavir 10 mg BID X 5 days
<b>Typical Pediatric Therapy</b>	Respiratory precautions. Influenza A or B: <a href="#">Oseltamivir</a> 2 mg/kg (max 75 mg) PO BID X 5d OR Zanamavir (age > 5 years) 10 mg BID X 5 days
<b>Vaccines</b>	<a href="#">Influenza - inactivated vaccine</a> <a href="#">Influenza - live vaccine</a>
<b>Clinical Hints</b>	Myalgia, headache, cough and fever Pharyngitis and conjunctivitis often present Usually encountered in the setting of an outbreak Leucocytosis, chest pain and lobar infiltrate herald bacterial (pneumococcal or staphylococcal) pneumonia
<b>Synonyms</b>	Asian flu, Aviaire influenza, Avian flu, Avian influenza, Bird flu, Epidemic catarrh, Grippe, H10N8, H1N1, H2N2, H3N2, H5N1, H7N9, Hong Kong flu, LPAI, Spanish influenza, Swine flu, Swine influenza. ICD9: 487 ICD10: J09,J10,J11

### Influenza in Guatemala

**GIDEON** does not follow routine country reports on human Influenza, since the scope and nature of these data are often diffuse, sporadic or inconsistent. See the "Worldwide" note for material regarding pandemic influenza, influenza vaccine, avian influenza in humans and other relevant subjects.

#### **Notable outbreaks**

Years	Deaths	Notes
2009 - 2010	26	<a href="#">1</a> <a href="#">2</a>

#### References

- [Influenza Other Respir Viruses 2010 May 1;4\(3\):129-40.](#)
- [PLoS One 2010 ;5\(12\):e15826.](#)

## Intestinal spirochetosis

Agent	BACTERIUM. <i>Brachyspira pilosicoli</i> and <i>B. aalborgi</i> Anaerobic gram-negative spirochetes
Reservoir	Human, Fowl, Pig
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Spirochetes resemble "brush border" on bowel biopsy; identification of <i>Brachyspira</i> by PCR
Typical Adult Therapy	<a href="#">Metronidazole</a> appears to be effective in some cases.
Typical Pediatric Therapy	As for adult.
Clinical Hints	Chronic diarrhea and abdominal pain in the absence of other identifiable etiology
Synonyms	Human intestinal spirochetosis. ICD9: 009.1 ICD10: A04.8

## Intra-abdominal abscess

<b>Agent</b>	BACTERIUM. Mixed anaerobic / aerobic, staphylococci, <i>Neisseria gonorrhoeae</i> , <i>Chlamydia trachomatis</i> , etc
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	None
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Various imaging techniques (CT, Gallium scan, ultrasound, etc).
<b>Typical Adult Therapy</b>	Percutaneous or open drainage + antibiotics directed at known or suspected pathogen(s)
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, chills and localizing pain (e.g., chest pain in subphrenic abscess) Setting of prior surgery, biliary or colonic disease, appendicitis, vaginal discharge (PID) FUO, subdiaphragmatic gas or limited diaphragmatic motion may be present
<b>Synonyms</b>	Abscess - Abdominal, Acute appendicitis, Appendicitis, Intraabdominal abscess, Intraperitoneal abscess, P.I.D., Pancreatic abscess, Pelvic abscess, Pelvic inflammatory disease, Pylephlebitis, Subhepatic abscess, Subphrenic abscess, Suppurative pancreatitis, Tuboovarian abscess. ICD9: 614,577.0 ICD10: K35,N73,K75.1,K85

**Intracranial venous thrombosis**

<b>Agent</b>	BACTERIUM. Oral anaerobes, streptococci, et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture (blood, CSF if indicated). Ophthalmoscopy. Roentgenographic studies of skull & sinuses.
<b>Typical Adult Therapy</b>	Antibiotic(s) directed at known or suspected pathogens
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Headache, seizures and fever Cranial nerve dysfunction may be present Usually occurs in the setting of ongoing facial, otic or sinus infection
<b>Synonyms</b>	Cavernous sinus thrombosis, Cerebral sinus thrombosis, Cortical vein thrombosis, Internal cerebral vein thrombosis, Straight sinus thrombosis, Superior sinus thrombosis, Transverse sinus thrombosis. ICD9: 325 ICD10: G08

## Isosporiasis

<b>Agent</b>	PARASITE - Protozoa. Apicomplexa, Eimeriida: <i>Isospora (Cystoisospora) belli</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Food, Liquids, Fecal-oral, Sexual (homosexual) contact
<b>Incubation Period</b>	7d - 10d
<b>Diagnostic Tests</b>	Microscopy of stool or duodenal contents. Advise laboratory when this organism is suspected.
<b>Typical Adult Therapy</b>	Sulfamethoxazole / <b>Trimethoprim</b> 800/160 mg BID X 10 days - Then BID X 3 weeks (may be indefinite in AIDS patient)  Increase dosage / duration in immune-suppressed patients  <b>Pyrimethamine</b> 50 to 75 mg per day + leucovorin if allergic to sulfa
<b>Typical Pediatric Therapy</b>	Sulfamethoxazole / <b>Trimethoprim</b> 25/5 mg/kg BID X 10 days - Then BID X 3 weeks
<b>Clinical Hints</b>	Myalgia, watery diarrhea, nausea and leukocytosis Eosinophilia may be present Illness is prolonged and severe in AIDS patients
<b>Synonyms</b>	Cystoisospora belli, Isospora belli. ICD9: 007.2 ICD10: A07.3

### Isosporiasis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
	Guatemala City	patients - HIV/AIDS	0.7	0.70% of patients with HIV/AIDS (Guatemala City)

## Kawasaki disease

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Diagnosis is based on clinical criteria only.
<b>Typical Adult Therapy</b>	Intravenous gamma globulin 2.0 g/kg over 10 to 12h X 1 dose. Plus aspirin 100 mg/kg/day X 14d (or until defervescence) - then 5 to 10 mg/kg/day until normal ESR Infliximab 5 mg/kg has been successful in some studies.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Disease is most common among children Fever, conjunctivitis, stomatitis and an erythematous rash which desquamates Occasionally complicated by coronary artery occlusion Case-fatality rates of 1% to 4% are reported
<b>Synonyms</b>	Kawasaki's disease, Mucocutaneous lymph node syndrome. ICD9: 446.1 ICD10: M30.3

## Kikuchi's disease and Kimura disease

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Biopsy.
<b>Typical Adult Therapy</b>	Supportive <a href="#">Hydroxychloroquine</a> and corticosteroids have been successful for Kikuchi's disease in some cases.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Most patients of Asian origin Kikuchi disease: - Prolonged (1 to 12 months) cervical lymphadenopathy (rubbery, non-matted - may be tender) - Fever (40%), weight loss, "sweats", leukopenia Kimura disease: - Similar to Kikuchi disease - Salivary gland involvement, glomerulitis, painless subcutaneous masses and eosinophilia suggest Kimura disease - May be misdiagnosed as filariasis
<b>Synonyms</b>	Angiolymploid hyperplasia, Angiolymploid hyperplasia-eosinophilia, Eosinophilic follicular lymphadenitis, Histiocytic necrotizing lymphadenitis, Kikuchi's disease, Kikuchi-Fujimoto disease, Kimura disease. ICD9: 289.3 ICD10: I89.8

## Kingella infection

Agent	BACTERIUM. <i>Kingella kingae</i> , et al A facultative gram-negative coccobacillus
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Culture of blood, joint fluid, CSF, etc. Alert laboratory if these organisms are suspected.
Typical Adult Therapy	<a href="#">Penicillin G</a> or <a href="#">Penicillin V</a> usually effective - dosage per severity/site
Typical Pediatric Therapy	As for adult
Clinical Hints	Most infections have been in young children. A relatively rare cause of septic arthritis, endocarditis, meningitis and other infections
Synonyms	



**Laryngotracheobronchitis**

<b>Agent</b>	VIRUS OR BACTERIUM. Parainfluenza virus, Influenza virus, <i>Mycoplasma</i> , et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	3d - 8d
<b>Diagnostic Tests</b>	Viral culture (respiratory secretions). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Most cases are in young children Usually encountered in the setting of bronchiolitis, laryngitis or croup following a minor upper respiratory infection
<b>Synonyms</b>	Bronchitis, Croup, Laringitis, Laryngite, Laryngitis, Laryngotracheitis. ICD9: 464,466 ICD10: J04,J05,J20,J21

## Legionellosis

<b>Agent</b>	BACTERIUM. <i>Legionella pneumophila</i> , et al An aerobic gram-negative bacillus
<b>Reservoir</b>	Water
<b>Vector</b>	None
<b>Vehicle</b>	Water, Aerosols, Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	5- 6d (range 2-12d); Pontiac fever = 1-2d
<b>Diagnostic Tests</b>	Serology. Culture. Urine antigen (certain types). Nucleic acid amplification. Alert lab if organism suspected.
<b>Typical Adult Therapy</b>	Fluoroquinolone ( <a href="#">Levofloxacin</a> , <a href="#">Trovaflaxacin</a> , <a href="#">Pefloxacin</a> , <a href="#">Sparfloxacin</a> or <a href="#">Moxifloxacin</a> ). OR <a href="#">Azithromycin</a> . OR <a href="#">Erythromycin</a> + <a href="#">Rifampin</a> OR <a href="#">Clarithromycin</a>
<b>Typical Pediatric Therapy</b>	<a href="#">Azithromycin</a> . OR <a href="#">Erythromycin</a> + <a href="#">Rifampin</a> OR <a href="#">Clarithromycin</a>
<b>Clinical Hints</b>	Respiratory illness with extrapulmonary manifestations (diarrhea, confusion, renal or hepatic dysfunction, relative bradycardia, etc.) Most cases reported during summer in temperate areas Case-fatality rates of 5% to 25% are reported
<b>Synonyms</b>	Doenca dos legionarios, Legionarsjuka, Legionarssjuka, Legionella, Legionellose, Legionellosi, Legionnaire's disease, Pontiac fever. ICD9: 482.84 ICD10: A48.1,A48.2

## Leishmaniasis - cutaneous

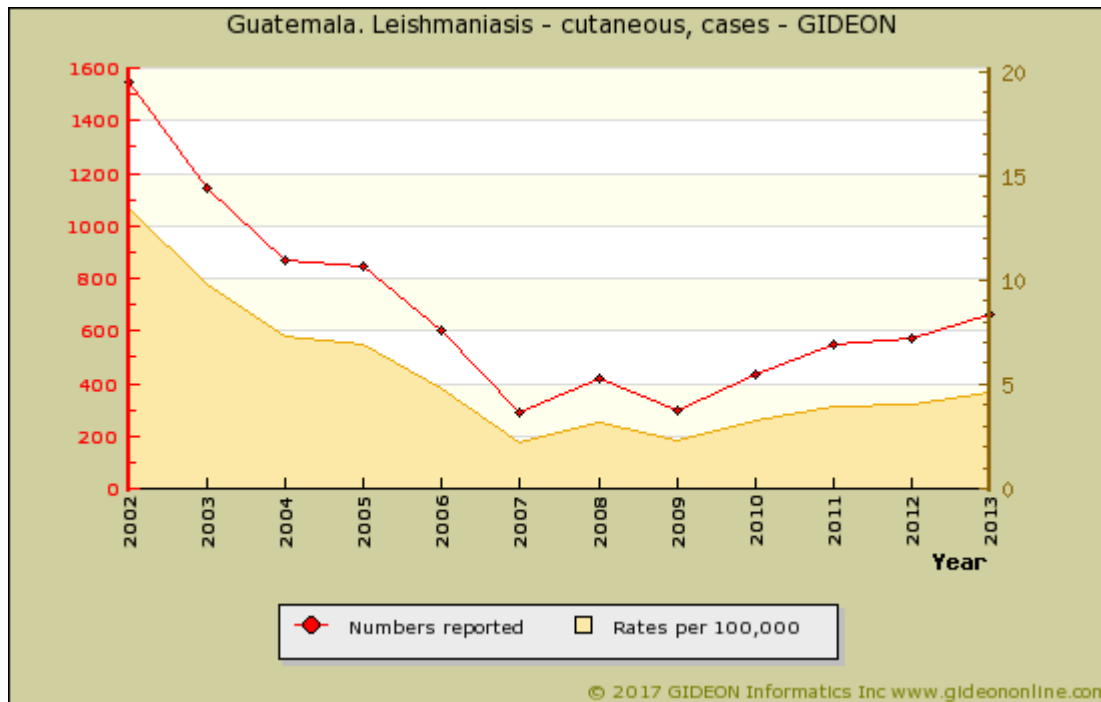
Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: <i>Leishmania tropica</i> , et al
Reservoir	Human, Hyrax, Rodent, Marsupial, Dog, Sloth, Anteater, Armadillo, Bat
Vector	Sandfly ( <i>Phlebotomus</i> for Old-world; <i>Lutzomyia</i> or <i>Psychodopygus</i> for New-world)
Vehicle	None
Incubation Period	2w - 8w (range 1w - months)
Diagnostic Tests	Identification of organism on smear or specialized culture. Nucleic acid amplification
Typical Adult Therapy	<b>Pentavalent antimonials</b> 20 mg/kg/d IV or IM X 21d & / or topical <b>paromomycin</b> . Alternatives: <i>L. major</i> - <b>Fluconazole</b> or <b>Azithromycin</b> , PO <i>L. mexicana</i> or <i>L. panamensis</i> - <b>Ketoconazole</b> , PO <i>L. braziliensis</i> - <b>Azithromycin</b> , PO
Typical Pediatric Therapy	As for adult
Clinical Hints	Chronic ulcerating skin nodule May be painless ( <i>Leishmania tropica</i> ) or painful ( <i>L. major</i> ) Diffuse infection or regional lymphadenopathy are occasionally encountered
Synonyms	Aleppo button, Antep boil, Baghdad boil, Bay sore, Bejuco, Biskra boil, Boessie-Yassi, Bolho, Boschyaws, Bosjaws, Bush yaws, Busi-yasi, Chiclero ulcer, Cutaneous leishmaniasis, Delhi ulcer, Domal, El-Mohtafura, Forest yaws, Gafsa boil, Granuloma endemicum, Hashara, Jericho boil, Kaal Daana, Kandahar sore, <i>Leishmania enriettii</i> , <i>Leishmania major</i> , <i>Leishmania martiniquensis</i> , <i>Leishmania tropica</i> , <i>Leishmania waltoni</i> , Leishmaniasis, Leishmaniose: Kutane, Leishmaniosi cutanea, Lepra de montana, Liana, Okhet, One-year boil, Oriental sore, Pendjeh sore, Pian bois, Saldana, Ulcera de Bejuco, Urfa boil, Uta, Yatevi, Year boil. ICD9: 085.1,085.2,085.3,085.4 ICD10: B55.1

## Leishmaniasis - cutaneous in Guatemala

### Time and Place:

Cutaneous leishmaniasis was first described in Guatemala in 1928. <sup>1</sup>

- An estimated 4,262,387 persons are at risk (2008) <sup>2</sup>
- Infection by *Leishmania mexicana* <sup>3 4</sup> is endemic to Peten, Izabal, Alta Verapaz, El Quiche and Huehuetenango.
- 84.7% of patients are above age 10 years, and 67% are males (2000 to 2007)
- 262 cases of "chiclero ulcer" were reported during 1957 to 1973 (with ear involvement in 54%).
- 684 cases per year were reported during 2004 to 2008 (true number estimated at 1,900 to 3,100 per year). <sup>5</sup>



Graph: Guatemala. Leishmaniasis - cutaneous, cases

#### Notes:

The local vector is *Bichromomyia olmeca* (*Lutzomyia olmeca olmeca*).

- *Lu. (Nyssomyia) ylephiletor* has also been implicated.
- *Lutzomyia ovallesi* *Lu. panamensis* and *Lu. ylephiletor* are identified as the vectors of *Leishmania braziliensis*.<sup>6</sup>

#### References

1. PLoS One 2012 ;7(5):e35671.
2. PLoS One 2012 ;7(5):e35671.
3. Arch Inst Pasteur Tunis 1993 Jul-Oct;70(3-4):325-9.
4. J Infect Dis 1992 Mar ;165(3):518-27.
5. PLoS One 2012 ;7(5):e35671.
6. Parassitologia 1991 Dec ;33 Suppl:501-4.

**Leishmaniasis - mucocutaneous**

<b>Agent</b>	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: <i>Leishmania braziliensis</i> , et al
<b>Reservoir</b>	Rodent, Human, Sloth, Marsupial
<b>Vector</b>	Sandfly ( <i>Lutzomyia</i> or <i>Psychodopygus</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	2w - 8w (range 1w - 6m)
<b>Diagnostic Tests</b>	Microscopy (culture in specialized laboratories). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<b>Pentavalent antimonials</b> (Stibogluconate) 20 mg/kg/d IV/IM X 28d. OR <b>Amphotericin B</b> 0.5 mg/kg/d X 4 to 8w High dose (8 mg/kg/day) <b>Fluconazole</b> has been used against <i>Leishmania braziliensis</i>
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Skin ulceration or nasopharyngitis associated with purulent, mucoid exudate The process may extend to underlying soft tissues Metastatic lesions often involve the palate and pharynx
<b>Synonyms</b>	Agla, Espundia, Mucocutaneous leishmaniasis. ICD9: 085.5 ICD10: B55.2

**Leishmaniasis - mucocutaneous in Guatemala**

The highest incidence is found in Peten and the central and western regions.

An estimated 1,085,357 people are at risk (2008) <sup>1</sup>

The local vectors of *L. braziliensis* are *Lutzomyia ovallesi*, *Lu. panamensis*, and *Lu. ylephiletor*. <sup>2</sup>

**References**

1. [PLoS One 2012 ;7\(5\):e35671.](#)
2. [Parassitologia 1991 Dec ;33 Suppl:501-4.](#)

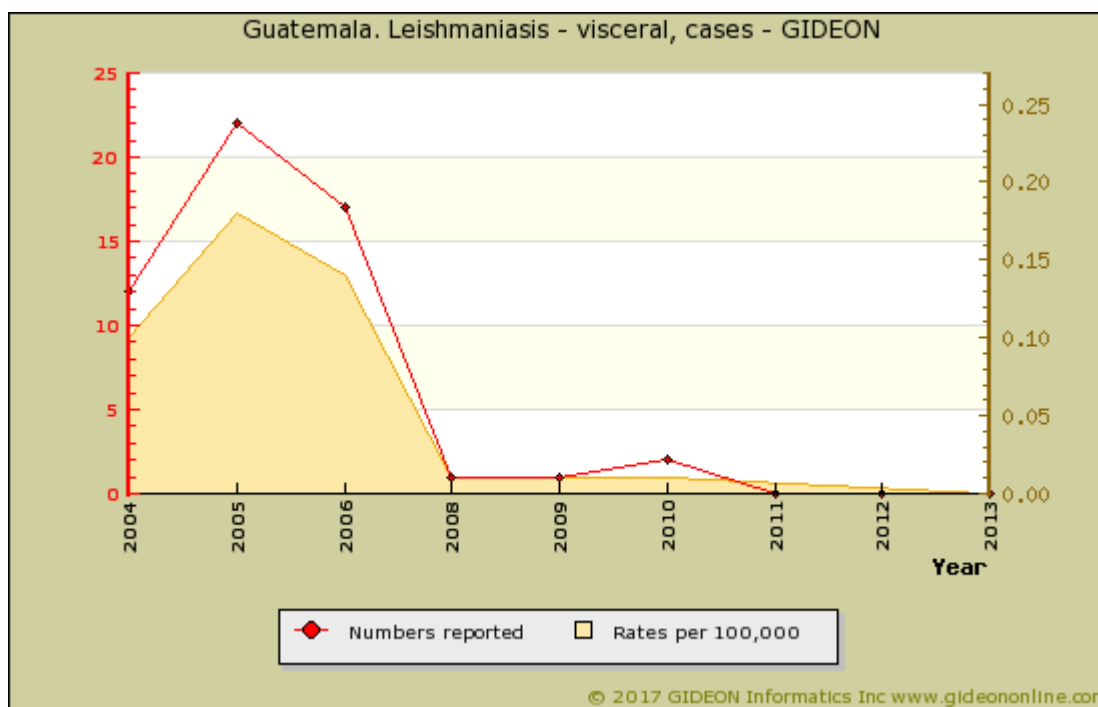
## Leishmaniasis - visceral

Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: <i>Leishmania donovani</i> , <i>L. infantum</i> , <i>L. cruzi</i> ; rarely, <i>L. tropica</i>
Reservoir	Human, Rodent, Dog, Fox, Hares
Vector	Sandfly ( <i>Phlebotomus</i> for Old-world; <i>Lutzomyia</i> for New-world)
Vehicle	Blood
Incubation Period	2m - 6m (10d - 12m)
Diagnostic Tests	Smear / culture of bone marrow, splenic aspirate, lymph nodes. Serology. Nucleic acid amplification.
Typical Adult Therapy	<b>Pentavalent antimonials</b> (Stibogluconate) 20 mg/kg/d X 28d. OR <b>Amphotericin B</b> 1 mg/kg/QOD X 8w (or lipid complex 3 mg/kg/d X 5d) OR <b>Paromomycin</b> 11 mg/kg IM QD X 21 days OR <b>Miltefosine</b> 50 to 150 mg PO daily X 4 to 6 weeks.
Typical Pediatric Therapy	<b>Pentavalent antimonials</b> (Stibogluconate) 20 mg/kg/d X 28d. OR <b>Amphotericin B</b> 1 mg/kg/QOD X 8w (or lipid complex 3 mg/kg/d X 5d) OR <b>Paromomycin</b> 11 mg/kg IM QD X 21 days OR <b>Miltefosine</b> 2.5 mg/kg daily (maximum 150 mg) X 28d
Clinical Hints	Chronic fever, weight loss, diaphoresis, hepatosplenomegaly, lymphadenopathy and pancytopenia Grey pigmentation (Kala Azar = "black disease") may appear late in severe illness Case-fatality rates vary from 5% (treated) to 90% (untreated)
Synonyms	Burdwan fever, Cachectic fever, Dum Dum fever, Kala azar, <i>Leishmania donovani</i> , <i>Leishmania infantum</i> , <i>Leishmania siamensis</i> , <i>Leishmania tarentolae</i> , Leishmaniose: Viszerale, Leishmaniosi viscerale, Ponos, Visceral leishmaniasis. ICD9: 085.0 ICD10: B55.0

Leishmaniasis - visceral in Guatemala**Time and Place:**

The first case of visceral leishmaniasis in Guatemala was reported in 1949. <sup>1</sup>

- Five additional cases were reported from El Progreso and Santa Rosa during 1950 to 1966.
- An estimated 4,359,734 people are considered at risk, in six departments (2008)
- 67 cases were reported during 2000 to 2007.
- 15 cases per year were reported during 2004 to 2008 (true number estimated at 20 to 30 per year). <sup>2</sup>



Graph: Guatemala. Leishmaniasis - visceral, cases

The local vectors are *Lutzomyia longipalpis*, *Lu. evansi* and *Lu. pseudolongipalpis*.

**References**

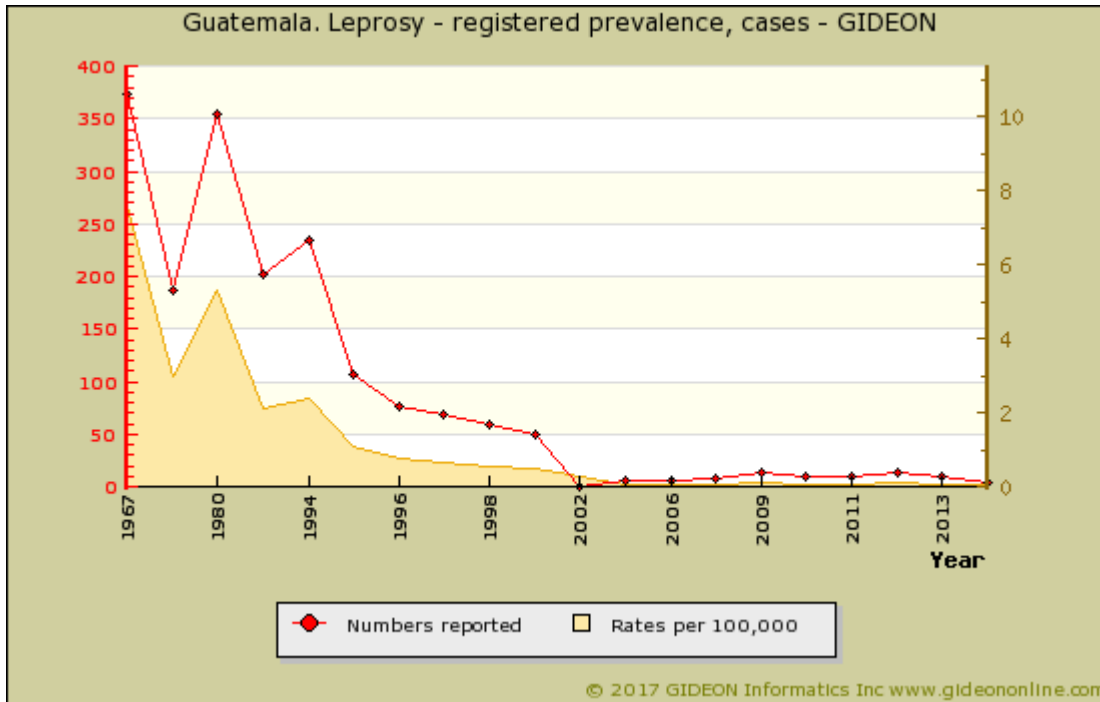
1. PLoS One 2012 ;7(5):e35671.
2. PLoS One 2012 ;7(5):e35671.

## Leprosy

<b>Agent</b>	BACTERIUM. <i>Mycobacterium leprae</i> <i>Mycobacterium lepromatosis</i> An acid-fast bacillus
<b>Reservoir</b>	Human, Armadillo, Squirrel
<b>Vector</b>	None
<b>Vehicle</b>	Secretions
<b>Incubation Period</b>	3y - 5y (range 3m - 40y)
<b>Diagnostic Tests</b>	Visualization of organisms in exudate, scrapings or biopsy. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Multibacillary: One year therapy <b>Dapsone</b> 100 mg + <b>Clofazimine</b> 50 mg daily; and, <b>Rifampin</b> 600 mg + <b>Clofazimine</b> 300 mg once monthly  Paucibacillary: Six month therapy <b>Dapsone</b> 100 mg daily; and <b>Rifampin</b> 600 mg once monthly
<b>Typical Pediatric Therapy</b>	Multibacillary: One year therapy <b>Dapsone</b> 1 to 2 mg/kg + <b>Clofazimine</b> 1 mg/kg daily; and, <b>Rifampin</b> 10 mg/kg + <b>Clofazimine</b> 1 mg/kg once monthly  Paucibacillary: Six month therapy <b>Dapsone</b> 1 to 2 mg/kg daily; and <b>Rifampin</b> 10 mg/kg once monthly
<b>Clinical Hints</b>	Anesthetic, circinate hypopigmented skin lesions and thickened peripheral nerves (tuberculoid leprosy) Diffuse, destructive papulonodular infection (lepromatous leprosy) Combined/intermediate forms are encountered
<b>Synonyms</b>	Aussatz, Doence de Hansen, Hansen's disease, Lebbra, Lepra, <i>Mycobacterium leprae</i> , <i>Mycobacterium lepromatosis</i> . ICD9: 030 ICD10: A30

### Leprosy in Guatemala





Graph: Guatemala. Leprosy - registered prevalence, cases

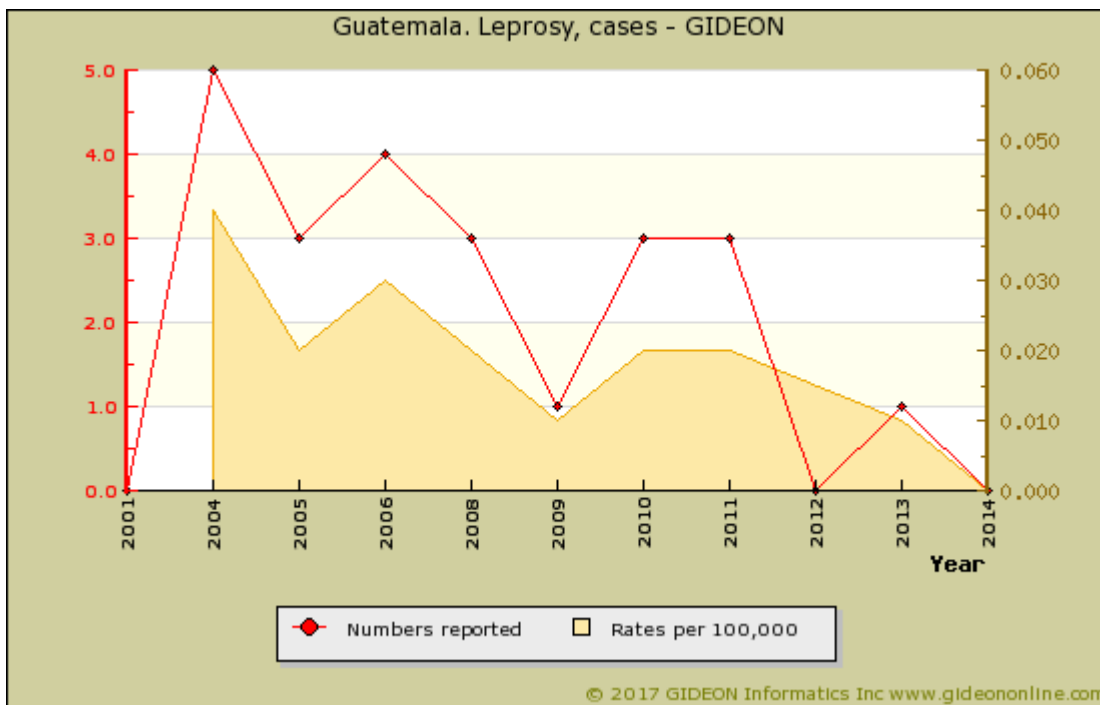
Notes:

Individual years:

1977 - True number estimated at 558 cases.

1980 - True number estimated at 708 cases (10 per 100,000).

77 new cases were reported during 1991 to 1997 - all adults and 85.7% multibacillary



Graph: Guatemala. Leprosy, cases

For a review of the history of leprosy in Guatemala see <sup>1</sup>

**References**

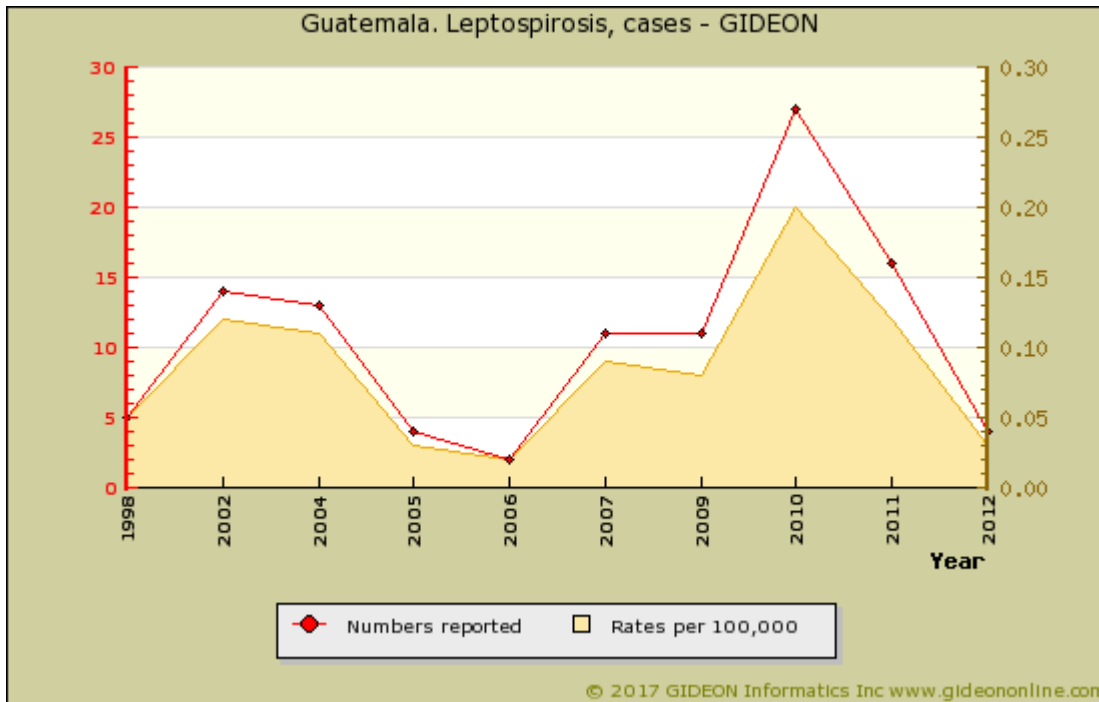
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1. [Acta Leprol 1984 Jan-Mar;2\(1\):19-37.](#)

## Leptospirosis

<b>Agent</b>	BACTERIUM. <i>Leptospira interrogans</i> , et al. An aerobic non-gram staining spirochete
<b>Reservoir</b>	Cattle, Dog, Horse, Deer, Rodent, Fox, Marine mammal, Cat, Marsupial, Frog
<b>Vector</b>	None
<b>Vehicle</b>	Water, Soil, Urine contact, Breastfeeding
<b>Incubation Period</b>	7d - 12d (range 2d - 26d)
<b>Diagnostic Tests</b>	Culture on specialized media. Dark field microscopy of urine, CSF. Serology.
<b>Typical Adult Therapy</b>	Penicillin 1.5 million units Q6h iv OR <a href="#">Doxycycline</a> 100 mg BID X 5 to 7d OR <a href="#">Ceftriaxone</a> 1g IV daily
<b>Typical Pediatric Therapy</b>	<a href="#">Penicillin G</a> 50,000u/kg q6h iv X 5 to 7d Age >= 8y: <a href="#">Doxycycline</a> 2.2 mg/kg BID X 5 to 7d may also be used
<b>Clinical Hints</b>	"Sterile" meningitis, nephritis, hepatitis, myositis and conjunctivitis Often follows recent skin contact with fresh water in rural or rodent-infested areas Case-fatality rates of 5% to 40% are reported
<b>Synonyms</b>	Andaman hemorrhagic fever, Canefield fever, Canicola fever, Field fever, Fish handler's disease, Fort Bragg fever, Japanese autumnal fever, Leptospira, Leptospirose, Leptospirosen, Leptospirosi, Mud fever, Pre-tibial fever, Rat fever, Rice field fever, Swamp fever, Swineherd disease, Weil's disease. ICD9: 100 ICD10: A27

### Leptospirosis in Guatemala



Graph: Guatemala. Leptospirosis, cases

**Notable outbreaks**

Years	Region	Cases	Notes
1999	Los amates	5	<a href="#">1</a>

**References**

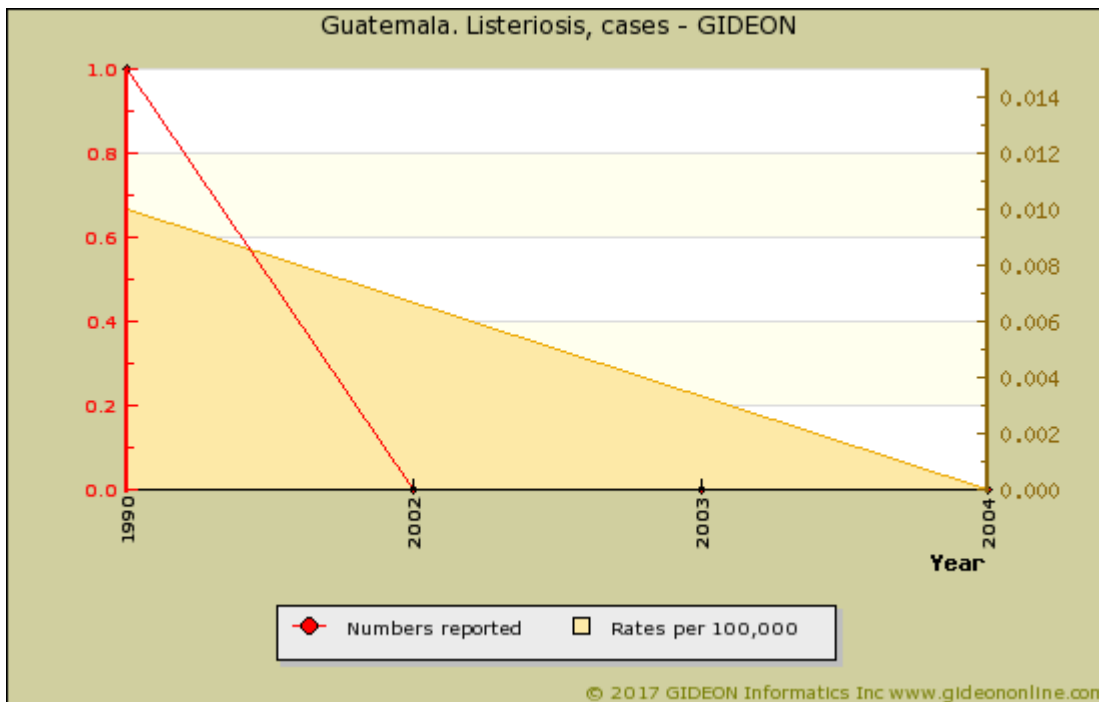
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1. ProMED <[promedmail.org](mailto:promedmail.org)> archive: 19990809.1377

## Listeriosis

Agent	BACTERIUM. <i>Listeria monocytogenes</i> A facultative gram-positive bacillus
Reservoir	Mammal, Human, Bird, Soil, Water
Vector	None
Vehicle	Transplacental, Dairy products (eg, soft cheeses), Infected secretions, Vegetables, Poultry, Water
Incubation Period	3d - 21d (60d post-ingestion)
Diagnostic Tests	Culture of blood or CSF.
Typical Adult Therapy	<b>Ampicillin</b> 2g IV q6h X 2w (higher dosage in meningitis) + <b>Gentamicin</b> . Sulfamethoxazole / <b>Trimethoprim</b> recommended for Penicillin-allergic patients
Typical Pediatric Therapy	<b>Ampicillin</b> 50 mg/kg IV Q6h X 2w (higher dosage in meningitis). Sulfamethoxazole / <b>Trimethoprim</b> recommended for Penicillin-allergic patients
Clinical Hints	Meningitis or sepsis, often in immune-suppressed patients (lymphoma, AIDS, etc) Gastroenteritis - may follow ingestion of "over-the-counter" foods Neonatal septicemia occasionally encountered
Synonyms	Listeria monocytogenes, Listeriose, Listeriosi. ICD9: 027.0 ICD10: A32

### Listeriosis in Guatemala



Graph: Guatemala. Listeriosis, cases

**Liver abscess - bacterial**

<b>Agent</b>	BACTERIUM. Various species from portal (Bacteroides, mixed aerobe-anaerobe) or biliary ( <i>Escherichia coli</i> , etc) source
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Ultrasonography, CT or radionucleotide scan. If amoebic abscess suspected, perform Entamoeba serology
<b>Typical Adult Therapy</b>	Intravenous antibiotic(s) directed at likely or suspected pathogens. Percutaneous or open drainage
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Tender liver and prolonged fever in a patient with history of diverticulosis, cholecystitis, appendicitis, etc Clinically similar to amoebic abscess, but often multiple.
<b>Synonyms</b>	Ascesso fegato, Bacterial liver abscess, Hepatic abscess - bacterial, Liver abscess. ICD9: 572.0 ICD10: K75.0

## Lymphocytic choriomeningitis

<b>Agent</b>	VIRUS - RNA. Arenaviridae, Arenavirus: Lymphocytic choriomeningitis virus
<b>Reservoir</b>	House mouse, Guinea pig, Hamster, Monkey
<b>Vector</b>	None
<b>Vehicle</b>	Urine, Saliva, Feces, Food, Dust, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	8d - 12d (range 6d - 14d)
<b>Diagnostic Tests</b>	Viral culture (blood, throat, CSF). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Headache, myalgia, meningitis and encephalitis Photophobia or pharyngitis may be present Preceding exposure to rodents Infection resolves within 2 weeks, however convalescence may require an additional 2 months.
<b>Synonyms</b>	

## Lymphogranuloma venereum

<b>Agent</b>	BACTERIUM. Chlamydiaceae, <i>Chlamydiae</i> , <i>Chlamydia trachomatis</i> , types L1, L2, L3
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual contact
<b>Incubation Period</b>	7d - 12d (range 3d - 30d)
<b>Diagnostic Tests</b>	Serology. Culture of pus performed in specialized laboratories.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 3w. OR <a href="#">Erythromycin</a> 500 mg QID X 3w OR <a href="#">Azithromycin</a> 1g po weekly X 3w
<b>Typical Pediatric Therapy</b>	Age < 8 years: <a href="#">Erythromycin</a> 10 mg/kg PO QID X 2 to 4w. Age >= 8 years: <a href="#">Doxycycline</a> 2 mg/kg PO BID X 2 to 4w
<b>Clinical Hints</b>	Genital nodule or vesicle with large, suppurating regional nodes Generalized lymphadenopathy or proctitis may be present Late complications include genital edema, rectal strictures and perianal abscesses
<b>Synonyms</b>	Bubonulus, Durand-Nicolas-Favre disease, Linfogranuloma venereo, Lymphogranuloma inguinale, Lymphopathia venereum, Maladie de Nicolas et Favre, Tropical bubo, Venereal bubo, Venerisk lymphogranulom. ICD9: 099.1 ICD10: A55



Malaria	
Agent	PARASITE - Protozoa. Apicomplexa, Haemosporida: <i>Plasmodium</i> spp.
Reservoir	Human Primate ( <i>Plasmodium knowlesi</i> )
Vector	Mosquito (Anopheles)
Vehicle	Blood
Incubation Period	7d -30d
Diagnostic Tests	Examination of blood smear. Serology, antigen & microscopic techniques. Nucleic acid amplification.
Typical Adult Therapy	Resistant falcip: <a href="#">Lumefantrine / Artemether</a> OR <a href="#">Quinine</a> + <a href="#">Doxycycline</a> or <a href="#">Clindamycin</a> OR <a href="#">Atovaquone / Proguanil</a> OR <a href="#">Artesunate</a> IV (severe malaria) If sens., <a href="#">Chloroquine</a> 1g, then 500 mg 6, 24 & 48 hrs. If <i>P. ovale</i> or <i>P. vivax</i> - follow with <a href="#">Primaquine</a>
Typical Pediatric Therapy	Resistant falcip: <a href="#">Lumefantrine / Artemether</a> OR <a href="#">Quinine</a> + <a href="#">Clindamycin</a> OR <a href="#">Atovaquone / Proguanil</a> OR <a href="#">Artesunate</a> (>age 8) IV (severe malaria) If sens., <a href="#">Chloroquine</a> 10 mg/kg, then 5 mg/kg 6, 24, & 48 hrs. If <i>P. ovale</i> or <i>P. vivax</i> - follow with <a href="#">Primaquine</a>
Clinical Hints	Fever, headache, rigors ("shaking chills"), vomiting, myalgia, diaphoresis and hemolytic anemia Fever pattern (every other or every third day) and splenomegaly may be present Clinical disease may relapse after 7 ( <i>ovale</i> and <i>vivax</i> ) to 40 ( <i>malariae</i> ) years
Synonyms	Ague, Bilious remittent fever, Chagres fever, Estiautumnal fever, Marsh fever, Marsh fever, Paludism, Paludismo, Plasmodium brasilianum, Plasmodium falciparum, Plasmodium knowlesi, Plasmodium malariae, Plasmodium ovale, Plasmodium vivax. ICD9: 084 ICD10: B50,B51,B52,B53,B54

Chloroquine resistant falciparum malaria endemic to 80 countries. Chloroquine-sensitive malaria endemic to 28 countries.

## Malaria in Guatemala

### Time and Place:

Malaria risk exists year-round.

- Most cases occur below elevations of 1,500 m.
- Risk areas encompass 80% of the country (20 of 22 departments).
- 70% are reported from El Peten, Alta Verapaz, Escuintla, Izabal and Toledo.
- High rates are also reported from Huehuetenango and Quiche, with some risk in Baja Verapaz, Jutipa, Retalhuleu, San Marcos, Suchitepequez and Zacapa.
- There is no risk in Antigua, Guatemala City or Lake Atitlan.

### Prevalence surveys

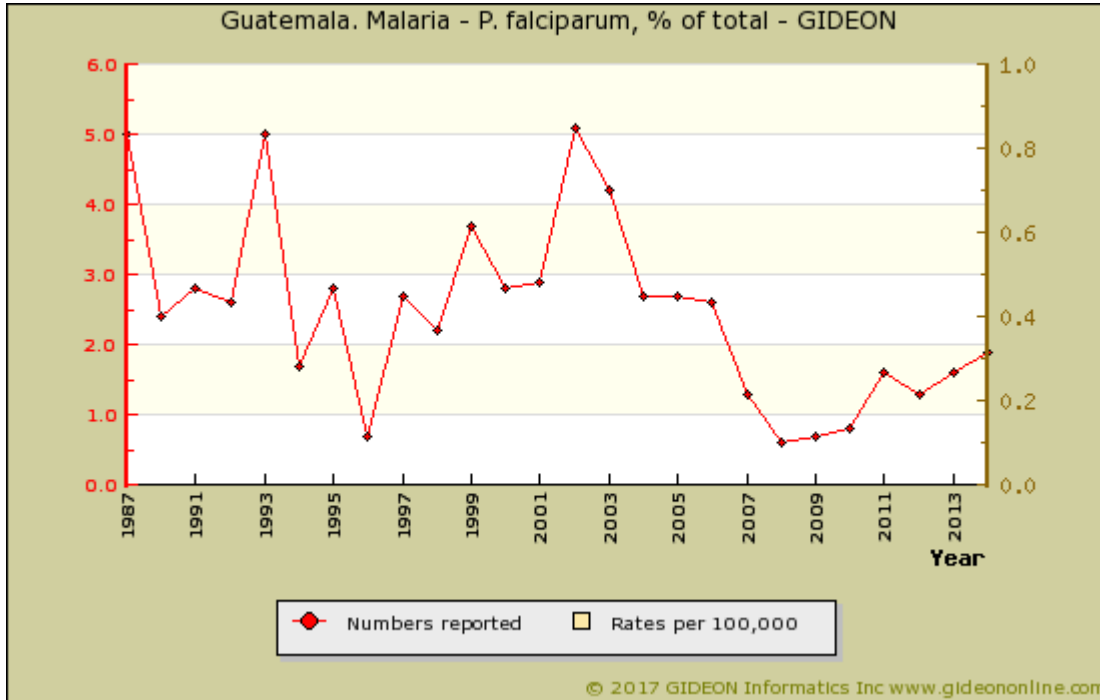
Years	Region	Study Group	%	Notes
2016*	multiple locations	general populaion	5.9-8.4	7.1% of asymptomatic individuals in Escuintla, 8.4% in Alta Verapaz and 5.9% in Zacapa (PCR, 2016 publication) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

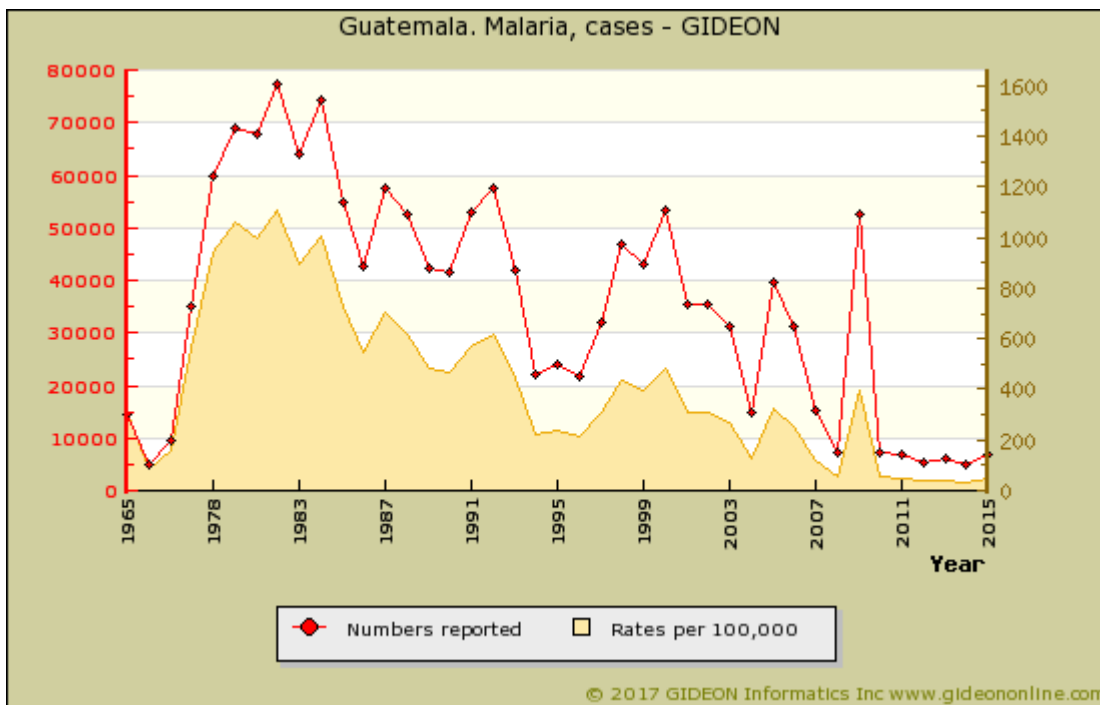
### Infecting species:

Chloroquine-resistant *P. falciparum* is **NOT** reported.

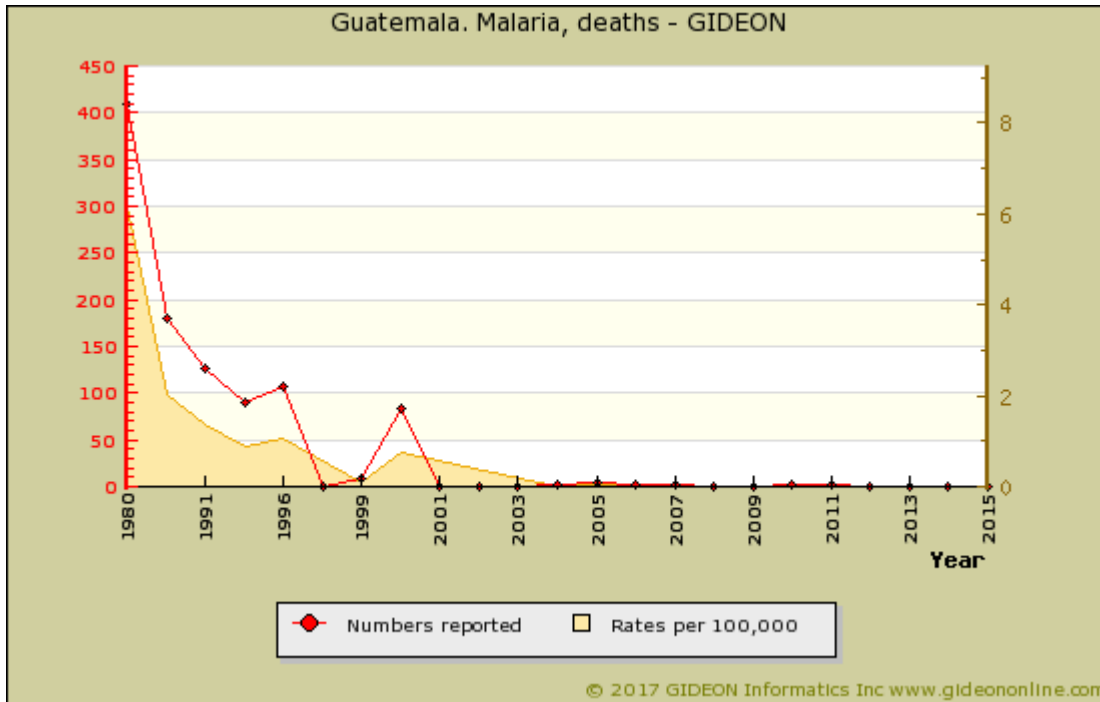
- Chloroquine resistant and primaquine-tolerant strains of *Plasmodium vivax* have been reported.
- The first case of *Plasmodium ovale* malaria in Central America (imported from Africa) was reported in Guatemala (2015 publication). <sup>2</sup>



Graph: Guatemala. Malaria - P. falciparum, % of total



Graph: Guatemala. Malaria, cases



Graph: Guatemala. Malaria, deaths

Notes:

- Figures for 1980, 1990, 2000 and 2010 are based on estimates of true mortality.<sup>3</sup> Since these estimates are significantly higher than official Health Ministry reports for other years during this period, resultant graphs will suggest unusual fluctuation in trends.
- 1,674 fatal cases were reported during 1983 to 1987 (age-adjusted mortality 5.8 per 100,000 per year)

Vectors:

- The principal vectors are *Anopheles darlingi*, *An. albimanus*<sup>4 5</sup> and *An. pseudopunctipennis*.<sup>6</sup>
- An. vestitipennis* is found in the north.<sup>7</sup>

Notable outbreaks

Years	Region	Cases	Notes
2008	Chiquimula	200	<sup>8</sup>

References

- Malar J 2016 ;15(1):441.
- Mil Med Res 2015 ;2:3.
- Lancet 2012 Feb 4;379(9814):413-31.
- Am J Trop Med Hyg 1995 May ;52(5):383-8.
- J Am Mosq Control Assoc 1997 Jun ;13(2):171-83.
- Am J Trop Med Hyg 1995 Oct ;53(4):362-77.
- Bull Pan Am Health Organ 1994 Jun ;28(2):112-21.
- ProMED <promedmail.org> archive: 20081201.3778

**Malignant otitis externa**

<b>Agent</b>	BACTERIUM. <i>Pseudomonas aeruginosa</i> : aerobic gram-negative bacillus (virtually all cases)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture of otic exudate and biopsy material. Careful roentgenographic and neurological examinations.
<b>Typical Adult Therapy</b>	Early debridement <a href="#">Ciprofloxacin</a> 400 mg iv Q8h Alternatives: <a href="#">Imipenem</a> , <a href="#">Meropenem</a> , <a href="#">Ceftazidime</a> , <a href="#">Cefepime</a> Early debridement
<b>Typical Pediatric Therapy</b>	Early debridement <a href="#">Imipenem</a> : Age 0 to 7 days: 25 mg/kg IV Q12h Age 8 to 28 days: 25 mg/kg IV Q8h Age >28 days: 15 to 25 mg/kg IV Q6h (maximum 2 g/day) Alternatives: <a href="#">Meropenem</a> , <a href="#">Ceftazidime</a> , <a href="#">Cefepime</a>
<b>Clinical Hints</b>	Otic pain, swelling and discharge Infection of bony and cartilaginous ear canal Over 80% of patients are diabetics over age 50 Cranial nerve (usually VII) signs in 50% Case-fatality rate > 55%.
<b>Synonyms</b>	

**Mansonelliasis - M. ozzardi**

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Mansonella ozzardi</i>
<b>Reservoir</b>	Human
<b>Vector</b>	Black fly ( <i>Simulium</i> spp.), Midge ( <i>Culicoides</i> spp.)
<b>Vehicle</b>	None
<b>Incubation Period</b>	5m - 18m (range 1m - 2y)
<b>Diagnostic Tests</b>	Identification of microfilariae in skin snips or blood. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Ivermectin</a> 150 ug/kg PO as single dose
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Arthralgia, pruritus, urticaria, rash Bronchospasm, headache, lymphadenopathy and eosinophilia
<b>Synonyms</b>	Filaria ozzardi, Mansonella ozzardi, Microfilaria bolivarensis, Ozzardiasis, Tetrapetalonema ozzardi. ICD9: 125.5 ICD10: B74.4

**Measles**

<b>Agent</b>	VIRUS - RNA. Mononegavirales Paramyxoviridae, Paramyxovirinae, Morbillivirus: Measles virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	8d - 14d
<b>Diagnostic Tests</b>	Viral culture (difficult and rarely indicated). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Respiratory isolation; supportive. <a href="#">Ribavirin</a> 20 to 35 mg/kg/day X 7 days has been used for severe adult infection
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">Measles vaccine</a> <a href="#">Measles-Mumps-Rubella vaccine</a> <a href="#">Measles-Rubella vaccine</a>
<b>Clinical Hints</b>	Coryza, fever, headache, conjunctivitis, photophobia and a maculopapular rash after 3 to 5 days Koplik's spots (bluish-grey lesions on buccal mucosa, opposite second molars) often precede rash Encephalitis or viral pneumonia occasionally encountered
<b>Synonyms</b>	Masern, Massling, Mazelen, Meslinger, Morbilli, Morbillo, Rubeola, Rugeole, Sarampion, Sarampo. ICD9: 055 ICD10: B05

**Measles in Guatemala****Vaccine Schedule:**

BCG - &lt; 1 year

DTwP - 18 months; 4 years

DTwPHibHepB - 2,4,6 months

HepB - birth and 3 doses for adults in risk groups

IPV - NA

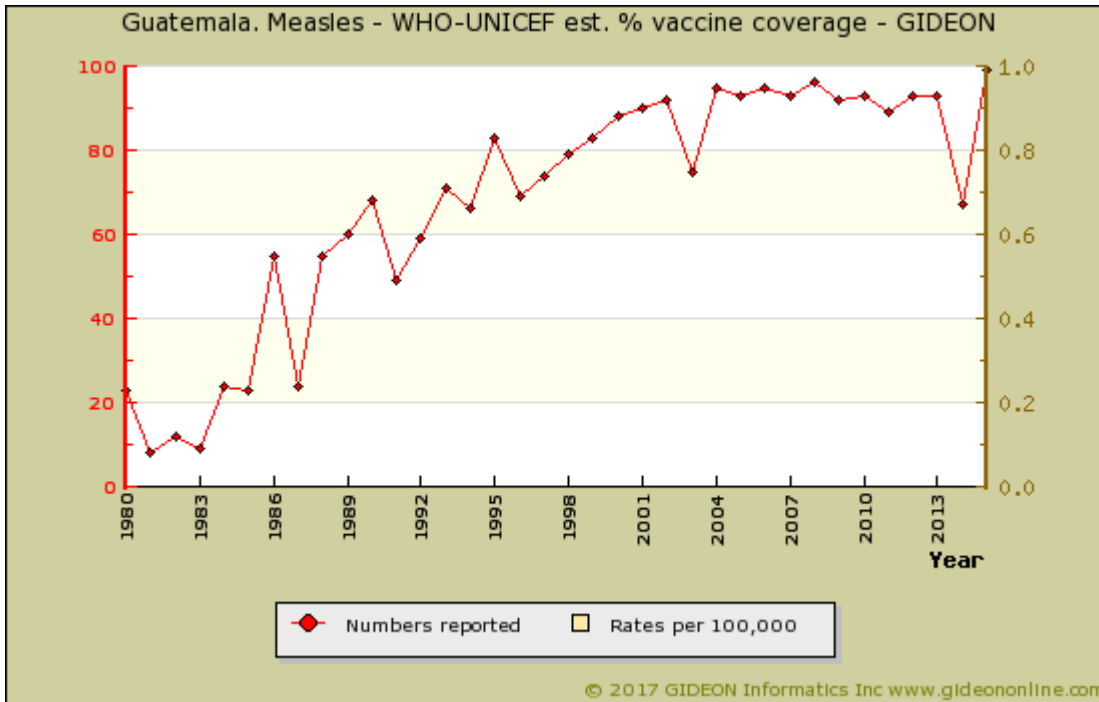
MMR - 12-23 months

OPV - 2,4,6,18 months; 4 years

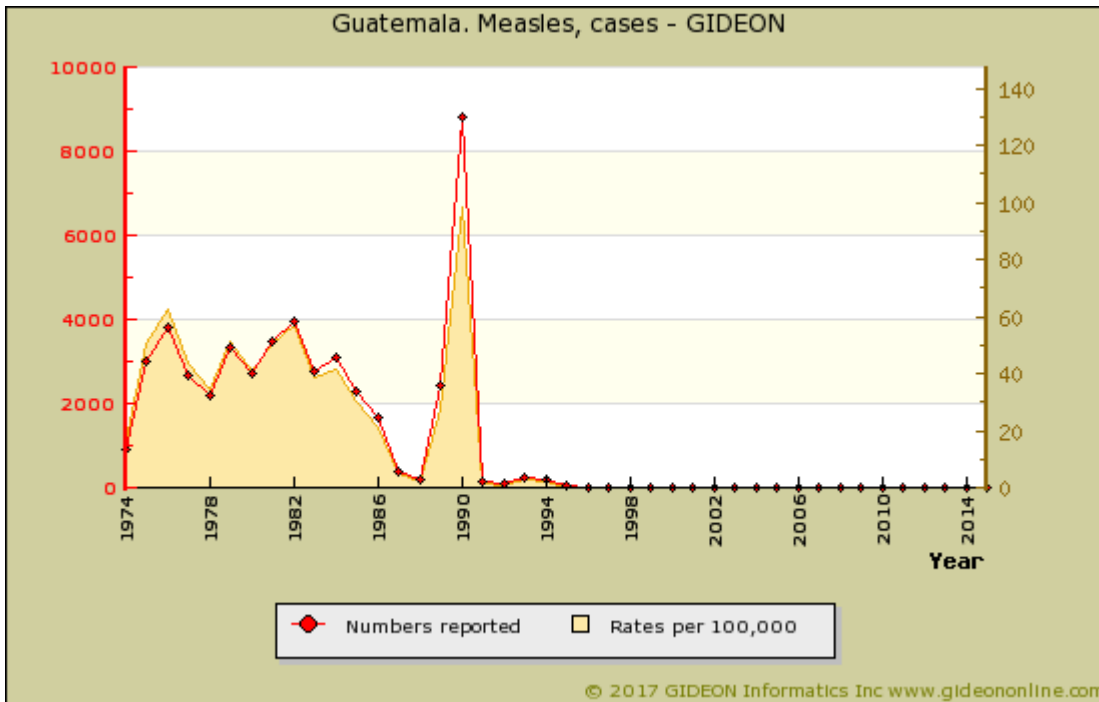
Pneumo conj - 2,4 months; 1 year

Rotavirus - 2,4 months

Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



Graph: Guatemala. Measles - WHO-UNICEF est. % vaccine coverage



Graph: Guatemala. Measles, cases

Notes:

1. WHO data - the Health Ministry reported 17 confirmed cases in 2004; 1 in 2005; 2 in 2006
2. During the 1990's, the annual age-specific mortality rate was 57.7 per 100,000 for ages 1 to 4 years, and 10.8 per 100,000 for ages 5 to 9 years.
3. 34 measles deaths were reported in 1994.

Melioidosis	
Agent	BACTERIUM. <i>Burkholderia pseudomallei</i> An aerobic gram-negative bacillus
Reservoir	Soil, Water, Sheep, Goat, Horse, Pig, Rodent, Monkey, Marsupial
Vector	None
Vehicle	Water (contact, ingestion, aerosol), Breastfeeding, Sexual contact, Respiratory or pharyngeal acquisition
Incubation Period	3d - 21d (range 2d - 1y)
Diagnostic Tests	Culture of blood, sputum, tissue. Serology. Nucleic acid amplification.
Typical Adult Therapy	<a href="#">Ceftazidime</a> or <a href="#">Meropenem</a> or <a href="#">Imipenem</a> IV X at least 14 days May be combined with Sulfamethoxazole / <a href="#">Trimethoprim</a> PO  Follow with Sulfamethoxazole / <a href="#">Trimethoprim</a> +/- <a href="#">Doxycycline</a> X at least 3 months.
Typical Pediatric Therapy	<a href="#">Ceftazidime</a> or <a href="#">Meropenem</a> or <a href="#">Imipenem</a> IV X at least 14 days May be combined with Sulfamethoxazole / <a href="#">Trimethoprim</a> PO  Follow with Sulfamethoxazole / <a href="#">Trimethoprim</a> X at least 3 months.
Clinical Hints	May present as: - lymphangitis with septicemia - fever, cough and chest pain - diarrhea Bone, central nervous system, liver and parotid infection are occasionally encountered Case-fatality rate 10% to over 50% (septicemic form)
Synonyms	<i>Burkholderia pseudomallei</i> , <i>Burkholderia thailandensis</i> , Melioidose, Nightcliff Gardeners' Disease, Whitmore disease. ICD9: 025 ICD10: A24.1,A24.2,A24.3,A24.4

Although Melioidosis is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

## Melioidosis in Guatemala

Two cases of melioidosis were reported in Guatemala during 1947 to 2015. <sup>1</sup>

### References

1. [Am J Trop Med Hyg 2015 Dec ;93\(6\):1134-9.](#)



**Meningitis - aseptic (viral)**

<b>Agent</b>	VIRUS - RNA. Picornaviridae, enteroviruses
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Droplet
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Viral isolation (stool, CSF, throat). Serology.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Lymphocytic meningitis, with normal CSF glucose level Often follows sore throat Typically occurs during late summer and early autumn in temperate regions
<b>Synonyms</b>	Aseptic meningitis, Encephalitis - viral, Meningite virale, Meningitis, viral, Meningo-encefalite virale, Viral encephalitis, Viral meningitis. ICD9: 047,048,049,320.2 ICD10: A87,G03.0

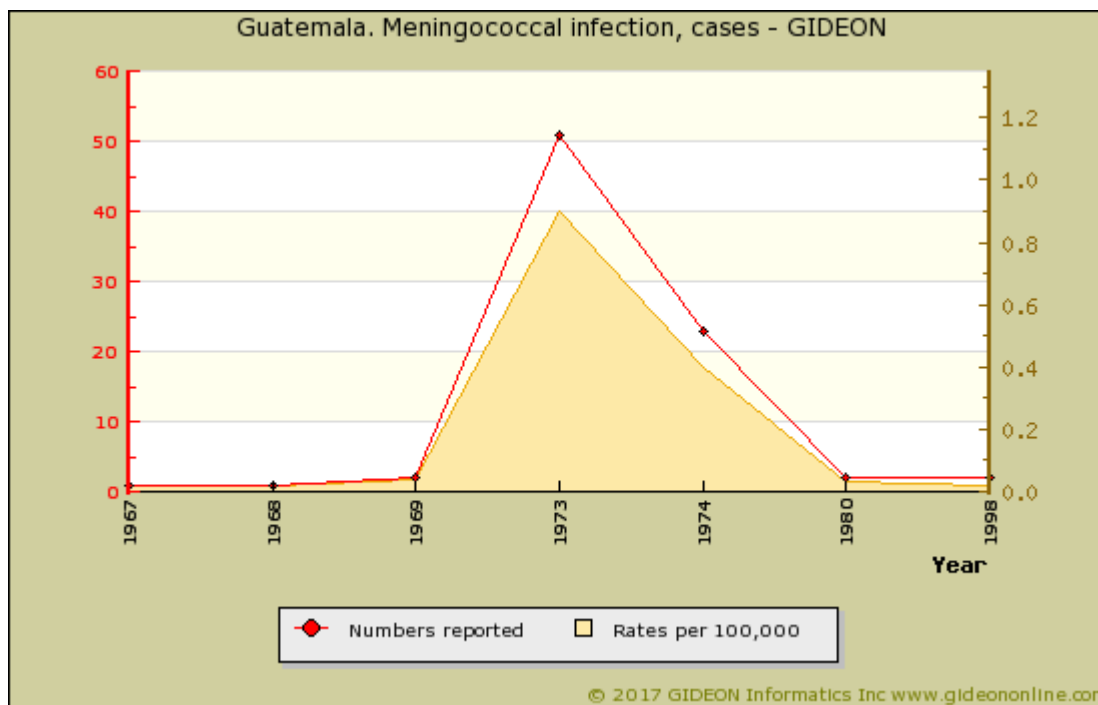
**Meningitis - aseptic (viral) in Guatemala**

528 cases of culture- and latex-negative meningitis (14.9% fatal) were reported among children ages 1 to 59 years in Guatemala City during 1996 to 2005.

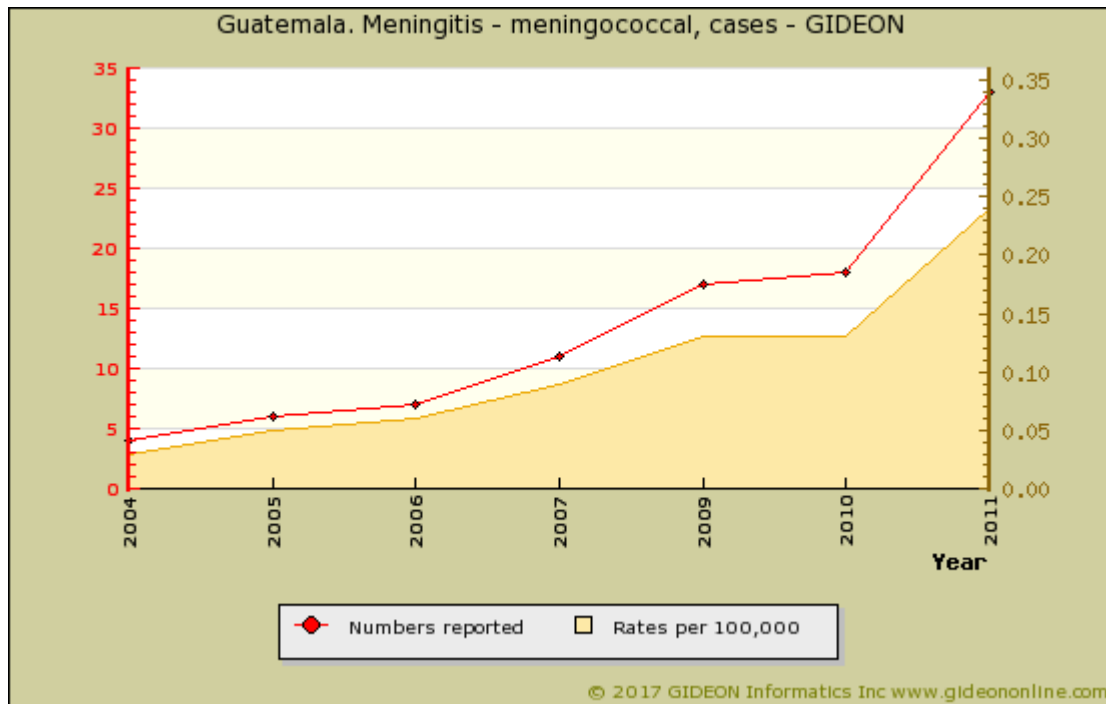
## Meningitis - bacterial

<b>Agent</b>	BACTERIUM. <i>Neisseria meningitidis</i> , <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i> , et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Secretions
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	CSF microscopy and culture. Blood culture.  Note: Antigen detection is non-specific and rarely useful.
<b>Typical Adult Therapy</b>	Bactericidal agent(s) appropriate to known or suspected pathogen + dexamethasone
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">H. influenzae (HbOC-DTP or -DTaP) vaccine</a> <a href="#">Haemophilus influenzae (HbOC) vaccine</a> <a href="#">Haemophilus influenzae (PRP-D) vaccine</a> <a href="#">Haemophilus influenzae (PRP-OMP) vaccine</a> <a href="#">Haemophilus influenzae (PRP-T) vaccine</a> <a href="#">Meningococcal vaccine</a> <a href="#">Hepatitis B + Haemoph. influenzae vaccine</a>
<b>Clinical Hints</b>	Headache, stiff neck, obtundation, high fever and leukocytosis Macular or petechial rash and preceding sore throat suggest meningococcal infection
<b>Synonyms</b>	Bacterial meningitis, Enfermedad Meningococica, Haemophilus influenzae, Haemophilus influenzaes, HIB meningitis, HIBs, Infections a meningocoque, Meningite batterica, Meningite meningococcica, Meningococcal, Meningokokken Erkr., Meningokokkose. ICD9: 036.0,320 ICD10: A39,G00,G01,G02

### Meningitis - bacterial in Guatemala



Graph: Guatemala. Meningococcal infection, cases



Graph: Guatemala. Meningitis - meningococcal, cases

The age-adjusted mortality rate for meningococcal infection is approximately 0.1 per 100,000 per year.

#### Vaccine Schedule:

BCG - < 1 year

DTwP - 18 months; 4 years

DTwPHibHepB - 2,4,6 months

HepB - birth and 3 doses for adults in risk groups

IPV - NA

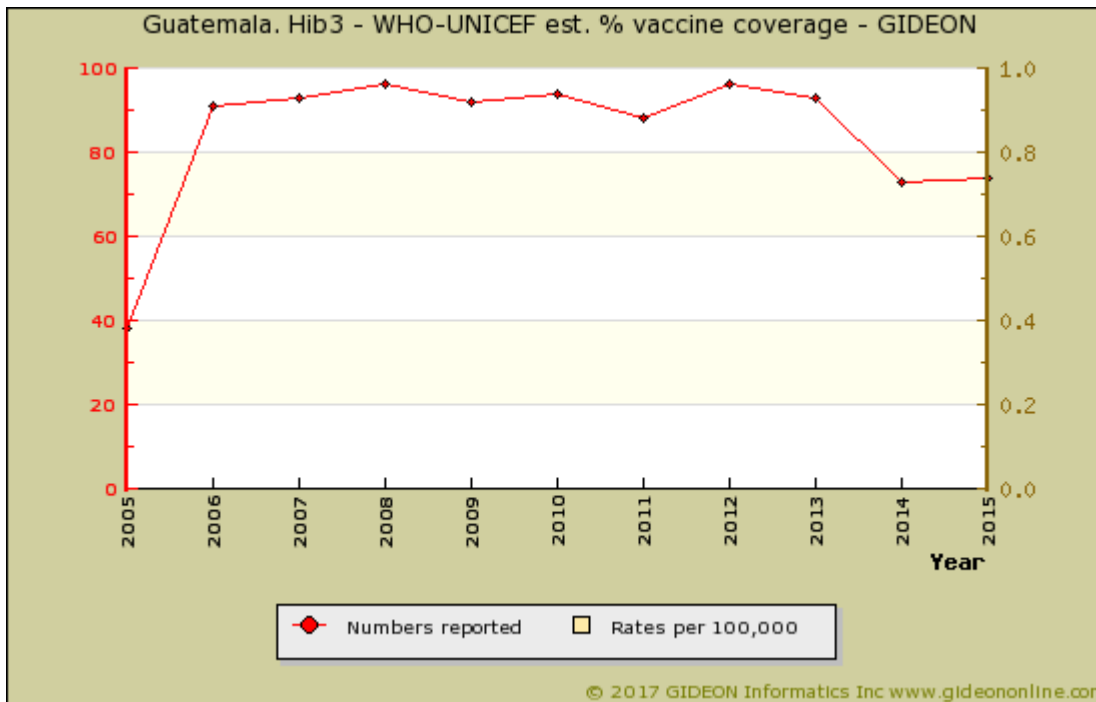
MMR - 12-23 months

OPV - 2,4,6,18 months; 4 years

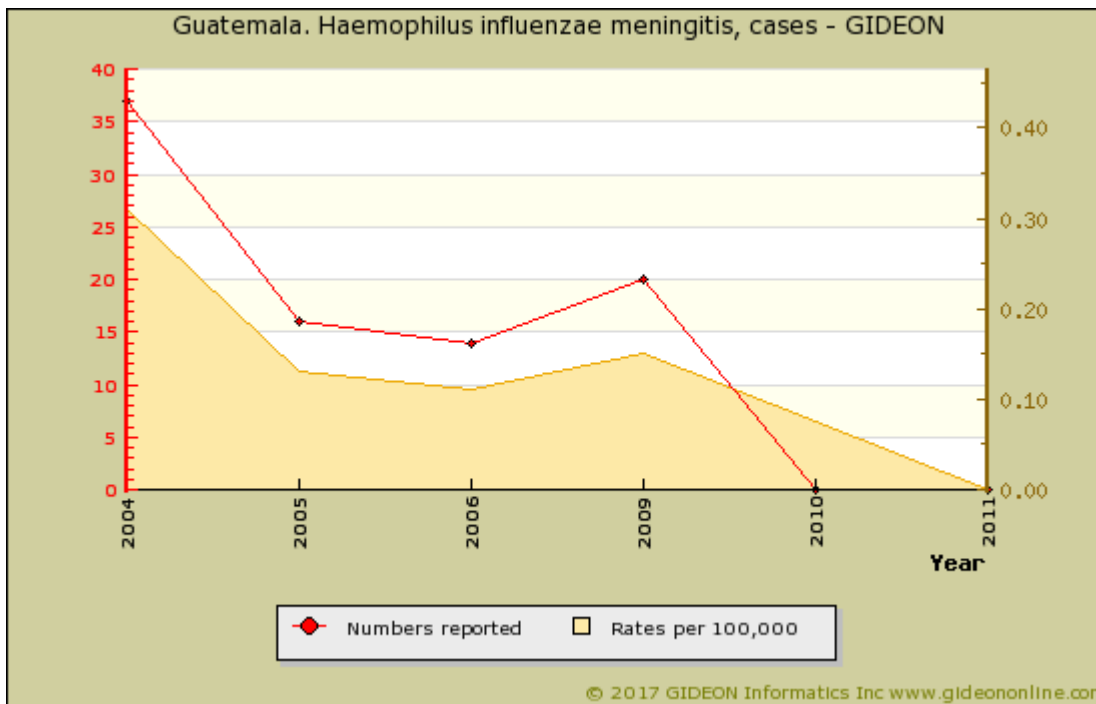
Pneumo conj - 2,4 months; 1 year

Rotavirus - 2,4 months

Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



Graph: Guatemala. Hib3 - WHO-UNICEF est. % vaccine coverage



Graph: Guatemala. Haemophilus influenzae meningitis, cases

357 children ages <= 5 years were hospitalized for meningitis (82 fatal) in Guatemala City during October 1996 to January 1999. <sup>1</sup>

- Haemophilus influenzae accounted for 71 of these cases (10 fatal) , and Streptococcus pneumoniae for 46 (17 fatal).
- The average rate for H. influenzae meningitis was 13.8 per 100,000.

1,021 children ages 1 to 59 years of age were hospitalized for meningitis (21.0% fatal) in Guatemala City during 1996 to 2005.

- Haemophilus influenzae accounted for 20.9% of cases, Streptococcus pneumoniae 16.7% and Neisseria meningitidis 1.4%.

- 528 cases were culture- and latex-negative.

#### References

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1. [Rev Panam Salud Publica 2003 Dec ;14\(6\):377-84.](#)

## Microsporidiosis

<b>Agent</b>	FUNGUS. Microsporidia: Enterocytozoon, <i>Encephalitozoon (Septata)</i> , <i>Vittaforma (Nosema)</i> , <i>Pleistophora</i> , <i>Trachipleistophora</i> , et al.
<b>Reservoir</b>	Rabbit, Rodent, Carnivore, Non-human primate, Fish, Dog, Bird
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Microscopy of duodenal aspirates. Inform laboratory if this organism is suspected. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg PO BID X 3 weeks. Add Fumagillin for ocular <i>S. intestinalis</i> may respond to <a href="#">Albendazole</a> and Fumagillin <a href="#">Nitazoxanide</a> has been used for <i>E. bienewisi</i> .
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 200 mg PO BID X 3 weeks. Add Fumagillin for ocular <i>S. intestinalis</i> may respond to <a href="#">Albendazole</a> and Fumagillin <a href="#">Nitazoxanide</a> has been used for <i>E. bienewisi</i> .
<b>Clinical Hints</b>	Self-limited diarrhea, traveler's diarrhea or asymptomatic carriage Immunocompromised patients present with chronic diarrhea, cholangitis, cholecystitis, sinusitis or pneumonia Ocular microsporidiosis is associated with keratoconjunctivitis Hepatitis or myositis are reported in some cases
<b>Synonyms</b>	Anncaliia, Brachiola, Encephalitozoon, Enterocytozoon, Microsporidium, Nosema, Pleistophora, Trachipleistophora, Tubulinosema, Vittaforma. ICD9: 136.8 ICD10: A07.8

**Molluscum contagiosum**

<b>Agent</b>	VIRUS - DNA. Poxviridae. Molluscipoxvirus. Molluscum contagiosum virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Sexual contact, Vertical transmission
<b>Incubation Period</b>	2-7 w (range 14 to 180d)
<b>Diagnostic Tests</b>	Histology of excised material. Nucleic acid amplification
<b>Typical Adult Therapy</b>	Topical therapy; excision
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	One or more raised, flesh-colored skin lesions with depressed center Lesions persist for 6 to 12 weeks Disseminated and indolent forms encountered, particularly in immune-suppressed patients
<b>Synonyms</b>	Water warts. ICD9: 078.0 ICD10: B08.1

## Mumps

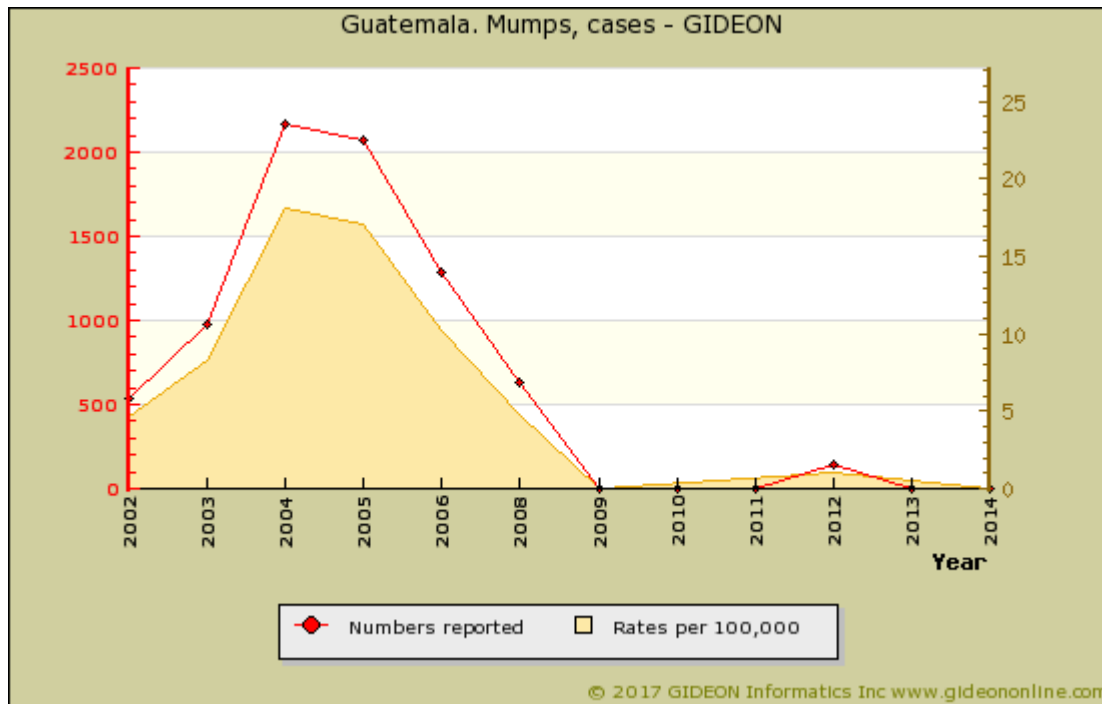
<b>Agent</b>	VIRUS - RNA. Mononegavirales Paramyxoviridae, Paramyxovirinae, Rubulavirus: Mumps virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Aerosol, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	14d - 24d (range 12d - 24d)
<b>Diagnostic Tests</b>	Viral culture (saliva, urine, CSF) indicated only in complicated cases. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Respiratory isolation; supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">Measles-Mumps-Rubella vaccine</a> <a href="#">Mumps vaccine</a> <a href="#">Rubella - Mumps vaccine</a>
<b>Clinical Hints</b>	Fever and parotitis Orchitis (20% of post-pubertal males), meningitis (clinically apparent in 1% to 10%), oophoritis, or encephalitis (0.1%) Most cases resolve within 1 to 2 weeks
<b>Synonyms</b>	Bof, Epidemic parotitis, Fiebre urliana, Infectious parotitis, Kusma, Oreillons, Paperas, Parotidite epidemica, Parotiditis, Parotite epidemica, Passjuka. ICD9: 072 ICD10: B26

### Mumps in Guatemala

**Vaccine Schedule:**

- BCG - < 1 year
- DTwP - 18 months; 4 years
- DTwPHibHepB - 2,4,6 months
- HepB - birth and 3 doses for adults in risk groups
- IPV - NA
- MMR - 12-23 months
- OPV - 2,4,6,18 months; 4 years
- Pneumo conj - 2,4 months; 1 year
- Rotavirus - 2,4 months
- Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)





Graph: Guatemala. Mumps, cases

## Myalgic encephalomyelitis

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Clinical diagnosis; ie, discount other diseases.
<b>Typical Adult Therapy</b>	Supportive; ? immune modulators (experimental)
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Unexplained depression, fatigue, cognitive disorders and sleep disturbance Recurrent bouts of pharyngitis and adenopathy Rheumatological symptoms and fever persist more than six months
<b>Synonyms</b>	Chronic fatigue syndrome, Systemic exercise intolerance disease. ICD9: 780.71 ICD10: G93.3

Mycetoma	
Agent	BACTERIUM OR FUNGUS. <i>Nocardia</i> spp, <i>Madurella mycetomatis</i> , <i>Actinomadura pelletieri</i> , <i>Streptomyces somaliensis</i> , et al
Reservoir	Soil, Vegetation
Vector	None
Vehicle	Contact, Wound, Soil
Incubation Period	2w - 2y
Diagnostic Tests	Bacterial and fungal culture of material from lesion.
Typical Adult Therapy	Antimicrobial or antifungal agent as determined by culture. Excision as indicated
Typical Pediatric Therapy	As for adult
Clinical Hints	Painless, chronic, draining, fistulous subcutaneous nodule - usually involving lower extremity Osteolytic lesions may be noted on x-ray Usually no fever Most patients are males age 20 to 40 (ie, occupational exposure).
Synonyms	Coelomycetes, Curvularia lunata, Cyphellophora, Diaporthe, Emarella, Fusarium subglutinans, Gloniopsis, Lasiodiplodia, Leptosphaeria tompkinsii, Madura foot, Madura-Fuss, Madurella, Medicopsis, Mycetom, Paraconiothyrium, Peyronellaea, Pleurostomophora, White grain eumycetoma. ICD9: 039.4,117.4 ICD10: B47

## Mycobacteriosis - M. marinum

Agent	BACTERIUM. Actinomycetes, <i>Mycobacterium marinum</i> An aerobic acid-fast bacillus
Reservoir	Fresh and salt water (swimming pools, aquaria), Fish (ornamental, salmon, sturgeon, bass)
Vector	None
Vehicle	Water (per areas of minor skin trauma), Contact
Incubation Period	5d - 270d (median 21d)
Diagnostic Tests	Mycobacterial culture from lesion. Alert laboratory when this organism is suspected.
Typical Adult Therapy	<a href="#">Clarithromycin</a> 500 mg BID X 3m Or Rifampicin 600 mg/day + <a href="#">Ethambutol</a> 20 mg/kg/day X 6w. OR <a href="#">Minocycline</a> 100 mg /day X 3m
Typical Pediatric Therapy	Sulfamethoxazole/trimethoprim 5 mg-25 mg/kg BID X 6w. Alternative <a href="#">Minocycline</a> (Age >= 8)
Clinical Hints	Violaceous papule, ulcer, plaque, psoriaform lesion Onset weeks after exposure to swimming pool, aquarium, other water source Commonly involves the elbow, knee, hand or foot
Synonyms	Aquarium granuloma, Fish fanciers' finger syndrome, Fish tank granuloma, Mariner's TB, Mycobacterium balnei, Mycobacterium marinum, Mycobacterium scrofulaceum, Spam, Swimming pool granuloma. ICD9: 031.1 ICD10: A31.1

## Mycobacteriosis - M. scrofulaceum

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Mycobacterium scrofulaceum</i> An aerobic acid-fast bacillus
<b>Reservoir</b>	Water (lakes, rivers), Soil, Raw milk, Plant material
<b>Vector</b>	None
<b>Vehicle</b>	Water, Soil, Areas of minor trauma, Contact
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Culture of tissue or aspirates.
<b>Typical Adult Therapy</b>	Excision. Drugs ( <i>Isoniazid</i> - <i>Rifampin</i> - <i>streptomycin</i> - <i>Cycloserine</i> ) are rarely indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Painless lymphadenopathy, most commonly unilateral and submandibular In contrast, true tuberculosis involves the lower neck and produces a strongly positive tuberculin reaction and/or suggestive chest X ray The condition is most common during early childhood.
<b>Synonyms</b>	

**Mycobacteriosis - miscellaneous nontuberculous**

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Mycobacterium</i> spp. - over 130 species as of 2016 An aerobic acid-fast bacillus
<b>Reservoir</b>	Water, Soil, Fish, Mammal, Bird
<b>Vector</b>	None
<b>Vehicle</b>	Air, Water, Milk ( <i>M. bovis</i> ), Contact, Ingestion, Trauma, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Microscopy & culture of tissue, secretions, blood. Nucleic acid amplification. Inform laboratory if suspected
<b>Typical Adult Therapy</b>	Drug, route and duration appropriate to clinical setting and species (in Therapy module, scroll through upper left box)
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Pneumonia, or chronic granulomatous infection of various tissues Systemic disease may complicate immune suppression <i>Mycobacterium avium-intracellulare</i> infection characterized by aggressive course and resistance to most antimycobacterial drugs
<b>Synonyms</b>	<i>Mycobacterium abscessus</i> , <i>Mycobacterium avium</i> , <i>Mycobacterium avium-intracellulare</i> , <i>Mycobacterium chimaera</i> , <i>Mycobacterium franklinii</i> , <i>Mycobacterium immunogenum</i> , <i>Mycobacterium jacussii</i> , <i>Mycobacterium kyorinense</i> , <i>Mycobacterium xenopi</i> , <i>Segniliparus</i> . ICD9: 031.9,031.2 ICD10: A31.0,A31.1,A31.8

**Mycoplasma (miscellaneous) infection**

<b>Agent</b>	BACTERIUM. Mycoplasmatales <i>Mycoplasma genitalium</i> , <i>Mycoplasma hominis</i> , <i>Mycoplasma fermentans</i> , <i>Mycoplasma penetrans</i> , <i>Mycoplasma parvum</i> , <i>Ureaplasma urealyticum</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Secretion, Sexual contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Culture (urine, pharynx). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 7 days OR <a href="#">Azithromycin</a> 500 mg PO, then 250 mg PO X 4 days OR <a href="#">Levofloxacin</a> 500 mg daily X 7 days OR <a href="#">Ofloxacin</a> 300 mg BID X 7 days
<b>Typical Pediatric Therapy</b>	<a href="#">Erythromycin</a> 10 mg/kg PO QID X 2w
<b>Clinical Hints</b>	Urethritis, vaginitis, neonatal pneumonia Rarely stillbirth, prematurity or infertility
<b>Synonyms</b>	Acholeplasma laidlawii, Epirythrozoön, Hemotrophic Mycoplasma, Mycoplasma amphoriforme, Mycoplasma buccale, Mycoplasma faucium, Mycoplasma felis, Mycoplasma fermentans, Mycoplasma genitalium, Mycoplasma hominis, Mycoplasma lipophilum, Mycoplasma orale, Mycoplasma penetrans, Mycoplasma pirum, Mycoplasma primum, Mycoplasma salivarium, Mycoplasma spermatophilum, T Mycoplasmas, T strains, Ureaplasma parvum, Ureaplasma urealyticum. ICD9: 041.81 ICD10: A49.3

**Mycoplasma pneumoniae infection**

<b>Agent</b>	BACTERIUM. Mollicutes. <i>Mycoplasma pneumoniae</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	6d - 23d
<b>Diagnostic Tests</b>	Culture (sputum, throat). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Erythromycin</a> 500 mg PO BID X 2w. OR <a href="#">Azithromycin</a> 1 g, followed by 500 mg PO daily X 5 days. OR <a href="#">Doxycycline</a> 100 mg PO BID OR <a href="#">Levofloxacin</a> 750 mg PO X 5d
<b>Typical Pediatric Therapy</b>	<a href="#">Azithromycin</a> 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR <a href="#">Erythromycin</a> 10 mg/kg PO QID X 2w
<b>Clinical Hints</b>	Coryza, "hacking" cough and subsegmental pulmonary infiltrate Bullous otitis media is often present Most patients below age 30 Cold agglutinins are neither sensitive nor specific for infection, and appear only during second week.
<b>Synonyms</b>	Mycoplasma pneumoniae, Primary atypical pneumonia. ICD9: 041.81,483.0 ICD10: B96.0



## Myiasis

<b>Agent</b>	PARASITE - Insecta (Diptera) larvae
<b>Reservoir</b>	Mammal
<b>Vector</b>	Arthropod
<b>Vehicle</b>	Fly eggs deposited by biting arthropod
<b>Incubation Period</b>	1w - 3m
<b>Diagnostic Tests</b>	Identification of extracted maggot.
<b>Typical Adult Therapy</b>	Removal of maggot
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fly larvae seen in various body regions Pruritic or painful draining nodule Fever and eosinophilia may be present Instances of brain, eye, middle ear and other deep infestations are described.
<b>Synonyms</b>	Calliphora, Chrysomya, Chrysomyia, Cochliomyia, Cordylobia, Cuterebrosis, Dermatobia, Eristalis, Furuncular myiasis, Gasterophilus, Hypoderma, Lucilia, Lund's fly, Maggot infestation, Megaselia, Musca, Muscina, Oedemagena, Oestrus larvae, Ophthalmomyiasis, Parasarcophaga, Psychoda, Rectal myiasis, Sarcophaga, Screw worm, Telmatoscopus, Urinary myiasis, Vaginal myiasis, Wohlfarthia. ICD9: 134.0 ICD10: B87

### Myiasis in Guatemala

*Dermatobia hominis* myiasis has been reported among tourists to Guatemala. <sup>1 2</sup>

#### Notable outbreaks

Years	Cases	Population	Notes
1978	6	travelers	Outbreak affected three groups of travelers during a 4-month period. <sup>3</sup>

#### References

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2. JAMA 1975 Sep 29;233(13):1375-6.
3. South Med J 1979 Dec ;72(12):1508-11.

**Necrotizing skin/soft tissue infx.**

<b>Agent</b>	BACTERIUM. <i>Streptococcus pyogenes, Clostridium perfringens</i> , mixed anaerobic and/or gram-negative bacilli
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Clinical features. Smear and culture (including anaerobic culture) of exudate.
<b>Typical Adult Therapy</b>	Debridement and parenteral antibiotics directed by smear and culture results. Hyperbaric oxygen in more severe infections
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	At least 7 distinct syndromes are described Local pain and swelling, skin discoloration or edema Gas formation, foul odor and variable degrees of systemic toxicity.
<b>Synonyms</b>	Anaerobic cellulitis, Chancrum oris, Clostridial cellulitis, Clostridium novyi, Fasciitis, Fournier's gangrene, Gangrenous cellulitis, Gangrenous stomatitis, Invasive group A strep. Infections, Meleney's synergistic gangrene, Necrotizing fasciitis, Noma, Streptococcal fasciitis, Synergistic necrotizing cellulitis. ICD9: 686.8,528.1 ICD10: M72.6,A69.0

**Neutropenic typhlitis**

<b>Agent</b>	BACTERIUM. <i>Clostridium septicum</i> (occasionally <i>Clostridium tertium</i> , <i>Clostridium sporogenes</i> , <i>Clostridium sordellii</i> or <i>Clostridium tertium</i> )
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Typical findings in the setting of neutropenia. Ultrasonography may be helpful.
<b>Typical Adult Therapy</b>	Broad spectrum antimicrobial coverage, which should include clostridia and <i>Pseudomonas aeruginosa</i> ; ie Piperacillin / Tazobactam (or Imipenem or Meropenem) OR Cefepime + Metronidazole Role of surgery is controversial
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, abdominal pain, diarrhea (occasionally bloody) and right lower quadrant signs in a neutropenic (leukemic, etc) patient; Infection may spread hematogenously to the extremities Case-fatality rate is 50% to 75%.
<b>Synonyms</b>	Neutropenic enterocolitis. ICD9: 540.0 ICD10: A04.8

## Nocardiosis

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Nocardia</i> spp. An aerobic gram positive bacillus (acid-fast using special technique)
<b>Reservoir</b>	Soil
<b>Vector</b>	None
<b>Vehicle</b>	Air, Dust, Wound, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Days to weeks
<b>Diagnostic Tests</b>	Culture and gram stain of exudates, sputa, tissue specimens. Advise laboratory when <i>Nocardia</i> suspected.
<b>Typical Adult Therapy</b>	Lymphadenitis or skin / soft tissue: Sulfamethoxazole / <a href="#">Trimethoprim</a> OR <a href="#">Minocycline</a> Pneumonia: Sulfamethoxazole / <a href="#">Trimethoprim</a> + <a href="#">Imipenem</a> ; OR <a href="#">Imipenem</a> + <a href="#">Amikacin</a> Brain abscess: Sulfamethoxazole / <a href="#">Trimethoprim</a> + <a href="#">Imipenem</a> ; OR <a href="#">Linezolid</a> + <a href="#">Meropenem</a>
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Pneumonia, lung abscess, brain abscess, or other chronic suppurative infection Often occurs in the setting of immune suppression.
<b>Synonyms</b>	<i>Nocardia</i> , Nocardiose. ICD9: 039 ICD10: A43

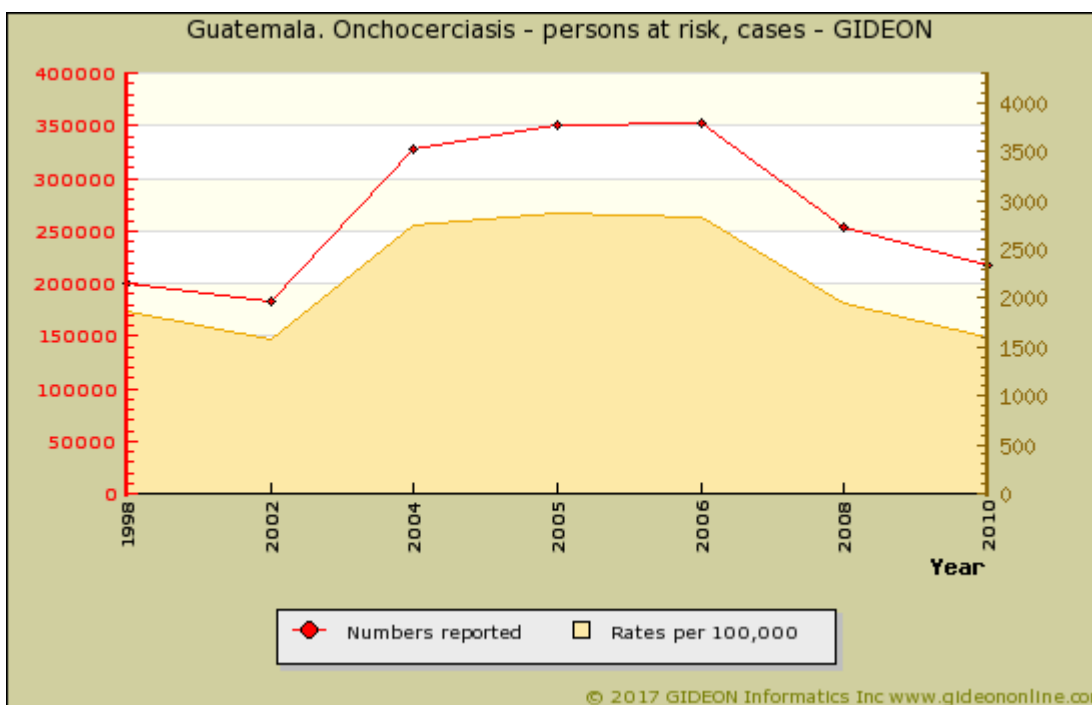
Onchocerciasis	
Agent	PARASITE - Nematoda. Secernentea: <i>Onchocerca volvulus</i>
Reservoir	Human
Vector	Black fly ( <i>Simulium</i> spp.)
Vehicle	None
Incubation Period	12m - 18m
Diagnostic Tests	Identification of microfilariae in skin snips or on ophthalmoscopy. Nucleic acid amplification.
Typical Adult Therapy	Excision of nodules. <a href="#">Ivermectin</a> 150ug/kg PO once. Repeat every 6 months  <a href="#">Doxycycline</a> 100 mg PO daily for 6 weeks prior to <a href="#">Ivermectin</a> improves cure rate  If eye involved, administer corticosteroid for several days prior to <a href="#">ivermectin</a> .
Typical Pediatric Therapy	Excision of nodules. <a href="#">Ivermectin</a> 150ug/kg PO once. Repeat every 6 months  Age > 8 years: <a href="#">Doxycycline</a> , as for adult
Clinical Hints	Macular, papular or dyschromic skin lesions Pruritus is common Lymphadenopathy and eosinophilia Keratitis or uveitis Firm nodules palpable over bony prominences Adult worms may survive for 15 years in the human host.
Synonyms	Aswad, Craw-craw, Erysipelas de la Costa, Flussblindheit, Jur blindness, Lichenified onchodermatitis, Nakalanga syndrome, Onchocerca volvulus, Onchozerkose, River blindness, Robles' disease, Sowda. ICD9: 125.3 ICD10: B73

## Onchocerciasis in Guatemala

### Time and Place:

American onchocerciasis was discovered in 1919 by the Guatemalan physician, R. Robles.

- As of 1957, endemic areas comprised only 1.66% of the area of Guatemala.
- Until recently, activity had also been described in Huehuetenango, Suchitepequez, Solola and Chimaltenango departments.
- Transmission in the Santa Rosa focus was eliminated as of 2007. <sup>1</sup>
- As of 2008, there were four endemic foci: Central, Cuilco (bordering Chiapas, Mexico), Escuintla-Guatemala and Santa Rosa. <sup>2</sup>
- As of 2011, there were only two endemic foci: Central and Cuilco. <sup>3 4</sup>
- Transmission was declared "interrupted" in Santa Rosa as of 2006, Escuintla as of 2007, Huehuetenango as of 2008 and Central as of 2011. <sup>5</sup>
- Transmission was declared "eliminated" in Santa Rosa and Escuintla as of 2010 and Huehuetenango as of 2011. <sup>6</sup>
- In September 2016, Guatemala was declared "free of onchocerciasis" by PAHO. <sup>7 8</sup>



Graph: Guatemala. Onchocerciasis - persons at risk, cases

Notes:

Individual years:

1946 - 25,000 persons (0.742% of the population) were infested. <sup>9</sup>

1985 - 40,000 persons were infested and 600 blind.

2002 - 518 endemic communities were identified.

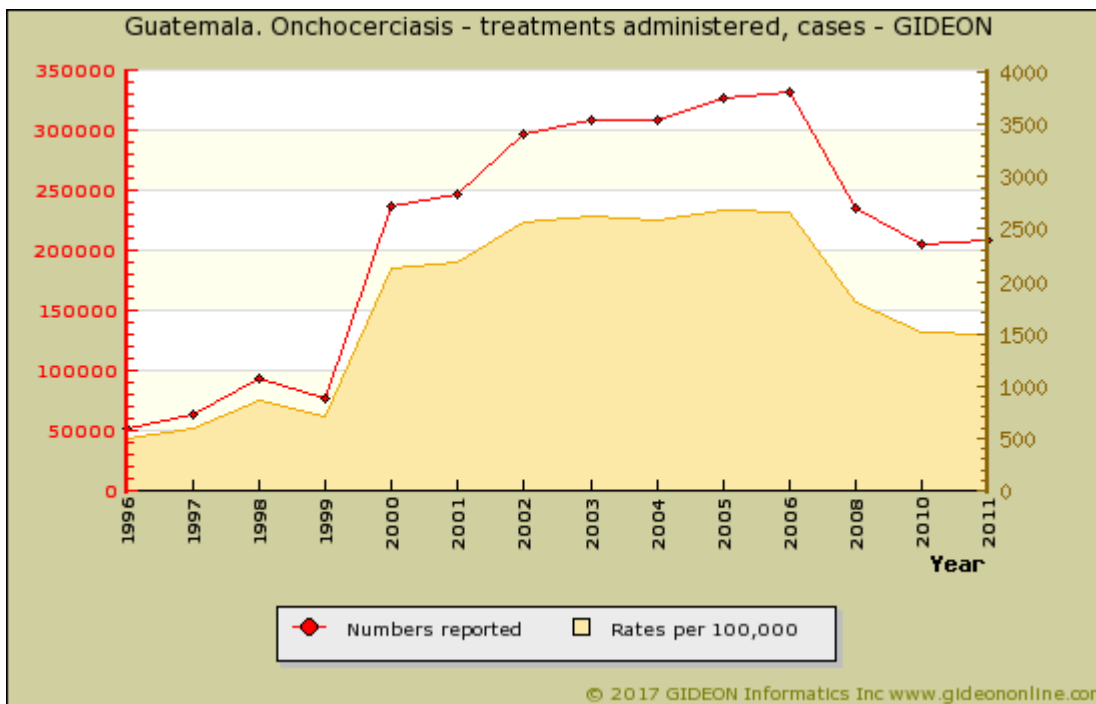
Prevalence surveys

Years	Region	Study Group	%	Notes
2006 - 2008	Huehuetenango	flies	0	0% of blackflies ( <i>Simulium ochraceum</i> ) in Huehuetenango (2006 to 2008) <sup>10</sup>
1933		general population	59.8	59.8% in endemic areas in 1933
1935		general population	29	29% in 1935
1943		general population	15.38	15.38% in 1943.
1979	Escuintla	general population	6.2	6.2% in Escuintla in 1979 <sup>11</sup>
1981	multiple locations	general population	7.2-20.7	20.7% in Central and 7.2% in Huehuetenango in 1981 <sup>12 13</sup>
2006		general population	0	0% in 2006 (microfilaria in anterior chamber) <sup>14</sup>
2006 - 2008	Huehuetenango	general population	0	0% in Huehuetenango during 2006 to 2008 <sup>15 16</sup>
2007	Central	general population	0	0% in Central in 2007 (microfilaria in anterior chamber) <sup>17 18</sup>

Seroprevalence surveys

Years	Study Group	%	Notes
2009*	Workers	0.6	0.6% of migrant workers on coffee plantations (2009 publication) <sup>19</sup>

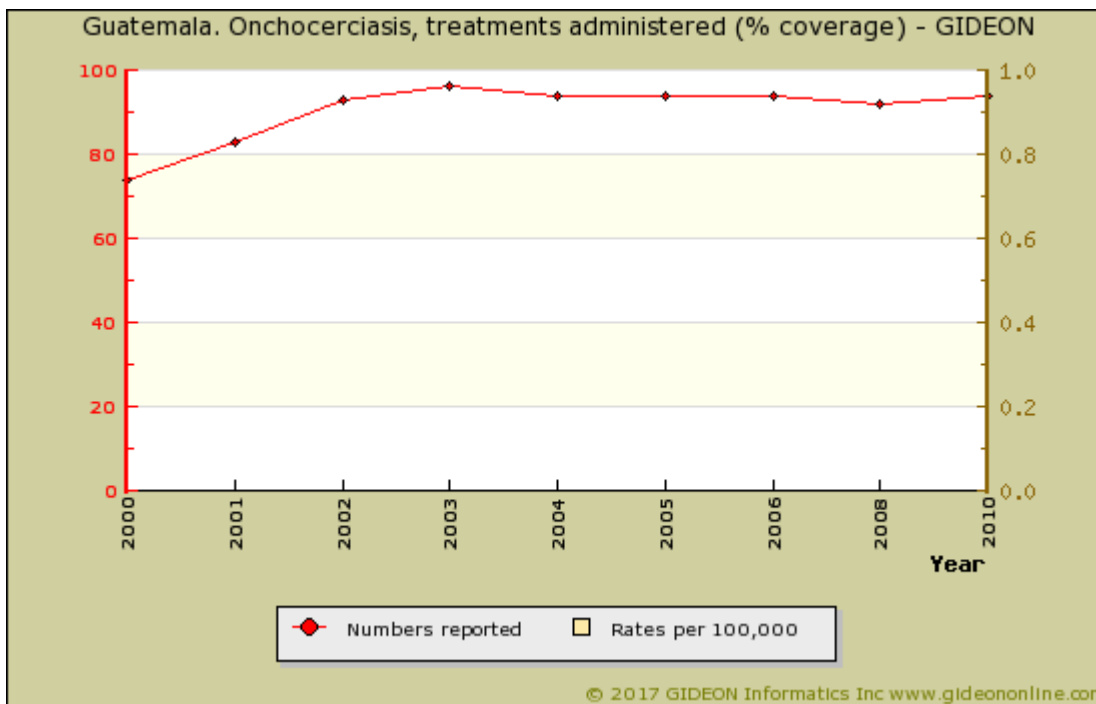
\* indicates publication year (not necessarily year of survey)



Graph: Guatemala. Onchocerciasis - treatments administered, cases

Notes:

1. Additional references: [20](#) [21](#) [22](#)



Graph: Guatemala. Onchocerciasis, treatments administered (% coverage)

**Vectors:**

The local vector is *Simulium ochraceum*. [23](#)

- *S. metallicum* and *S. callidum* are implicated as secondary vectors. [24](#)

- *S. gonzalezi*, *S. haematopotum*, *S. veracruzianum* and *S. horacioi* are considered potential vectors. [25](#)

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**Onchocerciasis - zoonotic**

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Onchocerca lupi</i> , et. al.
<b>Reservoir</b>	Cattle, Horse, Deer, Boar, Dog, Wolf
<b>Vector</b>	Black fly ( <i>Simulium</i> spp.)
<b>Vehicle</b>	None
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Identification of excised worm
<b>Typical Adult Therapy</b>	Excision
<b>Typical Pediatric Therapy</b>	As of adult
<b>Clinical Hints</b>	Subcutaneous or subconjunctival nodule, or eye-worm; may be history of animal contact
<b>Synonyms</b>	Dipetalonema arbuta, Dipetalonema sprenti, Onchocerca cervicalis, Onchocerca dewittei, Onchocerca guttarosa, Onchocerca jakutensis, Onchocerca lupi, Onchocerca reticulata, Pelecitus. ICD9: 123.8 ICD10: B71.1.

## Orbital and eye infection

<b>Agent</b>	BACTERIUM OR FUNGUS. <i>Streptococcus pyogenes</i> , oral anaerobes, <i>Aspergillus</i> spp., facultative gram-negative bacilli, et al
<b>Reservoir</b>	Endogenous, Introduced flora (trauma, surgery)
<b>Vector</b>	None
<b>Vehicle</b>	Trauma, Surgery, Contiguous (sinusitis), Hematogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Imaging techniques (CT or MRI). Culture of aspirates or surgical material.
<b>Typical Adult Therapy</b>	Local and systemic antimicrobial agents appropriate for species and severity
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Proptosis, chemosis, extraocular palsy, or hypopyon Associated with sinusitis, bacteremia, eye trauma or surgery Infection may involve the eye (endophthalmitis); periosteum (periorbital infection); orbit (orbital cellulitis); or multiple structures (panophthalmitis).
<b>Synonyms</b>	Bacterial keratitis, Ceratite, Cheratite, Endophthalmitis, Eye infection, Keratite, Keratitis, Orbital infection, Panophthalmitis, Queratitis. ICD9: 360.0 ICD10: H05.0

### Orbital and eye infection in Guatemala

#### Notable outbreaks

Years	Cases	Clinical	Notes
2003	2,269	conjunctivitis	

## Orf

<b>Agent</b>	VIRUS - DNA. Poxviridae, Parapoxvirus: Orf virus
<b>Reservoir</b>	Sheep, Goat, Reindeer, Musk ox
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Secretions, Fomite, Cat-scratch
<b>Incubation Period</b>	3d - 6d (range 2d - 7d)
<b>Diagnostic Tests</b>	Viral culture (skin lesion or exudate). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Skin pustule or ulcer following contact with sheep or goats Most lesions are limited to finger or hand Heals without scarring within 6 weeks
<b>Synonyms</b>	Contagious ecthyma, Contagious pustular dermatitis, Ecthyma contagiosum, Ovine pustular dermatitis, Scabby mouth. ICD9: 078.89 ICD10: B08.0

## Ornithosis

<b>Agent</b>	BACTERIUM. Chlamydiaceae, <a href="#">Chlamydiae</a> , <i>Chlamydophila (Chlamydia) psittaci</i>
<b>Reservoir</b>	Parakeet, Parrot, Pigeon, Turkey, Duck, Cat, Sheep, Goat, Cattle, Dog
<b>Vector</b>	None
<b>Vehicle</b>	Bird droppings, Dust, Air, Aerosol from cat, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	7d - 14d (range 4d - 28d)
<b>Diagnostic Tests</b>	Serology. Culture (available in special laboratories) rarely indicated.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 10d.  Alternatives: <a href="#">Azithromycin</a> 1 g, then 0.5 g daily X 4 days. <a href="#">Clarithromycin</a> 0.5 g BID <a href="#">Erythromycin</a> 500 mg PO QID X 10d. <a href="#">Levofloxacin</a> 750 mg PO X 7 days
<b>Typical Pediatric Therapy</b>	<a href="#">Azithromycin</a> 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR <a href="#">Erythromycin</a> 10 mg/kg QID X 10d Alternative (Age >=8 years): <a href="#">Doxycycline</a> 100 mg PO BID X 10d.
<b>Clinical Hints</b>	Headache, myalgia and pneumonia, often with relative bradycardia Hepatomegaly or splenomegaly common Onset 1 to 4 weeks following contact with pigeons, psittacine birds or domestic fowl Case-fatality rate without treatment is 20%.
<b>Synonyms</b>	<i>Chlamydophila abortus</i> , <i>Chlamydophila psittaci</i> , Ornitose, Papegojsjuka, Parrot fever, Psitacosis, Psittacosis, Psittakose. ICD9: 073 ICD10: A70

## Osteomyelitis

<b>Agent</b>	BACTERIUM OR FUNGUS. <i>Staphylococcus aureus</i> , facultative gram-negative bacilli, <i>Candida albicans</i> , etc
<b>Reservoir</b>	Endogenous
<b>Vector</b>	None
<b>Vehicle</b>	Trauma, Surgery, Hematogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Radiography, including bone scan. Culture of biopsy material.
<b>Typical Adult Therapy</b>	Systemic antimicrobial agent(s) appropriate to known or suspected pathogen. Surgery as indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Limb pain or gait disturbance, often associated with obscure fever May be preceded by infection of skin, soft tissues or joint; or result from bacteremia X-ray changes are not apparent for at least 10 days in acute infection
<b>Synonyms</b>	Osteomyelitis, Osteomyelitis, Osteomyelitis, Paravertebral abscess. ICD9: 015,730.9 ICD10: M86

## Otitis media

Agent	BACTERIUM OR VIRUS. <i>Haemophilus influenzae</i> & <i>Streptococcus pneumoniae</i> in most acute cases; RSV, Parainfluenza, et al
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Clinical findings. Culture of middle ear fluid if available.
Typical Adult Therapy	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): <a href="#">Amoxicillin / Clavulanate</a> 1000/62.5 mg BID X 3 days Alternatives: <a href="#">Cefdinir</a> , <a href="#">Cefpodoxime</a> proxtil, Cefprozil, fluoroquinolone
Typical Pediatric Therapy	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): <a href="#">Amoxicillin / Clavulanate</a> 45/3.2 mg/kg BID X 3 days
Vaccine	<a href="#">Pneumococcal conjugate vaccine</a>
Clinical Hints	Acute bacterial otitis media often represents the final stage in a complex of anatomic, allergic or viral disorders of the upper airways Recurrent or resistant infections may require surgical intervention.
Synonyms	Otitis media aguda. ICD9: 382.0 ICD10: H65,H66

## Otitis media in Guatemala

### Vaccine Schedule:

BCG - < 1 year

DTwP - 18 months; 4 years

DTwPHibHepB - 2,4,6 months

HepB - birth and 3 doses for adults in risk groups

IPV - NA

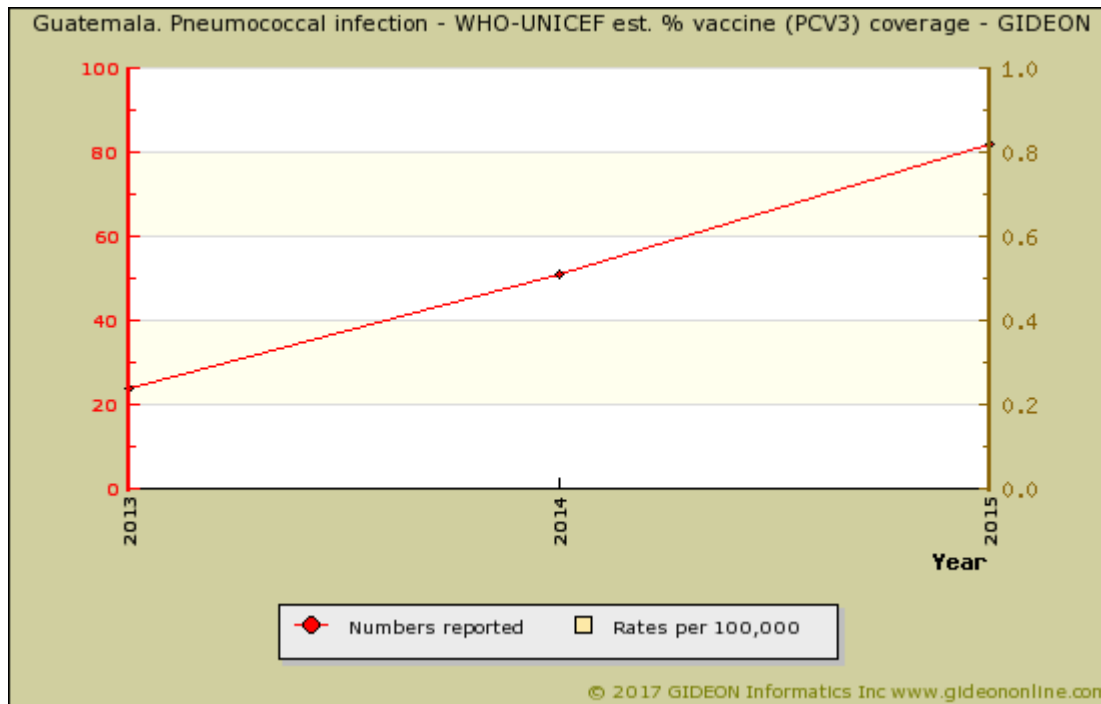
MMR - 12-23 months

OPV - 2,4,6,18 months; 4 years

Pneumo conj - 2,4 months; 1 year

Rotavirus - 2,4 months

Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



Graph: Guatemala. Pneumococcal infection - WHO-UNICEF est. % vaccine (PCV3) coverage

## Paragonimiasis

<b>Agent</b>	PARASITE - Platyhelminthes, Trematoda. <i>Paragonimus westermani</i> , <i>P. heterotremus</i> , <i>P. skrjabini</i> , <i>P. miyazakii</i> , <i>P. africanus</i> , et al.
<b>Reservoir</b>	Human, Dog, Cat, Pig, Wild carnivore, Deer, Snail ( <i>Semisulcospira</i> , <i>Thiara</i> , etc)
<b>Vector</b>	None
<b>Vehicle</b>	Fresh-water crab (at least 8 species), Crayfish ( <i>Cambaroides</i> ), raw meat (venison)
<b>Incubation Period</b>	6w - 6m
<b>Diagnostic Tests</b>	Identification of ova in sputum or stool. Serologic and skin tests are available.
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 25 mg/kg TID X 2d. OR <a href="#">Bithionol</a> 40 mg/kg every other day X 10 doses. OR <a href="#">Triclabendazole</a> 10 mg/kg/d X 2
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Pulmonary infection with bloody or "rusty" sputum Meningitis or seizures Eosinophilia Subcutaneous nodules in some cases Parasite may survive for decades in the human host
<b>Synonyms</b>	Alaria, Endemic hemoptysis, Lung fluke, Oriental lung fluke, Paragonimus, Poikilorchis, Pulmonary distomiasis. ICD9: 121.2 ICD10: B66.4



**Parainfluenza virus infection**

<b>Agent</b>	VIRUS - RNA. Paramyxoviridae: Respirovirus - Human Parainfluenza virus 1 and 3. Rubulavirus - Human Parainfluenza virus 2 and 4.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	3d - 8d
<b>Diagnostic Tests</b>	Viral culture (respiratory secretions). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Upper respiratory infection - often croup or laryngitis Most common during infancy Older children develop a "cold-like" illness Complicated by pneumonia in 7% to 17% of cases
<b>Synonyms</b>	Parainfluenza, Sendai. ICD9: 078.89,480.2 ICD10: J12.2

**Parvovirus B19 infection**

<b>Agent</b>	VIRUS - DNA. Parvoviridae, Parvovirinae: Erythrovirus B19
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	4d - 14d (range 3d - 21d)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification (testing should be reserved for the rare instance of complicated infection).
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Erythema infectiosum (erythema of cheeks; lacelike or morbilliform rash on extremities) Febrile polyarthralgia Bone marrow aplasia/hypoplasia may be present
<b>Synonyms</b>	Duke's disease, Erythema infantum febrile, Erythema infectiosum, Erythema simplex marginatum, Erythrovirus B19, Erythrovirus B19, Fifth disease, Fourth disease, Funfte Krankheit, Parascarlatina, Parvovirus 4, Parvovirus B19, Sticker's disease. ICD9: 057.0 ICD10: B08.3

**Pediculosis**

<b>Agent</b>	PARASITE - Insecta. Anoplura: <i>Pediculus humanus</i> , <i>Phthirus pubis</i> .
<b>Reservoir</b>	Human
<b>Vector</b>	Louse
<b>Vehicle</b>	Contact
<b>Incubation Period</b>	7d
<b>Diagnostic Tests</b>	Identification of adults and "nits."
<b>Typical Adult Therapy</b>	Permethrin 1%; or malathion 0.5%; or lindane OR <a href="#">Ivermectin</a> 200 mcg/kg PO
<b>Typical Pediatric Therapy</b>	Permethrin 1%; or malathion 0.5%; or lindane OR <a href="#">Ivermectin</a> 200 mcg/kg PO (> 15 kg body weight)
<b>Clinical Hints</b>	Pruritus in the setting of poor personal hygiene Adult insects or nits may be visible The body louse ( <i>Pediculus humanus</i> var. <i>corporis</i> ; rarely not the head louse) transmits such diseases as epidemic typhus, trench fever and relapsing fever
<b>Synonyms</b>	Crab louse, Lausebefall, Pediculose, Pediculus capitis, Pediculus corporis, Pedikulose, Phthirus pubis, Pidocci. ICD9: 132 ICD10: B85

**Pentastomiasis - Linguatula**

<b>Agent</b>	PARASITE - Pentastomid worm. <i>Linguatula serrata</i>
<b>Reservoir</b>	Herbivore
<b>Vector</b>	None
<b>Vehicle</b>	Meat (liver or lymph nodes of sheep/goat)
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Identification of larvae in nasal discharge.
<b>Typical Adult Therapy</b>	No specific therapy available
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Pharyngeal or otic itching Cough, rhinitis or nasopharyngitis which follows ingestion of undercooked liver.
<b>Synonyms</b>	Linguatula, Marrara syndrome. ICD9: 128.8 ICD10: B83.8

**Pericarditis - bacterial**

<b>Agent</b>	BACTERIUM. <i>Streptococcus pneumoniae</i> , <i>Staphylococcus aureus</i> , et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Ultrasonography and cardiac imaging techniques. Culture of pericardial fluid (include mycobacterial culture).
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) appropriate to known or anticipated pathogen. Drainage as indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, chest pain and dyspnea Patients are acutely ill and have overt signs such as venous distention Enlarged cardiac "shadow"; concurrent pneumonia or upper respiratory infection may be present The case-fatality rate is 20%.
<b>Synonyms</b>	Bacterial pericarditis, Pericardite. ICD9: 074.23,074.2,115.03,420 ICD10: I30

**Perinephric abscess**

<b>Agent</b>	BACTERIUM OR FUNGUS. <i>Escherichia coli</i> , other facultative gram negative bacilli, <i>Candida albicans</i> , et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	None
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Urine and blood culture. Renal imaging (CT, etc).
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) appropriate to known or anticipated pathogen. Surgery as indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Unexplained fever, leukocytosis and flank pain Patients are typically over age 50, and often diabetic Consider in the patient with nonresponsive "pyelonephritis" or a renal mass
<b>Synonyms</b>	

**Perirectal abscess**

<b>Agent</b>	BACTERIUM. Various (often mixed anaerobic and aerobic flora)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture of drainage material.
<b>Typical Adult Therapy</b>	Surgical drainage and antibiotics effective against fecal flora
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Anal or perianal pain with fever and a tender mass Granulocytopenic patients commonly develop small, soft and less overt abscesses - often due to <i>Pseudomonas aeruginosa</i> .
<b>Synonyms</b>	

**Peritonitis - bacterial**

<b>Agent</b>	BACTERIUM. Various (often mixed anaerobic and aerobic flora)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture of blood and peritoneal fluid. Peritoneal fluid cell count may also be useful.
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) appropriate to known or anticipated pathogens. Surgery as indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Abdominal pain and tenderness Vomiting, absent bowel sounds, guarding and rebound Diarrhea may be present in children Underlying visceral infection or perforation, trauma, hepatic cirrhosis (spontaneous peritonitis) etc.
<b>Synonyms</b>	Acute peritonitis, Bacterial peritonitis, Peritonite. ICD9: 567 ICD10: K65

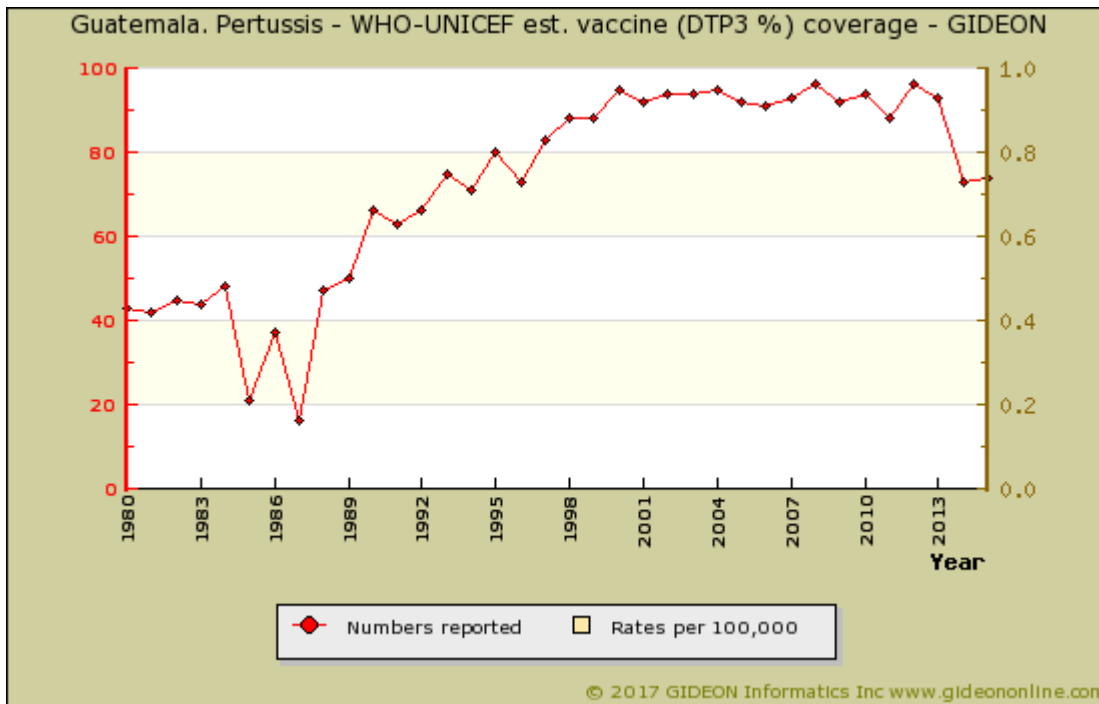


Pertussis	
Agent	BACTERIUM. <i>Bordetella pertussis</i> An aerobic gram-negative coccobacillus
Reservoir	Human
Vector	None
Vehicle	Air, Infected secretions, Respiratory or pharyngeal acquisition
Incubation Period	7d - 10d (range 5d - 21d)
Diagnostic Tests	Culture & direct fluorescence (nasopharynx). Alert laboratory when suspected. Serology.
Typical Adult Therapy	Respiratory precautions. <i>Azithromycin</i> 500 mg po X 1, then 250 mg daily X 4 days OR <i>Clarithromycin</i> 500 mg po BID X 7 days OR Sulfamethoxazole / <i>Trimethoprim</i>
Typical Pediatric Therapy	Respiratory precautions: <i>Azithromycin</i> 10mg /kg po daily for 5 days OR <i>Clarithromycin</i> 15/mg/kg BID X 7 days OR Sulfamethoxazole / <i>Trimethoprim</i>
Vaccines	<i>DTaP vaccine</i> <i>DTP vaccine</i>
Clinical Hints	Coryza, paroxysmal cough May be associated with pneumonia or otitis Prominent lymphocytosis Most often diagnosed in young children, but may present as indolent cough in adults Epistaxis and subconjunctival hemorrhage often noted Seizures (below age 2) The case-fatality rate is 0.5%.
Synonyms	<i>Bordetella holmesii</i> , <i>Bordetella parapertussis</i> , <i>Bordetella pertussis</i> , Coqueluche, Keuchhusten, Kikhosta, Kikhoste, Kinkhoest, Parapertussis, Pertosse, Syndrome coqueluchoide, Tos convulsa, Tos farina, Tosse convulsa, Tussis convulsa, Whooping cough. ICD9: 033 ICD10: A37

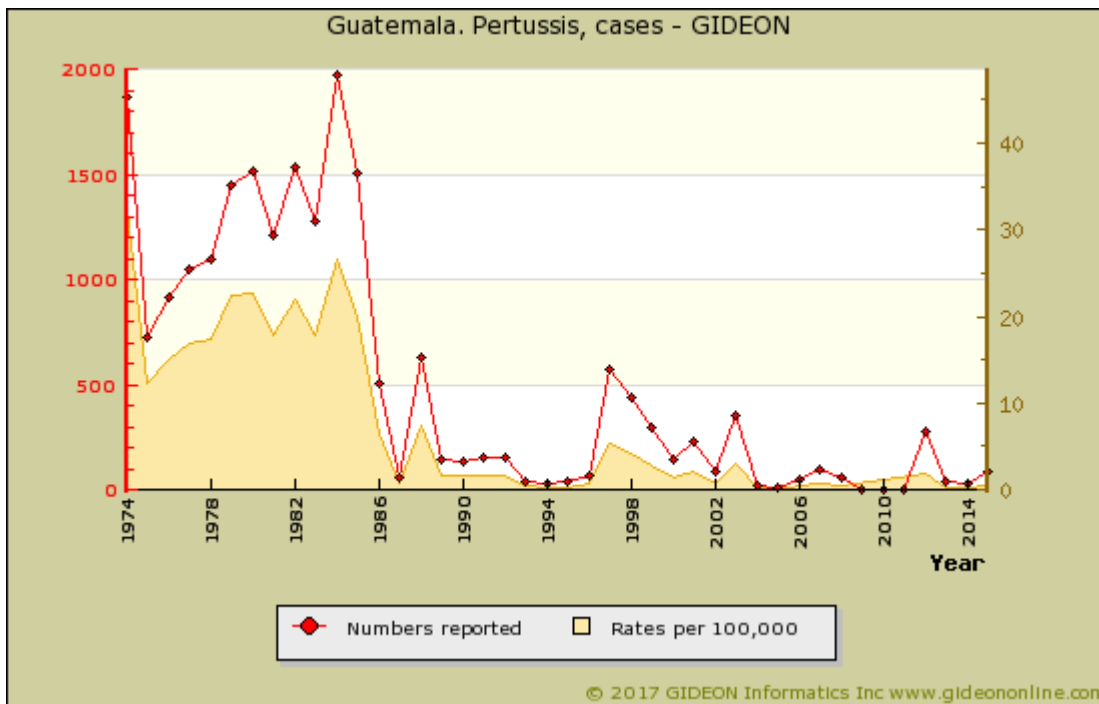
## Pertussis in Guatemala

### Vaccine Schedule:

BCG - < 1 year  
DTwP - 18 months; 4 years  
DTwPHibHepB - 2,4,6 months  
HepB - birth and 3 doses for adults in risk groups  
IPV - NA  
MMR - 12-23 months  
OPV - 2,4,6,18 months; 4 years  
Pneumo conj - 2,4 months; 1 year  
Rotavirus - 2,4 months  
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



Graph: Guatemala. Pertussis - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Guatemala. Pertussis, cases

**Notable outbreaks**

Years	Region	Cases	Deaths	Population	Notes
1997 - 1998	Quiche Department	593	17	indigenous peoples	



**Pharyngeal and cervical space infx.**

<b>Agent</b>	BACTERIUM. <i>Streptococcus pyogenes</i> , mixed oral anaerobes, etc.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Careful examination of region and X-ray (or CT scan). Smear and culture of pus if available.
<b>Typical Adult Therapy</b>	Surgical drainage and parenteral antibiotics effective against oral flora
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, painful swelling and displacement of the tongue, fauces and other intraoral structures; Dysphagia, dyspnea or jugular phlebitis may ensue in more virulent infections.
<b>Synonyms</b>	Cervical space infection, descending necrotizing mediastinitis, Lemmier's syndrome, Ludwig's angina, Post-anginal septicemia, Quinsy. ICD9: 682.0,682.1 ICD10: J36,J39.0,J39.1

**Pharyngitis - bacterial**

<b>Agent</b>	BACTERIUM. Most often <i>Streptococcus pyogenes</i> ; <i>Streptococcus</i> groups B, C, F and G are occasionally isolated
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Rarely food, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1d - 5d
<b>Diagnostic Tests</b>	Throat swab for culture or antigen detection (group A Streptococcus) ASLO titer may not indicate current infection
<b>Typical Adult Therapy</b>	Penicillin G or Penicillin V or other antistreptococcal antibiotic to maintain serum level for 10 days
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Purulent pharyngitis and cervical lymphadenopathy usually indicate streptococcal etiology Viruses (mononucleosis, Enteroviruses) and other bacteria (gonorrhea, diphtheria) should also be considered
<b>Synonyms</b>	Acute pharyngitis, Bacterial pharyngitis, Mal di gola batterica, Oral thrush, Streptococcal pharyngitis, Tonsillitis - bacterial, Vincent's angina. ICD9: 034.0,462 ICD10: J02,J03

**Philophthalmosis**

<b>Agent</b>	PARASITE - Platyhelminthes, Trematoda. <i>Philophthalmus gralli</i> , <i>Ph. lucipetus</i> , <i>Ph. lacrimosus</i>
<b>Reservoir</b>	Snail
<b>Vector</b>	None
<b>Vehicle</b>	Aquatic plants
<b>Incubation Period</b>	Unknown Less than 24 hours in birds
<b>Diagnostic Tests</b>	Identification of excised worm
<b>Typical Adult Therapy</b>	Removal of worm
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Conjunctivitis, lacrimation and the presence of an adult worm in the conjunctival sac
<b>Synonyms</b>	Oriental avian eye fluke, Oriental eye fluke, Philophthalmus. ICD9: 121.8 ICD10: b66.8

**Pityriasis rosea**

<b>Agent</b>	UNKNOWN. Human herpesvirus 7 has been implicated
<b>Reservoir</b>	Unknown
<b>Vector</b>	Unknown
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Clinical features.
<b>Typical Adult Therapy</b>	Supportive; ultraviolet B exposure is suggested <a href="#">Acyclovir</a> 400 mg PO TID X 7 days has been used in severe cases
<b>Typical Pediatric Therapy</b>	Supportive; ultraviolet B exposure is suggested
<b>Clinical Hints</b>	Herald patch followed by crops of pruritic, salmon-colored macules and papules Systemic symptoms are rare Illness resolves after 3 to 8 weeks
<b>Synonyms</b>	

## Plesiomonas infection

<b>Agent</b>	BACTERIUM. <i>Plesiomonas shigelloides</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Fish Animal, Soil, Reptile, Bird
<b>Vector</b>	None
<b>Vehicle</b>	Water, Food
<b>Incubation Period</b>	1d - 2d
<b>Diagnostic Tests</b>	Stool culture - alert laboratory when this organism is suspected. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions. <a href="#">Ciprofloxacin</a> 400 mg IV or 750 mg PO, BID Alternatives: Sulfamethoxazole / <a href="#">Trimethoprim</a> , <a href="#">Amoxicillin / Clavulanate</a> , <a href="#">Ceftriaxone</a>
<b>Typical Pediatric Therapy</b>	Stool precautions. Sulfamethoxazole / <a href="#">Trimethoprim</a> , <a href="#">Amoxicillin / Clavulanate</a> , <a href="#">Ceftriaxone</a>
<b>Clinical Hints</b>	Fever, abdominal pain, vomiting and severe diarrhea Symptoms often persist for 2 to 4 weeks In many cases, follows ingestion of shellfish or recent travel to developing countries
<b>Synonyms</b>	<i>Plesiomonas shigelloides</i> . ICD9: 008.8 ICD10: A04.8

### Plesiomonas infection in Guatemala

#### Prevalence surveys

Years	Study Group	%	Notes
2010*	patients	2	2% of American patients with travelers' diarrhea acquired in India, Guatemala or Mexico (2010 publication) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. [J Clin Microbiol 2010 Apr ;48\(4\):1417-9.](#)



**Pleurodynia**

<b>Agent</b>	VIRUS - RNA. Picornaviridae: Coxsackievirus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Fecal-oral, Fomite, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	3d - 5d
<b>Diagnostic Tests</b>	Viral culture (throat, stool). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	A late summer illness in temperate regions Sore throat followed by pleuritic chest pain Pain is often recurrent and appears in "waves" - local pressure on affected area may elicit the pain Usually resolves within one week.
<b>Synonyms</b>	Balme disease, Bamble disease, Bamie disease, Bornholm disease, Devil's grip, Drangedal disease, Epidemic benign dry pleurisy, Epidemic myalgia, Sylvest's disease. ICD9: 074.1 ICD10: B33.0

## Pneumocystis pneumonia

<b>Agent</b>	FUNGUS. Ascomycota, Archiascomycetes, Pneumocystidales: <i>Pneumocystis jiroveci</i> (now distinct from <i>Pneumocystis carinii</i> )
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	4d - 8w
<b>Diagnostic Tests</b>	Identification of organisms in induced sputum, bronchial washings, tissue. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Therapy: Sulfamethoxazole / <a href="#">Trimethoprim</a> 25 mg/5 mg/kg QID X 14d. OR <a href="#">Pentamidine</a> 4 mg/kg/d X 14d. OR <a href="#">Dapsone</a> + <a href="#">Trimethoprim</a> . OR <a href="#">Atovaquone</a> OR <a href="#">Primaquine</a> + <a href="#">Clindamycin</a>  Prophylaxis - similar, but at altered dosage. <a href="#">Dapsone</a> also used.
<b>Typical Pediatric Therapy</b>	Therapy: Sulfamethoxazole / <a href="#">Trimethoprim</a> 25 mg/5 mg/kg QID X 14d. OR <a href="#">Pentamidine</a> 4 mg/kg/d X 14d. OR <a href="#">Dapsone</a> + <a href="#">Trimethoprim</a> . OR <a href="#">Atovaquone</a> OR <a href="#">Primaquine</a> + <a href="#">Clindamycin</a>  Prophylaxis - similar, but at altered dosage.
<b>Clinical Hints</b>	Dyspnea, hypoxia and interstitial pneumonia Usually encountered in the setting of severe immune suppression (AIDS, leukemia, etc) Roentgenographic findings (typically bilateral alveolar pattern) may appear only after several days of illness
<b>Synonyms</b>	PCP, Pneumocystis carinii, Pneumocystis jiroveci. ICD9: 136.3 ICD10: B59

## Pneumocystis pneumonia in Guatemala

### Prevalence surveys

Years	Region	Study Group	%	Notes
1991 - 1992	Guatemala City	patients - HIV/AIDS	15.2	15.2% of HIV-positive outpatients (Guatemala City, 1991 to 1992). <sup>1</sup>

### References

1. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.](#)

**Pneumonia - bacterial**

<b>Agent</b>	BACTERIUM. <i>Streptococcus pneumoniae</i> , <i>Klebsiella pneumoniae</i> ssp <i>pneumoniae</i> , other aerobic and facultative gram negative bacilli, etc.
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Endogenous, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1d - 3d
<b>Diagnostic Tests</b>	Culture of sputum, blood. Analyze ("grade") sputum cytology to assess significance of culture.
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) appropriate to known or suspected pathogen
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Pneumococcal vaccine</a>
<b>Clinical Hints</b>	Rigors, pleuritic pain, hemoptysis, lobar infiltrate and leukocytosis Empyema and lung abscess suggest etiology other than pneumococcus Foul sputum with mixed flora may herald anaerobic (aspiration) pneumonia
<b>Synonyms</b>	Bacterial pneumonia, Empiema, Empeem, Empyem, Empyema, Empyeme, Lung abscess, Neumonia, Pleurisy, Pneumococcal infection - invasive, Pneumococcal pneumonia, Polmonite batterica, Streptococcus pneumoniae, Streptococcus pneumoniae - invasive. ICD9: 481,482,483,484 ICD10: J13,J14,J15,J17,J18,J85,J86

## Poliomyelitis and acute flaccid paralysis

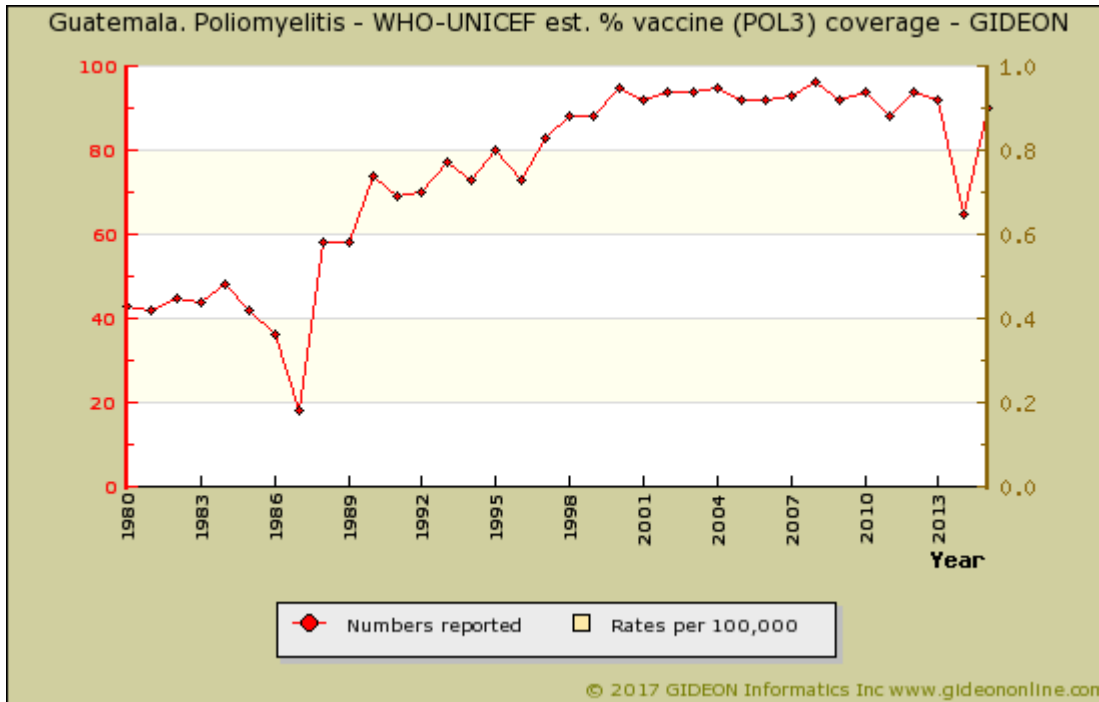
Agent	VIRUS - RNA. Picornaviridae, Picornavirus: Polio virus
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Dairy products, Food, Water, Fly, Respiratory or pharyngeal acquisition
Incubation Period	7d - 14d (range 3d - 35d)
Diagnostic Tests	Viral culture (pharynx, stool). Serology. Nucleic acid amplification.
Typical Adult Therapy	Stool precautions; supportive
Typical Pediatric Therapy	As for adult
Vaccines	<a href="#">Poliomyelitis - injectable vaccine</a> <a href="#">Poliomyelitis - oral vaccine</a>
Clinical Hints	Sore throat, headache, vomiting and myalgia followed by flaccid paralysis Meningeal involvement in 1% of cases - paralysis in only 0.1% Paralysis tends to be more extensive in adult patients
Synonyms	Acute flaccid paralysis, Heine-Medin disease, Infantile paralysis, Kinderlahmung, Kinderverlamming, Paralisi infantile, Paralysis flaccida, Paralysis flacida aguda, PFA (Paralysis Flacidas Agudas), Polio, Poliomyelite, Poliomyelitt. ICD9: 045 ICD10: A80

Although Poliomyelitis and acute flaccid paralysis is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

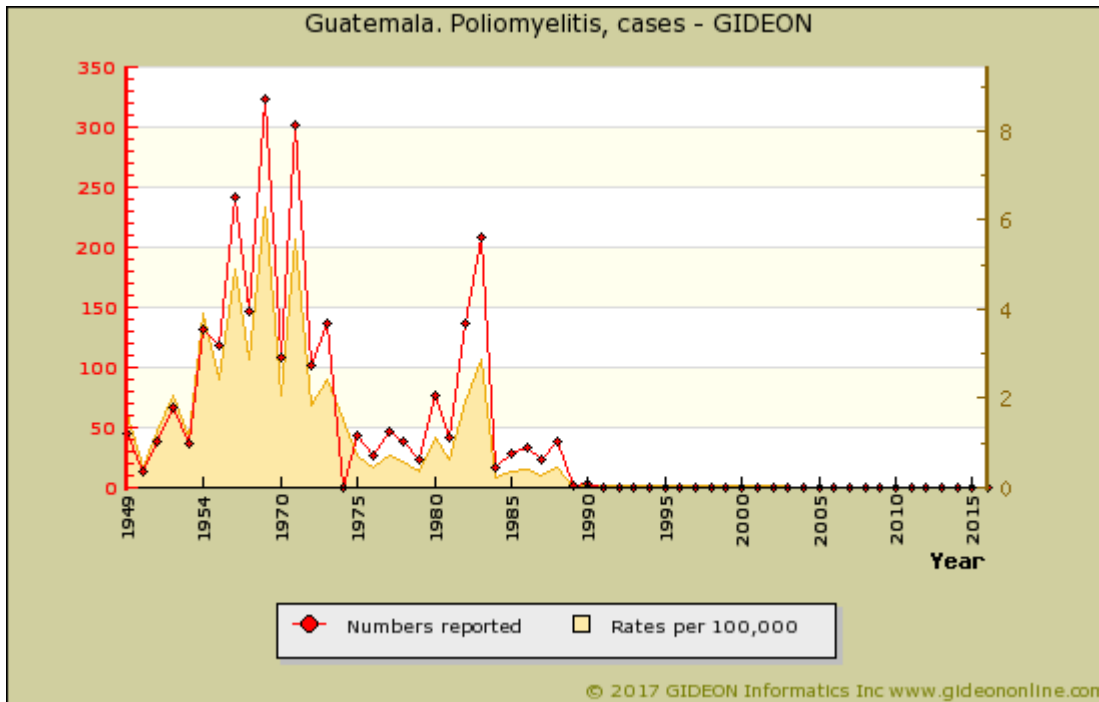
### Poliomyelitis and acute flaccid paralysis in Guatemala

#### Vaccine Schedule:

BCG - < 1 year  
DTwP - 18 months; 4 years  
DTwPHibHepB - 2,4,6 months  
HepB - birth and 3 doses for adults in risk groups  
IPV - NA  
MMR - 12-23 months  
OPV - 2,4,6,18 months; 4 years  
Pneumo conj - 2,4 months; 1 year  
Rotavirus - 2,4 months  
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



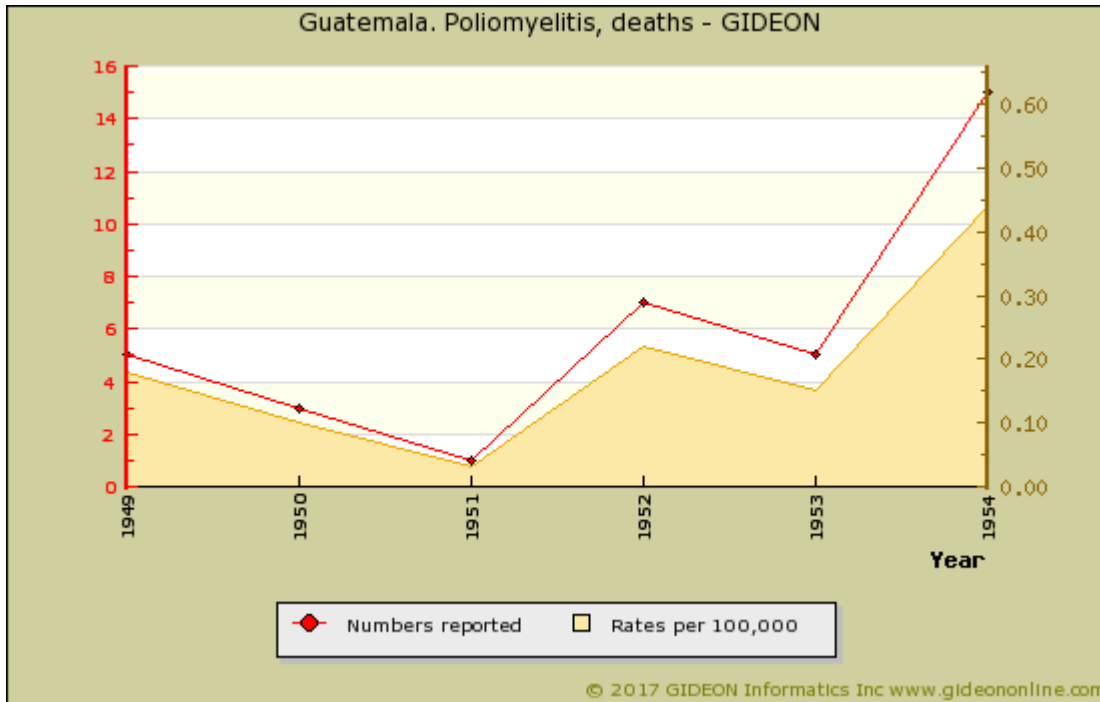
Graph: Guatemala. Poliomyelitis - WHO-UNICEF est. % vaccine (POL3) coverage



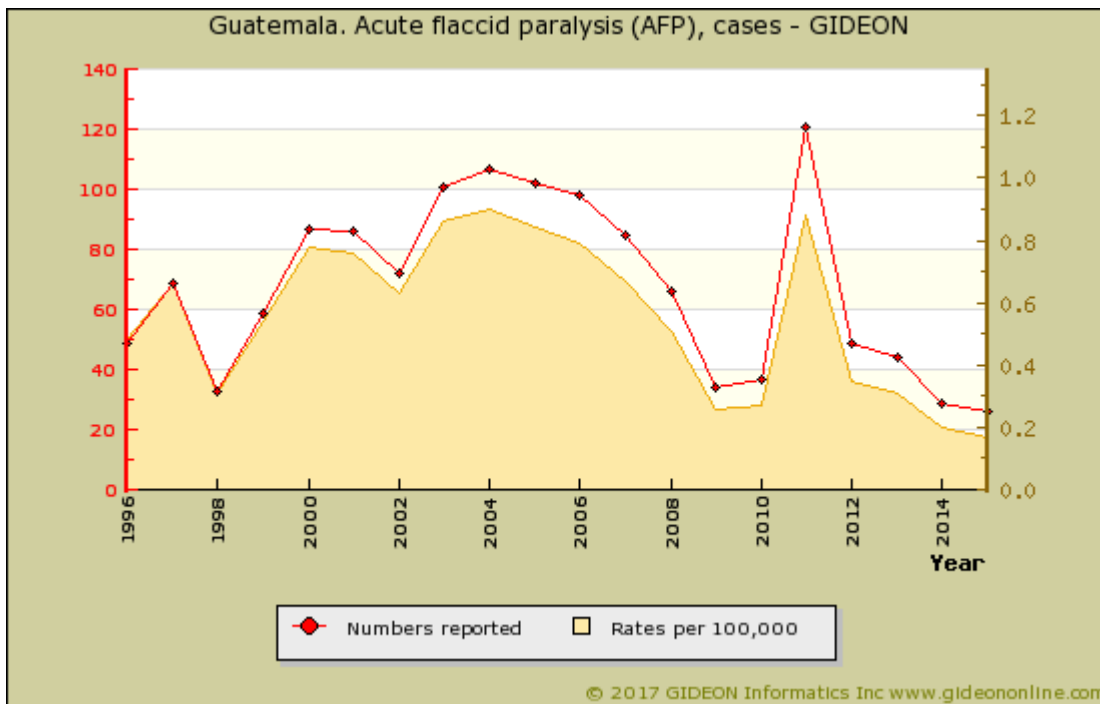
Graph: Guatemala. Poliomyelitis, cases

Notes:

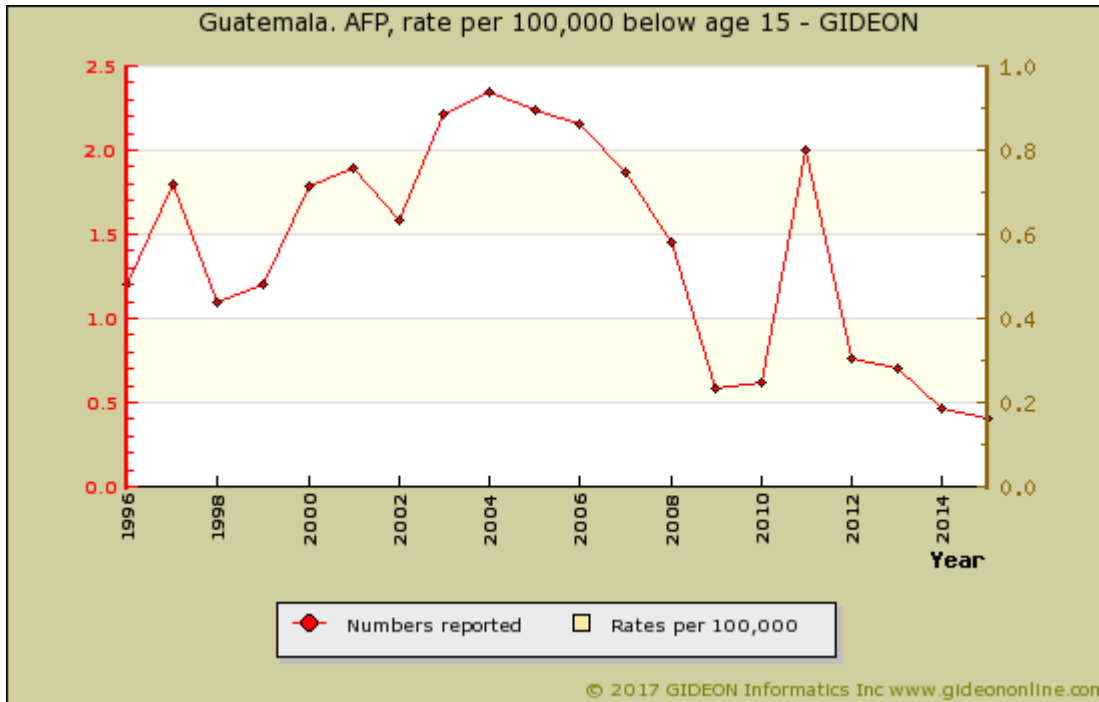
1. Historical data from references [1](#) [2](#)
2. The last case of wild virus infection was reported in 1990, and natural disease was declared eradicated as of 1991.
3. Four cases of vaccine-related polio were reported during 1989 to 1991.



Graph: Guatemala. Poliomyelitis, deaths



Graph: Guatemala. Acute flaccid paralysis (AFP), cases



Graph: Guatemala. AFP, rate per 100,000 below age 15

**Notable outbreaks**

Years	Notes
1954	Outbreak reported - additional details unavailable. <sup>3</sup>

**References**

1. Bull World Health Organ 1955 ;12(4):595-649.
2. Bull World Health Organ 1956 ;15(1-2):43-121.
3. Bull World Health Organ 1956 ;15(1-2):43-121.

## Protothecosis and chlorellosis

<b>Agent</b>	ALGA. <i>Prototheca wickerhamii</i> ; rarely <i>Pr. zopfii</i> , <i>Pr. cutis</i> Achloric algae  Chlorella spp. contain chloroplasts
<b>Reservoir</b>	Rare animal pathogens (cat, dog, cattle wild mammals).
<b>Vector</b>	None
<b>Vehicle</b>	Water, Sewage, Food, Skin trauma
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Culture on fungal media. Biopsy. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Surgical excision. There are anecdotal reports of successful therapy with <a href="#">Amphotericin B</a> , <a href="#">Ketoconazole</a> and <a href="#">Itraconazole</a> (latter 200 mg/day X 2 months) or <a href="#">voriconazole</a>
<b>Typical Pediatric Therapy</b>	As for adult ( <a href="#">Itraconazole</a> 2 mg/kg/day X 2 months)
<b>Clinical Hints</b>	May follow immune suppression or skin trauma Dermal papules, plaques, eczematoid or ulcerated lesions Olecranon bursitis is common Systemic infection reported in some cases
<b>Synonyms</b>	Chlorellosis, Prototheca, Protothecosis. ICD9: 136.8 ICD10: B99



## Pseudocowpox

<b>Agent</b>	VIRUS - DNA. Poxviridae, Parapoxvirus: Pseudocowpox virus
<b>Reservoir</b>	Cattle
<b>Vector</b>	None
<b>Vehicle</b>	Contact
<b>Incubation Period</b>	5d - 14d
<b>Diagnostic Tests</b>	Viral culture (skin lesion or exudate). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Umbilicated nodule on the hand following contact with cattle Mild regional lymphadenopathy.
<b>Synonyms</b>	Bovine papular stomatitis, Farmyard pox, Milker's nodule, Noduli mulgentinum, Paravaccinia, Sealpox. ICD9: 051.1 ICD10: B08.0

**Pyodermas (impetigo, abscess, etc)**

<b>Agent</b>	BACTERIUM. Various ( <i>Staphylococcus aureus</i> & <i>Streptococcus pyogenes</i> predominate)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous, Secretions, Contact, Trauma
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Clinical diagnosis usually sufficient. Aspiration of lesion for smear and culture may be helpful in some cases.
<b>Typical Adult Therapy</b>	Antibiotic directed at likely pathogens (Group A Streptococcus and Staphylococcus aureus)
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Impetigo characterized by vesicles which progress to pustules ("honey-colored pus") Highly contagious May be complicated by acute glomerulonephritis
<b>Synonyms</b>	Acne vulgaris, Carbonchio, Carbuncle, Follicolite, Follicolite, Folliculite, Folliculitis, Follikulitis, Foroncolosi, Forunculose, Forunculosi, Furunculosis, Furunkulose, Furunulose, Hydradenitis, Impetigine, Impetigo, Paronychia, Pyoderma. ICD9: 680,684,686 ICD10: L01,L02,L08.0,L73.2

## Pyomyositis

<b>Agent</b>	BACTERIUM. Usually <i>Staphylococcus aureus</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Ultrasonography or CT scan.
<b>Typical Adult Therapy</b>	Antibiotic directed at confirmed or suspected pathogen (usually <i>Staphylococcus aureus</i> ); drainage
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Pain, swelling and "woody" induration of a large muscle (usually lower limb or trunk) Associated with fever and leukocytosis Often follows trauma to the involved region Lymphadenopathy uncommon; leucocytosis in most cases.
<b>Synonyms</b>	Tropical pyomyositis. ICD9: 040.81 ICD10: M60.0

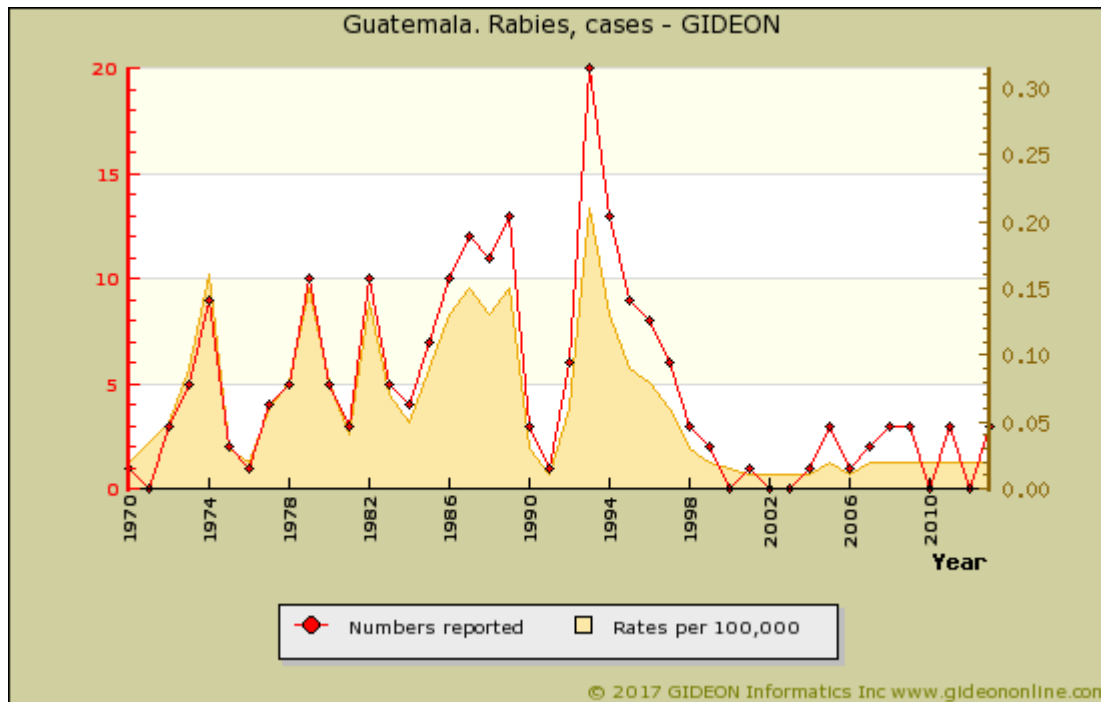
**Q-fever**

<b>Agent</b>	BACTERIUM. <i>Coxiella burnetii</i> Intracellular organism related to <a href="#">Rickettsiae</a>
<b>Reservoir</b>	Cattle, Sheep, Goat, Bird, Fish, Rodent, Rabbit, Tick, Bandicoot, Marsupial, Dog, Cat
<b>Vector</b>	None
<b>Vehicle</b>	Air, Dust, Secretions, Dairy products, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	18d - 21d (range 4d - 40d)
<b>Diagnostic Tests</b>	Serology. Culture possible in specialized laboratories. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg BID X 2w OR Fluoroquinolone Add <a href="#">Hydroxychloroquine</a> 600 mg per day if endocarditis
<b>Typical Pediatric Therapy</b>	Age < 8 years: <a href="#">Erythromycin</a> 10 mg/kg QID X 2 weeks Age >= 8 years: <a href="#">Doxycycline</a> 100 mg BID X 2 weeks
<b>Vaccine</b>	<a href="#">Q fever vaccine</a>
<b>Clinical Hints</b>	Headache, myalgia, cough and hepatic dysfunction Hepatosplenomegaly, "F.U.O." and endocarditis are encountered Proximity to farming or animals during 2 to 4 weeks preceding illness Most infections resolve in 1 to 2 weeks Reported case-fatality rate is 1.5%
<b>Synonyms</b>	Balkan grippe, Candidatus <i>Coxiella massiliensis</i> , <i>Coxiella burnetii</i> , Febbre australiana, Febre Q, Nine Mile fever, Q-Fieber, Q-koorts, Query fever, Red River fever. ICD9: 083.0 ICD10: A78

## Rabies

<b>Agent</b>	VIRUS - RNA. Rhabdoviridae, Mononegavirales, Lyssavirus: Rabies virus. Other human Lyssaviruses = Mokola, Duvenhage, European Bat (EBL)
<b>Reservoir</b>	Dog, Fox, Skunk, Jackal, Wolf, Cat, Raccoon, Mongoose, Bat, Rodent, Rabbit
<b>Vector</b>	None
<b>Vehicle</b>	Saliva, Bite, Transplants, Air (bat aerosol), Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1m - 3m (range 4d to 19 years !)
<b>Diagnostic Tests</b>	Viral culture & direct immunofluorescence of saliva, CSF, corneal smears. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Strict isolation; supportive. The Milwaukee protocol (prolonged deep sedation and support) has been successful in some cases.  See Vaccines module for pre- and post-exposure schedules
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">Rabies vaccine</a> <a href="#">Rabies immune globulin</a>
<b>Clinical Hints</b>	Follows animal bite (rarely lick) - often after months Agitation, confusion, seizures, painful spasms of respiratory muscles Progressive paralysis, coma and death Case-fatality rate exceeds 99.9%
<b>Synonyms</b>	Aravan, Australian bat lyssavirus, Ballina, BBLV, Bokeloh bat lyssavirus, Duvenhage, EBL, European bat Lyssavirus, Hondsdolheid, Hydrophobia, Ikoma lyssavirus, Irkut, Khujand, Lyssa, Mokola, Pteropus lyssavirus, Rabia, Rage, Raiva, Saint Hubert's disease, Shimoni bat virus, Tollwut, West Caucasian bat, Wutkrankheit. ICD9: 071 ICD10: A82

### Rabies in Guatemala



Graph: Guatemala. Rabies, cases

Notes:

1. The average incidence was 4 cases per year during 1970 to 1979; 5.4 per year during 1980 to 1984; 10.6 per year during 1985 to 1989; 9 during 1990 to 1994.

Individual years:

1993 - All from dogs.

1994 - All from dogs. 8,842 humans were given post-exposure prophylaxis.

1996 - Six from dogs.

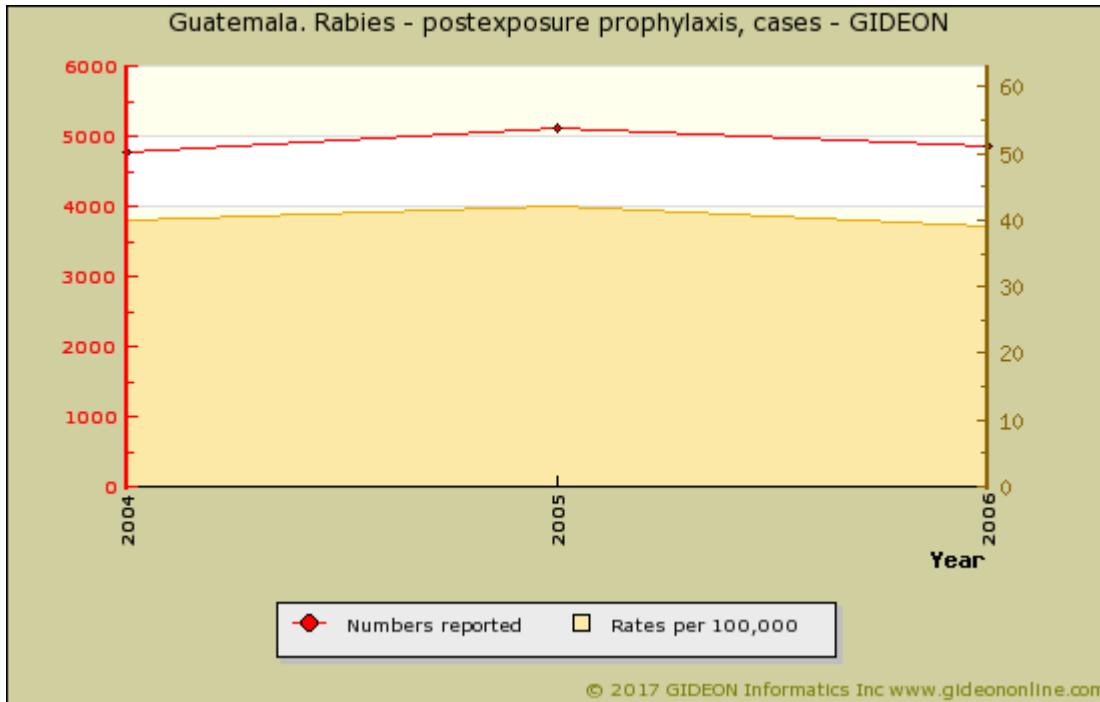
1999 - Both from dogs.

2007 - A case of rabies was reported in a pregnant woman. <sup>1</sup>

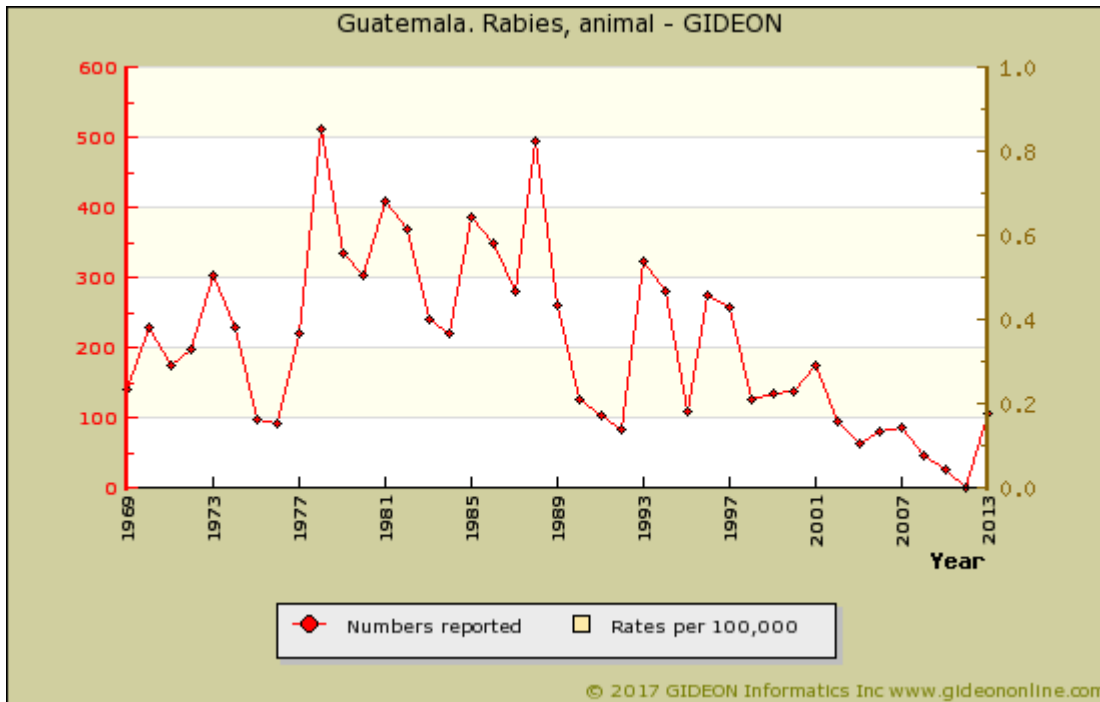
**Exported cases:**

1984 - A patient bitten by a dog in Guatemala died of rabies in the United States. <sup>2</sup>

2013 - A Guatemalan immigrant died of rabies in Texas. <sup>3 4</sup>



Graph: Guatemala. Rabies - postexposure prophylaxis, cases



Graph: Guatemala. Rabies, animal

Notes:

Individual years:

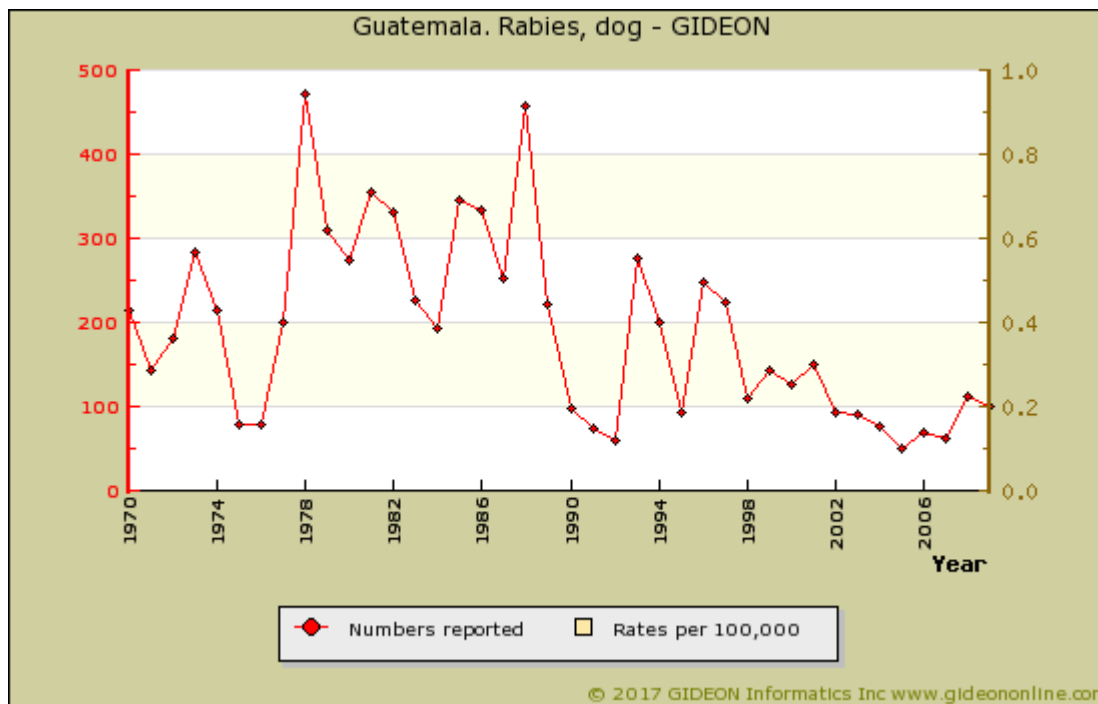
1994 - 85.4% dogs, 11.1% ruminants, 3.6% cats.

1996 - 90.8% dogs, 5.9% ruminants.

1998 - Included 9 ruminants and 4 cats.

No rabid bats were reported during 1998 to 2007

- Two rabid bats were identified during 2009 to 2011 (0.2% of bats sampled), and 7% of bats were found to be seropositive.



Graph: Guatemala. Rabies, dog

**References**

1. ProMED <promedmail.org> archive: 20070713.2241
2. JAMA 1985 May 24-31;253(20):2953-4.
3. MMWR Morb Mortal Wkly Rep 2014 May 23;63(20):446-9.
4. ProMED <promedmail.org> archive: 20130616.1775355
5. PLoS Negl Trop Dis 2014 ;8(7):e3070.



**Rat bite fever - spirillary**

<b>Agent</b>	BACTERIUM. <i>Spirillum minus</i> An aerobic gram-negative spirochete
<b>Reservoir</b>	Rat, Mouse, Cat
<b>Vector</b>	None
<b>Vehicle</b>	Bite
<b>Incubation Period</b>	7d - 21d (range 5d - 40d)
<b>Diagnostic Tests</b>	Dark-field exam of wound. Animal inoculation.
<b>Typical Adult Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 875 / 125 mg PO BID X 7d. OR Procaine <a href="#">Penicillin G</a> 600,000u IM q12h X 7d. OR <a href="#">Doxycycline</a> 200 mg BID X 7d
<b>Typical Pediatric Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 10 mg/kg PO BID X 7d OR Procaine <a href="#">Penicillin G</a> 25,000u/kg IM q12h X 7d
<b>Clinical Hints</b>	Lymphadenopathy, myalgia, maculopapular rash and recurrent fever Symptoms begin 1 to 3 weeks after rat bite Infection resolves after 3 to 6 days The case-fatality rate is 6%
<b>Synonyms</b>	Sodoku, Spirillosis, Spirillum minor, Spirillum minus. ICD9: 026.0 ICD10: A25.0

**Rat bite fever - streptobacillary**

<b>Agent</b>	BACTERIUM. <i>Streptobacillus moniliformis</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Rat, Squirrel, Weasel, Turkey
<b>Vector</b>	None
<b>Vehicle</b>	Secretions, Bite, Dairy products
<b>Incubation Period</b>	3d - 10d (range 1d - 22d)
<b>Diagnostic Tests</b>	Culture of blood or joint fluid. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 875 /1 25 mg PO BID X 7d. OR <a href="#">Doxycycline</a> 100 mg PO BID X 7d
<b>Typical Pediatric Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 10 mg/kg TID X 7d. OR (if age>8 years) <a href="#">Doxycycline</a> 2 mg/kg PO BID X 7 days (maximum 200 mg/day)
<b>Clinical Hints</b>	Headache, myalgia, maculopapular rash and arthralgia or arthritis History of a rat bite during the preceding 1 to 3 weeks in most cases Infection has also been acquired from contaminated milk The case-fatality rate is 10%.
<b>Synonyms</b>	Haverhill fever, Streptobacillosis, Streptobacillus moniliformis. ICD9: 026.1 ICD10: A25.1

## Relapsing fever

Agent	BACTERIUM. <i>Borrelia</i> spp. A microaerophilic spirochete
Reservoir	Human, Tick, Rodent
Vector	Tick ( <i>Ornithodoros</i> ), Louse ( <i>Pediculus</i> )
Vehicle	Blood, Blood products
Incubation Period	7d - 8d (range 2d - 18d)
Diagnostic Tests	Examination of blood smears (thick and thin smears). Some species ( <i>B. hermsii</i> ) may grow in BSK II medium.
Typical Adult Therapy	<a href="#">Doxycycline</a> 100 mg PO BID X 7d. OR <a href="#">Erythromycin</a> 500 mg QID X 7d  A single dose of <a href="#">Tetracycline</a> 500 mg or <a href="#">erythromycin</a> 500 mg may suffice for louse-borne infection
Typical Pediatric Therapy	<a href="#">Chloramphenicol</a> 12.5 mg/kg PO QID X 7d. OR <a href="#">Erythromycin</a> 10 mg/kg QID X 7d
Clinical Hints	Headache, myalgia, hepatosplenomegaly, rash and relapsing illness Louse-borne (vs. tick borne) infection characterized by higher case-fatality rate, fewer relapses and higher incidence of hepatosplenomegaly, jaundice and neurological complications
Synonyms	Bilious typhoid, <i>Borrelia anserina</i> , <i>Borrelia braziliensis</i> , <i>Borrelia caucasica</i> , <i>Borrelia coriacea</i> , <i>Borrelia crocidurae</i> , <i>Borrelia dipodilli</i> , <i>Borrelia duttonii</i> , <i>Borrelia graingeri</i> , <i>Borrelia hispanica</i> , <i>Borrelia latyschewii</i> , <i>Borrelia mazzottii</i> , <i>Borrelia merionesi</i> , <i>Borrelia microti</i> , <i>Borrelia miyamotoi</i> , <i>Borrelia parkeri</i> , <i>Borrelia persica</i> , <i>Borrelia queenslandica</i> , <i>Borrelia recurrentis</i> , <i>Borrelia theileri</i> , <i>Borrelia turicatae</i> , <i>Borrelia uzbekistana</i> , <i>Borrelia venezuelensis</i> , Borreliosis, Candidatus <i>Borrelia algerica</i> , Candidatus <i>Borrelia kalaharica</i> , Famine fever, Febbre recidiva, Febbre ricorrente, Febris recurrens, Fiebre recurrente, Lauseruckfallfieber, Mianeh fever, Ruckfall fieber, Tilbakefallsfeber, Tilbakefallsfever, Vagabond fever, Yellow famine fever, Yellow plague. ICD9: 087.9,087.0,087.1 ICD10: A68

### Relapsing fever in Guatemala

Three cases were reported in 1979, and 10 in 1980.

The local agent is *Borrelia mazzottii* (vector *Ornithodoros talaje*).

## Respiratory syncytial virus infection

<b>Agent</b>	VIRUS - RNA. Paramyxoviridae, Pneumovirinae: Human respiratory syncytial virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Infected secretions (hands), Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2d - 8d
<b>Diagnostic Tests</b>	Viral culture or DFA (nasal and other respiratory secretions). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Ribavirin</a> aerosol 20 mg/ml for 12h/d X 3 to 5d (severe infections). Effectiveness not proven
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">RSV immune globulin</a>
<b>Clinical Hints</b>	Rhinorrhea, cough, wheezing, bronchiolitis and respiratory distress Most cases occur during infancy
<b>Synonyms</b>	Chimpanzee coryza agent, Respiratory syncytial virus, RSV. ICD9: 079.6,480.1 ICD10: B97.4,J12.1

## Respiratory syncytial virus infection in Guatemala

Rates of RSV infection peak during wet months (2004 to 2012). <sup>1</sup>

### Prevalence surveys

Years	Study Group	%	Notes
2007 - 2010	children	25	25% of children below age 5 years hospitalized for acute respiratory infection (2007 to 2010) <sup>2</sup>
2007 - 2012	patients	24	24% of patients hospitalized with acute respiratory tract infection (2007 to 2012) <sup>3</sup>
2007 - 2012	patients	12-24	24% of inpatients and 12% of outpatients with acute respiratory infection (2007 to 2012) <sup>4</sup>

### References

1. [J Infect Dis 2013 Dec 15;208 Suppl 3:S246-54.](#)
2. [Pediatr Infect Dis J 2013 Jun ;32\(6\):629-35.](#)
3. [Influenza Other Respir Viruses 2014 Jul ;8\(4\):414-21.](#)
4. [J Infect Dis 2013 Dec 15;208 Suppl 3:S197-206.](#)

## Respiratory viruses - miscellaneous

<b>Agent</b>	VIRUS - RNA and DNA Paramyxoviridae: Mononegavirales Human Metapneumovirus  Coronaviridae: New Haven Coronavirus, HKU1  Parvovirinae: Human Bocavirus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Secretions (on hands), Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Viral culture. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	NA
<b>Typical Pediatric Therapy</b>	NA
<b>Clinical Hints</b>	Rhinorrhea, cough, wheezing, bronchiolitis and respiratory distress Age distribution and prominence of specific signs / symptoms vary somewhat among the specific viruses in this category
<b>Synonyms</b>	Acanthamoeba polyphaga mimivirus, Bat reovirus, Bocavirus, Bradford coccus, Cardiovirus, Coronavirus HKU1, Coronavirus NL63, Encephalomyocarditis Virus, HCoV-HKU1, HCoV-NL63, HK23629/07, HKU1, HRV-A, HRV-B, HRV-C, Human Bocavirus, Human Coronavirus NL63, Human CoV 229E, Human CoV OC43, Human metapneumovirus, Human rhinovirus, Kampar, Karolinska Institutet virus, KI virus, Melaka, Metapneumovirus, Mimivirus, New Haven coronavirus, Pulau, Rhinovirus, Small Anellovirus, Tioman virus, Torque tenovirus, Torquetenovirus, Washington University virus, WU polyomavirus, WU virus. ICD9: 079.89 ICD10: B34.2,J12.8

### Respiratory viruses - miscellaneous in Guatemala

#### Prevalence surveys

Years	Study Group	%	Notes
2007 - 2011	children	52.6	Viruses were identified in 52.6% of patients hospitalized for acute respiratory infection - 71.8% of infants below age 1 year (2007 to 2011) <sup>1</sup>
2007 - 2012	patients	9	Human metapneumovirus was identified in 9% of patients hospitalized with acute respiratory tract infection, and RSV in 24% (2007 to 2012) <sup>2</sup>

#### References

1. [PLoS One 2013 ;8\(12\):e83600.](#)
2. [Influenza Other Respir Viruses 2014 Jul ;8\(4\):414-21.](#)

**Reye's syndrome**

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Clinical diagnosis.
<b>Typical Adult Therapy</b>	Electrolyte & glucose management, ? enemas, ? dialysis
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Vomiting, lethargy, coma, seizures, hepatomegaly, hypoglycemia and elevated blood ammonia concentration Patients are usually anicteric Follows viral infection; aspirin ingestion is often implicated.
<b>Synonyms</b>	Reye syndrome. ICD9: 331.81 ICD10: G93.7

**Rheumatic fever**

Agent	BACTERIUM. <i>Streptococcus pyogenes</i> A facultative gram-positive coccus
Reservoir	Human
Vector	None
Vehicle	Droplet
Incubation Period	1w - 5w
Diagnostic Tests	Clinical diagnosis.
Typical Adult Therapy	Supportive; salicylates
Typical Pediatric Therapy	As for adult
Clinical Hints	Migratory arthritis, fever, carditis, chorea, subcutaneous nodules, erythema marginatum and leukocytosis In most cases, illness follows overt pharyngitis after 1 to 5 weeks An attack of rheumatic fever will persist for approximately 3 months.
Synonyms	Febbre reumatica. ICD9: 390,391 ICD10: I00,I01,I02

**Rheumatic fever in Guatemala**

Mortality rates of 0.2 per 100,000 per year are reported.

## Rhinoscleroma and ozena

<b>Agent</b>	BACTERIUM. <i>Klebsiella pneumoniae</i> ssp <i>ozaenae</i> and <i>Klebsiella pneumoniae</i> ssp <i>rhinoscleromatis</i> Facultative gram-negative bacilli
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Secretions, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Culture. Biopsy. Nucleic acid amplification. Advise laboratory when this diagnosis is suspected.
<b>Typical Adult Therapy</b>	Rhinoscleroma: <a href="#">Streptomycin</a> , often with systemic or topical <a href="#">Rifampin</a> - for 3 to 6 weeks; fluoroquinolones also appear to be effective.  Ozena: <a href="#">Ciprofloxacin</a> or Sulfamethoxazole/trimethoprim for 3 months
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Rhinoscleroma: - Chronic fetid nasal discharge - A crusting mass may develop in the nose - Infection may extend to the larynx, trachea of paranasal sinuses  Ozena: - Chronic rhinitis progressing to atrophy of the nasal mucosa - Extension to the larynx and systemic infection have been reported
<b>Synonyms</b>	<i>Klebsiella pneumoniae</i> ssp <i>ozaenae</i> , Ozena, Rhinoscleroma. ICD9: 040.1 ICD10: J31.0



## Rhodococcus equi infection

Agent	BACTERIUM. <i>Rhodococcus equi</i> An aerobic gram-positive coccobacillus
Reservoir	Farm animal, Farm soil
Vector	None
Vehicle	Inhalation, Contact, Ingestion
Incubation Period	Unknown
Diagnostic Tests	Culture of blood, body fluids and secretions. Advise laboratory when these organisms are suspected.
Typical Adult Therapy	Two drugs from the following, administered for two months: <a href="#">Levofloxacin</a> , <a href="#">Rifampin</a> , <a href="#">Azithromycin</a> , <a href="#">Ciprofloxacin</a> , <a href="#">Imipenem</a> , <a href="#">Vancomycin</a>
Typical Pediatric Therapy	Two drugs from the following, administered for two months: <a href="#">Levofloxacin</a> , <a href="#">Rifampin</a> , <a href="#">Azithromycin</a> , <a href="#">Imipenem</a> , <a href="#">Vancomycin</a>
Clinical Hints	Most often presents as pleuropulmonary infection in an immune-suppressed patient 40% of patients recall recent contact with farm or farm animals
Synonyms	Rhodococcus. ICD9: 027.9 ICD10: A92.8

## Rickettsia felis infection

<b>Agent</b>	BACTERIUM. <i>Rickettsia felis</i>
<b>Reservoir</b>	Opossum ( <i>Didelphis marsupialis</i> ), Flying squirrel, Raccoon, Cat, Flea, Dog
<b>Vector</b>	Flea ( <i>Ctenocephalides felis</i> , <i>Pulex irritans</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Serology (IFA). Nucleic acid amplification. Note that Weil-Felix reaction may be positive (OX-19).
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 3 to 5d. OR <a href="#">Chloramphenicol</a> 500 mg PO QID X 3 to 5d
<b>Typical Pediatric Therapy</b>	<a href="#">Doxycycline</a> 2 mg/kg PO BID X 3 to 5d (maximum 200 mg/day). OR <a href="#">Chloramphenicol</a> 10 mg/kg PO QID X 3 to 5d
<b>Clinical Hints</b>	Disease mimics endemic typhus Fever, headache and myalgia Macular rash present in 20% to 50% of patients, and is most prominent on the trunk and abdomen History of recent contact with opossum or other small mammal
<b>Synonyms</b>	California pseudotyphus, Cat flea typhus, ELB agent. ICD9: 081.1 ICD10: A79.8

### Rickettsia felis infection in Guatemala

#### Prevalence surveys

Years	Study Group	%	Notes
2009 - 2010	fleas	64	64% of dog and cat flea ( <i>Ctenocephalides felis</i> ) pools (2009 to 2010) <sup>1</sup>

#### References

1. [Am J Trop Med Hyg 2012 Jun ;86\(6\):1054-6.](#)

## Rotavirus infection

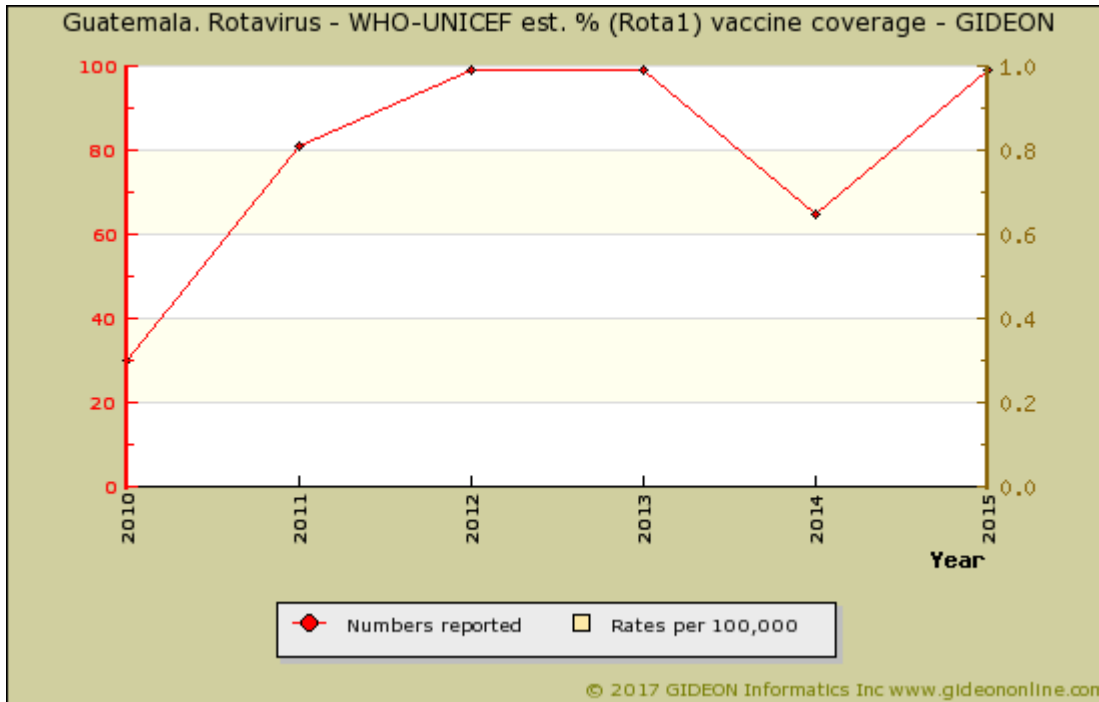
Agent	VIRUS - RNA. Reoviridae: Rotavirus
Reservoir	Human, Pig
Vector	None
Vehicle	Fecal-oral, Water
Incubation Period	2.0 d (range 12h - 3d)
Diagnostic Tests	Stool assay for viral antigen. Serology. Nucleic acid amplification.
Typical Adult Therapy	Stool precautions; supportive
Typical Pediatric Therapy	As for adult
Vaccine	<a href="#">Rotavirus vaccine</a>
Clinical Hints	Vomiting, diarrhea and mild fever The illness lasts approximately 1 week, and is most severe in infancy Fatal cases are associated with dehydration and electrolyte imbalance
Synonyms	Rotavirus. ICD9: 008.61 ICD10: A08.0

## Rotavirus infection in Guatemala

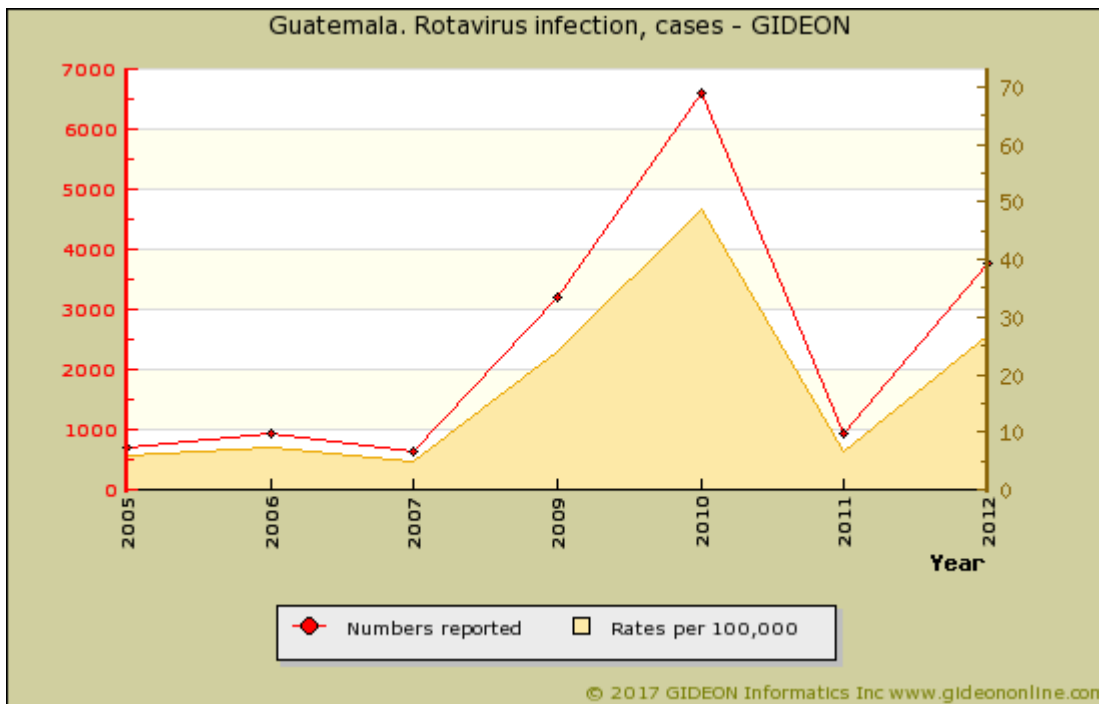
### Vaccine Schedule:

BCG - < 1 year  
DTwP - 18 months; 4 years  
DTwPHibHepB - 2,4,6 months  
HepB - birth and 3 doses for adults in risk groups  
IPV - NA  
MMR - 12-23 months  
OPV - 2,4,6,18 months; 4 years  
Pneumo conj - 2,4 months; 1 year  
Rotavirus - 2,4 months  
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)

Routine vaccination was introduced in 2010, and was followed by a reduction in Rotavirus disease . [1](#) [2](#) [3](#)



Graph: Guatemala. Rotavirus - WHO-UNICEF est. % (Rota1) vaccine coverage



Graph: Guatemala. Rotavirus infection, cases

Notes:

- 1. Confirmed cases only
- Individual years:
- 2005 - Included 8 fatal cases

**Prevalence surveys**

Years	Region	Study Group	%	Notes
2005		children	13.5	13.5% of hospitalizations for diarrhea among children below age 5 years (2005)
2006		children	52	52% of pediatric hospitalizations for diarrhea in 2006 <sup>4</sup>
2007 - 2009	Santa Rosa	children	54-79	79% of hospitalized and 54% of ambulatory children below age 5 years, with diarrhea (Santa Rosa, 2007 to 2009) <sup>5</sup>
2010		children	48	48% of pediatric hospitalizations for diarrhea in 2010 <sup>6</sup>

**Notable outbreaks**

Years	Region	Cases	Deaths	Population	Notes
2004	multiple locations	35,870	50	children	Outbreak in Ixcán, Peten Sur Oriente, Escuintla, Guatemala, Sacatepequez, Suchitepequez, Quetzaltenango, San Marcos, El Progreso, and Zacapa.
2005	Chimaltenango	1,021	2	children	<sup>7</sup>
2010					Outbreak reported - additional details unavailable. <sup>8</sup>

**References**

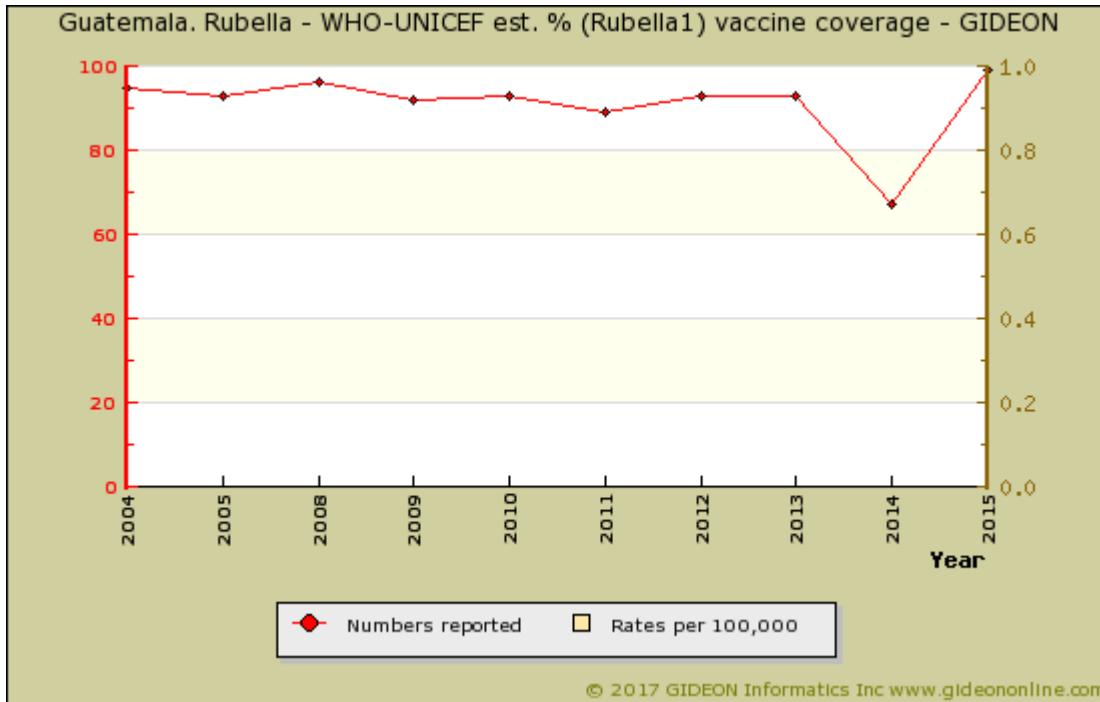
1. MMWR Morb Mortal Wkly Rep 2011 Dec 2;60(47):1611-4.
2. Clin Infect Dis 2016 May 1;62 Suppl 2:S121-6.
3. Clin Infect Dis 2016 May 1;62 Suppl 2:S121-6.
4. MMWR Morb Mortal Wkly Rep 2011 Dec 2;60(47):1611-4.
5. Trop Med Int Health 2012 Feb ;17(2):254-9.
6. MMWR Morb Mortal Wkly Rep 2011 Dec 2;60(47):1611-4.
7. ProMED <promedmail.org> archive: 20060102.0011
8. ProMED <promedmail.org> archive: 20100330.1009

Rubella	
Agent	VIRUS - RNA. Togaviridae: Rubivirus, Rubella virus
Reservoir	Human
Vector	None
Vehicle	Contact, Air, Transplacental, Breastfeeding, Respiratory or pharyngeal acquisition
Incubation Period	16d - 18d (range 14d - 23d)
Diagnostic Tests	Viral culture (throat, urine). Serology. Nucleic acid amplification.
Typical Adult Therapy	Respiratory precautions. Supportive
Typical Pediatric Therapy	As for adult
Vaccines	<a href="#">Rubella vaccine</a> <a href="#">Rubella - Mumps vaccine</a> <a href="#">Measles-Mumps-Rubella vaccine</a> <a href="#">Measles-Rubella vaccine</a>
Clinical Hints	Maculopapular rash following a one-day prodrome of coryza and headache Post auricular lymphadenopathy Arthralgia and arthritis are encountered in adults Severe thrombocytopenia or encephalitis may follow acute infection Congenital rubella characterized by hearing loss, congenital heart disease, cataracts, mental retardation and other abnormalities
Synonyms	Epidemic roseola, German measles, Roda hund, Rode hond, Rode hunder, Rodehond, Rosolia, Roteln, Rubeola [Spanish], Three-day measles. ICD9: 056 ICD10: B06

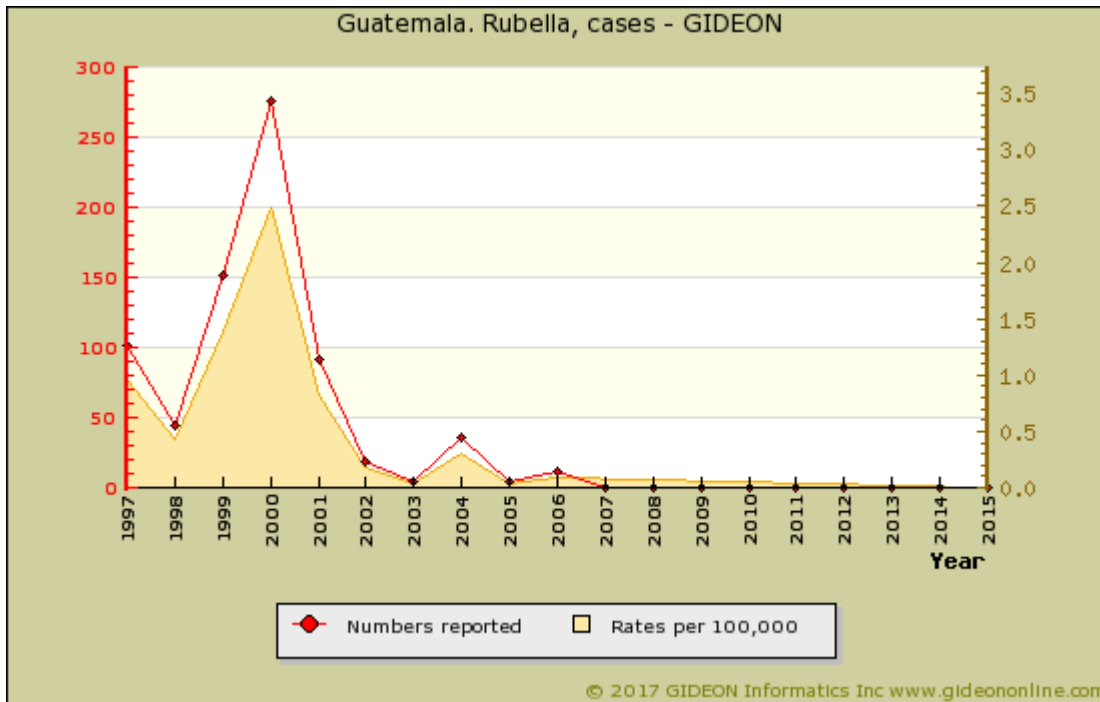
## Rubella in Guatemala

### Vaccine Schedule:

BCG - < 1 year  
DTwP - 18 months; 4 years  
DTwPHibHepB - 2,4,6 months  
HepB - birth and 3 doses for adults in risk groups  
IPV - NA  
MMR - 12-23 months  
OPV - 2,4,6,18 months; 4 years  
Pneumo conj - 2,4 months; 1 year  
Rotavirus - 2,4 months  
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



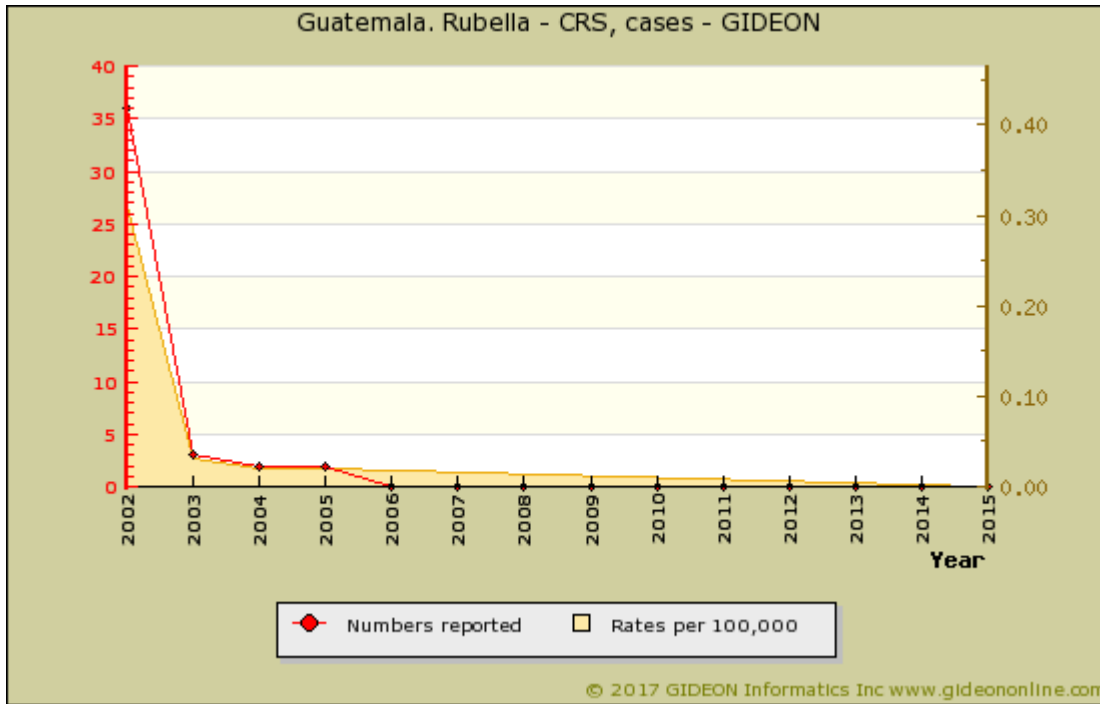
Graph: Guatemala. Rubella - WHO-UNICEF est. % (Rubella1) vaccine coverage



Graph: Guatemala. Rubella, cases

Notes:

- 1. Confirmed cases only



Graph: Guatemala. Rubella - CRS, cases



## Salmonellosis

Agent	BACTERIUM. <i>Salmonella</i> A facultative gram-negative bacillus
Reservoir	Mammal, Bird, Reptile
Vector	None
Vehicle	Food, Milk, Eggs, Poultry Shellfish, Meat, Vegetables, Fruit, Fecal-oral Breastfeeding, Fly
Incubation Period	12h - 36h (range 6h - 5d)
Diagnostic Tests	Culture (stool, blood, infected tissue). Serology.
Typical Adult Therapy	Stool precautions. Therapy not indicated for uncomplicated diarrhea; if necessary, treat per antibiogram
Typical Pediatric Therapy	As for adult
Clinical Hints	Fever, chills and watery diarrhea 12 to 24 hours after ingestion of eggs, meat, poultry Fecal leucocytes present Fever resolves in 2 days; but diarrhea may persist for up to 7 days (occasionally weeks)
Synonyms	Salmonellosen, Salmonellosi. ICD9: 003 ICD10: A02

### Salmonellosis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2010*	multiple locations	travelers	2	American patients with travelers' diarrhea acquired in India, Guatemala or Mexico <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

#### Notable outbreaks

Years	Region	Cases	Source	Pathogen	Notes
2011	foreign country	12	fruit - canteloupe	panama	Outbreak in the United States associated with contaminated cantaloupes imported from Guatemala <sup>2</sup>

#### References

1. J Clin Microbiol 2010 Apr ;48(4):1417-9.
2. ProMED <promedmail.org> archive: 20110325.0948

**Sarcocystosis**

<b>Agent</b>	PARASITE - Protozoa. Coccidea, Eimeriida: <i>Sarcocystis bovihominis</i> or <i>S. suihominis</i>
<b>Reservoir</b>	Cattle, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Meat, Water
<b>Incubation Period</b>	9d - 39d
<b>Diagnostic Tests</b>	Identification of cysts in stool.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Diarrhea and abdominal pain of varying severity Muscle pain and eosinophilia occasionally encountered
<b>Synonyms</b>	Isospora hominis, Kudoa, Sarcocystiasis, Sarcocystis, Sarcosporidiosis. ICD9: 136.5 ICD10: A07.8

## Scabies

<b>Agent</b>	PARASITE - Arthropod. Arachnid, Acarina (Mite), Sarcoptidae: <i>Sarcoptes (Acarus) scabiei</i>
<b>Reservoir</b>	Human
<b>Vector</b>	Mite
<b>Vehicle</b>	Contact, Sexual contact
<b>Incubation Period</b>	3d - 42d
<b>Diagnostic Tests</b>	Identification of mites in skin scrapings.
<b>Typical Adult Therapy</b>	Permethrin 5%. OR Lindane. OR Crotamiton 10% OR <a href="#">Ivermectin</a> 150 to 200 ug/kg PO as single dose
<b>Typical Pediatric Therapy</b>	Permethrin 5%. OR Lindane. OR Crotamiton 10% OR <a href="#">Ivermectin</a> 200 mcg/kg PO (> 15 kg body weight)
<b>Clinical Hints</b>	Intensely pruritic papules, vesicles and burrows Lesions prominent at interdigital webs, wrists, elbows, axillae, perineal region, buttocks and penis Pruritus is most intense at night Severe psoriaform infestation (Norwegian scabies) may affect debilitated patients
<b>Synonyms</b>	Cheyletiella, Cheyletiella infestation, Escabiose, Escabiosis, Histiostomatid mites, Kratze, Mange, Ornithonyssus, Pyemotes, <i>Sarcoptes scabiei</i> , Sarna, Scabbia, Skabies, Tropical rat mite. ICD9: 133 ICD10: B86

### Scabies in Guatemala

37,963 cases of scabies were reported in 2009.

**Scarlet fever**

Agent	BACTERIUM. <i>Streptococcus pyogenes</i> A facultative gram-positive coccus
Reservoir	Human
Vector	None
Vehicle	Secretions, Food, Respiratory or pharyngeal acquisition
Incubation Period	1d - 4d
Diagnostic Tests	Typical clinical features associated with group A streptococcal pharyngitis.
Typical Adult Therapy	Benzathine <b>Penicillin G</b> 1.2 million units IM as single dose
Typical Pediatric Therapy	Benzathine <b>Penicillin G</b> : Weight <14kg: 300,000 units IM Weight 14 to 28kg: 600,000 units IM Weight >28kg: 1.2 million units IM
Clinical Hints	Overt pharyngitis followed within 24 to 48 hrs by a florid desquamative erythematous rash
Synonyms	Escarlatina, Lanhousha, Scarlattina, Scharlach. ICD9: 034.1 ICD10: A38

**Scarlet fever in Guatemala**

99 cases (6 fatal) were reported in 1944, and 21 (10 fatal) in 1945.

## Septic arthritis

<b>Agent</b>	BACTERIUM or FUNGUS. Gram positive cocci most common; gram negative bacilli, gonococci, <a href="#">mycobacteria</a> , fungi, et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Smear and culture of joint fluid. Cytological and chemical analysis of joint fluid also useful.
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) directed at known or likely pathogen
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever (60% to 80%) associated with swelling, erythema and tenderness Usually involves a single joint, most commonly knee; elbow or ankle in child Mean fluid leukocyte count in acute bacterial forms is 50,000 per cu mm
<b>Synonyms</b>	

**Septicemia - bacterial**

<b>Agent</b>	BACTERIUM. <i>Escherichia coli</i> , <i>Staphylococcus aureus</i> , facultative gram negative bacilli, et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Culture of blood and sepsis source.
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) directed at known or likely pathogen
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, rigors, leukocytosis, tachypnea, mental changes Hypotension, acidosis and bleeding diathesis herald septic shock Additional signs (eg, urinary infection, phlebitis, etc) may point to the source of infection
<b>Synonyms</b>	Sepsis, Septicaemia, Septicemia, Septicemie, Septikemie, Settlicemia. ICD9: 036.2,036.3,038 ICD10: A40,A41

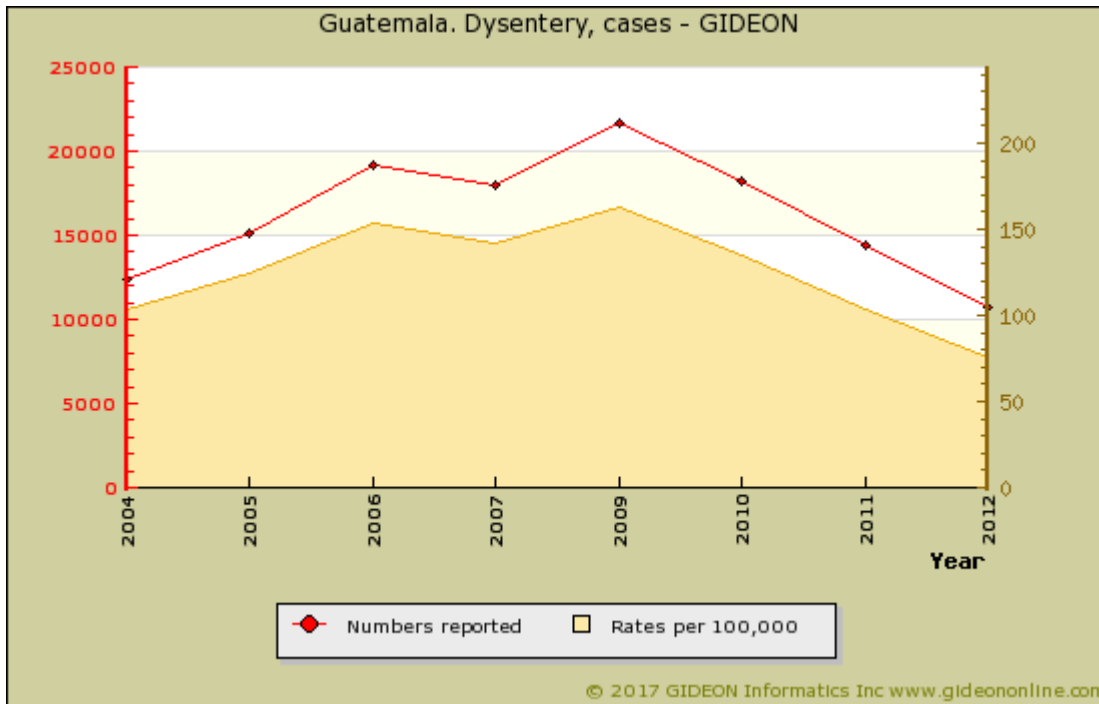
**Septicemia - bacterial in Guatemala**

Mortality rates of 8.0 per 100,000 per year are reported.

## Shigellosis

<b>Agent</b>	BACTERIUM. <i>Shigella sonnei</i> , <i>Shigella flexneri</i> , <i>Shigella boydii</i> or <i>Shigella dysenteriae</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Human, Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Water, Dairy products, Fomite, Fly, Vegetables
<b>Incubation Period</b>	48h - 72h (range 7h - 1w)
<b>Diagnostic Tests</b>	Stool culture.
<b>Typical Adult Therapy</b>	Stool precautions. Choice of antimicrobial agent based on regional susceptibility patterns. Continue treatment for five days
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Watery or bloody diarrhea, tenesmus, abdominal pain and headache Colonic hyperemia and abundant fecal leucocytes are present Usually resolves in 3 days, but may persist for up to 14 Reported case fatality rate is 1% - severity and mortality highest with <i>Shigella dysenteriae</i> infection
<b>Synonyms</b>	Bacillaire dysenterie, Bacillary dysentery, Dissenteria batterica, Dysentery bacillaris, Leptospiroenerkrankung, Ruhr, Shigella, Shigellose, Shigelose, Ubertragbare Ruhr. ICD9: 004 ICD10: A03

### Shigellosis in Guatemala



Graph: Guatemala. Dysentery, cases

#### Prevalence surveys

Years	Region	Study Group	%	Notes
1994*		children	4-9.8	4.0% of healthy rural children and 9.8% of children with diarrhea (1994 publication) <sup>1</sup>
2010*	multiple locations	travelers	4	4% of American patients with travelers' diarrhea acquired in India, Guatemala or Mexico (2010 publication) <sup>2</sup>

\* indicates publication year (not necessarily year of survey)

#### Notable outbreaks

Years	Region	Setting	Cases	Deaths	Pathogen	Notes
1965*	Highlands	village			<i>Shigella dysenteriae</i>	<sup>3</sup>
1968 - 1969						An outbreak of shigellosis was reported <sup>4 5</sup>
1969 - 1972			120,000	10,000	<i>Shigella dysenteriae</i>	Outbreak in the setting of a Central American pandemic. <sup>6 7</sup>
1991	Baja Verapaz		540		<i>Shigella dysenteriae</i>	<sup>8 9</sup>

\* indicates publication year (not necessarily year of outbreak)

#### References

1. *Pediatr Infect Dis J* 1994 Mar ;13(3):216-23.
2. *J Clin Microbiol* 2010 Apr ;48(4):1417-9.
3. *Am J Trop Med Hyg* 1965 May ;14:404-11.
4. *Am J Trop Med Hyg* 1971 Nov ;20(6):927-33.
5. *Bol Oficina Sanit Panam* 1971 Aug ;71(2):93-107.
6. *J Infect Dis* 1970 Sep ;122(3):181-90.
7. *Lancet* 1971 Oct 09;2(7728):823.
8. *Wkly Epidemiol Rec* 1991 Sep 06;66(36):270-1.
9. *MMWR Morb Mortal Wkly Rep* 1991 Jun 28;40(25):421, 427-8.



## Sinusitis

<b>Agent</b>	BACTERIUM. Various ( <i>Haemophilus influenzae</i> & <i>Streptococcus pneumoniae</i> in most acute cases)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	None
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Imaging techniques. Culture of sinus drainage.
<b>Typical Adult Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 2000 / 125 mg BID X 7 days Drainage as indicated Alternatives: <a href="#">Levofloxacin</a> , Clindamycin, <a href="#">Cefuroxime</a> , <a href="#">Cefdinir</a>
<b>Typical Pediatric Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 90 / 6.4 mg/kg BID X 7 days Drainage as indicated Alternatives: Clindamycin, <a href="#">Cefuroxime</a> , <a href="#">Cefdinir</a>
<b>Clinical Hints</b>	Sinusitis often follows upper respiration infections Headache, fever and local tenderness are common The precise presentation varies with patient age and anatomic localization
<b>Synonyms</b>	Acute sinusitis, Mastoidite, Mastoiditis, Rhinosinusitis, Sinusite. ICD9: 473.9,383.0,461 ICD10: H70,J01

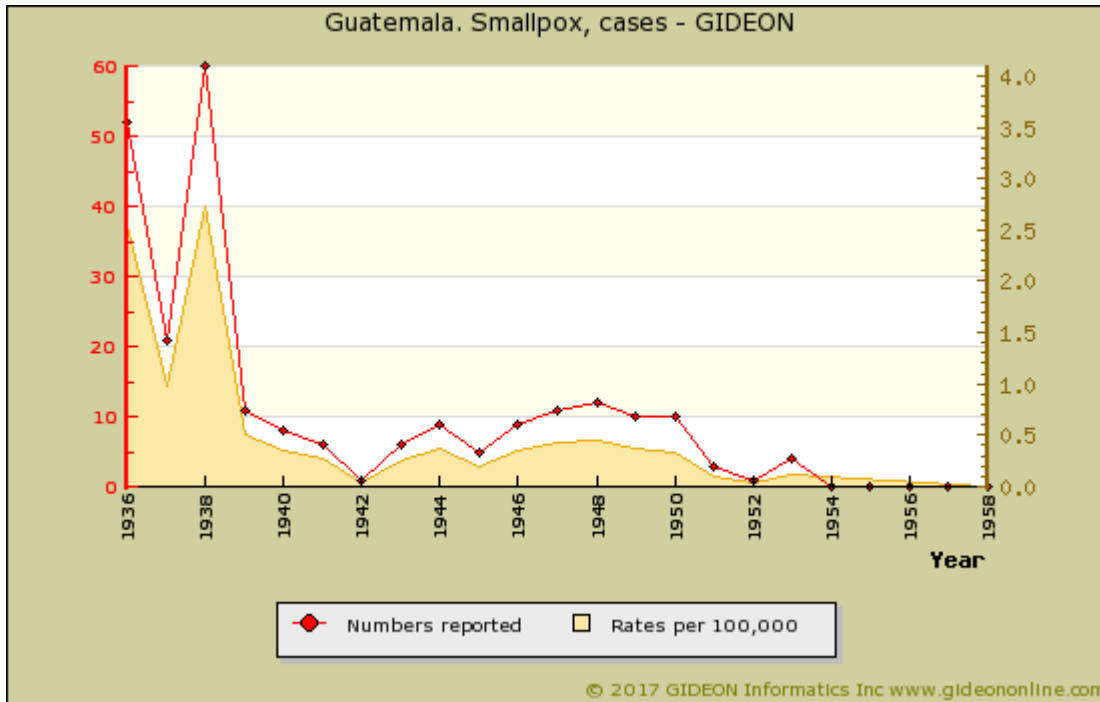
Smallpox	
Agent	VIRUS - DNA. Poxviridae, Orthopoxvirus: Variola virus
Reservoir	Human
Vector	None
Vehicle	Contact, Secretions, Fomite, Respiratory or pharyngeal acquisition
Incubation Period	7d - 17d
Diagnostic Tests	Culture and electron microscopy of skin lesions. Serology. Nucleic acid amplification.  Biosafety level 3.
Typical Adult Therapy	Isolation <a href="#">Tecovirimat</a> 400 to 600 mg PO once daily X 14 days <a href="#">Cidofovir</a> is effective in vitro
Typical Pediatric Therapy	Isolation Pediatric dosage of <a href="#">Tecovirimat</a> not established
Vaccine	<a href="#">Smallpox vaccine</a>
Clinical Hints	Fever, myalgia, headache with pustular or hemorrhagic rash Disease resolves in 2 to 3 weeks Reported case-fatality rate is 25% for severe form (variola major) and 1% for minor form; The last naturally-acquired case was reported in Somalia in 1977
Synonyms	Alastrim, Eczema vaccinatum, Kopper, Smallpox, Vailo, Variola, Variola minor, Varioloid. ICD9: 050 ICD10: B03

**Not currently endemic to any country.**

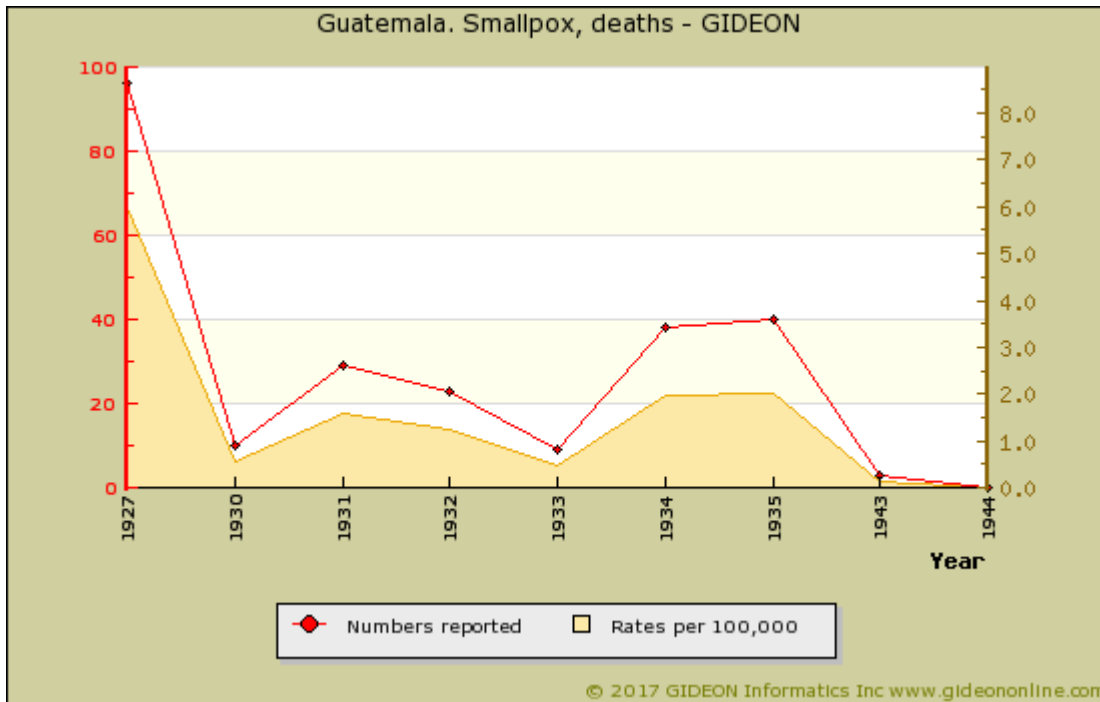
Although Smallpox is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

**Smallpox in Guatemala**

Smallpox vaccination was initiated in Guatemala in 1780. <sup>1</sup>



Graph: Guatemala. Smallpox, cases



Graph: Guatemala. Smallpox, deaths

Indigenous transmission ended in 1951.

**References**

1. Br J Hist Sci 2010 Dec ;43(159 Pt 4):519-37.

## Sporotrichosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomycetes, Ophiostomatales: <i>Sporothrix schenckii</i> , <i>S. brasiliensis</i> and <i>S. globosa</i> A dimorphic dematiaceous fungus
<b>Reservoir</b>	Soil, Vegetation, Wood
<b>Vector</b>	None
<b>Vehicle</b>	Trauma, Contact, Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1w - 3m
<b>Diagnostic Tests</b>	Fungal culture. Serologic tests available in some centers.
<b>Typical Adult Therapy</b>	<a href="#">Itraconazole</a> 100 to 200 mg PO daily X 3 to 6 months. OR <a href="#">Fluconazole</a> 400 mg PO daily X 6 months. OR Potassium iodide 1 to 5 ml PO TID X 3 to 6 months
<b>Typical Pediatric Therapy</b>	<a href="#">Itraconazole</a> 2 mg/kg PO daily X 3 to 6 months. OR <a href="#">Fluconazole</a> 3 mg/kg PO daily X 6 months.
<b>Clinical Hints</b>	Draining nodules which appear along the course of lymphatics Acquired from contact with flowers, thorns, trees or other plant material Eye, brain, testis, bone and other tissues may be involved
<b>Synonyms</b>	Rose gardener's disease, Schenck's disease, <i>Sporothrix brasiliensis</i> , <i>Sporothrix chiensis</i> , <i>Sporothrix globosa</i> , <i>Sporothrix mexicana</i> , <i>Sporothrix schenckii</i> , Sporotrichose. ICD9: 117.1 ICD10: B42

## Sporotrichosis in Guatemala

Sporotrichosis is endemic to the Ayarza lake region (1979 publication). <sup>1</sup>

- 53 cases were identified in the region during a three-year period - 45.3% of these following contact with fish (1978 publication). <sup>2</sup>

### References

1. Bol Oficina Sanit Panam 1979 Jul ;87(1):20-34.
2. Sabouraudia 1978 Sep ;16(3):185-98.

## Spotted fevers - New World

<b>Agent</b>	BACTERIUM. <i>Rickettsia rickettsii</i> <i>Rickettsia parkeri</i> and <i>Rickettsia amblyommii</i> associated with similar illness
<b>Reservoir</b>	Tick, Dog, Rodent
<b>Vector</b>	Tick ( <i>Dermacentor</i> , <i>Amblyomma</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	5d - 7d (range 2d - 14d)
<b>Diagnostic Tests</b>	Serology. Direct immunofluorescence or culture of skin lesions. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 7d. OR <a href="#">Chloramphenicol</a> 500 mg PO QID X7d
<b>Typical Pediatric Therapy</b>	<a href="#">Doxycycline</a> 2 mg/kg PO BID X 7d (maximum 200 mg/day). OR <a href="#">Chloramphenicol</a> 10 mg/kg PO QID X 7d
<b>Clinical Hints</b>	Headache, myalgia, vomiting and a maculopapular or petechial rash (primarily involving the extremities); May be history of a tick bite or dog contact during the preceding 1 to 2 weeks Rash is absent in 5% Reported case-fatality rate (untreated) is 25%
<b>Synonyms</b>	American spotted fever, Bullis fever, Febre maculosa brasileira, Fiebre manchada, Lone star fever, <i>Rickettsia</i> 364D, <i>Rickettsia amblyommii</i> , <i>Rickettsia canadensis</i> , <i>Rickettsia montanensis</i> , <i>Rickettsia parkeri</i> , <i>Rickettsia philippi</i> , <i>Rickettsia rickettsii</i> , <i>Rickettsia texiana</i> , <i>Rickettsiae</i> , RMSF, Rocky Mountain spotted fever, Sao Paulo fever, Tidewater spotted fever, Tobia fever. ICD9: 082.0,082.8 ICD10: A77.0

Although Spotted fevers - New World is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

### Spotted fevers - New World in Guatemala

#### Notable outbreaks

Years	Region	Setting	Cases	Deaths	Notes
2007	Southeast Region	farming community	17	2	Diagnosis speculative. <sup>1</sup>

#### References

- [Int J Infect Dis 2013 May ;17\(5\):e304-11.](#)

## St. Louis encephalitis

Agent	VIRUS - RNA. Flaviviridae, Flavivirus: St. Louis encephalitis virus
Reservoir	Bird, Mammal
Vector	Mosquito ( <i>Culex pipiens</i> , <i>Cx. tarsalis</i> , <i>Cx. nigripalpus</i> , <i>Cx. restuans</i> , <i>Cx. salinarius</i> , <i>Aedes</i> , <i>Sabethes</i> )
Vehicle	None
Incubation Period	4d - 21d
Diagnostic Tests	Viral culture (blood, brain tissue, CSF). Serology. Nucleic acid amplification.  Biosafety level 2.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	Headache, meningitis, encephalitis Sore throat, myalgia, vomiting and photophobia Most cases encountered during late summer Infection resolves in 5 to 10 days Case-fatality rate is 8% (over 25% above age 65).
Synonyms	American encephalitis, Modoc, Rio Bravo, SLE. ICD9: 062.3 ICD10: A83.3

### St. Louis encephalitis in Guatemala

Seropositive bats (St. Louis encephalitis and Rio Bravo virus) were identified during 1983 to 1984. <sup>1</sup>

A single isolate was recovered from a mosquito (*Culex nigripalpus*) on the Pacific coast. <sup>2</sup>

#### References

1. J Wildl Dis 1995 Jan ;31(1):1-9.
2. Am J Trop Med Hyg 1986 Jul ;35(4):851-9.

## Staphylococcal food poisoning

<b>Agent</b>	BACTERIUM. <i>Staphylococcus aureus</i> exotoxins
<b>Reservoir</b>	Human (nares, hands), Cattle (udder), Dog/Cat (nasopharyngeal)
<b>Vector</b>	None
<b>Vehicle</b>	Food (creams, gravies, sauces)
<b>Incubation Period</b>	2h - 4h (range 30 min - 9h)
<b>Diagnostic Tests</b>	Identification of bacterium in food.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	'Explosive" diarrhea and vomiting Usually no fever No fecal leucocytes Onset 1 to 6 hours after food Resolves within 1 to 2 days Fatality is rarely reported
<b>Synonyms</b>	Staphylococcus aureus food poisoning. ICD9: 005.0 ICD10: A05.0

**Staphylococcal scalded skin syndrome**

<b>Agent</b>	BACTERIUM. <i>Staphylococcus aureus</i> phage group 2 A facultative gram-positive coccus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Secretions
<b>Incubation Period</b>	1d - 4d
<b>Diagnostic Tests</b>	Typical clinical features; Recovery of <i>S. aureus</i> from localized wound or blood ; skin biopsy may be helpful
<b>Typical Adult Therapy</b>	Fluid replacement (as for burn) ; Intravenous <b>Nafcillin</b> or <b>Oxacillin</b> , in addition to application of anti-staphylococcal drug to local source infection; <b>Vancomycin</b> if MRSA <b>Clindamycin</b> used to interfere with toxin production.
<b>Typical Pediatric Therapy</b>	Fluid replacement (as for thermal burn) ; Intravenous <b>Nafcillin</b> or <b>Oxacillin</b> , in addition to application of anti-staphylococcal drug to local source infection; <b>Vancomycin</b> if MRSA
<b>Clinical Hints</b>	Acute, generalized exfoliative dermatitis which occurs primarily in infants and young children A pre-existing localized skin infection is present in most cases
<b>Synonyms</b>	Lyell disease, Ritter disease, Ritter von Ritterschein disease, Scalded skin syndrome, SSSS. ICD9: 695.81 ICD10: L00



## Streptococcus suis infection

<b>Agent</b>	BACTERIUM. <i>Streptococcus suis</i> I and <i>Streptococcus suis</i> II A facultative gram-positive coccus
<b>Reservoir</b>	Pig
<b>Vector</b>	None
<b>Vehicle</b>	Air, Secretions, Meat, Wound, Contact
<b>Incubation Period</b>	Unknown. Probably hours to few days
<b>Diagnostic Tests</b>	Culture of blood, tissue, body fluids
<b>Typical Adult Therapy</b>	Systemic antibiotic. Usually susceptible in vitro to Penicillin, <a href="#">Amoxicillin</a> , <a href="#">Chloramphenicol</a> and <a href="#">Gentamicin</a>
<b>Typical Pediatric Therapy</b>	Systemic antibiotic
<b>Clinical Hints</b>	Severe multisystem disease, hemorrhagic diatheses, deafness or meningitis Disease appears hours to a few days after contact with pigs or pig products
<b>Synonyms</b>	Streptococcus suis. ICD9: 027.8 ICD10: A48.8

## Strongyloidiasis

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Strongyloides stercoralis</i> ( <i>Strongyloides fulleborni</i> is occasionally implicated in systemic disease)
<b>Reservoir</b>	Human, Dog, Monkey (for <i>Strongyloides fulleborni</i> )
<b>Vector</b>	None
<b>Vehicle</b>	Skin contact, Soil, Feces, Autoinfection, Sexual contact
<b>Incubation Period</b>	14d - 30d
<b>Diagnostic Tests</b>	Identification of larvae (or ova, for <i>Strongyloides fulleborni</i> ) in stool or duodenal aspirate. Serology.
<b>Typical Adult Therapy</b>	Ivermectin 200 micrograms/kg/d PO daily X 2d OR Thiabendazole 25 mg/kg BID (max 3g) X 2d OR Albendazole 400 mg/d X 3d (7 days for hyperinfection syndrome)
<b>Typical Pediatric Therapy</b>	Ivermectin 200 micrograms/kg/d PO daily X 2d OR Thiabendazole 25 mg/kg BID (max 3g) X 2d. OR Albendazole 200 mg/d X 3d (7 days for hyperinfection syndrome)
<b>Clinical Hints</b>	Diarrhea, gluteal or perineal pruritus and rash Eosinophilia often present Widespread dissemination encountered among immune-suppressed patients (case-fatality rate for this complication = 80%)
<b>Synonyms</b>	Anguilluliasis, Anguillulosis, Cochin China gastroenteritis, Diploscapter, Halicephalobus, Larva currens, Leptodera intestinals, Leptodera stercoralis, Lungworm, Metastrongylus, Micronema, Pseudo-rhabdis stercoralis, Rhabditis stercoralis, Rhabdonema intestinale, Rhabdonema stercoralis, Strongyloides fulleborni, Strongyloides stercoralis, Strongyloidose, Threadworm, Turbatrix. ICD9: 127.2 ICD10: B78

### Strongyloidiasis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Highlands Region	children	0.1	0.1% of non-diarrheal stool specimens from children in the Guatemalan Highlands (2010) <sup>1</sup>
1991 - 1992	Guatemala City	patients - HIV/AIDS	1	1.0% of HIV-positive outpatients (disseminated infection, Guatemala City, 1991 to 1992). <sup>2</sup>

#### References

1. Am J Trop Med Hyg 2013 Jan ;88(1):167-71.
2. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.

## Subdural empyema

Agent	BACTERIUM. <i>Haemophilus influenzae</i> , oral anaerobes, streptococci, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Imaging techniques (CT scan, etc).
Typical Adult Therapy	Antimicrobial agent(s) directed at known or likely pathogen
Typical Pediatric Therapy	As for adult
Clinical Hints	Fever, severe headache, vomiting, signs of meningeal irritation and increased cerebrospinal fluid pressure May follow head trauma, meningitis, otitis or sinusitis Case-fatality rates vary from 15% (patient alert) to 60% (comatose)
Synonyms	

## Suppurative parotitis

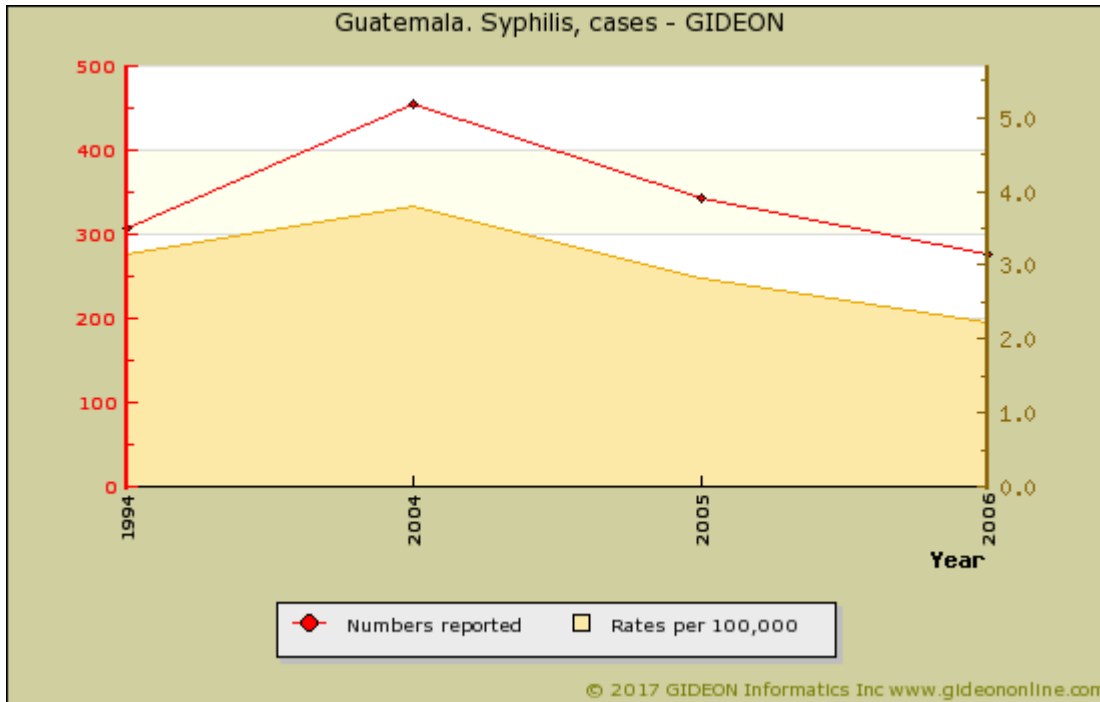
<b>Agent</b>	BACTERIUM. Most commonly <i>Staphylococcus aureus</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Clinical features (local swelling and purulent discharge from salivary ducts). Stain and culture of discharge.
<b>Typical Adult Therapy</b>	Surgical drainage and aggressive parenteral antistaphylococcal therapy
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Consider in patient with unexplained fever in the setting of malnutrition, dehydration and obtundation Local swelling and discharge of pus from salivary duct
<b>Synonyms</b>	Parotitis, bacterial. ICD9: 527.2 ICD10: K11.3

## Syphilis

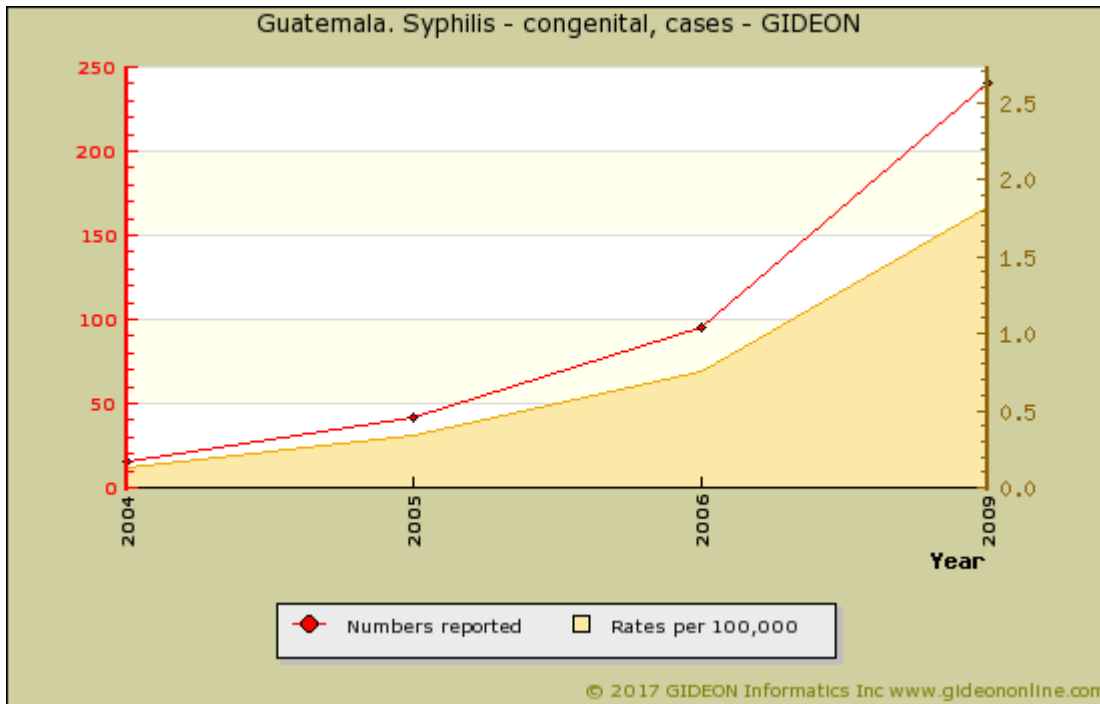
<b>Agent</b>	BACTERIUM. <i>Treponema pallidum</i> subsp. <i>pallidum</i> A microaerophilic gram-negative spirochete
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual contact, Secretions, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2w - 4w (range 10d - >8w)
<b>Diagnostic Tests</b>	Dark field microscopy (chancre). VDRL confirmed by antitreponemal test (FTA, MHTP). Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Primary, secondary or early (< 1 year) latent: Benzathine <b>Penicillin G</b> 2.4 million units IM  Other stages: Repeat dosage at one and two weeks  Alternatives: <b>Tetracycline</b> , <b>Ceftriaxone</b>
<b>Typical Pediatric Therapy</b>	Primary, secondary or early (< 1 year) latent: Benzathine <b>Penicillin G</b> : Weight <14 kg: 600,000u IM Weight 14 to 28 kg: 1,200,000u IM  Other stages: Repeat dosage at one and two weeks
<b>Clinical Hints</b>	Firm, painless chancre (primary syphilis) Fever, papulosquamous rash and multisystem infection (secondary syphilis) Late necrotic lesions of brain, aorta, bone or other organs (tertiary syphilis)
<b>Synonyms</b>	Canton rash, Chinese ulcer, Christian disease, French disease, German sickness, Harde sjanker, Lues, Neopolitan itch, Polish sickness, Sifilide, Sifilis, Spanish pockes, Syphilis, Treponema pallidum. ICD9: 090,091,092,093,094,095,096,097 ICD10: A50,A51,A52,A53

### Syphilis in Guatemala

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Graph: Guatemala. Syphilis, cases



Graph: Guatemala. Syphilis - congenital, cases

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
2005 - 2006	Guatemala City	pregnant women	0.6	0.60% of pregnant women (Guatemala City, 2005 to 2006) <sup>1</sup>
2011*	Escuintla	sex workers	1	1.0% of male clients of CSW in Escuintla (2011 publication) <sup>2</sup>

\* indicates publication year (not necessarily year of survey)

### References

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1. J Int Assoc Physicians AIDS Care (Chic) 2010 Sep-Oct;9(5):313-7.
2. Sex Transm Dis 2011 Aug ;38(8):735-42.

## Taeniasis

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Taenia solium</i> & <i>T. saginata</i> (other species occasionally encountered)
<b>Reservoir</b>	Cattle, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Meat
<b>Incubation Period</b>	6w - 14w
<b>Diagnostic Tests</b>	Identification of ova or proglottids in feces.
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 10 mg/kg PO as single dose OR <a href="#">Niclosamide</a> 2 g PO once
<b>Typical Pediatric Therapy</b>	<a href="#">Praziquantel</a> 10 mg/kg PO as single dose OR <a href="#">Niclosamide</a> 50 mg/kg PO once
<b>Clinical Hints</b>	Vomiting and weight loss Often symptomatic or first recognized due to passage of proglottids Parasite may survive for over 25 years in the human intestine
<b>Synonyms</b>	Bandwurm [Taenia], Drepanidotaenia, Gordiid worm, Hair snake, Mesocestoides, Raillietina, Taenia asiatica, Taenia longihamatus, Taenia saginata, Taenia saginata asiatica, Taenia solium, Taenia taeniaformis, Taeniarhynchiasis, Tapeworm (pork or beef), Tenia. ICD9: 123.0,123.2 ICD10: B68

## Taeniasis in Guatemala

### Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Highlands Region	children	0.1	0.1% of non-diarrheal stool specimens from children in the Guatemalan Highlands ( <i>Taenia saginata</i> , 2010) <sup>1</sup>
1991 - 1994	Jutiapa	general population	2.7	2.7% of individuals in rural Jutiapa Department (1991 to 1994) <sup>2</sup>
1996*		general population	3.4	3.4% of individuals in two communities ( <i>Taenia solium</i> , 1996 publication) <sup>3</sup>
1997*		general population	3.5	3.5% if a rural community ( <i>Taenia solium</i> , 1997 publication) <sup>4</sup>
1996*	Jutiapa	specimens - stool	0.3-1.6	0.3 to 1.6% of stool examinations - 2% in Jutiapa ( <i>Taenia solium</i> , 1996 publication) <sup>5</sup>

\* indicates publication year (not necessarily year of survey)

### References

1. [Am J Trop Med Hyg 2013 Jan ;88\(1\):167-71.](#)
2. [Ann Trop Med Parasitol 1996 Apr ;90\(2\):157-65.](#)
3. [Am J Trop Med Hyg 1996 Apr ;54\(4\):352-6.](#)
4. [Trans R Soc Trop Med Hyg 1997 Sep-Oct;91\(5\):595-8.](#)
5. [Am J Trop Med Hyg 1996 Sep ;55\(3\):282-9.](#)



Tetanus	
Agent	BACTERIUM. <i>Clostridium tetani</i> An anaerobic gram-positive bacillus
Reservoir	Animal feces, Soil
Vector	None
Vehicle	Trauma
Incubation Period	6d - 8d (range 1d - 90d)
Diagnostic Tests	Isolation of <i>C. tetani</i> from wound is rarely helpful. Serology (specimen taken before administration of antitoxin).
Typical Adult Therapy	Human antitoxin (see Vaccine module). <a href="#">Metronidazole</a> (2 g daily) or <a href="#">Penicillin G</a> (24 million u daily) or <a href="#">Doxycycline</a> (200 mg daily). Diazepam (30 to 240 mg daily). Tracheostomy, hyperalimentation
Typical Pediatric Therapy	Human antitoxin (see Vaccine module). <a href="#">Metronidazole</a> (30 mg/kg daily); or <a href="#">Penicillin G</a> (300,000 units/kilo daily). Diazepam. Tracheostomy, hyperalimentation
Vaccines	<a href="#">DT vaccine</a> <a href="#">DTaP vaccine</a> <a href="#">DTP vaccine</a> <a href="#">Td vaccine</a> <a href="#">Tetanus immune globulin</a> <a href="#">Tetanus vaccine</a>
Clinical Hints	Trismus, facial spasm, opisthotonus, tachycardia and recurrent tonic spasms of skeletal muscle Sensorium is clear Disease may persist for 4 to 6 weeks Case fatality rates of 10% to 40% are reported
Synonyms	Lockjaw, Starrkrampf, Stelkrampf, Tetano, Tetanos. ICD9: 037,771.3 ICD10: A33,A34,A35

## Tetanus in Guatemala

### Vaccine Schedule:

BCG - < 1 year

DTwP - 18 months; 4 years

DTwPHibHepB - 2,4,6 months

HepB - birth and 3 doses for adults in risk groups

IPV - NA

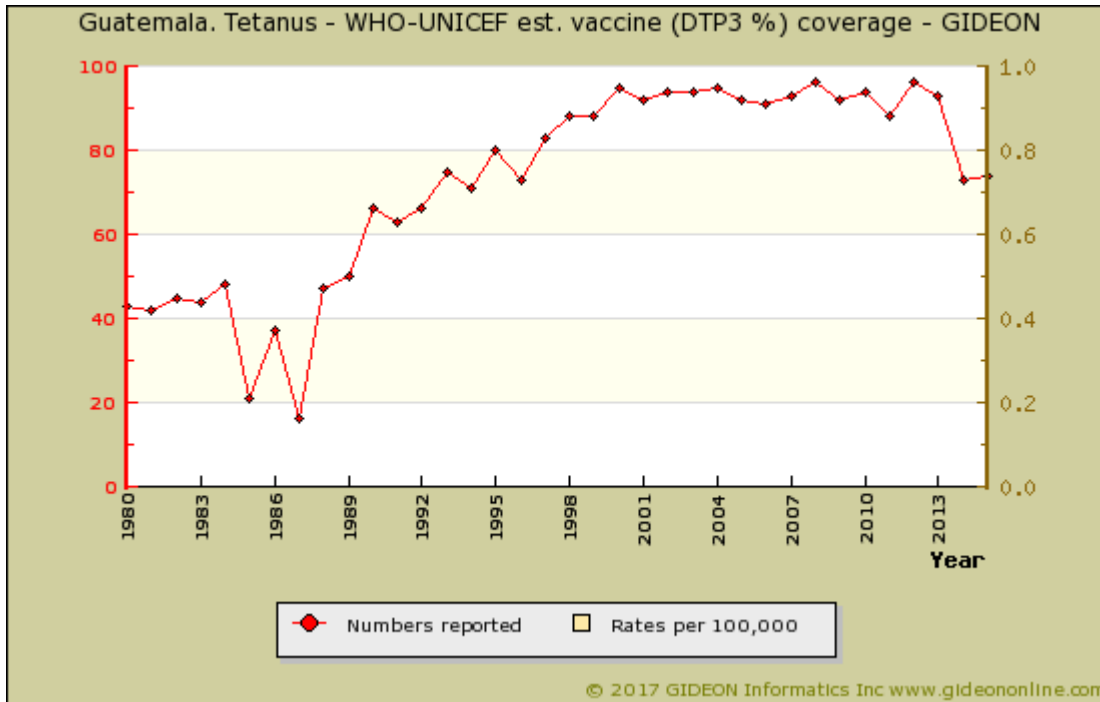
MMR - 12-23 months

OPV - 2,4,6,18 months; 4 years

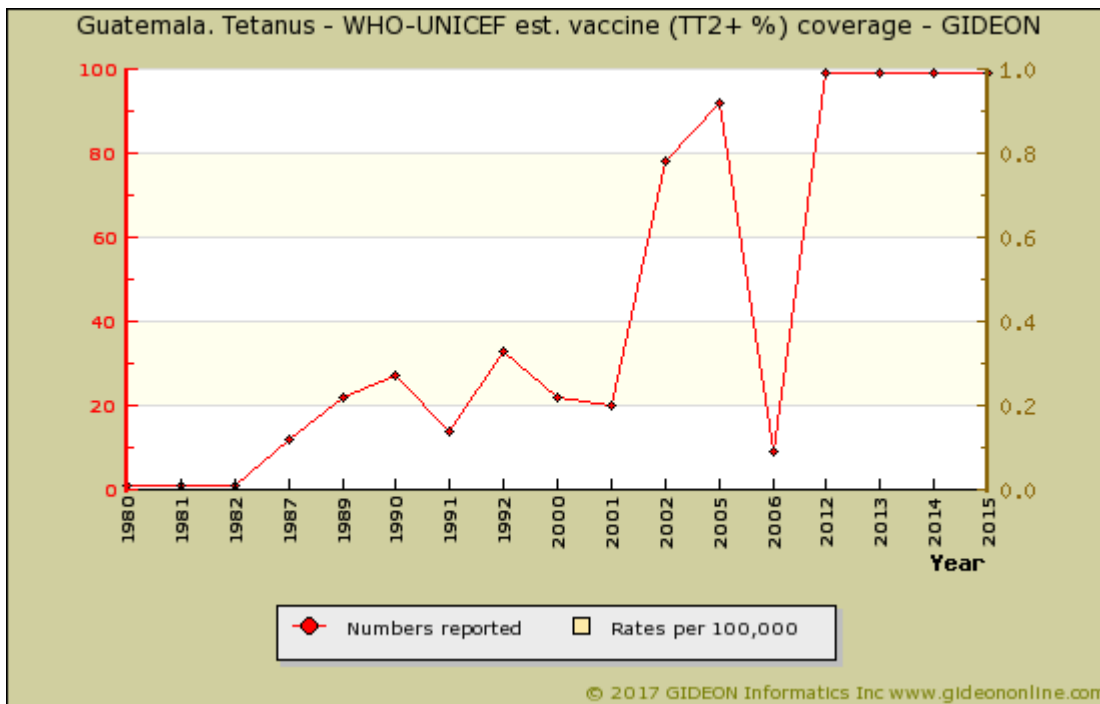
Pneumo conj - 2,4 months; 1 year

Rotavirus - 2,4 months

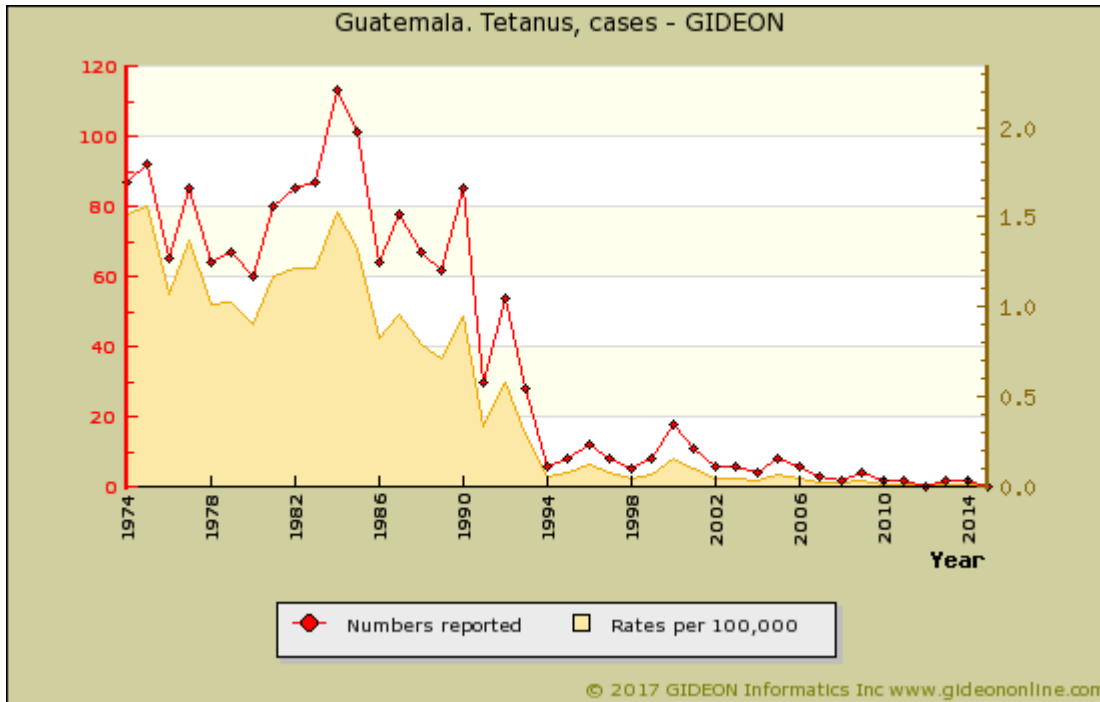
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



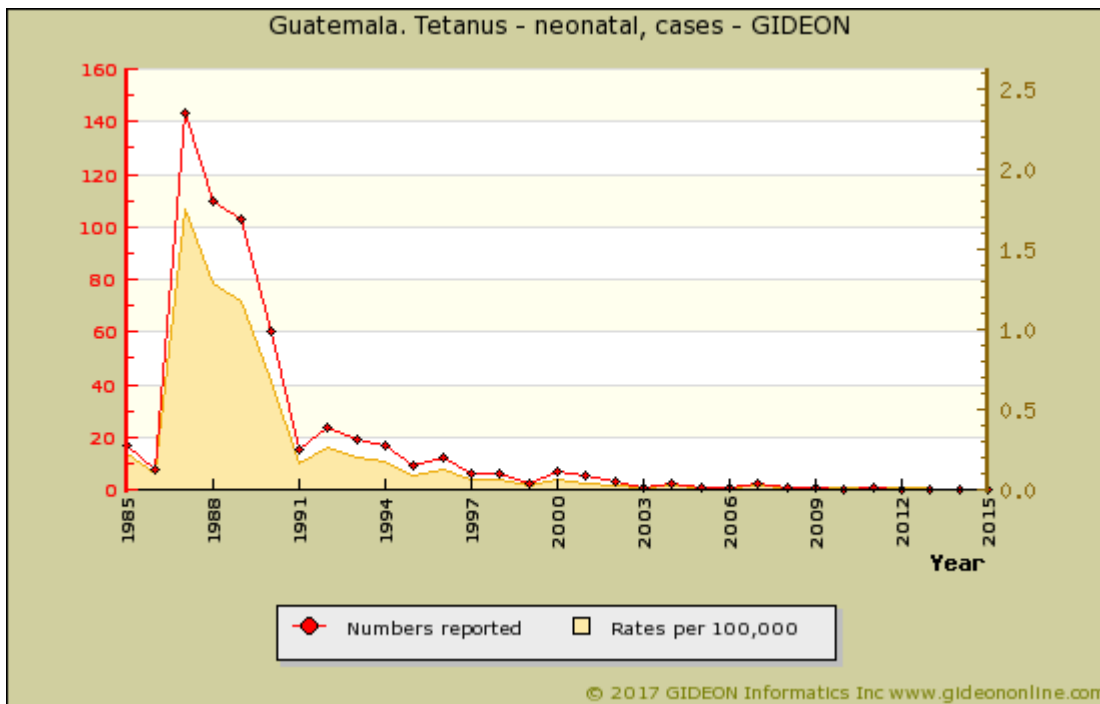
Graph: Guatemala. Tetanus - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Guatemala. Tetanus - WHO-UNICEF est. vaccine (TT2+ %) coverage



Graph: Guatemala. Tetanus, cases



Graph: Guatemala. Tetanus - neonatal, cases

**Thelaziasis**

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Thelazia callipaeda</i> (rarely <i>T. californiensis</i> )
<b>Reservoir</b>	Dog, Rabbit, Deer, Cat
<b>Vector</b>	Fly ( <i>Musca</i> and <i>Fannia</i> species)
<b>Vehicle</b>	None
<b>Incubation Period</b>	not known
<b>Diagnostic Tests</b>	Identification of parasite.
<b>Typical Adult Therapy</b>	Extraction of parasite
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Conjunctivitis and lacrimation associated with the sensation of an ocular foreign body
<b>Synonyms</b>	Conjunctival spirurosis, Oriental eye worm, Rictularia, <i>Thelazia californiensis</i> , <i>Thelazia callipaeda</i> . ICD9: 372.15 ICD10: B83.8

## Toxic shock syndrome

<b>Agent</b>	BACTERIUM. <i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , et al - (toxins) Facultative gram-positive cocci
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Tampon (Bandage, etc)
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Isolation of toxigenic <i>Staphylococcus aureus</i> . Toxin assay available in specialized laboratories.
<b>Typical Adult Therapy</b>	The role of topical (eg, vaginal) and systemic antistaphylococcal antibiotics is unclear; however, most authorities suggest intravenous administration of an anti-staphylococcal (anti-MRSA, anti-streptococcal as indicated) antibiotic.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever (>38.9), hypotension (<90 mm Hg) and dermal erythema with desquamation Respiratory, cardiac or other disease present Most cases associated with "super absorbent" tampon use or staphylococcal wound infection Case-fatality rates of 5% to 10% are reported
<b>Synonyms</b>	Streptococcal toxic shock syndrome, TSS. ICD9: 040.82 ICD10: A48.3

**Toxocariasis**

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Toxocara cati</i> and <i>T. canis</i>
<b>Reservoir</b>	Cat, Dog, Mouse
<b>Vector</b>	None
<b>Vehicle</b>	Soil ingestion
<b>Incubation Period</b>	1w - 2y
<b>Diagnostic Tests</b>	Identification of larvae in tissue. Serology.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg BID X 5d. OR <a href="#">Mebendazole</a> 100 to 200 mg PO bid X 5 days  Add corticosteroids if eye, brain, heart or lung involvement is present.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Cough, myalgia, seizures and urticaria Hepatomegaly, pulmonary infiltrates or retrobulbar lesions may be present Marked eosinophilia is common Symptoms resolve after several weeks, but eosinophilia may persist for years
<b>Synonyms</b>	<i>Ascaris suum</i> , <i>Toxocara canis</i> , <i>Toxocara cati</i> , Toxocarose, Toxocarosis, Visceral larva migrans. ICD9: 128.0 ICD10: B83.0

## Toxoplasmosis

<b>Agent</b>	PARASITE - Protozoa. Apicomplexa, Eimeriida: <i>Toxoplasma gondii</i>
<b>Reservoir</b>	Rodent, Pig, Cattle, Sheep, Chicken, Bird, Cat, Marsupial
<b>Vector</b>	None
<b>Vehicle</b>	Transplacental, Meat, Soil ingestion, Water , Milk, Filth flies
<b>Incubation Period</b>	1w - 3w (range 5d - 21d)
<b>Diagnostic Tests</b>	Serology. Cultivation or identification of organisms per specialized laboratories. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Pyrimethamine</a> 25 mg/d + <a href="#">Sulfonamides</a> 100 mg/kg (max 6g)/d X 4w - give with folic acid. Alternatives: <a href="#">Clindamycin</a> , <a href="#">Azithromycin</a> , <a href="#">Dapsone</a> . <a href="#">Spiramycin</a> (in pregnancy) 4g/d X 4w
<b>Typical Pediatric Therapy</b>	<a href="#">Pyrimethamine</a> 2 mg/kg/d X 3d, then 1 mg/kg/d + <a href="#">Sulfonamides</a> 100 mg/kg/d X 4w - give with folic acid. Alternatives: <a href="#">Clindamycin</a> , <a href="#">Azithromycin</a> , <a href="#">Dapsone</a> .
<b>Clinical Hints</b>	Fever, lymphadenopathy, hepatic dysfunction or chorioretinitis Cerebral cysts often encountered in patients with AIDS Congenital hydrocephalus associated with mental retardation, seizures or blindness.
<b>Synonyms</b>	Toxoplasma, Toxoplasrose, Toxoplasmosi. ICD9: 130 ICD10: B58

## Toxoplasmosis in Guatemala

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005*		cats	53	53% of stray cats ( <i>Felis domesticus</i> ); and one of two captive margays ( <i>Leopardus wiedii</i> ) (Peten region, 2005 publication) <sup>1</sup>
1999	San Juan Sacatepequez	children	12.4-43	12.4% of children (ages 2 months to 6 years) in 1999 - increasing to 24% to 43% by age 5 years in 2003 (San Juan Sacatepequez) <sup>2</sup>
1958*		indigenous peoples	50	50% (Mayan military recruits) to 94% (Mayan Indians) (1958 publication) <sup>3</sup>
1991 - 1992	Guatemala City	patients - HIV/AIDS	1	1.0% of HIV-positive outpatients (cerebral infection, Guatemala City, 1991 to 1992). <sup>4</sup>
1992*		pregnant women	44	44% of urban pregnant women (1992 publication) <sup>5</sup>

\* indicates publication year (not necessarily year of survey)

The rate of congenital toxoplasmosis is 10.9 per 1,000 live births (1992 publication). <sup>6</sup>

### References

1. J Zoo Wildl Med 2005 Mar ;36(1):121-3.
2. Am J Trop Med Hyg 2005 Mar ;72(3):295-300.
3. Am J Trop Med Hyg 1958 May ;7(3):334-8.
4. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.
5. Eur J Epidemiol 1992 Jul ;8(4):516-20.
6. Eur J Epidemiol 1992 Jul ;8(4):516-20.

## Trachoma

Agent	BACTERIUM. <i>Chlamydia trachomatis</i> , type A
Reservoir	Human
Vector	Fly
Vehicle	Secretions, Contact, Fly, Fomite
Incubation Period	5d - 12d
Diagnostic Tests	Culture or direct immunofluorescence of secretions. Serology. Nucleic acid amplification.
Typical Adult Therapy	<a href="#">Azithromycin</a> 1 g po as single dose. OR <a href="#">Doxycycline</a> 100 mg/day PO X 21 days. Also administer topical <a href="#">Tetracycline</a>
Typical Pediatric Therapy	<a href="#">Azithromycin</a> 20 mg/kg as single dose. Also administer topical <a href="#">Tetracycline</a>
Clinical Hints	Keratoconjunctivitis with palpebral scarring and pannus formation 0.5% of infections result in blindness
Synonyms	Egyptian ophthalmia, Granular conjunctivitis, Kornerkrankheit, Trachom, Tracoma. ICD9: 076 ICD10: A71

## Trachoma in Guatemala

229 cases were reported in 1980.

2,073 cases of active trachoma were estimated in 2003.

### Prevalence surveys

Years	Region	Study Group	Notes
2015*	Santa Catarina Costa	children	0% to 5.1% of children below age 10 years in Solola Region (8.1% in Nahuala Costa, 7.3% in Santa Catarina Costa) (2015 publication) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

### References

1. [Ophthalmic Epidemiol 2015 ;22\(3\):231-6.](#)



**Trichinosis**

<b>Agent</b>	PARASITE - Nematoda. <i>Trichinella spiralis</i> (occasionally <i>T. nativa</i> , <i>T. britovi</i> , <i>T. pseudospiralis</i> , <i>T. nelsoni</i> , et al)
<b>Reservoir</b>	Wild carnivore, Omnivore, Marine mammal
<b>Vector</b>	None
<b>Vehicle</b>	Meat
<b>Incubation Period</b>	10d - 20d (range 1w - 10w)
<b>Diagnostic Tests</b>	Identification of larvae in tissue. Serology.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg PO BID X 14d. OR <a href="#">Mebendazole</a> 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Give with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 7 mg/kg BID X 14 d. OR <a href="#">Mebendazole</a> 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Give with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)
<b>Clinical Hints</b>	Early diarrhea and vomiting Subsequent myalgia, facial edema and eosinophilia Onset 1 to 4 weeks following ingestion of undercooked meat (usually pork) Symptoms may persist for two months Reported case-fatality rate for symptomatic infection is 2%
<b>Synonyms</b>	Haycocknema, Trichinellose, Trichinellosis, Trichinose, Trikinose, Triquiniasis, Triquonosis. ICD9: 124 ICD10: B75

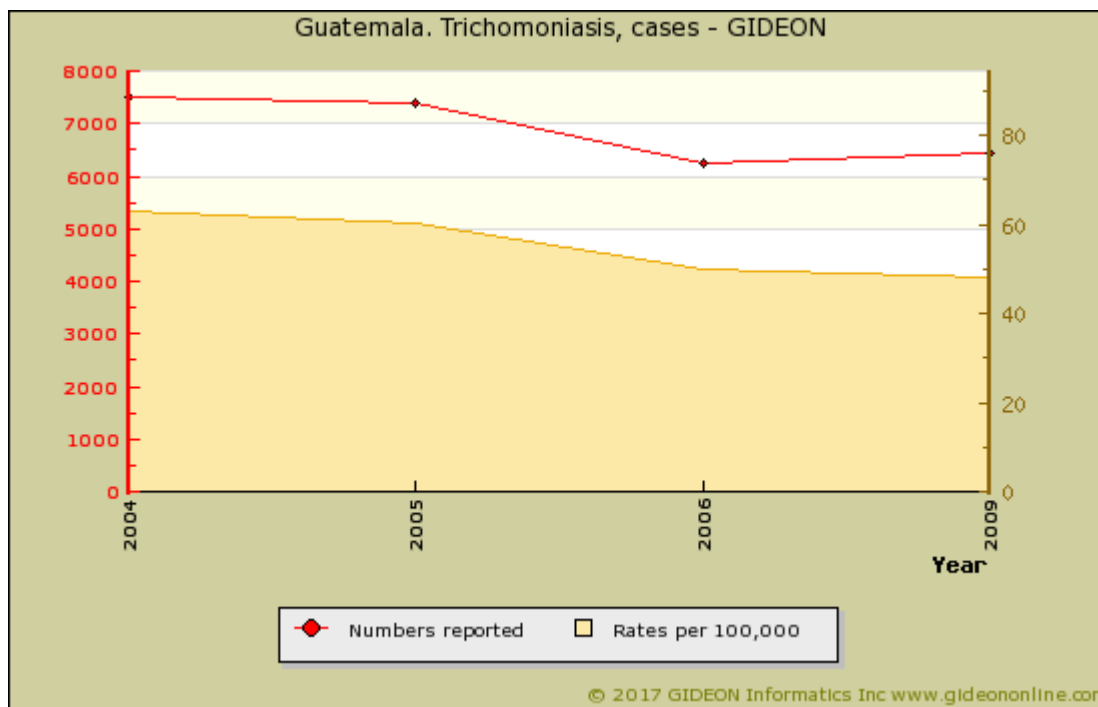
**Trichinosis in Guatemala**

Trichinosis, cases: None reported between 2002 and 2004

## Trichomoniasis

<b>Agent</b>	PARASITE - Protozoa. Metamonada, Parabasala, Trichomonadea. Flagellate: <i>Trichomonas vaginalis</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual contact
<b>Incubation Period</b>	4d - 28d
<b>Diagnostic Tests</b>	Microscopy of vaginal discharge. ELISA, culture, antigen detection tests available. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Metronidazole</a> or <a href="#">Tinidazole</a> 2g PO as single dose to both sexual partners
<b>Typical Pediatric Therapy</b>	<a href="#">Metronidazole</a> 5 mg/kg PO TID X 7d. OR <a href="#">Tinidazole</a> 50 mg/kg PO X 1 (maximum 2 grams)
<b>Clinical Hints</b>	Vaginal pruritus, erythema and thin or frothy discharge Mild urethritis may be present in male or female
<b>Synonyms</b>	Pentatrichomonas, Tetratrichomonas, Trichomonaden, Trichomonas, Trichomonas vaginalis, Tricomoniasis, Tritrichomonas. ICD9: 131 ICD10: A59

### Trichomoniasis in Guatemala



Graph: Guatemala. Trichomoniasis, cases

#### Prevalence surveys

Years	Study Group	%	Notes
1991	children	13.3	13.3% of street children attending a STD clinic (1991) <sup>1</sup>

**References**

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1. [Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:48-51.](#)

## Trichuriasis

<b>Agent</b>	PARASITE - Nematoda. <i>Trichuris trichiura</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Soil ingestion, Sexual contact, Flies
<b>Incubation Period</b>	2m - 2y
<b>Diagnostic Tests</b>	Stool microscopy or visualization of adult worms (adults are approximately 3 cm long).
<b>Typical Adult Therapy</b>	<a href="#">Mebendazole</a> 100 mg PO BID X 3d. OR <a href="#">Albendazole</a> 400 mg PO daily X 3 to 7 days OR <a href="#">Ivermectin</a> 200 mg/kg PO daily X 3 days
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 200 mg PO single dose OR <a href="#">Mebendazole</a> 100 mg BID X 3 d (> age 2). OR <a href="#">Ivermectin</a> 200 mg/kg PO daily X 3 days
<b>Clinical Hints</b>	Abdominal pain, bloody diarrhea Rectal prolapse or intestinal obstruction are occasionally encountered The parasite may survive for as long as five years in the human host
<b>Synonyms</b>	Trichocephaliasis, <i>Trichuris trichiura</i> , Tricuriasis, Whipworm. ICD9: 127.3 ICD10: B79

### Trichuriasis in Guatemala

#### Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	Santa Rosa	adults	2	2% of adults with diarrhea, in Santa Rosa (2011 publication) <sup>1</sup>
1996*		children	82	82% of children in Highland Indian towns (1996 publication) <sup>2</sup>
2008*	Santa Maria De Jesus	children	14	14% of children in urban Santa Maria de Jesus (2008 publication) <sup>3</sup>
2009*	Highlands	children	19.4	19.4% of children in the Guatemalan Highlands (2009 publication) <sup>4</sup>
2010	Highlands	children	0.3	0.3% of non-diarrheal stool specimens from children in the Guatemalan Highlands (2010) <sup>5</sup>
2011*	Izabal	children	39	39% of school children in Izabal Province (2011 publication) <sup>6</sup>
1993*		general population	60	60% in rural villages (1993 publication) <sup>7</sup>

\* indicates publication year (not necessarily year of survey)

#### References

1. [Am J Trop Med Hyg 2011 Dec ;85\(6\):1141-3.](#)
2. [Pediatrics 1996 Jun ;97\(6 Pt 1\):871-6.](#)
3. [J Community Health 2009 Apr ;34\(2\):98-101.](#)
4. [J Infect Dev Ctries 2009 ;3\(3\):229-34.](#)
5. [Am J Trop Med Hyg 2013 Jan ;88\(1\):167-71.](#)
6. [J Glob Infect Dis 2011 Jan ;3\(1\):25-31.](#)
7. [Mem Inst Oswaldo Cruz 1993 Jan-Mar;88\(1\):53-65.](#)

## Tropical phagedenic ulcer

<b>Agent</b>	BACTERIUM Mixed infection by <i>Fusobacterium</i> species and <i>Borrelia</i>
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Direct inoculation (skin trauma)
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Wound smear suggestive of fusobacterial infection.
<b>Typical Adult Therapy</b>	Systemic <a href="#">Penicillin G</a> . Excision/debridement as necessary
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	A deep, painful, foul-smelling ulcer (usually of the leg) with undermined edges May be complicated by secondary infection
<b>Synonyms</b>	Acute phagadenic ulcer, Aden ulcer, Delagoa sore, Malabar ulcer, Naga sore, Rhodesian sore, Tropical sloughing phagedaena. ICD9: 682.7 ICD10: A69.8,L97

**Tropical sprue**

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown - probably at least 6 months
<b>Diagnostic Tests</b>	Typical functional, roentgenographic and histological changes in bowel. Prompt response to therapy.
<b>Typical Adult Therapy</b>	<a href="#">Tetracycline</a> 250 mg PO QID + folate 5 mg PO daily. Administer for 6 months
<b>Typical Pediatric Therapy</b>	Nonabsorbable sulfa drug + folate. Administer for 6 months
<b>Clinical Hints</b>	Chronic (months to years) diarrhea, bloating, weight loss and anemia Occasional early fever, glossitis, neuropathy, dermatitis, nausea Malabsorption of fats, protein and minerals
<b>Synonyms</b>	Hill diarrhea, Postinfectious tropical malabsorption. ICD9: 579.1 ICD10: K90.1

## Trypanosomiasis - American

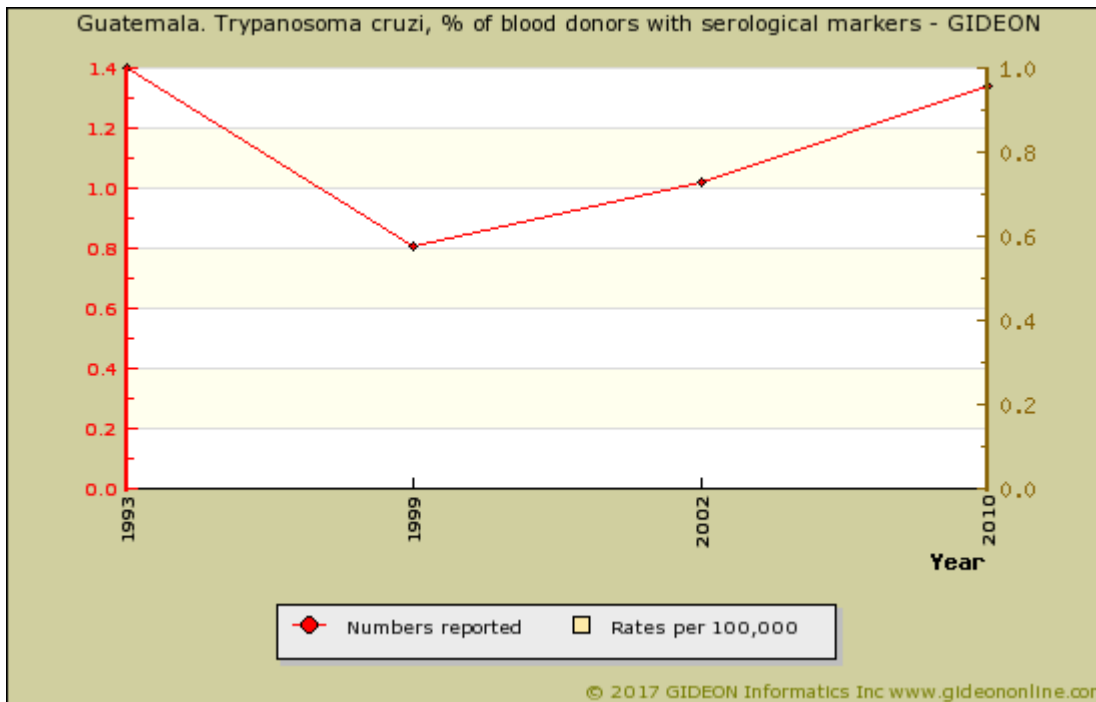
<b>Agent</b>	PARASITE - Protozoa. Euglenozoa, Kinetoplastida. Flagellate: <i>Trypanosoma cruzi</i>
<b>Reservoir</b>	Human, Dog, Cat, Pig, Guinea pig, Armadillo, Rat, Fox, Opossum, Raccoon, Bat, Mouse, Monkey, Rabbit
<b>Vector</b>	Triatome bug ( <i>Panstrongylus</i> , <i>Rhodnius</i> and <i>Triatoma</i> spp.)
<b>Vehicle</b>	Blood, Water, Food (fruit contaminated with insect secretions)
<b>Incubation Period</b>	5d - 14d (acute illness)
<b>Diagnostic Tests</b>	Identification of protozoa in blood or tissue. Serology. Xenodiagnosis. PCR (more sensitive than serology)
<b>Typical Adult Therapy</b>	<b>Nifurtimox</b> 2 mg/kg PO QID X 3m. OR <b>Benznidazole</b> 3 to 5 mg/kg/d X 30 to 120d
<b>Typical Pediatric Therapy</b>	<b>Nifurtimox:</b> Age 1 to 10 years: 5 mg/kg PO QID X 3m Age 11 to 16 years: 3.5 mg/kg PO QID X 3m (age 11 to 16y)  OR <b>Benznidazole</b> 3.75 mg/kg PO BID X 2m; or
<b>Clinical Hints</b>	Unilateral periorbital swelling (Romana's sign) with lymphadenopathy, hepatosplenomegaly and encephalitis Later cardiomyopathy, megaesophagus and megacolon 20% of patients progress to chronic stage Overall case-fatality rate is 10%
<b>Synonyms</b>	American trypanosomiasis, Chagas' disease, Chagas-Cruz disease, Chagas-Krankheit, <i>Trypanosoma cruzi</i> , <i>Trypanosoma rangeli</i> , Trypanosomiasis, amerikanische. ICD9: 086.0,086.1,086.2 ICD10: B57

### Trypanosomiasis - American in Guatemala

**Time and Place:**

Trypanosomiasis is most common in Chiquimula <sup>1</sup>, El Progreso, Jalapa, Santa Rosa <sup>2</sup> and Zacapa departments. <sup>3</sup>

- In 2010, 166,667 prevalent cases (1.230 per 100 population; 20,833 with cardiomyopathy) were estimated; 1.340 % of blood donors, 1,275 new vectorial cases (0.0090 per 100 population) and 164 congenital cases (0.035 per 100 live births) were estimated for 2010. The population at risk was estimated at 1,400,000. <sup>4</sup>
- 28,387 cases were estimated in 1990; 166,667 in 2010.



Graph: Guatemala. *Trypanosoma cruzi*, % of blood donors with serological markers

Notes:

1. 0.97% of blood in blood banks is infected.
2. 33 cases of transfusion-acquired infection were estimated for 1993. <sup>5</sup>

The estimated seroprevalence is 730,000.

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
2003 - 2006	Olopa	children	1.4	1.4% of children below age 15 years, in Olopa (2003 to 2006) <sup>6</sup>
2003*	multiple locations	children	4.16	4.16% of school-age children in Jutiapa, 6.72% in Chiquimula, 4.71% in Santa Rosa, 7.93% in Jalapa, 2.70% in Zacapa (2003 publication) <sup>7</sup>
2014*		dogs	37	37% of dogs (2014 publication) <sup>8</sup>

\* indicates publication year (not necessarily year of survey)

**Vectors:**

- The local vectors are *Rhodnius prolixus*, *Triatoma dimidiata* <sup>9 10</sup> and *T. nitida*. <sup>11 12</sup>
- 10% to 39% of *T. dimidiata* and 18% of *R. prolixus* are infested.

**References**

1. Rev Panam Salud Publica 1999 Aug ;6(2):110-6.
2. Trans R Soc Trop Med Hyg 2002 Jan-Feb;96(1):48-52.
3. Mem Inst Oswaldo Cruz 2003 Mar ;98(2):277-81.
4. Wkly Epidemiol Rec 2015 Feb 6;90(6):33-43.
5. Mem Inst Oswaldo Cruz 1999 ;94 Suppl 1:93-101.
6. PLoS Negl Trop Dis 2009 Jul 07;3(7):e488.
7. Am J Trop Med Hyg 2003 Jun ;68(6):678-82.
8. PLoS One 2014 ;9(8):e104599.
9. J Med Entomol 2003 Jul ;40(4):436-40.
10. Am J Trop Med Hyg 2006 Aug ;75(2):226-30.
11. Mem Inst Oswaldo Cruz 2003 Apr ;98(3):305-10.
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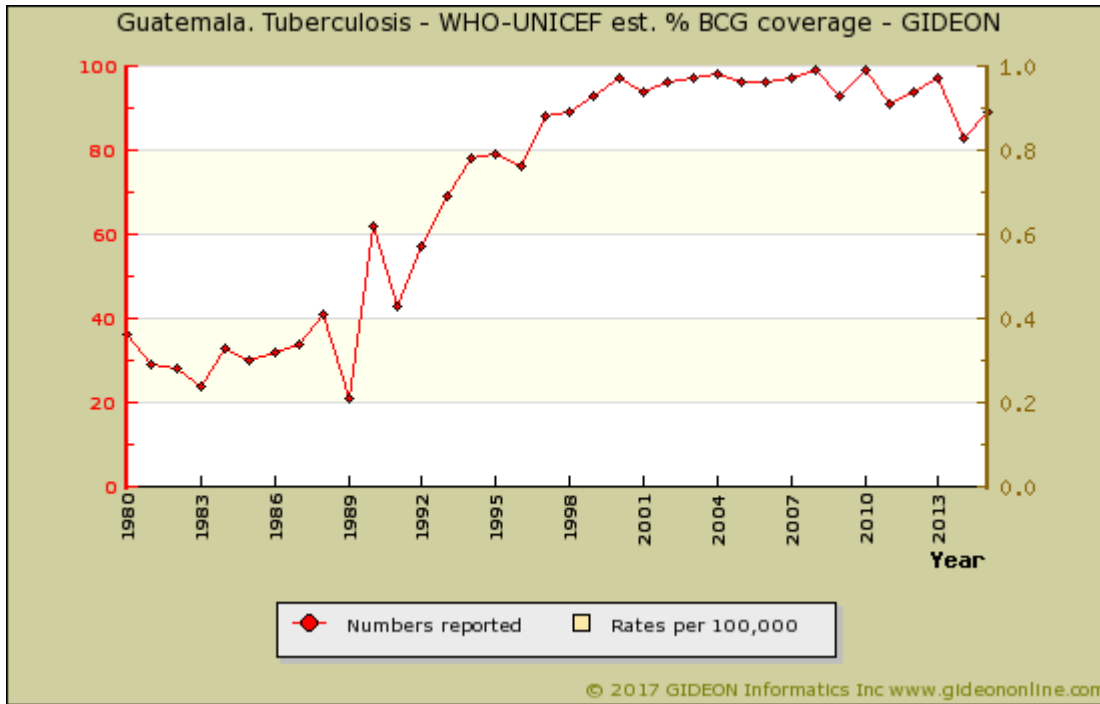
## Tuberculosis

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Mycobacterium tuberculosis</i> An aerobic acid-fast bacillus
<b>Reservoir</b>	Human, Cattle
<b>Vector</b>	None
<b>Vehicle</b>	Air, Dairy products, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	4w - 12w (primary infection)
<b>Diagnostic Tests</b>	Microscopy. Culture. Nucleic acid amplification. Inform laboratory when this diagnosis is suspected.
<b>Typical Adult Therapy</b>	Respiratory isolation. Typical pulmonary infection is treated with 6 months of <a href="#">Isoniazid</a> , <a href="#">Rifampin</a> & <a href="#">Pyrazinamide</a>
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">BCG vaccine</a>
<b>Clinical Hints</b>	Cough, "night sweats" and weight loss Often presents as prolonged fever (FUO) or infection of bone, meninges, kidneys or other organs Most infections represent reactivation of old foci in lungs, brain, bone, kidneys etc
<b>Synonyms</b>	Consumption, Mycobacterium africanum, Mycobacterium bovis, Mycobacterium caprae, Mycobacterium orygis, Mycobacterium tuberculosis, Oryx bacillus, Phthisis, TB, TB meningitis, Tuberculose, Tuberculose miliar, Tuberculosi, Tuberculous meningitis, Tuberkulose, White plague. ICD9: 010,012,013,014,015,016,017,018 ICD10: A15,A16,A17,A18,A19

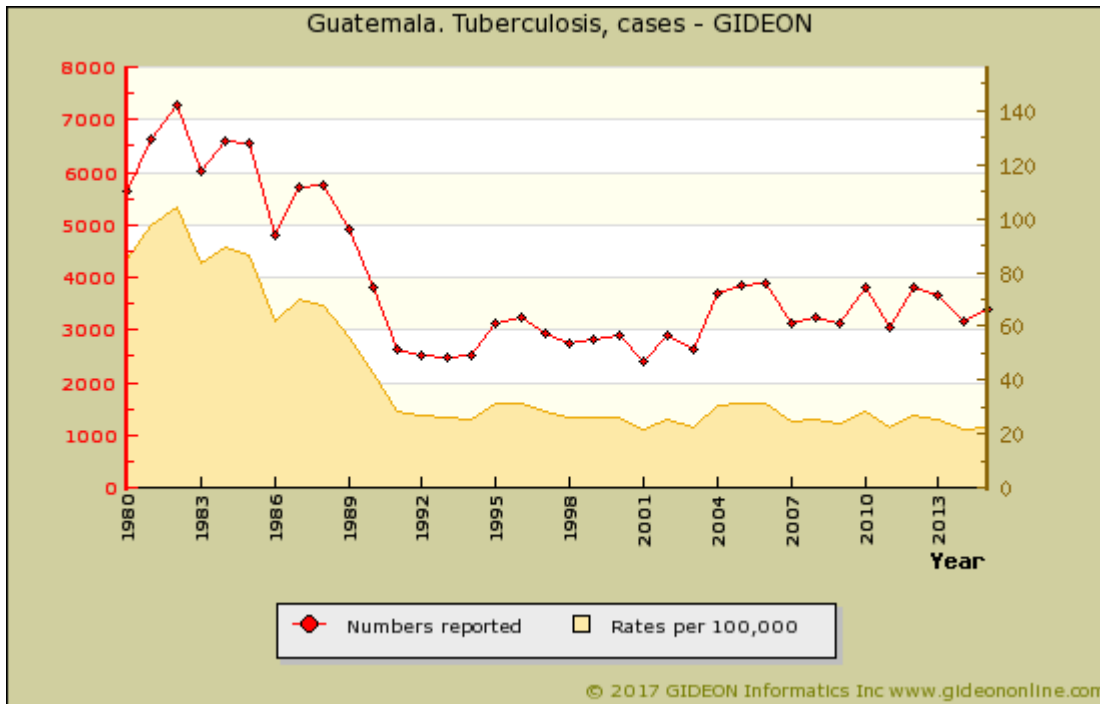
## Tuberculosis in Guatemala

### Vaccine Schedule:

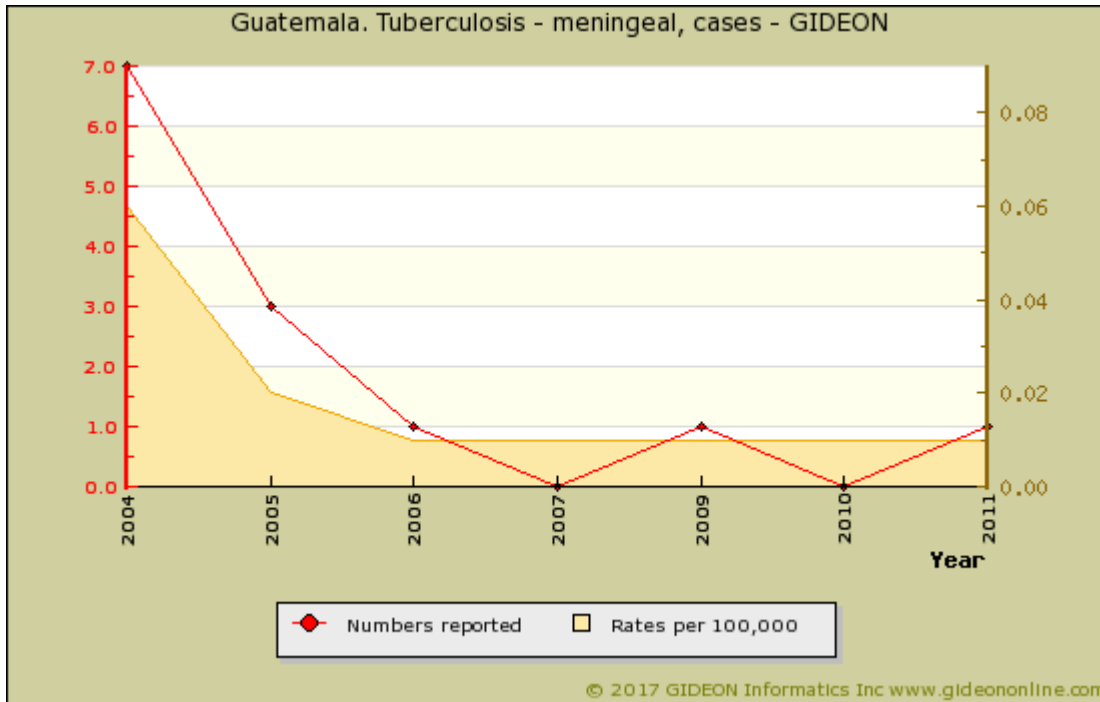
BCG - < 1 year  
DTwP - 18 months; 4 years  
DTwPHibHepB - 2,4,6 months  
HepB - birth and 3 doses for adults in risk groups  
IPV - NA  
MMR - 12-23 months  
OPV - 2,4,6,18 months; 4 years  
Pneumo conj - 2,4 months; 1 year  
Rotavirus - 2,4 months  
Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



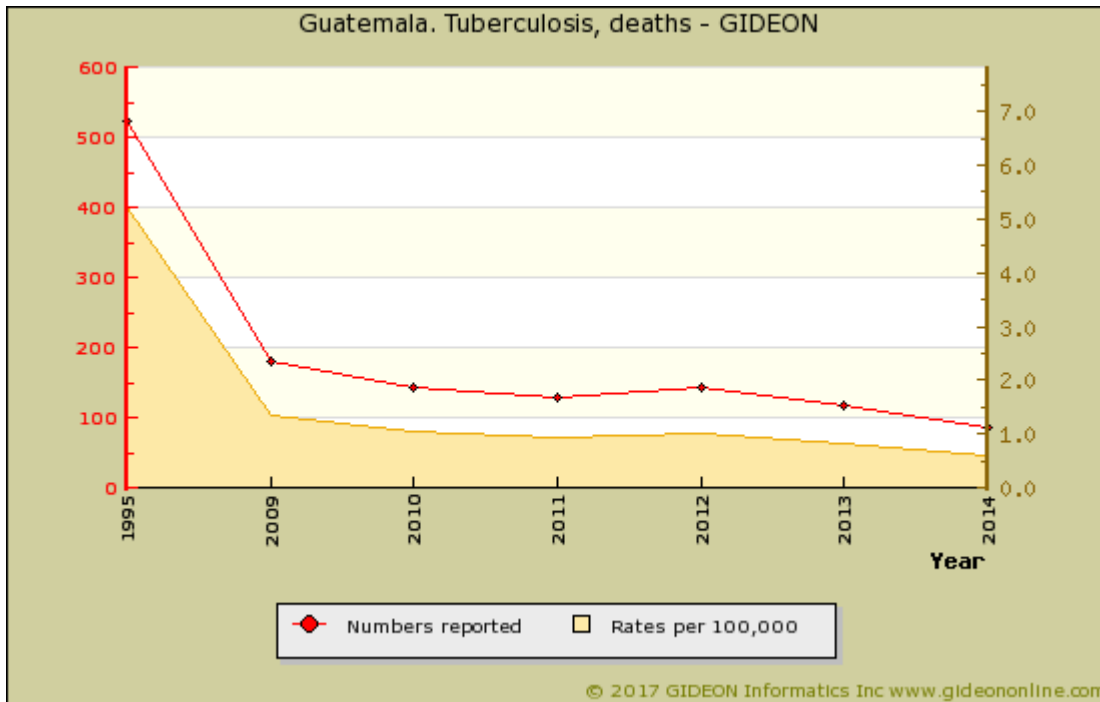
Graph: Guatemala. Tuberculosis - WHO-UNICEF est. % BCG coverage



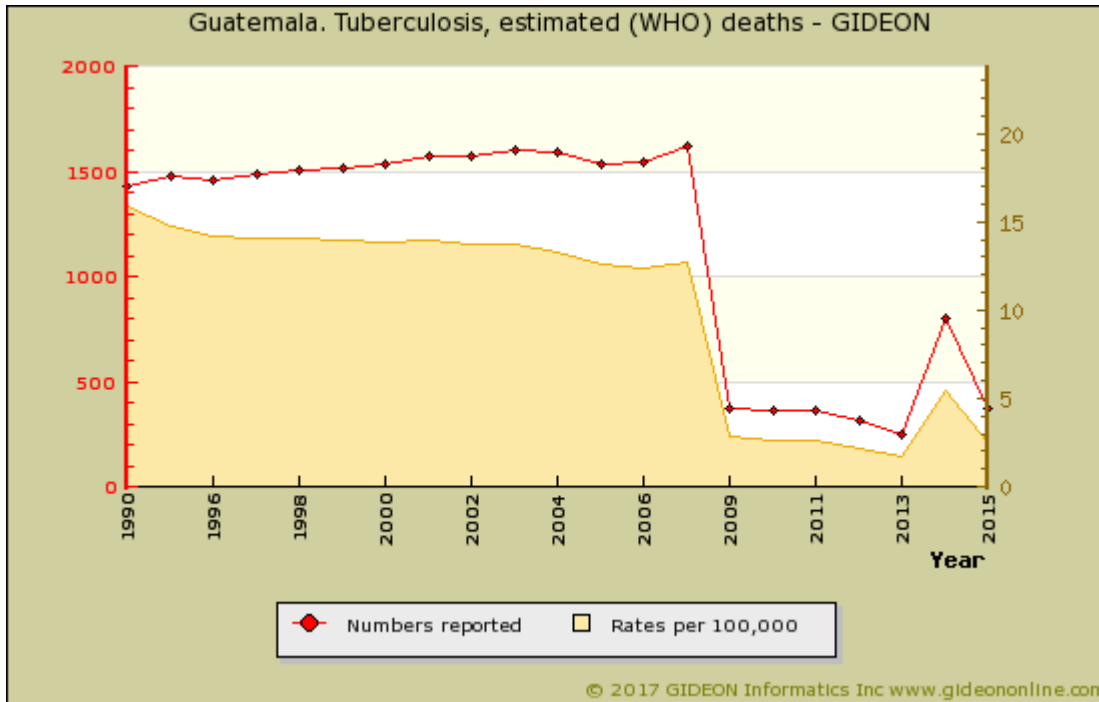
Graph: Guatemala. Tuberculosis, cases



Graph: Guatemala. Tuberculosis - meningial, cases



Graph: Guatemala. Tuberculosis, deaths



Graph: Guatemala. Tuberculosis, estimated (WHO) deaths

**Tuberculosis and HIV infection:**

- In 2000, 8% of tuberculosis patients were HIV positive.
- 13.9% of AIDS patients have tuberculosis (Guatemala City, 1999 to 2000). <sup>1</sup>
- 25% of HIV-positive outpatients have extrapulmonary tuberculosis (Guatemala City, 1991 to 1992). <sup>2</sup>

**Notable outbreaks**

Years	Region	Cases	Pathogen	Population	Notes
2007		102	MDR TB	immigrants	Outbreak (5 active and 97 latent cases) among Guatemalan immigrants living in the United States. <sup>3</sup>
2008	foreign country	14		immigrants	Outbreak among Guatemalan immigrants in the United States <sup>4</sup>

**References**

1. Int J STD AIDS 2003 Dec ;14(12):810-3.
2. Rev Col Med Cir Guatem 1992 Oct-Dec;2 Suppl:26-30.
3. South Med J 2010 Sep ;103(9):882-6.
4. Public Health Rep 2011 Sep-Oct;126(5):726-32.

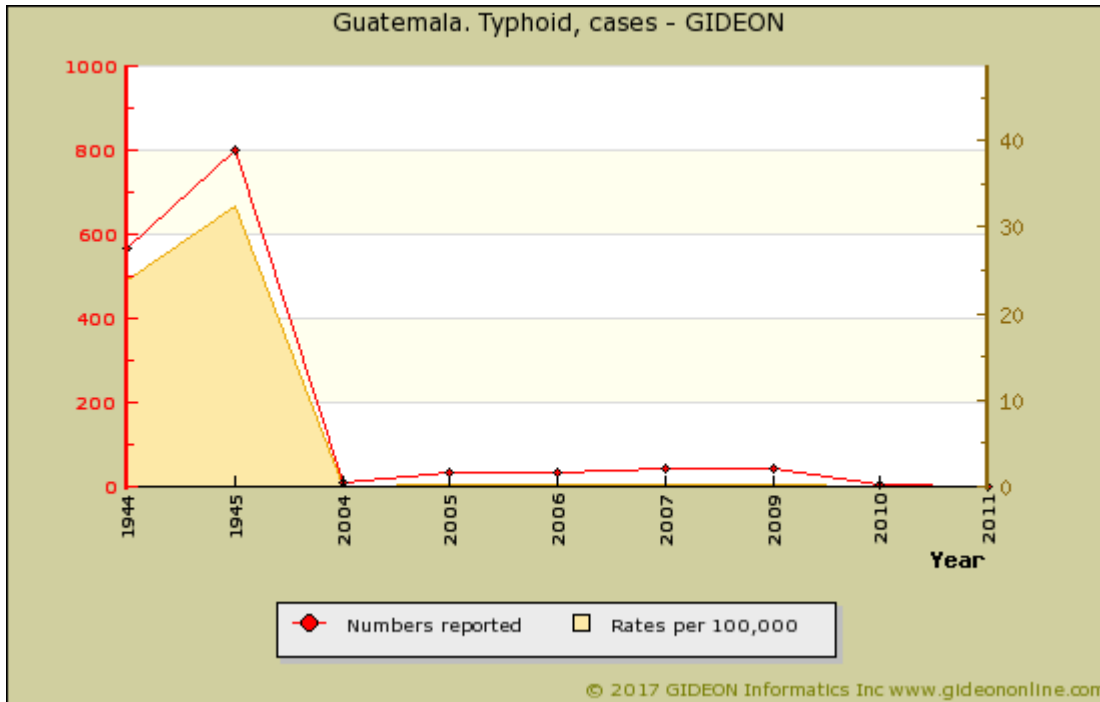
## Tungiasis

<b>Agent</b>	PARASITE - Insecta Siphonaptera (Flea), Tungidae: <i>Tunga penetrans</i> and <i>T. trimamillata</i> ("sand fleas")
<b>Reservoir</b>	Pig, Dog, Various other mammals
<b>Vector</b>	None
<b>Vehicle</b>	Contact
<b>Incubation Period</b>	8d - 12d
<b>Diagnostic Tests</b>	Identification of parasite.
<b>Typical Adult Therapy</b>	Extraction of parasite <a href="#">Ivermectin</a> has been advocated in some publications.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Painful papule or nodule, usually on the feet - may be multiple Onset 1 to 2 weeks after walking on dry soil Secondary infections and tetanus are reported
<b>Synonyms</b>	Bicho de pe, Chica, Chigger, Chigoe flea, Jigger, Nigua, Puce-chique, Tu, <i>Tunga penetrans</i> , <i>Tunga trimamillata</i> , Tungosis. ICD9: 134.1 ICD10: B88.1

## Typhoid and enteric fever

<b>Agent</b>	BACTERIUM. <i>Salmonella</i> serotype Typhi (certain other <i>Salmonella</i> species cause 'paratyphoid' fever) A facultative gram-negative bacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Food, Fly, Water
<b>Incubation Period</b>	15d - 21d (range 5d - 34d)
<b>Diagnostic Tests</b>	Culture (blood, urine, sputum culture). Stool usually negative unless late, untreated infection. Serology.
<b>Typical Adult Therapy</b>	<a href="#">Ceftriaxone</a> 2 g IV q12h to q 24h X 5 to 7d. OR <a href="#">Azithromycin</a> 1 gram PO on day 1; then 500 mg days 2 to 7.  Fluoroquinolones resistance common - not recommended for empiric therapy.  Add corticosteroids if evidence of shock or decreased mental status.
<b>Typical Pediatric Therapy</b>	<a href="#">Ceftriaxone</a> 50 to 80 mg/kg IV daily X 5 to 7d. OR <a href="#">Azithromycin</a> 15 mg/kg PO on day 1; then 7.5 mg/kg on days 2 to 7.
<b>Vaccines</b>	<a href="#">Typhoid - injectable vaccine</a> <a href="#">Typhoid - oral vaccine</a>
<b>Clinical Hints</b>	Transient diarrhea followed by fever, splenomegaly and obtundation Rose spots (during second week of illness), leukopenia and relative bradycardia are common Intestinal perforation or hemorrhage may occur in third to fourth week of illness Case-fatality rates are 0.8% (treated) to 15% (untreated)
<b>Synonyms</b>	Abdominal typhus, Abdominaltyphus, Buiktyphus, Enteric fever, Febbre tifoide, Febbre tifoidea, Fiebre tifoidea, Paratifoidea, Paratyfus, Paratyphoid, <i>Salmonella</i> serotype Typhi, Tyfoid, Typhoid, Typhoide. ICD9: 002 ICD10: A01

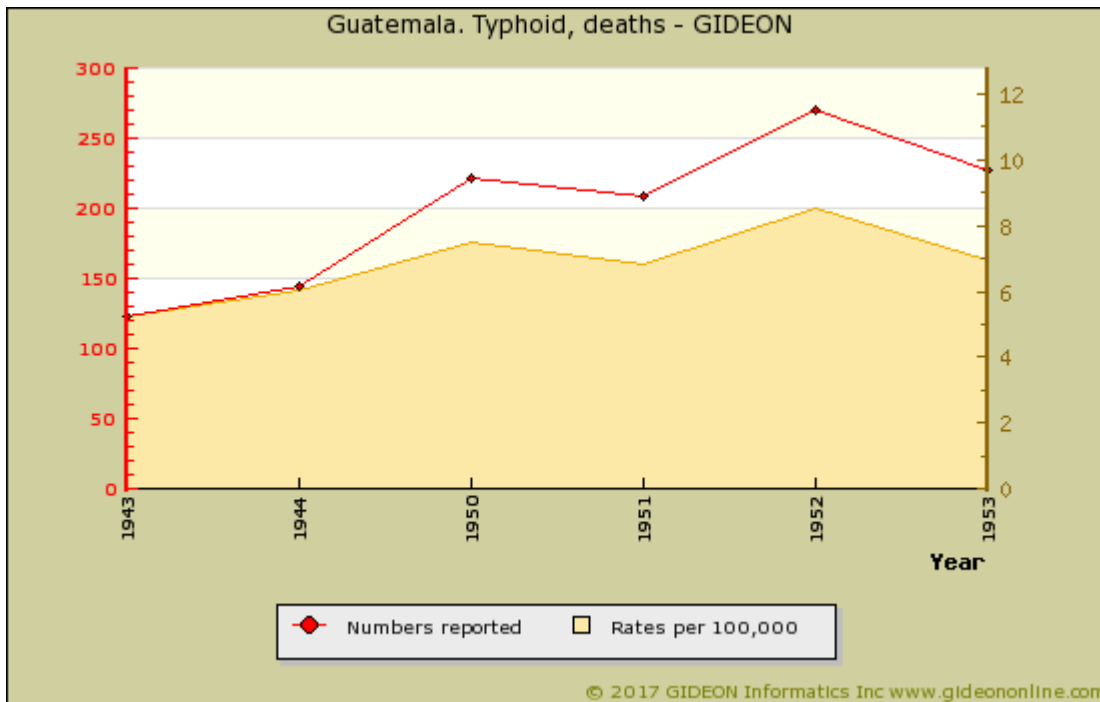
## Typhoid and enteric fever in Guatemala



Graph: Guatemala. Typhoid, cases

Notes:

1. During 1943 to 1949, the mean annual incidence was 817 cases <sup>1</sup>



Graph: Guatemala. Typhoid, deaths

**Notable outbreaks**

Years	Region	Setting	Cases	Source	Notes
1998 - 1999	foreign country		16	fruit - mamey	Outbreak (16 cases or more) in the United States was ascribed to frozen mamey (a tropical fruit) imported from Honduras and Guatemala. <sup>2 3 4</sup>

Years	Region	Setting	Cases	Source	Notes
1999	Puerto Barrios	carnival	120	water	<a href="#">5</a>
1999	Izabal		24		<a href="#">6</a>
2010	foreign country		12	fruit	Outbreak (16 cases or more) in the United States was ascribed to frozen mamey (a tropical fruit) imported from Guatemala. <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a>

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2. J Infect Dis 2002 Jul 15;186(2):234-9.
3. Clin Infect Dis 2012 Jul ;55(1):61-6.
4. ProMED <promedmail.org> archive: 19990222.0236
5. ProMED <promedmail.org> archive: 19990320.0446
6. ProMED <promedmail.org> archive: 19990420.0648
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8. ProMED <promedmail.org> archive: 20100814.2805
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**Typhus - endemic**

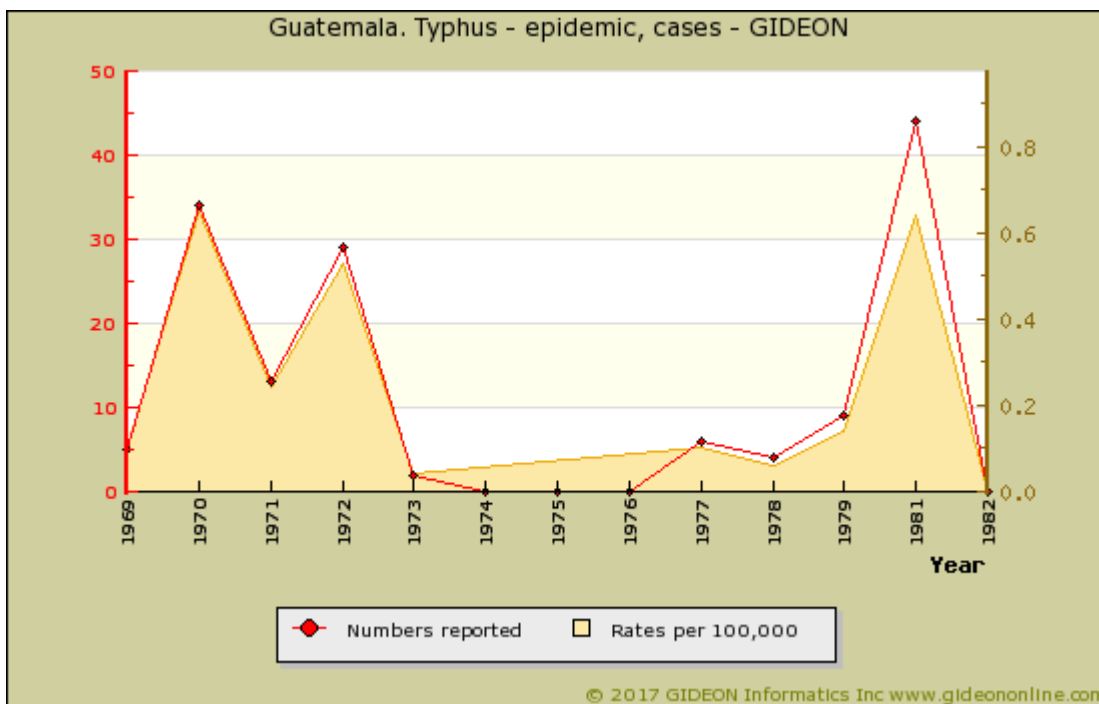
<b>Agent</b>	BACTERIUM. <i>Rickettsia typhi</i>
<b>Reservoir</b>	Rat
<b>Vector</b>	Flea ( <i>Xenopsylla</i> or <i>Nosopsyllus</i> spp.)
<b>Vehicle</b>	None
<b>Incubation Period</b>	10d - 12d (range 4d - 18d)
<b>Diagnostic Tests</b>	Serology. Identification of rickettsiae in smear or culture of skin lesions. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg BID X 7d
<b>Typical Pediatric Therapy</b>	<a href="#">Doxycycline</a> 2 mg/kg BID X 7d (maximum 200 mg/day); or <a href="#">Chloramphenicol</a> 12.5 mg/kg QID X 7d
<b>Clinical Hints</b>	Fever, headache and myalgia Truncal maculopapular rash (present in 60%) appears on days 3 to 5 and persists for 4 to 8 days Fever resolves after 12 to 16 days Case fatality rate (untreated) is 2%.
<b>Synonyms</b>	Endemic typhus, Murine typhus, <i>Rickettsia typhi</i> , Ship typhus, Tifo murino, Tifus pulgas, Vlektyphus. ICD9: 081.0 ICD10: A75.2

## Typhus - epidemic

<b>Agent</b>	BACTERIUM. <i>Rickettsia prowazekii</i>
<b>Reservoir</b>	Human, Flying squirrel ( <i>Glaucomys volans volans</i> , in the United States)
<b>Vector</b>	Louse ( <i>Pediculus</i> ), Squirrel flea
<b>Vehicle</b>	None
<b>Incubation Period</b>	10d - 14d (range 5d - 23d)
<b>Diagnostic Tests</b>	Serology. Identification of rickettsiae in smear or culture of skin lesions. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<b>Doxycycline</b> 100 mg PO BID X 3 to 5d. OR <b>Chloramphenicol</b> 500 mg QID X 3 to 5d
<b>Typical Pediatric Therapy</b>	<b>Doxycycline</b> 2 mg/kg PO BID X 3 to 5d (maximum 200 mg/day). OR <b>Chloramphenicol</b> 10 mg/kg PO QID X 3 to 5d
<b>Clinical Hints</b>	Fever, headache and myalgia Truncal maculopapular rash appears on days 4 to 7 Encephalopathy or myocarditis may ensue; Fever resolves after 2 weeks, but convalescence is prolonged Case-fatality rate (untreated) is 10% to 20%
<b>Synonyms</b>	Camp fever, Epidemic typhus, Jail fever, Red louse disease, Rickettsia prowazekii, Ship fever, Shop typhus, Sutama, Sylvatic epidemic typhus, Tifus piojos, Tobardillo. ICD9: 080 ICD10: A75.0

### Typhus - epidemic in Guatemala

Endemic typhus is most common in the mountainous regions.



Graph: Guatemala. Typhus - epidemic, cases

## Notes:

1. The disease is most common in the mountainous regions.
2. No fatal cases were reported during 1971 to 1978.

**Notable outbreaks**

Years	Region	Cases	Notes
1970	Quezaltenango	34	
1972	Quezaltenango	40	

## Urinary tract infection

<b>Agent</b>	BACTERIUM OR FUNGUS. <i>Escherichia coli</i> , other facultative gram negative bacilli, enterococci, et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Urine culture and leucocyte count.
<b>Typical Adult Therapy</b>	Antimicrobial agent(s) directed at known or likely pathogen
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Fever, dysuria, frequency, flank pain and vomiting Infection in children or men - and infection which relapses in women - may warrant radiological studies to rule out underlying obstruction or calculus
<b>Synonyms</b>	Cistite, Cistitis, Cystite, Cystitis, Pielite, Pielitis, Pielonefrite, Pielonefritis, Prostatite, Pyelitis, Pyelonephrite, Pyelonephritis, Trigonitis, Tubulointerstitial nephritis, Urethritis, Uretrite, Zystitis. ICD9: 791.9,136.9,599.0,590,601.0 ICD10: N10,N30,N41

**Vaccinia and cowpox**

<b>Agent</b>	VIRUS - DNA. Poxviridae, Orthopoxvirus. Cowpox virus
<b>Reservoir</b>	Cattle, Cat Rodent
<b>Vector</b>	None
<b>Vehicle</b>	Cattle, Cat
<b>Incubation Period</b>	2d - 4d
<b>Diagnostic Tests</b>	Viral isolation from skin exudate or biopsy. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Secretion precautions; supportive.  In severe cases, <a href="#">Tecovirimat</a> , 400 to 600 mg PO OD X 14 d.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Vaccinia immune globulin</a>
<b>Clinical Hints</b>	Vesicles or pustules (usually on hand) progressing to crusts Painful regional lymphadenopathy Follows contact with infected animals or smallpox vaccination (largely abandoned); see Buffalopox (India note).
<b>Synonyms</b>	Akhmeta poxvirus, Aracatuba, Buffalopox, Camelpox, Cantagalo, Cowpox, Passatempo, Vaccinia, Vaiolo. ICD9: 051.0 ICD10: B08.0

Varicella	
Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Human Herpesvirus 3 (Varicella-zoster virus)
Reservoir	Human
Vector	None
Vehicle	Air, Contact, Breastfeeding, Respiratory or pharyngeal acquisition
Incubation Period	2w - 3w
Diagnostic Tests	Viral culture (vesicles). Serology. Nucleic acid amplification.
Typical Adult Therapy	Respiratory isolation. Severe/complicated cases: <a href="#">Acyclovir</a> 10 to 12 mg/kg IV q8h X 7d Adolescent / young adult: 800 mg PO X 5 per day X 7 d. Alternatives: <a href="#">Valacyclovir</a> 1 g PO TID; or <a href="#">Famciclovir</a> 500 mg PO TID
Typical Pediatric Therapy	Respiratory isolation. <a href="#">Acyclovir</a> (severe/complicated cases) 150 mg/sq m IV q8h X 7d
Vaccines	<a href="#">Varicella vaccine</a> <a href="#">Varicella-Zoster immune globulin</a>
Clinical Hints	Cough and fever followed by a pruritic papulovesicular rash after 1 to 2 days Pneumonia is often encountered Case fatality rate is 4.3 per 100,000 cases (7% in immune-suppressed patients)
Synonyms	Chickenpox, Lechina, Skoldkopper, Vannkopper, Varicela, Varizellen, Vattenkopper, Waterpokken, Windpocken. ICD9: 052 ICD10: B01

## Varicella in Guatemala

The rate of varicella among children treated for cancer was 23.4 per 1,000 person-years (2009 to 2013). <sup>1</sup>

### References

1. [World J Pediatr 2016 Aug ;12\(3\):320-6.](#)

## Venezuelan equine encephalitis

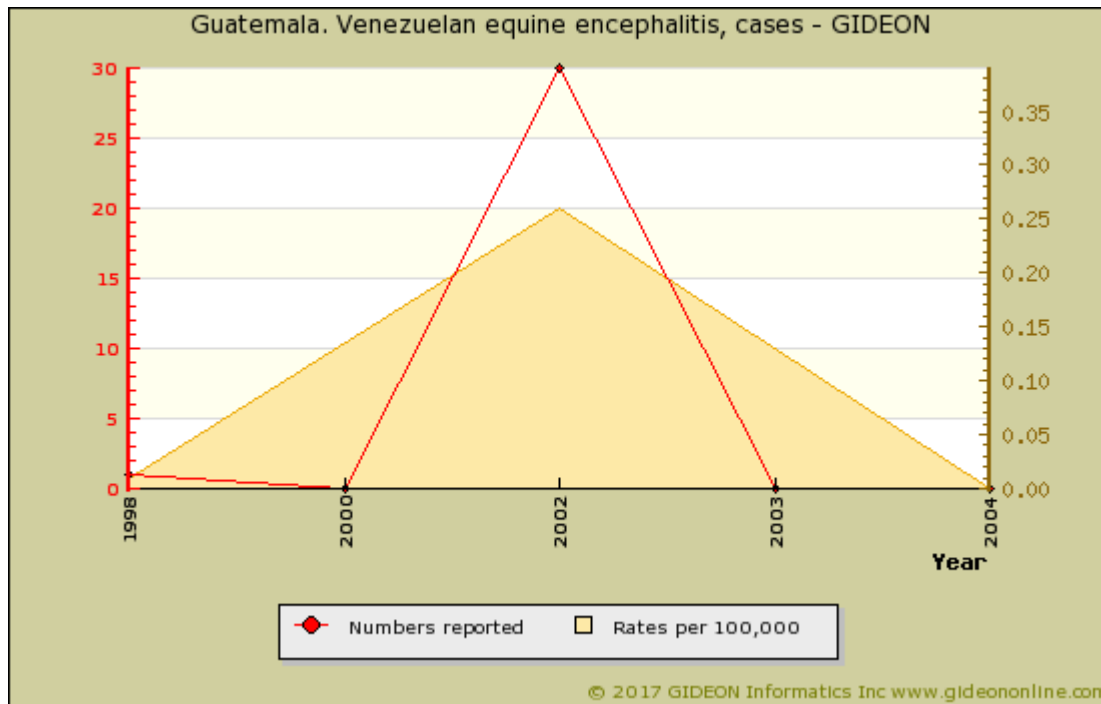
Agent	VIRUS - RNA. Togaviridae, Alphavirus: Venezuelan equine encephalitis virus
Reservoir	Rodent, Horse
Vector	Mosquito ( <i>Culex</i> spp, <i>Aedes taeniorhynchus</i> , <i>Psorophora confinnis</i> , <i>Anopheles</i> ) spp)
Vehicle	None
Incubation Period	2d - 5d (range 1d - 6d)
Diagnostic Tests	Viral culture (throat, blood, brain tissue). Serology. Nucleic acid amplification.  Biosafety level 3.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	<a href="#">Western equine encephalitis vaccine</a>
Clinical Hints	Fever, myalgia, arthralgia, vomiting, conjunctivitis and encephalitis Encephalitis is more common and more severe among children Case-fatality rate is 20%.
Synonyms	Everglades, Mucambo, Peste loca, Pixuna, Rio Negro, Tonate. ICD9: 066.2 ICD10: A92.2

## Venezuelan equine encephalitis in Guatemala

### Time and Place:

Enzootic foci exist in La Avellana and Puerto Barrios, on the Pacific and Caribbean lowlands (respectively).

- VE virus was recovered from sentinel hamsters in these areas during 1968 to 1980. <sup>1</sup>
- An epizootic was reported in 1969. <sup>2 3 4 5</sup>
- Equine cases were reported in 2001.
- Seropositive bats were identified during 1983 to 1984. <sup>6</sup>
- Sporadic cases were reported among equines in 2009 and 2010. <sup>7</sup>



Graph: Guatemala. Venezuelan equine encephalitis, cases

#### Vectors:

- The principal mosquito vector is *Culex taeniopus* (1977 to 1980).<sup>8</sup>
- *Culex (Melanoconion) opisthopus* may also serve as vector in the marshes on the Pacific coast.<sup>9</sup>

#### References

1. Am J Trop Med Hyg 1985 Jul ;34(4):790-8.
2. Am J Trop Med Hyg 1976 Jan ;25(1):151-62.
3. Am J Epidemiol 1971 Feb ;93(2):137-43.
4. Am J Epidemiol 1972 Mar ;95(3):255-66.
5. Am J Epidemiol 1971 Feb ;93(2):130-6.
6. J Wildl Dis 1995 Jan ;31(1):1-9.
7. ProMED <promedmail.org> archive: 20130201.1525356
8. Am J Trop Med Hyg 1986 Jul ;35(4):851-9.
9. Am J Trop Med Hyg 1979 Nov ;28(6):1060-3.



## Vibrio parahaemolyticus infection

Agent	BACTERIUM <i>Vibrio parahaemolyticus</i> A facultative gram-negative bacillus
Reservoir	Marine water, Seafood, Fish
Vector	None
Vehicle	Seafood
Incubation Period	10h - 20h (range 2h - 4d)
Diagnostic Tests	Stool culture - alert laboratory when this organism is suspected.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	Vomiting and explosive diarrhea Onset 4 to 24 hours following ingestion of seafood (often steamed crabs) Diarrhea may persist for 7 to 10 days Case fatality rate is 0.1%
Synonyms	Vibrio parahaemolyticus. ICD9: 005.4 ICD10: A05.3

**West Nile fever**

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Flavivirus: West Nile virus A subtype of West Nile virus, Kunjin virus, is associated with human disease in Oceania and Asia
<b>Reservoir</b>	Bird, Horse, Bat, Tick
<b>Vector</b>	Mosquito ( <i>Culex univittatus</i> , <i>Cx. pipiens</i> , <i>Cx. vishnui</i> , <i>Cx. naevei</i> , <i>Coquillettidia</i> , <i>Aedes</i> and <i>Anopheles</i> spp.)
<b>Vehicle</b>	Blood, Breastfeeding
<b>Incubation Period</b>	3d - 6d (range 1d - 14d)
<b>Diagnostic Tests</b>	Viral culture (blood, CSF). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	Myalgia, arthralgia, lymphadenopathy, headache, conjunctivitis and a macular rash Sporadic instances of encephalitis, meningitis and myocarditis are reported Kunjin virus is similar, but often associated with arthralgia, myalgia and rash Illness resolves within one week in most cases
<b>Synonyms</b>	Bagaza, Fiebre del Oeste del Nilo, Kunjin, Lourdige, Near Eastern equine encephalitis, Ntaya, Usutu, WNF. ICD9: 066.4 ICD10: A92.3

**West Nile fever in Guatemala**

2003 to 2004 - Seropositive horses were identified. <sup>1</sup>

2005 to 2008 - A transmission focus was identified in Puerto Barrios. Seropositive chickens were reported, and West Nile virus was identified in *Culex quinquefasciatus* and *Culex mollis/Culex inflicus* - but not in *Culex nigripalpus*. The major amplifying host in the region appears to be great-tailed grackle (*Quiscalus mexicanus*). <sup>2</sup>

**References**

1. [Emerg Infect Dis 2006 Jun ;12\(6\):1038-9.](#)
2. [Am J Trop Med Hyg 2013 Jan ;88\(1\):116-26.](#)

## Western equine encephalitis

Agent	VIRUS - RNA. Togaviridae, Alphavirus: Western equine encephalitis virus
Reservoir	Bird, Horse, Amphibian, Reptile
Vector	Mosquito ( <i>Culex tarsalis</i> )
Vehicle	None
Incubation Period	5d - 15d
Diagnostic Tests	Viral culture (CSF, blood, brain tissue). Serology. Nucleic acid amplification.  Biosafety level 2.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	<a href="#">Western equine encephalitis vaccine</a>
Clinical Hints	Headache, back pain, vomiting, meningitis and encephalitis Often encountered in late summer and autumn in temperate regions Disease most severe in children Resolves after 5 to 10 days Case fatality rate is 5%
Synonyms	WEE. ICD9: 062.1 ICD10: A83.1

Although Western equine encephalitis is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

### Western equine encephalitis in Guatemala

Seropositive bats were identified during 1983 to 1984. <sup>1</sup>

### References

1. [J Wildl Dis 1995 Jan ;31\(1\):1-9.](#)

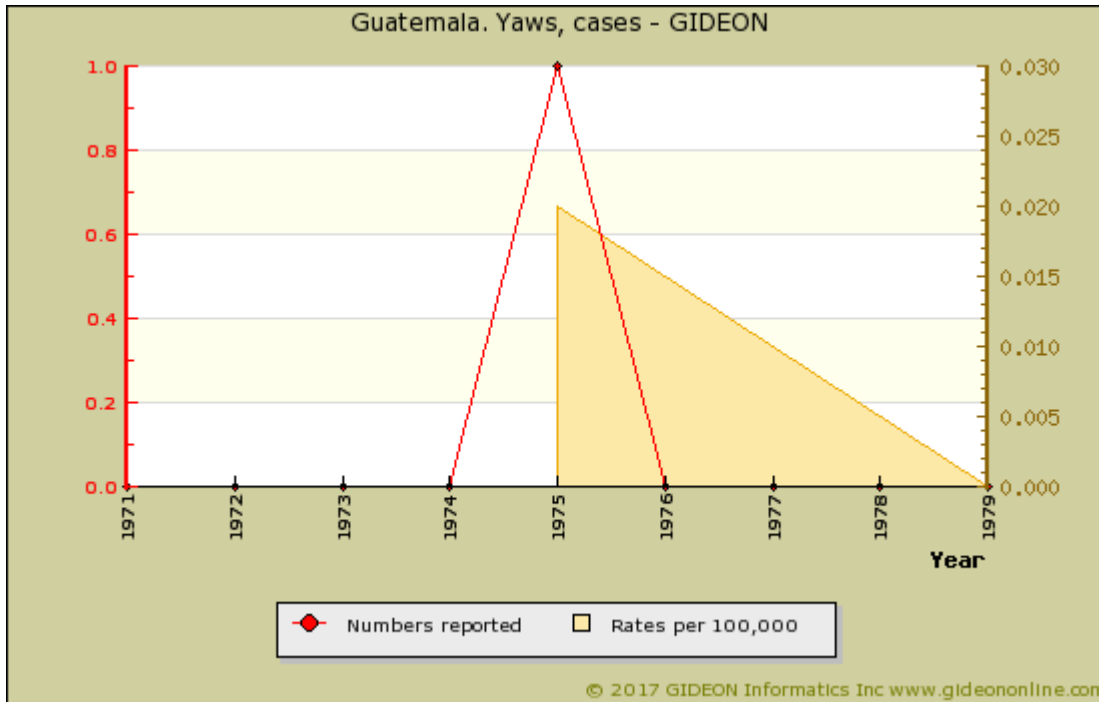
## Whipple's disease

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Tropheryma whipplei</i> A gram positive bacillus
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	None
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Identification of inclusions in lamina propria (other tissues). Tissue culture. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<b>Ceftriaxone</b> 2.0 g IV daily X 14 days. OR <b>Penicillin G</b> 12 million u + <b>Streptomycin</b> 1 g daily X 14d. Then, Sulfamethoxazole / <b>Trimethoprim</b> X 1 year  OR: <b>Doxycycline</b> 100 mg PO BID + <b>Hydroxychloroquine</b> X 1 year, followed by <b>Doxycycline</b> for life
<b>Typical Pediatric Therapy</b>	Disease is rarely, if ever, encountered in children
<b>Clinical Hints</b>	Chronic multisystem disorder characterized by weight loss, diarrhea, abdominal and joint pain Dermal hyperpigmentation, fever and lymphadenopathy are often present <i>Tropheryma whipplei</i> has recently been recovered from the blood of patients with fever, headache or cough.
<b>Synonyms</b>	Intestinal lipodystrophy, Lipophagic granulomatosis, Mesenteric chyladenectasis, Steatorrhea arthropericarditica, <i>Tropheryma whipplei</i> . ICD9: 040.2 ICD10: K90.8

## Yaws

<b>Agent</b>	BACTERIUM. <i>Treponema pallidum</i> subsp. <i>pertenue</i> : microaerophilic gram-negative spirochete
<b>Reservoir</b>	Human, Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Insect bite, Fomite
<b>Incubation Period</b>	3w - 5w (range 10d - 12w)
<b>Diagnostic Tests</b>	VDRL and antitreponemal tests (FTA, MHTP) positive as in syphilis.
<b>Typical Adult Therapy</b>	<b>Azithromycin</b> 30 mg/kg p.o. as single dose OR Benzathine <b>Penicillin G</b> 1.2 million units IM as single dose.
<b>Typical Pediatric Therapy</b>	<b>Azithromycin</b> 30 mg/kg p.o. as single dose OR Benzathine <b>Penicillin G</b> : Weight <14kg: 300,000u IM Weight 14 to 28kg: 600,000u IM Weight >28kg - 1.2 million u IM
<b>Clinical Hints</b>	Dermal papillomata, periostitis and soft tissue suppuration Regional lymphadenopathy is common Relapses often seen during the initial 5 years of illness Gummata and hyperkeratotic plaques appear in advanced stages of the infection
<b>Synonyms</b>	Anakhre, Bouba, Breda's disease, Charlouis' Disease, Frambesia, Gangosa, Goundou, Granuloma tropicum, Gundo, Henpue, Henpuye, Ogo Mutilans, Parangi, Patek, Pian, <i>Treponema pallidum</i> subsp <i>pertenue</i> . ICD9: 102 ICD10: A66

### Yaws in Guatemala



Graph: Guatemala. Yaws, cases



Yellow fever	
Agent	VIRUS - RNA. Flaviviridae, Flavivirus: Yellow fever virus
Reservoir	Human, Mosquito, Monkey, Marsupial
Vector	Mosquito ( <i>Stegomyia (Aedes)</i> , <i>Haemagogus</i> , <i>Sabethes</i> )
Vehicle	None
Incubation Period	3d - 6d (range 2.5d - 14d)
Diagnostic Tests	Viral culture (blood, liver). Serology. Nucleic acid amplification.  Biosafety level 3.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	<a href="#">Yellow fever vaccine</a>
Clinical Hints	Headache, backache, vomiting, myalgias, jaundice and hemorrhagic diathesis Relative bradycardia and leukopenia are present Illness is often biphasic Case fatality rate is 10% to 60%, within 7 days of onset
Synonyms	Bulan fever, Febbre gialla, Febre amarela, Fever of Fernando Po, Fever of the blight of Benin, Fiebre amarilla, Fievre jaune, Gelbfieber, Gele koorts, Gul feber, Gula febern, Inflammatory fever, Kendal's disease, Magdalena fever, Maladie de Siam, Pest of Havana, Stranger's fever. ICD9: 060 ICD10: A95

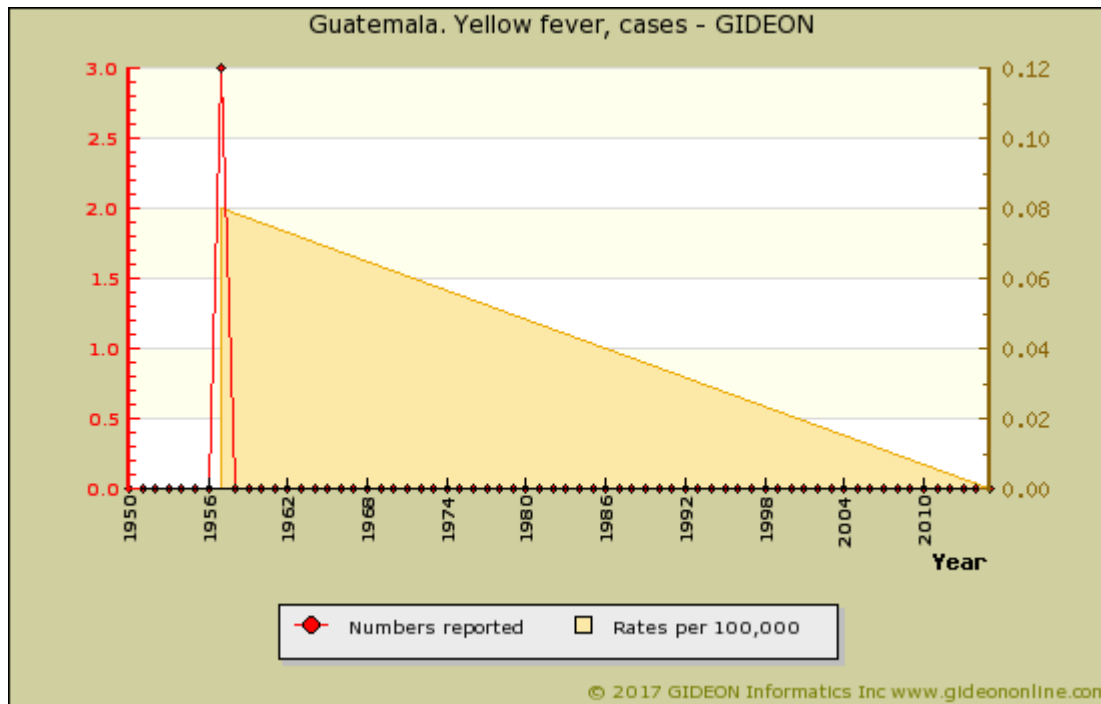
Although Yellow fever is not endemic to Guatemala, imported, expatriate or other presentations of the disease have been associated with this country.

## Yellow fever in Guatemala

### Time and Place:

Epidemics of yellow fever were reported in Livingston (Atlantic coast) in 1891.

- In 1905, epidemics were reported in Livingston, Zacapa (700 cases) Gualan and Puerto-Barios.
- Yellow fever virus was identified in mosquitoes (*Haemagogus mesodentatus*, *H. equinus* and *Sabethes chloropterus*) captured in Guatemala in 1956. <sup>1</sup>



Graph: Guatemala. Yellow fever, cases

Notes:

Individual years:

1957 - see reference <sup>2</sup>

Proof of vaccination **IS** required for travelers from a country with risk of YFV transmission and  $\geq 1$  year of age, including transit  $>12$  hours in an airport located in a country with risk of YFV transmission. This country considers the certificate of YF vaccination to be valid for life.

**References**

1. Am J Trop Med Hyg 1957 Mar ;6(2):232-7.
2. Am J Trop Med Hyg 1958 Jan ;7(1):25-35.



## Yersiniosis

<b>Agent</b>	BACTERIUM. <i>Yersinia enterocolitica</i> and <i>Yersinia pseudotuberculosis</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Pig, Rodent, Rabbit, Sheep, Goat, Cattle, Horse, Dog, Cat, Bat
<b>Vector</b>	None
<b>Vehicle</b>	Food, Water, Meat, Dairy products, Vegetables, Fecal-oral, Blood
<b>Incubation Period</b>	4d - 7d (range 1d - 11d)
<b>Diagnostic Tests</b>	Culture stool, blood. Alert laboratory when these organisms are suspected.
<b>Typical Adult Therapy</b>	Stool precautions; diarrhea is self-limited. If severe disease - <a href="#">Ciprofloxacin</a> 500 mg BID X 5 to 7d. OR Sulfamethoxazole / <a href="#">Trimethoprim</a>
<b>Typical Pediatric Therapy</b>	Stool precautions; diarrhea is self-limited. If severe disease - Sulfamethoxazole / <a href="#">Trimethoprim</a> 20 mg-4 mg/kg BID X 5 to 7d
<b>Clinical Hints</b>	Fever, diarrhea, and right lower quadrant pain Fecal leucocytes present May be associated with rheumatologic manifestations such as erythema multiforme, Reiter's syndrome and chronic arthritis
<b>Synonyms</b>	Far East scarlet-like fever, FESLF, <i>Yersinia enterocolitica</i> , <i>Yersinia pseudotuberculosis</i> , Yersiniose. ICD9: 008.44 ICD10: A04.6,A28.2

## Yersiniosis in Guatemala

### Prevalence surveys

Years	Region	Study Group	Notes
2010*	multiple locations	travelers	0% of American patients with travelers' diarrhea acquired in India, Guatemala or Mexico (2010 publication) <sup>1</sup>

\* indicates publication year (not necessarily year of survey)

### References

1. [J Clin Microbiol 2010 Apr ;48\(4\):1417-9.](#)

## Zika

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Flavivirus: Zika virus
<b>Reservoir</b>	Human, Mosquito, Monkey
<b>Vector</b>	Mosquito ( <i>Aedes</i> spp)
<b>Vehicle</b>	Sexual contact, Saliva, Blood transfusion
<b>Incubation Period</b>	5d - 8d (range 2d - 15d)
<b>Diagnostic Tests</b>	Viral isolation (blood). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	A mild dengue-like illness with conjunctivitis and a pruritic maculopapular rash that starts on the face and spreads to the rest of the body; Joint pain is common Myalgia, retroorbital pain and leg edema may occur May be associated with Guillain-Barre syndrome and congenital neurological defects
<b>Synonyms</b>	Zika fever. ICD9: 078.89 ICD10: A92.8

### Zika in Guatemala

2016 - A Korean traveler <sup>1</sup> and a Belgian traveler acquired Zika virus infection in Guatemala. <sup>2</sup> 2016 - A Korean traveler <sup>3</sup> and a Belgian traveler acquired Zika virus infection in Guatemala. <sup>4</sup>

#### Vectors:

*Aedes albopictus* was discovered for the first time in Guatemala in 1995. <sup>5</sup>

- As of 2003, *Stegomyia (Aedes) albopictus* was present in ten American countries: Brazil, the Cayman Islands <sup>6</sup>, the Dominican Republic, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Trinidad and the United States.

#### Notable outbreaks

Years	Cases	Notes
2015	68	<sup>7 8</sup>
2016 - 2017	3,343	Case numbers to January 12, 2017. Includes 15 cases of congenital syndrome. Case numbers to November <sup>9 10</sup> <sup>11 12 13 14 15</sup>

#### References

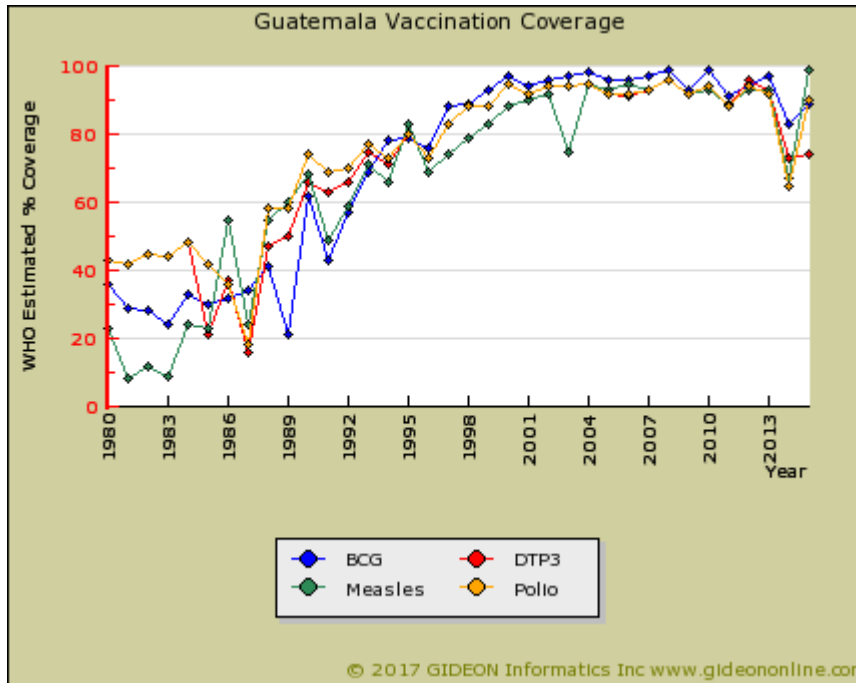
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## Zygomycosis

<b>Agent</b>	FUNGUS. Zygomycota, Zygomycetes, Mucorales: <i>Mucor</i> spp., <i>Rhizopus</i> spp., <i>Lichtheimia</i> (formerly <i>Absidia</i> ) spp, <i>Saksenaea</i> spp, et al
<b>Reservoir</b>	Saprophytes
<b>Vector</b>	None
<b>Vehicle</b>	Air, Bandages, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Fungal smear and culture.
<b>Typical Adult Therapy</b>	<a href="#">Amphotericin B</a> to maximum dose 0.8 mg/kg/d; and to total dose of 3g. Excision as indicated
<b>Typical Pediatric Therapy</b>	<a href="#">Amphotericin B</a> max dose 0.8 mg/kg/d; and to total dose of 40 mg/kg. Excision as indicated
<b>Clinical Hints</b>	Periorbital pain, sinusitis, and palatal, nasal or cerebral infarcts Occurs in the setting of preexisting acidosis (diabetes, uremia) Pulmonary infection may complicate leukemia
<b>Synonyms</b>	Absidia, Actinomucor, Apophysomyces, Cokeromyces, Cunninghamella, Hormographiella, Lichtheimia, Lichtheimia, Mucor, Mucormycosis, Mycocladus, Phycomycosis, Rhizomucor, Rhizopus, Saksenaea, Syncephalastrum. ICD9: 117.7 ICD10: B46

## Vaccine Schedule and coverage for Guatemala

BCG - DTwP - 18 months; 4 years  
 DTwPHibHepB - 2,4,6 months  
 HepB - birth and 3 doses for adults in risk groups  
 IPV - NA  
 MMR - 12-23 months  
 OPV - 2,4,6,18 months; 4 years  
 Pneumo conj - 2,4 months; 1 year  
 Rotavirus - 2,4 months  
 Td - 1st contact; +4 weeks; +6 months; +1, +1 year or 1st contact; +4 weeks; +6 months; +10, +10 years (if not at risk)



A given generic vaccine may have multiple designations in this list due to variations in terminology used by individual countries. Vaccination policies evolve rapidly in response to changes in disease occurrence and the introduction of new vaccines. Every effort has been made to update these lists accordingly.

### Vaccine Abbreviations

- aP - Attenuated pertussis
- ap - Attenuated pertussis
- BCG - Bacillus Calmette Guerin
- CBAW - Childbearing age women
- D - Diphtheria
- HCW - Health-care workers
- Hep - Hepatitis B
- HEP - Hepatitis B
- HepA - Hepatitis A
- HepB - Hepatitis B
- Hib - Haemophilus influenzae type B
- HPV - Human papillomavirus
- IPV - Injectable polio vaccine
- MenACWY - Meningococcus types A,C,Y and W
- MenC-conj - Meningococcus type C conjugate
- MR - Measles, Rubella
- MMR - Measles, Mumps, Rubella
- MMRV - Measles, Mumps, Rubella, Varicella
- NA - Details not available
- OPV - Oral polio vaccine
- P - Pertussis
- Pneumo - Pneumococcal vaccine
- Pneumo conj - Pneumococcal conjugate
- Pneumo ps - Pneumococcal polysaccharide
- T - Tetanus

TBE - Tick-borne encephalitis  
Td - Tetanus lower dose diphtheria  
TT - Tetanus toxoid  
wP - Whole-cell pertussis  
YF - Yellow fever  
Zoster - Herpes zoster

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