

INFECTIOUS DISEASES OF BELIZE



Stephen Berger, MD

gideon 

2021 Edition

Infectious Diseases of Belize - 2021 edition

Stephen Berger, MD

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Published by GIDEON Informatics, Inc, Los Angeles, California, USA. www.gideononline.com

Cover design by GIDEON Informatics, Inc

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ISBN: 978-1-4988-2989-2

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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

Infectious Diseases of Belize 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 three sub-sections:

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

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

Agent	Classification (e.g., virus, parasite) and taxonomic designation.
Reservoir	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.
Vector	An arthropod or other living carrier which transports an infectious agent from an infected organism or reservoir to a susceptible individual or immediate surroundings.
Vehicle	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 Belize follows the diseases chapters.

Content

There are 361 generic infectious diseases in the world today. 212 of these are endemic, or potentially endemic, to Belize. A number of other diseases are not relevant to Belize 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 Belize.

Sources

Data are based on the GIDEON web application (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 Belize.

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.

We welcome feedback, and will be pleased to add any relevant, sourced material. Email us at ebook@gideononline.com

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Last updated: February 26, 2021

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

+ Country specific note exists for disease

Acanthocephalan infections

Agent	PARASITE - Archiacanthocephala. Moniliformida: <i>Moniliformis moniliformis</i> , Oligacanthorhynchida: <i>Maracanthorhynchus hirudinaceus</i> .
Reservoir	Pig (<i>Maracanthorhynchus</i>), rat and fox (<i>Moniliformis</i>),
Vector	None
Vehicle	Insect ingestion
Incubation Period	Unknown - presumed 15 to 40 days
Diagnostic Tests	Identification of worm in stool: Moniliformis moniliformis adult: female - 10 to 30 cm; male - 4 to 5 cm Macracanthorhynchus hirudinaceus adult: female - 5.6 to 35.1 cm; male 5.2 to 8.9 cm
Typical Adult Therapy	Infection is usually self-limited. Pyrantel pamoate has been used against <i>Moniliformis moniliformis</i> - 11 mg/kg PO - repeat once in 2 weeks Levamisole (3 mg/kg/day for 3 days) OR Mebendazole (100 mg PO BID X3 days, repeated after one week) have been used successfully ^{1 2}
Typical Pediatric Therapy	Infection is usually self-limited. Pyrantel pamoate has been used against <i>Moniliformis moniliformis</i> - 11 mg/kg PO - repeat once in 2 weeks Levamisole (3 mg/kg/day for 3 days) OR Mebendazole (100 mg PO BID X3 days, repeated after one week) have been used successfully
Clinical Hints	- 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
Synonyms	<i>Chlamydia abortus</i> , <i>Corynosoma</i> , <i>Macracanthorhynchus</i> , <i>Moniliform acanthocephalan</i> , <i>Moniliformis moniliformis</i> , Venezuelan equine encaph. IIIB. ICD9: 128.9 ICD10: B83.8

References

1. [Ann Saudi Med 2006 Jul-Aug;26\(4\):321-4.](#)
2. [Korean J Parasitol 2007 Jun ;45\(2\):145-8.](#)

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	Penicillin G 18 to 24 million units/day X 2 to 6w Then Penicillin V 2 to 4 Grams daily X 6 to 12 months Alternatives: Doxycycline , Ceftriaxone , Erythromycin Excision/drainage ¹
Typical Pediatric Therapy	Penicillin G 100,000 units/kg/day X 2 to 6 weeks Then Penicillin V 25,000 units/day X 6-12m Alternatives: Ceftriaxone , Erythromycin Excision/drainage
Clinical Hints	<ul style="list-style-type: none"> - 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

References

1. [BMJ 2011 Oct 11;343:d6099.](#)

Adenovirus infection

Agent	VIRUS - DNA. Adenoviridae, Adenovirus Enteric strains are classified in genus Mastadenovirus
Reservoir	Human, Non-human primates
Vector	None
Vehicle	Droplet, Water, Respiratory of pharyngeal acquisition
Incubation Period	4d - 12d
Diagnostic Tests	Viral culture/serology or antigen assay. Direct fluorescence of secretions. Nucleic acid amplification.
Typical Adult Therapy	Enteric/secretion precautions. Cidofovir and Brincidofovir have been used in some cases. Symptomatic therapy ^{1 2 3}
Typical Pediatric Therapy	As for adult
Vaccine	Adenovirus vaccine
Clinical Hints	<ul style="list-style-type: none"> - Generally, an uncomplicated illness lasting 3 to 5 days - Atypical pneumonia, upper respiratory infection, tracheitis, bronchiolitis - Keratoconjunctivitis with preauricular adenopathy - Gastroenteritis or hemorrhagic cystitis
Synonyms	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

References

1. [Biol Blood Marrow Transplant 2017 Mar ;23\(3\):512-521.](#)
2. [Bone Marrow Transplant 2003 Mar ;31\(6\):481-6.](#)
3. [Pediatr Infect Dis J 2020 May 12;](#)

Aeromonas and marine Vibrio infx.

Agent	BACTERIUM. <i>Aeromonas hydrophila</i> , <i>Vibrio vulnificus</i> , et al Facultative gram-negative bacilli
Reservoir	Salt or brackish water, Fish
Vector	None
Vehicle	Water, Shellfish, Contact
Incubation Period	Range 2d - 7d
Diagnostic Tests	Culture. Notify laboratory if these organisms are suspected in stool.
Typical Adult Therapy	Fluoroquinolone, third generation cephalosporin or Sulfamethoxazole / Trimethoprim . Doxycycline + Ciprofloxacin or Ceftriaxone for necrotizing infection. Other antimicrobial agent as determined by susceptibility testing ^{1 2}
Typical Pediatric Therapy	Sulfamethoxazole / Trimethoprim . Or other antimicrobial agent as determined by susceptibility testing
Clinical Hints	<ul style="list-style-type: none"> - Disease follows marine injury or ingestion of raw oysters / contaminated fresh or brackish water - Diarrhea, fever, vomiting or sepsis - Fecal leukocytes present - Severe or fatal in immunosuppressed or alcoholic patients
Synonyms	Aeromonas, Aeromonas hydrophila, Vibrio mimicus, Vibrio vulnificus. ICD9: 005.81,027.9 ICD10: A48.8

References

1. [Clin Infect Dis 2014 Jul 15;59\(2\):e10-52.](#)
2. [Antimicrob Agents Chemother 2012 Feb ;56\(2\):1110-2.](#)

Amoeba - free living

Agent	PARASITE - Protozoa. Centramoebida, Acanthamoebidae: <i>Acanthamoeba</i> and <i>Balamuthia</i> Schizopyrenida, Vahlkampfiidae: <i>Naegleria</i>
Reservoir	Water, Soil
Vector	None
Vehicle	Water (diving, swimming), Contact
Incubation Period	5d - 6d (range 2d - 14d) Granulomatous ? to 2m
Diagnostic Tests	Wet preparation. Specialized cultures. Serology available in reference centers.
Typical Adult Therapy	CNS <i>Naegleria</i> : Amphotericin B to 1.5 mg/kg/d IV + 1.5 mg intrathecal. X 8 days + Fluconazole 10 mg/kg/day PO + Rifampin 10 mg/kg/day PO + Azithromycin 10 mg/kg/day PO + Miltefosine 50 mg TID PO + dexamethasone. <i>Acanthamoeba</i> : Pentamidine , Amphotericin B , Flucytosine , Rifampin , Itraconazole Miltefosine used in some cases of <i>Acanthamoeba</i> / <i>Balamuthia</i> infection ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Severe, progressive meningoencephalitis (<i>Naegleria</i> , <i>Acanthamoeba</i> or <i>Balamuthia</i>) after swimming or diving in fresh water - Keratitis (<i>Acanthamoeba</i>), associated with contaminated solutions used to clean contact lenses
Synonyms	Acanthamoben, Acanthamoeba, Allovahlkampfia, Amebic keratitis, Balamuthia, Balmuthia, Dictyostelium, Free-living amoeba, Leptomyxid amoeba, Naegleria, Paravahlkampfia, Primary amebic meningoencephalitis, Sappinia, Vahlkampfia. ICD9: 136.2 ICD10: B60.1,B60.2

References

1. [Pediatrics 2015 Mar ;135\(3\):e744-8.](#)
2. [Clin Microbiol Rev 2003 Apr ;16\(2\):273-307.](#)
3. [Emerg Infect Dis 2008 Nov ;14\(11\):1743-6.](#)

Amoebiasis

Agent	PARASITE - Protozoa. Sarcomastigota, Entamoebidea: <i>Entamoeba histolytica</i> (must be distinguished from non-invasive, <i>Entamoeba dispar</i>)
Reservoir	Human
Vector	Fly (Musca) - occasionally
Vehicle	Food, Water, Sexual contact, Fly
Incubation Period	1w - 3w (range 3d - 90d)
Diagnostic Tests	Fresh stool/aspirate for microscopy. Stool antigen assay. Stool PCR. Note: serological tests usually negative.
Typical Adult Therapy	Tinidazole 2 G PO X 5d OR Metronidazole 500 mg TID X 7-10d Follow with: Paromomycin 500 mg PO TID X 7d ¹
Typical Pediatric Therapy	Tinidazole 50 mg/kg/d PO X 5d OR Metronidazole 15 mg/kg TID PO X 10d Follow with: Paromomycin 10 mg/kg PO TID X 7d
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Amebiasis, Amebiasis intestinal, Amebic colitis, Amebic dysentery, Amoebenruhr, Entamoeba bangladeshi, Entamoeba gingivalis, Entamoeba hartmanni, Entamoeba moshkovskii. ICD9: 006.0,006.1,006.2 ICD10: A06.0,A06.1,A06.2

Amoebiasis in Belize

Prevalence surveys

Years	Region	Study Group	%	Notes
2004*	Toledo	general population	6	6% of individuals in rural Toledo District ²

* indicates publication year (not necessarily year of survey)

References

1. [Cochrane Database Syst Rev 2009 Apr 15;\(2\):CD006085.](#)
2. [Southeast Asian J Trop Med Public Health 2004 Sep ;35\(3\):506-11.](#)

Amoebic abscess

Agent	PARASITE - Protozoa. Sarcomastigota, Entamoebidea: <i>Entamoeba histolytica</i> (must be distinguished from non-invasive, <i>Entamoeba dispar</i>)
Reservoir	Human
Vector	Fly (Musca) - occasionally
Vehicle	Food, Water, Sexual contact, Fly
Incubation Period	2w - 6m (rarely years; 95% within 6m)
Diagnostic Tests	Imaging. Serology. Nucleic acid amplification. Note: Amoebae are usually not present in stool at this stage.
Typical Adult Therapy	Tinidazole 2 G X 5d OR Metronidazole 750 mg PO TID X 10d ¹
Typical Pediatric Therapy	Metronidazole 15 mg/kg TID X 10d OR Tinidazole 15 to 20 mg/kg TID X 5d
Clinical Hints	- Fever, local pain and weight loss - Concurrent amoebic colitis is usually not present - Typically a single abscess in the right hepatic lobe (bacterial abscesses may be multiple)
Synonyms	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 Belize

Epidemiological data regarding Amebic abscess are included in the notes for Amoebiasis.

References

1. [J Trop Med Hyg 1978 Jan ;81\(1\):16-9.](#)

Angiostrongyliasis - abdominal

Agent	PARASITE - Nematoda. <i>Parastrongylus</i> (<i>Angiostrongylus</i> , <i>Morerastrongylus</i>) <i>costaricensis</i>
Reservoir	Cotton rat (<i>Sigmodon</i>), Slug
Vector	None
Vehicle	Slug, Slug excretions
Incubation Period	10d - 14d
Diagnostic Tests	Identification of ova or adults in surgical material. Serology. Nucleic acid amplification. Angiostrongylus costaricensis adult: female - 33 mm; male - 20 mm
Typical Adult Therapy	Mebendazole 200 to 400 mg PO tid X 10 days. OR Thiabendazole 25 mg/kg TID (max 3g/d) X 3d. Surgery for complications ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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)
Synonyms	Angiostrongylus costaricensis, Parastrongylus costaricensis. ICD9: 128.9 ICD10: B81.3

References

1. [Rev Inst Med Trop Sao Paulo 2008 Nov-Dec;50\(6\):339-41.](#)

Animal bite-associated infection

Agent	BACTERIUM. <i>Pasteurella multocida</i> , and other zoonotic bite pathogens
Reservoir	Cat, Dog, Marsupial, Other mammal, Rarely bird
Vector	None
Vehicle	Bite (cat in 60%, dog in 30%), No obvious source in 10%
Incubation Period	3h - 3d
Diagnostic Tests	Gram stain/culture. Hold specimen for 2 weeks to discount Capnocytophaga & other genera.
Typical Adult Therapy	Amoxicillin-clavulanate , Doxycycline , Cefuroxime . Dosage and duration appropriate for nature and severity of infection ¹
Typical Pediatric Therapy	Amoxicillin-clavulanate , Cefuroxime . Dosage and duration appropriate for nature and severity of infection
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	<p>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, Seal finger, Staphylococcus intermedius, Vibrio harveyi.</p> <p>ICD9: 027.2 ICD10: A28.0</p>

References

1. Clin Infect Dis 2014 Jul 15;59(2):147-59.

Anisakiasis	
Agent	PARASITE - Nematoda. Secernentea: <i>Anisakis simplex</i> and <i>Pseudoterranova decipiens</i>
Reservoir	Marine mammals Fish
Vector	None
Vehicle	Undercooked fish
Incubation Period	Hours - 14d
Diagnostic Tests	Endoscopic identification of larvae. Anisakis larvae: length 5 to 30 mm
Typical Adult Therapy	Endoscopic removal of larvae; surgery for complications Mebendazole has been effective in animal models ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	Follows ingestion of undercooked fish (e.g., sushi), squid or octopus May present as - Generalized allergic reaction, or - Acute and chronic abdominal pain, often with "peritoneal signs" or hematemesis
Synonyms	Anasakis, Anisakidosis, Bolbosoma, Cod worm disease, Contracaecum, Eustrongylides, Herring worm disease, Hysterothylacium, Pseudoterranova, Whaleworm. ICD9: 127.1 ICD10: B81.0

References

1. Clin Microbiol Rev 1989 Jul ;2(3):278-84.
2. Dig Dis Sci 2020 Feb 27;

Anthrax

Agent	BACTERIUM. <i>Bacillus anthracis</i> An aerobic gram positive bacillus
Reservoir	Soil, Goat, Cattle, Sheep, Water, Horse
Vector	Fly (rare)
Vehicle	Hair, Wool, Hides, Bone products, Air, Meat, Contact, Respiratory or pharyngeal acquisition
Incubation Period	1d-7d; 1-12 cutaneous, 1-7 GI; 1-43 pulmonary
Diagnostic Tests	Bacteriological culture. Alert laboratory that organism may be present. Serology and rapid tests by Ref. Centers.
Typical Adult Therapy	Isolation (secretions). Ciprofloxacin (or Penicillin if susceptible). If systemic infection, add Meropenem (or Imipenem) + Linezolid (or Rifampin or Clindamycin) Dosage/route/duration as per severity If inhalational anthrax, add Raxibacumab ¹
Typical Pediatric Therapy	As for adult
Vaccine	Anthrax vaccine
Clinical Hints	Acquired from contact with large mammals or their products (meat, wool, hides, bone). Anthrax may present as 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
Synonyms	Antrace, Antrax, Antraz, Bacillus cereus biovar anthracis, Carhunco, 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

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

Anthrax in Belize

Anthrax does not occur in this country.

References

1. [Health Secur 2015 Nov-Dec;13\(6\):355-64.](#)

Ascariasis

Agent	PARASITE - Nematoda. Secernentea: <i>Ascaris lumbricoides</i>
Reservoir	Human, Dog
Vector	None
Vehicle	Vegetables, Fly
Incubation Period	10d - 14d (range 7d - >200d)
Diagnostic Tests	Stool microscopy. Ascaris lumbricoides adult: female - 20 to 49 cm; male - 15 to 30 cm
Typical Adult Therapy	Mebendazole 500 mg BID X 1 dose OR Albendazole 400 mg X 1 dose ^{1 2}
Typical Pediatric Therapy	Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2).
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Ascaris, Ascaris lumbricoides, Askariasis. ICD9: 127.0 ICD10: B77

Ascariasis in Belize

Prevalence surveys

Years	Region	Study Group	%	Notes
2004*	Toledo	general population	30	30% of individuals in rural Toledo District ³

* indicates publication year (not necessarily year of survey)

References

1. [JAMA 2008 Apr 23;299\(16\):1937-48.](#)
2. [Cochrane Database Syst Rev 2020 Apr 14;4:CD010599.](#)
3. [Southeast Asian J Trop Med Public Health 2004 Sep ;35\(3\):506-11.](#)

Aspergillosis

Agent	FUNGUS. Ascomycota, Euecomycetes, Eurotiales: <i>Aspergillus</i> . A hyaline hyphomycete
Reservoir	Compost, Hay, Cereal, Soil
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	3d - 21d
Diagnostic Tests	Fungal culture. Biopsy. Nasal culture or serologic testing may be useful in select cases.
Typical Adult Therapy	Voriconazole 6 mg/kg IV Q12h, day 1; follow with 4 mg/kg IV OR Liposomal Amphotericin B 3 to 5 mg/kg/day OR Isavuconazole 200 mg q8h for 6 doses, then 200 mg daily ¹
Typical Pediatric Therapy	Voriconazole 9 mg/kg IV q12h, day 1; follow with 8 mg/kg IV q12h OR Liposomal Amphotericin B , dosing as for adults
Clinical Hints	- 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
Synonyms	Aspergillose, Aspergillus. ICD9: 117.3 ICD10: B44

References

1. [Clin Infect Dis 2016 08 15;63\(4\):e1-e60.](#)

Bacillary angiomatosis

Agent	BACTERIUM. <i>Bartonella henselae</i> or <i>Bartonella quintana</i> . <i>Rickettsia</i> -like bacteria
Reservoir	Human, Tick, Cat
Vector	Cat flea, Tick (Ixodid)
Vehicle	None
Incubation Period	Unknown
Diagnostic Tests	Histology with special stains. Specialized culture techniques. Serology. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg BID X 3 months OR Erythromycin 500 mg QID X 3 months ¹
Typical Pediatric Therapy	Erythromycin 10 mg/kg/day QID X 4 months
Clinical Hints	<ul style="list-style-type: none"> - Virtually all cases occur in the setting of AIDS or other immune deficiency - Hemangiomatous papules and nodules of skin, spleen, liver (peliosis hepatis), bone or other tissues - Rare instances are reported following tick bite in immune-competent individuals
Synonyms	Bacillary peliosis, Peliosis hepatis. ICD9: 757.32,083.8 ICD10: K76.4,A44.0

References

1. [Antimicrob Agents Chemother 2004 Jun ;48\(6\):1921-33.](#)

Bacillus cereus food poisoning

Agent	BACTERIUM. <i>Bacillus cereus</i> (toxin). An aerobic gram-positive bacillus
Reservoir	Soil, Processed & dried foods
Vector	None
Vehicle	Food
Incubation Period	2h - 9h (range 1h - 24h)
Diagnostic Tests	No practical test available. Isolation of organism from suspect food.
Typical Adult Therapy	Supportive ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	Bacillus cytotoxicus. ICD9: 005.89 ICD10: A05.4

References

1. Clin Microbiol Rev 1993 Oct ;6(4):324-38.

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	Metronidazole 500 mg PO BID X 7d OR intravaginal Metronidazole 0.75% gel daily X 5 days OR Clindamycin 300 mg PO BID X 7d OR intravaginal Clindamycin 2% gel daily X 7 days Also treat sexual partner ¹
Typical Pediatric Therapy	Metronidazole 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

References

1. MMWR Recomm Rep 2015 Jun 05;64(RR-03):1-137.

Balantidiasis	
Agent	PARASITE - Protozoa. Ciliate (Ciliophora), Litostomatea: <i>Neobalantidium (Balantidium; Balantioides) coli</i>
Reservoir	Pig, Non-human primate, Rodent
Vector	None
Vehicle	Water, Food
Incubation Period	1d - 7d (range 1d - 60d)
Diagnostic Tests	Microscopy of stool or colonic aspirates.
Typical Adult Therapy	Tetracycline 500 mg QID X 10d. OR Metronidazole 750 mg TID X 5d. OR Iodoquinol 650 mg TID X 20d ¹
Typical Pediatric Therapy	Age >= 8 years: Tetracycline 10 mg/kg QID (max 2g/d) X 10d. Age <8 yrs, Metronidazole 15 mg/kg TID X 5d; or Iodoquinol 13 mg/kg TID X 20d
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	Balantidiose, Balantidiosis, Balantidium coli, Balantidosis, Balantioides coli, Balindosis, Ciliary dysentery, Neobalantidium coli. ICD9: 007.0 ICD10: A07.0

References

1. [Clin Microbiol Rev 2008 Oct ;21\(4\):626-38.](#)

Bartonellosis - cat borne

Agent	BACTERIUM. <i>Afipia felis</i> , <i>Bartonella henselae</i> , <i>Bartonella clarridgeiae</i> , <i>Bartonella grahamii</i> , et al. A facultative gram-negative coccobacillus
Reservoir	Cat, Possibly tick
Vector	Cat flea (<i>Ctenocephalides</i>)
Vehicle	Cat scratch, Plant matter (thorn, etc)
Incubation Period	3d - 14d
Diagnostic Tests	Visualization of organisms on Warthin Starry stain. Culture. Serology. Nucleic acid amplification.
Typical Adult Therapy	Azithromycin 500 mg day 1, then 250 daily X 4 days Alternatives: Clarithromycin , Ciprofloxacin , Sulfamethoxazole / Trimethoprim Aspiration of nodes as necessary. ¹
Typical Pediatric Therapy	Azithromycin 10 mg/kg day 1, then 5 mg/kg daily X 4 days Aspiration of nodes as necessary.
Clinical Hints	<ul style="list-style-type: none"> - 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.
Synonyms	<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

References

1. [Pediatr Infect Dis J 1998 Jun ;17\(6\):447-52.](#)

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	Doxycycline 100 mg PO BID + Rifampin 300 mg BID X 4 to 6 weeks (neuroretinitis) OR Rifampin 300 mg BID +/- Gentamicin or Trimethoprim -Sulfamethoxazole X 14 days (hepatosplenic) If endocarditis, Doxycycline 100 mg PO BID X 4 weeks + Gentamicin 3 mg/kg daily X 2 weeks) ^{1 2 3}
Typical Pediatric Therapy	Rifampin 20 mg/kg/d X 14 days +/- Gentamicin or Trimethoprim -Sulfamethoxazole (hepatosplenic)
Clinical Hints	<ul style="list-style-type: none"> - 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 roussetti</i> , <i>Bartonella schoenbuchensis</i> , <i>Bartonella tamiae</i> , <i>Bartonella taylorii</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

References

1. [Ophthalmology](#) 1998 Mar ;105(3):459-66.
2. [Eur Heart J](#) 2015 Nov 21;36(44):3075-3128.
3. [Clin Infect Dis](#) 1999 Apr ;28(4):778-84.

Blastocystis hominis infection

Agent	PARASITE - Protozoa. Chromista, Bigyra, Blastocystea: <i>Blastocystis hominis</i> . (taxonomic status remains uncertain)
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Water
Incubation Period	Unknown
Diagnostic Tests	Stool microscopy. Nucleic acid amplification.
Typical Adult Therapy	No treatment necessary for asymptomatic patients Nitazoxanide 500 mg BID X 3 d. OR Metronidazole 750 mg TID X 10d. OR Tinidazole 2 G Once OR Sulfamethoxazole / Trimethoprim ^{1 2 3}
Typical Pediatric Therapy	No treatment necessary for asymptomatic patients Nitazoxanide - 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 Metronidazole 15 mg/kg/d X 10d. OR Tinidazole (age >3) 50 mg/kg Once OR Sulfamethoxazole / Trimethoprim
Clinical Hints	The precise role of this organism in disease is controversial <ul style="list-style-type: none"> - Diarrhea and flatulence, usually without fever - The illness is similar to giardiasis - Increased risk among immune-suppressed patients
Synonyms	Apoi, Blastocystiose, Blastocystis hominis, Zierdt-Garavelli disease. ICD9: 007.8 ICD10: A07.8

References

1. J Travel Med 2003 Mar-Apr;10(2):128-30.
2. Am J Gastroenterol 1999 Nov ;94(11):3245-7.
3. Clin Gastroenterol Hepatol 2005 Oct ;3(10):987-91.

Borna virus encephalitis

Agent	VIRUS - RNA Mononegavirales Bornavirus
Reservoir	Squirrel, Horse, Sheep
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Metagenomic analysis of brain tissue and cerebrospinal fluid Culture on specialized cell lines Serology
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - May follow animal (horse, squirrel) contact - Most infections are 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
Synonyms	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) antitoxin (following test dose) 1 vial (10-22 ml) in 100 ml saline over 30 min For wound botulism debridement AND Penicillin G 3 million units X6/day Respiratory support
Typical Pediatric Therapy	Age < 1 year: Botulism immune globulin 50 mg/kg 1-17 years: Heptavalent antitoxin, 20%-100% of adult dose: For weight >= 30 kg: % adult dose = weight (kg) + 30
Vaccine	Botulism antitoxin
Clinical Hints	<ul style="list-style-type: none"> - Clinical manifestations similar to those of atropine poisoning - Dysarthria, diplopia, dilated pupils, dry mouth, constipation, flaccid paralysis - Onset approximately 36 hrs after ingestion of poorly-preserved food - 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

Agent	BACTERIUM OR FUNGUS. Mixed oral anaerobes / streptococci, <i>Staphylococcus aureus</i> (from endocarditis), etc.
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Imaging techniques (CT, scan, etc).
Typical Adult Therapy	Antibiotic(s) appropriate to likely pathogens + drainage Typical empiric therapy: Intravenous Ceftriaxone 2 gm Q12h + Metronidazole 500 mg Q8h ¹
Typical Pediatric Therapy	Typical empiric therapy: Intravenous Ceftriaxone 50 mg/kg Q12 h + Metronidazole 7.5 to 15 mg/kg IV, Q8h
Clinical Hints	<ul style="list-style-type: none">- Headache, vomiting and focal neurological signs- Often associated with chronic sinusitis or otitis media, pleural or heart valve infection- Patients are often afebrile
Synonyms	Ascesso cerebrale, Cerebral abscess. ICD9: 324.0 ICD10: G06.0

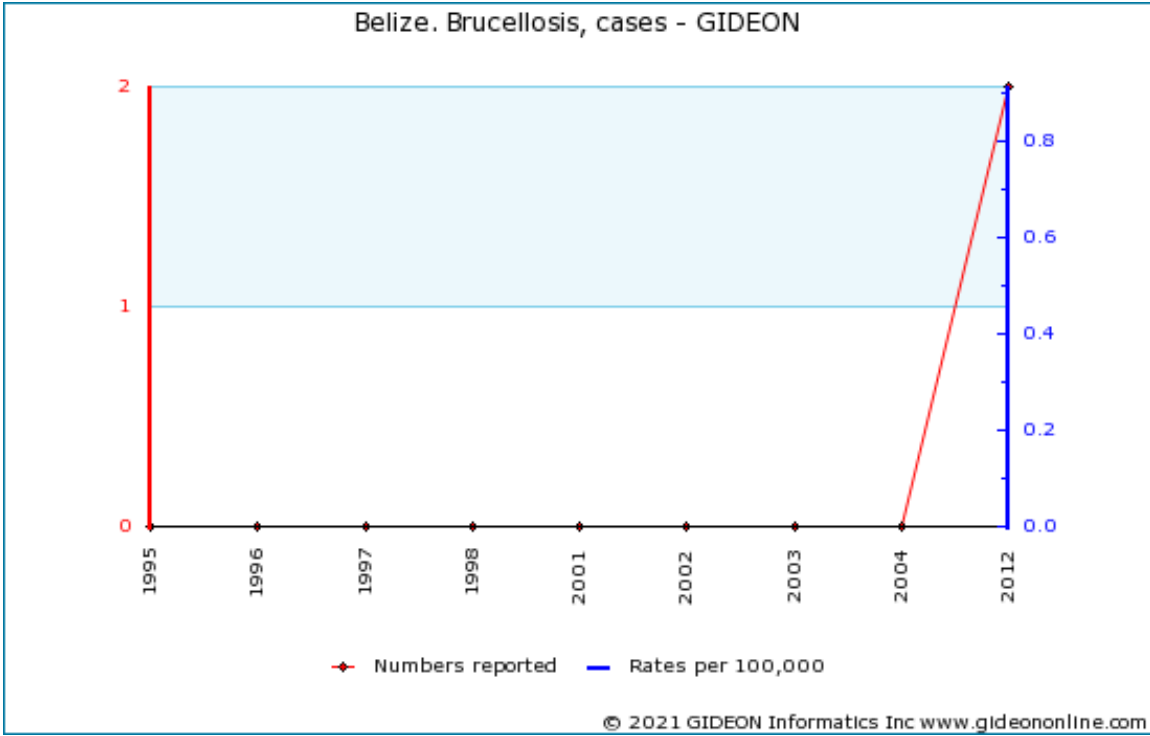
References

1. [Handb Clin Neurol 2017 ;140:349-364.](#)

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	Doxycycline 100 mg BID X 6 weeks PLUS Rifampin 600 mg once daily X 6 weeks. OR Gentamicin 5 mg/kg daily X 7 days OR Streptomycin 1 g IM daily X 14 days ^{1 2 3}
Typical Pediatric Therapy	Rifampin 20 mg/kg/day (maximum 600 mg) PLUS if age >8 years: Doxycycline 2 mg/kg BID PO X 6w if age <8 years Sulfamethoxazole / Trimethoprim 4/20 mg/kg BID X 4 to 6w Consider adding aminoglycoside 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 Belize

Human disease in this country is due to *Brucella abortus*.



Graph: Belize. Brucellosis, cases

References

1. [Ann Intern Med 1992 Jul 01;117\(1\):25-30.](#)
2. [Clin Infect Dis 2006 Apr 15;42\(8\):1075-80.](#)
3. [Pediatr Infect Dis J 1989 Feb ;8\(2\):75-8.](#)

Bunyaviridae infections - misc.

Agent	VIRUS - RNA. Bunyaviridae, Orthobunyavirus. Over 30 strains have been associated with human disease (see Synonyms)
Reservoir	Rat, Bird, Marsupial, Chipmunk, Cattle, Sheep, Horse, Bat
Vector	Mosquito (exceptions: Shuni is transmitted by culicoid flies; Bhanja, Tamdy, Wanowrie and Zirqa by ticks)
Vehicle	None
Incubation Period	3d - 12d
Diagnostic Tests	Biosafety level 2 or 3. Serology and virus isolation. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Abbey Lake, Avalon, Bangui, Batai, Bhanja, Bunyamwera, Bwamba, Cache Valley, Calovo, Cat Que, Catu, Chittoor virus, Cristoli, Ebinur Lake, Fort Sherman, Garissa, Germiston, Guama, Hartland virus, Ilesha, Ingwavuma, Issyk-Kul, Kairi, Lumbo, Maguari, Ngari, Northway, Ntwetwe, Nyando, Pongola, Shokwe, Shuni, Tacaiuma, Tamdy, Tataguine, Tensaw, Umbre, Wanowrie, Wyeomyia, Yezo virus, Zirqa. ICD9: 066.3 ICD10: A93.8

Campylobacteriosis

Agent	BACTERIUM. <i>Campylobacter jejuni</i> subsp <i>jejuni</i> , et al A microaerophilic gram-negative bacillus
Reservoir	Human, Mammal, Bird
Vector	None
Vehicle	Water, Food
Incubation Period	2d - 4d (range 1d - 10d)
Diagnostic Tests	Stool (rarely blood, CSF) culture. Nucleic acid amplification. Alert laboratory when these organisms are suspected.
Typical Adult Therapy	Stool precautions. Azithromycin 500 mg QD X 3 days Alternatives Erythromycin , Fluoroquinolone (Ciprofloxacin , Levofloxacin , Trovafloxacin , Pefloxacin , Sparfloxacin or Moxifloxacin), Gentamicin ¹
Typical Pediatric Therapy	Stool precautions. Azithromycin 10 mg/kg QD X 3 days Alternatives - Erythromycin , Gentamicin
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Campylobacter. ICD9: 008.43 ICD10: A04.5

Campylobacteriosis in Belize

{Graph 1 Belize. Campylobacteriosis, cases}

References

1. [Expert Rev Anti Infect Ther 2016 ;14\(2\):193-206.](#)

Candidiasis

Agent	FUNGUS - Yeast. Ascomycota, Hemiascomycetes, Saccharomycetales. <i>Candida albicans</i> , and other species.
Reservoir	Human
Vector	None
Vehicle	Contact, Catheter
Incubation Period	Variable
Diagnostic Tests	Culture. Serology and assays for cell-specific antigens are performed in some centers,
Typical Adult Therapy	Topical, oral, systemic antifungal agent depending on clinical presentation and species (in Drugs module, scroll through upper left box) ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Dermal erythema with satellite pustules - "Cheesy" mucosal discharge - Candidemia in the setting of intravenous catheter or endocarditis - Severe, widespread or intractable disease may suggest underlying diabetes, AIDS or other form of immune suppression
Synonyms	Candida, Candida-Mykosen, Candidiase, Candidiasi, Candidose, Monilia, Moniliasis, Thrush. ICD9: 112 ICD10: B37

References

1. J Antimicrob Chemother 2018 Jan 01;73(suppl_1):i33-i43.
2. J Antimicrob Chemother 2018 01 01;73(suppl_1):i14-i25.

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	Azithromycin 1.0 g PO X 1 dose. OR Ceftriaxone 250 mg IM X 1 dose. OR Ciprofloxacin 500 mg PO BID X 3 days OR Erythromycin 500 mg PO TID X 7d. ^{1 2 3}
Typical Pediatric Therapy	Azithromycin 20 mg/kg PO X 1 dose OR Erythromycin 10 mg/kg PO TID X 7d. OR Ceftriaxone 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

References

1. [Sex Transm Dis 1994 Jul-Aug;21\(4\):231-4.](#)
2. [MMWR Recomm Rep 2015 Jun 05;64\(RR-03\):1-137.](#)
3. [Antimicrob Agents Chemother 1987 Jan ;31\(1\):67-9.](#)

Chandipura and Vesicular stomatitis viruses

Agent	VIRUS - RNA. Mononegavirales Rhabdoviridae, Vesiculovirus: Chandipura virus Vesicular stomatitis virus
Reservoir	Horse, Cattle, Pig
Vector	Sandfly
Vehicle	Aerosol from animal, Contact, Respiratory or pharyngeal acquisition
Incubation Period	2d - 6d (range 1d - 8d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	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%
Synonyms	Alagoas, Calchaqui, Chandipura, Cocal, Epidemic stroke, Indiana, Isfahan, LeDantec, Ledantevirus, Piry, Vesicular stomatitis. ICD9: 066.8 ICD10: A93.8

Chandipura and Vesicular stomatitis viruses in Belize

Chronology

- 1997 - An outbreak of vesicular stomatitis in cattle during involved three districts.
- 2004 - A single case of bovine infection (New Jersey type virus) was reported. ¹
- 2005 - An outbreak (5 horses and 4 cattle, 0 fatal) involved six farms in Cayo. ²
- 2007 - A single case of equine infection was reported. ³
- 2011 - Outbreaks were reported among bovines ⁴ and equines. ^{5 6}
- 2013 - An outbreak was reported among equines in Cayo. ⁷

References

1. ProMED <promedmail.org> archive: 20040925.2650
2. ProMED <promedmail.org> archive: 20050217.0531
3. ProMED <promedmail.org> archive: 20070319.0967
4. ProMED <promedmail.org> archive: 20111231.3721
5. ProMED <promedmail.org> archive: 20110227.0652
6. ProMED <promedmail.org> archive: 20110306.0739
7. ProMED <promedmail.org> archive: 20130524.1735502

Chikungunya

Agent	VIRUS - RNA. Togaviridae, Alphavirus: Chikungunya virus. Related Semliki Forest and Me Tri viruses are found in Africa & Asia
Reservoir	Non-human primate
Vector	Mosquito (<i>Aedes</i> spp.; <i>Ae. fuscifer-taylori</i> group in Africa)
Vehicle	None
Incubation Period	2d - 12d
Diagnostic Tests	Biosafety level 3. Viral culture (blood). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Abrupt onset of fever, leukopenia, myalgia and prominent bilateral joint pain - 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
Synonyms	Buggy Creek, Getah, Kidenga pepo, Knuckle fever, Me Tri, Semliki Forest. ICD9: 062.8,066.3 ICD10: A92.1

Chikungunya in Belize

2014 - Three autochthonous cases of Chikungunya were reported to November. ¹

References

1. ProMED <promedmail.org> archive: 20141130.2998621

Chlamydia infections, misc.

Agent	BACTERIUM. Chlamydiaceae, <i>Chlamydiae</i> , <i>Chlamydia trachomatis</i> ; <i>Simkania negevensis</i> ; <i>Waddlia chondrophila</i>
Reservoir	Human
Vector	None
Vehicle	Sexual contact
Incubation Period	5d - 10d
Diagnostic Tests	Microscopy and immunomicroscopy of secretions. Serology. Tissue culture. Nucleic acid amplification.
Typical Adult Therapy	Azithromycin 1g as single dose OR Doxycycline 100 mg BID X 7d. OR Levofloxacin 500 mg daily X 7 days OR Ofloxacin 300 mg BID X 7 days ^{1 2}
Typical Pediatric Therapy	Weight <45 kg: Erythromycin 12.5 mg/kg QID X 14d Weight ≥45 kg, but age <8 years: Azithromycin 1 g as single dose Age ≥ 8 years: Azithromycin 1 g as single dose OR Doxycycline 100 mg BID X 7 d
Clinical Hints	<ul style="list-style-type: none"> - Thin, scant penile discharge - Cervicitis, with overt pelvic inflammatory disease in some cases - Conjunctivitis or neonatal pneumonia - Concurrent gonorrhea may be present
Synonyms	Bedsonia, Chlamydia felis, Chlamydia gallinacea, Chlamydia suis, Chlamydia trachomatis, Chlamydien-Urethritis, Chlamydien-Zervizitis, Chlamydophila, Inclusion blenorrea, 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

References

1. MMWR Recomm Rep 2015 Jun 05;64(RR-03):1-137.
2. 2016 ;

Chlamydia pneumoniae infection

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

References

1. [Expert Rev Anti Infect Ther 2003 Oct ;1\(3\):493-503.](#)

Cholecystitis and cholangitis

Agent	BACTERIUM. <i>Escherichia coli</i> , <i>Klebsiella pneumoniae</i> , enterococci, et al.
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Roentgenograms/imaging (cholecystogram, ultrasound, CT, etc).
Typical Adult Therapy	Antibiotics and surgical intervention as required
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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"
Synonyms	Acute cholecystitis, Angiocholite, Ascending cholangitis, Cholangitis, Cholecystite, Cholecystitis, Cholezystitis, Colangite, Colangitis, Colecistite, Gall bladder. ICD9: 575.0,576.1 ICD10: K81,K83.0

Cholera

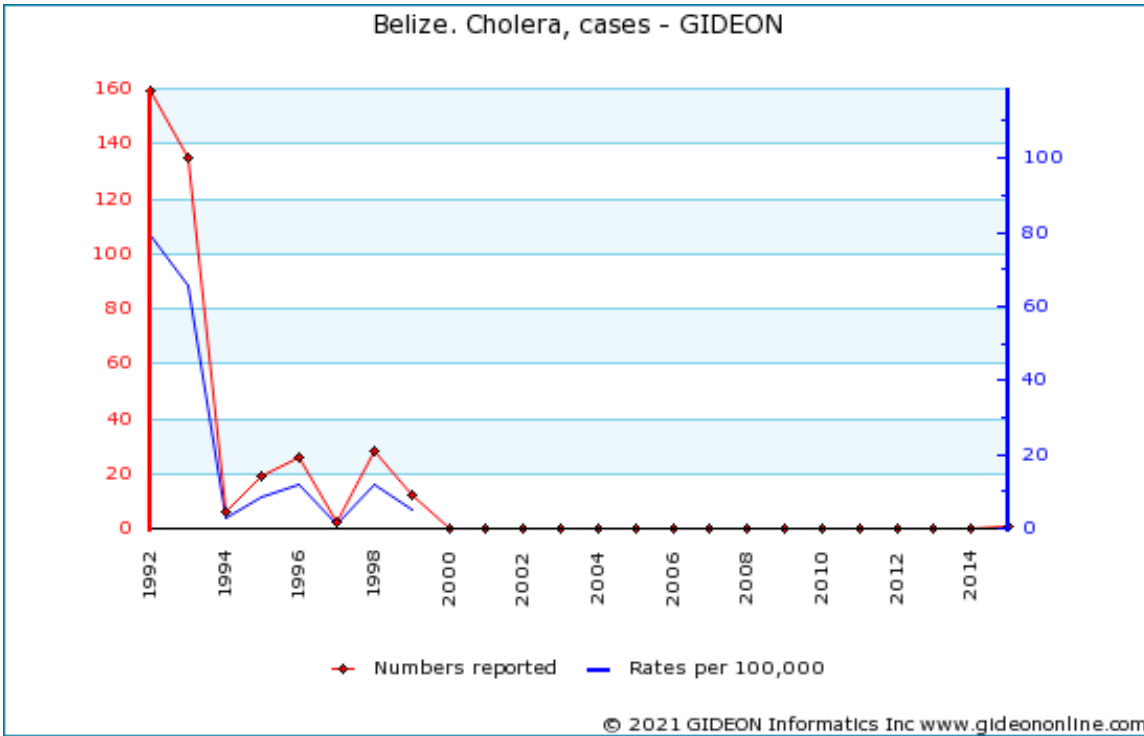
Agent	BACTERIUM. <i>Vibrio cholerae</i> A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Water, Fecal-oral, Seafood (oyster, ceviche), Vegetables, Fly
Incubation Period	1d - 5d (range 9h - 6d)
Diagnostic Tests	Stool culture. Advise laboratory when this organism is suspected.
Typical Adult Therapy	Stool precautions. Doxycycline 300 mg single dose OR Tetracycline 500 mg Q6h X 3d OR Azithromycin 1000 mg single dose OR Erythromycin 500 mg Q6h X 3d OR Ciprofloxacin 1000 mg single dose Fluids (g/l): NaCl 3.5, NaHCO ₃ 2.5, KCl 1.5, glucose 20 IV Ringer's lactate if severe ¹
Typical Pediatric Therapy	Stool precautions. Doxycycline 4-6 mg/kg single dose OR Tetracycline 10-12 mg/kg Q6h X 3d OR Azithromycin 20 mg/kg single dose OR Erythromycin 10 mg/kg Q6h X 3d Fluids as for adult
Vaccine	Cholera - injectable vaccine Cholera - oral vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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 Belize

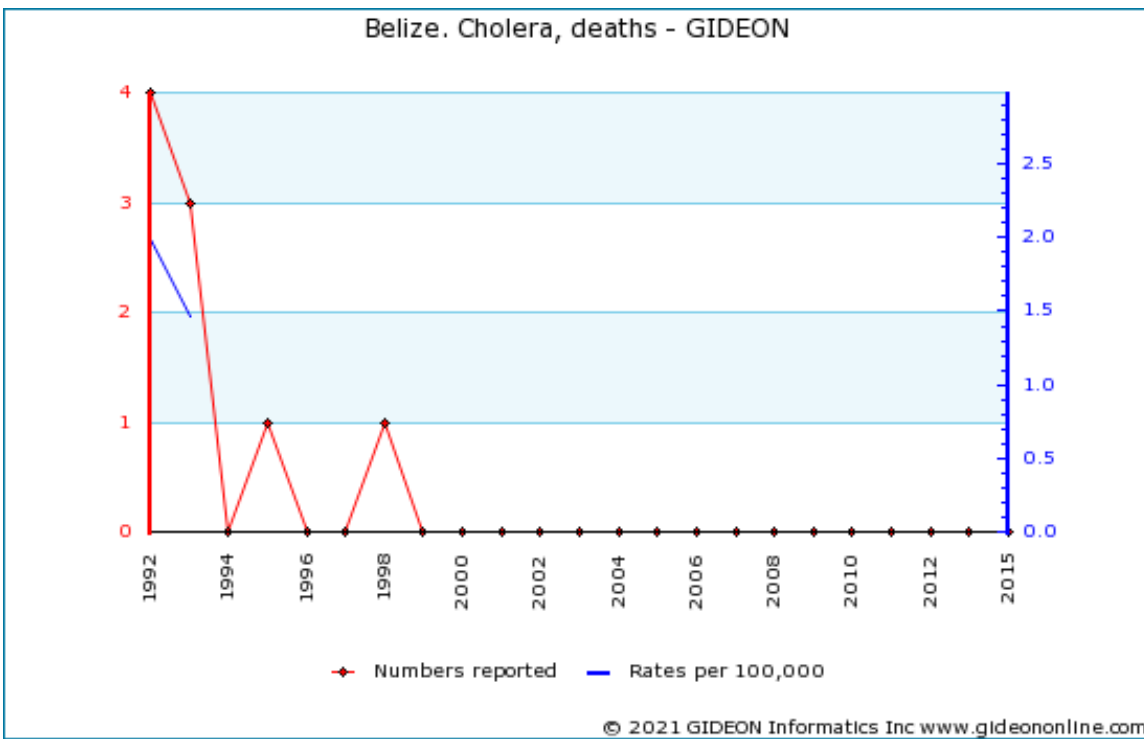
In recent years cholera has been reported from: ² ³

Cayo District
Toledo District

Belize was removed from the WHO "Infected areas list" as of June 2001.



Graph: Belize. Cholera, cases



Graph: Belize. Cholera, deaths

Notable outbreaks

Years	Region	Cases	Deaths	Notes
1995	Melchor	19	4	⁴
1998	Belmopan	5	1	⁵

References

1. Cochrane Database Syst Rev 2014 Jun 19;(6):CD008625.
2. Wkly Epidemiol Rec 2002 Mar 08;77(10):78-80.
3. Wkly Epidemiol Rec 2002 Aug 02;77(31):267-8.
4. ProMED <promedmail.org> archive: 19980613.1117
5. ProMED <promedmail.org> archive: 19981123.2259

Chromomycosis

Agent	FUNGUS. Ascomycota, Euscomycetes, Chaetothyriales. Dematiaceous molds: <i>Phialophora</i> , <i>Cladiophialophora</i> , <i>Fonsecaea</i> , <i>Rhinocladiella</i>
Reservoir	Wood, Soil, Vegetation
Vector	None
Vehicle	Minor trauma
Incubation Period	14d - 90d
Diagnostic Tests	Biopsy and fungal culture.
Typical Adult Therapy	Itraconazole 100-200 mg PO BID X (up to) 36 m. OR Terbinafine 500 mg QD X (minimum) 12 months OR Posaconazole 400 mg PO BID X 12 months Local heat Excision as necessary ¹
Typical Pediatric Therapy	Itraconazole 2.5 mg/kg PO BID X (up to) 36 m. OR Terbinafine Weight 35 kg 250 mg QD Local heat Excision as necessary
Clinical Hints	- Violaceous, verrucous, slowly-growing papule(s) or nodules - Most commonly on lower extremities - Usually follows direct contact with plant matter in tropical regions
Synonyms	Chromoblastomycosis, Chromomykose, Phoma insulana, Veronaea, Verrucous dermatitis. ICD9: 117.2 ICD10: B43.0

References

1. [Clin Microbiol Rev 2017 01 ;30\(1\):233-276.](#)

Chronic meningococemia

Agent	BACTERIUM. <i>Neisseria meningitidis</i> An aerobic gram-negative coccus
Reservoir	Human
Vector	None
Vehicle	Air, Infected secretions
Incubation Period	Unknown
Diagnostic Tests	Blood culture. Test patient for complement component deficiency.
Typical Adult Therapy	Ceftriaxone 2 g IV BID X 7-10d ¹
Typical Pediatric Therapy	Ceftriaxone 50 mg/kg BID X 7-10d
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	Meningococemia, chronic. ICD9: 036.2 ICD10: A39.3

References

1. [Pediatr Dermatol 1996 Nov-Dec;13\(6\):483-7.](#)

Clostridial food poisoning

Agent	BACTERIUM. <i>Clostridium perfringens</i> An anaerobic gram-positive bacillus
Reservoir	Soil, Human, Pig, Cattle, Fish, Poultry
Vector	None
Vehicle	Food
Incubation Period	8h - 14h (range 5h - 24h)
Diagnostic Tests	Laboratory diagnosis is usually not practical. Attempt culture of food for C. perfringens.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	

Clostridial myonecrosis

Agent	BACTERIUM. <i>Clostridium perfringens</i> An anaerobic gram-positive bacillus
Reservoir	Soil, Human
Vector	None
Vehicle	Soil, Trauma
Incubation Period	6h - 3d
Diagnostic Tests	Gram stain of exudate. Wound and blood cultures. Presence of gas in tissue (not specific).
Typical Adult Therapy	Prompt, aggressive debridement. Penicillin G 3 million units IV Q4h + Clindamycin 900 mg IV Q8h. OR Piperacillin-tazobactam 4.5 g + Clindamycin 900 mg TID
Typical Pediatric Therapy	Prompt, aggressive debridement. Penicillin G 50,000 units/kg IV Q4h + Clindamycin 10 mg/kg IV Q6h. OR Piperacillin-tazobactam (dosing for piperacillin): 100 mg/kg TID (maximum 16 g/day) + Clindamycin 10 mg/kg IV Q6h
Vaccine	Gas gangrene antitoxin
Clinical Hints	<ul style="list-style-type: none"> - Rapidly progressive tender and foul-smelling infection of muscle - Local gas present - crepitus or visible on X-ray - Hypotension, intravascular hemolysis and obtundation
Synonyms	Anaerobic myonecrosis, Clostridial gangrene, Gas gangrene. ICD9: 040.0 ICD10: A48.0

Clostridioides difficile colitis

Agent	BACTERIUM. <i>Clostridioides difficile</i> An anaerobic gram-positive bacillus
Reservoir	Human
Vector	None
Vehicle	Endogenous, Food
Incubation Period	Variable
Diagnostic Tests	Assay of stool for C. difficile toxin.
Typical Adult Therapy	Vancomycin 125 mg (oral preparation) QID X 10d OR Fidaxomicin 200 mg PO BID X 10d OR Metronidazole 500 mg PO TID X 10d. Fecal transplantation (PO or by enema) has been effective in some cases. ^{1 2}
Typical Pediatric Therapy	Vancomycin 10 mg/kg PO QID X 10d OR Metronidazole 7.5 mg/kg PO QID X 10d
Vaccine	Bezlotoxumab
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	<i>Klebsiella oxytoca colitis</i> , Pseudomembranous colitis. ICD9: 008.45 ICD10: A04.7

References

1. Clin Infect Dis 2018 Feb 15;
2. Curr Opin Gastroenterol 2019 Jan ;35(1):20-24.

Common cold

Agent	VIRUS - RNA. Picornaviridae. Rhinoviruses, Coronavirus, et al.
Reservoir	Human
Vector	None
Vehicle	Droplet, Contact, Respiratory or pharyngeal acquisition
Incubation Period	1d - 3d
Diagnostic Tests	Viral culture and serology are available, but not practical.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Acute coryza, Raffreddore. ICD9: 079,460 ICD10: J00

Conjunctivitis - inclusion

Agent	BACTERIUM. Chlamydiae , <i>Chlamydia trachomatis</i>
Reservoir	Human
Vector	None
Vehicle	Infected secretions, Sexual contact, Water (swimming pools)
Incubation Period	2d - 20d
Diagnostic Tests	Demonstration of chlamydiae on direct fluorescence or culture of exudate.
Typical Adult Therapy	Secretion precautions. Azithromycin 1g as single dose OR Doxycycline 100 mg BID X 7d. OR Levofloxacin 500 mg daily X 7 days OR Ofloxacin 300 mg BID X 7 days ¹
Typical Pediatric Therapy	Secretion precautions. Weight =45 kg, but age = 8 years: Azithromycin 1 g as single dose OR Doxycycline 100 mg BID X 7 d
Clinical Hints	- Ocular foreign body sensation, photophobia and discharge - Illness can persist for months, to as long as 2 years
Synonyms	Inclusion conjunctivitis, Paratrachoma. ICD9: 077.0 ICD10: P39.1,A74.0

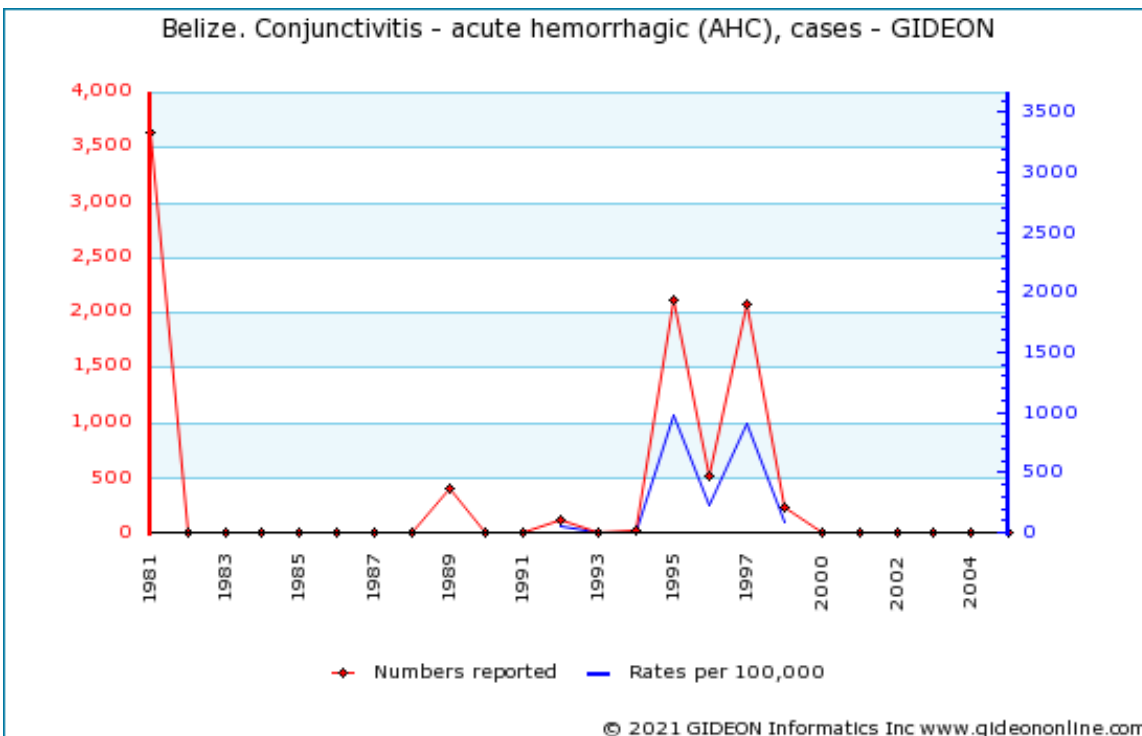
References

1. [MMWR Recomm Rep 2015 Jun 05;64\(RR-03\):1-137.](#)

Conjunctivitis - viral

Agent	VIRUS. Picornavirus, Adenovirus
Reservoir	Human
Vector	None
Vehicle	Contact
Incubation Period	1d - 3d
Diagnostic Tests	Viral isolation is available but rarely practical.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	- Watery discharge, generalized conjunctival injection and mild pruritus - May be associated with an upper respiratory infection
Synonyms	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 Belize



Graph: Belize. Conjunctivitis - acute hemorrhagic (AHC), cases

Notable outbreaks

Years	Cases	Clinical	Notes
1981		conjunctivitis - acute hemorrhagic	1 2

Years	Cases	Clinical	Notes
2017	1,108		Case count to September 26 ³

References

1. [MMWR Morb Mortal Wkly Rep 1981 Oct 09;30\(39\):497-500.](#)
2. [Bull Pan Am Health Organ 1983 ;17\(3\):275-80.](#)
3. [ProMED <promedmail.org> archive: 20171011.5371895](#)

COVID-19

Agent	Virus - RNA Coronaviridae, Betacoronavirus. SARS-CoV-2 (Severe acute respiratory syndrome coronavirus-2)
Reservoir	Human, Bat, Mink, Cat, Dog, Mammal
Vector	None
Vehicle	Droplet, Contact, Food, Fecal-oral, Respiratory or pharyngeal acquisition
Incubation Period	2d - 14d (mean 5 to 7 days)
Diagnostic Tests	Identification of virus - PCR or direct methods Serology
Typical Adult Therapy	<p>Isolation (respiratory and other secretions).</p> <p>Remdesivir (released for use in several countries) 200 mg IV day 1; then, 100 mg IV X 4 to 9 days Baricitinib appears to increase the effectiveness of Remdesivir and has been used in situations where corticosteroids cannot be administered.</p> <p>Chloroquine 500 mg PO BID X 10 days has been used in some cases. (several publications have suggested that Hydroxychloroquine is more effective and less toxic) The effectiveness of these drugs against COVID-19 is unproven.</p> <p>Monoclonal antibodies (Casirivimab / Imdevimab; Bamlanivimab) have been issued emergency use authorization for treatment of patients aged >=12 years at high risk for severe COVID-19.</p> <p>There is some evidence that corticosteroids, Lopinavir and other antivirals may be effective</p> <p>There is some evidence that convalescent plasma from COVID-19 patients may be effective.^{1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19}</p>
Typical Pediatric Therapy	As for adult
Vaccines	Bamlanivimab Casirivimab / Imdevimab COVID-19 vaccine - inactivated COVID-19 vaccine - mRNA COVID-19 vaccine - viral vector
Clinical Hints	<ul style="list-style-type: none"> - Exposure to endemic area or patient - Fever (>38 C), cough, respiratory difficulty, pneumonia - Rhinorrhea and sneezing are relatively uncommon - Diminished sense of smell and / or taste is an important early symptom - Severe illness more common in the elderly and individuals with underlying conditions - Case-fatality rate 2-5%
Synonyms	2019-nCoV, 2019-new coronavirus, 2019-Novel coronavirus infection, Covid-19, covid19, Novel coronavirus 2019 infection, Pediatric multisystem inflammatory syndrome, SARS-CoV-2 infection, Severe Specific Contagious Pneumonia, SSCP. ICD9: 079.82 ICD10: U07.1

COVID-19 in Belize

2020 - The first case of COVID-19 in Belize was reported in San Pedro Town on March 23 - imported from the United States.

- 2020 - Status report on COVID-19 in Belize ²⁰

Notable outbreaks

Years	Region	Cases	Deaths	Notes
2020 - 2021	Nationwide	12,280	315	Case count to February 26. ^{21 22 23 24 25 26 27 28 29 30 31}

References

1. Int J Antimicrob Agents 2020 Mar 20;:105949.
2. Intensive Care Med 2020 Feb 10;
3. Microbes Infect 2020 Feb 01;
4. J Med Virol 2020 Feb 13;
5. Zhonghua Jie He He Hu Xi Za Zhi 2020 Feb 20;43:E019.
6. Travel Med Infect Dis 2020 Mar 04;:101615.
7. Int J Antimicrob Agents 2020 Mar 04;:105932.
8. Antimicrob Agents Chemother 2020 Mar 09;
9. Zhonghua Jie He He Hu Xi Za Zhi 2020 Mar 12;43(3):185-188.
10. Zhonghua Jie He He Hu Xi Za Zhi 2020 Mar 12;43(3):170-172.
11. J Crit Care 2020 Mar 10;
12. J Antimicrob Chemother 2020 Mar 20;
13. Travel Med Infect Dis 2020 Apr 02;:101647.
14. N Engl J Med 2020 May 07;
15. Drug Discov Ther 2020 ;14(2):73-76.
16. N Engl J Med 2020 May 22;
17. N Engl J Med 2020 Jun 03;
18. Contemp Clin Trials 2021 Jan 07;:106272.
19. Ann Intern Med 2021 Feb 09;
20. Asia Pac J Public Health 2020 Sep 25;:1010539520962604.
21. ProMED <promedmail.org> archive: 20200327.7149046
22. ProMED <promedmail.org> archive: 20200404.7182744
23. ProMED <promedmail.org> archive: 20200412.7213517
24. ProMED <promedmail.org> archive: 20200417.7235118
25. ProMED <promedmail.org> archive: 20200425.7267692
26. ProMED <promedmail.org> archive: 20200506.7306556
27. ProMED <promedmail.org> archive: 20200527.7385049
28. ProMED <promedmail.org> archive: 20200611.7458885
29. ProMED <promedmail.org> archive: 20200807.7653452
30. ProMED <promedmail.org> archive: 20201205.7994443
31. ProMED <promedmail.org> archive: 20210130.8149707

Cryptococcosis

Agent	FUNGUS - Yeast. Basidiomycota, Hymenomycetes, Sporidiales: <i>Cryptococcus neoformans</i> and other species
Reservoir	Pigeon, Soil
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	Variable
Diagnostic Tests	Fungal culture and stains. Latex test for fungal antigen in CSF and serum. Nucleic acid amplification.
Typical Adult Therapy	(Induction) Liposomal Amphotericin B 3-4 mg/kg/d X 2-6 weeks + (Preferred) Flucytosine 25 mg/kg/d PO QID X 2 weeks OR Fluconazole 400 mg BID X 2 weeks ¹
Typical Pediatric Therapy	(Induction) Amphotericin B deoxycholate 1 mg/kg/d X 2-6w + Flucytosine 25 mg/kg/d PO QID X 2 weeks
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Busse-Buschke disease, Cryptococcus, European blastomycosis, Torulosis. ICD9: 117.5,321.0 ICD10: B45

References

1. [Clin Infect Dis 2010 Feb 01;50\(3\):291-322.](#)

Cryptosporidiosis

Agent	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).
Reservoir	Mammal (over 150 species)
Vector	None
Vehicle	Water, Feces, Oysters, Fly
Incubation Period	5d - 10d (range 2d - 14d)
Diagnostic Tests	Stool/duodenal aspirate for acid-fast, direct fluorescence staining, or antigen assay. Nucleic acid amplification
Typical Adult Therapy	Stool precautions. Nitazoxanide 500 mg PO BID X 3 days ^{1 2}
Typical Pediatric Therapy	Stool precautions. Nitazoxanide : 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
Clinical Hints	<ul style="list-style-type: none"> - Watery diarrhea, vomiting, abdominal pain - Self-limited disease in healthy subjects - Immunosuppressed (e.g., AIDS) patients experience chronic, wasting illness (may be associated with pulmonary disease)
Synonyms	<p><i>Cryptosporidium</i>, <i>Cryptosporidium andersoni</i>, <i>Cryptosporidium baileyi</i>, <i>Cryptosporidium chipmunk</i> genotype, <i>Cryptosporidium cunulicus</i>, <i>Cryptosporidium ditrichi</i>, <i>Cryptosporidium fayeri</i>, <i>Cryptosporidium felis</i>, <i>Cryptosporidium hedgehog</i> genotype, <i>Cryptosporidium hominis</i>, <i>Cryptosporidium meleagridis</i>, <i>Cryptosporidium occultus</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.</p> <p>ICD9: 007.4 ICD10: A07.2</p>

References

1. [Lancet 2002 Nov 02;360\(9343\):1375-80.](#)
2. [J Infect Dis 2001 Jul 01;184\(1\):103-6.](#)

Cutaneous larva migrans

Agent	PARASITE - Nematoda. Secernentea: <i>Ancylostoma braziliense</i> , <i>A. caninum</i> , <i>Bunostomum phlebotomum</i> , <i>Strongyloides myopotami</i>
Reservoir	Cat, Dog, Cattle
Vector	None
Vehicle	Soil, Contact
Incubation Period	2d - 3d (range 1d - 30d)
Diagnostic Tests	Biopsy is rare helpful.
Typical Adult Therapy	Ivermectin 200 micrograms/kg as single dose OR Albendazole 200 mg BID X 3d OR Thiabendazole topical X 5d ^{1 2}
Typical Pediatric Therapy	Ivermectin 200 micrograms/kg as single dose. OR Albendazole 7.5 mg/kg BID X 3d OR Thiabendazole topical X 5d
Clinical Hints	<ul style="list-style-type: none"> - 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.
Synonyms	Creeping eruption, Pelodera, Plumber's itch. ICD9: 126.2,126.8,126.9 ICD10: B76.9

Cutaneous larva migrans in Belize

Cross-border events

Does not include individual case reports

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2001	United Kingdom	Belize	military	13	An outbreak (13 cases) was reported among British military personnel in Belize ³

** Country or Nationality

Notable outbreaks

Years	Cases	Population	Notes
2001	13	military personnel	Outbreak among British military personnel in Belize ⁴

References

1. Clin Infect Dis 2013 Oct ;57(8):1155-7.
2. Eur J Dermatol 1999 Jul-Aug;9(5):352-3.
3. J Travel Med 2001 Sep-Oct;8(5):267-9.
4. J Travel Med 2001 Sep-Oct;8(5):267-9.

Cyclosporiasis

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

References

1. [Lancet 1995 Mar 18;345\(8951\):691-3.](#)
2. [Ann Intern Med 2000 Jun 06;132\(11\):885-8.](#)

Cysticercosis	
Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Taenia solium</i>
Reservoir	Pig, Human
Vector	None
Vehicle	Soil (contaminated by pigs), Fecal-oral, Fly
Incubation Period	3m - 3y
Diagnostic Tests	Serology (blood or CSF) and identification of parasite in biopsy material.
Typical Adult Therapy	Albendazole 7.5 mg/kg PO BID X 10-14d AND / OR Praziquantel 17 mg/kg TID X 14d Add corticosteroids if brain involved Surgery as indicated ¹
Typical Pediatric Therapy	Albendazole 15 mg/kg PO BID X 30d. AND / OR Praziquantel 30 mg/kg TID X 14d (15 to 30d for neurocysticercosis). Add corticosteroids if brain involved. Surgery as indicated
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	<i>Taenia crassiceps</i> , <i>Taenia martis</i> , <i>Versteria</i> . ICD9: 123.1 ICD10: B69

References

1. [Clin Infect Dis 2018 Apr 03;66\(8\):e49-e75.](#)

Cystoisosporiasis

Agent	PARASITE - Protozoa. Apicomplexa, Eimeriida: <i>Isospora (Cystoisospora) belli</i>
Reservoir	Human
Vector	None
Vehicle	Food, Liquids, Fecal-oral, Sexual (homosexual) contact
Incubation Period	7d - 10d
Diagnostic Tests	Microscopy of stool or duodenal contents. Advise laboratory when this organism is suspected.
Typical Adult Therapy	Immunocompetent patients: Sulfamethoxazole / Trimethoprim 800/160 mg BID X 10 days OR Ciprofloxacin 500 mg PO BID X 10 days Immunosuppressed: Sulfamethoxazole / Trimethoprim 800/160 mg BID X 10 days then 3/week until CD4>200 OR Pyrimethamine 75 mg QD + leucovorin then 25 mg QD until CD4>200 OR Ciprofloxacin 500 mg PO BID X 10 days then 3/week until CD4>200 ^{1 2 3}
Typical Pediatric Therapy	As for adult (dosage adjusted for weight)
Clinical Hints	- Myalgia, watery diarrhea, nausea and leukocytosis - Eosinophilia may be present - Illness is prolonged and severe in AIDS patients
Synonyms	<i>Isospora belli</i> , Isosporiasis. ICD9: 007.2 ICD10: A07.3

References

1. [N Engl J Med 1986 Jul 10;315\(2\):87-90.](#)
2. [Ann Intern Med 1988 Sep 15;109\(6\):474-5.](#)
3. [Ann Intern Med 2000 Jun 06;132\(11\):885-8.](#)

Cytomegalovirus infection

Agent	VIRUS - DNA. Herpesviridae, Betaherpesvirinae: Human herpesvirus 5 (Cytomegalovirus)
Reservoir	Human
Vector	None
Vehicle	Droplet (respiratory), Urine, Dairy products, Tears, Stool, Sexual, contact (rare), Transplacental, Breastfeeding
Incubation Period	3w - 5w (range 2w - 12w)
Diagnostic Tests	Viral culture (blood, CSF, urine, tissue). Serology. Direct viral microscopy. Nucleic acid amplification
Typical Adult Therapy	(Most cases self-limited). Ganciclovir 5 mg/kg q12h IV X 2 to 3w. OR Foscarnet 90 mg/kg Q12h IV OR Cidofovir 5 mg/kg IV weekly + probenicid ^{1 2 3 4 5}
Typical Pediatric Therapy	(Most cases self-limited) Ganciclovir 5 mg/kg q12h IV X 2 to 3w
Vaccine	Cytomegalovirus immunoglobulin
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Cytomegalovirus, Zytomegalie. ICD9: 078.5 ICD10: B25

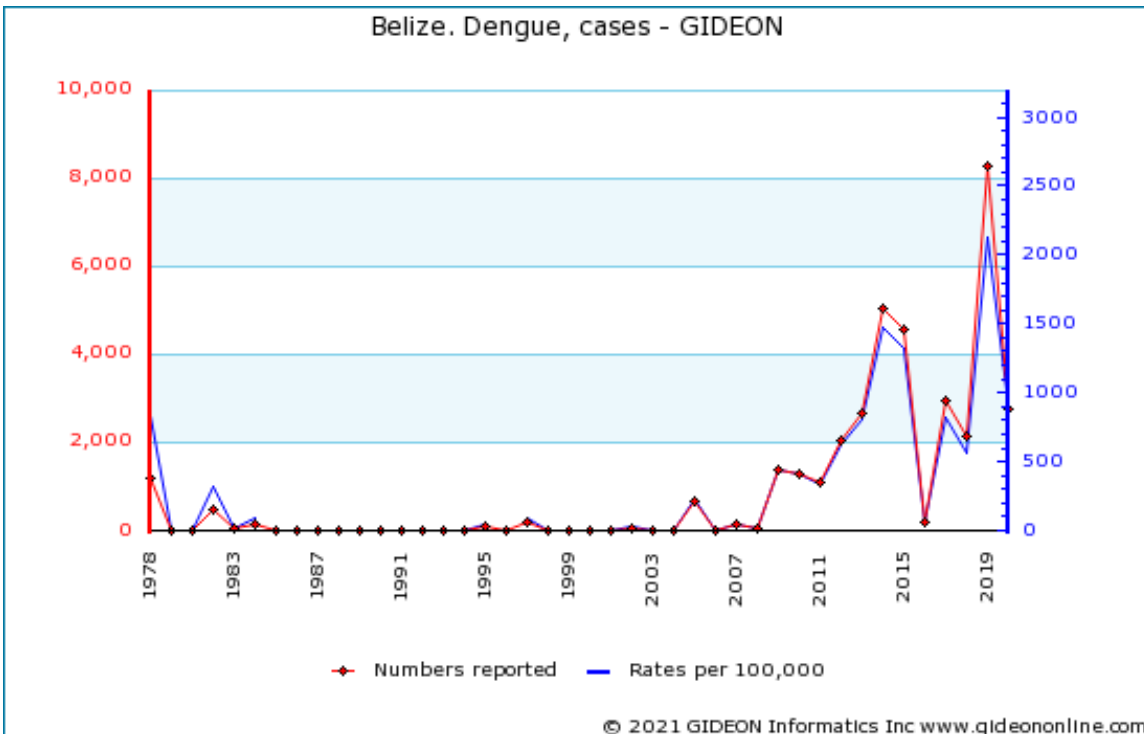
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2. Pediatr Ann 2015 May ;44(5):e115-25.
3. Paediatr Child Health 2017 May ;22(2):72-74.
4. Acta Paediatr 2010 Apr ;99(4):509-15.
5. Virus Res 2011 May ;157(2):212-21.

Dengue

Agent	VIRUS - RNA. Flaviviridae, Flavivirus: Dengue virus
Reservoir	Human, Mosquito, Monkey (in Malaysia and Africa)
Vector	Mosquito - <i>Stegomyia (Aedes) aegypti</i> , <i>S. albopictus</i> , <i>S. polynesiensis</i> , <i>S. scutellaris</i>
Vehicle	Blood, Breastfeeding
Incubation Period	5d - 8d (range 2d - 15d)
Diagnostic Tests	Biosafety level 2. Viral isolation (blood). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive; IV fluids to maintain blood pressure and reverse hemoconcentration
Typical Pediatric Therapy	As for adult
Vaccine	Dengue vaccine
Clinical Hints	- Headache, myalgia, arthralgia - Relative bradycardia, leukopenia and macular rash - Severe dengue (DHF or dengue-shock syndrome) defined by thrombocytopenia, hemoconcentration and hypotension
Synonyms	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 Belize



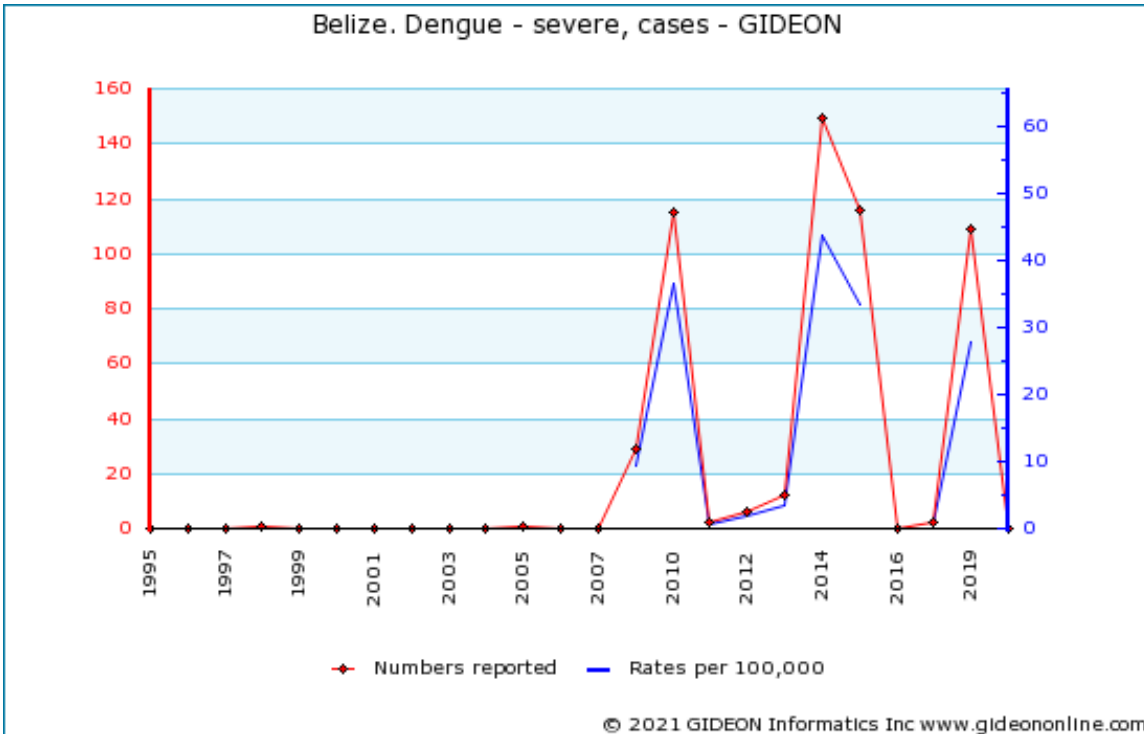
Graph: Belize. Dengue, cases

Notes:

Individual years:

- 1982 - Most reported from Belize City and Santa Elena.
- 1995 - Included nine confirmed cases.
- 2015 - 280 cases were reported to September. ^{1 2}
- 2016 - 56 cases were reported to July. ^{3 4}
- 2017 - 4 cases were reported to May 15. ⁵
- 2020 - 2,293 cases were reported to October 17. ^{6 7 8}

No fatal cases were reported during 1995 to 2006; 0 in 2010.



Graph: Belize. Dengue - severe, cases

Notes:

- 1. Formerly reported as Dengue hemorrhagic fever (DHF)

Seroprevalence surveys

Years	Study Group	%	Notes
2009 - 2011	pregnant women	36	⁹

Notable outbreaks

Years	Region	Cases	Deaths	Notes
2009	Cayo	114	0	¹⁰
2010		348	1	¹¹
2014		323	0	¹²
2017		2,626	0	Case count to October 13
2018	Multiple locations	1,881	0	Case count to December 7 ^{13 14}
2019	Multiple locations	2,340	0	Case count to November 2 ^{15 16}
2020		2,293	0	Case count to October 17. ^{17 18}

References

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2. ProMED <promedmail.org> archive: 20150928.3675184
3. ProMED <promedmail.org> archive: 20160605.4266936
4. ProMED <promedmail.org> archive: 20160712.4338859
5. ProMED <promedmail.org> archive: 20170905.5297066
6. ProMED <promedmail.org> archive: 20200307.7058361
7. ProMED <promedmail.org> archive: 20200901.7737065
8. ProMED <promedmail.org> archive: 20201115.7945357
9. Am J Trop Med Hyg 2014 Sep ;91(3):642-4.
10. ProMED <promedmail.org> archive: 20090727.2642
11. ProMED <promedmail.org> archive: 20100720.2435
12. ProMED <promedmail.org> archive: 20141012.2856404
13. ProMED <promedmail.org> archive: 20180911.6019472
14. ProMED <promedmail.org> archive: 20181109.6135133
15. ProMED <promedmail.org> archive: 20190425.6440108
16. ProMED <promedmail.org> archive: 20190508.6461377
17. ProMED <promedmail.org> archive: 20200811.7664969
18. ProMED <promedmail.org> archive: 20201115.7945357

Dermatophytosis

Agent	FUNGUS. Ascomycota, Euascomyces, Onygenales: <i>Epidermophyton</i> , <i>Microsporum</i> , <i>Trichophyton</i> , <i>Trichosporon</i> spp., <i>Arthroderma</i> , et al
Reservoir	Human, Dog, Cat, Rabbit, Marsupial, Other mammal
Vector	None
Vehicle	Contaminated soil/flooring, Animal Contact
Incubation Period	2w - 38w
Diagnostic Tests	Fungal culture and microscopy of skin, hair or nails. Nucleic acid amplification.
Typical Adult Therapy	Skin - topical Clotrimazole, Miconazole , etc. Hair/nails - Terbinafine , Griseofulvin , Itraconazole or Fluconazole PO ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Erythematous, circinate, scaling or dyschromic lesions of skin, hair or nails - Pruritus, secondary infection or regional lymphadenopathy may be present
Synonyms	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

References

1. [Dig Endosc 2014 Nov ;26\(6\):752-3.](#)
2. [Arch Dermatol 1989 Nov ;125\(11\):1537-9.](#)
3. [Br J Dermatol 1997 Apr ;136\(4\):575-7.](#)

Dientamoeba fragilis infection

Agent	PARASITE - Protozoa. Metamonada, Parabasala, Trichomonadea. Flagellate: <i>Dientamoeba fragilis</i>
Reservoir	Human, Gorilla, Pig
Vector	None
Vehicle	Fecal-oral (ingestion of pinworm ova)
Incubation Period	8d - 25d
Diagnostic Tests	Identification of trophozoites in stool. Nucleic acid amplification. Alert laboratory if this diagnosis is suspected.
Typical Adult Therapy	Stool precautions. Iodoquinol 650 mg PO TID X 20d. OR Tetracycline 500 mg QID X 10d. OR Paromomycin 10 mg/kg TID X 7d OR Metronidazole 750 mg PO TID X 10d ^{1 2 3 4 5 6}
Typical Pediatric Therapy	Stool precautions. Iodoquinol 13 mg/kg PO TID X 20d. OR (age >8) Tetracycline 10 mg/kg QID X 10d OR Paromomycin 10 mg/kg TID X 7d OR Metronidazole 15 mg/kg PO TID X 10d
Clinical Hints	<ul style="list-style-type: none"> - Abdominal pain with watery or mucous diarrhea - Eosinophilia may be present - Concurrent enterobiasis (pinworm) is common - Infestation may persist for more than one year
Synonyms	

References

1. [Int J Parasitol Drugs Drug Resist](#) 2012 Dec ;2:204-15.
2. [Int J Infect Dis](#) 2016 Aug ;49:59-61.
3. [Antimicrob Agents Chemother](#) 2012 Jan ;56(1):487-94.
4. [Am J Trop Med Hyg](#) 2012 Dec ;87(6):1046-52.
5. [Pediatr Infect Dis J](#) 2013 Apr ;32(4):e148-50.
6. [Expert Rev Gastroenterol Hepatol](#) 2020 Mar 10;

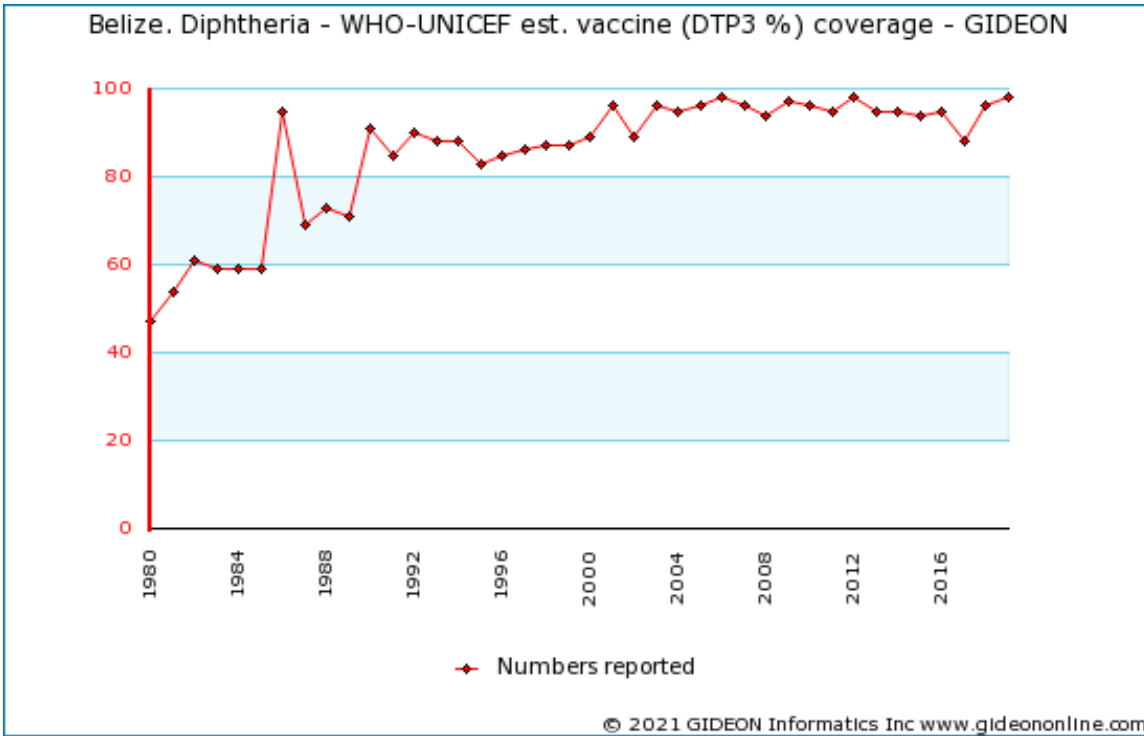
Diphtheria

Agent	BACTERIUM. <i>Corynebacterium diphtheriae</i> A facultative gram-positive bacillus
Reservoir	Human
Vector	None
Vehicle	Droplet, Contact, Dairy products, Clothing
Incubation Period	2d - 5d (range 1d - 10d)
Diagnostic Tests	Culture on special media. Advise laboratory when this diagnosis is suspected.
Typical Adult Therapy	Respiratory isolation. Equine antitoxin 20,000 to 120,000 units IM. (first perform scratch test) AND Erythromycin 500 mg QID (or Penicillin preparation) X 14d ¹
Typical Pediatric Therapy	Respiratory isolation. Equine antitoxin 20,000 to 120,000 units IM. (first perform scratch test) AND Erythromycin 10 mg/kg QID (or penicillin preparation) X 14d
Vaccines	Diphtheria antitoxin Diphtheria vaccine DT vaccine DTaP vaccine DTP vaccine Td vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	<i>Corynebacterium diphtheriae</i> , Difteri, Difteria, Difterie, Difterite, Diphterie. ICD9: 032 ICD10: A36

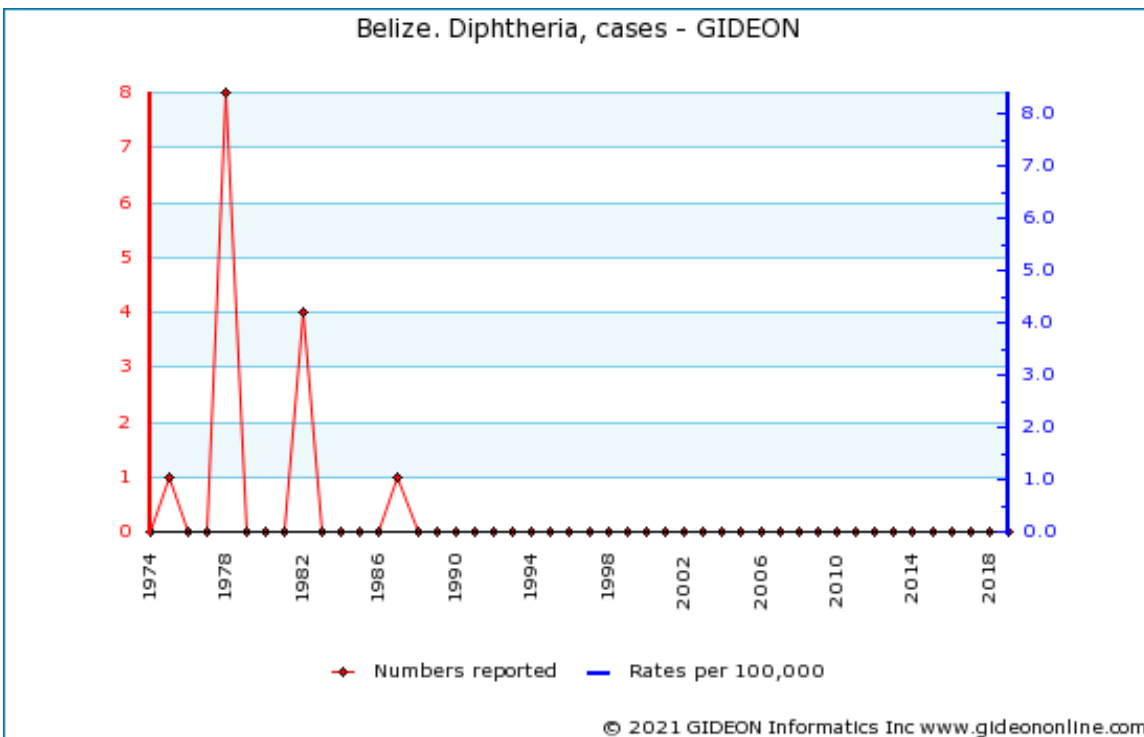
Diphtheria in Belize

Vaccine Schedule:

- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years



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



Graph: Belize. Diphtheria, cases

References

1. [Clin Infect Dis 1998 Oct ;27\(4\):845-50.](#)

Diphyllobothriasis

Agent	PARASITE - Platyhelminthes, Cestoda. Pseudophyllidea, Diphyllbothriidae: <i>Diphyllobothrium latum</i> , et al
Reservoir	Human, Dog, Bear, Fish-eating mammal
Vector	None
Vehicle	Fresh-water fish - notably (for <i>D. latum</i>) perch, burbot and pike
Incubation Period	4w - 6w (range 2w - 2y)
Diagnostic Tests	Identification of ova or proglottids in feces. Tapeworm length often exceeds ten meters
Typical Adult Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once ^{1 2}
Typical Pediatric Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 50 mg/kg PO once
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Adenocephalus pacificus, Bandwurm [Diphyllobothrium], Bothriocephalus acheilognathi, Bothriocephalus latus, Broad fish tapeworm, Dibothriocephalus infection, Diphyllobothrium cordatum, Diphyllobothrium dalliae, Diphyllobothrium dendriticum, Diphyllobothrium klebanovskii, Diphyllobothrium latum, Diphyllobothrium nihonkaiense, Diphyllobothrium stemmacephalum, Diphyllobothrium ursi, Diplogonoporiosis, Fish tapeworm. ICD9: 123.4 ICD10: B70.0

References

1. [Acta Trop 1980 Sep ;37\(3\):293-6.](#)
2. [Curr Opin Infect Dis 2007 Oct ;20\(5\):524-32.](#)

Dipylidiasis

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Dipylidiidae: <i>Dipylidium caninum</i>
Reservoir	Dog, Cat
Vector	None
Vehicle	Ingested flea (<i>Ctenocephalides</i> spp.)
Incubation Period	21d - 28d
Diagnostic Tests	Identification of proglottids in feces. Tapeworm length may exceed 50 cm.
Typical Adult Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once ^{1 2}
Typical Pediatric Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide : weight 11-34 kg 1 g PO as single dose weight >34 kg 1.5 g PO as single dose
Clinical Hints	- Diarrhea, abdominal distention and restlessness (in children) - Eosinophilia present in some cases - Proglottids may migrate out of the anus
Synonyms	Cucumber tapeworm, <i>Dipylidium caninum</i> , Dog tapeworm, Double-pored dog tapeworm. ICD9: 123.8 ICD10: B71.1

References

1. [Acta Trop 1980 Sep ;37\(3\):293-6.](#)
2. [Pediatr Infect Dis J 2018 Nov 07;](#)

Dirofilariasis

Agent	PARASITE - Nematoda. Secernentea: <i>Dirofilaria (Nochtiella) immitis</i> (pulmonary); <i>D. tenuis</i> & <i>D. repens</i> (subcutaneous infection) & <i>D. ursi</i>
Reservoir	Mammal, Dog, Wild carnivore (<i>D. tenuis</i> in raccoons; <i>D. ursi</i> in bears)
Vector	Mosquito
Vehicle	None
Incubation Period	60d - 90d
Diagnostic Tests	<p>Identification of parasite in tissue. Serology. Nucleic acid amplification.</p> <p><i>Dirofilaria immitis</i> adult: female - 23 to 31 cm; male - 12 to 23 cm</p> <p><i>Dirofilaria repens</i> adult: female - 25 to 30 cm; male - 5 to 7 cm</p>
Typical Adult Therapy	Not available; excision is often diagnostic and curative
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Breinlia, Candidatus <i>Dirofilaria hongkongensis</i> , Dirofilariosis, Dirofiliaria, Dog heartworm, <i>Filaria conjunctivae</i> , Loaina. ICD9: 125.6 ICD10: B74.8

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	Transplant (rare)
Incubation Period	7d - 10d (range 5d - 15d)
Diagnostic Tests	Biosafety level 2. Viral culture (brain tissue, CSF, serum). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Eastern equine encephalitis vaccine
Clinical Hints	- Most common during summer in temperate areas. - Headache, fever, seizures, coma and leukocytosis - Neurological sequelae in 40% - Case-fatality rates may approach 70%
Synonyms	Caaingua, EEE, Madariaga virus. ICD9: 062.2 ICD10: A83.2

Eastern equine encephalitis in Belize

1996 - An epizootic was reported in Orange Walk and Cayo Districts.

Animal infection

- 2005 - An infected equine was reported. ¹
- 2009 - An infected equine was reported. ^{2 3}

References

1. ProMED <promedmail.org> archive: 20051126.3428
2. ProMED <promedmail.org> archive: 20091019.3593
3. ProMED <promedmail.org> archive: 20091025.3690

Echinococcosis - unilocular

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Echinococcus granulosus</i> , <i>Echinococcus canadensis</i>
Reservoir	Dog, Wolf, Dingo, Sheep, Horse, Pig
Vector	None
Vehicle	Soil, Dog feces, Fly
Incubation Period	1y - 20y
Diagnostic Tests	Serology. Identification of parasite in surgical specimens.
Typical Adult Therapy	Albendazole 400 mg BID X 1-3 months Praziquantel has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) is also used ¹
Typical Pediatric Therapy	Albendazole 10 mg/kg/day X 1-3 months Praziquantel has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) also used
Clinical Hints	- Calcified hepatic cyst or mass lesions in lungs and other organs - Brain and lung involvement are common in pediatric cases
Synonyms	Echinococcus canadensis, Echinococcus granulosus, Echinococcus intermedius, Echinococcus ortleppi, 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

References

1. [Infect Dis Clin North Am 2012 Jun ;26\(2\):421-35.](#)

Endocarditis - infectious

Agent	BACTERIUM OR FUNGUS. viridans streptococci, <i>Staphylococcus aureus</i> , enterococci, <i>Candida albicans</i> , et al.
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Blood culture, clinical findings, ultrasonography of heart valves.
Typical Adult Therapy	Bactericidal antibiotic appropriate to species ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- Consider in any patient with prolonged and unexplained fever,- Multisystem disease and a preexisting cardiac valvular lesion may be present- Skin lesions, hematuria, neurological symptoms, single or multiple abscesses or bone, brain, lung (etc)
Synonyms	Bacterial endocarditis, Endocardite, Endocarditis, Endokarditis, Fungal endocarditis, Infectious endocarditis, S.B.E.. ICD9: 421 ICD10: I33

References

1. Infect Dis Clin North Am 2009 Sep ;23(3):643-64.
2. J Antimicrob Chemother 1987 Sep ;20 Suppl A:143-5.
3. Curr Cardiol Rep 2018 Aug 16;20(10):86.

Enterobiasis

Agent	PARASITE - Nematoda. Secernentea: <i>Enterobius vermicularis</i>
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Air, Clothing, Sexual contact
Incubation Period	14d - 42d
Diagnostic Tests	Apply scotch tape to anal verge in a.m. & paste onto glass slide for microscopy. Enterobius vermicularis adult: female - 8 to 13 mm; male - 1 to 4 mm
Typical Adult Therapy	Albendazole 400 mg PO as single dose - repeat in 2w. OR Mebendazole 100 mg PO as single dose - repeat in 2w. OR Pyrantel pamoate 11 mg/kg (max 1g) PO as single dose; or ¹
Typical Pediatric Therapy	Mebendazole 100 mg PO as single dose (>age 2) - repeat in 2w. OR Pyrantel pamoate 11 mg/kg (max 1g) PO X 1
Clinical Hints	- Nocturnal anal pruritus - Occasionally presents with vaginitis or abdominal pain - Eosinophilia is rarely, if ever, encountered
Synonyms	Enterobio, Enterobius vermicularis, Oxyuriasis, Oxyuris, Pinworm, Seatworm. ICD9: 127.4 ICD10: B80

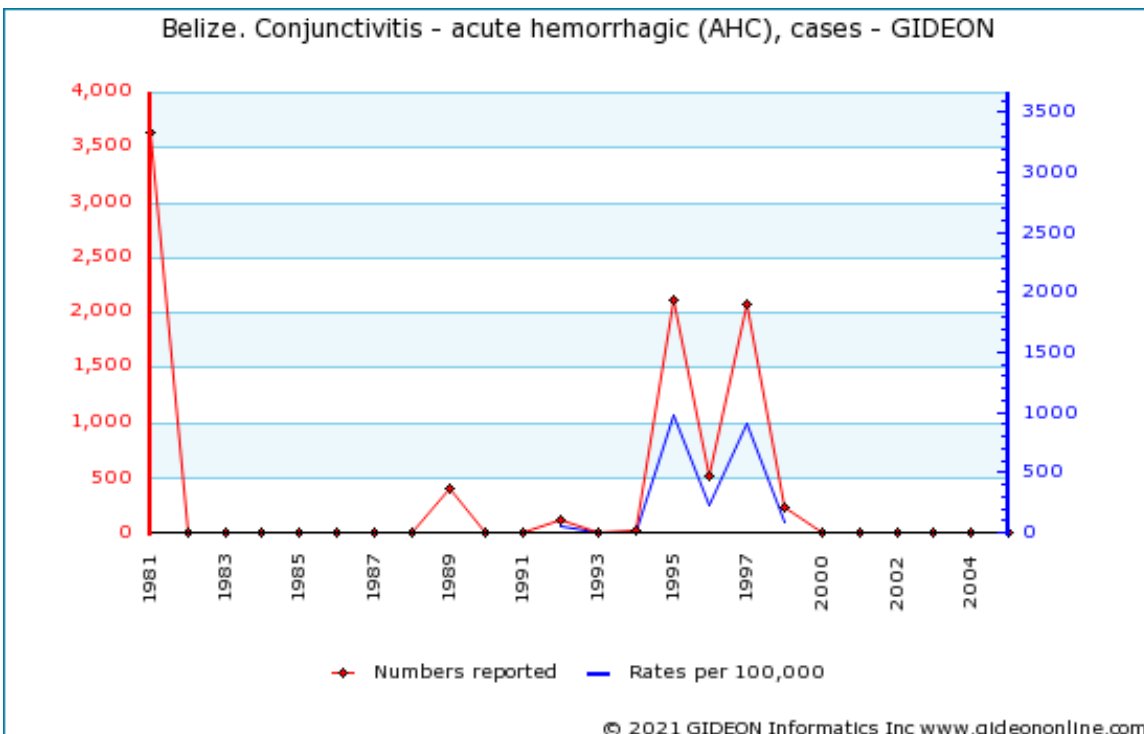
References

1. [Expert Opin Pharmacother 2001 Feb ;2\(2\):267-75.](#)

Enterovirus infection

Agent	VIRUS - RNA. Picornaviridae: Coxsackievirus, ECHO virus, Enterovirus, Parechovirus
Reservoir	Human
Vector	None
Vehicle	Droplet, Fecal-oral, Breastfeeding, Respiratory or pharyngeal acquisition
Incubation Period	2d-7d
Diagnostic Tests	Viral culture (stool, pharynx, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive. Pleconaril 200 to 400 mg PO TID X 7d has been used for severe infections ^{1 2}
Typical Pediatric Therapy	Supportive. Pleconaril 8.5 mg/kg PO TID has been used for severe infections
Vaccine	Enterovirus 71 vaccine
Clinical Hints	- Summer-to-autumn sore throat - Specific forms present with conjunctivitis, chest pain, macular or vesicular rash, meningitis, myopericarditis, etc
Synonyms	Acute flaccid myelitis, 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 Belize



Graph: Belize. Conjunctivitis - acute hemorrhagic (AHC), cases

Notable outbreaks

Years	Clinical	Notes
1981	conjunctivitis - acute hemorrhagic	3 4

References

1. Antimicrob Agents Chemother 2006 Jul ;50(7):2409-14.
2. J Pediatric Infect Dis Soc 2016 Mar ;5(1):53-62.
3. MMWR Morb Mortal Wkly Rep 1981 Oct 09;30(39):497-500.
4. Bull Pan Am Health Organ 1983 ;17(3):275-80.

Epidural abscess

Agent	BACTERIUM. <i>Staphylococcus aureus</i> , facultative gram negative bacilli, etc
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Imaging (CT scan, MRI). Gram-stain and culture of blood or pus.
Typical Adult Therapy	Intravenous antibiotic(s) appropriate to identified or suspected pathogens. Drainage as indicated ^{1 2}
Typical Pediatric Therapy	Intravenous antibiotic(s) appropriate to identified or suspected pathogen. Drainage as indicated
Clinical Hints	- Frontal bone abscess; or spinal cord compression with signs of infection - Often in setting of injecting drug abuse or preexisting staphylococcal infection
Synonyms	

References

1. Continuum (Minneap Minn) 2018 Oct ;24(5, Neuroinfectious Disease):1327-1348.
2. Acta Neurochir (Wien) 2018 Mar ;160(3):487-496.

Erysipelas or cellulitis

Agent	BACTERIUM. Erysipelas: <i>Streptococcus pyogenes</i> Cellulitis: <i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , occasionally others
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	1d - 7d
Diagnostic Tests	Clinical diagnosis is usually sufficient. Aspiration of lesion for smear and culture may be helpful in some cases.
Typical Adult Therapy	Antibiotic directed at likely pathogens (Group A Streptococcus and Staphylococcus aureus) ^{1 2 3 4}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Erysipelas is well-circumscribed, tender, edematous (peau d'orange), warm and painful - Cellulitis is less painful, flat and without a distinct border
Synonyms	Cellulite, Cellulitis, Celulite, Celulitis, Erisipela, Erysipelas, St. Anthony's fire (erysipelas), St. Francis' fire (erysipelas), Zellulitis. ICD9: 035,681,682 ICD10: A46,L03

References

1. 2018 01 ;
2. Cochrane Database Syst Rev 2017 06 20;6:CD009758.
3. Cochrane Database Syst Rev 2010 Jun 16;(6):CD004299.
4. BMJ Clin Evid 2008 Jan 02;2008

Erysipeloid

Agent	BACTERIUM. <i>Erysipelothrix rhusiopathiae</i> A facultative gram-positive bacillus
Reservoir	Mammal, Bird, Fish
Vector	None
Vehicle	Contact with meat (mammal, poultry or fish)
Incubation Period	1d - 7d
Diagnostic Tests	Culture.
Typical Adult Therapy	Oral therapy for 7 days: Penicillin V , Cephalexin , Ciprofloxacin , Clindamycin . For diffuse cutaneous or systemic infection parenteral therapy: Penicillin , Ceftriaxone , Imipenem , Ciprofloxacin , Levofloxacin , Daptomycin ^{1 2 3}
Typical Pediatric Therapy	Oral therapy for 10 days: Penicillin V , Ampicillin , third-generation cephalosporin or Erythromycin , Clindamycin are generally adequate
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Erysipelothrix rhusiopathiae, Rutlauf. ICD9: 027.1 ICD10: A26

References

1. Arch Derm Syphilol 1945 Nov-Dec;52:400.
2. Rev Infect Dis 1988 Mar-Apr;10(2):317-25.
3. Clin Microbiol Rev 1989 Oct ;2(4):354-9.

Erythrasma

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

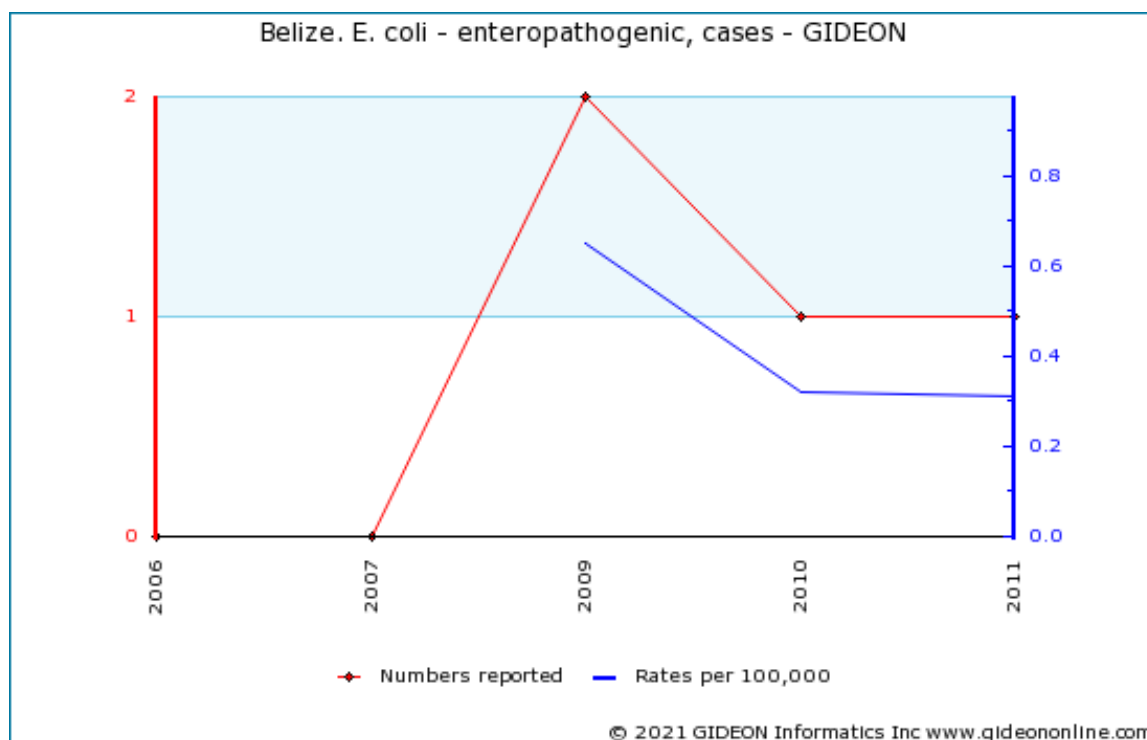
References

1. [J Dermatolog Treat 2013 Feb ;24\(1\):70-4.](#)

Escherichia coli diarrhea

Agent	BACTERIUM. <i>Escherichia coli</i> A facultative gram-negative bacillus
Reservoir	Human, Mammal
Vector	None
Vehicle	Food, Water, Fecal-oral
Incubation Period	1d - 3d (range 12h - 10d)
Diagnostic Tests	Stool culture. Request characterization of E. coli isolates.
Typical Adult Therapy	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 ¹
Typical Pediatric Therapy	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
Clinical Hints	<ul style="list-style-type: none"> - Watery diarrhea or dysentery - Common among travelers and infants - Hemorrhagic colitis and hemolytic uremic syndrome with type O157, and occasionally other strains
Synonyms	DAEC (Diffusely Adherent E. coli), E. coli diarrhea, EAEC (Enteroadherent E. coli), EAggEC (Enteroaggregative E. coli), EHEC (Enterohemorrhagic E. coli), EIEC (Enteroinvasive E. coli), EPEC (Enteropathogenic E. coli), Escherichia albertii, ETEC (Enterotoxigenic E. coli), Hamolytisch-uramisches Syndrom, Hemolytic Uremic Syndrome, HUS. ICD9: 008.0 ICD10: A04.0,A04.1,A04.2,A04.3,A04.4

Escherichia coli diarrhea in Belize



Graph: Belize. E. coli - enteropathogenic, cases

References

1. [Expert Rev Anti Infect Ther 2016 ;14\(2\):193-206.](#)

Fungal infection - invasive

Agent	FUNGUS. Various (major syndromes such as Candidiasis, Blastomycosis, etc are discussed separately in this module)
Reservoir	Human
Vector	None
Vehicle	Endogenous, Respiratory or pharyngeal acquisition
Incubation Period	Variable
Diagnostic Tests	Culture of blood, urine, biopsy material. Serum antigen or antibody assay in some cases.
Typical Adult Therapy	Antifungal agent(s) directed at known or likely pathogen ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fungal etiology should be suspected in any patient with evidence of severe local or multisystem infection - Commonly encountered in the setting of immune suppression
Synonyms	Acremonium, Acrophialophora, Adiaspiromycosis, Allescheriasis, Alternaria, Arthrographis kalrae, Athopsis, Aureobasidium, Bipolaris, Blastobotrys proliferans, Chaetomium, Chrysosporium, Cladophialophora, Cladosporium, Curvularia, Cyphellophora, Dactylaria, Debaryomyces, Dreschlera, Emergomyces, Emmonsia, Exophiala, Exserohilum, Fonsecaea, Fungal meningitis, Fungal sepsis, Fusariosis, Fusarium, Geosmithia, Geosmithia argillacea, Geotrichosis, Graphium, Hansenula, Haplomycosis, Hendersonula, Humicola, Hyalophycomycosis, Kluyveromyces, Lasiodiplodia, Lecythophora, Lomentospora, Magnusiomyces, Malassezia furfur, Monascus, Monosporiosis, Mycocentrospora, Nannizziopsis, Neocosmospora vasinfected, Neosartorya hiratsukae, Neosartorya udagawae, Neoscytalidium, Ochroconis, Oidiodendron, Paecilomyces, Paraconiothyrium, Parathyridaria, Pestalotiopsis, Phaeoacremonium, Phaeohiphomyces, 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

References

1. Pharmacol Ther 2018 Oct 19;
2. Curr Opin Infect Dis 2018 Dec ;31(6):490-498.
3. J Mycol Med 2018 Sep ;28(3):574-584.

Gastroenteritis - viral

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

Gianotti-Crosti syndrome

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

Giardiasis

Agent	PARASITE - Protozoa. Sarcocystidophora, Metamonada, Treponomadea. 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	Tinidazole 2 g PO X1. OR Nitazoxanide 500 mg PO BID X 3d Alternatives: Metronidazole 250 mg PO TID X 5d. OR Furazolidone 100 mg PO QID X 7d. OR Paromomycin 10 mg/kg PO TID X 7d OR Quinacrine 100 mg PO TID X 5d ^{1 2 3}
Typical Pediatric Therapy	Tinidazole 50 mg PO X 1 (maximum 2g). OR Nitazoxanide : Age 1 to 3y 100 mg BID X 7 d Age 4 to 11y 200 mg BID X 7d Alternatives: Metronidazole 5 mg/kg PO TID X 5d. OR Furazolidone 2 mg/kg QID X 7d
Clinical Hints	<ul style="list-style-type: none"> - 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> , Lambliasis. ICD9: 007.1 ICD10: A07.1

Giardiasis in Belize

Prevalence surveys

Years	Region	Study Group	%	Notes
2004*	Toledo	general population	12	12% of individuals in rural Toledo District ⁴

* indicates publication year (not necessarily year of survey)

2003 to 2004 - *Giardia intestinalis* was identified in free-ranging black howler monkeys (*Alouatta pigra*) which live near human settlements. ⁵

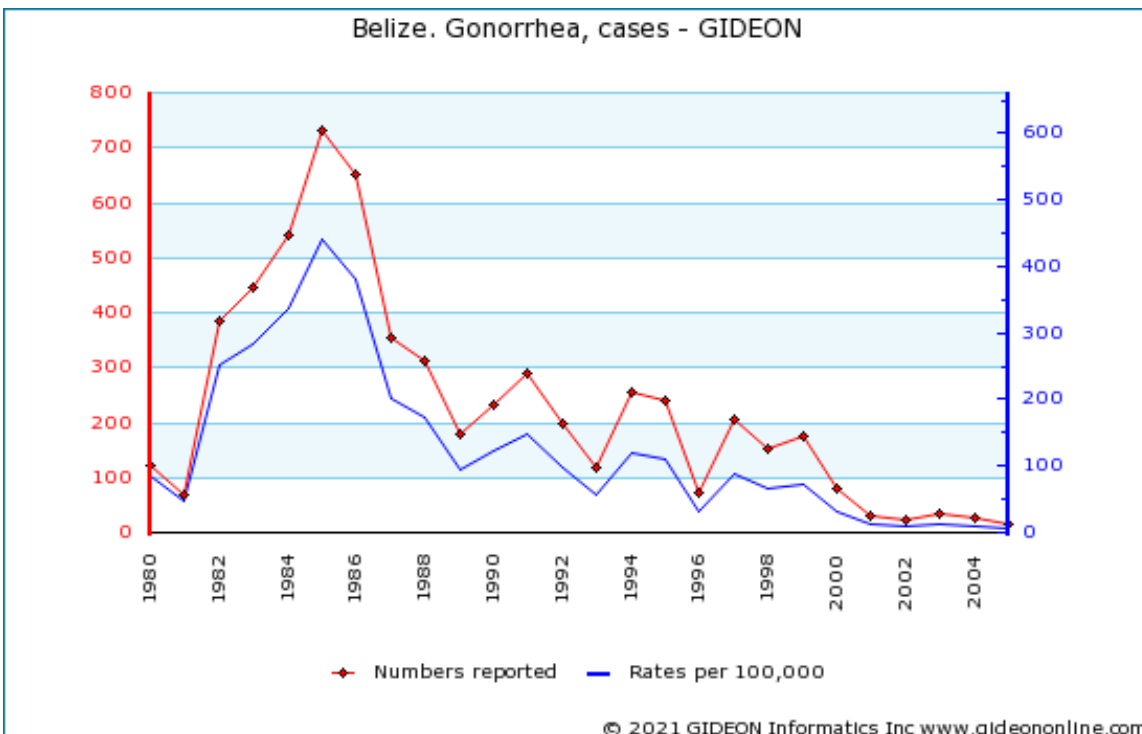
References

1. Expert Rev Anti Infect Ther 2014 Sep ;12(9):1143-57.
2. 2018 01 ;
3. Clin Microbiol Infect 2018 Jan ;24(1):37-42.
4. Southeast Asian J Trop Med Public Health 2004 Sep ;35(3):506-11.
5. Am J Primatol 2006 Nov ;68(11):1089-97.

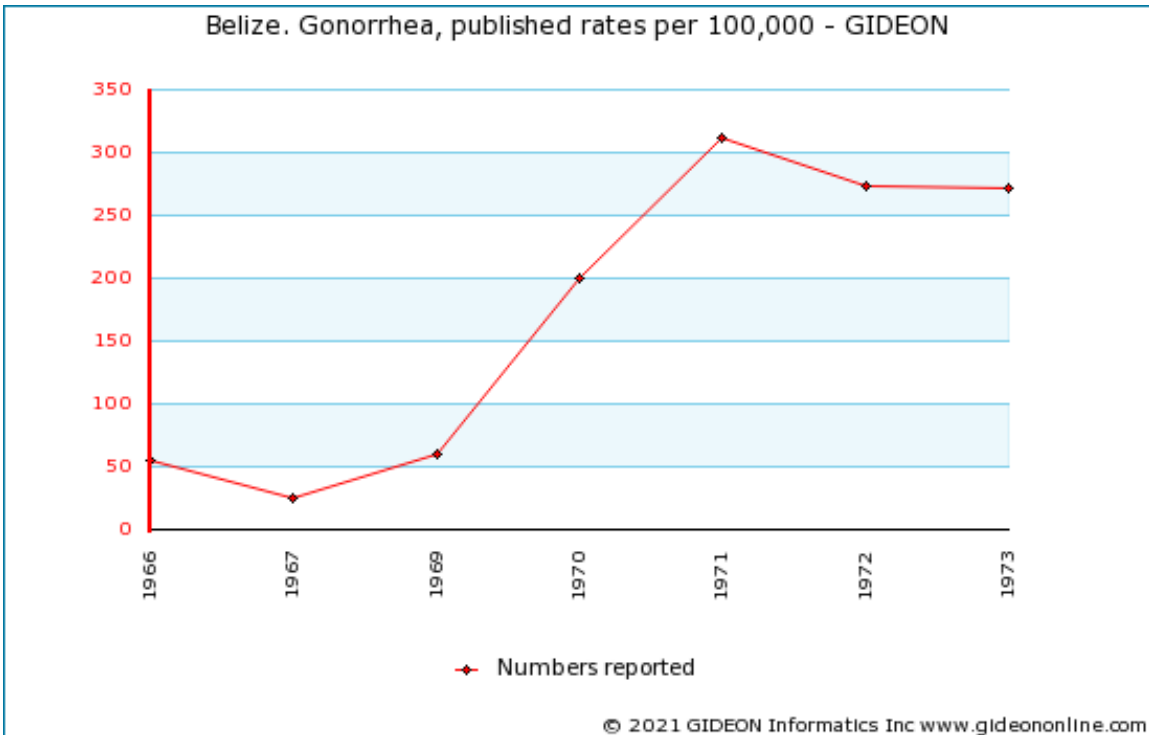
Gonococcal infection

Agent	BACTERIUM. <i>Neisseria gonorrhoeae</i> An aerobic gram-negative coccus
Reservoir	Human
Vector	None
Vehicle	Sexual, contact, Childbirth, Exudates, Respiratory or pharyngeal acquisition
Incubation Period	2d - 7d
Diagnostic Tests	Smear (male), culture. Consult laboratory for proper acquisition & transport. Nucleic acid amplification.
Typical Adult Therapy	Ceftriaxone 500 mg IM X 1. If chlamydial infection has not been excluded, add Doxycycline 100 mg PO BID X 7 days ^{1 2 3}
Typical Pediatric Therapy	Weight <=45 kg: Ceftriaxone 25 - 50 mg/kg IM or IV X 1 (max. 125 mg IM) Weight >45 kg: as for adult.
Clinical Hints	<ul style="list-style-type: none"> - Onset 2 to 7 days after sexual exposure - Copious urethral discharge (male) or cervicitis - Pelvic inflammatory disease - Systemic disease associated with fever, painful pustules and suppurative arthritis (primarily encountered in postmenstrual females)
Synonyms	Blennorrhagia, Blenorragia, Gonococemia, Gonore, Gonorre, Gonorrea, Gonorrhoea, Gonorrhoe, Gonorrhho, Gonorrhoe, Infeccion gonococica, Infeccoes gonococicas, Neisseria gonorrhoeae. ICD9: 098 ICD10: A54

Gonococcal infection in Belize



Graph: Belize. Gonorrhea, cases



Graph: Belize. Gonorrhea, published rates per 100,000

References

1. [MMWR Recomm Rep 2015 Jun 05;64\(RR-03\):1-137.](#)
2. [Clin Infect Dis 2014 Oct 15;59\(8\):1083-91.](#)
3. 2016 ;

Granuloma inguinale

Agent	BACTERIUM. <i>Klebsiella granulomatis</i> (formerly <i>Calymmatobacterium granulomatis</i>) A gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Sexual, contact, Direct contact
Incubation Period	7d - 30d (range 3d - 1 year)
Diagnostic Tests	Identification of organism in stained smears. Culture in specialized laboratories (HEp-2 cells).
Typical Adult Therapy	Azithromycin 1 g weekly X 3 w. Alternatives: Doxycycline 100 mg BID PO X 3w. Sulfamethoxazole / Trimethoprim 800/160 mg BID X 3w Erythromycin 500 mg QID X 3w. Ciprofloxacin 750 mg BID X 3w ¹
Typical Pediatric Therapy	Azithromycin 10 mg / kg po day 1; then 250 mg / kg daily days 2 to 5 Alternatives: Sulfamethoxazole / Trimethoprim , Erythromycin or Doxycycline
Clinical Hints	<ul style="list-style-type: none"> - Slowly expanding, ulcerating skin nodule with friable base - Usually painless - May be complicated by edema or secondary infection - Rarely spreads to bone or joints
Synonyms	<i>Calymmatobacterium granulomatis</i> , Donovanosis, Granuloma genitoinguinale, Granuloma inguinale tropicum, Granuloma venereum, Sixth venereal disease. ICD9: 099.2 ICD10: A58

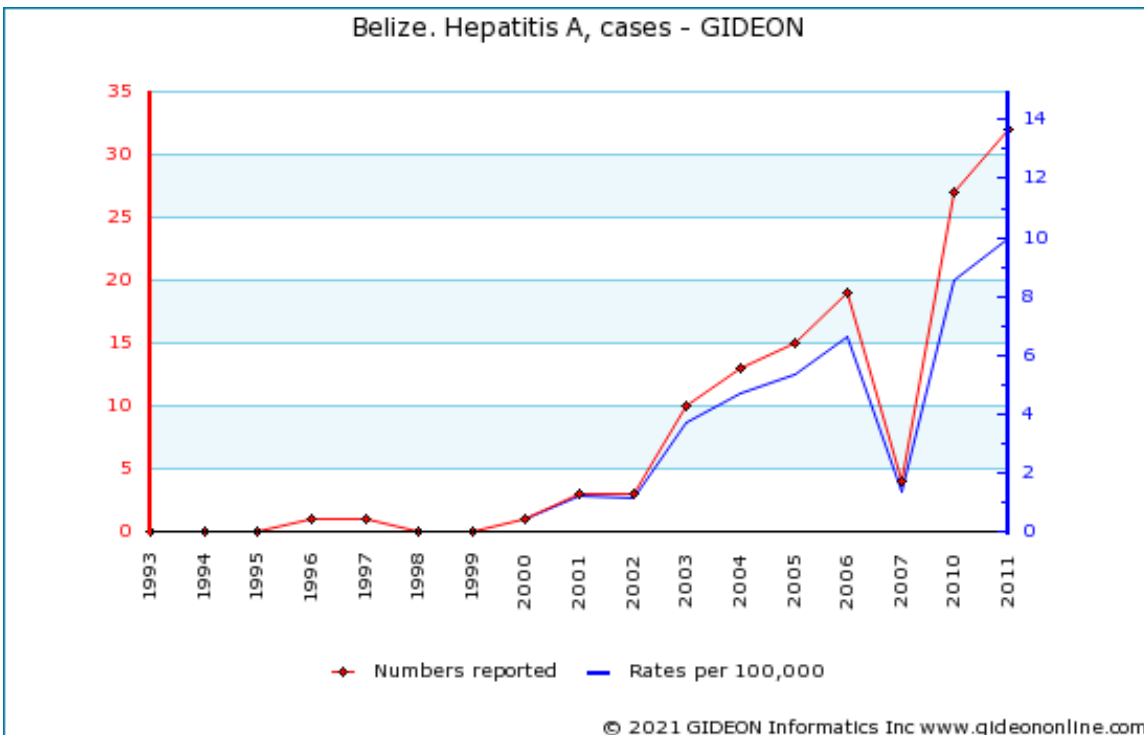
References

1. MMWR Recomm Rep 2015 Jun 05;64(RR-03):1-137.

Hepatitis A

Agent	VIRUS - RNA. Picornaviridae, Hepatovirus: Hepatitis A virus
Reservoir	Human, Non-human primate
Vector	None
Vehicle	Fecal-oral, Food, Water, Milk, Fly, Breastfeeding
Incubation Period	21d - 30d (range 14d - 60d)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Stool precautions; supportive
Typical Pediatric Therapy	As for adult
Vaccine	Hepatitis A + Hepatitis B vaccine Hepatitis A vaccine Immune globulin
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Botkin's disease, Epatite A, HAV, Hepatite per virus A, Infectious hepatitis. ICD9: 070.0 ICD10: B15.0, B15.9

Hepatitis A in Belize



Graph: Belize. Hepatitis A, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
1994 - 1995	Stann Creek	patients - hepatitis	9.7	9.7% of acute hepatitis cases (Stann Creek, 1994 to 1995). ¹

Seroprevalence surveys

Years	Study Group	%	Notes
1993*	military personnel	94-100	94% (males) to 100% (females) of military personnel (1993 publication) ²

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Population	Notes
2001	Cayo		18		
2013	Stann Creek		14		³
2015	Buena Vista	school	21	students	⁴

References

1. Am J Trop Med Hyg 2001 Oct ;65(4):318-24.
2. Am J Trop Med Hyg 1993 Oct ;49(4):430-4.
3. ProMED <promedmail.org> archive: 20130327.1606732
4. ProMED <promedmail.org> archive: 20150128.3126384

Hepatitis B

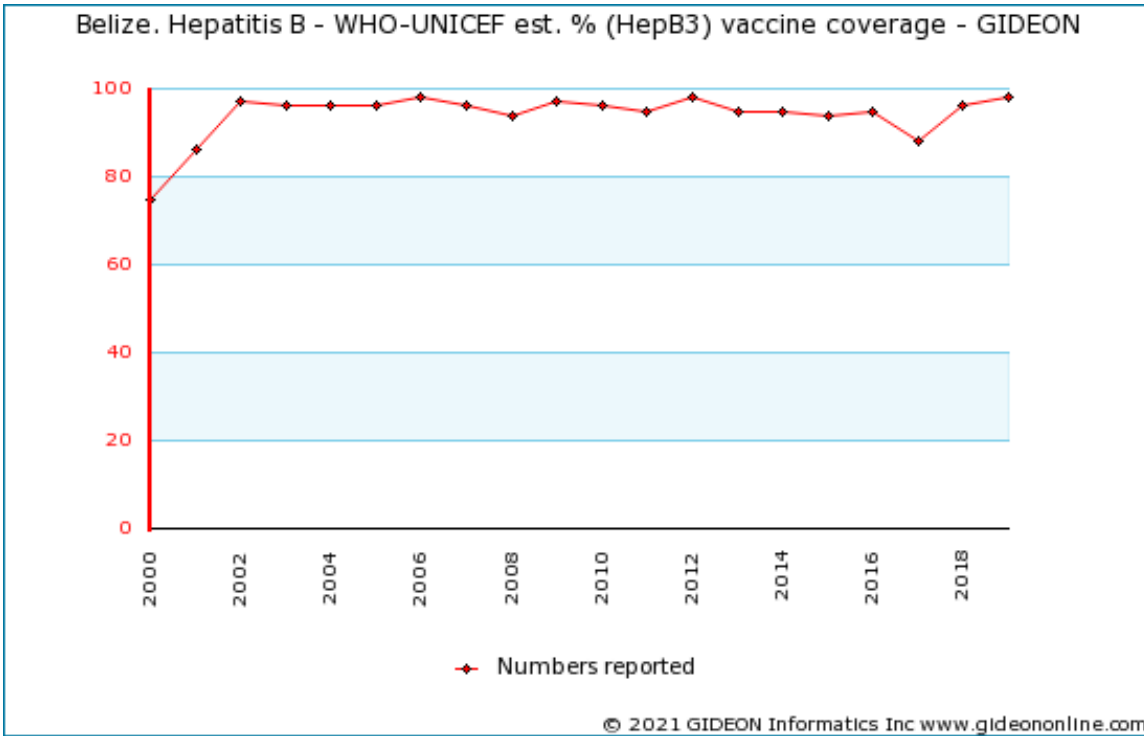
Agent	VIRUS - DNA. Hepadnaviridae, Orthohepadnavirus: Hepatitis B virus
Reservoir	Human Non-human primate
Vector	None
Vehicle	Blood, Infected secretions, Sexual contact, Transplacental
Incubation Period	2m - 3m (range 1m - 13m)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Needle precautions. For chronic infection: Entecavir OR Tenofovir OR Peginterferon alfa-2a OR Peginterferon alfa-2b ^{1 2}
Typical Pediatric Therapy	As for adult
Vaccines	Hepatitis A + Hepatitis B vaccine Hepatitis B + Haemoph. influenzae vaccine Hepatitis B immune globulin Hepatitis B vaccine
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 Belize

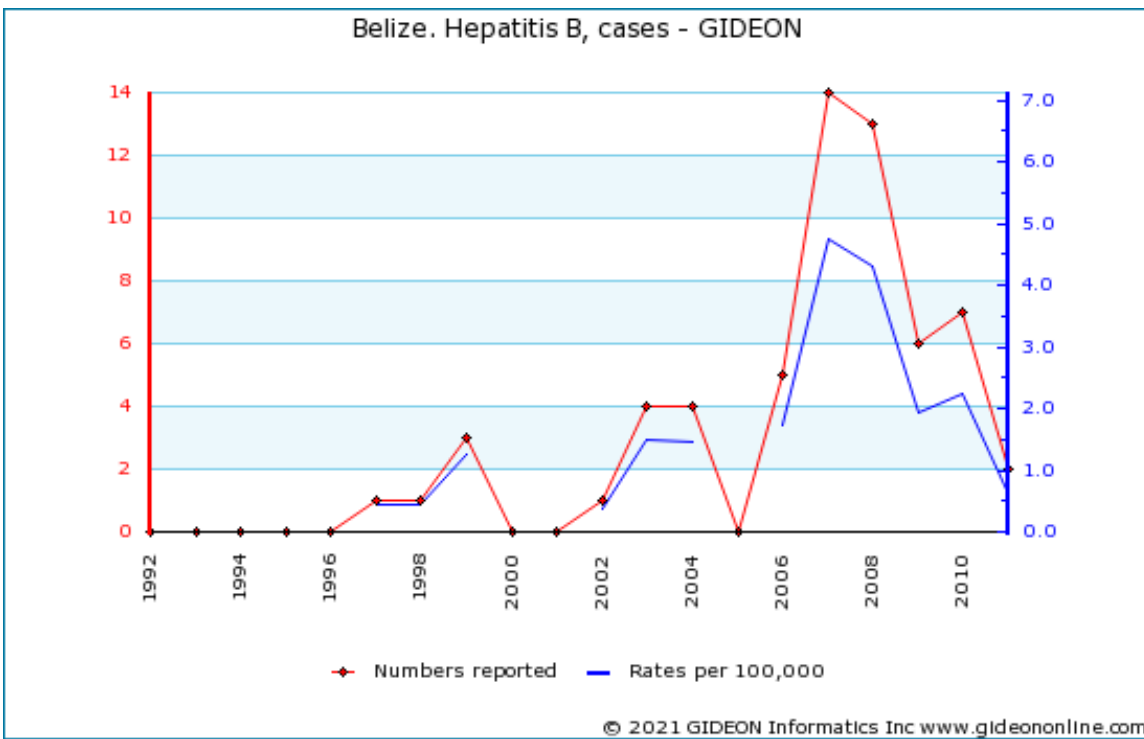
Vaccine Schedule:

- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years

- 1993 (publication year) - Highest rates are reported among Creoles and Garifuna; and residents of Stann Creek and Toledo districts. ³



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



Graph: Belize. Hepatitis B, cases

Notes:

- 35 cases were reported during 2006 to 2009.

Prevalence surveys

Years	Region	Study Group	%	Notes
1994 - 1995	Stann Creek	patients - hepatitis	79	79.0% of acute hepatitis cases (Stann Creek, 1994 to 1995). ⁴

- 1993 - Antibody to core antigen was present in 33% of military personnel and 14.9% of pregnant women. ⁵

HBsAg-positivity surveys

Years	Region	Study Group	%	Notes
1996*	Stann Creek	children	7.7	7.7% of school children in Stann Creek district (1996 publication) ⁶
1995*		workers	1	1% of health care workers (1995 publication) ⁷
1991		various	13-37	37% of non-A, non-B hepatitis, 18% of banana workers and 13% of the general population (1991) ⁸

* indicates publication year (not necessarily year of survey)

References

1. Therap Adv Gastroenterol 2018 ;11:1756284818786108.	5. Am J Trop Med Hyg 1997 Mar ;56(3):285-90.
2. JAMA 2018 May 01;319(17):1802-1813.	6. Am J Trop Med Hyg 1996 Oct ;55(4):452-5.
3. Am J Trop Med Hyg 1993 Oct ;49(4):430-4.	7. Am J Trop Med Hyg 1995 Aug ;53(2):118-22.
4. Am J Trop Med Hyg 2001 Oct ;65(4):318-24.	8. Trans R Soc Trop Med Hyg 1993 May-Jun;87(3):259-62.

Hepatitis C

Agent	VIRUS - RNA. Flaviviridae, Hepacivirus: Hepatitis C virus
Reservoir	Human
Vector	None
Vehicle	Blood, Sexual contact, Transplacental
Incubation Period	5w - 10w (range 3w - 16w)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Needle precautions. For chronic infection: Ledipasvir / Sofosbuvir (Genotype 1,4,5,6) OR Sofosbuvir / Velpatasvir (Genotype 1,2,3,4,5,6) OR Ombitasvir-Paritaprevir-Ritonavir + Dasabuvir + Ribavirin (Genotype 1,4) (Regimen / Duration dependent on viral genotype) ^{1 2 3}
Typical Pediatric Therapy	Most agents recommended for adult disease are not currently licensed for use in children except (age >12): Sofosbuvir / Ribavirin Ledipasvir / Sofosbuvir Peginterferon alfa-2b 3 MU/m2 SC x1 weekly + Ribavirin 15mg/kg
Clinical Hints	- 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
Synonyms	Babesia motasi, 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 Belize

Seroprevalence surveys

Years	Study Group	%	Notes
1993*	military personnel	0.4	0.4% of military personnel (1993 publication) ⁴

* indicates publication year (not necessarily year of survey)

- 1997 - The nationwide carriage rate was estimated at 1.07%
- 1999 - The nationwide carriage rate was estimated at 0.1%.

References

1. [World J Hepatol 2018 Oct 27;10\(10\):670-684.](#)
2. [Gastroenterology 2018 Oct 17;](#)
3. [Expert Rev Anti Infect Ther 2018 08 ;16\(8\):599-610.](#)
4. [Am J Trop Med Hyg 1993 Oct ;49\(4\):430-4.](#)

Hepatitis D

Agent	VIRUS - RNA. Deltavirus: Hepatitis D virus - a 'satellite' virus which is encountered as infection with a co-virus (Hepatitis B)
Reservoir	Human
Vector	None
Vehicle	Infected secretions, Blood, Sexual contact
Incubation Period	4w - 8w (range 2w - 20w)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Needle precautions; supportive Interferon alfa 2-a has been used. Foscarnet has been used. ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- Vomiting and jaundice- Biphasic course often noted- Occurs as a coinfection or superinfection of hepatitis B- May be chronic or fulminant- Hepatitis D coinfection worsens prognosis of Hepatitis B
Synonyms	Epatite D, Hepatitis delta. ICD9: 070.41,070.52 ICD10: B17.0

References

1. [Prog Clin Biol Res 1987 ;234:309-20.](#)

Hepatitis E

Agent	VIRUS - RNA. Hepeviridae: Hepatitis E virus
Reservoir	Human, Rodent, Pig, Rabbit
Vector	None
Vehicle	Fecal-oral, Water, Shellfish, Blood, Meat
Incubation Period	30d - 40d (range 10d - 70d)
Diagnostic Tests	Identification of virus by immune electron microscopy (stool). Serology. Nucleic acid amplification.
Typical Adult Therapy	Stool precautions; supportive Ribavirin 300-500 mg PO BID has been used successfully in patients with Genotype 3 ¹
Typical Pediatric Therapy	Stool precautions; supportive Ribavirin 15 mg/kg BID has been used successfully in patients with Genotype 3
Vaccine	Hepatitis E vaccine
Clinical Hints	- Clinically similar to hepatitis A - Chronic residua are rare - Severe or fatal if acquired during pregnancy (10% to 24% case-fatality rate).
Synonyms	Epatite E, Non-A, non-B enteric hepatitis. ICD9: 070.43,070.53 ICD10: B17.2

Hepatitis E in Belize

Prevalence surveys

Years	Region	Study Group	%	Notes
2001*	Stann Creek	patients - hepatitis	0	0% of acute hepatitis (Stann Creek, 2001 publication) ²

* indicates publication year (not necessarily year of survey)

References

1. J Viral Hepat 2016 Feb ;23(2):68-79.
2. Am J Trop Med Hyg 2001 Oct ;65(4):318-24.

Herpes B infection

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesviridae, Simplexvirus: Cercopithecine herpesvirus 1 (Herpes B virus)
Reservoir	Monkey (<i>Macaca species</i> and <i>Cynomolgus</i>)
Vector	None
Vehicle	Contact or bite, Respiratory or pharyngeal acquisition
Incubation Period	10d - 20d (range 2d - 60d)
Diagnostic Tests	Biosafety level 4. Viral culture (skin exudates). Nucleic acid amplification.
Typical Adult Therapy	Therapy: Acyclovir 10 mg/kg IV q8h. OR Ganciclovir 5 mg/kg IV q12h for 14-21d Follow with prolonged Acyclovir 800 mg PO 5X daily OR Valacyclovir 1 g PO TID. Postexposure prophylaxis: Valacyclovir 1g PO q8h X 14 days. OR Acyclovir 800 mg PO X 14 days ^{1 2}
Typical Pediatric Therapy	Acyclovir or Ganciclovir as for adult.
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Cercopithecine herpesvirus 1, Herpes B, Herpesvirus simiae, Macacine herpesvirus 1, MCHV-1. ICD9: 078.89 ICD10: B00.4

References

1. J Occup Med Toxicol 2009 Nov 26;4:29.
2. Sante 2008 Jan-Mar;18(1):3-8.

Herpes simplex encephalitis

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus (usually type I)
Reservoir	Human
Vector	None
Vehicle	Infected secretions, Sexual contact
Incubation Period	Unknown
Diagnostic Tests	Viral culture CSF usually negative. CT brain. Compare CSF/blood antibody levels. Nucleic acid amplification.
Typical Adult Therapy	Acyclovir 10 mg/kg IV Q8h ^{1 2}
Typical Pediatric Therapy	Acyclovir 10 mg/kg IV Q8h
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	

References

1. [Med Lett Drugs Ther 2018 Sep 24;60\(1556\):153-157.](#)
2. [Curr Infect Dis Rep 2017 Mar ;19\(3\):13.](#)

Herpes simplex infection

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus I and II
Reservoir	Human
Vector	None
Vehicle	Infected secretions, Sexual contact, Breastfeeding, Respiratory or pharyngeal acquisition
Incubation Period	1d - 14d
Diagnostic Tests	Viral culture or microscopy of lesions. Serology. Nucleic acid amplification.
Typical Adult Therapy	Skin / lesion precautions Famciclovir 1,500 mg PO once OR Valacyclovir 1 g PO BID X 1d OR Acyclovir 400 mg PO X 5 per day X 5d Dosage and duration may vary for initial vs. recurrent vs. suppressive regimens. ^{1 2}
Typical Pediatric Therapy	Skin / lesion precautions Acyclovir 10 mg/kg PO QID X 7 d
Clinical Hints	- Recurring localized crops of painful vesicles on a red base - Regional adenopathy often present - May follow a prodrome of neuropathy or hyperesthesia
Synonyms	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

References

- 2016 ;
- Med Lett Drugs Ther 2018 Sep 24;60(1556):153-157.

Herpes zoster

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Varicella-zoster virus
Reservoir	Human
Vector	None
Vehicle	Air, Direct contact
Incubation Period	Unknown
Diagnostic Tests	Viral culture (vesicles). Serology. Nucleic acid amplification.
Typical Adult Therapy	Skin / lesion precautions Acyclovir 800 mg PO X 5 daily X 7d. OR Famciclovir 500 PO TID X 7d. OR Valacyclovir 1 g PO TID X 7d ^{1 2}
Typical Pediatric Therapy	Skin / lesion precautions Acyclovir 20 mg/kg PO QID X 7 d
Vaccine	Herpes zoster vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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 eyes, extremities and other areas also affected - Recurrence is common
Synonyms	Fuocodi Saint'Antonio, Shingles, Zona, Zoster. ICD9: 053 ICD10: B02

References

1. [Curtis 2017 Nov ;100\(5\):321;324;330.](#)
2. [Med Lett Drugs Ther 2018 Sep 24;60\(1556\):153-157.](#)

Histoplasmosis

Agent	FUNGUS. Ascomycota, Euascomycetes, Onygenales: <i>Histoplasma capsulatum</i> var. <i>capsulatum</i> A dimorphic fungus
Reservoir	Soil, Caves, Chicken roosts, Bat
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	10d - 14d (range 5d - 25d)
Diagnostic Tests	Fungal culture. Serologic tests less helpful. Antigen tests currently under study. Nucleic acid amplification.
Typical Adult Therapy	Itraconazole 200 mg PO TID X 3 days, then 1-2 daily X 6-12w For severe or immunocompromised patients: Liposomal Amphotericin B 3 to 5 mg/kg/d OR Amphotericin B deoxycholate 0.7 to 1 mg/kg/d, followed by Itraconazole as above ¹
Typical Pediatric Therapy	Itraconazole 2 to 5 mg/kg PO TID X 3 days, then BID daily X 12w. For severe or immunocompromised patients: Liposomal Amphotericin B 3 to 5 mg/kg/d X 2w, followed by Itraconazole as above
Clinical Hints	- Fever, cough, myalgia - Pulmonary infiltrates and calcifying hilar lymphadenopathy - Chronic multisystem infection is often encountered
Synonyms	Darling's disease, Histoplasma capsulatum, Histoplasmosse, 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 Belize

1978 (publication year) - Histoplasmosis is often acquired in caves in Belize. ²

Cross-border events

Years	Acquired by **	Originated in **	Setting	Cases	Notes
2000	Canada	Belize	cave exposure	14	³

** Country or Nationality

Notable outbreaks

Years	Cases	Source	Population	Notes
2000	14	cave exposure	tourists	Outbreak among Canadian students who had been exploring a bat-infested cave ⁴

References

1. Clin Infect Dis 2007 Oct 01;45(7):807-25.
2. Am J Trop Med Hyg 1978 May ;27(3):558-61.
3. J Travel Med 2002 Jan-Feb;9(1):48-50.
4. J Travel Med 2002 Jan-Feb;9(1):48-50.

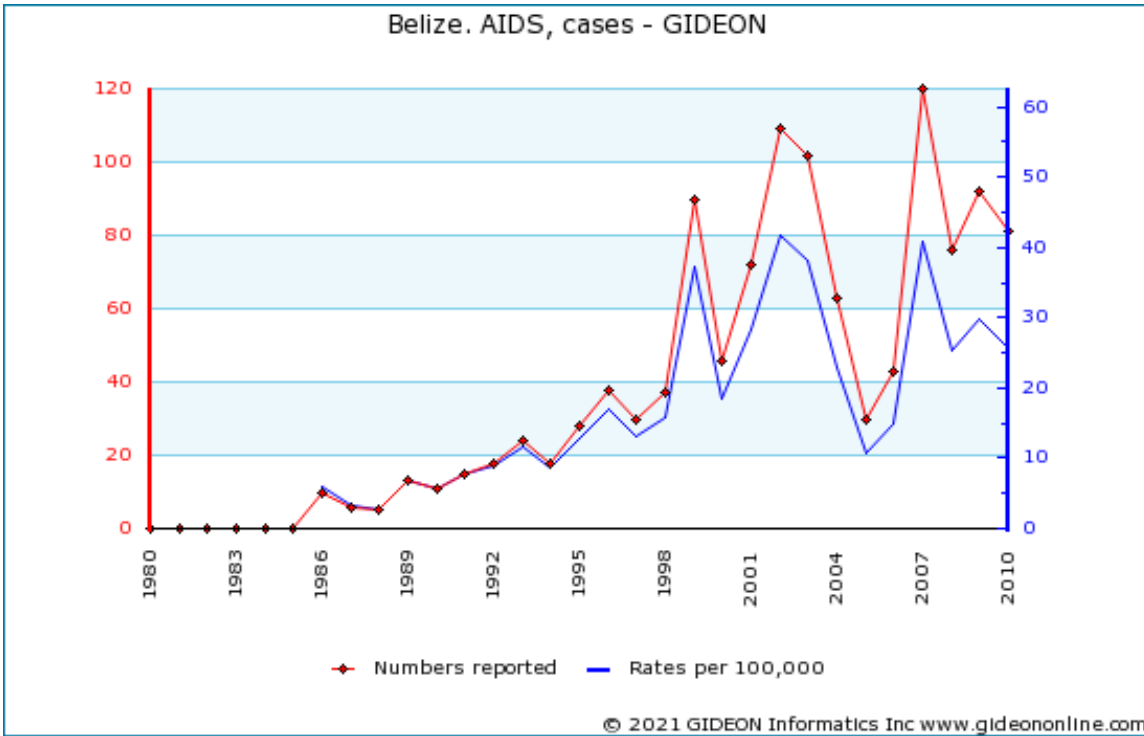
HIV infection - initial illness

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

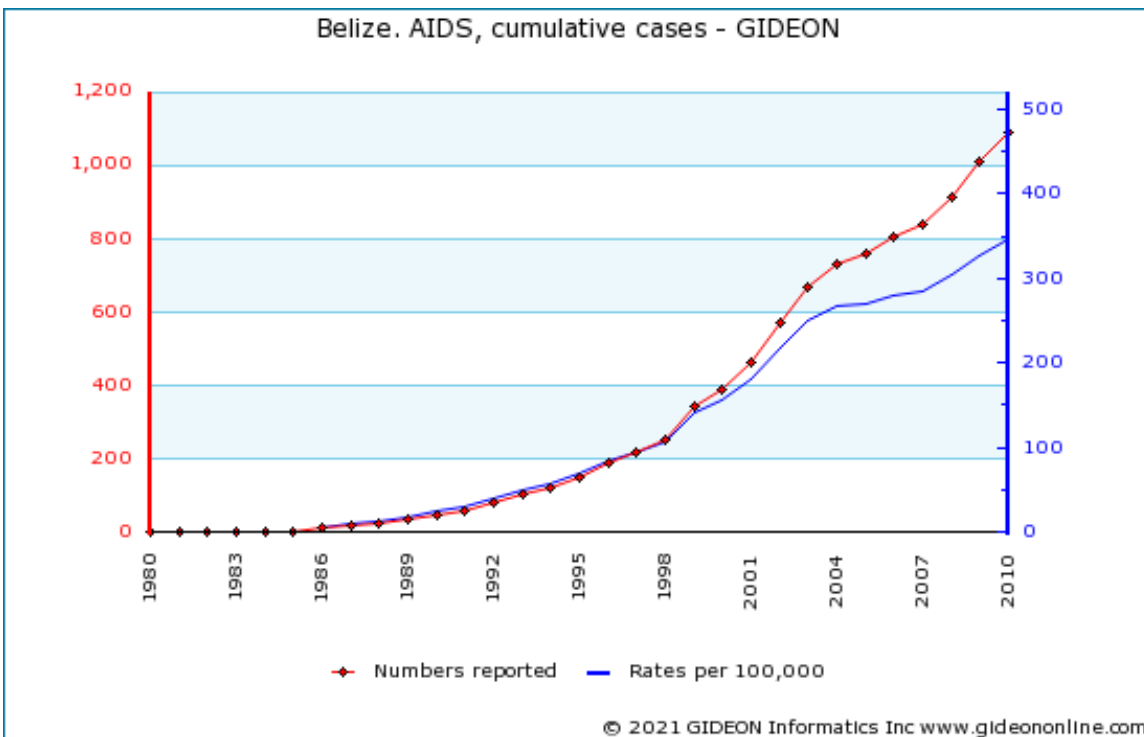
HIV/AIDS	
Agent	VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus, HIV
Reservoir	Human
Vector	None
Vehicle	Blood, Semen, Sexual, Transplacental, Breastfeeding
Incubation Period	2m - 10y (50% within 10y)
Diagnostic Tests	HIV antibody (ELISA, Western blot). Nucleic acid amplification. Tests for HIV antigen & viral load as indicated.
Typical Adult Therapy	Regimens vary - in general: Two Nucleoside/nucleotide reverse transcriptase inhibitors + A Non-nucleoside reverse transcriptase inhibitor OR a Protease Inhibitor OR an Integrase strand transfer inhibitor
Typical Pediatric Therapy	As for adult
Vaccine	Ibalizumab
Clinical Hints	- 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
Synonyms	AIDS, ARC, GRID, HIV-1, HIV-2, HIV-AIDS, SIDA, Slim disease. ICD9: 042 ICD10: B20,B21,B22,B23,B24

HIV/AIDS in Belize

The first cases of AIDS were reported in 1986.



Graph: Belize. AIDS, cases



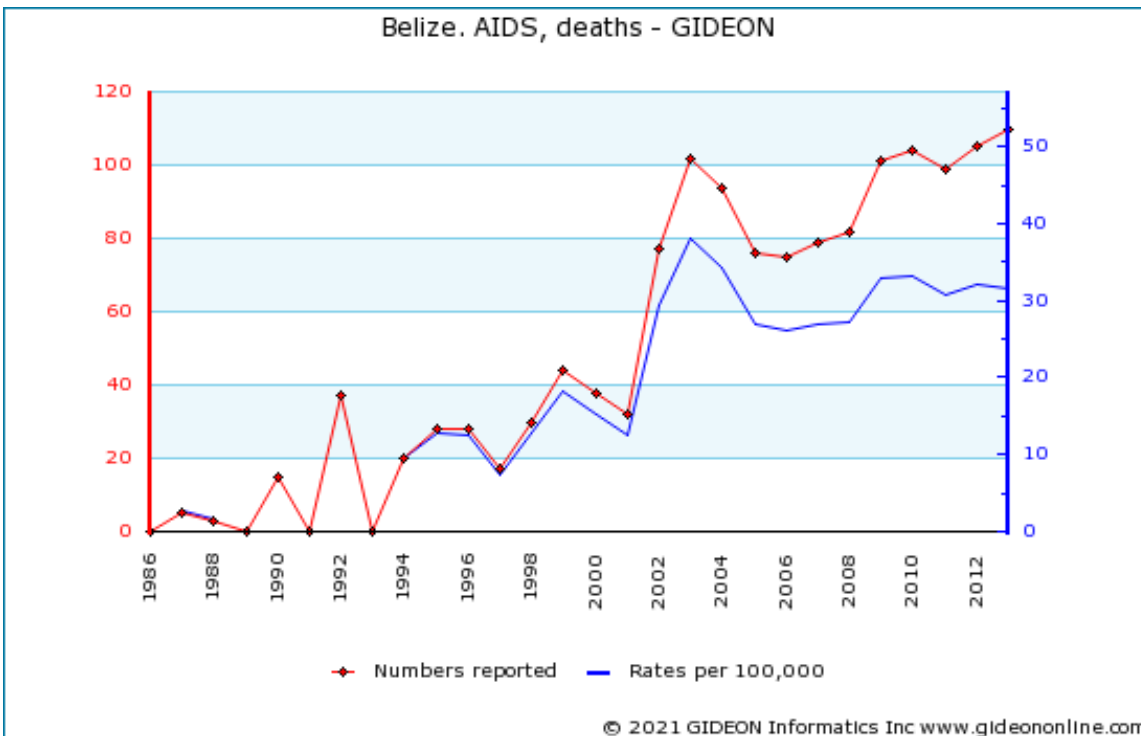
Graph: Belize. AIDS, cumulative cases

960 AIDS cases were estimated to December 1997.

- 198 cases of AIDS were officially reported as of December 1996 (61% of these in Belize District and 17% in Stann Creek); 393 to November 2001.

Demography and risk factors

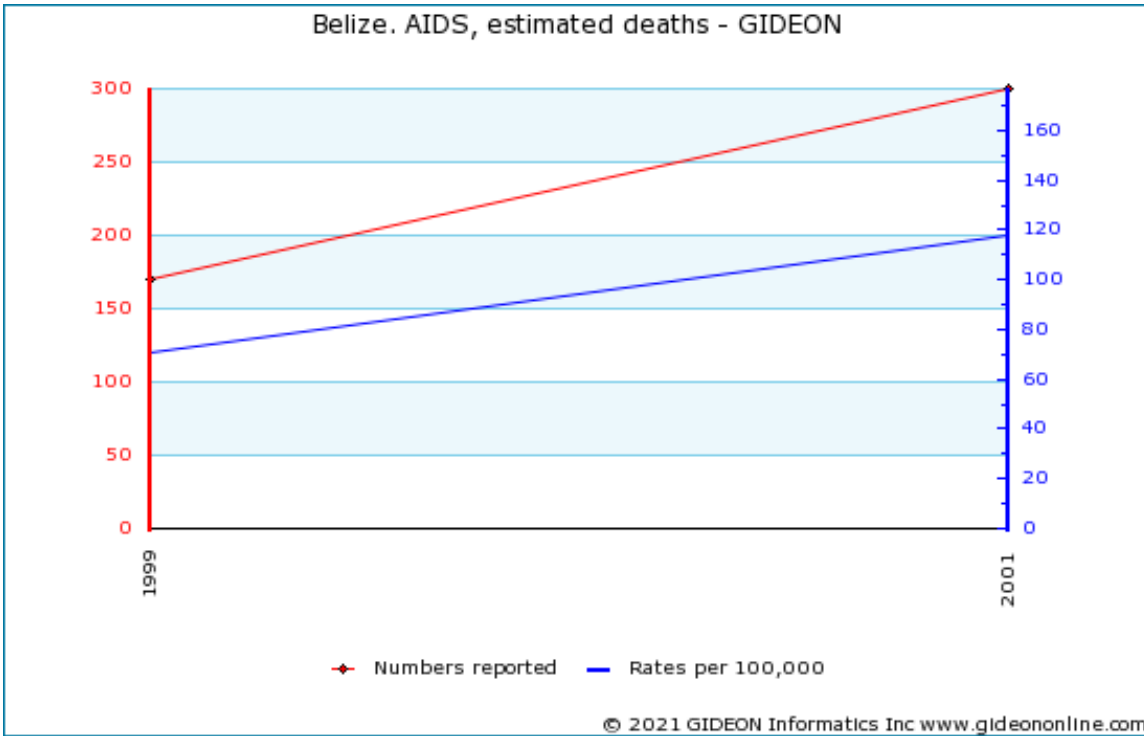
- Cases to December 1996: 80% ages 15 to 49; 68% males; 65% heterosexual; 30% men who have sex with men; 1% IDU; 4% mother to infant).
- Cases during 1995 to 1996: 80% ages 15 to 49; 73% males. During 1995 to 1997: 63% heterosexual; 33% men who have sex with men 0% IDU; 0% transfusion/hemophilia; 5% mother to infant.
- Cases during 1997 to 2000: 83% heterosexual; 16% men who have sex with men; 0% IDU; 0% transfusion/hemophilia; 1% mother to infant.



Graph: Belize. AIDS, deaths

Notes:

1. 276 AIDS deaths were officially reported to December 2001; 464 to December 2003; 646 to December 2005.



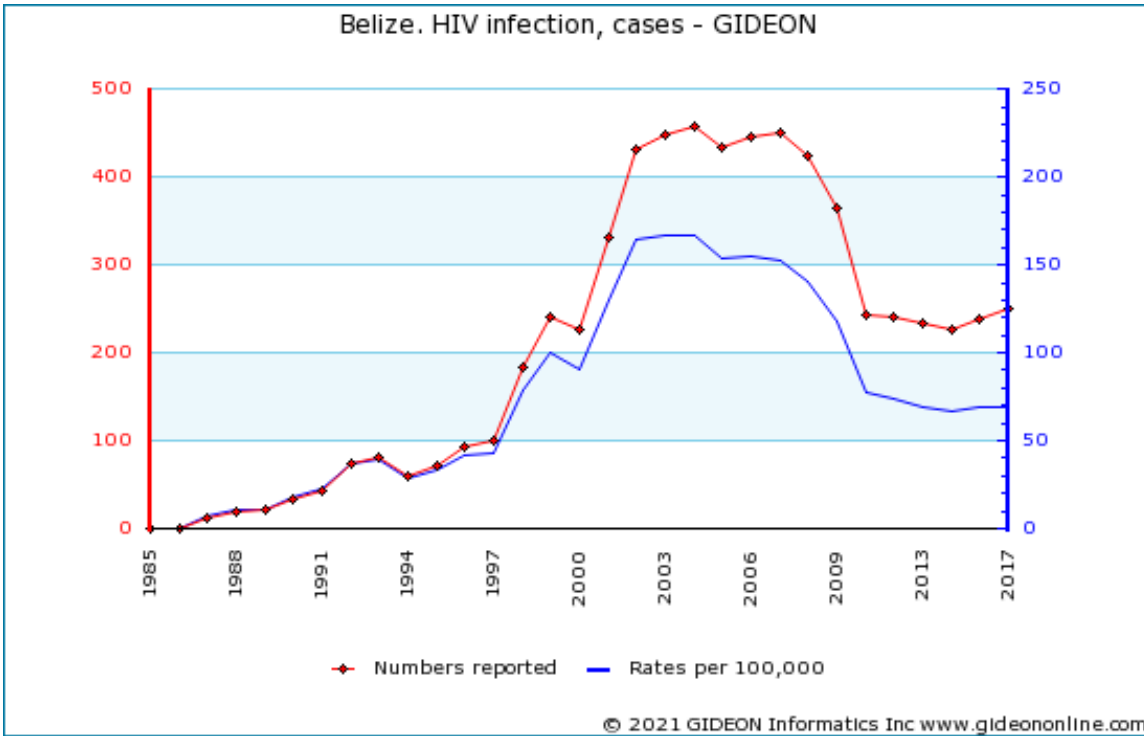
Graph: Belize. AIDS, estimated deaths

Notes:

1. 960 AIDS deaths were estimated to December 1997.
2. 420 AIDS orphans were estimated to December 1999; 950 in 2001.

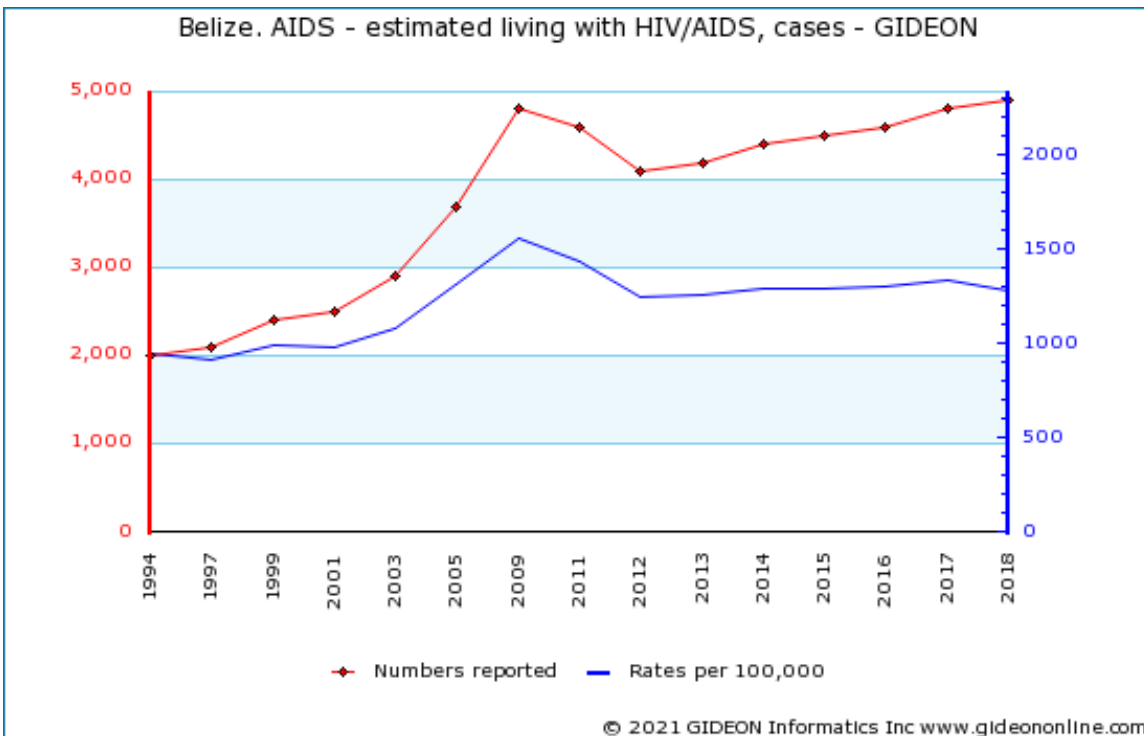
Seroprevalence surveys

Years	Region	Study Group	%	Notes
2011		MSM	13.85	
2005		prisoners	4	¹
1993	Multiple locations	pregnant women	0.2	Survey of pregnant women in six districts ²
1995		pregnant women	0.96	
2003		pregnant women	0.92	



Graph: Belize. HIV infection, cases

486 seropositives were reported to December 1996; 2,471 to December 2003.



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

Notes:

1. Figure for 1997 represents 1.89% of all adults; 2.0% in 2001; 2.4% in 2003.

Associated Infections

Tuberculosis

Nine cases of HIV-tuberculosis coinfection were reported in 1996.

References

1. [Rev Panam Salud Publica 2009 Apr ;25\(4\):292-9.](#)
2. [Am J Trop Med Hyg 1997 Mar ;56\(3\):285-90.](#)

Hookworm

Agent	PARASITE - Nematoda. Secernentea: <i>Necator americanus</i> , <i>Ancylostoma duodenale</i> , <i>A. ceylanicum</i> (in Kolkata and the Philippines)
Reservoir	Human, Non-human primates
Vector	None
Vehicle	Soil, Contact
Incubation Period	7d - 2y
Diagnostic Tests	Examination of stool for ova. Ancylostoma duodenale adult: female - 10 to 13 mm; male - 8 to 11 mm Necator americanus adult: female - 9 to 11 mm; male - 5 to 9 mm
Typical Adult Therapy	Albendazole 400 mg X 1 dose. OR Mebendazole 100 mg BID X 3d. OR Pyrantel pamoate 11 mg/kg (max 3g) X 3d ^{1 2}
Typical Pediatric Therapy	Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2).
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Anchilostoma, Ancylostoma ceylanicum, Ancylostoma duodenale, Ancylostomiasis, Anquilostomiasis, Cycloodontostomum, 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 Belize

Prevalence surveys

Years	Region	Study Group	%	Notes
2004*	Toledo	general population	55	55% of individuals in rural Toledo District (2004 publication) ³

* indicates publication year (not necessarily year of survey)

References

1. [BMJ 2017 Sep 25;358:j4307.](#)
2. [PLoS One 2011 ;6\(9\):e25003.](#)
3. [Southeast Asian J Trop Med Public Health 2004 Sep ;35\(3\):506-11.](#)

HTLV Infections

Agent	VIRUS - RNA Retroviridae. Deltaretrovirus Human T-lymphotropic virus I to IV (disease limited to I and II)
Reservoir	HumanNon-human primate
Vector	None
Vehicle	Blood, Needles, Semen, Sexual contact, Transplacental, Breastfeeding, Meat (bush-meat)
Incubation Period	6 months to 20 years
Diagnostic Tests	Serology Nucleic acid amplification
Typical Adult Therapy	Specific therapy not available. Advanced symptomatic disease has been treated with Mogamulizumab and interferon OR Zidovudine + Interferon, Cyclosporine, or anti-neoplastic agents ^{1 2}
Typical Pediatric Therapy	As of adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	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

References

1. [N Engl J Med 2018 02 08;378\(6\):529-538.](#)
2. [J Neurovirol 2007 Aug ;13\(4\):364-72.](#)

Human herpesvirus 6 infection

Agent	VIRUS - DNA. Herpesviridae, Betaherpesvirinae, Roseolovirus: Herpesvirus 6 (Herpesvirus 7 is also implicated)
Reservoir	Human
Vector	None
Vehicle	Droplet, Contact, Respiratory or pharyngeal acquisition
Incubation Period	10d - 15d
Diagnostic Tests	Viral isolation and serologic tests rarely indicated. Nucleic acid amplification has been used
Typical Adult Therapy	Supportive Ganciclovir and Foscarnet have been used in unusual and severe cases. ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	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

References

1. Clin Infect Dis 2005 Mar 15;40(6):887-9.
2. Am J Transplant 2004 Jul ;4(7):1200-3.

Human pegivirus infection

Agent	VIRUS - RNA. Flaviviridae, Pegivirus GB virus C (Hepatitis G virus)
Reservoir	Human
Vector	None
Vehicle	Blood, Vertical transmission, Sexual contact suspected
Incubation Period	Unknown
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive. Alpha interferon has been shown to ? transiently eliminate the carrier state ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	Epatite G, GB virus C, GBV-C, Hepatitis G, Hepatitis GB, HPgV, HPgV-2, Human hepegivirus, Human Pegivirus 2. ICD9: 070,59 ICD10: B17.8

References

1. [Acta Virol 2017;61\(4\):401-412.](#)

Hymenolepis diminuta infection

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: <i>Hymenolepis diminuta</i>
Reservoir	Rodent, Various insects
Vector	None
Vehicle	Arthropod ingestion
Incubation Period	2w - 4w
Diagnostic Tests	Identification of ova in stool Adult worm may measure 20 to 60 cm.
Typical Adult Therapy	Praziquantel 25 mg/kg as single dose. OR Niclosamide 2g, then 1g/d X 6d ¹
Typical Pediatric Therapy	Praziquantel 25 mg/kg as single dose. OR Niclosamide 1g, then 0.5g/d X 6d (1.5g, then 1g for weight >34kg)
Clinical Hints	<ul style="list-style-type: none">- Nausea, abdominal pain and diarrhea- Eosinophilia may be present- Primarily a disease of children, in rodent-infested areas- Infestation resolves spontaneously within 2 months
Synonyms	Hymenolepis diminuta, Mathevotaenia, Rat tapeworm. ICD9: 123.6 ICD10: B71.0

References

1. [MedGenMed 2004 Apr 22;6\(2\):7.](#)

Hymenolepis nana infection

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: <i>Hymenolepis (Rodentolepis) nana</i>
Reservoir	Human, Rodent (hamster)
Vector	None
Vehicle	Food, Water, Fecal-oral
Incubation Period	2w - 4w
Diagnostic Tests	Identification of ova in stool Adult worm may measure 15 to 40 mm.
Typical Adult Therapy	Praziquantel 25 mg/kg once. OR Nitazoxanide 500 mg BID X 3d OR Niclosamide 2g/d X 1 ¹ ²
Typical Pediatric Therapy	Praziquantel 25 mg/kg once. OR Nitazoxanide 100 mg (age 1 to 3 years) to 200 mg (age 4 to 11 years) BID X 3d OR Niclosamide 1g/d X 1 (weight 11-34 kg) to 1.5g/d X 1 (weight >34 kg)
Clinical Hints	<ul style="list-style-type: none"> - Nausea, abdominal pain, diarrhea, irritability and weight loss - Eosinophilia may be present - Continued infestation maintained by autoinfection (worm reproduces within the intestinal lumen)
Synonyms	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

References

1. [Am J Trop Med Hyg 1980 Mar ;29\(2\):320-1.](#)
2. [Trans R Soc Trop Med Hyg 1984 ;78\(2\):280-1.](#)

Infection of wound, puncture, IV line, etc

Agent	BACTERIUM. <i>Staphylococcus aureus</i> , streptococci, facultative or aerobic gram negative bacilli, anaerobes, et al
Reservoir	Human, Soil, Water, Air (spores), Various animals and plants
Vector	None
Vehicle	Trauma, Water, Medications, Bandages, Autoinoculation
Incubation Period	Variable
Diagnostic Tests	Smear and culture of catheter, material from wound.
Typical Adult Therapy	Drainage, remove catheter, debridement and antibiotics appropriate to infecting species
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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> - Onset within 2 to 7 days = <i>S. aureus</i> - Onset after more than 7 days = gram negative bacilli - Foul odor = mixed infection or anaerobic bacteria
Synonyms	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

Agent	VIRUS - DNA. Herpesviridae. Gammaherpesvirinae, Lymphocryptovirus: Human herpesvirus 4 (Epstein Barr virus)
Reservoir	Human
Vector	None
Vehicle	Saliva, Blood transfusion, Breastfeeding, Respiratory or pharyngeal acquisition
Incubation Period	28d - 42d
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	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

Agent	VIRUS - RNA. Orthomyxoviridae, Orthomyxovirus: Influenza virus
Reservoir	Human, Ferret, Bird, Pig
Vector	None
Vehicle	Droplet, Respiratory or pharyngeal acquisition
Incubation Period	1d - 3d
Diagnostic Tests	Viral culture (respiratory secretions). Serology. Nucleic acid amplification techniques are available.
Typical Adult Therapy	Respiratory precautions. Influenza A or B: Oseltamivir 75 mg PO BID X 5d OR Zanamivir 10 mg BID X 5 days ^{1 2 3}
Typical Pediatric Therapy	Respiratory precautions. Influenza A or B: Oseltamivir 2 mg/kg (max 75 mg) PO BID X 5d OR Zanamivir (age > 5 years) 10 mg BID X 5 days Alternative drugs: Amantadine , Baloxavir , Favipiravir , Peramivir , Rimantadine , Umifenovir
Vaccine	Influenza - inactivated vaccine Influenza - live vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	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 Belize

Avian influenza - chronology

2015 - Avian influenza H5N2 was reported among poultry. ^{4 5}

Notable outbreaks

Years	Cases	Deaths	Pathogen	Notes
1918 - 1920		2,000	H1N1	1,010 to 2,000 fatal cases were estimated. ⁶
2009 - 2010	60		H1N1	An outbreak was reported. For comprehensive analyses of the H1N1 pdm09 pandemic see the Worldwide note.

References

1. [Front Immunol 2018 ;9:1946.](#)
2. [Clin Ther 2018 Aug 01;](#)
3. [Arch Virol 2018 Apr ;163\(4\):831-844.](#)
4. [ProMED <promedmail.org> archive: 20150124.3114605](#)
5. [ProMED <promedmail.org> archive: 20150509.3352492](#)
6. [Soc Hist Med 1994 Apr ;7\(1\):59-87.](#)

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	Metronidazole appears to be effective in some cases. ¹
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

References

1. [Dig Dis Sci 2013 Jan ;58\(1\):202-8.](#)

Intra-abdominal abscess

Agent	BACTERIUM. Mixed anaerobic / aerobic, staphylococci, <i>Neisseria gonorrhoeae</i> , <i>Chlamydia trachomatis</i> , etc
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Various imaging techniques (CT, Gallium scan, ultrasound, etc).
Typical Adult Therapy	Percutaneous or open drainage + antibiotics directed at known or suspected pathogen(s)
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Fever, chills and localizing pain (e.g., chest pain in subphrenic abscess) - Setting of prior surgery, biliary or colonic disease, appendicitis, vaginal discharge (PID) - F.U.O, subdiaphragmatic gas or limited diaphragmatic motion may be present
Synonyms	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

Agent	BACTERIUM. Oral anaerobes, streptococci, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture (blood, CSF if indicated). Ophthalmoscopy. Roentgenographic studies of skull & sinuses.
Typical Adult Therapy	Antibiotic(s) directed at known or suspected pathogens ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Headache, seizures and fever - Cranial nerve dysfunction may be present - Usually occurs in the setting of ongoing facial, otic or sinus infection
Synonyms	Cavernous sinus thrombosis, Cerebral sinus thrombosis, Cortical vein thrombosis, Internal cerebral vein thrombosis, Lateral sinus thrombosis, Straight sinus thrombosis, Superior sinus thrombosis, Transverse sinus thrombosis. ICD9: 325 ICD10: G08

References

1. J Neurol Sci 2016 Mar 15;362:221-7.
2. Curr Cardiol Rep 2014 Sep ;16(9):523.

Kawasaki disease

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Diagnosis is based on clinical criteria only.
Typical Adult Therapy	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 (a chimeric monoclonal antibody) 5 mg/kg has been successful in some studies. Glucocorticoids in addition to IVIG have been successful in some studies. 1 2 3
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- Disease 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
Synonyms	Kawasaki's disease, Mucocutaneous lymph node syndrome. ICD9: 446.1 ICD10: M30.3

References

1. J Pediatr 1997 Dec ;131(6):888-93.
2. Cochrane Database Syst Rev 2003 ;(4):CD004000.
3. JAMA Pediatr 2016 Dec 01;170(12):1156-1163.

Kikuchi's disease and Kimura disease

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Biopsy.
Typical Adult Therapy	Supportive Hydroxychloroquine and corticosteroids have been successful for Kikuchi's disease in some cases. ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	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
Synonyms	Angiolymphoid hyperplasia, Angiolymphoid hyperplasia-eosinophilia, Eosinophilic follicular lymphadenitis, Histiocytic necrotizing lymphadenitis, Kikuchi's disease, Kikuchi-Fujimoto disease, Kimura disease. ICD9: 289.3 ICD10: I89.8

References

1. Clin Infect Dis 2004 Dec 15;39(12):e124-6.

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	Ampicillin usually effective For resistant organisms : Ampicillin /Sulbactam OR Amoxicillin /Clavulanate OR Cefazolin Dosage per severity/site ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Most cases reported among young children - May present as septic arthritis, endocarditis, meningitis and other localized or systemic infections
Synonyms	

References

1. [BMC Infect Dis 2015 Jul 07;15:260.](#)
2. [Pediatr Infect Dis J 2012 Feb ;31\(2\):212.](#)
3. [Diagn Microbiol Infect Dis 1999 May ;34\(1\):73-6.](#)

Laryngotracheobronchitis

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

Legionellosis	
Agent	BACTERIUM. <i>Legionella pneumophila</i> , et al An aerobic gram-negative bacillus
Reservoir	Water
Vector	None
Vehicle	Water, Aerosols, Droplet, Respiratory or pharyngeal acquisition
Incubation Period	5- 6d (range 2-12d); Pontiac fever = 1-2d
Diagnostic Tests	Serology. Culture. Urine antigen (certain types). Nucleic acid amplification. Alert lab if organism suspected.
Typical Adult Therapy	Fluoroquinolone (Levofloxacin , Trovafoxacin , Pefloxacin , Sparfloxacin or Moxifloxacin). OR Azithromycin . OR Erythromycin + Rifampin OR Clarithromycin ^{1 2 3}
Typical Pediatric Therapy	Azithromycin . OR Erythromycin + Rifampin OR Clarithromycin
Clinical Hints	- 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
Synonyms	Doença dos legionarios, Legionarsjuka, Legionarssjuka, Legionella, Legionellose, Legionellose, Legionnaire's disease, Pontiac fever. ICD9: 482.84 ICD10: A48.1,A48.2

References

1. [Infect Dis Clin North Am 2017 03 ;31\(1\):179-191.](#)
2. [Lancet Infect Dis 2014 Oct ;14\(10\):1011-21.](#)
3. [Curr Opin Infect Dis 2010 Apr ;23\(2\):152-7.](#)

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	Local therapy: Cryotherapy; Laser ablation Pentavalent antimonials or Paromomycin. For complicated disease: Fluconazole or Miltefosine, PO Alternatives: Amphotericin B deoxycholate, Liposomal Amphotericin B, Pentavalent antimony IV, Pentamidine ^{1 2 3}
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, Crithidia, Cutaneous leishmaniasis, Delhi ulcer, Domal, El-Mohtafura, Forest yaws, Gafsa boil, Granuloma endemicum, Hashara, Jericho boil, Kaal Daana, Kandahar sore, Leishmania aethiops, Leishmania enriettii, Leishmania garnhami, Leishmania guyanensis, Leishmania killicki, Leishmania lainsoni, Leishmania lindenbergi, Leishmania major, Leishmania martiniquensis, Leishmania mexicana, Leishmania naiffi, Leishmania orientalis, Leishmania panamensis, Leishmania peruviana, Leishmania shawi, Leishmania tropica, Leishmania turanica, Leishmania venezuelensis, Leishmania waltoni, Leishmaniasis, Leishmaniose: Kutane, Leishmaniosi cutanea, Lepra de montana, Liana, Mundinia enriettii, Mundinia martiniquensis, Mundinia orientalis, 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 Belize

In 2015, the WHO endemicity status for cutaneous leishmaniasis of Belize was changed to "endemic"

Approximately 50% of cases present as ear lesions.

- *Leishmania mexicana* predominates^{4 5} as the cause of 'Bay sore', and is most common in the central areas.⁶

Reservoirs

- The local reservoirs are the big-eared climbing rat (*Otolyolomys phyllotis*), Desmarest's spiny pocket mouse (*Heteromys desmarestianus*), the hispid cotton rat (*Sigmodon hispidus*) and Sumichrast's vesper rat (*Nyctomys sumichrasti*).

Prevalence surveys

Years	Study Group	%	Notes
1998	military personnel	25.2	25.2% of Dutch military personnel in Belize in 1998 ⁷
2004	military personnel	17.5	17.5% of Dutch military personnel in Belize in 2004 (<i>Leishmania braziliensis</i>) ⁸

- 1998 to 2009 - 343 cases of cutaneous leishmaniasis were confirmed by major Tropical Medicine centers in the United Kingdom. Military personnel accounted for 45% (156 cases), of which 103 (66%) were acquired in Belize. ⁹

Vectors

- The local vector is *Lutzomyia (Nyssomyia) olmeca olmeca*. ¹⁰
- *Phlebotomus pessoanus* was also implicated during the 1960's. ¹¹

Notable outbreaks

Years	Cases	Population	Notes
2007*	3	military personnel	Outbreak among Austrian military personnel who had been in Belize ¹²

* indicates publication year (not necessarily year of outbreak)

References

1. Lancet 2018 09 15;392(10151):951-970.	7. Travel Med Infect Dis 2011 May ;9(3):153-60.
2. Cochrane Database Syst Rev 2017 12 01;12:CD005067.	8. Travel Med Infect Dis 2011 May ;9(3):153-60.
3. Cochrane Database Syst Rev 2017 11 17;11:CD005067.	9. Travel Med Infect Dis 2011 Sep ;9(5):253-4.
4. Am J Trop Med Hyg 1987 Mar ;36(2):270-87.	10. Trans R Soc Trop Med Hyg 1970 ;64(3):317-68.
5. Braz J Infect Dis 2006 Aug ;10(4):305-8.	11. Trans R Soc Trop Med Hyg 1966 ;60(2):192-207.
6. Trans R Soc Trop Med Hyg 1984 ;78(6):851-2.	12. Wien Klin Wochenschr 2007 ;119(19-20 Suppl 3):102-5.

Leishmaniasis - mucocutaneous

Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: <i>Leishmania braziliensis</i> , et al
Reservoir	Rodent, Human, Sloth, Marsupial
Vector	Sandfly (<i>Lutzomyia</i> or <i>Psychodopygus</i>)
Vehicle	None
Incubation Period	2w - 8w (range 1w - 6m)
Diagnostic Tests	Microscopy (culture in specialized laboratories). Serology. Nucleic acid amplification.
Typical Adult Therapy	Pentavalent antimonials (Stibogluconate) 20 mg/kg/d IV/IM X 28d. OR Amphotericin B deoxycholate 0.5 mg/kg/d X 4 to 8w OR Liposomal Amphotericin B 3 mg/kg/d X 1 to 3w OR Miltefosine 0.8 mg/kg TID X 28d OR Pentamidine 2-4 mg/kg/d X 2w ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	Agla, Espundia, Mucocutaneous leishmaniasis. ICD9: 085.5 ICD10: B55.2

Leishmaniasis - mucocutaneous in Belize

Infection by *Leishmania (Viannia) braziliensis* is reported. ^{3 4 5}

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

References

1. Lancet 2018 09 15;392(10151):951-970.
2. Rev Soc Bras Med Trop 2018 May-Jun;51(3):318-323.
3. QJM 2004 Dec ;97(12):781-8.
4. Am J Trop Med Hyg 1992 Apr ;46(4):465-8.
5. Br J Dermatol 1993 Jan ;128(1):63-8.

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, Cat, 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	Liposomal Amphotericin B 3 mg/kg/d on days 1, 5, 14, 21 OR Miltefosine 0.8 mg/kg TID X 28d OR Pentavalent antimonials (Stibogluconate) 20 mg/kg/d X 28d. OR Paromomycin 15 mg/kg/d IM or IV X 21 days ^{1 2 3}
Typical Pediatric Therapy	Pentavalent antimonials (Stibogluconate) 20 mg/kg/d X 28d. OR Amphotericin B 1 mg/kg/QOD X 8w (or lipid complex 3 mg/kg/d X 5d) OR Paromomycin 11 mg/kg IM QD X 21 days OR Miltefosine 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, Visceral leishmaniosis. ICD9: 085.0 ICD10: B55.0

Although Leishmaniasis - visceral is not endemic to Belize, imported, expatriate or other presentations of the disease have been associated with this country.

Leishmaniasis - visceral in Belize

As of 2012, visceral leishmaniasis had not been reported in Belize. ⁴

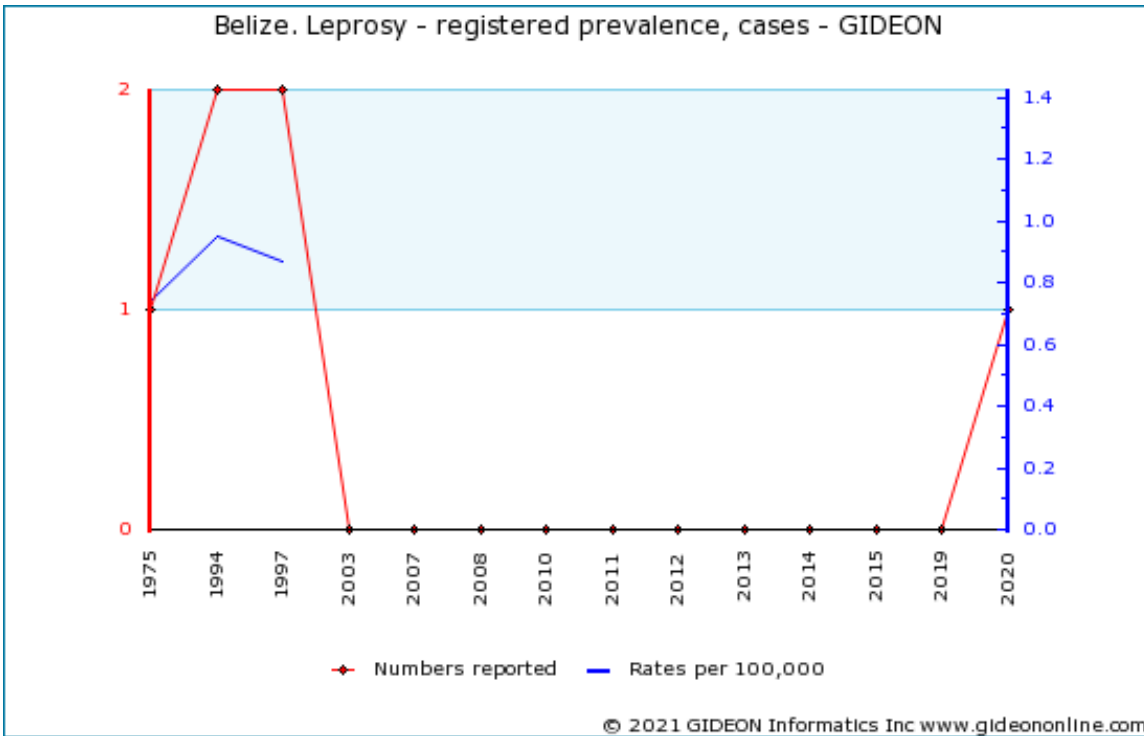
References

1. Lancet 2018 09 15;392(10151):951-970.
2. Clin Microbiol Infect 2018 Jun ;24(6):591-598.
3. Ther Adv Infect Dis 2016 Jun ;3(3-4):98-109.
4. PLoS One 2012 ;7(5):e35671.

Leprosy

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

Leprosy in Belize

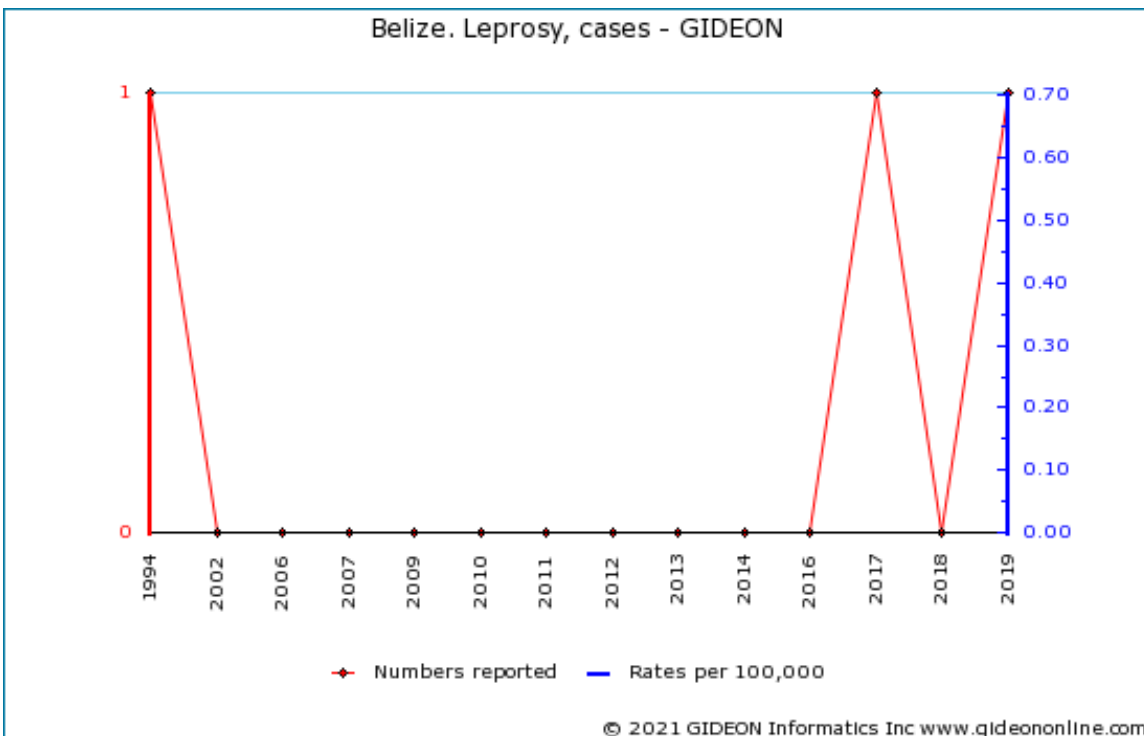


Graph: Belize. Leprosy - registered prevalence, cases

Notes:

Individual years:

1975 - True number estimated at 10 cases.



Graph: Belize. Leprosy, cases

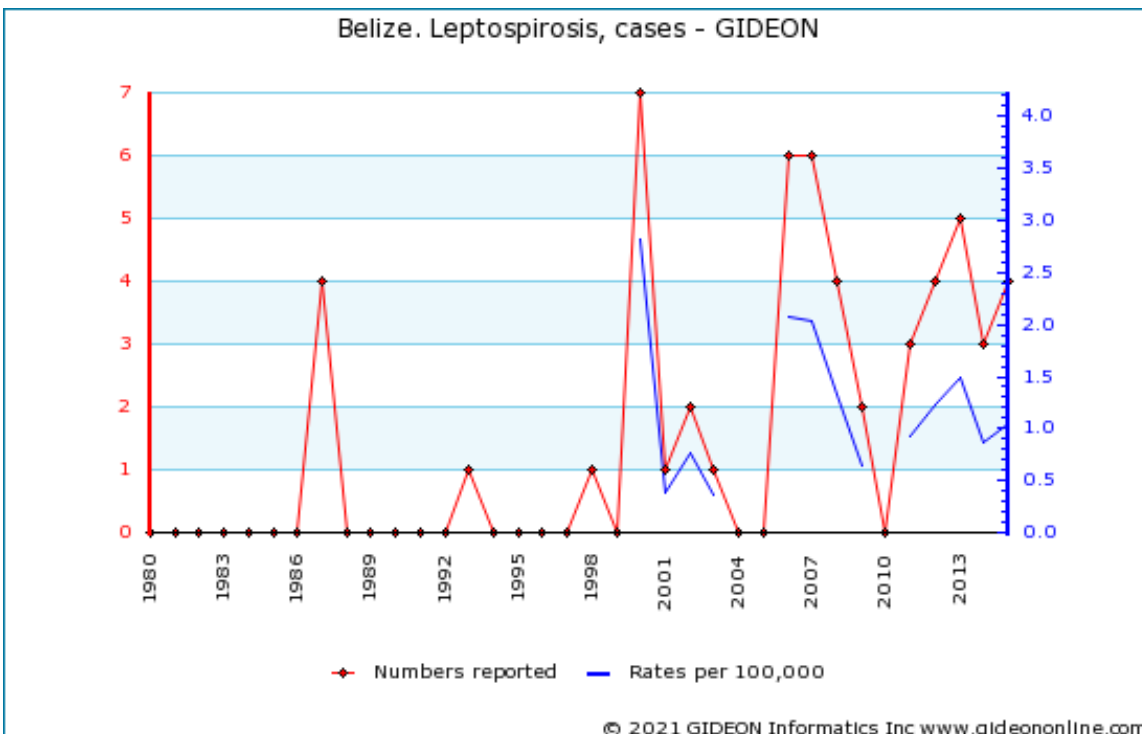
References

1. [Lepr Rev 2015 Dec ;86\(4\):307-15.](#)
2. [Med Mal Infect 2015 Sep ;45\(9\):383-93.](#)
3. [Clin Microbiol Rev 2015 Jan ;28\(1\):80-94.](#)

Leptospirosis

Agent	BACTERIUM. <i>Leptospira interrogans</i> , et al. An aerobic non-gram staining spirochete
Reservoir	Cattle, Dog, Horse, Deer, Rodent, Fox, Marine mammal, Cat, Marsupial, Frog
Vector	None
Vehicle	Water, Soil, Urine contact, Breastfeeding
Incubation Period	7d - 12d (range 2d - 26d)
Diagnostic Tests	Culture on specialized media. Dark field microscopy of urine, CSF. Serology.
Typical Adult Therapy	Penicillin G 1.5 million units Q6h iv OR Doxycycline 100 mg BID X 5 to 7d OR Ceftriaxone 1g IV daily ^{1 2 3}
Typical Pediatric Therapy	Penicillin G 50,000u/kg q6h iv X 5 to 7d Age >= 8y: Doxycycline 2.2 mg/kg BID X 5 to 7d may also be used
Clinical Hints	- Often follows recent skin contact with fresh water in rural or rodent-infested areas - "Sterile" meningitis, nephritis, hepatitis, myositis and conjunctivitis - Case-fatality rates of 5% to 40% are reported
Synonyms	Andaman hemorrhagic fever, Canefield fever, Canicola fever, Field fever, Fish handler's disease, Fort Bragg fever, Japanese autumnal fever, Kelsch's disease, 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 Belize



Graph: Belize. Leptospirosis, cases

Seroprevalence surveys

Years	Study Group	%	Notes
1984	cattle	81	81% of cattle ⁴
1984	students	11.5	11.5% of school pupils
1984	sheep and goats	40	40% of goats and sheep (1984) ⁵
1984	general population	22	22% of urban community subjects
1984	general population	37	37% of rural community subjects
1984	general population	12-37	12% (urban) to 37% (rural) of the population
2009 - 2011	pregnant women	8	8.0% of pregnant women (2009 to 2011) ⁶

- 1984 - Serogroup *Sejiro* predominates, accounting for 43% of all isolates, Pyrogenes 16% and Australis 15%.
⁷

References

1. Cochrane Database Syst Rev 2012 Feb 15;(2):CD008264.
2. J Crit Care 2018 Feb ;43:361-365.
3. Microb Pathog 2020 Feb 09;;104050.
4. Trans R Soc Trop Med Hyg 1988 ;82(3):495-9.
5. Trans R Soc Trop Med Hyg 1988 ;82(3):495-9.
6. Am J Trop Med Hyg 2014 Sep ;91(3):642-4.
7. Trans R Soc Trop Med Hyg 1988 ;82(3):495-9.

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, Fish, Shellfish
Incubation Period	3d - 21d (60d post-ingestion)
Diagnostic Tests	Culture of blood or CSF.
Typical Adult Therapy	Ampicillin 2g IV q6h X 2w (higher dosage in meningitis) + Gentamicin . Sulfamethoxazole / Trimethoprim recommended for Penicillin-allergic patients ^{1 2}
Typical Pediatric Therapy	Ampicillin 50 mg/kg IV Q6h X 2w (higher dosage in meningitis). Sulfamethoxazole / Trimethoprim recommended for Penicillin-allergic patients
Clinical Hints	<ul style="list-style-type: none"> - 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 Belize

Belize. Listeriosis, cases: None reported between 1996 and 2004

References

1. Clin Microbiol Infect 2016 Aug ;22(8):725-30.
2. Expert Rev Anti Infect Ther 2015 Mar ;13(3):395-403.

Liver abscess - bacterial

Agent	BACTERIUM. Various species from portal (Bacteroides, mixed aerobe-anaerobe) or biliary (<i>Escherichia coli</i> , etc) source
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Ultrasonography, CT or radionucleotide scan. If amoebic abscess suspected, perform Entamoeba serology
Typical Adult Therapy	Intravenous antibiotic(s) directed at likely or suspected pathogens. Percutaneous or open drainage ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Tender liver and prolonged fever in a patient - Often associated with diverticulosis, cholecystitis, appendicitis, etc - Clinically similar to amoebic abscess, but often multiple
Synonyms	Ascesso fegato, Bacterial liver abscess, Hepatic abscess - bacterial, Liver abscess. ICD9: 572.0 ICD10: K75.0

References

1. *Medicine (Baltimore)* 2018 May ;97(19):e0628.
2. *Viszeralmedizin* 2014 Oct ;30(5):334-41.
3. *J Visc Surg* 2015 Sep ;152(4):231-43.

Lymphocytic choriomeningitis

Agent	VIRUS - RNA. Arenaviridae, Mammarenavirus: Lymphocytic choriomeningitis virus
Reservoir	House mouse, Guinea pig, Hamster, Monkey
Vector	None
Vehicle	Urine, Saliva, Feces, Food, Dust, Respiratory or pharyngeal acquisition
Incubation Period	8d - 12d (range 6d - 14d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, throat, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	

Lymphogranuloma venereum

Agent	BACTERIUM. Chlamydiaceae, <i>Chlamydiae</i> , <i>Chlamydia trachomatis</i> , types L1, L2, L3
Reservoir	Human
Vector	None
Vehicle	Sexual contact
Incubation Period	7d - 12d (range 3d - 30d)
Diagnostic Tests	Serology. Culture of pus performed in specialized laboratories.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 3w. OR Erythromycin 500 mg QID X 3w OR Azithromycin 1g po weekly X 3w ¹
Typical Pediatric Therapy	Age < 8 years: Erythromycin 10 mg/kg PO QID X 2 to 4w. Age >= 8 years: Doxycycline 2 mg/kg PO BID X 2 to 4w
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	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

References

1. [MMWR Recomm Rep 2015 Jun 05;64\(RR-03\):1-137.](#)

Malaria

Agent	PARASITE - Protozoa. Apicomplexa, Haemosporida: <i>Plasmodium</i> spp.
Reservoir	Human Primate (<i>Plasmodium knowlesi</i> , <i>P. cynomolgi</i> , <i>P. simium</i>)
Vector	Mosquito (<i>Anopheles</i>)
Vehicle	Blood
Incubation Period	7d -30d
Diagnostic Tests	Examination of blood smear. Serology, antigen & microscopic techniques. Nucleic acid amplification.
Typical Adult Therapy	<p>Therapy: Resistant falciparum: Lumefantrine / Artemether OR Quinine + Doxycycline or Clindamycin OR Atovaquone / Proguanil OR Artesunate IV (severe malaria) If sens., Chloroquine 1g, then 500 mg 6, 24 & 48 hrs. If <i>P. ovale</i> or <i>P. vivax</i> - follow with Primaquine</p> <p>Severe malaria: Artesunate: 2.4 mg/kg IV at 0, 12, 24 and 48 hours</p> <p>Prophylaxis: Atovaquone / Proguanil, Chloroquine, Doxycycline, Mefloquine, Tafenoquine (see Drugs module for dosages)¹</p>
Typical Pediatric Therapy	<p>Therapy: Resistant falciparum: Lumefantrine / Artemether OR Quinine + Clindamycin OR Atovaquone / Proguanil OR Artesunate (>age 8) IV (severe malaria) If sens., Chloroquine 10 mg/kg, then 5 mg/kg 6, 24, & 48 hrs. If <i>P. ovale</i> or <i>P. vivax</i> - follow with Primaquine</p> <p>Severe malaria, weight <20 kg: Artesunate: 3.0 mg/kg IV at 0, 12, 24 and 48 hours</p> <p>Prophylaxis: Atovaquone / Proguanil, Chloroquine, Mefloquine, Tafenoquine (see Drugs module for dosages)</p>
Clinical Hints	<ul style="list-style-type: none"> - 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	<p>Ague, Bilious remittent fever, Chagres fever, Estiautumnal fever, Marsh fever, Paludism, Paludismo, Plasmodium brasilianum, Plasmodium cynomolgi, Plasmodium falciparum, Plasmodium knowlesi, Plasmodium malariae, Plasmodium ovale, Plasmodium simium, Plasmodium vivax. ICD9: 084 ICD10: B50,B51,B52,B53,B54</p>

Chloroquine resistant falciparum malaria endemic to 80 countries. Chloroquine-sensitive malaria endemic to 21 countries.

Malaria in Belize

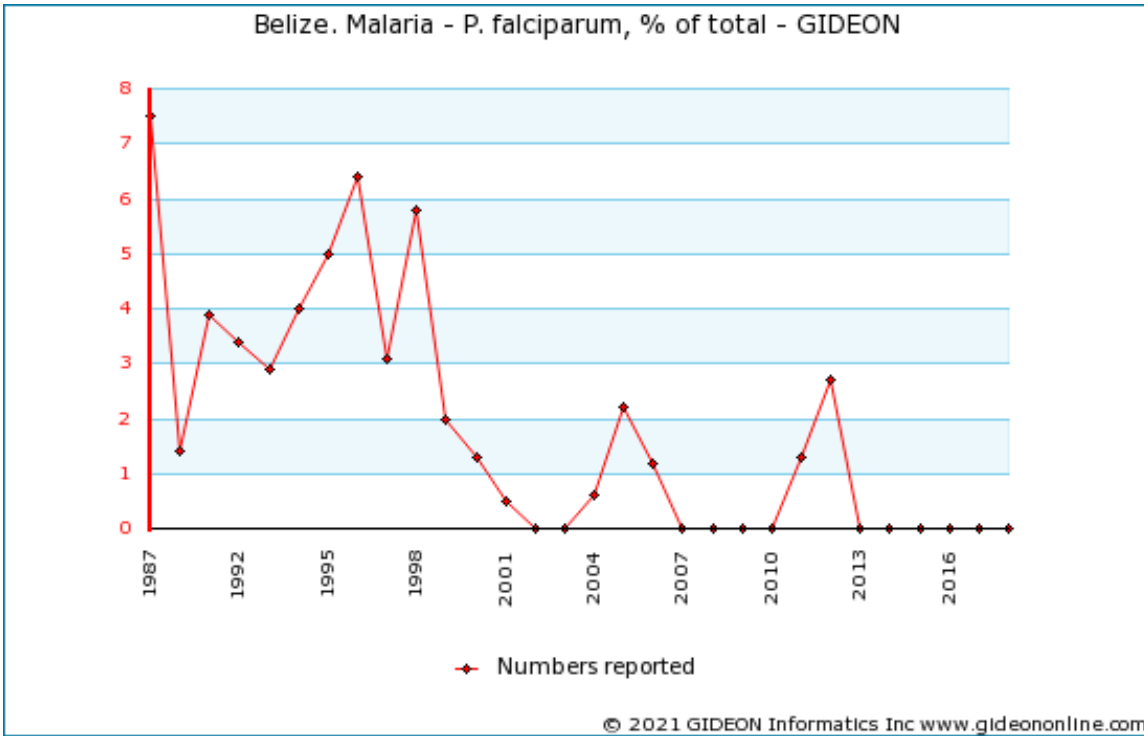
Time and Place

Risk for malaria is minimal.

- Small areas with transmission in the districts of Toledo and Stann Creek.
- There is no risk in Belize City and islands frequented by tourists

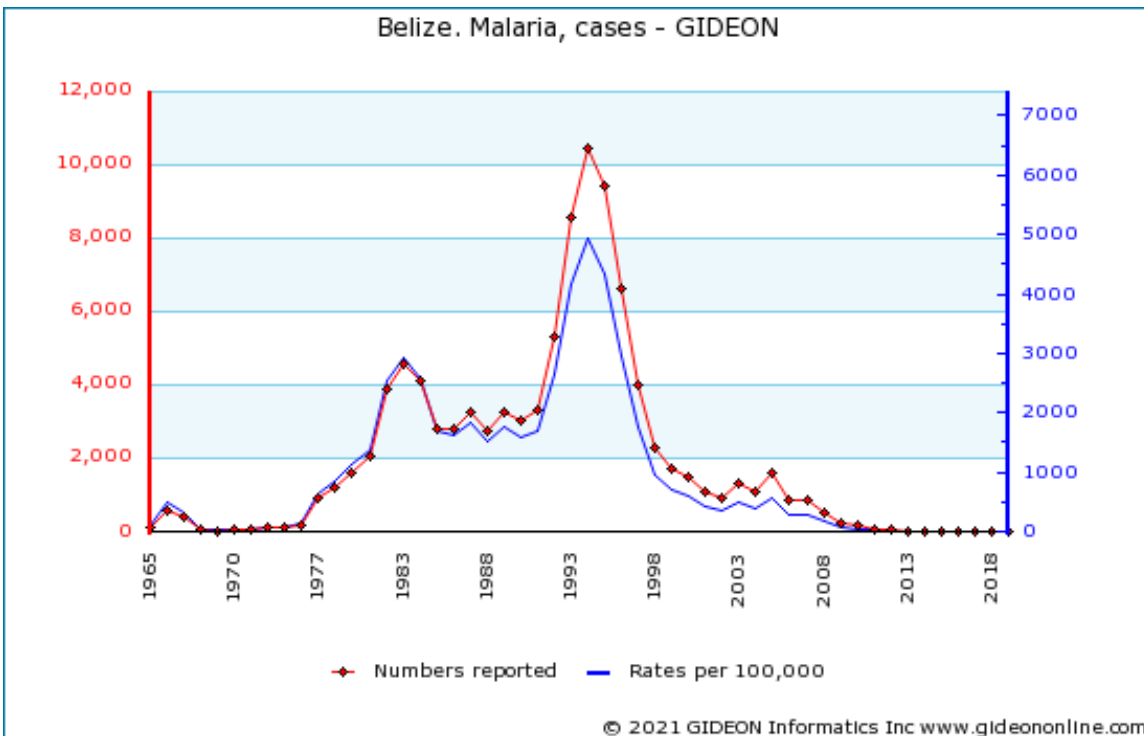
Infecting species

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



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

- 1994 to 1995 - Malaria accounted for 8.1% of acute hepatitis cases in Stann Creek.



Graph: Belize. Malaria, cases

Notes:

Individual years:

1993 - Highest rate for the Americas.

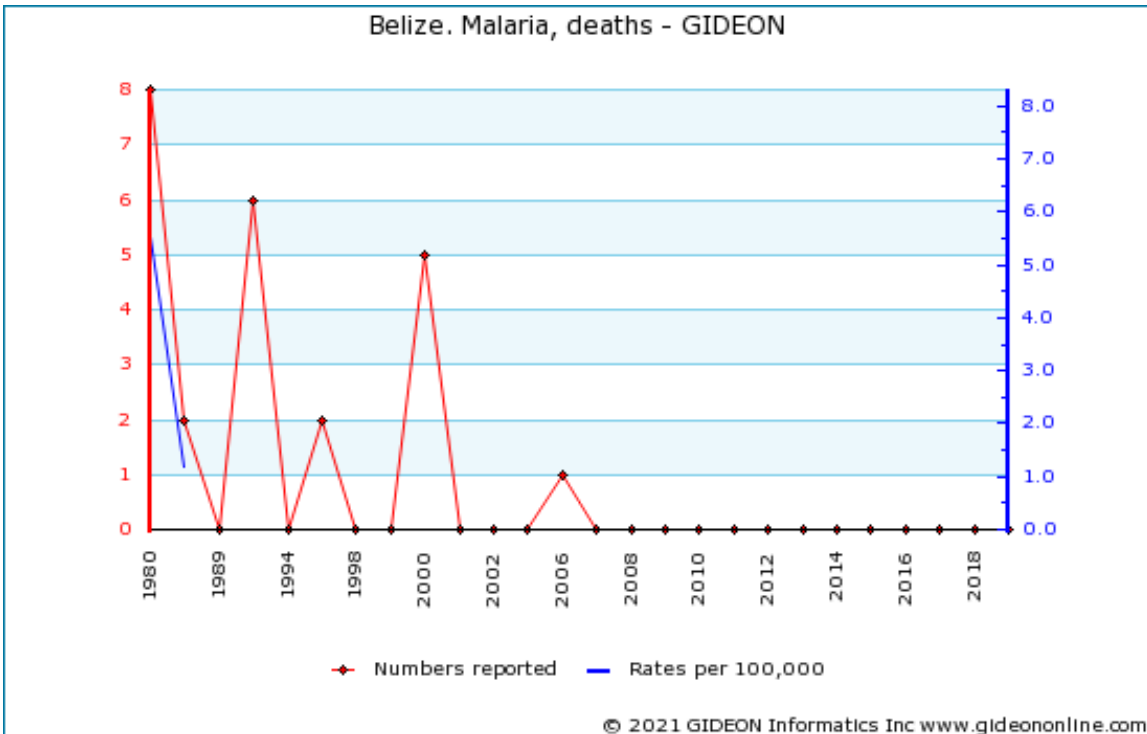
1994 - "Increase" possibly related to improved surveillance.

1994 - 3,533 from Cayo, 2,110 from Toledo, 1,245 from Corozal.

1996 - 2,246 from Cayo, 2,006 from Toledo, 1,495 from Stann Creek.

2015 - Included 13 imported cases.

2019 - No autochthonous cases were reported to October. ²



Graph: Belize. Malaria, deaths

Vectors

The principal vectors are *Anopheles darlingi* ³, *An. pseudopunctipennis* ⁴ and *An. albimanus*. ⁵

References

1. Lancet 2018 Apr 06;
2. ProMED <promedmail.org> archive: 20191121.6789751
3. Mem Inst Oswaldo Cruz 1998 Sep-Oct;93(5):647-50.
4. Am J Trop Med Hyg 1995 Oct ;53(4):362-77.
5. Environ Entomol 1996 Oct ;25(5):1058-67.

Malignant otitis externa

Agent	BACTERIUM. <i>Pseudomonas aeruginosa</i> : aerobic gram-negative bacillus (virtually all cases)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of otic exudate and biopsy material. Careful roentgenographic and neurological examinations.
Typical Adult Therapy	Early debridement Ciprofloxacin 400 mg iv Q8h Alternatives: Imipenem, Meropenem, Ceftazidime, Cefepime, Piperacillin Early debridement ¹
Typical Pediatric Therapy	Early debridement Early debridement Ciprofloxacin 10-15 mg/kg IV Q12h Alternatives: Imipenem, Meropenem, Ceftazidime, Cefepime, Piperacillin
Clinical Hints	<ul style="list-style-type: none"> - Over 80% of patients are diabetics above age 50 - Otic pain, swelling and discharge - Infection of bony and cartilaginous ear canal - Cranial nerve (usually VII) signs in 50% - Case-fatality rate > 55%
Synonyms	

References

1. Am J Med 1989 Nov 30;87(5A):138S-141S.

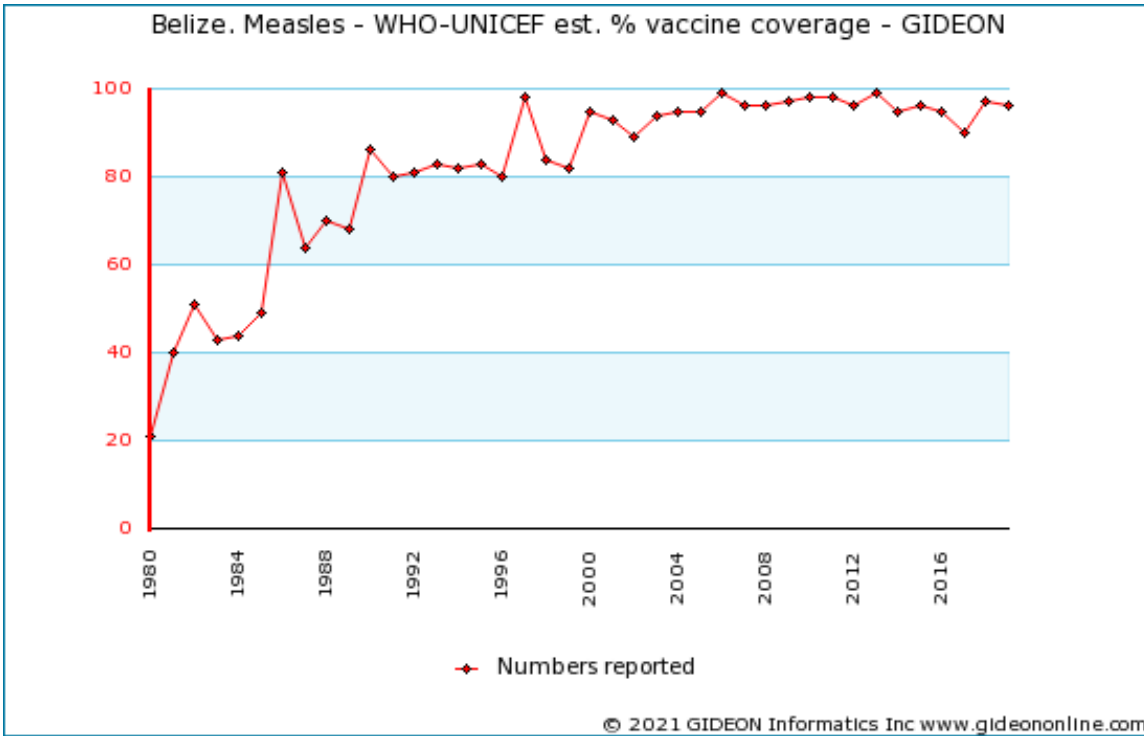
Measles

Agent	VIRUS - RNA. Mononegavirales Paramyxoviridae, Paramyxovirinae, Morbillivirus: Measles virus
Reservoir	Human
Vector	None
Vehicle	Droplet, Respiratory or pharyngeal acquisition
Incubation Period	8d - 14d
Diagnostic Tests	Viral culture (difficult and rarely indicated). Serology. Nucleic acid amplification.
Typical Adult Therapy	Respiratory isolation; supportive. Ribavirin 20 to 35 mg/kg/day X 7 days has been used for severe adult infection ^{1 2}
Typical Pediatric Therapy	Respiratory isolation; supportive. Ribavirin 7.5-10 mg/kg PO BID X 5-7 d has been used for severe infection
Vaccine	Measles vaccine Measles-Mumps-Rubella vaccine Measles-Rubella vaccine
Clinical Hints	- 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
Synonyms	Masern, Massling, Mazelen, Meslinger, Morbilli, Morbillo, Rubeola, Rugeole, Sarampion, Sarampo. ICD9: 055 ICD10: B05

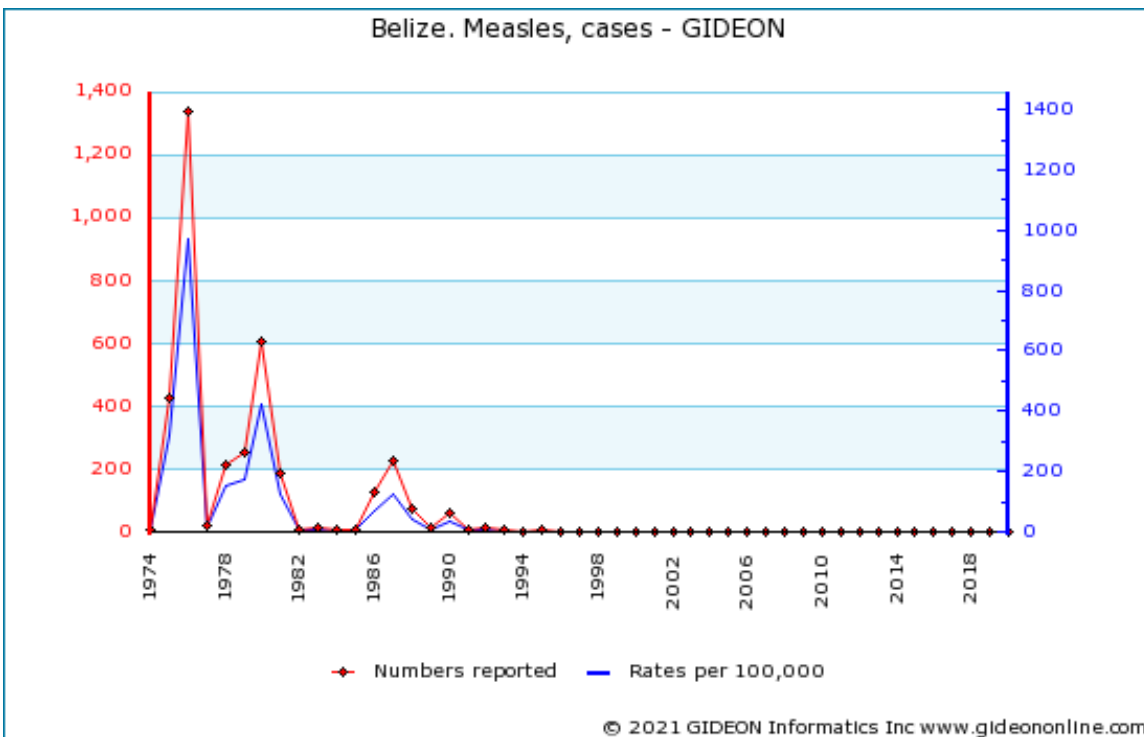
Measles in Belize

Vaccine Schedule:

BCG - birth
 DT - 2,4,6, 18 months; 4 years
 DTP - 18 months; 4 years
 DTPHibHepB - 2,4,6 months
 HepB - birth
 IPV - 2,4,6,18 months; 4,12 years
 MMR - 12, 18 months
 OPV - 4,6,18 months; 4 years
 Td - 1st contact; +6 months; +1, 12 years



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



Graph: Belize. Measles, cases

Notes:

1. 24 measles fatalities were reported in 1980, 0 in 1989, 0 in 1994, and 0 in 1995.

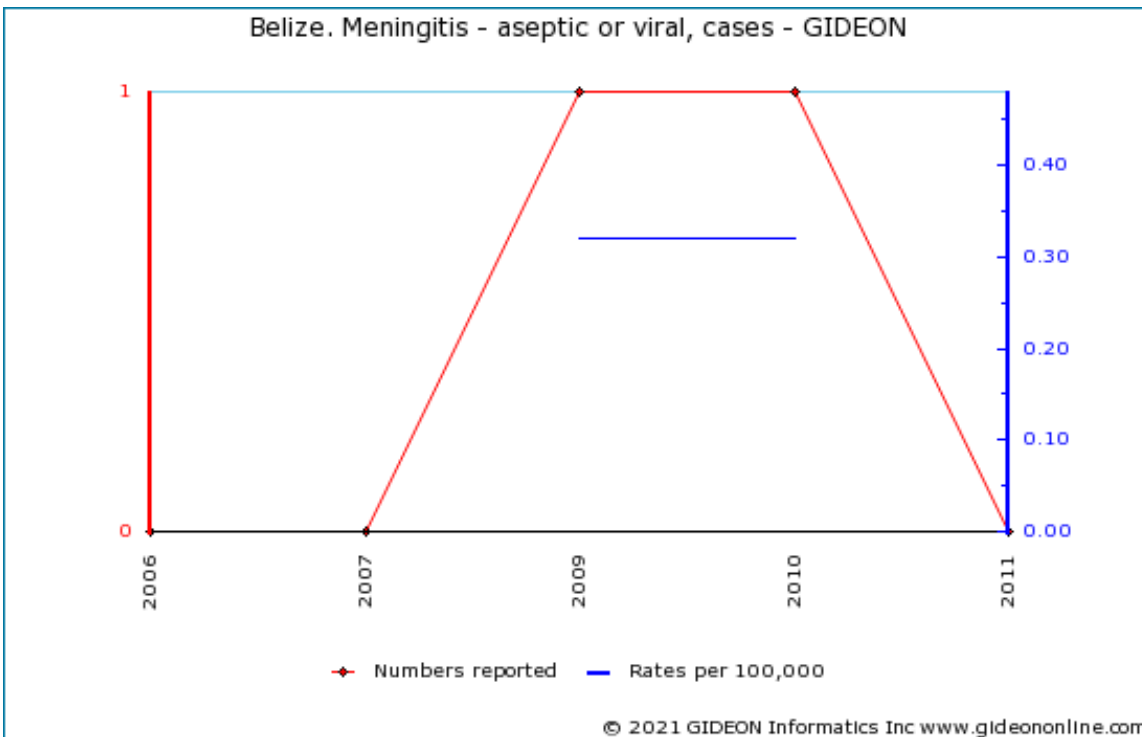
References

1. Clin Respir J 2016 Sep ;10(5):673-5.
2. Expert Opin Pharmacother 2001 Aug ;2(8):1317-24.

Meningitis - aseptic (viral)

Agent	VIRUS - RNA. Picornaviridae, enteroviruses
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Droplet
Incubation Period	Variable
Diagnostic Tests	Viral isolation (stool, CSF, throat). Serology.
Typical Adult Therapy	Supportive ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Lymphocytic meningitis, with normal CSF glucose level - Often follows sore throat - Typically occurs during late summer and early autumn in temperate regions
Synonyms	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 Belize



Graph: Belize. Meningitis - aseptic or viral, cases

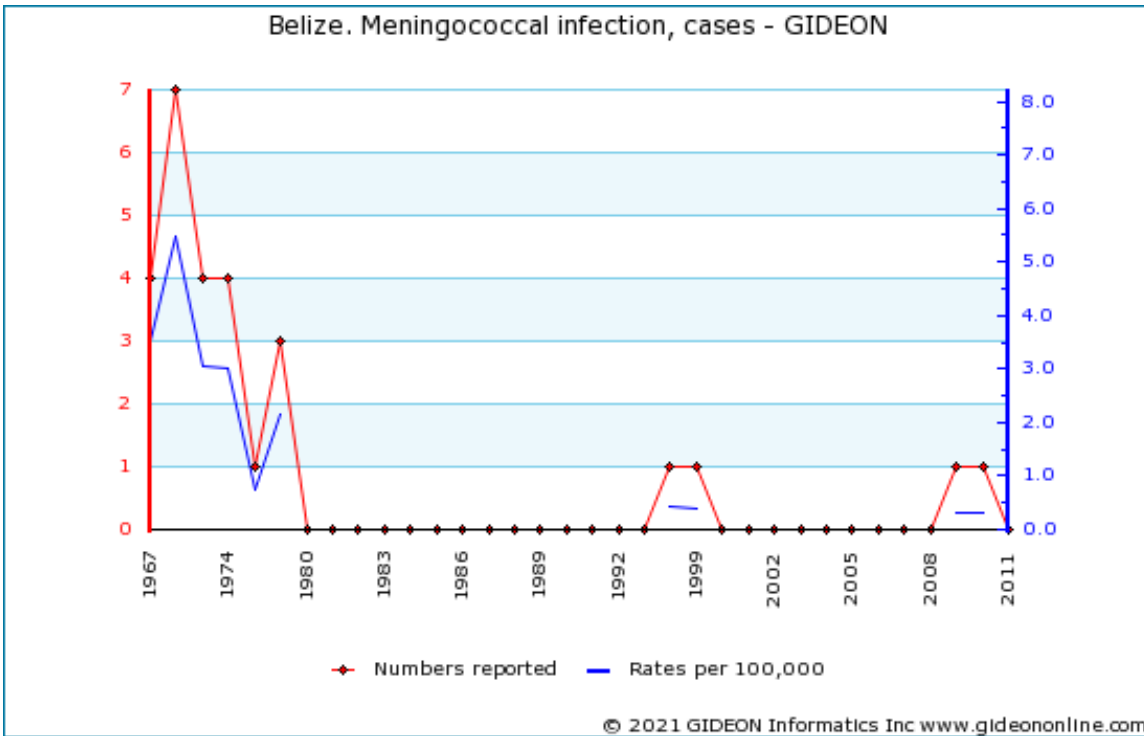
References

1. [Curr Opin Infect Dis 2017 Apr ;30\(2\):248-256.](#)

Meningitis - bacterial

Agent	BACTERIUM. <i>Neisseria meningitidis</i> , <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i> , et al
Reservoir	Human
Vector	None
Vehicle	Air, Secretions
Incubation Period	Variable
Diagnostic Tests	CSF microscopy and culture. Blood culture. Note: Antigen detection is non-specific and rarely useful.
Typical Adult Therapy	If meningococcal meningitis is confirmed or suspected - respiratory isolation Bactericidal agent(s) appropriate to known or suspected pathogen + dexamethasone ^{1 2 3}
Typical Pediatric Therapy	As for adult
Vaccines	H. influenzae (HbOC-DTP or -DTaP) vaccine Haemophilus influenzae (HbOC) vaccine Haemophilus influenzae (PRP-D) vaccine Haemophilus influenzae (PRP-OMP) vaccine Haemophilus influenzae (PRP-T) vaccine Meningococcal vaccine Hepatitis B + Haemoph. influenzae vaccine
Clinical Hints	- Headache, stiff neck, obtundation, high fever and leukocytosis - Macular or petechial rash and preceding sore throat suggest meningococcal infection
Synonyms	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 Belize



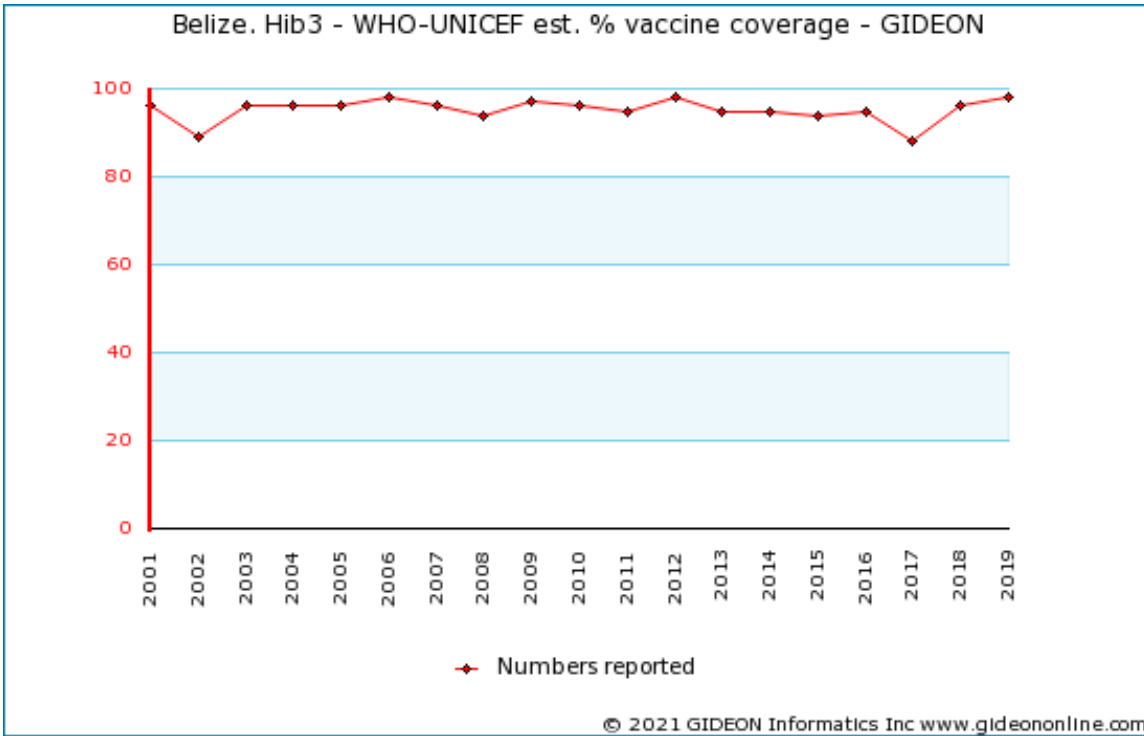
Graph: Belize. Meningococcal infection, cases

Notes:

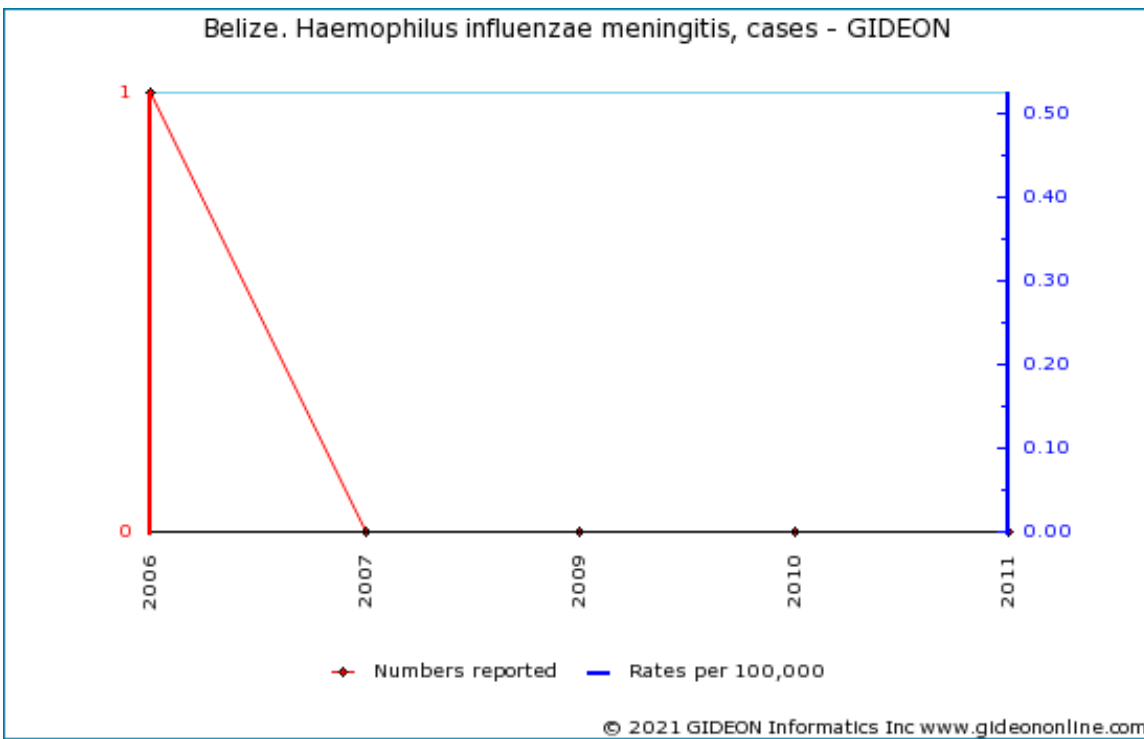
1. No deaths were ascribed to meningococcal infection in 1989, and 0 during 1994 to 1995.

Vaccine Schedule:

- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years



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



Graph: Belize. Haemophilus influenzae meningitis, cases

References

1. Prim Care 2018 Sep ;45(3):505-518.
2. 2018 01 ;
3. 2018 01 ;

Microsporidiosis

Agent	FUNGUS. Microsporidia: <i>Enterocytozoon</i> , <i>Encephalitozoon (Septata)</i> , <i>Vittaforma (Nosema)</i> , <i>Pleistophora</i> , <i>Trachipleistophora</i> , et al.
Reservoir	Rabbit, Rodent, Carnivore, Non-human primate, Fish, Dog, Bird
Vector	None
Vehicle	Fecal-oral
Incubation Period	Unknown
Diagnostic Tests	Microscopy of duodenal aspirates. Inform laboratory if this organism is suspected. Nucleic acid amplification.
Typical Adult Therapy	Albendazole 400 mg PO BID X 3 weeks. Add Fumagillin for ocular disease <i>S. intestinalis</i> may respond to Albendazole and Fumagillin Nitazoxanide has been used for <i>E. bienewisi</i> . ¹
Typical Pediatric Therapy	Albendazole 200 mg PO BID X 3 weeks. Add Fumagillin for ocular disease <i>S. intestinalis</i> may respond to Albendazole and Fumagillin Nitazoxanide has been used for <i>E. bienewisi</i> .
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Anncalia, Brachiola, Encephalitozoon, Enterocytozoon, Microsporidium, Nosema, Pleistophora, Trachipleistophora, Tubulinosema, Vittaforma. ICD9: 136.8 ICD10: A07.8

References

1. [Drug Resist Updat 2000 Dec ;3\(6\):384-399.](#)

Molluscum contagiosum

Agent	VIRUS - DNA. Poxviridae. Molluscipoxvirus. Molluscum contagiosum virus
Reservoir	Human
Vector	None
Vehicle	Contact, Sexual contact, Vertical transmission
Incubation Period	2-7 w (range 14 to 180d)
Diagnostic Tests	Histology of excised material. Nucleic acid amplification
Typical Adult Therapy	Cryotherapy; excision Topical Catharidin and Podophyllotoxin have been used successfully in children ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Water warts. ICD9: 078.0 ICD10: B08.1

References

1. J Am Acad Dermatol 2000 Sep ;43(3):503-7.
2. Dermatology 1994 ;189(1):65-8.

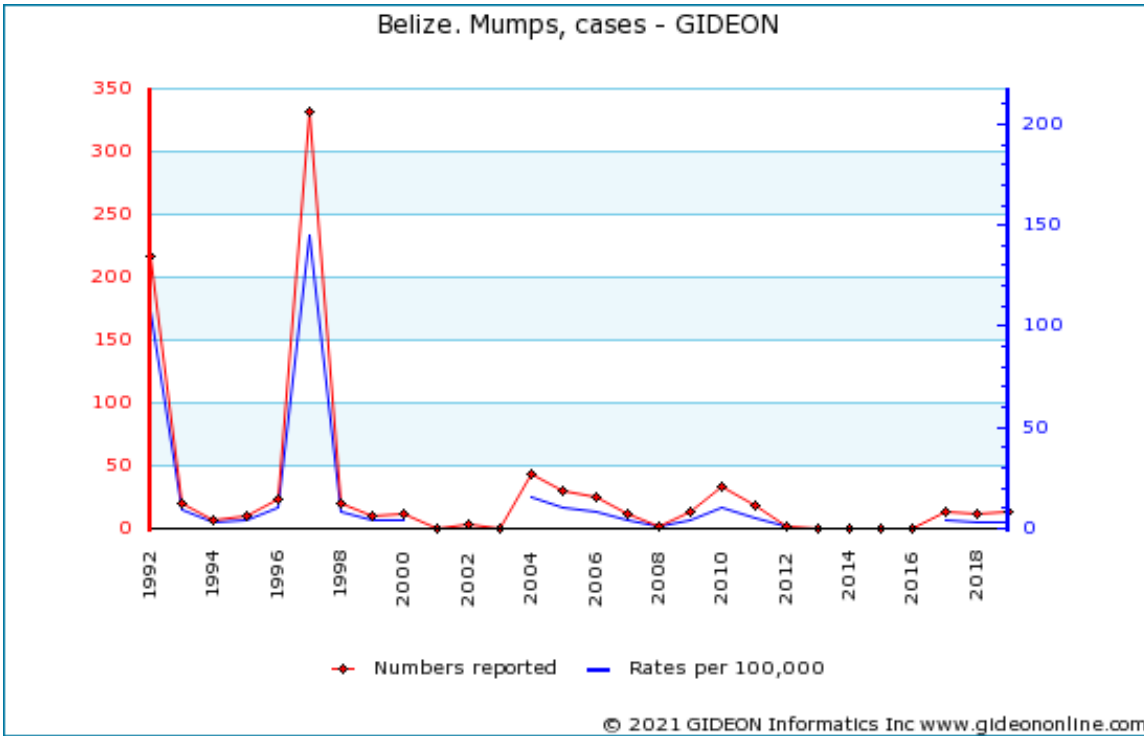
Mumps

Agent	VIRUS - RNA. Mononegavirales Paramyxoviridae, Paramyxovirinae, Rubulavirus: Mumps virus
Reservoir	Human
Vector	None
Vehicle	Aerosol, Respiratory or pharyngeal acquisition
Incubation Period	14d - 24d (range 12d - 24d)
Diagnostic Tests	Viral culture (saliva, urine, CSF) indicated only in complicated cases. Serology. Nucleic acid amplification.
Typical Adult Therapy	Respiratory isolation Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Measles-Mumps-Rubella vaccine Mumps vaccine Rubella - Mumps vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Bof, Epidemic parotitis, Fiebre urliana, Infectious parotitis, Kusma, Oreillons, Paperas, Parotidite epidemica, Parotiditis, Parotite epidemica, Passjuka. ICD9: 072 ICD10: B26

Mumps in Belize

Vaccine Schedule:

- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years



Graph: Belize. Mumps, cases

Notes:

1. 52 clinical cases of mumps were reported during 2006 to 2009.

Myalgic encephalomyelitis

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Clinical diagnosis; ie, discount other diseases.
Typical Adult Therapy	Supportive; ? immune modulators (experimental)
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Unexplained depression, fatigue, cognitive disorders and sleep disturbance - Recurrent bouts of pharyngitis and adenopathy - Rheumatological symptoms and fever persist more than six months
Synonyms	<p>Akureyri disease, Atypical poliomyelitis, Chronic fatigue syndrome, Effort syndrome, Epidemic neuromyasthenia, Fabricula, Iceland disease, Royal Free disease, Systemic exercise intolerance disease, Tapanui disease.</p> <p>ICD9: 780.71 ICD10: G93.3</p>

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 ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Most patients are males age 20 to 40 (ie, occupational exposure) - Painless, chronic, draining, fistulous subcutaneous nodule - usually involving lower extremity - Osteolytic lesions may be noted on x-ray - Usually no fever
Synonyms	Actinomadura, Chaetomium atrobrunneum, Coelomycetes, Curvularia lunata, Cyphellophora, Diaporthe, Emarellia, Fusarium chlamydosporum, Fusarium subglutinans, Gloniopsis, Gordonia westfalica, Leptosphaeria tompkinsii, Madura foot, Madura-Fuss, Madurella, Medicopsis, Mycetom, Nigrograna, Paraconiothyrium, Peyronellaea, Pleurostomophora, Trematospheria, White grain eumycetoma. ICD9: 039.4,117.4 ICD10: B47

References

1. JBI Database System Rev Implement Rep 2018 Jul ;16(7):1519-1536.
2. Cutis 2017 Feb ;99(2):E11-E15.
3. JBI Database System Rev Implement Rep 2016 11 ;14(11):91-98.

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	Clarithromycin 500 mg BID X 3-4m AND. OR Rifampin 600 mg/day OR Ethambutol 15 mg/kg/day X 3-4m OR Rifampin 600 mg/d + Ethambutol 15 mg/kg/d X 3-4m OR Minocycline 100 mg /day X 3m OR Sulfamethoxazole / Trimethoprim 160/800 mg BID X 3-4m ¹
Typical Pediatric Therapy	Sulfamethoxazole / Trimethoprim 5 mg-25 mg/kg BID X 6w. Alternative Minocycline (Age >= 8)
Clinical Hints	- Onset weeks after exposure to swimming pool, aquarium, other water source - Violaceous papule, ulcer, plaque, psoriaform lesion - 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

References

1. Expert Opin Pharmacother 2009 Dec ;10(17):2787-99.

Mycobacteriosis - M. scrofulaceum

Agent	BACTERIUM. Actinomycetes, <i>Mycobacterium scrofulaceum</i> An aerobic acid-fast bacillus
Reservoir	Water (lakes, rivers), Soil, Raw milk, Plant material
Vector	None
Vehicle	Water, Soil, Areas of minor trauma, Contact
Incubation Period	Unknown
Diagnostic Tests	Culture of tissue or aspirates.
Typical Adult Therapy	Excision. Drugs (Isoniazid - Rifampin - Streptomycin - Cycloserine) are rarely indicated ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- Most common during early childhood.- 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
Synonyms	

References

1. [Biomed Res Int 2017 ;2017:1584658.](#)
2. [Expert Opin Pharmacother 2012 May ;13\(7\):967-86.](#)
3. [Expert Opin Pharmacother 2009 Dec ;10\(17\):2787-99.](#)

Mycobacteriosis - miscellaneous nontuberculous

Agent	BACTERIUM. Actinomycetes, <i>Mycobacterium</i> spp. - over 130 species as of 2016 An aerobic acid-fast bacillus
Reservoir	Water, Soil, Fish, Mammal, Bird
Vector	None
Vehicle	Air, Water, Milk (<i>M. bovis</i>), Contact, Ingestion, Trauma, Respiratory or pharyngeal acquisition
Incubation Period	Variable
Diagnostic Tests	Microscopy & culture of tissue, secretions, blood. Nucleic acid amplification. Inform laboratory if suspected
Typical Adult Therapy	Drug, route and duration appropriate to clinical setting and species (in Drugs module, scroll through upper left box) ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	<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 jacobii</i> , <i>Mycobacterium kyorinense</i> , <i>Mycobacterium xenopi</i> , <i>Segniliparus</i> . ICD9: 031.9,031.2 ICD10: A31.0,A31.1,A31.8

References

1. [Semin Respir Crit Care Med 2018 Jun ;39\(3\):351-361.](#)
2. [Biomed Res Int 2017 ;2017:1584658.](#)
3. [Expert Opin Pharmacother 2009 Dec ;10\(17\):2787-99.](#)

Mycoplasma (miscellaneous) infection

Agent	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> <i>Spiroplasma</i> spp.
Reservoir	Human
Vector	None
Vehicle	Secretion, Sexual contact, Respiratory or pharyngeal acquisition
Incubation Period	Unknown
Diagnostic Tests	Culture (urine, pharynx). Serology. Nucleic acid amplification.
Typical Adult Therapy	<i>Azithromycin</i> 1 g PO once OR <i>Moxifloxacin</i> 400 mg PO daily X 7 days OR <i>Doxycycline</i> 100 mg PO BID X 7 days OR <i>Pristinamycin</i> 1 g PO Q6h X 10 days ^{1 2}
Typical Pediatric Therapy	<i>Azithromycin</i> 10 mg/kg PO once
Clinical Hints	- Urethritis, vaginitis - Neonatal pneumonia - Rarely stillbirth, prematurity or infertility
Synonyms	<i>Acholeplasma laidlawii</i> , <i>Candidatus Mycoplasma haemohominis</i> , <i>Epirythrozoon</i> , Hemotrophic <i>Mycoplasma</i> , <i>Mycoplasma amphoriforme</i> , <i>Mycoplasma buccale</i> , <i>Mycoplasma faucium</i> , <i>Mycoplasma felis</i> , <i>Mycoplasma fermentans</i> , <i>Mycoplasma genitalium</i> , <i>Mycoplasma hominis</i> , <i>Mycoplasma lipophilum</i> , <i>Mycoplasma orale</i> , <i>Mycoplasma penetrans</i> , <i>Mycoplasma pirum</i> , <i>Mycoplasma primatum</i> , <i>Mycoplasma salivarium</i> , <i>Mycoplasma spermatophilum</i> , <i>Spiroplasma</i> infection, T <i>Mycoplasmas</i> , T strains, <i>Ureaplasma parvum</i> , <i>Ureaplasma urealyticum</i> . ICD9: 041.81 ICD10: A49.3

References

1. J Eur Acad Dermatol Venereol 2016 Oct ;30(10):1650-1656.
2. MMWR Recomm Rep 2015 Jun 05;64(RR-03):1-137.

Mycoplasma pneumoniae infection

Agent	BACTERIUM. Mollicutes. <i>Mycoplasma pneumoniae</i>
Reservoir	Human
Vector	None
Vehicle	Droplet, Respiratory or pharyngeal acquisition
Incubation Period	6d - 23d
Diagnostic Tests	Culture (sputum, throat). Serology. Nucleic acid amplification.
Typical Adult Therapy	Azithromycin 500 mg, followed by 250 mg PO daily X 5 days. OR Doxycycline 100 mg PO BID X 7d OR Levofloxacin 750 mg PO X 7 d ^{1 2 3}
Typical Pediatric Therapy	Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR Erythromycin 10 mg/kg PO QID X 10 d OR Clarithromycin 7.5 mg/kg PO BID X 10 d OR Doxycycline 2 mg/kg PO BID (maximum 200 mg/d) X 10 d
Clinical Hints	<ul style="list-style-type: none"> - Coryza, "hacking" cough and subsegmental pulmonary infiltrate - Bullous otitis media is often present - Most patients below age 30 - Cold agglutinins neither sensitive nor specific, and appear only during second week
Synonyms	Mycoplasma pneumoniae, Primary atypical pneumonia. ICD9: 041.81,483.0 ICD10: B96.0

References

1. Clin Microbiol Rev 2017 Jul ;30(3):747-809.
2. Clin Respir J 2017 Jul ;11(4):419-429.
3. Cochrane Database Syst Rev 2015 Jan 08;1:CD004875.

Myiasis	
Agent	PARASITE - Insecta (Diptera) larvae
Reservoir	Mammal
Vector	Arthropod
Vehicle	Fly eggs deposited by biting arthropod
Incubation Period	1w - 3m
Diagnostic Tests	Identification of extracted maggot. Dermatobia hominis larvae: length - 13 to 25 mm Cordylobia anthropophaga larvae: length - 11 to 15 mm
Typical Adult Therapy	Removal of maggot
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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.
Synonyms	Calliphora, Cayor Worm, Chrysomya, Chrysomyia, Clogmia, Cochliomyia, Cordylobia, Cuterebrosis, Dermatobia, Eristalis, Fannia, Furuncular myiasis, Gasterophilus, Hypoderma, Lucilia, Lund's fly, Maggot infestation, Megaselina, Musca, Muscina, Oedemagena, Oestrus, Ophthalmomyiasis, Palpada, Parasarcophaga, Psychoda, Rectal myiasis, Sarcophaga, Screw worm, Telmatoscopus, Urinary myiasis, Vaginal myiasis, Wohlfarthia. ICD9: 134.0 ICD10: B87

Myiasis in Belize

2012 (publication year) - A case of myiasis due to *Dermatobia hominis* was acquired in Belize. ¹

References

1. J Emerg Med 2012 Oct ;43(4):618-21.

Necrotizing skin/soft tissue infx.

Agent	BACTERIUM. <i>Streptococcus pyogenes, Clostridium perfringens</i> , mixed anaerobic and/or gram-negative bacilli
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Clinical features. Smear and culture (including anaerobic culture) of exudate.
Typical Adult Therapy	Debridement and parenteral antibiotics directed by smear and culture results. Hyperbaric oxygen in more severe infections
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - At least seven distinct syndromes are described - Local pain and swelling, skin discoloration or edema - Gas formation, foul odor and variable degrees of systemic toxicity
Synonyms	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

Agent	BACTERIUM. <i>Clostridium septicum</i> (occasionally <i>Clostridium tertium</i> , <i>Clostridium sporogenes</i> , <i>Paenibacillus sordellii</i> or <i>Clostridium tertium</i>)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Typical findings in the setting of neutropenia. Ultrasonography may be helpful.
Typical Adult Therapy	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 ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Condition affects neutropenic (leukemic, genetic, etc) patients - Fever, abdominal pain, diarrhea (occasionally bloody) and right lower quadrant signs - Infection may spread hematogenously to the extremities - Case-fatality rate is 50% to 75%
Synonyms	Neutropenic enterocolitis. ICD9: 540.0 ICD10: A04.8

References

1. World J Gastroenterol 2017 Jan 07;23(1):42-47.
2. Acta Paediatr 2012 Mar ;101(3):308-12.

Nocardiosis

Agent	BACTERIUM. Actinomycetes, <i>Nocardia</i> spp. An aerobic gram positive bacillus (acid-fast using special technique)
Reservoir	Soil
Vector	None
Vehicle	Air, Dust, Wound, Contact, Respiratory or pharyngeal acquisition
Incubation Period	Days to weeks
Diagnostic Tests	Culture and gram stain of exudates, sputa, tissue specimens. Advise laboratory when Nocardia suspected.
Typical Adult Therapy	Lymphadenitis or skin / soft tissue: Sulfamethoxazole / Trimethoprim OR Minocycline Pneumonia: Sulfamethoxazole / Trimethoprim + Imipenem ; OR Imipenem + Amikacin Brain abscess: Sulfamethoxazole / Trimethoprim + Imipenem ; OR Linezolid + Meropenem ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Pneumonia, lung abscess, brain abscess, or other chronic suppurative infection - Often occurs in the setting of immune suppression.
Synonyms	Nocardia, Nocardiose. ICD9: 039 ICD10: A43

References

1. [Antimicrob Agents Chemother 2014 ;58\(2\):795-800.](#)
2. [Expert Opin Pharmacother 2013 Dec ;14\(17\):2387-98.](#)
3. [Mayo Clin Proc 2012 Apr ;87\(4\):403-7.](#)

Onchocerciasis - zoonotic

Agent	PARASITE - Nematoda. Secernentea: <i>Onchocerca lupi</i> , et. al.
Reservoir	Cattle, Horse, Deer, Boar, Dog, Wolf
Vector	Black fly (<i>Simulium</i> spp.)
Vehicle	None
Incubation Period	Unknown
Diagnostic Tests	Identification of excised worm Moniliformis moniliformis adult female - size unknown; male - 43 to 50 mm
Typical Adult Therapy	Excision
Typical Pediatric Therapy	As of adult
Clinical Hints	- May be history of animal contact - Subcutaneous or subconjunctival nodule, or eye-worm
Synonyms	Dipetalonema arbuta, Dipetalonema sprengi, Onchocerca cervicalis, Onchocerca dewittei, Onchocerca guttarosa, Onchocerca jakutensis, Onchocerca lupi, Onchocerca reticulata, Pelecitus. ICD9: 123.8 ICD10: B71.1.

Orbital and eye infection

Agent	BACTERIUM OR FUNGUS. <i>Streptococcus pyogenes</i> , oral anaerobes, <i>Aspergillus</i> spp., facultative gram-negative bacilli, et al
Reservoir	Endogenous, Introduced flora (trauma, surgery)
Vector	None
Vehicle	Trauma, Surgery, Contiguous (sinusitis), Hematogenous
Incubation Period	Variable
Diagnostic Tests	Imaging techniques (CT or MRI). Culture of aspirates or surgical material.
Typical Adult Therapy	Local and systemic antimicrobial agents appropriate for species and severity ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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).
Synonyms	Bacterial keratitis, Ceratite, Cheratite, Endophthalmitis, Eye infection, Keratite, Keratitis, Orbital infection, Panophthalmitis, Queratitis. ICD9: 360.0 ICD10: H05.0

Orbital and eye infection in Belize

Notable outbreaks

Years	Clinical	Notes
1981	conjunctivitis - acute hemorrhagic	^{4 5}

References

1. 2018 01 ;
2. *Pharmaceutics* 2018 May 29;10(2)
3. *Clin Microbiol Rev* 2017 07 ;30(3):597-613.
4. *MMWR Morb Mortal Wkly Rep* 1981 Oct 09;30(39):497-500.
5. *Bull Pan Am Health Organ* 1983 ;17(3):275-80.

Orf

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

Ornithosis	
Agent	BACTERIUM. Chlamydiaceae, Chlamydiae , <i>Chlamydia (Chlamydophila) psittaci</i>
Reservoir	Parakeet, Parrot, Pigeon, Turkey, Duck, Cat, Sheep, Goat, Cattle, Dog
Vector	None
Vehicle	Bird droppings, Dust, Air, Aerosol from cat, Respiratory or pharyngeal acquisition
Incubation Period	7d - 14d (range 4d - 28d)
Diagnostic Tests	Serology. Culture (available in special laboratories) rarely indicated.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 10d. OR Azithromycin 1 g, then 0.5 g daily X 4 days OR Clarithromycin 0.5 g BID OR Erythromycin 500 mg PO QID X 10d. OR Levofloxacin 750 mg PO X 7 days ^{1 2 3}
Typical Pediatric Therapy	Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR Erythromycin 10 mg/kg QID X 10d. Alternative (Age >=8 years): Doxycycline 100 mg PO BID X 10d.
Clinical Hints	<ul style="list-style-type: none"> - Headache, myalgia and pneumonia - Relative bradycardia is common - 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%
Synonyms	<i>Chlamydophila abortus</i> , <i>Chlamydophila psittaci</i> , Ornitose, Papegojsjuka, Parrot fever, Psitacosis, Psittacosis, Psittakose. ICD9: 073 ICD10: A70

References

1. [Infect Dis Clin North Am](#) 2010 Mar ;24(1):7-25.
2. [Clin Microbiol Infect](#) 2009 Jan ;15(1):11-7.
3. [Semin Respir Infect](#) 1997 Mar ;12(1):7-11.

Osteomyelitis

Agent	BACTERIUM OR FUNGUS. <i>Staphylococcus aureus</i> , facultative gram-negative bacilli, <i>Candida albicans</i> , etc
Reservoir	Endogenous
Vector	None
Vehicle	Trauma, Surgery, Hematogenous
Incubation Period	Variable
Diagnostic Tests	Radiography, including bone scan. Culture of biopsy material.
Typical Adult Therapy	Systemic antimicrobial agent(s) appropriate to known or suspected pathogen. Surgery as indicated ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	Osteomyelitis, Osteomyelitis, Osteomyelitis, Paravertebral abscess. ICD9: 015,730.9 ICD10: M86

References

1. Rev Recent Clin Trials 2017 ;12(4):260-268.
2. Infect Dis Clin North Am 2017 06 ;31(2):325-338.

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): Amoxicillin / Clavulanate 1,000/62.5 mg BID X 3 days Alternatives: Cefdinir , Cefpodoxime , Cefprozil , fluoroquinolone ^{1 2 3 4}
Typical Pediatric Therapy	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): Amoxicillin / Clavulanate 45/3.2 mg/kg BID X 3 days
Vaccine	Pneumococcal conjugate vaccine
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

References

1. [J Med Microbiol 2018 Oct ;67\(10\):1417-1425.](#)
2. [BMJ Open 2018 Jun 08;8\(6\):e021133.](#)
3. [Pediatr Clin North Am 2018 02 ;65\(1\):105-123.](#)
4. [2018 01 ;](#)

Parainfluenza virus infection

Agent	VIRUS - RNA. Paramyxoviridae: Respirovirus - Human Parainfluenza virus 1 and 3. Rubulavirus - Human Parainfluenza virus 2 and 4.
Reservoir	Human
Vector	None
Vehicle	Droplet, Respiratory or pharyngeal acquisition
Incubation Period	3d - 8d
Diagnostic Tests	Viral culture (respiratory secretions). Serology. Nucleic acid amplification.
Typical Adult Therapy	Respiratory precautions Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Human respirovirus, Human rubulavirus, Parainfluenza, Respirovirus, Rubulavirus, Sendai. ICD9: 078.89,480.2 ICD10: J12.2

Parvovirus B19 infection

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

Pediculosis

Agent	PARASITE - Insecta. Anoplura: <i>Pediculus humanus humanus</i> (body louse) <i>Pediculus humanus capitis</i> (head louse) <i>Pthirus pubis</i> (pubic louse)
Reservoir	Human
Vector	None
Vehicle	Contact
Incubation Period	7d
Diagnostic Tests	Identification of adults and "nits" with the help of a louse comb
Typical Adult Therapy	Permethrin 1%; or Malathion 0.5%; or Lindane OR Ivermectin 200 mcg/kg PO ^{1 2 3 4}
Typical Pediatric Therapy	Permethrin 1%; or Malathion 0.5% OR Ivermectin 200 mcg/kg PO (> 15 kg body weight)
Clinical Hints	- Pruritus - Adult insects or nits may be visible - Body louse (rarely the head louse) transmits such diseases as epidemic typhus, trench fever and relapsing fever
Synonyms	Crab louse, Kopflaus, Lausebefall, Pediculose, Pediculosis corporis, Pediculus capitis, Pediculus corporis, Pediculus humanis corporis, Pedikulose, Pidocci, Pou de tete, Pthirus pubis. ICD9: 132 ICD10: B85

References

1. J Eur Acad Dermatol Venereol 2017 Sep ;31(9):1425-1428.
2. Pediatr Dermatol 2016 Sep ;33(5):466-72.
3. Pediatrics 2015 May ;135(5):e1355-65.
4. Clin Dermatol 2015 May-Jun;33(3):347-54.

Pentastomiasis - Linguatula

Agent	PARASITE - Pentastomid worm. <i>Linguatula serrata</i>
Reservoir	Herbivore
Vector	None
Vehicle	Meat (liver or lymph nodes of sheep/goat)
Incubation Period	Unknown
Diagnostic Tests	Identification of parasite in nasal discharge. Linguatula serrata adult: female - 80 to 120 mm; male - 18 to 25 mm
Typical Adult Therapy	No specific therapy available ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	- May follow ingestion of undercooked liver. - Pharyngeal or otic itching - Cough, rhinitis or nasopharyngitis
Synonyms	Linguatula, Marrara syndrome. ICD9: 128.8 ICD10: B83.8

References

1. [Med Mal Infect 2016 Sep ;46\(6\):269-75.](#)

Pericarditis - bacterial

Agent	BACTERIUM. <i>Streptococcus pneumoniae</i> , <i>Staphylococcus aureus</i> , et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Ultrasonography and cardiac imaging techniques. Culture of pericardial fluid (include mycobacterial culture).
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or anticipated pathogen. Drainage as indicated ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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- Case-fatality rate is 20%
Synonyms	Bacterial pericarditis, Pericardite. ICD9: 074.23,074.2,115.03,420 ICD10: I30

References

1. [Cardiol Clin 2017 Nov ;35\(4\):615-622.](#)
2. [JAMA 2015 Oct 13;314\(14\):1498-506.](#)

Perinephric abscess

Agent	BACTERIUM OR FUNGUS. <i>Escherichia coli</i> , other facultative gram negative bacilli, <i>Candida albicans</i> , et al
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Urine and blood culture. Renal imaging (CT, etc).
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or anticipated pathogen. Surgery as indicated ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	

References

1. Urologia 2014 Jul-Sep;81(3):144-7.
2. BJU Int 2011 Apr ;107 Suppl 3:20-3.

Perirectal abscess

Agent	BACTERIUM. Various (often mixed anaerobic and aerobic flora)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of drainage material.
Typical Adult Therapy	Surgical drainage and antibiotics effective against fecal flora ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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> .
Synonyms	

References

1. Med Clin North Am 2014 May ;98(3):609-23.
2. Clin Colon Rectal Surg 2007 May ;20(2):102-9.

Peritonitis - bacterial

Agent	BACTERIUM. Various (often mixed anaerobic and aerobic flora)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of blood and peritoneal fluid. Peritoneal fluid cell count may also be useful.
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or anticipated pathogens. Surgery as indicated ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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.
Synonyms	Acute peritonitis, Bacterial peritonitis, Peritonite. ICD9: 567 ICD10: K65

References

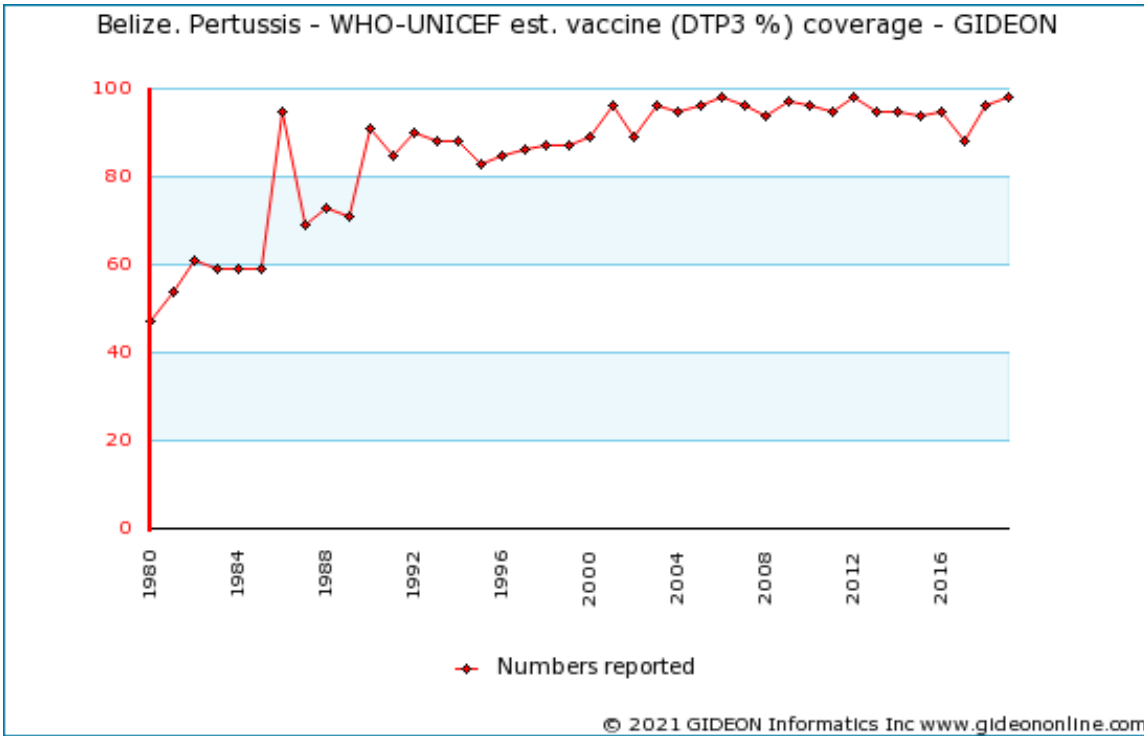
1. [BMJ 2018 06 18;361:k1407.](#)
2. [World J Emerg Surg 2017 ;12:29.](#)

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. Azithromycin 500 mg PO X 1, then 250 mg daily X 4 days OR Clarithromycin 500 mg PO BID X 7 days OR Sulfamethoxazole / Trimethoprim 800/160 mg PO BID X 14 days ¹
Typical Pediatric Therapy	Respiratory precautions: Azithromycin (age 6 mo): 10 mg/kg PO X 1, then 5 mg/kg daily X 4 days OR Clarithromycin 15/mg/kg PO BID X 7 days OR Sulfamethoxazole / Trimethoprim TMP 4 mg/kg PO BID X 14 days
Vaccine	DTaP vaccine DTP vaccine
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) - Case-fatality rate is 0.5%
Synonyms	Bordetella holmesii, Bordetella parapertussis, Bordetella pertussis, Chincofe, Chyncough, Coqueluche, Keichhusten, Keuchhusten, Kichhosta, Kikhosta, Kikhoste, Kinkhoest, Kinkhost, Kirkhosta, Parapertussis, Pertosse, Syndrome coqueluchoide, Tos convulsa, Tos farina, Tosse convulsa, Tussis convulsa, Whooping cough. ICD9: 033 ICD10: A37

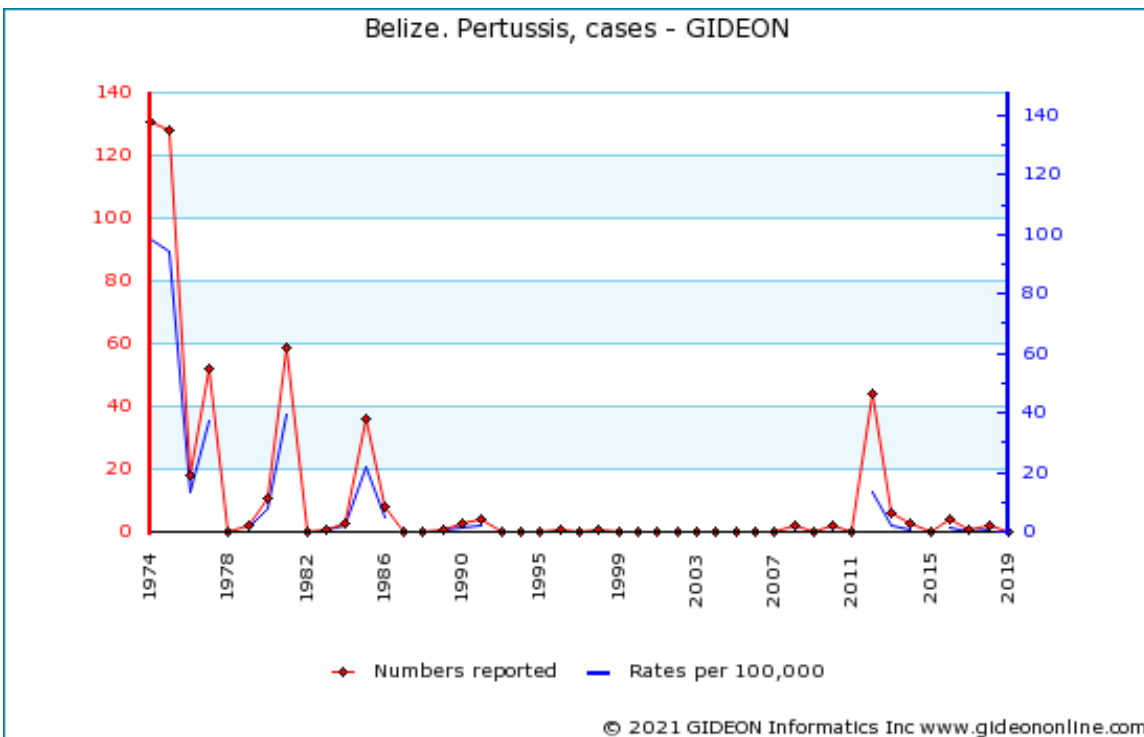
Pertussis in Belize

Vaccine Schedule:

BCG - birth
DT - 2,4,6, 18 months; 4 years
DTP - 18 months; 4 years
DTPHibHepB - 2,4,6 months
HepB - birth
IPV - 2,4,6,18 months; 4,12 years
MMR - 12, 18 months
OPV - 4,6,18 months; 4 years
Td - 1st contact; +6 months; +1, 12 years



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



Graph: Belize. Pertussis, cases

Notes:

1. No deaths were ascribed to pertussis in 1989, 1 in 1994, and 0 in 1995.

References

1. [MMWR Recomm Rep 2005 Dec 09;54\(RR-14\):1-16.](#)

Pharyngeal and cervical space infx.

Agent	BACTERIUM. <i>Streptococcus pyogenes</i> , mixed oral anaerobes, etc.
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Careful examination of region and X-ray (or CT scan). Smear and culture of pus if available.
Typical Adult Therapy	Surgical drainage and parenteral antibiotics effective against oral flora ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fever, painful swelling and displacement of the tongue, fauces and other intraoral structures - Dysphagia, dyspnea or jugular phlebitis may ensue in more virulent infections
Synonyms	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

References

1. Eur Arch Otorhinolaryngol 2009 Mar ;266(3):315-23.
2. Infect Dis Clin North Am 2007 Jun ;21(2):523-41, viii.

Pharyngitis - bacterial

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

References

1. [PLoS Negl Trop Dis 2018 03 ;12\(3\):e0006335.](#)

Philophthalmosis

Agent	PARASITE - Platyhelminthes, Trematoda. <i>Philophthalmus gralli</i> , <i>Ph. lucipetus</i> , <i>Ph. lacrimosus</i>
Reservoir	Snail
Vector	None
Vehicle	Aquatic plants
Incubation Period	Unknown Less than 24 hours in birds
Diagnostic Tests	Identification of excised worm Philophthalmus gralli adult length - 2.5 to 3.4 mm
Typical Adult Therapy	Removal of worm
Typical Pediatric Therapy	As for adult
Clinical Hints	- Conjunctivitis and lacrimation - Presence of an adult worm in the conjunctival sac
Synonyms	Oriental avian eye fluke, Oriental eye fluke, Philophthalmus. ICD9: 121.8 ICD10: b66.8

Pityriasis rosea

Agent	UNKNOWN. Human herpesvirus 7 has been implicated
Reservoir	Unknown
Vector	Unknown
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Clinical features.
Typical Adult Therapy	Supportive; ultraviolet B exposure is suggested Acyclovir 400 mg PO TID X 7 days has been used in severe cases ¹
Typical Pediatric Therapy	Supportive; ultraviolet B exposure is suggested
Clinical Hints	<ul style="list-style-type: none">- Herald patch followed by crops of pruritic, salmon-colored macules and papules- Systemic symptoms are rare- Illness resolves after 3 to 8 weeks
Synonyms	

References

1. [J Eur Acad Dermatol Venereol 2011 Jan ;25\(1\):24-6.](#)

Plesiomonas infection

Agent	BACTERIUM. <i>Plesiomonas shigelloides</i> A facultative gram-negative bacillus
Reservoir	Fish Animal, Soil, Reptile, Bird
Vector	None
Vehicle	Water, Food
Incubation Period	1d - 2d
Diagnostic Tests	Stool culture - alert laboratory when this organism is suspected. Nucleic acid amplification.
Typical Adult Therapy	Stool precautions. Ciprofloxacin 400 mg IV or 750 mg PO, BID Alternatives: Sulfamethoxazole / Trimethoprim, Amoxicillin / Clavulanate, Ceftriaxone ^{1 2 3}
Typical Pediatric Therapy	Stool precautions. Sulfamethoxazole / Trimethoprim, Amoxicillin / Clavulanate, Ceftriaxone
Clinical Hints	<ul style="list-style-type: none"> - In many cases, follows ingestion of shellfish or recent travel to developing countries - Fever, abdominal pain, vomiting and severe diarrhea - Symptoms often persist for 2 to 4 weeks
Synonyms	Plesiomonas shigelloides. ICD9: 008.8 ICD10: A04.8

References

1. Antimicrob Agents Chemother 1989 Sep ;33(9):1609-10. ;27(2):129-39.
2. Comp Immunol Microbiol Infect Dis 2004 Mar
3. J Antimicrob Chemother 2001 Dec ;48(6):803-11.

Pleurodynia

Agent	VIRUS - RNA. Picornaviridae: Coxsackievirus
Reservoir	Human
Vector	None
Vehicle	Air, Fecal-oral, Fomite, Respiratory or pharyngeal acquisition
Incubation Period	3d - 5d
Diagnostic Tests	Viral culture (throat, stool). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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.
Synonyms	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

Agent	FUNGUS. Ascomycota, Archiascomycetes, Pneumocystidales: <i>Pneumocystis jiroveci</i> (now distinct from <i>Pneumocystis carinii</i>)
Reservoir	Human
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	4d - 8w
Diagnostic Tests	Identification of organisms in induced sputum, bronchial washings, tissue. Serology. Nucleic acid amplification.
Typical Adult Therapy	Therapy: Sulfamethoxazole / Trimethoprim 25 mg/5 mg/kg QID X 14d. OR Pentamidine 4 mg/kg/d X 14d. OR Dapsone + Trimethoprim. OR Atovaquone OR Primaquine + Clindamycin Prophylaxis - similar, but at altered dosage. Dapsone also used. ^{1 2 3 4}
Typical Pediatric Therapy	Therapy: Sulfamethoxazole / Trimethoprim 25 mg/5 mg/kg QID X 14d. OR Pentamidine 4 mg/kg/d X 14d. OR Dapsone + Trimethoprim. OR Atovaquone OR Primaquine + Clindamycin Prophylaxis - similar, but at altered dosage.
Clinical Hints	- 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 after several days
Synonyms	PCP, Pneumocystis carinii, Pneumocystis jiroveci. ICD9: 136.3 ICD10: B59

References

1. 2018 01 ;
2. Clin Chest Med 2017 Sep ;38(3):465-477.
3. Expert Rev Anti Infect Ther 2017 09 ;15(9):873-892.
4. Open Forum Infect Dis 2020 May ;7(5):ofaa112.

Pneumonia - bacterial

Agent	BACTERIUM. <i>Streptococcus pneumoniae</i> , <i>Klebsiella pneumoniae</i> ssp <i>pneumoniae</i> , other aerobic and facultative gram negative bacilli, etc.
Reservoir	Human
Vector	None
Vehicle	Droplet, Endogenous, Respiratory or pharyngeal acquisition
Incubation Period	1d - 3d
Diagnostic Tests	Culture of sputum, blood. Analyze ("grade") sputum cytology to assess significance of culture.
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or suspected pathogen
Typical Pediatric Therapy	As for adult
Vaccine	Pneumococcal vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Bacterial pneumonia, Empiema, Empeem, Empeem, Empeema, Empeeme, 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

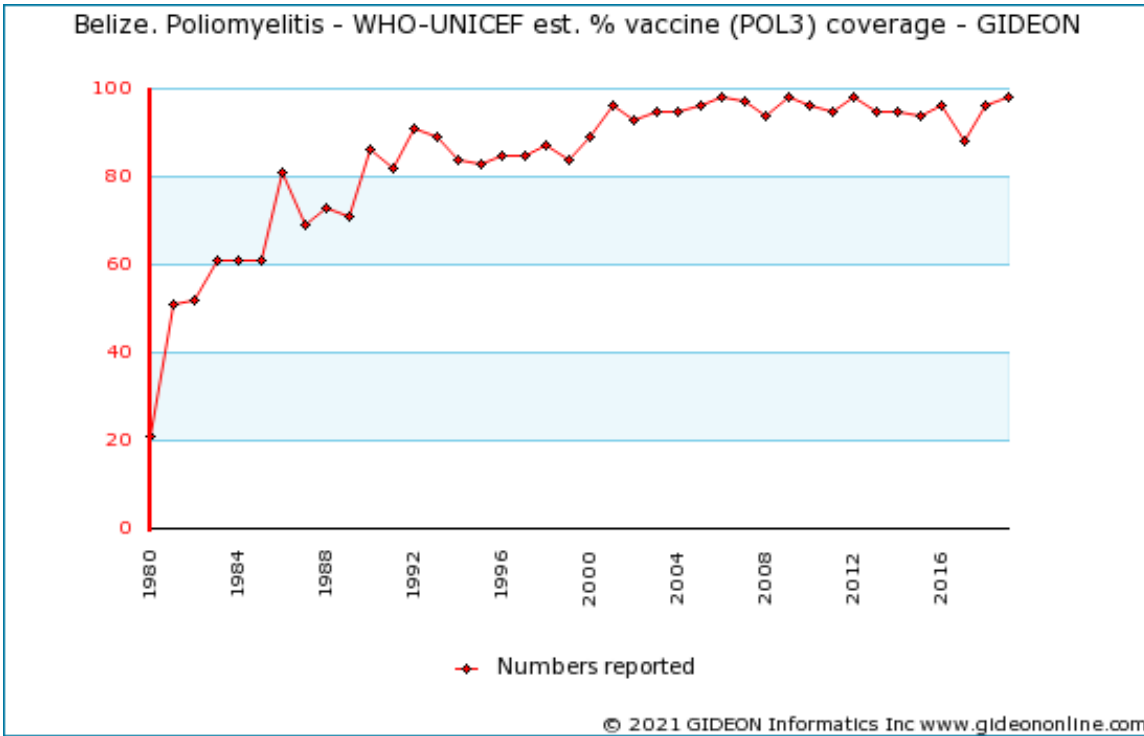
Agent	VIRUS - RNA. Picornaviridae, Picornavirus: Polio virus
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Dairy products, Food, Water, Fly, Respiratory or pharyngeal acquisition
Incubation Period	7d - 14d (range 3d - 35d)
Diagnostic Tests	Viral culture (pharynx, stool). Serology. Nucleic acid amplification.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

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

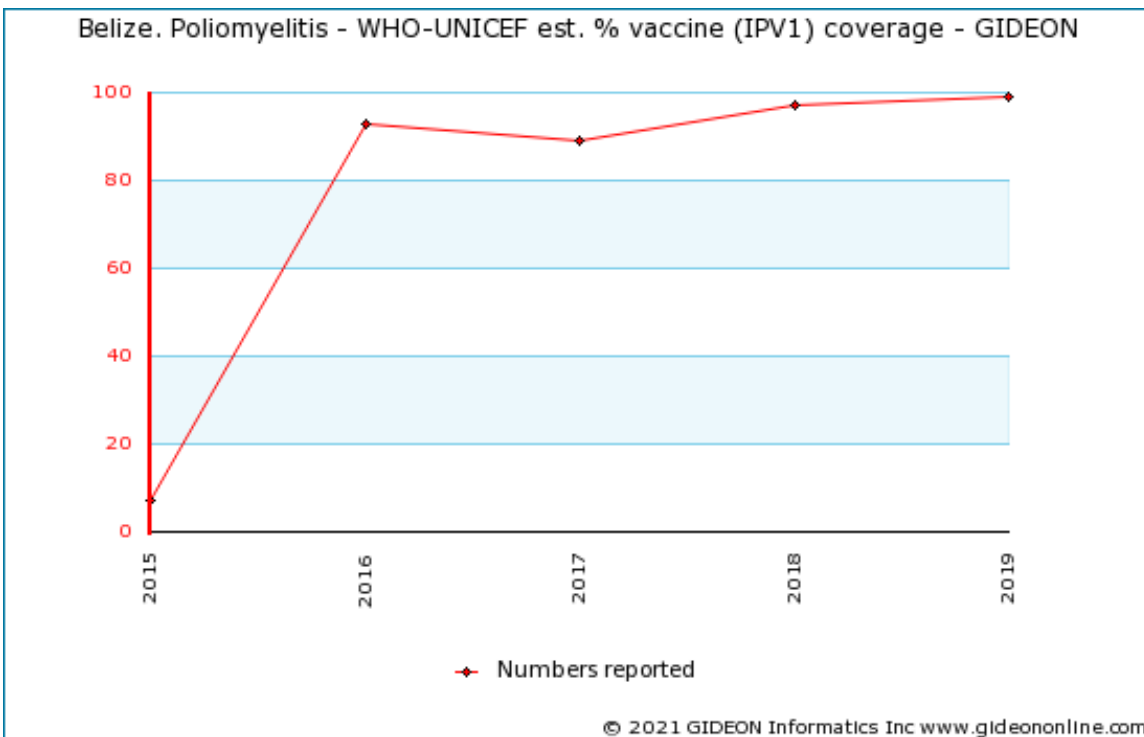
Poliomyelitis and acute flaccid paralysis in Belize

Vaccine Schedule:

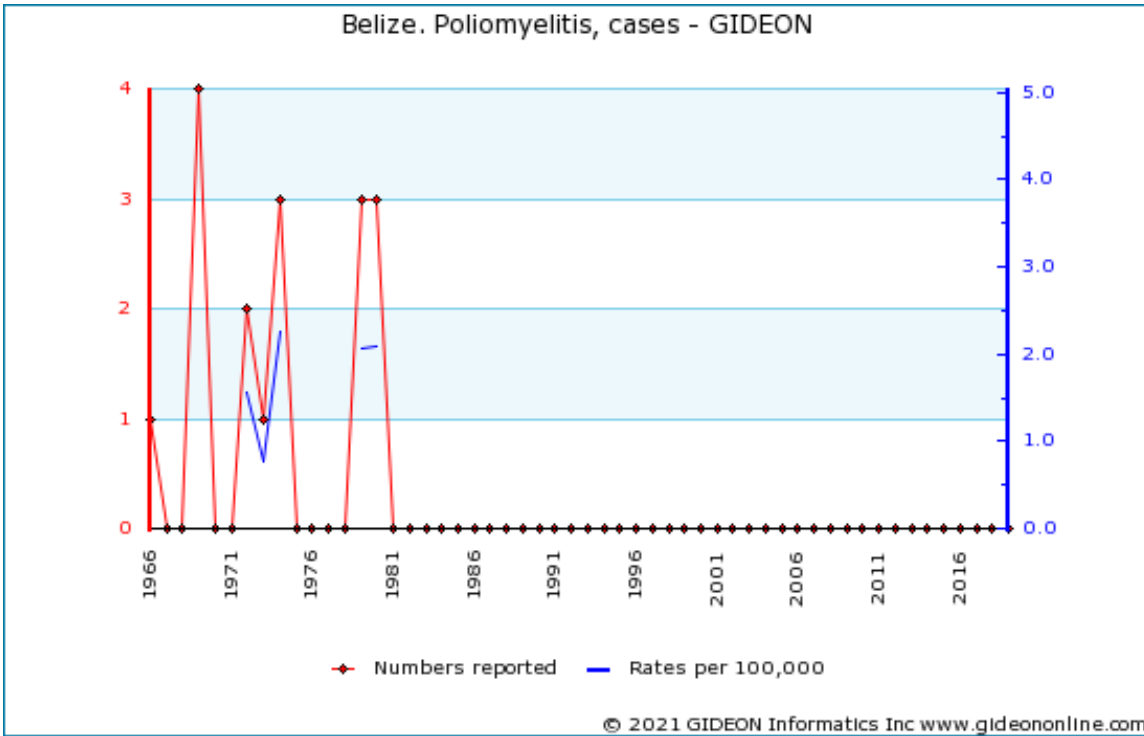
- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years



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



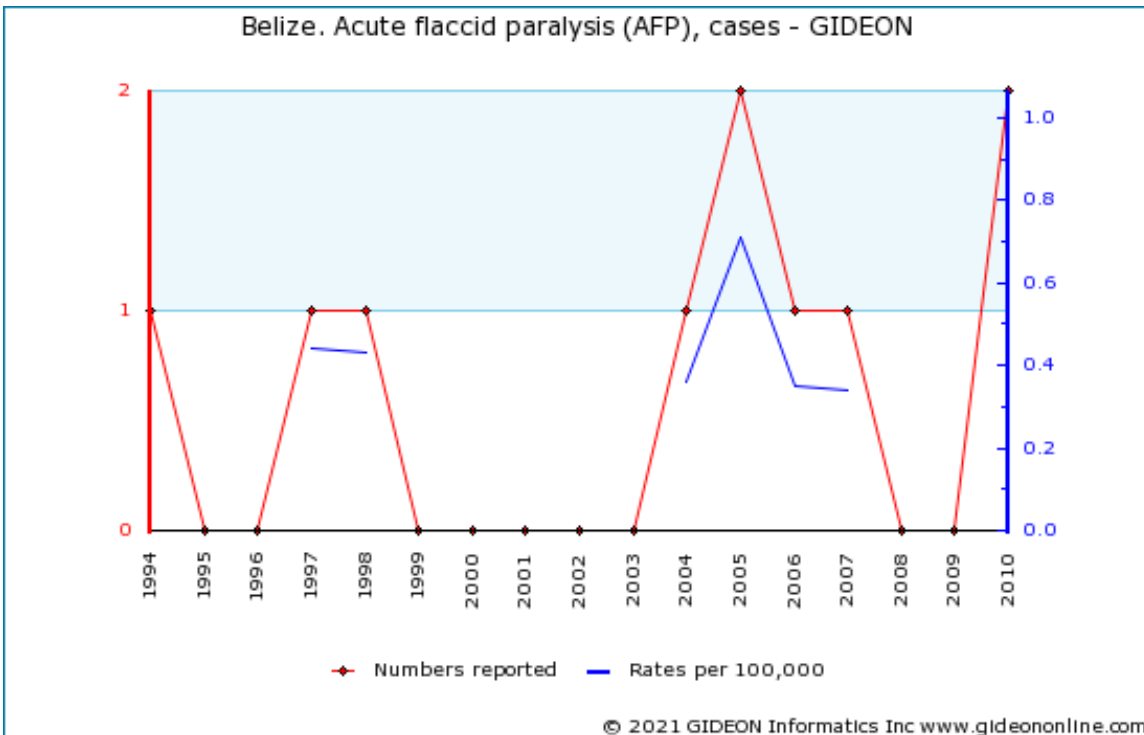
Graph: Belize. Poliomyelitis - WHO-UNICEF est. % vaccine (IPV1) coverage



Graph: Belize. Poliomyelitis, cases

Notes:

1. The last case of poliomyelitis in Belize was reported in 1981.



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

Notes:

Individual years:

1998 - January to April

Protothecosis and chlorellosis

Agent	ALGA. <i>Prototheca wickerhamii</i> ; rarely <i>Pr. zopfii</i> , <i>Pr. cutis</i> Achloric algae Chlorella spp. contain chloroplasts
Reservoir	Rare animal pathogens (cat, dog, cattle wild mammals).
Vector	None
Vehicle	Water, Sewage, Food, Skin trauma
Incubation Period	Unknown
Diagnostic Tests	Culture on fungal media. Biopsy. Nucleic acid amplification.
Typical Adult Therapy	Surgical excision. There are anecdotal reports of successful therapy with Amphotericin B , Ketoconazole and Itraconazole (latter 200 mg/day X 2 months) or Voriconazole ¹
Typical Pediatric Therapy	As for adult (Itraconazole 2 mg/kg/day X 2 months)
Clinical Hints	<ul style="list-style-type: none"> - May follow immune suppression or skin trauma - Dermal papules, plaques, eczematoid or ulcerated lesions - Olecranon bursitis is common - Systemic infection reported in some cases
Synonyms	Chlorellosis, Prototheca, Protothecosis. ICD9: 136.8 ICD10: B99

References

1. [Mycopathologia 2018 Aug 16](#);

Pseudocowpox

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

Pseudorabies virus infection

Agent	VIRUS - DNA Herpesviridae, Alphaherpesvirinae: Suid herpesvirus 1
Reservoir	Pig, Panther, Raccoon, Coyote, Cattle, Deer, Mink, Fox
Vector	None
Vehicle	Aerosol or secretions from animal
Incubation Period	3d-14d
Diagnostic Tests	Serology, Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Disease follows contact (ie, occupational injury) associated with pigs - Headache, fever, seizures, coma. - Lymphocytic pleocytosis of CSF - Severe pneumonia during hospitalization is common - Endophthalmitis or retinitis in some cases.
Synonyms	Aujeszky's disease, Suid herpesvirus type 1. ICD9: 078.89 ICD10: B33.8

Pyodermas (impetigo, abscess, etc)

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

Pyomyositis

Agent	BACTERIUM. Usually <i>Staphylococcus aureus</i>
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Ultrasonography or CT scan.
Typical Adult Therapy	Antibiotic directed at confirmed or suspected pathogen (usually <i>Staphylococcus aureus</i>); drainage ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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.
Synonyms	Purulent infectious myositis, Tropical pyomyositis. ICD9: 040.81 ICD10: M60.0

References

1. Clin Microbiol Rev 2008 Jul ;21(3):473-94.

Q-fever	
Agent	BACTERIUM. <i>Coxiella burnetii</i> Intracellular organism related to Rickettsiae
Reservoir	Cattle, Sheep, Goat, Bird, Fish, Rodent, Rabbit, Tick, Bandicoot, Marsupial, Dog, Cat, Horse
Vector	None
Vehicle	Air, Dust, Secretions, Dairy products, Respiratory or pharyngeal acquisition
Incubation Period	18d - 21d (range 4d - 40d)
Diagnostic Tests	Serology. Culture possible in specialized laboratories. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg BID X 2w OR Trimethoprim /Sulfamethoxazole 160/800 mg PO BID X 2w Add Hydroxychloroquine 600 mg per day if endocarditis ^{1 2 3}
Typical Pediatric Therapy	Age < 8 years: Trimethoprim /Sulfamethoxazole TMP 4-6 mg/kg PO BID X 2 weeks Age >= 8 years: Doxycycline 100 mg BID X 2 weeks
Vaccine	Q fever vaccine
Clinical Hints	<ul style="list-style-type: none"> - Proximity to farming or animals during 2 to 4 weeks preceding illness - Headache, myalgia, cough and hepatic dysfunction - Hepatosplenomegaly, "F.U.O." and endocarditis are encountered - Most infections resolve in 1 to 2 weeks - Case-fatality rate is 1.5%
Synonyms	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

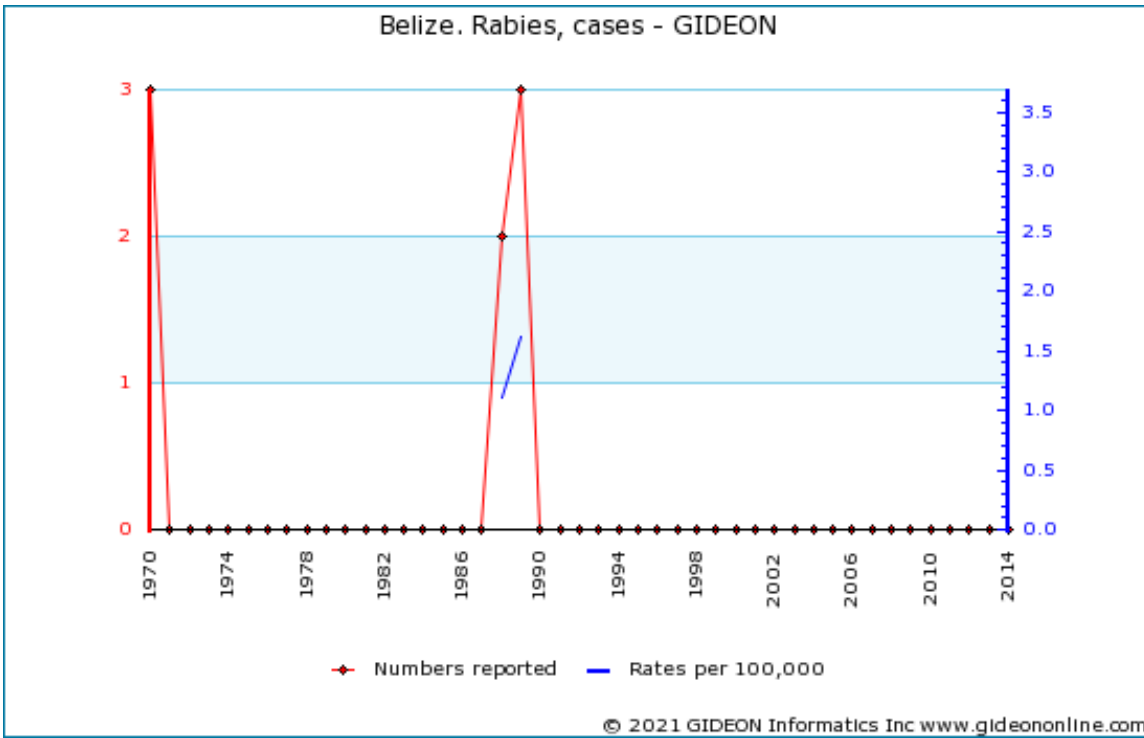
References

1. [Expert Rev Anti Infect Ther 2013 Nov ;11\(11\):1207-14.](#)
2. [J Infect 2015 Jun ;71 Suppl 1:S2-9.](#)
3. [Recent Pat Antiinfect Drug Discov 2014 ;9\(2\):104-11.](#)

Rabies

Agent	VIRUS - RNA. Rhabdoviridae, Mononegavirales, Lyssavirus: Rabies virus. Other human Lyssaviruses = Mokola, Duvenhage, European Bat (EBL)
Reservoir	Dog, Fox, Skunk, Jackal, Wolf, Cat, Raccoon, Mongoose, Bat, Rodent, Rabbit
Vector	None
Vehicle	Saliva, Bite, Transplants, Air (bat aerosol), Respiratory or pharyngeal acquisition
Incubation Period	1m - 3m (range 4d to 19 years !)
Diagnostic Tests	Viral culture & direct immunofluorescence of saliva, CSF, corneal smears. Serology. Nucleic acid amplification.
Typical Adult Therapy	Strict isolation Supportive. The Milwaukee protocol (prolonged deep sedation and support) was apparently successful in some cases, but has since been abandoned.. See Vaccines module for pre- and post-exposure schedules 1 2 3 4 5
Typical Pediatric Therapy	As for adult
Vaccine	Rabies immune globulin Rabies vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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%
Synonyms	Aravan, Australian bat lyssavirus, Ballina, BBLV, Bokeloh bat lyssavirus, Duvenhage, EBL, European bat 1 Lyssavirus, European bat 2 Lyssavirus, European bat Lyssavirus, Gannorow bat lyssavirus, Hondsdolheid, Hydrophobia, Ikoma lyssavirus, Irkut, Khujand, Kotolahti bat lyssavirus, Lleida bat lyssavirus, Lyssa, Matlo bat lyssavirus, Mokola, Pteropus lyssavirus, Rabia, Rage, Raiva, Saint Hubert's disease, Shimoni bat virus, Taiwan bat lyssavirus, Tollwut, West Caucasian bat, Wutkrankheit. ICD9: 071 ICD10: A82

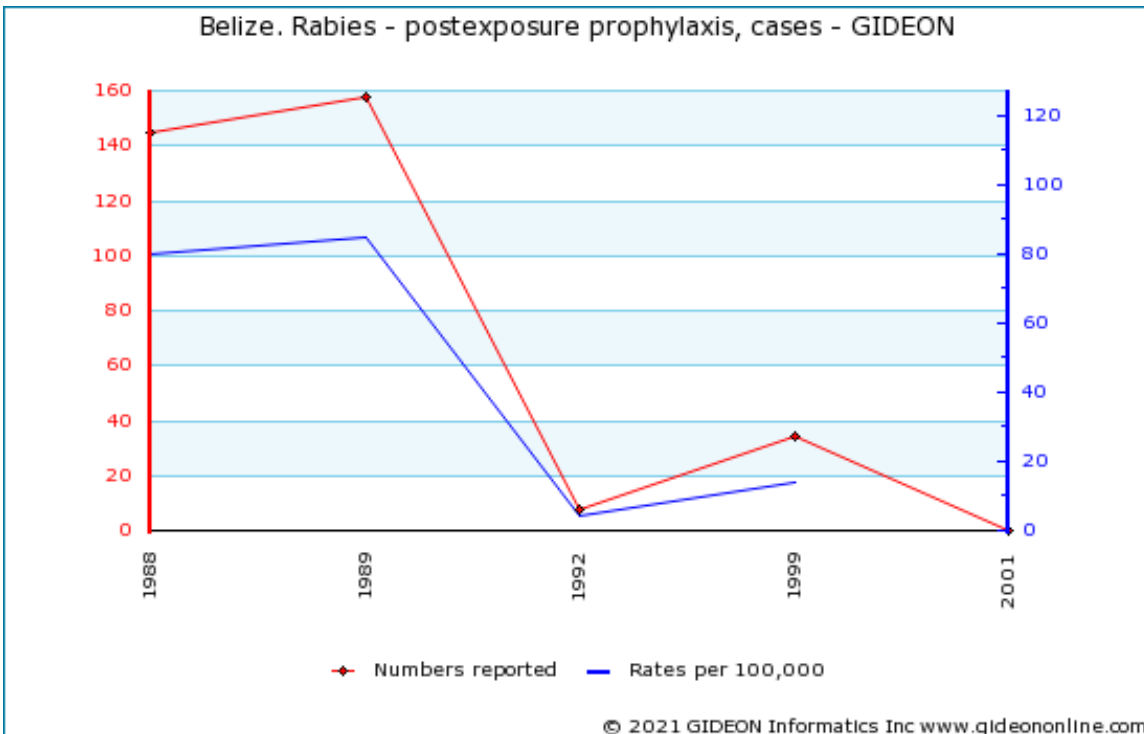
Rabies in Belize



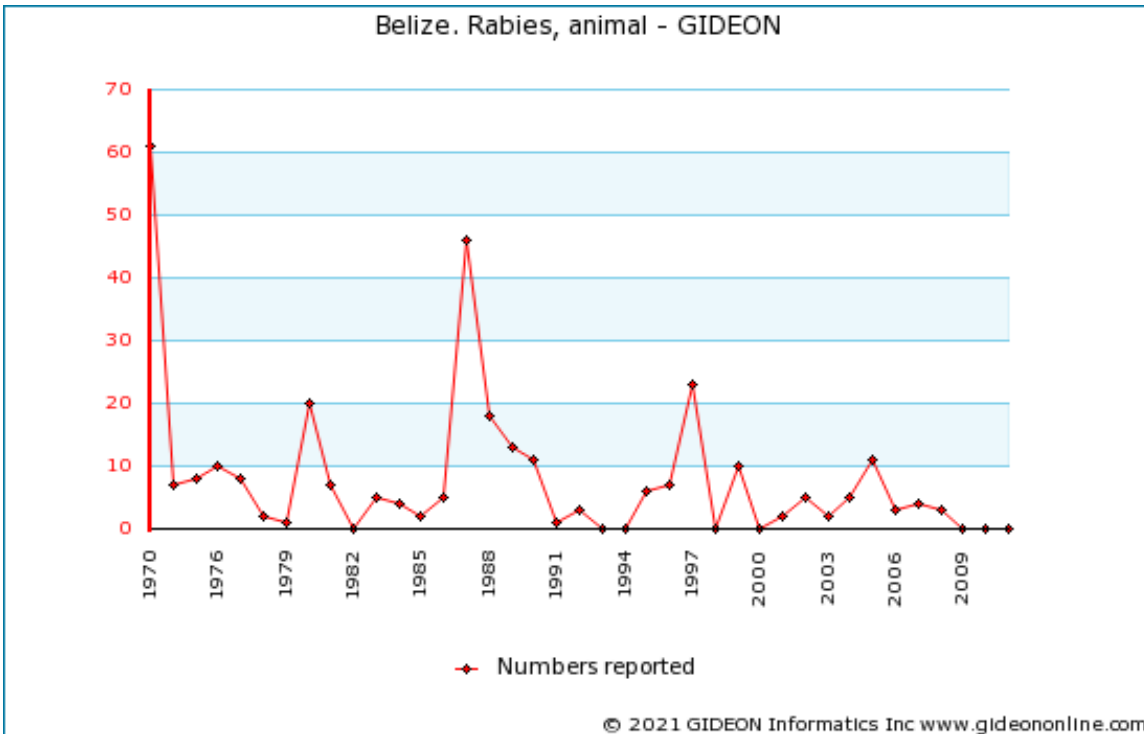
Graph: Belize. Rabies, cases

Notes:

1. 1989 - Two from dogs, and 1 from a cat.



Graph: Belize. Rabies - postexposure prophylaxis, cases



Graph: Belize. Rabies, animal

Notes:

Individual years:

1970 - Included ten farm animals.

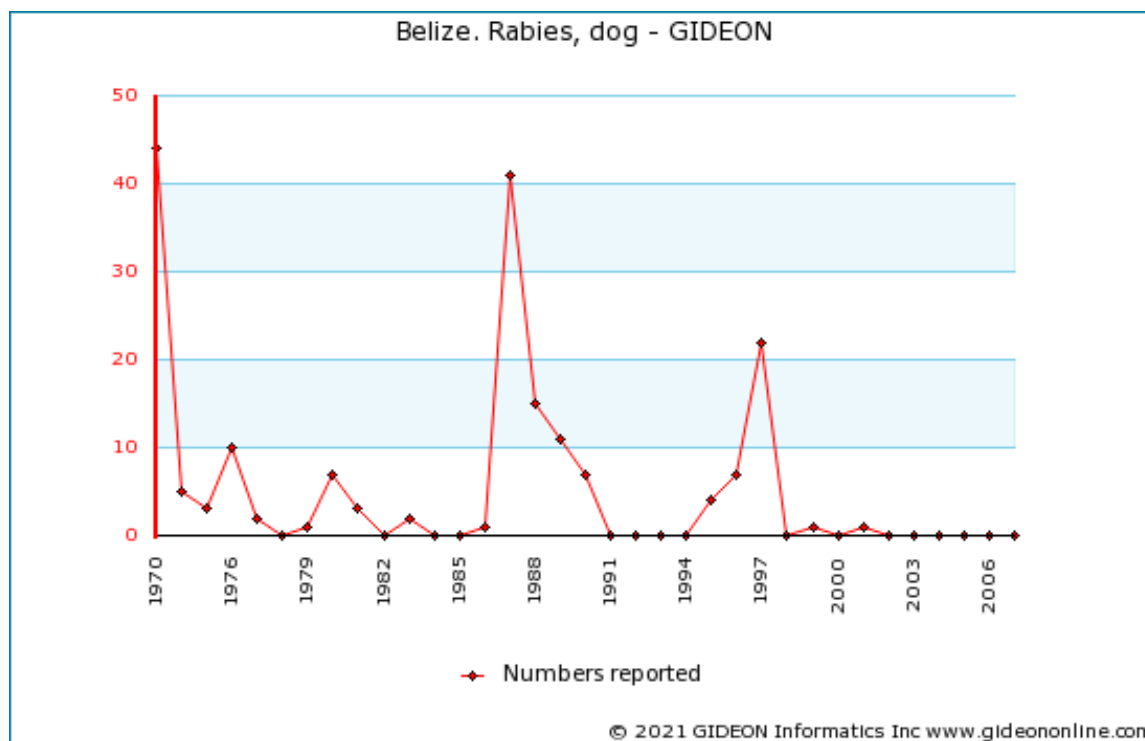
1999 - Seven ruminants and three foxes.

2002 - All ruminants

2004 - A rabid horse was reported in Cayo District - the first case of equine rabies reported in Belize since 1983. ⁶

2016 - 44 bovine cases (22 confirmed) were reported among 19 farms during January to November. ⁷

- 1998 to 2001 - No rabid bats were reported.
- 2003 to 2007 - No rabid bats were reported.



Graph: Belize. Rabies, dog

References

1. N Engl J Med 2005 Jun 16;352(24):2508-14.
2. Curr Infect Dis Rep 2009 Jul ;11(4):296-301.
3. Clin Infect Dis 2011 Sep ;53(6):572-4.
4. Curr Infect Dis Rep 2016 Nov ;18(11):38.
5. Am J Trop Med Hyg 2018 Nov 05;
6. ProMED <promedmail.org> archive: 20041030.2928
7. ProMED <promedmail.org> archive: 20161115.4629279

Rat bite fever - spirillary

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

Rat bite fever - streptobacillary

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

References

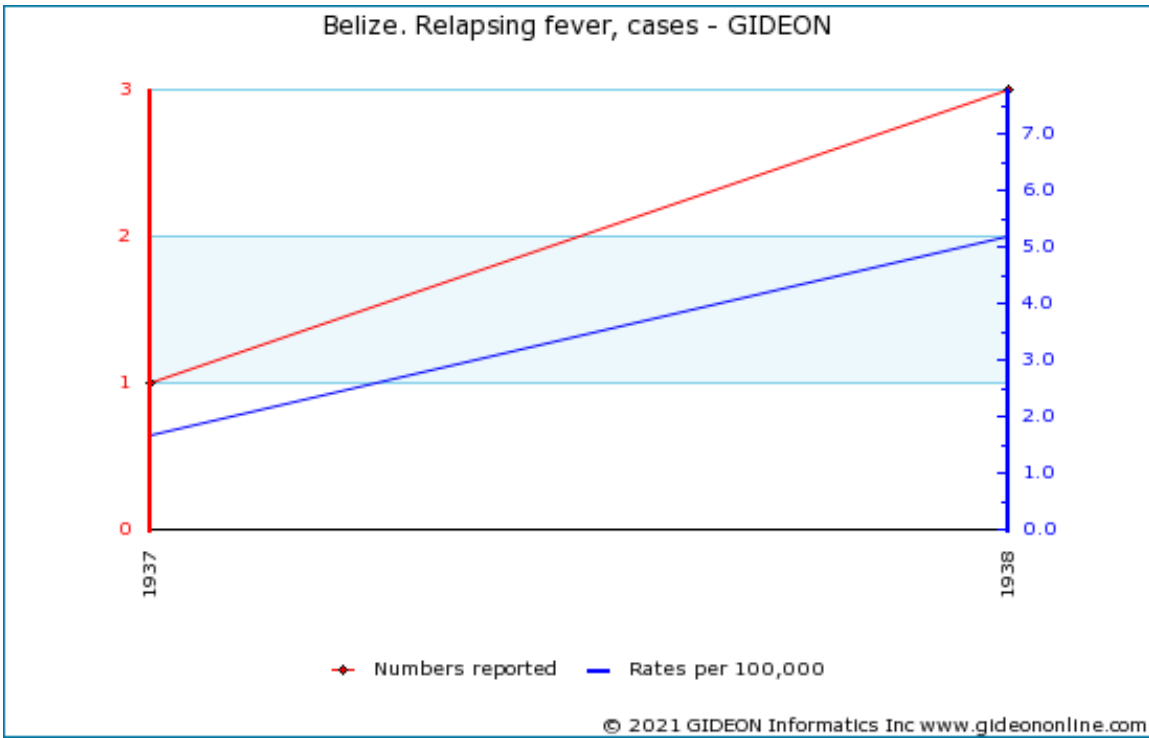
1. Clin Microbiol Rev 2007 Jan ;20(1):13-22.
2. Vet Microbiol 2009 Jan 13;133(3):211-28.

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).- less sensitive for <i>B. miyamotoi</i> infection Some species (<i>B. hermsii</i>) may grow in BSK II medium.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 10d. OR Ceftriaxone 2 g IV daily X 10d Louse-borne infection: A single dose of Procaine Penicillin G 800000 units IM OR Tetracycline 500 mg PO OR Erythromycin 500 mg PO may suffice for louse-borne infection ^{1 2 3}
Typical Pediatric Therapy	>8 years Doxycycline 100 mg PO BID X 10d OR Ceftriaxone 50-75 mg/kg/d IV X 10d OR Penicillin G 50-100000 units/kg IV QID X 10d
Clinical Hints	- Headache, myalgia, hepatosplenomegaly and rash - Relapsing illness Louse-borne (vs. tick borne) infection characterized by: - higher case-fatality rate - fewer relapses - 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 fainii</i> , Candidatus <i>Borrelia kalaharica</i> , Famine fever, Febbre recidiva, Febbre ricorrente, Febris recurrens, Fiebre recurrenente, Lauseruckfallfieber, Mianeh fever, Persistent syndrome, Ruckfall fieber, Tilbakefallsfeber, Tilbakefallsfever, Vagabond fever, Yellow famine fever, Yellow plague. ICD9: 087.9,087.0,087.1 ICD10: A68

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

Relapsing fever in Belize



Graph: Belize. Relapsing fever, cases

References

1. Curr Opin Infect Dis 2009 Oct ;22(5):443-9.
2. Clin Lab Med 2015 Dec ;35(4):867-82.
3. Infect Dis Clin North Am 2008 Sep ;22(3):449-68, viii.

Respiratory syncytial virus infection

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

References

1. Clin Infect Dis 2018 Sep 08;
2. Curr Opin Infect Dis 2017 Dec ;30(6):573-578.
3. Clin Ther 2018 Aug 01;

Respiratory viruses - miscellaneous

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

Reye's syndrome

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Clinical diagnosis.
Typical Adult Therapy	Management of increased intracranial pressure, fluid and electrolyte balance as appropriate ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- Follows viral infection; aspirin ingestion is often implicated.- Vomiting, lethargy, coma, seizures- Hepatomegaly, hypoglycemia and elevated blood ammonia concentration- Patients are usually anicteric
Synonyms	Reye syndrome. ICD9: 331.81 ICD10: G93.7

References

1. [Ann Neurol 1980 Jan ;7\(1\):2-4.](#)

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; NSAIDs Eradication of GAS colonization: Benzathine Penicillin G 1.2 million units IM once OR Penicillin V 500 mg PO BID X 10d OR Azithromycin 500 mg PO daily X 3d ^{1 2 3}
Typical Pediatric Therapy	Supportive; NSAIDs Eradication of GAS colonization: Benzathine Penicillin G 50000 units/kg IM once OR Penicillin V 25 mg/kg PO TID X 10d
Clinical Hints	<ul style="list-style-type: none"> - In most cases, illness follows overt pharyngitis, after 1 to 5 weeks - Migratory arthritis, fever, carditis, chorea - Subcutaneous nodules, erythema marginatum and leukocytosis - An attack of rheumatic fever will persist for approximately 3 months
Synonyms	Febbre reumatica. ICD9: 390,391 ICD10: I00,I01,I02

References

1. [Lancet 2018 07 14;392\(10142\):161-174.](#)
2. [PLoS Negl Trop Dis 2018 03 ;12\(3\):e0006335.](#)
3. [Curr Treat Options Cardiovasc Med 2017 Feb ;19\(2\):15.](#)

Rhinoscleroma and ozena

Agent	BACTERIUM. <i>Klebsiella pneumoniae</i> ssp <i>ozaenae</i> and <i>Klebsiella pneumoniae</i> ssp <i>rhinoscleromatis</i> Facultative gram-negative bacilli
Reservoir	Human
Vector	None
Vehicle	Secretions, Contact, Respiratory or pharyngeal acquisition
Incubation Period	Unknown
Diagnostic Tests	Culture. Biopsy. Nucleic acid amplification. Advise laboratory when this diagnosis is suspected.
Typical Adult Therapy	Rhinoscleroma: Ciprofloxacin 750 mg PO BID X 3 months Ozena: Ciprofloxacin 750 mg PO BID X 3 months or Sulfamethoxazole / Trimethoprim X 3 months ^{1 2}
Typical Pediatric Therapy	Ciprofloxacin or Sulfamethoxazole / Trimethoprim for 3 months. Amoxicillin /Clavulanate has been used successfully.
Clinical Hints	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
Synonyms	<i>Klebsiella pneumoniae</i> ssp <i>ozaenae</i> , Ozena, Respiratory scleroma, Rhinoscleroma. ICD9: 040.1 ICD10: J31.0

References

1. Arch Pathol Lab Med 2018 Aug 31;
2. Pediatr Infect Dis J 2014 Jul ;33(7):774-5.

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: Levofloxacin , Rifampin , Azithromycin , Ciprofloxacin , Imipenem , Vancomycin ^{1 2}
Typical Pediatric Therapy	Two drugs from the following, administered for two months: Levofloxacin , Rifampin , Azithromycin , Imipenem , Vancomycin
Clinical Hints	- 40% of patients recall recent contact with farm or farm animals - Most often presents as pleuropulmonary infection in an immune-suppressed individual
Synonyms	Rhodococcus. ICD9: 027.9 ICD10: A92.8

References

1. [Antimicrob Agents Chemother 2019 Jan ;63\(1\)](#)
2. [J Antimicrob Chemother 2014 Apr ;69\(4\):1045-9.](#)

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	Rotavirus vaccine
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 Belize

Rotavirus - WHO-UNICEF est. % (Rota1) vaccine coverage} was 69% in 2019.

Belize. Rotavirus infection, cases: None reported between 2006 and 2011

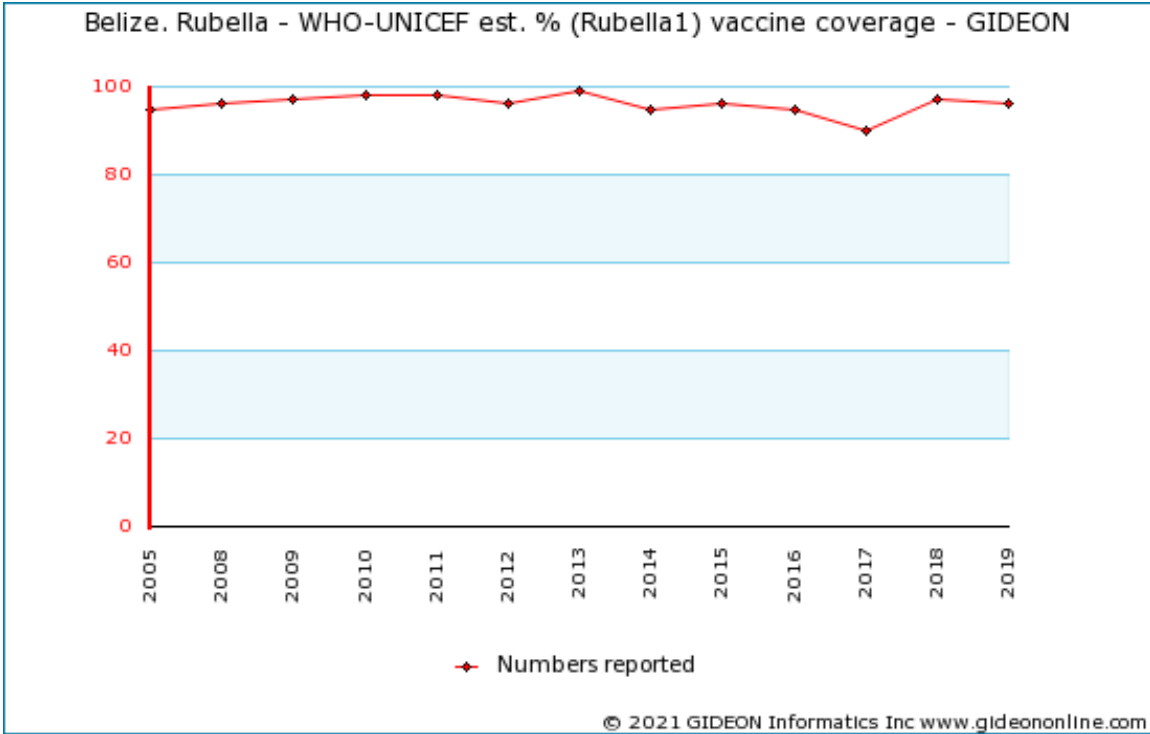
Rubella

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	Measles-Mumps-Rubella vaccine Measles-Rubella vaccine Rubella - Mumps vaccine Rubella vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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

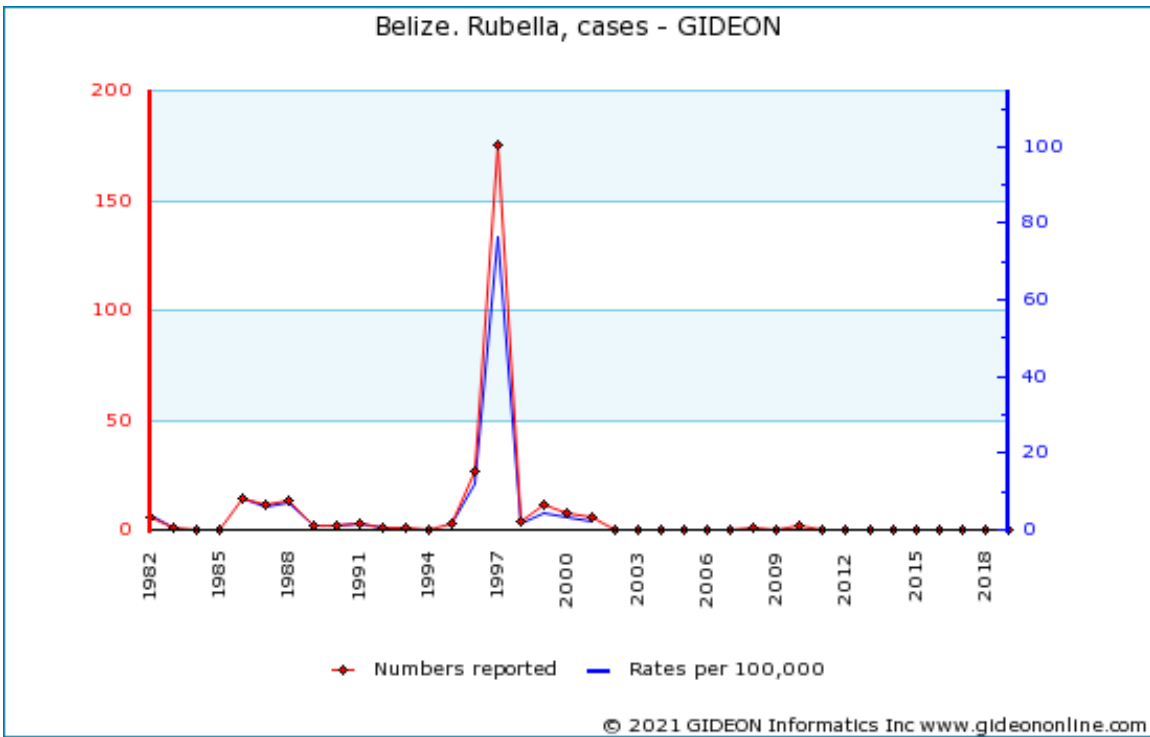
Rubella in Belize

Vaccine Schedule:

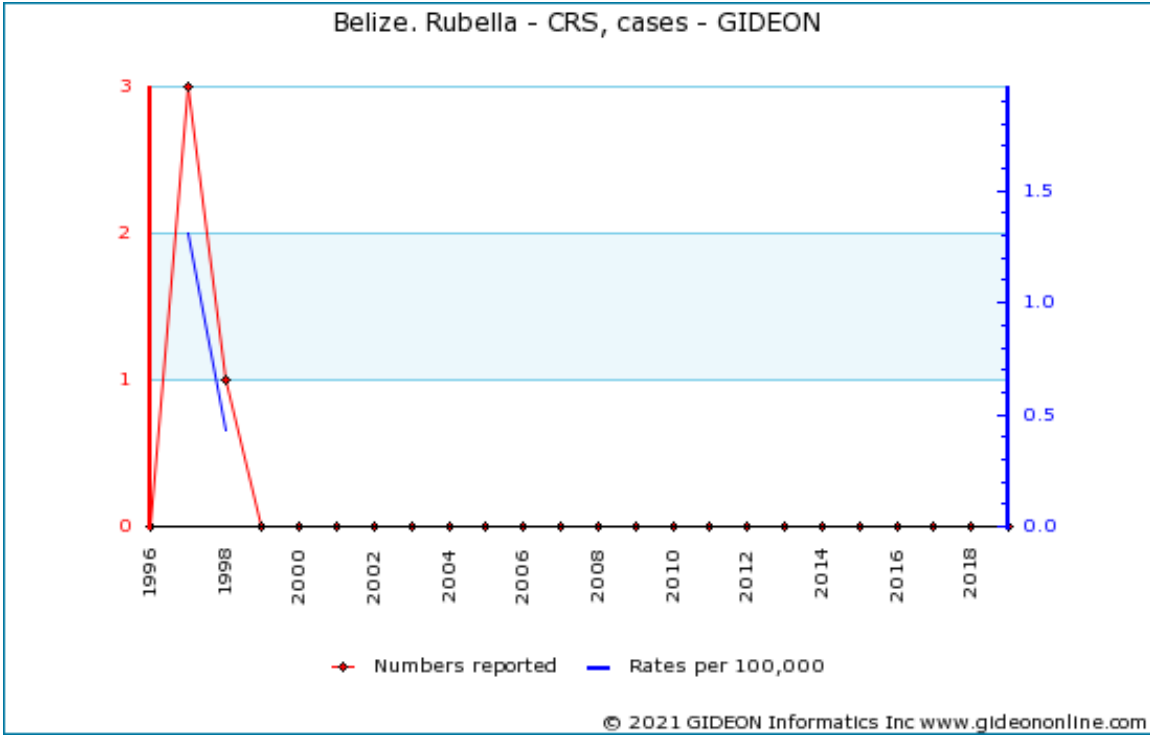
- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years



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



Graph: Belize. Rubella, cases

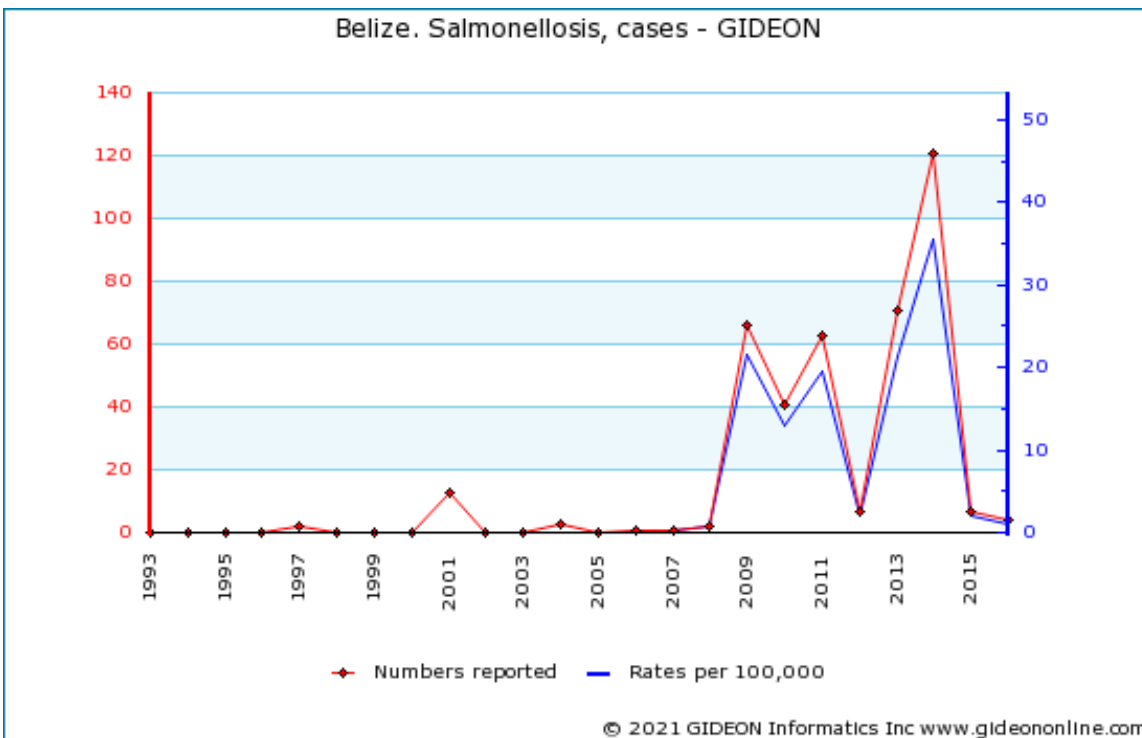


Graph: Belize. Rubella - CRS, cases

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 - 6d)
Diagnostic Tests	Culture (stool, blood, infected tissue). Serology.
Typical Adult Therapy	Stool precautions. Therapy not indicated for uncomplicated diarrhea; if necessary, treat per antibiogram ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Onset 12 to 24 hours after ingestion of eggs, meat, poultry - Fever, chills and watery diarrhea - 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 Belize



Graph: Belize. Salmonellosis, cases

References

1. [N Engl J Med 1969 Sep 18;281\(12\):636-40.](#)
2. [Cochrane Database Syst Rev 2000 ;\(2\):CD001167.](#)
3. [Expert Rev Anti Infect Ther 2016 ;14\(2\):193-206.](#)

Sarcocystosis

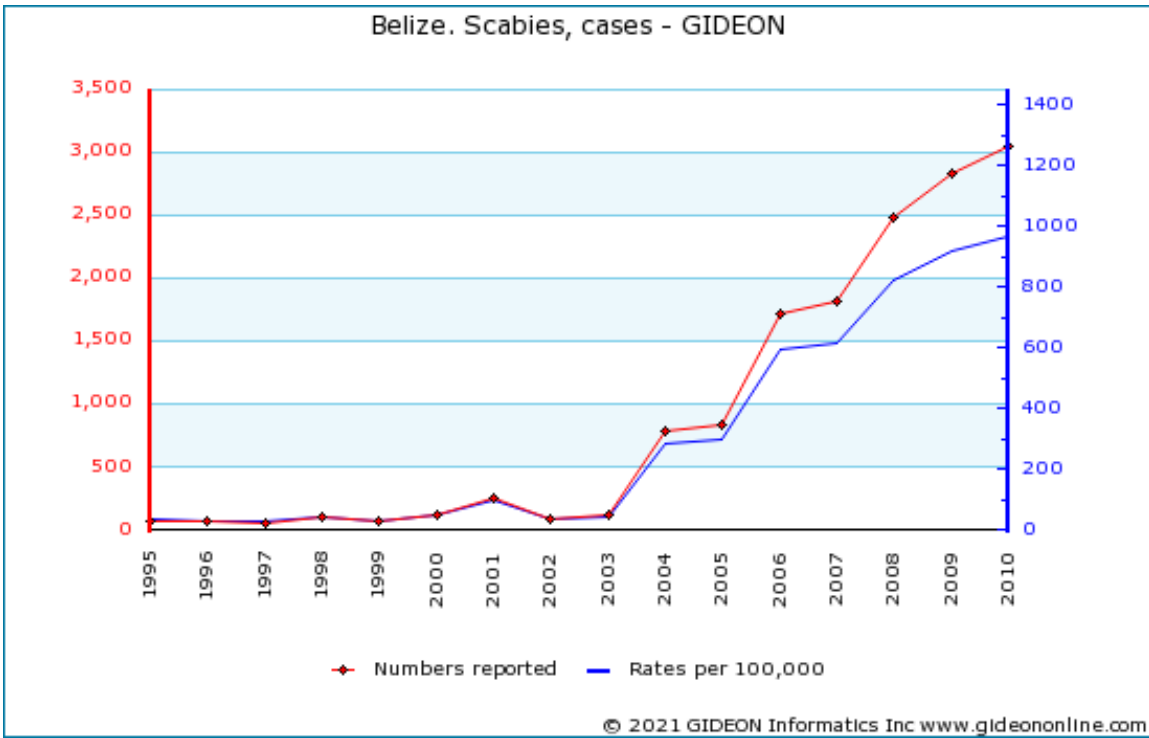
Agent	PARASITE - Protozoa. Coccidea, Eimeriida: <i>Sarcocystis bovihominis</i> or <i>S. suihominis</i>
Reservoir	Cattle, Pig
Vector	None
Vehicle	Meat, Water
Incubation Period	9d - 39d
Diagnostic Tests	Identification of cysts in stool.
Typical Adult Therapy	Supportive ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	- Diarrhea and abdominal pain of varying severity - Muscle pain and eosinophilia occasionally encountered
Synonyms	Isospora hominis, Kudoa, Sarcocystiasis, Sarcocystis, Sarcosporidiosis. ICD9: 136.5 ICD10: A07.8

References

1. [Clin Microbiol Rev 2015 Apr ;28\(2\):295-311.](#)

Scabies	
Agent	PARASITE - Arthropod. Arachnid, Acari (Mite), Sarcoptidae: <i>Sarcoptes scabiei</i>
Reservoir	Human
Vector	None
Vehicle	Contact, Sexual contact
Incubation Period	1d - 42d
Diagnostic Tests	Identification of mites in skin scrapings. Dermoscopy
Typical Adult Therapy	Isolation until treated. Towel, bedding precautions Permethrin 5% as single application OR Ivermectin 150 to 200 mcg/kg PO as single dose OR Ivermectin 1% as single application Second treatment course may be necessary ¹
Typical Pediatric Therapy	Permethrin 5% as single application OR Ivermectin 200 mcg/kg PO (> 15 kg body weight) OR Ivermectin 1% as single application
Clinical Hints	<ul style="list-style-type: none"> - Intensely pruritic papules, vesicles and burrows - Nodular and bullous lesions are also encountered - 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 and immunosuppressed individuals
Synonyms	Cheyletiella, Cheyletiella infestation, Escabiose, Escabiosis, Histiostomatid mites, Itch mite, Kraetze, Kratze, Mange, Ornithonyssus, Pyemotes, Sarcoptes scabiei, Sarna, Scabbia, Skabies, Tropical rat mite. ICD9: 133 ICD10: B86

Scabies in Belize



Graph: Belize. Scabies, cases

References

1. Indian J Dermatol Venereol Leprol 2012 Sep-Oct;78(5):605-10.

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 Penicillin G 1.2 million units IM as single dose ¹
Typical Pediatric Therapy	Benzathine Penicillin G : Weight <14kg: 300,000 units IM Weight 14 to 28kg: 600,000 units IM Weight >28kg: 1.2 million units IM
Clinical Hints	<ul style="list-style-type: none"> - Overt exudative pharyngitis - Appearance of a florid desquamative erythematous rash within 24 to 48 hours - Facial flushing and circum-oral pallor - Lingual desquamation ("strawberry tongue")
Synonyms	Escarlatina, Lanhousha, Scarlattina, Scharlach. ICD9: 034.1 ICD10: A38

References

1. Drug Ther Bull 2017 Sep ;55(9):102.

Septic arthritis

Agent	BACTERIUM or FUNGUS. Gram positive cocci most common; gram negative bacilli, gonococci, mycobacteria , fungi, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Smear and culture of joint fluid. Cytological and chemical analysis of joint fluid also useful.
Typical Adult Therapy	Antimicrobial agent(s) directed at known or likely pathogen ¹
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- Fever (60% to 80%) associated with swelling, erythema and tenderness- Usually involves a single joint, most commonly knee (elbow or ankle in children)- Mean fluid leukocyte count in acute bacterial forms is 50,000 per cu mm
Synonyms	

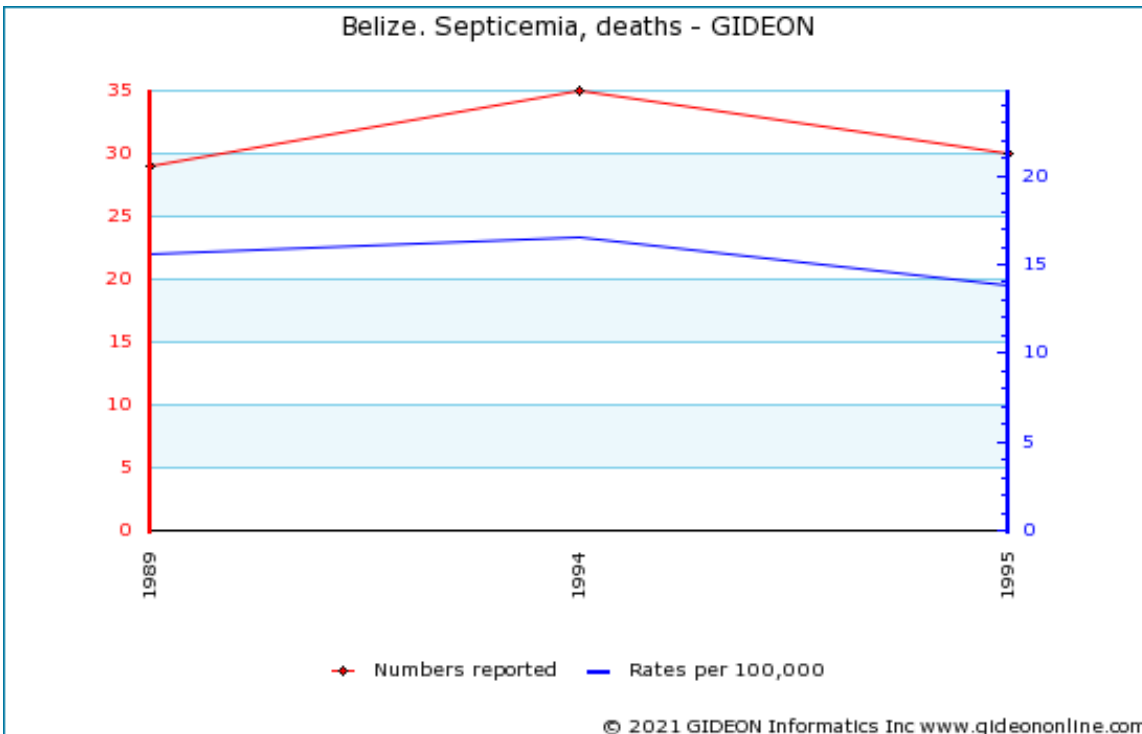
References

1. [Pediatric Health Med Ther 2017 ;8:65-68.](#)

Septicemia - bacterial

Agent	BACTERIUM. <i>Escherichia coli</i> , <i>Staphylococcus aureus</i> , facultative gram negative bacilli, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of blood and sepsis source.
Typical Adult Therapy	Antimicrobial agent(s) directed at known or likely pathogen
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Sepsis, Septicaemia, Septicemia, Septicemie, Septikemie, Settlicemia. ICD9: 036.2,036.3,038 ICD10: A40,A41

Septicemia - bacterial in Belize

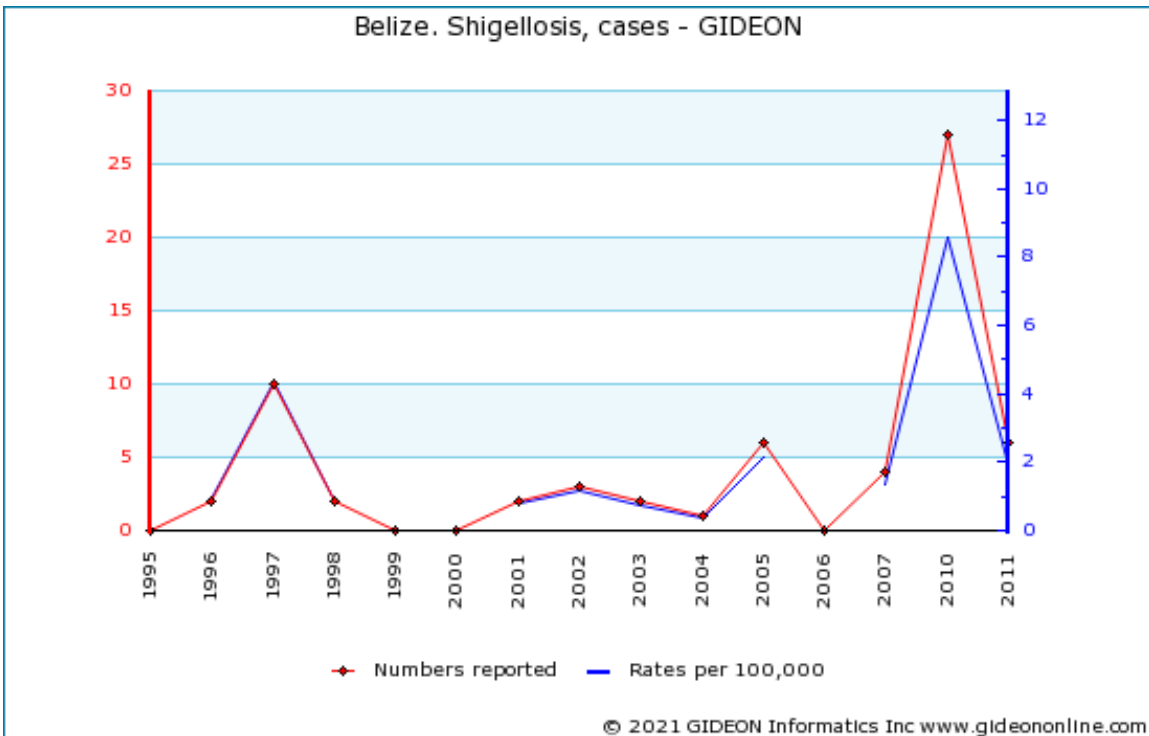


Graph: Belize. Septicemia, deaths

Shigellosis

Agent	BACTERIUM. <i>Shigella sonnei</i> , <i>Shigella flexneri</i> , <i>Shigella boydii</i> or <i>Shigella dysenteriae</i> A facultative gram-negative bacillus
Reservoir	Human, Non-human primate
Vector	None
Vehicle	Fecal-oral, Water, Dairy products, Fomite, Fly, Vegetables
Incubation Period	48h - 72h (range 7h - 1w)
Diagnostic Tests	Stool culture.
Typical Adult Therapy	Stool precautions. Choice of antimicrobial agent based on regional susceptibility patterns. Continue treatment for five days ^{1 2 3 4}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Bacillaire dysenterie, Bacillary dysentery, Dissenteria batterica, Dysenteria bacillaris, Leptospiroenerkrankung, Ruhr, Shigella, Shigellose, Shigelose, Ubertragbare Ruhr. ICD9: 004 ICD10: A03

Shigellosis in Belize



Graph: Belize. Shigellosis, cases

References

1. Paediatr Int Child Health 2018 Nov ;38(sup1):S50-S65.
2. Lancet 2018 02 24;391(10122):801-812.
3. Lancet Glob Health 2017 12 ;5(12):e1235-e1248.
4. Expert Rev Anti Infect Ther 2016 ;14(2):193-206.

Sinusitis

Agent	BACTERIUM. Various (<i>Haemophilus influenzae</i> & <i>Streptococcus pneumoniae</i> in most acute cases)
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Imaging techniques. Culture of sinus drainage.
Typical Adult Therapy	Amoxicillin / Clavulanate 2000 / 125 mg BID X 7 days Drainage as indicated Alternatives: Levofloxacin , Clindamycin , Cefuroxime , Cefdinir ¹
Typical Pediatric Therapy	Amoxicillin / Clavulanate 22.5 to 45 mg/kg (Amoxicillin) BID X 7 days Drainage as indicated Alternatives: Clindamycin , Cefuroxime , Cefdinir
Clinical Hints	<ul style="list-style-type: none"> - Sinusitis often follows upper respiratory infections - Headache, fever and local tenderness are common - The precise presentation varies with patient age and anatomic localization
Synonyms	Acute sinusitis, Mastoidite, Mastoiditis, Rhinosinusitis, Sinusite. ICD9: 473.9,383.0,461 ICD10: H70,J01

References

1. [Cochrane Database Syst Rev 2018 09 10;9:CD006089.](#)

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	Biosafety level 3. Culture and electron microscopy of skin lesions. Serology. Nucleic acid amplification.
Typical Adult Therapy	Strict isolation Tecovirimat 400 to 600 mg PO once daily X 14 days Cidofovir is effective in vitro ¹
Typical Pediatric Therapy	Strict isolation Tecovirimat 13 to <25 kg: 200 mg BID 25 to <40 kg: 400 mg BID
Vaccine	Smallpox + Monkeypox Smallpox vaccine
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, Kopfer, Smallpox, Vailo, Variola, Variola minor, Varioloid. ICD9: 050 ICD10: B03

Not currently endemic to any country.

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

Smallpox in Belize

Indigenous transmission ended in 1939.

References

1. [N Engl J Med 2018 07 05;379\(1\):44-53.](#)

Sparganosis	
Agent	PARASITE - Platyhelminthes, Cestoda. Pseudophyllidea, Diphyllbothriidae: <i>Spirometra</i> spp.
Reservoir	Copepod (to bird, amphibian or reptile)
Vector	None
Vehicle	Water (ingested copepod), Undercooked reptile or amphibian meat, Contact (ie, conjunctiva)
Incubation Period	20d - 3y
Diagnostic Tests	Identification of parasite in tissue. Spirometra length - 2 mm to 10 cm
Typical Adult Therapy	Excision Praziquantel 40 mg/kg PO TID X 2 days Praziquantel 25 mg/kg TID X 10 days has been used for cerebral sparganosis ^{1 2}
Typical Pediatric Therapy	Excision Praziquantel 50 mg/kg PO TID X 2 days
Clinical Hints	- Painful or pruritic nodules and eosinophilia - Worm present in skin, eye, brain or other foci - Parasite may survive for over five years
Synonyms	Spirometra. ICD9: 123.5 ICD10: B70.1

References

1. [Lancet Infect Dis 2015 Oct ;15\(10\):1226-1235.](#)
2. [PLoS Negl Trop Dis 2019 Jan ;13\(1\):e0007018.](#)

Sporotrichosis

Agent	FUNGUS. Ascomycota, Euascomycetes, Ophiostomatales: <i>Sporothrix schenckii</i> , <i>S. brasiliensis</i> and <i>S. globosa</i> A dimorphic dematiaceous fungus
Reservoir	Soil, Vegetation, Wood
Vector	None
Vehicle	Trauma, Contact, Air, Respiratory or pharyngeal acquisition
Incubation Period	1w - 3m
Diagnostic Tests	Fungal culture. Serologic tests available in some centers.
Typical Adult Therapy	Itraconazole 100 to 200 mg PO daily X 3 to 6 months. OR Fluconazole 400 mg PO daily X 6 months. OR Potassium iodide 1 to 5 ml PO TID X 3 to 6 months OR Liposomal Amphotericin B (severe disease) 3-5 mg/kg/d IV, then Itraconazole 200 mg PO BID for at least 1 year ¹
Typical Pediatric Therapy	Itraconazole 2 mg/kg PO daily X 3 to 6 months. OR Fluconazole 3 mg/kg PO daily X 6 months. OR Potassium iodide 1-2 drops/year age (maximum 30-40 drops) PO TID X 3 to 6 months OR Liposomal Amphotericin B (severe disease) 3-5 mg/kg/d IV, then Itraconazole 3-5 mg/kg PO BID for at least 1 year
Clinical Hints	<ul style="list-style-type: none"> - Recent contact with flowers, thorns, trees or other plant material (occasionally cats) - Draining nodules which appear along the course of lymphatics - Eye, brain, testis, bone and other tissues may be involved
Synonyms	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

References

1. [Clin Infect Dis 2007 Nov 15;45\(10\):1255-65.](#)

Spotted fevers - New World

Agent	BACTERIUM. <i>Rickettsia rickettsii</i> <i>Rickettsia parkeri</i> , <i>Rickettsia amblyommii</i> , et al associated with similar illness
Reservoir	Tick, Dog, Rodent
Vector	Tick (<i>Dermacentor</i> , <i>Amblyomma</i>)
Vehicle	None
Incubation Period	5d - 7d (range 2d - 14d)
Diagnostic Tests	Serology. Direct immunofluorescence or culture of skin lesions. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 7d. OR Chloramphenicol 500 mg PO QID X7d ¹
Typical Pediatric Therapy	Doxycycline 2 mg/kg PO BID X 7d (maximum 200 mg/day). OR Chloramphenicol 10 mg/kg PO QID X 7d
Clinical Hints	<ul style="list-style-type: none"> - May be history of a tick bite or dog contact during the preceding 1 to 2 weeks - Headache, myalgia, vomiting and a maculopapular or petechial rash (primarily involving the extremities) - Rash is absent in 5% - Case-fatality rate (untreated) is 25%
Synonyms	American spotted fever, Brazilian spotted fever, Bullis fever, Febre maculosa brasileira, Fiebre manchada, Lone star fever, Minas Gerais exanthematic typhus, Pacific Coast fever, <i>Rickettsia</i> 364D, <i>Rickettsia amblyommatis</i> , <i>Rickettsia amblyommii</i> , <i>Rickettsia bellii</i> , <i>Rickettsia canadensis</i> , <i>Rickettsia montanensis</i> , <i>Rickettsia parkeri</i> , <i>Rickettsia philipii</i> , <i>Rickettsia rickettsii</i> , <i>Rickettsia texiana</i> , <i>Rickettsia</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 Belize, imported, expatriate or other presentations of the disease have been associated with this country.

Spotted fevers - New World in Belize

Seroprevalence surveys

Years	Study Group	%	Notes
2009 - 2011	pregnant women	54	54.0% of pregnant women (Spotted fever-group rickettsiae, 2009 to 2011) ²

References

1. [Expert Rev Anti Infect Ther 2012 Dec ;10\(12\):1425-37.](#)
2. [Am J Trop Med Hyg 2014 Sep ;91\(3\):642-4.](#)

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	Biosafety level 2. Viral culture (blood, brain tissue, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - Most cases encountered during late summer - Headache, meningitis, encephalitis - Sore throat, myalgia, vomiting and photophobia - Infection resolves in 5 to 10 days - Case-fatality rate 8% (over 25% above age 65)
Synonyms	American encephalitis, Modoc, Rio Bravo, SLE. ICD9: 062.3 ICD10: A83.3

Staphylococcal food poisoning

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

References

1. [World J Pediatr 2018 04 ;14\(2\):116-120.](#)
2. [J Infect 2015 Jun ;71 Suppl 1:S76-9.](#)

Staphylococcal scalded skin syndrome

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

Streptococcus suis infection

Agent	BACTERIUM. <i>Streptococcus suis</i> I and <i>Streptococcus suis</i> II A facultative gram-positive coccus
Reservoir	Pig
Vector	None
Vehicle	Air, Secretions, Meat, Wound, Contact
Incubation Period	Unknown. Probably hours to few days
Diagnostic Tests	Culture of blood, tissue, body fluids
Typical Adult Therapy	Systemic antibiotic. Usually susceptible in vitro to Penicillin, Amoxicillin, Chloramphenicol and Gentamicin ^{1 2}
Typical Pediatric Therapy	Systemic antibiotic
Clinical Hints	- Disease appears hours to a few days after contact with pigs or pig products - Severe multisystem illness, hemorrhagic diatheses, deafness or meningitis
Synonyms	Streptococcus suis. ICD9: 027.8 ICD10: A48.8

References

1. [Vet Microbiol 2018 Aug ;222:109-113.](#)
2. [Vet Microbiol 2016 Oct 15;194:5-10.](#)

Strongyloidiasis	
Agent	PARASITE - Nematoda. Secernentea: <i>Strongyloides stercoralis</i> (<i>Strongyloides fulleborni</i> is occasionally implicated in systemic disease)
Reservoir	Human, Dog, Monkey (for <i>Strongyloides fulleborni</i>)
Vector	None
Vehicle	Skin contact, Soil, Feces, Autoinfection, Sexual contact
Incubation Period	14d - 30d
Diagnostic Tests	Identification of larvae (or ova, for <i>Strongyloides fulleborni</i>) in stool or duodenal aspirate. Serology.
Typical Adult Therapy	Ivermectin 200 micrograms/kg/d PO daily X 2d OR Albendazole 400 mg/d X 3d (7 days for hyperinfection syndrome) OR Moxidectin 8 mg PO once ^{1 2}
Typical Pediatric Therapy	Ivermectin 200 micrograms/kg/d PO daily X 2d OR Albendazole 200 mg/d X 3d (7 days for hyperinfection syndrome) OR Moxidectin (age >12 years) 8 mg PO once
Clinical Hints	<ul style="list-style-type: none"> - Diarrhea - Gluteal or perineal pruritus and rash - Eosinophilia often present - Widespread dissemination encountered among immune-suppressed patients (case-fatality rate for this complication = 80%)
Synonyms	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

References

1. [Clin Infect Dis 2017 Jul 15;65\(2\):276-281.](#)
2. [Int J Antimicrob Agents 2008 Jan ;31\(1\):46-9.](#)

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 ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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	

References

1. [Infection 2018 Dec ;46\(6\):785-792.](#)
2. [World Neurosurg 2016 Mar ;87:663.e1-8.](#)

Suppurative parotitis

Agent	BACTERIUM. Most commonly <i>Staphylococcus aureus</i>
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Clinical features (local swelling and purulent discharge from salivary ducts). Stain and culture of discharge.
Typical Adult Therapy	Surgical drainage and aggressive parenteral antistaphylococcal therapy ^{1 2 3}
Typical Pediatric Therapy	As for adult
Clinical Hints	- Consider in patient with unexplained fever in the setting of malnutrition, dehydration and obtundation - Local swelling and discharge of pus from salivary duct
Synonyms	Parotitis, bacterial. ICD9: 527.2 ICD10: K11.3

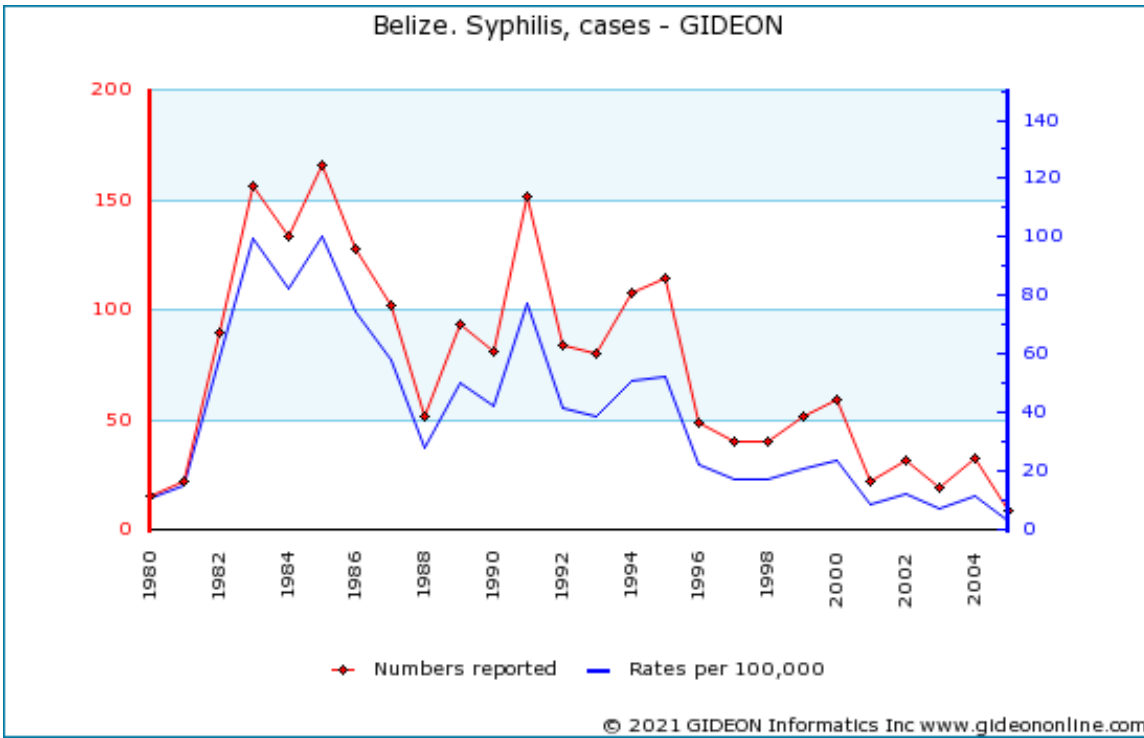
References

1. Eur Arch Otorhinolaryngol 2009 Mar ;266(3):315-23.
2. Infect Dis Clin North Am 2007 Jun ;21(2):523-41, viii.
3. J Craniofac Surg 2003 Jan ;14(1):37-40.

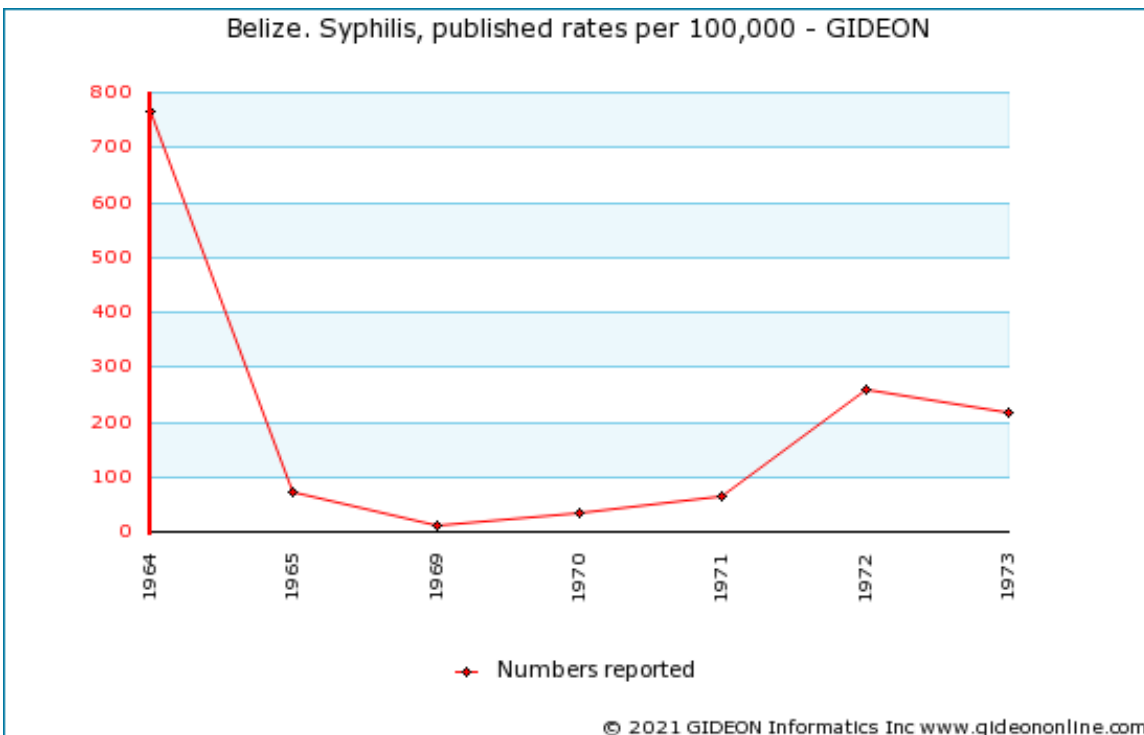
Syphilis

Agent	BACTERIUM. <i>Treponema pallidum</i> subsp. <i>pallidum</i> A microaerophilic gram-negative spirochete
Reservoir	Human
Vector	None
Vehicle	Sexual contact, Secretions, Respiratory or pharyngeal acquisition
Incubation Period	2w - 4w (range 10d - >8w)
Diagnostic Tests	Dark field microscopy (chancre). VDRL confirmed by antitreponemal test (FTA, MHTP). Nucleic acid amplification.
Typical Adult Therapy	Primary, secondary or early (< 1 year) latent: Benzathine Penicillin G 2.4 million units IM Other stages: Repeat dosage at one and two weeks Alternatives: Tetracycline , Ceftriaxone ^{1 2 3}
Typical Pediatric Therapy	Primary, secondary or early (< 1 year) latent: Benzathine Penicillin G : Weight <14 kg: 600,000u IM Weight 14 to 28 kg: 1,200,000u IM Other stages: Repeat dosage at one and two weeks
Clinical Hints	- 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)
Synonyms	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 Belize



Graph: Belize. Syphilis, cases



Graph: Belize. Syphilis, published rates per 100,000

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1993	Multiple locations	pregnant women	2.8	2.8% of pregnant women in 6 districts (1993) ⁴
2004		pregnant women	1.5	1.5% of pregnant women (PAHO statistic) (2004)

References

1. Emerg Med Clin North Am 2018 Nov ;36(4):767-776.
2. 2016 ;
3. Clin Infect Dis 2015 Dec 15;61 Suppl 8:S818-36.
4. Am J Trop Med Hyg 1997 Mar ;56(3):285-90.

Taeniasis

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Taenia solium</i> & <i>T. saginata</i> (other species occasionally encountered)
Reservoir	Cattle, Pig
Vector	None
Vehicle	Meat
Incubation Period	6w - 14w
Diagnostic Tests	Identification of ova or proglottids in feces.
Typical Adult Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once ^{1 2 3}
Typical Pediatric Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide : weight 11-34 kg - 1 g PO as single dose weight >34 kg - 1.5 g PO as single dose
Clinical Hints	- 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
Synonyms	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

References

1. Risk Manag Healthc Policy 2017 ;10:107-116.
2. Infect Disord Drug Targets 2010 Oct ;10(5):313-21.
3. Curr Opin Infect Dis 2007 Oct ;20(5):524-32.

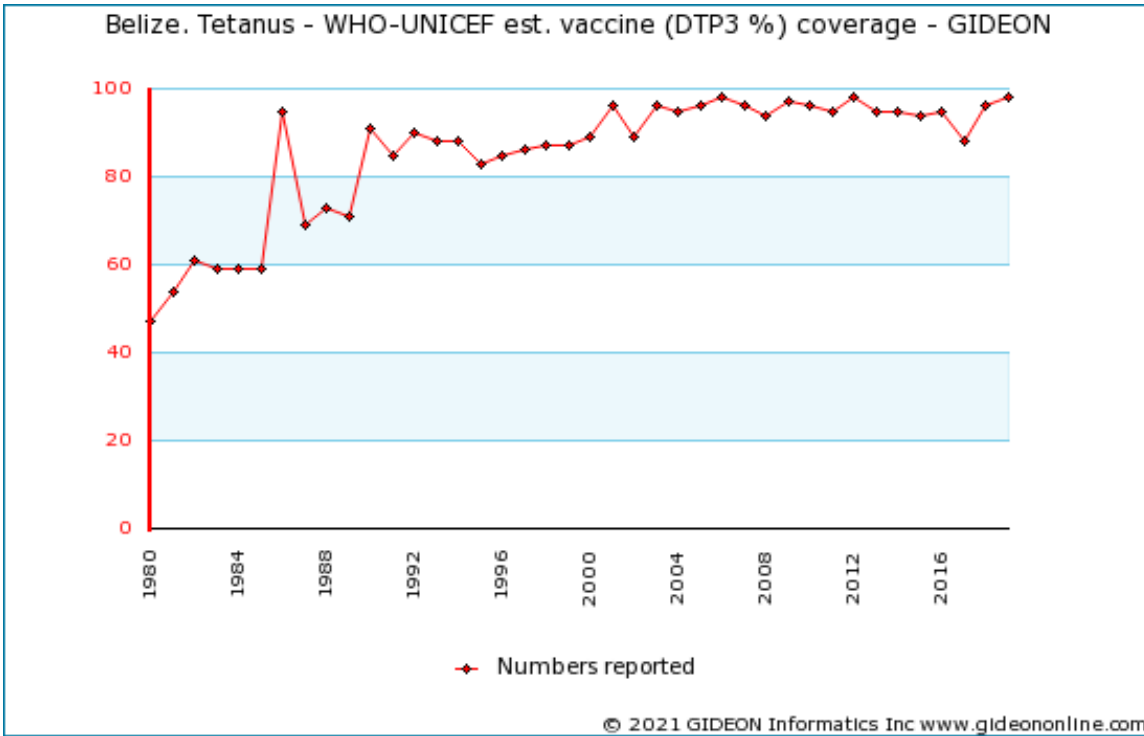
Tetanus

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). Metronidazole 500 mg IV q6h OR Penicillin G (4 million u IV q4h) OR Doxycycline (100 mg IV BID). Diazepam (30 to 240 mg daily). Tracheostomy, hyperalimentation Active immunization should be started at the time of diagnosis ¹
Typical Pediatric Therapy	Human antitoxin (see Vaccine module). Metronidazole (30 mg/kg daily); OR Penicillin G (300,000 units/kilo daily). Diazepam. Tracheostomy, hyperalimentation Active immunization should be started at the time of diagnosis
Vaccines	DT vaccine DTaP vaccine DTP vaccine Td vaccine Tetanus immune globulin Tetanus vaccine
Clinical Hints	- Trismus, facial spasm, opisthotonus and tachycardia - 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, Stelkramp, Tetano, Tetanos. ICD9: 037,771.3 ICD10: A33,A34,A35

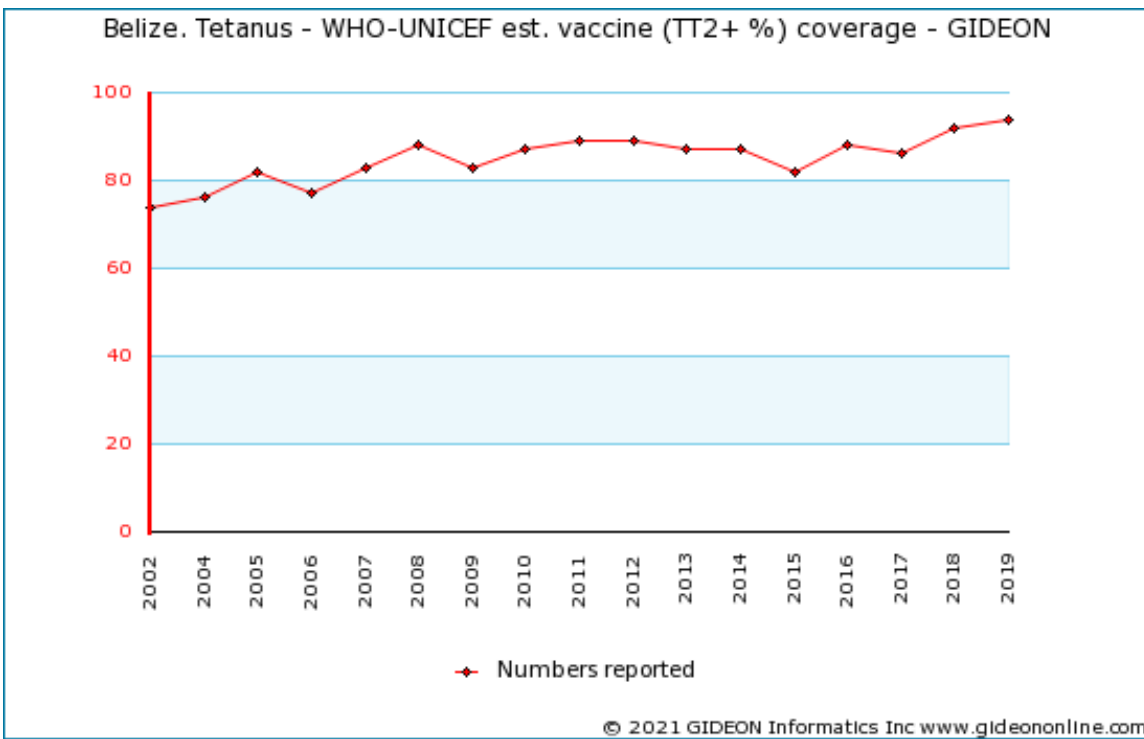
Tetanus in Belize

Vaccine Schedule:

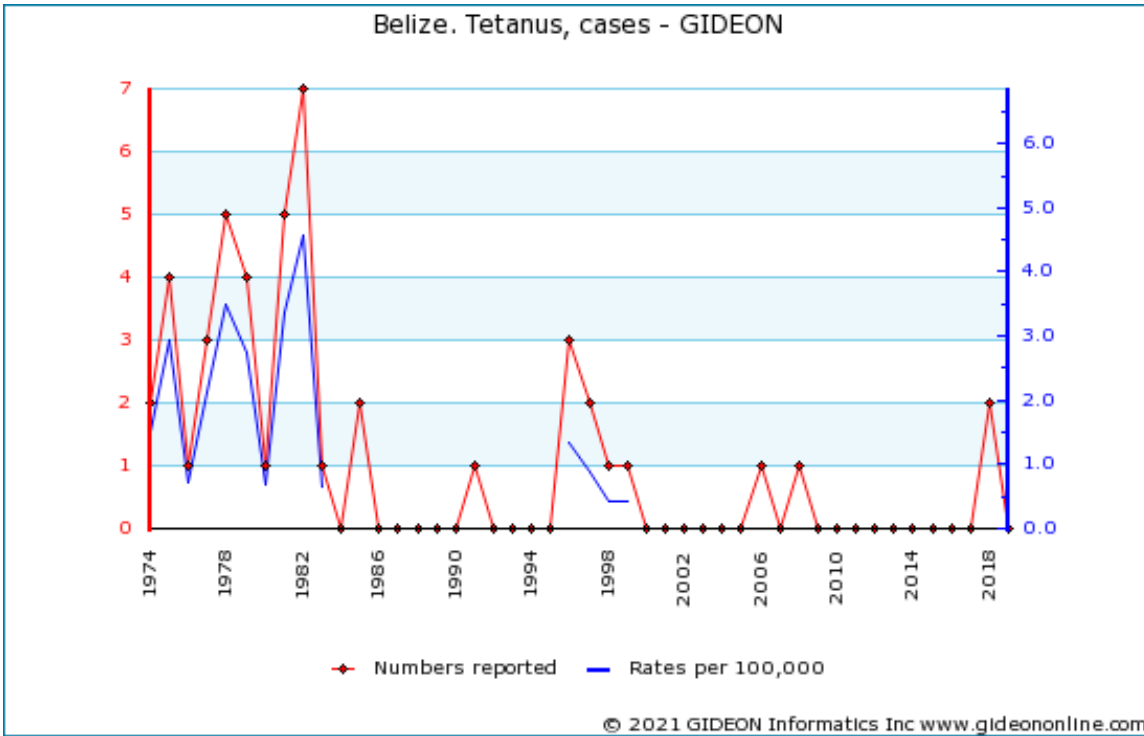
BCG - birth
 DT - 2,4,6, 18 months; 4 years
 DTP - 18 months; 4 years
 DTPHibHepB - 2,4,6 months
 HepB - birth
 IPV - 2,4,6,18 months; 4,12 years
 MMR - 12, 18 months
 OPV - 4,6,18 months; 4 years
 Td - 1st contact; +6 months; +1, 12 years



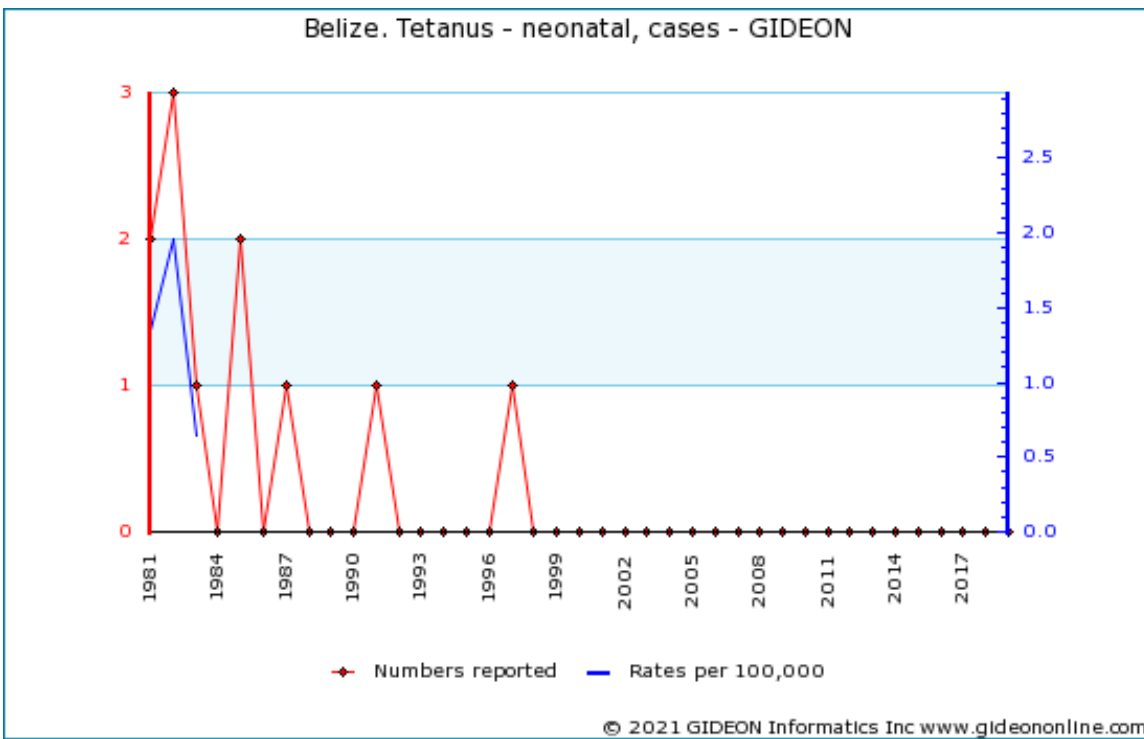
Graph: Belize. Tetanus - WHO-UNICEF est. vaccine (DTP3 %) coverage



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



Graph: Belize. Tetanus, cases



Graph: Belize. Tetanus - neonatal, cases

References

1. [Crit Care 2014 Mar 26;18\(2\):217.](#)

Toxic shock syndrome

Agent	BACTERIUM. <i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , et al - (toxins) Facultative gram-positive cocci
Reservoir	Human
Vector	None
Vehicle	Tampon (Bandage, etc)
Incubation Period	Unknown
Diagnostic Tests	Isolation of toxigenic <i>Staphylococcus aureus</i> . Toxin assay available in specialized laboratories.
Typical Adult Therapy	Vancomycin 15-20 mg/kg IV BID + Clindamycin 900 mg IV TID Definitive therapy: Streptococcus - Penicillin G 4 million u IV q4h + Clindamycin 900 mg IV q8h Staphylococcus: MSSA - Nafcillin or Oxacillin 2 g IV q4h + Clindamycin 900 mg IV q8h MRSA as for empirical therapy The role of IVIG remains uncertain - consider in severe cases ^{1 2}
Typical Pediatric Therapy	Vancomycin 10 mg/kg IV QID + Clindamycin 8-13 mg/kg mg IV TID Definitive therapy: Streptococcus - Penicillin G 40-50000 units/kg (maximum 4 million) IV q4h + Clindamycin 8-13 mg/kg IV q8h Staphylococcus: MSSA - Nafcillin or Oxacillin 25-37.5 mg/kg IV q6h + Clindamycin 8-13 mg/kg mg IV q8h MRSA as for empirical therapy The role of IVIG remains uncertain; consider in severe cases
Clinical Hints	- Most cases associated with "super absorbent" tampon use or staphylococcal wound infection - Fever (>38.9), hypotension (<90 mm Hg) and dermal erythema with desquamation - Respiratory, cardiac or other disease present - Case-fatality rates of 5% to 10% are reported
Synonyms	Streptococcal toxic shock syndrome, TSS. ICD9: 040.82 ICD10: A48.3

References

1. Ann Intensive Care 2018 Sep 17;8(1):88.
2. J Emerg Med 2018 Jan 20;

Toxocariasis	
Agent	PARASITE - Nematoda. Secernentea: <i>Toxocara cati</i> and <i>T. canis</i>
Reservoir	Cat, Dog, Mouse
Vector	None
Vehicle	Soil ingestion
Incubation Period	1w - 2y
Diagnostic Tests	Identification of larvae in tissue. Serology.
Typical Adult Therapy	Albendazole 400 mg BID X 5d. OR Mebendazole 100 to 200 mg PO bid X 5 days Add corticosteroids if eye, brain, heart or lung involvement is present. ^{1 2}
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Ascaris suum, Toxocara canis, Toxocara cati, Toxocarose, Toxocarosis, Visceral larva migrans. ICD9: 128.0 ICD10: B83.0

Toxocariasis in Belize

1986 (publication year) - *Toxocara cati* is found in jaguars (*Panthera onca*) and related carnivores in the Cockscomb Basin.³

References

1. *Parasitology* 1995 Jun ;110 (Pt 5):529-33.
2. *J Ocul Pharmacol Ther* 2001 Jun ;17(3):287-94.
3. *J Parasitol* 1986 Aug ;72(4):517-20.

Toxoplasmosis

Agent	PARASITE - Protozoa. Apicomplexa, Eimeriida: <i>Toxoplasma gondii</i>
Reservoir	Rodent, Pig, Cattle, Sheep, Chicken, Bird, Cat, Marsupial
Vector	None
Vehicle	Transplacental, Meat, Soil ingestion, Water , Milk, Filth flies
Incubation Period	1w - 3w (range 5d - 21d)
Diagnostic Tests	Serology. Cultivation or identification of organisms per specialized laboratories. Nucleic acid amplification.
Typical Adult Therapy	60 kg: Pyrimethamine 75 mg/d + Sulfadiazine 1.5 g PO QID X 6w - administer with folic acid Alternatives: Clindamycin , Trimethoprim /Sulfamethoxazole, Atovaquone Spiramycin (in pregnancy) 4g/d X 4w ^{1 2}
Typical Pediatric Therapy	Pyrimethamine 1 mg/kg/d X 3d, then 0.5 mg/kg/d + Sulfadiazine 100 mg/kg/d X 4w - administer with folic acid. Alternatives: Clindamycin , Trimethoprim /Sulfamethoxazole, Atovaquone .
Clinical Hints	<ul style="list-style-type: none"> - Fever, lymphadenopathy, hepatic dysfunction or chorioretinitis - Cerebral cysts often encountered in patients with AIDS - Congenital hydrocephalus associated with mental retardation - Seizures or blindness
Synonyms	Toxoplasma, Toxoplasrose, Toxoplasmosi. ICD9: 130 ICD10: B58

Toxoplasmosis in Belize

Seroprevalence surveys

Years	Study Group	%	Notes
2016*	pregnant women	50	50% of pregnant women (2016 publication) ³

* indicates publication year (not necessarily year of survey)

References

1. Clin Microbiol Rev 2018 Oct ;31(4)
2. Parasitol Res 2018 Aug 08;
3. Parasitol Res 2016 Apr ;115(4):1627-34.

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	Azithromycin 1 g po as single dose. Also administer topical Tetracycline ¹
Typical Pediatric Therapy	Azithromycin 20 mg/kg as single dose. Also administer topical Tetracycline
Clinical Hints	- Keratoconjunctivitis with follicular hypertrophy, palpebral scarring and pannus formation - In later stages, eyelashes may protrude inward or outward - 0.5% of infections result in blindness
Synonyms	Egyptian ophthalmia, Granular conjunctivitis, Kernerkrankheit, Trachom, Tracoma. ICD9: 076 ICD10: A71

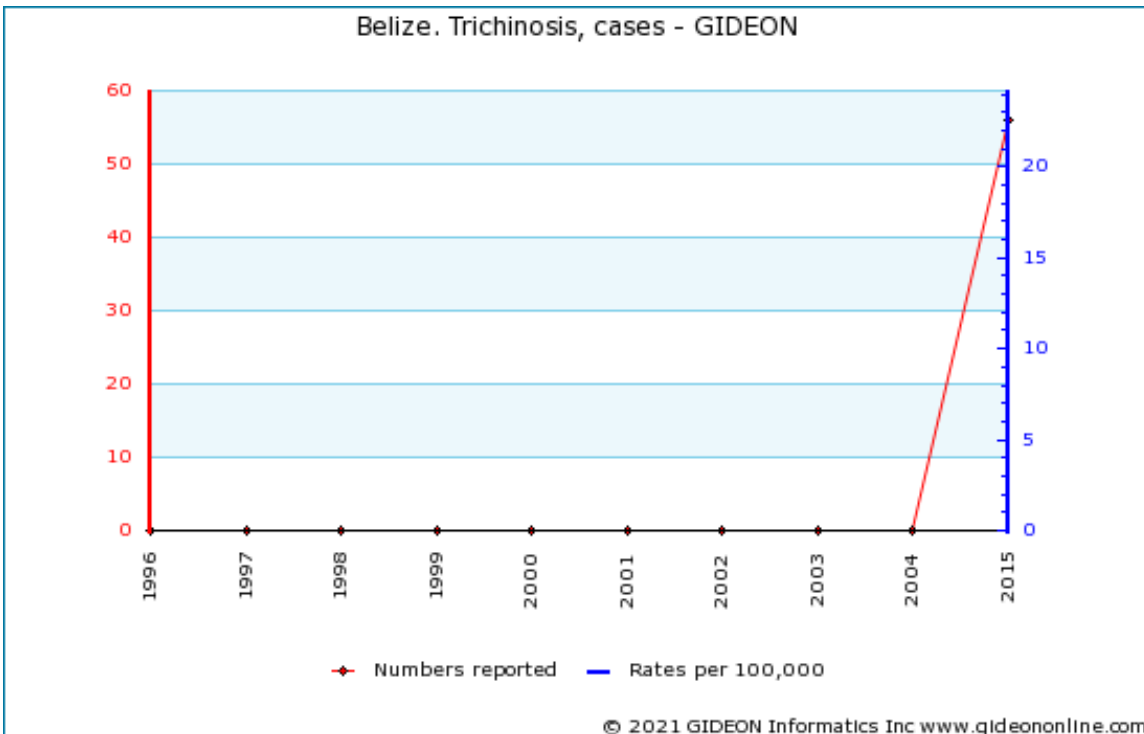
References

1. [Lancet 1993 Aug 21;342\(8869\):453-6.](#)

Trichinosis

Agent	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)
Reservoir	Wild carnivore, Omnivore, Marine mammal
Vector	None
Vehicle	Meat
Incubation Period	10d - 20d (range 1w - 10w)
Diagnostic Tests	Identification of larvae in tissue. Serology.
Typical Adult Therapy	Albendazole 400 mg PO BID X 14d. OR Mebendazole 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Administer with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage) ^{1 2}
Typical Pediatric Therapy	Albendazole 7 mg/kg BID X 14 d. OR Mebendazole 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Administer with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)
Clinical Hints	<ul style="list-style-type: none"> - Onset 1 to 4 weeks following ingestion of undercooked meat - Early diarrhea and vomiting - Subsequent myalgia, facial edema and eosinophilia - Symptoms may persist for two months - Reported case-fatality rate for symptomatic infection is 2%
Synonyms	Trichinellose, Trichinellosis, Trichinose, Trikinose, Triquiniasis, Triquonosis. ICD9: 124 ICD10: B75

Trichinosis in Belize



Graph: Belize. Trichinosis, cases

References

1. Clin Infect Dis 2017 Nov 29;65(12):e45-e80.
2. J Infect Dis 2000 Jul ;182(1):371-4.

Trichomoniasis

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

References

1. [MMWR Recomm Rep 2015 Jun 05;64\(RR-03\):1-137.](#)

Trichuriasis

Agent	PARASITE - Nematoda. <i>Trichuris trichiura</i>
Reservoir	Human
Vector	None
Vehicle	Soil ingestion, Sexual contact, Flies
Incubation Period	2m - 2y
Diagnostic Tests	Stool microscopy or visualization of adult worms Trichuris trichiura adult: female - 35 to 50 mm; male - 30 to 45 mm
Typical Adult Therapy	Mebendazole 100 mg PO BID X 3d. OR Albendazole 400 mg PO daily X 3 to 7 days OR Ivermectin 200 mg/kg PO daily X 3 days ^{1 2}
Typical Pediatric Therapy	Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2). OR Ivermectin 200 mg/kg PO daily X 3 days
Clinical Hints	- 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
Synonyms	Trichocephaliasis, Trichuris trichiura, Tricuriasis, Whipworm. ICD9: 127.3 ICD10: B79

Trichuriasis in Belize

Prevalence surveys

Years	Region	Study Group	%	Notes
2004*	Toledo	general population	19	19% of individuals in rural Toledo District (2004 publication) ³

* indicates publication year (not necessarily year of survey)

References

1. Clin Infect Dis 2019 Jan 01;68(1):96-105.
2. PLoS Negl Trop Dis 2018 04 ;12(4):e0006458.
3. Southeast Asian J Trop Med Public Health 2004 Sep ;35(3):506-11.

Tropical phagedenic ulcer

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

Tropical sprue

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown - probably at least 6 months
Diagnostic Tests	Typical functional, roentgenographic and histological changes in bowel. Prompt response to therapy.
Typical Adult Therapy	Tetracycline 250 mg PO QID + folate 5 mg PO daily.+ Vitamin B12 Administer for 6 months ^{1 2}
Typical Pediatric Therapy	Nonabsorbable sulfa drug + folate.+ Vitamin B12 Administer for 6 months
Clinical Hints	<ul style="list-style-type: none">- Chronic (months to years) diarrhea, bloating, weight loss and anemia- Occasional early fever, glossitis, neuropathy, dermatitis, nausea- Malabsorption of fats, protein and minerals
Synonyms	Hill diarrhea, Postinfectious tropical malabsorption. ICD9: 579.1 ICD10: K90.1

References

1. [Gastroenterology](#) 1969 Nov ;57(5):559-68.
2. [Ann Intern Med](#) 1972 Feb ;76(2):203-10.

Trypanosomiasis - American

Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastida. Flagellate: <i>Trypanosoma cruzi</i>
Reservoir	Human, Dog, Cat, Pig, Guinea pig, Armadillo, Rat, Fox, Opossum, Raccoon, Bat, Mouse, Monkey, Rabbit
Vector	Triatome bug (<i>Panstrongylus</i> , <i>Rhodnius</i> and <i>Triatoma</i> spp.)
Vehicle	Blood, Water, Food (fruit contaminated with insect secretions) , Sexual contact
Incubation Period	5d - 14d (acute illness)
Diagnostic Tests	Identification of protozoa in blood or tissue. Serology. Xenodiagnosis. PCR (more sensitive than serology)
Typical Adult Therapy	Nifurtimox 2 mg/kg PO QID X 3-4m. OR Benznidazole 2.5-3.5 mg/kg PO BID X 2m ¹
Typical Pediatric Therapy	Nifurtimox: 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 OR Benznidazole 3.75 mg/kg PO BID X 2m
Clinical Hints	- Unilateral periorbital swelling (Romana's sign) with lymphadenopathy - Hepatosplenomegaly and encephalitis may be present - Later cardiomyopathy, megaesophagus and megacolon - 20% of patients progress to chronic stage - Overall case-fatality rate is 10%
Synonyms	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 Belize

45,000 persons (20% of the population) are at risk.

The estimated seroprevalence in 1992 was 600 persons.

26 new cases were estimated for 1990.

- 2010 - 1,040 prevalent cases (0.330 per 100 population; 200 with cardiomyopathy) were estimated for 2010; 10 new vectorial cases (0.0030 per 100 population) and 25 congenital cases (0.333 per 100 live births). The population at risk was estimated at 70,752. ²

13 cases were reported through blood bank screening in 2006; 15 in 2007; 23 in 2008; 35 in 2009; 45 in 2010.

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1997*		various	0-6.1	0.5% of blood donors, 0% of military personnel and 6.1% of migrant workers on banana plantations (1997 publication) ³
1967	Western Highway	general population	2.7	2.7% of persons along the Western Highway (1967)
1990 - 1999	Toledo	general population	31.4	31.4% of individuals in Toledo District (1990's)
1993		blood donors	0.72	0.72% of blood in blood banks (1993)

* indicates publication year (not necessarily year of survey)

Reservoirs

- 1969 (publication year) - Natural infection has been demonstrated in the opossum (*Didelphis marsupialis*)⁴
- 1969 (publication year) - Natural infection has been demonstrated in the cotton rat (*Sigmodon hispidus*).⁵

Vectors

- The vector for Belize is *Triatoma dimidiata*.
- 18.4% to 26.1% of cave-dwelling *T. dimidiata* are infested (Cayo and Toledo Districts, 1971).⁶
- 28% of *T. dimidiata* from dwellings are infested (Cayo and Toledo districts, 2009 publication)⁷

References

1. N Engl J Med 2015 Jul 30;373(5):456-66.
2. Wkly Epidemiol Rec 2015 Feb 06;90(6):33-43.
3. Am J Trop Med Hyg 1997 Sep ;57(3):298-301.
4. Ann Trop Med Parasitol 1969 Mar ;63(1):47-56.
5. Ann Trop Med Parasitol 1969 Mar ;63(1):57-61.
6. Ann Trop Med Parasitol 1971 Jun ;65(2):169-78.
7. Vector Borne Zoonotic Dis 2009 Feb ;9(1):19-24.

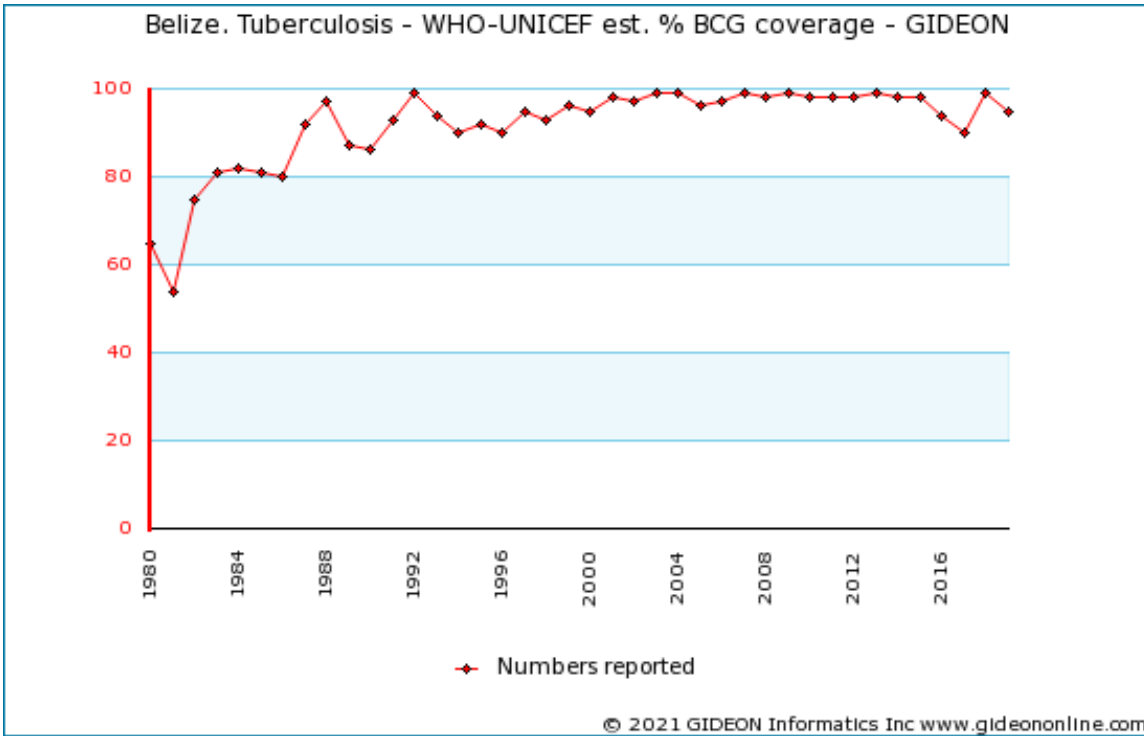
Tuberculosis

Agent	BACTERIUM. Actinomycetes, <i>Mycobacterium tuberculosis</i> An aerobic acid-fast bacillus
Reservoir	Human, Cattle
Vector	None
Vehicle	Air, Dairy products, Respiratory or pharyngeal acquisition
Incubation Period	4w - 12w (primary infection)
Diagnostic Tests	Microscopy. Culture. Nucleic acid amplification. Inform laboratory when this diagnosis is suspected.
Typical Adult Therapy	Respiratory isolation. Typical pulmonary infection is treated with 2 months of Isoniazid , Rifampin & Pyrazinamide (with Ethambutol until results of sensitivity testing) , followed by 4 months of Isoniazid and Rifampin alone. MDR tuberculosis - 5 drugs (including Pyrazinamide and/or Ethambutol if possible) for at least 6 months, followed by 4 drugs for 18-24 months. ^{1 2 3}
Typical Pediatric Therapy	As for adult
Vaccine	BCG vaccine
Clinical Hints	- Cough, "night sweats" and weight loss - Most infections represent reactivation of old foci in lungs, brain, bone, kidneys etc - Often presents as prolonged fever (FUO) or infection of bone, meninges, kidneys or other organs
Synonyms	Consumption, Mycobacterium africanum, Mycobacterium bovis, Mycobacterium canettii, Mycobacterium caprae, Mycobacterium orygis, Mycobacterium pinnipedii, 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

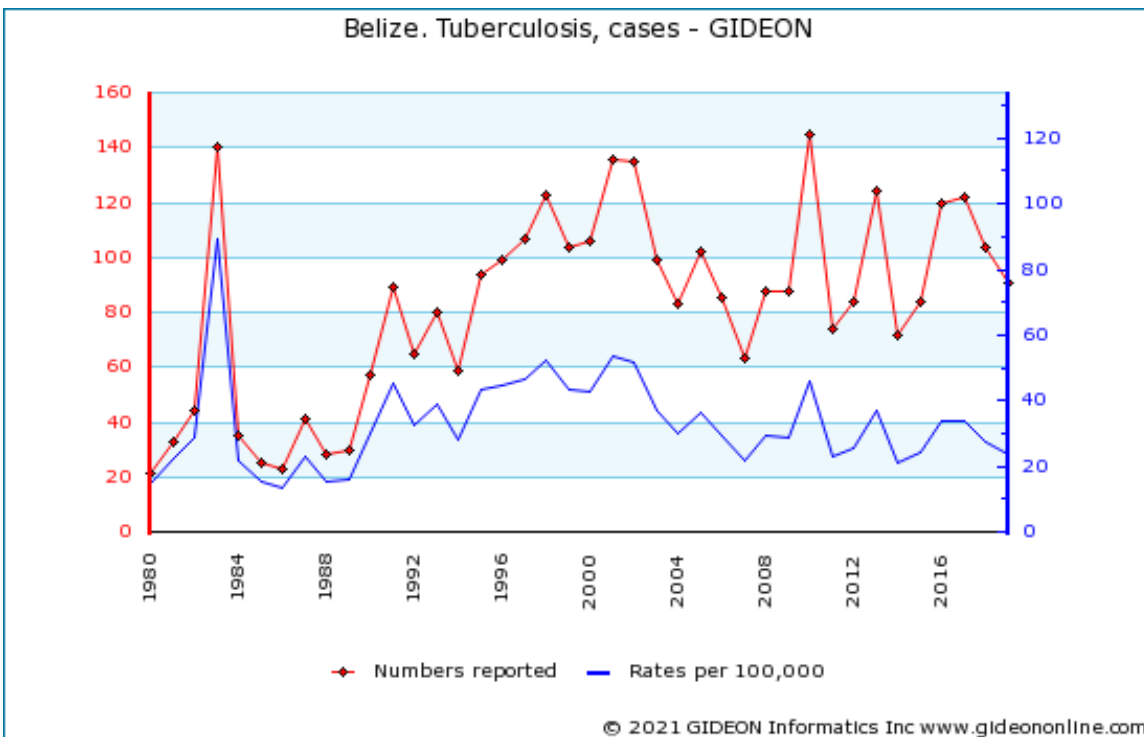
Tuberculosis in Belize

Vaccine Schedule:

- BCG - birth
- DT - 2,4,6, 18 months; 4 years
- DTP - 18 months; 4 years
- DTPHibHepB - 2,4,6 months
- HepB - birth
- IPV - 2,4,6,18 months; 4,12 years
- MMR - 12, 18 months
- OPV - 4,6,18 months; 4 years
- Td - 1st contact; +6 months; +1, 12 years



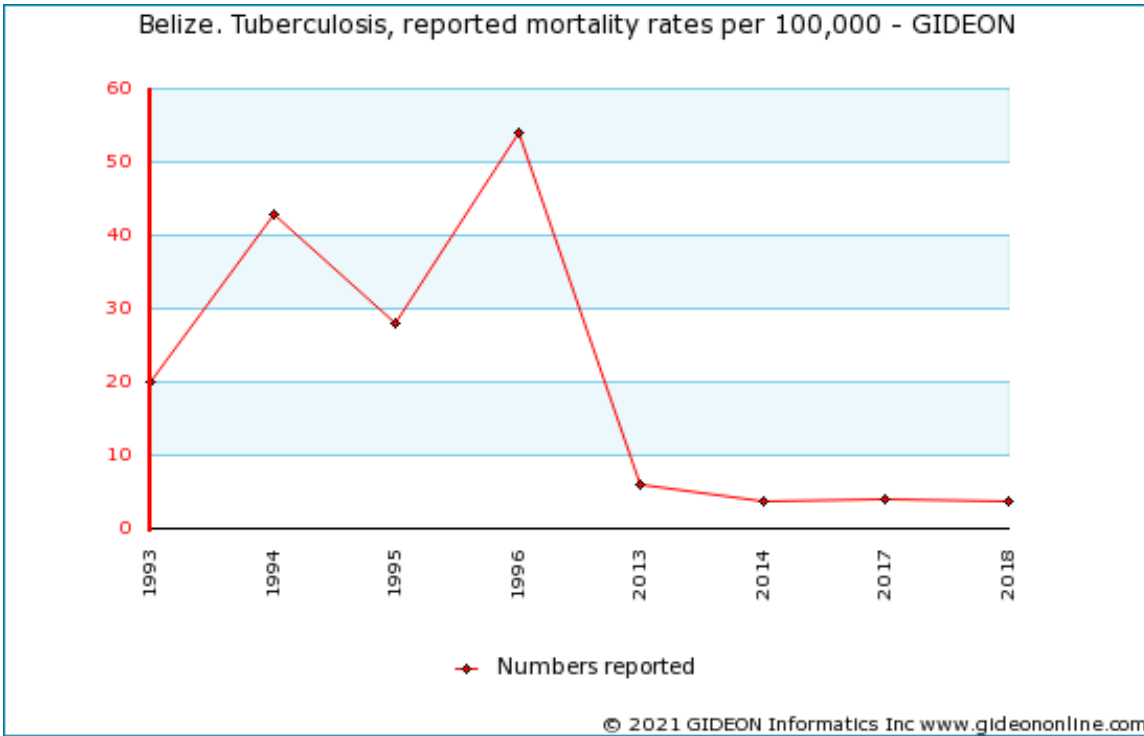
Graph: Belize. Tuberculosis - WHO-UNICEF est. % BCG coverage



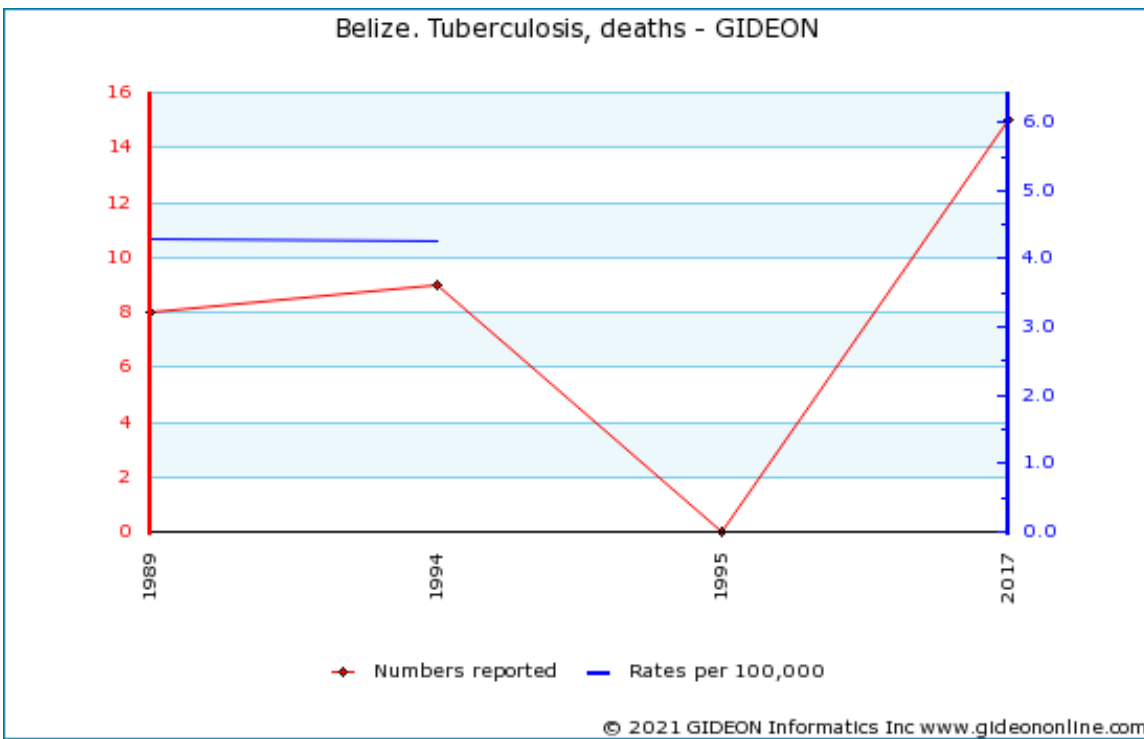
Graph: Belize. Tuberculosis, cases

Notes:

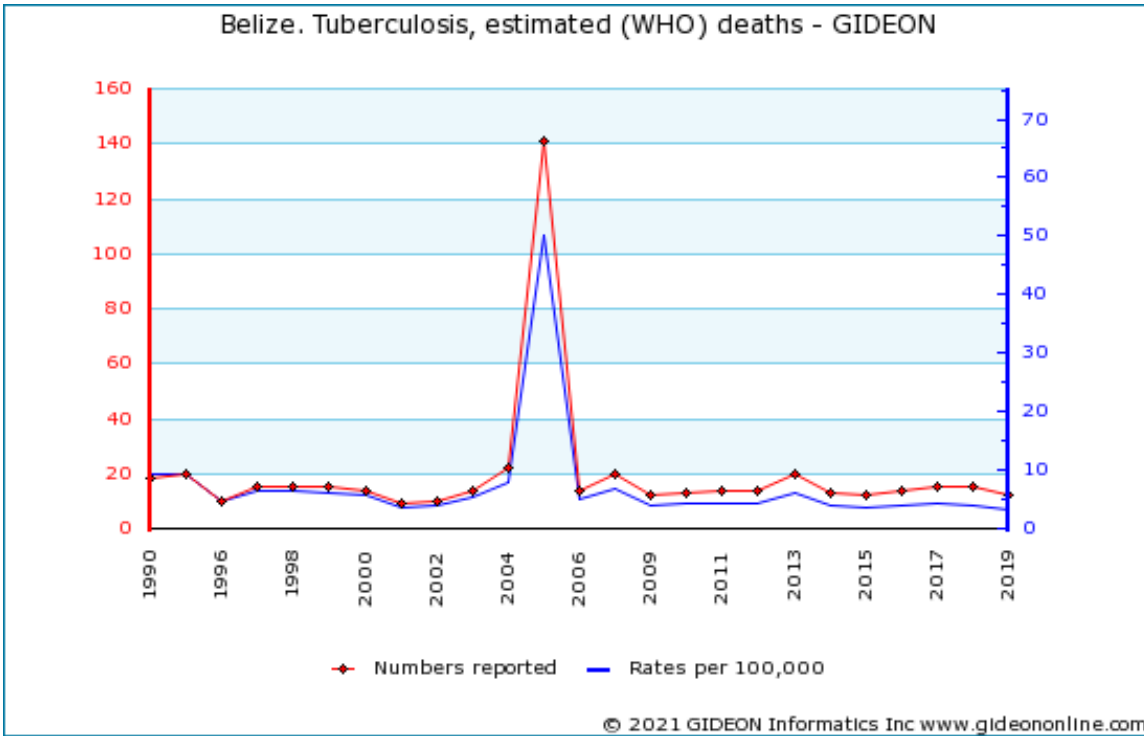
1. The disease rate was 36 per 100,000 in 1976.



Graph: Belize. Tuberculosis, reported mortality rates per 100,000



Graph: Belize. Tuberculosis, deaths



Graph: Belize. Tuberculosis, estimated (WHO) deaths

- 2014 - An infected cow (*Mycobacterium bovis*) was reported. ⁴

References

1. 2018 ;
2. Bull World Health Organ 2018 Mar 01;96(3):173-184F.
3. Tuberc Respir Dis (Seoul) 2018 Jan ;81(1):6-12.
4. ProMED <promedmail.org> archive: 20140131.2245196

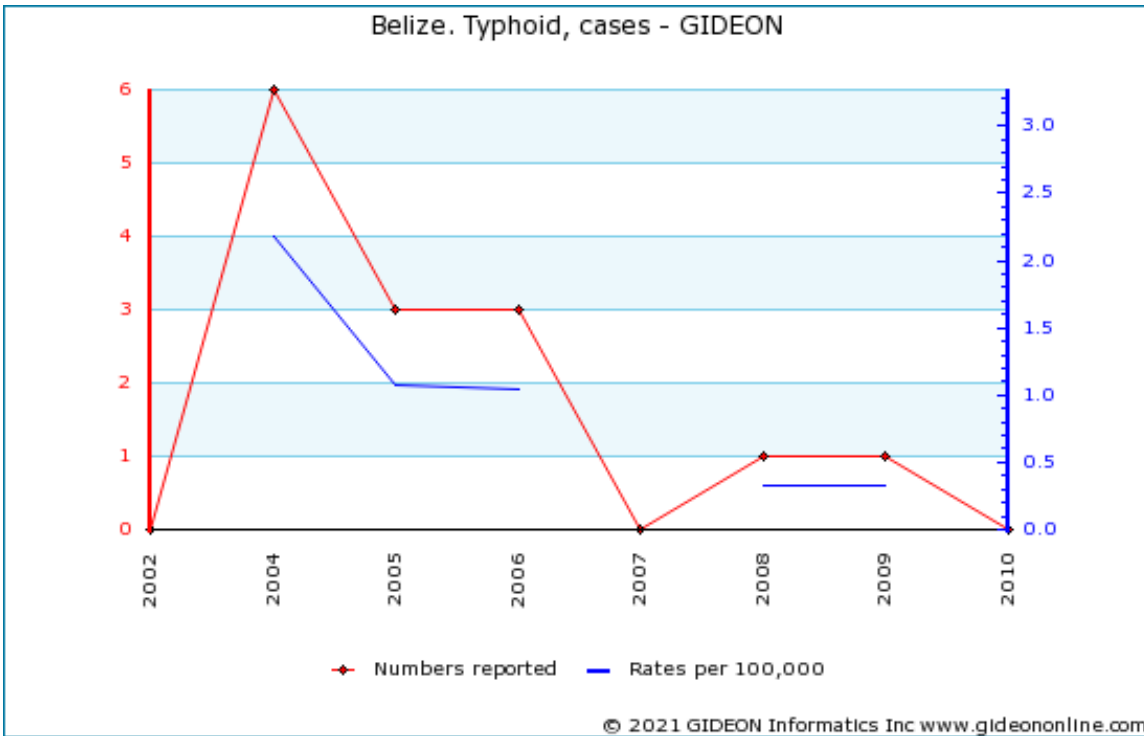
Tungiasis

Agent	PARASITE - Insecta Siphonaptera (Flea), Tungidae: <i>Tunga penetrans</i> and <i>T. trimamillata</i> ("sand fleas")
Reservoir	Pig, Dog, Various other mammals
Vector	None
Vehicle	Contact
Incubation Period	8d - 12d
Diagnostic Tests	Identification of parasite.
Typical Adult Therapy	Extraction of parasite Ivermectin has been advocated in some publications.
Typical Pediatric Therapy	As for adult
Clinical Hints	<ul style="list-style-type: none">- 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
Synonyms	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

Agent	BACTERIUM. <i>Salmonella</i> serotype Typhi (certain other <i>Salmonella</i> species cause 'paratyphoid' fever) A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Food, Fly, Water
Incubation Period	15d - 21d (range 5d - 34d)
Diagnostic Tests	Culture (blood, urine, sputum culture). Stool usually negative unless late, untreated infection. Serology.
Typical Adult Therapy	Stool precautions Ceftriaxone 2 g IV q12h to q 24h X 10-14d. OR Azithromycin 1 gram PO on day 1; then 500 mg days 2 to 7. Fluoroquinolone resistance is common - not recommended for empiric therapy. Add corticosteroids if evidence of shock or decreased mental status. 1 2 3 4
Typical Pediatric Therapy	Stool precautions Ceftriaxone 50 to 100 mg/kg IV daily X 10-14d. OR Azithromycin 15 mg/kg PO on day 1; then 7.5 mg/kg on days 2 to 7.
Vaccine	Typhoid - injectable vaccine Typhoid - oral vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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)
Synonyms	Abdominal typhus, Abdominaltyphus, Buiktyphus, Enteric fever, Febbre tifoide, Febbre tifoidea, Fiebre tifoidea, Paratifoidea, Paratyfus, Paratyphoid, Salmonella serotype Typhi, Tyfoïd, Typhoid, Typhoïde. ICD9: 002 ICD10: A01

Typhoid and enteric fever in Belize



Graph: Belize. Typhoid, cases

No deaths were ascribed to typhoid in 1989; 0 in 1994; 1 in 1995.

References

1. Curr Opin Infect Dis 2016 Oct ;29(5):453-8.
2. Clin Infect Dis 2017 Jun 01;64(11):1522-1531.
3. PLoS Negl Trop Dis 2018 Oct 11;12(10):e0006779.
4. Curr Opin Infect Dis 2018 Aug 21;

Typhus - endemic

Agent	BACTERIUM. <i>Rickettsia typhi</i>
Reservoir	Rat
Vector	Flea (<i>Xenopsylla</i> or <i>Nosopsyllus</i> spp.)
Vehicle	None
Incubation Period	10d - 12d (range 4d - 18d)
Diagnostic Tests	Serology. Identification of rickettsiae in smear or culture of skin lesions. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg BID X 7d ¹
Typical Pediatric Therapy	Doxycycline 2.2 mg/kg BID X 7d (maximum 200 mg/day) OR Chloramphenicol 12.5 mg/kg QID X 7d
Clinical Hints	<ul style="list-style-type: none">- 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%
Synonyms	Endemic typhus, Murine typhus, <i>Rickettsia typhi</i> , Ship typhus, Tifo murino, Tifus pulgas, Vlektyphus. ICD9: 081.0 ICD10: A75.2

References

1. [Expert Rev Anti Infect Ther 2012 Dec ;10\(12\):1425-37.](#)

Urinary tract infection

Agent	BACTERIUM OR FUNGUS. <i>Escherichia coli</i> , other facultative gram negative bacilli, enterococci, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Urine culture and leucocyte count.
Typical Adult Therapy	Antimicrobial agent(s) directed at known or likely pathogen
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	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

Agent	VIRUS - DNA. Poxviridae, Orthopoxvirus. Cowpox virus
Reservoir	Cattle, Cat Rodent
Vector	None
Vehicle	Cattle, Cat
Incubation Period	2d - 4d
Diagnostic Tests	Biosafety level 3. Viral isolation from skin exudate or biopsy. Nucleic acid amplification.
Typical Adult Therapy	Secretion precautions; supportive. In severe cases, Tecovirimat , 400 to 600 mg PO OD X 14 d. ¹
Typical Pediatric Therapy	As for adult
Vaccine	Vaccinia immune globulin
Clinical Hints	<ul style="list-style-type: none">- Vesicles or pustules (usually on hand) progressing to crusts- Painful regional lymphadenopathy- Follows contact with infected animals or smallpox vaccination
Synonyms	Akhmeta poxvirus, Alaskapox, Aracatuba, Buffalopox, Camelpox, Cantagalo, Cowpox, Passatempo, Vaccinia, Vaiolo. ICD9: 051.0 ICD10: B08.0

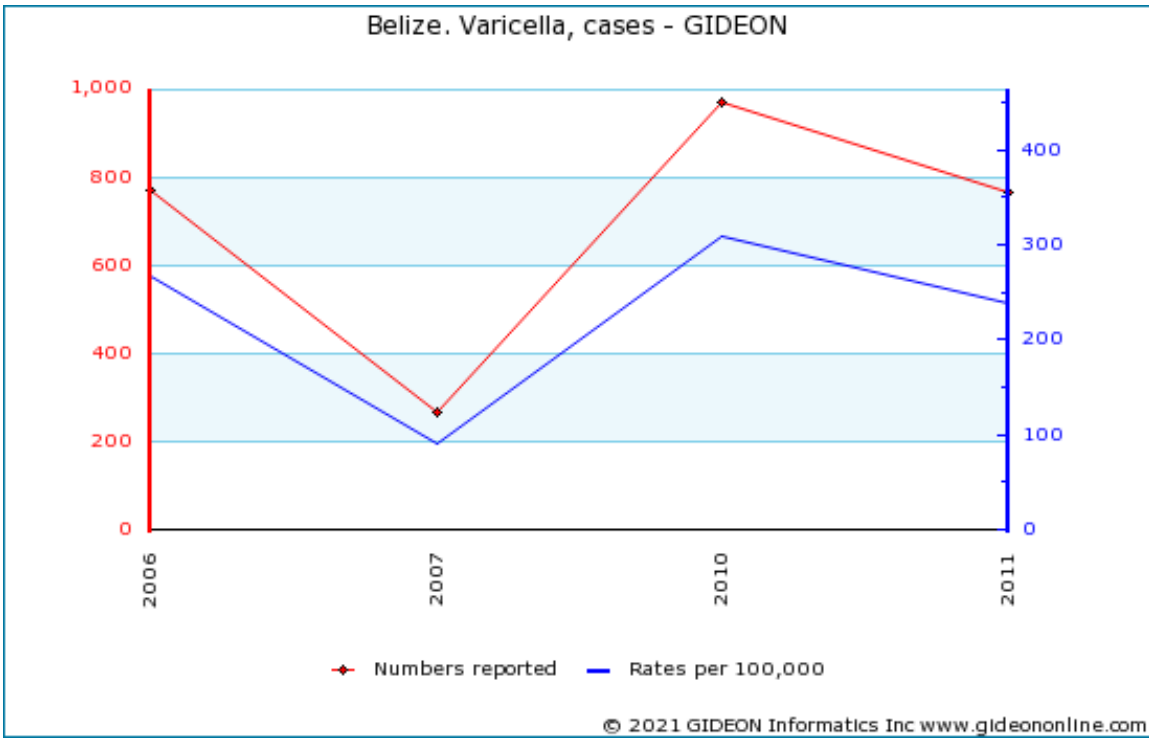
References

1. [Emerg Infect Dis 2015 Dec ;21\(12\):2261-3.](#)

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: Acyclovir 10 to 12 mg/kg IV q8h X 7d Adolescent / young adult: 800 mg PO X 5 per day X 7 d. Alternatives: Valacyclovir 1 g PO TID; or Famciclovir 500 mg PO TID ^{1 2}
Typical Pediatric Therapy	Respiratory isolation. Acyclovir (severe/complicated cases) 150 mg/sq m IV q8h X 7d
Vaccine	Varicella vaccine Varicella-Zoster immune globulin
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 Belize



Graph: Belize. Varicella, cases

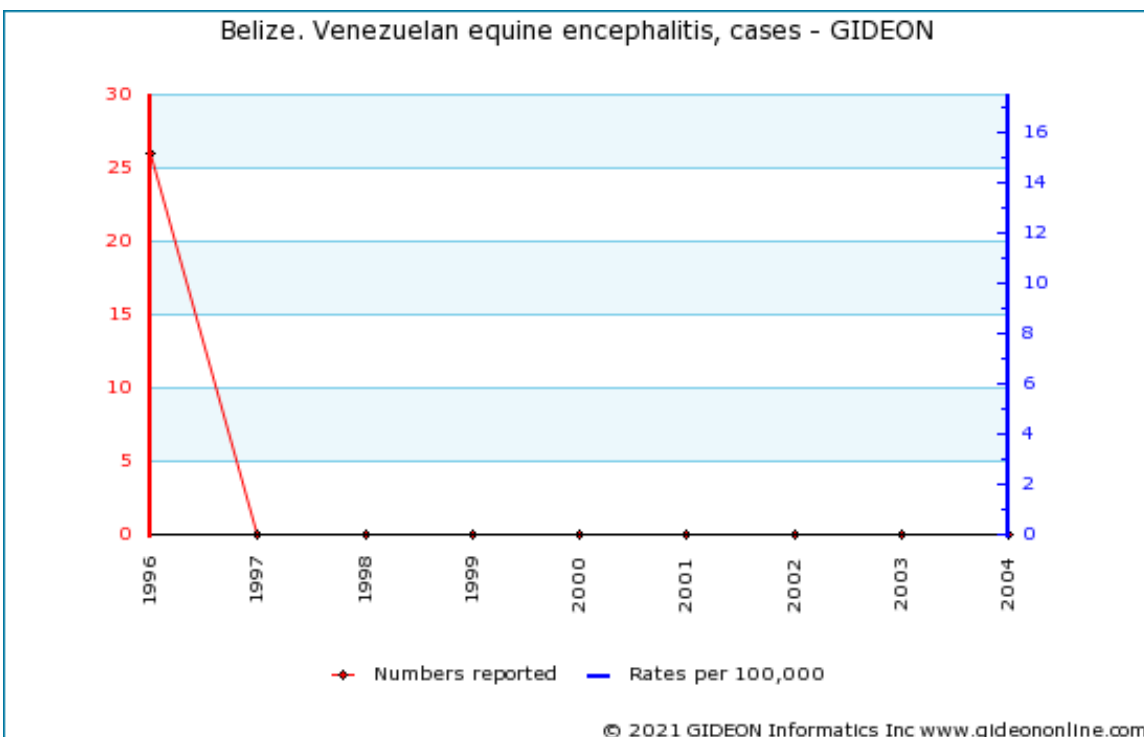
References

1. Clin Ther 2018 Aug 10;
2. Med Lett Drugs Ther 2018 Sep 24;60(1556):153-157.

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	Biosafety level 3. Viral culture (throat, blood, brain tissue). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Venezuelan equine encephalitis vaccine
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. ICD9: 066.2 ICD10: A92.2

Venezuelan equine encephalitis in Belize



Graph: Belize. Venezuelan equine encephalitis, cases

Cross-border events

Years	Acquired by **	Originated in **	Setting	Cases	Notes
2012*	United States	Belize	travel	1	¹

* indicates publication year (not necessarily year of event)

** Country or Nationality

Notable outbreaks

Years	Region	Cases	Population	Notes
2009	Cayo	12	equines	12 cases in 8 outbreaks. An additional case was reported in 2010. ^{2 3 4}
2012	Corozal	3	equines	⁵
2013	Cayo	1	equines	⁶
2014	Cayo	3	equines	⁷
2019	Corozal	4	equines	⁸

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 2. [ProMED <promedmail.org> archive: 20090925.3364](#)
 3. [ProMED <promedmail.org> archive: 20091010.3513](#)
 4. [ProMED <promedmail.org> archive: 20100912.3294](#)
 5. [ProMED <promedmail.org> archive: 20130201.1525356](#)
 6. [ProMED <promedmail.org> archive: 20130201.1525356](#)
 7. [ProMED <promedmail.org> archive: 20141028.2909119](#)
 8. [ProMED <promedmail.org> archive: 20200220.7008958](#)

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	Stool precautions
	Supportive For severe infection, consider treatment with Doxycycline , Azithromycin or Ciprofloxacin
Typical Pediatric Therapy	Supportive
	For severe infection, consider treatment with Doxycycline or Azithromycin .
Clinical Hints	<ul style="list-style-type: none"> - Onset 4 to 24 hours following ingestion of seafood (often steamed crabs) - Vomiting and explosive diarrhea - 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

Agent	VIRUS - RNA. Flaviviridae, Flavivirus: West Nile virus
Reservoir	Bird, Horse, Bat, Tick
Vector	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.)
Vehicle	Blood, Breastfeeding
Incubation Period	3d - 6d (range 1d - 14d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	- Myalgia, arthralgia, lymphadenopathy, headache, conjunctivitis and a macular rash - Sporadic instances of encephalitis, meningitis and myocarditis are reported - Illness resolves within one week in most cases
Synonyms	Bagaza, Fiebre del Oeste del Nilo, Lourdige, Near Eastern equine encephalitis, Ntaya, Usutu, WNF. ICD9: 066.4 ICD10: A92.3

West Nile fever in Belize

2004 - Three infected horses were detected - in Indian Creek (Orange Walk District), Blue Creek and Barton Creek.
¹

Notable outbreaks

Years	Region	Cases	Population	Notes
2010	Multiple locations	5	equines	Outbreaks in Cayo and Orange Walk ²

References

1. Rev Panam Salud Publica 2006 Feb ;19(2):112-7.
2. ProMED <promedmail.org> archive: 20100913.3301

Whipple's disease

Agent	BACTERIUM. Actinomycetes, <i>Tropheryma whipplei</i> A gram positive bacillus
Reservoir	Unknown
Vector	None
Vehicle	None
Incubation Period	Unknown
Diagnostic Tests	Identification of inclusions in lamina propria (other tissues). Tissue culture. Nucleic acid amplification.
Typical Adult Therapy	Ceftriaxone 2.0 g IV daily X 14d. OR Penicillin G 4 million u IV q4h X 14d. OR Meropenem 1 g IV TID X 14-28d Continue Sulfamethoxazole / Trimethoprim X 1 year ^{1 2 3}
Typical Pediatric Therapy	Disease is rarely, if ever, encountered in children
Clinical Hints	- 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.
Synonyms	Intestinal lipodystrophy, Lipophagic granulomatosis, Mesenteric chyladenectasis, Steatorrhea arthropericarditica, Tropheryma whipplei. ICD9: 040.2 ICD10: K90.8

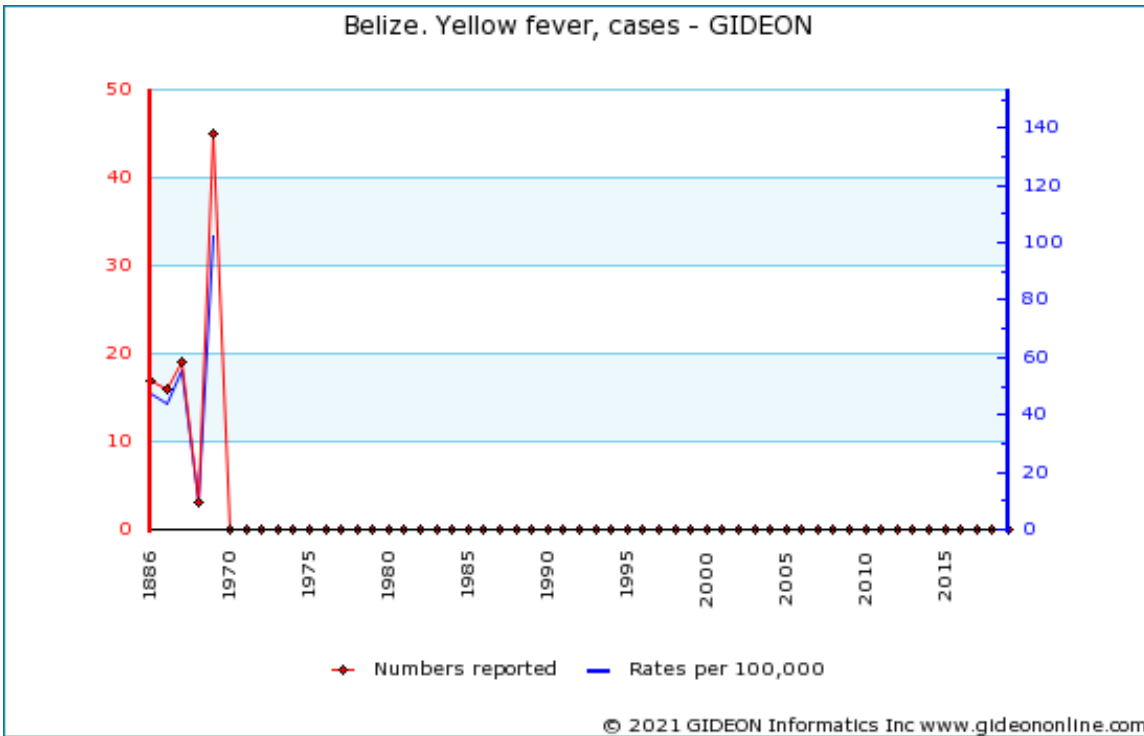
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1. Clin Microbiol Rev 2017 Apr ;30(2):529-555.
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3. Lancet Infect Dis 2016 Mar ;16(3):e13-22.

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	Breast feeding
Incubation Period	3d - 6d (range 2.5d - 14d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, liver). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Yellow fever vaccine
Clinical Hints	<ul style="list-style-type: none"> - 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%, occurring within 7 days of disease 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 Belize, imported, expatriate or other presentations of the disease have been associated with this country.

Yellow fever in Belize



Graph: Belize. Yellow fever, cases

Yellow fever is no longer reported in Belize.

Proof of vaccination **IS** required for travelers arriving from a country with risk of yellow fever transmission and ≥ 1 year of age

Notable outbreaks

Years	Notes
1860 - 1861	Outbreak reported - additional details unavailable. ¹

References

1. West Indian Med J 1958 Dec ;7(4):291-4.

Yersiniosis

Agent	BACTERIUM. <i>Yersinia enterocolitica</i> and <i>Yersinia pseudotuberculosis</i> A facultative gram-negative bacillus
Reservoir	Pig, Rodent, Rabbit, Sheep, Goat, Cattle, Horse, Dog, Cat, Bat
Vector	None
Vehicle	Food, Water, Meat, Dairy products, Vegetables, Fecal-oral, Blood
Incubation Period	4d - 7d (range 1d - 11d)
Diagnostic Tests	Culture stool, blood. Alert laboratory when these organisms are suspected.
Typical Adult Therapy	Stool precautions; diarrhea is self-limited. If severe - Ciprofloxacin 500 mg BID X 5 to 7d. OR Sulfamethoxazole / Trimethoprim
Typical Pediatric Therapy	Stool precautions; diarrhea is self-limited. If severe - Sulfamethoxazole / Trimethoprim 20 mg-4 mg/kg BID X 5 to 7d
Clinical Hints	<ul style="list-style-type: none"> - 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
Synonyms	Far East scarlet-like fever, FESLF, Yersinia enterocolitica, Yersinia pseudotuberculosis, Yersiniose. ICD9: 008.44 ICD10: A04.6,A28.2

Zika

Agent	VIRUS - RNA. Flaviviridae, Flavivirus: Zika virus
Reservoir	Human, Mosquito, Monkey
Vector	Mosquito (<i>Aedes</i> spp)
Vehicle	Sexual contact, Saliva, Blood transfusion, Breast-feeding
Incubation Period	5d - 8d (range 2d - 15d)
Diagnostic Tests	Viral isolation (blood). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	Zika fever. ICD9: 078.89 ICD10: A92.8

Zika in Belize

- 2015 to 2016 - 61 cases of Zika virus infection were confirmed during October 2015 to December 2016, including 0 cases of congenital syndrome and 0 of Guillain-Barre syndrome. ¹]

- 2015 to 2018 - 2,005 autochthonous cases of Zika virus infection and 0 cases of congenital syndrome were reported to January 4, 2018. ^{2 3 4 5}

Notable outbreaks

Years	Cases	Notes
2016 - 2018	2,005	Case numbers to January 4, 2018. No cases of congenital syndrome were reported ^{6 7 8 9 10 11 12 13 14 15 16 17 18 19 20}

References

1. Rev Panam Salud Publica 2019 ;43:e10.
2. PLoS One 2018 ;13(7):e0201075.
3. ProMED <promedmail.org> archive: 20180407.5731753
4. ProMED <promedmail.org> archive: 20160419.4168370
5. ProMED <promedmail.org> archive: 20160529.4253278
6. Glob Public Health 2018 May 07;:1-14.
7. PLoS One 2018 ;13(7):e0201075.
8. ProMED <promedmail.org> archive: 20160419.4168370
9. ProMED <promedmail.org> archive: 20160529.4253278
10. ProMED <promedmail.org> archive: 20161001.4529740
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Zygomycosis

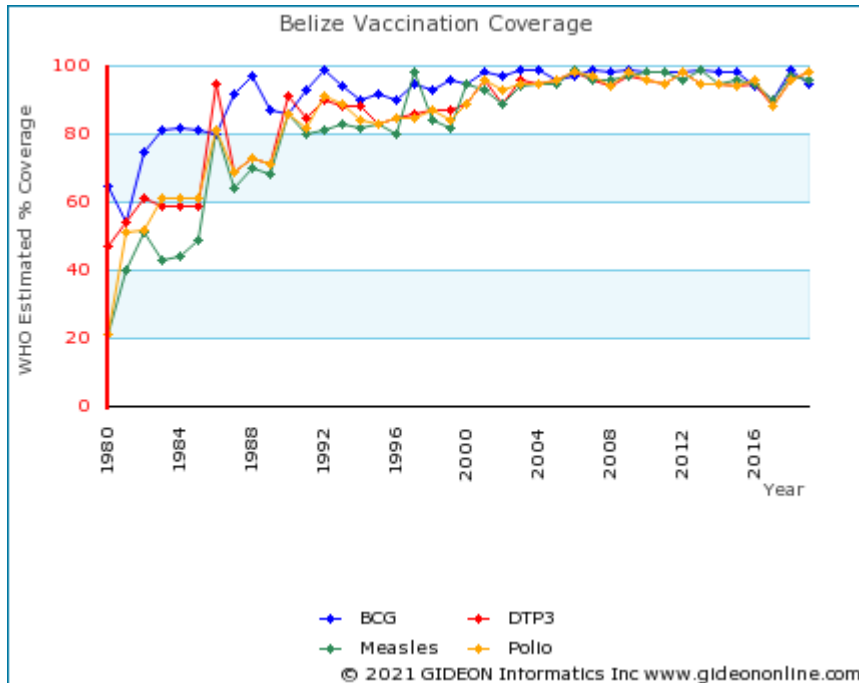
Agent	FUNGUS. Zygomycota, Zygomycetes, Mucorales: <i>Mucor</i> spp., <i>Rhizopus</i> spp., <i>Lichtheimia</i> (formerly <i>Absidia</i>) spp, <i>Saksenaea</i> spp, et al
Reservoir	Saprophytes
Vector	None
Vehicle	Air, Bandages, Contact, Respiratory or pharyngeal acquisition
Incubation Period	Variable
Diagnostic Tests	Fungal smear and culture.
Typical Adult Therapy	Liposomal Amphotericin B 5 mg/kg/d IV OR Amphotericin B deoxycholate 1 mg/kg/d IV Followed by Posaconazole 300 mg PO BID X 1 day, then 300 mg PO daily OR Isavuconazole 200 mg PO TID X 2 days, then 200 mg PO daily Excision as indicated ^{1 2}
Typical Pediatric Therapy	Liposomal Amphotericin B 5 mg/kg/d IV OR Amphotericin B deoxycholate 1 mg/kg/d IV Excision as indicated
Clinical Hints	- Occurs in the setting of preexisting acidosis (diabetes, uremia) - Periorbital pain, sinusitis, and palatal, nasal or cerebral infarcts - Pulmonary infection may complicate leukemia
Synonyms	<i>Absidia</i> , <i>Actinomucor</i> , <i>Apophysomyces</i> , <i>Cokeromyces</i> , <i>Cunninghamella</i> , <i>Hormographiella</i> , <i>Lichtheimia</i> , <i>Mucor</i> , <i>Mucormycosis</i> , <i>Mycocladius</i> , <i>Phycomycosis</i> , <i>Rhizomucor</i> , <i>Rhizopus</i> , <i>Saksenaea</i> , <i>Syncephalastrum</i> . ICD9: 117.7 ICD10: B46

References

1. *Infect Dis Clin North Am* 2016 Mar ;30(1):143-63.
2. *Lancet Infect Dis* 2019 Dec ;19(12):e405-e421.

Vaccine Schedule and coverage for Belize

BCG - birth
 DT - 2,4,6, 18 months; 4 years
 DTP - 18 months; 4 years
 DTPHibHepB - 2,4,6 months
 HepB - birth
 IPV - 2,4,6,18 months; 4,12 years
 MMR - 12, 18 months
 OPV - 4,6,18 months; 4 years
 Td - 1st contact; +6 months; +1, 12 years



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

Pneumo-con - Pneumococcal conjugate
T - Tetanus
TBE - Tick-borne encephalitis
TT - Tetanus toxoid
YF - Yellow fever
Zoster - Herpes zoster

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