

# INFECTIOUS DISEASES OF COSTA RICA



Stephen Berger, MD

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E-BOOK SERIES

2018 Edition

Infectious Diseases of Costa Rica - 2018 edition

Stephen Berger, MD

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#### **Scope of Content**

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

## Introduction: The GIDEON e-book series

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*Infectious Diseases of Costa Rica* 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 Costa Rica
3. References

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

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

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

### **Content**

There are 357 generic infectious diseases in the world today. 224 of these are endemic, or potentially endemic, to Costa Rica. A number of other diseases are not relevant to Costa Rica 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 Costa Rica.

### **Sources**

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

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

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

### **Exploring Outbreaks and Surveys**

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

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



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

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

<sup>+</sup> Country specific note exists for disease

## Acanthocephalan infections

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

## Actinomycosis

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Actinomyces</i> spp. Anaerobic gram-positive bacillus
<b>Reservoir</b>	Human (oral, fecal and vaginal flora)
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Gram stain and bacteriological culture using strict anaerobic technique. Growth is apparent in 3-7 days.
<b>Typical Adult Therapy</b>	<b>Ampicillin</b> 50 mg/kg/day IV X 4 to 6 weeks - then <b>Amoxicillin</b> 1.5 g/d PO X 6 months. OR <b>Penicillin G</b> 10 to 20 million units/day X 4 to 6w; then <b>Penicillin V</b> X 6 to 12m. Alternatives: <b>Doxycycline</b> , <b>Ceftriaxone</b> , <b>Erythromycin</b> Excision/drainage
<b>Typical Pediatric Therapy</b>	<b>Ampicillin</b> 50 mg/kg/day IV X 4 to 6 weeks - then <b>Amoxicillin</b> 20 mg/kg/day PO X 6 months. <b>Penicillin G</b> 100,000 units/kg/day X 4 to 6w; then <b>Penicillin V</b> 25,000 units/day X 6 to 12m. Excision/drainage
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Actinomyces, Aktinomykose, Lumpy jaw. ICD9: 039. ICD10: A42

## Adenovirus infection

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

## Aeromonas and marine Vibrio infx.

<b>Agent</b>	BACTERIUM. <i>Aeromonas hydrophila</i> , <i>Vibrio vulnificus</i> , et al Facultative gram-negative bacilli
<b>Reservoir</b>	Salt or brackish water, Fish
<b>Vector</b>	None
<b>Vehicle</b>	Water, Shellfish, Contact
<b>Incubation Period</b>	Range 2d - 7d
<b>Diagnostic Tests</b>	Culture. Notify laboratory if these organisms are suspected in stool.
<b>Typical Adult Therapy</b>	Fluoroquinolone or Sulfamethoxazole / <a href="#">Trimethoprim</a> . Other antimicrobial agent as determined by susceptibility testing
<b>Typical Pediatric Therapy</b>	Sulfamethoxazole / <a href="#">Trimethoprim</a> . Or other antimicrobial agent as determined by susceptibility testing
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Aeromonas, Aeromonas hydrophila, Vibrio mimicus, Vibrio vulnificus. ICD9: 005.81,027.9 ICD10: A48.8

## Aeromonas and marine Vibrio infx. in Costa Rica

Aeromonas species are commonly isolated from bivalves, mud, and water from the Gulf of Nicoya (1989 publication)<sup>1</sup>

### References

1. [Rev Biol Trop 1989 Jun ;37\(1\):69-73.](#)

## Amoeba - free living

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

## Amoeba - free living in Costa Rica

Pathogenic free living amoeba have been identified in Costa Rica.<sup>1</sup>

2006 (publication year) - The first case report of amebic encephalitis in Costa Rica was reported - *Naegleria fowleri*-associated encephalitis in a cow.<sup>2</sup>

### Cross-border events

Years	Acquired by **	Originated in **	Setting	Cases	Deaths	Notes
2014	United States	Costa Rica	travel	1	1	<i>Naegleria fowleri</i> meningoencephalitis acquired while swimming a hot spring. <sup>3</sup>

\*\* Country or Nationality

Cysts of *Acanthamoeba* and *Balamuthia mandrillaris* were identified in combination shower units (2014 publication).<sup>4</sup>

### Prevalence surveys

Years	Study Group	%	Notes
2015*	dental units	14	14% of dental units ( <i>Acanthamoeba</i> tenotype T4, <sup>5</sup>

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

**References**

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1. [Rev Latinoam Microbiol 1979 Jul-Sep;21\(3\):135-42.](#)
2. [Vet Parasitol 2006 Jun 30;139\(1-3\):221-3.](#)
3. [Emerg Infect Dis 2015 Feb ;21\(2\):382-4.](#)
4. [Parasitol Res 2014 Nov ;113\(11\):4117-22.](#)
5. [J Eukaryot Microbiol 2015 Nov-Dec;62\(6\):733-6.](#)

## Amoebiasis

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

## Amoebiasis in Costa Rica

### Prevalence surveys

Years	Study Group	%	Notes
1996*	vegetables	2.5-6.2	6.2% of cilantro leaves, 2.5% of cilantro roots, 2.5% of lettuce and 2.5% of radish <a href="#">1</a>

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

### References

- Arch Latinoam Nutr 1996 Dec ;46(4):292-4.

## Amoebic abscess

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

## Amoebic abscess in Costa Rica

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

## Angiostrongyliasis - abdominal

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

## Angiostrongyliasis - abdominal in Costa Rica

Abdominal angiostrongyliasis was first reported in Costa Rica in 1970.<sup>1</sup>

The disease is widespread in Costa Rica, and most common among children during October to November.

Over 650 cases were registered in 1993 (21.6 per 100,000).

Although found in eleven species of rodents, the principal reservoir is the cotton rat (*Sigmodon hispidus*).<sup>2</sup>

Natural infection has been reported in a dog.<sup>3</sup>

### Prevalence surveys

Years	Study Group	%	Notes
1988*	slugs	50	Fifty percent of veronicellid slugs are infested. <sup>4</sup>

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

### References

1. Rev Biol Trop 1970 Jul-Dec;18(1):173-85.
2. Rev Biol Trop 2000 Mar ;48(1):121-3.

3. Vet Parasitol 2015 Sep 15;212(3-4):431-4.
4. Rev Biol Trop 1988 Nov ;36(2B):519-26.

## 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	Penicillin, a <a href="#">Tetracycline</a> or <a href="#">Cefuroxime</a> . Dosage and duration appropriate for nature and severity of infection
Typical Pediatric Therapy	Penicillin or <a href="#">Cefuroxime</a> . Dosage and duration appropriate for nature and severity of infection
Clinical Hints	- 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	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. ICD9: 027.2 ICD10: A28.0

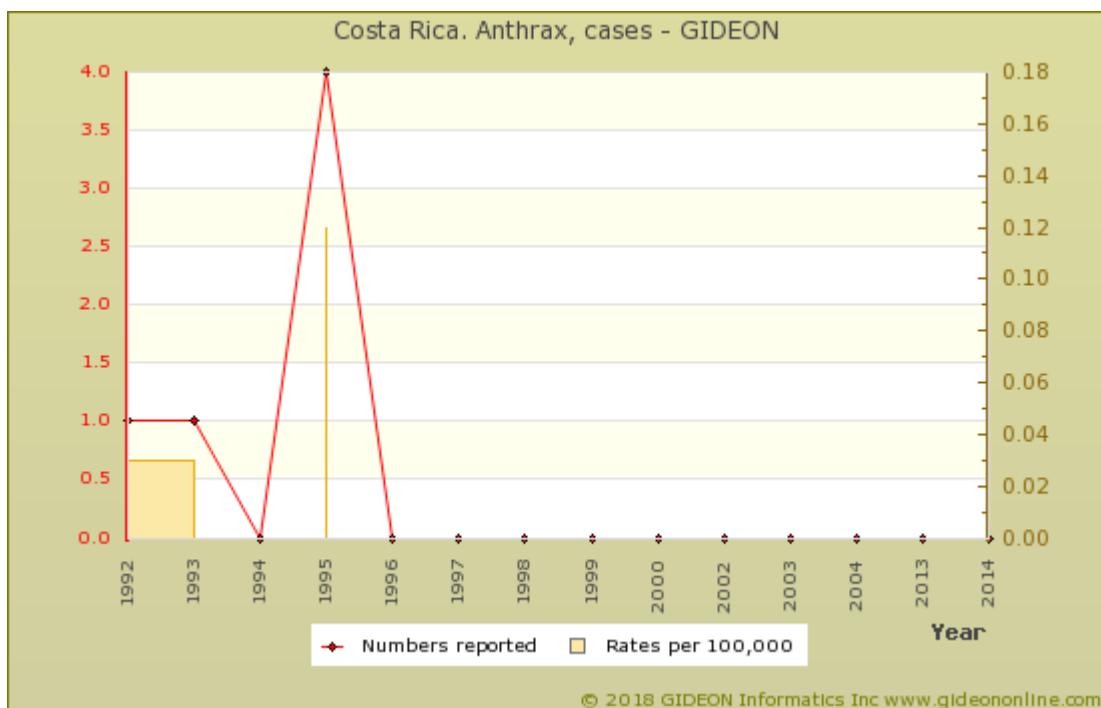
## Anisakiasis

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

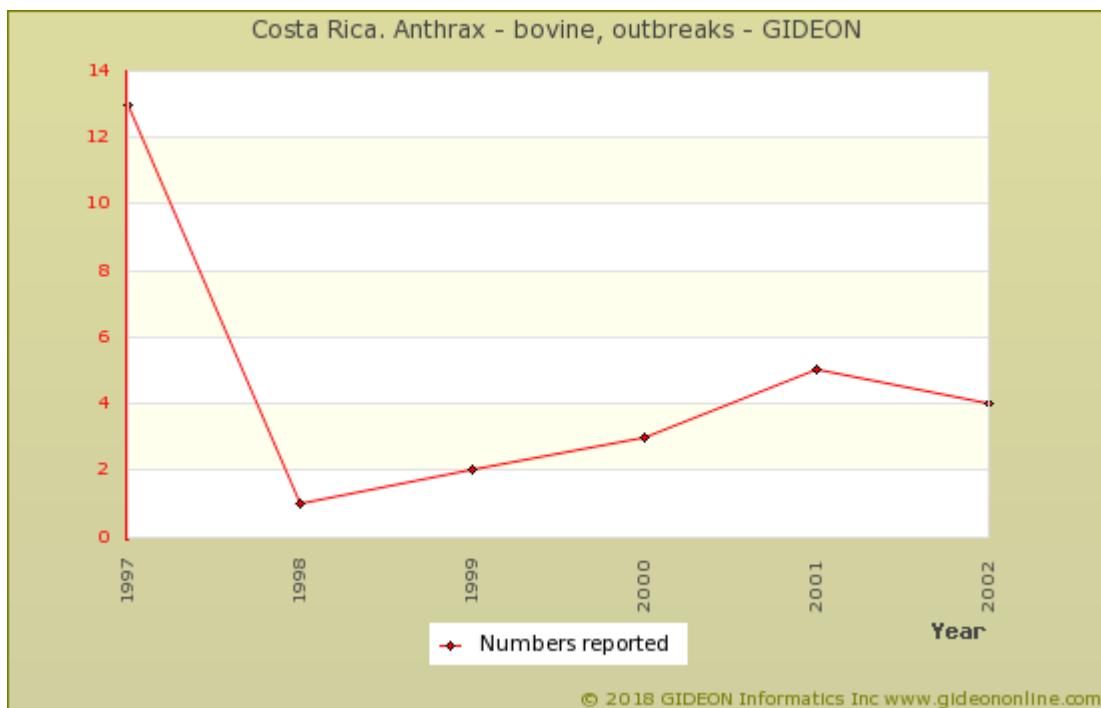
## Anthrax

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

## Anthrax in Costa Rica



Graph: Costa Rica. Anthrax, cases



Graph: Costa Rica. Anthrax - bovine, outbreaks



Graph: Costa Rica. Anthrax - bovine

One outbreak (1 case) of swine anthrax was reported in 1998.

## 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.
Typical Adult Therapy	<a href="#">Mebendazole</a> 500 mg BID X 1 dose OR <a href="#">Albendazole</a> 400 mg X 1 dose
Typical Pediatric Therapy	<a href="#">Albendazole</a> 200 mg PO single dose OR <a href="#">Mebendazole</a> 100 mg BID X 3 d (> age 2).
Clinical Hints	- 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, <i>Ascaris lumbricoides</i> , Askariasis. ICD9: 127.0 ICD10: B77

## Ascariasis in Costa Rica

170 cases of ascariasis were officially-reported in 2010.

*Ascaris lumbricoides* was identified in the feces of mantled howling monkeys (*Alouatta palliata palliata*) in Guanacaste Province. <sup>1</sup>

## References

1. [J Wildl Dis 1990 Oct ;26\(4\):547-9.](#)

## Aspergillosis

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

## Bacillary angiomatosis

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

## Bacillus cereus food poisoning

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

## Bacillus cereus food poisoning in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
2010*	San Jose	cheese	33	33% of spiced cheese products sold in San Jose <sup>1</sup>
2012*	San Jose	rice	10	10% of white cooked rice from restaurants in San Jose <sup>2</sup>

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

### References

1. Arch Latinoam Nutr 2009 Dec ;59(4):402-6.
2. Arch Latinoam Nutr 2012 Sep ;62(3):283-9.

## Bacterial vaginosis

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

## Balantidiasis

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

## Bartonellosis - cat borne

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

## Bartonellosis - other systemic

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

## Bartonellosis - other systemic in Costa Rica

A variety of *Bartonella* species have been identified in Costa Rican bats and bat flies (2015 publication) <sup>1</sup>

### Prevalence surveys

Years	Study Group	%	Notes
2015*	fleas	4.2-22.7	4.2% of <i>Ctenocephalides felis</i> and 22.7% of <i>Pulex simulans</i> flea pools from dogs and cats ( <i>Bartonella vinsonii</i> subsp. <i>berkhoffii</i> and <i>B. rochalimae</i> ) <sup>2</sup>

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

### References

1. Zoonoses Public Health 2015 Dec ;62(8):609-17.
2. Vector Borne Zoonotic Dis 2015 Oct ;15(10):630-2.

## Baylisascariasis

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Baylisascaris procyonis</i>
<b>Reservoir</b>	Mammal (over 40 species), Bird
<b>Vector</b>	None
<b>Vehicle</b>	Animal feces (usually raccoon)
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Serology. Identification of larvae in tissue.
<b>Typical Adult Therapy</b>	Therapy not established. <a href="#">Levamisole</a> , <a href="#">Albendazole</a> , <a href="#">Mebendazole</a> and <a href="#">Thiabendazole</a> effective in animal models. If ingestion suspected, suggest <a href="#">Albendazole</a> 25 mg/kg daily X 20 d + systemic corticosteroids ? laser ablation for retinal larva
<b>Typical Pediatric Therapy</b>	As for adult.
<b>Clinical Hints</b>	- Encountered in proximity to raccoon habitats - Ocular, visceral or neural larva migrans - Eosinophilic meningitis - Ocular disease characterized as DUSN (Diffuse Unilateral Subacute Neuroretinitis) - Asymptomatic infections have been reported.
<b>Synonyms</b>	Baylisascariasis. ICD9: 128.8 ICD10: B83.8

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

### Baylisascariasis in Costa Rica

#### Prevalence surveys

Years	Study Group	%	Notes
2014	raccoons	50	50% of raccoons from the greater metropolitan area <sup>1</sup>

#### References

1. [Emerg Infect Dis 2016 Aug ;22\(8\):1502-3.](#)

## Blastocystis hominis infection

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

**Borna virus encephalitis**

<b>Agent</b>	VIRUS - RNA Mononegavirales Bornavirus
<b>Reservoir</b>	Squirrel, Horse, Sheep
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Metagenomic analysis of brain tissue and cerebrospinal fluid Culture on specialized cell lines Serology
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- May follow animal (horse, squirrel) contact - 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
<b>Synonyms</b>	Borna disease, Heated head disease, Sad horse disease, Staggering disease of cats, Variegated squirrel 1 bornavirus, VSBV-1. ICD9: 323.9 ICD10: A83.9

## Botulism

<b>Agent</b>	BACTERIUM. <i>Clostridium botulinum</i> . An anaerobic gram-positive bacillus
<b>Reservoir</b>	Soil, Animal, Fish
<b>Vector</b>	None
<b>Vehicle</b>	Food, Soil (contamination of wound or injected drug)
<b>Incubation Period</b>	1d - 2d
<b>Diagnostic Tests</b>	Electrophysiologic (EMG) pattern. Isolation of organism from food (occ. from infant stomach). Mouse toxin assay
<b>Typical Adult Therapy</b>	Heptavalent (types A-G) or trivalent (types A, B, E) antitoxin (following test dose) 10 ml in 100 ml saline over 30 min Additional 10 ml at 2 and 4 hours if necessary. Respiratory support
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Botulism antitoxin</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Botulisme, Botulismo, Botulismus, Kerner's disease. ICD9: 005.1 ICD10: A05.1

## Botulism in Costa Rica

Botulism was reported in a three-month old Costa Rican boy - the first case of infant botulism in Central America (2014 publication). <sup>1</sup>

### Prevalence surveys

Years	Region	Study Group	Notes
2006*	Multiple locations	food - honey	0% of raw honey samples <sup>2</sup>

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

### References

1. [J Infect Dev Ctries 2014 Jan 15;8\(1\):123-5.](#)
2. [Rev Biol Trop 2006 Mar ;54\(1\):29-34.](#)

## Brain abscess

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

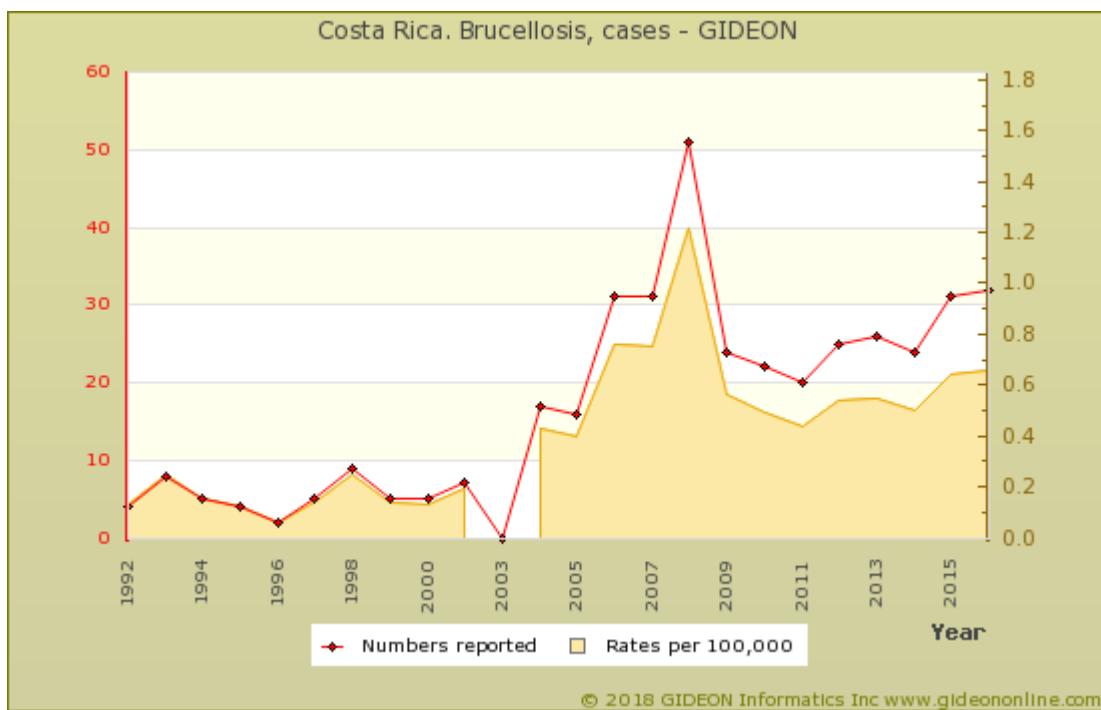
## Brucellosis

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

### Brucellosis in Costa Rica

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

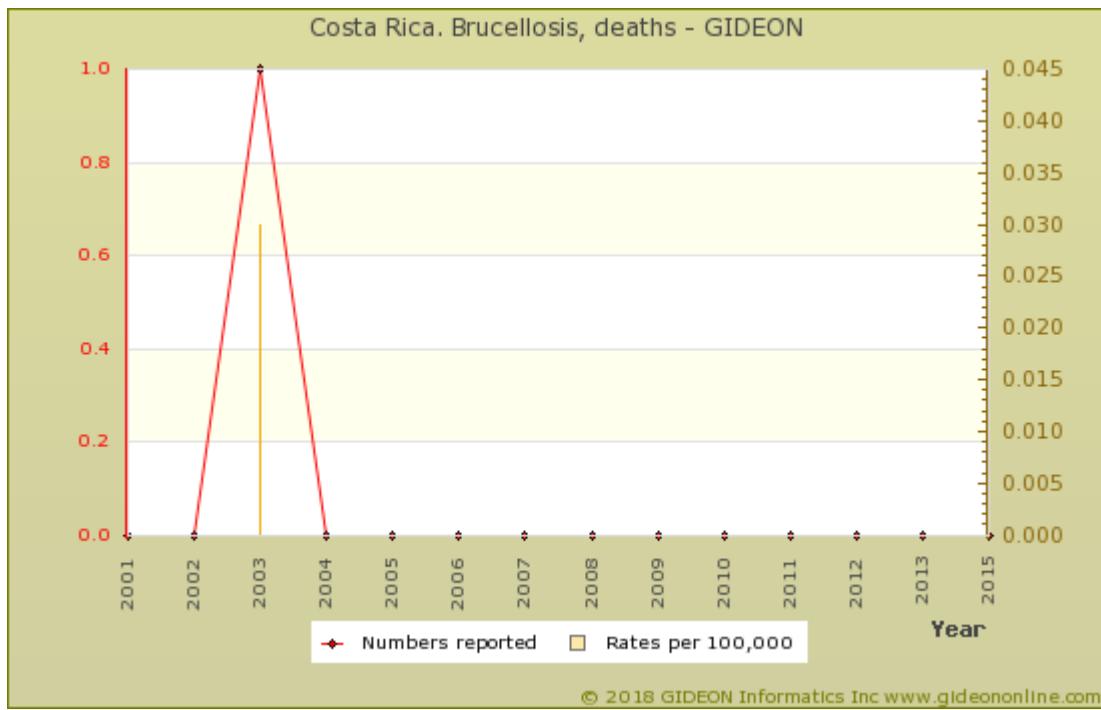
- Two cases (2008 and 2011) of human neurobrucellosis due to *Brucella neotomae* have been confirmed in Costa Rica. <sup>1</sup> <sup>2</sup>
- *Brucella canis* infection is reported among dogs. <sup>3</sup>



Graph: Costa Rica. Brucellosis, cases

**Notes:**

1. 18 cases were reported during 1969 to 1970



Graph: Costa Rica. Brucellosis, deaths

39,954 infected cattle were estimated in 1972.

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
2003 - 2016	Nationwide	animals	0.7-21.7	0.98% of goat herds, 0.7% of sheep herds, 6.5% of horse farms and 21.7% of buffalo farms <sup>4</sup>
2012 - 2013	Multiple locations	cattle	10.5-11.4	10.5% to 11.4% (Rose-Bengal test) <sup>5</sup>

### References

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1. [Emerg Infect Dis 2017 Jun ;23\(6\):997-1000.](#)
2. [ProMED <promedmail.org> archive: 20170501.5006161](#)
3. [ProMED <promedmail.org> archive: 19980506.0877](#)
4. [PLoS One 2017 ;12\(8\):e0182644.](#)
5. [PLoS One 2017 ;12\(8\):e0182380.](#)

**Bunyaviridae infections - misc.**

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

## Campylobacteriosis

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

## Campylobacteriosis in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
1978 - 1979		children	8	8% of pediatric diarrhea episodes <sup>1</sup>
1979 - 1981	Periscal	children	10.5	10.5% of pediatric diarrhea in rural Periscal <sup>2</sup>
2017*		pigeons	1.4	Survey of fecal samples from pigeons ( <i>Columba livia</i> ) in urban parks <sup>3</sup>

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

### References

1. [Am J Trop Med Hyg](#) 1983 Jan ;32(1):146-53.
2. [Rev Biol Trop](#) 1984 Jun ;32(1):137-43.
3. [Vector Borne Zoonotic Dis](#) 2017 Dec 15;

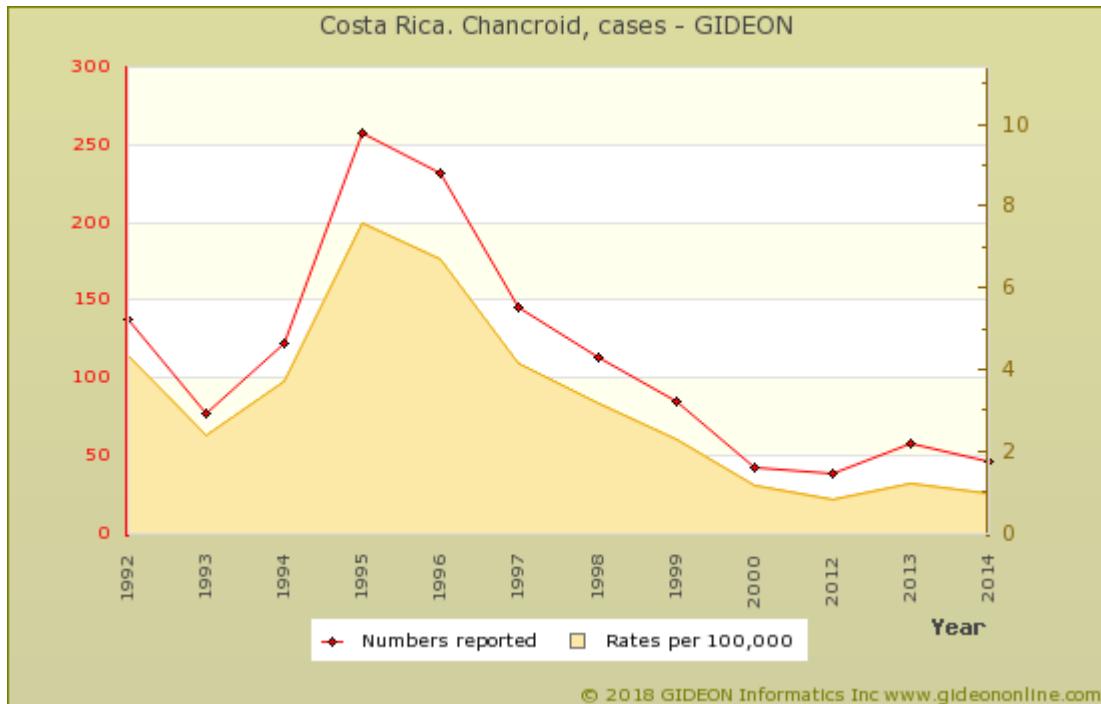
## Candidiasis

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

## Chancroid

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

## Chancroid in Costa Rica



Graph: Costa Rica. Chancroid, cases



## Chandipura and Vesicular stomatitis viruses

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

## Chandipura and Vesicular stomatitis viruses in Costa Rica

Vesicular stomatitis virus is often identified in dairy herds <sup>1</sup> and free-ranging howler monkeys (*Alouatta palliata palliata*).

Horses are commonly seropositive toward New Jersey and Indiana serotypes - with highest rates in the low, dry North Pacific region and in the highlands. <sup>2</sup>

Seropositive rodents are also identified. <sup>3 4</sup>

39 infected cattle were identified during 1991 to 1992, on nine farms. <sup>5</sup>

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005 - 2007	Multiple locations	sloths	14	14% of sloths from Finmac and Upala (Vesicular stomatitis virus) <sup>6</sup>

A number of possible vectors are found in endemic areas: *Lutzomyia volcanensis*, *Lu. shannoni*, *Lu. pia*, *Lu. sanguinaria*, *Lu. youngi*, *Lu. longipalpis*, *Lu. serrana*, and *Lu. gomezi*. <sup>7</sup>

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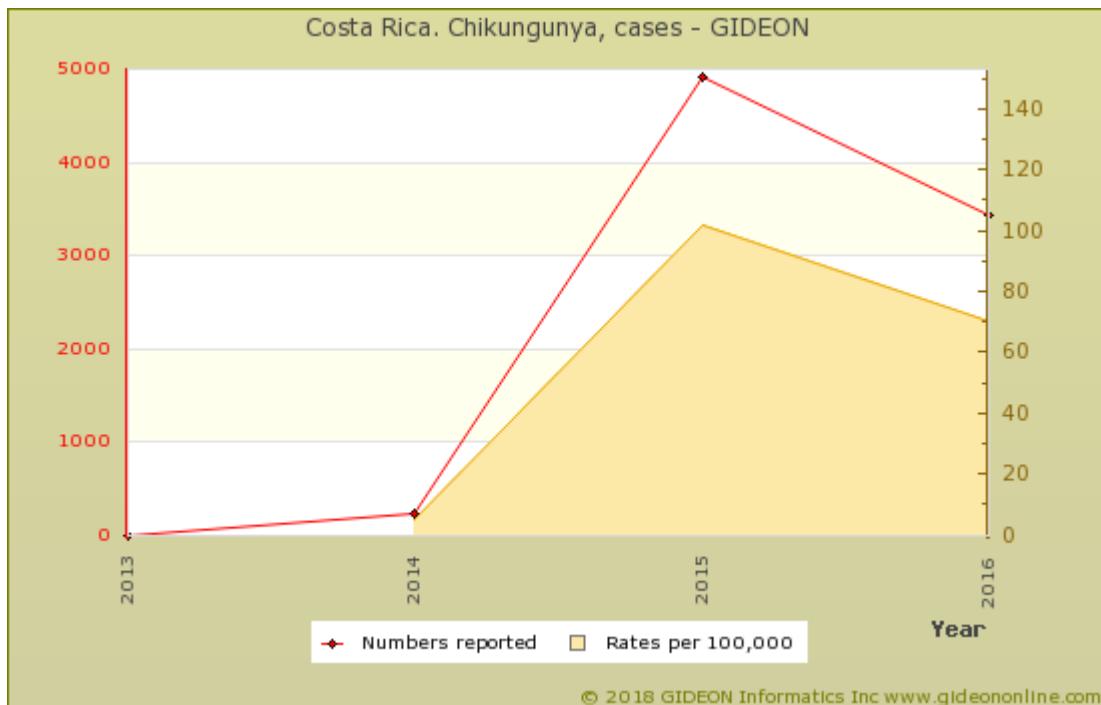
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- 2. J Vet Diagn Invest 2002 Sep ;14(5):438-41.
- 3. Ann N Y Acad Sci 2000 ;916:453-63.
- 4. J Wildl Dis 1996 Apr ;32(2):274-9.

5. Am J Trop Med Hyg 1995 Oct;53(4):342-50.
6. J Wildl Dis 2016 Oct;52(4):883-892.
7. J Med Entomol 1994 Nov;31(6):912-4.

## Chikungunya

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

## Chikungunya in Costa Rica



Graph: Costa Rica. Chikungunya, cases

2016 - Croatia reported its first case of Chikungunya - imported from Costa Rica. <sup>1</sup>

### Notable outbreaks

Years	Region	Cases	Notes
2014	Multiple locations	225	185 autochthonous and 40 imported cases) <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> <a href="#">6</a> <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a> <a href="#">11</a> <a href="#">12</a> <a href="#">13</a> <a href="#">14</a>
2015	Multiple locations	3,700	<a href="#">15</a> <a href="#">16</a> <a href="#">17</a> <a href="#">18</a>
2016	Multiple locations	3,215	Cases to November <a href="#">19</a> <a href="#">20</a> <a href="#">21</a> <a href="#">22</a> <a href="#">23</a> <a href="#">24</a> <a href="#">25</a>
2017		309	Case count to September 8 <a href="#">26</a> <a href="#">27</a> <a href="#">28</a> <a href="#">29</a> <a href="#">30</a>

## References

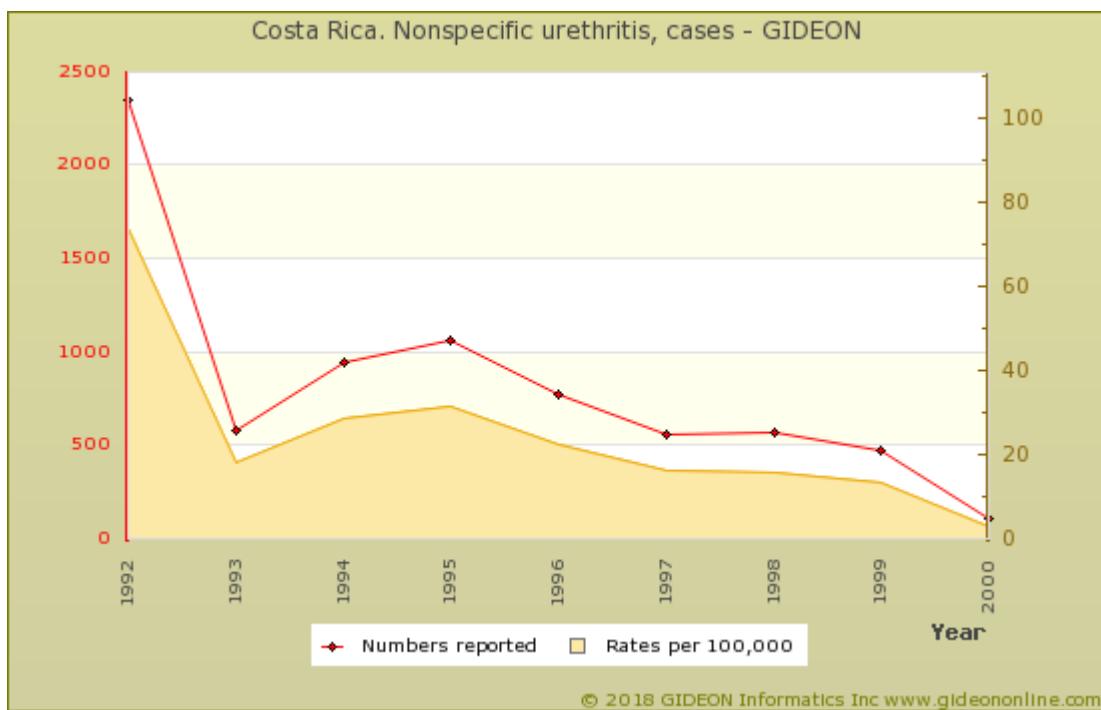
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## Chlamydia infections, misc.

Agent	BACTERIUM. Chlamydiaceae, <a href="#">Chlamydiae</a> , <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	<b>Azithromycin</b> 1g as single dose OR <b>Doxycycline</b> 100 mg BID X 7d. OR <b>Levofloxacin</b> 500 mg daily X 7 days OR <b>Ofloxacin</b> 300 mg BID X 7 days
Typical Pediatric Therapy	Weight <45 kg: <b>Erythromycin</b> 12.5 mg/kg QID X 14d Weight >=45 kg, but age <8 years: <b>Azithromycin</b> 1 g as single dose Age >= 8 years: <b>Azithromycin</b> 1 g as single dose OR <b>Doxycycline</b> 100 mg BID X 7 d
Clinical Hints	- 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 blenorhea, Non-gonococcal urethritis, Nonspecific urethritis, Parachlamydia, Parachlamydia acanthamoebiae, Prachlamydia, Protochlamydia, Protochlamydia naegleriophila, Rhabdochlamydia, Simkania negevensis, Waddlia chondrophila. ICD9: 099.41,099.5 ICD10: A56,A55

## Chlamydia infections, misc. in Costa Rica



Graph: Costa Rica. Nonspecific urethritis, cases

**Prevalence surveys**

Years	Region	Study Group	%	Notes
2008*	San Jose	women	14.2	14.2% of women 18 to 25 years of age who reported previous sexual activity <a href="#">1</a>

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

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
1984 - 1985	Nationwide	women	51.1-64.2	51.1% of women ages 25 to 39, 64.2% ages 40 to 59 <a href="#">2</a>

**References**

1. Sex Transm Dis 2008 May ;35(5):461-8.
2. Genitourin Med 1990 Jun ;66(3):182-8.

## Chlamydophila pneumoniae infection

Agent	BACTERIUM. Chlamydiaceae, <a href="#">Chlamydiae</a> , <i>Chlamydophila (Chlamydia) 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. <a href="#">Azithromycin</a> 500 mg day 1, then 0.25 g daily X 4 days OR <a href="#">Levofloxacin</a> 750 mg po BID X 7d. OR Alternatives: <a href="#">Doxycycline</a> 100 mg BID X 7d. <a href="#">Erythromycin</a> 500 mg QID X 10d. <a href="#">Clarithromycin</a> 0.5 g BID X 7d
Typical Pediatric Therapy	Respiratory isolation <a href="#">Azithromycin</a> 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5
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	Chlamydia pneumoniae, Chlamydia TWAR, Chlamydophila pneumoniae, TWAR. ICD9: 078.88 ICD10: J16.0

## Cholecystitis and cholangitis

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

## Cholera

<b>Agent</b>	BACTERIUM. <i>Vibrio cholerae</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Water, Fecal-oral, Seafood (oyster, ceviche), Vegetables, Fly
<b>Incubation Period</b>	1d - 5d (range 9h - 6d)
<b>Diagnostic Tests</b>	Stool culture. Advise laboratory when this organism is suspected.
<b>Typical Adult Therapy</b>	Stool precautions. <a href="#">Doxycycline</a> 100 mg BID X 5d, or Fluoroquinolone ( <a href="#">Levofloxacin</a> , <a href="#">Trovafloxacin</a> , <a href="#">Pefloxacin</a> , <a href="#">Sparfloxacin</a> or <a href="#">Moxifloxacin</a> ), or <a href="#">Azithromycin</a> Fluids (g/l): NaCl 3.5, NaHCO <sub>3</sub> 2.5, KCl 1.5, glucose 20
<b>Typical Pediatric Therapy</b>	Stool precautions. Age >=8 years: <a href="#">Doxycycline</a> 2 mg/kg BID X 5d. Age <8 years: Sulfamethoxazole / <a href="#">Trimethoprim</a> Fluids (g/l): NaCl 3.5, NaHCO <sub>3</sub> 2.5, KCl 1.5, glucose 20
<b>Vaccines</b>	<a href="#">Cholera - injectable vaccine</a> <a href="#">Cholera - oral vaccine</a>
<b>Clinical Hints</b>	- Massive, painless diarrhea and dehydration - Occasionally vomiting - Apathy or altered consciousness are common - Rapid progression to acidosis, electrolyte imbalance and shock - Fever is uncommon
<b>Synonyms</b>	Colera, Kolera. ICD9: 001 ICD10: A00

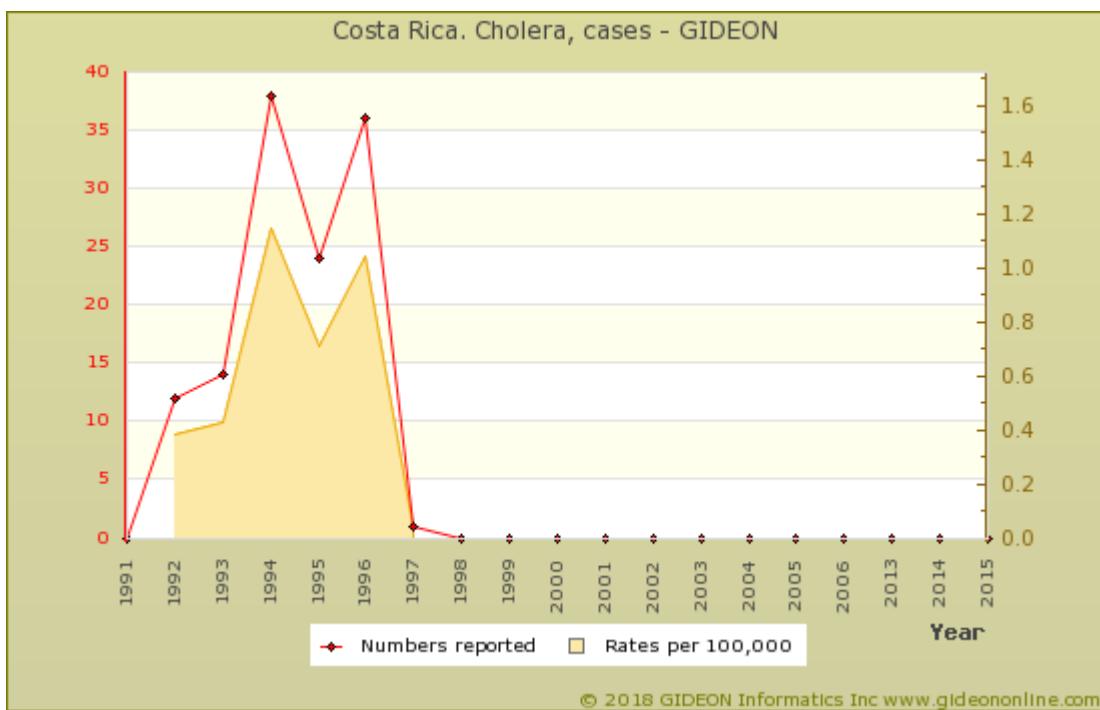
Although Cholera is not endemic to Costa Rica, imported, expatriate or other presentations of the disease have been associated with this country.

### Cholera in Costa Rica

**In recent years cholera has been reported from:** [1](#) [2](#)

Limon Province  
San Jose Province

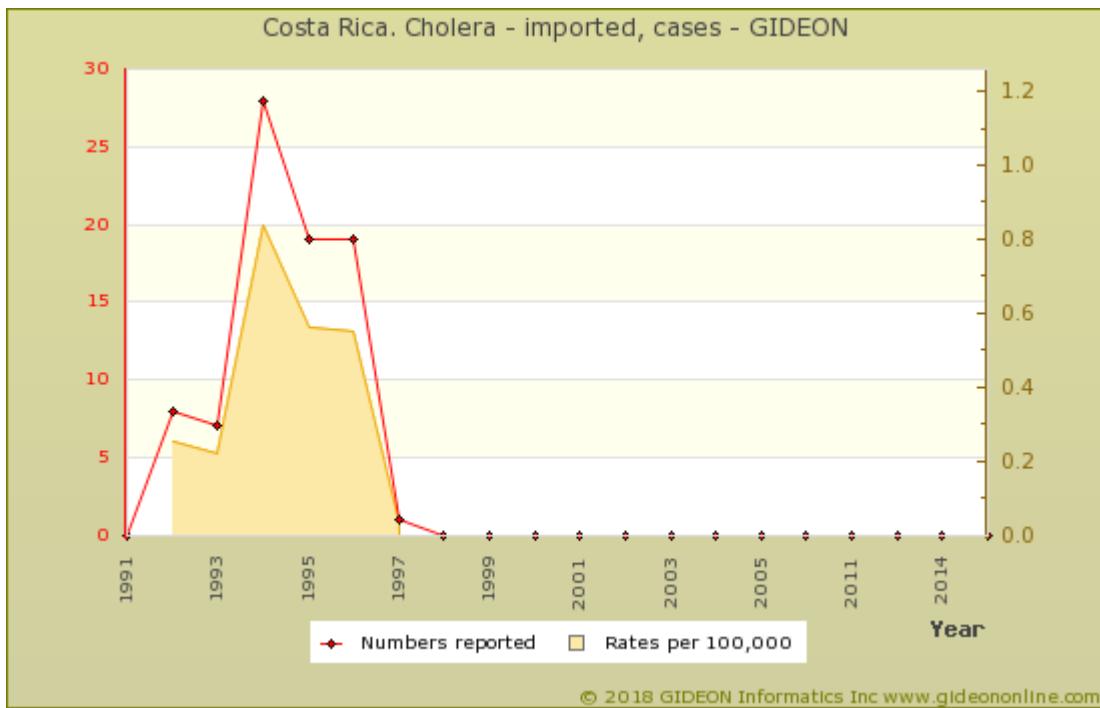
Costa Rica was removed from the WHO "Infected areas list" as of June 2001.



Graph: Costa Rica. Cholera, cases

**Notes:**

- One fatal case (in 1996) was reported during 1991 to 2005.



Graph: Costa Rica. Cholera - imported, cases

**References**

- Wkly Epidemiol Rec 2002 Mar 08;77(10):78-80.
- Wkly Epidemiol Rec 2002 Aug 02;77(31):267-8.

## Chromomycosis

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

### Chromomycosis in Costa Rica

140 cases had been diagnosed as of 1966, with an incidence of 14 cases per year during 1961 to 1966.

The most common agent is *Fonsecaea pedrosoi*, with most infections involving the feet and legs.

## Chronic meningococcemia

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

## Clostridial food poisoning

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

### Clostridial food poisoning in Costa Rica

*Clostridium perfringens* is present in 75% of ground meat and 36% of stewed meat sold in markets.<sup>1</sup>

#### Notable outbreaks

Years	Region	Setting	Cases	Source	Notes
2002	Cartago	prison	133	poultry - chicken	

#### References

1. Arch Latinoam Nutr 2002 Jun ;52(2):155-9.

## Clostridial myonecrosis

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

## Clostridium difficile colitis

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

## Clostridium difficile colitis in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
2008*	San Jose	patients	29.8	29.8% of nosocomial antibiotic-associated diarrhea in adults <a href="#">1</a>

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

### Notable outbreaks

Years	Region	Setting	Deaths	Notes
2009 - 2010	San Jose	hospital	7	<a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> <a href="#">6</a>

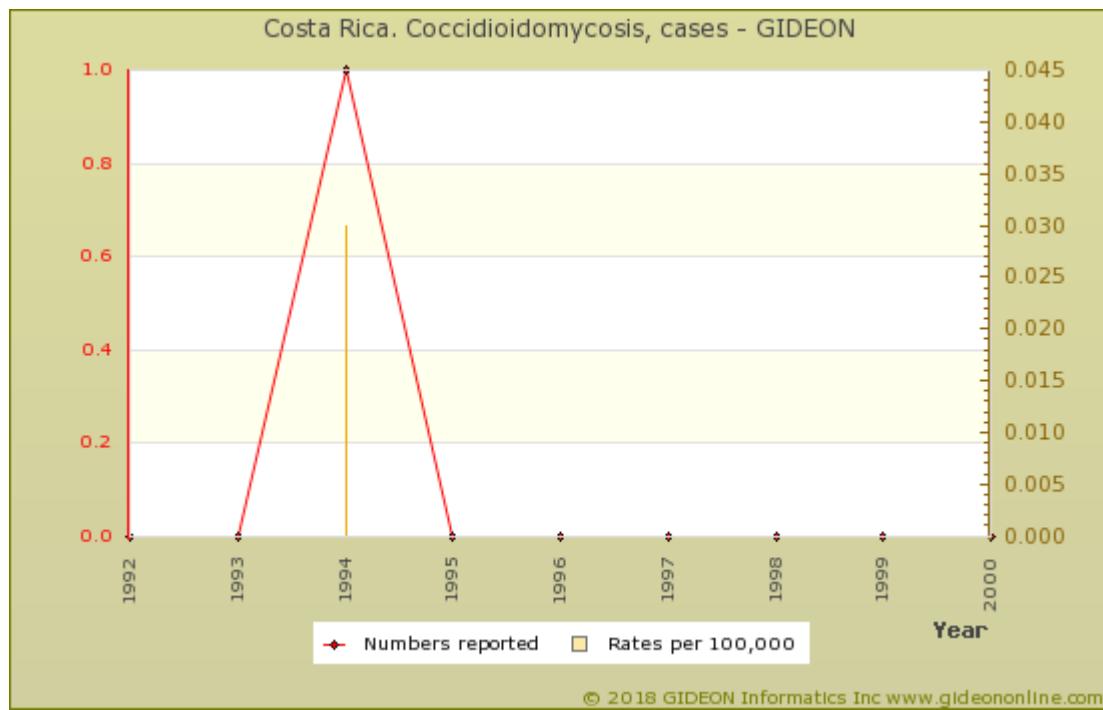
### References

1. Am J Trop Med Hyg 2008 Aug ;79(2):164-5.
2. Rev Panam Salud Publica 2012 Dec ;32(6):413-8.
3. J Infect Dev Ctries 2013 Dec 15;7(12):914-21.
4. J Clin Microbiol 2015 Apr ;53(4):1216-26.
5. Antimicrob Agents Chemother 2017 Apr ;61(4)
6. ProMED <promedmail.org> archive: 20090522.1920

## Coccidioidomycosis

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

## Coccidioidomycosis in Costa Rica



Graph: Costa Rica. Coccidioidomycosis, cases

## Cross-border events

Years	Acquired by **	Originated in **	Setting	Cases	Notes
2001	Germany	Costa Rica	travel	2	

\*\* Country or Nationality

## Common cold

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

## Conjunctivitis - inclusion

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

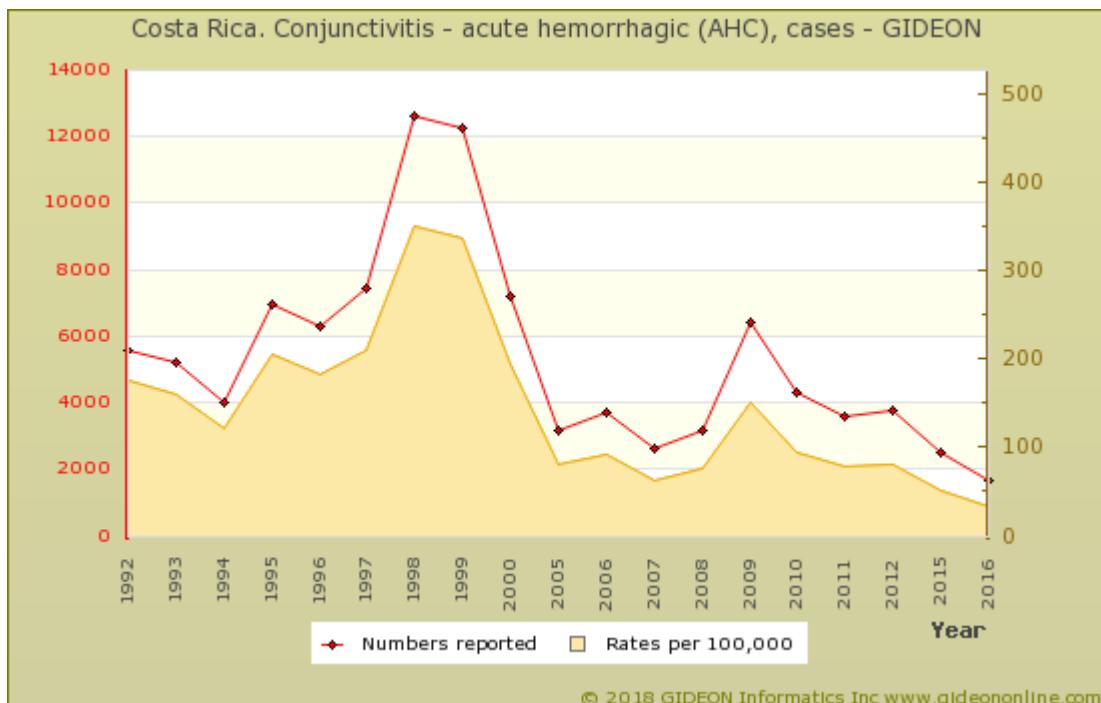
## Conjunctivitis - inclusion in Costa Rica

Six cases were reported in 1995; 0 during 1996 to 2000.

## Conjunctivitis - viral

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

## Conjunctivitis - viral in Costa Rica



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

## Cryptococcosis

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

## Cryptosporidiosis

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

## Cryptosporidiosis in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
1984*	Multiple locations	children	14.8-15.4	14.8% (urban) to 15.4% (rural) children with diarrhea <sup>1</sup>
2014*		health-care workers	0.23	0.23% of health-care workers returning from a cholera epidemic zone in Haiti (asymptomatic carriage) <sup>2</sup>

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

*Cryptosporidium* oocysts have been found in cilantro, lettuce, radishes, tomatoes, cucumbers and carrots - with highest contamination rates during the rainy season. <sup>3</sup> <sup>4</sup>

### References

- 1. Rev Biol Trop 1984 Jun ;32(1):129-35.
- 2. Epidemiol Infect 2015 Apr ;143(5):1016-9.
- 3. Arch Latinoam Nutr 2004 Dec ;54(4):428-32.
- 4. Arch Latinoam Nutr 1996 Dec ;46(4):292-4.

## Cutaneous larva migrans

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

## Cyclosporiasis

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

## Cysticercosis

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

### Cysticercosis in Costa Rica

Seven deaths were ascribed to cysticercosis during 2006 to 2010.

## Cytomegalovirus infection

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

## Dengue

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

## Dengue in Costa Rica

### Time and Place

The local vector, *Stegomyia (Aedes) aegypti*, had been eradicated in 1960, but reappeared in 1971, and no cases were reported until 1993.

- The Central Pacific region accounted for 56.3% of all cases reported during 1993 to 1997; Chorotega 28.8%; Huetar Atlantica 9.7%.
- The Central Pacific region accounted for 18.6% of cases during 2006 to 2010; Chorotega 8.73%; Huetar Atlantica 6.00%.
- DHF first reappeared in 1995, in the Chorotega Region.
- Periodic outbreaks have since occurred, primarily in Puntarenas, Liberia and Limon.
- In 2016, Costa Rica approved the routine use of quadrivalent vaccine for the age group 9 to 45 years.



Graph: Costa Rica. Dengue, cases

**Notes:**

1. 84,443 cases were reported during 2006 to 2010.

**Individual years:**

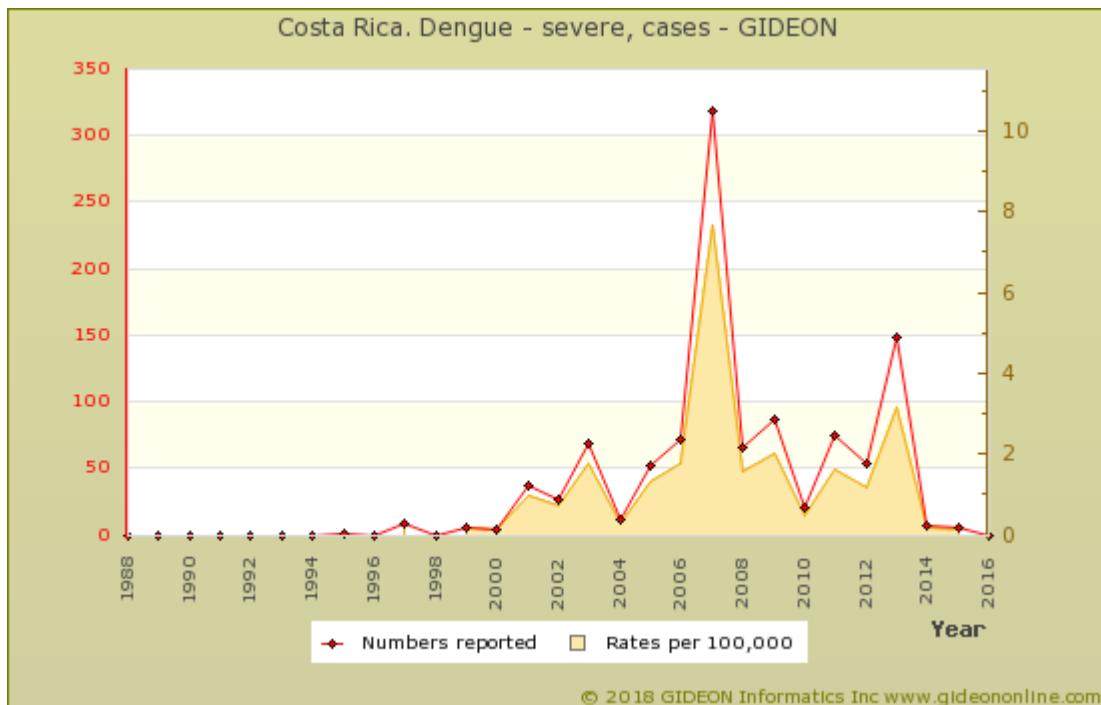
1993 - 93% from Guanacaste and Puntarenas provinces.

1997 - Most cases reported from the central Pacific region.

1998 - 44.5% reported from Chorotega, and 33.4% from Brunca

2007 - Number estimated.

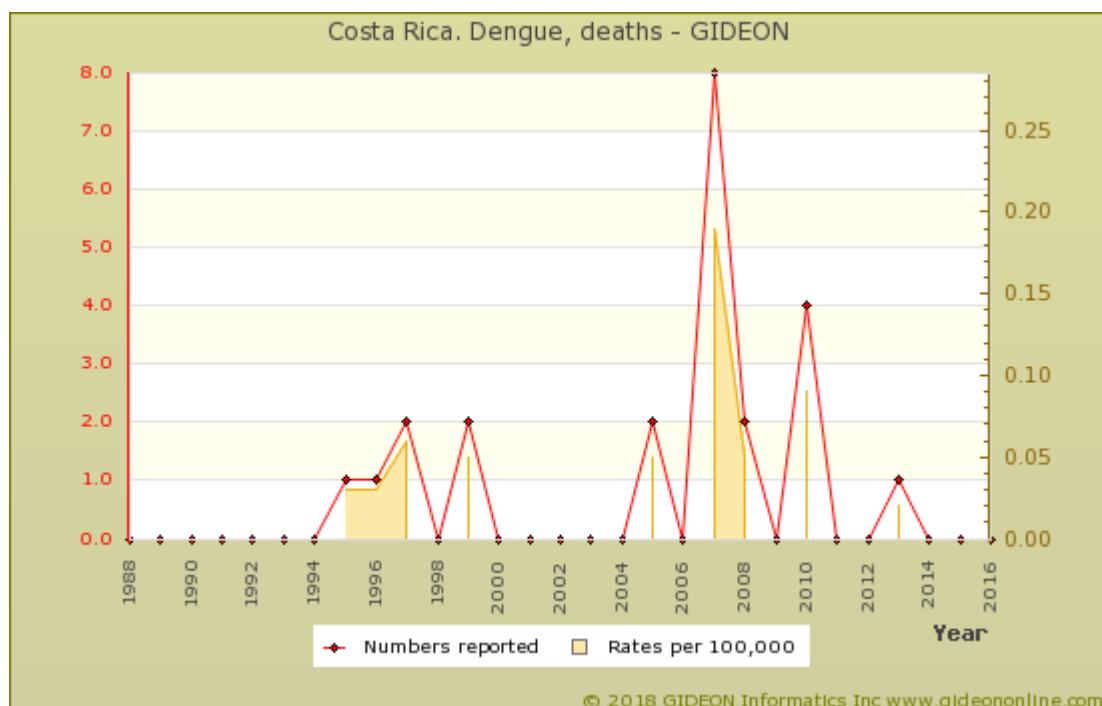
2015 - 4,240 cases were reported to August. [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#)



Graph: Costa Rica. Dengue - severe, cases

**Notes:**

- Formerly reported as Dengue hemorrhagic fever (DHF)



Graph: Costa Rica. Dengue, deaths

#### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1998		bats	22.6	22.6% of bats <a href="#">10</a>
2002 - 2003	Multiple locations	children	2.9-36.9	36.9% of children ages 1 to 10 years in the coastal region, and 2.9% of children in inland areas

#### Notable outbreaks

Years	Cases	Deaths	Notes
1993	4,103		<a href="#">11</a>
2007	26,504		<a href="#">12</a>
2010	20,675	4	<a href="#">13</a> <a href="#">14</a> <a href="#">15</a> <a href="#">16</a> <a href="#">17</a> <a href="#">18</a> <a href="#">19</a> <a href="#">20</a>
2011	6,650		<a href="#">21</a> <a href="#">22</a> <a href="#">23</a>
2012	26,808	0	<a href="#">24</a> <a href="#">25</a> <a href="#">26</a> <a href="#">27</a> <a href="#">28</a> <a href="#">29</a> <a href="#">30</a>
2013	44,933	1	<a href="#">31</a> <a href="#">32</a> <a href="#">33</a> <a href="#">34</a> <a href="#">35</a> <a href="#">36</a> <a href="#">37</a> <a href="#">38</a> <a href="#">39</a> <a href="#">40</a> <a href="#">41</a> <a href="#">42</a> <a href="#">43</a> <a href="#">44</a> <a href="#">45</a> <a href="#">46</a> <a href="#">47</a> <a href="#">48</a> <a href="#">49</a> <a href="#">50</a>
2014	10,460		<a href="#">51</a> <a href="#">52</a> <a href="#">53</a> <a href="#">54</a> <a href="#">55</a> <a href="#">56</a> <a href="#">57</a>
2015	14,322	0	<a href="#">58</a> <a href="#">59</a> <a href="#">60</a> <a href="#">61</a> <a href="#">62</a>
2016	1,972	0	Cases to November <a href="#">63</a> <a href="#">64</a> <a href="#">65</a> <a href="#">66</a> <a href="#">67</a> <a href="#">68</a> <a href="#">69</a> <a href="#">70</a>
2017	4,254	0	Case count to September 8 <a href="#">71</a> <a href="#">72</a> <a href="#">73</a> <a href="#">74</a> <a href="#">75</a>

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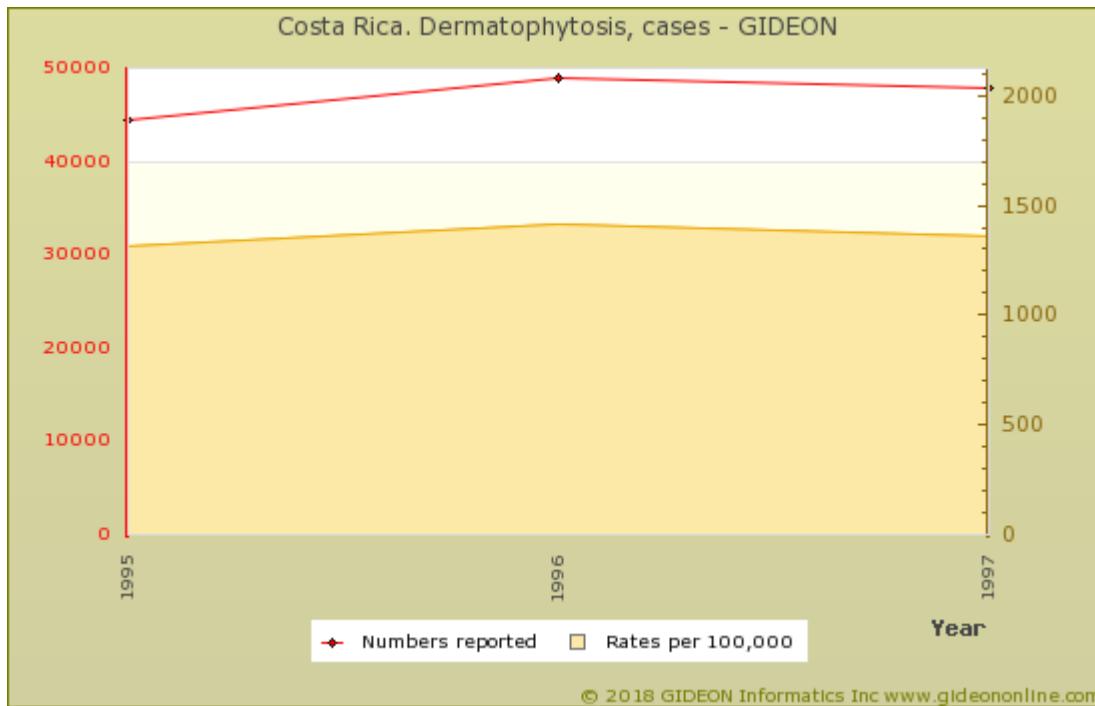
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## Dermatophytosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomyces, Onygenales: <i>Epidermophyton</i> , <i>Microsporum</i> , <i>Trichophyton</i> , <i>Trichosporon</i> spp., <i>Arthroderma</i> , et al
<b>Reservoir</b>	Human, Dog, Cat, Rabbit, Marsupial, Other mammal
<b>Vector</b>	None
<b>Vehicle</b>	Contaminated soil/flooring, Animal Contact
<b>Incubation Period</b>	2w - 38w
<b>Diagnostic Tests</b>	Fungal culture and microscopy of skin, hair or nails. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Skin - topical Clotrimazole, Miconazole, etc. Hair/nails - <i>Terbinafine</i> , <i>Griseofulvin</i> , <i>Itraconazole</i> or <i>Fluconazole</i> PO
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Erythematous, circinate, scaling or dyschromic lesions of skin, hair or nails - Pruritus, secondary infection or regional lymphadenopathy may be present
<b>Synonyms</b>	Arthroderma, Dermatomicose, Dermatomycose, Dermatomycosis, Dermatomykose, Dermatomykosen, Emericella, Favus, Granuloma trichophyticum, Gruby's disease, Kodamaea, Leukonychia trichophytica, Microsporum, Nattrassia, 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 gladiatorium. ICD9: 110,111 ICD10: B35,B36

## Dermatophytosis in Costa Rica



Graph: Costa Rica. Dermatophytosis, cases



## Dientamoeba fragilis infection

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

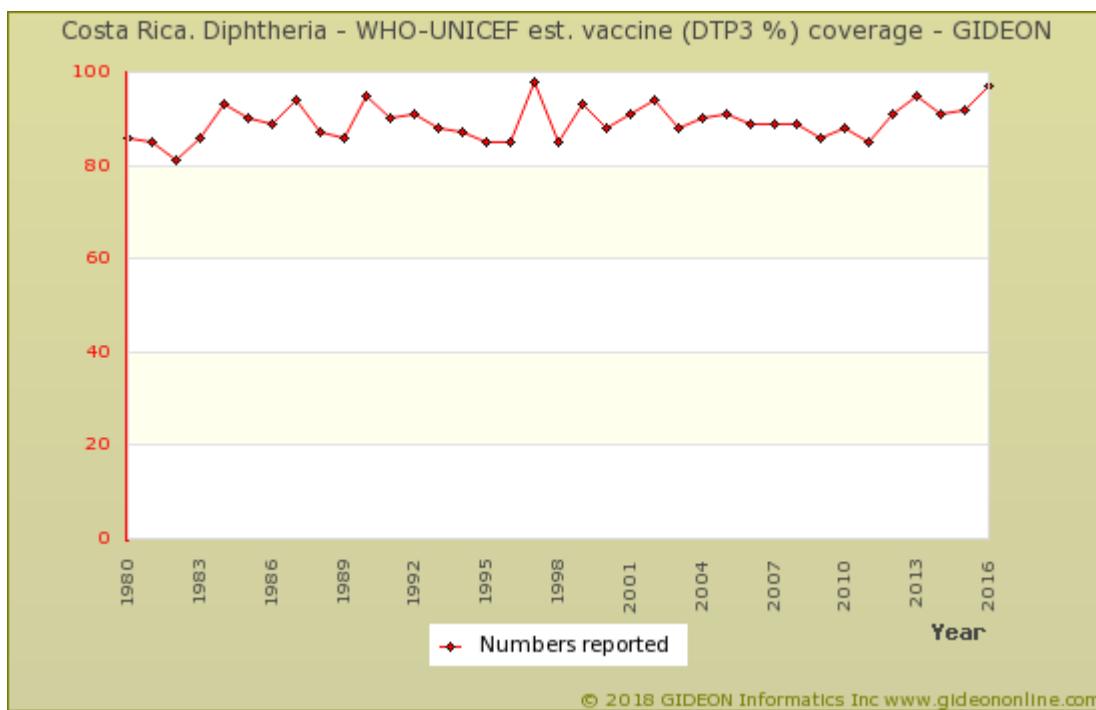
## Diphtheria

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

## Diphtheria in Costa Rica

### Vaccine Schedule:

BCG - birth  
 DTaPHibIPV - 2,4,6,15 months  
 DTaPIPV - 4 years  
 HepB - birth 2, 6 months and adults at risk  
 MMR - 15 months; 7 years  
 Pneumo conj - 2,4,15 months  
 Pneumo ps - >=60 years  
 Td - 10 years  
 Tdap - pregnant women  
 Varicella - 15 months



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



Graph: Costa Rica. Diphtheria, cases

## Diphyllobothriasis

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

## Dipylidiasis

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

## Dirofilariasis

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

## Dirofilariasis in Costa Rica

Cases of periorbital <sup>1</sup>, subcutaneous <sup>2</sup> and pulmonary <sup>3</sup> dirofilariasis are reported.

### Prevalence surveys

Years	Region	Study Group	%	Notes
2014*		dogs	22.5	<sup>4</sup>
2017*	Nationwide	dogs	8	<sup>5</sup>
2011*	San Isidro de El General	various	2.3	2.3% of dogs and cats in San Isidro de El General <sup>6</sup>

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

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- 6. [Vet Parasitol 2011 Dec 29;183\(1-2\):178-83.](#)

## Eastern equine encephalitis

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

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

### Eastern equine encephalitis in Costa Rica

#### Seroprevalence surveys

Years	Region	Study Group	Notes
2005 - 2007	Multiple locations	sloths	Survey of sloths in Finmac and Upala <sup>1</sup>

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## Echinococcosis - American polycystic

<b>Agent</b>	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: <i>Echinococcus vogeli</i> and <i>E. oligarthrus</i>
<b>Reservoir</b>	Bush dog, Paca, Rodent
<b>Vector</b>	None
<b>Vehicle</b>	Carnivore feces, Soil
<b>Incubation Period</b>	3y - 30y
<b>Diagnostic Tests</b>	Serology (may cross react with <i>E. granulosus</i> ). Identification of parasite in surgical specimens.
<b>Typical Adult Therapy</b>	<a href="#">Albendazole</a> 400 mg PO BID X 28d (not of proven benefit) followed by surgery as indicated
<b>Typical Pediatric Therapy</b>	<a href="#">Albendazole</a> 10 mg/kg/day PO X 28d (not of proven benefit) followed by surgery as indicated
<b>Clinical Hints</b>	- Right upper quadrant pain and hepatic mass - Disease appears years after acquisition in an endemic area - Jaundice may be present
<b>Synonyms</b>	American polycystic echinococcosis, <i>Echinococcus oligarthrus</i> , <i>Echinococcus vogeli</i> , Human polycystic hydatid disease, Neotropical echinococcosis, Neotropical polycystic echinococcosis, Neotropical unicystic echinococcosis, Polycystic echinococcosis, Polycystic neotropical echinococcosis. ICD9: 122.9 ICD10: B67.9

## Echinococcosis - American polycystic in Costa Rica

As of 2007, a single cases of human infection by *Echinococcus vogeli* had been reported.<sup>1</sup>

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## Echinococcosis - unilocular

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidae, 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	<b>Albendazole</b> 400 mg BID X 28d. Repeat X 3, with 2 week hiatus between cycles. <b>Praziquantel</b> has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) is also used
Typical Pediatric Therapy	<b>Albendazole</b> 10 mg/kg/day X 28d. Repeat X 3, with 2 week hiatus between cycles. <b>Praziquantel</b> has been used preoperatively to sterilize cyst. Follow by surgery as indicated. PAIR (puncture-aspiration-injection-reaspiration) also used
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 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

## Echinococcosis - unilocular in Costa Rica

The first case report of echinococcosis in a human in Costa Rica was published in 1977. <sup>1</sup>

### References

1. Rev Cubana Med Trop 1977 Jan-Apr;29(1):5-8.

## Ehrlichiosis - human monocytic

<b>Agent</b>	BACTERIUM. Anaplasmataceae <i>Ehrlichia chaffeensis</i> <i>Ehrlichia canis</i> <i>Neoehrlichia mikurensis</i> , et al. Intracellular <i>Rickettsia</i> -like bacteria
<b>Reservoir</b>	Dog, Tick, Deer, Coyote
<b>Vector</b>	Tick ( <i>Dermacentor variabilis</i> or <i>Amblyomma americanum</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	7d - 21d
<b>Diagnostic Tests</b>	Intramonomocytic inclusions seen in blood smear. Serology. Nucleic acid amplification. Cell culture (HL60 cells).
<b>Typical Adult Therapy</b>	<b>Doxycycline</b> 100 mg PO BID X 7 to 14 days OR <b>Rifampin</b> 600 mg daily
<b>Typical Pediatric Therapy</b>	Above age 8 years: <b>Doxycycline</b> 2 mg/kg PO BID X 7 to 14 days. OR <b>Rifampin</b> 10 mg/kg/day PO
<b>Clinical Hints</b>	- Headache, myalgia and vomiting 1 to 2 weeks following tick bite - Arthralgia or macular rash may be present - Leukopenia, thrombocytopenia or hepatic dysfunction are common - Inclusions may be visible in monocytes
<b>Synonyms</b>	Candidatus <i>Neoehrlichia mikurensis</i> , <i>Cowdria ruminantium</i> , <i>Ehrlichia canis</i> , <i>Ehrlichia chaffeensis</i> , <i>Ehrlichia muris</i> , <i>Ehrlichia ruminantium</i> , <i>Ehrlichia</i> sp. Panola Mountain, Human monocytic ehrlichiosis, Human monocyteotropic ehrlichiosis, <i>Neoehrlichia mikurensis</i> , Panola Mountain Ehrlichia. ICD9: 082.41 ICD10: B28.8

## Ehrlichiosis - human monocytic in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
2010*		dogs	47.7	47.7% of dogs ( <i>Ehrlichia canis</i> ) <sup>1</sup>
2013*	Multiple locations	dogs	34	34% of dogs ( <i>Ehrlichia canis</i> , 4 regions) <sup>2</sup>
2014*		dogs	50	50% of dogs ( <i>Ehrlichia canis</i> ) <sup>3</sup>
2015*	Alejuela	patients	15	15% of patients in Zarcero, Alejuela with non-specific symptoms following tick bites ( <i>Ehrlichia chaffeensis</i> ) <sup>4</sup>
2016*	Nationwide	ticks	6.9	6.9% of ticks from dogs ( <i>Ehrlichia canis</i> ) <sup>5</sup>

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

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2016*		blood donors	35	35% of human blood donors ( <i>Ehrlichia canis</i> ) <sup>6</sup>
2016*	Nationwide	dogs	32.1	32.1% of dogs ( <i>Ehrlichia canis</i> ) <sup>7</sup>
2017*	Nationwide	dogs	38.2	38.2% of dogs were seropositive toward <i>Ehrlichia canis</i> <sup>8</sup>

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

**References**

- 
1. [Res Vet Sci 2011 Aug ;91\(1\):95-7.](#)
  2. [Vet Parasitol 2014 Jan 31;199\(3-4\):121-8.](#)
  3. [Acta Parasitol 2014 Mar ;60\(1\):21-5.](#)
  4. [Emerg Infect Dis 2015 Mar ;21\(3\):532-4.](#)
  5. [Ticks Tick Borne Dis 2016 Oct ;7\(6\):1245-1251.](#)
  6. [Ticks Tick Borne Dis 2017 Jan ;8\(1\):36-40.](#)
  7. [Ticks Tick Borne Dis 2016 Oct ;7\(6\):1245-1251.](#)
  8. [Vet Parasitol 2017 Mar 15;236:97-107.](#)

## Endocarditis - infectious

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

## Enterobiasis

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

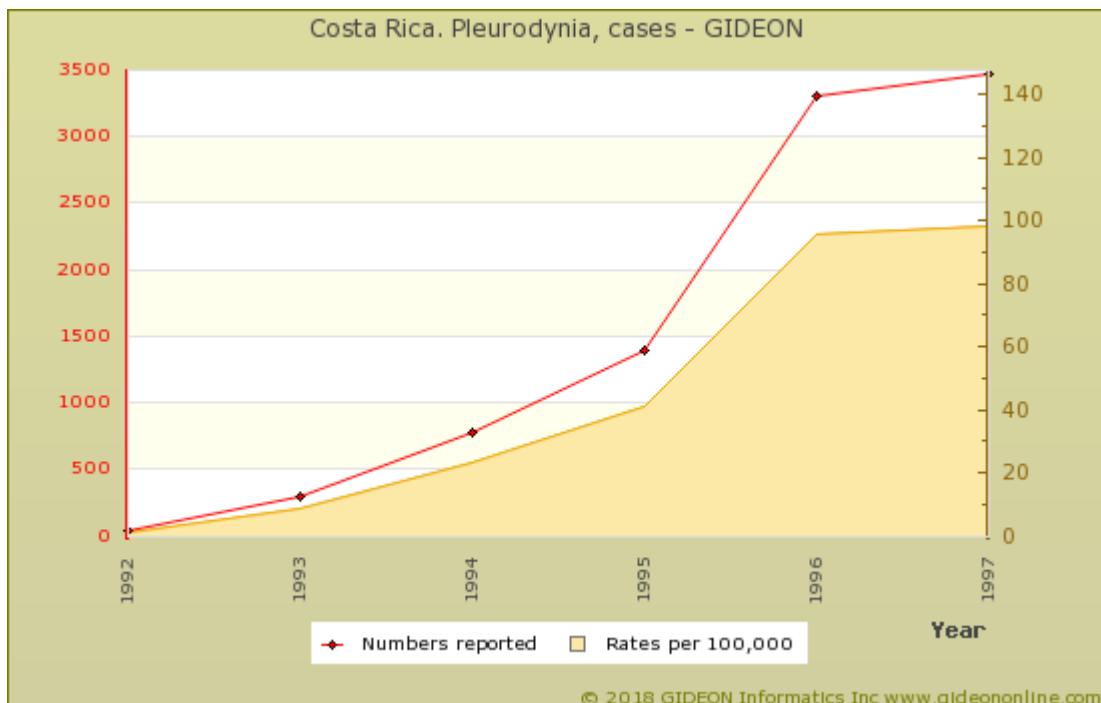
## Enterobiasis in Costa Rica

90 cases of enterobiasis were officially reported in 2010.

## Enterovirus infection

<b>Agent</b>	VIRUS - RNA. Picornaviridae: Coxsackievirus, ECHO virus, Enterovirus, Parechovirus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet, Fecal-oral, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2d-7d
<b>Diagnostic Tests</b>	Viral culture (stool, pharynx, CSF). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive. <b>Pleconaril</b> 200 to 400 mg PO TID X 7d has been used for severe infections
<b>Typical Pediatric Therapy</b>	Supportive. <b>Pleconaril</b> 5 mg/kg PO BID has been used for severe infections
<b>Clinical Hints</b>	- Summer-to-autumn sore throat - Specific forms present with conjunctivitis, chest pain, macular or vesicular rash, meningitis, myopericarditis, etc
<b>Synonyms</b>	Boston exanthem [Caxsackie 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 Costa Rica

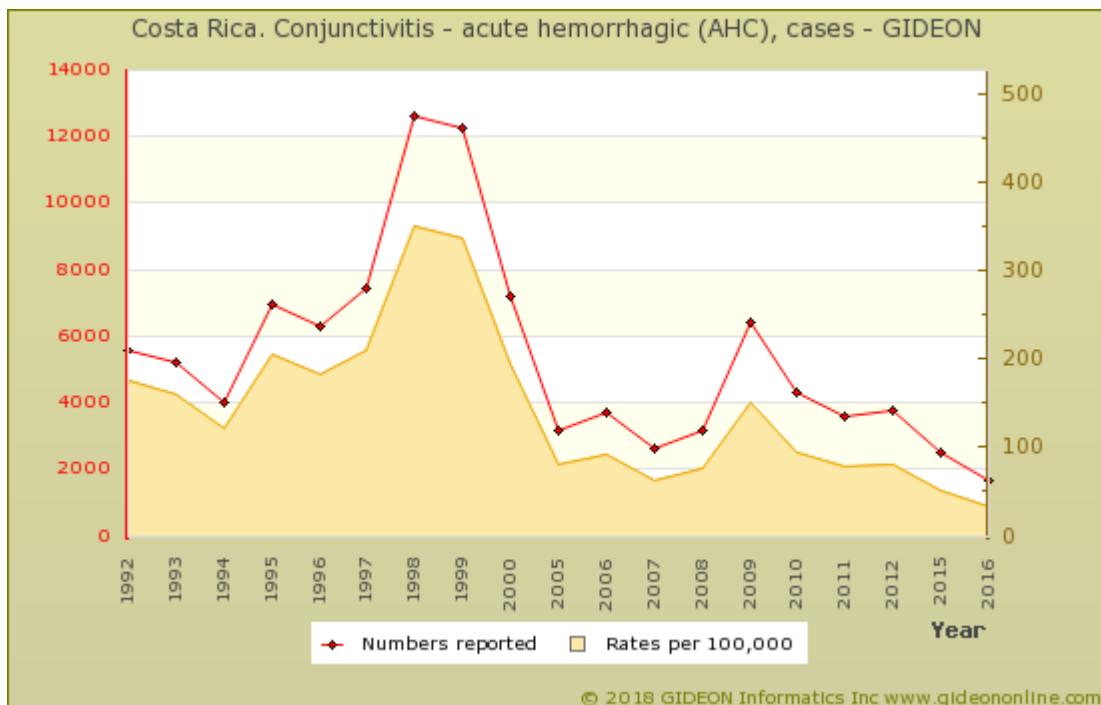


Graph: Costa Rica. Pleurodynia, cases

Notes:

Individual years:

1995 - 41.4 per 100,000  
1997 - 98.7 per 100,000



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

## Entomophthoramycosis

<b>Agent</b>	FUNGUS. Zygomycota, Zygomycetes, Entomophthorales, Entomophthoramycota. <i>Basidiobolus</i> or <i>Conidiobolus</i>
<b>Reservoir</b>	Vegetation, Soil, Amphibian, Reptile
<b>Vector</b>	None
<b>Vehicle</b>	Air (inhalation), Direct inoculation, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Biopsy and fungal culture.
<b>Typical Adult Therapy</b>	Antifungal agents and excision as indicated. Oral potassium iodide may be helpful
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Slowly-spreading subcutaneous nodule involving nose, upper face, pharynx - Skin ulceration and systemic signs are absent
<b>Synonyms</b>	Basidiobolomycosis, Basidiobolus, Conidiobolosis, Conidiobolus, Rhinomycosis, Rhinophycomycosis, entomophthorae, Subcutaneous phycomycosis, Subcutaneous zygomycosis. ICD9: 117.9 ICD10: B48.8

## Epidural abscess

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

## Erysipelas or cellulitis

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

## Erysipeloid

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

## Erythrasma

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

## Escherichia coli diarrhea

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

### Prevalence surveys

Years	Region	Study Group	%	Notes
1978 - 1979		children	13.4	ETEC accounts for 13.4% of pediatric diarrhea episodes <sup>1</sup>
2017*		pigeons	6.4	Survey of fecal samples from pigeons ( <i>Columba livia</i> ) in urban parks <sup>2</sup>
2012*	San Jose	rice	16	<i>Escherichia coli</i> was identified in 16% of white cooked rice from restaurants in San Jose <sup>3</sup>

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

### References

1. Am J Trop Med Hyg 1983 Jan ;32(1):146-53.
2. Vector Borne Zoonotic Dis 2017 Dec 15;
3. Arch Latinoam Nutr 2012 Sep ;62(3):283-9.

## Fascioliasis

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

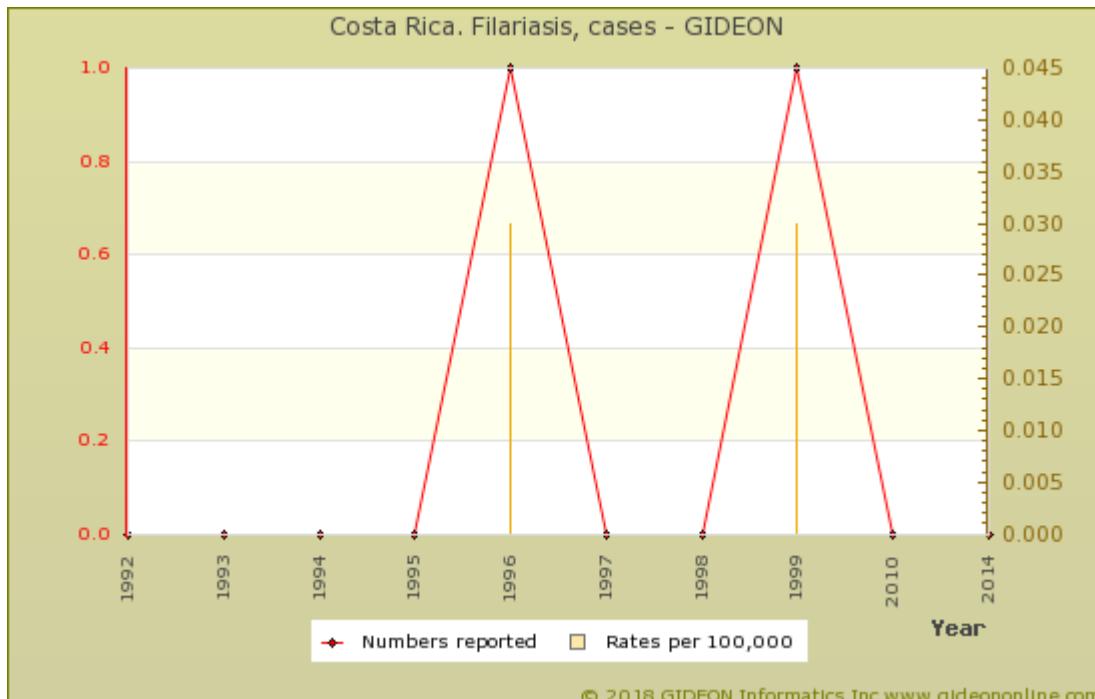
## Fascioliasis in Costa Rica

Costa Rica. Fascioliasis, cases: None reported between 1992 and 2000

## Filarisis - Bancroftian

<b>Agent</b>	PARASITE - Nematoda. Secernentea: <i>Wuchereria bancrofti</i>
<b>Reservoir</b>	Human
<b>Vector</b>	Mosquito ( <i>Anopheles, Aedes, Culex</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	5m - 18m (range 1m - 2y)
<b>Diagnostic Tests</b>	Identification of microfilariae in nocturnal blood specimen. Nucleic acid amplification. Serology may be helpful.
<b>Typical Adult Therapy</b>	<b>Diethylcarbamazine :</b> 50 mg day 1 50 mg TID day 2 100 mg TID day 3 Then 2 mg/kg TID X 18 days. OR <b>Ivermectin</b> 200ug/kg PO as single dose. <b>Doxycycline</b> 200 mg daily X 8 w is also effective.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Lymphangitis, lymphadenitis and eosinophilia - Epididymitis, orchitis, hydrocoele or progressive edema are common - Chyluria occasionally encountered - Episodes of fever and lymphangitis may recur over several years
<b>Synonyms</b>	Bancroftian filariasis, Rosetta leg, Wuchereria bancrofti. ICD9: 125.0 ICD10: B74.0

## Filarisis - Bancroftian in Costa Rica



Graph: Costa Rica. Filarisis, cases

1.8% to 2.7% of the population of Puerto Limon are microfilaremic (1983 publication). <sup>1</sup>

The local vector is *Culex pipiens fatigans*. <sup>2</sup>

#### **References**

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1. Am J Trop Med Hyg 1983 Nov ;32(6):1294-7.
2. Am J Trop Med Hyg 1977 Nov ;26(6 Pt 1):1148-52.

## Fungal infection - invasive

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

## Gastroenteritis - viral

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

## Gastroenteritis - viral in Costa Rica

### Notable outbreaks

Years	Pathogen	Population	Notes
1994 - 1995	multiple pathogens	children	<a href="#">1</a>

### References

- Rev Biol Trop 1997 Sep ;45(3):989-91.

## Gianotti-Crosti syndrome

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

## Giardiasis

<b>Agent</b>	PARASITE - Protozoa. Sarcomastigophora, Metamonada, Trepomonadea. Flagellate: <i>Giardia lamblia</i> ( <i>G. intestinalis</i> , <i>G. duodenalis</i> )
<b>Reservoir</b>	Human, Beaver, Muskrat, Dog, Cat, Carnivores, Sheep, Goat, Horse, Cattle
<b>Vector</b>	None
<b>Vehicle</b>	Food, Water, Fecal-oral, Fly
<b>Incubation Period</b>	1w - 3w (range 3d - 6w)
<b>Diagnostic Tests</b>	String test (gelatin capsule containing string). Stool microscopy or antigen assay. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<b>Tinidazole</b> 2 g PO X1. OR <b>Nitazoxanide</b> 500 mg PO BID X 3d Alternatives: <b>Metronidazole</b> 250 mg PO TID X 5d. OR <b>Furazolidone</b> 100 mg PO QID X 7d. OR <b>Paromomycin</b> 10 mg/kg PO TID X 7d OR <b>Quinacrine</b> 100 mg PO TID X 5d
<b>Typical Pediatric Therapy</b>	<b>Tinidazole</b> 50 mg PO X 1 (maximum 2g). OR <b>Nitazoxanide</b> : Age 1 to 3y 100 mg BID X 7 d Age 4 to 11y 200 mg BID X 7d Alternatives: <b>Metronidazole</b> 5 mg/kg PO TID X 5d. OR <b>Furazolidone</b> 1.5 mg/kg QID X 7d
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Beaver fever, Giardia duodenalis, Giardia intestinalis, Giardia lamblia, Lambliasis. ICD9: 007.1 ICD10: A07.1

## Giardiasis in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	San Isidro	cats	67.5	67.5% of cats in San Isidro de El General <a href="#">1</a> <a href="#">2</a>
1996*		cilantro	2.5-5.2	5.2% of cilantro leaves and 2.5% of cilantro roots <a href="#">3</a>

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

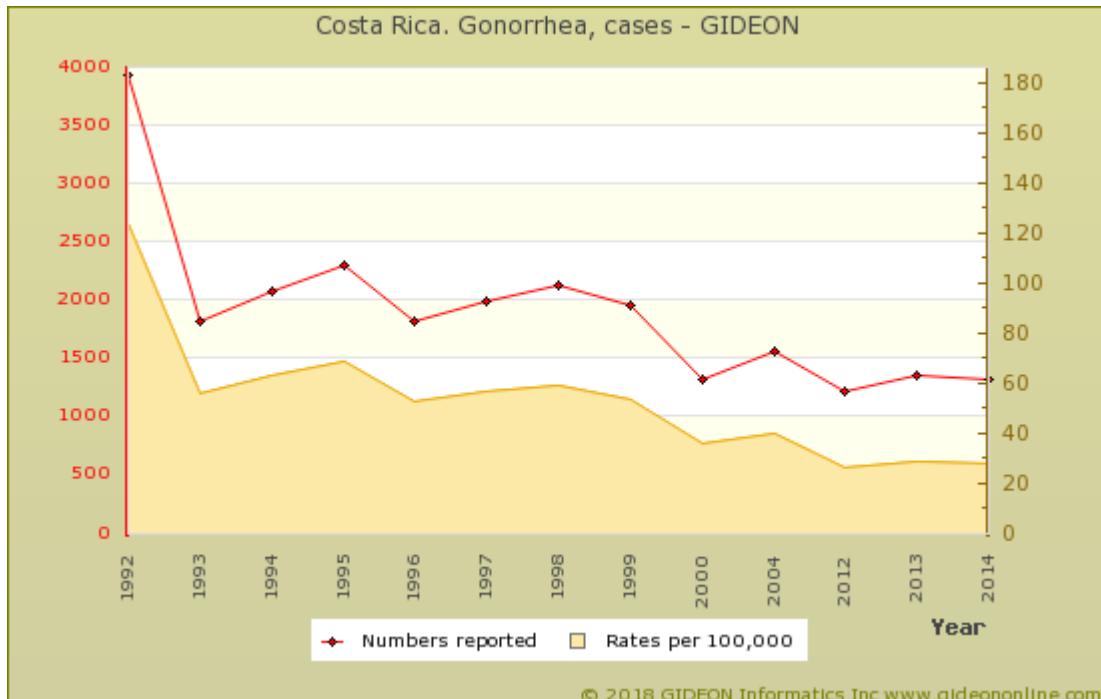
### References

1. *Vet Parasitol* 2011 Dec 29;183(1-2):178-83.
2. *Vet Parasitol* 2011 Dec 29;183(1-2):178-83.
3. *Arch Latinoam Nutr* 1996 Dec ;46(4):292-4.

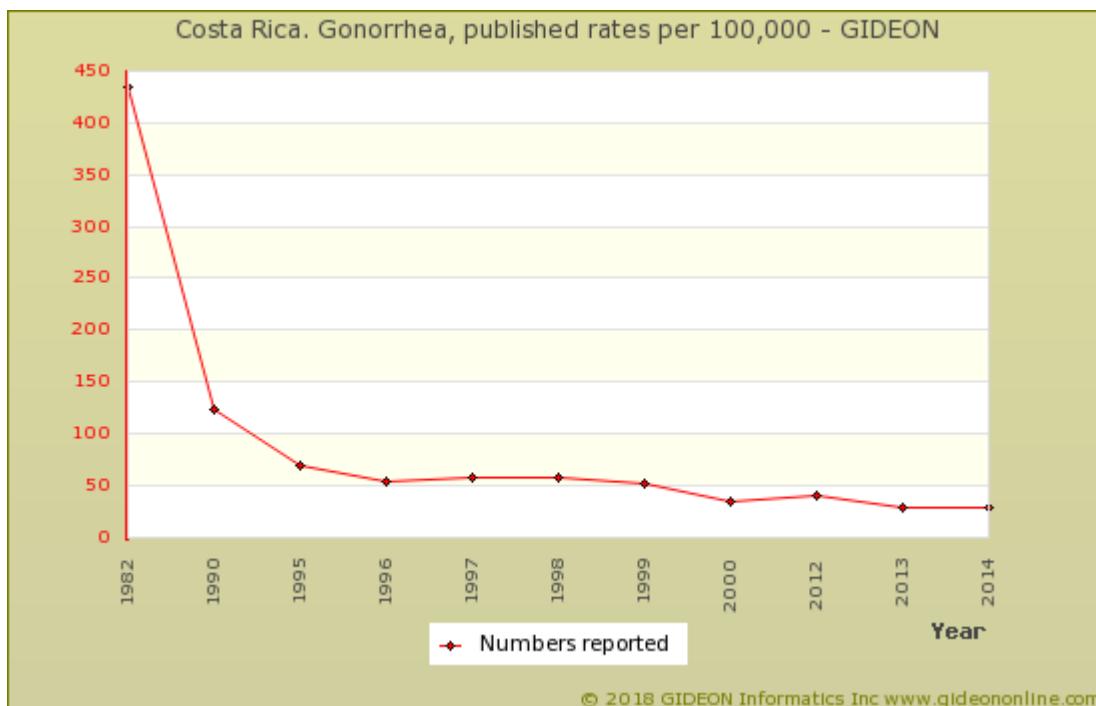
## Gonococcal infection

<b>Agent</b>	BACTERIUM. <i>Neisseria gonorrhoeae</i> An aerobic gram-negative coccus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Sexual, contact, Childbirth, Exudates, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2d - 7d
<b>Diagnostic Tests</b>	Smear (male), culture. Consult laboratory for proper acquisition & transport. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Ceftriaxone 250 mg IM X 1. PLUS Azithromycin 1 g PO as single dose.
<b>Typical Pediatric Therapy</b>	Weight <=45 kg: Ceftriaxone 25 - 50 mg/kg IM or IV X 1 (max. 125 mg IM) Weight >45 kg: as for adult. PLUS Azithromycin
<b>Clinical Hints</b>	- 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)
<b>Synonyms</b>	Blennorragie, Blenorragia, Gonococcemia, Gonore, Gonorre, Gonorrhea, Gonorrhoea, Gonorrhoe, Gonorrhoe, Gonorrhoe, Infeccion gonococica, Infeccoes gonococicas, Neisseria gonorrhoeae. ICD9: 098 ICD10: A54

## Gonococcal infection in Costa Rica



Graph: Costa Rica. Gonorrhea, cases

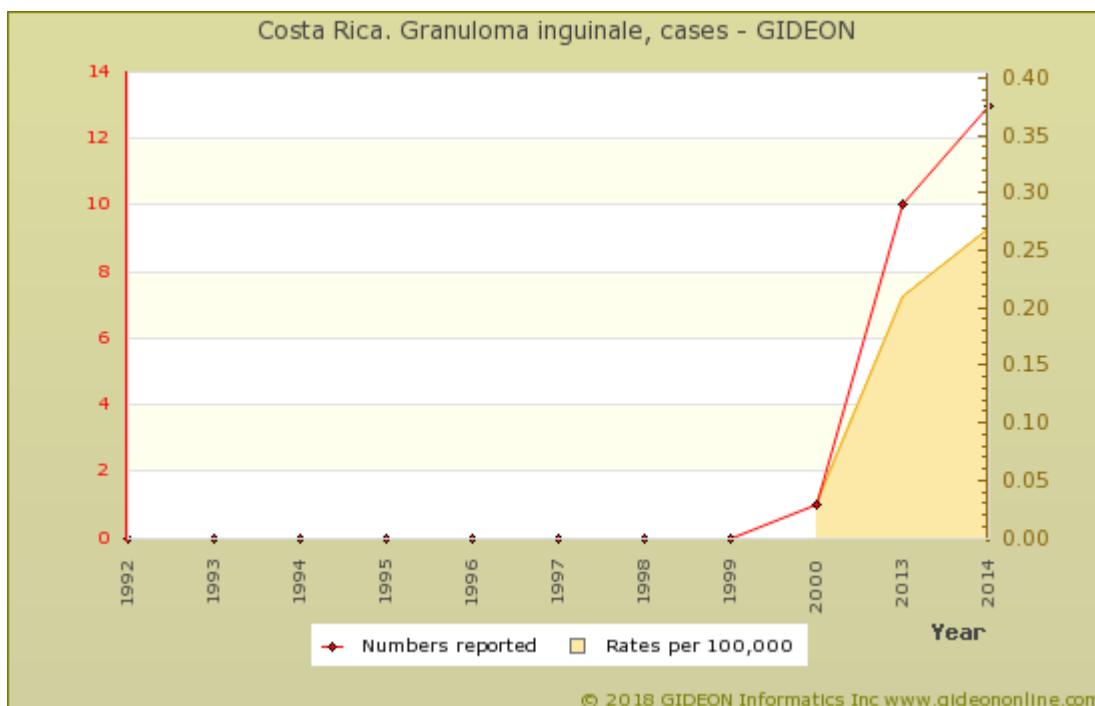


Graph: Costa Rica. Gonorrhea, published rates per 100,000

## Granuloma inguinale

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

## Granuloma inguinale in Costa Rica



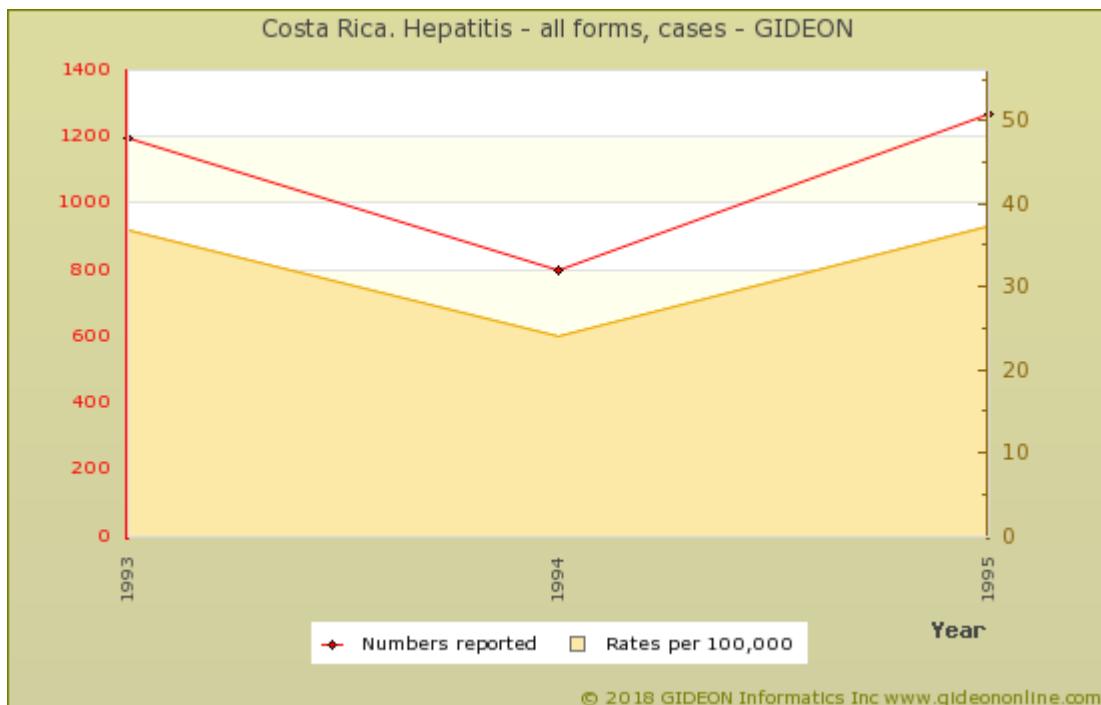
Graph: Costa Rica. Granuloma inguinale, cases



## Hepatitis A

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

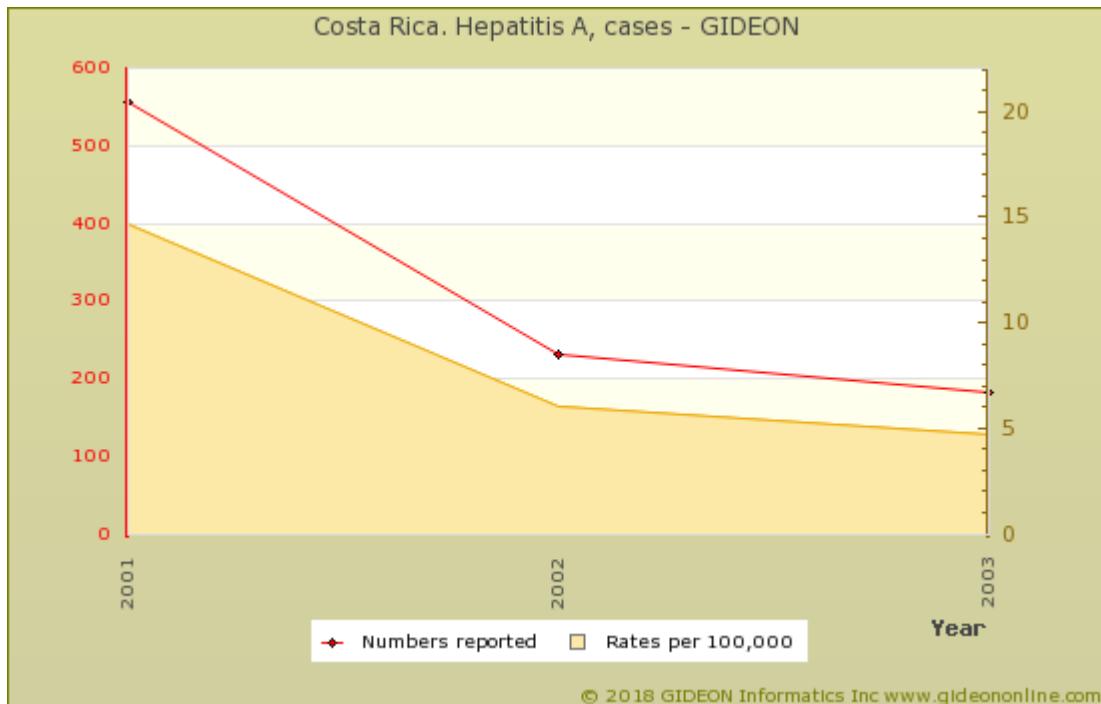
## Hepatitis A in Costa Rica



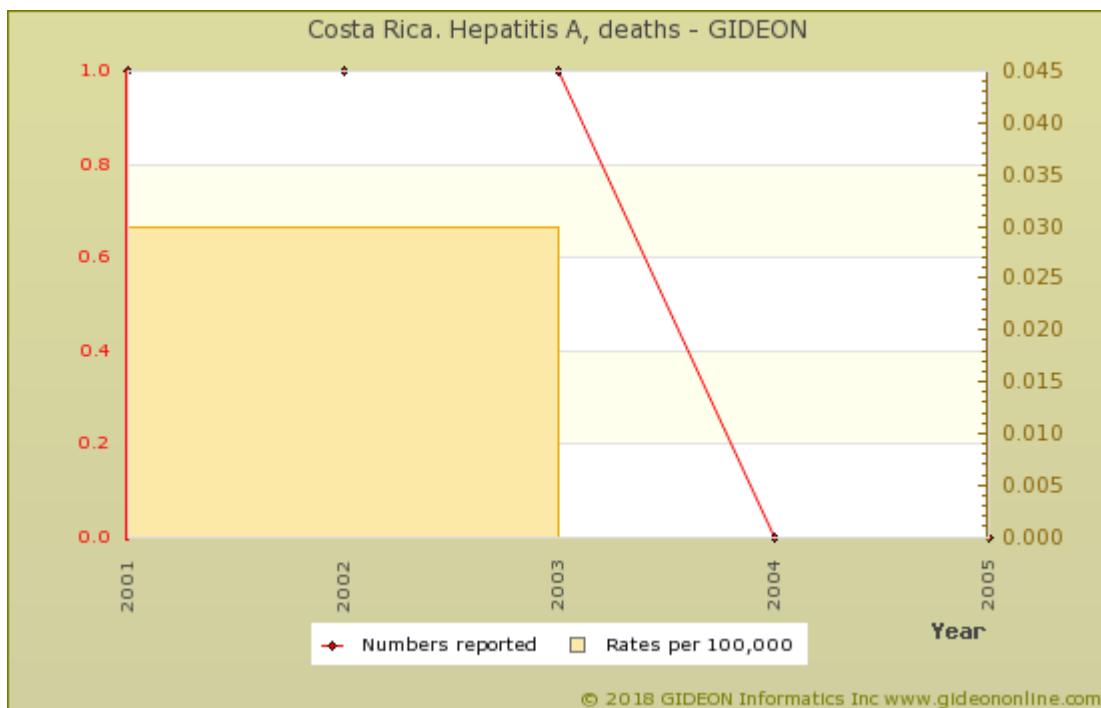
Graph: Costa Rica. Hepatitis - all forms, cases

### Notes:

1. 484 cases were reported during January to August 1996.



Graph: Costa Rica. Hepatitis A, cases



Graph: Costa Rica. Hepatitis A, deaths

**Seroprevalence surveys**

Years	Study Group	%	Notes
	general population	70	70% of the population by age 10; and virtually all adults

**Notable outbreaks**

Years	Notes
1966*	Outbreak reported - additional details unavailable. <sup>1</sup>
1999	Outbreak reported - additional details unavailable. <sup>2</sup>

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

#### References

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1. Am J Epidemiol 1966 Nov ;84(3):457-66.
2. J Med Virol 2001 Nov ;65(3):449-56.

## Hepatitis B

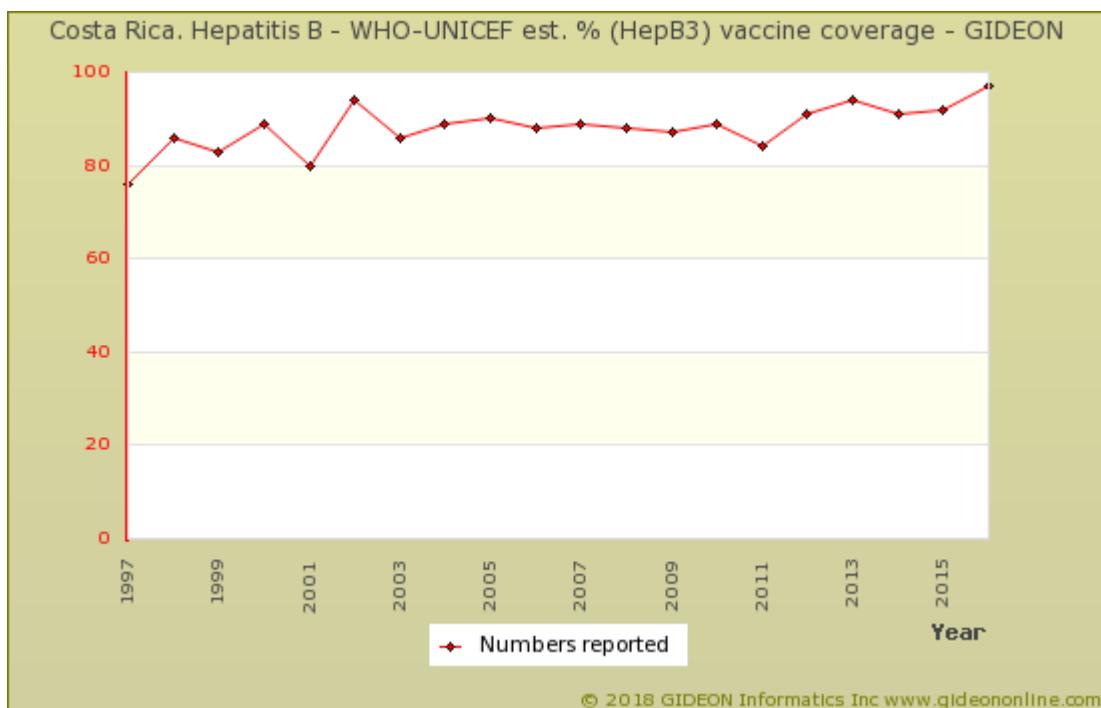
<b>Agent</b>	VIRUS - DNA. Hepadnaviridae, Orthohepadnavirus: Hepatitis B virus
<b>Reservoir</b>	Human Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Infected secretions, Sexual contact, Transplacental
<b>Incubation Period</b>	2m - 3m (range 1m - 13m)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Needle precautions. For chronic infection: <a href="#">Peginterferon alfa-2a</a> or <a href="#">Peginterferon alfa-2b</a> OR <a href="#">Entecavir</a> OR <a href="#">Tenofovir</a>
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">Hepatitis A + Hepatitis B vaccine</a> <a href="#">Hepatitis B + Haemoph. influenzae vaccine</a> <a href="#">Hepatitis B immune globulin</a> <a href="#">Hepatitis B vaccine</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Epatite B, HBV, Hepatite per virus B, Serum hepatitis. ICD9: 070.1 ICD10: B16.2,B16.9, B16.1

## Hepatitis B in Costa Rica

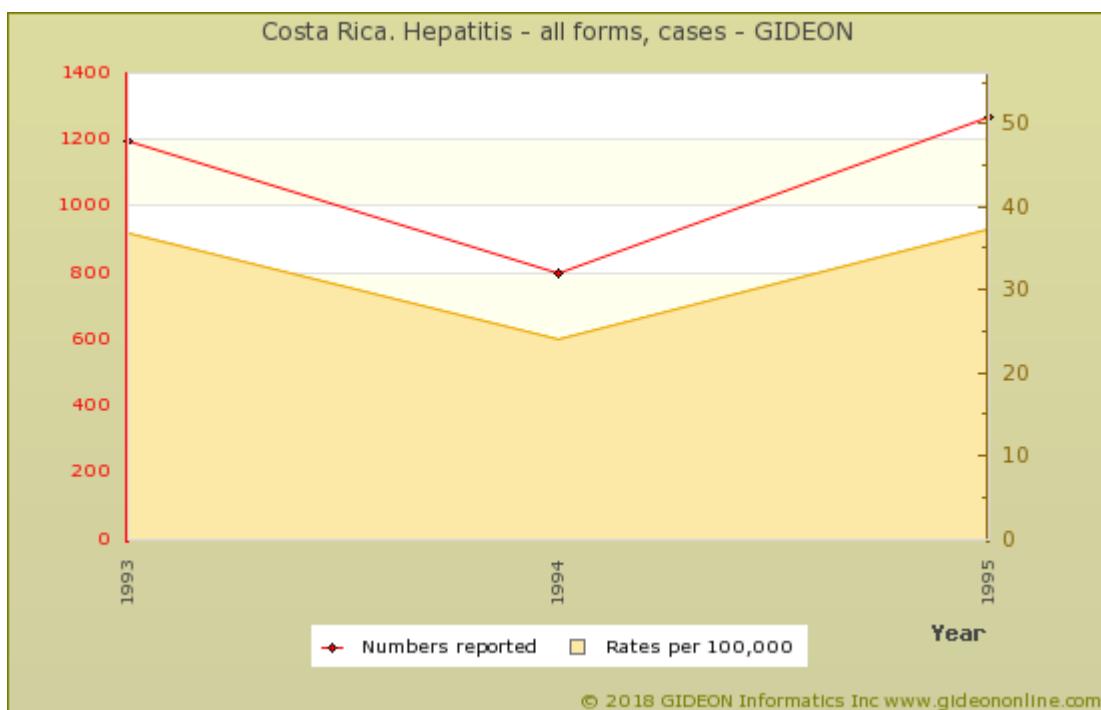
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### Vaccine Schedule:

BCG - birth  
 DTaPHibIPV - 2,4,6,15 months  
 DTaPIPV - 4 years  
 HepB - birth 2, 6 months and adults at risk  
 MMR - 15 months; 7 years  
 Pneumo conj - 2,4,15 months  
 Pneumo ps - >=60 years  
 Td - 10 years  
 Tdap - pregnant women  
 Varicella - 15 months



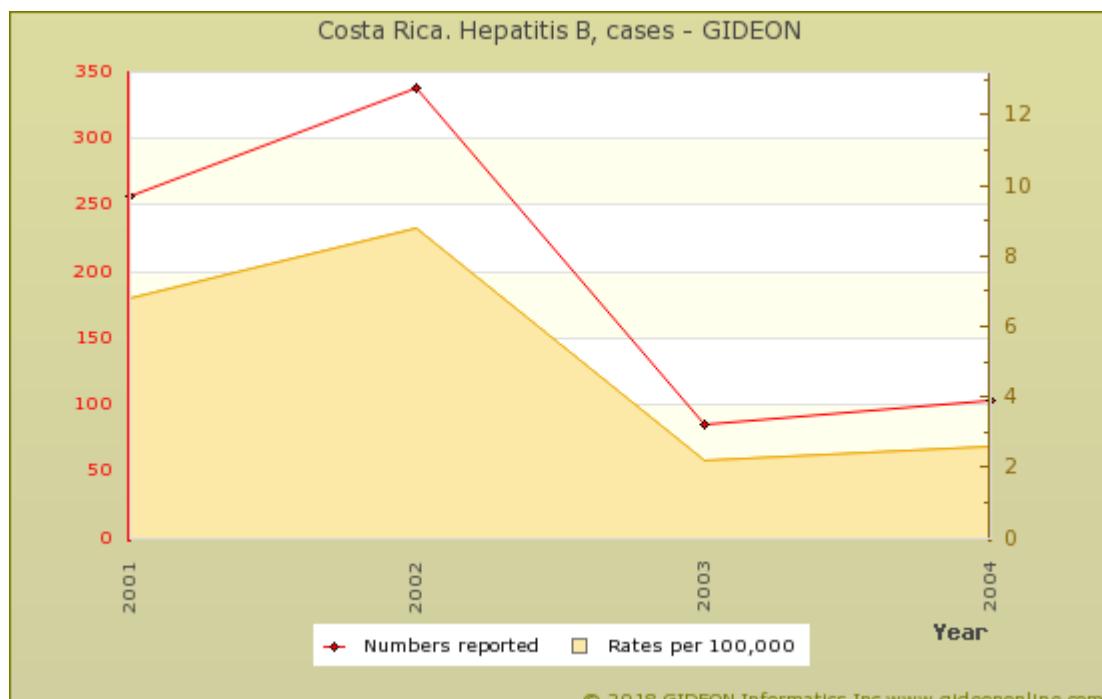
Graph: Costa Rica. Hepatitis B - WHO-UNICEF est. % (HepB3) vaccine coverage



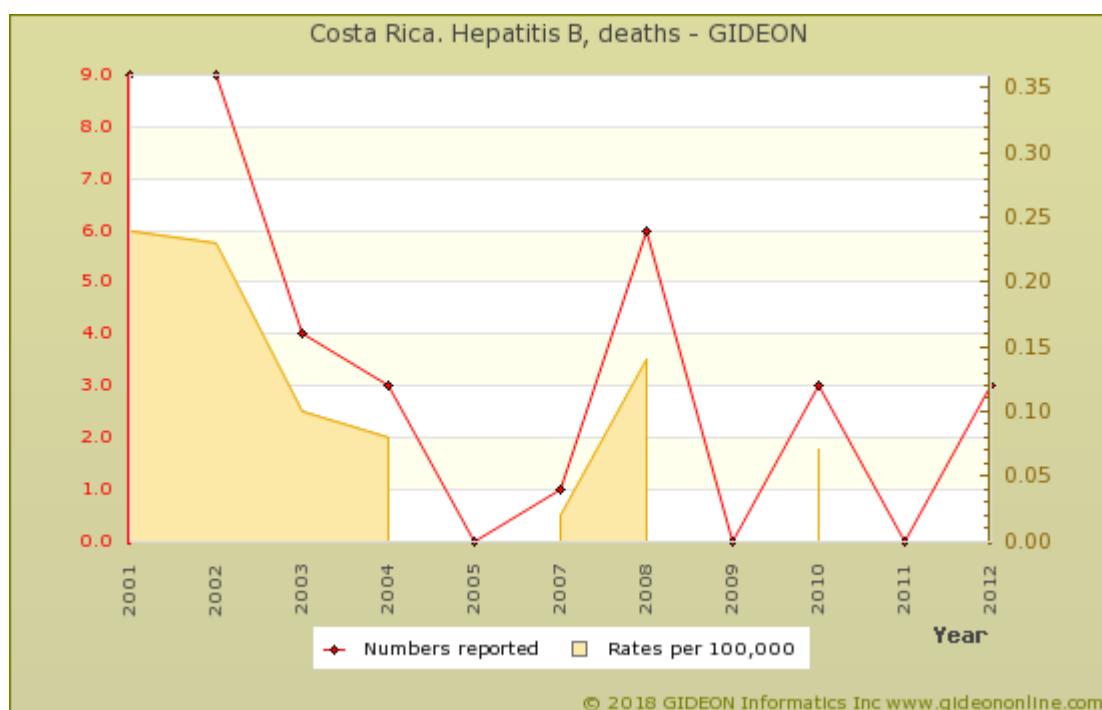
Graph: Costa Rica. Hepatitis all forms, cases

## Notes:

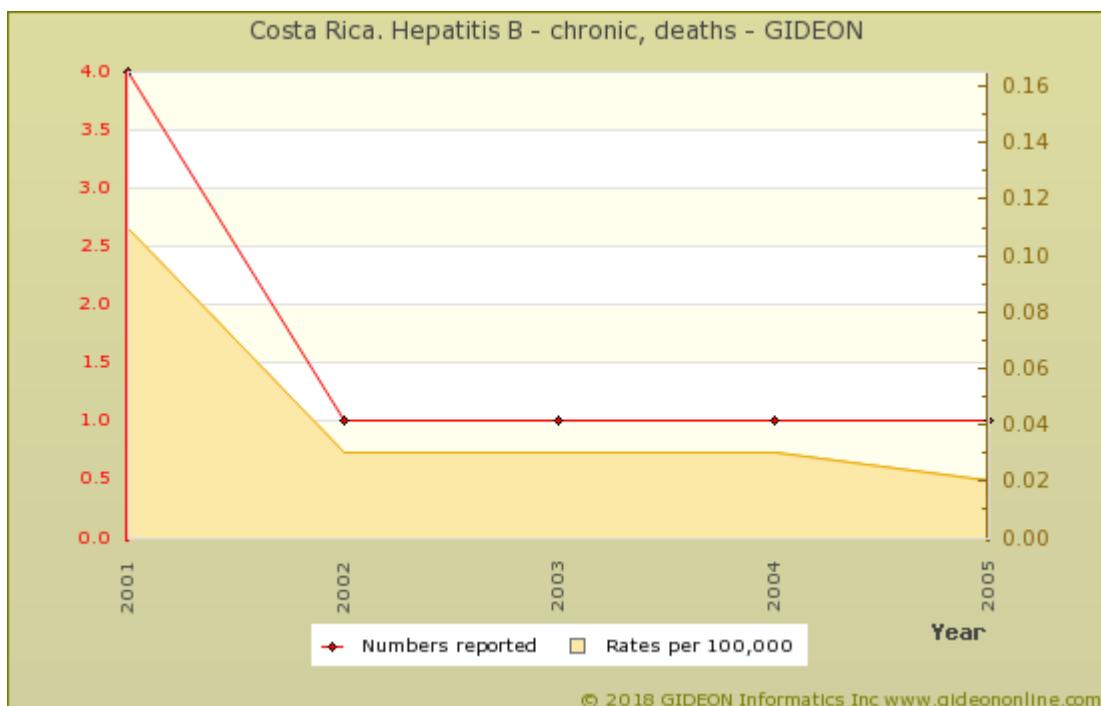
1. 484 cases were reported during January to August 1996.



Graph: Costa Rica. Hepatitis B, cases



Graph: Costa Rica. Hepatitis B, deaths

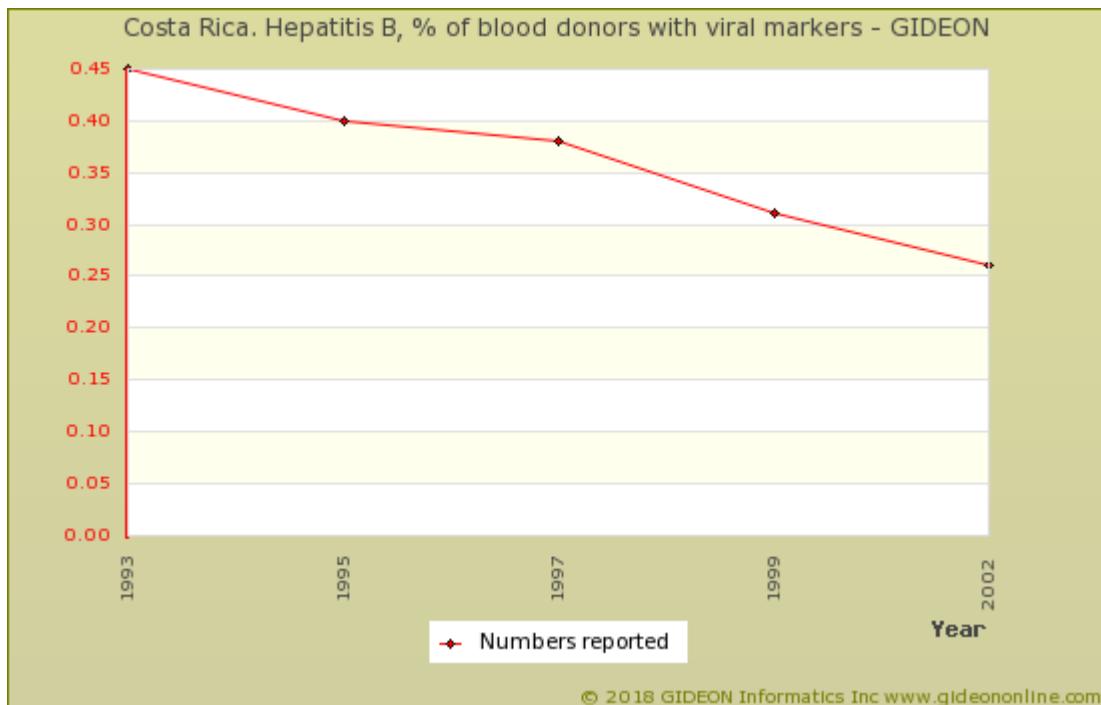


Graph: Costa Rica. Hepatitis B - chronic, deaths

**HBsAg-positivity surveys**

Years	Study Group	%	Notes
1998*	general population	0.45	0.45% in 1993 - the lowest rate in Central America (1998 publication) <sup>1</sup>

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



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

## Notes:

1. 0.16% of blood donors were HBsAg-positive during 2000 to 2001.

**Notable outbreaks**

Years	Region	Cases	Notes
1972*			Outbreak reported - additional details unavailable. <sup>2</sup>
1975*	San Rafael	147	Outbreaks of non-parenteral hepatitis B reported in two villages <sup>3</sup>

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

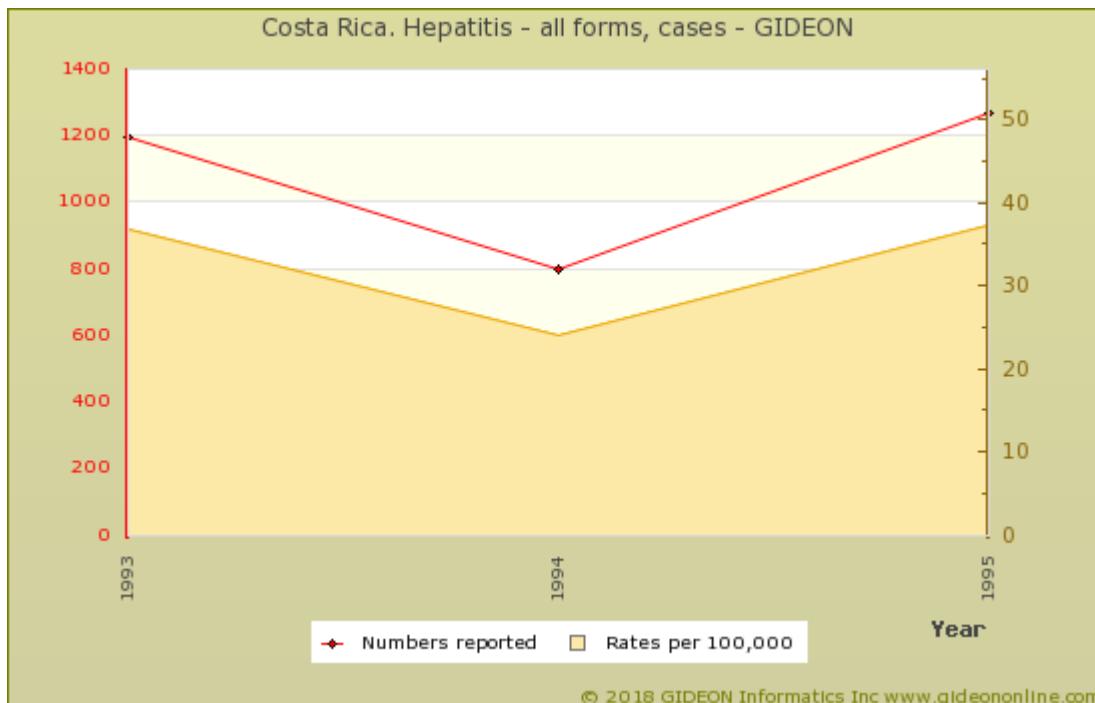
**References**

1. [Emerg Infect Dis 1998 Jan-Mar;4\(1\):5-11.](#)
2. [Am J Epidemiol 1972 Nov ;96\(5\):372-8.](#)
3. [Am J Med Sci 1975 Sep-Oct;270\(2\):309-12.](#)

## Hepatitis C

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

## Hepatitis C in Costa Rica

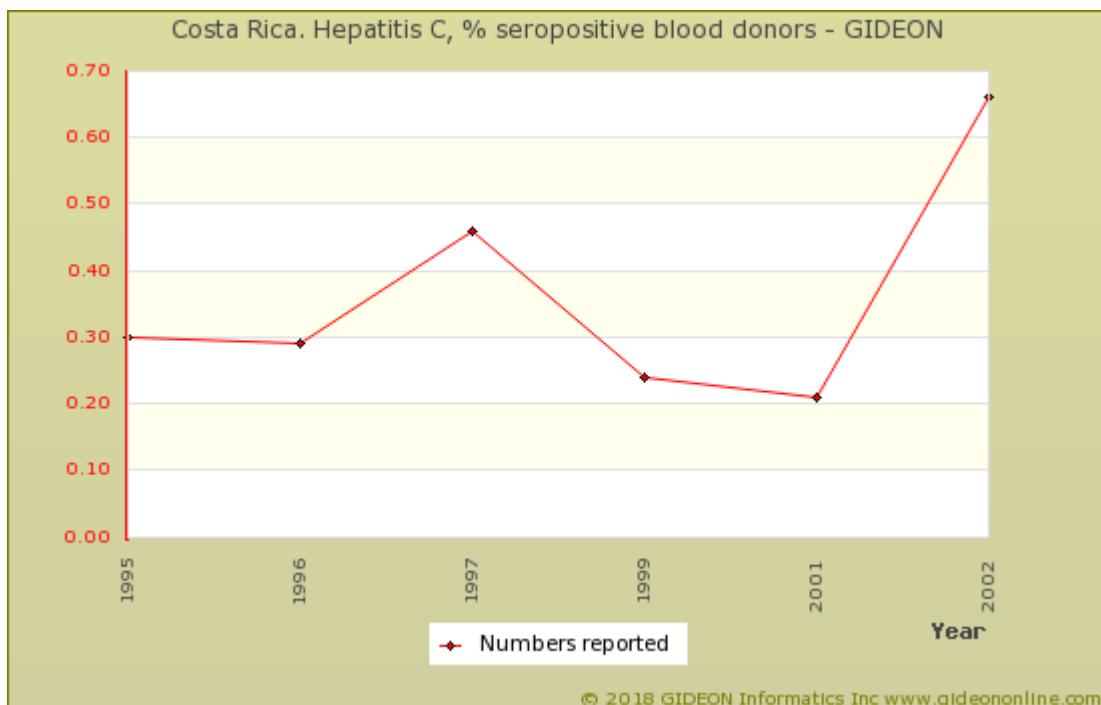


Graph: Costa Rica. Hepatitis - all forms, cases

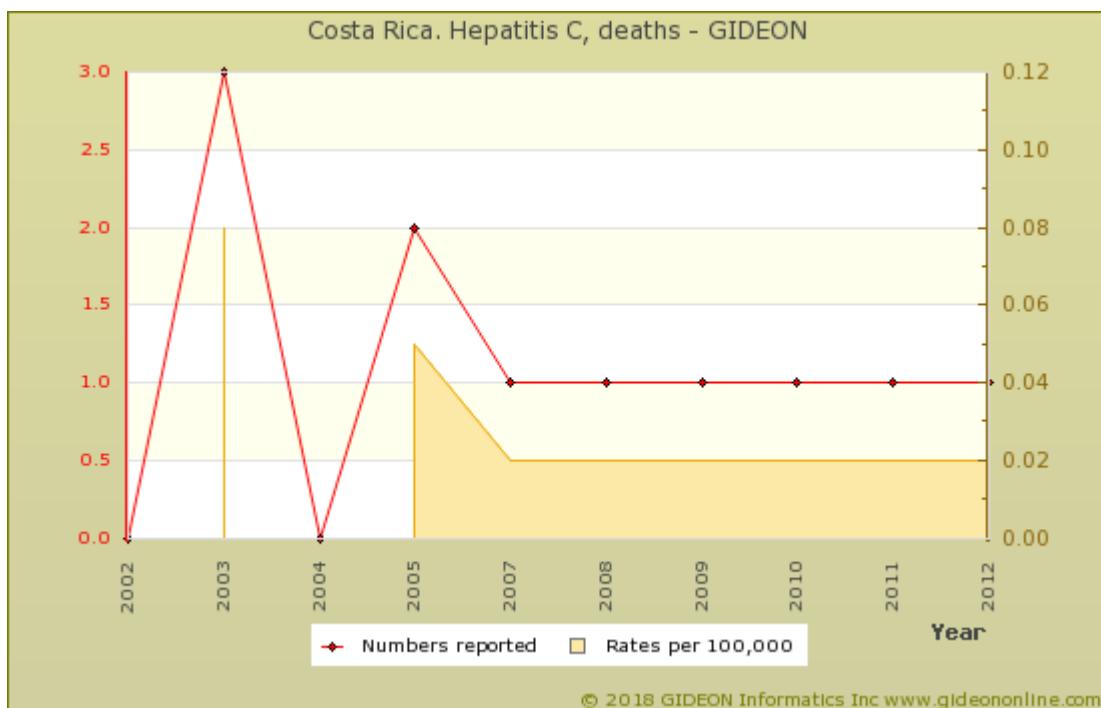
## Notes:

1. 484 cases were reported during January to August 1996.

The nationwide carriage rate in 1997 was estimated at 0.30%.



Graph: Costa Rica. Hepatitis C, % seropositive blood donors



Graph: Costa Rica. Hepatitis C, deaths



## Hepatitis D

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

## Hepatitis E

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

## Hepatitis E in Costa Rica

Large outbreaks are occasionally reported.

### Prevalence surveys

Years	Region	Study Group	%	Notes
2008*	Multiple locations	pigs	36.5	36.5% of swine fecal samples (2008 publication) <a href="#">1</a>

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

### References

1. [Int J Environ Health Res 2008 Jun ;18\(3\):165-76.](#)

## Herpes B infection

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

**Herpes simplex encephalitis**

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

## Herpes simplex infection

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

## Herpes simplex infection in Costa Rica

72 cases of ano-genital Herpes simplex infection were officially reported in 2013; 220 in 2014.

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1984 - 1985		general population	33	33% by age 25 to 29, and 46% by ages 50 to 59 (HSV-2, 1984 to 1985) <sup>1</sup>
2003*	Guanacaste	women	38.5	38.5% of women in Guanacaste (HSV-2, 2003 publication) <sup>2</sup>

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

### References

1. Am J Trop Med Hyg 1989 Aug ;41(2):224-9.
2. Sex Transm Infect 2003 Dec ;79(6):460-5.

## Herpes zoster

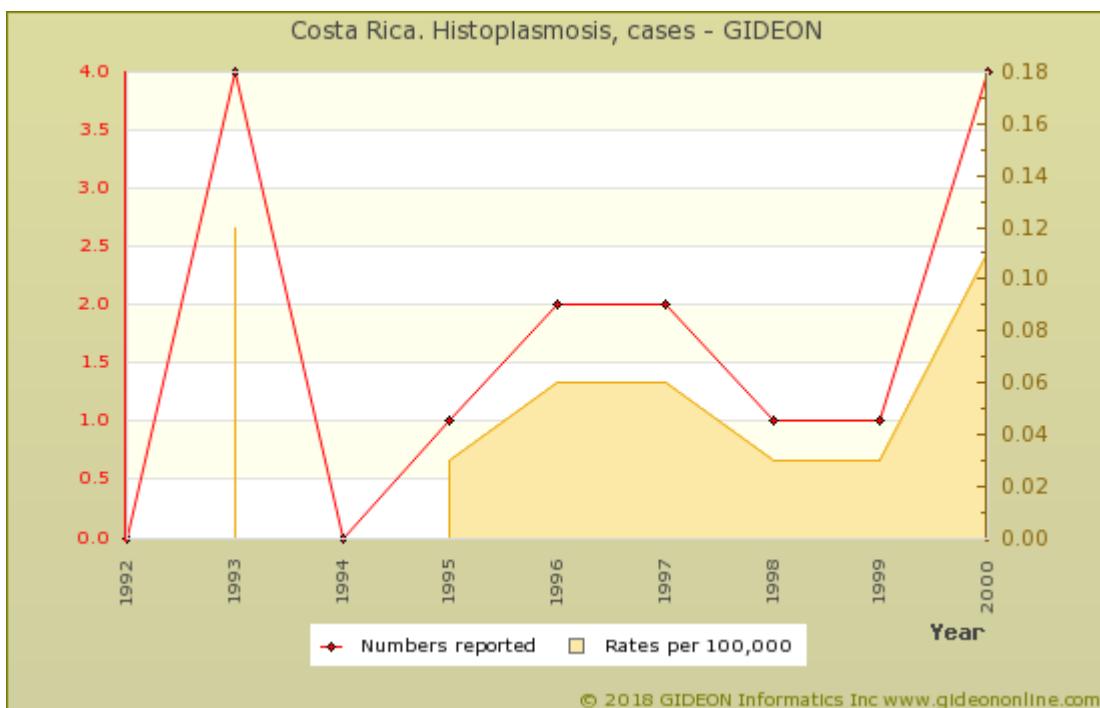
<b>Agent</b>	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Varicella-zoster virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Direct contact
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Viral culture (vesicles). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy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

## Histoplasmosis

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

Disease in this country has been acquired in caves.



Graph: Costa Rica. Histoplasmosis, cases

**Cross-border events**

Years	Acquired by **	Originated in **	Setting	Cases	Notes
1998 to 1999		Costa Rica	cave exposure	9	Outbreak included 42 citizens and 9 tourists (from the United States and Canada). <sup>1</sup>
2013*	Canada	Costa Rica	travel	1	<sup>2</sup>

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

\*\* Country or Nationality



Graph: Costa Rica. Histoplasmosis, deaths

40 cases of disseminated histoplasmosis were reported from a single pediatric hospital in San Jose for the period 1983 to 1996. <sup>3</sup>

#### Notable outbreaks

Years	Region	Setting	Cases	Population	Notes
1988	Guanacaste Province	cave	15	students	Outbreak among students following a trip to a cave in Santa Rosa National Park, Guanacaste Province. <sup>4 5 6</sup>
1998 - 1999		cave	42		42 Costa Rican citizens and 9 tourists from the United States and Canada acquired acute pulmonary histoplasmosis in a cave in Costa Rica. <sup>7</sup>

#### References

- 1. Am J Trop Med Hyg 2004 Apr ;70(4):438-42.
- 2. Can J Infect Dis Med Microbiol 2013 ;24(1):35-7.
- 3. Pediatr Infect Dis J 1999 Dec ;18(12):1065-8.
- 4. MMWR Morb Mortal Wkly Rep 1988 May 27;37(20):312-3.
- 5. Arch Dermatol 1988 Jul ;124(7):994.
- 6. JAMA 1988 Jun 24;259(24):3535-6.
- 7. Am J Trop Med Hyg 2004 Apr ;70(4):438-42.

## HIV infection - initial illness

<b>Agent</b>	VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Semen, Sexual contact, Transplacental, Breastfeeding
<b>Incubation Period</b>	1w - 6w
<b>Diagnostic Tests</b>	HIV antibody (ELISA, Western blot). HIV or HIV antigen assays. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Antiretroviral therapy - most experts will initiate treatment even if no symptoms + normal CD4 count.
<b>Typical Pediatric Therapy</b>	Antiretroviral therapy - most experts will initiate treatment even if no symptoms + normal CD4 count.
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	HIV, HIV infection, HTLV-III infection. ICD9: 042 ICD10: B20,B21,B22,B23,B24

## HIV infection - initial illness in Costa Rica

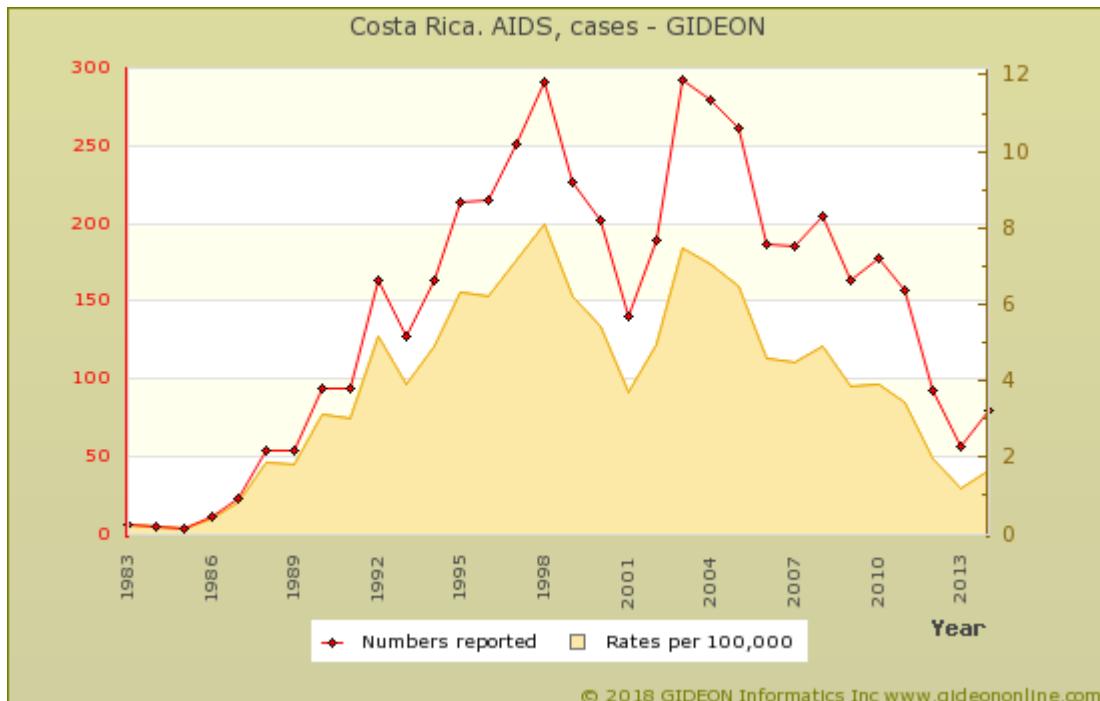
Data and background information regarding HIV infection are included in the note for **HIV/AIDS**

**HIV/AIDS**

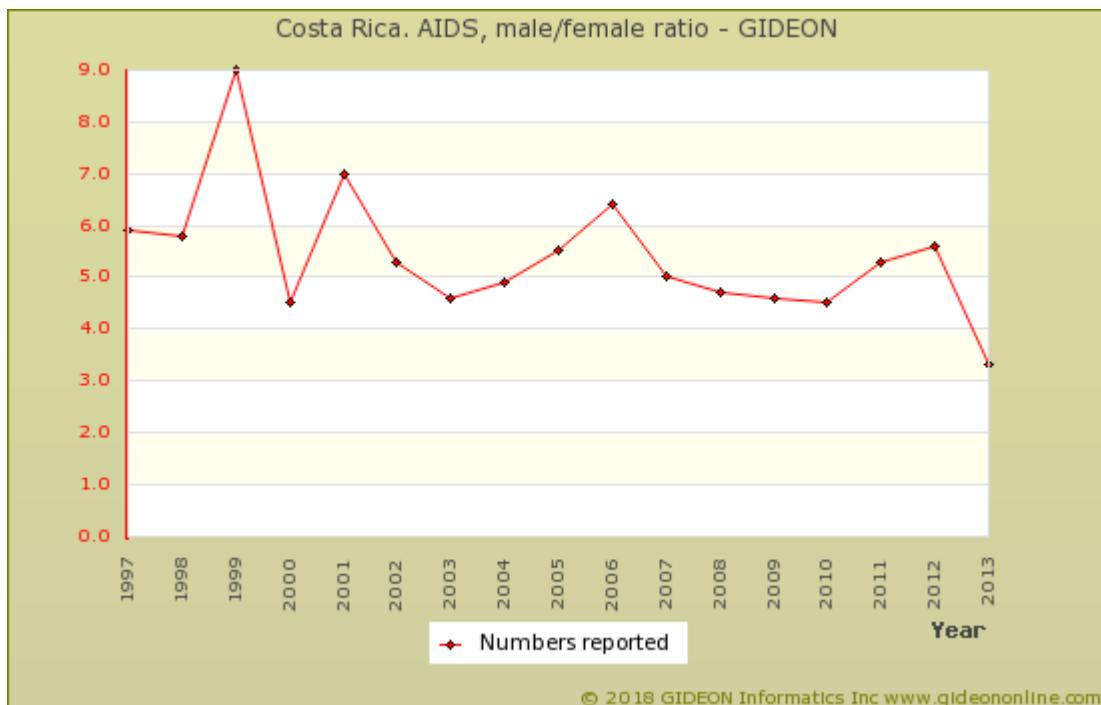
<b>Agent</b>	VIRUS - RNA. Retroviridae, Lentivirinae: Human Immunodeficiency Virus, HIV
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Semen, Sexual, Transplacental, Breastfeeding
<b>Incubation Period</b>	2m - 10y (50% within 10y)
<b>Diagnostic Tests</b>	HIV antibody (ELISA, Western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

**HIV/AIDS in Costa Rica**

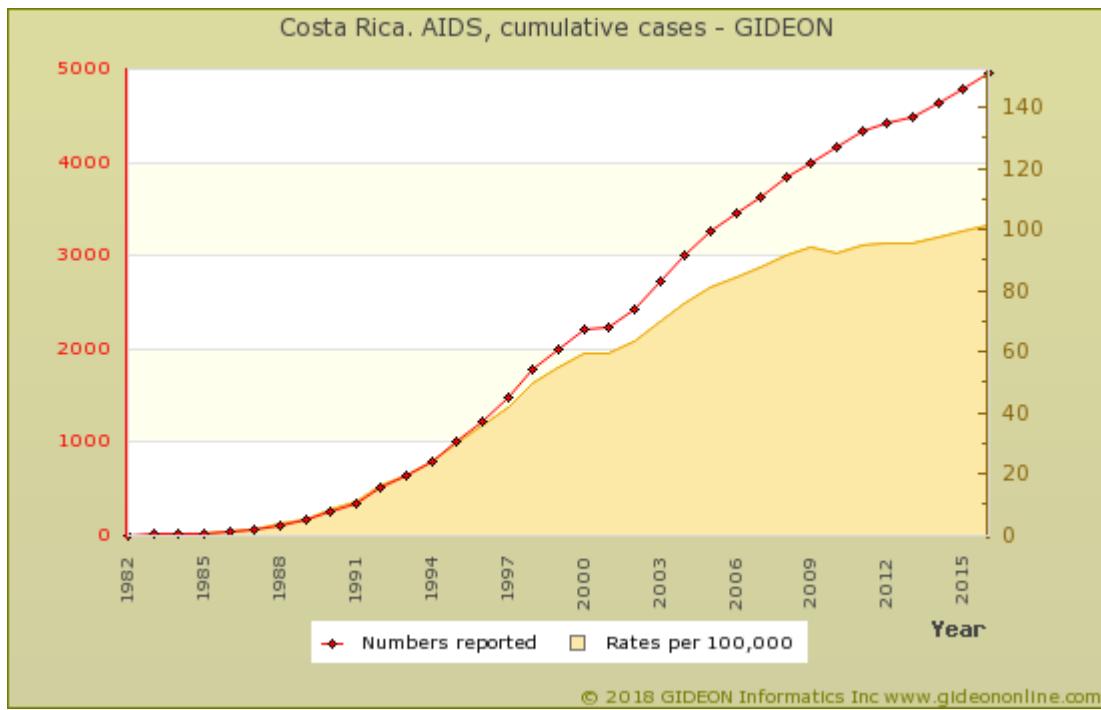
The first cases of AIDS were reported in 1983. <sup>1</sup>



Graph: Costa Rica. AIDS, cases



Graph: Costa Rica. AIDS, male/female ratio



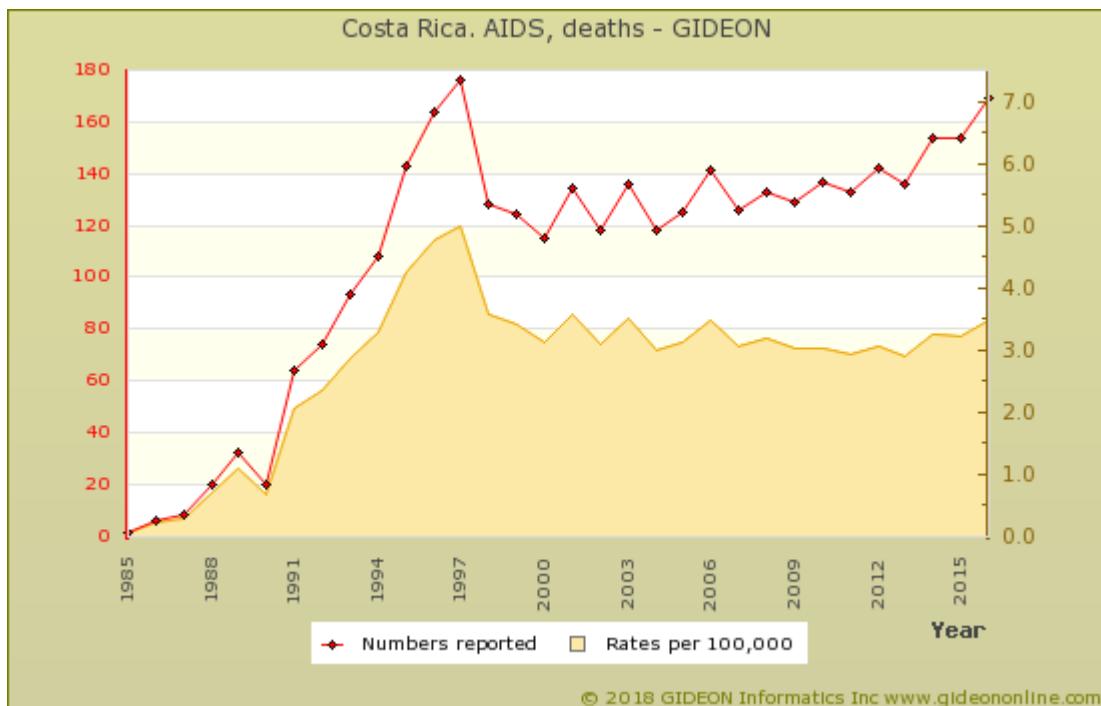
Graph: Costa Rica. AIDS, cumulative cases

**Notes:**

1. 283 cases of AIDS were reported during 1983 to August 1991. <sup>2</sup>
2. 58.3% of cases to 2000 were reported in San Jose Province and 11.3% in Alajuela Province.
3. The true number of AIDS cases to December 1997 was estimated at 3,400.

**Demography and risk factors:**

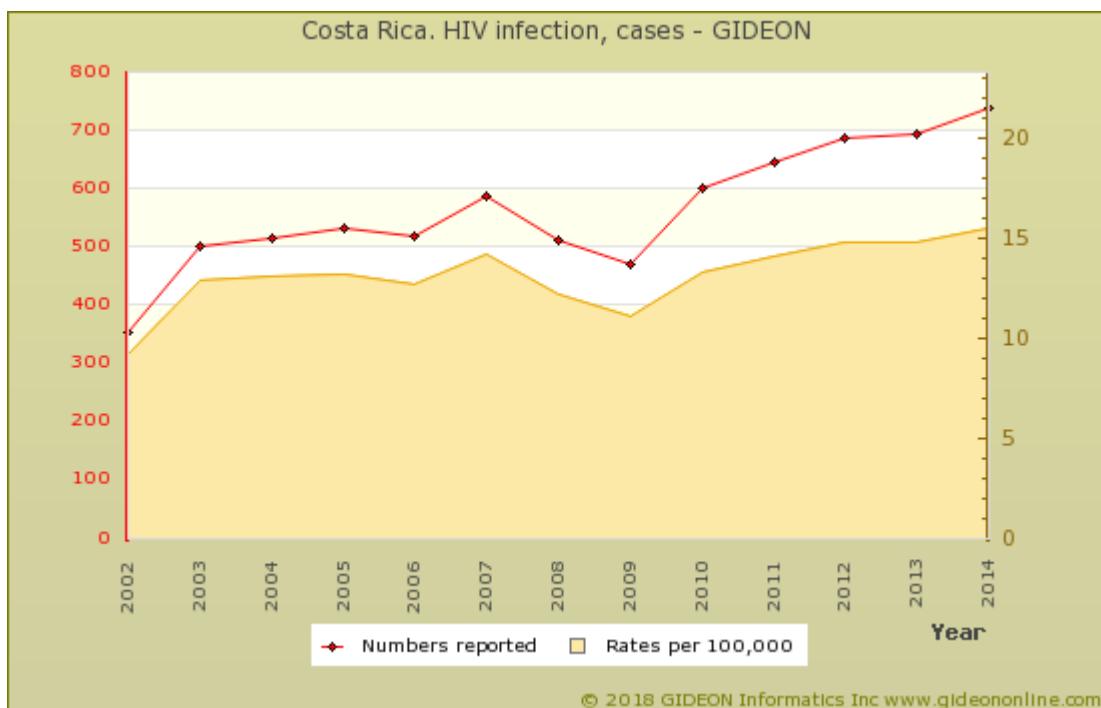
- Cases to September 1997: 90% ages 15 to 49; m/f = 8.09/1; 22% heterosexual; 73% men who have sex with men; 2% IDU; 1% transfusion; 2% mother to infant.
- Cases to December 1993: 10% heterosexual, 71% men who have sex with men; 2% IDU; 1.4% mother to infant.<sup>3</sup>
- Cases during 1997 to 2000: 88% ages 15 to 49; 86% males; 37% heterosexual; 60% men who have sex with men; 1% IDU; 1% transfusion/hemophilia; 1% mother to infant.



Graph: Costa Rica. AIDS, deaths

## Notes:

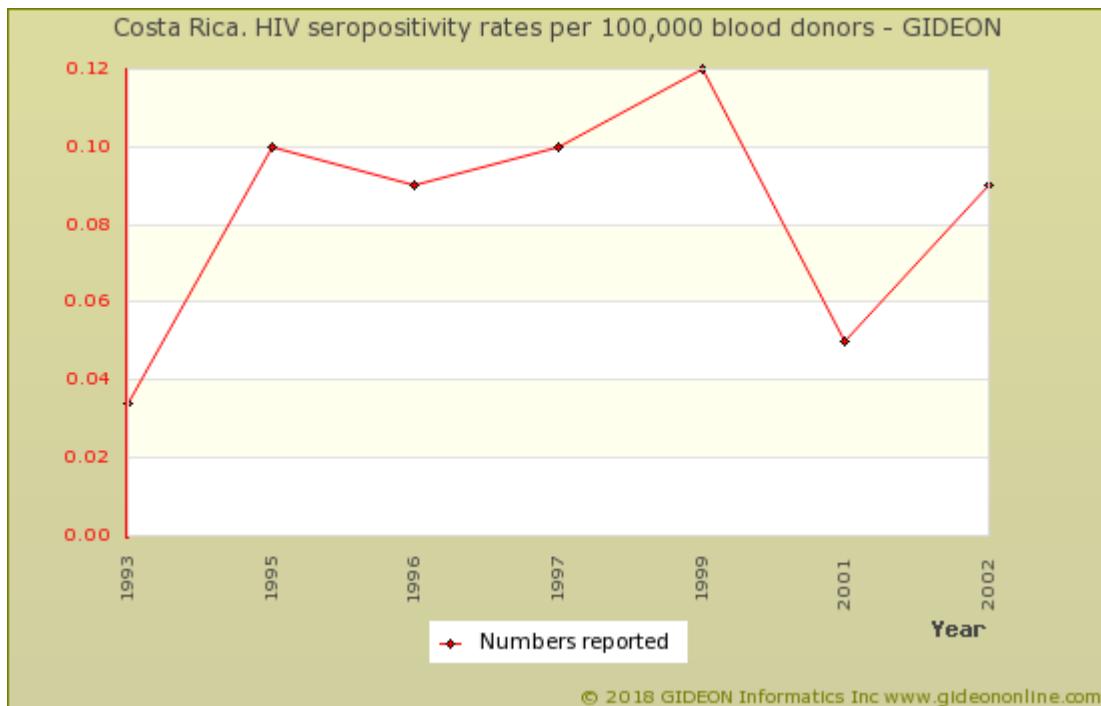
1. 183 AIDS deaths were reported to 1991<sup>4</sup>; 621 to 1996. 1,015 to December 2001.
2. The true number of AIDS deaths to December 1997 was estimated at 3,100.
3. 630 AIDS deaths were estimated during 1997; 750 during 1999; 890 in 2001.
4. 1,300 AIDS orphans were estimated to December 1999; 3,000 in 2001.



Graph: Costa Rica. HIV infection, cases

**Notes:**

1. 2,278 cases of HIV infection were reported during 2002 to 2010.

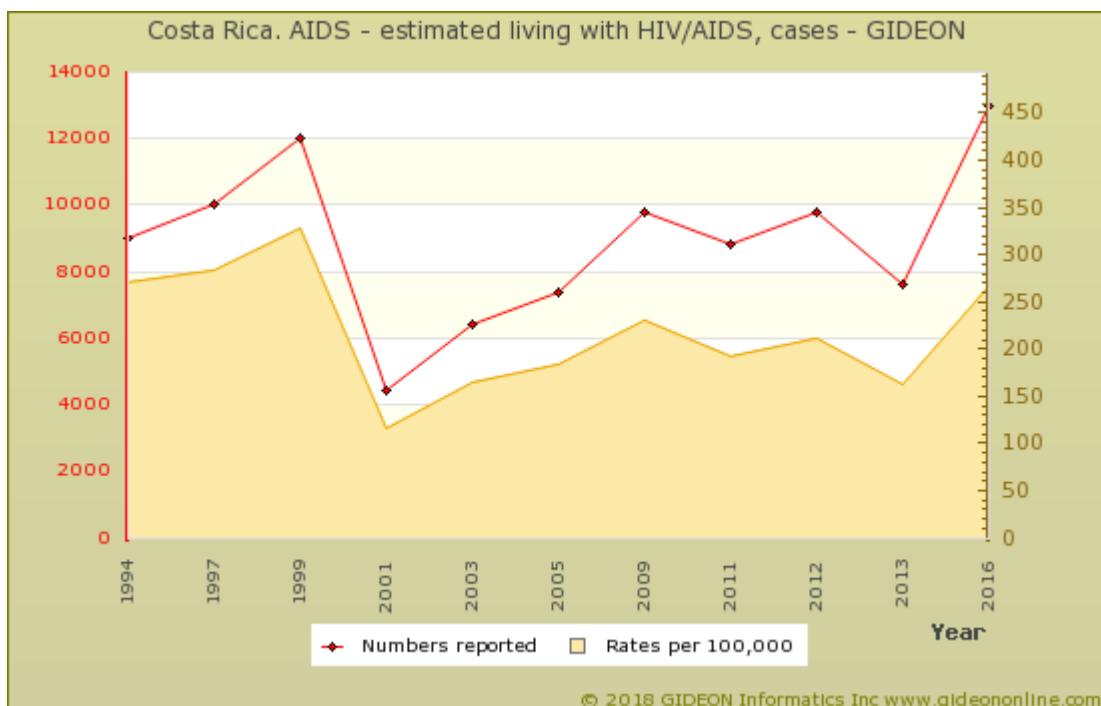


Graph: Costa Rica. HIV seropositivity rates per 100,000 blood donors

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
		MSM	20	
2009	San Jose	MSM	12.7	

Years	Region	Study Group	%	Notes
1990		patients - hemophilia	40	
1994		patients - STD	3.17	
1997		pregnant women	0.3	0.3% of urban pregnant women
1997		pregnant women	0.1	0.1% of rural pregnant women
1990		sex workers	2	
1995		sex workers	0.9	
2005		sex workers	0.1	

**Notes:**

1. Figure for 1997 represented 0.55% of adults ages 15 to 49; 0.6% in 2003.

**References**

1. [Cell Mol Biol \(Noisy-le-grand\) 1995 ;41 Suppl 1:S53-63.](#)
2. [Bull Pan Am Health Organ 1993 ;27\(2\):145-50.](#)
3. [Cell Mol Biol \(Noisy-le-grand\) 1995 ;41 Suppl 1:S53-63.](#)
4. [Cell Mol Biol \(Noisy-le-grand\) 1995 ;41 Suppl 1:S53-63.](#)

## Hookworm

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

## HTLV Infections

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

## Human herpesvirus 6 infection

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

## Human Pegivirus infection

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Pegivirus GB virus C (Hepatitis G virus)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Blood, Vertical transmission, Sexual contact suspected
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Supportive. Alpha interferon has been shown to ? transiently eliminate the carrier state
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Acute or chronic hepatitis acquired from blood (needles, etc) - Clinically milder than hepatitis C - Most cases limited elevation of hepatic enzyme levels, without jaundice - Viremia has been documented for as long as 10 years
<b>Synonyms</b>	Epatite G, GB virus C, GBV-C, Hepatitis G, Hepatitis GB, HPgV, HPgV-2. ICD9: 070.59 ICD10: B17.8

## Hymenolepis diminuta infection

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

## Hymenolepis nana infection

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

## Ilheus and Bussuquara

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

Although Ilheus and Bussuquara is not endemic to Costa Rica, imported, expatriate or other presentations of the disease have been associated with this country.

### Ilheus and Bussuquara in Costa Rica

#### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005 - 2007	Multiple locations	sloths	67	67% of sloths <sup>1</sup>

#### References

1. J Wildl Dis 2016 Oct ;52(4):883-892.

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

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

**Infectious mononucleosis or EBV infection**

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

## Influenza

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

## Influenza in Costa Rica

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

### Notable outbreaks

Years	Deaths	Pathogen	Notes
2009 - 2010	65	H1N1	An outbreak was reported. For comprehensive analyses of the H1N1 pdm09 pandemic see the Worldwide note. <sup>1</sup>

### References

1. Emerg Infect Dis 2014 May ;20(5):878-81.

## Intestinal spirochetosis

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

## Intra-abdominal abscess

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

## Intracranial venous thrombosis

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

## Isosporiasis

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

## Kawasaki disease

<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Diagnosis is based on clinical criteria only.
<b>Typical Adult Therapy</b>	Intravenous gamma globulin 2.0 g/kg over 10 to 12h X 1 dose. Plus aspirin 100 mg/kg/day X 14d (or until defervescence) - then 5 to 10 mg/kg/day until normal ESR Infliximab (a chimeric monoclonal antibody) 5 mg/kg has been successful in some studies.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Kawasaki's disease, Mucocutaneous lymph node syndrome. ICD9: 446.1 ICD10: M30.3

**Kikuchi's disease and Kimura disease**

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

## Kingella infection

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

## Lagochilascariasis

<b>Agent</b>	PARASITE - Nematoda. <i>Lagochilascaris minor</i>
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Ingestion of ova (soil)
<b>Incubation Period</b>	>30d
<b>Diagnostic Tests</b>	Identification of ova or adult parasites in tissue and exudates.
<b>Typical Adult Therapy</b>	No proven therapy. <a href="#">Albendazole</a> has been used with some success
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Tender subcutaneous mass (usually limited to scalp and neck, occasionally pharynx or paranasal sinuses) - Suppuration and fistulae - Eosinophilia may be present
<b>Synonyms</b>	Lagochilascaris minor. ICD9: 128.8 ICD10: A81.8

### Lagochilascariasis in Costa Rica

*Lagochilascaris* sp. has been identified in the larynx of a Costa Rican ocelot (*Felis pardalis mearnsi*). <sup>1</sup>

### References

1. [J Parasitol 1972 Oct ;58\(5\):978.](#)

## Laryngotracheobronchitis

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

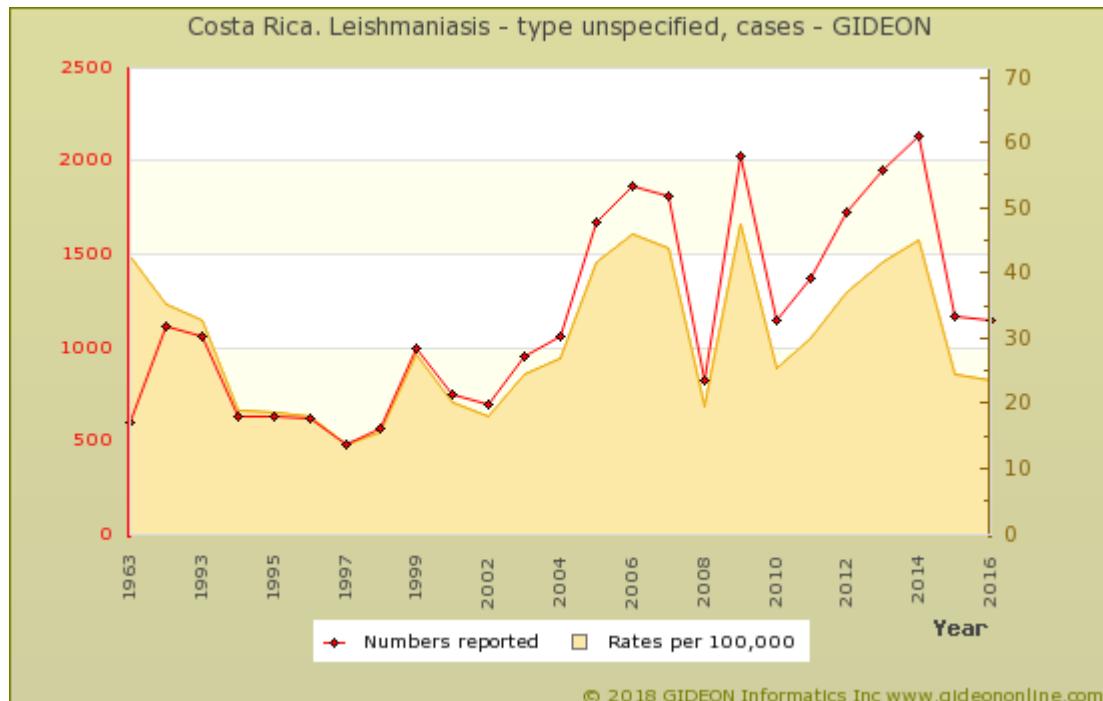
## Legionellosis

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

## Leishmaniasis - cutaneous

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

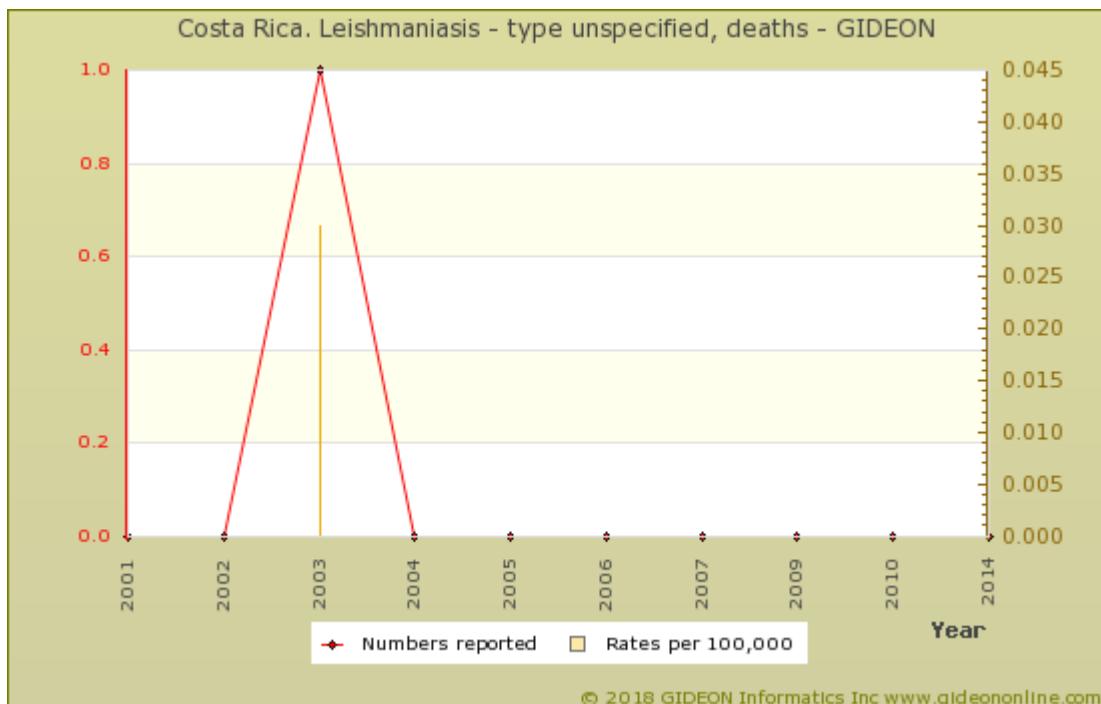
## Leishmaniasis - cutaneous in Costa Rica



## Graph: Costa Rica. Leishmaniasis - type unspecified, cases

Notes:

1. Rates of 32.2 to 58.8 per 100,000 per year were reported during 1973 to 1980.
2. 1,249 cases per year were reported during 2002 to 2006 (true number estimated at 3,500 to 5,700 per year). <sup>1</sup>



## Graph: Costa Rica. Leishmaniasis - type unspecified, deaths

**Infecting species:**

- Infection by *Leishmania panamensis* <sup>2</sup> occurs in Alajuela, Guanacaste, Limon, Puntarenas and San Jose.
- *L. amazonensis* is also encountered.
- Atypical cutaneous leishmaniasis due to *Leishmania chagasi* has been reported. <sup>3</sup>

The local vectors are *Lutzomyia ypsilon* and *Lu. shannoni*.

The two-toed sloth *Choloepus hoffmanni*) has been identified as a probable reservoir. <sup>4</sup>

*Leishmania panamensis* has been isolated from a spiny-pocket mouse (*Heteromys desmarestianus*). <sup>5</sup>

**Notable outbreaks**

Years	Region	Cases	Pathogen	Notes
1986 - 1987	Guanacaste Province	200	<i>Leishmania infantum</i>	<sup>6</sup>

**References**

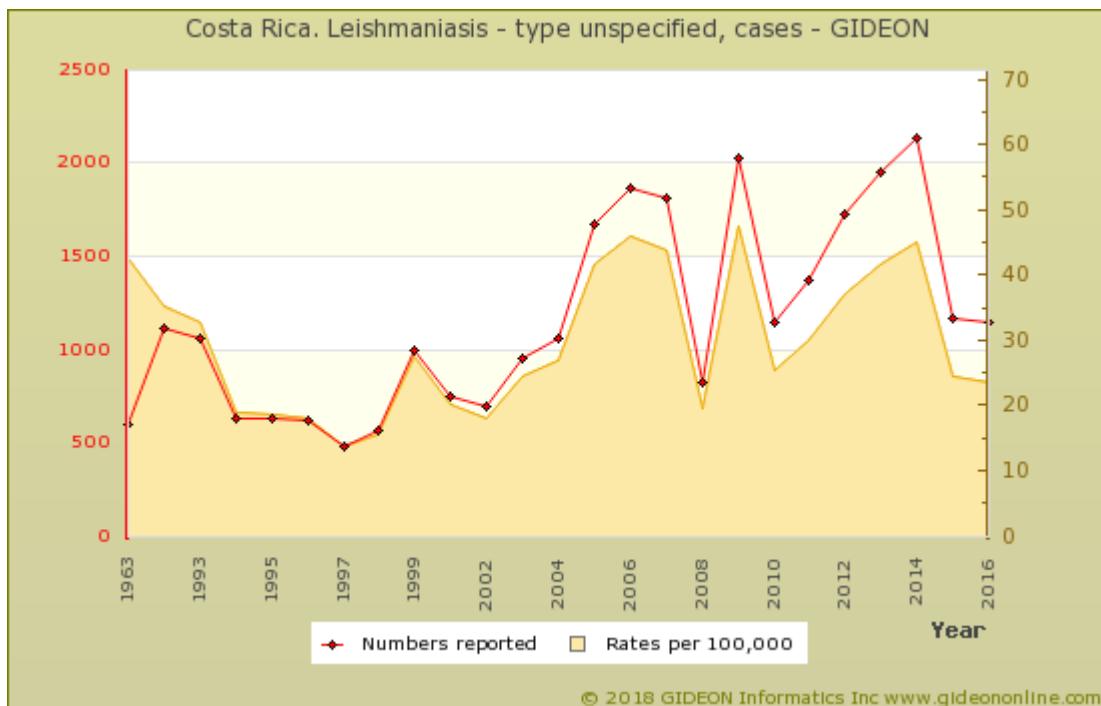
1. PLoS One 2012 ;7(5):e35671.
2. Mem Inst Oswaldo Cruz 1998 May-Jun;93(3):283-7.
3. Trans R Soc Trop Med Hyg 2005 Jan ;99(1):13-7.
4. Trop Med Health 2015 Mar ;43(1):75-8.
5. Am J Trop Med Hyg 1977 Sep ;26(5 Pt 1):1044-5.
6. Trans R Soc Trop Med Hyg 1991 Jul-Aug;85(4):557.

## Leishmaniasis - mucocutaneous

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

## Leishmaniasis - mucocutaneous in Costa Rica

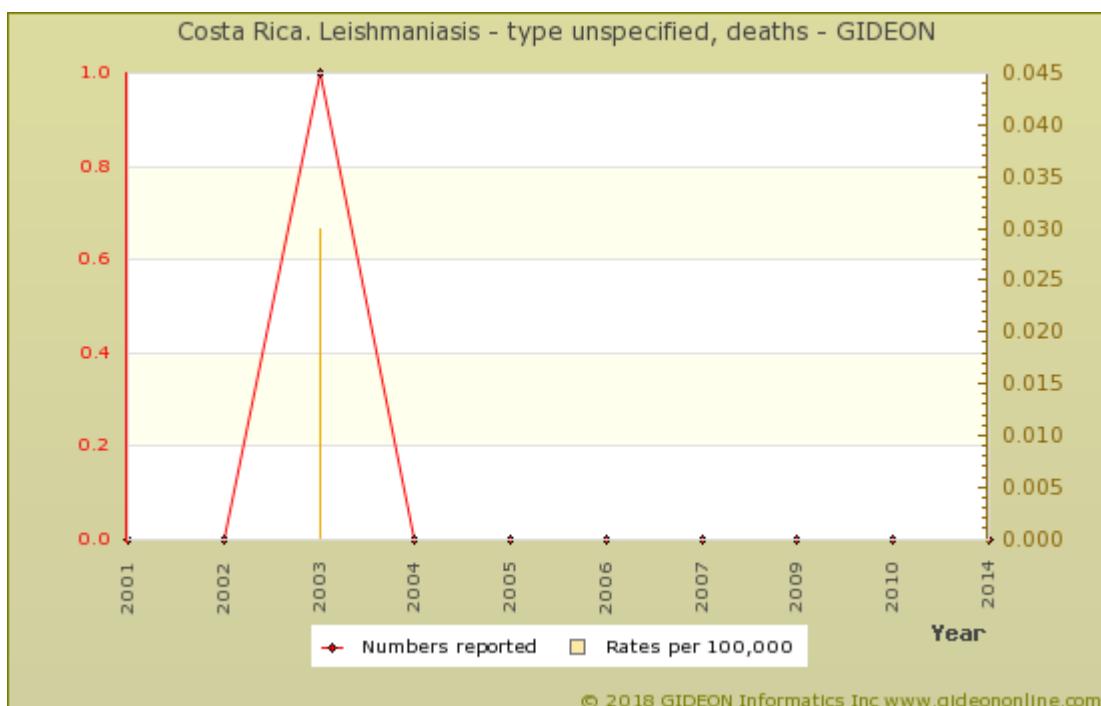
Most cases occur in rural and forested areas.



Graph: Costa Rica. Leishmaniasis - type unspecified, cases

Notes:

1. Rates of 32.2 to 58.8 per 100,000 per year were reported during 1973 to 1980.



Graph: Costa Rica. Leishmaniasis - type unspecified, deaths

Mucocutaneous leishmaniasis in Costa Rica is caused by *Leishmania braziliensis* <sup>1</sup> and *L. panamensis* <sup>2</sup>

*Leishmania panamensis* has been isolated from a spiny-pocket mouse (*Heteromys desmarestianus*). <sup>3</sup>

- *L. braziliensis* has been isolated from sloths (*Bradypus griseus* and *Choloepus hoffmanni*). <sup>4</sup>

## References

1. Mem Inst Oswaldo Cruz 1998 May-Jun;93(3):283-7.
2. Am J Trop Med Hyg 1987 Mar ;36(2):270-87.
3. Am J Trop Med Hyg 1977 Sep ;26(5 Pt 1):1044-5.
4. Am J Trop Med Hyg 1975 Jul ;24(4):706-7.

## Leishmaniasis - visceral

<b>Agent</b>	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: <i>Leishmania donovani</i> , <i>L. infantum</i> , <i>L. cruzi</i> ; rarely, <i>L. tropica</i>
<b>Reservoir</b>	Human, Rodent, Dog, Fox, Hares
<b>Vector</b>	Sandfly ( <i>Phlebotomus</i> for Old-world; <i>Lutzomyia</i> for New-world)
<b>Vehicle</b>	Blood
<b>Incubation Period</b>	2m - 6m (10d - 12m)
<b>Diagnostic Tests</b>	Smear / culture of bone marrow, splenic aspirate, lymph nodes. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	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 50 to 150 mg PO daily X 4 to 6 weeks.
<b>Typical Pediatric Therapy</b>	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
<b>Clinical Hints</b>	- 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)
<b>Synonyms</b>	Burdwan fever, Cachectic fever, Dum Dum fever, Kala azar, Leishmania donovani, Leishmania infantum, Leishmania siamensis, Leishmania tarentolae, Leishmaniose: Viszerale, Leishmaniosi viscerale, Ponos, Visceral leishmaniasis. ICD9: 085.0 ICD10: B55.0

## Leishmaniasis - visceral in Costa Rica

The first case of human visceral leishmaniasis was reported in 1998. <sup>1</sup>

The disease is reported from Puerto Limon.

Atypical cutaneous leishmaniasis due to *Leishmania infantum* has also been reported.

The local vector is *Lutzomyia longipalpis*. <sup>2</sup>

## References

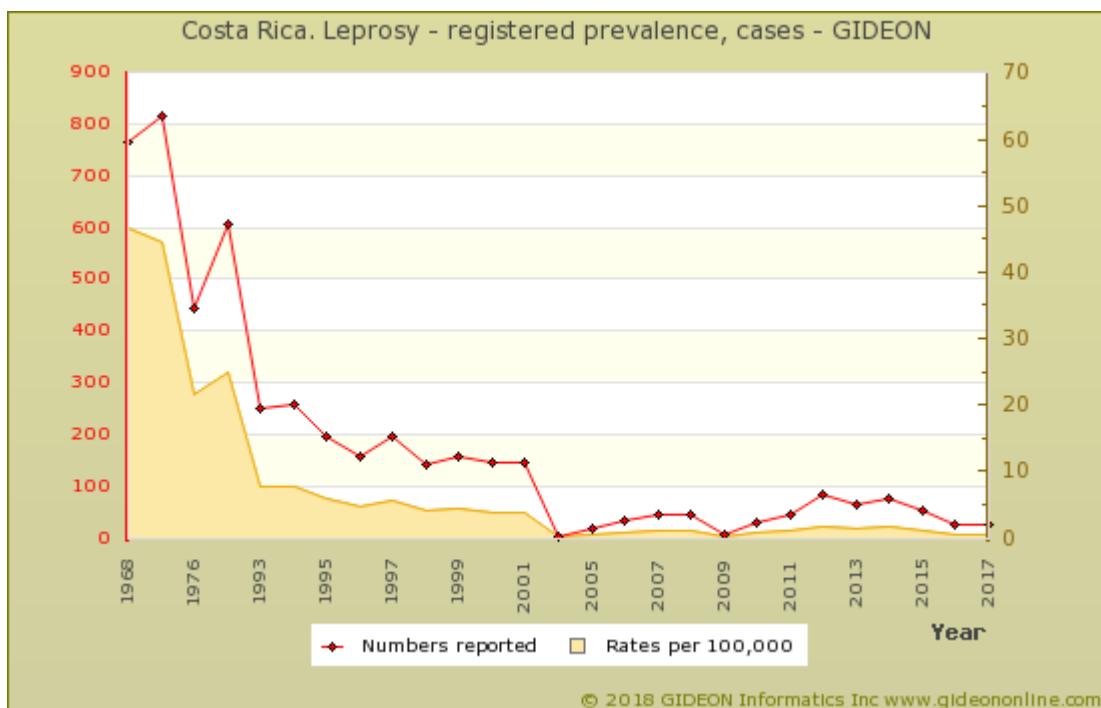
1. Clin Infect Dis 1999 Sep ;29(3):678-9.
2. Mem Inst Oswaldo Cruz 1999 Nov-Dec;94(6):729-34.

## Leprosy

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

## Leprosy in Costa Rica

Leprosy is most common in Limones, with pockets in the central Pacific coast, Huetar Atlantica and Huetar Norte.



Graph: Costa Rica. Leprosy - registered prevalence, cases

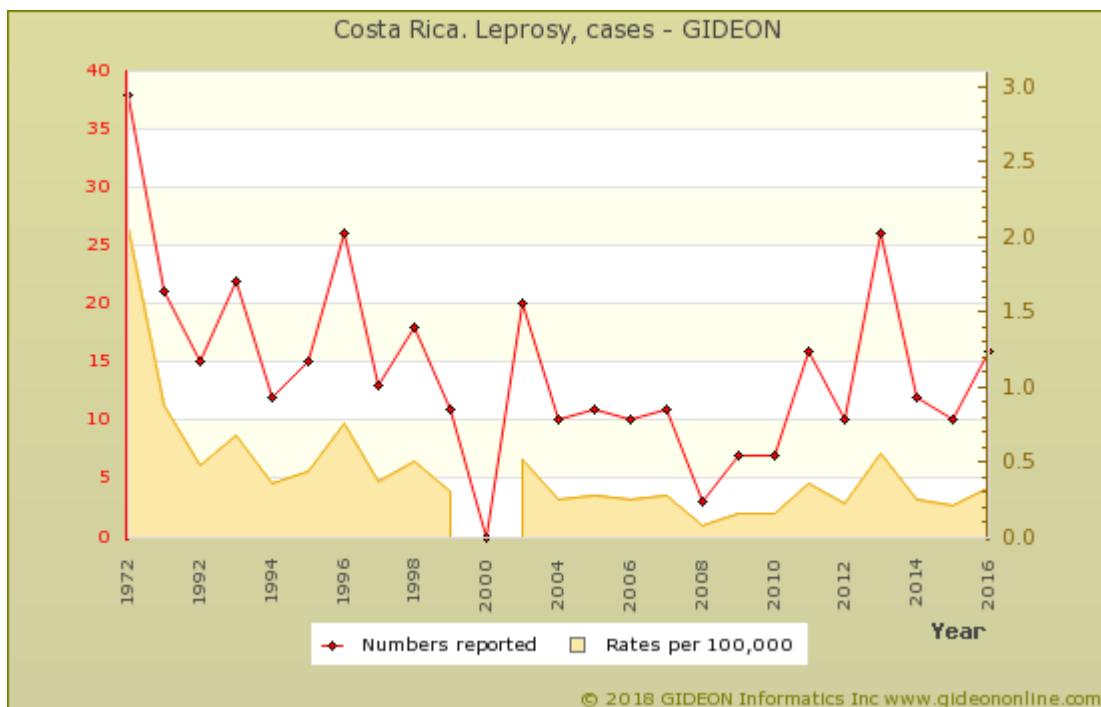
**Notes:**

1. 78% of cases are multibacillary.
2. The male/female ratio is roughly 2/1.

**Individual years:**

1976 - True number estimated at 777 cases.

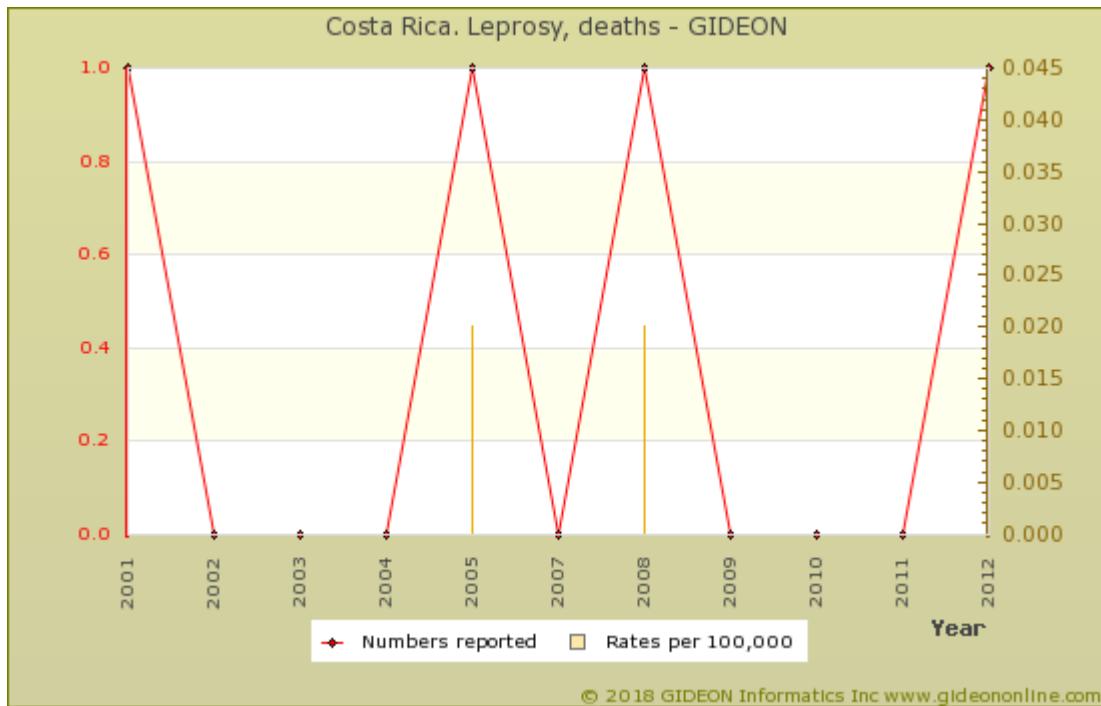
1982 - True number estimated at 1,061 cases (50 per 100,000).



Graph: Costa Rica. Leprosy, cases

**Notes:**

1. 96 cases of leprosy were reported during 1995 to 2011.<sup>1</sup>



Graph: Costa Rica. Leprosy, deaths

MDT coverage is 81.7% (1998).

#### References

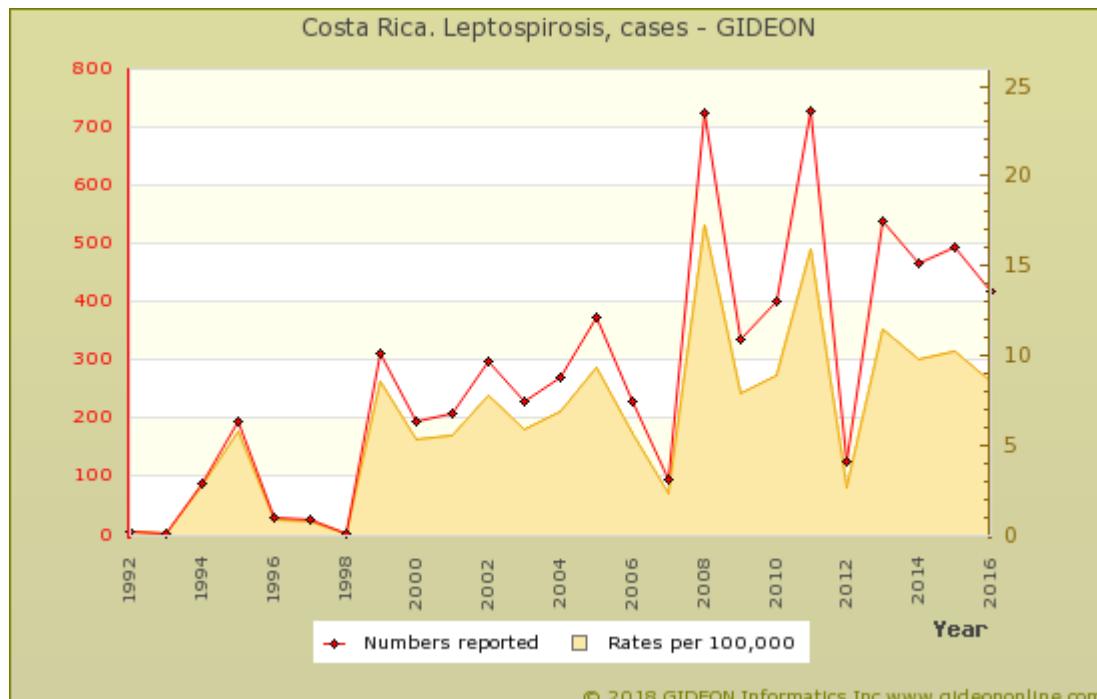
1. ProMED <[promedmail.org](mailto:promedmail.org)> archive: 20140606.2523681

## Leptospirosis

<b>Agent</b>	BACTERIUM. <i>Leptospira interrogans</i> , et al. An aerobic non-gram staining spirochete
<b>Reservoir</b>	Cattle, Dog, Horse, Deer, Rodent, Fox, Marine mammal, Cat, Marsupial, Frog
<b>Vector</b>	None
<b>Vehicle</b>	Water, Soil, Urine contact, Breastfeeding
<b>Incubation Period</b>	7d - 12d (range 2d - 26d)
<b>Diagnostic Tests</b>	Culture on specialized media. Dark field microscopy of urine, CSF. Serology.
<b>Typical Adult Therapy</b>	Penicillin 1.5 million units Q6h iv OR Doxycycline 100 mg BID X 5 to 7d OR Ceftriaxone 1g IV daily
<b>Typical Pediatric Therapy</b>	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
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Andaman hemorrhagic fever, Canefield fever, Canicola fever, Field fever, Fish handler's disease, Fort Bragg fever, Japanese autumnal fever, Leptospira, Leptospirosis, Leptospirosis, Leptospirosis, Mud fever, Pre-tibial fever, Rat fever, Rice field fever, Swamp fever, Swineherd disease, Weil's disease. ICD9: 100 ICD10: A27

## Leptospirosis in Costa Rica

The country's first leptospirosis epidemic followed a hurricane in 1988.



Graph: Costa Rica. Leptospirosis, cases

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## Notes:

1. 2,150 cases (46 fatal) were reported during 2006 to 2010.

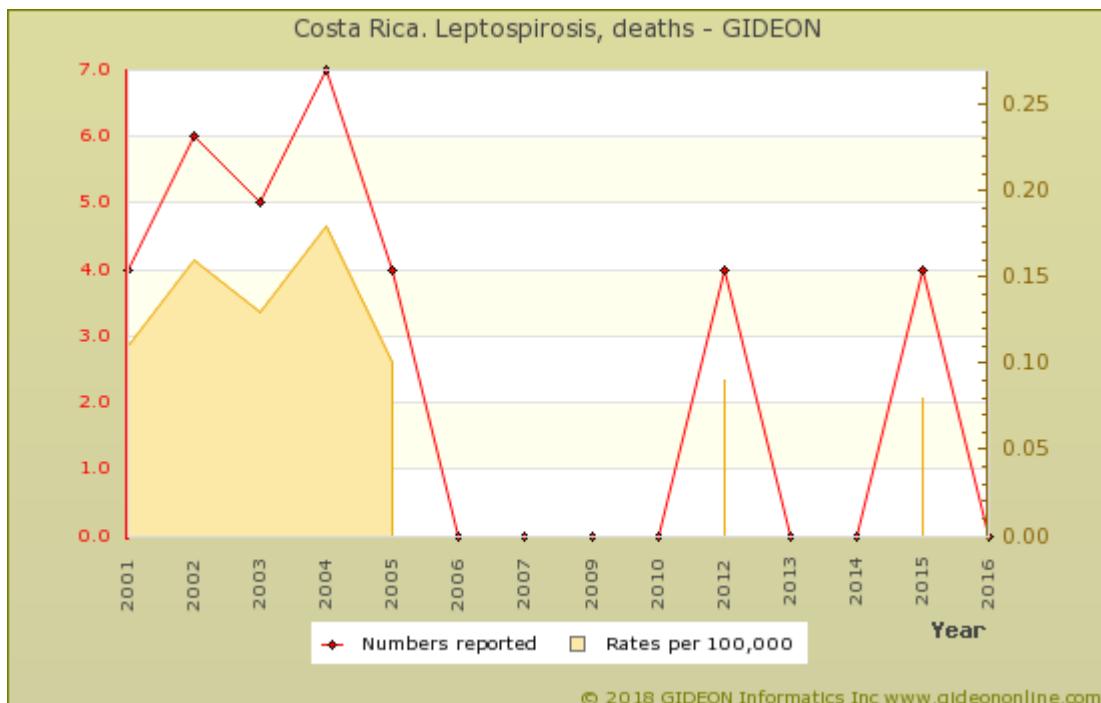
Individual years:

1998 - 112 cases were reported during January to June, with highest incidence in Limon, Turrialba, San Carlos and Golfito.

## Cross-border events

Years	Acquired by **	Originated in **	Setting	Cases	Notes
1996	United States	Costa Rica	sporting event	5	Outbreak among American "white water rafters" in Costa Rica <a href="#">1</a> <a href="#">2</a>

\*\* Country or Nationality



Graph: Costa Rica. Leptospirosis, deaths

## Notes:

1. The mortality rate during the 1990's was 1.7 per year (5.3 per 100,000).

The principal reservoirs in this country are rats, pigs, goats and cattle.

The principal species are *Leptospira* serovars. *icterohaemorrhagiae*, *pyrogenes*, *australis*, *sejroe* and *Ballum*.

- Common serovars detected in San Jose included *hebdomadis* 14.7%, *hardjo* 11.8%, *pomona* 8.8% and *icterohaemorrhagiae* 5.9%. (2007 publication) [3](#)
- Two new serovars, designated Corredores and Costa Rica, have been recovered from patients in Puntarenas. [4](#)

## Notable outbreaks

Years	Setting	Cases	Source	Notes
1996	river	5	water	Outbreak among American "white water rafters" in Costa Rica. <a href="#">5</a> <a href="#">6</a>

## References

- JAMA 1997 Sep 10;278(10):808-9.
- MMWR Morb Mortal Wkly Rep 1997 Jun 27;46(25):577-9.
- Invest Clin 2007 Sep ;48(3):295-304.
- J Med Microbiol 2013 Sep ;62(Pt 9):1263-71.
- JAMA 1997 Sep 10;278(10):808-9.
- MMWR Morb Mortal Wkly Rep 1997 Jun 27;46(25):577-9.

## Listeriosis

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

## Listeriosis in Costa Rica



Graph: Costa Rica. Listeriosis, cases

*Listeria monocytogenes* is found in raw milk <sup>1</sup>, ice cream <sup>2</sup>, cabbage <sup>3</sup>, soft cheese <sup>4</sup> and fish fillets marketed in San Jose. <sup>5</sup>

- *L. grayi*, *L. welshimeri* and *L. innocua* are found in fruit and enteral formulae prepared with milk. <sup>6</sup>

**Prevalence surveys**

Years	Study Group	%	Notes
1996*	salad	20	20% of cabbage salad samples. (1996 publication) <a href="#">7</a>

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

**Notable outbreaks**

Years	Cases	Deaths	Source	Population	Notes
1989	9	1	mineral oil	neonates	Outbreak caused by contaminated mineral oil used for bathing purposes <a href="#">8</a>

**References**

1. Arch Latinoam Nutr 2003 Dec ;53(4):389-92.
2. Arch Latinoam Nutr 2000 Sep ;50(3):301-3.
3. Arch Latinoam Nutr 1996 Dec ;46(4):292-4.
4. Rev Biol Trop 1994 Apr-Aug;42(1-2):327-8.
5. Arch Latinoam Nutr 1999 Dec ;49(4):358-62.
6. Arch Latinoam Nutr 1998 Mar ;48(1):68-70.
7. Arch Latinoam Nutr 1996 Dec ;46(4):292-4.
8. Pediatr Infect Dis J 1991 Mar ;10(3):183-9.

**Liver abscess - bacterial**

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

## Lobomycosis

<b>Agent</b>	FUNGUS. <i>Lacazia (Loboia) loboi</i>
<b>Reservoir</b>	Human, Dolphin ( <i>Tursiops truncatus</i> and <i>Sotalia guianensis</i> )
<b>Vector</b>	None
<b>Vehicle</b>	Skin trauma, Contact
<b>Incubation Period</b>	1y - 2y
<b>Diagnostic Tests</b>	Biopsy. Note: Organism does not grow under laboratory conditions.
<b>Typical Adult Therapy</b>	<a href="#">Posaconazole</a> or Clofazamine may be effective; excision indicated in most cases.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Spreading skin nodules and regional lymphadenopathy - May follow animal (dolphin) contact - The infection may persist for decades
<b>Synonyms</b>	Jorge Lobo's disease, Keloidal blastomycosis, <i>Lacazia loboi</i> , <i>Lacaziasis</i> , Lobo's disease, Loba loboi. ICD9: 116.2 ICD10: B48.0

## Lyme disease

<b>Agent</b>	BACTERIUM. <i>Borrelia</i> spp.: <i>Borrelia burgdorferi</i> ; <i>B. afzelii</i> and <i>B. garinii</i> are also encountered (in Eurasia) A microaerophilic spirochete
<b>Reservoir</b>	Tick, Deer, Rodent, Bird
<b>Vector</b>	Tick ( <i>Ixodes</i> , <i>Amblyomma</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	7d - 14d (range 2d - 180d)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification. Culture of blood and body fluids available in some laboratories.
<b>Typical Adult Therapy</b>	<b>Doxycycline, Ceftriaxone, Amoxicillin or Cefuroxime</b> Dosage, route and duration according to nature and severity of disease
<b>Typical Pediatric Therapy</b>	>= Age 8 years: As for adult < Age 8 years: <b>Ceftriaxone, Cefuroxime or Amoxicillin</b> . Dosage, route and duration according to nature and severity of disease
<b>Vaccine</b>	<b>Lyme disease vaccine</b>
<b>Clinical Hints</b>	- Patient may recall recent tick bite - Fever, circular erythematous skin lesion, arthralgia and lymphadenopathy - Later meningitis or myocarditis, and eventual destructive polyarthritis
<b>Synonyms</b>	Arcodermatitis chronica atrophicans, Baggio-Yoshinari syndrome, Borrelia A 14S, Borrelia afzelii, Borrelia americana, Borrelia bavariensis, Borrelia bissettii, Borrelia burgdorferi, Borrelia carolinensis, Borrelia garinii, Borrelia honesta, Borrelia lusitaniae, Borrelia mayonii, Borrelia spielmanii, Borrelia valaisiana, Borrelial lymphocytoma, Doenca de Lyme, Erythema chronicum migrans, Erythema migrans, Garin-Bujadoux-Bannwarth syndrome, LD imitator syndrome, LD-like syndrome, Lyme borreliosis, Lyme borreliosis, Master's disease, Neuroborreliosis, Southern tick-associated rash illness, STARI, TAPOS, Tick-associated poly-organic syndrome. ICD9: 088.81 ICD10: A69.2

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

### Lyme disease in Costa Rica

#### Seroprevalence surveys

Years	Region	Study Group	%
2017*	Nationwide	dogs	0.3

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

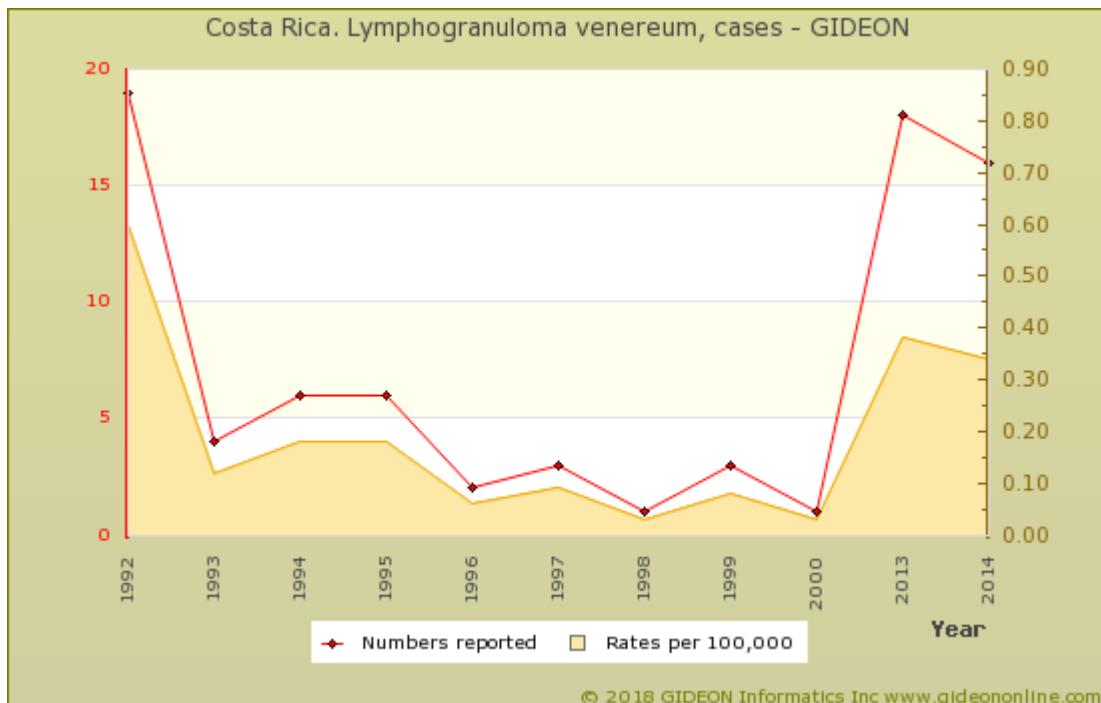
## Lymphocytic choriomeningitis

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

## Lymphogranuloma venereum

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

### Lymphogranuloma venereum in Costa Rica



Graph: Costa Rica. Lymphogranuloma venereum, cases

## Malaria

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

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

## Malaria in Costa Rica

### Time and Place

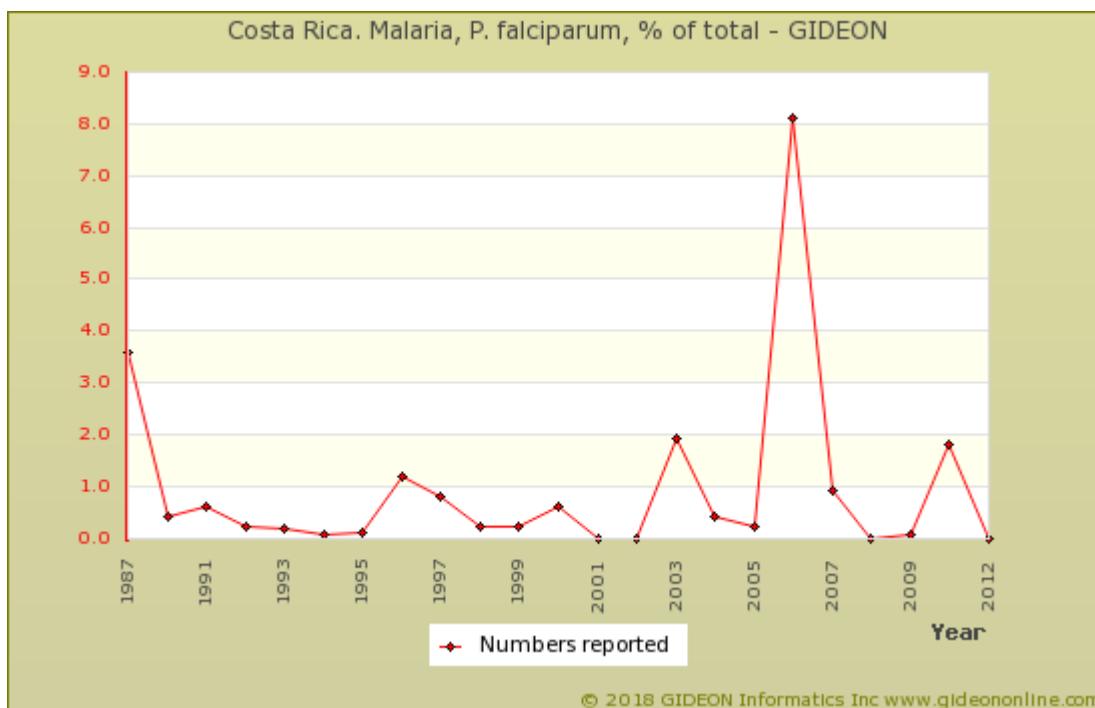
Risk exists year-round.

Most cases are reported from rural areas below 700 meters elevation, principally from Limon province.

- Lower risk exists in Alajuela, Guanacaste, Heredia, and Puntarenas Provinces (San Carlos, Los Chiles and Sarapique Cantons).
- There is no risk in Limon city (Puerto Limon).
- In recent years, the disease had shifted from the Pacific coast to the northern region and Atlantic coast - a result of deforestation and worker migration.
- 1,395,825 persons were at risk for malaria as of 2003; 1,393,787 as of 2005.
- As of 2014, the United States Centers for Disease Control stated that there is no risk for American travelers.

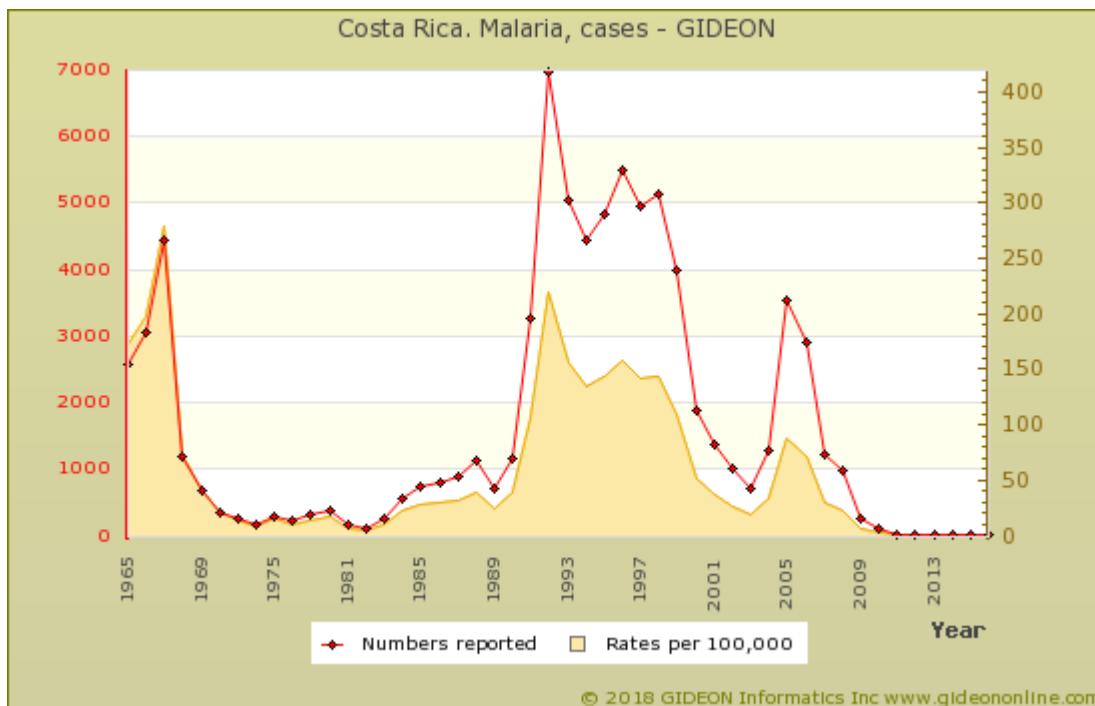
### Infecting species:

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

Graph: Costa Rica. Malaria - *P. falciparum*, % of total

## Notes:

1. All remaining cases are due to *P. vivax*.
2. Most *P. falciparum* infection is imported.



Graph: Costa Rica. Malaria, cases

## Notes:

1. No autochthonous cases were reported during 2012<sup>1</sup> to 2015.

Individual years:

1991 to 1992 - Increasing incidence ascribed to Limon earthquake.<sup>2</sup>

1998 - 45.4% from Hueter Atlantico and 29.2% from Hueter Norte.

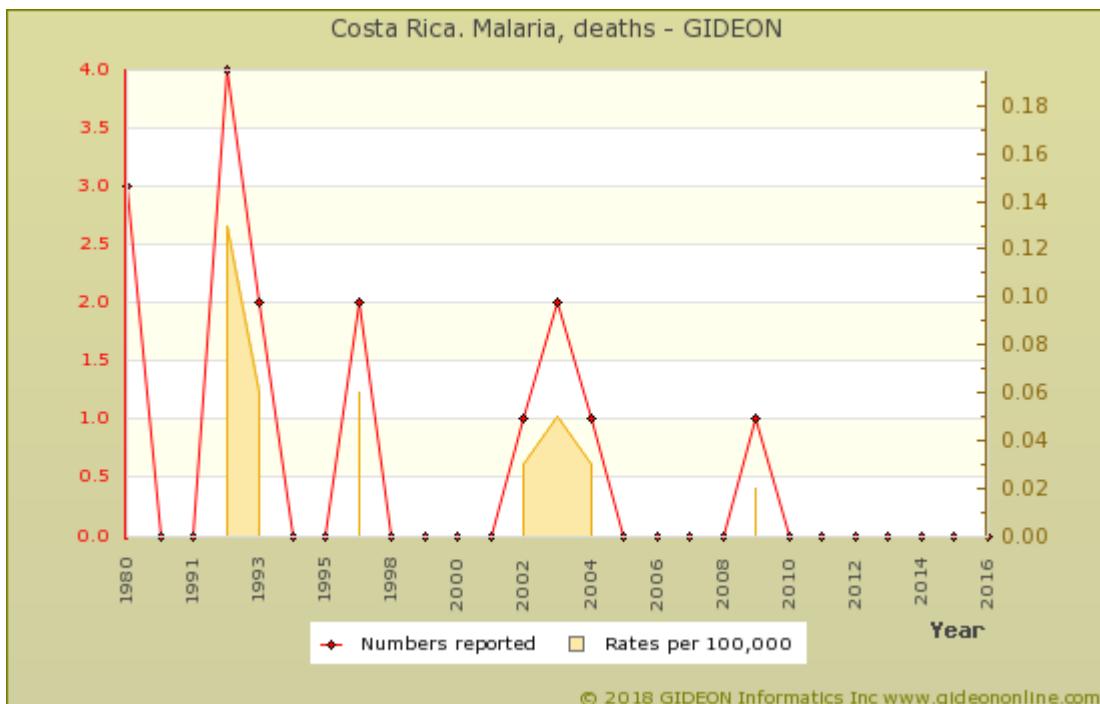
2017 - Nine cases of locally-transmitted malaria were reported during March to September - in Matina Canton (4), Limon

Province, Sarapiqui Canton (3) Heredia Province, and Pital District in San Carlos Canton (2) in Alajuela.

### Prevalence surveys

Years	Region	Study Group	%	Notes
2012*	Baru	specimens	0.8	0.8% of blood specimens from Baru (Panama-Costa Rica border, 2012 publication) <sup>3</sup>

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



Graph: Costa Rica. Malaria, deaths

### Notes:

1. 176 fatal cases were reported during 1986 to 1988.

### Vectors:

- The principal vectors are *Anopheles albimanus*<sup>4 5</sup> and *An. aquasalis* (in the south).

### Notable outbreaks

Years	Region	Setting	Cases	Pathogen	Notes
1991	Multiple locations	flooding			<sup>6</sup>
2006	Limon		13	<i>P. falciparum</i>	<sup>7</sup>

### References

1. ProMED <promedmail.org> archive: 20131203.2089941
2. Prehosp Disaster Med 1995 Jul-Sep;10(3):154-60.
3. Biomedica 2012 Oct-Dec;32(4):557-69.
4. Am J Trop Med Hyg 2004 Sep ;71(3):350-9.
5. Am J Trop Med Hyg 1999 Aug ;61(2):230-9.
6. Prehosp Disaster Med 1995 Jul-Sep;10(3):154-60.
7. ProMED <promedmail.org> archive: 20061116.3280

## 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 <i>Ciprofloxacin</i> 400 mg iv Q8h Alternatives: <i>Imipenem</i> , <i>Meropenem</i> , <i>Ceftazidime</i> , <i>Cefepime</i> Early debridement
Typical Pediatric Therapy	Early debridement <i>Imipenem</i> : Age 0 to 7 days: 25 mg/kg IV Q12h Age 8 to 28 days: 25 mg/kg IV Q8h Age >28 days: 15 to 25 mg/kg IV Q6h (maximum 2 g/day) Alternatives: <i>Meropenem</i> , <i>Ceftazidime</i> , <i>Cefepime</i>
Clinical Hints	- 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	

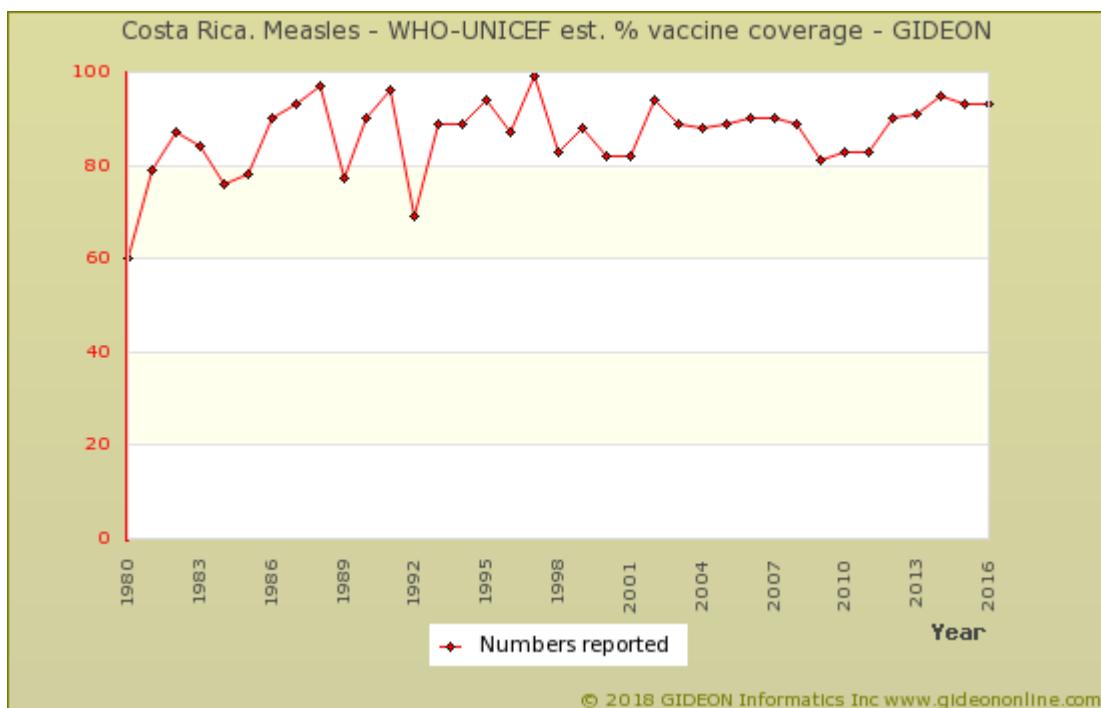
## Measles

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

## Measles in Costa Rica

### Vaccine Schedule:

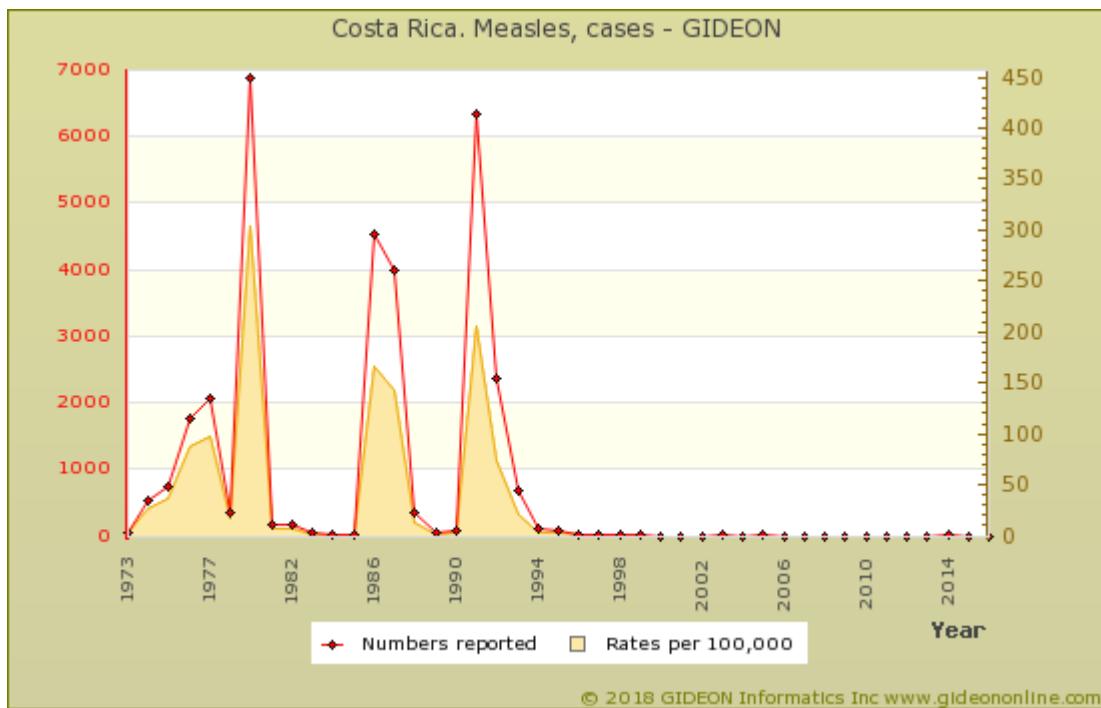
BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months



Graph: Costa Rica. Measles - WHO-UNICEF est. % vaccine coverage

## Notes:

1. Measles vaccine was introduced in Costa Rica in 1967. <sup>1</sup>
2. MMR vaccine was introduced in 1986
3. A booster at age 7 years was introduced in 1992. <sup>2</sup>
4. In 2001, over 1.6 million were vaccinated in mass-vaccination program using MR vaccine. <sup>3</sup>

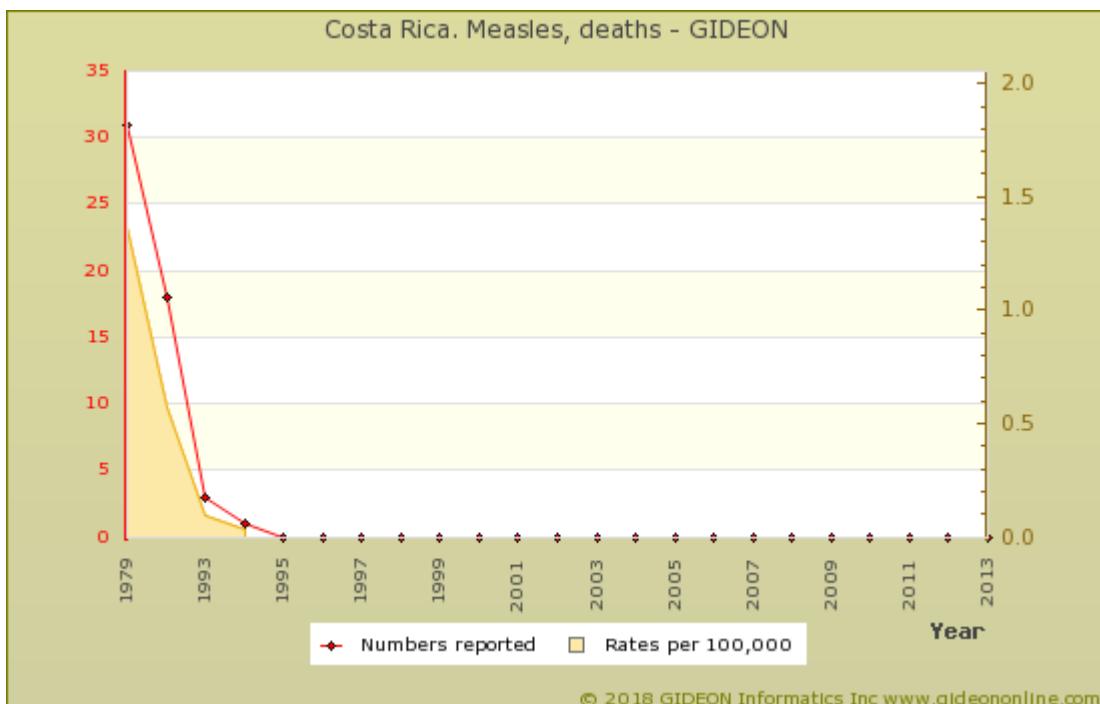


Graph: Costa Rica. Measles, cases

## Notes:

1. Imported cases of measles were detected in 2003 and 2005, with no secondary spread. <sup>4</sup>
- Individual years:

1997 - Most associated with an outbreak in Guanacaste.  
 1998 - 28 cases were reported to PAHO.  
 2003 - Case imported from India.



Graph: Costa Rica. Measles, deaths

#### Notable outbreaks

Years	Cases	Deaths	Notes
1977			Outbreak reported - additional details unavailable. <a href="#">5</a>
1979			Outbreak reported - additional details unavailable. <a href="#">6</a>
1990 - 1993	9,292	56	
1997			Outbreak reported - additional details unavailable. <a href="#">7</a>

#### References

1. Rev Infect Dis 1983 May-Jun;5(3):588-91.
2. J Infect Dis 2011 Sep 01;204 Suppl 2:S690-7.
3. MMWR Morb Mortal Wkly Rep 2001 Nov 09;50(44):976-9.
4. J Infect Dis 2011 Sep 01;204 Suppl 2:S690-7.
5. Rev Infect Dis 1983 May-Jun;5(3):588-91.
6. Rev Infect Dis 1983 May-Jun;5(3):588-91.
7. EPI News 1998 Apr ;20(2):3.

## Melioidosis

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

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

### Melioidosis in Costa Rica

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

### References

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

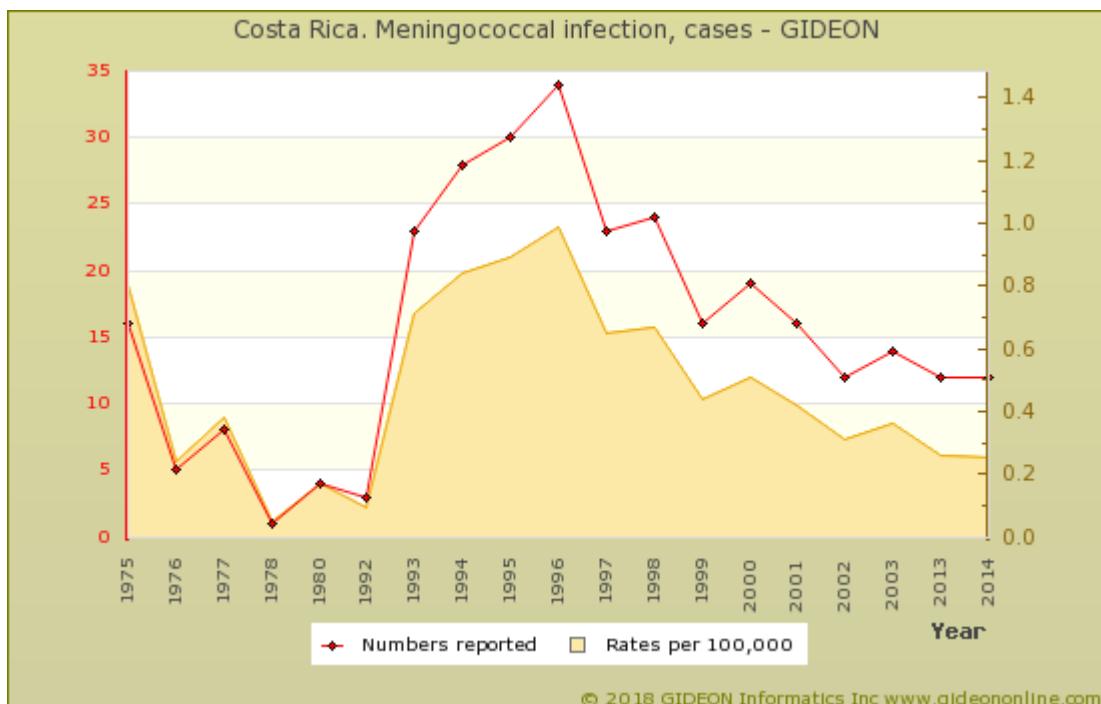
**Meningitis - aseptic (viral)**

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

## Meningitis - bacterial

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

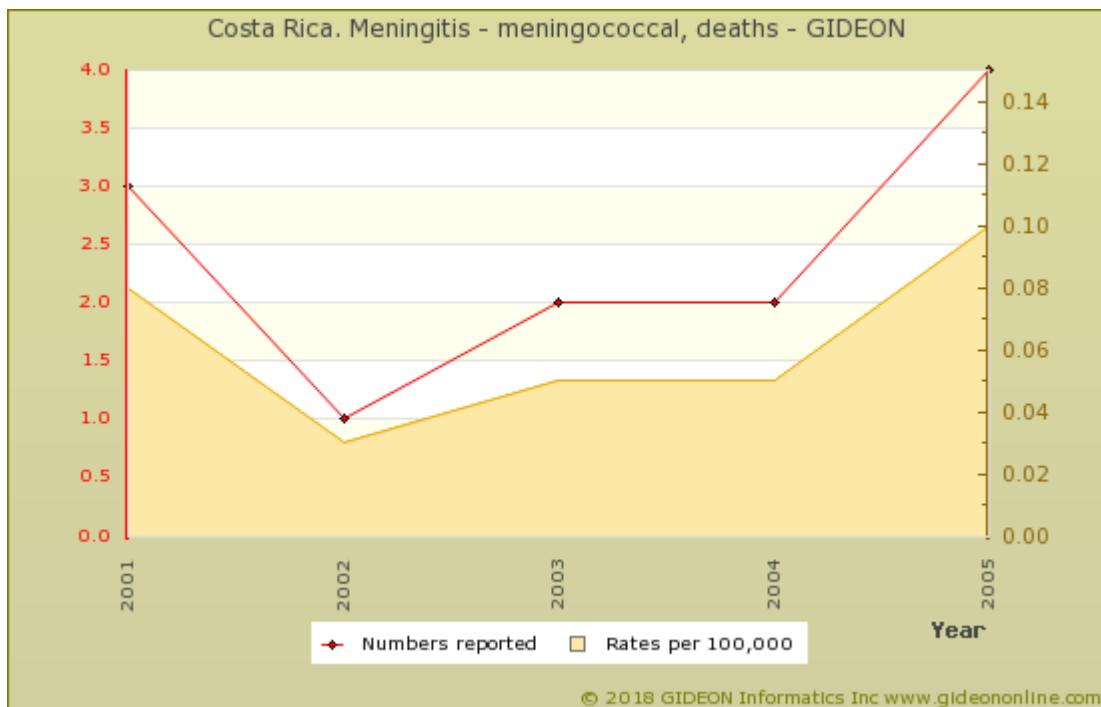
## Meningitis - bacterial in Costa Rica



## Graph: Costa Rica. Meningococcal infection, cases

Notes:

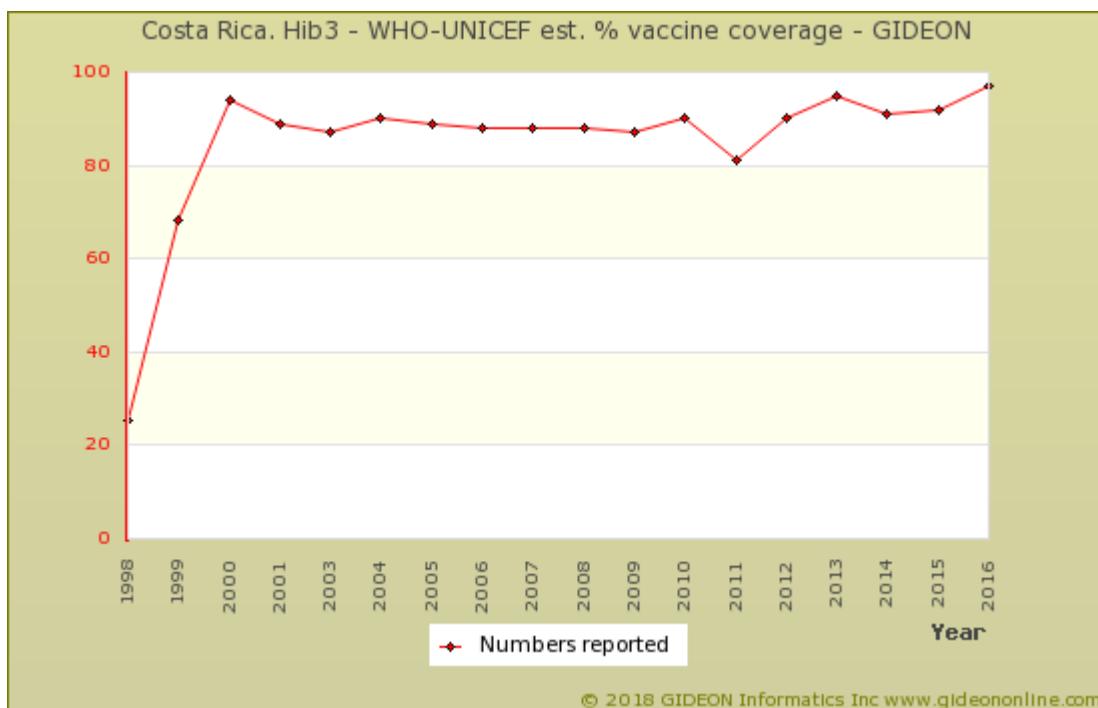
1. No fatal cases were reported in 2001 or 2002.



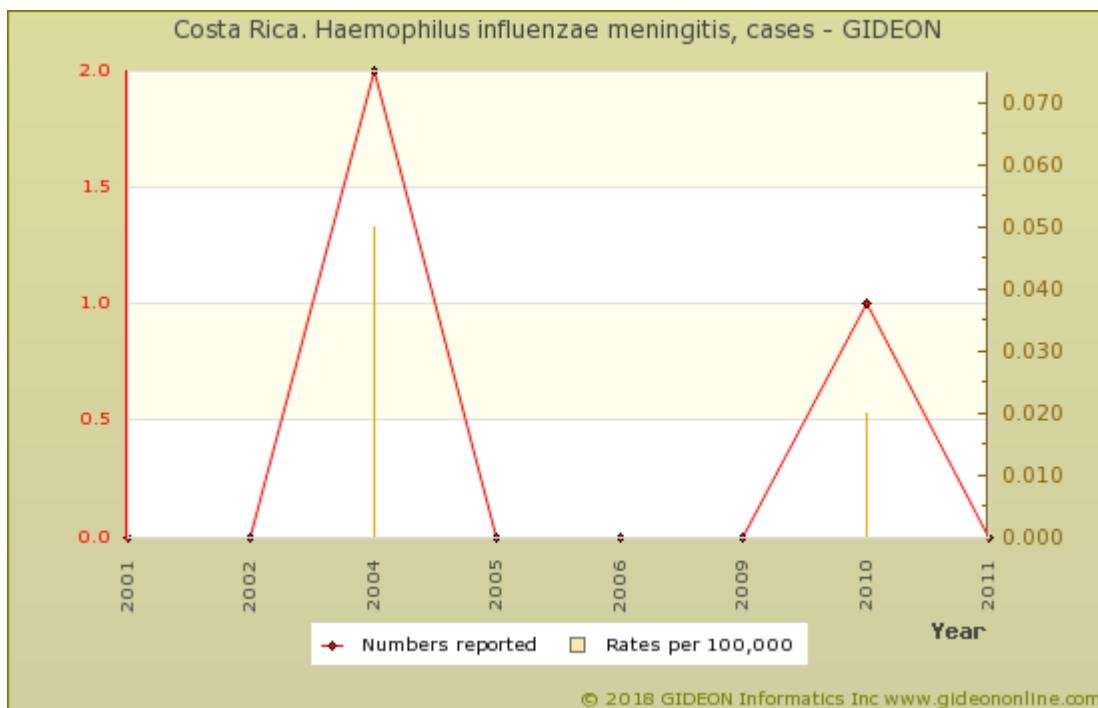
Graph: Costa Rica. Meningitis - meningococcal, deaths

**Vaccine Schedule:**

BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months



Graph: Costa Rica. Hib3 - WHO-UNICEF est. % vaccine coverage

Graph: Costa Rica. *Haemophilus influenzae* meningitis, cases**Notable outbreaks**

Years	Pathogen	Notes
1970 - 1971	meningococcus group C	<a href="#">1</a>

**References**

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1. Bol Med Hosp Infant Mex 1979 Mar-Apr;36(2):279-86.

## Microsporidiosis

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

**Molluscum contagiosum**

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

## Mumps

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

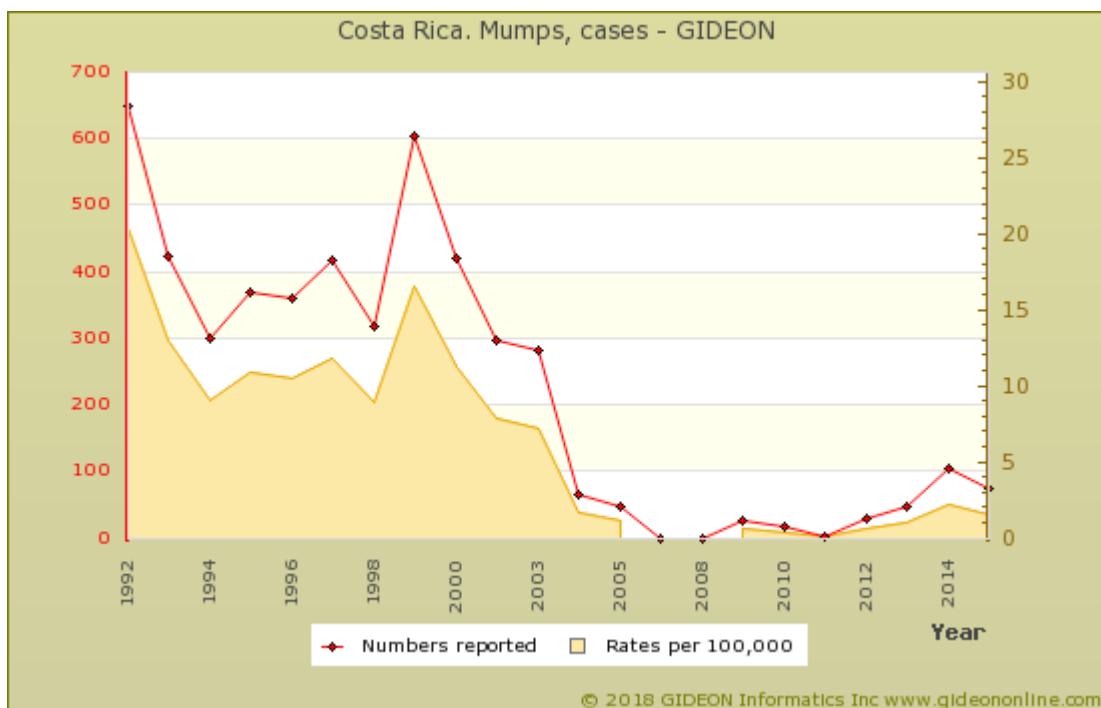
## Mumps in Costa Rica

### Vaccine Schedule:

BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months

MMR vaccination was introduced in 1986.

- A booster at age 7 years was introduced in 1992. <sup>1</sup>



Graph: Costa Rica. Mumps, cases

No fatal cases were reported during 2001 to 2005.

## References

1. J Infect Dis 2011 Sep 01;204 Suppl 2:S690-7.

## Myalgic encephalomyelitis

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

## Mycetoma

<b>Agent</b>	BACTERIUM OR FUNGUS. <i>Nocardia</i> spp, <i>Madurella mycetomatis</i> , <i>Actinomadura pellitieri</i> , <i>Streptomyces somaliensis</i> , et al
<b>Reservoir</b>	Soil, Vegetation
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Wound, Soil
<b>Incubation Period</b>	2w - 2y
<b>Diagnostic Tests</b>	Bacterial and fungal culture of material from lesion.
<b>Typical Adult Therapy</b>	Antimicrobial or antifungal agent as determined by culture. Excision as indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Coelomycetes, Curvularia lunata, Cyphellophora, Diaporthe, Emarella, Fusarium subglutinans, Gloniopsis, Lasiodiplodia, Leptosphaeria tompkinsii, Madura foot, Madura-Fuss, Madurella, Medicopsis, Mycetom, Paraconiothyrium, Peyronellaea, Pleurostomophora, White grain eumycetoma. ICD9: 039.4,117.4 ICD10: B47

## Mycobacteriosis - M. marinum

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

## Mycobacteriosis - M. scrofulaceum

<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Mycobacterium scrofulaceum</i> An aerobic acid-fast bacillus
<b>Reservoir</b>	Water (lakes, rivers), Soil, Raw milk, Plant material
<b>Vector</b>	None
<b>Vehicle</b>	Water, Soil, Areas of minor trauma, Contact
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Culture of tissue or aspirates.
<b>Typical Adult Therapy</b>	Excision. Drugs ( <a href="#">Isoniazid</a> - <a href="#">Rifampin</a> - <a href="#">streptomycin</a> - <a href="#">Cycloserine</a> ) are rarely indicated
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	

**Mycobacteriosis - miscellaneous nontuberculous**

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

## Mycoplasma (miscellaneous) infection

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

## Mycoplasma pneumoniae infection

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

## Mycoplasma pneumoniae infection in Costa Rica

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1983	Palmares	children	53	53% of school children (1983) <sup>1</sup>

### References

1. Rev Biol Trop 1993 Dec ;41(3A):371-7.

## Myiasis

<b>Agent</b>	PARASITE - Insecta (Diptera) larvae
<b>Reservoir</b>	Mammal
<b>Vector</b>	Arthropod
<b>Vehicle</b>	Fly eggs deposited by biting arthropod
<b>Incubation Period</b>	1w - 3m
<b>Diagnostic Tests</b>	Identification of extracted maggot.
<b>Typical Adult Therapy</b>	Removal of maggot
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	<ul style="list-style-type: none"> <li>- Fly larvae seen in various body regions</li> <li>- Pruritic or painful draining nodule</li> <li>- Fever and eosinophilia may be present</li> <li>- Instances of brain, eye, middle ear and other deep infestations are described.</li> </ul>
<b>Synonyms</b>	Calliphora, Chrysomya, Chrysomyia, Clogmia, Cochliomyia, Cordylobia, Cuterebrosis, Dermatobia, Eristalis, Fannia, Furuncular myiasis, Gasterophilus, Hypoderma, Lucilia, Lund's fly, Maggot infestation, Megaselia, Musca, Muscina, Oedemagena, Oestrus, Ophthalmomyiasis, Parasarcophaga, Psychoda, Rectal myiasis, Sarcophaga, Screw worm, Telmatoscopus, Telmatoscopus, Urinary myiasis, Vaginal myiasis, Wohlfarthia. ICD9: 134.0 ICD10: B87

## Myiasis in Costa Rica

*Dermatobia hominis* myiasis has been reported among travelers returning from Costa Rica. [1](#) [2](#) [3](#) [4](#) [5](#)

## References

- |   |  |
|---|--|
| 1. <a href="#">J AAPOS 2008 Oct ;12(5):516-7.</a><br>2. <a href="#">J Travel Med 2005 Sep-Oct;12(5):285-8.</a><br>3. <a href="#">Dermatology 2004 ;208(3):268-70.</a> | 4. <a href="#">Gac Med Mex 2004 Jan-Feb;140(1):81-3.</a><br>5. <a href="#">J Ark Med Soc 2002 Sep ;99(3):86-7.</a> |
|---|--|

**Necrotizing skin/soft tissue infx.**

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

## Neutropenic typhlitis

<b>Agent</b>	BACTERIUM. <i>Clostridium septicum</i> (occasionally <i>Clostridium tertium</i> , <i>Clostridium sporogenes</i> , <i>Clostridium sordellii</i> or <i>Clostridium perfringens</i> )
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Endogenous
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Typical findings in the setting of neutropenia. Ultrasonography may be helpful.
<b>Typical Adult Therapy</b>	Broad spectrum antimicrobial coverage, which should include clostridia and <i>Pseudomonas aeruginosa</i> ; ie <i>Piperacillin / Tazobactam</i> (or <i>Imipenem</i> or <i>Meropenem</i> ) OR <i>Cefepime + Metronidazole</i> Role of surgery is controversial
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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%
<b>Synonyms</b>	Neutropenic enterocolitis. ICD9: 540.0 ICD10: A04.8

## Nocardiosis

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

## Onchocerciasis - zoonotic

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

## Orbital and eye infection

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

**Orf**

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

## Ornithosis

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

## Ornithosis in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
2009	Multiple locations	birds	3.4	3.4% of captive psittacines (2009) <sup>1</sup>
2017*		pigeons	9.2	Survey of fecal samples from pigeons ( <i>Columba livia</i> ) in urban parks <sup>2</sup>

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

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
1998 - 1999	Multiple locations	birds	12.39	12.39% of captive macaws ( <i>Ara macao</i> , 1998 to 1999) <sup>3</sup>

### References

1. [Vet Med Int](#) 2013 ;2013:142962.
2. [Vector Borne Zoonotic Dis](#) 2017 Dec 15;
3. [J Vet Med B Infect Dis Vet Public Health](#) 2001 Dec ;48(10):721-6.

## Osteomyelitis

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

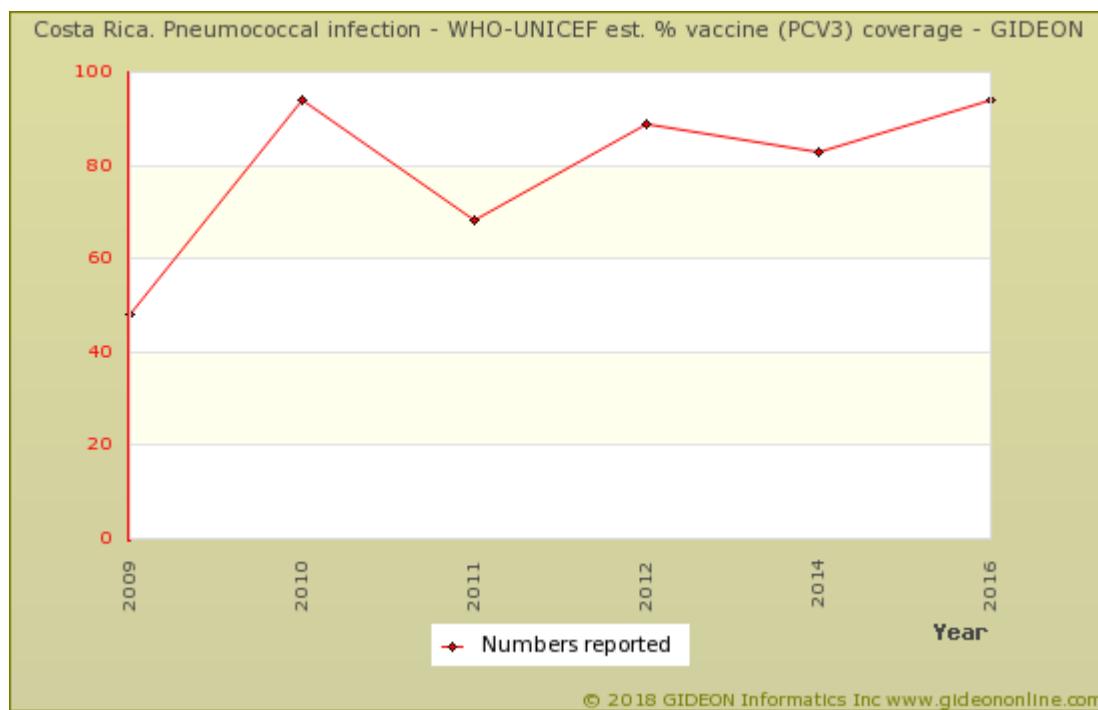
## Otitis media

<b>Agent</b>	BACTERIUM OR VIRUS. <i>Haemophilus influenzae</i> & <i>Streptococcus pneumoniae</i> in most acute cases; RSV, Parainfluenza, et al
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	None
<b>Incubation Period</b>	Variable
<b>Diagnostic Tests</b>	Clinical findings. Culture of middle ear fluid if available.
<b>Typical Adult Therapy</b>	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): <a href="#">Amoxicillin / Clavulanate</a> 1000/62.5 mg BID X 3 days Alternatives: <a href="#">Cefdinir</a> , <a href="#">Cefpodoxime</a> proxtil, Cefprozin, fluoroquinolone
<b>Typical Pediatric Therapy</b>	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): <a href="#">Amoxicillin / Clavulanate</a> 45/3.2 mg/kg BID X 3 days
<b>Vaccine</b>	<a href="#">Pneumococcal conjugate vaccine</a>
<b>Clinical Hints</b>	- 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.
<b>Synonyms</b>	Otitis media aguda. ICD9: 382.0 ICD10: H65,H66

## Otitis media in Costa Rica

### Vaccine Schedule:

BCG - birth  
 DTaPHibIPV - 2,4,6,15 months  
 DTaPIPV - 4 years  
 HepB - birth 2, 6 months and adults at risk  
 MMR - 15 months; 7 years  
 Pneumo conj - 2,4,15 months  
 Pneumo ps - >=60 years  
 Td - 10 years  
 Tdap - pregnant women  
 Varicella - 15 months



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

## Paragonimiasis

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

## Paragonimiasis in Costa Rica

Cases of pericarditis <sup>1</sup> , pulmonary and cerebral <sup>2</sup> infections due to *Paragonimus mexicanus* <sup>3</sup> have been reported in Costa Rica.

Parasites are found in local snails (*Aroapyrgus costaricensis*). <sup>4</sup>

Intermediate hosts include *Ptychophallus richmondi*, *Ptychophallus tumimanus* <sup>5</sup> and *Ptychophallus tristani*. <sup>6</sup>

## References

1. [J Trop Med Hyg 1995 Oct ;98\(5\):316-8.](#)
2. [Am J Trop Med Hyg 1982 May ;31\(3 Pt 1\):522-6.](#)
3. [J Electron Microsc \(Tokyo\) 1989 ;38\(1\):41-6.](#)
4. [J Parasitol 1975 Apr ;61\(2\):355-9.](#)
5. [J Parasitol 1986 Oct ;72\(5\):777-8.](#)
6. [Rev Inst Med Trop Sao Paulo 1985 Jan-Feb;27\(1\):23-6.](#)

## Parainfluenza virus infection

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

## Parvovirus B19 infection

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

## Pediculosis

<b>Agent</b>	PARASITE - Insecta. Anoplura: <i>Pediculus humanus</i> , <i>Phthirus pubis</i> .
<b>Reservoir</b>	Human
<b>Vector</b>	Louse
<b>Vehicle</b>	Contact
<b>Incubation Period</b>	7d
<b>Diagnostic Tests</b>	Identification of adults and "nits."
<b>Typical Adult Therapy</b>	Permethrin 1%; or malathion 0.5%; or lindane OR <b>Ivermectin</b> 200 mcg/kg PO
<b>Typical Pediatric Therapy</b>	Permethrin 1%; or malathion 0.5%; or lindane OR <b>Ivermectin</b> 200 mcg/kg PO (> 15 kg body weight)
<b>Clinical Hints</b>	- Pruritus in the setting of poor personal hygiene - Adult insects or nits may be visible - Body louse (rarely the head louse) transmits such diseases as epidemic typhus, trench fever and relapsing fever
<b>Synonyms</b>	Crab louse, Lausebefall, Pediculose, <i>Pediculus capitus</i> , <i>Pediculus corporis</i> , Pedikulose, <i>Phthirus pubis</i> , Pidocci. ICD9: 132 ICD10: B85

## Pediculosis in Costa Rica



Graph: Costa Rica. Pediculosis, cases

## Pentastomiasis - Linguatula

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

## Pentastomiasis - Linguatula in Costa Rica

Linguatulosis has been reported in Costa Rica. <sup>1</sup>

### References

1. Rev Latinoam Microbiol 1986 Apr-Jun;28(2):157-66.

**Pericarditis - bacterial**

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

**Perinephric abscess**

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

**Perirectal abscess**

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

**Peritonitis - bacterial**

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

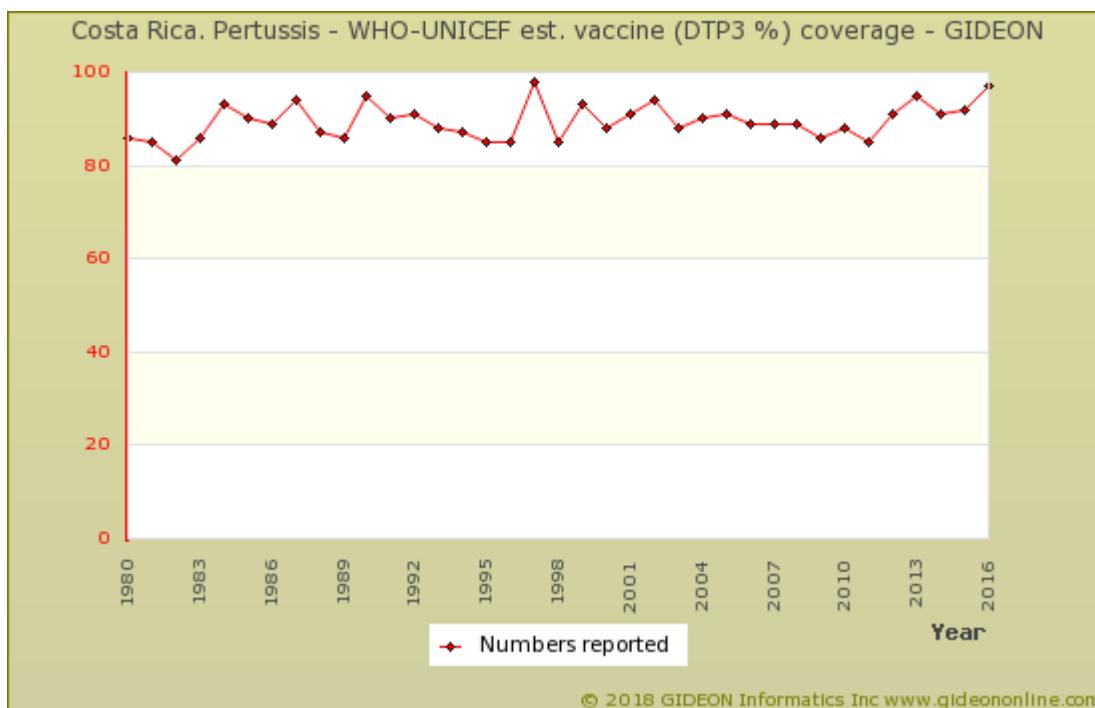
## Pertussis

<b>Agent</b>	BACTERIUM. <i>Bordetella pertussis</i> An aerobic gram-negative coccobacillus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Infected secretions, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	7d - 10d (range 5d - 21d)
<b>Diagnostic Tests</b>	Culture & direct fluorescence (nasopharynx). Alert laboratory when suspected. Serology.
<b>Typical Adult Therapy</b>	Respiratory precautions. <a href="#">Azithromycin</a> 500 mg po X 1, then 250 mg daily X 4 days OR <a href="#">Clarithromycin</a> 500 mg po BID X 7 days OR Sulfamethoxazole / <a href="#">Trimethoprim</a>
<b>Typical Pediatric Therapy</b>	Respiratory precautions: <a href="#">Azithromycin</a> 10mg /kg po daily for 5 days OR <a href="#">Clarithromycin</a> 15/mg/kg BID X 7 days OR Sulfamethoxazole / <a href="#">Trimethoprim</a>
<b>Vaccines</b>	<a href="#">DTaP vaccine</a> <a href="#">DTP vaccine</a>
<b>Clinical Hints</b>	- 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%
<b>Synonyms</b>	Bordetella holmesii, Bordetella parapertussis, Bordetella pertussis, Chincofe, Chyncough, Coqueluche, Keichhusten, Keuchhusten, Kichhosta, Kikhusta, Kikhoste, Kinkhoest, Kinkhost, Kirkhosta, Parapertussis, Pertosse, Syndrome coqueluchoide, Tos convulsa, Tos farina, Tosse convulsa, Tussis convulsa, Whooping cough. ICD9: 033 ICD10: A37

## Pertussis in Costa Rica

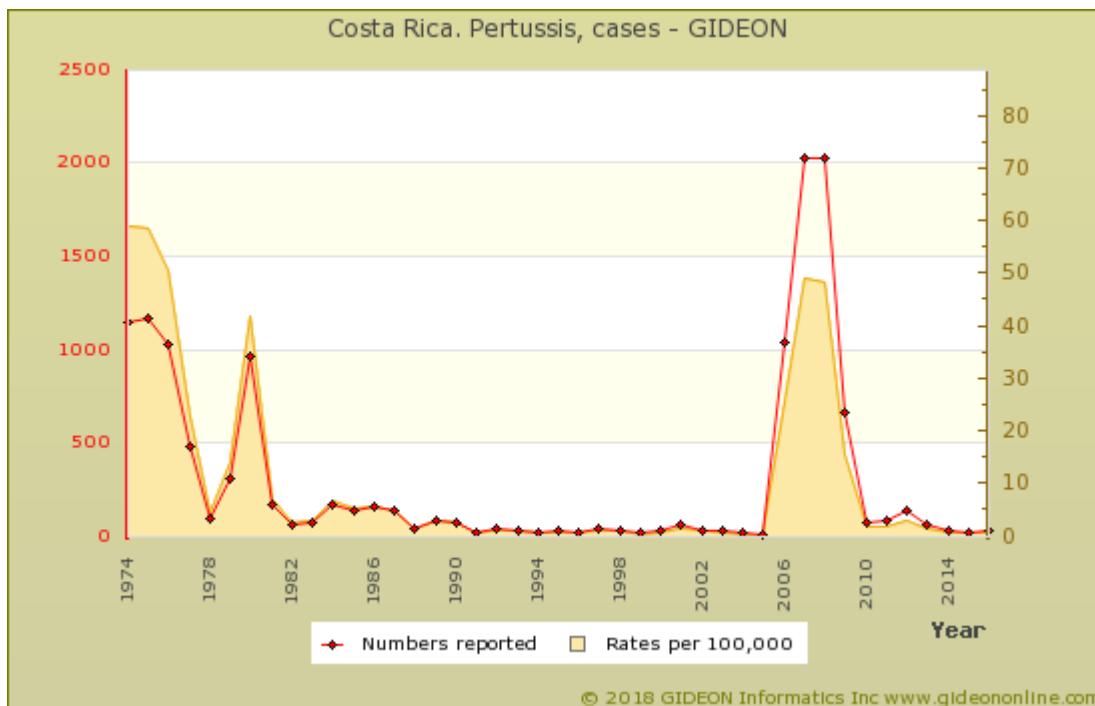
### Vaccine Schedule:

BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months



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

Pertussis was confirmed in 12% of children <1 year of age in 11 countries admitted to pediatric intensive care units (PICU) and pediatric wards presenting with respiratory failure, apnea, bradycardia, or cough accompanied by paroxysms, vomiting, whoop or cyanosis - 10% in Costa Rica (2001 to 2004)<sup>1</sup>



Graph: Costa Rica. Pertussis, cases



Graph: Costa Rica. Pertussis, deaths

## References

- Pediatr Infect Dis J 2007 Mar ;26(3):238-42.

## Pharyngeal and cervical space infx.

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

## Pharyngitis - bacterial

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

## Philophthalmosis

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

## Philophthalmosis in Costa Rica

Infection by *Philophthalmus gralli* was been identified in great tinamous (*Tinamus major*) in Costa Rica. <sup>1</sup>

### References

1. Parasitol Int 2013 Dec ;62(6):571-4.

## Phleboviruses - New World

<b>Agent</b>	VIRUS - RNA. Bunyaviridae, Phlebovirus: Alenquer, Arboledas, Bujaru, Cacao, Candiru, Chagres and Punta Toro viruses
<b>Reservoir</b>	Sandfly ( <i>Lutzomyia trapidoi</i> , <i>Lu. ylephiletor</i> ), Rodent
<b>Vector</b>	Sandfly ( <i>Lutzomyia</i> , Tick
<b>Vehicle</b>	None
<b>Incubation Period</b>	3d - 4d (range 2d - 9d)
<b>Diagnostic Tests</b>	Viral culture (blood, CSF, biopsy). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Myalgia, eye pain, arthralgia, vomiting, facial flush and leukopenia - Fatalities and sequelae are not reported
<b>Synonyms</b>	Alanquer, Arboledas, Bujaru, Cacao, Campana, Candiru, Capira, Chagres, Changuinola, Coclé, Leticia, Punta Toro. ICD9: 078.89 ICD10: A93.8

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

### Phleboviruses - New World in Costa Rica

#### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005 - 2007	Multiple locations	sloths	32	32% / 20% (Punta Toro virus / Changuinola virus) of sloths (Finmac and Upala) <a href="#">1</a>

#### References

1. J Wildl Dis 2016 Oct ;52(4):883-892.

## Pityriasis rosea

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

## Plesiomonas infection

<b>Agent</b>	BACTERIUM. <i>Plesiomonas shigelloides</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Fish Animal, Soil, Reptile, Bird
<b>Vector</b>	None
<b>Vehicle</b>	Water, Food
<b>Incubation Period</b>	1d - 2d
<b>Diagnostic Tests</b>	Stool culture - alert laboratory when this organism is suspected. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions. <a href="#">Ciprofloxacin</a> 400 mg IV or 750 mg PO, BID Alternatives: Sulfamethoxazole / <a href="#">Trimethoprim</a> , <a href="#">Amoxicillin</a> / <a href="#">Clavulanate</a> , <a href="#">Ceftriaxone</a>
<b>Typical Pediatric Therapy</b>	Stool precautions. Sulfamethoxazole / <a href="#">Trimethoprim</a> , <a href="#">Amoxicillin</a> / <a href="#">Clavulanate</a> , <a href="#">Ceftriaxone</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Plesiomonas shigelloides. ICD9: 008.8 ICD10: A04.8

## Plesiomonas infection in Costa Rica

*Plesiomonas shigelloides* is commonly isolated from bivalves, mud, and water from the Gulf of Nicoya (1989 publication) <sup>1</sup>

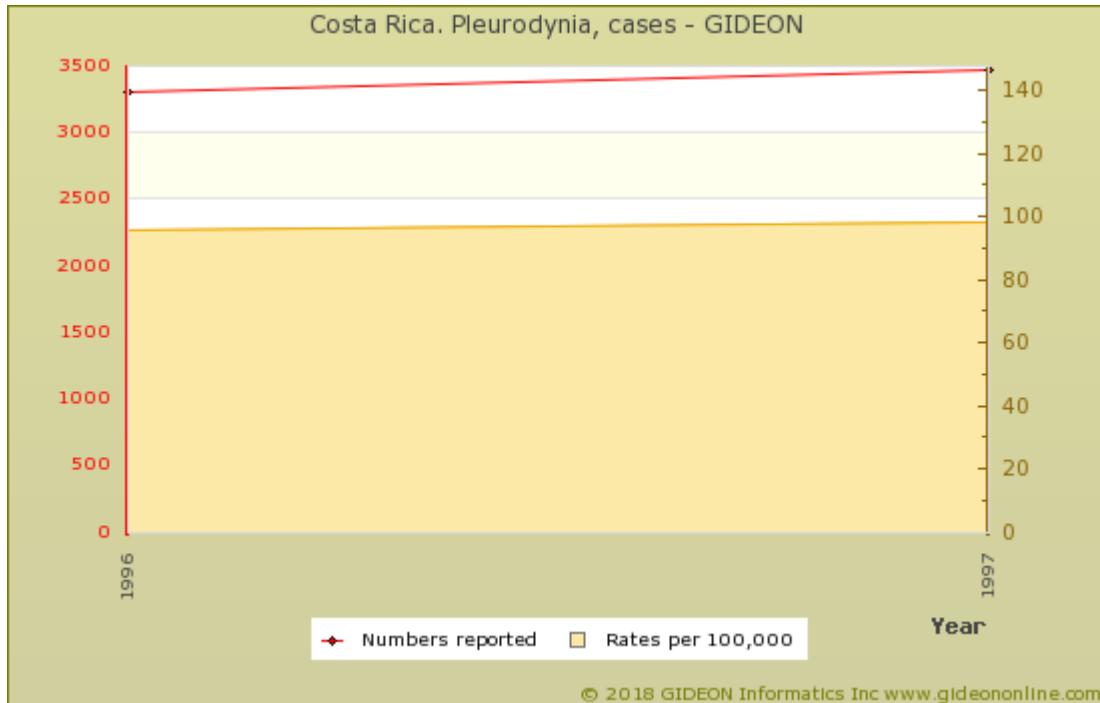
### References

1. [Rev Biol Trop 1989 Jun ;37\(1\):69-73.](#)

## Pleurodynia

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

## Pleurodynia in Costa Rica



Graph: Costa Rica. Pleurodynia, cases

## Pneumocystis pneumonia

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

**Pneumonia - bacterial**

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

## Poliomyelitis and acute flaccid paralysis

<b>Agent</b>	VIRUS - RNA. Picornaviridae, Picornavirus: Polio virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Dairy products, Food, Water, Fly, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	7d - 14d (range 3d - 35d)
<b>Diagnostic Tests</b>	Viral culture (pharynx, stool). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions; supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	<a href="#">Poliomyelitis - injectable vaccine</a> <a href="#">Poliomyelitis - oral vaccine</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Acute flaccid paralysis, Heine-Medin disease, Infantile paralysis, Kinderlähmung, Kinderverlamming, Paralisi infantile, Parálisis flaccida, Parálisis flacida aguda, PFA (Parálisis Flacidas Agudas), Polio, Poliomielitis, Poliomielitis.
	ICD9: 045 ICD10: A80

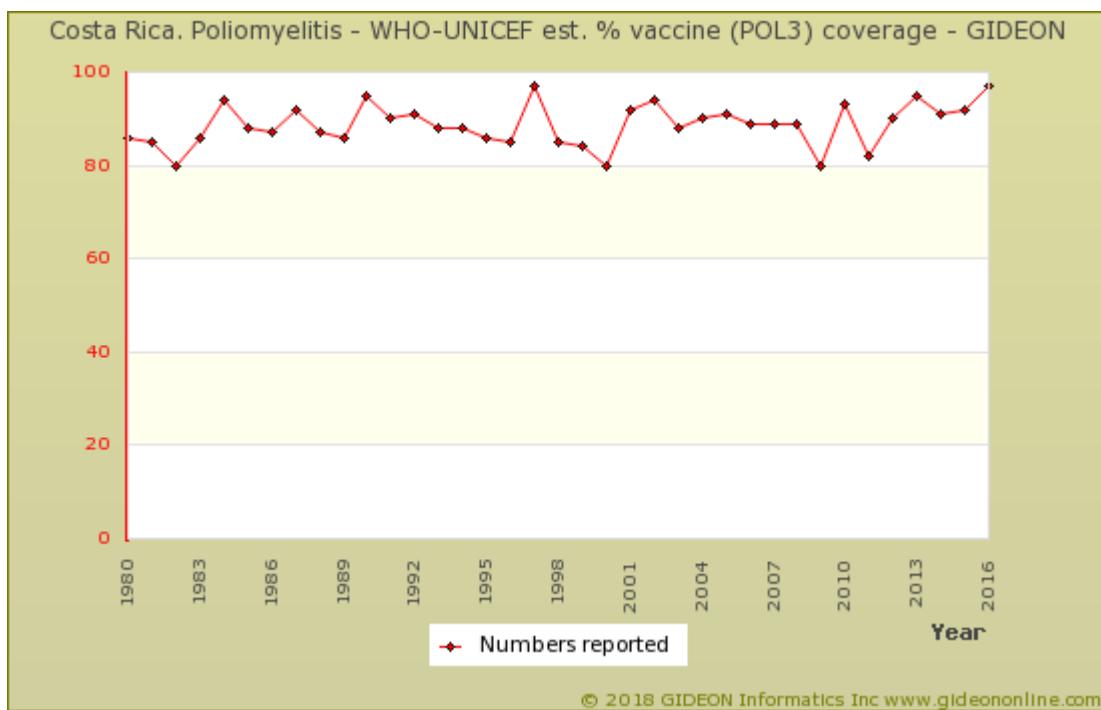
Although Poliomyelitis and acute flaccid paralysis is not endemic to Costa Rica, imported, expatriate or other presentations of the disease have been associated with this country.

### Poliomyelitis and acute flaccid paralysis in Costa Rica

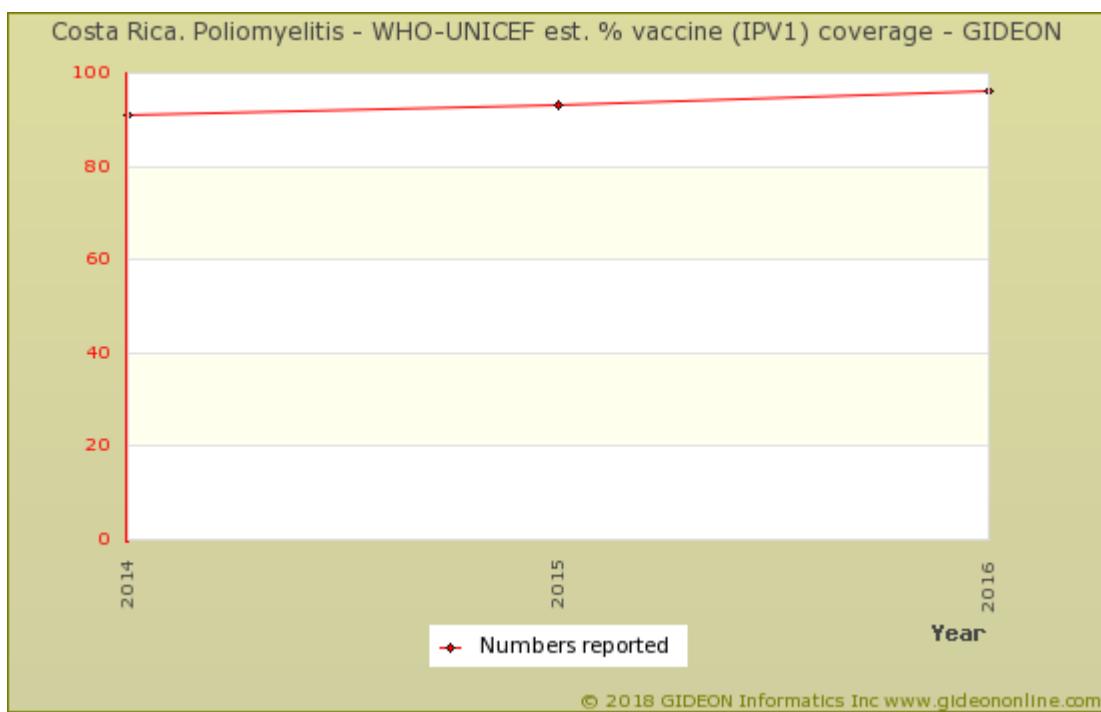
#### Vaccine Schedule:

BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months

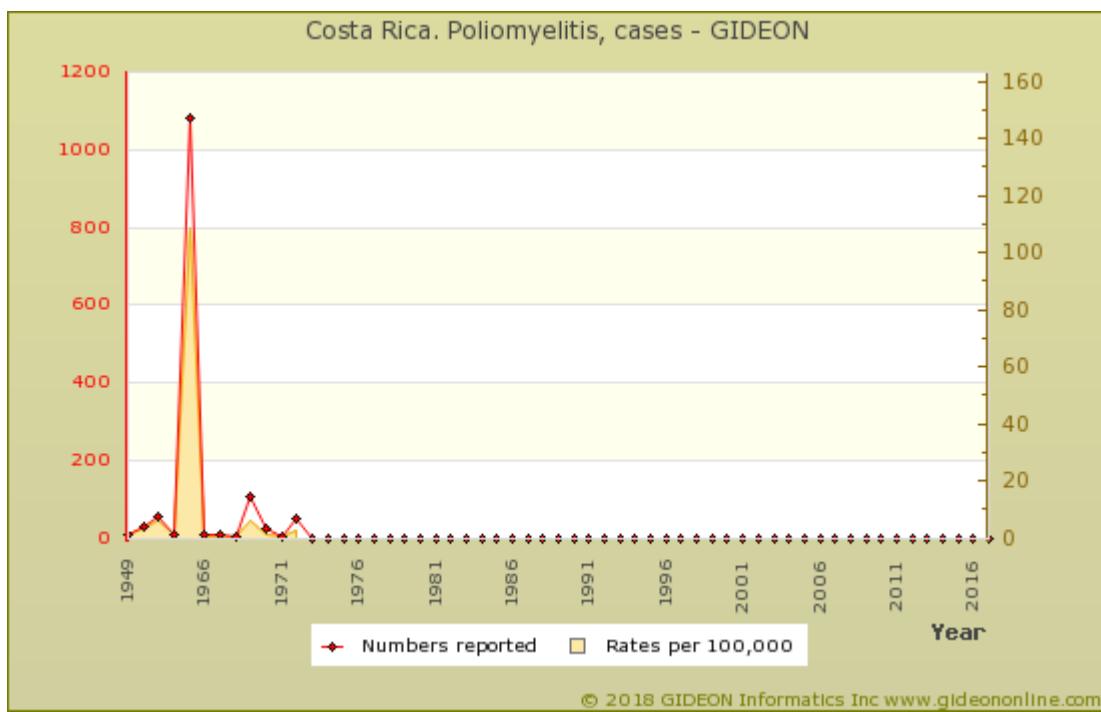
Mass vaccination using Salk vaccine was introduced in 1956, and Sabin vaccine in 1959. <sup>1</sup>



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



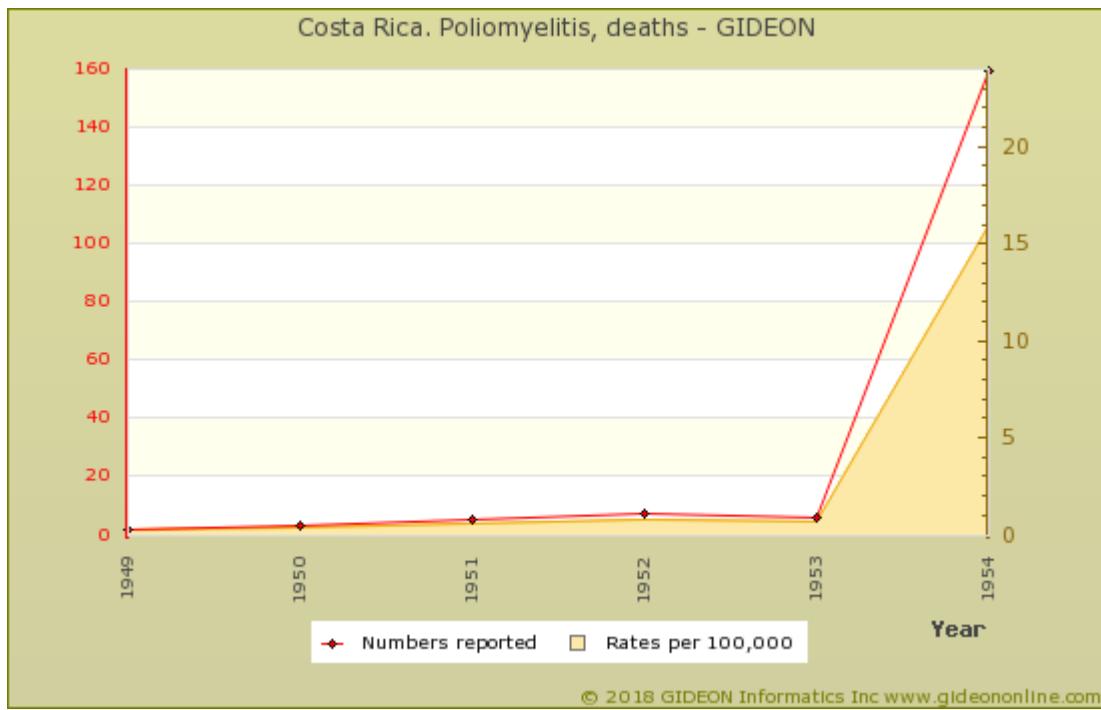
Graph: Costa Rica. Poliomyelitis - WHO-UNICEF est. % vaccine (IPV1) coverage



Graph: Costa Rica. Poliomyelitis, cases

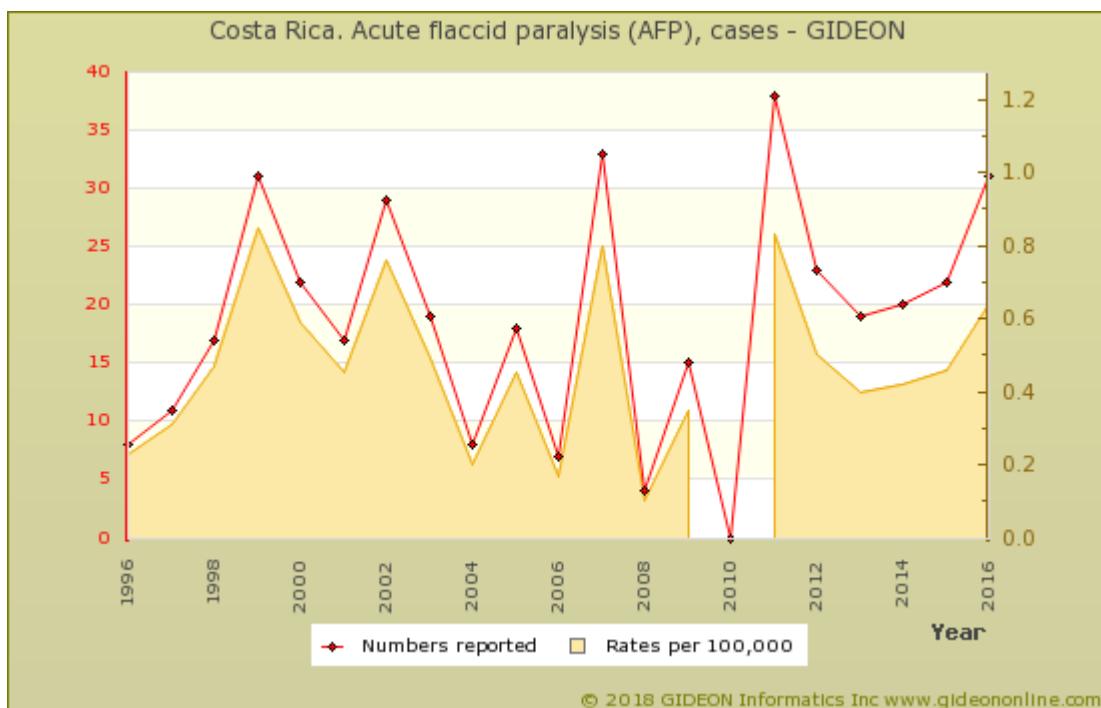
## Notes:

1. The last case of wild virus infection was reported in 1973.

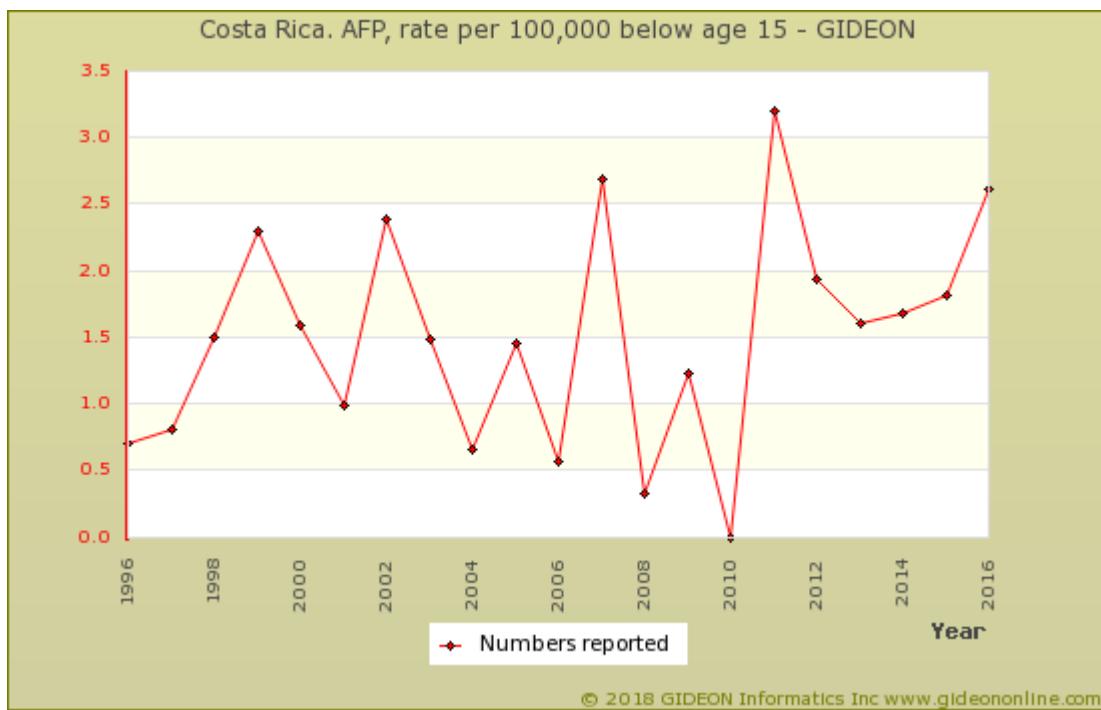


Graph: Costa Rica. Poliomyelitis, deaths

In 2005, an American visitor acquired poliomyelitis from a vaccinated infant in Costa Rica. [2](#) [3](#)



Graph: Costa Rica. Acute flaccid paralysis (AFP), cases



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

**Notable outbreaks**

Years	Notes
1954	Outbreak reported - additional details unavailable. <sup>4</sup>
1972	Outbreak reported - additional details unavailable. <sup>5</sup>

**References**

- 
1. [Rev Infect Dis 1984 May-Jun;6 Suppl 2:S442-3.](#)
  2. [MMWR Morb Mortal Wkly Rep 2006 Feb 03;55\(4\):97-9.](#)
  3. [ProMED <promedmail.org> archive: 20060202.0334](#)
  4. [Bull World Health Organ 1956 ;15\(1-2\):43-121.](#)
  5. [Rev Infect Dis 1984 May-Jun;6 Suppl 2:S442-3.](#)

## Protothecosis and chlorellosis

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

## Pseudocowpox

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

**Pyoderma (impetigo, abscess, etc)**

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

## Pyomyositis

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

**Q-fever**

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

**Q-fever in Costa Rica****Prevalence surveys**

Years	Study Group	Notes
2014*	dogs	0% of dogs (PCR, 2014 publication) <sup>1</sup>

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

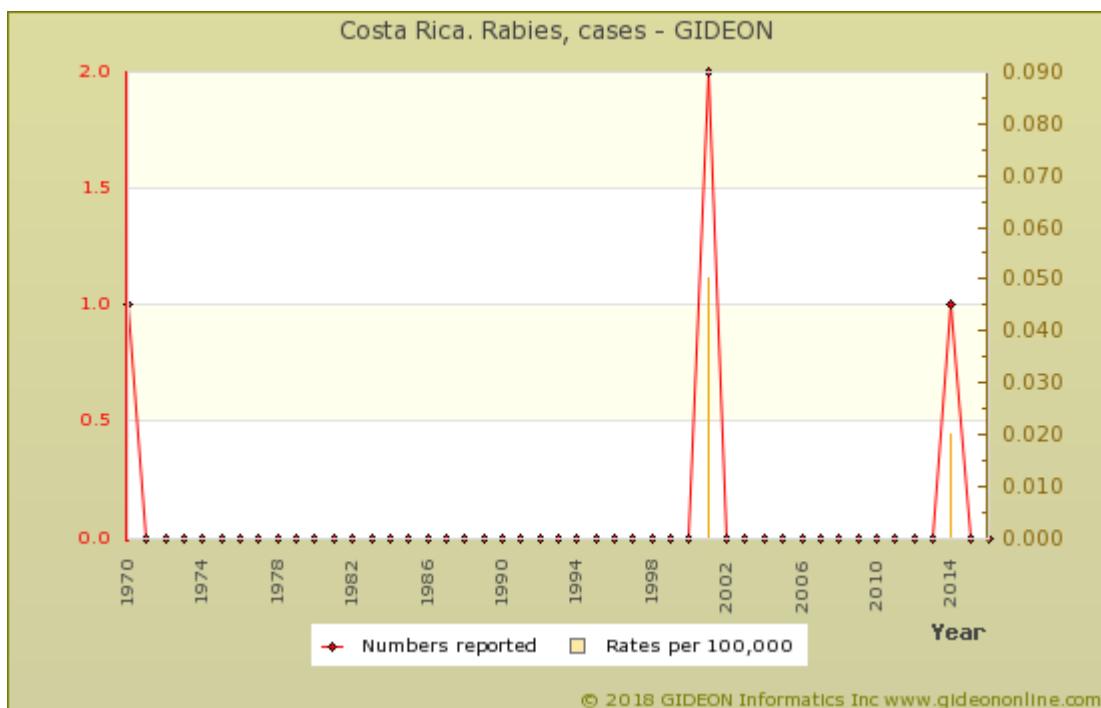
**References**

- Acta Parasitol 2014 Mar ;60(1):21-5.

## Rabies

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

## Rabies in Costa Rica



Graph: Costa Rica. Rabies, cases

**Notes:**

Individual years:

2001 - Two cases were reported in Brunca region. The disease was due to a vampire bat (*Desmodus rotundus*) strain and acquired from the bites of a cat.<sup>1</sup>

2014 - A child in Puntarenas Province acquired rabies from the bite of a squirrel.<sup>2</sup>

20 postexposure treatment courses were administered in 1988, and 23 in 1989.

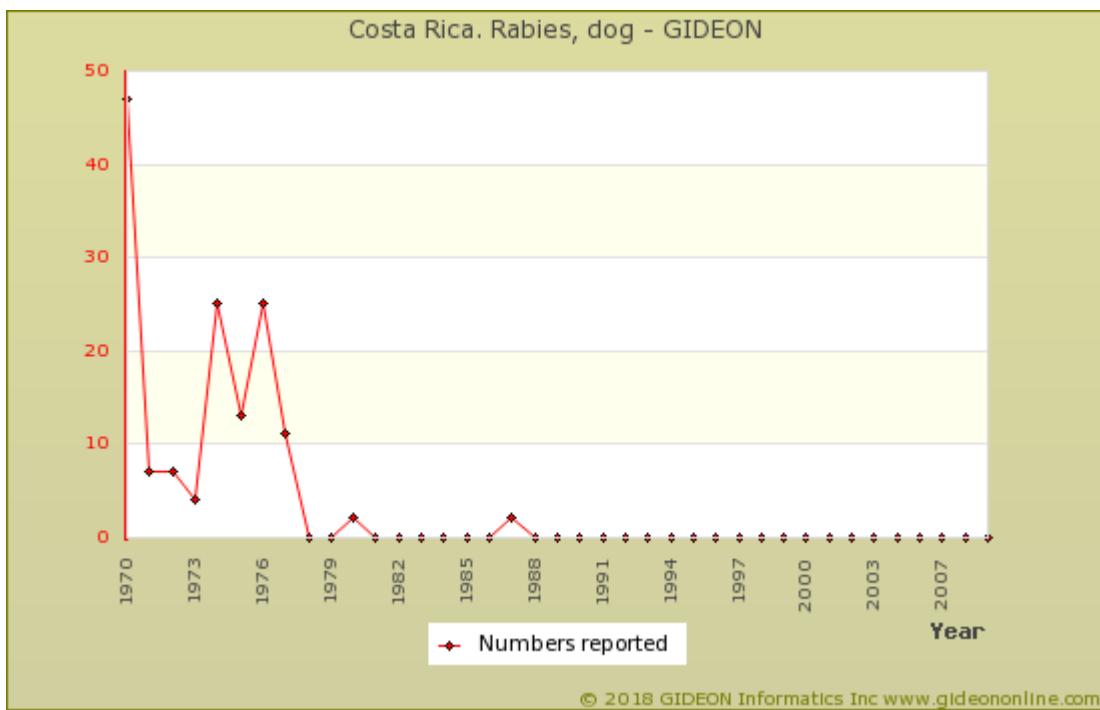


Graph: Costa Rica. Rabies, animal

**Notes:**

1. Ruminants accounted for 100% of rabid animals reported in 1994, 1995, 1998 to 2004

2. No rabid bats were reported in 1989; 0 in 1992 to 1995; 0 during 1998 to 2001; 0 during 2003 to 2007.  
 3. 78 outbreaks (723 cattle) of bovine rabies were reported during 1985 to 2014 <sup>3</sup>; 2 in 2011; 4 in 2012; 2 in 2013. <sup>4</sup>



Graph: Costa Rica. Rabies, dog

#### Notable outbreaks

Years	Region	Setting	Cases	Deaths	Population	Notes
2011	Northern Region	farm	4	4	cattle	<sup>5</sup>
2014	San Jose		5	5	cattle	<sup>6</sup>
2015	Multiple locations				cattle	Outbreak in Alajuela and San Jose Provinces <sup>7</sup>

#### References

- 1. Emerg Infect Dis 2003 Jun ;9(6):721-3.
- 2. ProMED <[promedmail.org](http://promedmail.org)> archive: 20140728.2641077
- 3. Vector Borne Zoonotic Dis 2016 May ;16(5):334-41.
- 4. ProMED <[promedmail.org](http://promedmail.org)> archive: 20140728.2641077
- 5. ProMED <[promedmail.org](http://promedmail.org)> archive: 20111220.3640
- 6. ProMED <[promedmail.org](http://promedmail.org)> archive: 20140801.2652582
- 7. ProMED <[promedmail.org](http://promedmail.org)> archive: 20150908.3631749

## Rat bite fever - spirillary

<b>Agent</b>	BACTERIUM. <i>Spirillum minus</i> An aerobic gram-negative spirochete
<b>Reservoir</b>	Rat, Mouse, Cat
<b>Vector</b>	None
<b>Vehicle</b>	Bite
<b>Incubation Period</b>	7d - 21d (range 5d - 40d)
<b>Diagnostic Tests</b>	Dark-field exam of wound. Animal inoculation.
<b>Typical Adult Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 875 / 125 mg PO BID X 7d. OR Procaine <a href="#">Penicillin G</a> 600,000u IM q12h X 7d. OR <a href="#">Doxycycline</a> 200 mg BID X 7d
<b>Typical Pediatric Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 10 mg/kg PO BID X 7d OR Procaine <a href="#">Penicillin G</a> 25,000u/kg IM q12h X 7d
<b>Clinical Hints</b>	- 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%
<b>Synonyms</b>	Sodoku, Spirilosis, <i>Spirillum minor</i> , <i>Spirillum minus</i> . ICD9: 026.0 ICD10: A25.0

## Rat bite fever - streptobacillary

<b>Agent</b>	BACTERIUM. <i>Streptobacillus moniliformis</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Rat, Squirrel, Weasel, Turkey
<b>Vector</b>	None
<b>Vehicle</b>	Secretions, Bite, Dairy products
<b>Incubation Period</b>	3d - 10d (range 1d - 22d)
<b>Diagnostic Tests</b>	Culture of blood or joint fluid. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 875 / 125 mg PO BID X 7d. OR <a href="#">Doxycycline</a> 100 mg PO BID X 7d
<b>Typical Pediatric Therapy</b>	<a href="#">Amoxicillin / Clavulanate</a> 10 mg/kg TID X 7d. OR (if age > 8 years) <a href="#">Doxycycline</a> 2 mg/kg PO BID X 7 days (maximum 200 mg/day)
<b>Clinical Hints</b>	- 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%.
<b>Synonyms</b>	Haverhill fever, Streptobacillosis, <i>Streptobacillus moniliformis</i> . ICD9: 026.1 ICD10: A25.1

## Relapsing fever

<b>Agent</b>	BACTERIUM. <i>Borrelia</i> spp. A microaerophilic spirochete
<b>Reservoir</b>	Human, Tick, Rodent
<b>Vector</b>	Tick ( <i>Ornithodoros</i> ), Louse ( <i>Pediculus</i> )
<b>Vehicle</b>	Blood, Blood products
<b>Incubation Period</b>	7d - 8d (range 2d - 18d)
<b>Diagnostic Tests</b>	Examination of blood smears (thick and thin smears). Some species ( <i>B. hermsii</i> ) may grow in BSK II medium.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 7d. OR <a href="#">Erythromycin</a> 500 mg QID X 7d  A single dose of <a href="#">Tetracycline</a> 500 mg or <a href="#">erythromycin</a> 500 mg may suffice for louse-borne infection
<b>Typical Pediatric Therapy</b>	<a href="#">Chloramphenicol</a> 12.5 mg/kg PO QID X 7d. OR <a href="#">Erythromycin</a> 10 mg/kg QID X 7d
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Bilious typhoid, <i>Borrelia anserina</i> , <i>Borrelia braziliensis</i> , <i>Borrelia caucasica</i> , <i>Borrelia coriaceae</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> , <i>Borreliosis</i> , <i>Candidatus Borrelia algerica</i> , <i>Candidatus Borrelia kalaharica</i> , Famine fever, Febbre recidiva, Febbre ricorrente, Febris recurrens, Fiebre recurrente, Lauseruckfallfieber, Mianeh fever, Ruckfall fieber, Tilbakefallsfeber, Tilbakefallsfever, Vagabond fever, Yellow famine fever, Yellow plague. ICD9: 087.9,087.0,087.1 ICD10: A68

## Relapsing fever in Costa Rica

Costa Rica. Relapsing fever, cases: None reported between 1992 and 2000

## Respiratory syncytial virus infection

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

## Respiratory viruses - miscellaneous

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

## Respiratory viruses - miscellaneous in Costa Rica

Nine children with Human metapneumovirus infection were reported from a hospital during a two-month period (2008). <sup>1</sup>

### References

- Pediatr Infect Dis J 2009 May ;28(5):452-3.

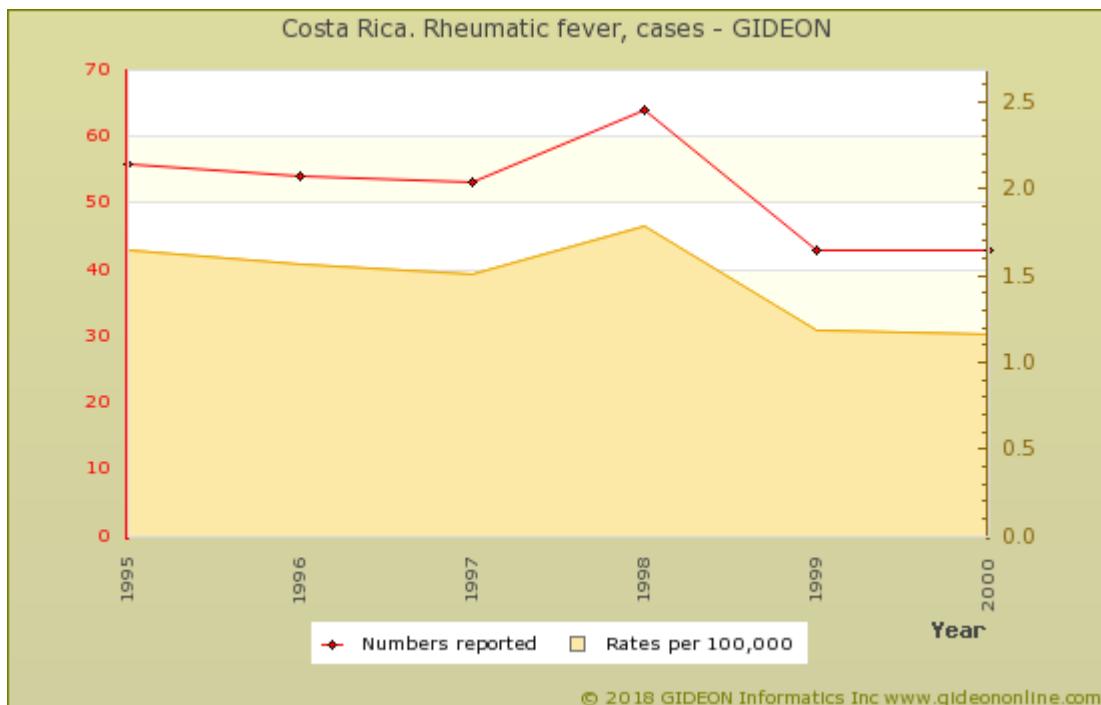
## Reye's syndrome

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

## Rheumatic fever

<b>Agent</b>	BACTERIUM. <i>Streptococcus pyogenes</i> A facultative gram-positive coccus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Droplet
<b>Incubation Period</b>	1w - 5w
<b>Diagnostic Tests</b>	Clinical diagnosis.
<b>Typical Adult Therapy</b>	Supportive; salicylates
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Febbre reumática. ICD9: 390,391 ICD10: I00,I01,I02

## Rheumatic fever in Costa Rica



Graph: Costa Rica. Rheumatic fever, cases

### Notes:

- No fatal cases were reported during 2001 to 2005.

Since the 1970's, aggressive use of intramuscular penicillin for pharyngitis has reduced the incidence of rheumatic fever in Costa Rica.<sup>1</sup>

**References**

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1. [J Pediatr 1992 Oct ;121\(4\):569-72.](#)

## Rhinoscleroma and ozena

<b>Agent</b>	BACTERIUM. <i>Klebsiella pneumoniae</i> ssp <i>ozaenae</i> and <i>Klebsiella pneumoniae</i> ssp <i>rhinoscleromatis</i> Facultative gram-negative bacilli
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Secretions, Contact, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Culture. Biopsy. Nucleic acid amplification. Advise laboratory when this diagnosis is suspected.
<b>Typical Adult Therapy</b>	Rhinoscleroma: <a href="#">Ciprofloxacin</a> 750 mg PO BID X 3 months  Ozena: <a href="#">Ciprofloxacin</a> 750 mg PO BID X 3 months or Sulfamethoxazole / <a href="#">Trimethoprim</a> X 3 months
<b>Typical Pediatric Therapy</b>	Rhinoscleroma: <a href="#">Streptomycin</a> , often with systemic or topical <a href="#">Rifampin</a> - for 3 to 6 weeks  Ozena: <a href="#">Ciprofloxacin</a> or Sulfamethoxazole / <a href="#">Trimethoprim</a> for 3 months
<b>Clinical Hints</b>	Rhinoscleroma: - Chronic fetid nasal discharge - A crusting mass may develop in the nose - Infection may extend to the larynx, trachea or paranasal sinuses  Ozena: - Chronic rhinitis progressing to atrophy of the nasal mucosa - Extension to the larynx and systemic infection have been reported
<b>Synonyms</b>	Klebsiella pneumoniae ssp <i>ozaenae</i> , Ozena, Rhinoscleroma. ICD9: 040.1 ICD10: J31.0

## Rhodococcus equi infection

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

## Rickettsia felis infection

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

## Rickettsia felis infection in Costa Rica

*Rickettsia felis* has been identified in cat fleas (*Ctenocephalides felis*) in this country. [1](#) [2](#) [3](#)

### Prevalence surveys

Years	Region	Study Group	%	Notes
2014 *		dogs	0	0% of dogs (PCR, 2014 publication) <a href="#">4</a>
2009 - 2010	Caribbean slope Region	fleas	58	58% of dog and cat flea ( <i>Ctenocephalides felis</i> ) pools (2009 to 2010) <a href="#">5</a>

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

### References

- 1. Vector Borne Zoonotic Dis 2011 Oct ;11(10):1395-7.
- 2. Ticks Tick Borne Dis 2016 Jul ;7(5):748-753.
- 3. Ticks Tick Borne Dis 2016 Oct ;7(6):1128-1134.
- 4. Acta Parasitol 2014 Mar ;60(1):21-5.
- 5. Am J Trop Med Hyg 2012 Jun ;86(6):1054-6.

## Rickettsialpox

<b>Agent</b>	BACTERIUM. <i>Rickettsia akari</i>
<b>Reservoir</b>	Mouse ( <i>Mus musculus</i> ), Dog, Mite
<b>Vector</b>	Mite ( <i>Allodermanyssus sanguineus</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	9d - 14d (range 7d - 24d)
<b>Diagnostic Tests</b>	Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<a href="#">Doxycycline</a> 100 mg PO BID X 3 to 5d. OR <a href="#">Chloramphenicol</a> 500 mg PO QID X 3 to 5d
<b>Typical Pediatric Therapy</b>	<a href="#">Doxycycline</a> 2 mg/kg PO BID X 3 to 5d (maximum 200 mg/day). OR <a href="#">Chloramphenicol</a> 10 mg/kg PO QID X 3 to 5d
<b>Clinical Hints</b>	- Dermal eschar followed by fever, headache, myalgia, cough, photophobia and a papular or vesicular rash - Infection resolves in 3 to 10 days - Fatality and residua have not been reported
<b>Synonyms</b>	Kew Gardens fever, Rickettsia akari. ICD9: 083.2 ICD10: A79.1

## Rotavirus infection

<b>Agent</b>	VIRUS - RNA. Reoviridae: Rotavirus
<b>Reservoir</b>	Human, Pig
<b>Vector</b>	None
<b>Vehicle</b>	Fecal-oral, Water
<b>Incubation Period</b>	2.0 d (range 12h - 3d)
<b>Diagnostic Tests</b>	Stool assay for viral antigen. Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Stool precautions; supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Rotavirus vaccine</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Rotavirus. ICD9: 008.61 ICD10: A08.0

## Rotavirus infection in Costa Rica

227 cases of Rotavirus infection were reported in 2014 - including 139 in San Jose.

### Prevalence surveys

Years	Region	Study Group	%	Notes
1978 - 1979	San Jose	children	45.3	45.3% of pediatric diarrhea episodes, with highest rates during December to January (1978 to 1979) <a href="#">1</a> <a href="#">2</a>
1979 - 1981	Periscal	children	17	17% of pediatric diarrhea in rural Periscal (1979 to 1981) <a href="#">3</a>
1985*		children	1.04	1.04% of diarrhea episodes among children below age 2 years (1985 publication) <a href="#">4</a>

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

### Notable outbreaks

Years	Region	Population	Notes
1994 - 1995	San Jose	children	<a href="#">5</a>

### References

- 1. [Am J Trop Med Hyg 1983 Jan ;32\(1\):146-53.](#)
- 2. [Rev Biol Trop 1997 Sep ;45\(3\):989-91.](#)
- 3. [Rev Biol Trop 1984 Jun ;32\(1\):137-43.](#)
- 4. [J Infect Dis 1985 Dec ;152\(6\):1134-42.](#)
- 5. [Rev Biol Trop 1997 Sep ;45\(3\):989-91.](#)

## Rubella

<b>Agent</b>	VIRUS - RNA. Togaviridae: Rubivirus, Rubella virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Air, Transplacental, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	16d - 18d (range 14d - 23d)
<b>Diagnostic Tests</b>	Viral culture (throat, urine). Serology. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	Respiratory precautions. Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccines</b>	Rubella vaccine Rubella - Mumps vaccine Measles-Mumps-Rubella vaccine Measles-Rubella vaccine
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Epidemic roseola, German measles, Roda hund, Rode hond, Rode hunder, Rodehond, Rosolia, Roteln, Rubeola [Spanish], Three-day measles. ICD9: 056 ICD10: B06

## Rubella in Costa Rica

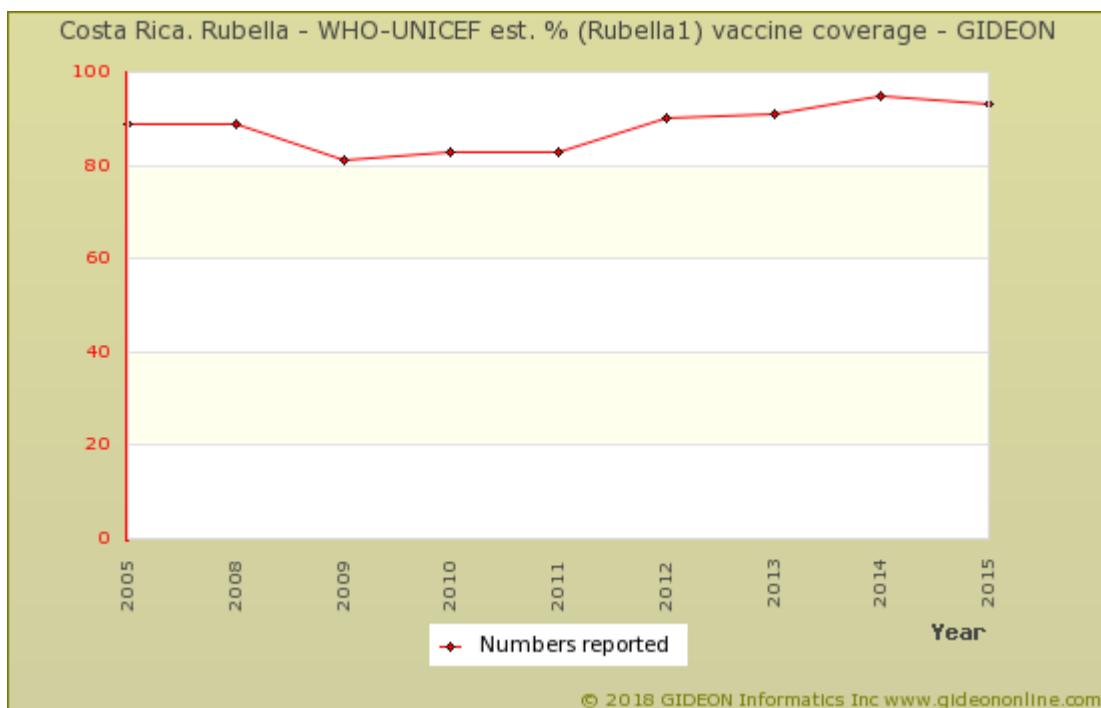
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### Vaccine Schedule:

BCG - birth  
 DTaPHibIPV - 2,4,6,15 months  
 DTaPIPV - 4 years  
 HepB - birth 2, 6 months and adults at risk  
 MMR - 15 months; 7 years  
 Pneumo conj - 2,4,15 months  
 Pneumo ps - >=60 years  
 Td - 10 years  
 Tdap - pregnant women  
 Varicella - 15 months

Routine rubella immunization was introduced in 1972. <sup>1</sup>

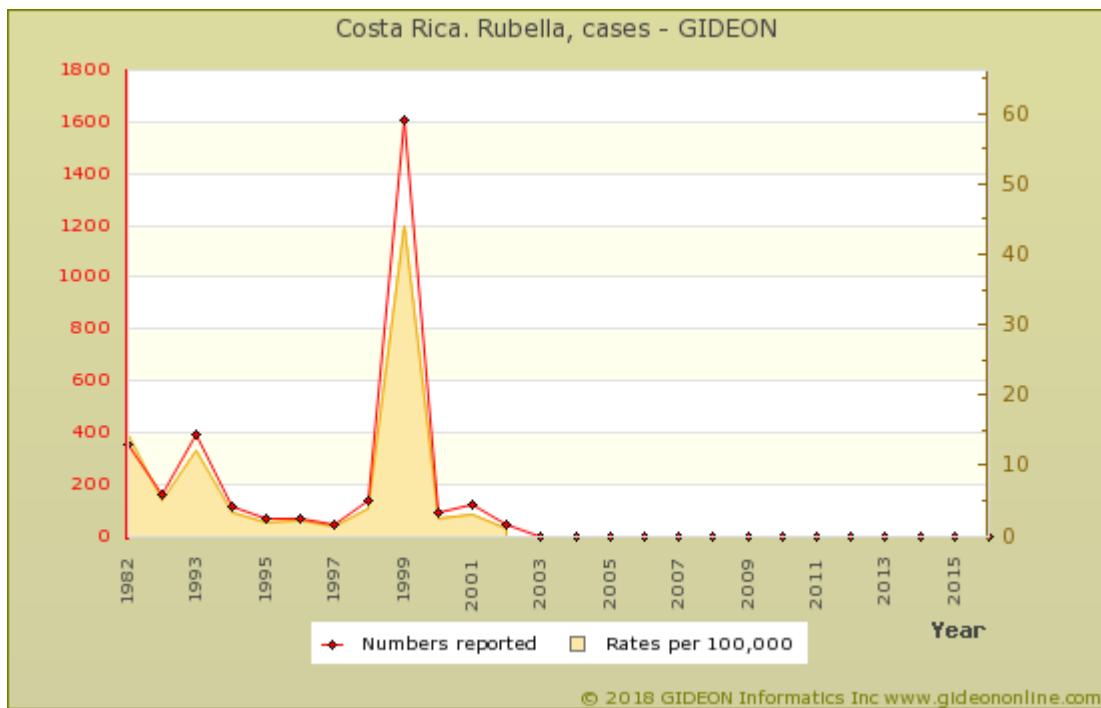
- Monovalent vaccine was replaced by MMR in 1986
- A booster at age 7 years was introduced in 1992. <sup>2</sup>



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

Estimated vaccine coverage was approximately 80% in 1984.

- 7% of preschool children and 36% of women of childbearing age were seronegative in 1996.
- In 2001, over 1.6 million were vaccinated in mass-vaccination program using MR vaccine.<sup>3</sup>



Graph: Costa Rica. Rubella, cases

#### Notes:

1. 1,079 cases were reported during 1987 to 1988.
2. Seven laboratory-confirmed cases were reported in 1995, 15 in 1996, 95 in 1998, 86 in 2000.
3. No cases were confirmed in 2003; 0 in 2004

45% of patients reported during 1987 to 1988 were in the age group 15 to 24; 25% during 1993 to 1994; 11% during 1998 to 1999.

- 23% of patients reported during 1987 to 1988 were in the age group 15 to 24; 31% during 1993 to 1994; 41% during 1998 to 1999.

Costa Rica. Rubella - CRS, cases: None reported between 1992 and 2016

Notes:

1. No cases of congenital rubella syndrome were reported during 1992 to 2006; however, active case-finding during 1996 to 2000 disclosed 49 cases of CRS. [4](#) [5](#)
2. No endemic cases of CRS were reported during 2002 to 2010. [6](#)

#### Notable outbreaks

Years	Cases	Notes
1999	1,610	<a href="#">7</a> <a href="#">8</a>

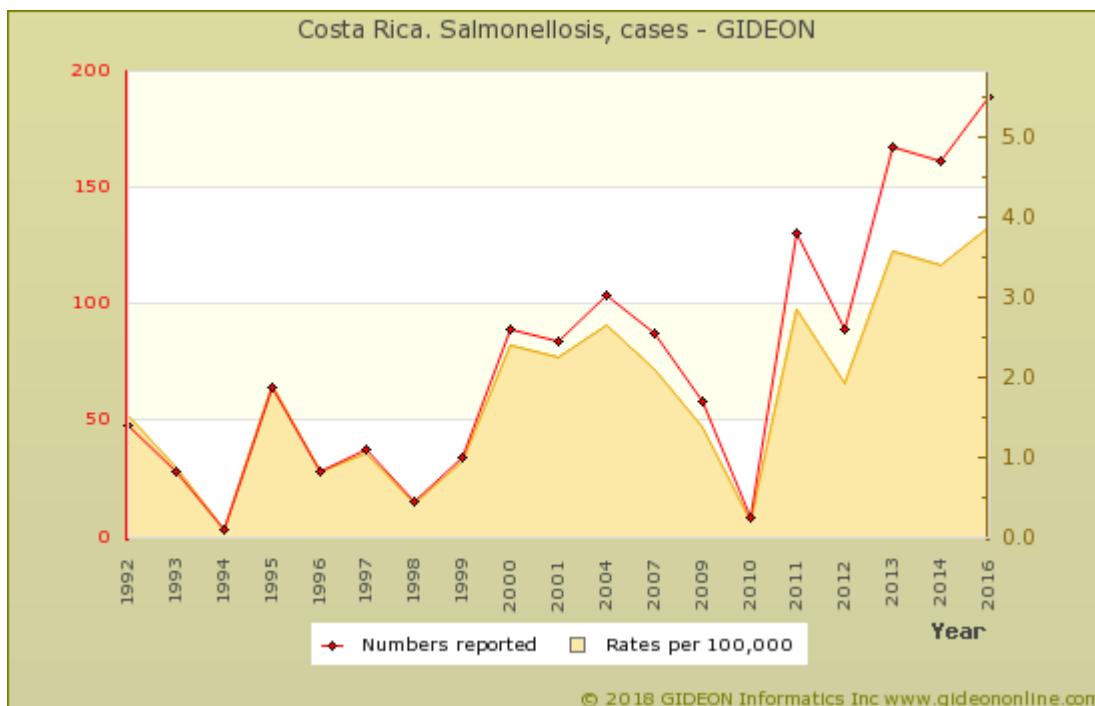
#### References

1. [Wkly Epidemiol Rec 2001 Aug 31;76\(35\):265-70.](#)
2. [J Infect Dis 2011 Sep 01;204 Suppl 2:S690-7.](#)
3. [MMWR Morb Mortal Wkly Rep 2001 Nov 09;50\(44\):976-9.](#)
4. [An Pediatr \(Barc\) 2005 Jan ;62\(1\):43-7.](#)
5. [Wkly Epidemiol Rec 2001 Aug 31;76\(35\):265-70.](#)
6. [J Infect Dis 2011 Sep 01;204 Suppl 2:S690-7.](#)
7. [EPI News 1999 Aug ;21\(4\):4.](#)
8. [MMWR Morb Mortal Wkly Rep 2001 Nov 09;50\(44\):976-9.](#)

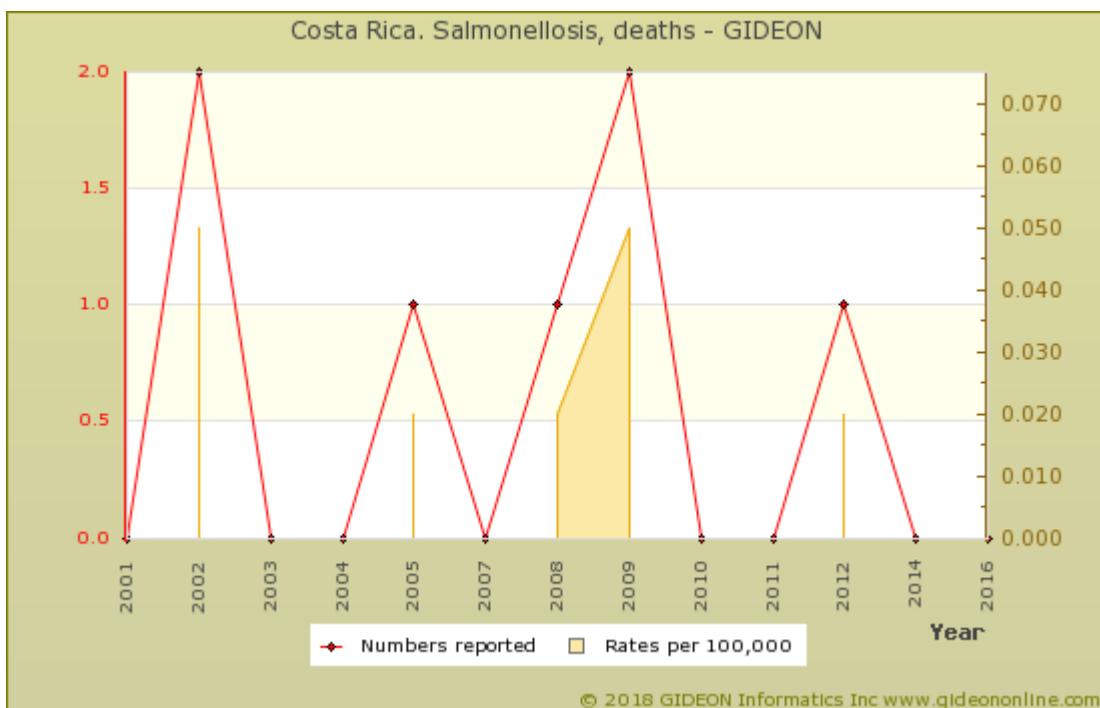
## Salmonellosis

<b>Agent</b>	BACTERIUM. <i>Salmonella</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Mammal, Bird, Reptile
<b>Vector</b>	None
<b>Vehicle</b>	Food, Milk, Eggs, Poultry Shellfish, Meat, Vegetables, Fruit, Fecal-oral Breastfeeding, Fly
<b>Incubation Period</b>	12h - 36h (range 6h - 6d)
<b>Diagnostic Tests</b>	Culture (stool, blood, infected tissue). Serology.
<b>Typical Adult Therapy</b>	Stool precautions. Therapy not indicated for uncomplicated diarrhea; if necessary, treat per antibiogram
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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)
<b>Synonyms</b>	Salmonellosen, Salmonellosi. ICD9: 003 ICD10: A02

## Salmonellosis in Costa Rica



Graph: Costa Rica. Salmonellosis, cases



Graph: Costa Rica. Salmonellosis, deaths

**Prevalence surveys**

Years	Study Group	%	Notes
1978 - 1979	children	7.3	Pediatric diarrhea episodes <sup>1</sup>
2017*	pigeons	24.1	Survey of fecal samples from pigeons ( <i>Columba livia</i> ) in urban parks ( <i>Salmonella enterica</i> subsp. <i>enterica</i> serovar Braenderup) <sup>2</sup>

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

**References**

1. Am J Trop Med Hyg 1983 Jan;32(1):146-53.
2. Vector Borne Zoonotic Dis 2017 Dec 15;

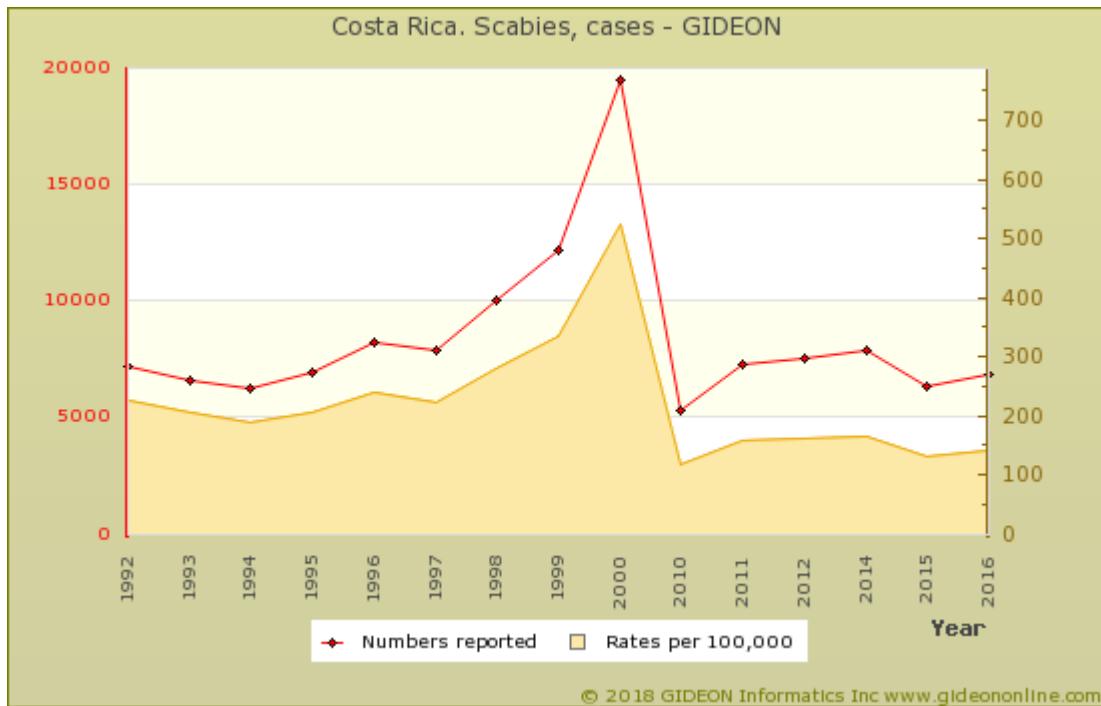
## Sarcocystosis

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

## Scabies

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

## Scabies in Costa Rica



Graph: Costa Rica. Scabies, cases



## Scarlet fever

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

## Schistosomiasis - mansoni

<b>Agent</b>	PARASITE - Platyhelminthes, Trematoda. Strigeida, Schistosomatidae: <i>Schistosoma mansoni</i>
<b>Reservoir</b>	Snail ( <i>Biomphalaria</i> ), Dog, Cat, Pig, Cattle, Rodent, Horse, Non-human primate
<b>Vector</b>	None
<b>Vehicle</b>	Water (skin contact)
<b>Incubation Period</b>	2w - 6w
<b>Diagnostic Tests</b>	Identification of ova in stool or biopsy specimens. Serology. Antigen detection.
<b>Typical Adult Therapy</b>	<a href="#">Praziquantel</a> 20 mg/kg PO BID X one day OR <a href="#">Oxamniquine</a> 15 mg PO X one dose
<b>Typical Pediatric Therapy</b>	<a href="#">Praziquantel</a> 20 mg/kg PO BID X one day OR <a href="#">Oxamniquine</a> 10 mg PO BID X one day
<b>Clinical Hints</b>	- Early urticaria, fever and eosinophilia - Later, hepatosplenomegaly and portal hypertension - Parasite may survive for decades in human host
<b>Synonyms</b>	Bilharziasis, intestinal, Katayama fever [3], Schistosoma mansoni. ICD9: 120.1 ICD10: B65.1

Although Schistosomiasis - mansoni is not endemic to Costa Rica, imported, expatriate or other presentations of the disease have been associated with this country.

### Schistosomiasis - mansoni in Costa Rica

Costa Rica. Schistosoma mansoni infection, cases: None reported between 1992 and 2000

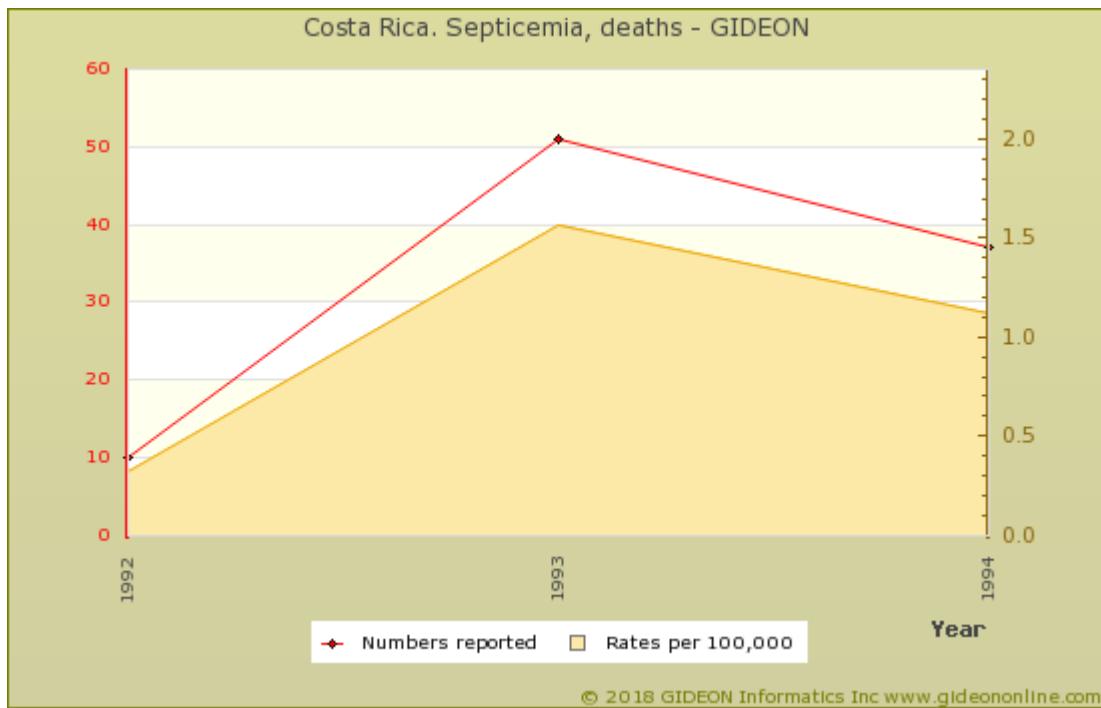
## Septic arthritis

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

## Septicemia - bacterial

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

## Septicemia - bacterial in Costa Rica

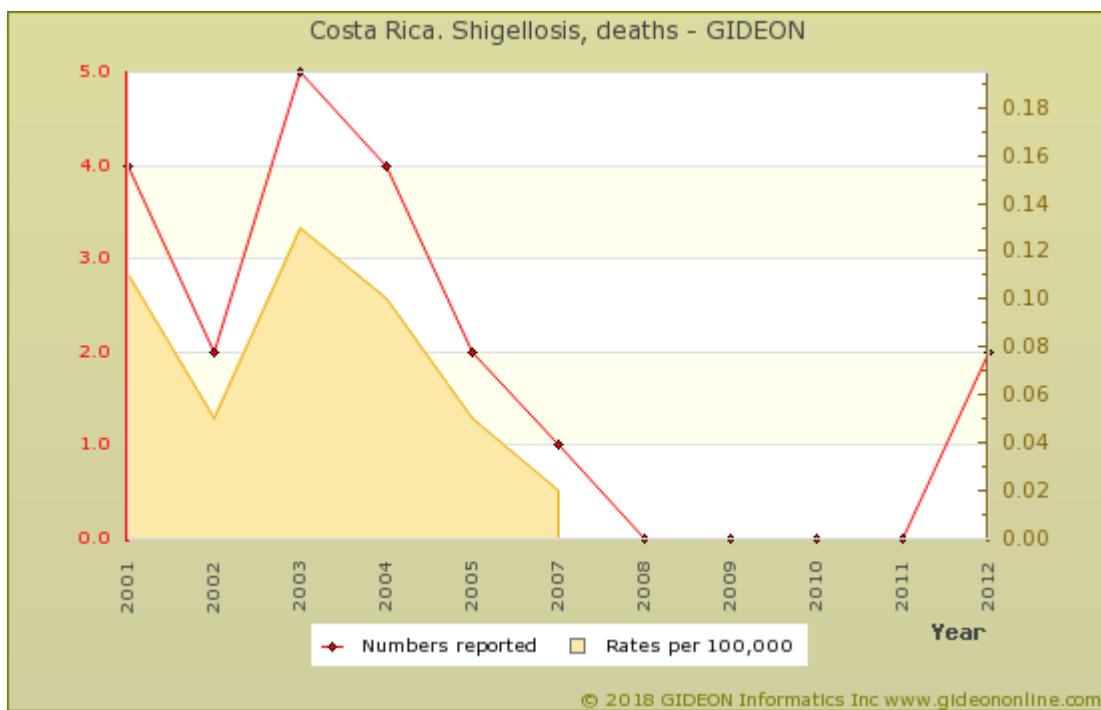


## Shigellosis

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

## Shigellosis in Costa Rica





Graph: Costa Rica. Shigellosis, deaths

**Prevalence surveys**

Years	Study Group	%	Notes
1978 - 1979	children	8.1	8.1% of pediatric diarrhea episodes (1978 to 1979) <a href="#">1</a>

**Notable outbreaks**

Years	Region	Cases	Source	Notes
2001	San Jose	700	water	<a href="#">2</a>

**References**

1. Am J Trop Med Hyg 1983 Jan;32(1):146-53.
2. ProMED <promedmail.org> archive: 20010727.1472

## Sinusitis

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

## Smallpox

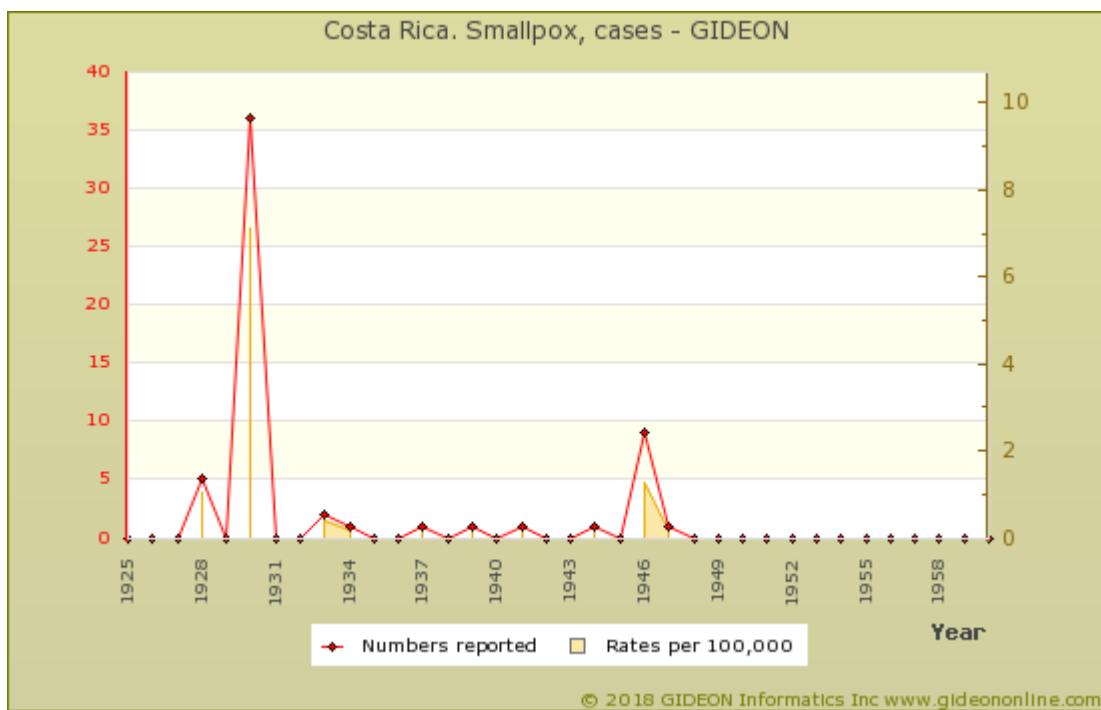
<b>Agent</b>	VIRUS - DNA. Poxviridae, Orthopoxvirus: Variola virus
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Contact, Secretions, Fomite, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	7d - 17d
<b>Diagnostic Tests</b>	Culture and electron microscopy of skin lesions. Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Isolation <a href="#">Tecovirimat</a> 400 to 600 mg PO once daily X 14 days <a href="#">Cidofovir</a> is effective in vitro
<b>Typical Pediatric Therapy</b>	Isolation Pediatric dosage of <a href="#">Tecovirimat</a> not established
<b>Vaccine</b>	<a href="#">Smallpox vaccine</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Alastrim, Eczema vaccinatum, Kopper, Smallpox, Vailo, Variola, Variola minor, Varioloid. ICD9: 050 ICD10: B03

**Not currently endemic to any country.**

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

### Smallpox in Costa Rica

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Graph: Costa Rica. Smallpox, cases

Indigenous transmission ended in 1920.

## Sporotrichosis

<b>Agent</b>	FUNGUS. Ascomycota, Euascomycetes, Ophiostomatales: <i>Sporothrix schenckii</i> , <i>S. brasiliensis</i> and <i>S. globosa</i> A dimorphic dematiaceous fungus
<b>Reservoir</b>	Soil, Vegetation, Wood
<b>Vector</b>	None
<b>Vehicle</b>	Trauma, Contact, Air, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	1w - 3m
<b>Diagnostic Tests</b>	Fungal culture. Serologic tests available in some centers.
<b>Typical Adult Therapy</b>	<b>Itraconazole</b> 100 to 200 mg PO daily X 3 to 6 months. OR <b>Fluconazole</b> 400 mg PO daily X 6 months. OR Potassium iodide 1 to 5 ml PO TID X 3 to 6 months
<b>Typical Pediatric Therapy</b>	<b>Itraconazole</b> 2 mg/kg PO daily X 3 to 6 months. OR <b>Fluconazole</b> 3 mg/kg PO daily X 6 months.
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Rose gardener's disease, Schenck's disease, Sporothrix brasiliensis, Sporothrix chiensis, Sporothrix globosa, Sporothrix mexicana, Sporothrix schenckii, Sporotrichose. ICD9: 117.1 ICD10: B42

## Spotted fevers - New World

<b>Agent</b>	BACTERIUM. <i>Rickettsia rickettsii</i> <i>Rickettsia parkeri</i> and <i>Rickettsia amblyommii</i> associated with similar illness
<b>Reservoir</b>	Tick, Dog, Rodent
<b>Vector</b>	Tick ( <i>Dermacentor</i> , <i>Amblyomma</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	5d - 7d (range 2d - 14d)
<b>Diagnostic Tests</b>	Serology. Direct immunofluorescence or culture of skin lesions. Nucleic acid amplification.
<b>Typical Adult Therapy</b>	<b>Doxycycline</b> 100 mg PO BID X 7d. OR <b>Chloramphenicol</b> 500 mg PO QID X7d
<b>Typical Pediatric Therapy</b>	<b>Doxycycline</b> 2 mg/kg PO BID X 7d (maximum 200 mg/day). OR <b>Chloramphenicol</b> 10 mg/kg PO QID X 7d
<b>Clinical Hints</b>	- 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%
<b>Synonyms</b>	American spotted fever, Brazilian spotted fever, Bullis fever, Febre maculosa brasileira, Fiebre manchada, Lone star fever, Minas Gerais exanthematic typhus, Pacific Coast fever, Rickettsia 364D, Rickettsia amblyommii, Rickettsia canadensis, Rickettsia montanensis, Rickettsia parkeri, Rickettsia philippii, Rickettsia rickettsii, Rickettsia texiana, Rickettsiae, RMSF, Rocky Mountain spotted fever, Sao Paulo fever, Tidewater spotted fever, Tobia fever. ICD9: 082.0,082.8 ICD10: A77.0

## Spotted fevers - New World in Costa Rica

The first case report of Rocky Mountain spotted fever in Costa Rica was published in 1979. <sup>1</sup>

Seropositivity has been demonstrated in humans, dogs, and wild rabbits. <sup>2</sup>

### Prevalence surveys

Years	Study Group	%	Notes
2016*	various	23.9	23.9% of flea- and tick pools <sup>3</sup>

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

### Seroprevalence surveys

Years	Study Group	%	Notes
2016*	dogs	18.5	18.5% of dogs from sites associated with human cases of spotted fever (2016 publication) <sup>4</sup>

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

*Rickettsia rickettsii* has been demonstrated in rabbit ticks (*Haemaphysalis leporispalustris*) in the Atlantic zone. <sup>5</sup>

- A potential vector, *Amblyomma cajennense*, is also found in this country.

*Rickettsia amblyommii* was identified in ticks (*Amblyomma cajennense*) infesting horses in Cahuita and Turrialba districts (2010). <sup>6</sup>

### Notable outbreaks

Years	Notes
1974	Outbreak reported - additional details unavailable. <sup>7 8</sup>

**References**

1. Rev Latinoam Microbiol 1979 Oct-Dec;21(4):167-72.
2. Am J Trop Med Hyg 1986 Jan ;35(1):192-6.
3. Ticks Tick Borne Dis 2016 Oct ;7(6):1128-1134.
4. Ticks Tick Borne Dis 2016 Jul ;7(5):748-753.
5. Am J Trop Med Hyg 1985 May ;34(3):564-7.
6. Vector Borne Zoonotic Dis 2011 Oct ;11(10):1395-7.
7. Bull Pan Am Health Organ 1978 ;12(2):104-11.
8. Bol Oficina Sanit Panam 1979 Oct ;87(4):325-33.

## St. Louis encephalitis

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Flavivirus: St. Louis encephalitis virus
<b>Reservoir</b>	Bird, Mammal
<b>Vector</b>	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>Sabettus</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	4d - 21d
<b>Diagnostic Tests</b>	Viral culture (blood, brain tissue, CSF). Serology. Nucleic acid amplification.  Biosafety level 2.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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)
<b>Synonyms</b>	American encephalitis, Modoc, Rio Bravo, SLE. ICD9: 062.3 ICD10: A83.3

## St. Louis encephalitis in Costa Rica

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005 - 2007	Multiple locations	sloths	80	80% of sloths (Finmac and Upala) <sup>1</sup>

### References

1. J Wildl Dis 2016 Oct ;52(4):883-892.

## Staphylococcal food poisoning

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

## Staphylococcal scalded skin syndrome

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

## Streptococcus suis infection

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

## Strongyloidiasis

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

## Strongyloidiasis in Costa Rica

49 cases of strongyloidiasis were officially reported in 2010.

### Prevalence surveys

Years	Study Group	%	Notes
	general population	1.1-16.5	1.1% to 16.5% of the general population
2001*	patients	5.7	5.7% of alcoholic patients (2001 publication) <sup>1</sup>

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

### References

1. Mem Inst Oswaldo Cruz 2001 Aug ;96(6):805-7.

## Subdural empyema

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

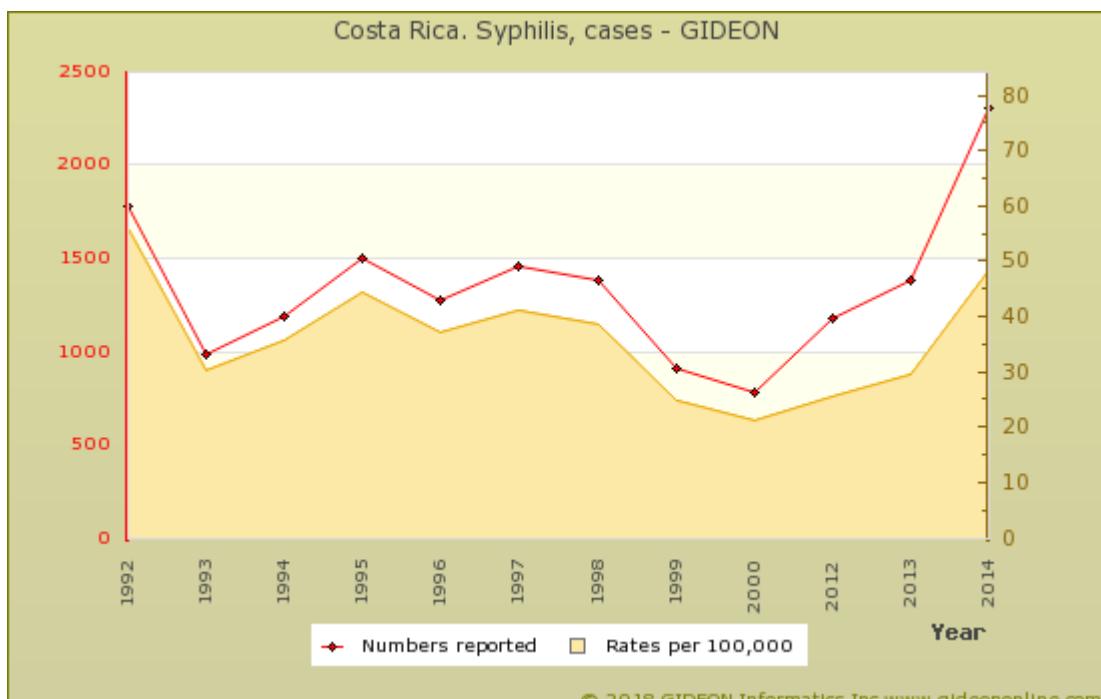
## Suppurative parotitis

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

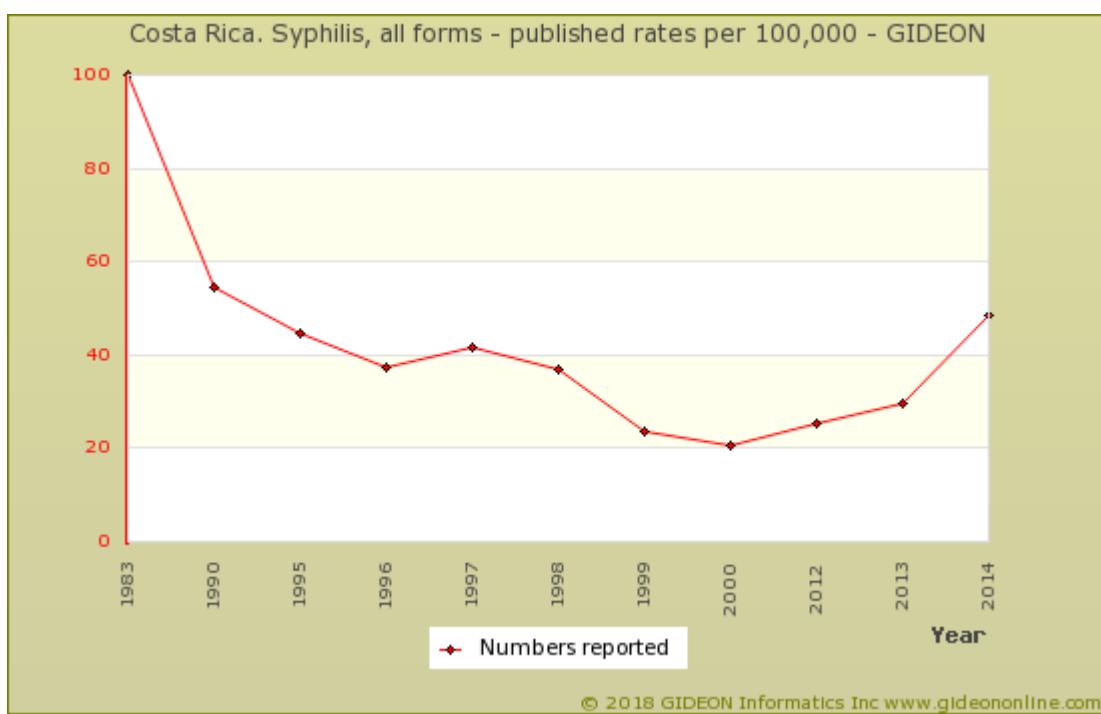
## Syphilis

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

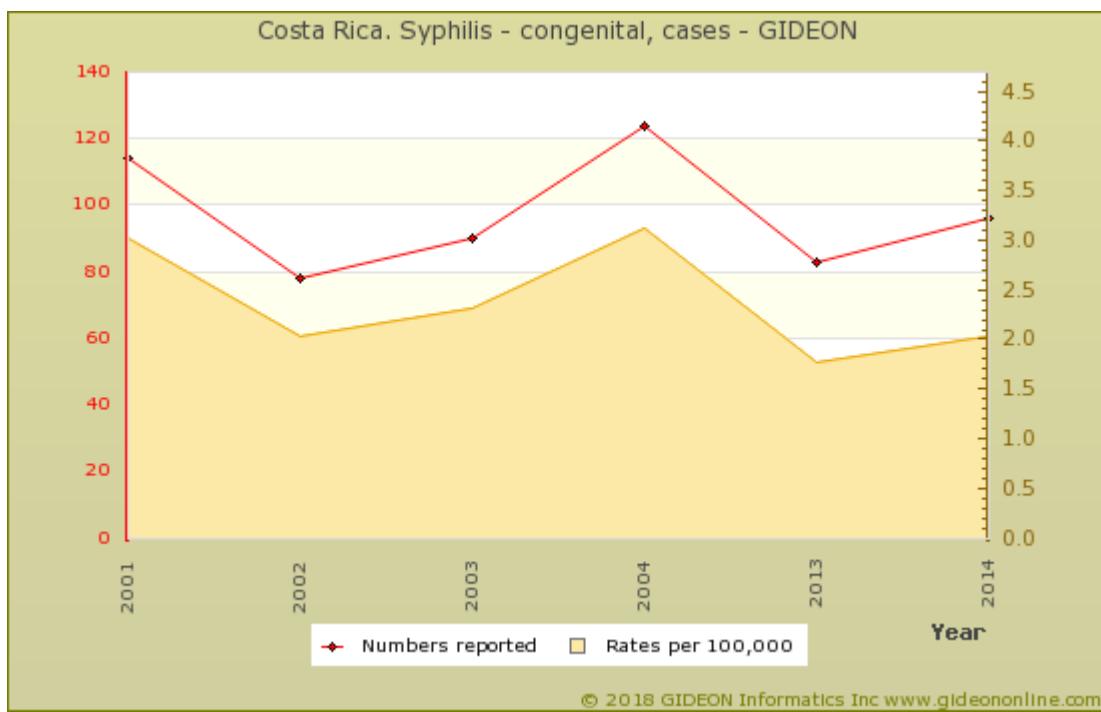
## Syphilis in Costa Rica



Graph: Costa Rica. Syphilis, cases



Graph: Costa Rica. Syphilis, all forms - published rates per 100,000



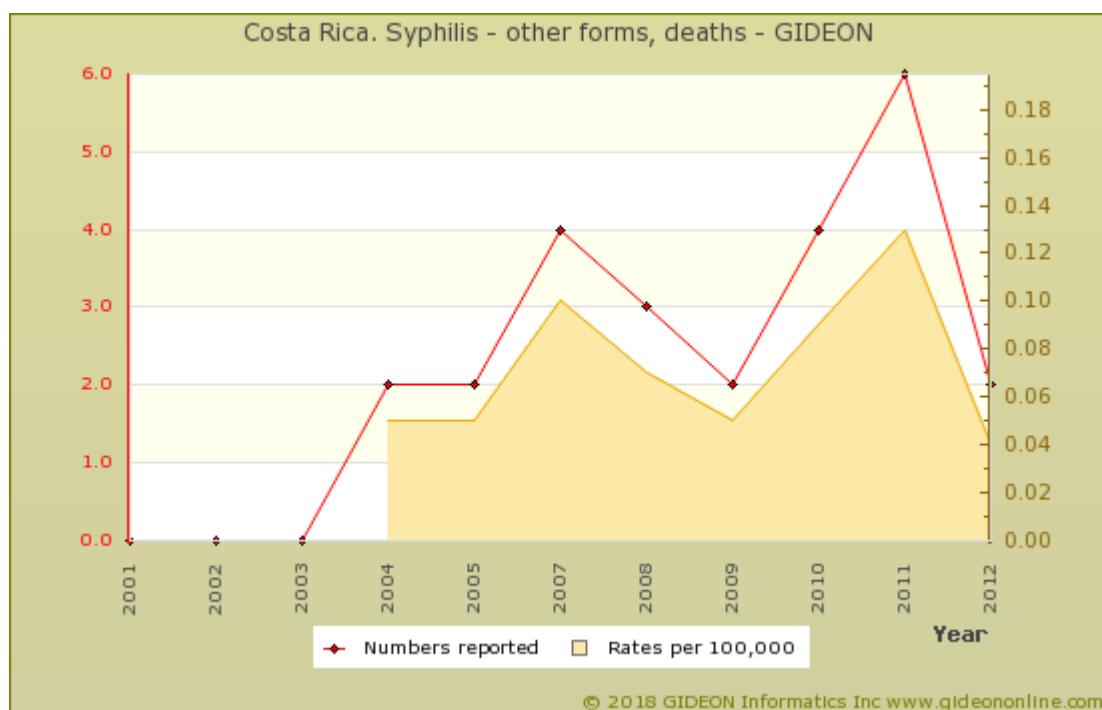
Graph: Costa Rica. Syphilis - congenital, cases

## Notes:

1. 90 to 150 cases of congenital syphilis were reported annually during the 1990's



Graph: Costa Rica. Syphilis - congenital, deaths



Graph: Costa Rica. Syphilis - other forms, deaths

## Taeniasis

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

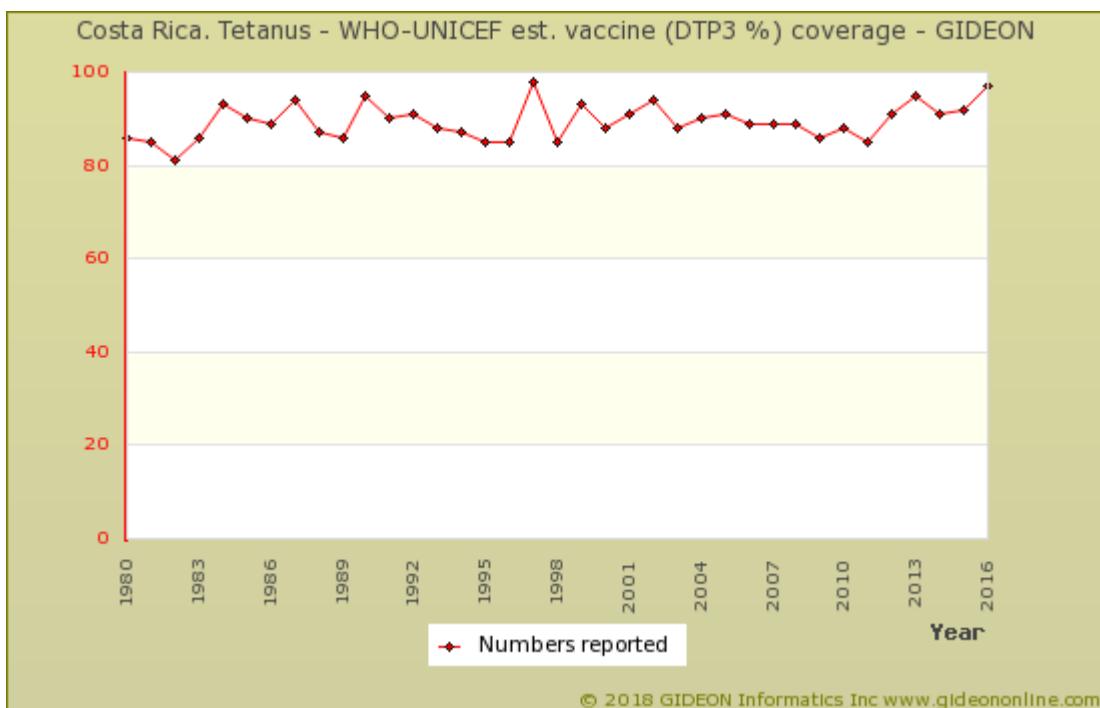
## Tetanus

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

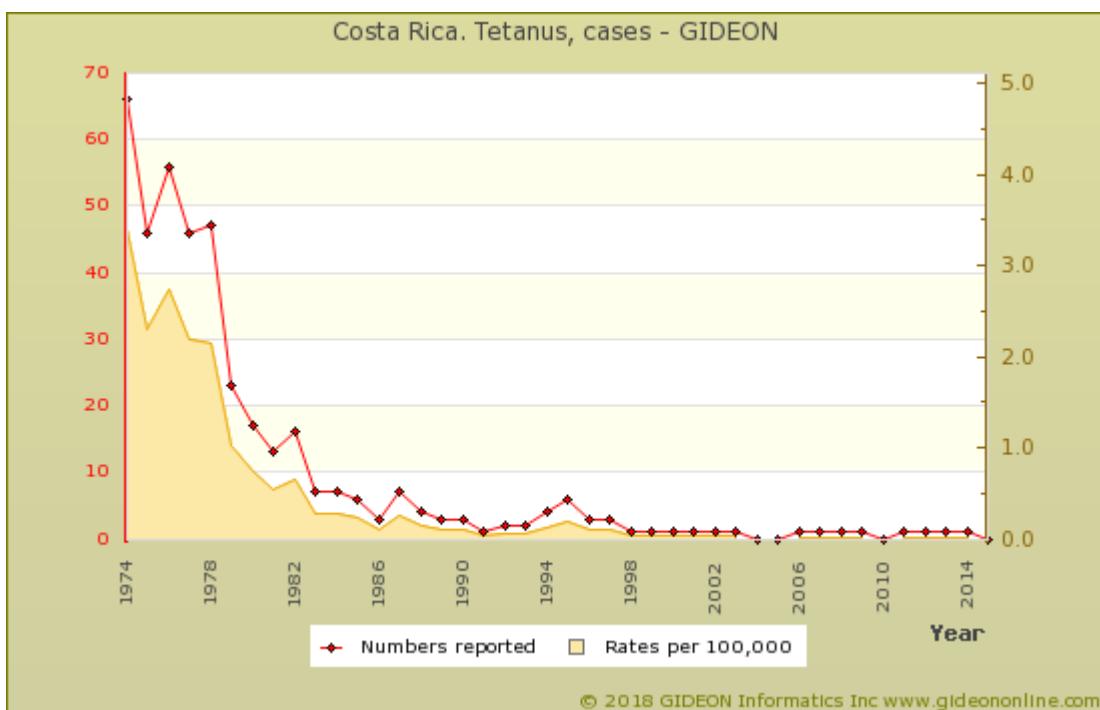
## Tetanus in Costa Rica

### Vaccine Schedule:

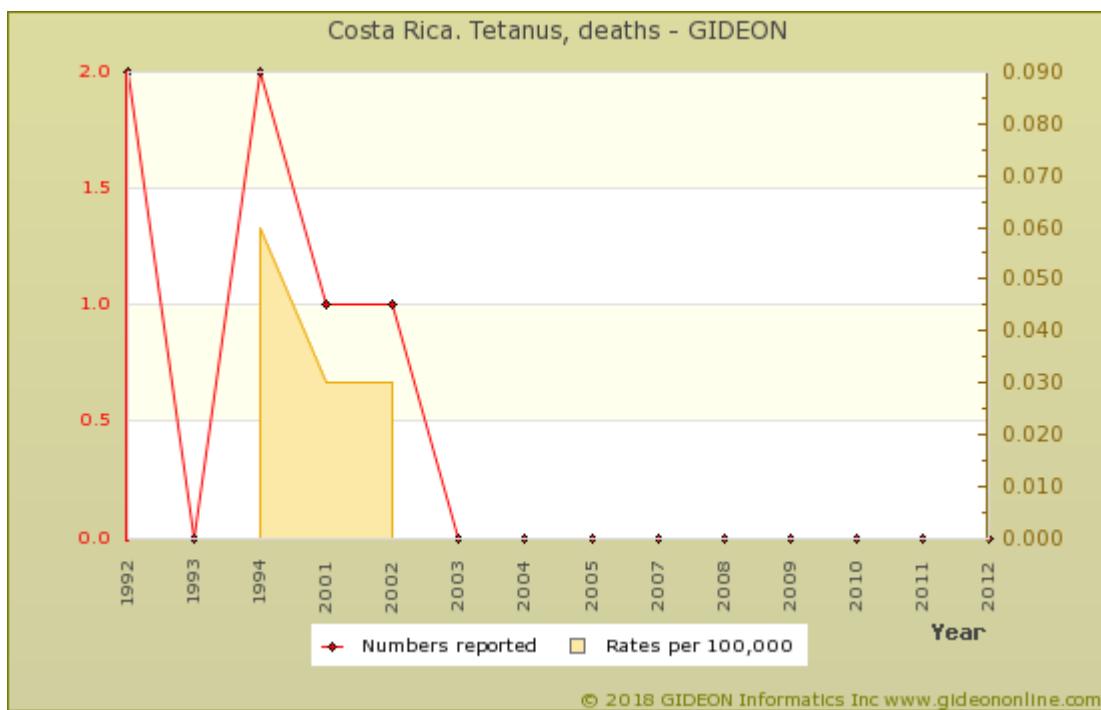
BCG - birth  
 DTaPHibIPV - 2,4,6,15 months  
 DTaPIPV - 4 years  
 HepB - birth 2, 6 months and adults at risk  
 MMR - 15 months; 7 years  
 Pneumo conj - 2,4,15 months  
 Pneumo ps - >=60 years  
 Td - 10 years  
 Tdap - pregnant women  
 Varicella - 15 months



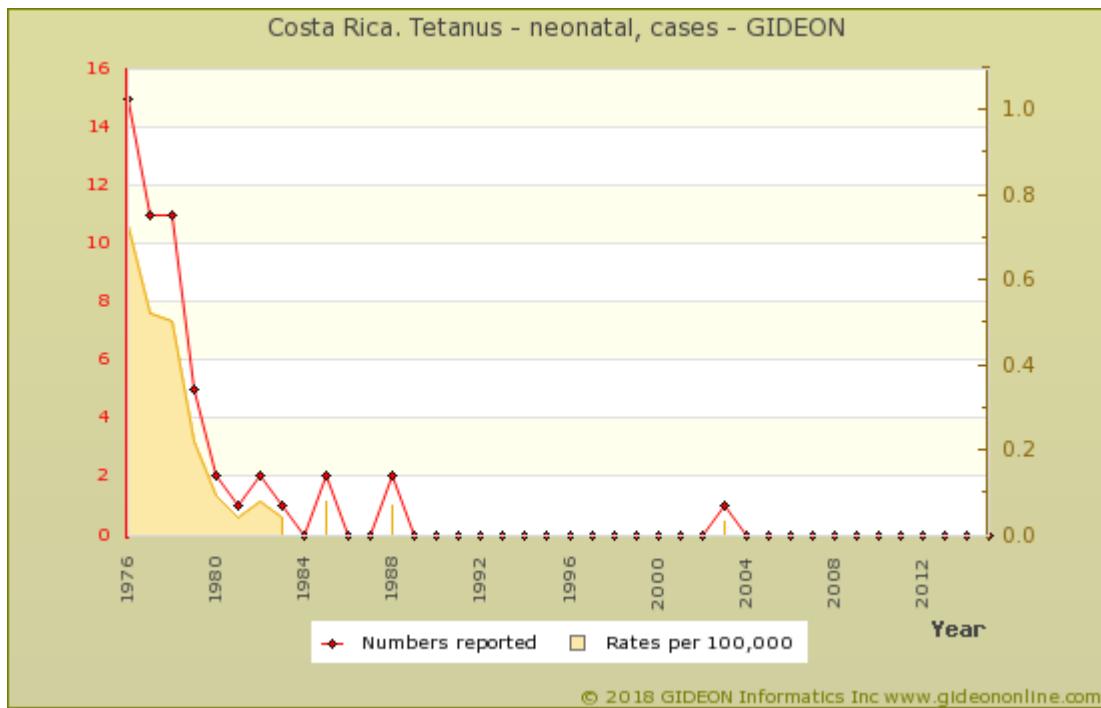
Graph: Costa Rica. Tetanus - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Costa Rica. Tetanus, cases



Graph: Costa Rica. Tetanus, deaths



Graph: Costa Rica. Tetanus - neonatal, cases

## Toxic shock syndrome

<b>Agent</b>	BACTERIUM. <i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , et al - (toxins) Facultative gram-positive cocci
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Tampon (Bandage, etc)
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Isolation of toxigenic <i>Staphylococcus aureus</i> . Toxin assay available in specialized laboratories.
<b>Typical Adult Therapy</b>	The role of topical (eg, vaginal) and systemic antistaphylococcal antibiotics is unclear; however, most authorities suggest intravenous administration of an anti-staphylococcal (anti-MRSA, anti-streptococcal as indicated) antibiotic.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Streptococcal toxic shock syndrome, TSS. ICD9: 040.82 ICD10: A48.3

## Toxocariasis

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

## Toxocariasis in Costa Rica

### Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Multiple locations	environmental - soil	7	7% of fecal samples from public parks and beaches (2007 publication) <a href="#">1</a>

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

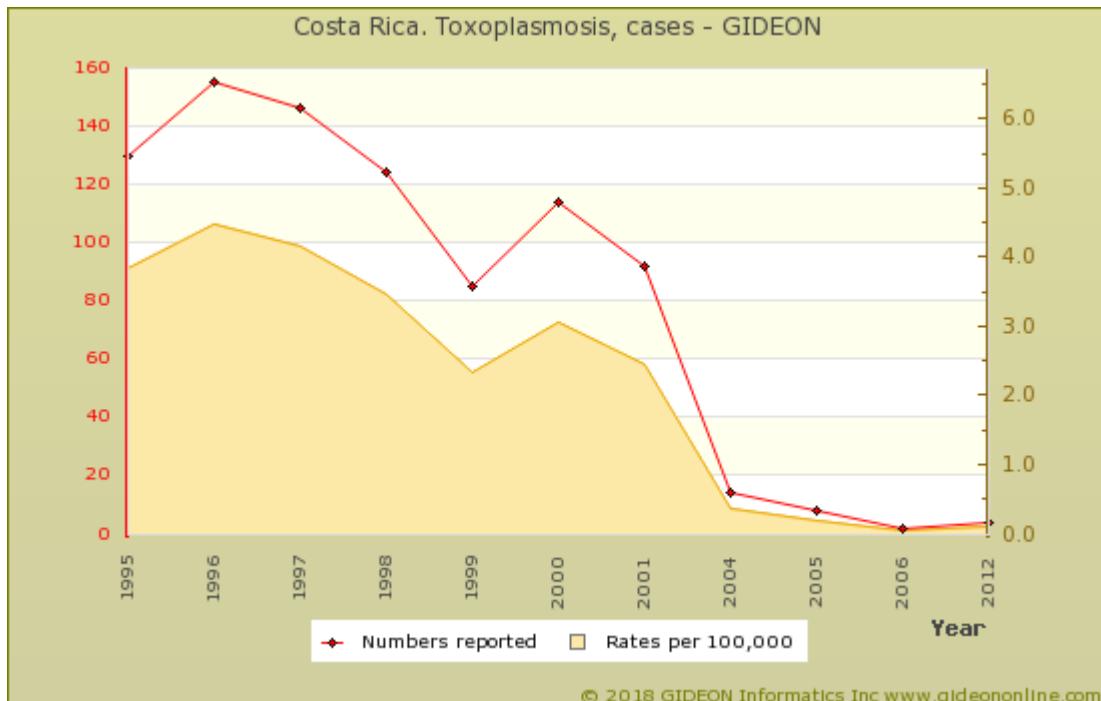
### References

- Acta Trop 2007 Oct ;104(1):30-7.

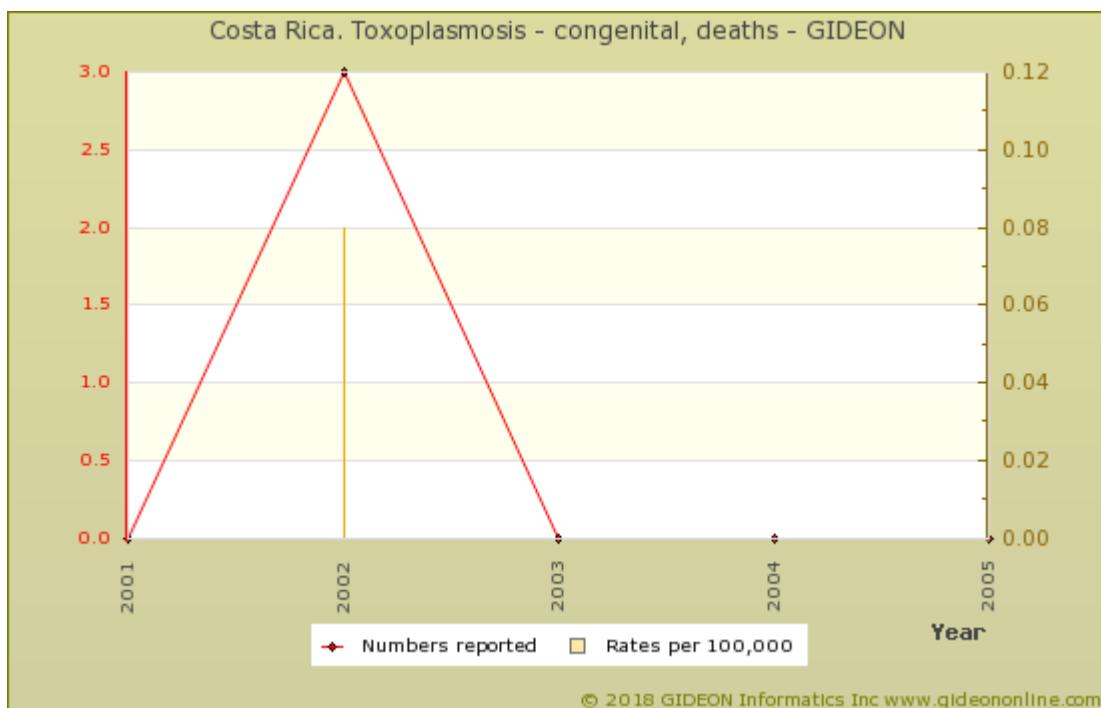
## Toxoplasmosis

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

## Toxoplasmosis in Costa Rica



Graph: Costa Rica. Toxoplasmosis, cases



Graph: Costa Rica. Toxoplasmosis - congenital, deaths

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
1994*	Nationwide	animals	34.4-43.8	34.4% of cattle and 43.8% of swine (1994 publication) <sup>1</sup>
1996*		general population	60-90	60% in the age group 1 to 4 years, to 90% over 25 years (1996 publication) <sup>2</sup>
2011*		horses	34	34.0% of horses (2011 publication) <sup>3</sup>
2006*		poultry - chicken	40.1	40.1% of free-range chickens ( <i>Gallus domesticus</i> ) (2006 publication) <sup>4</sup>

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

*T. gondii* has been identified in the brain of a dolphin (*Stenella coeruleoalba*) on the Pacific coast (2007 publication) <sup>5</sup>

- *T. gondii* has been identified in a keel-billed toucan (*Ramphastos sulfuratus*) <sup>6</sup>

**References**

1. Rev Biol Trop 1994 Apr-Aug;42(1-2):15-20.
2. Rev Biol Trop 1996 Aug ;44(2A):377-81.
3. J Parasitol 2011 Jun ;97(3):522-4.
4. Vet Parasitol 2006 Jun 30;139(1-3):29-36.
5. J Parasitol 2007 Jun ;93(3):710-1.
6. J Parasitol 2009 Apr ;95(2):467-8.

## Trachoma

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

## Trachoma in Costa Rica

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Costa Rica. Trachoma, cases: None reported between 1992 and 2000

## 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	<b>Albendazole</b> 400 mg PO BID X 14d. OR <b>Mebendazole</b> 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Give with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)
Typical Pediatric Therapy	<b>Albendazole</b> 7 mg/kg BID X 14 d. OR <b>Mebendazole</b> 200 to 400 mg PO tid X 3 days, then 400 to 500 mg PO. tid X 10 days. Give with prednisone 50 mg PO daily X 3 to 5 days (then 'taper' dosage)
Clinical Hints	- 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	Haycocknema, Trichinellose, Trichinellosis, Trichinose, Trikinose, Triquiniasis, Triquonosis. ICD9: 124 ICD10: B75

## Trichinosis in Costa Rica

Costa Rica. Trichinosis, cases: None reported between 1992 and 2004

## Trichomoniasis

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

### Trichomoniasis in Costa Rica

376 cases of Trichomoniasis were officially reported in 2013; 356 in 2014.

## Trichuriasis

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

## Trichuriasis in Costa Rica

22 cases of trichuriasis were officially reported in 2010.

### Prevalence surveys

Years	Region	Study Group	%	Notes
1985	Pueblo Nuevo	refugees	22	22% of Nicaraguan refugees in Costa Rica (1985) <sup>1</sup>

### References

1. [Trop Doct 1989 Jan ;19\(1\):14-7.](#)

## Tropical phagedenic ulcer

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

## Tropical pulmonary eosinophilia

<b>Agent</b>	UNKNOWN Possibly related to filarial infection
<b>Reservoir</b>	Unknown
<b>Vector</b>	Unknown
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown
<b>Diagnostic Tests</b>	Antifilarial antibodies may be present. Response to therapeutic trial.
<b>Typical Adult Therapy</b>	<a href="#">Diethylcarbamazine</a> 2 mg/kg PO TID X 21d
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- Acquired in countries known to be endemic for filariasis - Chronic cough, wheezing and dyspnea - Reticular-nodular pulmonary infiltrates and eosinophilia (over 3,000 per cu. mm.)
<b>Synonyms</b>	

## Tropical sprue

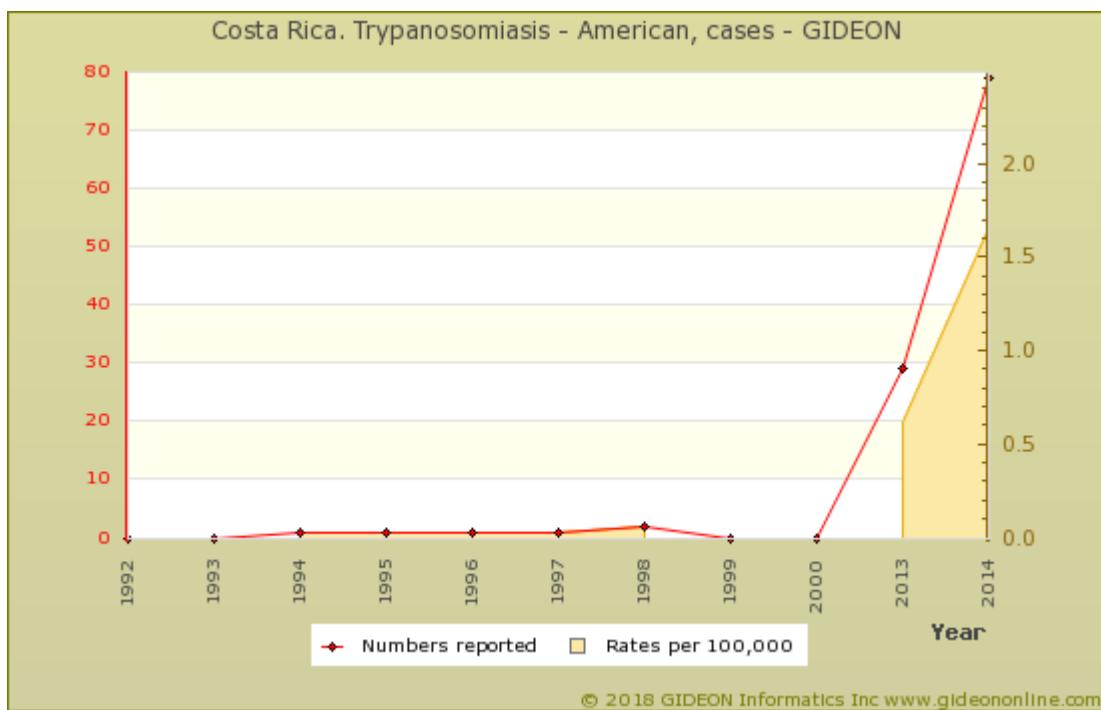
<b>Agent</b>	UNKNOWN
<b>Reservoir</b>	Unknown
<b>Vector</b>	None
<b>Vehicle</b>	Unknown
<b>Incubation Period</b>	Unknown - probably at least 6 months
<b>Diagnostic Tests</b>	Typical functional, roentgenographic and histological changes in bowel. Prompt response to therapy.
<b>Typical Adult Therapy</b>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

## Trypanosomiasis - American

Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastidea. 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)
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	<b>Nifurtimox</b> 2 mg/kg PO QID X 3m. OR <b>Benznidazole</b> 3 to 5 mg/kg/d X 30 to 120d
Typical Pediatric Therapy	<b>Nifurtimox</b> : Age 1 to 10 years: 5 mg/kg PO QID X 3m Age 11 to 16 years: 3.5 mg/kg PO QID X 3m (age 11 to 16y)  OR <b>Benznidazole</b> 3.75 mg/kg PO BID X 2m; or
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, Trypanosoma cruzi, <i>Trypanosoma rangeli</i> , Trypanosomiasis, amerikanische. ICD9: 086.0,086.1,086.2 ICD10: B57

### Trypanosomiasis - American in Costa Rica

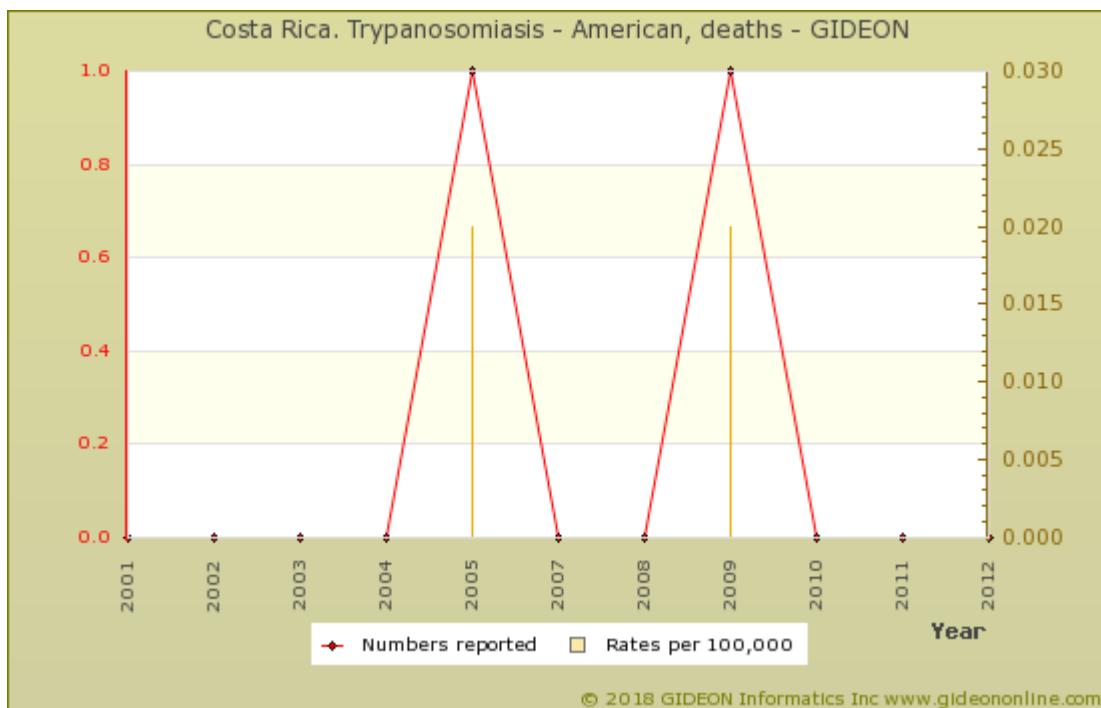
In 2010, 7,667 prevalent cases (0.169 per 100 population; 2,300 with cardiomyopathy) were estimated; 0.045% of blood donors, 10 new vectorial cases (0.0002 per 100 population) and 61 congenital cases (0.080 per 100 live births) were estimated for 2010. The population at risk was estimated at 233,333. <sup>1</sup>



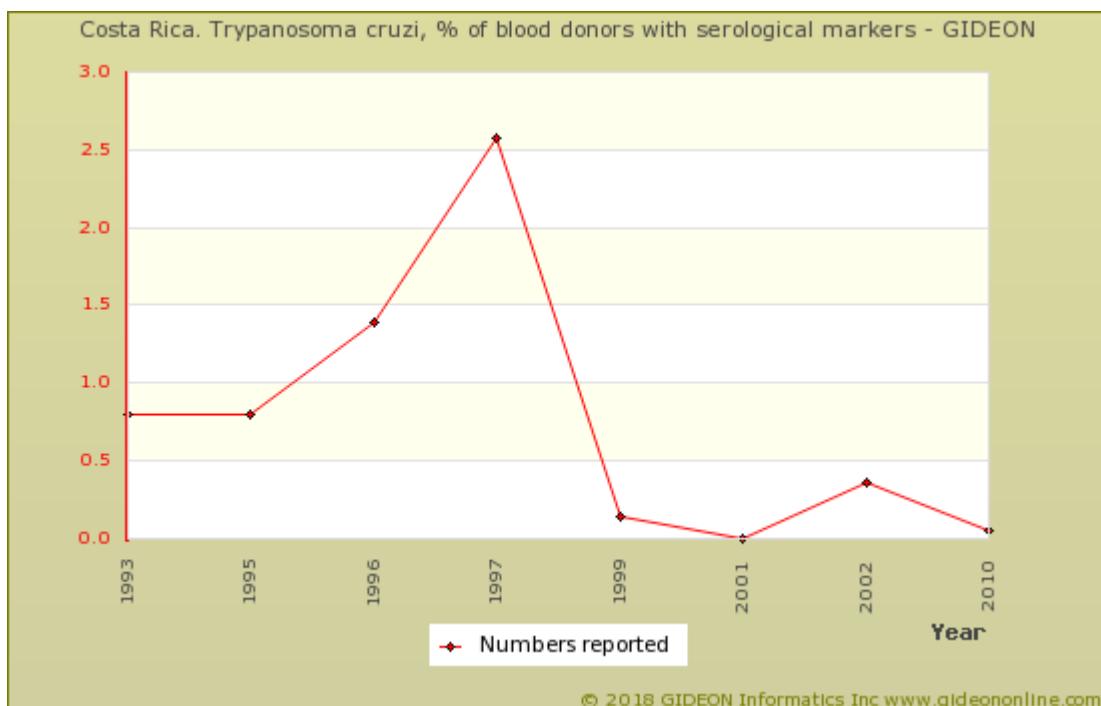
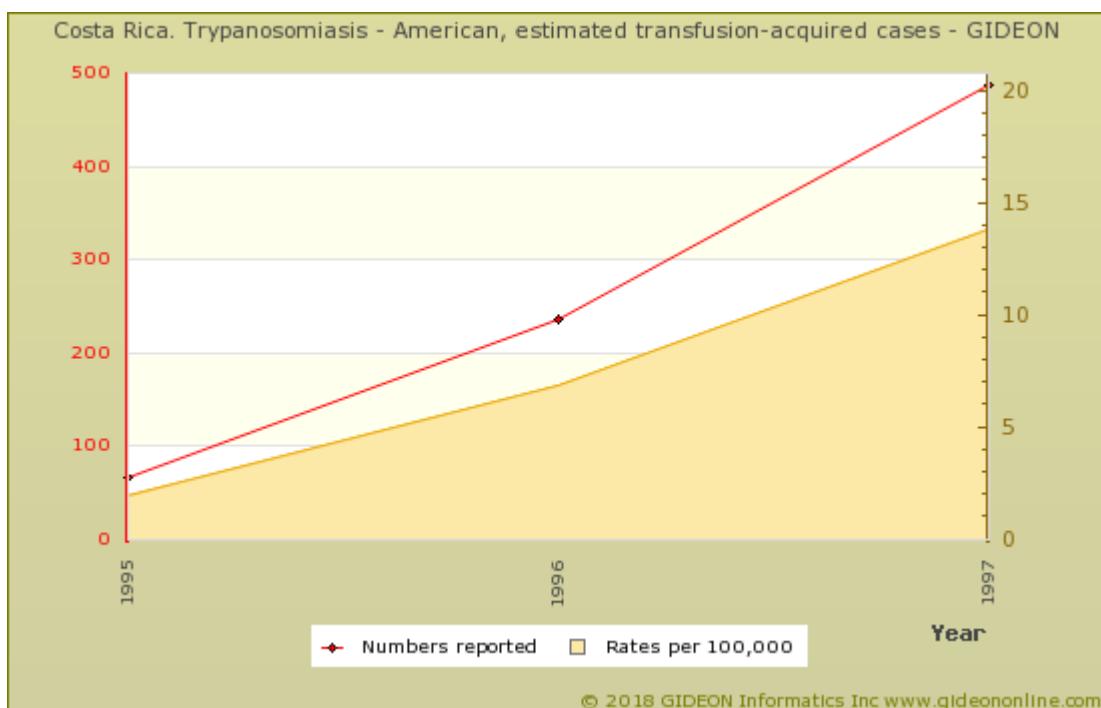
Graph: Costa Rica. Trypanosomiasis - American, cases

## Notes:

1. 3,320 new cases were estimated for 1990.



Graph: Costa Rica. Trypanosomiasis - American, deaths

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

Graph: Costa Rica. Trypanosomiasis - American, estimated transfusion-acquired cases

**Prevalence surveys**

Years	Region	Study Group	%	Notes
2011	Monteverde	coati	35	35% of white-nosed coatis ( <i>Nasua narica</i> , 2011) <sup>2</sup>
2012*		insects	47.3	47.3% of <i>Triatoma dimidiata</i> (2012 publication) <sup>3</sup>

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

**Seroprevalence surveys**

Years	Region	Study Group	%	Notes
2002*	Central Valley	dogs	27.7	27.7% of dogs in the Central Valley (2002 publication) <sup>4</sup>

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

**Reservoirs:**

- *T. cruzi* has been demonstrated in dogs, cats, rats (*Rattus rattus* and *R. norvegicus*), mice, opossum <sup>5</sup> and white-nosed coatis (*Nasua narica*). <sup>6</sup>

**Vectors:**

- The principal local vector is *Triatoma dimidiata*. <sup>7</sup> <sup>8</sup>
- *Rhodnius prolixus* is also implicated. <sup>9</sup>

**References**

1. Wkly Epidemiol Rec 2015 Feb 06;90(6):33-43.
2. J Wildl Dis 2013 Oct ;49(4):1014-8.
3. Parasitol Res 2012 Oct ;111(4):1615-20.
4. Mem Inst Oswaldo Cruz 2002 Jun ;97(4):491-4.
5. Am J Trop Med Hyg 1975 Mar ;24(2):214-25.
6. J Wildl Dis 2013 Oct ;49(4):1014-8.
7. Am J Epidemiol 1991 Apr 01;133(7):740-7.
8. Mem Inst Oswaldo Cruz 2005 Oct ;100(6):507-12.
9. Medicina (B Aires) 1999 ;59 Suppl 2:117-9.

## Tuberculosis

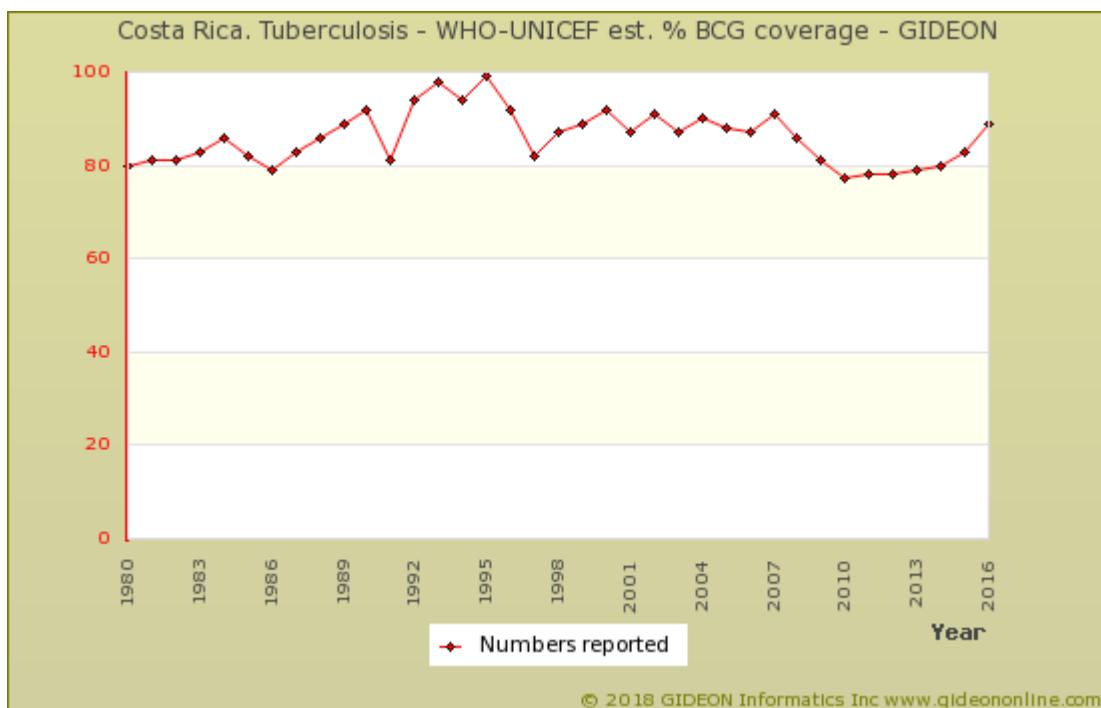
<b>Agent</b>	BACTERIUM. Actinomycetes, <i>Mycobacterium tuberculosis</i> An aerobic acid-fast bacillus
<b>Reservoir</b>	Human, Cattle
<b>Vector</b>	None
<b>Vehicle</b>	Air, Dairy products, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	4w - 12w (primary infection)
<b>Diagnostic Tests</b>	Microscopy. Culture. Nucleic acid amplification. Inform laboratory when this diagnosis is suspected.
<b>Typical Adult Therapy</b>	Respiratory isolation. Typical pulmonary infection is treated with 6 months of <b>Isoniazid</b> , <b>Rifampin</b> & <b>Pyrazinamide</b> MDR tuberculosis - 5 drugs (including <b>pyrazinamide</b> if possible) initially, followed by 4 drugs.
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<b>BCG vaccine</b>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	Consumption, <i>Mycobacterium africanum</i> , <i>Mycobacterium bovis</i> , <i>Mycobacterium caprae</i> , <i>Mycobacterium orygis</i> , <i>Mycobacterium tuberculosis</i> , Oryx bacillus, Phthisis, TB, TB meningitis, Tuberculose, Tuberculose miliar, Tuberculosis, Tuberculous meningitis, Tuberkulose, White plague. ICD9: 010,012,013,014,015,016,017,018 ICD10: A15,A16,A17,A18,A19

## Tuberculosis in Costa Rica

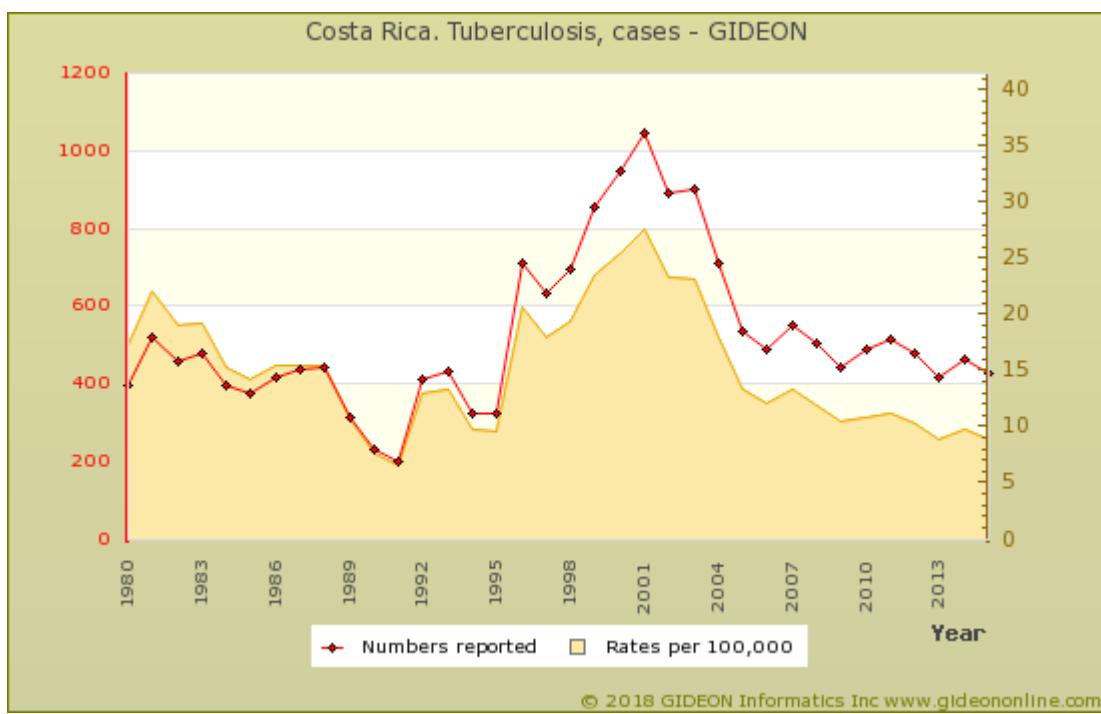
### Vaccine Schedule:

BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months

Routine BCG vaccination was introduced during the 1960's.



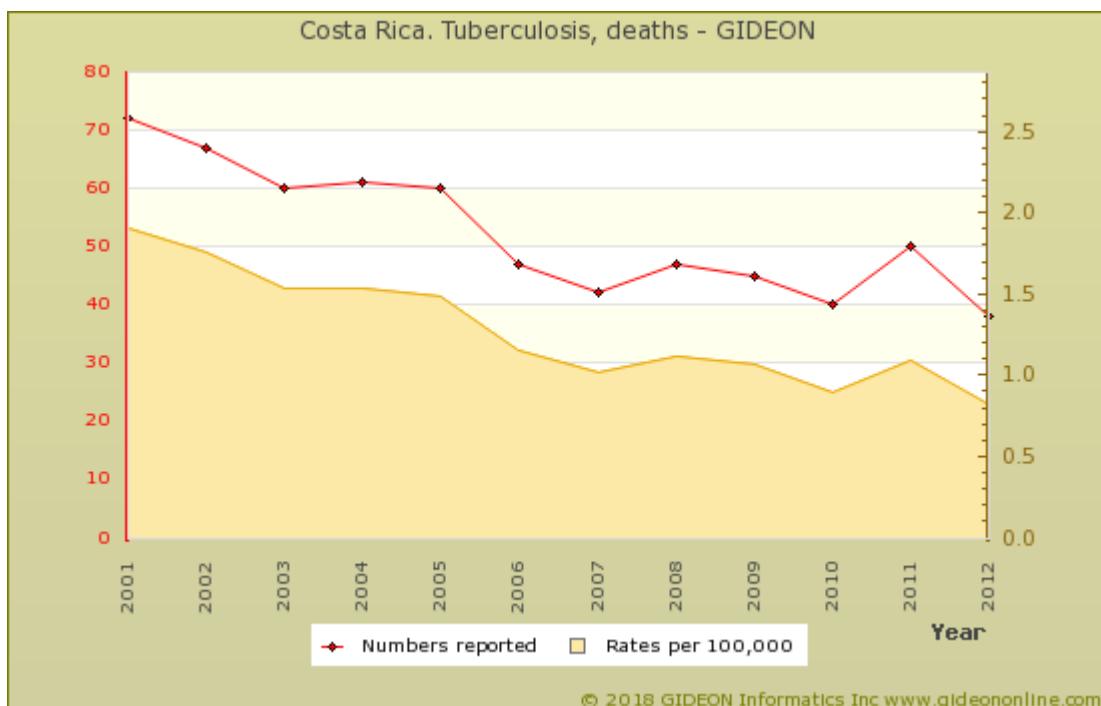
Graph: Costa Rica. Tuberculosis - WHO-UNICEF est. % BCG coverage



Graph: Costa Rica. Tuberculosis, cases

**Notes:**

1. Highest incidence is noted in Puntarenas (Pacific Central) and Limon (Huetar Atlantica) regions.
2. The male/female ratio is approximately 2/1. Pulmonary infection accounts for 90% of reported cases.
3. Nine cases of tuberculous meningitis were reported in 2001; 9 in 2002.



Graph: Costa Rica. Tuberculosis, deaths



Graph: Costa Rica. Tuberculosis, estimated (WHO) deaths

**Notes:**

1. 93 deaths were ascribed to tuberculosis in 1992; 76 in 1993; 80 in 1994.
2. The national mortality rate for tuberculosis was 2.1 per 100,000 in 1995.

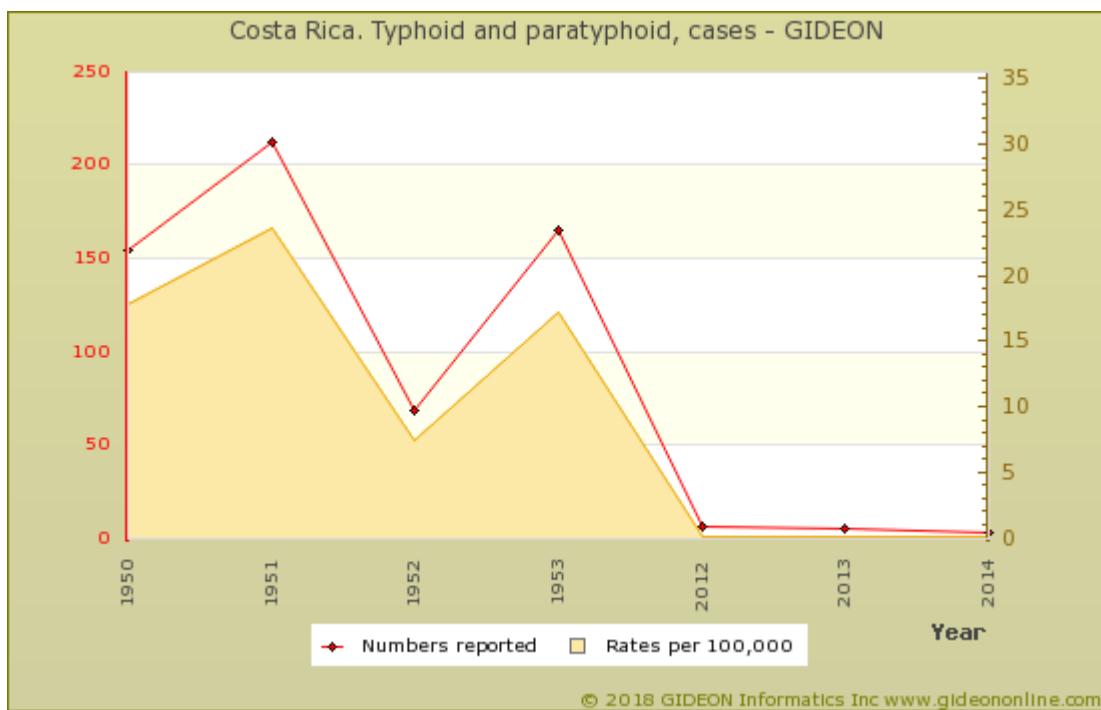
## Tungiasis

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

## Typhoid and enteric fever

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

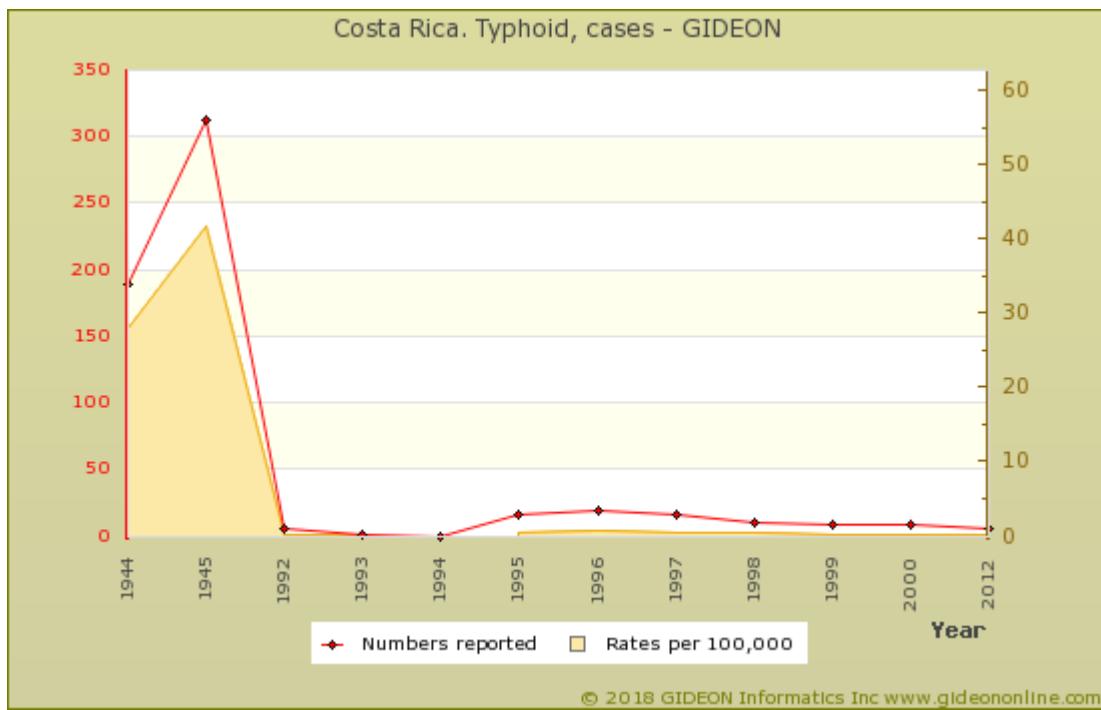
### Typhoid and enteric fever in Costa Rica



Graph: Costa Rica. Typhoid and paratyphoid, cases

## Notes:

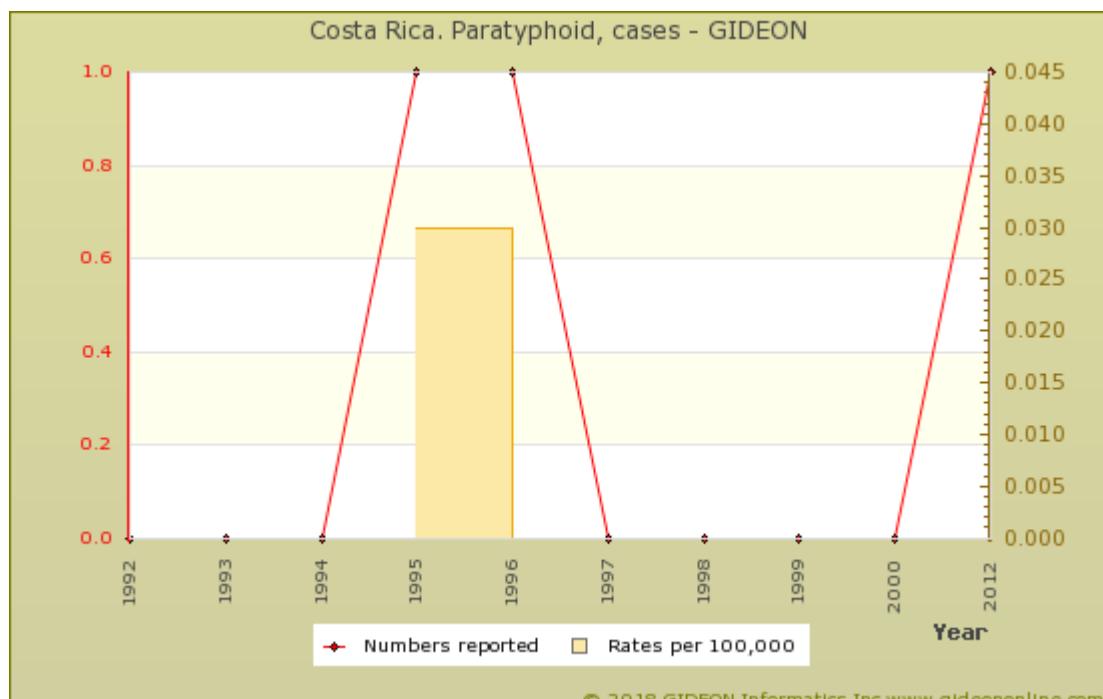
- During 1943 to 1949, the mean annual incidence was 256 cases <sup>1</sup>



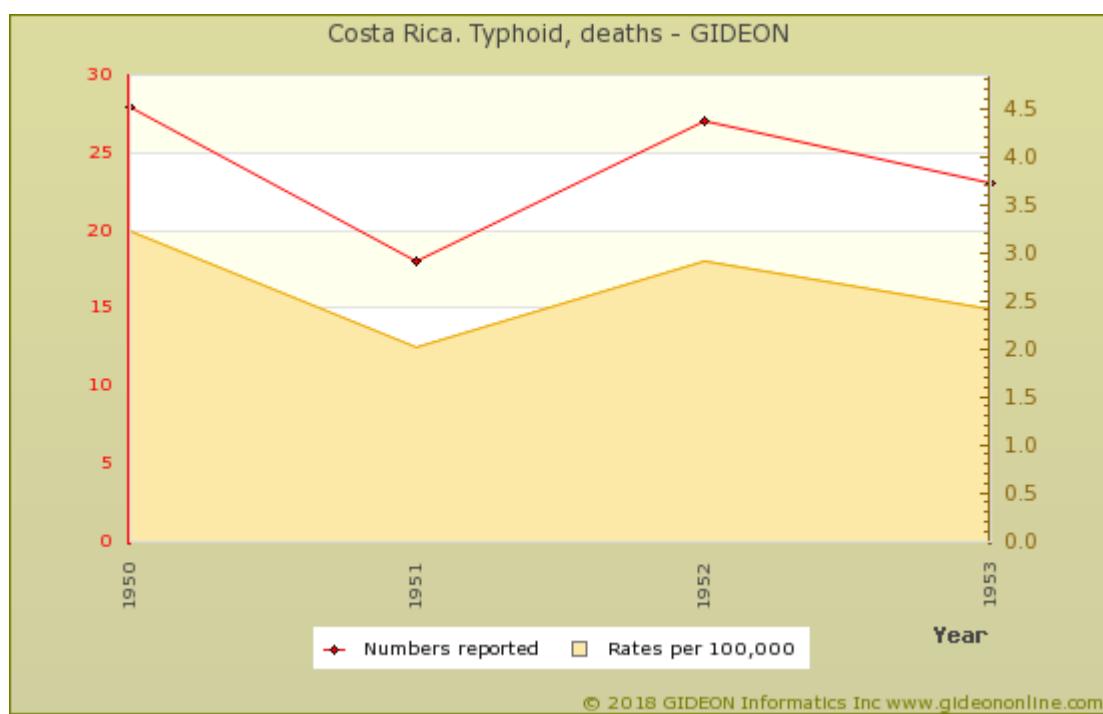
Graph: Costa Rica. Typhoid, cases

## Notes:

- 39 fatal cases were reported in 1944, and 60 in 1945.



Graph: Costa Rica. Paratyphoid, cases



Graph: Costa Rica. Typhoid, deaths

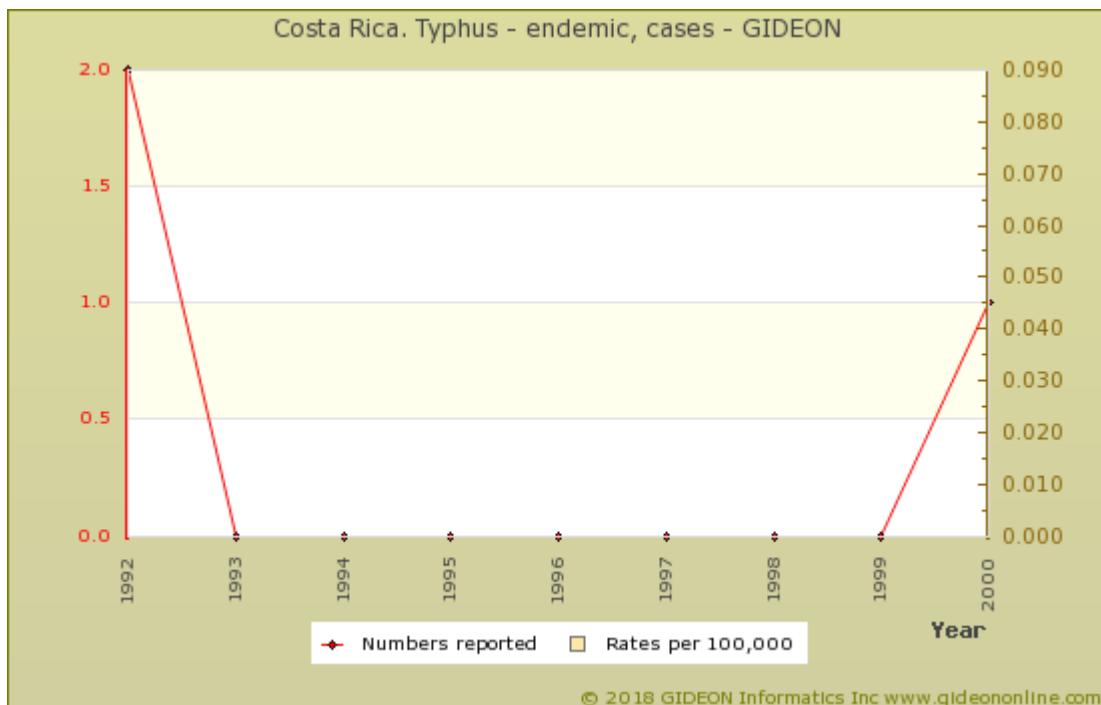
## References

1. Bull World Health Organ 1955 ;13(1):173-91.

## Typhus - endemic

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

## Typhus - endemic in Costa Rica

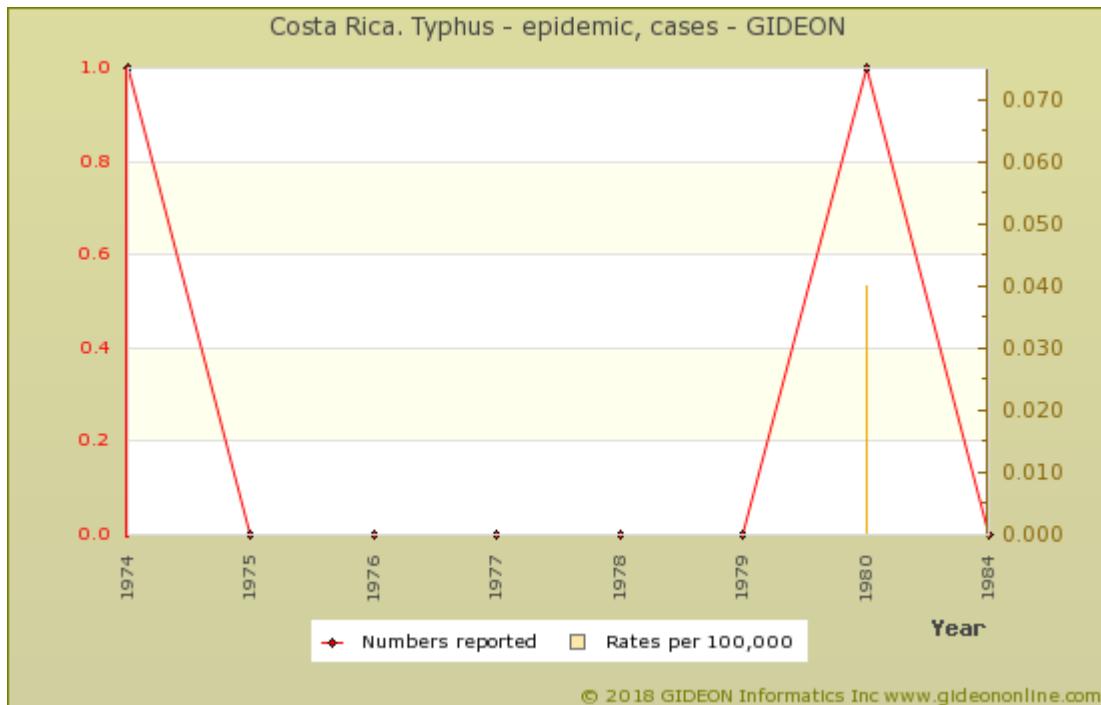


Graph: Costa Rica. Typhus - endemic, cases

## Typhus - epidemic

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

## Typhus - epidemic in Costa Rica



Graph: Costa Rica. Typhus - epidemic, cases

Notes:

Individual years:  
1980 - Nonfatal.

## Urinary tract infection

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

## Vaccinia and cowpox

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

## Varicella

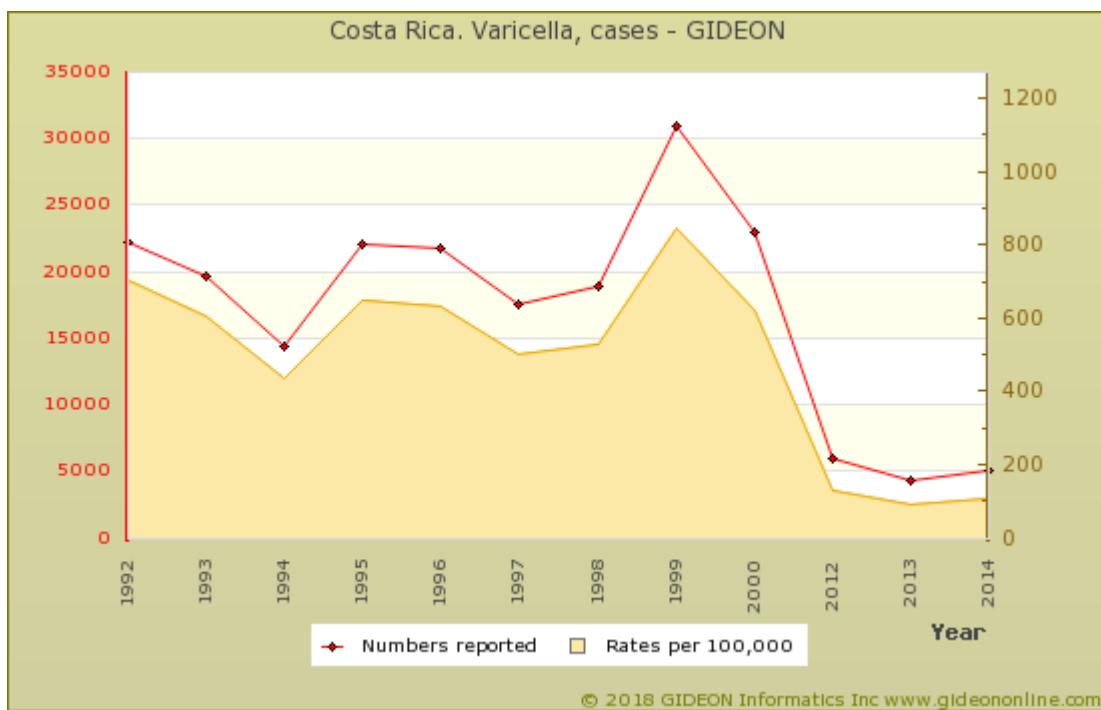
<b>Agent</b>	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Human Herpesvirus 3 (Varicella-zoster virus)
<b>Reservoir</b>	Human
<b>Vector</b>	None
<b>Vehicle</b>	Air, Contact, Breastfeeding, Respiratory or pharyngeal acquisition
<b>Incubation Period</b>	2w - 3w
<b>Diagnostic Tests</b>	Viral culture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

## Varicella in Costa Rica

### Vaccine Schedule:

BCG - birth  
DTaPHibIPV - 2,4,6,15 months  
DTaPIPV - 4 years  
HepB - birth 2, 6 months and adults at risk  
MMR - 15 months; 7 years  
Pneumo conj - 2,4,15 months  
Pneumo ps - >=60 years  
Td - 10 years  
Tdap - pregnant women  
Varicella - 15 months

Introduction of vaccination in 2007 was followed by a major reduction in disease rates. <sup>1</sup>



Graph: Costa Rica. Varicella, cases



Graph: Costa Rica. Varicella, deaths

## References

1. Expert Rev Vaccines 2017 Mar ;16(3):229-234.

## Venezuelan equine encephalitis

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

## Venezuelan equine encephalitis in Costa Rica

1997 to 2000 - Twelve humans were found to be seropositive toward Venezuelan equine encephalitis virus. <sup>1</sup>

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005 - 2007	Multiple locations	shoths	11	11% of sloths (Finmac and Upala) <sup>2</sup>

### Notable outbreaks

Years	Region	Cases	Population	Notes
1970				Outbreak among humans and equines <sup>3</sup>
2009	Guanacaste	5	equines	<sup>4</sup>
2015	Guanacaste		horses	<sup>5</sup>

### References

1. J Zoo Wildl Med 2005 Jun ;36(2):176-87.
2. J Wildl Dis 2016 Oct ;52(4):883-892.
3. Am J Epidemiol 1972 Jun ;95(6):565-78.
4. ProMED <promedmail.org> archive: 20090925.3364
5. ProMED <promedmail.org> archive: 20151023.3739448

## Vibrio parahaemolyticus infection

<b>Agent</b>	BACTERIUM <i>Vibrio parahaemolyticus</i> A facultative gram-negative bacillus
<b>Reservoir</b>	Marine water, Seafood, Fish
<b>Vector</b>	None
<b>Vehicle</b>	Seafood
<b>Incubation Period</b>	10h - 20h (range 2h - 4d)
<b>Diagnostic Tests</b>	Stool culture - alert laboratory when this organism is suspected.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Clinical Hints</b>	- 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%
<b>Synonyms</b>	Vibrio parahaemolyticus. ICD9: 005.4 ICD10: A05.3

## West Nile fever

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

## West Nile fever in Costa Rica

### Seroprevalence surveys

Years	Region	Study Group	%	Notes
2004		horses	28	28% of horses (2004) <sup>1</sup>
2005 - 2007	Multiple locations	sloths	15	15% of sloths (Finmac and Upala) <sup>2</sup>

### References

1. Vector Borne Zoonotic Dis 2011 Aug ;11(8):1081-4.
2. J Wildl Dis 2016 Oct ;52(4):883-892.

## Whipple's disease

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

## Yaws

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

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

### Yaws in Costa Rica

Six cases were reported during 1951 to 1956.

## Yellow fever

<b>Agent</b>	VIRUS - RNA. Flaviviridae, Flavivirus: Yellow fever virus
<b>Reservoir</b>	Human, Mosquito, Monkey, Marsupial
<b>Vector</b>	Mosquito ( <i>Stegomyia (Aedes)</i> , <i>Haemagogus</i> , <i>Sabettus</i> )
<b>Vehicle</b>	None
<b>Incubation Period</b>	3d - 6d (range 2.5d - 14d)
<b>Diagnostic Tests</b>	Viral culture (blood, liver). Serology. Nucleic acid amplification.  Biosafety level 3.
<b>Typical Adult Therapy</b>	Supportive
<b>Typical Pediatric Therapy</b>	As for adult
<b>Vaccine</b>	<a href="#">Yellow fever vaccine</a>
<b>Clinical Hints</b>	- 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
<b>Synonyms</b>	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

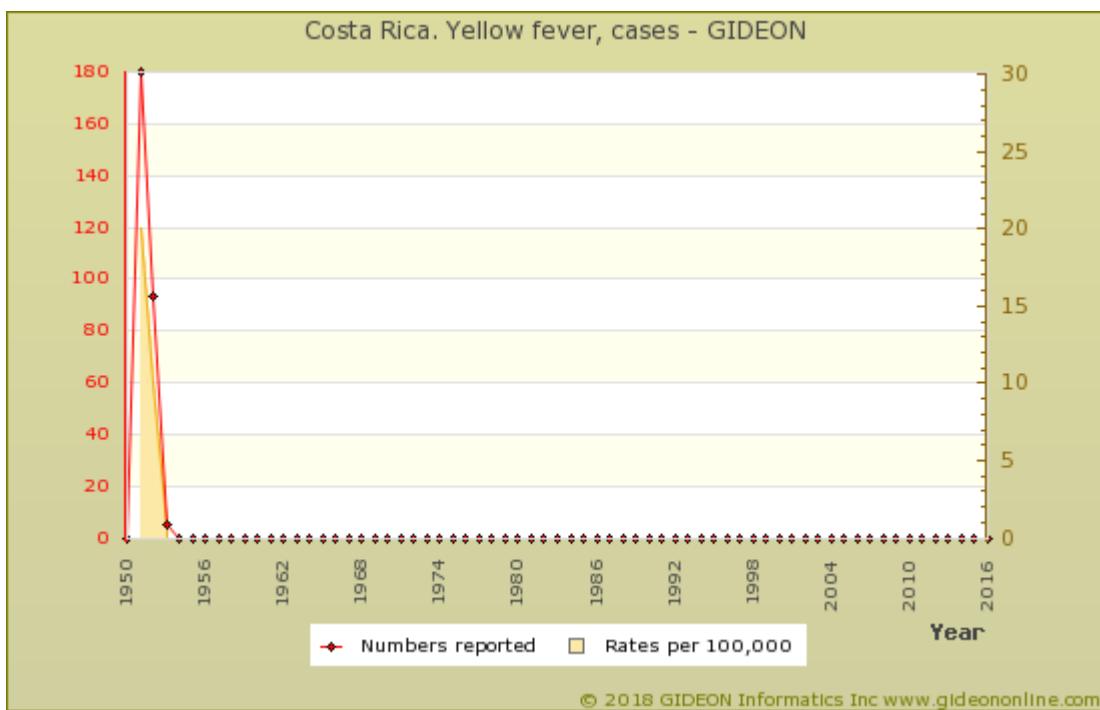
Although Yellow fever is not endemic to Costa Rica, imported, expatriate or other presentations of the disease have been associated with this country.

### Yellow fever in Costa Rica

#### Time and Place

Outbreaks of yellow fever were recorded in 1901, 1903 and 1910.

- Natural infection of monkeys and forest canopy mosquitoes was documented during the early 1950's. [1](#) [2](#)
- Yellow fever is no longer endemic to Costa Rica.



Graph: Costa Rica. Yellow fever, cases

Proof of vaccination **IS** required for travelers  $\geq 9$  months of age arriving from countries with risk of YFV transmission, and for travelers who have been in transit  $>12$  hours in an airport located in a country with risk of YFV transmission.  
This requirement excludes Argentina, Burundi, Central African Republic, Chad, Congo, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Guinea-Bissau, Guyana, Kenya, Mali, Mauritania, Niger, Panama, Paraguay, Rwanda, Senegal, South Sudan, Suriname, Togo, Trinidad and Tobago, and Uganda.

This country considers the certificate of YF vaccination to be valid for life.

## References

1. Am J Trop Med Hyg 1955 May ;4(3):543-9.
2. Am J Trop Med Hyg 1953 Sep ;2(5):850-63.

## Yersiniosis

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

**Zika**

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

**Zika in Costa Rica**

2016 - A case of presumed Zika virus infection was reported in an American tourist who had returned from Costa Rica. [1](#)

2016 - Five imported cases of Zika virus infection were reported - from Colombia, Nicaragua and Honduras. [2](#)

2016 - A pregnant woman who had been infected by Zika virus in El Salvador delivered a microcephalic infant in Costa Rica. [3](#)

A presumed vector, *Stegomyia (Aedes) aegypti*, had been eradicated in 1960, but reappeared in 1971, and no cases were reported until 1993.

**Notable outbreaks**

Years	Cases	Notes
2016 - 2018	7,782	Cases to January 4, 2018. Includes 19 cases of congenital syndrome <a href="#">4</a> <a href="#">5</a> <a href="#">6</a> <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a> <a href="#">11</a> <a href="#">12</a> <a href="#">13</a> <a href="#">14</a> <a href="#">15</a> <a href="#">16</a> <a href="#">17</a> <a href="#">18</a> <a href="#">19</a> <a href="#">20</a> <a href="#">21</a> <a href="#">22</a> <a href="#">23</a> <a href="#">24</a> <a href="#">25</a> <a href="#">26</a> <a href="#">27</a> <a href="#">28</a> <a href="#">29</a> <a href="#">30</a>

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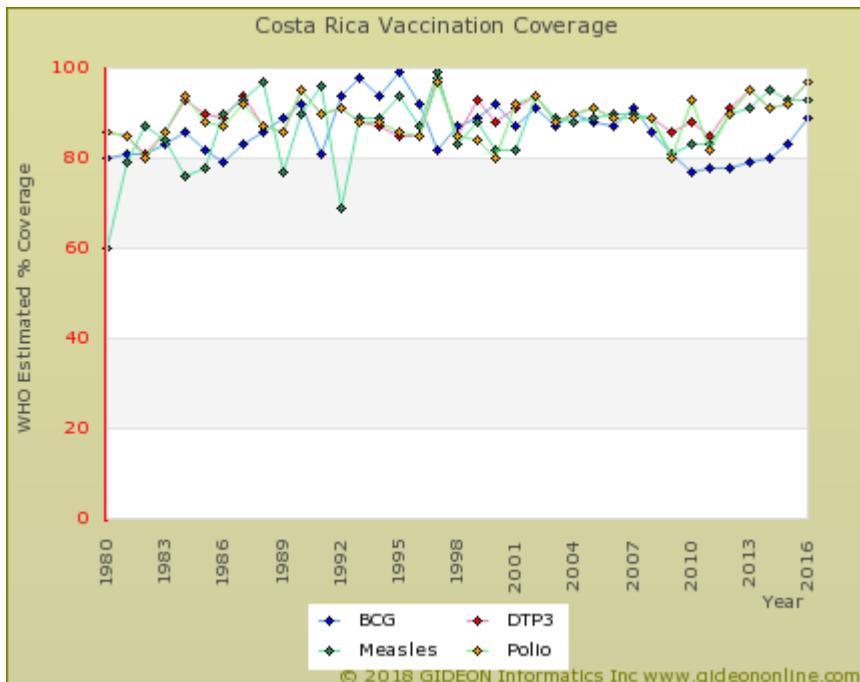
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29. ProMED <promedmail.org> archive: 20171009.5367967
30. ProMED <promedmail.org> archive: 20180201.5600535

## Zygomycosis

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

## Vaccine Schedule and coverage for Costa Rica

BCG - birth  
 DTaPHibIPV - 2,4,6,15 months  
 DTaPIPV - 4 years  
 HepB - birth 2, 6 months and adults at risk  
 MMR - 15 months; 7 years  
 Pneumo conj - 2,4,15 months  
 Pneumo ps - >=60 years  
 Td - 10 years  
 Tdap - pregnant women  
 Varicella - 15 months



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

### Vaccine Abbreviations

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

Pneumo ps - Pneumococcal polysaccharide

T - Tetanus

TBE - Tick-borne encephalitis

Td - Tetanus lower dose diphtheria

TT - Tetanus toxoid

wP - Whole-cell pertussis

YF - Yellow fever

Zoster - Herpes zoster

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