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INFECTIOUS DISEASES OF TURKEY

STEPHEN BERGER, MD

2022 EDITION

Infectious Diseases of Turkey - 2022 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 (Coltiviruses - Old world). Such classification reflects the clinical approach to disease allocation in the Infectious Diseases Module of the GIDEON web application. Similarly, a number of diseases which are generally diagnosed and treated outside of the field of Infectious Diseases are not included, despite the fact that a clear infectious etiology exists. Examples include Peptic ulcer, Creutzfeldt-Jakob disease, Human papillomavirus infections, etc. In contrast, a number of other entities of unknown etiology which do present to Infectious Diseases specialists have been included: Kawasaki's disease, Chronic fatigue syndrome, Kikuchi and Kimura diseases. Several minor infections having minimal relevance to the field of Infectious Diseases are not covered: Paronychia, Otitis externa, etc.

Introduction: The GIDEON e-book series

Infectious Diseases of Turkey 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 Turkey
3. References

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

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

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

Content
There are 364 generic infectious diseases in the world today. 222 of these are endemic, or potentially endemic, to Turkey. A number of other diseases are not relevant to Turkey 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 Turkey.

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

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

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

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

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

+ Country specific note exists for disease

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Acanthocephalan infections

Agent	PARASITE - Archiacanthocephala. Moniliformida: *Moniliformis moniliformis*, Oligocanthorhynchida: *Maracanthorhynchus hirudinaceus*.
Reservoir	Pig (*Maracanthorhynchus*), rat and fox (*Moniliformis*), Zoonotic
Vector	None
Vehicle	Insect ingestion
Incubation Period	Unknown - presumed 15 to 40 days
Diagnostic Tests	Identification of worm in stool: Moniliformis moniliformis adult: female - 10 to 30 cm; male - 4 to 5 cm Macracanthorhynchus hirudinaceus adult: female - 5.6 to 35.1 cm; male 5.2 to 8.9 cm
Typical Adult Therapy	Infection is usually self-limited. Pyrantel pamoate has been used against Moniliformis moniliformis - 11 mg/kg PO - repeat once in 2 weeks Levamisole (3 mg/kg/day for 3 days) OR Mebendazole (100 mg PO BID X3 days, repeated after one week) have been used successfully[1] [2] [3]
Typical Pediatric Therapy	Infection is usually self-limited. Pyrantel pamoate has been used against Moniliformis moniliformis - 11 mg/kg PO - repeat once in 2 weeks Levamisole (3 mg/kg/day for 3 days) OR Mebendazole (100 mg PO BID X3 days, repeated after one week) have been used successfully
Clinical Hints	- Most infections are characterized by asymptomatic passage of a worm - In some cases, only vague complaints such as 'periumbilical discomfort' and 'giddiness' have been described
Synonyms	Corynosoma, Macracanthorhynchus, Moniliform acanthocephalan, Moniliformis moniliformis, Negi nagi. ICD9: 128.9 ICD10: B83.8

Acanthocephalan infections in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2007 - 2008	Bursa	pigs	19	infestation by *Macracanthorhynchus hirudinaceus* [4]

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Actinomycosis

Agent	BACTERIUM. Actinomycetes, *Actinomyces* spp. Anaerobic gram-positive bacillus
Reservoir	Human (oral, fecal and vaginal flora)
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Gram stain and bacteriological culture using strict anaerobic technique. Growth is apparent in 3-7 days.
Typical Adult Therapy	Penicillin G 18 to 24 million units/day X 2 to 6w Then Penicillin V 2 to 4 Grams daily X 6 to 12 months Alternatives: Doxycycline, Ceftriaxone, Erythromycin Excision/drainage[1]
Typical Pediatric Therapy	Penicillin G 100,000 units/kg/day X 2 to 6 weeks Then Penicillin V 25,000 units/day X 6-12m Alternatives: Ceftriaxone, Erythromycin Excision/drainage
Clinical Hints	- Mandibular osteomyelitis with fistulae (sulfur granules) in the setting of poor dental hygiene - Pelvic abscesses in a women with intra-uterine device - Fever, right lower quadrant mass and fistulae - Suppurative pleuropulmonary infection with fistulae
Synonyms	Actinomyces, Aktinomykose, Lumpy jaw. ICD9: 039. ICD10: A42

Actinomycosis in Turkey

Sporadic case reports of actinomycosis are published. [2] [3]

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Adenovirus infection

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

Adenovirus infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Mersin	children	8	children ages 0 to 2 years with acute bronchiolitis [4]
2012 - 2014	Ankara	children	3	Survey of children with febrile neutropenia [5]
2013 - 2015	Istanbul	children	5	5% of hospitalized children with the symptoms of influenza-like illness [6]
2016 - 2017	Multiple locations	children	11.1	Survey of children with febrile seizures [7]
2013 - 2016	Izmir	infants	7.2	7.2% of infants below age 2 years hospitalized with acute bronchiolitis [8]
2000 - 2014	Multiple locations	patients	2.3	patients with acute flaccid paralysis [9]
2002 - 2014	Izmir	patients	5.5-11	5.5% / 11% (children / adults) with upper or lower respiratory tract infections [10]
2007 - 2008	Istanbul	patients	8.9	8.9% of patients with acute gastroenteritis [11]
2010 - 2013	Izmir	patients	1.2	patients with flu-like symptoms [12]
2013 - 2017	Istanbul	patients	4.7	Adenovirus was identified in 4.7% of patients at autopsy who had been considered to have respiratory tract infection [13]
2015 - 2018	Bursa	patients	12.9	15.1% of inpatients with respiratory infection [14]
2018	Istanbul	patients	0.5	Viruses detected in stool specimens from patients with diarrhea in Istanbul include rotavirus (16.3%), norovirus (7.6%), sapovirus (2.7%),

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Years	Region	Study Group	%	Notes
				astrovirus (1%), and adenovirus (0.5%) [15]
2021*		various	2.1-24	2.1% of healthy individuals and 24% of children with otitis media with effusion [16]
2007 - 2008	Istanbul	specimens - stool	8.9	patients with vomiting and / or diarrhea [17]
2008 - 2010	Izmir	specimens - stool	1.2	fecal samples tested at a hospital [18]
2006 - 2010	Izmir	patients - eye	44	ocular samples from patients with conjunctivitis [19]
2010 - 2017	Izmir	patients - CNS	5.5	Survey of pathogens associated with central nervous system infections [20]
2014*	Ankara	tonsils	12.5	tonsillar tissue samples [21]
1994 - 1995	Istanbul	children - respiratory	3.6	children with acute lower respiratory infection [22]
1998 - 2000	Kirikkale	children - respiratory	3.9-14.8	3.9% of pediatric and 14.8% of adult respiratory tract infection [23]
2002 - 2004	Manisa	children - respiratory	31.5	community-acquired viral lower respiratory infection in young children [24]
2003 - 2015	Ankara	children - respiratory	17.2	Adenovirus accounted for 17.2% of microorganisms associated with recurrent pneumonia among children [25]
2006 - 2015	Ankara	children - respiratory	1.6	1.6% of children with respiratory tract infection [26]
2010 - 2011	Istanbul	children - respiratory	26.2	children hospitalized with respiratory infection [27]
2011*	Istanbul	children - respiratory	5.6	% of viral lower respiratory tract infection in hospitalized children [28]
2011 - 2012	Antalya	children - respiratory	5.8	children ages 0 to 5 years, hospitalized with lower respiratory tract infection [29]
2012*	Istanbul	children - respiratory	3.6	pediatric acute respiratory tract infections [30]
2013 - 2014	Istanbul	children - respiratory	7.8	children ages >2 years, with fever and respiratory tract symptoms [31]
2016 - 2018	Istanbul	children - respiratory	4.8	Survey of children hospitalized in an Intensive Care Unit for lower respiratory tract infection [32]
2016*	Gaziantep	children - respiratory	1.7-4.4	4.4% / 1.7% of children with acute lower respiratory tract infection and wheezing / controls [33]
2021*	Eskisehir	children - respiratory	27.2	Viruses were identified in 30.1% of children with malignancies and febrile neutropenia episodes; Adenovirus 18.4%, Influenza B 18.4%; Coronavirus 23.7%, RSV 9.1% [34]
2007 - 2011	Ankara	children - gastrointestinal	13.9	Survey of children with acute gastroenteritis [35]
2007	Istanbul	children - gastrointestinal	8.6	children ages 0 to 5 years, presenting to an urban emergency room with gastroenteritis [36]
2008	Mersin	children - gastrointestinal	10.5	children ages 0 to 6 years, hospitalized with diarrhea [37]
2009	Istanbul	children - gastrointestinal	4.9	children admitted for gastroenteritis to a pediatric emergency unit [38]
2015*	Malatya	children - gastrointestinal	16	children with acute viral gastroenteritis [39]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Clinical	Population	Notes
2008	Multiple		4,000	gastrointestinal		water. An outbreak of diarrhea in Askaray and

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Years	Region	Setting	Cases	Clinical	Population	Notes
	locations			infection		Sereflikochisar caused by Adenovirus, Rotavirus, Norovirus and *Escherichia coli* [40]
2011*	Malatya	neonatal intensive care unit	24	conjunctivitis	neonates	Adenovirus 8. [41]
2012	Ankara	neonatal intensive care unit	43	conjunctivitis	neonates	[42]
2012*	Izmir	neonatal intensive care unit	34	keratoconjunctivitis	neonates	[43]

* indicates publication year (not necessarily year of outbreak)

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Aeromonas and marine Vibrio infx.

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

Aeromonas and marine Vibrio infx. in Turkey

Prevalence surveys

Years	Study Group	%	Notes
2020*	seafood	3.42	*Vibrio vulnificus* was identified in 3.42% of seafood samples [3]
2010*	seafood - fish	97.3	Motile aeromonads were found in 97.3% of marine fish and 10% of freshwater fish
2010*	seafood - fish	36.3-40.9	*Vibrio* spp. in 36.3% to 40.9% of marine fish, and 0% of freshwater fish [4]

* indicates publication year (not necessarily year of survey)

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African tick bite fever

Agent	BACTERIUM. Rickettsiales: *Rickettsia africae*
Reservoir	Sheep, Goat, Cattle, Tick, Zoonotic
Vector	Tick (*Rhipicephalus*, *Haemaphysalis*, *Amblyomma*)
Vehicle	None
Incubation Period	6d - 7d (range 3d - 18d)
Diagnostic Tests	Serology. Demonstration of rickettsiae by immunofluorescence or culture. Nucleic acid amplification
Typical Adult Therapy	Doxycycline 100 mg PO BID X 7d. OR Chloramphenicol 500 mg PO QID X 3 to 5d[1]
Typical Pediatric Therapy	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
Clinical Hints	- Fever and rash following a tick bite In contrast to Mediterranean spotted fever: - Multiple eschars may be present - The rash is vesicular, and is present in only 30% of patients
Synonyms	Rickettsia africae, South African spotted fever. ICD9: 082.1 ICD10: A77.1

Although African tick bite fever is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

African tick bite fever in Turkey

2006 - *Rickettsia africae* was identified in a tick collected from a human in the region of Istanbul. [2]

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Amoeba - free living

Agent	PARASITE - Protozoa. Centramoebida, Acanthamoebidae: *Acanthamoeba* and *Balamuthia* Schizopyrenida, Vahkampfidae: *Naegleria*
Reservoir	Water, Soil
Vector	None
Vehicle	Water (diving, swimming), Contact
Incubation Period	5d - 6d (range 2d - 14d) Granulomatous ? to 2m
Diagnostic Tests	Wet preparation. Specialized cultures. Serology available in reference centers.
Typical Adult Therapy	CNS *Naegleria*: Amphotericin B to 1.5 mg/kg/d IV + 1.5 mg intrathecal. X 8 days + Fluconazole 10 mg/kg/day PO + Rifampin 10 mg/kg/day PO + Azithromycin 10 mg/kg/day PO + Miltefosine 50 mg TID PO + dexamethasone. *Acanthamoeba*: Pentamidine, Amphotericin B, Flucytosine, Rifampin, Itraconazole Miltefosine used in some cases of *Acanthamoeba* / *Balamuthia* infection[1] [2] [3] [4]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Severe, progressive meningoencephalitis (*Naegleria*, *Acanthamoeba* or *Balamuthia*) after swimming or diving in fresh water - Keratitis (*Acanthamoeba*), associated with contaminated solutions used to clean contact lenses
Synonyms	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 Turkey

Amoebic keratitis

Acanthamoeba keratitis has been reported in the presence [5] and absence of contact lens usage. [6] [7] [8]

- 2005 to 2006 - *Paravahlkampfia* sp. has been identified in a case of keratitis in Turkey. [9]
- 2010 to 2012 - 26 cases of non-contact lens-related *Acanthamoeba* keratitis were treated at a tertiary center. [10]

Amoebic encephalitis

- 2009 (publication year) - The first case of granulomatous amoebic encephalitis in Turkey was reported. [11]
- 2018 (publication year) - A case of *Acanthamoeba* encephalitis was reported. [12]
- 2022 (publication year) - A case of primary amoebic encephalitis due to *Naegleria fowleri* was reported following a visit to a hot spring. [13]

Acanthamoeba, *Balamuthia*, *Naegleria* and *Hartmanella* spp. are present in drinking water and environmental sources. [14] [15] [16]
Acanthamoeba genotype T4 and *Vermamoeba vermiformis* have been identified in tap water in Istanbul (2018 publication) [17]

Prevalence surveys

Years	Region	Study Group	%	Notes
2016*		dogs	14.6	*Acanthamoeba* identified in 14.6% of conjunctival scrapings from stray dogs. [18]
2017*	Western Region	birds	16.6	Corneal infection by *Acanthamoeba* spp was found in 16.6% of wild birds in Izmir and Manisa Provinces (PCR)

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Years	Region	Study Group	%	Notes
2015*	Sivas	patients	0.4	0.4% of swab samples from conjunctivae and lower eye lids [19]
2012*	Sivas	water	30	30.0% of tap water and environmental water sources [20]
2016 - 2017	Black Sea	water	0-44	*Acanthamoeba* spp. were identified in 0% / 44% of drinking water / river water samples [21]
2018*	Multiple locations	environmental	6.6-33.3	*Acanthamoeba* spp. were detected in 33.3% / 26.6% and *Balamuthia mandrillaris* in 6.6% / 13.3% of home air conditioners in Adana Province / Gaziantep province [22]
2020*		environmental - water	28	28% of swimming pool and biofield samples (FISH method) [23]
2012 - 2018	Izmir	patients - eye	7.7	7.7% of patients with contact lens-associated microbial keratitis [24]

* indicates publication year (not necessarily year of survey)

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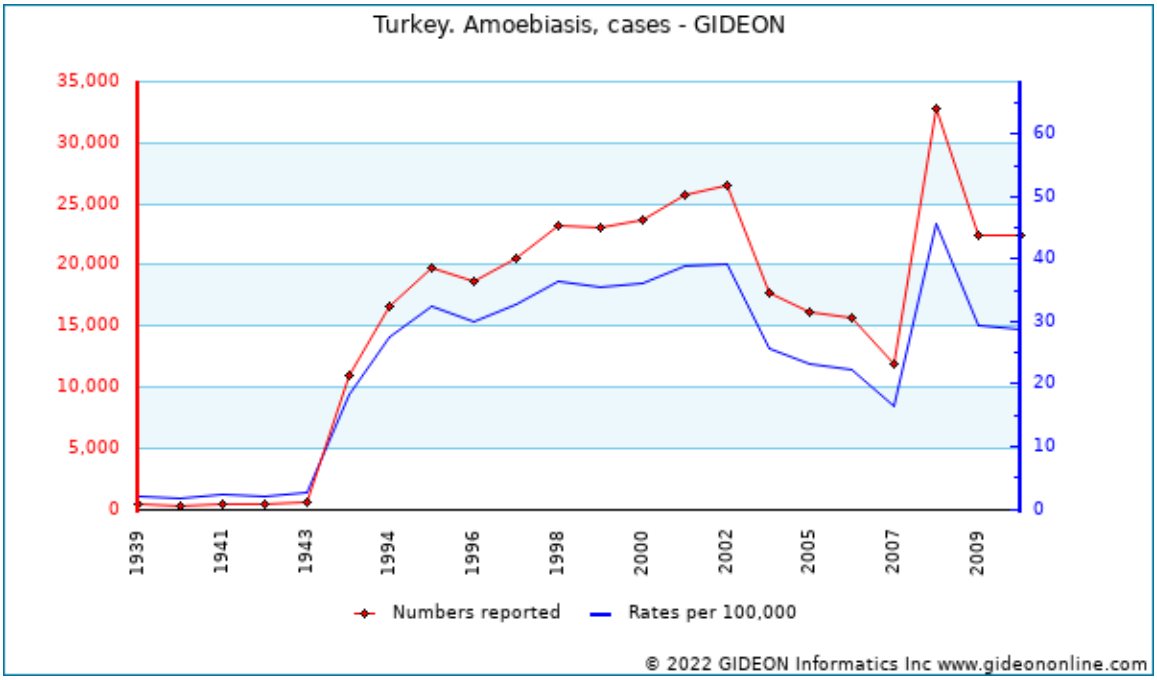
Amoebiasis

Agent	PARASITE - Protozoa. Sarcomastigota, Entamoebidea: *Entamoeba histolytica* (must be distinguished from non-invasive, *Entamoeba dispar*)
Reservoir	Human
Vector	Fly (Musca) - occasionally
Vehicle	Food, Water, Sexual contact, Fly
Incubation Period	1w - 3w (range 3d - 90d)
Diagnostic Tests	Fresh stool/aspirate for microscopy. Stool antigen assay. Stool PCR. Note: serological tests usually negative.
Typical Adult Therapy	Tinidazole 2 G PO X 5d OR Metronidazole 500 mg TID X 7-10d Follow with: Paromomycin 500 mg PO TID X 7d[1]
Typical Pediatric Therapy	Tinidazole 50 mg/kg/d PO X 5d OR Metronidazole 15 mg/kg TID PO X 10d Follow with: Paromomycin 10 mg/kg PO TID X 7d
Clinical Hints	- Dysentery, abdominal pain, tenesmus. - Unlike shigellosis, hyperemia of the rectal mucosa and fecal pus are absent. - Liver abscess and dysentery rarely coexist in a given patient
Synonyms	Amebiasis, Amebiasis intestinal, Amebic colitis, Amebic dysentery, Amoebenruhr, Entamoeba bangladeshi, Entamoeba gingivalis, Entamoeba hartmanni, Entamoeba moshkovskii. ICD9: 006.0,006.1,006.2 ICD10: A06.0,A06.1,A06.2

Amoebiasis in Turkey



Graph: Turkey. Amoebiasis, cases

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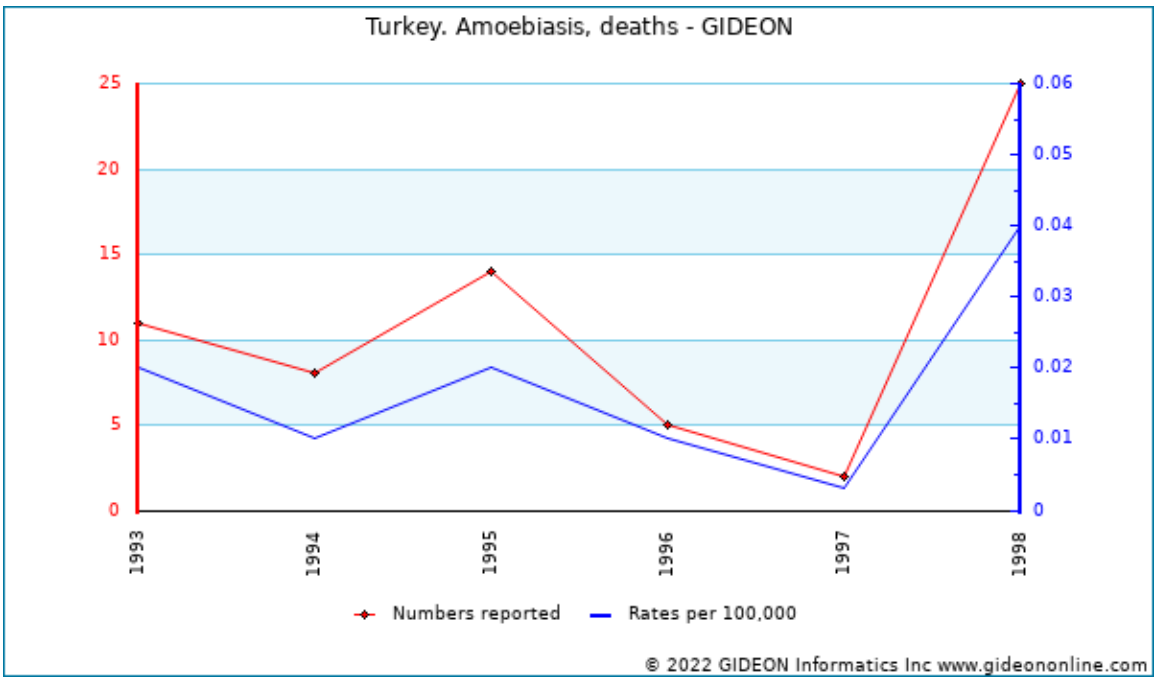

Graph: Turkey. Amoebiasis, deaths

2007 (publication year) - Two cases of *Entamoeba moshkovskii* infection were identified in an urban slum of Sanliurfa. [2]

Prevalence surveys

Years	Region	Study Group	%	Notes
1991*	Mardin	children	6	6% of primary school students in Mardin [3]
2003 - 2005	Van	children	1.1	1.1% of school children ages 7 to 15 in Van Province [4] [5]
2005	Van	children	1.5	1.5% of school children ages 7 to 15 in Van Province [6]
2006*	Sivas	children	5.3	5.3% of primary school children in Sivas [7]
2007*	Manisa	children	1.3	1.3% of primary school children in Manisa [8]
2008*	Yozgat	children	1.6	1.6% of primary school children in Yozgat [9]
2008*	Sivas	children	7.4	7.4% of primary school children in Sivas [10]
2009*	Mersin	children	3.8	3.8% of children in a social services center in Mersin [11]
2011*	Sivas	children	1.5	1.5% of primary school children in rural Sivas [12]
2019*		adults - elderly	1.2	Survey of elderly patients in a nursing home [13]
2011*		workers	0.13	0.13% of administrators and workers in sanitary and non-sanitary institutions [14]
2007*	Ankara	transplant recipients	2	2% of diarrhea episodes in kidney or liver transplant patients [15]
1997 - 2007	Van	patients	0.8	Survey of hospital outpatients [16]
2003 - 2006	Istanbul	patients	7.3	7.3% of parasitic infections among hospitalized patients [17]
2003 - 2004	Izmir	patients	3.43	3.43% of patients with gastrointestinal complaints [18]
2004 - 2009	Istanbul	patients	5.2	5.2% of patients hospitalized with gastrointestinal symptoms [19]
2005 - 2008	Izmir	patients	0.24	0.24% of patients with gastrointestinal complaints at a

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Years	Region	Study Group	%	Notes
				University Medical Faculty Hospital [20]
2005 - 2009	Izmir	patients	0.19	0.19% of stool specimens from patients with gastrointestinal symptoms, [21]
2005*	Sanliurfa	patients	13	13% of patients with diarrhea in Sanliurfa [22]
2005 - 2007	Camlihemsin	patients	56	56% of persons admitted to a healthcare center (*E. histolytica/ dispar*) [23]
2005 - 2008	Ankara	patients	27	27% of patients hospitalized with acute gastroenteritis [24]
2006 - 2018	Sivas	patients	1.5	Survey of patients with gastrointestinal symptoms [25]
2007*	Ankara	patients	0.5	0.5% of patients admitted to a hospital in Ankara [26]
2008*	Mersin	patients	10.6	10.6% of patients with diarrhea in Mersin - 72.4% *E. histolytica* and 27.6% *E. dispar*) [27]
2008*	Mersin	patients	8.82	8.82% of patients with diarrhea in Mersin [28]
2009 - 2010	Bursa	patients	0.95	0.95% of patients with gastrointestinal symptoms [29]
2011*	Ankara	patients	2.1	2.1% of patients with diarrhea, admitted to an emergency department [30]
2011 - 2018	Izmir	patients	0.1	Survey of patients referred to a Parasitology laboratory. [31]
2013*	Sanliurfa	patients	3.3	3.3% of patients with gastrointestinal symptoms, in an endemic region (*Entamoeba histolytica*) [32]
2016 - 2018	Adıyaman	patients	6.1	Survey of patients with gastrointestinal symptoms [33]
2007*	Kutahya	adults	1.04	1.04% of persons over age 15 years in Kutahya [34] [35]
2012 - 2013	Kocaeli	patients - dialysis	2.1	[36]
2006*	Kayseri-Karpuzsekisi	general population	1.66	1.66% of individuals in the Kayseri Karpuzsekisi basin [37]
2007*	Multiple locations	food handlers	1.72	1.72% of food workers employed in hospitals (*E. histolytica/ dispar*) in Aydin and Yil states [38]
2007*	Van	food handlers	0.27	0.27% of persons working in the food sector [39]
2008*	Manisa	food handlers	6.1	6.1% of food-handlers in Manisa [40]
1993 - 2000	Bursa	specimens - stool	0.35	0.35% of fecal samples processed at a university parasitology laboratory [41]
1993 - 2006	Sivas	specimens - stool	3.7	3.7% of fecal samples processed at a university parasitology laboratory in Sivas [42]
1997 - 2001	Istanbul	specimens - stool	3.68	3.68% of fecal samples examined in Istanbul
1999 - 2009	Istanbul	specimens - stool	0.05	0.05% of stool examinations from hospitalized patients [43]
2000 - 2004	Ankara	specimens - stool	2.51	2.51% of stools examined at a laboratory in Ankara
2000 - 2006	Malatya	specimens - stool	5.3	5.3% (*E. histolytica/dispar*) fecal samples processed in a single hospital in Malatya [44]
2002 - 2004	Sivas	specimens - stool	2.4	2.4% of fecal samples processed at a university parasitology laboratory in Sivas [45]
2003 - 2007	Eskisehir	specimens - stool	31	31% of parasites found in stools at a university medical facility in Eskishir [46]
2005	Hatay	specimens - stool	13.4	13.4% of fecal samples processed at a university parasitology laboratory [47]
2005 - 2008	Kayseri	specimens - stool	0.87	0.87% of fecal samples processed at a university parasitology laboratory [48]
2006 - 2007	Bornova	specimens - stool	0.37	0.37% of fecal samples processed at a university parasitology laboratory in Bornova [49]
2007 - 2009	Tokat	specimens - stool	0.8	0.8% of stool specimens examined by Tokat public health

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Years	Region	Study Group	%	Notes
				laboratory [50]
2009	Van	specimens - stool	0.1	0.1% of stools examined at a laboratory in Van [51]
2012 - 2014	Istanbul	specimens - stool	1.6	[52]
2012 - 2014	Istanbul	specimens - stool	1.45	Survey of specimens submitted to a hospital laboratory [53]
1999 - 2012	Ankara	specimens	0.17	0.17% of appendectomy specimens [54]
2006*	Malatya	sanitation workers	0.8	0.8% of municipal sanitary workers in Malatya [55]
2018*	Istanbul	patients - HIV / AIDS	4.4	[56]
2002 - 2006	Ankara	patients - inflammatory bowel disease	31.5	31.5% of active ulcerative colitis outpatients treated in a single institution [57]
2005*	Hatay	children - gastrointestinal	1.64	1.64% of children ages 0 to 14 with gastrointestinal symptomatology, in Hatay [58]
2007*	Southern Region	children - gastrointestinal	17	17% of children ages 0 to 14 with diarrhea in Southern Turkey (Adana and Mersin provinces) [59]
2007	Kars	children - gastrointestinal	10.1	10.1% of children ages 2 to 6 years with gastrointestinal symptomatology seen at a hospital in Kars [60]
2012*	Eskisehir	children - gastrointestinal	0.9	0.9% of children with diarrhea [61]

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Amoebic abscess

Agent	PARASITE - Protozoa. Sarcomastigota, Entamoebidea: *Entamoeba histolytica* (must be distinguished from non-invasive, *Entamoeba dispar*)
Reservoir	Human
Vector	Fly (Musca) - occasionally
Vehicle	Food, Water, Sexual contact, Fly
Incubation Period	2w - 6m (rarely years; 95% within 6m)
Diagnostic Tests	Imaging. Serology. Nucleic acid amplification. Note: Amoebae are usually not present in stool at this stage.
Typical Adult Therapy	Tinidazole 2 G X 5d OR Metronidazole 750 mg PO TID X 10d[1]
Typical Pediatric Therapy	Metronidazole 15 mg/kg TID X 10d OR Tinidazole 15 to 20 mg/kg TID X 5d
Clinical Hints	- Fever, local pain and weight loss - Concurrent amebic colitis is usually not present. - Typically a single abscess in the right hepatic lobe (bacterial abscesses may be multiple)
Synonyms	Absceso amebiano, Amebic liver abscess. ICD9: 006.3,006.4,006.5,006.6,006.8 ICD10: A06.4,106.5,A06.7,106.8

Amoebic abscess in Turkey

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

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Anaplasmosis

Agent	BACTERIUM. Anaplasmataceae *Anaplasma phagocytophilum*. (*E. phagocytophila*, *E. equi* "HE agent" merged into this species) Intracellular *Rickettsia*-like
Reservoir	Rodent, Rabbit, Deer, Tick, Primate, Cattle, Horse, Goat, Sheep, Zoonotic
Vector	Tick (*Ixodes scapularis*, *Ix. pacificus*, *Ix. ricinus*)
Vehicle	Blood or secretions (rare)
Incubation Period	Unknown; mean 8d
Diagnostic Tests	Intraleucocytic inclusions ('morulae') seen in blood smear. Serology. Nucleic acid amplification/
Typical Adult Therapy	Doxycycline 100 mg PO BID X 4 to 5 days OR Rifampin 300 mg PO BID X 5 to 7 days[1] [2]
Typical Pediatric Therapy	Above age 8 years: Doxycycline 2 mg/kg PO BID X 4 to 5 days OR Rifampin 10 mg/kg/day PO BID X 5 to 7 days Below age 8 years: Tetracycline 25 mg/kg/d PO QID X 4 to 5 days OR Rifampin 10 mg/kg/day PO BID X 5 to 7 days
Clinical Hints	- Fever, headache and myalgia following tick bite or exposure - Arthralgia or macular rash may be present - Leukopenia, thrombocytopenia or hepatic dysfunction are common - Inclusions may be seen in granulocytes - Case-fatality rate is 5%
Synonyms	Anaplasma capra, Anaplasma ovis, Anaplasma phagocytophilum, Anaplasma platys, Anaplasmosis - human granulocytic, Ehrlichia equi, Ehrlichia ewingii, Ehrlichia microti, Ehrlichia phagocytophila, Ehrlichiosis - human granulocytic, Human granulocytic anaplasmosis, Human granulocytic ehrlichiosis. ICD9: 082.4 ICD10: B28.8

Anaplasmosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	Multiple locations	cattle	1	1.0% of cattle (6 provinces, *Anaplasma phagocytophilum*) [3]
2020*		sheep and goats	66.7	[4]
2021*	Multiple locations	ruminants	1.4	1.4% of small ruminants (*Anaplasma phagocytophilum*) [5]
2017 - 2021	Tekiradag	cats	7.2	Survey of house cats [6]
2016*	Thrace	various	0.7-4	4% of dogs and 0.7% of tick (*Rhipicephalus sanguineus*) pools [7]
2007 - 2008	Black Sea	ticks	6.78	6.78% of adult ticks in the Black Sea region (*Anaplasma phagocytophilum* [8]
2007	Multiple locations	ticks	17-22.2	17.0% of adult and 22.2% of nymphal tick (*Ixodes ricinus*) pools [9]
2011*	Multiple locations	ticks	2.7-17.5	2.7% of questing *Ixodes ricinus* ticks in Istanbul and 17.5% in Kirklareli [10]
2016*	Thrace	ticks	0.7	0.7% of tick (*Rhipicephalus sanguineus*) pools [11]
2016 - 2020	Multiple locations	ticks	6.36	*Anaplasma* spp were detected in 6.36% of ticks [12]

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Years	Region	Study Group	%	Notes
2017	Sinop	ticks	0.17-1.2	1.20% / 0.17% of *Ixodes ricinus* adults / nymphs [13]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2015*	Multiple locations	cattle	30.8	30.8% of cattle (*Anaplasma phagocytophilum*) [14]
2008*	Multiple locations	ruminants	14.86-15.27	15.27% of cattle and 14.86% of sheep in the Middle and Eastern Black Sea Regions of Turkey [15]
2001	Northern Region	rodents	0	0% of wild mice (Apodemus sylvaticus) were seropositive toward *Borrelia afzelii* (2001) [16]

* indicates publication year (not necessarily year of survey)

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Animal bite-associated infection

Agent	BACTERIUM. *Pasteurella multocida*, and other zoonotic bite pathogens
Reservoir	Cat, Dog, Marsupial, Other mammal, Rarely bird, Zoonotic
Vector	None
Vehicle	Bite (cat in 60%, dog in 30%), No obvious source in 10%
Incubation Period	3h - 3d
Diagnostic Tests	Gram stain/culture. Hold specimen for 2 weeks to discount Capnocytophaga & other genera.
Typical Adult Therapy	Amoxicillin-clavulanate, Doxycycline, Cefuroxime. Dosage and duration appropriate for nature and severity of infection[1]
Typical Pediatric Therapy	Amoxicillin-clavulanate, Cefuroxime. Dosage and duration appropriate for nature and severity of infection
Clinical Hints	- 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, Coryebacterium 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

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Anisakiasis

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

Anisakiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2019*		fish	82.5	82.5% of Senegalese John Dory (*Zeus faber*) sold in Turkish supermarkets [3]
2020*	Multiple locations	fish	0-98	98% of imported frozen whole Atlantic mackerel (*Scomber scombrus*) ; 0% of ready-to-eat fish products; and 0% of frozen Atlantic salmon fillets [4]
2020*	Multiple locations	seafood - fish	46-47.1	47.1% to 46% of fish from the Aegean Sea (*Anisakis pegreffii*, *Anisakis typica* and *Anisakis simplex*) and Mediterranean Sea (*A. pegreffii*)
2014*	Black Sea	seafood - fish	0	[5]

* indicates publication year (not necessarily year of survey)

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Anthrax

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

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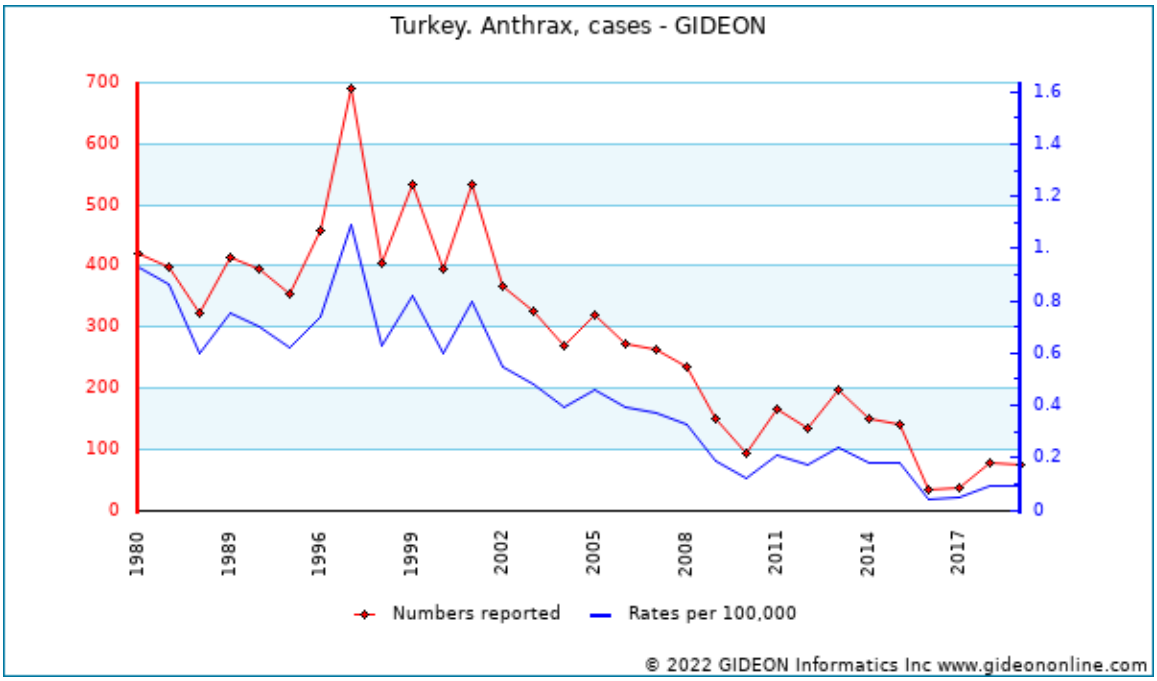
Anthrax in Turkey



Graph: Turkey. Anthrax, cases

Notes:
1. 10,724 cases were reported during 1960 to 1969; 8,906 during 1967 to 1979; 4,423 during 1980 to 1989; 926 during 1995 to 2005 [2] ; 1,174 (9 fatal) during 2009 to 2018. [3]
2. One fatal case was reported in 2005; 1 in 2006; 1 in 2018 [4]

Cross-border events
Includes outbreaks associated with importation of contaminated vehicles

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2011	France	Turkey	travel	1	
2014	Switzerland	Turkey		1	[5]

** Country or Nationality

Case series

- 1992 to 2008 - 58 cases of cutaneous anthrax were treated at a hospital in Ankara. [6]
- 2001 to 2012 - 58 cases of cutaneous anthrax were treated at a hospital in southeast Anatolia. [7]
- 2002 to 2007 - 85 cases of cutaneous anthrax were treated at a hospital in Van [8]
- 2008 to 2014 - 82 cases of cutaneous anthrax were treated at a hospital in eastern Anatolia. [9]
- 2009 to 2014 - 28 cases of cutaneous anthrax were treated at a hospital in eastern Anatolia. [10]

- 1980 to 2008 - Seven cases (all fatal) of meningeal anthrax were reported in Turkey. [11]

- 1992 to 2004 - 503 cases of human and 464 animal anthrax were reported in Eastern Turkey. [12]
- 2001 to 2003 - 277 cases of animal anthrax were reported in 2001; 218 in 2002; 72 during the first eight months of 2003.
- 2018 (publication year) - Anthrax was reported in two captive pumas (*Puma concolor*) [13]

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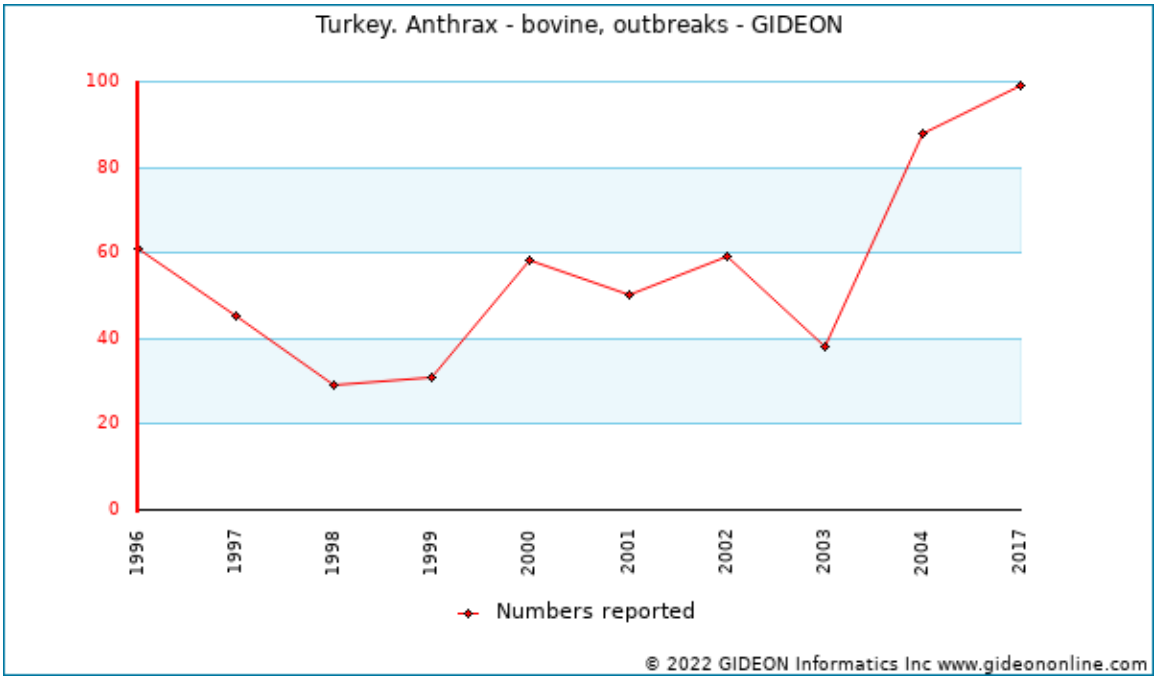
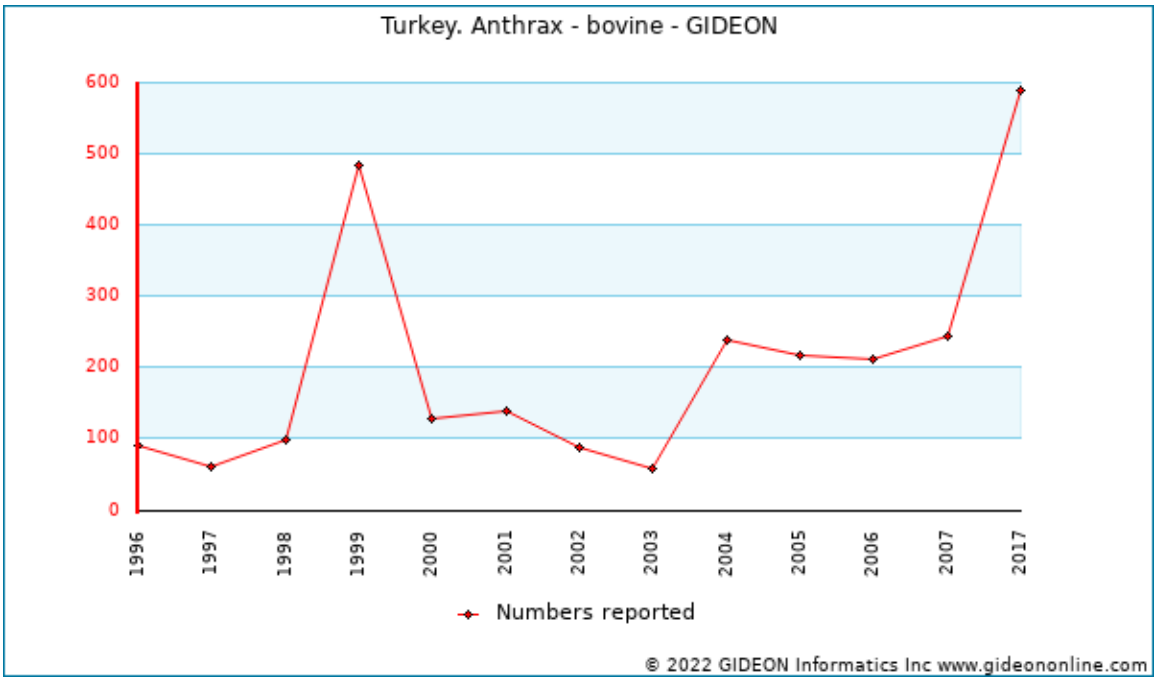


Graph: Turkey. Anthrax - bovine, outbreaks

Notes:
1. Outbreaks of bovine anthrax were reported in Denizli in 2015, 2016 and 2017. [14]



Graph: Turkey. Anthrax - bovine

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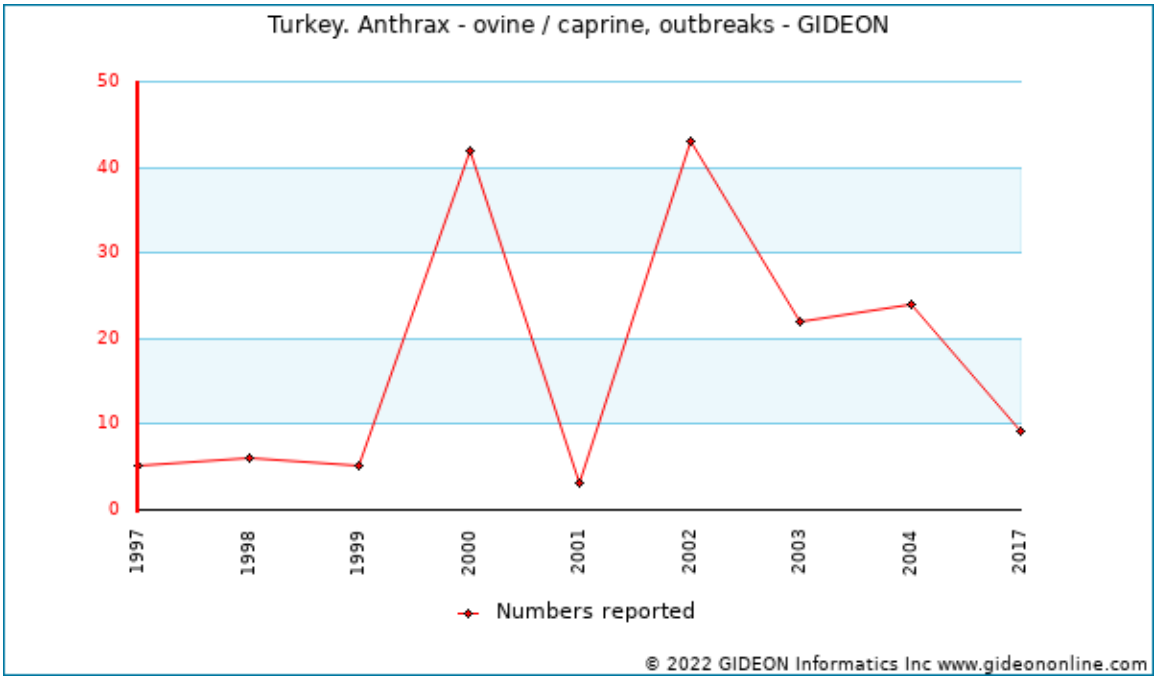
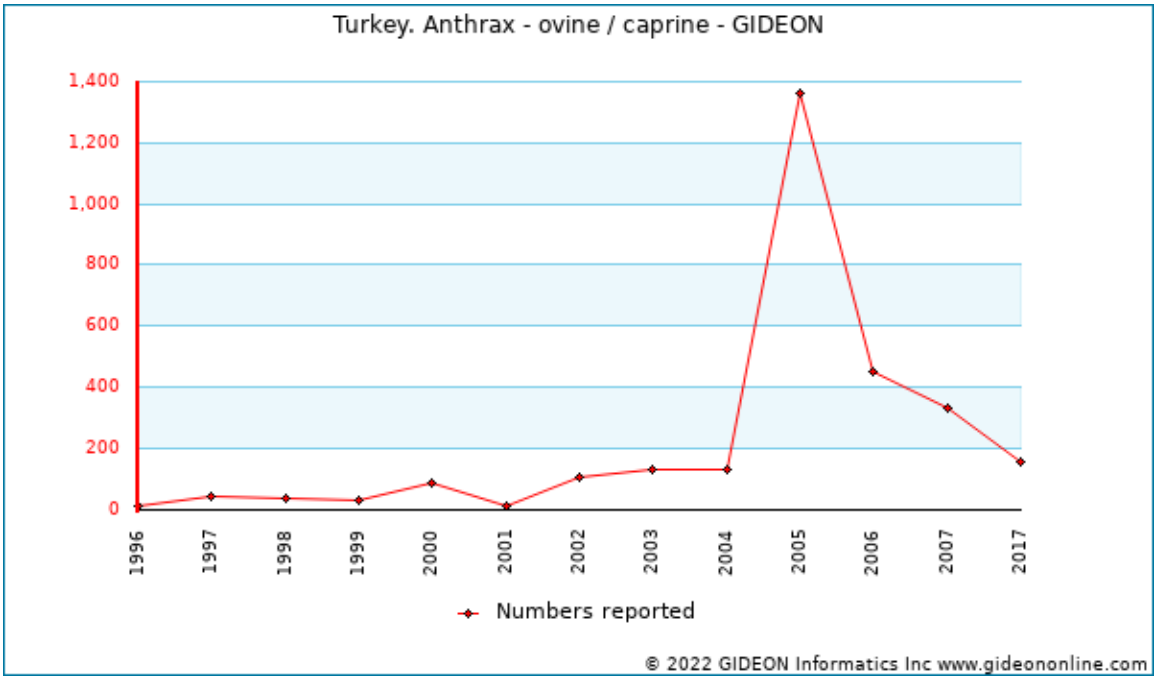


Graph: Turkey. Anthrax - ovine / caprine, outbreaks



Graph: Turkey. Anthrax - ovine / caprine

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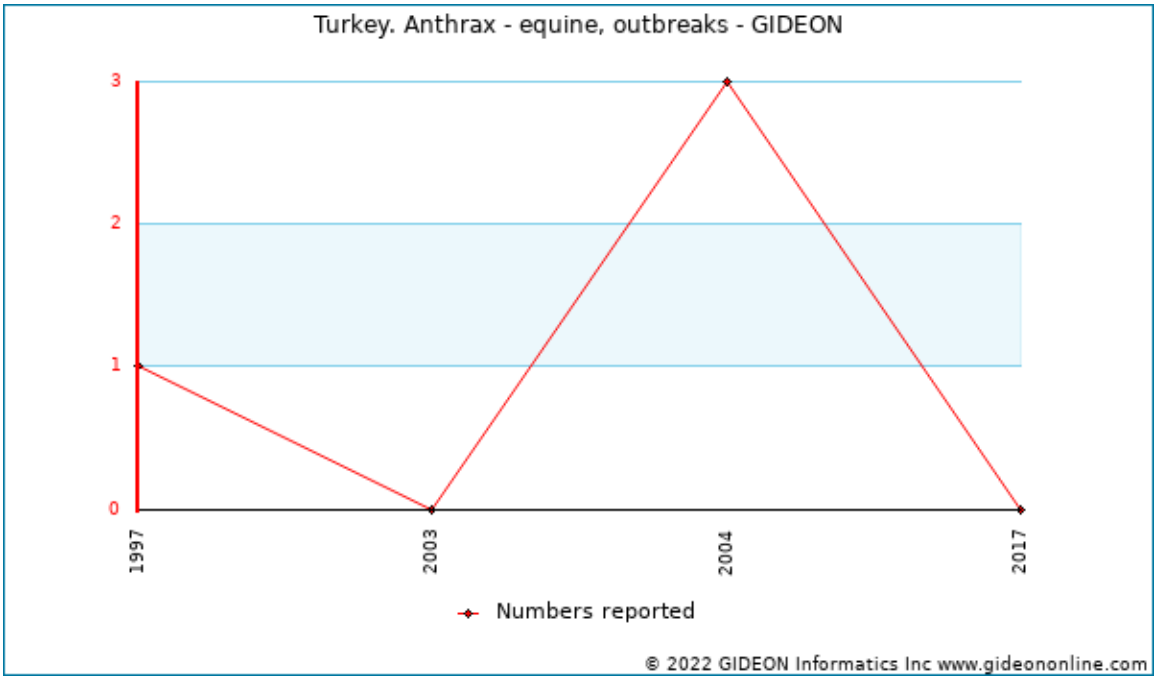
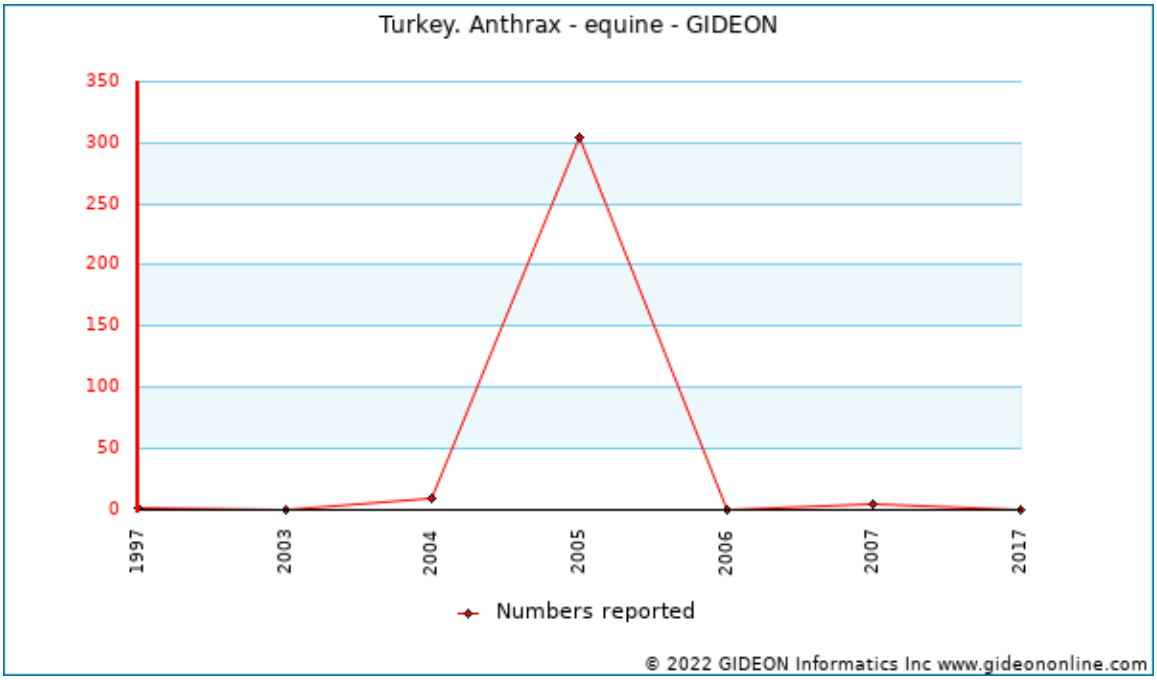


Graph: Turkey. Anthrax - equine, outbreaks



Graph: Turkey. Anthrax - equine

Notable outbreaks

Years	Region	Cases	Deaths	Clinical	Source	Population	Notes
2006	Hakkari	80				ruminants	15
2011	Hakkari-Yuksekova	46					16

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Years	Region	Cases	Deaths	Clinical	Source	Population	Notes
2014	Haymana	10			cattle		[17]
2015	Black Sea	4					[18]
2017			745			animals	99 outbreaks in cattle (590 deaths) and 9 in sheep (155 deaths) [19]
2018	Istanbul	8		cutaneous infection			[20]
2018	Trabzon	73	1		meat - beef		73 suspected cases, 3 confirmed [21] [22] [23]
2018	Multiple locations					cattle	Outbreaks of bovine anthrax were reported in 25 provinces to September. [24] [25] [26] [27] [28]
2019*	Erdine	6		cutaneous infection	meat		Outbreak of cutaneous anthrax in Trakya Region, Erdine [29]
2020	Trabzon				meat - beef		Outbreak of suspected anthrax - details pending [30]

* indicates publication year (not necessarily year of outbreak)

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Ascariasis

Agent	PARASITE - Nematoda. Secernentea: *Ascaris lumbricoides*
Reservoir	Human, Dog, Zoonotic
Vector	None
Vehicle	Vegetables, Fly
Incubation Period	10d - 14d (range 7d - >200d)
Diagnostic Tests	Stool microscopy. Ascaris lumbricoides adult: female - 20 to 49 cm; male - 15 to 30 cm
Typical Adult Therapy	Mebendazole 500 mg BID X 1 dose OR Albendazole 400 mg X 1 dose[1] [2]
Typical Pediatric Therapy	Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2).
Clinical Hints	- Highest rates among children and in areas of crowding and poor sanitation - Acute illness characterized by cough, wheezing and eosinophilia - Adult worms are associated with abdominal pain (occasionally obstruction), pancreatic or biliary disease - Passage of a roundworm longer than 5 cm is virtually pathognomonic
Synonyms	Ascaris, Ascaris lumbricoides, Askariasis. ICD9: 127.0 ICD10: B77

Ascariasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2000	Sanliurfa	children	43.17	43.17% of school children in Sanliurfa shanty towns [3]
2003 - 2005	Van	children	7.5	7.5% of school children ages 7 to 15 [4] [5]
2005	Van	children	6.6	6.6% of school children ages 7 to 15 [6]
2005*	Hakkari	children	6.14	6.14% of primary school children in Hakkari [7]
2006	Malatya	children	0.2	0.2% of children in Malatya [8]
2006*	Sivas	children	15.8	15.8% of primary school children in Siva [9]
2006*	Malatya	children	0.5	0.5% of primary school children in central Malatya [10]
2007*	Elazig	children	3	3% of primary school children in Elazig [11]
2007	Sanliurfa	children	18.39	18.39% of children ages <= 6 years, in Sanliurfa [12]
2008*	Yozgat	children	1.6	1.6% of primary school children in Yozgat [13]
2009*	Hatay	children	6.2	6.2% of orphans in Hatay [14]
2015*	Yigilca	children	0.19	0.19% of school children in Yigilca [15]
1991*	Mardin	students	12	12% of primary school students in Mardin [16]
1992*	Trabzon	students	31.4	31.4% of primary school students in Trabzon [17]
2010*	Van	students	2.6	2.6% of primary school students in Va [18]
1988 - 2012	Istanbul	patients	7	7% of parasites identified in stool specimens from hospitalized patients [19]

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Years	Region	Study Group	%	Notes
1997 - 2007	Van	patients	2.5	Survey of hospital outpatients [20]
2000 - 2007	Ankara	patients	16.7	16.7% of biliary parasitoses [21]
2003 - 2006	Istanbul	patients	0.5	0.5% of parasitic infections among hospitalized patients [22]
2005*	Sanliurfa	patients	2.1	2.1% of patients with diarrhea in Sanliurfa [23]
2006 - 2018	Sivas	patients	0.2	Survey of patients with gastrointestinal symptoms [24]
1976*	Ankara	general population	7.4	7.4% of individuals in poor districts of Ankara [25]
2006*	Anatolia	general population	4.8	4.8% of individuals in southeastern Anatolia [26]
2007*	Van	food handlers	1.21	1.21% of persons working in the food sector [27]
2009*	Sanliurfa	food handlers	10.7	10.7% of food-handlers in Sanliurfa [28]
2004 - 2005	Afyonkarahisar	water	1.5	1.5% of untreated wastewater in Afyonkarahisar [29]
1993 - 2006	Sivas	specimens - stool	1	1% of fecal samples processed at a university parasitology laboratory in Sivas [30]
1993 - 2000	Bursa	specimens - stool	0.22	0.22% of fecal samples processed at a university parasitology laboratory in Bursa [31]
1993 - 2000	Bursa	specimens - stool	0.22	0.22% of specimens examined at a parasitology laboratory in Bursa [32]
1997 - 2001	Istanbul	specimens - stool	4.73	4.73% of fecal samples examined in Istanbul
1999 - 2009	Istanbul	specimens - stool	0.03	0.03% of stool examinations from hospitalized patients [33]
2000 - 2006	Malatya	specimens - stool	3	3% of fecal samples analyzed in a single hospital in Malatya [34]
2005 - 2008	Kayseri	specimens - stool	0.12	0.12% of stools examined at a university parasitology laboratory [35]
2005	Hatay	specimens - stool	1	1% of stools examined at a university parasitology laboratory [36]
2007 - 2009	Tokat	specimens - stool	0.2	0.2% of stool specimens examined by Tokat public health laboratory [37]
2009	Van	specimens - stool	0.5	0.5% of stools examined at a laboratory in Van [38]
2010*	Bursa	vegetables	2	2% of unwashed vegetables [39]
2006*	Malatya	sanitation workers	0.05	0.05% of municipal sanitary worker in Malatya [40]
1999 - 2018	Malatya	specimens - tissue	0.03	Survey of appendectomy specimens [41]
2007	Kars	children - gastrointestinal	1.4	1.4% of children ages 2 to 6 years with gastrointestinal symptomatology seen at a hospital in Kars [42]
2012*	Eskisehir	children - gastrointestinal	1.3	1.3% of children with diarrhea [43]

* indicates publication year (not necessarily year of survey)

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Aspergillosis

Agent	FUNGUS. Ascomycota, Euascomycetes, Eurotiales: *Aspergillus*. A hyaline hyphomycete
Reservoir	Compost, Hay, Cereal, Soil
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	3d - 21d
Diagnostic Tests	Fungal culture. Biopsy. Nasal culture or serologic testing may be useful in select cases.
Typical Adult Therapy	Voriconazole 6 mg/kg IV Q12h, day 1; follow with 4 mg/kg IV OR Liposomal Amphotericin B 3 to 5 mg/kg/day OR Isavuconazole 200 mg q8h for 6 doses, then 200 mg daily[1]
Typical Pediatric Therapy	Voriconazole 9 mg/kg IV q12h, day 1; follow with 8 mg/kg IV q12h OR Liposomal Amphotericin B, dosing as for adults
Clinical Hints	- Pulmonary "fungus ball" or adult-onset asthma - Pulmonary consolidation or infected "pulmonary infarct" in the setting of immune suppression (e.g., AIDS, leukemia, etc) - May progress to widespread hematogenous dissemination if not treated promptly
Synonyms	Aspergillose, Aspergillus. ICD9: 117.3 ICD10: B44

Aspergillosis in Turkey

As of 2005, an estimated 2,228 patients were living with chronic pulmonary aspergillosis secondary to tuberculosis, with 707 new cases occurring each year. [2]

Notable outbreaks

Years	Region	Setting	Cases	Clinical	Pathogen	Population	Notes
2003 - 2004	Ankara	ophthalmology department	3	endophthalmitis	*Aspergillus ustus*	patients	Outbreak of postoperative *Aspergillus ustus* endophthalmitis [3]

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Babesiosis

Agent	PARASITE - Protozoa. Apicomplexa: *Babesia microti*, *Babesia duncani* (U.S.); or *B. divergens*, *Babesia* EU1 and *B. bigemina* (Europe)
Reservoir	Rodent (usually white-footed mouse = *Peromyscus leucopus*), Rabbit, Deer, Cattle, Tick, Zoonotic
Vector	Tick (*Ixodes scapularis* for *Babesia microti*; *Ixodes ricinus* for *B. divergens*)
Vehicle	Blood
Incubation Period	1w - 2w (range 1w - 9w)
Diagnostic Tests	Microscopy of stained blood smears. Animal inoculation. Serology. Nucleic acid amplification.
Typical Adult Therapy	Atovaquone 750 mg BID + Azithromycin 500 mg daily X 7 to 10 days. OR Clindamycin 600 mg PO TID + Quinine 650 mg PO TID X 7d. Exchange transfusion has been used in cases of high grade (>10%) parasitemia. [1] [2] [3]
Typical Pediatric Therapy	Atovaquone 20 mg/kg BID + Azithromycin 10 mg/kg on day 1, then 5 mg/kg daily X 7 to 10 days. OR Clindamycin 7 to 10 mg/kg PO TID + Quinine 8 mg/kg TID X 7 to 10 days.
Clinical Hints	- Fever, rigors, myalgia, hepatomegaly and hemolysis - mimics malaria - Multiple relapses are common - Severe disease among asplenic patients - jaundice, renal failure and death - European (*Babesia divergens*) infection is restricted to splenectomized patients is usually fatal
Synonyms	Anthemosoma garnhami, Babesia, Babesia bigemina, Babesia bovis, Babesia crassa, Babesia divergens, Babesia duncani, Babesia EU1, Babesia microti, Babesia motasi, Babesia odocoilei, Babesia sp. FR1, Babesia sp. XXB/HangZhou, Babesia venatorum, Babesiose, Colpodella. ICD9: 088.82 ICD10: B60.0

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

Babesiosis in Turkey

Sporadic cases of babesiosis are reported in humans. [4]

Prevalence surveys

Years	Region	Study Group	%	Notes
2015*	Black Sea	cattle	0.08-15.4	0.08% to 0.9% / 2.5% to 15.4% / 7.4% (*Babesia bovis* / *B. bigemina* / *B. divergens*) of cattle with clinical signs of babesiosis [5]
2017 - 2021	Tekiradag	cats	2.4	*Babesia microti* was identified in 2.4% of house cats [6]
2007 - 2008	Black Sea	ticks	3.33	3.33% of adult ticks in the Black Sea region (*Babesia* spp.) [7]
2013 - 2017	Istanbul	ticks	0.3	*Babesia* spp were found in 0.3% of ticks [8]
2014	Corum	ticks	0.93	*Babesia microti* identified in 0.93% of ticks [9]
2016 - 2020	Multiple locations	ticks	1.81	[10]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

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Years	Region	Study Group	%	Notes
2010*	Sivas	cattle	13.3-37.5	13.3% of cattle toward *Babesia bovis* and in 37.5% toward *Babesia bigemina*) [11]
2006 - 2007	Sinop	general population	6.23	6.23% of villagers in the Sinop region [12]

* indicates publication year (not necessarily year of survey)

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Bacillary angiomatosis

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

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Bacillus cereus food poisoning

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

Bacillus cereus food poisoning in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	Ankara	food	80	80% of stuffed mussels sold by street vendors in Ankara [2]
2019*		food	15.4-23.1	Toxigenic *Bacillus cereus* was identified in 15.4% and 23.1% (two toxins examined) of retail fish and ground beef [3]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Notes
1985	Sivas	work place	25	[4]

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Bacterial vaginosis

Agent	BACTERIUM. *Gardnerella vaginalis* (facultative gram-negative bacillus), *Mobiluncus curtisii*, *Mobiluncus mulieris*, *Prevotella*, et al
Reservoir	Human
Vector	None
Vehicle	Sexual contact, Normal flora in 14% (girls) to 70% (women)
Incubation Period	Unknown
Diagnostic Tests	Identification of "clue cells" or positive KOH test in vaginal discharge. Culture.
Typical Adult Therapy	Metronidazole 500 mg PO BID X 7d OR intravaginal Metronidazole 0.75% gel daily X 5 days OR Clindamycin 300 mg PO BID X 7d OR intravaginal Clindamycin 2% gel daily X 7 days Also treat sexual partner[1]
Typical Pediatric Therapy	Metronidazole 7.5 mg/kg BID X 7d
Clinical Hints	- Thin vaginal discharge - "fishy" odor when mixed with KOH - Mild to moderate pruritis - Urethritis may be present in sexual partner
Synonyms	Gardnerella, Gardnerella vaginalis, Mobiluncus. ICD9: 041.89,616,10,099.8 ICD10: N76.1

Bacterial vaginosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2003*		women	9.3-23.2	9.3% of women (Amstel criteria) vs. 23.2% (Nugent criteria) of women attending an inner-city family planning clinic for intrauterine device (IUD) insertion [2]
2005*		women	44.4	44.4% of women with trichomoniasis vs. 5.5% of women without trichomoniasis [3]
2005*	Gaziantep	women	26.8	26.8% of nonpregnant women (ages 18 to 45) with a clinical diagnosis of lower genital tract infection [4]
2006*		women	7.1	7.1% of women with an intrauterine contraceptive device, vs. 1.8% of a control group [5]
2020*		women	2.4-13.8	13.8% / 2.4% of women having a poor obstetric history with / without the presence of autoimmune antibodies [6]
2016 - 2017	Istanbul	transplant recipients	25	Survey of asymptomatic renal transplant recipients [7]
2001 - 2010		specimens	5.6	5.6% of cervical smears [8]
2004 - 2005	Denizli	specimens	8.3	8.3% of cervical smears [9]
2007 - 2011	Ankara	specimens	7.76	7.76% of cervical smears [10]
2002 - 2004	Duzce	patients - vaginitis	30.7	30.7% of women with cervicovaginitis [11]
2006*		patients - vaginitis	35.8	35.8% of symptomatic women [12]

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Years	Region	Study Group	%	Notes
2010*	Istanbul	patients - vaginitis	10.2	10.2% of women with vaginal discharge [13]
2012*	Konya	patients - vaginitis	13	13% of women ages 18 to 45 with vaginal discharge [14]
2015*		patients - vaginitis	5.2	5.2% of women with intrauterine devices and vaginal discharge [15]
2020*	Antalya	patients - vaginitis	11.2	[16]

* indicates publication year (not necessarily year of survey)

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Balantidiasis

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

Balantidiasis in Turkey

2004 (publication year) - A single case of *Balantidium coli* infection was reported. [2]

Prevalence surveys

Years	Region	Study Group	%	Notes
2009*	Multiple locations	pigs	1.6	1.6% of pig fecal samples [3]
2016 - 2017	Marmara	patients	2	Survey of appendectomy specimens [4]

* indicates publication year (not necessarily year of survey)

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Bartonellosis - cat borne

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

Bartonellosis - cat borne in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2008*	Ankara	cats	8.2	8.2% of cats in Ankara (*Bartonella henselae*) [2]
2017 - 2021	Tekiradag	cats	40.1	Survey of house cats [3]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2012*	Denizli	transplant recipients	16.9	16.9% of kidney transplant recipients [4]
2011*	Multiple locations	cats	12.5-41.3	41.3% of cats in Bursa, 33.9% in Adana, 32.9% in Aydin, 27.5% in Burdur, 17.9% in Kayseri and 12.5% in Istanbul [5]
2012*	Multiple locations	animal contact	22.2	22.2% of cattle breeders and veterinarians in rural Aydin and Denizli [6]
2009*	Denizli	blood donors	6	6% of blood donors in Denizli (*Bartonella henselae*) [7]
2011	Aydin	blood donors	3.3	3.3% of blood donors in Aydin Province [8]

* indicates publication year (not necessarily year of survey)

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Bartonellosis - other systemic

Agent	BACTERIUM. *Bartonella quintana*, *B. koehlerae*, *B. elizabethae*, *B. tamiae*, *B. washoensis*, etc A fastidious gram-negative coccobacillus
Reservoir	Human, Louse, Rat, Cat, Dog, Sheep, Zoonotic
Vector	Louse (*Pediculus*)Flea (*Ctenocephalides*, *Pulex*), Mite (*Dermanyssus*)
Vehicle	Wound or eye contact with secretions/louse feces
Incubation Period	9d - 25d (range 4d - 35d)
Diagnostic Tests	Serology. Culture. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg PO BID + Rifampin 300 mg BID X 4 to 6 weeks (neuroretinitis) OR Rifampin 300 mg BID +/- Gentamicin or Trimethoprim-Sulfamethoxazole X 14 days (hepatosplenic) If endocarditis, Doxycycline 100 mg PO BID X 4 weeks + Gentamicin 3 mg/kg daily X 2 weeks)[1] [2] [3]
Typical Pediatric Therapy	Rifampin 20 mg/kg/d X 14 days +/- Gentamicin or Trimethoprim-Sulfamethoxazole (hepatosplenic)
Clinical Hints	- Often associated with poor hygiene and crowding - Headache, myalgias, shin pain, macular rash and splenomegaly - Endocarditis and bacteremia in some cases - Relapse is common
Synonyms	Bartonella alsatica, Bartonella bovis, Bartonella capreoli, Bartonella doshiae, Bartonella elizabethae, Bartonella melophagi, Bartonella quintana, Bartonella rochalimae, Bartonella rousetti, 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 Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2006 - 2007	Ankara	dogs	9.2	9.2% of dogs in Ankara Province (bacteremia, *Bartonella vinsonii* subsp. *berkhoffii*) [4]
2014	Corum	ticks	0	[5]
2016 - 2020	Multiple locations	ticks	0	[6]
2017	Sinop	ticks	0.34-0.8	0.80% / 0.34% of *Ixodes ricinus* adults / nymphs [7]
2017*	Southeast Region	lice	13.1	*Bartonella quintana* DNA was found in 13.1% of *Pediculus humanus capitis* [8]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2010*	Multiple locations	dogs	6.6	6.6% of urban stray dogs, shepherd dogs and farm guard dogs from rural areas (*Bartonella vinsonii* subsp. *berkhoffii*) [9]
2017*	Ordu	animal	0	Survey of veterinarian, butchers and farmers [10]

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Years	Region	Study Group	%	Notes
		contact		

* indicates publication year (not necessarily year of survey)

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Blastocystis hominis infection

Agent	PARASITE - Protozoa. Chromista, Bigyra, Blastocystea: *Blastocystis hominis*. (taxonomic status remains uncertain)
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Water
Incubation Period	Unknown
Diagnostic Tests	Stool microscopy. Nucleic acid amplification.
Typical Adult Therapy	No treatment necessary for asymptomatic patients Nitazoxanide 500 mg BID X 3 d. OR Metronidazole 750 mg TID X 10d. OR Tinidazole 2 G Once OR Sulfamethoxazole / Trimethoprim[1] [2] [3]
Typical Pediatric Therapy	No treatment necessary for asymptomatic patients Nitazoxanide - Age 1 to 3 years: 5 ml (100 mg) PO Q12h X 3 days Age 4 to 11 years: 10 mg (200 mg) PO Q12h X 3 days; OR Metronidazole 15 mg/kg/d X 10d. OR Tinidazole (age >3) 50 mg/kg Once OR Sulfamethoxazole / Trimethoprim
Clinical Hints	The precise role of this organism in disease is controversial - Diarrhea and flatulence, usually without fever - The illness is similar to giardiasis - Increased risk among immune-suppressed patients
Synonyms	Apoi, Blastocystiose, Blastocystis hominis, Zierdt-Garavelli disease. ICD9: 007.8 ICD10: A07.8

Blastocystis hominis infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2003 - 2005	Van	children	27.4	27.4% of school children ages 7 to 15 in Van Province [4] [5]
2005*	Hakkari	children	23.6	23.6% of primary school children in Hakkari [6]
2005	Van	children	3.3	3.3% of school children ages 7 to 15 in Van Province [7]
2006	Malatya	children	0.6	0.6% of children in Malatya [8]
2006*	Sivas	children	1.1	1.1% of primary school children in Sivas [9]
2006*	Malatya	children	1.4	1.4% of primary school children in central Malatya [10]
2007	Kars	children	6.5	at a hospital in Kars [11]
2007*	Manisa	children	14.2	14.2% of primary school children in Manisa [12]
2007	Sanliurfa	children	1.15	1.15% of children ages <= 6 years, in Sanliurfa [13]
2007*	Izmir	children	14.6	14.6% of primary school children in Izmir [14]

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Years	Region	Study Group	%	Notes
2008*	Kocaeli	children	5.8	5.8% of children in Kocaeli [15]
2008*	Sivas	children	2.2	2.2% of primary school children in Sivas [16]
2009*	Denizli	children	14	14% of children ages 1 to 15 in Denizli Province [17]
2011*	Kayseri-Hacilar	children	23.5	23.5% of primary school children ages 6 to 14, in Kayseri-Hacilar region [18]
2013*	Istanbul	children	5.71	5.71% of children with *Helicobacter pylori* gastritis [19]
2016	Van	children	12.6	Survey of children hospitalized in an Intensive Care Unit [20]
2019*		adults - elderly	13.4	Survey of elderly patients in a nursing home [21]
2005*	Hatay	students	96.92	96.92% of female students ages 16 to 18, in Hatay [22]
2010*	Van	students	14.4	14.4% of primary school students in Van [23]
2010*	Kayseri	students	32.8	32.8% of foreign high school students [24]
2021*	Multiple locations	animals	19.4	Survey of farm and pet animals in Central Anatolia and the Middle Black Sea Region [25]
2008*	Van	workers	9.2	9.2% of slaughterhouse workers in Van Municipality [26]
2011*		workers	7.2	7.2% of administrators and workers in sanitary and non-sanitary institutions [27]
1997 - 2007	Van	patients	26.5	Survey of hospital outpatients [28]
2000*		patients	13	13% of patients with hematological malignancy, and 1% of healthy controls [29]
2001 - 2004	Bursa	patients	0.96	0.96% of inpatients and outpatients with gastrointestinal symptoms at a University Medical Faculty Hospital [30]
2003 - 2006	Istanbul	patients	59.7	59.7% of parasitic infections among hospitalized patients [31]
2003 - 2004	Izmir	patients	44.04	44.04% of patients with gastrointestinal complaints [32]
2005*	Sanliurfa	patients	22.6	22.6% of patients with diarrhea in Sanliurfa [33]
2005 - 2009	Izmir	patients	4.38	4.38% of stool specimens from patients with gastrointestinal symptoms, in Izmir [34]
2005 - 2008	Izmir	patients	4.83	4.83% of patients with gastrointestinal complaints at a University Medical Faculty Hospital [35]
2007*	Ankara	patients	12.2	12.2% of patients admitted to a hospital in Ankara [36]
2008*	Aydin	patients	22.6	22.6% of patients with iron-deficiency anemia, and 5.6% of a control group [37]
2009 - 2010	Bursa	patients	23.57	23.57% of patients with gastrointestinal complaints [38]
2011 - 2018	Izmir	patients	4.8	Survey of patients referred to a Parasitology laboratory. [39]
2015*	Corum	patients	30	30% of post-traumatic splenectomy patients and 13% of healthy controls [40]
2017 - 2019	Ankara	patients	12.7-21.8	12.7% / 21.8% of immune-deficient / immune-competent patients, with diarrhea [41]
2007*	Utah	adults	0.15-1.04	0.15% to 1.04% of persons over age 15 years in Kutahya [42] [43]
2012 - 2013	Kocaeli	patients - dialysis	23.9	23.9% of dialysis patients [44]
2008 - 2015	Izmir	immunocompromised	11	11% of patients with common variable immune deficiency syndrome [45]
2006*	Kayseri	general population	34.16	34.16% of individuals in the Kayseri Karpuzsekisi basin [46]

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Years	Region	Study Group	%	Notes
2006*	Kayseri-Karpuzsekisi	general population	34.16	34.16% of village residents in the Kayseri-Karpuzsekisi basin [47]
2007*	Multiple locations	food handlers	15.51	15.51% of food workers employed in hospitals [48]
2007*	Van	food handlers	4.87	4.87% of persons working in the food sector [49]
1988 - 2012	Istanbul	specimens - stool	6	6% of parasites identified in stool specimens from hospitalized patients [50]
1997 - 2001	Istanbul	specimens - stool	1.05	1.05% of fecal samples examined in Istanbul
1999 - 2009	Istanbul	specimens - stool	2.1	2.1% of stool examinations from hospitalized patients in Istanbul [51]
2000 - 2004	Ankara	specimens - stool	6.6	6.60% of stools examined at a laboratory in Ankara
2002 - 2004	Sivas	specimens - stool	0.4	0.4% of fecal samples processed at a university parasitology laboratory in Sivas [52]
2003 - 2007	Eskisehir	specimens - stool	7	7% of parasites found in stools at a university medical facility in Eskishir [53]
2003 - 2012	Ankara	specimens - stool	22	22% of stool parasites identified by a University Parasitology laboratory in Ankara [54]
2005	Izmir	specimens - stool	4.96	4.96% of stools examined at a university parasitology laboratory [55]
2005 - 2008	Kayseri	specimens - stool	19.72	19.72% of stools examined at a university parasitology laboratory [56]
2006 - 2010	Manisa	specimens - stool	7.64	7.64% of stools examined at a university parasitology laboratory in Manisa [57]
2007*	Ankara	specimens - stool	12.2	12.2% of fecal samples processed at a university hospital in Ankara [58]
2007*	Hatay	specimens - stool	25.3	25.3% of stools examined at the parasitology laboratory of the Mustafa Kemal University. [59]
2007*	Ankara	specimens - stool	12.2	12.2% of stools examined at a clinic laboratory in Ankara [60]
2009 - 2010	Izmir	specimens - stool	32.33	32.33% of stools examined at a laboratory in Izmir [61]
2009	Van	specimens - stool	15.4	15.4% of stools examined at a laboratory in Van [62]
2012 - 2014	Istanbul	specimens - stool	65.3	[63]
2012 - 2014	Istanbul	specimens - stool	63.23	Survey of specimens submitted to a hospital laboratory [64]
2015 - 2016	Sanliurfa	specimens - stool	25.6	[65]
2015*	Van	specimens - stool	0.54	0.54% of stools examined at a laboratory in Van [66]
2006*	Malatya	sanitation workers	3.3	3.3% of municipal sanitary workers in Malatya [67]
2019*		patients - skin	18.4	Survey of patients with urticaria [68]
2021*	Ankara	patients - immunocompromised	11	[69]
2018*	Istanbul	patients - HIV / AIDS	22.2	[70]
2018*	Izmir	patients - HIV / AIDS	10.8	[71]
2014 - 2016	Antalya	patients - inflammatory bowel disease	34	*Blastocystis hominis* was identified in 34% of patients with ulcerative colitis [72]
2005*	Hatay	children - gastrointestinal	9.09	9.09% of children ages 0 to 14 with gastrointestinal symptomatology, in Hatay [73]

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Years	Region	Study Group	%	Notes
2012*	Eskisehir	children - gastrointestinal	7.1	7.1% of children with diarrhea [74]

* indicates publication year (not necessarily year of survey)

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Borna virus encephalitis

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

Borna virus encephalitis in Turkey

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2002*	Marmara	horses	25	25% of horses [1]
2001*	Istanbul	cats	42.5	42.5% of cats [2]
2012*		various	4-14	4.9% of horses, 12% of sheep, 4% of goats, 14% of cattle and 6.6% of cats [3]

* indicates publication year (not necessarily year of survey)

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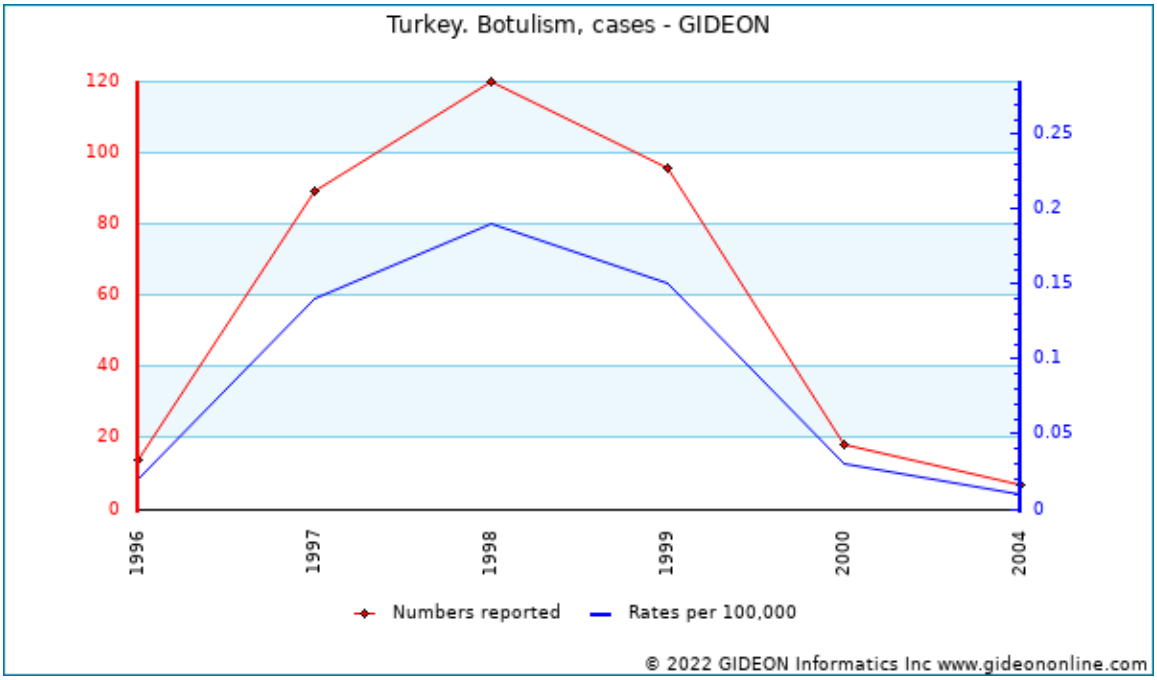
Botulism

Agent	BACTERIUM. *Clostridium botulinum*. An anaerobic gram-positive bacillus
Reservoir	Soil, Animal, Fish
Vector	None
Vehicle	Food, Soil (contamination of wound or injected drug)
Incubation Period	1d - 2d
Diagnostic Tests	Electrophysiologic (EMG) pattern. Isolation of organism from food (occ. from infant stomach). Mouse toxin assay
Typical Adult Therapy	Heptavalent (types A-G) antitoxin (following test dose) 1 vial (10-22 ml) in 100 ml saline over 30 min For wound botulism debridement AND Penicillin G 3 million units X6/day Respiratory support
Typical Pediatric Therapy	Age < 1 year: Botulism immune globulin 50 mg/kg 1-17 years: Heptavalent antitoxin, 20%-100% of adult dose: For weight >= 30 kg: % adult dose = weight (kg) + 30
Vaccine	Botulism antitoxin
Clinical Hints	- Clinical manifestations similar to those of atropine poisoning - Dysarthria, diplopia, dilated pupils, dry mouth, constipation, flaccid paralysis - Onset approximately 36 hrs after ingestion of poorly-preserved food - May follow contaminated injection (ie, illicit drug) or other wound - Infant botulism associated with infant formula containing honey contaminated by bacterial spores
Synonyms	Botulisme, Botulismo, Botulismus, Kerner's disease. ICD9: 005.1 ICD10: A05.1

Botulism in Turkey



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Graph: Turkey. Botulism, cases

Notes:
1. 95 cases (18 fatal) of botulism were published during 1983 to 2017. [1]
2. Eight fatal cases were reported in 1996; 10 in 1997; 0 in 1998.

- Home prepared foods, notably green beans, are implicated in most cases. [2] [3] [4]
- 2010 (publication year) - Four cases of iatrogenic botulism were caused by injections of botulinum toxin type A for treatment of blepharospasm. [5]

Cross-border events
Includes botulism associated with imported foods

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2008	Netherlands	Turkey	travel	8	Outbreak among Dutch adults who had returned from a Mediterranean cruise was ascribed to contaminated black olives consumed in Turkey. [6] [7]

** Country or Nationality

Prevalence surveys

Years	Region	Study Group	%	Notes
2014*	Samsun	honey	2.6	2.6% of honey samples in Samsun (type C botulinum toxin) [8]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Source	Population	Notes
2005	Anatolia	10	yoghurt		Outbreak in eastern Anatolia was associated with ingestion of suzme (condensed yoghurt buried under soil). [9]
2008		8	olives	adults	Outbreak among Dutch adults who had returned from a Mediterranean cruise was ascribed to contaminated black olives consumed in Turkey. [10] [11]

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Brain abscess

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

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Brucellosis

Agent	BACTERIUM. *Brucella abortus*, *Brucella melitensis*, *Brucella suis*, *Brucella canis* An aerobic gram-negative bacillus
Reservoir	Pig, Cattle, Sheep, Goat, Dog, Coyote, Caribou, Zoonotic
Vector	None
Vehicle	Food, Air, Dairy products, Animal excretions, Breastfeeding
Incubation Period	10d - 14d (range 5d - 60d)
Diagnostic Tests	Culture of blood or bone marrow. Serology. Note: Alert laboratory to possibility of Brucella.
Typical Adult Therapy	Doxycycline 100 mg BID X 6 weeks PLUS Rifampin 600 mg once daily X 6 weeks. OR Gentamicin 5 mg/kg daily X 7 days OR Streptomycin 1 g IM daily X 14 days[1] [2] [3]
Typical Pediatric Therapy	Rifampin 20 mg/kg/day (maximum 600 mg) PLUS if age >8 years: Doxycycline 2 mg/kg BID PO X 6w if age <8 years Sulfamethoxazole / Trimethoprim 4/20 mg/kg BID X 4 to 6w Consider adding aminoglycoside if severe
Clinical Hints	- Prolonged fever, hepatosplenomegaly, lymphadenopathy - Arthritis, osteomyelitis or chronic multisystem infection - Follows ingestion of unpasteurized dairy products, contact with farm animals or meat processing
Synonyms	Bang's disease, Bangsche Krankheit, Brucella, Brucellemia, Brucelliasis, Brucellose, Brucellosen, Brucellosi, Brucelose, Brucelosis, Cyprus fever, Febris melitensis, Febris sudoralis, Febris undulans, Fievre caprine, Gibraltar fever, Goat fever, Malta fever, Maltafieber, Melitococcosis, Neapolitan fever, Rock fever, Typhomalarial fever, Undulant fever. ICD9: 023 ICD10: A23

Brucellosis in Turkey

Time and Place

Human disease in Turkey is due to *Brucella abortus* and *B. melitensis*. [4] [5]

- Rare instances of human infection by *B. canis* are also encountered. [6]
- *Brucella suis* was isolated from a human for the first time in Turkey in 2016 (publication year) [7]
- Routine vaccination of animals has been utilized in Turkey since 1984. [8]
- A review of brucellosis in Turkey (2012) [9]

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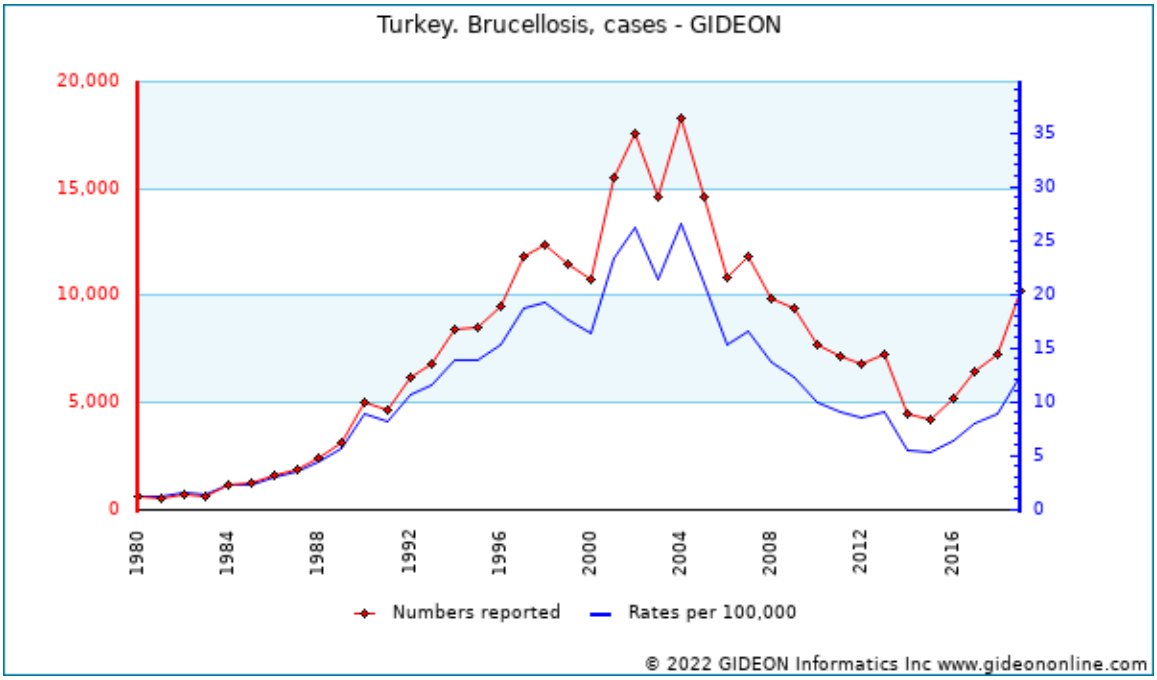

Graph: Turkey. Brucellosis, cases

Notes:
1. Disease notification rates are 31.8% of actual disease incidence (Izmir, 2003) [10]

2005 - A Czech tourist acquired brucellosis in Turkey. [11]

Case-series

- 1997 to 2006 - 36 cases of neuro-brucellosis were reported from a hospital. [12]
- 2000 to 2010 - 97 cases of pediatric brucellosis were treated at a hospital in Ankara. [13]
- 2000 to 2013 - 390 cases of genitourinary brucellosis were treated among 34 institutions. [14]
- 2002 to 2005 - 128 cases of neurobrucellosis were treated at a hospital in Ankara. [15]
- 2002 to 2015 - 242 cases of brucellosis during pregnancy were analyzed in a multicenter study. Obstetric complications occurred in 34 cases, 15 aborted and 5 had intrauterine demise. [16]
- 2003 to 2005 - 151 cases of brucellosis were reported from a clinic in Ankara. [17]
- 2004 to 2011 - 447 cases of brucellosis were treated at a clinic in Ankara. [18]
- 2005 to 2021 - 189 cases (40.2% bacteremic) of brucellosis in children ages 1 month to 18 years diagnosed in a pediatric infectious diseases clinic in Ankara [19]
- 2006 to 2013 - 28 cases of brucellar epididymo-orchitis were reported among 4 institutions. [20]
- 2009 (publication year) - 1,028 cases of brucellosis were reported from an institution during a 10-year period. [21]
- 2009 to 2013 - 496 cases of pediatric brucellosis were treated in Van Province [22]
- 2010 to 2018 - 25 cases of brucellar epididymo-orchitis were treated at two centers. [23]
- 2012 to 2013 - 202 children were treated for brucellosis at a hospital in Gaziantep, including 53 with osteoarticular involvement. [24]
- 2014 to 2015 - 98 cases of pediatric brucellosis were treated at a hospital in Van. [25]
- 2016 (publication year) - 622 cases of pediatric brucellosis were treated at a hospital in Van Province during a six-year period (2016 publication) [26]
- 2016 (publication year) - 263 cases of neurobrucellosis were treated among 26 referral centers (2016 publication) [27]
- 2017 to 2018 - 248 cases of pediatric brucellosis were treated at a hospital in Van. [28]
- 2018 - 210 cases of brucellosis were treated at a hospital in Konya. [29]

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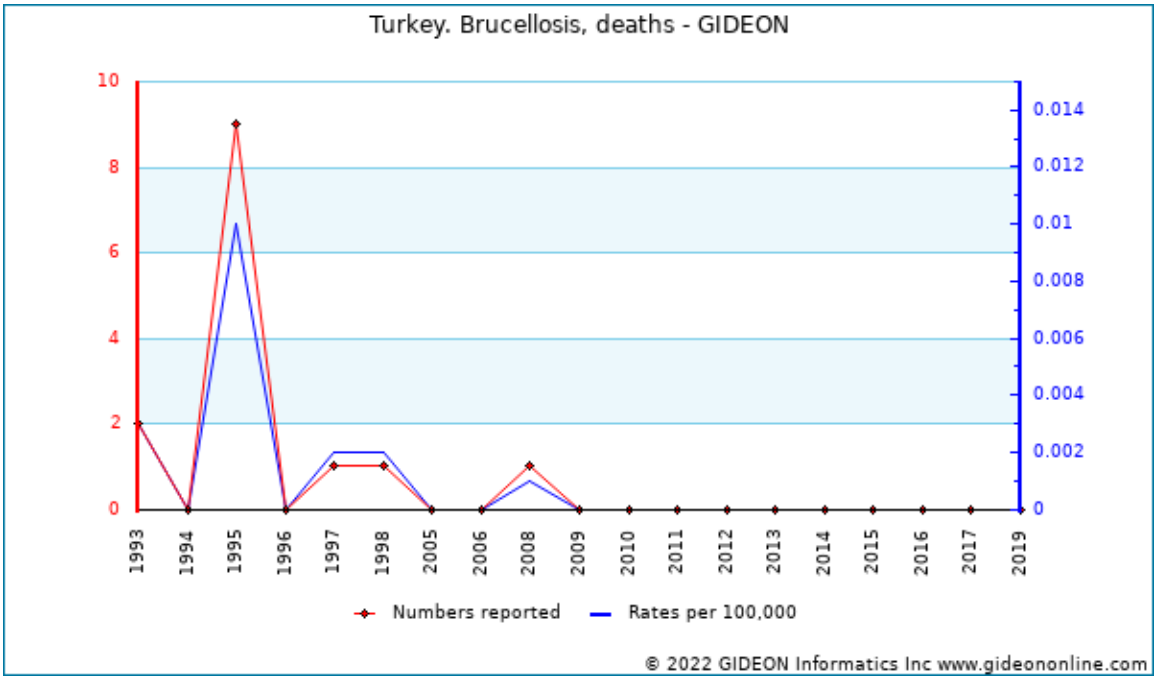

Graph: Turkey. Brucellosis, deaths

- 2012 (publication year) - 5.8% of Turkish laboratory workers reported a history of laboratory-associated brucellosis. [30]

Prevalence surveys

Years	Region	Study Group	%	Notes
2003 - 2008	Aegean	children	15.2	15.2% of fever of unknown origin among children [31]
1988 - 2009	Ankara	patients	0.6	Brucellosis was the cause of infectious uveitis in 0.6% of patients. [32]
2019	Konya	ruminants	5.2-20.9	*Brucella abortus* infection was associated with 5.2% of ruminant abortions and *B. melitensis* with 20.9% [33]
2013*	Black Sea	patients - fever	8	8% of patients ages 18 to 45, with acute fever [34]
2016*	Edirne	milk	2.02	2.02% of raw bovine milk [35]
2016	Anatolia	milk	17.32	17.32% of raw milk samples [36]
2013 - 2014	Van	patients - hepatitis	9	Active brucellosis was identified in 9% of patients with Delta hepatitis [37]
2007*	Nationwide	patients - fever (Literature Review)	12.6	12.6% of infectious causes for fever of unknown origin [38]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2014*	Anatolia	children	0.5	0.5% of children in the middle Anatolia region [39]
2008	Adana	cattle	3.03	3.03% of cattle in Adana Province [40]
2013	Sanliurfa	women	11.5	11.5% of reproductive-age female farm workers were found to be seropositive (Rose-Bengal) [41]
2010	Konya	patients	0.34	0.34% of patients with symptoms of brucellosis [42]
2011*		patients	8.9	8.9% of patients with symptoms of brucellosis [43]

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Years	Region	Study Group	%	Notes
2015*		patients	17	17% of household members of brucellosis patients [44]
2008	Kars	sheep	36.7	36.7% of sheep undergoing abortion [45]
2008*		sheep	27.8	27.8% of sheep at slaughter [46]
2003*	Anatolia	adults	3.2	3.2% of elderly adults in mid-Anatolia [47]
2004*	Bolu	general population	1	1% of individuals in the Bolu region [48]
2006*	Anatolia	general population	2.9-8.5	2.9% to 8.5% of individuals in rural west Anatolia [49]
2008*	Eastern Region	general population	11.9	11.9% of individuals in rural areas of Eastern Turkey [50]
2012*	Anatolia	general population	8.8	8.8% of villagers in eastern Anatolia [51]
2008	Konya	animal contact	9.2	9.2% of persons at-risk in Konya Province
2017*	Ordu	animal contact	7.8	Survey of veterinarian, butchers and farmers [52]
2006*	Multiple locations	patients - fever	33	33% of veterinarians [53]
2010	Kocaeli	blood donors	1.6	1.6% of healthy blood donors in Kocaeli Province [54]
2017*		patient contacts	36.8	36.8% of family members of brucellosis patients were found to be seropositive [55]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Source	Notes
1979	Ankara	village	23		[56]
2019	Mus		15	food	[57]

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Bunyaviridae infections - misc.

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

Although Bunyaviridae infections - misc. is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Bunyaviridae infections - misc. in Turkey

2009 (publication year) - The ecosystem of European Turkey could possibly support the presence of Bhanja virus. [1]

2018 (publication year) - Tamdy virus was identified in ticks collected from *Meriones tristrami* in Anatolia. [2]
2018 (publication year) - Tamdy virus was identified in ticks (*Hyalomma aegyptium*) in Anatolia. [3]

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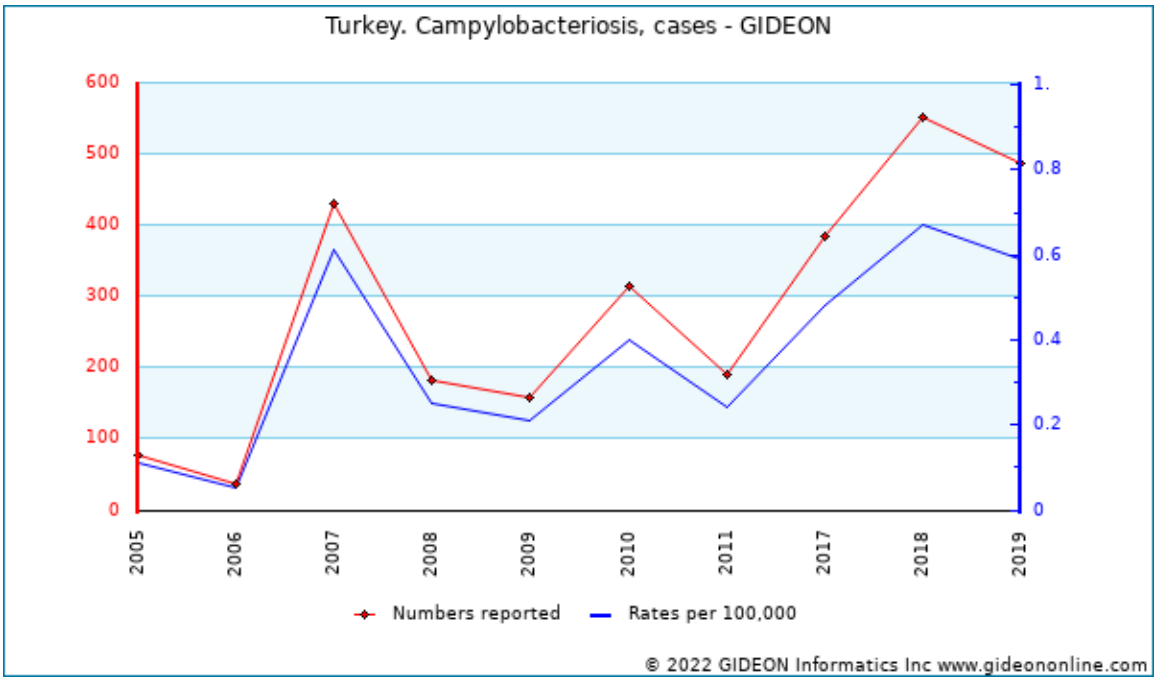
Campylobacteriosis

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

Campylobacteriosis in Turkey

Campylobacter jejuni is the second most common agent for diarrhea among children under age 14 years.



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Graph: Turkey. Campylobacteriosis, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
2009*	Incirlik	military personnel	12	12% of travelers' diarrhea cases among American military personnel in Incirlik [2]
2008*		poultry workers	12.1-40.4	12.1% (*Campylobacter coli*) to 40.4% (*C. jejuni*) of poultry at slaughter [3]
2013*		birds	29.2	29.2% of fecal samples from bald ibis (*Geronticus eremita*) [4]
2017 - 2018	Multiple locations	birds	5.2-93	5.2% / 93% of Song thrushes / Eurasian coots [5]
2007*	Ankara	transplant recipients	4	4% of diarrhea episodes in kidney or liver transplant patients. [6]
2005 - 2008	Ankara	patients	0.06	0.06% of patients hospitalized with acute gastroenteritis [7]
2019	Konya	ruminants	20.9	*Campylobacter fetus* infection was associated with 20.9% of ruminant abortions [8]
2005 - 2006	Istanbul	various	11.1-50.4	11.1% of beef carcasses, 21.6% mutton, and 50.4% chicken [9]
1999*	Ankara	milk	8.05	8.05% of raw milk samples (1999 publication) [10]
2009 - 2010	Elazig	poultry - chicken	14.4-41.7	14.4% (*Campylobacter coli*) to 41.7% (*C. jejuni*) of chicken meat [11]
2018	Kayseri	environmental	11.3	Survey of samples from slaughterhouses [12]
2018*		patients - inflammatory bowel disease	5	5% of patients with ulcerative colitis [13]
1989 - 1990	Ankara	children - gastrointestinal	10.6	10.6% of diarrhea below age 15 years requiring hospitalization [14]
1993 - 1994	Ankara	children - gastrointestinal	8.3	8.3% of diarrhea below age 14 years [15]

* indicates publication year (not necessarily year of survey)

Cross-border events

Does not include individual case reports

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2009	United Kingdom	Turkey	travel	87	Outbreak of gastroenteritis caused by *Salmonella enterica* serovar Enteritidis, *Campylobacter* and/or *Cryptosporidium* was associated with a resort in Sarigeme, Turkey.

** Country or Nationality

Notable outbreaks

Years	Region	Cases	Pathogen	Population	Notes
2009	Sarigerme	87	multiple pathogens	tourists	Outbreak caused by *Salmonella enterica* serovar Enteritidis (47 cases), *Campylobacter* (2 cases) and/or *Cryptosporidium* (31 cases) was reported among British tourists returning from a resort in Sarigeme, Turkey.

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Candidiasis

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

Candidiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2001 - 2010		women	2.7	2.7% of cervical smears [3]
2004 - 2005	Denizli	women	6.9	6.9% of cervical smears [4]
2005*	Gaziantep	women	38.8	38.8% of nonpregnant women (ages 18 to 45) with a clinical diagnosis of lower genital tract infection [5]
2007 - 2011	Ankara	women	2.81	2.81% of cervical smears [6]
2016 - 2017	Istanbul	transplant recipients	2.5	Survey of asymptomatic STD among renal transplant recipients [7]
2002 - 2004	Duzce	patients - vaginitis	18.4	18.4% of women with cervicovaginitis [8]
2005*		patients - vaginitis	14	14% of women with an intrauterine contraceptive device, vs. 8% of a control group (vaginitis [9]
2010*	Istanbul	patients - vaginitis	17.4	17.4% of women with vaginal discharge (microbiologic diagnosis [10]
2012*	Konya	patients - vaginitis	16	16% of women ages 18 to 45 with vaginal discharge [11]
2015*		patients - vaginitis	7.3	7.3% of women with intrauterine devices and vaginal discharge [12]
2020*	Antalya	patients - vaginitis	14.9	[13]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Deaths	Clinical	Pathogen	Notes
2002*	Kayseri	hospital	9			*Candida*	children. Outbreak associated with bottles used for

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Years	Region	Setting	Cases	Deaths	Clinical	Pathogen	Notes
						glabrata	milk feedings [14]
2012	Istanbul	intensive-care unit	13	5	fungemia		adults. [15]
2016*	Van	neonatal unit	7		fungemia	*Candida albicans*	neonates. [16]

* indicates publication year (not necessarily year of outbreak)

Case series

- 2007 to 2019 - 225 isolates of *Candida parapsilosis* were recovered from 223 patients in a hospital in Izmir. 38.1% of the infections were fatal. [17]
- 2012 to 2018 - 126 cases (5 fatal) of candidemia in children ages >7 years were reported from a hospital in Izmir. [18]
- 2020 to 2021 - Three cases of *Candida auris* infection were reported from an Intensive Care Unit in Istanbul. [19]
- 2020 to 2021 - Clinical characteristics of 63 Intensive Care patients with COVID-19 and candidemia [20]

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Capillariasis - extraintestinal

Agent	PARASITE - Nematoda. *Capillaria hepatica* (*Calodium hepaticum*), *Capillaria aerophila*, *Anatrichosoma cutaneum*
Reservoir	Rat, Dog, Cat, Monkey, Soil, Earthworm, Zoonotic
Vector	None
Vehicle	Soil Earthworm
Incubation Period	21d -28d
Diagnostic Tests	Visualization of ova or adults in liver, lung or dermal tissue. Capillaria hepatica adult: female - 53 to 78 mm; male - 24 to 37 mm
Typical Adult Therapy	Consider Thiabendazole 25 mg/kg/day X 30d[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Three infecting species, associated with: - Bronchitis or pneumonia - Acral pruritic rash - Tender hepatomegaly, abdominal distention, eosinophilia and fever
Synonyms	Anatrichosoma cutaneum, Calodiasis, Calodium hepaticum, Capillaria aerophila, Capillaria hepatica, Capillariasis - pulmonary, Capillary liver worm, Eucoleus aerophilus, Hepatic capillariasis, Thominx aerophilus. ICD9: 128.8 ICD10: B83.8

Capillariasis - extraintestinal in Turkey

- 1954 - A single case of extraintestinal capillariasis was reported from Istanbul.

2014 (publication year) - *Capillaria hepatica* infection was identified in a mouse (*Apodemus flavicollis*) in Giresun Province. [2]

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Chancroid

Agent	BACTERIUM. *Haemophilus ducreyi*. A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Sexual contact
Incubation Period	3d - 10d (2d - 21d)
Diagnostic Tests	Culture (inform laboratory when this diagnosis is suspected). Fluorescent staining under development
Typical Adult Therapy	Azithromycin 1.0 g PO X 1 dose. OR Ceftriaxone 250 mg IM X 1 dose. OR Ciprofloxacin 500 mg PO BID X 3 days OR Erythromycin 500 mg PO TID X 7d.[1] [2] [3]
Typical Pediatric Therapy	Azithromycin 20 mg/kg PO X 1 dose OR Erythromycin 10 mg/kg PO TID X 7d. OR Ceftriaxone10 mg/kg IM X 1
Clinical Hints	- Soft, painful and tender chancre on erythematous base - Regional lymphadenopathy - generally unilateral and painful - Onset three-to-ten days following sexual exposure
Synonyms	Blot sjanker, Chancre mou, Chancro blando, Haemophilus ducreyi, Nkumunye, Soft chancre, Ulcera mole, Ulcus molle, Weeke sjanker, Weicher Schanker. ICD9: 099.0 ICD10: A57

Chancroid in Turkey

Notable outbreaks

Years	Region	Cases	Notes
1976 - 1977	Istanbul	240	240 cases were treated at a single hospital [4]
1981	Foreign Country	25	This outbreak in Austria was ascribed to infection from Turkish prostitutes [5]

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1. Sex Transm Dis 1994 Jul-Aug;21(4):231-4.
2. MMWR Recomm Rep 2015 Jun 05;64(RR-03):1-137.
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Chikungunya

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

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

Chikungunya in Turkey

2010 - Chikungunya was confirmed in a Turkish government employee returning from India. [1]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2015	Kirikkale	blood donors	0.4	[2]

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Chlamydia infections, misc.

Agent	BACTERIUM. Chlamydiaceae, Chlamydiae, *Chlamydia trachomatis*; *Simkania negevensis*; *Waddlia chondrophila*
Reservoir	Human
Vector	None
Vehicle	Sexual contact
Incubation Period	5d - 10d
Diagnostic Tests	Microscopy and immunomicroscopy of secretions. Serology. Tissue culture. Nucleic acid amplification.
Typical Adult Therapy	Azithromycin 1g as single dose OR Doxycycline 100 mg BID X 7d. OR Levofloxacin 500 mg daily X 7 days OR Ofloxacin 300 mg BID X 7 days[1] [2]
Typical Pediatric Therapy	Weight <45 kg: Erythromycin 12.5 mg/kg QID X 14d Weight >=45 kg, but age <8 years: Azithromycin 1 g as single dose Age >= 8 years: Azithromycin 1 g as single dose OR Doxycycline 100 mg BID X 7 d
Clinical Hints	- 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 suis, Chlamydia trachomatis, Chlamydien-Urethritis, Chlamydien-Zervizitis, Chlamydophila, Inclusion blenorrhea, Non-gonococccal urethritis, Nonspecific urethritis, Parachlamydia, Parachlamydia acanthamoebae, Prachlamydia, Protochlamydia, Protochlamydia naegleriophila, Rhabdochlamydia, Simkania negevensis, Waddlia chondrophila. ICD9: 099.41,099.5 ICD10: A56,A55

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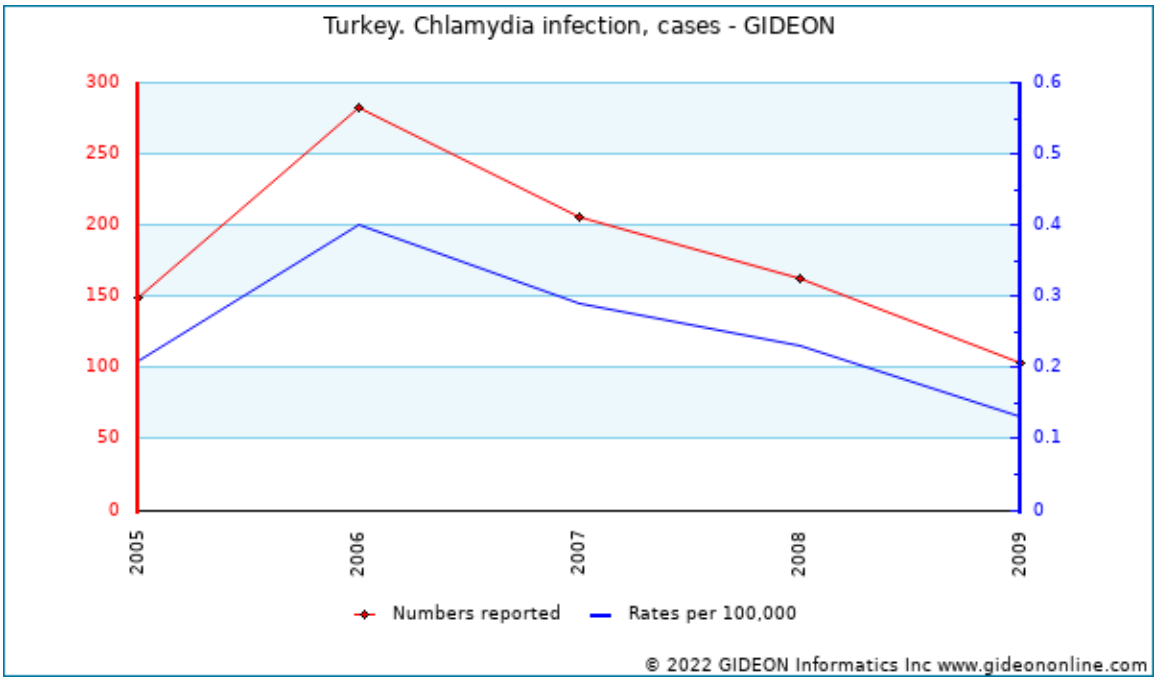
Chlamydia infections, misc. in Turkey



Graph: Turkey. Chlamydia infection, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
2002*		women	20	20% of women with "genital complaints" [3]
2005*		women	12.7	12.7% of sexually-active women [4]
2007*	Ankara	women	24.5	24.5% of non-pregnant women (16.2% with and 28.8% without gynecological symptoms) at a university hospital [5]
2008*	Trabzon	women	12.7	12.7% of young adult low-risk women attending inner-city family planning clinics [6]
2010*		women	1.11-5.16	5.16% of symptomatic, 1.11% of asymptomatic and in 2.15% of infertile women [7]
2013*	Istanbul	women	9.1	9.1% of patients with cervical cancer and 0% of a control group [8]
2001*	Istanbul	patients	15.7	15.7% of male urethritis [9]
2003 - 2004	Ankara	patients	6.34	6.34% of male urethritis [10]
1997 - 1998	Istanbul	general population	1.9	1.9% of family planning clinic clients [11]
2010*	Ankara	sex workers	1.4	[12]
2018*	Ankara	patients - STD	3.2	Survey of patients with "resistant discharge" [13]
2015*		patients - vaginitis	5.2	5.2% of women with intrauterine devices and vaginal discharge [14]
2020*	Antalya	patients - vaginitis	0.9	[15]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

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Years	Region	Study Group	%	Notes
2009*	Ankara	women	52.2	52.2% of women above age 15 [16]
2003 - 2005	Ankara	pregnant women	25	25% of women with ectopic pregnancy vs. 9.6% of controls [17]

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

2015 (publication year) - *Simkania negevensis* was not identified during a study of pediatric community-acquired pneumonia in Kayseri, bronchiolitis and asthma exacerbation. [18]

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Chlamydia pneumoniae infection

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

Chlamydia pneumoniae infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	Gaziantep	patients	30	30% of vascular samples from patients with atherosclerosis, 16.7% those without atherosclerosis, 24.2% of patients undergoing aortic valve replacement and 21.4% undergoing mitral valve replacement [2]
2012*	Istanbul	patients	0	0% of pediatric acute respiratory tract infections [3]
2012*	Manisa	patients	3.2	3.2% of adults with community-acquired pneumonia [4]
2008*	Adana	patients - asthma	28.6	28.6% of adults with stable asthma [5]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1998*	Izmir	children	18.7-64.3	64.3% of adults and 18.7% of children in Izmir ([6]
2004*	Kirikkale	patients	17.1	17.1% of pediatric and 13.3% of adult respiratory tract infection [7]
2012*	Sivas	patients	100	100% of patients with atherosclerosis vs. 94% of a control group [8]
2015*	Kirikkale	patients	98	98% of patients with Parkinson's disease vs. 92% of a control group [9]
2017*	Istanbul	patients -	44	44% of patients with schizophrenia were seropositive vs. 37% of a control

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Years	Region	Study Group	%	Notes
		psychiatric		group [10]
1991*	Istanbul	children - respiratory	5	5% of children hospitalized for pneumonia [11]
2004 - 2005	Istanbul	children - respiratory	5.8	5.8% of children aged 5 to 15 years seen at an outpatient clinic with lower respiratory infection; in 3.5% of cases, *Mycoplasma pneumoniae* serology (IgM) was also positive. [12]
2006*	Izmir	children - respiratory	2	2% of children ages 3 months to 12 years hospitalized for respiratory infection [13]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Population	Notes
2007*	Izmir	39	military recruits	[14]

* indicates publication year (not necessarily year of outbreak)

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1. Expert Rev Anti Infect Ther 2003 Oct ;1(3):493-503.
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Cholecystitis and cholangitis

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

Cholecystitis and cholangitis in Turkey

2000 to 2007 - Parasites accounted for 0.66% of biliary disease among patients undergoing ERCP in Ankara. [1]

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Cholera

Agent	BACTERIUM. *Vibrio cholerae* A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Water, Fecal-oral, Seafood (oyster, ceviche), Vegetables, Fly
Incubation Period	1d - 5d (range 9h - 6d)
Diagnostic Tests	Stool culture. Advise laboratory when this organism is suspected.
Typical Adult Therapy	Stool precautions. Doxycycline 300 mg single dose OR Tetracycline 500 mg Q6h X 3d OR Azithromycin 1000 mg single dose OR Erythromycin 500 mg Q6h X 3d OR Ciprofloxacin 1000 mg single dose Fluids (g/l): NaCl 3.5, NaHCO3 2.5, KCl 1.5, glucose 20 IV Ringer's lactate if severe[1]
Typical Pediatric Therapy	Stool precautions. Doxycycline 4-6 mg/kg single dose OR Tetracycline 10-12 mg/kg Q6h X 3d OR Azithromycin 20 mg/kg single dose OR Erythromycin 10 mg/kg Q6h X 3d Fluids as for adult
Vaccine	Cholera - injectable vaccine Cholera - oral vaccine
Clinical Hints	- Massive, painless diarrhea and dehydration - Occasionally vomiting - Apathy or altered consciousness are common - Rapid progression to acidosis, electrolyte imbalance and shock - Fever is uncommon
Synonyms	Colera, Kolera. ICD9: 001 ICD10: A00

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

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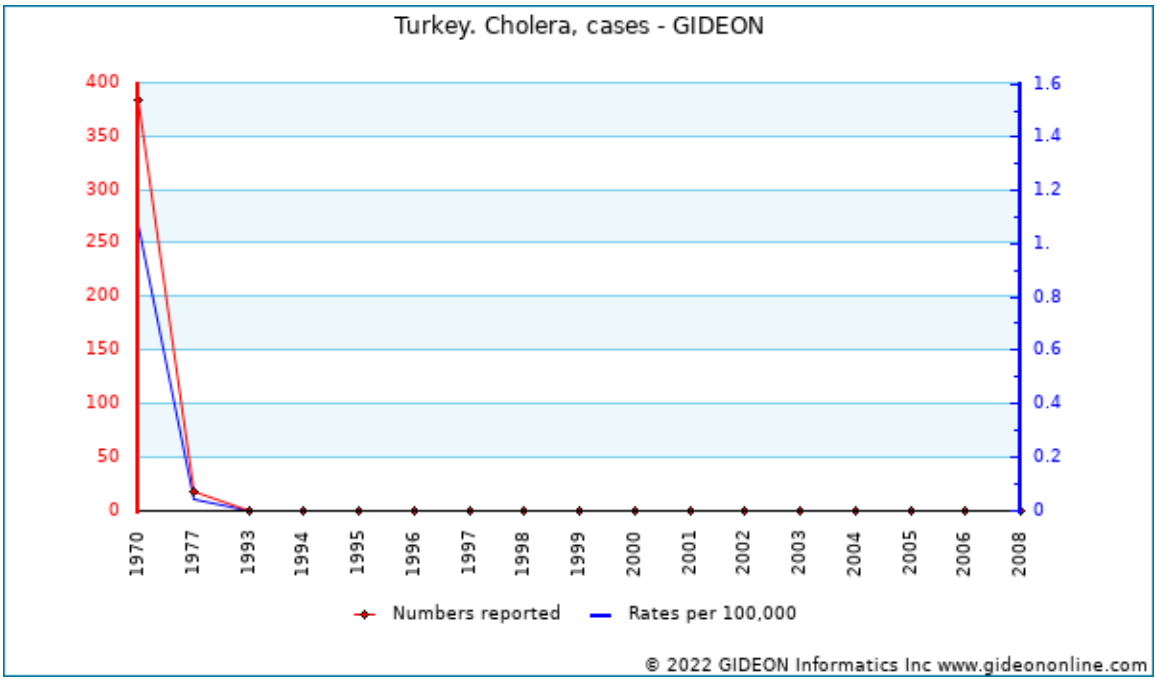
Cholera in Turkey



Graph: Turkey. Cholera, cases

Cross-border events

Outbreaks among tourists, refugees and other groups

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2005	Belgium	Turkey	travel	6	2 confirmed and 4 probable cases among Belgian tourists in Turkey. [2] [3]

** Country or Nationality

Notable outbreaks

Years	Region	Cases	Deaths	Population	Notes
1847	Istanbul				[4]
1893 - 1894	Multiple locations				Outbreak in Istanbul, later spreading to Iznik, Salonika and Anatolia [5]
1911	Multiple locations	18,576	143		Outbreak of cholera affected the Ottoman Empire [6]
1970	Istanbul	16			[7]
2005		6		tourists	Outbreak (2 confirmed and 4 probable cases) among Belgian tourists in Turkey [8] [9]

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Chromomycosis

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

References

1. Clin Microbiol Rev 2017 01 ;30(1):233-276.

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Chronic meningococcemia

Agent	BACTERIUM. *Neisseria meningitidis* An aerobic gram-negative coccus
Reservoir	Human
Vector	None
Vehicle	Air, Infected secretions
Incubation Period	Unknown
Diagnostic Tests	Blood culture. Test patient for complement component deficiency.
Typical Adult Therapy	Ceftriaxone 2 g IV BID X 7-10d[1]
Typical Pediatric Therapy	Ceftriaxone 50 mg/kg BID X 7-10d
Clinical Hints	- Recurrent episodes of low-grade fever, rash, arthralgia and arthritis - May persist for months - Rash is distal and prominent near joints and may be maculopapular, petechial or pustular - In some cases, associated with complement component-deficiency
Synonyms	Meningococcemia, chronic. ICD9: 036.2 ICD10: A39.3

References

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

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Clostridial food poisoning

Agent	BACTERIUM. *Clostridium perfringens* An anaerobic gram-positive bacillus
Reservoir	Soil, Human, Pig, Cattle, Fish, Poultry
Vector	None
Vehicle	Food
Incubation Period	8h - 14h (range 5h - 24h)
Diagnostic Tests	Laboratory diagnosis is usually not practical. Attempt culture of food for C. perfringens.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	- Abdominal pain and watery diarrhea - Usually no fever or vomiting - Onset 8 to 14 hours after ingestion of meat, fish or gravy - Fecal leukocytes not seen - Most cases resolve within 24 hours
Synonyms	ICD9: 005.2 ICD10: A05.2

Clostridial food poisoning in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Kars	meat	12-19	12% and 19% of minced meat samples from local markets and small butcher shops in Kars are contaminated by *Clostridium perfringens* [1]
2011*	Ankara	shellfish	13.3	13.3% of stuffed mussels sold by street vendors in Ankara is contaminated by *Clostridium perfringens* [2]

* indicates publication year (not necessarily year of survey)

References

1. Food Addit Contam 2007 Jul ;24(7):673-8.

2. Indian J Microbiol 2011 Jul ;51(3):350-4.

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Clostridial myonecrosis

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

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Clostridioides difficile colitis

Agent	BACTERIUM. *Clostridioides difficile* An anaerobic gram-positive bacillus
Reservoir	Human
Vector	None
Vehicle	Endogenous,Food
Incubation Period	Variable
Diagnostic Tests	Assay of stool for C. difficile toxin.
Typical Adult Therapy	Fidaxomicin 200 mg PO BID X 10d OR Vancomycin 125 mg (oral preparation) QID X 10d OR Metronidazole 500 mg PO TID X 10d. Add Bezlotoxumab in cases of recurrence within six months of initial episode. Fecal transplantation (PO or by enema) has been effective in some cases.[1] [2] [3] [4]
Typical Pediatric Therapy	Fidaxomicin Age 0 to <6 years: 16 mg/kg oral suspension twice daily (maximum, 400 mg/d) Age >=6 to <18 years: 200 mg PO BID OR Vancomycin 10 mg/kg PO QID X 10d OR Metronidazole 7.5 mg/kg PO QID X 10d
Vaccine	Bezlotoxumab
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

Clostridioides difficile colitis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Ankara	transplant recipients	6	6% of diarrhea episodes in kidney or liver transplant patients. [5]
2020*	Marmara	chickens	37.3	Survey of chicken carcasses [6]
2018*		ruminants	25.3-33.6	25.3% / 33.6% of sheep / cattle carcasses [7]
2013 - 2014	Sakarya	meat	1.98	1.98% of retail beef and chicken products [8]
2017 - 2018	Istanbul	meat	6.9	Survey of meat products from butcheries and supermarkets [9]
2012 - 2014	Istanbul	children - gastrointestinal	0.8	0.8% of hospitalized children with diarrhea [10]

* indicates publication year (not necessarily year of survey)

- 2004 to 2005 - The rate of *Clostridioides difficile*-associated diarrhea at a university hospital in Bursa was 0.26 per 1,000 hospital days = 0.21% of admissions. [11]
- 2015 to 2016 - *Clostridioides. difficile* was identified in 12% of cases of healthcare associated diarrhea in hospitalized children aged two to 18 years in Istanbul. The incidence was 8.8 per 10,000 patient days. [12]

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References

1. Clin Infect Dis 2018 Feb 15;
2. Curr Opin Gastroenterol 2019 Jan ;35(1):20-24.
3. Adv Geriatr Med Res 2021 ;3(2)
4. J Clin Gastroenterol 2021 Sep 09;
5. Transpl Infect Dis 2007 Dec ;9(4):270-5.
6. J Vet Res 2020 Sep ;64(3):407-412.
7. Meat Sci 2018 Jan 31;139:120-124.
8. Korean J Food Sci Anim Resour 2018 Sep ;38(4):759-767.
9. Food Sci Anim Resour 2020 Jul ;40(4):578-587.
10. Springerplus 2016 ;5(1):1329.
11. Med Mal Infect 2009 Jun ;39(6):382-7.
12. Turk J Pediatr 2021 ;63(6):1004-1011.

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Coccidioidomycosis

Agent	FUNGUS. Ascomycota, Euascomyces, Onygenales: *Coccidioides immitis* (also *Coccidioides posadasii*) A dimorphic fungus
Reservoir	Soil, Zoonotic
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	10d - 14d (range 7d - 28d)
Diagnostic Tests	Culture of sputum, CSF, biopsy etc for fungi. Nucleic acid amplification.
Typical Adult Therapy	Fluconazole 400 mg PO daily. OR Itraconazole 200 mg PO BID X 1y. OR Amphotericin B deoxycholate 0.3-0.6 mg/kg/d until stable then Fluconazole as above OR Liposomal Amphotericin B 3-5 mg/kg/d until stable then Fluconazole as above[1]
Typical Pediatric Therapy	Fluconazole 8 mg/kg/day PO or IV OR Amphotericin B 0.3-0.6 mg/kg/d until stable then Fluconazole as above OR Liposomal Amphotericin B 3-5 mg/kg/d until stable then Fluconazole as above
Clinical Hints	- Cough, chest pain and myalgia - Eosinophilia, erythema nodosum or headache in many cases - Extrapulmonary infection (bone, skin, genitourinary, etc) is occasionally encountered
Synonyms	California disease, Coccidioides immitis, Coccidioides posadasii, Coccidioidomykose, Desert rheumatism, Posada's disease, Valley fever. ICD9: 114 ICD10: B38

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

Coccidioidomycosis in Turkey

2011 - Coccidioidomycosis was diagnosed in a renal transplant recipient (source not established). [2]

Cross-border events

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2011	Turkey	United States	travel	1	[3]
2017*	Turkey	United States	travel	1	[4]

***** indicates publication year (not necessarily year of event)
****** Country or Nationality

References

1. Clin Infect Dis 2016 Sep 15;63(6):e112-46.
2. Exp Clin Transplant 2014 Feb ;12(1):71-3.
3. Med Mycol Case Rep 2014 Jan ;3:20-5.
4. Mikrobiyol Bul 2017 Apr ;51(2):183-190.

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Coenurosis

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: *Taenia multiceps* (*Multiceps* spp.) and *Taenia serialis*
Reservoir	Sheep, Wild carnivore, Horse, Dog, Zoonotic
Vector	None
Vehicle	Water, Food, Soil (contaminated by dog)
Incubation Period	months to years
Diagnostic Tests	Identification of parasite in biopsy material.
Typical Adult Therapy	Excision Consider praziquantel[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Mass in brain, eye, muscle or subcutaneous tissue - May present months to years after exposure in sheep-raising areas - Basilar arachnoiditis with internal hydrocephalus is common
Synonyms	Coenurus cerebralis, Multiceps, Taenia multiceps, Taenia serialis. ICD9: 123.8 ICD10: B71.8

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

Coenurosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2009 - 2010	Erzurum	cattle	0.47	0.47% of cattle brains

References

1. Clin Infect Dis 1998 Sep ;27(3):519-23.

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Common cold

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

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Conjunctivitis - inclusion

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

References

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

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Conjunctivitis - viral

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

Conjunctivitis - viral in Turkey

2006 to 2010 - Adenovirus was identified in 44% of ocular samples from patients in Izmir with conjunctivitis. [1]

Notable outbreaks

Years	Region	Setting	Cases	Clinical	Pathogen	Population	Notes
2010	Istanbul						2
2011*	Malatya	neonatal intensive care unit	24		Adenovirus 8	neonates	3
2012	Ankara	neonatal intensive care unit	43		Adenovirus	neonates	4
2012*	Izmir	neonatal intensive care unit	34	keratoconjunctivitis	Adenovirus	neonates	5

* indicates publication year (not necessarily year of outbreak)

References

1. J Med Virol 2015 Mar ;87(3):472-7.
2. ProMED <promedmail.org> archive: 20100819.2890
3. J Hosp Infect 2012 Feb ;80(2):144-9.
4. Cutan Ocul Toxicol 2015 Mar ;34(1):12-5.
5. Ophthalmic Epidemiol 2012 Dec ;19(6):371-9.

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COVID-19

Agent	Virus - RNA Coronaviridae, Betacoronavirus. SARS-CoV-2 (Severe acute respiratory syndrome coronavirus-2)
Reservoir	Human, Bat, Mink, Cat, Dog, Mammal, Zoonotic
Vector	None
Vehicle	Droplet, Contact, Food, Fecal-oral, Respiratory or pharyngeal acquisition
Incubation Period	2d - 14d (mean 5 to 7 days)
Diagnostic Tests	Identification of virus - PCR or direct methods Serology
Typical Adult Therapy	Isolation (respiratory and other secretions). Molnupiravir 800 mg PO every 12 hours X 5 days. For early treatment of mild to moderate disease. Nirmatrelvir/ritonavir 300 mg/100 mg BID X 5 days. For early treatment of mild-to-moderate COVID-19 who are at high risk for progression to severe disease Remdesivir (released for use in several countries) 200 mg IV day 1; then, 100 mg IV X 4 to 9 days Baricitinib appears to increase the effectiveness of Remdesivir and has been used in situations where corticosteroids cannot be administered. Chloroquine 500 mg PO BID X 10 days has been used in some cases. (several publications have suggested that Hydroxychloroquine is more effective and less toxic) The effectiveness of these drugs against COVID-19 is unproven. Monoclonal antibodies (Casirivimab / Imdevimab; Bamlanivimab) have been issued emergency use authorization for treatment of patients aged >=12 years at high risk for severe COVID-19. Tocilizumab (a monoclonal antibody that inhibits IL-6 receptors) may dampen the response to cytokines. Corticosteroids have been used as an adjunct or substitute to Remdesivir in some cases. Lopinavir and other antivirals may be effective There is some evidence that convalescent plasma from COVID-19 patients may be effective.[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31]
Typical Pediatric Therapy	Molnupirivir: Use in children not established. Nirmatrelvir/ritonavir: Use in children not established. Remdesivir: Weight 3.5 to 40 Kg: Day 1: 5 mg/kg IV X 1 Days 2-10: 2.5 mg/kg IV X 1 Monoclonal antibodies: Use in children not established.
Vaccines	Bamlanivimab Bebtelovimab Casirivimab / Imdevimab COVID-19 vaccine - inactivated COVID-19 vaccine - mRNA COVID-19 vaccine - recombinant nanoparticle COVID-19 vaccine - viral vector Regdanvimab Sotrovimab Tixagevimab / Cilgavimab
Clinical Hints	- Exposure to endemic area or patient

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	- Fever (>38 C), cough, respiratory difficulty, pneumonia - Diminished sense of smell and / or taste is an important early symptom - Severe illness more common in the elderly and individuals with underlying conditions - Case-fatality rate 2-5%
Synonyms	2019-nCoV, 2019-new coronavirus, 2019-Novel coronavirus infection, Covid-19, covid19, Novel coronavirus 2019 infection, Pediatric multisystem inflammatory syndrome, SARS-CoV-2 infection, Severe Specific Contagious Pneumonia, SSCP. ICD9: 079.82 ICD10: U07.1

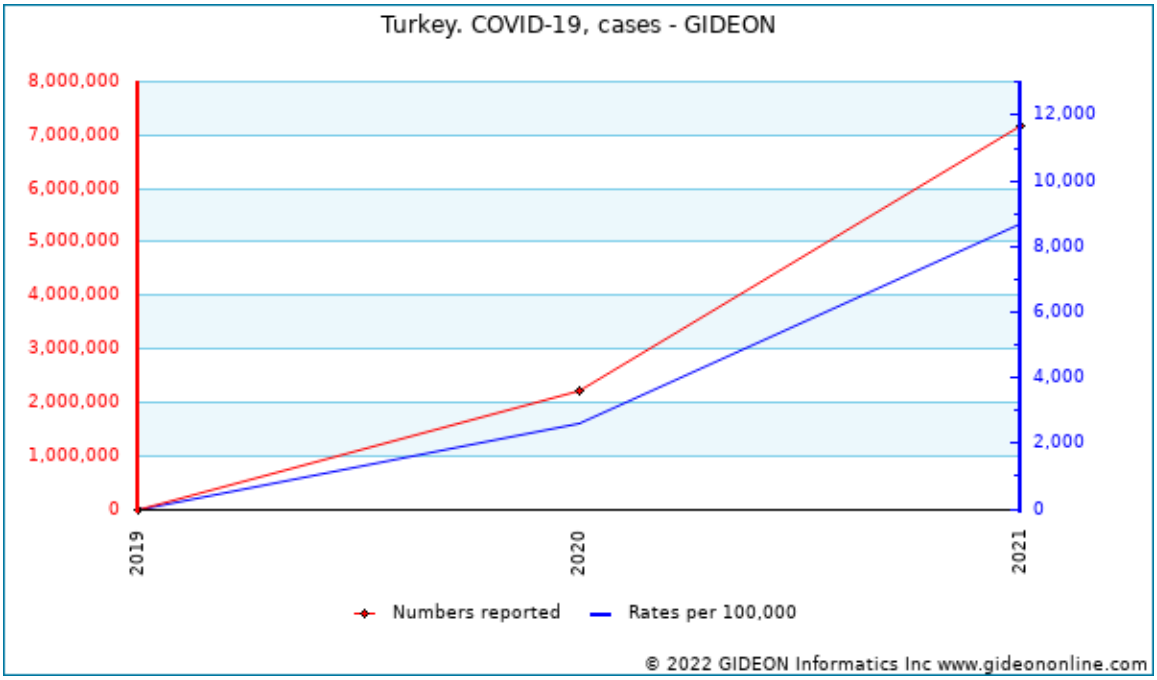
COVID-19 in Turkey

2020 - The first case of COVID-19 in Turkey was reported on March 11 - imported from Europe.

- 2020 - Status report on COVID-19 in Turkey [32]
- 2020 - Analysis of the Public Health response of Turkey to COVID-19 [33]
- 2020 - Analysis of COVID-19 reporting deficiencies in Turkey [34]

Notable outbreaks

Years	Region	Cases	Deaths	Notes
2020 - 2022	Nationwide	13,841,889	93,539	Case count to February 26, 2022. Includes 2,208.652 cases (20,881 fatal) in 2020. [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] [49]



Graph: Turkey. COVID-19, cases

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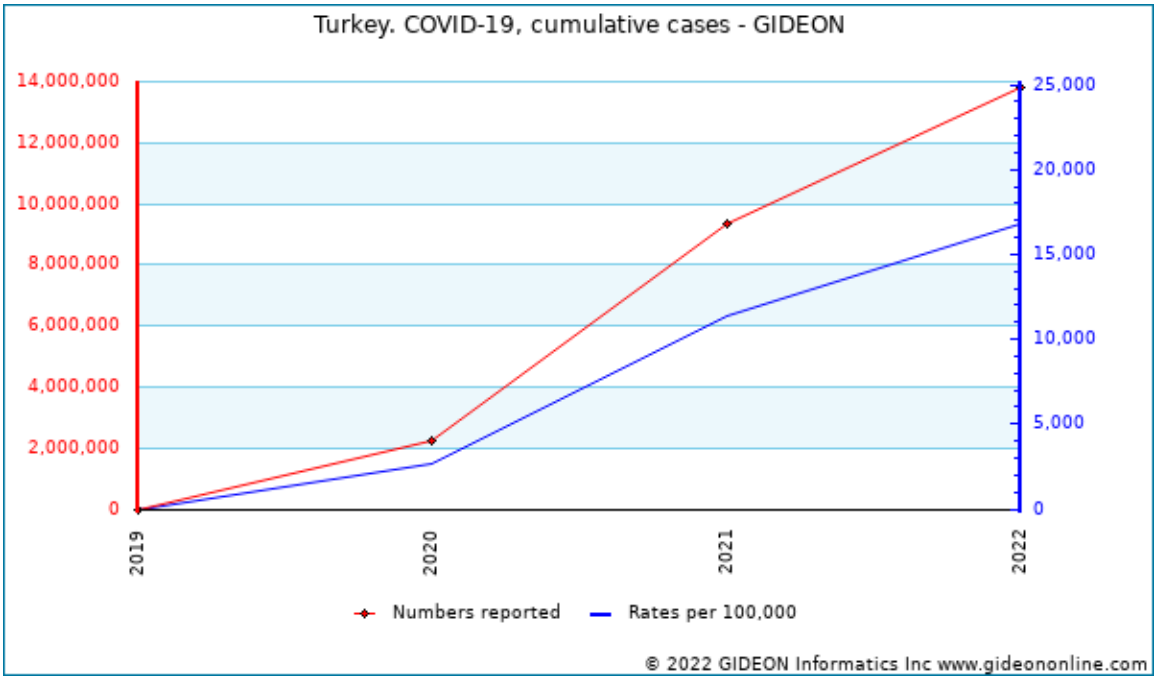
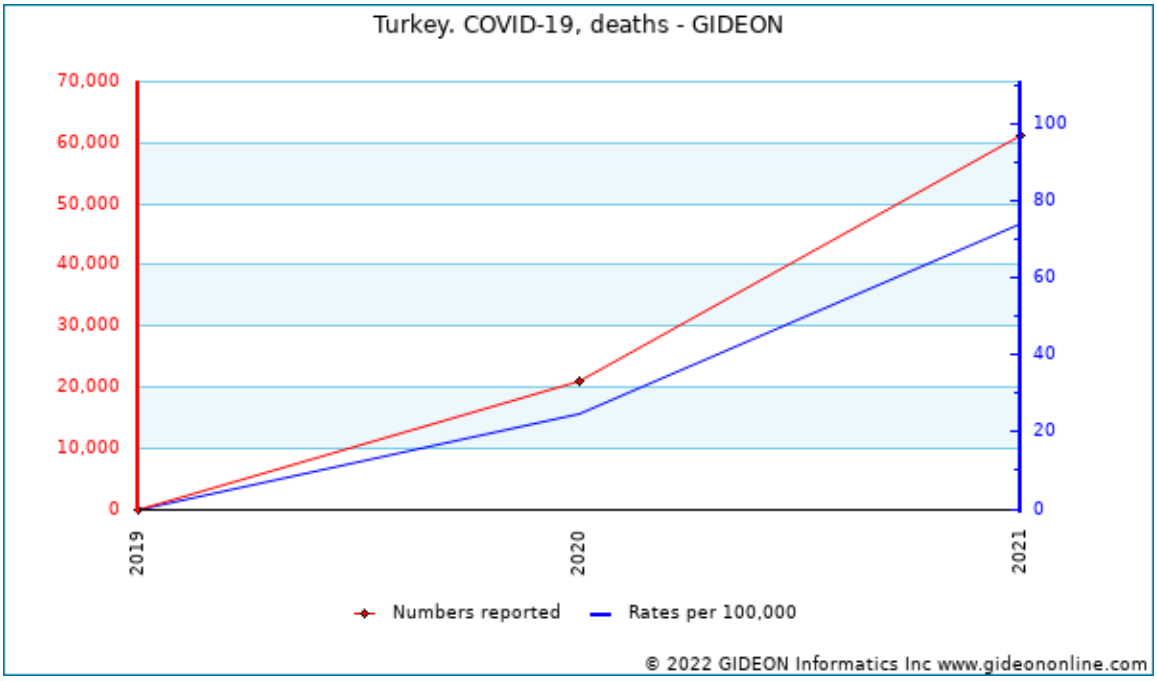


Graph: Turkey. COVID-19, cumulative cases

Notes:
Individual years:
2022 - Reported cases as of February 26, 2022.



Graph: Turkey. COVID-19, deaths

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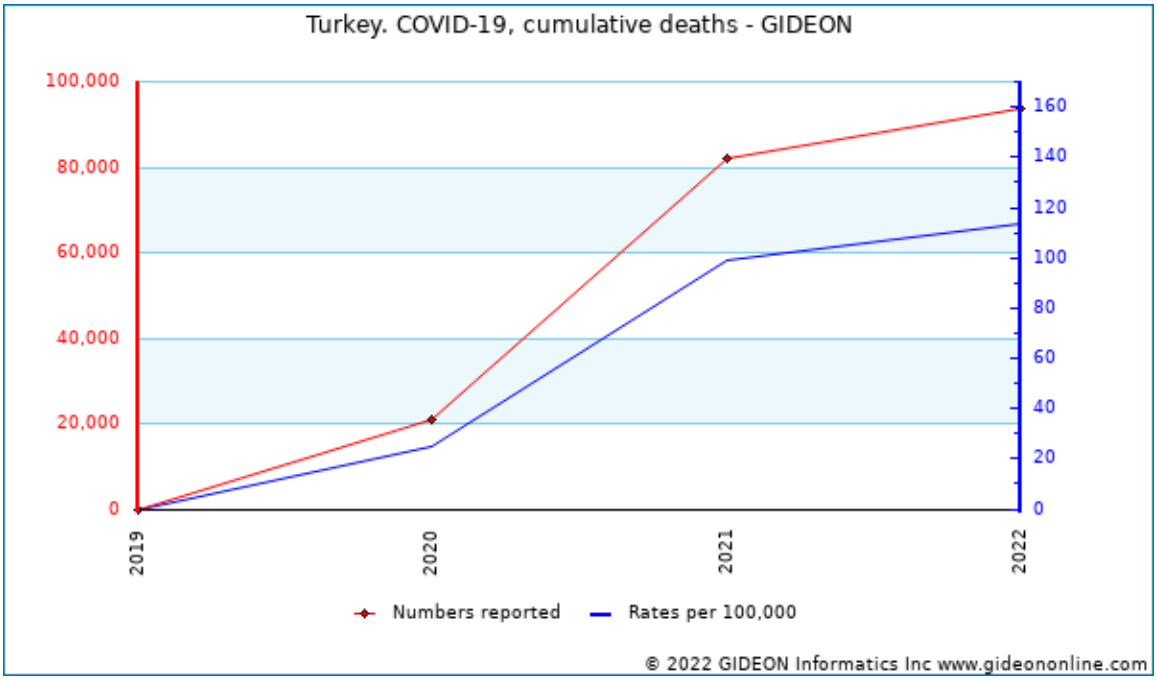

Graph: Turkey. COVID-19, cumulative deaths

Notes:
Individual years:
2022 - Reported cases as of February 26, 2022.

Prevalence surveys

Years	Region	Study Group	%	Notes
2020	Nationwide	patients - cancer	6.7	Survey of women undergoing gynecologic cancer surgery. [50]
2020	Istanbul	patients	39.5-76.3	SARS-CoV-2 was identified in 76.3% of saliva, 55.3% of tears and 39.5% of cerumen samples from COVID-19 patients [51]
2020	Erzurum	patients	7	Survey of patients with upper respiratory tract infection [52]
2020	Zonguldak	health care workers	7.1	Survey of health-care workers at a university hospital [53]
2020	Ankara	pregnant women	1.4	1.4% of asymptomatic pregnant women [54]
2022*	Istanbul	patients - tuberculosis	1.9	COVID-19 was identified in 1.9% of outpatients under treatment for active tuberculosis [55]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2020	Sakarya	health care workers	3.6	Survey of health-care workers at a university hospital [56]
2020	Nationwide	health care workers	6.1	National survey of Pediatric health-care workers {P 34592441}
2020	Ankara	health care workers	7.4	[57]
2020	Multiple locations	health care workers	2.7	[58]
2020	Istanbul	patients - rheumatological	9.4	Survey of children with rheumatological diseases [59]

Case series *

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- 2020 - Clinical characteristics of 93,571 patients with COVID-19 - impact of comorbid diabetes [60]
- 2020 - Clinical characteristics of 18,426 patients hospitalized with COVID-19 - impact of comorbid diabetes [61]
- 2020 - Clinical characteristics of 16,942 older adults hospitalized with COVID-19 [62]
- 2020 - Clinical characteristics and outcomes among 14,625 patients with COVID-19 - impact of obesity [63]
- 2020 - Clinical characteristics of 12,917 non-diabetic patients with COVID-19 - impact of blood glucose levels [64]
- 2020 - Clinical characteristics and outcomes of 12,295 older / frail adults hospitalized with COVID-19 [65]
- 2021 (publication year) - Clinical characteristics of 8,321 patients hospitalized with COVID-19 - impact of a history of heart failure [66]
- 2020 - Clinical characteristics of 4,489 patients hospitalized with COVID-19 - impact of comorbid cancer [67]
- 2020 - Clinical characteristics and mortality among 4,118 patients hospitalized with COVID-19 - impact of blood lipid levels [68]
- 2020 - Clinical characteristics of 3,532 patients with COVID-19 - impact of secondary bacterial infections [69]
- 2020 - Clinical characteristics of 2,257 patients hospitalized with COVID-19 - impact of neurological findings [70]
- 2020 to 2021 - Clinical characteristics of 1,175 Emergency Department patients with COVID-19 - impact of neutrophil-lymphocyte ratio [71]
- 2020 - Clinical characteristics of 1,523 cancer patients with COVID-19 [72]
- 2020 - Clinical characteristics and prognosis among 1,506 patients with COVID-19 - impact of initial symptoms [73]
- 2020 to 2021 - Clinical characteristics and outcomes among 1,416 pregnant women with COVID-19 [74]
- 2020 - Clinical characteristics of 1,340 children hospitalized with COVID-19 - impact of multisystem inflammatory syndrome [75]
- 2020 to 2021 - Clinical characteristics of 1,229 Intensive Care patients with COVID-19 - impact of candidemia [76]
- 2020 - Clinical characteristics of 1,219 children hospitalized with COVID-19 [77]
- 2020 - Clinical characteristics of 1,210 patients hospitalized with COVID-19 - impact of kidney disease [78]
- 2020 - Clinical and epidemiological characteristics of 1,156 children with COVID-19 [79]
- 2020 - Clinical characteristics of 1,086 patients with COVID-19 - impact of diarrhea [80]
- 2020 - Ocular symptoms among 1,083 patients with COVID-19 [81]
- 2021 (publication year) - Clinical characteristics of 1,082 patients hospitalized with COVID-19 - impact of co-morbid asthma or COPD [82]
- 2020 - Clinical characteristics of 1,069 patients with COVID-19 - impact of co-morbid COPD [83]
- 2020 - Clinical characteristics and prognostic factors among 1,024 solid tumor patients with COVID-19 [84]
- 2020 - Imaging characteristics of 1,024 patients with COVID-19 - impact of patient gender and age [85]
- 2021 (publication year) - Clinical characteristics of 1,013 patients hospitalized with COVID-19 [86]
- 2020 - Clinical characteristics and outcomes among 974 Intensive Care Unit patients with COVID-19 [87]
- 2020 - Clinical characteristics of 892 patients hospitalized with COVID-19 - impact of psychiatric complications [88]
- 2020 - Clinical characteristics of 879 patients hospitalized with COVID-19 - impact of advanced age and kidney disease [89]
- 2020 - Clinical characteristics of 770 patients hospitalized with COVID-19 - impact of acute kidney injury [90]
- 2020 - Clinical characteristics of 776 patients with COVID-19 - impact of co-morbid thyroid cancer [91]
- 2020 - Inflammatory and coagulation markers in 750 patients hospitalized with COVID-19 [92]
- 2020 - Clinical characteristics and outcomes of 740 patients with hematological malignancy and COVID-19 [93]
- 2020 - Clinical characteristics of 722 patients hospitalized with COVID-19 [94]
- 2020 - Clinical characteristics of 717 patients hospitalized with COVID-19 - impact of d-dimer/albumin ratio and fibrinogen/albumin ratio [95]
- 2020 - Clinical characteristics of 681 patients hospitalized with COVID-19 - impact of acute limb ischemia [96]
- 2020 - Clinical characteristics of 659 patients hospitalized with COVID-19 - impact of mediastinal lymphadenopathy [97]
- 2020 - Clinical characteristics of 658 patients hospitalized with COVID-19 - impact of new-onset atrial fibrillation [98]
- 2020 to 2021 - Clinical characteristics and outcomes among 643 elderly patients hospitalized with COVID-19 [99]
- 2020 - Clinical characteristics of 642 severely ill patients hospitalized with COVID-19 - comparison of fist epidemic wave and second wave [100]

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- 2020 - Clinical characteristics of 639 patients hospitalized with COVID-19 - impact of advanced age, and of neutrophil-lymphocyte and CRP-albumin ratios [101]
- 2020 to 2021 - Clinical characteristics of 627 Intensive Care patients with COVID-19 - impact of fungal co-infections [102]
- 2020 - Clinical characteristics of 621 patients hospitalized with COVID-19 - impact of kidney disease [103]
- 2020 - Clinical characteristics of 621 Pediatric Emergency Room patients with COVID-19 [104]
- 2020 - Clinical characteristics of 614 patients hospitalized with COVID-19 - impact of hepatic dysfunction at admission [105]
- 2020 - Clinical characteristics of 609 patients with chronic kidney disease and COVID-19 [106]
- 2020 - Clinical characteristics of 607 patients hospitalized with COVID-19 - impact of cardiac injury [107]
- 2020 - Clinical characteristics of 578 patients with COVID-19 and acute kidney injury [108]
- 2020 - Clinical characteristics of 567 hemodialysis patients with COVID-19 [109]
- 2020 - Clinical characteristics of 565 patients with COVID-19 - impact of smoking and co-morbidities [110]
- 2020 - Laboratory test parameters in 555 patients with COVID-19 [111]
- 2020 - Clinical characteristics and prognostic factors among 540 patients with COVID-19 [112]
- 2020 - Clinical characteristics of 533 Intensive Care patients with COVID-19 - impact of liver function [113]
- 2020 - Clinical characteristics of 533 pregnant women with COVID-19 [114]
- 2020 - Clinical characteristics of 518 children with COVID-19 - impact of viral load on disease severity [115]
- 2021 (publication year) - Clinical characteristics of 511 patients with COVID-19 - impact of coagulation parameters [116]
- 2020 to 2021 - Clinical characteristics and prognosis among 500 Emergency Department patients with COVID-19 - impact of routine blood parameters [117]
- 2020 - Clinical characteristics of 483 elderly patients with COVID-19 - impact of comorbid factors [118]
- 2020 - Clinical and neuroimaging characteristics of 436 patients with COVID-19 [119]
- 2020 - Clinical characteristics of 427 Intensive Care patients with COVID-19 - impact of pneumomediastinum [120]
- 2020 - Clinical characteristics and outcomes among 421 Intensive Care patients with COVID-19 [121]
- 2020 - Clinical characteristics of 415 patients hospitalized with COVID-19 [122]
- 2020 to 2021 - Clinical characteristics and prognostic factors among 419 Emergency Department patients with COVID-19 [123]
- 2021 (publication year) - Clinical characteristics and risk factors among 414 patients with COVID-19 [124]
- 2020 - Clinical characteristics of 408 patients with COVID-19 - impact of electrolyte imbalance [125]
- 2020 - Imaging characteristics of 405 patients with COVID-19 [126]
- 2020 - Clinical characteristics of 397 patients hospitalized with COVID-19 - factors associated with mortality [127]
- 2021 - Clinical characteristics at follow-up among 396 patients treated for COVID-19 [128]
- 2020 - Clinical characteristics of 388 Intensive Care patients with COVID-19 - impact of delta neutrophil index [129]
- 2020 - Clinical characteristics of 383 patients hospitalized with COVID-19 - impact of comorbid factors [130]
- 2020 to 2021 - Clinical characteristics of 382 children with COVID-19 - impact of neurological manifestations [131]
- 2020 - Clinical characteristics of 379 patients hospitalized with COVID-19 - impact of neurological findings [132]
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* series do not include experimental diagnostic or treatment protocols

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Creutzfeldt-Jakob disease

Agent	PRION
Reservoir	Human
Vector	None
Vehicle	Corneal graft Dural graft Neurosurgical instrumens
Incubation Period	14 months to >=42 years
Diagnostic Tests	Biopsy and specialized tests for protein markers in cerebrospinal fluid protein
Typical Adult Therapy	None
Typical Pediatric Therapy	NA
Clinical Hints	- Most infections are sporadic and characterized by severe, progressive and ultimately fatal neurological disease - Patient may recall neurosurgical intervention several year previously
Synonyms	CJD, Familial spongiform encephalopathy, Fatal familial insomnia, Gerstmann–Straussler–Scheinker syndrome, Subacute spongiform encephalopathy, Variably protease-sensitive prionopathy. ICD9: 046.11 ICD10: A81.09

Creutzfeldt-Jakob disease in Turkey

Individual cases and small case series of sporadic Creutzfeldt-Jakob disease have been reported from Turkey. [1] [2] [3] [4] [5]

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Crimean-Congo hemorrhagic fever

Agent	VIRUS - RNA. Bunyaviridae, Nairovirus: CCHF virus. Infections also ascribed to related agents (Nairobi sheep and Dugbe viruses)
Reservoir	Hare, Bird, Tick, Cattle, Sheep, Goat, Zoonotic
Vector	Tick (*Hyalomma* - over 30 potential vectors in this genus)
Vehicle	Infected secretions from patient or livestock, Respiratory or pharyngeal acquisition
Incubation Period	2d - 6d (range 1d - 53d)
Diagnostic Tests	Biosafety level 4. Viral culture (blood, CSF, tissue). Serology. Nucleic acid amplification.
Typical Adult Therapy	Isolation. Supportive therapy. Ribavirin: 1g PO QID X 4d, then 0.5g QID X 6d[1] [2]
Typical Pediatric Therapy	Isolation. Supportive therapy Ribavirin (dosage not established)
Clinical Hints	- Headache, chills, myalgia, abdominal pain and photophobia - Conjunctivitis and pharyngitis are often present - Petechiae, thrombocytopenia and leukopenia are common - Onset 3 to 7 days following a tick bite or exposure to infected patient - Case-fatality rate is approximately 30%
Synonyms	Acute infectious capillary toxinosis, CCHF, Crimea Congo hemorrhagic fever, Dugbe, Erve, Ganjam, Kasokero, Kemerovo, Nairobi sheep, Orungo, Songling, Tribec, Xinjiang hemorrhagic fever. ICD9: 065.0 ICD10: A98.0

Crimean-Congo hemorrhagic fever in Turkey

Time and Place

Crimean-Congo hemorrhagic fever was first reported in Turkey in 2002 - a nurse in Tokat. [3]

- Over 90% of cases are reported in the Black Sea and Central Anatolia regions. [4]
- The disease is endemic to 15 provinces (1,200 villages) as of 2009. [5]
- 84.1% of cases occur during May to July [6] , and 69.4% in rural areas (2002 to 2007) [7]
- Highest incidence is reported in the Anatolian and eastern Anatolian provinces, especially Tokat, Corum, Sivas, Amasya, Yozgat, Gumushane, Bayburt, Erzurum and Erzincan. [8]
- Transmission does not occur in Istanbul. [9]
- Crimean Congo hemorrhagic fever was confirmed in 11% of suspected cases in Turkey. (2007 publication) [10]
- A status report on Crimean Congo hemorrhagic fever in Turkey (2015 publication) [11]

- 2020 (publication year) - Factors associated with confirmed cases of CCHF: Working with agriculture or livestock, tick exposure, contact with body fluids from animals, travel to rural areas within 2 weeks, fever, headache, leucopenia and anemia. [12]

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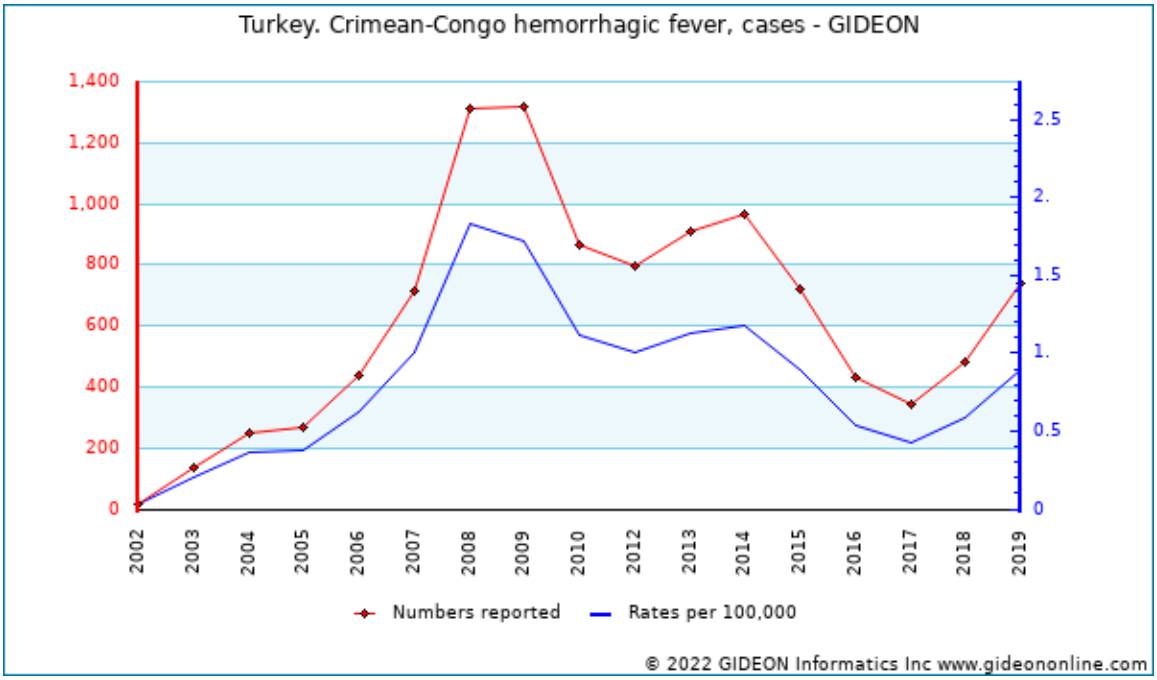

Graph: Turkey. Crimean-Congo hemorrhagic fever, cases

Notes:
1. Crimean-Congo hemorrhagic fever has been a reportable disease in Turkey since December 2003.
2. 1,820 cases (92 fatal) were reported during 2002 to 2007 - including 3 nosocomial cases. [13] [14] [15]
3. 2,315 cases (140 fatal) were reported during 2002 to May 2009 - in 100 villages. [16]
Individual years:
2005 - Included 41 cases (1 fatal) in Yozgat Province. [17]
2006 - 242 cases (24 fatal) were reported to August - with highest incidence in Kilkit Valley (Tokat, Sivas, Gumushane, Amasya, Yozgat and Corum provinces). [18] [19] [20] [21]
2008 - Included two physicians in Ankara who were presumably infected through conjunctival contamination by a patient's blood. [22]
2020 - 480 cases were reported to June. [23]
2021 - 243 cases were reported to May 31. [24]

Case series

Amasya
- 2011 to 2015 - 281 cases were treated at a hospital . [25]

Ankara
- 2004 to 2011 - Nine infected health-care workers were treated at a medical center. [26]
- 2008 to 2009 - 31 pediatric cases (0 fatal) were treated at a hospital during April 2008 to October 2009. [27]

Black Sea region
- 2002 to 2003 - 19 cases (2 fatal) were reported in the eastern region. [28] Eighteen of the patients had handled livestock, and one was a nurse who was presumably infected in-hospital. [29] [30]

Bolu
- 2006 to 2012 - 46 cases (4 fatal) were reported. [31]

Elazig
- 2011 to 2018 - 61 cases (1 fatal) were treated at a hospital in Elazig, Eastern Anatolia. [32]

Erzincan

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- 2011 to 2017 - 206 cases (7 fatal) were reported from Erzincan. [33]

Erzurum

- 2014 to 2019 - Liver function abnormalities and risk for bleeding among 450 patients with CCHF. [34]

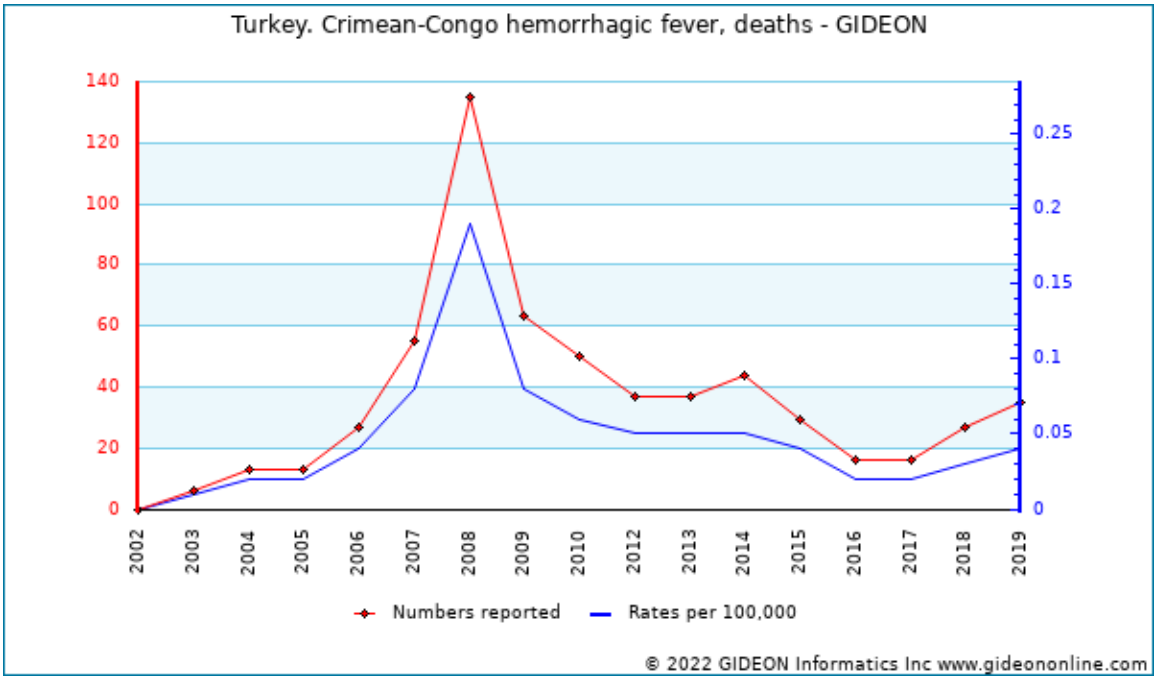
Samsun

- 2007 to 2011 - 126 cases were treated. [35]
- 2008 to 2011 - 54 pediatric cases (1 fatal) were treated at a hospital. [36]

Sivas

- 2021 (publication year) - Ocular findings in 24 pediatric cases treated at a hospital in Sivas. [37]

Tokat: 66 patients (4.5% fatal) were reported. [38]



Graph: Turkey. Crimean-Congo hemorrhagic fever, deaths

Notes:

1. 147 fatal cases were reported during 2003 to 2008 [39] ; 174 during 2002 to 2012. [40]
2. 114 fatal cases were reported during 2002 to June 2008 [41] [42] , including 94 during 2003 to 2007. [43] [44]
3. 44 fatal cases were reported between 2003 and the first half of 2006, most in the central Anatolia provinces (case fatality rate approximately 5%). [45] [46]

Individual years:

2009 - Included 274 cases (61 fatal) during January to August. [47] [48] [49] [50]

2021 - 13 fatal cases were reported to May 31. [51]

Prevalence surveys

Years	Region	Study Group	%	Notes
2016 - 2018	Thrace	various	5.26-12.26	9.52% of blood samples from tortoises, 12.26% of tick (*Hyalomma aegyptium*) pools from tortoises, and 5.26% of questing ticks [52]
2020*	Thrace	various	0	Survey of sheep, cattle, ticks and mosquitoes [53]
2014 - 2017	Kastamonu	patients - fever	46.1	CCHF was confirmed in 46.1% of patients with a presumptive diagnosis of CCHF [54]
2007	Multiple	ticks	0.91-3.11	0.91% of human ticks, 2.10% of cattle ticks and 3.11% of sheep ticks

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Years	Region	Study Group	%	Notes
	locations			(estimated maximum likelihood, Sivas and Tokat [55]
2008	Amasya	ticks	28	28% of *Hyalomma* tick pools in Amasya Province [56]
2010*	Sinop	ticks	14.63	14.63% of tick pools in Sinop [57]
2010*	Ordu	ticks	4.34	4.34% of tick pools in Ordu [58]
2010*	Multiple locations	ticks	5.08-8.06	Tokat 5.08% and Sivas 8.06% [59]
2010*	Thrace	ticks	0.72	0.72% of ticks in Thrace [60]
2010*	Giresun	ticks	8.86	
2010*	Samsun	ticks	4.38	tick pools [61]
2010*	Samsun	ticks	33.87	tick pools [62]
2010*	Giresun	ticks	6.32	
2010*	Amasya	ticks	5.55	tick pools
2010*	Tokat	ticks	3.38	3.38% of tick pools in Tokat [63]
2010	Ankara	ticks	22.7	22.7% of tick pools (*Rhipicephalus bursa*, *Hyalomma marginatum* and *Haemaphysalis parva* [64]
2010*	Ordu	ticks	4.34	
2010 - 2012	Kizilirmak Delta	ticks	1.1	1.1% of ticks associated with migratory birds in the Kizilirmak Delta [65]
2010*	Sinop	ticks	6.09	tick pools
2010*	Amasya	ticks	7.4	
2011*	Tokat	ticks	2	2% of ixodid ticks in Tokat Province [66]
2012*	Marmara	ticks	12.3	12.3% of tick pools from infested livestock in South Marmara region [67]
2012*	Black Sea	ticks	11.76	11.76% of hard tick pools collected from sheep and goats in the middle Black Sea region [68]
2015	Tokat	ticks	12.8	Survey of ticks from sheep and goats [69]
2017*	Multiple locations	ticks	3.6	West Black Sea regions to the Central Anatolia. [70]
2020*	Anatolia	ticks	1.1	[71]
2021*	Thrace	ticks	51.5	Survey of questing *Hyalomma marginatum* ticks. [72]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2012*	Black Sea	sheep and goats	67-86	67% of goats and 86% of sheep in the middle Black Sea region [73]
2015	Tokat	ruminants	38.5-83.3	38.5% of cattle, 83.3% of sheep0 and 82.8% of goats [74]
2016*		ruminants	57	57% of ruminants [75]
2009		general population	10	10% of asymptomatic persons living in a region where outbreaks had occurred
2012	Manisa	general population	3.7	[76]
2012	Van	general population	14.4	14.4% of individuals in Van Province [77]
2013*	Multiple locations	general population	2.3	2.3% of the general population (seven provinces) [78]
2016*	Erzincan	general population	14	[79]

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Years	Region	Study Group	%	Notes
2021*	Tokat	general population	5.6	[80]
2006	Multiple locations	animal contact	12.8	12.8% of high-risk populations in Tokat and Sivas Provinces [81]
2006*	Multiple locations	veterinarians	3	3% of veterinarians [82]
2020*	Erzurum	high-risk population	6.94	Survey of slaughterhouse workers, animal breeders, and veterinarians. [83]
2020*	Samsun	water buffalo	0	[84]

* indicates publication year (not necessarily year of survey)

Vectors

- *Rhipicephalus bursa* and *Hyalomma marginatum* in the Kelkit Valley. [85] [86]
- *Hyalomma anatolicum*, *Hyalomma detritum*, *Hyalomma marginatum*, *Hyalomma turanicum*, *Rhipicephalus bursa*, and *Rhipicephalus turanicus* in Tokat Province. [87]
- *Hyalomma marginatum*, *Rhipicephalus bursa* and *Rhipicephalus (Boophilus) annulatus* in Thrace [88]
- *Rhipicephalus turanicus*, *R. bursa*, *H. marginatum* and *D. marginatus* in south Marmara region [89]

Notable outbreaks

Years	Region	Cases	Deaths	Notes
2002 - 2003	Tokat			[90]
2007		133	7	[91]
2008	Multiple locations	688	41	91% of cases reported in Central and Eastern Anatolia (Amasya, Bursa, Canakkale, Corum, Gumushane, Samsun, Sivas, Tokat and Yozgat). At least one health care worker was infected during the outbreak. [92] [93] [94] [95] [96] [97] [98] [99] [100] [101] [102] [103] [104] [105]
2012	Kastamonu		7	[106] [107]

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Cryptococcosis

Agent	FUNGUS - Yeast. Basidiomycota, Hymenomycetes, Sporidiales: *Cryptococcus neoformans* and other species
Reservoir	Pigeon, Soil, Zoonotic
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	Variable
Diagnostic Tests	Fungal culture and stains. Latex test for fungal antigen in CSF and serum. Nucleic acid amplification.
Typical Adult Therapy	(Induction) Liposomal Amphotericin B 3-4 mg/kg/d X 2-6 weeks + (Preferred) Flucytosine 25 mg/kg/d PO QID X 2 weeks OR Fluconazole 400 mg BID X 2 weeks[1]
Typical Pediatric Therapy	(Induction) Amphotericin B deoxycholate 1 mg/kg/d X 2-6w + Flucytosine 25 mg/kg/d PO QID X 2 weeks
Clinical Hints	- Chronic lymphocytic meningitis or pneumonia in an immune-suppressed patient - Meningitis may be subclinical, or "wax and wane" - Nuchal rigidity is absent or minimal; - Bone, skin, adrenals, liver, prostate and other sites may be infected hematogenously
Synonyms	Busse-Buschke disease, Cryptococcus, European blastomycosis, Torulosis. ICD9: 117.5,321.0 ICD10: B45

Cryptococcosis in Turkey

Case reports

- 2007 (publication year) - Human infection by *Cryptococcus albidus* was reported. [2]
- 2007 (publication year) - Human infection by *Cryptococcus diffluens* was reported. [3]

Reservoirs

- 2004 (publication year) - *Cryptococcus neoformans var. grubii* was identified in honeybee colonies [4]
- 2004 (publication year) - *Cryptococcus neoformans var. grubii* was identified in a eucalyptus tree. [5]

Prevalence surveys

Years	Region	Study Group	%	Notes
1989*	Bursa	birds - pigeon	13.9	13.9% of pigeon feces in Bursa City [6]
1998*	Nationwide	birds - pigeon	4.6	4.6% of pigeon droppings, nationwide - all isolates were *Cryptococcus neoformans var. neoformans* [7]
2016	Anatolia	eucalyptus	24.2	24.2% of *Eucalyptus camaldulensis* [8]
2019*		patients - HIV / AIDS	11	Cryptococcal antigenemia was present in 11% of HIV-positive patients [9]

* indicates publication year (not necessarily year of survey)

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Cryptosporidiosis

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

Cryptosporidiosis in Turkey

Cryptosporidiosis became a reportable disease in Turkey in 2005.

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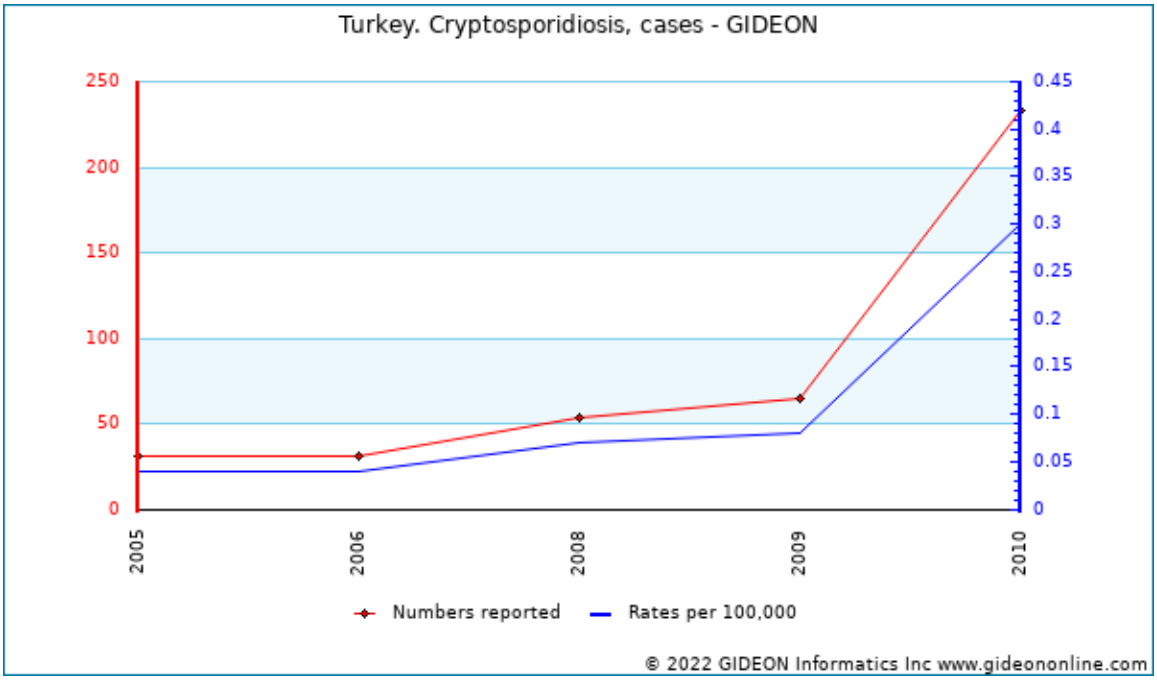

Graph: Turkey. Cryptosporidiosis, cases

Notes:
1. 43 cases were reported during January 2005 to August 2006.

Cross-border events

Does not include individual case reports

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2009	United Kingdom	Turkey	travel	87	Outbreak at a resort in Sarigeme; caused by *Salmonella enterica* serovar Enteritidis (47 cases), *Campylobacter* (2 cases) and/or *Cryptosporidium* infection (31 cases)

** Country or Nationality

Prevalence surveys

Years	Region	Study Group	%	Notes
2002*	Ankara	children	4	4% of asymptomatic children [4]
2007*	Mersin	children	5.5	5.5% of asymptomatic children [5]
2008*		children	12.35	12.35% of children ages 1 to 14 years with lymphoma or leukemia [6]
2009*	Mersin	children	2.8	2.8% of children in a social services center [7]
2012 - 2015	Izmir	children	22.5	Survey of immunocompromised children with diarrea [8]
2013*	Sanliurfa	children	0	0% of children in an orphanage in Sanliurfa [9]
2016	Van	children	2	Survey of children hospitalized in an Intensive Care Unit [10]
2019*		adults - elderly	2.43	Survey of elderly patients in a nursing home [11]
2020*	Multiple locations	cattle	34-37.2	34.0% / 37.2% of cattle from Central Anatolia / Mediterranean Region [12]
2006	Ege	students	0.6	0.6% of asymptomatic elementary school students [13]
2009*	Multiple	pigs	8.8	8.8% of pig fecal samples [14]

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Years	Region	Study Group	%	Notes
	locations			
2007*	Ankara	transplant recipients	13	13% of diarrhea episodes in kidney or liver transplant patients [15]
2021*	Izmir	patients - cancer	5.3	5.3% of patients undergoing chemotherapy for malignant solid tumors (PCR) [16]
2021*	Malatya	patients	1.5	1.5% of diarrhea in Malatya
1995*		patients	17	17% of patients with neoplasia and diarrhea [17]
1997 - 2007	Van	patients	0.7	Survey of hospital outpatients [18]
2006 - 2018	Sivas	patients	0.3	Survey of patients with gastrointestinal symptoms [19]
2008 - 2009	Adana	patients	5.19	5.19% of patients with diarrhea [20]
2008*	Kocaeli	patients	3.37	3.37% of patients with gastrointestinal complaints [21]
2010 - 2018	Van	patients	2.8	Survey of patietns referred to a Parasitology laboratory [22]
2011*	Ankara	patients	0	0% of patients with diarrhea, admitted to an emergency department [23]
2016 - 2018	Adıyaman	patients	0.8	Survey of patients with gastrointestinal symptoms [24]
2008*	Kars	sheep	38.8	38.8% of lambs in Kars Province [25]
2012 - 2013	Kocaeli	patients - dialysis	2.1	2.1% of dialysis patients [26]
2008 - 2015	Izmir	immunocompromised	35	patients with common variable immune deficiency syndrome [27]
2020	Multiple locations	cats	0	[28]
2008*	Van	various	1.1-13.2	1.1% of slaughterhouse workers, 13.2% of sheep, 10.7% of goats and 8.1% of cattle in Van Municipality [29]
2013*	Van	food handlers	1.27	1.27% of asymptomatic food handlers [30]
2013*	Adana	food handlers	0	0% of food handlers in Adana [31]
2007 - 2009	Mersin	water	5.2	5.2% of water samples in Mersin [32]
2011	Multiple locations	water	60.3-61.4	61.4% of sea water samples from Ordu, 60.3% from Sinop [33]
2003 - 2007	Eskisehir	specimens - stool	4.5	4.5% of parasites found in stools at a university medical facility [34]
2009 - 2010	Izmir	specimens - stool	33.47	33.47% of stools examined at a laboratory [35]
2012 - 2014	Istanbul	specimens - stool	1.94	Survey of specimens submitted to a hospital laboratory [36]
2017*		patients - HIV / AIDS	2.6	[37]
2018*	Izmir	patients - HIV / AIDS	21.5	[38]
2018*	Istanbul	patients - HIV / AIDS	3.3	[39]
1999*		children - gastrointestinal	3.5	3.5% of childhood diarrhea [40]
2004 - 2006	Van	children - gastrointestinal	4.9	4.9% of children with diarrhea [41]
2012*	Eskisehir	children - gastrointestinal	13.3	13.3% of children with diarrhea [42]
2008*	Van	cattle - calves	13.19	13.19% of calves in Van Province [43]

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Years	Region	Study Group	%	Notes
2008*	Erzurum	cattle - calves	22.8	22.8% of calves in Erzurum Province [44]
2011	Kars	cattle - calves	5.1	5.1% of calves (ELISA) [45]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Source	Population	Notes
		dairy farm	11	water	cattle - calves	Outbreak among dairy calves associated with a contaminated artesian well. [46]
2005	Western Region		22			multiple pathogens. Outbreak of *Cryptosporidium* and *Cyclospora* infections was reported. [47]
2009	Sarigerme		87		tourists	multiple pathogens. Outbreak caused by *Salmonella enterica* serovar Enteritidis (47 cases), *Campylobacter* (2 cases) and/or *Cryptosporidium* (31 cases) was reported among British tourists returning from a resort in Sarigeme, Turkey.

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Cutaneous larva migrans

Agent	PARASITE - Nematoda. Secernentea: *Ancylostoma braziliense*, *A. caninum*, *Bunostomum phlebotomum*, *Strongyloides myopotami*
Reservoir	Cat, Dog, Cattle, Zoonotic
Vector	None
Vehicle	Soil, Contact
Incubation Period	2d - 3d (range 1d - 30d)
Diagnostic Tests	Biopsy is rare helpful.
Typical Adult Therapy	Ivermectin 200 micrograms/kg as single dose OR Albendazole 200 mg BID X 3d OR Thiabendazole topical X 5d[1] [2]
Typical Pediatric Therapy	Ivermectin 200 micrograms/kg as single dose. OR Albendazole 7.5 mg/kg BID X 3d OR Thiabendazole topical X 5d
Clinical Hints	- Erythematous, serpiginous, intensely pruritic and advancing lesion(s) or bullae - Usually involves the feet - Follows contact with moist sand or beach - May recur or persist for months.
Synonyms	Creeping eruption, Pelodera, Plumber's itch, Uncinariasis. ICD9: 126.2,126.8,126.9 ICD10: B76.9

Cutaneous larva migrans in Turkey

2016 (publication year) - Three cases of autochthonous cutaneous larva migrans were reported in the Western Black Sea region. [3]

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Multiple locations	dogs	6.5-59.4	59.4% and 6.5% of stray dogs in animal shelters in Afyonkarahisar and Eskisehir provinces, respectively are infested with *Ancylostoma canis* [4]
2013*	Aydin	dogs	3	3% of dogs in Aydin District (fecal PCR) [5]

* indicates publication year (not necessarily year of survey)

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Cyclosporiasis

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

Cyclosporiasis in Turkey

2006 to 2009 - There is evidence that cyclosporiasis in Turkey is most common during warm, dry summer seasons. [3]

2016 (publication year) - Seven cases of autochthonou8s cyclosporiasis were treated at a facility in Van Province. [4]

Prevalence surveys

Years	Region	Study Group	%	Notes
2012 - 2015	Izmir	children	9.6	Survey of immunocompromised children with diarrea [5]
2016	Van	children	5.3	Survey of children hospitalized in an Intensive Care Unit [6]
2004	Western Region	patients	0.46	0.46% of stool specimens from patients with gastrointestinal symptoms [7]
2006	Malatya	patients	5.7	5.7% of stools from patients with gastrointestinal symptoms [8]
2005	Izmir	specimens - stool	1.91	1.91% of stools examined at a university parasitology laboratory [9]
2009	Van	specimens - stool	0.1	0.1% of stools examined at a laboratory [10]
2009 - 2010	Izmir	specimens - stool	16.43	16.43% of stools examined at a laboratory [11]
2014*	Izmir	shellfish	30.2	30.2% of mussels (*Mytilus galloprovincialis*) in coastal Izmir [12]
2017*		patients - HIV / AIDS	2.6	[13]
2018*	Izmir	patients - HIV / AIDS	3.1	[14]
2007	Kars	children - gastrointestinal	0.7	0.7% of children ages 2 to 6 years with gastrointestinal symptomatology seen at a hospital in Kars [15]
2012*	Eskisehir	children - gastrointestinal	0.4	0.4% of children with diarrhea [16]

* indicates publication year (not necessarily year of survey)

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2006 (publication year) - Cyclosporiasis was diagnosed in a man who had been boating in the vicinity of Greece. [17]

Notable outbreaks

Years	Region	Cases	Pathogen	Notes
2005	Western Region	22	multiple pathogens	Outbreak of *Cryptosporidium* and *Cyclospora* infections was reported. [18]

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Cysticercosis

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: *Taenia solium*
Reservoir	Pig, Human, Zoonotic
Vector	None
Vehicle	Soil (contaminated by pigs), Fecal-oral, Fly
Incubation Period	3m - 3y
Diagnostic Tests	Serology (blood or CSF) and identification of parasite in biopsy material.
Typical Adult Therapy	Albendazole 7.5 mg/kg PO BID X 10-14d AND / OR Praziquantel 17 mg/kg TID X 14d Add corticosteroids if brain involved Surgery as indicated[1]
Typical Pediatric Therapy	Albendazole 15 mg/kg PO BID X 30d. AND / OR Praziquantel 30 mg/kg TID X 14d (15 to 30d for neurocysticercosis). Add corticosteroids if brain involved. Surgery as indicated
Clinical Hints	- Cerebral, ocular or subcutaneous mass - Usually no eosinophilia - Calcifications noted on X-ray examination - Associated with regions where pork is eaten - 25% to 50% of patients have concurrent tapeworm infestation
Synonyms	Taenia crassiceps, Taenia martis, Versteria. ICD9: 123.1 ICD10: B69

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Cystoisosporiasis

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

Cystoisosporiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2012 - 2015	Izmir	children	3.2	Survey of immunocompromised children with diarrea [4]
1997 - 2007	Van	patients	0.004	Survey of hospital outpatients [5]
2007*	Ankara	patients	0.1	0.1% of patients admitted to a hospital in Ankara (2007 publication) [6]
2004 - 2005	Izmir	specimens - stool	0.4	0.4% of stools examined at the parasitology laboratory of a university hospital (Izmir, 2004 to 2005) [7]

* indicates publication year (not necessarily year of survey)

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Cytomegalovirus infection

Agent	VIRUS - DNA. Herpesviridae, Betaherpesvirinae: Human herpesvirus 5 (Cytomegalovirus)
Reservoir	Human
Vector	None
Vehicle	Droplet (respiratory), Urine, Dairy products, Tears, Stool, Sexual, contact (rare), Transplacental, Breastfeeding
Incubation Period	3w - 5w (range 2w - 12w)
Diagnostic Tests	Viral culture (blood, CSF, urine, tissue). Serology. Direct viral microscopy. Nucleic acid amplification
Typical Adult Therapy	(Most cases self-limited). Ganciclovir 5 mg/kg q12h IV X 2 to 3w. OR Foscarnet 90 mg/kg Q12h IV OR Cidofovir 5 mg/kg IV weekly + probenicid[1] [2] [3] [4] [5]
Typical Pediatric Therapy	(Most cases self-limited) Ganciclovir 5 mg/kg q12h IV X 2 to 3w
Vaccine	Cytomegalovirus immunoglobulin
Clinical Hints	- Heterophile-negative "mononucleosis" - Mild pharyngitis, without exudate - Variable degree of lymphadenopathy and splenomegaly - Retinitis in AIDS patients - Pneumonia in setting of immune suppression - Congenital infection characterized by multisystem disease in newborns
Synonyms	Cytomegalovirus, Zytomegalie. ICD9: 078.5 ICD10: B25

Cytomegalovirus infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2015*		neonates	1.91	1.91% of live-born infants (all asymptomatic) [6]
2015 - 2017	Izmir	neonates	0.2	Congenital infection was confirmed in 0.2% of neonates [7]
2003 - 2010		transplant recipients	24.9	24.9% of patients who underwent peripheral blood stem cell or bone marrow transplantation [8]
2006 - 2007		transplant recipients	20.5	20.5% of bone marrow transplant recipients [9]
2007 - 2016	Izmir	transplant recipients	18	18% of renal transplant recipients ((serum DNA) [10]
2008*	Izmir	transplant recipients	24.1	24.1% of renal transplant recipients [11]
2010 - 2015	Ankara	transplant recipients	37	CMV reactivation was identified in 37% of patients undergoing autologous hematopoietic cell transplantation [12]
2021*		patients - cancer	70.34	Survey for viremia among children with acute lymphoblastic leukemia [13]
1988 - 2009	Ankara	patients	5.9	5.9% of patients with infectious uveitis. [14]
2011*	Gaziantep	patients	10	10% of vascular samples from patients with atherosclerosis, 0% those without atherosclerosis, 21.2% of patients undergoing aortic valve replacement and 11.9% undergoing mitral valve replacement [15]
2008*		immunocompromised	14	14% of pulmonary infections among immunocompromised hosts

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Years	Region	Study Group	%	Notes
				with hematological malignancy [16]
2007*	Antalya	pregnant women	1.1	1.1% of pregnant women (0.3% primary, 0.8% recurrent infection) [17]
2008*	Multiple locations	patients - fever	3.2	3.2% of fever of unknown origin [18]
2014*	Ankara	specimens	5.4	5.4% of tonsillar tissue samples [19]
2015*	Eskisehir	specimens	27	27% / 10% of specimens from large / small apical dental abscesses [20]
2007*	Antalya	congenital	0.1	Incidence of congenital CMV infection was 0.1% and the rate following primary maternal infection was 33% [21]
2009 - 2015	Izmir	patients - CNS	3.28	Survey of patients with viral central nervous system infection [22]
2010 - 2017	Izmir	patients - CNS	2.2	Survey of pathogens associated with central nervous system infections [23]
2020*	Nationwide	neonates (Literature Review)	1.6-1.9	[24]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2011*		students	85.4	85.4% of female nursing students
2015 - 2017	Bolu	women	98.2	Survey of women of childbearing age [25]
2021*		patients - cancer	90.11	Survey of children with acute lymphoblastic leukemia [26]
2009	Hatay	general population	98.9	98.9% of women and children in Hatay [27]
2001 - 2008	Izmir	pregnant women	98.3	[28]
2004 - 2005	Samsun	pregnant women	97.3	[29]
2004 - 2006	Hatay	pregnant women	94.9	[30]
2007*	Antalya	pregnant women	98.5	98.5% of pregnant women at 8 to 20 weeks' gestation [31]
2008 - 2017	Ankara	pregnant women	62	[32]
2008 - 2013	Istanbul	pregnant women	99.3	99.3% of pregnant women [33]
2009*	Western Region	pregnant women	96.4	96.4% of pregnant women [34]
2009 - 2013	Istanbul	pregnant women	84.1	[35]
2012 - 2014	Northwest Region	pregnant women	91.5	91.5% of pregnant women [36]
2012 - 2013	Van	pregnant women	100	[37]
2013 - 2015	Anatolia	pregnant women	99.5	[38]
2014*		pregnant women	98.1-98.3	98.1% of pregnant and 98.3% of non-pregnant women [39]
2014 - 2016	Izmir	pregnant women	98.9	[40]
2020*	Nationwide	pregnant women (Literature Review)	96-99.8	[41]

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* indicates publication year (not necessarily year of survey)

- 1996 to 2019 - 41 patients with CMV retinitis were treated at a center in Istanbul. [42]
- 2020 (publication year) - An overview of congenital cytomegalovirus infection in Turkey [43]

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Dengue

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

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

Dengue in Turkey

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2010*	Multiple locations	blood donors	0.9	0.9% of blood donors in Ankara, Konya, Eskisehir and Zonguldak Provinces [1]
2010 - 2011	Mersin	blood donors	0.9	0.9% of asymptomatic blood donors in Mersin Province [2]

* indicates publication year (not necessarily year of survey)

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Dermatophytosis

Agent	FUNGUS. Ascomycota, Euascomyces, Onygenales: *Epidermophyton*, *Microsporum*, *Trichophyton*, *Trichosporon* spp., *Arthroderma*, et al
Reservoir	Human, Dog, Cat, Rabbit, Marsupial, Other mammal, Zoonotic
Vector	None
Vehicle	Contaminated soil/flooring, Animal Contact
Incubation Period	2w - 38w
Diagnostic Tests	Fungal culture and microscopy of skin, hair or nails. Nucleic acid amplification.
Typical Adult Therapy	Skin - topical Clotrimazole, Miconazole, etc. Hair/nails - Terbinafine, Griseofulvin, Itraconazole or Fluconazole PO[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Erythematous, circinate, scaling or dyschromic lesions of skin, hair or nails - Pruritus, secondary infection or regional lymphadenopathy may be present
Synonyms	Arthroderma, Dermatomicose, Dermatomycose, Dermatomycosis, Dermatomykose, Dermatomykosen, Emericella, Favus, Granuloma trichophyticum, Gruby's disease, Kodamaea, Leukonychia trichophytica, Microsporum, 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 gladiatorum. ICD9: 110,111 ICD10: B35,B36

Dermatophytosis in Turkey

2004 to 2008 - The most common agents of onychomycosis in the middle Black Sea region were *Trichophyton rubrum* (38%), *Trichophyton mentagrophytes* (20.4%), *Epidermophyton floccosum* (17%), and *Trichophyton verrucosum* (14.2%). [4]

Notable outbreaks

Years	Cases	Clinical	Pathogen	Population	Notes
2007*	29	tinea capitus gladiatorum	*Trichophyton tonsurans*	wrestlers	[5] [6]

* indicates publication year (not necessarily year of outbreak)

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Dicrocoeliasis

Agent	PARASITE - Platyhelminthes, Trematoda. Plagiorchiida, Dicrocoeliidae: *Dicrocoelium dendriticum* and *D. hospes*
Reservoir	Sheep, Cattle, Pig, Goat, Snail, Ant, Zoonotic
Vector	None
Vehicle	Ingested ant
Incubation Period	Unknown
Diagnostic Tests	Identification of ova in stool, bile or duodenal aspirate.
Typical Adult Therapy	Triclabendazole 10 mg/kg single dose OR Praziquantel 25 mg/kg PO TID X 1d (investigational)[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Acquired in sheep-raising areas - Abdominal pain, often accompanied by eosinophilia - Follows inadvertent ingestion of ants (with raw vegetables or fruit)
Synonyms	Dicrocoelium dendriticum, Dicrocoelium hospes, Halzoun, Lancet liver fluke. ICD9: 121.8 ICD10: B66.2

Dicrocoeliasis in Turkey

Sporadic cases of human dicrocoeliasis are reported. [2] [3] [4]

2017 (publication year) - Landsnails which serve as first intermediate hosts for dicrocoeliasis in Turkey include *Helicopsis derbentina*, *Helicopsis protea*, *Helicopsis krynickii*, *Cernuella virgata*, *Trochoidea pyramidata*, *Cochicella acuta*, *Monacha carthusiana*, *Helicella candicans*, *Helix aspersa*, *Helix lucorum* [5] and *Chondrus tournefortianus*. [6]

Prevalence surveys

Years	Region	Study Group	%	Notes
2003	Afyon	cattle	15.3	15.3% of cattle in Afyon Province [7]
2020*	Agri	cattle	25.5	Survey of cattle at slaughter [8]
2008*	Hakkari	goats	8.6	8.6% of hair goats at slaughter in Hakkari Province [9]
2006 - 2007	Samsun	animals	0.9	0.9% of zoo animals in Samsun [10]
2016*	Erzurum	horses	2.63	[11]
2004 - 2005	Multiple locations	equines	0-12.8	12.8% of donkeys, 0% of horses and 0% of mules [12]
2006 - 2010	Black Sea	deer	20	20% of roe deer (*Capreolus capreolus*) in the middle Black Sea region [13]
1997 - 2007	Van	patients	0.001	Survey of hospital outpatients [14]
2006 - 2018	Sivas	patients	0.01	Survey of patients with gastrointestinal symptoms [15]
2019	Erzurum	sheep	33.91	33.91% of sheep (*Dicrocoelium* spp) [16]
1993 - 2006	Sivas	specimens - stool	0.1	0.1% of fecal samples processed at a university parasitology laboratory in Sivas [17]
1993 - 2000	Bursa	specimens - stool	0.021	0.021% of specimens examined at a parasitology laboratory in Bursa [18]
2005	Hatay	specimens - stool	1.2	1.2% of stools examined at a university parasitology laboratory [19]

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Years	Region	Study Group	%	Notes
2009	Van	specimens - stool	0.03	0.03% of stools examined at a laboratory in Van [20]
2013	Kastamonu	snails	27.6	27.6% of *Helix lucorum* snails in the vicinity of Kastamonu [21]
2014	Mersin	snails	2.4	2.4% of *Helix aspersa* snails in Mersin [22]
2017	Van	snails	22	22% of *Helix lucorum* snails are infested by *Dicrocoelium* spp. [23]
2007 - 2008	Bursa	pigs - boars	33	33% of wild boars in Bursa Province [24]
2005*	Hatay	children - gastrointestinal	0.71	0.71% of children ages 0 to 14 with gastrointestinal symptomatology, in Hatay [25]

* indicates publication year (not necessarily year of survey)

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Dientamoeba fragilis infection

Agent	PARASITE - Protozoa. Metamonada, Parabasala, Trichomonadea. Flagellate: *Dientamoeba fragilis*
Reservoir	Human, Gorilla, Pig, Zoonotic
Vector	None
Vehicle	Fecal-oral (ingestion of pinworm ova)
Incubation Period	8d - 25d
Diagnostic Tests	Identification of trophozoites in stool. Nucleic acid amplification. Alert laboratory if this diagnosis is suspected.
Typical Adult Therapy	Stool precautions. Iodoquinol 650 mg PO TID X 20d. OR Tetracycline 500 mg QID X 10d. OR Paromomycin 10 mg/kg TID X 7d OR Metronidazole 750 mg PO TID X 10d[1] [2] [3] [4] [5] [6]
Typical Pediatric Therapy	Stool precautions. Iodoquinol 13 mg/kg PO TID X 20d. OR (age >8) Tetracycline 10 mg/kg QID X 10d OR Paromomycin 10 mg/kg TID X 7d OR Metronidazole 15 mg/kg PO TID X 10d
Clinical Hints	- Abdominal pain with watery or mucous diarrhea - Eosinophilia may be present - Concurrent enterobiasis (pinworm) is common - Infestation may persist for more than one year
Synonyms	ICD9: 007.8 ICD10: A60.8

Dientamoeba fragilis infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2003 - 2005	Van	children	0.4	0.4% of school children ages 7 to 15 in Van Province [7] [8]
2006	Malatya	children	0.6	0.6% of children in Malatya [9]
2007*	Manisa	children	3.4	3.4% of primary school children in Manisa [10]
2019*		adults - elderly	2.43	Survey of elderly patients in a nursing home [11]
1997 - 2007	Van	patients	0.009	Survey of hospital outpatients [12]
2003 - 2006	Istanbul	patients	1.5	1.5% of parasitic infections among hospitalized patients [13]
2003*	Manisa	patients	8.8	8.8% of patients hospitalized for diarrhea in Manisa [14]
2005*	Sanliurfa	patients	2.3	2.3% of patients with diarrhea in Sanliurfa [15]
2007*	Manisa	patients	9.6	9.6% of persons with enterobiasis - 25.4% persons with Dientamoeba infection are coinfected with *Enterobius vermicularis* [16]
2007*	Ankara	patients	2.7	2.7% of patients admitted to a hospital in Ankara [17]
2017 - 2019	Ankara	patients	10.6-13.5	10.6% / 13.5% of immune-deficient / immune-competent patients, with diarrhea [18]
2017 -	Aydin	patients	37.84	Survey of patients with *Enterobius vermicularis* infestation [19]

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Years	Region	Study Group	%	Notes
2018				
2018*	Multiple locations	patients	10.7	10.7% of patients with gastrointestinal complaints (iron hematoxylin stain) [20]
2019*	Multiple locations	patients	12.04	Survey of outpatients with gastrointestinal symptoms [21]
2003 - 2012	Ankara	specimens - stool	9	9% of stool parasites identified by a University Parasitology laboratory in Ankara [22]
2003 - 2005	Kocaeli	specimens - stool	1.8	1.8% of parasites detected in stool specimens from Kocaeli [23]
2006*	Malatya	sanitation workers	0.8	0.8% of municipal sanitary workers in Malatya [24]
2011*		sanitation workers	0.9	0.9% of administrators and workers in sanitary and non-sanitary institutions [25]
2019*		patients - skin	2.6	Survey of patients with urticaria [26]
2018*	Istanbul	patients - HIV / AIDS	13.3	[27]
2012 - 2014	Ankara	children - gastrointestinal	3	3% of children with chronic diarrhea [28]
2012*	Eskisehir	children - gastrointestinal	1.3	1.3% of children with diarrhea [29]

* indicates publication year (not necessarily year of survey)

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Diphtheria

Agent	BACTERIUM. *Corynebacterium diphtheriae* A facultative gram-positive bacillus
Reservoir	Human
Vector	None
Vehicle	Droplet, Contact, Dairy products, Clothing
Incubation Period	2d - 5d (range 1d - 10d)
Diagnostic Tests	Culture on special media. Advise laboratory when this diagnosis is suspected.
Typical Adult Therapy	Respiratory isolation. Equine antitoxin 20,000 to 120,000 units IM. (first perform scratch test) AND Erythromycin 500 mg QID (or Penicillin preparation) X 14d[1]
Typical Pediatric Therapy	Respiratory isolation. Equine antitoxin 20,000 to 120,000 units IM. (first perform scratch test) AND Erythromycin 10 mg/kg QID (or penicillin preparation) X 14d
Vaccines	Diphtheria antitoxin Diphtheria vaccine DT vaccine DTaP vaccine DTP vaccine Td vaccine
Clinical Hints	- Pharyngeal membrane with cervical edema and lymphadenopathy - "Punched out" skin ulcers with membrane - Myocarditis or neuropathy (foot/wrist drop) may appear weeks following initial infection
Synonyms	Corynebacterium diphtheriae, Difteri, Difteria, Difterie, Difterite, Diphterie. ICD9: 032 ICD10: A36

Diphtheria in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

Diphtheria-Pertussis immunization was introduced in 1937; and DPT in 1968. [2]

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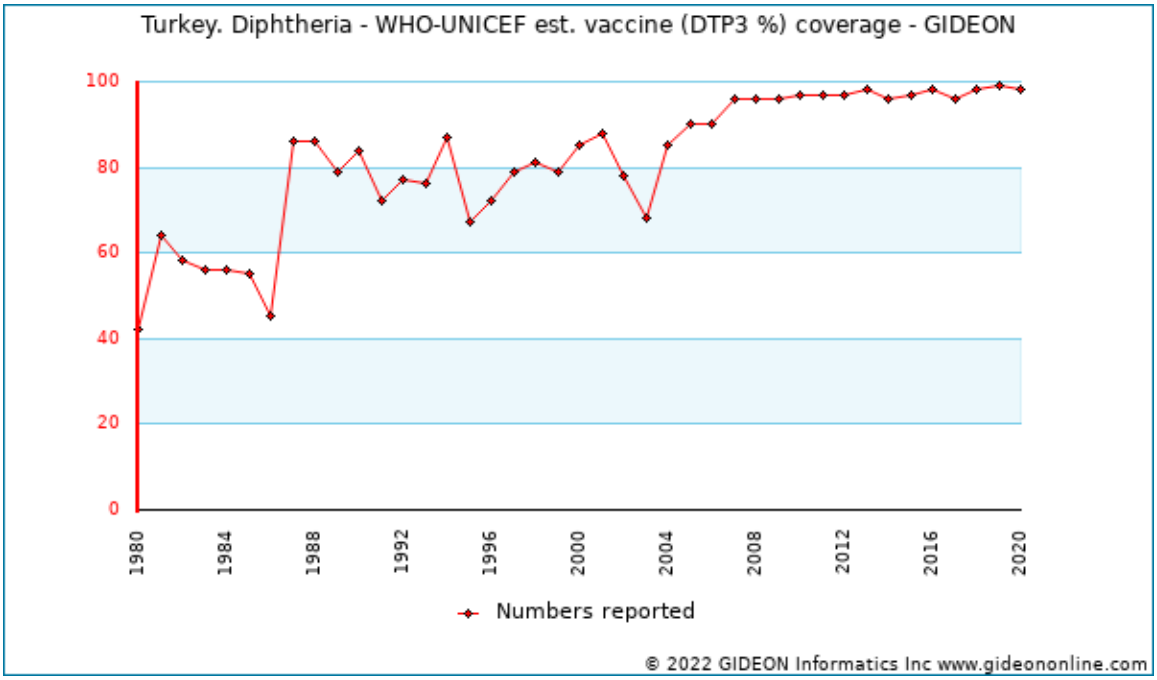
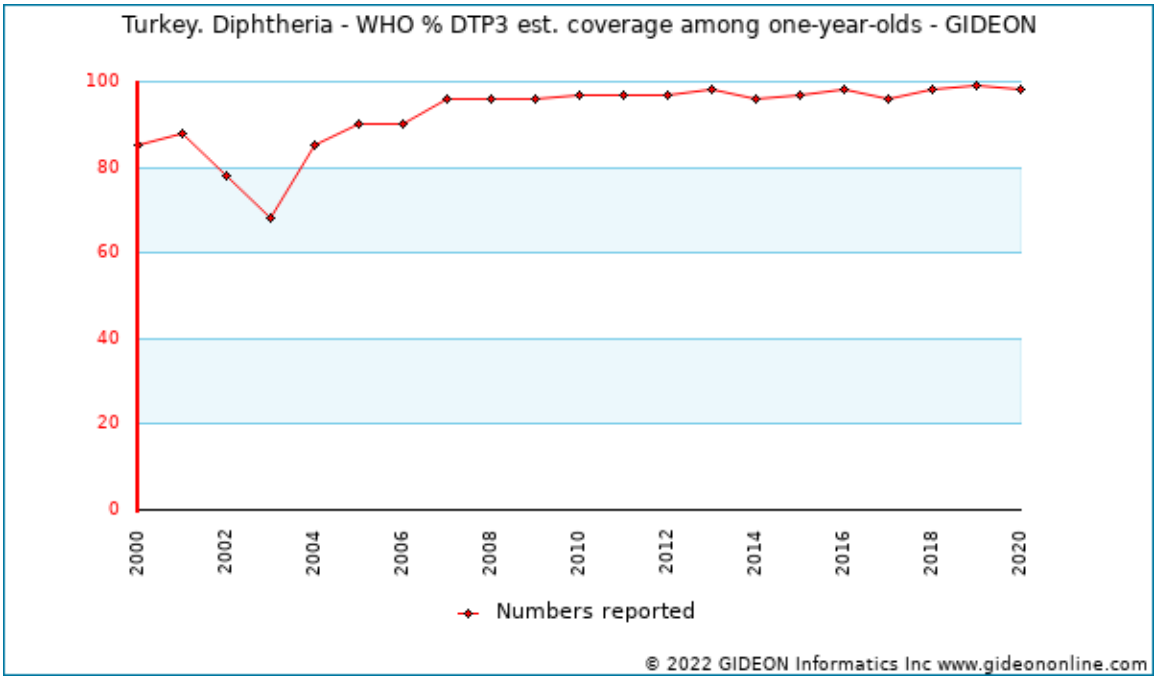


Graph: Turkey. Diphtheria - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Turkey. Diphtheria - WHO % DTP3 est. coverage among one-year-olds

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2003*	Eastern Region	children	69.8-84	74.5% of children in eastern Turkey (Erzurum Erzincan and Kars) below age 1 year, 84% at ages 3 to 4 years, and 80% ages 4 to 5 years, and 69.8% ages 5 to 6 years. 3 4

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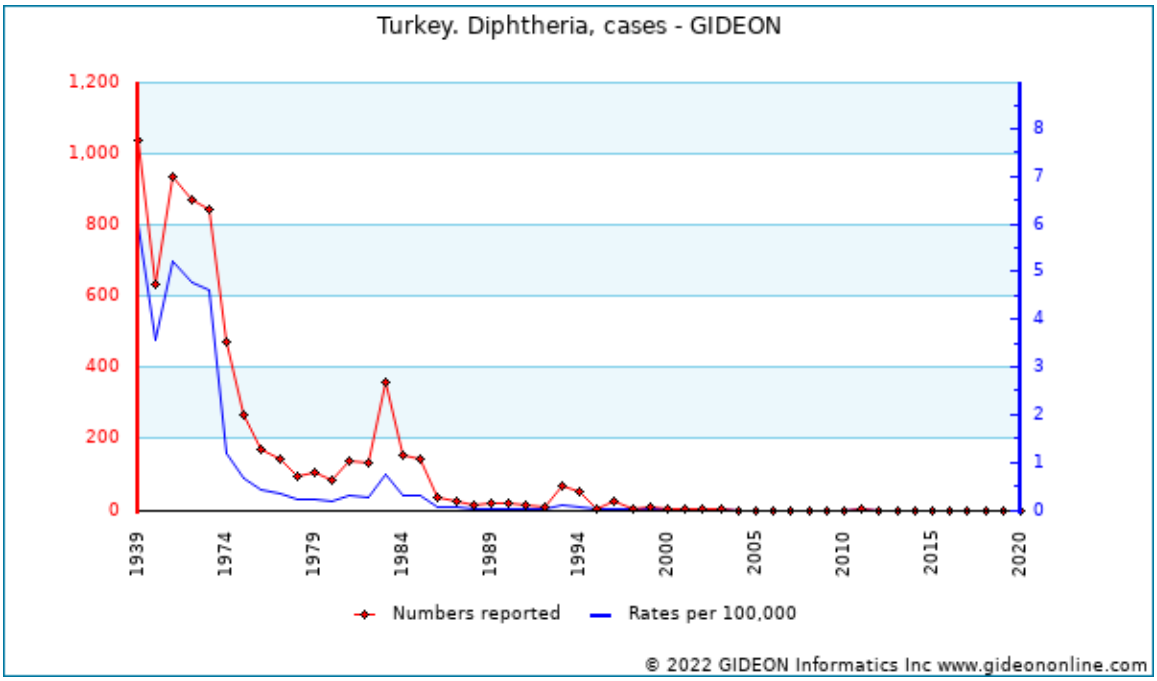
Years	Region	Study Group	%	Notes
2009*	Kocaeli	children	11.1	11.1% of children with acute lymphoblastic leukemia were found to have protective antibodies prior to revaccination [5]
2011*	Izmir	children	92.5	92.5% of children ages 0 to 2 years, 93.2% ages 7 to 9 years, and 86.0% ages 15 to 19 years [6]
2014*	Istanbul	women	50-85.5	50% / 85.5% of unvaccinated / vaccinated mothers [7]
2014*	Ankara	patients	35	35% of adult outpatients treated at a university hospital [8]
2007*	Izmir	adults	56.3	56.3% of adults in Izmir [9]
2007*	Izmir	general population	79.1	79.1% of individuals in Izmir - 60% among adults, and 40.2% in the age group 30 to 44
1997		general population	71.2-71.3	71.3% ages 3 to 6, and 71.2% above age 60
2002*		general population	64.2	64.2% of the general population [10]
2002*		general population	62-64.2	62% to 64.2% of the general population [11]
2009*	Edirne	general population	98	98% of individuals in Edirne [12]

* indicates publication year (not necessarily year of survey)



Graph: Turkey. Diphtheria, cases

Notes:
1. Three fatal cases were reported during 1987 to 1991.

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Diphyllobothriasis

Agent	PARASITE - Platyhelminthes, Cestoda. Pseudophyllidea, Diphyllobothriidae: *Diphyllobothrium latum*, et al
Reservoir	Human, Dog, Bear, Fish-eating mammal, Zoonotic
Vector	None
Vehicle	Fresh-water fish - notably (for *D. latum*) perch, burbot and pike
Incubation Period	4w - 6w (range 2w - 2y)
Diagnostic Tests	Identification of ova or proglottids in feces. Tapeworm length often exceeds ten meters
Typical Adult Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once[1] [2]
Typical Pediatric Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 50 mg/kg PO once
Clinical Hints	- Abdominal pain, diarrhea and flatulence - Vitamin B12 deficiency is noted in 0.02% of patients - Rare instances of intestinal obstruction have been described - Worm may survive for decades in the human intestine
Synonyms	Adenocephalus pacificus, Bandwurmer [Diphyllobothrium], Bothriocephalus acheilongnathi, Bothriocephalus latus, Broad fish tapeworm, Dibothriocephalus infection, Diphyllobothrium cordatum, Diphyllobothrium dalliae, Diphyllobothrium dendriticum, Diphyllobothrium klebanovskii, Diphyllobothrium latum, Diphyllobothrium nihonkaiense, Diphyllobothrium stemmacephalum, Diphyllobothrium ursi, Diplogonoporiasis, Fish tapeworm. ICD9: 123.4 ICD10: B70.0

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Dipylidiasis

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

Dipylidiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2006*	Van	dogs	3.5	3.5% of dogs in the Van region [3]
2007*	Multiple locations	dogs	2.9-4.3	2.9% of stray dogs in Afyonkarahisar Province and 4.3% in Eskisehir Province [4]
2021*	Multiple locations	foxes	0.97	Survey of red foxes from 29 provinces [5]

* indicates publication year (not necessarily year of survey)

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Dirofilariasis

Agent	PARASITE - Nematoda. Secernentea: *Dirofilaria* (*Nochtiella*) *immitis* (pulmonary); *D. tenuis* & *D. repens* (subcutaneous infection) & *D. ursi*
Reservoir	Mammal, Dog, Wild carnivore (*D. tenuis* in raccoons; *D. ursi* in bears), Zoonotic
Vector	Mosquito
Vehicle	None
Incubation Period	60d - 90d
Diagnostic Tests	Identification of parasite in tissue. Serology. Nucleic acid amplification. Dirofilaria immitis adult: female - 23 to 31 cm; male - 12 to 23 cm Dirofilaria repens adult: female - 25 to 30 cm; male - 5 to 7 cm
Typical Adult Therapy	Not available; excision is often diagnostic and curative
Typical Pediatric Therapy	As for adult
Clinical Hints	- Most patients are asymptomatic - Cough and chest pain in some cases - Solitary pulmonary coin lesion seen on imaging - Multiple tender subcutaneous nodules may be present - Eosinophilia is usually absent
Synonyms	Breinlia, Candidatus Dirofilaria hongkongensis, Dirofilaria sp. genotype Hongkong, Dirofilariosis, Dirofiliaria, Dog heartworm, Filaria conjunctivae, Loaina. ICD9: 125.6 ICD10: B74.8

Dirofilariasis in Turkey

Sporadic cases of human dirofilariasis are reported. [1] [2] [3] [4] [5] [6]

Prevalence surveys

Years	Region	Study Group	%	Notes
2000 - 2001	Ankara	dogs	9.3	9.3% of domestic dogs in the Ankara region [7]
2005 - 2006	Kayseri	dogs	9.6	[8]
2006	Hatay	dogs	26	[9]
2008*	Multiple locations	dogs	12.8	12.8% of dogs in Sakarya, Kocaeli, Ankara, Elazig and Mersin [10]
2008*	Kirikkale	dogs	27.46	[11]
2010 - 2011	Multiple locations	dogs	8.5	8.5% of dogs (10 provinces) [12]
2011*	Erzurum	dogs	8.1	8.1% of stray dogs in Erzurum [13]
2016*	Elazig	dogs	4.2	[14]
2017*	Erzurum	dogs	0-1.5	0% of dogs were infested with *Dirofilaria repens* and 1.5% with *D. immitis* [15]
2010*	Kayseri	mosquitoes	0.33	0.33% of mosquito pools in Felahiye district, Kayseri [16]
2012 - 2014	Northeast Region	mosquitoes	1.33	Survey of mosquitoes in the Aras Valley [17]

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* indicates publication year (not necessarily year of survey)

Vectors

- 2011 (publication year) - *Aedes vexans* was identified as the probable vector in Kayseri Province. [18]
- 2012 to 2014 - *Anopheles maculipennis*, *Aedes caspius*, *Ae. vexans*, *Culex theileri* and *Cx. pipiens* were identified as potential vectors of *Dirofilaria immitis* and *D. repens*. [19]

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Echinococcosis - multilocular

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: *Echinococcus multilocularis*
Reservoir	Fox, Wolf, Coyote, Dog, Cat, Vole, Lemming, Shrew, Mouse, Zoonotic
Vector	None
Vehicle	Animal feces
Incubation Period	not known
Diagnostic Tests	Serology. Identification of parasite in surgical specimens.
Typical Adult Therapy	Surgery (including liver transplantation in some cases). Albendazole 400 mg PO BID X 28d - multiple courses advocated following 'wash-out' periods[1]
Typical Pediatric Therapy	Surgery (including liver transplantation in some cases). Albendazole 10 mg/kg/d PO X 28d - multiple courses advocated following 'wash-out' periods
Clinical Hints	- Epigastric pain or chronic cholestatic jaundice - Illness appears 5-to-15 years following acquisition of the parasite - Metastatic cysts in brain, bone, lungs, other organs - may mimic malignancy
Synonyms	Alveolar colloid of the liver, Alveolar hydatid disease, Alveolococcosis, Echinococcus multilocularis, Small fox tapeworm. ICD9: 122.5,122.6,122.7 ICD10: B67.5,B67.6,B67.7

Echinococcosis - multilocular in Turkey

Time and Place

The first case of human alveolar echinococcosis in Turkey was reported in 1939.

- A total of 52 cases were confirmed to 1974. [2]
- Most cases are reported from 86.24% in eastern and southeastern Anatolia. [3]
- *Echinococcus multilocularis* accounted for 33.3% of echinococcosis cases in southeast Turkey, and *Echinococcus granulosis* for 66.7% (2021 publication). [4]
- 62.20% of patients are females (2000 to 2010)

- 2019 (publication year) - A review of *Echinococcus multilocularis* in Turkey [5]

Incidence and case-series

- 1962 to 1996 - 207 cases were reported
- 1980 to 2000 - 47 cases were identified through active case finding in Diyarbakier and Urfa (south eastern Anatolia). [6]
- 2000 to 2010 - 162 cases were reported. [7]
- 2001 to 2019 - 34 cases (3 fatal) of pulmonary alveolar echinococcosis were treated at a center in Erzurum. [8]
- 2002 to 2014 - A review of ten liver transplantations performed for alveolar echinococcosis [9]
- 2008 - A case was reported in Malatya Province (2008 publication) [10]

Reservoirs

- 2015 to 2016 - The principal definitive hosts are assumed to be red foxes [11]
- 2017 (publication year) - The intermediate hosts are rodents (*Microtus* spp.) [12]
- 2018 (publication year) - *Echinococcus multilocularis* was identified in a Eurasian lynx (*Lynx lynx*) in Erzurum. [13]

Prevalence surveys

Years	Region	Study Group	%	Notes
2014 - 2015	Multiple locations	foxes	1.9	1.9% of fox fecal samples collected from the environment [14]
2017*	Erzurum	rodents	1.3	[15]

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Echinococcosis - unilocular

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

Echinococcosis - unilocular in Turkey

The first reference to echinococcosis in Turkey was published in 1872. [2]

- 2001 to 2005 - Central Anatolia accounted for 38.57% of cases, Aegean region 16.94%, Mediterranean region 16.09%, Marmara region 13.13%, East Anatolian region 6.80%, Black Sea region 5.70% and Southeast Anatolian region 2.75%. [3]

- 2021 (publication year) - *Echinococcus multilocularis* accounted for 33.3% of echinococcosis cases in southeast Turkey, and *Echinococcus granulosis* for 66.7%. [4]

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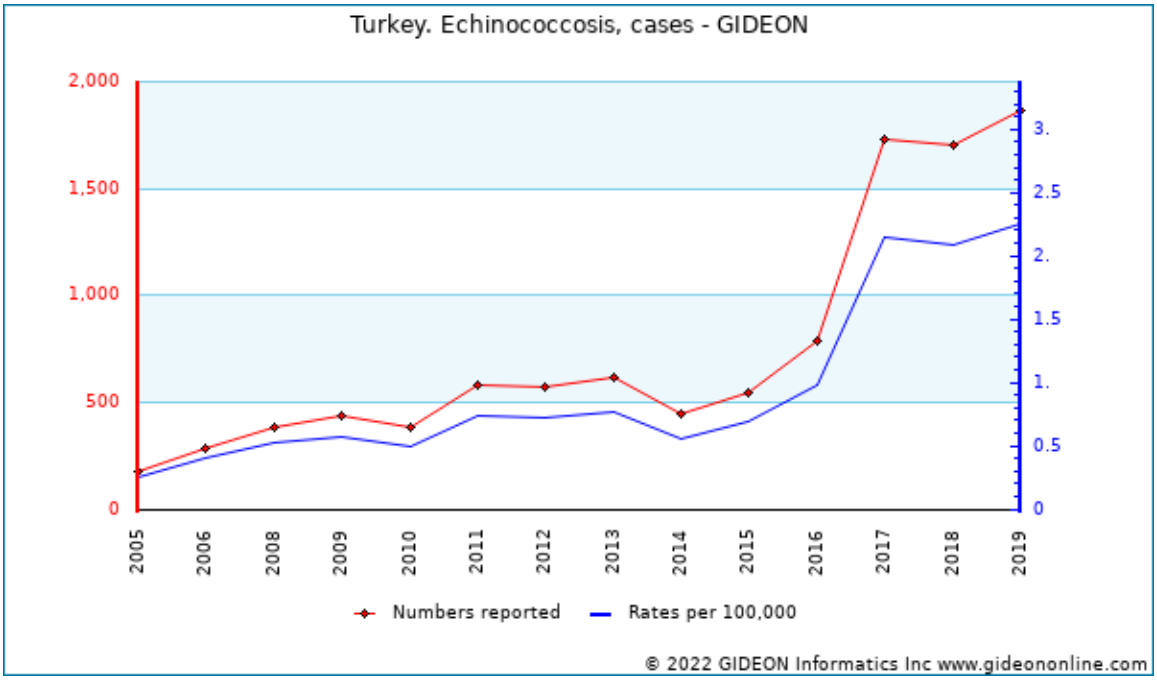

Graph: Turkey. Echinococcosis, cases

Notes:
1. A yearly average of 300 cases was reported during the 1950's. [5]
2. 1,000 to 1,500 cases were reported yearly during the 1980's.

Case series

- 1975 to 1994 - 40,242 surgical operations were performed for hydatid cyst, nationwide. [6]
- 1999 to 2017 - 649 children underwent surgery for pulmonary hydatid cyst at a center in Izmir. [7]
- 2000 to 2009 - Cyst rupture occurred in 5.7% (21 of 368) cases reported from a hospital in Izmir. [8]
- 2000 to 2017 - 78 children underwent surgery for echinococcosis at a hospital in Elazig. [9]
- 2001 to 2005 - 14,789 cases were identified through active case finding. [10]
- 2003 to 2020 - 29 patients were treated for intraperitoneal rupture of hydatid cysts at a hospital in Malatya. [11]
- 2005 to 2007 - 234 cases were confirmed at a hospital in Diyarbakir. [12]
- 2005 to 2016 - 25 children below age 15 underwent echinococcosis surgery at a hospital in Bursa. [13]
- 2008 to 2010 - 60 patients underwent surgery for echinococcosis at a hospital in Adana. [14]
- 2008 to 2020 - The epidemiology, clinical and laboratory parameters, radiological, serological, pathological, and treatment in 550 cases (9 fatal) of echinococcosis treated at nine centers. [15]
- 2009 to 2016 - 178 patients were treated for echinococcosis at a hospital in Izmir. [16]
- 2011 to 2020 - Therapy and complications in 153 patients with pulmonary hydatid cyst (0 fatal) treated at a center in Erzurum. [17]
- 2013 to 2018 - 393 patients with hydatid cyst were treated at a hospital in Sanliurfa. [18]
- 2014 - 715 pulmonary hydatid cyst operations (690 patients) were performed among 101 centers in 81 cities. [19]
- 2014 to 2019 - A follow-up study of 170 patients treated for hydatid disease at six centers - see reference [20]
- 2018 to 2020 - Eight pregnant women with echinococcal cysts were treated at a tertiary health center. [21]
- 2020 (publication year) - Molecular characterization of 102 echinococcal cysts from patients in Van Province [22]
- 2021 (publication year) - 205 children were treated for hydatid cyst at a hospital in Ankara. [23]
- 2021 - 107 patients with hepatic hydatid cysts were treated surgically at a hospital in Kars. [24]

The rate of surgical intervention for echinococcosis is estimated at 2,663 cases per year (0.87 to 6.6 per 100,000). [25]

Incidence by region

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- Aegean region reported 2,114 cases during 2001 to 2005
- Ankara reported 1,470 cases during 1984 to 1994
- Black Sea region reported 428 cases during 2001 to 2005
- Eastern Anatolian region reported 844 cases during 2001 to 2005
- Istanbul reported 1,812 cases during 1985 to 1995
- Kayseri reported 699 hospitalized cases during 1994 to 1998 [26]
- Konya state reported 833 surgical cases during 1986 to 1999.
- Malatya reported 381 cases during 1990 to 1999
- Marmar region reported 2,534 cases during 2001 to 2005
- Mediterranean region reported 2,578 cases during 2001 to 2005
- Middle Anatolian region reported 5,404 cases during 2001 to 2005
- Southeastern Anatolian region reported 887 cases during 2001 to 2005

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Manisa	children	0.15	0.15% of primary school children in Manisa [27]
2012*	Eastern Region	children	0.2	0.2% of primary school children in East Turkey [28]
2005*	Kirikkale	cattle	14.2	14.2% of slaughtered cattle in Kirikkale [29]
2008*	Antakya	cattle	3.23	3.23% of slaughtered cattle in Antakya [30]
2008 - 2009	Eastern Region	cattle	33.9	33.9% of cattle in an endemic area of eastern Turkey [31]
2013*	Van	cattle	44.4	44.4% of slaughtered cattle in Van [32]
2019	Mugla	cattle	0.21	0.21% of cattle at slaughter [33]
1997	Multiple locations	dogs	0.94-40.5	0.94% (Ankara, 1997) to 40.5% in (Kars, 1997) of dogs
2013*	Aydin	dogs	1	1% of dogs in Aydin District [34]
2017*	Ankara	dogs	14	Stool PCR [35]
2011*	Erzurum	equines	20.4-33.5	20.4% of horses and 33.5% of donkeys in Erzurum Province [36]
1999 - 2010	Kayseri	patients	24.3	24.3% of persons tested because of clinical suspicion of echinococcosis [37]
2000 - 2007	Ankara	patients	66	66% of biliary parasitosis ([38]
2009 - 2013	Nationwide	patients	15.03	15.03% of serum samples submitted from patients with suspected echinococcosis (nationwide) [39]
2011*		patients	42.2	42.2% of patients suspected of having echinococcosis - 2.2 were found to have fascioliasis [40]
2003*	Kirikkale	sheep	50.9	50.9% of adult sheep in Kirikkale [41]
2018 - 2019	Konya	sheep	1.97	Survey of sheep at slaughter [42]
2014 - 2015	Multiple locations	foxes	0.5	0.5% of fox fecal samples collected from the environment [43]
2000 - 2001	Bardur	various	13.5-26.6	13.5% of cattle, 26.6% sheep and 22.1% of goats in Bardur at slaughter [44]
2003 - 2012	Ankara	specimens - stool	4	4% of stool parasites identified by a University Parasitology laboratory in Ankara (*Echinococcus* spp.) [45]
2003 - 2004	Istanbul	deaths	2	2% of autopsies performed for sudden death [46]
2006 - 2010	Black Sea	water buffalo	10.2	10.2% of slaughtered water buffalo in the Black Sea region [47]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

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Years	Region	Study Group	%	Notes
2003 - 2004	Izmir	patients	17	17% of persons tested because of clinical suspicion of echinococcosis [48]
2005 - 2011	Samsun	patients	18	18% of patients suspected of having echinococcosis [49]
2012*	Erzincan	patients	35.5	35.5% of persons tested because of clinical suspicion of echinococcosis [50]
2003	Afyon	general population	14.6	14.6% of the rural population of Afyon, midwestern Turkey [51]
2006*	Kayseri	general population	2.7	2.7% in rural Kaysari, central Anatolia [52]
2017*	Ordu	animal contact	0	Survey of veterinarian, butchers and farmers [53]
2007*	Ankara	veterinarians	2.15	2.15% of veterinary surgeons [54]
2005*	Malatya	waste collectors	7.08	7.08% of garbage men [55]

* indicates publication year (not necessarily year of survey)

- 2009 (publication year) - *Echinococcus canadensis* infection has been identified in humans and sheep. [56]
- 2009 (publication year) - *Echinococcus granulosus* infection was reported in a Turkish mouflon (*Ovis gmelinii anatolica*). [57]

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Ehrlichiosis - human monocytic

Agent	BACTERIUM. Anaplasmataceae *Ehrlichia chaffeensis* *Ehrlichia canis* *Neoehrlichia mikurensis*, et al. Intracellular *Rickettsia*-like bacteria
Reservoir	Dog, Tick, Deer, Coyote, Zoonotic
Vector	Tick (*Dermacentor variabilis* or *Amblyomma americanum*)
Vehicle	None
Incubation Period	7d - 21d
Diagnostic Tests	Intramonocytic inclusions seen in blood smear. Serology. Nucleic acid amplification. Cell culture (HL60 cells).
Typical Adult Therapy	Doxycycline 100 mg PO BID X 7 to 14 days OR Rifampin 300 mg BID[1]
Typical Pediatric Therapy	Above age 8 years: Doxycycline 2 mg/kg PO BID X 7 to 14 days. OR Rifampin 10 mg/kg/day (maximum 300 mg) PO
Clinical Hints	- 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
Synonyms	Candidatus Neoehrlichia mikurensis, Cowdria ruminantium, Ehrlichia canis, Ehrlichia chaffeensis, Ehrlichia muris, Ehrlichia runinantium, Ehrlichia sp. Panola Mountain, Human monocytic ehrlichiosis, Human monocytotropic ehrlichiosis, Neoehrlichia mikurensis, Panola Mountain Ehrlichia. ICD9: 082.41 ICD10: B28.8

Although Ehrlichiosis - human monocytic is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Ehrlichiosis - human monocytic in Turkey

2017 - Ehrlichiosis was reported in a child from Konya [2]

Prevalence surveys

Years	Region	Study Group	%	Notes
2015*	Multiple locations	dogs	4.9	4.9% of dogs (*Ehrlichia canis*) [3]
2017*	Southeast Region	dogs	10.5	*Ehrlichia canis* was identified in 10.5% of shelter dogs [4]
2019*	Multiple locations	dogs	5.8	5.8% of shelter dogs (*Ehrlichia canis*) [5]
2017 - 2021	Tekiradag	cats	0	Survey of house cats [6]
2016*	Thrace	various	6-15.75	6% of dogs and 15.75% of tick (*Rhipicephalus sanguineus*) pools (*Ehrlichia canis*) [7]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2016*	Thrace	dogs	27.25	27.25% of dogs (*Ehrlichia canis*) [8]

* indicates publication year (not necessarily year of survey)

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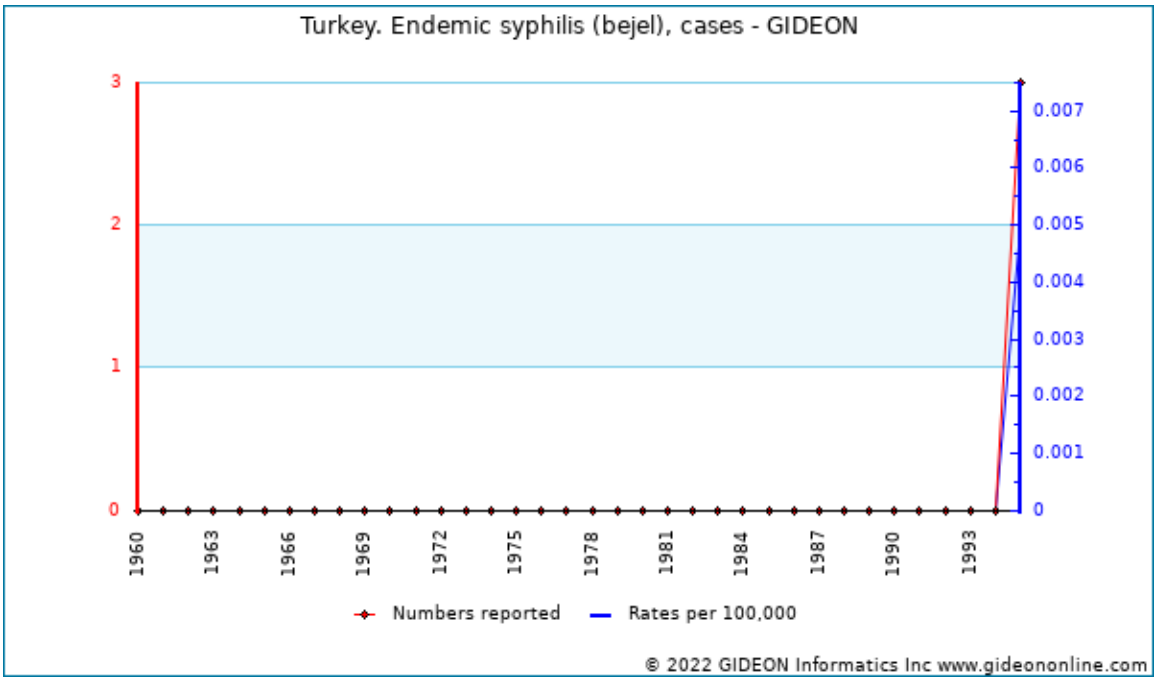
Endemic syphilis (bejel)

Agent	BACTERIUM. *Treponema pallidum* subsp. *endemicum* A microaerophilic gram-negative spirochete
Reservoir	Human
Vector	None
Vehicle	Contact Sexual contact
Incubation Period	14d - 90d
Diagnostic Tests	VDRL & FTA (or MHTP) are positive, as in venereal syphilis.
Typical Adult Therapy	Benzathine Penicillin G 2.4 million units OR Azithromycin 2 g given once[1]
Typical Pediatric Therapy	Benzathine Penicillin G IM: <14 kg - 300,000u X one dose 14 to 18kg - 600,000u X one dose >18kg - 1.2 million units X one dose OR Azithromycin 30 mg/kg given once
Clinical Hints	- Oral mucous patches, intertriginous papillomata and generalized lymphadenopathy - Occasional instances of condyloma lata are encountered - Late gummata and periostitis (often of the tibia or fibula) may develop
Synonyms	Bejel, Belesh, Dichuchwa, Endemic syphilis, Firjal, Frenga, Mal de Breno, Morbus Skerljebo, Njovera, Siti, Skerljevo. ICD9: 104.0 ICD10: A65

Endemic syphilis (bejel) in Turkey



Graph: Turkey. Endemic syphilis (bejel), cases

Notes:

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Individual years:
1995 - Cases reported from Malatya. [2]

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Endocarditis - infectious

Agent	BACTERIUM OR FUNGUS. viridans streptococci, *Staphylococcus aureus*, enterococci, *Candida albicans*, et al.
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Blood culture, clinical findings, ultrasonography of heart valves.
Typical Adult Therapy	Bactericidal antibiotic appropriate to species[1] [2] [3] [4]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Consider in any patient with prolonged and unexplained fever, - Multisystem disease and a preexisting cardiac valvular lesion may be present - Skin lesions, hematuria, neurological symptoms, single or multiple abscesses or bone, brain, lung (etc)
Synonyms	Bacterial endocarditis, Endocardite, Endocarditis, Endokarditis, Fungal endocarditis, Infectious endocarditis, S.B.E.. ICD9: 421 ICD10: I33

Endocarditis - infectious in Turkey

- 2018 (publication year) - A country-by-country review of studies of endocarditis in the Mediterranean basin - [5]

- 2009 to 2018 - 155 adults were treated for endocarditis at a tertiary center in Istanbul. [6]

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Enterobiasis

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

Enterobiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
1999	Duzce	children	13.5	13.5% of children displaced by an earthquake [2]
2002	Karaman	children	76.2	76.2% of school children in Karaman [3]
2003 - 2005	Van	children	0.6	0.6% of school children ages 7 to 15 in Van Province [4] [5]
2005*	Sivas	children	15.6	15.6% of primary school children in Sivas [6]
2005	Kayseri	children	5.1	5.1% of preschool children [7]
2005	Van	children	0.3	0.3% of school children ages 7 to 15 in Van Province [8]
2006 - 2008	Sivas	children	7-14.8	7.0% to 14.8% of school children in Sivas [9]
2006	Malatya	children	0.9	0.9% of children in Malatya [10]
2006*	Izmir	children	43.8	43.8% of school children in the Izmir region [11]
2007*	Elazig	children	8	8% of primary school children in Elazig [12]
2007*	Riza	children	1.3	1.3% of children (ages 1 to 6 years) in nurseries in Riza [13]
2007*	Izmir	children	10.1	10.1% of primary school children in Izmir [14]
2007*	Manisa	children	1	1% of primary school children in Manisa [15]
2007	Sanliurfa	children	27.58	27.58% of children ages <= 6 years, in Sanliurfa [16]
2008*	Kocaeli	children	15	15% of children in Kocaeli [17]
2008*	Aydin	children	3	3% of children in day nurseries and a kindergarten in Aydin [18]
2008*	Sivas	children	12.8	12.8% of primary school children in Sivas [19]

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Years	Region	Study Group	%	Notes
2008*	Yozgat	children	8.4	8.4% of primary school children in Yozgat [20]
2009*	Ankara	children	10.6	10.6% of primary school children in Ankara [21]
2009*	Denizli	children	29.6	29.6% of children ages 1 to 15 in Denizli Province [22]
2009*	Hatay	children	32.2	32.2% of orphans in Hatay [23]
2010 - 2011	Ankara	children	8.5	8.5% of primary school children in Ankara [24]
2011*	Kayseri-Hacilar	children	10.7	10.7% of primary school children ages 6 to 14, in Kayseri-Hacilar region [25]
2015*	Yigilca	children	16.1	16.1% of school children in Yigilca [26]
2015*	Kayseri	children	10.4	10.4% of primary school children in Kayseri [27]
2005*	Hatay	students	6.61	6.61% of female students ages 16 to 18, in Hatay [28]
2010*	Kayseri	students	0	0% of foreign high school students in Kayseri [29]
1997 - 2007	Van	patients	0.6	Survey of hospital outpatients (stool specimens only) [30]
2001 - 2004	Bursa	patients	1.56	1.56% of inpatients and outpatients with gastrointestinal symptoms at a university medical faculty [31]
2003 - 2004	Izmir	patients	10.1	10.1% of patients with gastrointestinal complaints [32]
2003 - 2006	Istanbul	patients	2	2% of parasitic infections among hospitalized patients [33]
2005 - 2007	Camlihemsin	patients	24	24% of persons admitted to a healthcare center [34]
2005 - 2009	Izmir	patients	0.25	0.25% of stool specimens from patients with gastrointestinal symptoms, in Izmir [35]
2005 - 2008	Izmir	patients	0.16	0.16% of patients with gastrointestinal complaints at a University Medical Faculty Hospital [36]
2006 - 2018	Sivas	patients	10.8	Survey of patients with gastrointestinal symptoms [37]
2007*	Manisa	patients	25.4	25.4% persons with *Dientamoeba* infection - 9.6% of persons with enterobiasis are co-infected with *Dientamoeba fragilis* [38]
2009 - 2010	Bursa	patients	9.3	9.3% of patients with gastrointestinal complaints [39]
2009 - 2010	Bursa	patients	12.08	12.08% of patients with gastrointestinal symptoms, in Bursa [40]
2010 - 2017	Adıyaman	patients	0.74	*Enterobius vermicularis* infection was identified in 0.74% of appendectomies [41]
2011 - 2018	Izmir	patients	0.3	Survey of patients referred to a Parasitology laboratory. [42]
2012 - 2015	Bingol	patients	1.36	*Enterobius* was identified in 1.36% of appendectomy specimens [43]
2014 - 2018	Erzincan	patients	0.9	Survey of patients undergoing appendectomy [44]
2016 - 2017	Marmara	patients	2	Survey of appendectomy specimens [45]
1976*	Ankara	general population	3	3.0% of individuals in poor districts of Ankara [46]
2006*	Kayseri	general population	15.41	15.41% of individuals in the Kayseri Karpuzsekisi basin [47]
2007*	Multiple locations	food handlers	8.62	8.62% of food workers employed in hospitals (Aydin and Yil states) [48]
2007*	Van	food handlers	0.81	0.81% of persons working in the food sector [49]
1988 - 2012	Istanbul	specimens - stool	16	16% of parasites identified in stool specimens from hospitalized patients [50]
1997 - 2001	Istanbul	specimens - stool	25.5	25.5% of fecal samples examined in Istanbul
2000 - 2006	Malatya	specimens - stool	8.3	8.3% of fecal samples analyzed in a single hospital [51]

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Years	Region	Study Group	%	Notes
2003 - 2007	Eskisehir	specimens - stool	2.3	2.3% of parasites found in stools at a university medical facility [52]
2003 - 2005	Kocaeli	specimens - stool	23.3	23.3% of parasites detected in stool specimens from Kocaeli [53]
2005 - 2008	Kayseri	specimens - stool	0.2	0.20% of stools examined at a university parasitology laboratory [54]
2005	Hatay	specimens - stool	8.72	8.72% of stools examined at a university parasitology laboratory16% of parasites identified in stool specimens from hospitalized patients [55]
2005	Izmir	specimens - stool	1.86	1.86% of stools examined at a university parasitology laboratory [56]
2009	Van	specimens - stool	0.1	0.1% of stools examined at a laboratory in Van [57]
2012 - 2014	Istanbul	specimens - stool	12.58	Survey of specimens submitted to a hospital laboratory [58]
2012 - 2014	Istanbul	specimens - stool	2.4	[59]
1993 - 2000	Bursa	specimens	3.41	3.41% of celo- tape preparations processed at a university parasitology laboratory [60]
1999 - 2012	Ankara	specimens	1.29	1.29% of appendectomy specimens [61]
1999 - 2011	Malatya	specimens	1.9	1.9% of appendectomy specimens [62]
1999 - 2009	Istanbul	specimens	9	9% of cellophane tape examinations from hospitalized patients in Istanbul [63]
2000 - 2006	Antalya	specimens	2.1	2.1% of appendectomy specimens (all noninflamed)
2002 - 2004	Sivas	specimens	5.4	5.4% of cello tape preparations processed at a university parasitology laboratory [64]
2006 - 2010	Manisa	specimens	4.25	4.25% of cellophane tape preparations processed at a university parasitology laboratory [65]
2007 - 2009	Tokat	specimens	7.9	7.9% of cellophane tape examinations by Tokat public health laboratory [66]
2007*	Malatya	specimens	2	2% of appendectomy specimens [67]
2008 - 2014		specimens	1.4	1.4% of appendectomy specimens [68]
2012 - 2016	Adıyaman	specimens	0.56	*Enterobius vermicularis* was identified in 0.56% of appendectomy specimens [69]
2013*	Malatya	specimens	0.6	0.6% of appendectomy specimens [70]
2015*	Mus	specimens	0.62	0.62% of appendectomy specimens [71]
2000*	Ankara	environmental - soil	1.2	1.2% of soil samples from parks in Ankara [72]
2006*	Malatya	sanitation workers	13.3	13.3% of municipal sanitary workers [73]
2011*		sanitation workers	0.04	0.04% of administrators and workers in sanitary and non-sanitary institutions [74]
1999 - 2018	Malatya	specimens - tissue	1.38	Survey of appendectomy specimens [75]
2009 - 2017		specimens - tissue	0.35	Survey of appendectomy specimens [76]
2010 - 2020	Diyarbakir	specimens - tissue	1.81	Survey of appendectomy specimens [77]
2005*	Manisa	children - gastrointestinal	10.3	10.3% of children with gastrointestinal symptomatology [78]
2005*	Hatay	children - gastrointestinal	15.9	15.9% of children ages 0 to 14 with gastrointestinal symptomatology [79]

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Years	Region	Study Group	%	Notes
2007	Kars	children - gastrointestinal	0.7	0.7% of children ages 2 to 6 years with gastrointestinal symptomatology seen at a hospital in Kars [80]

* indicates publication year (not necessarily year of survey)

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Enterovirus infection

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

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Mersin	children	1.6	1.6% of children ages 0 to 2 years with acute bronchiolitis [3]
2012 - 2014	Ankara	children	1.8	Enteroviruses were found in 1.2% of children with febrile neutropenia, and Human parechovirus in 0.6% [4]
2009 - 2015	Izmir	patients - CNS	3.37	Survey of patients with viral central nervous system infection [5]
2010 - 2017	Izmir	patients - CNS	69	Survey of pathogens associated with central nervous system infections [6]
2012 - 2016	Istanbul	children - respiratory	0.3	Survey of children hospitalized with lower respiratory tract infection [7]
2016 - 2018	Istanbul	children - respiratory	1.6	Survey of children hospitalized in an Intensive Care Unit for lower respiratory tract infection [8]
2016*	Gaziantep	children - respiratory	0	0% / 0% of children with acute lower respiratory tract infection and wheezing / controls [9]
2015*	Malatya	children - gastrointestinal	16-22.1	22.1% / 16.0% of children with acute viral gastroenteritis (Enterovirus / Parechovirus) [10]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Clinical	Notes
1999	Multiple locations	176	meningitis	Outbreak reported in Ankara and Antalya. [11] [12] [13]

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Epidural abscess

Agent	BACTERIUM. *Staphylococcus aureus*, facultative gram negative bacilli, etc
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Imaging (CT scan, MRI). Gram-stain and culture of blood or pus.
Typical Adult Therapy	Intravenous antibiotic(s) appropriate to identified or suspected pathogens. Drainage as indicated[1] [2]
Typical Pediatric Therapy	Intravenous antibiotic(s) appropriate to identified or suspected pathogen. Drainage as indicated
Clinical Hints	- Frontal bone abscess; or spinal cord compression with signs of infection - Often in setting of injecting drug abuse or preexisting staphylococcal infection
Synonyms	ICD9: 324.9 ICD10: G06.1,G06.2

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Erysipelas or cellulitis

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

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Erysipeloid

Agent	BACTERIUM. *Erysipelothrix rhusiopathiae* A facultative gram-positive bacillus
Reservoir	Mammal, Bird, Fish, Zoonotic
Vector	None
Vehicle	Contact with meat (mammal, poultry or fish)
Incubation Period	1d - 7d
Diagnostic Tests	Culture.
Typical Adult Therapy	Oral therapy for 7 days: Penicillin V, Cephalexin, Ciprofloxacin, Clindamycin. For diffuse cutaneous or systemic infection parenteral therapy: Penicillin, Ceftriaxone, Imipenem, Ciprofloxacin, Levofloxacin, Daptomycin[1] [2] [3]
Typical Pediatric Therapy	Oral therapy for 10 days: Penicillin V, Ampicillin, third-generation cephalosporin or Erythromycin, Clindamycin are generally adequate
Clinical Hints	- Typically follows contact with raw animal or fish products - Annular erythema or "target lesion" on hand - Fever is present in only 10% of cases. - Local pain and swelling, without discharge
Synonyms	Erysipelothrix rhusiopathiae, Rutlauf. ICD9: 027.1 ICD10: A26

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Erythrasma

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

Erythrasma in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Southern Region	patients	46.7	46.7% of patients with interdigital foot lesions [2]
2014*		patients	33.7	33.7% of patients with interdigital foot lesions [3]
2015*		patients	40.1	40.1% of patients with interdigital foot lesions [4]

* indicates publication year (not necessarily year of survey)

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Escherichia coli diarrhea

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

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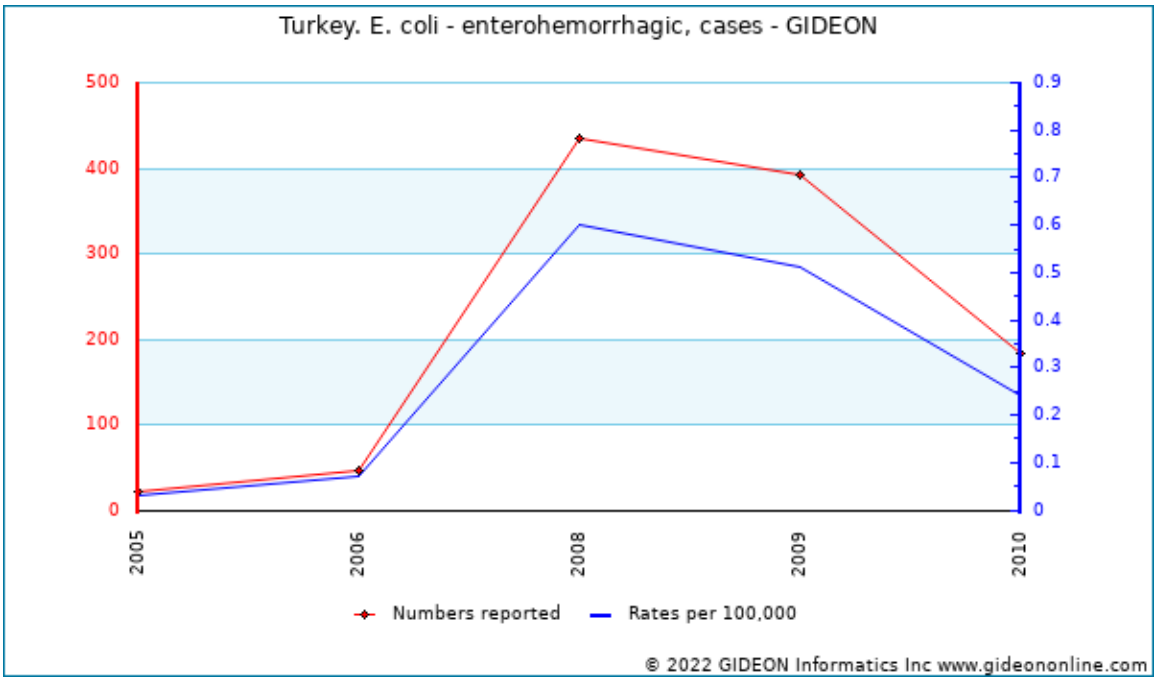
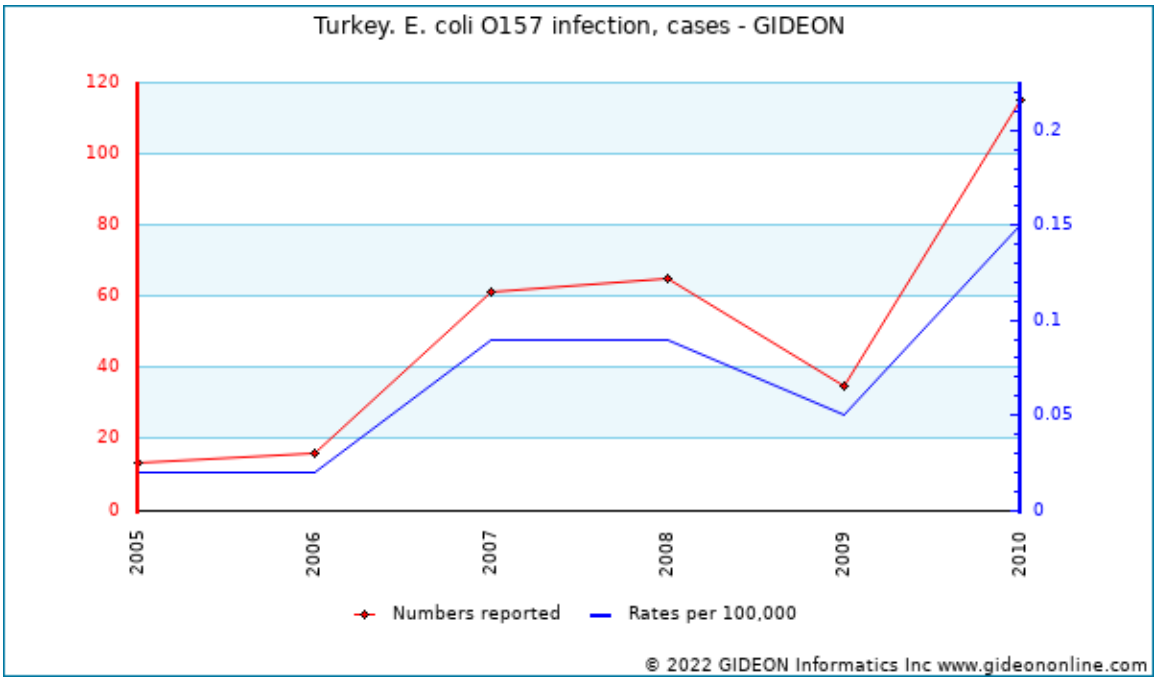
Escherichia coli diarrhea in Turkey



Graph: Turkey. E. coli - enterohemorrhagic, cases



Graph: Turkey. E. coli O157 infection, cases

2011 - 70 cases of diarrhea-related Hemolytic uremic syndrome were identified through active case-finding. [2]

Cross-border events
Does not include individual case reports

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Years	Acquired by**	Originated in**	Setting	Cases	Notes
1999	United Kingdom	Turkey	travel	5	An outbreak (5 cases, 2 HUS) of *E. coli* O157 infection was reported among British tourists in southern Turkey.
2005	Scotland	Turkey	travel	15	An outbreak (10 confirmed, 5 suspected cases) was reported among Scottish tourists returning from resorts in Turkey. [3] [4]
2007	Scotland	Turkey	travel	3	An outbreak (3 cases, 2 confirmed) of *E. coli* O157 infection was reported among Scottish tourists returning from Turkey [5]
2011	France	Turkey	travel	8	An outbreak (8 cases, 2 HUS) of *E. coli* O104:H4 infection was reported among French tourists in Turkey. [6] [7]

** Country or Nationality

Prevalence surveys

Years	Region	Study Group	%	Notes
2009*	Incirlik	military personnel	41	ETEC was identified in 41% of travelers' diarrhea cases among American military personnel in Incirlik [8]
2005 - 2008	Ankara	patients	0.1	*Escherichia coli* O157:H7 was found in 0.1% of patients hospitalized with acute gastroenteritis [9]
2020*		seafood	18.71	[10]
2011*	Ankara	shellfish	30	*Escherichia coli* was present in 30% of stuffed mussels sold by street vendors in Ankara [11]
2004	Afyon	meat - beef	1.6-2.9	*Escherichia coli* O157:H7 was present in 2.9% of retail minced beef and 1.6% of chopped beef samples in Afyon Province
2017*	Kayseri	meat - pastrami	2.6	[12]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Source	Pathogen	Population	Notes
1974	Ankara	106		*E. coli* O111:B4		[13]
1999	Southern Region	5		*E. coli* O157	tourists	Outbreak among British tourists in southern Turkey
2005	Southwest Region	5			tourists	Outbreak among Scottish tourists returning from resorts on Turkey [14] [15]
2007	Mamaris	3		*E. coli* O157	tourists	among Scottish tourists returning from resorts on Turkey [16]
2008	Multiple locations	4,000	water	multiple pathogens		gastrointestinal infection. An outbreak of diarrhea in Askaray and Sereflikochisar caused by Adenovirus, Rotavirus, Norovirus and *Escherichia coli* [17]
2011		8		*E. coli* O104:H4	tourists	Outbreak among French tourists in Turkey; included 2 cases of HUS. [18] [19]
2015	Istanbul	32		EAEC	children	A high rate of HUS was reported [20]

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Fascioliasis

Agent	PARASITE - Platyhelminthes, Trematoda. Echinostomatida, Fasciolidae: *Fasciola hepatica* or *Fasciola gigantica*
Reservoir	Sheep, Cattle, Snail (*Lymnaea*, *Galba*, *Fossaria*), Zoonotic
Vector	None
Vehicle	Food, Aquatic plants, Watercress (*Nasturtium officinale*)
Incubation Period	2w - 3m
Diagnostic Tests	Identification of ova in stool or duodenal aspirates (adult parasite in tissue). Serology. PCR. CT scan. Fasciola hepatica adult: 13 mm X 30 mm
Typical Adult Therapy	Triclabendazole 10 mg/kg PO X 2 doses. OR Nitazoxanide 500 mg PO BID X 7d[1] [2] [3]
Typical Pediatric Therapy	Triclabendazole 10 mg/kg PO X 2 doses. OR Nitazoxanide: Age 1 to 3y 100 mg BID X 7 d Age 4 to 11y 200 mg BID X 7d Multiple regimens may be necessary for cure in some cases
Clinical Hints	- Fever, hepatomegaly, cholangitis, jaundice and eosinophilia - Urticaria occasionally observed during the acute illness - Parasite may survive more than 10 years in the biliary tract
Synonyms	Eurytrema, Fasciola gigantica, Fasciola hepatica, Hepatic distomiasis, Lederegelbefall, Sheep liver fluke. ICD9: 121.3 ICD10: B663.

Fascioliasis in Turkey

Time and Place

Eight Turkish cases of fascioliasis were published in the world's literature during 1969 to 1989.

- Sporadic cases have been subsequently reported. [4] [5] [6] [7]

Cross-border events

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2000*	Germany	Turkey	travel	1	[8]
2001*	Netherlands	Turkey	imported goods	1	Fascioliasis acquired from imported watercress. [9]
2002*	Germany	Turkey	travel	1	Infection presumably from ingestion of local watercress. [10]
2017*	Germany	Turkey	travel	1	[11]

* indicates publication year (not necessarily year of event)
** Country or Nationality

Case series

- 2003 (publication year) - A review of 19 cases of fascioliasis identified through active case finding in the Isparta region [12]
- 2008 to 2011 - 30 cases were treated at a hospital in Diyarbakir. [13]

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- 2009 to 2014 - 22 cases were treated at a university hospital in Gaziantep. [14]
- 2014 (publication year) - 39 cases were treated at a university clinic in Diyarbakir. [15]
- 2014 to 2016 - Six cases of pediatric fascioliasis were treated at a hospital in Van. [16]

Prevalence surveys

Years	Region	Study Group	%	Notes
2008 - 2009	Nevsehir	cattle	3.03	3.03% of cattle in Derinkuyu district, Nevsehir [17]
2020*	Agri	cattle	78.7	Survey of cattle at slaughter (stool ELISA) [18]
2016*	Erzurum	horses	2.63	*Fasciola* spp. [19]
2004 - 2005	Multiple locations	equines	0-15	15% of donkeys, 0% of horses and 0% of mules [20]
1997 - 2007	Van	patients	0.04	Survey of hospital outpatients [21]
2000 - 2007	Ankara	patients	16.7	16.7% of biliary parasitosis [22]
2011*		patients	2.2	2.2% of patients suspected of having echinococcosis [23]
2015*	Van	patients	1.8	1.8% of outpatients in Van Province [24]
2019	Erzurum	sheep	5.68	5.68% of sheep (*Fasciola* spp) [25]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2003 - 2005	Van	children	0.03	0.03% of school children ages 7 to 15 in Van Province [26] [27]
2005*	Afyon	cattle	4.6	4.6% of cattle in Afyon Province [28]
2008*	Hakkari	goats	20.41	20.41% of hair goats at slaughter in Hakkari Province [29]
2003*		patients	14.5	14.5% of patients with chronic urticaria [30]
2011 - 2018	Eastern Anatolia	patients	5.5	Survey of patients with suspected fascioliasis [31]
2013*		patients	0	0% of patients with chronic urticaria [32]
2015*	Van	patients	5.6	5.6% of outpatients in Van Province [33]
2005 - 2007	Black Sea	sheep	25.4-34.9	32.4% of sheep in Samsun, 25.4% in Sinop and 34.9% in Tokat (middle Black Sea region) [34]
2018	Siirt	sheep and goats	7.5-14.14	7.50% of sheep and 14.14% of goats [35]
2002*	Elazig	general population	2.78	2.78% of healthy individuals in the Elazig region [36]
2003*	Isparta	general population	6.1	6.1% in the Isparta region with eosinophilia [37]
2004*	Van	general population	1.8	1.8% in Ercis (Van Province) [38]
2004	Isparta	general population	2.4-9.3	2.4% of urban and 9.3% of rural populations of Isparta [39]
2009*	Mersin	general population	0.79	0.79% of individuals in Mersin Province - 1.93% of persons with family history of fascioliasis [40]
2007*	Antalya	specimens	3	3% of at a university microbiology laboratory in Antalya [41]

* indicates publication year (not necessarily year of survey)

Reservoirs

- The local reservoir is *Lymnaea (Fossaria) truncatula*.

Notable outbreaks

Years	Region	Cases	Source	Population	Notes
2008*	Anatolia	24	vegetable - watercress	family members	[42]

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* indicates publication year (not necessarily year of outbreak)

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Filariasis - Bancroftian

Agent	PARASITE - Nematoda. Secernentea: *Wuchereria bancrofti*
Reservoir	Human
Vector	Mosquito (*Anopheles*, *Aedes*, *Culex*)
Vehicle	None
Incubation Period	5m - 18m (range 1m - 2y)
Diagnostic Tests	Identification of microfilariae in nocturnal blood specimen. Nucleic acid amplification. Serology may be helpful.
Typical Adult Therapy	Diethylcarbamazine : 50 mg day 1 50 mg TID day 2 100 mg TID day 3 Then 2 mg/kg TID X 18 days. OR Ivermectin 200ug/kg PO as single dose. Doxycycline 200 mg daily X 8 w is also effective.[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	Bancroftian filariasis, Rosetta leg, Wuchereria bancrofti. ICD9: 125.0 ICD10: B74.0

Filariasis - Bancroftian in Turkey

Disease in Turkey is nocturnally periodic.

Small pockets may exist in Antalya and Elazig. [2] [3] [4]

The local vector is *Culex pipiens*.

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Fungal infection - invasive

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

Fungal infection - invasive in Turkey

Prevalence surveys

Years	Study Group	%	Notes
2008*	immunocompromised	35	35% of pulmonary infections among immunocompromised hosts with hematological malignancy [4]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Clinical	Pathogen	Notes
2003 - 2004	Ankara	ophthalmology department	3	endophthalmitis	*Aspergillus ustus*	[5]
2004*	Mersin	hospital	3		*Dipodascus capitatus*	[6]
2009*	Istanbul	ophthalmology department	8	endophthalmitis	*Fusarium*	Outbreak associated with cataract surgery [7]
2011*	Istanbul	ophthalmology department	9	endophthalmitis	*Fusarium*	Outbreak associated with cataract surgery [8]

* indicates publication year (not necessarily year of outbreak)

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Gastroenteritis - viral

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

Prevalence surveys

Years	Region	Study Group	%	Notes
2018	Istanbul	patients	0.5-16.3	Viruses detected in stool specimens from patients with diarrhea in Istanbul include rotavirus (16.3%), norovirus (7.6%), sapovirus (2.7%), astrovirus (1%), and adenovirus (0.5%) [1]
2009 - 2010	Izmir	shellfish	30	Noroviruses were found in 30% of mussels (*Mytilus galloprovincialis*) in the Gulf of Izmir [2]
2004 - 2010	Ankara	children - gastrointestinal	14.1	Noroviruses were found in 14.1% of children ages 0 to 5 years with acute gastroenteritis [3]
2008	Mersin	children - gastrointestinal	1.7-32.2	Astrovirus was found in 1.7% of children ages 0 to 6 years, hospitalized with diarrhea, Rotavirus 32.2% and Adenovirus 10.5% [4]
2009	Istanbul	children - gastrointestinal	4.9-12.7	Rotavirus was found in 12.7% of children admitted for gastroenteritis to a pediatric emergency unit, Noroviruses 9.8% and Adenovirus 4.9% [5]
2009 - 2010		children - gastrointestinal	10.9	Noroviruses were found in 10.9% of children below age 16, hospitalized for gastroenteritis [6]
2012	Ankara	children - gastrointestinal	2-16	Noroviruses were found in 16% of children below age 5 years hospitalized with diarrhea, Rotavirus 4%, Astrovirus 2% and Sapovirus 2% [7]
2015*	Malatya	children - gastrointestinal	54.6	Viruses were identified in 54.6% of children with acute gastroenteritis: Norovirus accounted for 42.8%, Rotavirus 33.6%, Enterovirus 22.1%, Parechovirus 16.0%, Sapovirus 3.8% and Aichivirus 0.8% [8]
2019*	Erzurum	children - gastrointestinal	59.2	Viruses were identified in 59.2% of children ages <5 years with gastroenteritis; Rotavirus 32.3%, Norovirus 20.3%, Adenovirus 9.6% and Astrovirus 5.6% [9]

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* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Clinical	Source	Pathogen	Notes
2008	Multiple locations	4,000	gastrointestinal infection	water	multiple pathogens	An outbreak of diarrhea in Askaray and Sereflikochisar caused by Adenovirus, Rotavirus, Norovirus and *Escherichia coli* [10]
2012	Erzurum			water	multiple pathogens	Outbreak of infection by Norovirus, Astrovirus, Rotavirus and *Shigella sonnei* [11]

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Gianotti-Crosti syndrome

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

Gianotti-Crosti syndrome in Turkey

Five case reports had been published as of 2008. [1] [2] [3] [4] [5]

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Giardiasis

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

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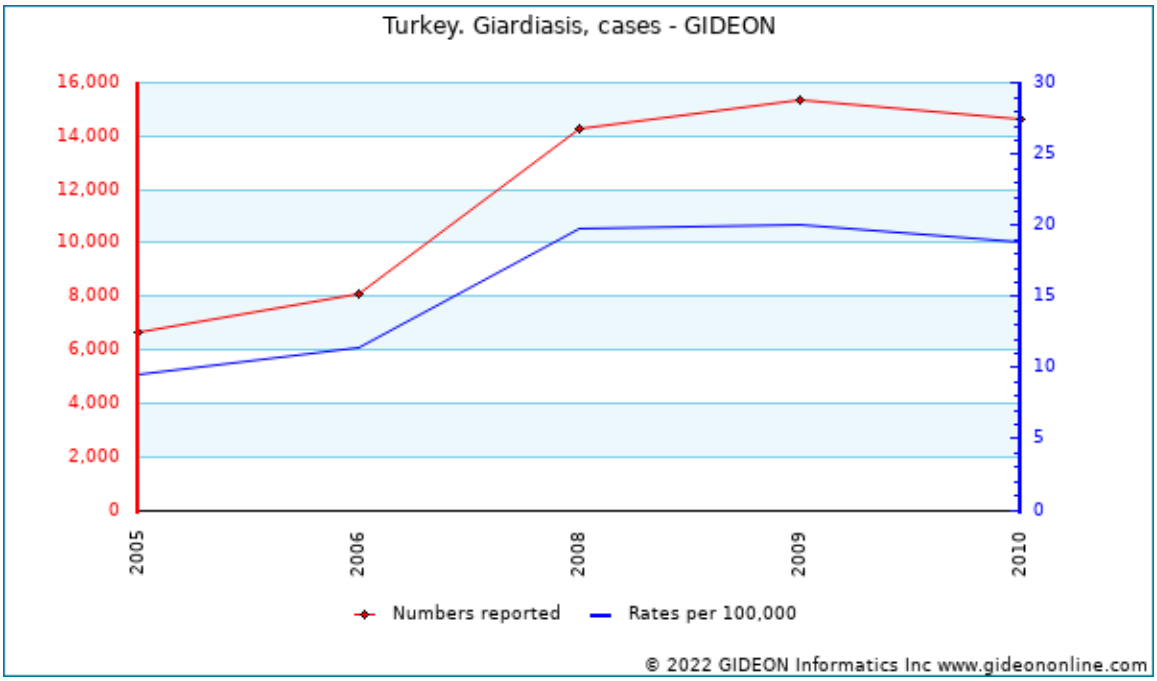
Giardiasis in Turkey



Graph: Turkey. Giardiasis, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
1992*	Trabzon	children	10.71	10.71% of primary school children in Trabzon [5]
1999	Duzce	children	10.4	10.4% of children displaced by an earthquake Duzce, 1999 [6]
2003 - 2005	Van	children	16.4	16.4% of school children ages 7 to 15 in Van Province [7] [8]
2005*	Nationwide	children	7.3-28	7.3% to 28% of school children, nationwide [9]
2005	Van	children	15.4	15.4% of school children ages 715 in Van Province [10]
2005*	Hakkari	children	28.9	28.9% of primary school children in Hakkari [11]
2006*	Sivas	children	17.4	17.4% of primary school children in Sivas [12]
2006	Malatya	children	1.3	1.3% of children in Malatya [13]
2006*	Malatya	children	8.5	8.5% of primary school children in central Malatya [14]
2007	Sanliurfa	children	42.53	42.53% of children ages <= 6 years, in Sanliurfa 2007 [15]
2007*	Izmir	children	7.8	7.8% of primary school children in Izmir [16]
2007*	Riza	children	11	11% of children ages 16 years in nurseries in Riza [17]
2007*	Manisa	children	9.2	9.2% of primary school children in Manisa [18]
2008*	Aydin	children	9.8	9.8% of children in day nurseries and a kindergarten in Aydin [19]
2008*	Sivas	children	13.7	13.7% of primary school children in Sivas [20]
2008*	Kocaeli	children	19.8	19.8% of children in Kocaeli [21]
2008*	Yozgat	children	15.5	15.5% of primary school children in Yozgat [22]
2009*	Hatay	children	7.9	7.9% of orphans in Hatay [23]
2009*	Denizli	children	31.4	31.4% of children ages 115 in Denizli Province [24]

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Years	Region	Study Group	%	Notes
2009*	Mersin	children	17	17% of children in a social services center in Mersin [25]
2010*	Sanliurfa	children	32.7	32.7% of farm workers' children ages 6 to 59 months, in Sanliurfa [26]
2011*	Kayseri-Hacilar	children	4.3	4.3% of primary school children ages 6 to 14, in Kayseri-Hacilar region [27]
2013*	Sanliurfa	children	19.6	19.6% of children in an orphanage in Sanliurfa [28]
2013*	Istanbul	children	1.91	1.91% of children with *Helicobacter pylori* gastritis [29]
2015*	Yigilca	children	15.1	15.1% of school children in Yigilca [30]
2016	Van	children	12.6	Survey of children hospitalized in an Intensive Care Unit [31]
2019*		adults - elderly	1.2	Survey of elderly patients in a nursing home [32]
2017 - 2019	Anatolia	cattle	30.2	[33]
1991*	Mardin	students	9	9% of primary school students in Mardin [34]
2005*	Hatay	students	3.08	3.08% of female students ages 16 to 18, in Hatay [35]
2010*	Van	students	36.4	36.4% of primary school students in Van [36]
2010*	Kayseri	students	6.7	6.7% of foreign high school students in Kayseri [37]
2009*	Multiple locations	pigs	3.7	3.7% of pig fecal samples [38]
2017*	Aydin	dogs	18.8	[39]
2019*	Anatolia	horses	16.6	[40]
1997 - 2007	Van	patients	9.3	Survey of hospital outpatients [41]
2001 - 2004	Bursa	patients	1.03	1.03% of inpatients and outpatients with gastrointestinal symptoms at a University Medical Faculty Bursa [42]
2003 - 2004	Izmir	patients	16.57	16.57% of patients with gastrointestinal complaints Izmir [43]
2003*	Manisa	patients	8.5	8.5% of patients hospitalized for diarrhea in Manisa [44]
2003 - 2006	Istanbul	patients	22	22% of parasitic infections among hospitalized patients Istanbul [45]
2004 - 2009	Istanbul	patients	11.1	11.1% of patients hospitalized with gastrointestinal symptoms ELISA, Istanbul [46]
2005 - 2008	Izmir	patients	2.24	2.24% of patients with gastrointestinal complaints at a University Medical Faculty Hospital Izmir [47]
2005 - 2007	Camlihemsin	patients	20	20% of persons admitted to healthcare center [48]
2005 - 2008	Ankara	patients	0.2	0.2% of patients hospitalized with acute gastroenteritis Ankara [49]
2005*	Sanliurfa	patients	11.5	11.5% of patients with diarrhea in Sanliurfa [50]
2006 - 2018	Sivas	patients	6.9	Survey of patients with gastrointestinal symptoms [51]
2007*	Ankara	patients	17	17% of diarrhea episodes in kidney or liver transplant patients. [52]
2009 - 2010	Bursa	patients	34.48	34.48% of patients with gastrointestinal complaints Bursa [53]
2009 - 2010	Bursa	patients	3.23	3.23% of patients with gastrointestinal symptoms, in Bursa [54]
2011*	Istanbul	patients	7-15	7% of dyspeptic patients, 15% of diabetics and 0% of healthy controls [55]

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Years	Region	Study Group	%	Notes
2011 - 2018	Izmir	patients	0.4	Survey of patients referred to a Parasitology laboratory. [56]
2011*	Ankara	patients	13.8	13.8% of patients with diarrhea, admitted to an emergency department stool antigen, Ankara, [57]
2015		patients	79.8	Survey of patients with gastrointestinal complaints (PCR) [58]
2016 - 2018	Adıyaman	patients	4.1	Survey of patients with gastrointestinal symptoms [59]
2016*		patients	1.6-14.18	14.8% / 1.6% of patients with / without *Helicobacter pylori* infection [60]
2019	Erzurum	patients	4.9	4.9% of patients with diarrhea (DFA) [61]
2012 - 2013	Kocaeli	patients - dialysis	8.5	8.5% of dialysis patients Kocaeli [62]
2008 - 2015	Izmir	immunocompromised	27	patients with common variable immune deficiency syndrome [63]
2020	Multiple locations	cats	8	[64]
2020*	Anatolia	cats	68.6	Survey of cats with diarrhea [65]
2006*	Karpuzsekisi	general population	2.91	2.91% of village residents in the Kayseri- Karpuzsekisi basin [66]
2006*	Anatolia	general population	18.1	18.1% in southeastern Anatolia [67]
2006*	Kayseri	general population	2.91	2.91% of individuals in the Kayseri Karpuzsekisi basin [68]
2007*	Utah	general population	1.48	1.48% of persons over age 15 years in Kutahya [69] [70]
2007*	Van	food handlers	2.84	2.84% of persons working in the food sector Van [71]
2007*	Aydin	food handlers	1.72	1.72% of food workers employed in hospitals Aydin and Yil states [72]
2008*	Manisa	food handlers	2.2	2.2% of food-handlers in Manisa [73]
2009*	Sanliurfa	food handlers	26.8	26.8% of food-handlers in Sanliurfa [74]
2013*	Adana	food handlers	4.8	4.8% of food handlers in Adana DFA [75]
1988 - 2012	Istanbul	specimens - stool	62	62% of parasites identified in stool specimens from hospitalized patients Istanbul [76]
1993 - 2000	Bursa	specimens - stool	3.63	3.63% of fecal samples processed at a university parasitology laboratory in Bursa [77]
1993 - 2006	Sivas	specimens - stool	12.4	12.4% of fecal samples processed at a university parasitology laboratory in Sivas [78]
1997 - 2001	Istanbul	specimens - stool	54.8	54.8% of fecal samples examined in Istanbul
1999 - 2009	Istanbul	specimens - stool	1.4	1.4% of stool examinations from hospitalized patients Istanbul [79]
2000 - 2004	Ankara	specimens - stool	2.75	2.75% of stools examined at a laboratory in Ankara
2000 - 2006	Malatya	specimens - stool	25.9	25.9% of fecal samples analyzed in a single hospital in Malatya [80]
2002 - 2004	Sivas	specimens - stool	3.7	3.7% of fecal samples processed at a university parasitology laboratory in Sivas [81]
2003 - 2005	Kocaeli	specimens - stool	24.9	24.9% of parasites detected in stool specimens from Kocaeli [82]
2003 - 2012	Ankara	specimens - stool	40	40% of stool parasites identified by a University Parasitology laboratory in Ankara [83]
2003 - 2012	Ankara	specimens - stool	5	5% of stool parasites identified by a University Parasitology laboratory in Ankara [84]

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Years	Region	Study Group	%	Notes
2003 - 2007	Eskisehir	specimens - stool	19	19% of parasites found in stools at a university medical facility in Eskishir [85]
2005	Izmir	specimens - stool	1.78	1.78% of stools examined at a university parasitology laboratory. Izmir [86]
2005 - 2008	Kayseri	specimens - stool	1.96	1.96% of stools examined at a university parasitology laboratory Kayseri [87]
2005	Hatay	specimens - stool	31.5	31.5% of stools examined at a university parasitology laboratory Hatay [88]
2005 - 2009	Izmir	specimens - stool	1.14	1.14% of stool specimens from patients with gastrointestinal symptoms, in Izmir [89]
2006 - 2010	Manisa	specimens - stool	1.96	1.96% of stools examined at a university parasitology laboratory in Manisa [90]
2007 - 2009	Tokat	specimens - stool	2.8	2.8% of stool specimens examined by Tokat public health laboratory [91]
2009	Van	specimens - stool	6.6	6.6% of stools examined at a laboratory in Van [92]
2012 - 2014	Istanbul	specimens - stool	17.26	Survey of specimens submitted to a hospital laboratory [93]
2012 - 2014	Istanbul	specimens - stool	26.2	[94]
2015 - 2016	Sanliurfa	specimens - stool	2.3	[95]
2008*	Van	slaughterhouse workers	19.5	19.5% of slaughterhouse workers in Van Municipality [96]
2012 - 2014	Black Sea	environmental	26.1-57.8	Samples of water and environmental sources. [97]
2006*	Malatya	sanitation workers	9.1	9.1% of municipal sanitary workers in Malatya [98]
2011*		sanitation workers	3.4	3.4% of administrators and workers in sanitary and non-sanitary institutions [99]
2019*		patients - sickle cell	1.3	Survey of patients with urticaria [100]
2019*		patients - sickle cell	1.3	Survey of patients with urticaria [101]
2021*	Ankara	patients - immunocompromised	2	[102]
2018*	Istanbul	patients - HIV / AIDS	2.2	[103]
2005*	Manisa	children - gastrointestinal	40.1	40.1% of children with gastrointestinal symptomatology, in Manisa [104]
2005*	Hatay	children - gastrointestinal	4.27	4.27% of children ages 0 to 14 with gastrointestinal symptomatology, in Hatay [105]
2007	Kars	children - gastrointestinal	10.9	10.9% of children ages 26 years with gastrointestinal symptomatology seen at a hospital in Kars 2007 [106]
2012 - 2014	Ankara	children - gastrointestinal	8	8% of children with chronic diarrhea Ankara [107]
2012*	Eskisehir	children - gastrointestinal	1.8	1.8% of children with diarrhea [108]
2008*	Van	cattle - calves	9.34	9.34% of calves in Van Province [109]

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Glanders

Agent	BACTERIUM. *Burkholderia mallei* An aerobic gram negative bacillus
Reservoir	Horse, Mule, Donkey, Zoonotic
Vector	None
Vehicle	Infected secretions, Contact, Respiratory or pharyngeal acquisition
Incubation Period	5d - 14d (range 1d - 21d)
Diagnostic Tests	Culture of blood or exudate. Serology.
Typical Adult Therapy	Imipenem 25 mg/kg IV QID OR Meropenem 25 mg/kg IV TID OR Ceftazidime 50 mg/kg IV QID +/- Sulfamethoxazole / Trimethoprim 8/40 mg/kg IV TID For at least 10d Followed by: Sulfamethoxazole / Trimethoprim 8/40 mg/kg PO TID OR Doxycycline 2.5 mg/kg PO BID OR Amoxicillin-clavulanate 500 mg PO TID For 12-52 weeks[1]
Typical Pediatric Therapy	As for adult (dosage adjusted for weight)
Clinical Hints	- Ulcerating skin nodule with lymphangitis - Fever, myalgia, pneumonia and pleuritis in some cases - Usually follows contact with equines
Synonyms	Burkholderia mallei, Farcy, Mormo, Rotz. ICD9: 024 ICD10: A24.0

Glanders in Turkey

Chronology

- 1998 - Equine glanders was reported in Turkey. [2]
- 1999 (publication year) - 35 horses (3.1% of total horses) in the Marmara region were found to be infected. [3]
- 2017 - 18 cases of equine glanders were reported on Buyukada Island, Sea of Marmara. [4]
- 2019 - An outbreak of equine glanders was reported on Buyukada Island. [5] [6]

Notable outbreaks

Years	Region	Cases	Deaths	Population	Notes
1986*	Istanbul			various	[7]
2019		91	91	horses	[8] [9]

* indicates publication year (not necessarily year of outbreak)

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Gongylonemiasis

Agent	PARASITE - Nematoda. Secernentea: *Gongylonema pulchrum*
Reservoir	Sheep, Cattle, Pig, Bear, Monkey, Zoonotic
Vector	None
Vehicle	Insect ingestion
Incubation Period	Unknown - presumed 60 to 80 days
Diagnostic Tests	Identification of worm following extraction. Gongylonema pulchrum adult: female - 58.7 mm; male - 29 mm
Typical Adult Therapy	No proven treatment Albendazole 400 mg PO daily X 3 days is recommended in addition to extraction of the parasite Failure of response may be treated with longer period of Albendazole (up to 30d)[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Protracted discomfort or sensation of movement in the buccal, oral or gingival areas associated with a foreign body sensation
Synonyms	Filaria labialis, Gongylonema pulchrum, Gongylonemosis, Scutate threadworm. ICD9: 125.6 ICD10: B83.8

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

Gongylonemiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2005 - 2006	Sanliurfa	goats	32.53	32.53% of hair goats in Sanliurfa [2]
2007 - 2008	Bursa	pigs - boars	11	11% of wild boars in Bursa Province [3]

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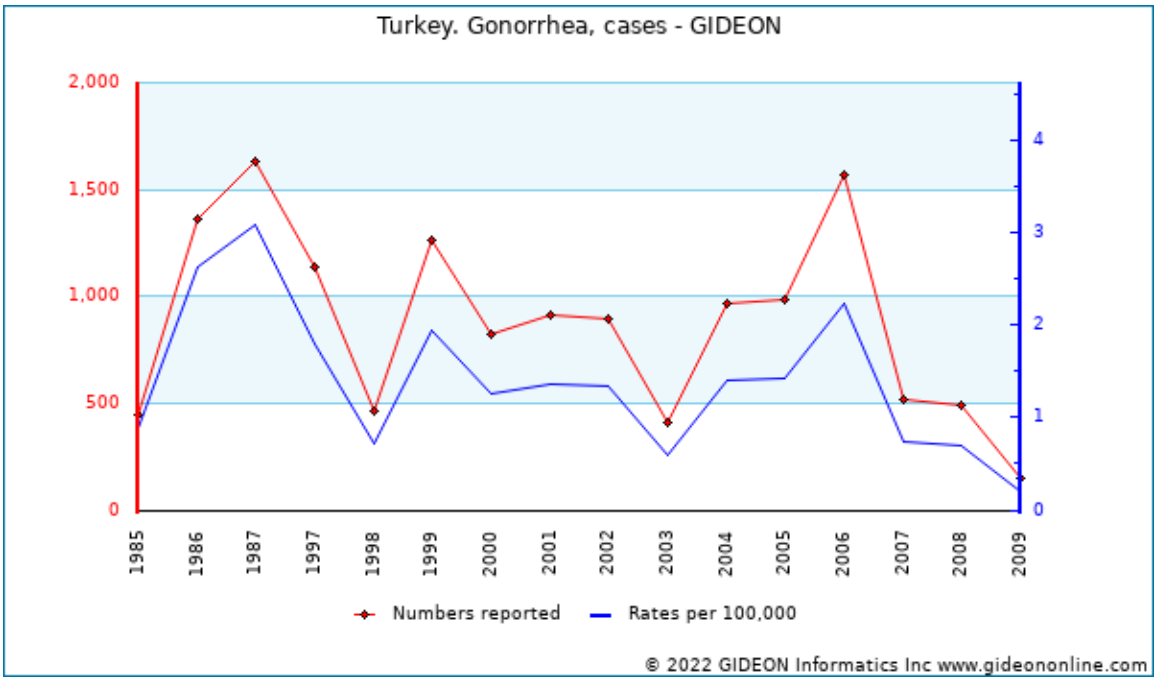
Gonococcal infection

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

Gonococcal infection in Turkey



Graph: Turkey. Gonorrhea, cases

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Prevalence surveys

Years	Region	Study Group	%	Notes
2010*		women	2.42	2.42% of symptomatic and in 1.02% of infertile women [4]
2010*	Ankara	sex workers	0	0% of CSW [5]
2001*	Istanbul	men	9.4	9.4% of male urethritis [6]
2003 - 2004	Ankara	men	9.52	9.52% of male urethritis [7]
2018*	Ankara	patients - STD	6.4	Survey of patients with "resistant discharge" [8]
2002 - 2004	Duzce	patients - vaginitis	0.1	0.1% of women with cervicovaginitis [9]
2015*		patients - vaginitis	0	0% of women with intrauterine devices and vaginal discharge [10]
2020*	Antalya	patients - vaginitis	0.5	[11]

* indicates publication year (not necessarily year of survey)

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Granuloma inguinale

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

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Hantaviruses - Old World

Agent	VIRUS - RNA. Bunyaviridae, Hantavirus - Old world : Hantaan, Puumala, Dobrava/Belgrade, Saaremaa & Seoul viruses
Reservoir	Field mouse (*Apodemus agrarius*-Hantaan), Vole (*Myodes glareolus*-Puumala), Rat (*Rattus norvegicus*-Seoul), Bat, Bird, Zoonotic
Vector	None
Vehicle	Animal excreta, Respiratory or pharyngeal acquisition
Incubation Period	12d - 21d (range 4d - 42d)
Diagnostic Tests	Biosafety level 3. Serology. Viral culture. Nucleic acid amplification.
Typical Adult Therapy	Supportive. Suggest Ribavirin: Loading dose 33 mg/kg, then 16 mg/kg IV q6h X 4d, then 8 mg/kg q8h X 3d[1] [2] [3]
Typical Pediatric Therapy	Supportive. Suggest Ribavirin
Vaccine	Hantavirus vaccine
Clinical Hints	- Headache, backache, myalgia, diarrhea, vomiting, conjunctivitis - Hemorrhage and azotemia - Proteinuria and thrombocytopenia are common - History of local rodent infestation may be elicited - Case-fatality rates 0.1% (Puumala virus) to 15% (Belgrade virus)
Synonyms	Acute epidemic hemorrhagic fever, Anjozorobe , Bosnian hemorrhagic fever, Churilov disease, Dobrava/Belgrade, Endemic benign nephropathy, Epidemic hemorrhagic fever, Far eastern hemorrhagic fever, Haemorrhagic nephrosonephritis, Hantaan, Hemorrhagic fever & renal syndrome, Imjin virus, Infectious hemorrhagic fever, Khabarovsk, Korean hemorrhagic fever, Mouse fever, Muju, Muroid virus nephropathy, Nephropathia epidemica, Puumala, Rodent-borne viral nephropathy, Saaremaa, Sandinavian epidemic nephropathy, Sangassou, Seoul, Sochi virus, Songo fever, Sorkfeber, Thailand orthohantavirus, Thailand virus, Thottapalayam, Topografov, Tula, Viral hemorrhagic fever, Viral hemorrhagic fevers. ICD9: 078.6 ICD10: A98.5

Hantaviruses - Old World in Turkey

Time and Place

- 2009 - A case of fatal infection was reported in Bartin district in 2009 - the country's first fatality from this disease. [4] [5]
- 2007 to 2009 - Retrospective testing among patients from Bartin with compatible illness disclosed 10 cases. [6]
- 2009 - A second death from suspected Hantavirus infection was subsequently reported in Zonguldak. [7]
- 2010 (publication year) - The first cases of Hantavirus infection in the eastern Black Sea region were reported. [8]
- 2010 - Two cases (1 fatal) of Dobrova virus infection were reported in Istanbul. [9] [10]

Case series

- 2012 to 2018 - 20 cases of Hantavirus infection were treated at a hospital in Duzce. [11]

Prevalence surveys

Years	Region	Study Group	%	Notes
2018*	Kirklareli	mice	11	Dobrava virus was found in 11% of *Apodemus flavicolis* [12]
2018*		voles	8	A novel Tula orthobunyavirus was identified in 8% of voles [13]

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* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2009	Giresun	general population	3.2	3.2% of healthy persons ages 15 to 84 in Giresun Province (2009) [14]
2019*	Ducze	general population	6	[15]
2009	Bartin	rodents	16.2	16.2% of rodents in rural Bartin Province (*Apodemus agrarius* and *A. uralensis* , IgG, 2009) [16]
2016*		rodents	26.2	26.2% of wild rodents (Apodemus and Microtus species, 2016 publication) [17]
2004	Multiple locations	small mammals	6.2	6.2% of voles (*Microtis* sp.) in Altindere and Cosandere (Macka, Trabzon Province), Ayder, Ortan, and Yolkiyi (Camlihemsin, Rize Province), and Bozdag (Odemis, Izmir Province) in northeastern and western Turkey are seropositive toward Puumala virus [18]

* indicates publication year (not necessarily year of survey)

Reservoirs [19]

- *Apodemus flavicollis*, a known reservoir for Dobrava virus [20] , is common in Turkey.
- *Apodemus agrarius*, a known reservoir of Saaremaa virus, is found only on the European side of the Bosporus Strait
- Other *Apodemus*_ species on the Anatolian side of Turkey include *A. mystacinus*, *A. uralensis*, *A. witherbyi*, *A. hermonensis*, *A. fulvipectus*, *A. ponticus*, and possibly *A. hyrcacinus* and *A. arianus*.

- *Myodes glareolus*, the host of Puumala virus, is found on the northern Black Sea coast in Turkey.

- A Tula orthobunyavirus was identified in rodents (*Microtus* sp. and *Apodemus* sp., 2018 publication). [21]

Notable outbreaks

Years	Region	Cases	Pathogen	Notes
2009	Black Sea	24	Puumala	Outbreak in Zongulak and Bartin, Black Sea region [22] [23] [24] [25]

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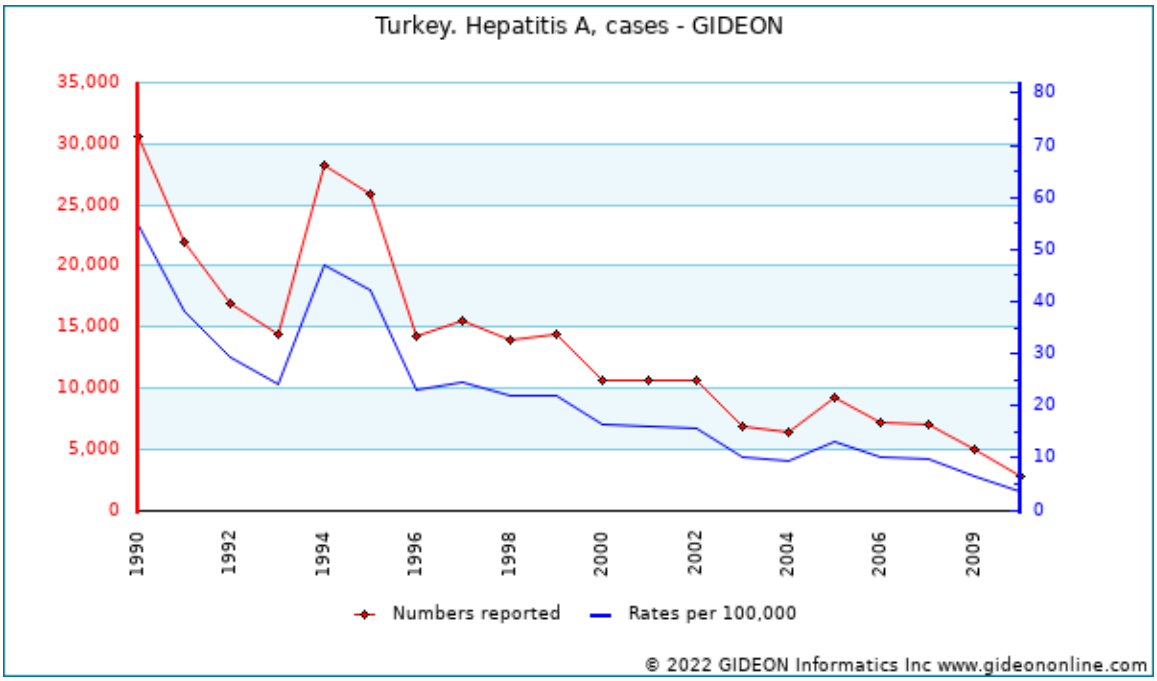
Hepatitis A

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

Hepatitis A in Turkey



Graph: Turkey. Hepatitis A, cases

Notes:

1. Disease notification rates are 31.6% of actual disease incidence (Izmir, 2003) [1]

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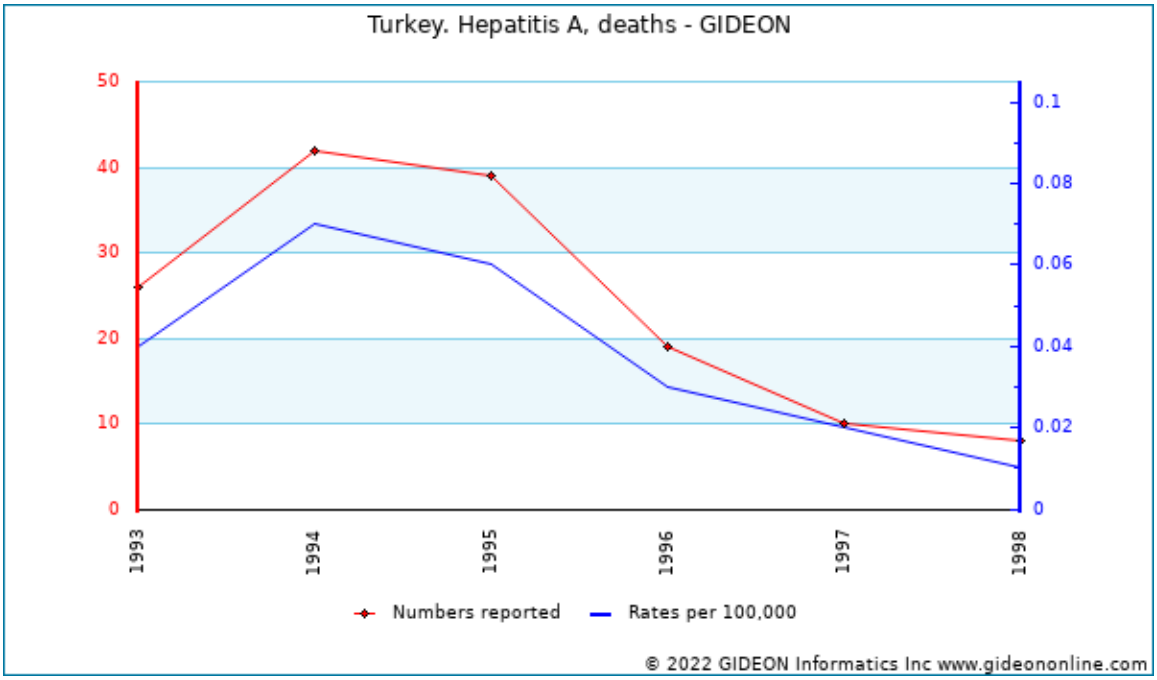
- 2012 to 2016 - 1,354 cases were reported among Syrian refugees in Turkey. [2]



Graph: Turkey. Hepatitis A, deaths

Cross-border events

Does not include individual case reports

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2002 to 2003	Denmark	Turkey	travel	25	Outbreak among children in Denmark followed a visit to Turkey [3]
2005	Denmark	Turkey	travel	4	[4] [5]
2010	France	Turkey	imported goods	59	Outbreaks in France (59 cases) and the Netherlands (13 cases) were associated with consumption of imported semi-dried tomatoes from Turkey. [6] [7] [8] [9]
2010	Netherlands	Turkey	imported goods	13	Outbreaks in France (59 cases) and the Netherlands (13 cases) were associated with consumption of imported semi-dried tomatoes from Turkey. [10] [11] [12] [13]
2013	United States	Turkey	imported goods	157	Outbreak in the United States was associated with contaminated pomegranate seeds imported from Turkey. [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25]
2013	United States	Turkey	imported goods	165	An outbreak (165 cases, 0 fatal) in the United States was associated with contaminated pomegranate seeds imported from Turkey. [26] [27] [28] [29] [30] [31] [32] [33] [34] [35]

** Country or Nationality

Prevalence surveys

Years	Region	Study Group	%	Notes
1987 - 2006	Ankara	children	67	67% of infectious causes for acute hepatic failure in children (1987 to 2006) [36]
2012 - 2014	Isparta	children	18.9	18.9% of children with hypertransaminasemia (2012 to 2014)

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Years	Region	Study Group	%	Notes
				[37]
2018*	Multiple locations	patients - hepatitis	37.6	Multicenter survey of adults with acute viral hepatitis [38]
2014*	Nationwide	children (Literature Review)	20.9	20.9% of acute liver failure among children (2014 publication) [39]
2009 - 2010	Izmir	shellfish	26.7	26.7% of mussels (*Mytilus galloprovincialis*) in the Gulf of Izmir (2009 to 2010) [40]
2009 - 2016	Malatya	patients - CNS	2.6	Survey of children with acute ataxia [41]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
	Ankara	children	2.7	2.7% of children from higher socioeconomic classes (ages 24 to 72 months) in Ankara.
	Adana	children	28.8-68	28.8% of children ages 2.1 to 6 years, 49.8% ages 6.1 to 12, and 68% ages 12.1 to 16.5 (Adana)
1997 - 1998	Istanbul	children	15.1-29	29% of children below age 15; and 15.1% by age 5 years [42]
1997 - 2006	Ankara	children	75.5	75.5% of children scheduled for hematopoietic stem-cell transplantation (Ankara, 1997 to 2006) [43]
2002*	Ahatli	children	19.9	19.9% of preschool children and 43.9% of school children in Ahatli, Antalya (2002 publication) [44]
2003	Duzce	children	63.8	63.8% of children ages 6 months to 17 years in Duzce (2003) [45]
2004*	Konya	children	67.8	67.8% of children under age 6 years in rural Konya and 25.8% in urban Konya (2004 publication) [46]
2007*	Kahramanmaras	children	35.5	35.5% of children ages 6 to 23 months in Kahramanmaras (Eastern Mediterranean region); 19.2% ages 2 to 5 years; 74.3% ages 6 to 10 years; 83.0% ages 11 to 14 years; 92.8% ages 15 to 18 years [47]
2009	Adana	children	22.2-71.4	33.9 % / 22.2 % (in 1998 / in 2009) of children in Adana ages 48 to 71 months, 29.5 % / 25.3 % ages 72 to 95 months, 52.2 % / 30.8 % ages 96 to 119 months, 69.7 % / 35.2 % ages 120 to 143 months, 66.9 % / 37.7 % ages 144 to 167 months, and 71.4 % / 47.3 % [48]
2009*	Ankara	children	47.2	47.2% of children ages 1 to 15 in Ankara (2009 publication) [49]
2011*	Ankara	children	23.5	23.5% of 12-month-old infants in Ankara (2011 publication) [50]
2011*	Istanbul	children	11.4-69	11.4% of children ages 5 to 9 years, 29% ages 10 to 14 years, 49.7% ages 15 to 19 years, 69% ages 20 to 25 years (Istanbul, 2011 publication) [51]
2011*	Izmir	children	4.6-85	4.6% of children ages 1 to 4 years in Izmir, 23% age 10 to 14 years and 85% ages 20 to 29 years (2011 publication) [52]
2013*	Thrace	children	25.4	25.4% of children ages 6 months to 12 years, in Tekirdag, Thrace (2013 publication) [53]
2015*	Van	children	54.9	54.9% of children ages 1 to 15 years in Van (2015 publication) [54]
2018*	Diyarbakir	schoolchildren	45.7	[55]
2000	Foreign Country	refugees	94.4	94.4% of Kurdish refugees from Iraq and Turkey, in Italy [56]
2004*	Erdine	adolescents	43.1	43.1% of persons ages 15 to 19 in Erdine (2004 publication) [57]
2013	Anatolia	women	99.1	99.1% of female farm workers [58]
2009	Izmir	patients	29.5	29.5% of children ages 1 to 18 years from a low socioeconomic population, attending outpatients clinics in Izmir (2009) [59]
2011 -	Konya	patients	97.5	97.5% of patients with chronic hepatitis B, and 93.6% of patients

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Years	Region	Study Group	%	Notes
2014				with chronic hepatitis C (Konya, 2011 to 2014) [60]
2000 - 2001	Ankara	adults	72.7-87.4	87.4% of adults in Ankara, 72.7% in the age group 15 to 30 (2000 to 2001) [61]
2018*	Yozgat	health care workers	15.4	15.4% of first-year nursing students [62]
2018	Izmir	health care workers	34.9	Survey of fist-year health-care students [63]
2005*	Aydin	students - medical	64	64% of medical students in Aydin (2005 publication) [64]
2004*	Manisa	general population	44.6	44.6% of individuals in Manisa (2004 publication) [65]
2008*	Multiple locations	general population	64.4	64.4% of the general population (medical centers, 2008 publication) [66]
2019*	Yozgat	general population	79.1	[67]
2009 - 2013	Ankara	patients - hepatitis	34	34% of patients with chronic hepatitis B [68]
2016 - 2017	Izmir	patients - chronic liver disease	98.7	Survey of patients with cirrhosis and excessive alcohol consumption [69]
1994 - 2012	Izmir	patients - liver	91.5	91.5% of alcoholics with hepatic cirrhosis (1994 to 2012) [70]
2015 - 2017	Erzurum	specimens - serum	87.3	[71]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Source	Population	Notes
1963 - 1964	Istanbul				[72]
1965	Istanbul				[73]
2002 - 2003	Foreign Country	25			Outbreak in Denmark was related to return of infected children following a visit to Turkey. [74]
2005	Foreign Country	4		tourists	Outbreak among Danish tourists returning from Turkey [75] [76]
2010	Foreign Country	59	vegetable - tomatoes		Outbreak in France was associated with consumption of semi-dried tomatoes imported from Turkey [77]
2013	Foreign Country	157	fruit - pomegranate		Outbreak in the United States was associated with contaminated pomegranate seeds imported from Turkey. [78] [79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89]

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Hepatitis B

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

Hepatitis B in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

Mandatory vaccination against Hepatitis B was introduced in 1998.

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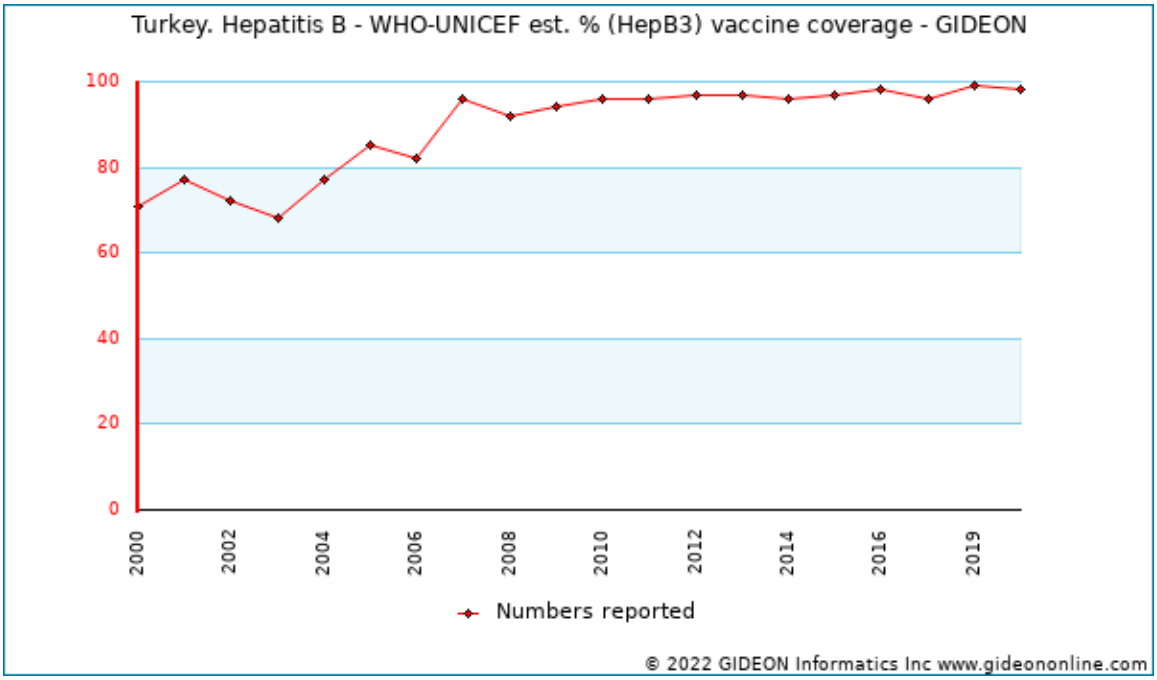
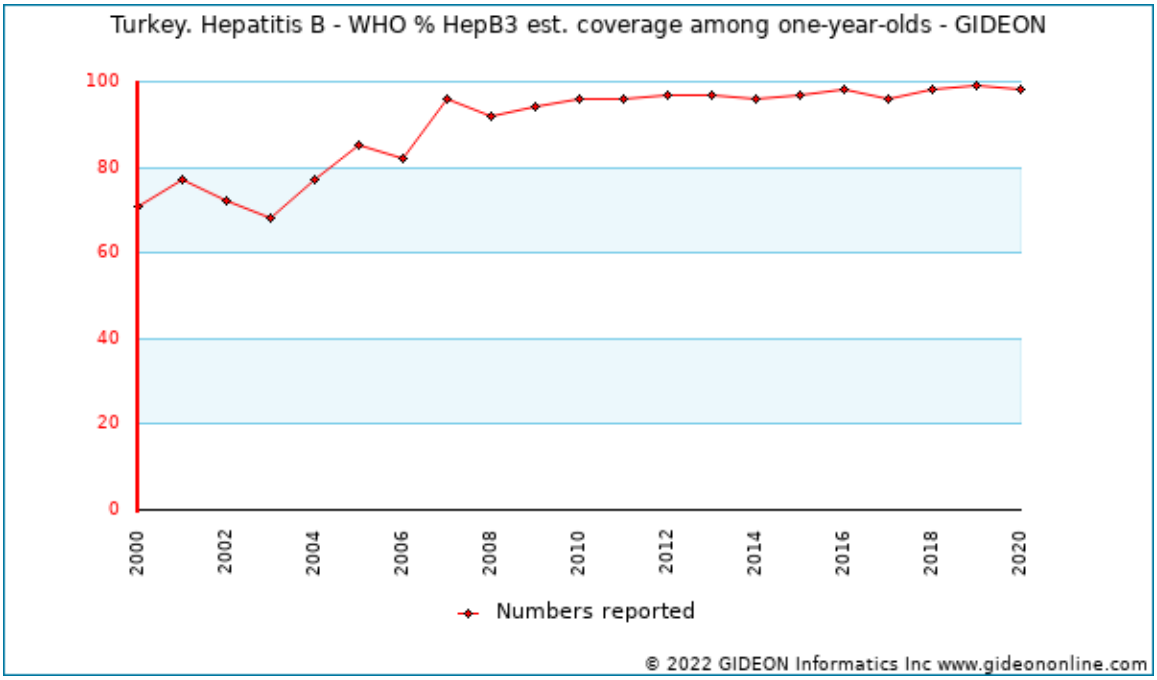


Graph: Turkey. Hepatitis B - WHO-UNICEF est. % (HepB3) vaccine coverage



Graph: Turkey. Hepatitis B - WHO % HepB3 est. coverage among one-year-olds

Routine Hepatitis B immunization was initiated in 1998.

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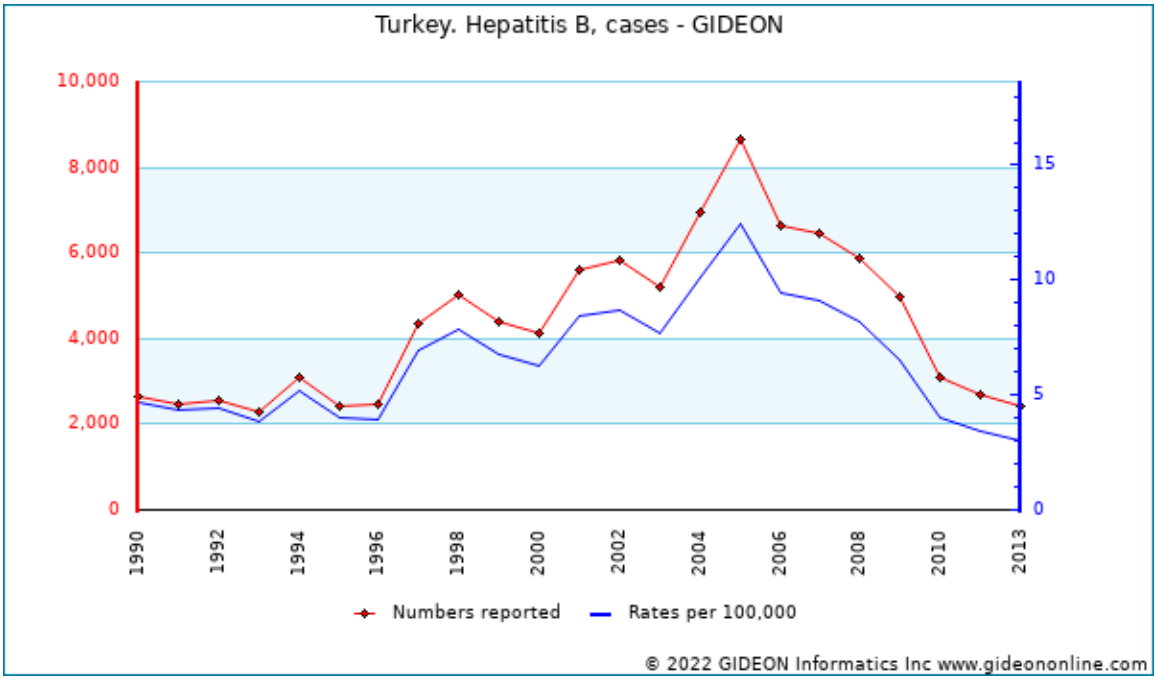

Graph: Turkey. Hepatitis B, cases

Notes:

1. Disease notification rates are 12.1% of actual disease incidence (Izmir, 2003) [3]
2. Disease rates per 100,000 were 4.8 in 1990; 12.3 in 2005; 3.9 in 2011; 3.6 in 2012. [4]

Prevalence surveys

Years	Region	Study Group	%	Notes
1994 - 1997	Multiple locations	patients - hepatocellular carcinoma	56	56% of patients with hepatocellular carcinoma (1994 to 1997) [5]
2001 - 2011	Istanbul	patients - hepatocellular carcinoma	52.6	[6]
2004 - 2010	Van	patients - hepatocellular carcinoma	60.2	60.2% of patients with hepatocellular carcinoma (2004 to 2010) [7]
2014*	Multiple locations	patients - hepatocellular carcinoma	57.6	57.6% of patients with hepatocellular carcinoma (2014 publication) [8]
2014*	Nationwide	adults (Literature Review)	34.7	34.7% of acute liver failure among adults (2014 publication) [9]
2015 - 2019	Multiple locations	patients - hepatitis	4.1	4.1% of patients who received direct-acting antivirals for HCV had HBV co-infection [10]
2018*	Multiple locations	patients - hepatitis	55.2	Multicenter survey of adults with acute viral hepatitis [11]
2001 - 2007	Ankara	patients - chronic liver disease	51.61	51.61% of patients with chronic liver disease (2001 to 2007) [12]
2014*	Erzurum	patients - chronic liver disease	47	47% of patients with hepatic cirrhosis (Erzurum, 2014 publication) [13]

* indicates publication year (not necessarily year of survey)

HBsAg-positivity surveys

Years	Region	Study Group	%	Notes
		children	1.9	1.9% of children under age 15
1994 -	Istanbul	children	10	10% of multi-transfused children with cancer (Istanbul, 1994

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Years	Region	Study Group	%	Notes
1995				to 1995) [14]
1997*	Adana	children	26.8	26.8% of children with hemophilia (1997 publication) [15]
2003*	Erzurum	children	9.1	9.1% of the general population of Erzurum - 1.8% of urban children (2003 publication) [16]
2005*	Erdine	children	1.7	1.7% of children ages 0 to 18 in Erdine (2005 publication) [17]
2009	Tokat	children	25.2	25.2% of children with HBsAg-positive mothers and 2.5% of those with HBsAg-positive fathers (2009) [18]
2010 - 2012	Istanbul	children	0	Survey of children with cancer [19]
2014 - 2015	Izmir	children	4.2	Survey of Syrian refugee children admitted to outpatient clinics [20]
2016*	Kahramanmaras	prisoners	2.6	2.6% of prisoners in Kahramanmaras (2016 publication) [21]
2019*		prisoners	4.7	Survey of male prisoners [22]
2006 - 2008		military personnel	2.8	2.8% of military recruits (2006 to 2008) [23]
2006*	Foreign Country	military personnel	2.16	2.16% of Turkish soldiers in northern Cyprus (2006 publication) [24]
2000	Foreign Country	refugees	6.8	6.8% of Kurdish refugees from Turkey, in Italy [25]
2000*	Anatolia	students	21	21% of students in southeastern Anatolia by the eleventh grade (2000 publication) [26]
2010*	Mugla	students	0.7	0.7% of university nursing students (2010 publication) [27]
2014*	Foreign Country	immigrants	5	5% of Turkish immigrants in Germany (2014 publication) [28]
2012 - 2013	Multiple locations	injecting drug users	5.9	Survey of IDU inpatients [29]
2013 - 2017	Izmir	injecting drug users	2.2	[30]
2015*	Anatolia	injecting drug users	2.6	2.6% of IDU in Eastern Anatolia (2015 publication) [31]
1998 - 2000	Istanbul	workers	3	3.0% of health care workers in Istanbul (1998 to 2000) [32]
2009*	Sivas	workers	3.87	3.87% of sanitary workers in Sivas (2009 publication)
2013	Southeast Region	workers	5.7	5.7% of female farm workers of reproductive age (southeastern Turkey, 2013) [33]
2008 - 2010	Istanbul	transplant recipients	2.7	2.7% of renal transplant recipients in Istanbul (2008 to 2010) [34]
2010*	Ankara	transplant recipients	6.7	6.7% of autologous hematopoietic stem cell transplantation recipients (pre-transplantation, 2010 publication) [35]
1999 - 2017	Multiple locations	patients - cancer	11.2	Survey of patients with splenic marginal zone lymphoma [36]
2000 - 2014	Multiple locations	patients - cancer	3.65	3.65% of cancer patients, vs. 3.3% of controls [37]
2012 - 2018	Trabzon	patients - cancer	2.9	Survey of patients with solid tumors receiving chemotherapy [38]
1990 - 2008	Foreign Country	migrants	3	3.0% of first-generation migrants from Turkey, living in the Netherlands (Arnhem, 1990 to 2008) [39]
2017 - 2018	Foreign Country	migrants	2.4	Survey of Turkish migrants in Belgium [40]
2017 - 2018	Afyon	patients	6-9.4	9.4% of male and 6.0% of female hospital patients in Afyon
1998 -	Istanbul	patients	6.6	6.6% of hospital outpatients in Istanbul (1998 to 2001) [41]

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Years	Region	Study Group	%	Notes
2001				
2002 - 2005	Black Sea	patients	3.7	3.7% of lymphoma patients and 5.3% of controls in the eastern Black Sea region (2002 to 2005) [42]
2003 - 2004	Ankara	patients	2.3	2.3% of traumatology and orthopedics patients (Ankara, 2003 to 2004) [43]
2005 - 2010	Konya	patients	5.15	5.15% of patients admitted to first-step health organizations in Konya (2005 to 2010) [44]
2005 - 2015	Istanbul	patients	3.6	survey of patients undergoing nasal septoplasty [45]
2005 - 2010	Ankara	patients	4.4	Survey of patients with renal cell carcinoma
2006 - 2007	Izmir	patients	4.2	4.2% of oncology patients (Izmir, 2006 to 2007) [46]
2007*	Diyarbakir	patients	10.5	10.5% of pre-dialysis renal disease patients in Diyarbakir (2007 publication) [47]
2007 - 2010	Samsun	patients	3.8	3.8% of patients attending a Maternity and Children's Hospital in Samsun (2007 to 2010) [48]
2008*	Gaziantep	patients	8.7	8.7% of patients with lymphoid tumors vs. 6.1% of controls are HBsAg-positive and/or seropositive toward Hepatitis C virus (2008 publication) [49]
2009*	Ankara	patients	11.9	11.9% of elderly nursing home patients (Ankara, 2009 publication) [50]
2010*	Gaziantep	patients	2.9	2.9% of patients scheduled for gastrointestinal endoscopy (2010 publication) [51]
2010 - 2012		patients	12.7	12.7% of patients with cystic hydatid disease vs. 5.2% of a control group (2010 to 2012) [52]
2011*	Ankara	patients	4.2	4.2% of patients with spinal cord injury (2011 publication) [53]
2012 - 2013	Istanbul	patients	5	5% of patients attending an Emergency Department (Istanbul, 2012 to 2013) [54]
2014 - 2016	Samsun	patients	4	Survey of patients at a tertiary hospital [55]
2014*	Ankara	patients	4.4	4.4% of patients with solid tumors (2014 publication) [56]
2016*	Multiple locations	patients	2.3	patients with ankylosing spondylitis [57]
2018*	Ankara	patients	4	4% of Gastroenterology patients [58]
2009*	Hatay	patients - dialysis	4.3	4.3% of hemodialysis patients in Hatay (2009 publication) [59]
2012*		patients - dialysis	3.8	3.8% of hemodialysis patients (2012 publication) [60]
2017*	Multiple locations	patients - dialysis	3.4	[61]
2015*	Sakarya	health care workers	1.4	1.4% of ambulance attendants in Sakarya Province (2015 publication) [62]
2018	Izmir	health care workers	0.3	Survey of fist-year health-care students [63]
2018		general population	6.5	6.5% to 32.8% in the general population, increasing with age group
2004*	Bolu	general population	2.6-2.85	2.6% to 2.85% of individuals in Bolu Province (2004 publication) [64]
2005*	Southeast Region	general population	6.2-8.2	6.2% (urban) to 8.2% (rural) of individuals in southeastern Turkey (2005 publication) [65]
2005	Sivas	general population	1.7	1.7% of persons engaged to be married (Sivas, Antalya,

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Years	Region	Study Group	%	Notes
				2005) [66]
2006 - 2007	Southwest Region	general population	2.5	2.5% of individuals in southwestern Turkey (2006 to 2007) [67]
2006*	Afyon	general population	6.6	6.6% of healthy individuals in Afyon (2006 publication) [68]
2009*	Tokat	general population	5.5	5.5% of individuals in Tokat Province (2009 publication) [69]
2012*		general population	3.6	3.6% of persons engaged to be married (2012 publication) [70]
2014*	Duzce	general population	4.8	4.8% of individuals in Duzce (2014 publication) [71]
2015*	Multiple locations	general population	4	4.0% of the general population (2015 publication) [72]
1991*	Elazig	sex workers	19.7	19.7% of CSW in Elazig (1991 publication) [73]
1991*	Elazig	sex workers	19.7	19.7% of CSW (1991 publication) [74]
1992*	Erzurum	sex workers	12.8	12.8% of CSW (1992 publication) [75]
1993*		sex workers	6.3	6.3% of CSW (1993 publication) [76]
1994*	Ankara	pregnant women	4.33	4.33% of pregnant women (1994 publication) [77]
2002 - 2008	Istanbul	pregnant women	2.6	2.6% of pregnant women in Istanbul during 2002 to 2008
2008 - 2013	Istanbul	pregnant women	1.2	1.2% of pregnant women in Istanbul (2008 to 2013) [78]
2009 - 2015	Multiple locations	pregnant women	0.8	[79]
2010 - 2017	Multiple locations	pregnant women	1.14	[80]
2011*	Southern Region	pregnant women	2.1	2.1% of pregnant women in southern Turkey (2011 publication) [81]
2012 - 2018	Istanbul	pregnant women	1.1-1.8	1.1% of pregnant Syrian refugees in Turkey and 1.8% of pregnant Turkish women [82]
2013 - 2016	Erzurum	pregnant women	1.2	[83]
2015	Istanbul	pregnant women	1.1-1.8	1.1% / 1.8% of Syrian immigrant / Turkish pregnant women in Turkey [84]
2016	Antakya	pregnant women	2.1	[85]
2010*		patients - hepatocellular carcinoma	54	54% of patients with hepatocellular carcinoma and 64% of patients with cirrhosis (2010 publication)
2016*	Ardahan	specimens	3.2	3.2% of tests performed at a state hospital laboratory (2016 publication) [86]
2013*	Sanliurfa	patients - hepatitis	8.5	8.5% of patients infected by HCV (2013 publication) [87]
2016 - 2017	Elazig	patients - hepatitis	9.6	9.6% of patients with previous HBV infection [88]
1987	Istanbul	blood donors	5.98	5.98% of blood donors in 1987, 2.07% in 2003 (Istanbul) [89]
1989 - 2004	Multiple locations	blood donors	2.1-5.23	4.92% of blood donors in 1989, 5.23 in 1991, 2.10% in 2004 [90]
1996 - 2010		blood donors	1.07	1.07% of blood donors (1996 to 2010) [91]
1997 - 2000	Trabzon	blood donors	3.94	3.94% of blood donors (Trabzon, 1997 to 2000) [92]
1999 - 2002	Kocaeli	blood donors	2.3	2.3% of blood donors (Kocaeli, 1999 to 2002) [93]
2000 -	Anatolia	blood donors	3.17	3.17% of blood donors in southeastern Anatolia (2000 to

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Years	Region	Study Group	%	Notes
2010				2010) [94]
2004 - 2010	Western Region	blood donors	1.23-1.36	1.23% of familial blood donors and 1.36% of voluntary blood donors in western Turkey (2004 to 2010) [95]
2010 - 2011	Western Region	blood donors	1	1% of blood donors in western Turkey (2010 to 2011) [96]
2012*		blood donors	1.8	1.8% of blood donors and 3.4% of healthy persons undergoing pre-marital screening (2012 publication) [97]
2013 - 2018	Istanbul	blood donors	0.4-0.5	0.4% of females and 0.5% of males [98]
2014*	Southeast Region	blood donors	3	3.0% of blood donors in southeastern Turkey (2014 publication) [99]
2015*	Istanbul	blood donors	1.54	1.54% of blood donors in Istanbul (2015 publication) [100]
2015*	Adana	blood donors	1.66	1.66% of blood donors in Adana (2015 publication) [101]
1999 - 2009	Nationwide	general population (Literature Review)	4.57	4.57% of the general population (meta-analysis, 1999 to 2009) [102]
1994 - 2012	Izmir	patients - liver disease	16.3	16.3% of alcoholics with hepatic cirrhosis (1994 to 2012) [103]
2007 - 2015	Izmir	transplant donors	5.7	5.7% of cornea donors (Izmir, 2007 to 2015) [104]
2008 - 2014	Antalya	transplant donors	5.12	5.12% of renal transplant donors (Antalya, 2008 to 2014) [105]
2000 - 2010	Ankara	testing center	6	6% of persons tested at a reference center (Ankara, 2000 to 2010) [106]
2016 - 2017	Izmir	patients - chronic liver disease	19.5	Survey of patients with cirrhosis and excessive alcohol consumption [107]
2011*	Izmir	barbers	2.2	2.2% of barbers (Izmir, 2011 publication) [108]
2001 - 2005	Sivas	family members	30.5	30.5% of family members of HBsAg-positive persons (2001 to 2005) [109]
2006 - 2010	Kahramanmaras	patients - diabetes	3.7	3.7% of diabetics vs. 1.08% of a control group [110]
2006*	Multiple locations	patients - sickle cell	0.75	0.75% of patients with sickle cell anemia or thalassemia (2006 publication) [111]
2012 - 2019	Ankara	patients - immunocompromised	4.8	Survey of patients with plasma cell disorders [112]
2010 - 2017	Nationwide	patients - HIV / AIDS	3.2	[113]

* indicates publication year (not necessarily year of survey)

- 2002 to 2003 - 18.7% of nurses had evidence for current or prior hepatitis B exposure. [114]

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Hepatitis C

Agent	VIRUS - RNA. Flaviviridae, Hepacivirus: Hepatitis C virus
Reservoir	Human
Vector	None
Vehicle	Blood, Sexual contact, Transplacental
Incubation Period	5w - 10w (range 3w - 16w)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Needle precautions. For chronic infection: Ledipasvir / Sofosbuvir (Genotype 1,4,5,6) OR Sofosbuvir / Velpatasvir (Genotype 1,2,3,4,5,6) OR Ombitasvir-Paritaprevir-Ritonavir + Dasabuvir + Ribavirin (Genotype 1,4) (Regimen / Duration dependent on viral genotype)[1] [2] [3]
Typical Pediatric Therapy	Most agents recommended for adult disease are not currently licensed for use in children except (age >12): Sofosbuvir / Ribavirin Ledipasvir / Sofosbuvir Peginterferon alfa-2b 3 MU/m2 SC x1 weekly + Ribavirin 15mg/kg
Clinical Hints	- Vomiting and jaundice - May be history of transfusion or injection within preceding 1 to 4 months - Chronic hepatitis and fulminant infections are encountered - Hepatic cirrhosis or hepatoma may follow years after acute illness
Synonyms	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

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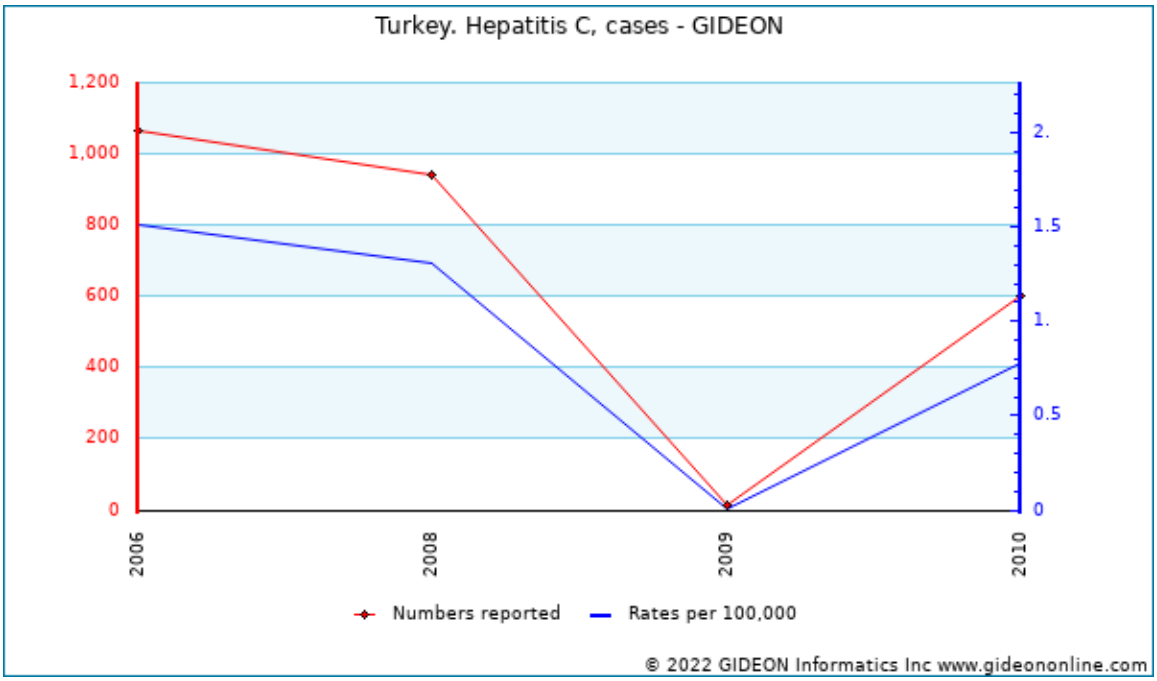
Hepatitis C in Turkey



Graph: Turkey. Hepatitis C, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
2014 - 2017	Samsun	patients	2.05	Survey of hospital patients [4]
2016 - 2018	Adana	patients	0.009	Survey of adult hospital patients [5]
2017	Ankara	patients	0.1	0.1% of hospital patients [6]
2001 - 2011	Istanbul	patients - hepatocellular carcinoma	22	[7]
2004 - 2010	Van	patients - hepatocellular carcinoma	15.3	15.3% of patients with hepatocellular carcinoma (2004 to 2010) [8]
2014*	Multiple locations	patients - hepatocellular carcinoma	16.5	16.5% of patients with hepatocellular carcinoma (2014 publication) [9]
2018*	Multiple locations	patients - hepatitis	1.2	Multicenter survey of adults with acute viral hepatitis [10]
2010*		patients - liver disease	11-25	25% of patients with hepatocellular carcinoma and 11% of patients with cirrhosis (2010 publication)
2001 - 2007	Ankara	patients - chronic liver disease	25.25	25.25% of patients with chronic liver disease (2001 to 2007) [11]
2014*	Erzurum	patients - chronic liver disease	11	11% of patients with hepatic cirrhosis (Erzurum, 2014 publication) [12]
2017 - 2020	Corum	specimens - serum	0.12	Survey of patient specimens submitted to a hospital laboratory [13]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1994 -	Istanbul	children	14	14% of multi-transfused children with cancer (Istanbul, 1994

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Years	Region	Study Group	%	Notes
1995				to 1995) [14]
1997*	Adana	children	24.4	24.4% of children with hemophilia (1997 publication) [15]
1999	Diyarbakir	children	0.56	0.56% of school children ages 5 to 16 (Diyarbakir, 1999)
2010 - 2012	Istanbul	children	0	Survey of children with cancer [16]
2016*	Kahramanmaras	prisoners	17.7	17.7% of prisoners in Kahramanmaras (2016 publication) [17]
2019*		prisoners	0.5	Survey of male prisoners [18]
2012 - 2013	Multiple locations	injecting drug users	51.9	Survey of IDU inpatients [19]
2013 - 2017	Izmir	injecting drug users	0.6	[20]
2015*	Anatolia	injecting drug users	9.4	9.4% of IDU in Eastern Anatolia (2015 publication) [21]
2009*	Kayseri	women	8.9	8.9 of married women (2009 publication) [22]
2008 - 2010	Istanbul	transplant recipients	5.4	5.4% of renal transplant recipients in Istanbul (2008 to 2010) [23]
1999 - 2017	Multiple locations	patients - cancer	1	Survey of patients with splenic marginal zone lymphoma [24]
2000 - 2014	Multiple locations	patients - cancer	1.2	1.2% of cancer patients, vs. 0.84% of controls [25]
1990 - 2008	Arnhem	migrants	4	4.0% of first-generation migrants from Turkey, living in the Netherlands (Arnhem, 1990 to 2008) [26]
1990 - 2008	Afyon	patients	0.8-1	0.8% to 1.0% of hospital patients in Afyon
1998 - 1999	Istanbul	patients	2.4	2.4% of hospital outpatients in Istanbul (1998 to 1999)
2002 - 2005	Black Sea	patients	2.8	2.8% of lymphoma patients and 5.1% of controls in the eastern Black Sea region (2002 to 2005) [27]
2003 - 2004	Ankara	patients	0.5-0.6	0.5% to 0.6% of traumatology and orthopedics patients (Ankara, 2003 to 2004) [28]
2005 - 2010	Konya	patients	1.16	1.16% of patients admitted to first-step health organizations in Konya (2005 to 2010) [29]
2005 - 2010	Multiple locations	patients	1.7	1.7% of renal cell carcinoma patients and 1.5% of controls (2005 to 2010) [30]
2005 - 2015	Istanbul	patients	0.3	survey of patients undergoing nasal septoplasty [31]
2005 - 2010	Ankara	patients	1.7	Survey of patients with renal cell carcinoma
2006 - 2007	Izmir	patients	0.7	0.7% of oncology patients (Izmir, 2006 to 2007) [32]
2007*	Diyarbakir	patients	7	7% of pre-dialysis renal disease patients in Diyarbakir (2007 publication) [33]
2008*	Gaziantep	patients	8.7	8.7% of patients with lymphoid tumors vs. 6.1% of controls are HBsAg-positive and/or seropositive toward Hepatitis C virus (2008 publication) [34]
2009*	Ankara	patients	2.5	2.5% of elderly nursing home patients (Ankara, 2009 publication) [35]
2010*	Gaziantep	patients	0.2	0.2% of patients scheduled for gastrointestinal endoscopy (2010 publication) [36]
2012 - 2013	Istanbul	patients	1.8	1.8% of patients attending an Emergency Department (Istanbul, 2012 to 2013) [37]
2013 -	Mersin	patients	1.7	Survey of hospital patients [38]

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Years	Region	Study Group	%	Notes
2018				
2014 - 2017	Samsun	patients	2.76	Survey of hospital patients [39]
2014*	Ankara	patients	2.8	2.8% of patients with solid tumors (2014 publication) [40]
2016 - 2018	Adana	patients	1.7	Survey of adult hospital patients [41]
2016*	Multiple locations	patients	1.1	patients with ankylosing spondylitis [42]
2017	Ankara	patients	0.28	0.28% of hospital patients [43]
2005	Sivas	adults	0.1	0.1% of persons engaged to be married (Sivas, Antalya, 2005) [44]
2005*	Izmir	patients - dialysis	19	19% of hemodialysis patients in Izmir (2005 publication) [45]
2009*	Hatay	patients - dialysis	7.6	7.6% of hemodialysis patients in Hatay (2009 publication) [46]
2012*		patients - dialysis	10.8	10.8% of hemodialysis patients (2012 publication) [47]
2017*	Multiple locations	patients - dialysis	10.3	[48]
1998 - 2000	Istanbul	health care workers	0.3	0.3% of health care workers in Istanbul (1998 to 2000)
2003 - 2004	Multiple locations	health care workers	5.4	5.4% of nurses (2003 to 2004) [49]
2018	Izmir	health care workers	0	Survey of fist-year health-care students [50]
2018	Ankara	general population	1	<1% of individuals in the higher socioeconomic grouping
1997	Nationwide	general population	1.5	1.50% nationwide (1997, estimated)
2002 - 2004	Afyon	general population	2.2	2.2% of healthy individuals in Afyon [51]
2006 - 2007	Southwest Region	general population	1	1.0% of individuals in southwestern Turkey (2006 to 2007) [52]
2009*	Tokat	general population	2.1	2.1% of individuals in Tokat Province (2009 publication) [53]
2011*		general population	0.3-0.4	0.3% to 0.4% of the general population (2011 publication) [54]
2012*	Anatolia	general population	3.1	3.1% of individuals in a city in southern Anatolia (2012 publication) [55]
2014*	Duzce	general population	0.7	0.7% of individuals in Duzce (2014 publication) [56]
2015*	Multiple locations	general population	1	1.0% of the general population (2015 publication) [57]
2012 - 2018	Istanbul	pregnant women	0.1-0.2	0.1% of pregnant Syrian refugees in Turkey and 0.2% of pregnant Turkish women [58]
2013 - 2016	Erzurum	pregnant women	0.06	[59]
1994 - 2012	Izmir	alcoholics	8.2	8.2% of alcoholics with hepatic cirrhosis (1994 to 2012) [60]
2000 - 2017	Ankara	specimens - blood	1-1.4	1.0% / 1.4% of specimens from men / women at a hospital laboratory [61]
2009 - 2010	Ardahan	specimens	0.97	0.97% of tests performed at a state hospital laboratory (2016 publication) [62]
2009 - 2010	Southern Region	blood donors	0.54	0.54% (southern region) to 1.9% (Ankara) of blood donors
1987 - 2003	Istanbul	blood donors	0.05	0.05% of blood donors (Istanbul, 1987 to 2003) [63]

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Years	Region	Study Group	%	Notes
1996 - 2010		blood donors	0.39	0.39% of blood donors (1996 to 2010) [64]
1996 - 2004	Multiple locations	blood donors	0.18-0.56	0.18% of blood donors in 1996, 0.56 in 1998, 0.34% in 2004 [65]
1997 - 2000	Trabzon	blood donors	0.74	0.74% of blood donors (Trabzon, 1997 to 2000) [66]
1999 - 2002	Kocaeli	blood donors	0.37	0.37% of blood donors (Kocaeli, 1999 to 2002) [67]
2000 - 2010	Anatolia	blood donors	0.64	0.64% of blood donors (southeastern Anatolia, 2000 to 2010) [68]
2004 - 2010	Western Region	blood donors	0.37-0.42	0.37% of familial blood donors and 0.42% of voluntary blood donors in western Turkey (2004 to 2010) [69]
2013 - 2018	Istanbul	blood donors	0.3-0.4	0.3% of males and 0.4% of females [70]
2015*	Adana	blood donors	0.05	0.05% of blood donors in Adana (2015 publication) [71]
2015*	Istanbul	blood donors	0.38	0.38% of blood donors (Istanbul , 2015 publication) [72]
2010*		patients - liver disease	11-25	25% of patients with hepatocellular carcinoma and 11% of patients with cirrhosis (2010 publication)
2007 - 2015	Izmir	transplant donors	1.5	1.5% of cornea donors (Izmir, 2007 to 2015) [73]
2016 - 2017	Izmir	patients - chronic liver disease	3.9	Survey of patients with cirrhosis and excessive alcohol consumption [74]
2011*	Izmir	barbers	0.4	0.4% of barbers (Izmir, 2011 publication) [75]
2006 - 2010	Kahramanmaras	patients - diabetes	2.2	2.2% of diabetics vs. 0.5% of a control group [76]
2009*	Sivas	sanitation workers	0.77	0.77% of sanitary workers in Sivas (2009 publication)
2006*	Multiple locations	patients - sickle cell	4.5	4.5% of patients with sickle cell anemia or thalassemia (2006 publication) [77]
2015*	Sakarya	ambulance attendants	0	0% of ambulance attendants in Sakarya Province (2015 publication) [78]
2012 - 2019	Ankara	patients - immunocompromised	1.3	Survey of patients with plasma cell disorders [79]
2017 - 2020	Corum	specimens - serum	0.81	Survey of patient specimens submitted to a hospital laboratory [80]
2006 - 2013	Istanbul	patients - HIV / AIDS	0.9	0.9% of HIV-positive patients (Istanbul, 2006 to 2013) [81]
2010 - 2017	Nationwide	patients - HIV / AIDS	0.5	[82]

* indicates publication year (not necessarily year of survey)

Co-infections

- 2004 - Antibody toward hepatitis E was found in 54% of patients with chronic hepatitis C, and 15.7% of healthy controls. [83]
- 2013 (publication year) - 8.5% of patients infected by HCV were HBsAg-positive. [84]

Notable outbreaks

Years	Region	Setting	Cases	Source	Notes
2000*		hemodialysis unit	4		[85]
2016	Tekiradag		18	dialysis	[86]

* indicates publication year (not necessarily year of outbreak)

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Hepatitis D

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

Hepatitis D in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2001 - 2011	Istanbul	patients - hepatocellular carcinoma	6.7	[2]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
	Ankara	HBsAg-positives	17.5	17.5% of patients with acute hepatitis B (Ankara)
	Ankara	HBsAg-positives	5.2	5.2% of asymptomatic hepatitis B carriers (Ankara)
1991*	Ankara	HBsAg-positives	38.9	38.9% of patients with chronic hepatitis B (Ankara, 1991 publication) [3]
2002 - 2004	Southeast Region	HBsAg-positives	6-27.5	6% of asymptomatic hepatitis B carriers and 27.5% of patients with chronic active hepatitis B (southeastern Turkey, 2002 to 2004) [4]
2006*	Multiple locations	HBsAg-positives	3-32.5	4.9% of HBsAg-positive patients, 3.0% of acute viral hepatitis, 8.1% of acute hepatitis B patients, 20% of chronic hepatitis B patients, 32.5% of patients with hepatic cirrhosis (2006 publication) [5]
2007 - 2009	Izmir	HBsAg-positives	2.5	2.5% of HBsAg-positive patients (Izmir, 2007 to 2009) [6]
2008*	Multiple locations	HBsAg-positives	5-27	5% of patients with chronic hepatitis B and liver cirrhosis in western Turkey, and 27% in southeastern Turkey (2008 publication) [7]
2010 - 2011	Multiple locations	HBsAg-positives	3.4	3.4% of HBsAg-positive blood donors in western Turkey (2010 to 2011) [8]
2010*	Elazig	HBsAg-positives	45.5	45.5% of patients with chronic hepatitis B in the Elazig region (2010 publication) [9]

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Years	Region	Study Group	%	Notes
2013*	Western Region	HBsAg-positives	1.6	1.6% of children with hepatitis B virus infection (western Turkey, 2013 publication) [10]
2014*	Southeast Region	HBsAg-positives	6.98	6.98% of HBsAg-positive blood donors in southeastern Turkey (2014 publication) [11]
2014*	Erzurum	HBsAg-positives	11	11% of HBsAg-positive patients with hepatic cirrhosis (Erzurum, 2014 publication) [12]
2016 - 2017	Izmir	patients - chronic liver disease	7.6	Survey of HBsAg-positive patients with cirrhosis and excessive alcohol consumption [13]
2012 - 2019	Ankara	patients - immunocompromised	0	Survey of patients with plasma cell disorders [14]

* indicates publication year (not necessarily year of survey)

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Hepatitis E

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

Hepatitis E in Turkey

- The disease is most common in Adana, and peaks during warmer months.
  - High rates are also noted in Erzurum (Eastern Turkey).

Prevalence surveys

Years	Region	Study Group	%	Notes
2022*	Multiple locations	transplant recipients	0	Hepatitis E RNA was not detected among plasma samples from 485 solid organ recipients at 7 transplant centers in Turkey. [2]
2019*		milk	20.34	HEV RNA was detected in 20.34% of raw milk samples obtained from a variety of animals [3]
1994*		patients - hepatitis	73.3	73.3% of enterically transmitted non-A, non-B hepatitis (1994 publication) [4]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1997 - 1998	Istanbul	children	3.7	3.7% of children by age 5 years (Istanbul, 1997 to 1998)
2001*	Istanbul	children	2.1	2.1% of children in Istanbul (2001 publication) [5]
2002*	Antalya	children	1.6	1.6% of school children in Ahatli, Antalya (2002 publication) [6]
2003	Duzce	children	0.3	0.3% of children ages 6 months to 17 years in Duzce (2003) [7]
2004*	Konya	children	5.2-8.5	5.2% of urban children and 8.5% of rural children in Konya - ages 6 to 11 (2004 publication) [8]
2009*	Ankara	children	1.7-2.1	1.7% to 2.1% of primary school children in Ankara (2009 publication) [9]

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Years	Region	Study Group	%	Notes
2013*	Denizli	children	12.4	12.4% of primary school children in Denizli (2013 publication) [10]
2014	Van	children	4.2	[11]
2000	Foreign Country	refugees	10	10% of Kurdish refugees from Turkey, in Italy [12]
2022*	Multiple locations	transplant recipients	17.3	17.3% of solid organ recipients at 7 transplant centers in Turkey. [13]
2000 - 2001	Ankara	adults	3.8	3.8% of adults in Ankara (2000 to 2001) [14]
2009*	Erdine	adults	2.4	2.4% of adults in Erdine Province (2009 publication) [15]
2009*	Hatay	patients - dialysis	20.6	20.6% of hemodialysis patients in Hatay (2009 publication) [16]
2012 - 2013	Ankara	various	0.92-6	0.92% of blood donors and 6.0% of hospital inpatients (Ankara, 2012 to 2013) [17]
2012 - 2013	Malatya	general population	9.8	9.8% of individuals in Malatya
2004*	Afyon	pregnant women	12.6	12.6% of pregnant women in Afyon (2004 publication) [18]
2006*	Aydin	pregnant women	7	7.0% of pregnant women in Aydin (2006 publication) [19]
2006*		water	34.8	34.8% of farmers using untreated waste water
1990 - 2020	Nationwide	adults (Literature Review)	9.52	[20]
1990 - 2020		patients - hepatitis	5.9-6.6	5.9% to 6.6% of the healthy population and 7.7% of patients with non-A, non-B hepatitis
2019*	Nationwide	blood donors	11.5	[21]
2021*	Mersin	blood donors	12.8	[22]
2018*		various (Literature Review)	0-54	7 to 8% in pregnant women, 13% in chronic HBV patients, 54% in chronic HCV patients, 13.9 to 20.6% in patients with chronic renal failure, and approximately 35% in agriculture workers. [23]
2004	Gaziantep	patients - chronic liver disease	13.7-54	13.7% of patients with chronic hepatitis B, 54% of patients with chronic hepatitis C, and 15.7% of healthy controls (2004) [24]
2017 - 2018	Sakarya	patients - HIV / AIDS	4	[25]

* indicates publication year (not necessarily year of survey)

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Herpes B infection

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesviridae, Simplexvirus: Cercopithecine herpesvirus 1 (Herpes B virus)
Reservoir	Monkey (*Macaca species* and *Cynomolgus*), Zoonotic
Vector	None
Vehicle	Contact or bite, Respiratory or pharyngeal acquisition
Incubation Period	10d - 20d (range 2d - 60d)
Diagnostic Tests	Biosafety level 4. Viral culture (skin exudates). Nucleic acid amplification.
Typical Adult Therapy	Therapy: Acyclovir 10 mg/kg IV q8h. OR Ganciclovir 5 mg/kg IV q12h for 14-21d Follow with prolonged Acyclovir 800 mg PO 5X daily OR Valacyclovir 1 g PO TID. Postexposure prophylaxis: Valacyclovir 1g PO q8h X 14 days. OR Acyclovir 800 mg PO X 14 days[1] [2]
Typical Pediatric Therapy	Acyclovir or Ganciclovir as for adult.
Clinical Hints	- Skin vesicles, lymphadenopathy, myalgia, singultus, major neurological signs - Usually onset within one month of contact with monkey - Case-fatality rates exceed 80% - Permanent neurological residua are common
Synonyms	Cercopithecine herpesvirus 1, Herpes B, Herpesvirus simiae, Macacine herpesvirus 1, McHV-1. ICD9: 078.89 ICD10: B00.4

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Herpes simplex encephalitis

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus (usually type I)
Reservoir	Human
Vector	None
Vehicle	Infected secretions, Sexual contact
Incubation Period	Unknown
Diagnostic Tests	Viral culture CSF usually negative. CT brain. Compare CSF/blood antibody levels. Nucleic acid amplification.
Typical Adult Therapy	Acyclovir 10 mg/kg IV Q8h[1] [2]
Typical Pediatric Therapy	Acyclovir 10 mg/kg IV Q8h
Clinical Hints	- Rapidly-progressive severe encephalitis - Exanthem not evident in most cases - Often unilateral, with temporal and parietal lobe predominance - Permanent residua and high case-fatality rate in untreated cases
Synonyms	ICD9: 054.3 ICD10: B00.4

Herpes simplex encephalitis in Turkey

- 2014 (publication year) - Analysis of 106 cases (8% fatal) of Herpes simplex encephalitis treated during a ten-year period [3]

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Herpes simplex infection

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae, Simplexvirus: Human herpesvirus I and II
Reservoir	Human
Vector	None
Vehicle	Infected secretions, Sexual contact, Breastfeeding, Respiratory or pharyngeal acquisition
Incubation Period	1d - 14d
Diagnostic Tests	Viral culture or microscopy of lesions. Serology. Nucleic acid amplification.
Typical Adult Therapy	Skin / lesion precautions Famciclovir 1,500 mg PO once OR Valacyclovir 1 g PO BID X 1d OR Acyclovir 400 mg PO X 5 per day X 5d Dosage and duration may vary for initial vs. recurrent vs. suppressive regimens.[1] [2]
Typical Pediatric Therapy	Skin / lesion precautions Acyclovir 10 mg/kg PO QID X 7 d
Clinical Hints	- Recurring localized crops of painful vesicles on a red base - Regional adenopathy often present - May follow a prodrome of neuropathy or hyperesthesia
Synonyms	Herpes gladiatorum, Herpes rugbiorum, Herpes simplex, Scrum pox. ICD9: 054.0,054.1,054.2,054.4,054.5,054.6,054.7,054.8,054.9 ICD10: A60,B00

Herpes simplex infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2016 - 2017	Istanbul	transplant recipients	1.25	Survey of asymptomatic STD among renal transplant recipients (HSV-2) [3]
1988 - 2009	Ankara	patients	39.2	39.2% of patients with infectious uveitis. [4]
2014*	Ankara	patients	1.8	1.8% of tonsillar tissue samples (2014 publication) [5]
2009 - 2010	Istanbul	patients - eye	13.3	13.3% of anterior uveitis cases (Istanbul, 2009 to 2010) [6]
2009 - 2016	Malatya	patients - CNS	2.6	Survey of children with acute ataxia [7]
2009 - 2015	Izmir	patients - CNS	1.88	Survey of patients with viral central nervous system infection [8]
2010 - 2017	Izmir	patients - CNS	15	Survey of pathogens associated with central nervous system infections [9]
2015 - 2017	Konya	patients - CNS	1.9	HSV was detected in 10% of CSF samples from patients hospitalized with suspected encephalitis/meningitis [10]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2006*	Istanbul	adults	4.8-85.3	4.8% and 85.3% of sexually active adults [11]
2006*	Istanbul	sex workers	99-99	60% and 99% of sex workers (HSV-2 and HSV-1, 2006 publication) [12]

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Years	Region	Study Group	%	Notes
2006*	Istanbul	pregnant women	5-98	5% and 98% of pregnant women, 17.3% and 93.6% of patients with genital warts (HSV-2/HSV-1) [13]
2009*	Izmir	pregnant women	8.2-94.7	8.2% (HSV-2) and 94.7% (HSV-1) of asymptomatic pregnant women (Izmir, 2009 publication) [14]
2009*	Ankara	pregnant women	53.5	53.5% of women above age 15 (HSV-2, Ankara, 2009 publication) [15]
2006*	Istanbul	blood donors	5.5-96	5.5% (HSV-2) and 96% (HSV-1) of blood donors [16]
2006*	Istanbul	hotel workers	8.3-97.3	8.3% (HSV-2) and 97.3% (HSV-1) of hotel staff [17]
2007 - 2008	Eskisehir	patients - rheumatological	8-99	99% / 8% of patients with lupus erythematosus and rheumatoid arthritis toward HSV-1 / HSV-2, and 94% / 12% of controls, (2007 to 2008) [18]

* indicates publication year (not necessarily year of survey)

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Herpes zoster

Agent	VIRUS - DNA. Herpesviridae, Alphaherpesvirinae: Varicella-zoster virus
Reservoir	Human
Vector	None
Vehicle	Air, Direct contact
Incubation Period	Unknown
Diagnostic Tests	Viral culture (vesicles). Serology. Nucleic acid amplification.
Typical Adult Therapy	Skin / lesion precautions Acyclovir 800 mg PO X 5 daily X 7d. OR Famciclovir 500 PO TID X 7d. OR Valacyclovir 1 g PO TID X 7d[1] [2]
Typical Pediatric Therapy	Skin / lesion precautions Acyclovir 20 mg/kg PO QID X 7 d
Vaccine	Herpes zoster vaccine
Clinical Hints	- Patients usually above age 50 - Unilateral dermatomal pain, tenderness and paresthesia - Rash appears after 3 to 5 days - macular, erythematous lesions which evolve into vesicles - Trunk and chest wall most commonly involved; but eyes, extremities and other areas also affected - Recurrence is common
Synonyms	Fuocodi Saint'Antonio, Shingles, Zona, Zoster. ICD9: 053 ICD10: B02

Herpes zoster in Turkey

Case series

- 2012 to 2018 - 60 patients below age 18 years were treated for herpes zoster at two institutions. [3]
- 2020 (publication year) - 69 immunocompetent children were treated for herpes zoster at two institutions. [4]

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Histoplasmosis

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

- The first case reports of histoplasmosis in Turkey were published in 1946 and 1949. [2]
- A subsequent case was reported in 1995. [3]

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HIV infection - initial illness

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

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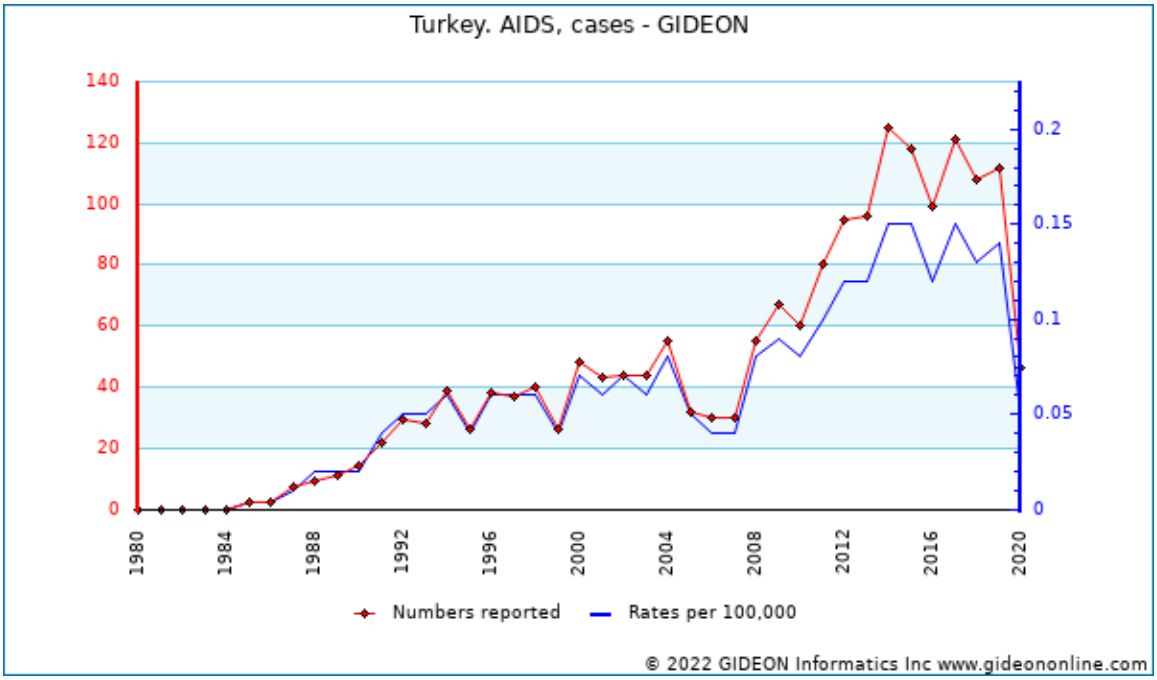
HIV/AIDS

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

HIV/AIDS in Turkey

The first case of AIDS was reported in 1985.



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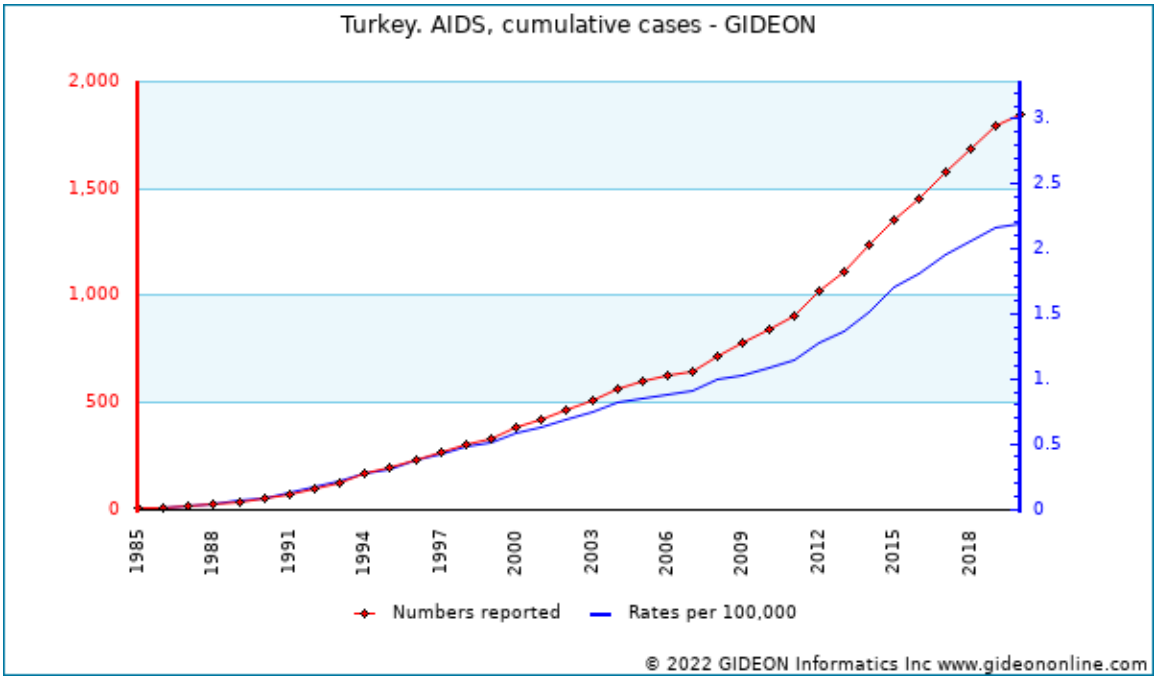
Graph: Turkey. AIDS, cases



Graph: Turkey. AIDS, cumulative cases

Demography and risk factors

- Cases reported to May 1998: 76% ages 15 to 49; 84% males; 51% heterosexual; 19% men who have sex with men; 17% IDU - including injecting men who have sex with men; 21% transfusion or hemophilia-related; 2% mother to infant.
- Cases during 1997 to 1999: 79% ages 15 to 49; 86% males; 69% heterosexual; 7% men who have sex with men; 22% IDU; 2% transfusion/hemophilia; 0% mother to infant.
- Cases during 1997 to 2001: 97% ages 15 to 49; 77% males; 81% heterosexual; 5% men who have sex with men; 10% IDU; 2% transfusion/hemophilia; 2% mother to infant.

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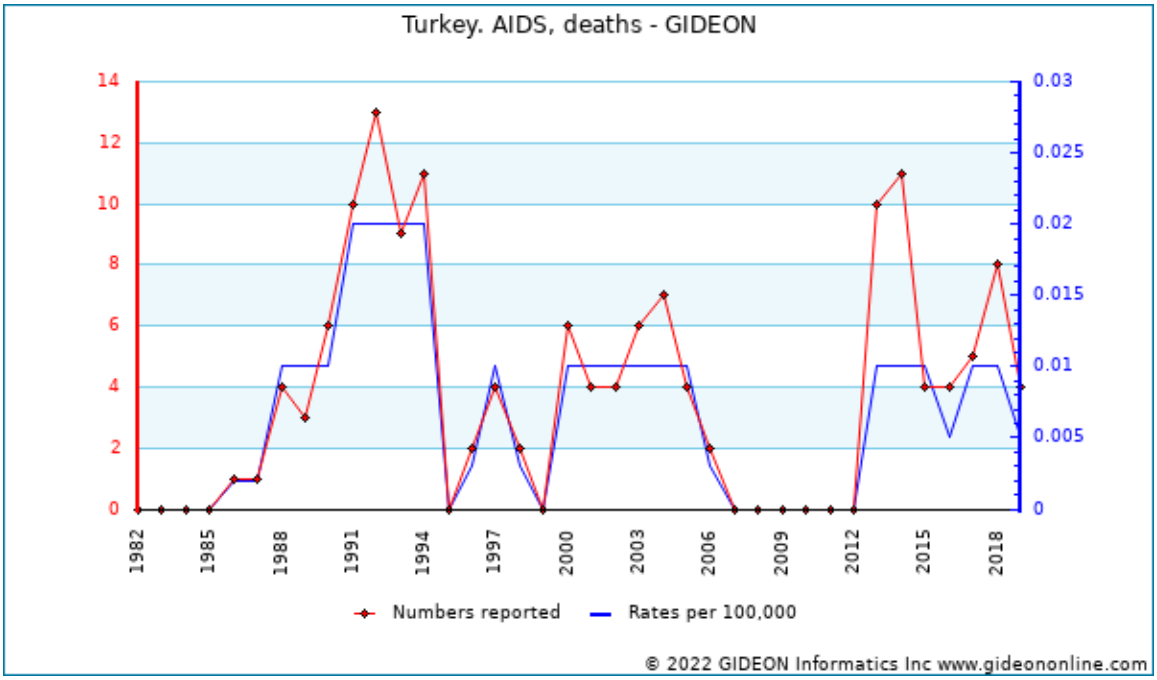
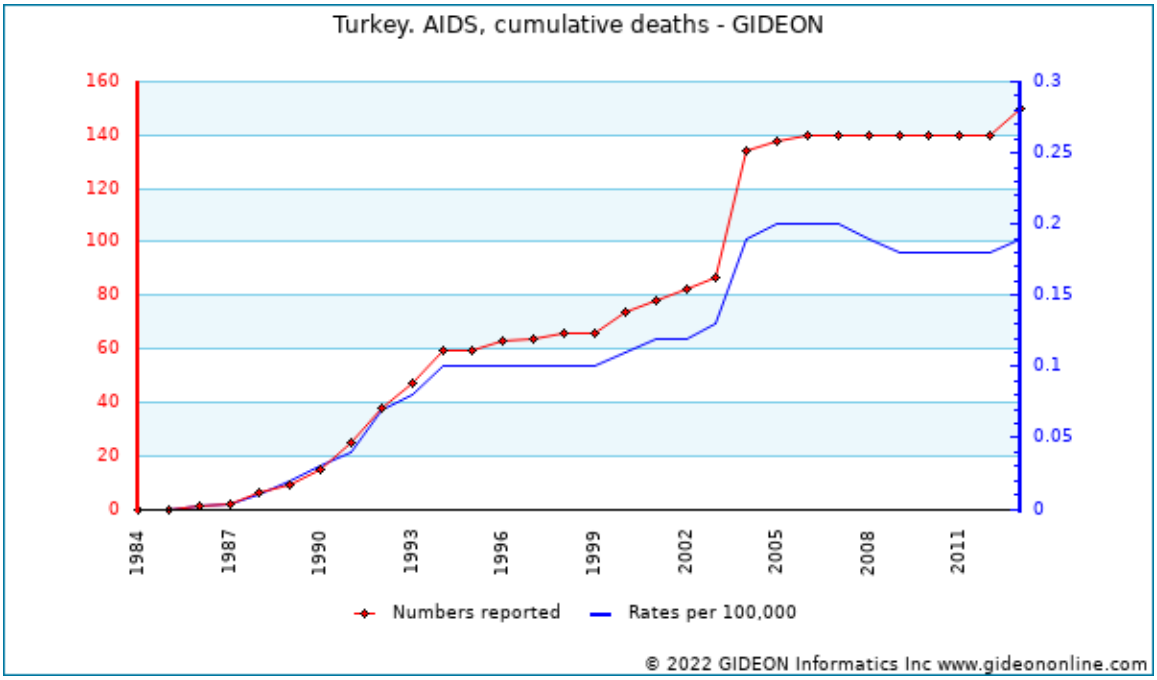


Graph: Turkey. AIDS, deaths



Graph: Turkey. AIDS, cumulative deaths

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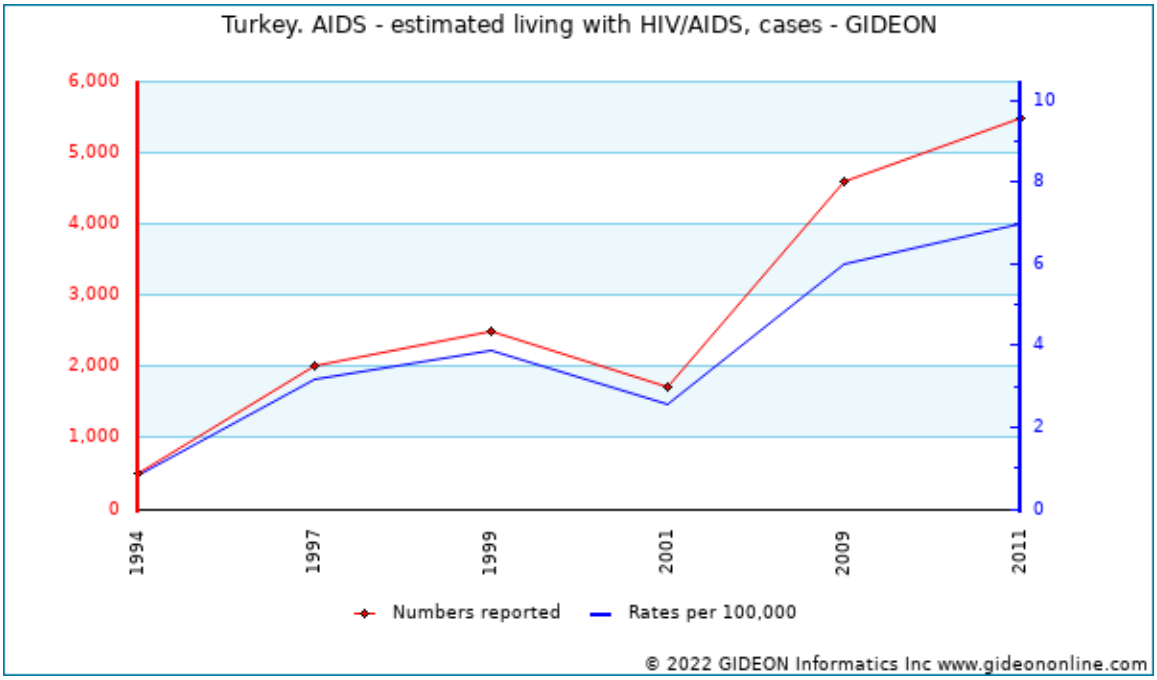
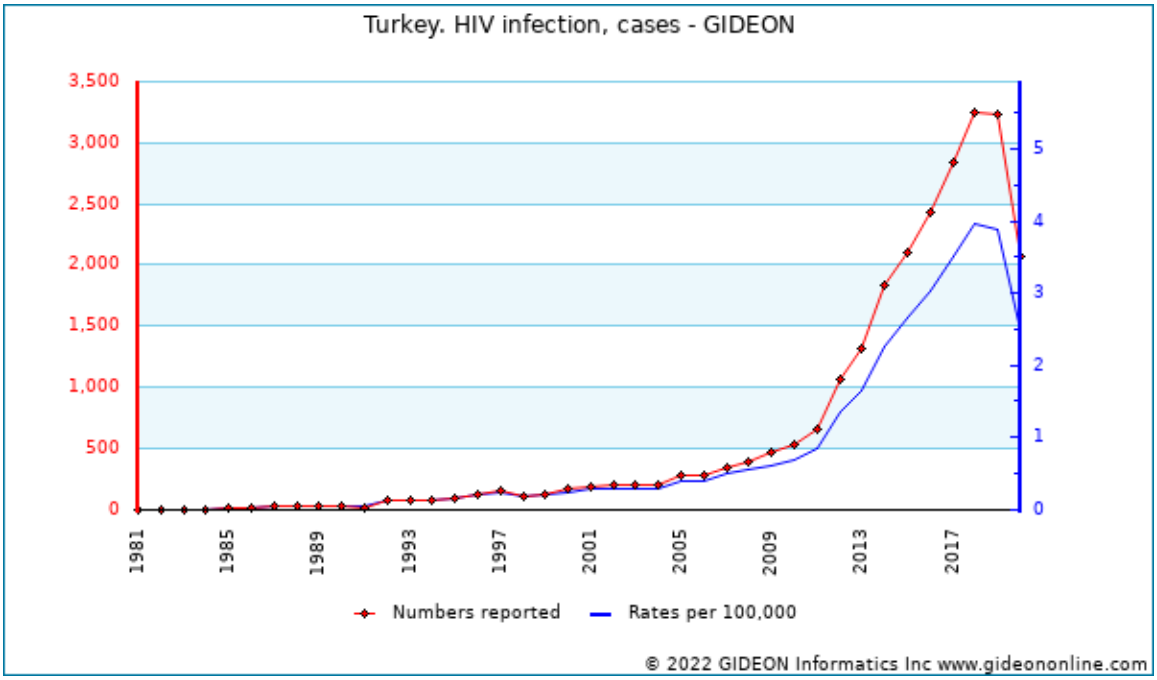


Graph: Turkey. AIDS - estimated living with HIV/AIDS, cases

Notes:
1. Figure for 1997 represented 0.01% of all adults



Graph: Turkey. HIV infection, cases

Notes:
1. Disease notification rates are 100% of actual disease incidence (Izmir, 2003) [1]

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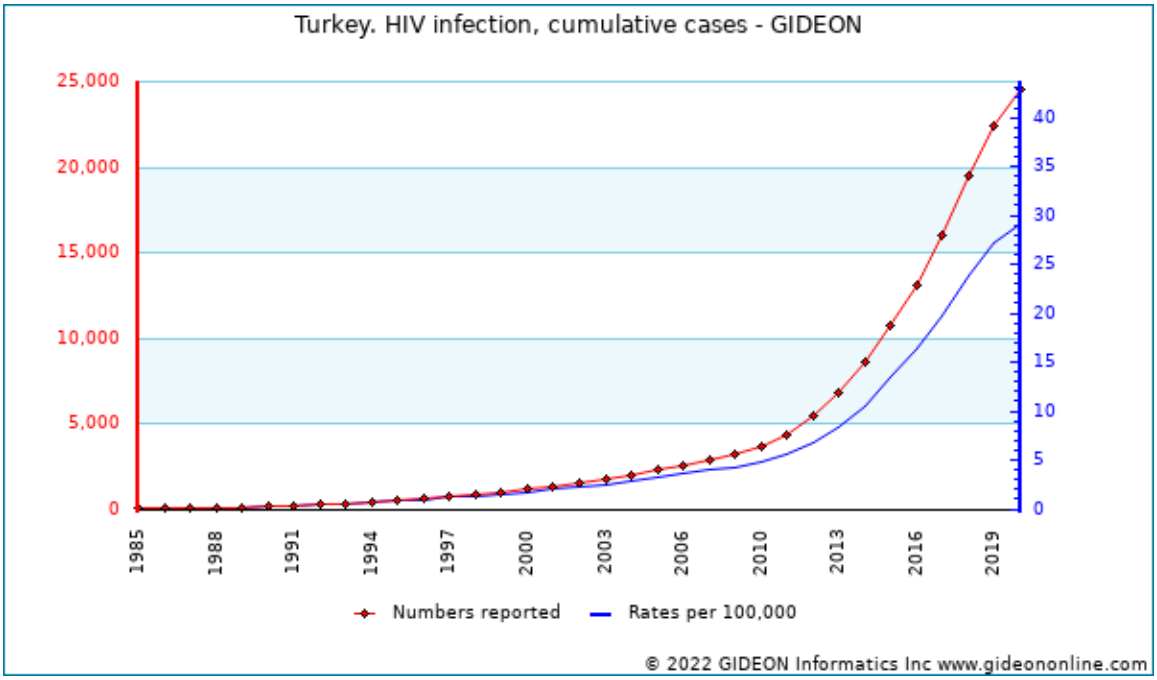

Graph: Turkey. HIV infection, cumulative cases

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1994 - 1995	Istanbul	children	0	0% of multi-transfused children with cancer [2]
2010 - 2012	Istanbul	children	0	Survey of children with cancer [3]
2016*	Istanbul	MSM	12.7	[4]
1996		military personnel	0.008	
1992	Istanbul	injecting drug users	0	
2013 - 2017	Izmir	injecting drug users	0.2	[5]
2015*	Eastern Anatolia	injecting drug users	0	[6]
2005 - 2015	Istanbul	patients	0.2	survey of patients undergoing nasal septoplasty [7]
2012 - 2013	Istanbul	patients	0	0% of patients attending an Emergency Department ([8]
2009*	Sivas	adults	0.1	0.1% of persons engaged to be married [9]
1991*	Elazig	sex workers	0	[10]
2012 - 2018	Istanbul	pregnant women	0.03-0.08	0.03% of pregnant Syrian refugees in Turkey and 0.08% of pregnant Turkish women [11]
2013 - 2016	Erzurum	pregnant women	0	[12]
1987 - 2003	Istanbul	blood donors	0.01	[13]
1997 - 2000	Trabzon	blood donors	0	[14]
1998 - 2007	Eskisehir	blood donors	0.015	[15]

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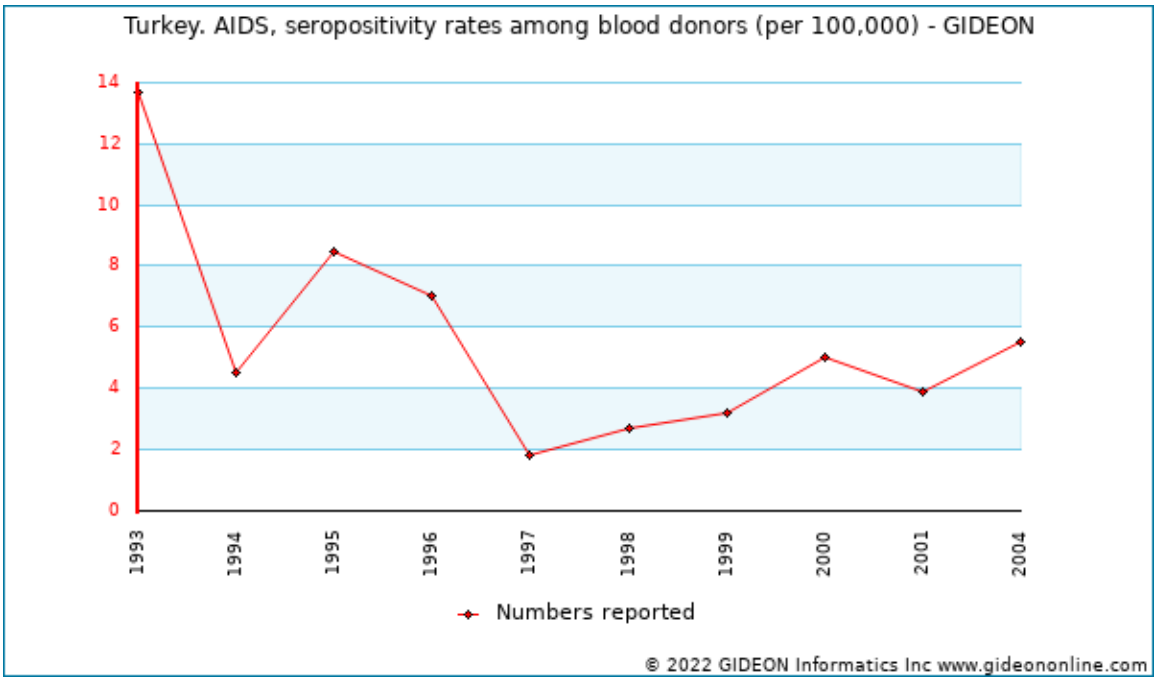
Years	Region	Study Group	%	Notes
2000 - 2010	Anatolia	blood donors	0.0004	[16]
2004 - 2010	Western Region	blood donors	0-0.004	0% of familial blood donors and 0.004% of voluntary blood donors [17]
2013 - 2018	Istanbul	blood donors	0.1	0.1% of males and 0.1% of females [18]
2015*	Istanbul	blood donors	0.01	[19]
2015*	Adana	blood donors	0.003	[20]
1992		patients - STD	0.126	
2007 - 2015	Izmir	transplant donors	2.8	2.8% of cornea donors0% of patients attending an Emergency Department [21]
1996 - 2019	Istanbul	patients - eye	27	27% of patients with CMV retinitis were HIV-positive [22]
2009*	Sivas	sanitation workers	0	
2012 - 2019	Ankara	patients - immunocompromised	0	Survey of patients with plasma cell disorders [23]

* indicates publication year (not necessarily year of survey)



Graph: Turkey. AIDS, seropositivity rates among blood donors (per 100,000)

Associated Infections

Parasites - miscellaneous

1.2% of HIV-positive persons were found to be seropositive toward *Leishmania infantum* (Ankara, 2004 to 2006) [24]

- Cyclosporiasis and cryptosporidiosis were each identified in 2.6% of HIV-positive individuals (2017 publication) [25]
- *Blastocystis* spp. was identified in stool samples from 22.2% of HIV-positive individuals, *Dientamoeba* spp. 13.3%, *Entamoeba histolytica* 4.4%, *Cryptosporidium* spp. 3.3%, and *Giardia* spp. 2.2% (2018 publication) [26]

- *Cryptosporidium* spp. were found in 21.5% of HIV-positive patients, *Cyclospora* in 3.1% and *Blastocystis* spp. in 10.8% (Izmir, 2018 publication) [27]

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Syphilis

12.9% of HIV-positive patients in Istanbul were seropositive for syphilis (2006 to 2013) [28]

- 13.3% of HIV-positive patients were seropositive for syphilis (2018 publication year) [29]
- 19.3% of HIV-positive males in Istanbul were seropositive for syphilis (2018) [30]

Toxoplasmosis

52% of HIV-positive patients were found to be seropositive toward *Toxoplasma gondii* (2011 publication) [31]

- 43.5% of HIV-positive patients were found to be seropositive toward *Toxoplasma gondii* (2006 to 2017) [32]

Viral hepatitis

0.9% of HIV-positive patients were found to be seropositive toward HCV (Istanbul, 2006 to 2013) [33]

- 3.2% of HIV-positive patients were found to be HBsAg-positive and 0.5% seropositive toward HCV (nationwide, 2010 to 2017) [34]
- 4.0% of HIV-positive patients were found to be seropositive toward HEV (Sakarya, 2017 to 2018) [35]

Viruses - miscellaneous

27% of patients with CMV retinitis were HIV-positive (Istanbul, 1996 to 2019) [36]

- 0% of HIV-positive patients were seropositive toward HTLV (Ankara, 2017 to 2019) [37]

Case series

- 2005 to 2017 - Dermatological lesions among 500 patients with HIV infection treated at a clinic in Istanbul - see reference [38]

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Hookworm

Agent	PARASITE - Nematoda. Secernentea: *Necator americanus*, *Ancylostoma duodenale*, *A. ceylonicum* (in Kolkata and the Philippines)
Reservoir	Human, Non-human primates, Zoonotic
Vector	None
Vehicle	Soil, Contact
Incubation Period	7d - 2y
Diagnostic Tests	Examination of stool for ova. Ancylostoma duodenale adult: female - 10 to 13 mm; male - 8 to 11 mm Necator americanus adult: female - 9 to 11 mm; male - 5 to 9 mm
Typical Adult Therapy	Albendazole 400 mg X 1 dose. OR Mebendazole 100 mg BID X 3d. OR Pyrantel pamoate 11 mg/kg (max 3g) X 3d[1] [2]
Typical Pediatric Therapy	Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2).
Clinical Hints	- Pruritic papules, usually on feet - Later cough and wheezing - Abdominal pain and progressive iron-deficiency anemia - Eosinophilia is common - Dyspnea and peripheral edema in heavy infections
Synonyms	Anchilostoma, Ancylostoma ceylanicum, Ancylostoma duodenale, Ancylostomiasis, Anquilostomiasis, Cyclodontostomum, Eosinophilis enteritis, Hakenwurmer-Befall, Miner's anemia, Necator americanus, Necator gorillae, Necatoriasis. ICD9: 126.0,126.1 ICD10: B76.0,B76.1,B76.8

Hookworm in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
1997 - 2007	Van	patients	0.001	Survey of hospital outpatients [3]
2004 - 2005	Afyonkarahisar	environmental - wastewater	10.8	10.8% of untreated wastewater in Afyonkarahisar (2004 to 2005) [4]

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HTLV Infections

Agent	VIRUS - RNA Retroviridae. Deltaretrovirus Human T-lymphotrophic virus I to IV (disease limited to I and II)
Reservoir	Human, Non-human primate
Vector	None
Vehicle	Blood, Needles, Semen, Sexual contact, Transplacental, Breastfeeding, Meat (bush-meat)
Incubation Period	6 months to 20 years
Diagnostic Tests	Serology Nucleic acid amplification
Typical Adult Therapy	Specific therapy not available. Advanced symptomatic disease has been treated with Mogamulizumab and interferon OR Zidovudine + Interferon, Cyclosporine, or anti-neoplastic agents[1] [2]
Typical Pediatric Therapy	As of adult
Clinical Hints	- Overt disease is evident in only 1% to 5% of infections - Increased susceptibility to pyodermas, sepsis, bronchiectasis - Keratoconjunctivitis sicca or uveitis - Late development of tropical spastic paraparesis or T-cell leukemia/lymphoma
Synonyms	Adult T-cell leukemia / lymphoma, HTLV-1, HTLV-1/2, HTLV-2, HTLV-4, HTLV-I, HTLV-I/II, HTLV-II, HTLV-IV, Human T-cell lymphotropic virus, Human T-lymphotropic virus, Primate T-lymphotropic virus, PTLV-1, Tropical spastic paraparesis. ICD9: 204.0,208.9 ICD10: C83,C88,G04.1

HTLV Infections in Turkey

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2010*	Izmir	blood donors	0	0% of blood donors in Izmir (2010 publication) [3]
2017 - 2019	Ankara	patients - HIV / AIDS	0	[4]

* indicates publication year (not necessarily year of survey)

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Human herpesvirus 6 infection

Agent	VIRUS - DNA. Herpesviridae, Betaherpesvirinae, Roseolovirus: Herpesvirus 6 (Herpesvirus 7 is also implicated)
Reservoir	Human
Vector	None
Vehicle	Droplet, Contact, Respiratory or pharyngeal acquisition
Incubation Period	10d - 15d
Diagnostic Tests	Viral isolation and serologic tests rarely indicated. Nucleic acid amplification has been used
Typical Adult Therapy	Supportive Ganciclovir and Foscarnet have been used in unusual and severe cases.[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- High fever followed by sudden defervescence and fleeting rash - Most patients are below the age of 2 years - Note that only 10% to 20% of Herpesvirus 6 infections are associated with a rash
Synonyms	Dreitagefieber, Exanthem criticum, Exanthem subitum, Herpesvirus 6, HHV-6, Pseudorubella, Roseola, Roseola infantilis, Roseola subitum, Sixth disease, Zahorsky's disease. ICD9: 057.8 ICD10: B08.2

Human herpesvirus 6 infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2013*		specimens	100	100% of tonsil and adenoid tissue specimens (Western Blot, 2013 publication) [3]
2015*	Eskisehir	specimens	9	9% of specimens from large apical dental abscesses (2015 publication) [4]
2009 - 2015	Izmir	patients - CNS	1.05	Survey of patients with viral central nervous system infection [5]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Study Group	%	Notes
1994*	transplant recipients	44	44% of renal transplant recipients and 38% of control patients (HHV-6 DNA in mononuclear cells, 1994 publication) [6]
2011*	patients - dialysis	25.7	25.7% of hemodialysis patients, 22.2% of peritoneal dialysis patients and 10.0% of control subjects (2011 publication) [7]

* indicates publication year (not necessarily year of survey)

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Human pegivirus infection

Agent	VIRUS - RNA. Flaviviridae, Pegivirus GB virus C (Hepatitis G virus)
Reservoir	Human
Vector	None
Vehicle	Blood, Vertical transmission, Sexual contact suspected
Incubation Period	Unknown
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive. Alpha interferon has been shown to ? transiently eliminate the carrier state[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Acute or chronic hepatitis acquired from blood (needles, etc) - Clinically milder than hepatitis C - Most cases limited elevation of hepatic enzyme levels, without jaundice - Viremia has been documented for as long as 10 years
Synonyms	Epatite G, GB virus C, GBV-C, Hepatitis G, Hepatitis GB, HPgV, HPgV-2, Human hepegivirus, Human Pegivirus 2. ICD9: 070,59 ICD10: B17.8

Human pegivirus infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
	Ankara	patients - dialysis	25	25% of chronic hemodialysis patients Ankara
		patients - hepatitis	4.6	4.6% of patients with chronic hepatitis
2008*	Denizli	blood donors	14	14% of hemodialysis patients and 2% of blood donors Denizli [2]

* indicates publication year (not necessarily year of survey)

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Hymenolepis diminuta infection

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

Hymenolepis diminuta infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
1979*	Beytepe	rodents	3.7	3.7% of rats and mice in the area of Beytepe Village (1979 publication) [2]
2010*		rodents	62.5	62.5% of laboratory rats and 19.9% of laboratory mice (2010 publication) [3]
2004 - 2005	Afyonkarahisar	environmental - wastewater	2.5	2.5% of untreated wastewater in Afyonkarahisar (2004 to 2005) [4]

* indicates publication year (not necessarily year of survey)

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Hymenolepis nana infection

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Hymenolepididae: *Hymenolepis* (*Rodentolepis*) *nana*
Reservoir	Human, Rodent (hamster)
Vector	None
Vehicle	Food, Water, Fecal-oral
Incubation Period	2w - 4w
Diagnostic Tests	Identification of ova in stool Adult worm may measure 15 to 40 mm.
Typical Adult Therapy	Praziquantel 25 mg/kg once. OR Nitazoxanide 500 mg BID X 3d OR Niclosamide 2g/d X 1[1] [2]
Typical Pediatric Therapy	Praziquantel 25 mg/kg once. OR Nitazoxanide 100 mg (age 1 to 3 years) to 200 mg (age 4 to 11 years) BID X 3d OR Niclosamide 1g/d X 1 (weight 11-34 kg) to 1.5g/d X 1 (weight >34 kg)
Clinical Hints	- Nausea, abdominal pain, diarrhea, irritability and weight loss - Eosinophilia may be present - Continued infestation maintained by autoinfection (worm reproduces within the intestinal lumen)
Synonyms	Dwarf tapeworm, Hymenolepis nana, Rodentolepis microstoma, Rodentolepis nana, Rodentolepsiasis, Vampirolepis nana. ICD9: 123.6 ICD10: B71.0

Hymenolepis nana infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2000	Sanliurfa	children	4.03	4.03% of school children in Sanliurfa shanty towns (2000) [3]
2003 - 2005	Van	children	5.3	5.3% of school children ages 7 to 15 in Van Province (2003 to 2005) [4] [5]
2005	Van	children	6.3	6.3% of school children ages 7 to 15 in Van Province (2005) [6]
2006	Malatya	children	2.1	2.1% of children in Malatya (2006) [7]
2007	Sanliurfa	children	5.75	5.75% of children ages <= 6 years, in Sanliurfa (2007) [8]
2011*	Kayseri-Hacilar	children	0.3	0.3% of primary school children ages 6 to 14, in Kayseri-Hacilar region (2011 publication) [9]
2015*	Yigilca	children	0.19	0.19% of school children in Yigilca (2015 publication) [10]
1991*	Mardin	students	7.1	7.1% of primary school students in Mardin (1991 publication) [11]
2006*	Malatya	students	0.3	0.3% of primary school students in central Malatya (2006 publication) [12]
2006*	Sivas	students	4.8	4.8% of primary school students in Sivas (2006 publication) [13]
2007*	Manisa	students	0.3	0.3% of primary school students in Manisa (2007 publication) [14]
2008*	Sivas	students	1.2	1.2% of primary school students in Sivas (2008 publication) [15]
2008*	Yozgat	students	2.2	2.2% of primary school students in Yozgat (2008 publication) [16]
2010*	Van	students	10.8	10.8% of primary school students in Van (2010 publication) [17]
2011*		workers	0.04	0.04% of administrators and workers in sanitary and non-sanitary

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Years	Region	Study Group	%	Notes
				institutions (2011 publication) [18]
1997 - 2007	Van	patients	1.2	Survey of hospital outpatients [19]
2003 - 2006	Istanbul	patients	0.3	0.3% of parasitic infections among hospitalized patients (Istanbul, 2003 to 2006) [20]
2005*	Sanliurfa	patients	3.1	3.1% of patients with diarrhea in Sanliurfa (2005 publication) [21]
2006 - 2018	Sivas	patients	0.1	Survey of patients with gastrointestinal symptoms [22]
1976*	Ankara	general population	4.4	4.4% of individuals in poor districts of Ankara (1976 publication) [23]
2006*	Anatolia	general population	3.9	3.9% of individuals in southeastern Anatolia (2006 publication) [24]
2007*	Van	food handlers	0.67	0.67% of persons working in the food sector (Van, 2007 publication) [25]
1993 - 2006	Sivas	specimens - stool	1.8	1.8% of fecal samples processed at a university parasitology laboratory in Sivas (1993 to 2006) [26]
1993 - 2000	Bursa	specimens - stool	0.012	0.012% of fecal samples processed at a university parasitology laboratory in Bursa (1993 to 2000) [27]
1997 - 2001	Istanbul	specimens - stool	1.7	1.7% of fecal samples examined in Istanbul (1997 to 2001)
2000 - 2006	Malatya	specimens - stool	2	2% of fecal samples analyzed in a single hospital in Malatya (2000 to 2006) [28]
2002 - 2004	Sivas	specimens - stool	0.01	0.01% of fecal samples processed at a university parasitology laboratory in Sivas (2002 to 2004) [29]
2005	Hatay	specimens - stool	1.4	1.4% of stools examined at a university parasitology laboratory (Hatay, 2005) [30]
2005 - 2008	Kayseri	specimens - stool	0.06	0.06% of stools examined at a university parasitology laboratory (Kayseri, 2005 to 2008) [31]
2007 - 2009	Tokat	specimens - stool	0.9	0.9% of stool specimens examined by Tokat public health laboratory (2007 to 2009) [32]
2009	Van	specimens - stool	1.3	1.3% of stools examined at a laboratory in Van (2009) [33]
2012 - 2014	Istanbul	specimens - stool	1.6	[34]
1979*	Beytepe	rodents	5.6	5.6% of rats and mice in the area of Beytepe Village (1979 publication) [35]
2010*		rodents	6.8	6.8% of laboratory rats (2010 publication) [36]
2008*	Van	slaughterhouse workers	1.1	1.1% of slaughterhouse workers in Van Municipality (2008 publication) [37]
2006*	Malatya	sanitation workers	0.4	0.4% of municipal sanitary workers in Malatya (2006 publication) [38]
2004 - 2005	Afyonkarahisar	environmental - wastewater	2.5	2.5% of untreated wastewater in Afyonkarahisar (2004 to 2005) [39]
2005*	Hatay	children - gastrointestinal	0.17	0.17% of children ages 0 to 14 with gastrointestinal symptomatology, in Hatay (2005 publication) [40]
2007	Kars	children - gastrointestinal	0.7	0.7% of children ages 2 to 6 years with gastrointestinal symptomatology seen at a hospital in Kars (2007) [41]

* indicates publication year (not necessarily year of survey)

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Infection of wound, puncture, IV line, etc

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

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Infectious mononucleosis or EBV infection

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

Infectious mononucleosis or EBV infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2011*	Gaziantep	patients	0	0% of vascular samples from patients with atherosclerosis, 0% those without atherosclerosis, 3% of patients undergoing aortic valve replacement and 0% undergoing mitral valve replacement (EBV DNA, 2011 publication) [1]
2015*	Aydin	patients	32-53.8	53.8% of tonsillar specimens from patients with recurrent tonsillitis and 32.0% with hypertrophic tonsillitis (EBV, 2015 publication) [2]
2014*	Ankara	specimens	53.6	53.6% of tonsillar tissue samples (2014 publication) [3]
2015*	Eskisehir	specimens	8	8% / 10% of specimens from large / small apical dental abscesses (2015 publication) [4]
2009 - 2015	Izmir	patients - CNS	4.35	Survey of patients with viral central nervous system infection [5]
2010 - 2017	Izmir	patients - CNS	4.4	Survey of pathogens associated with central nervous system infections [6]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2010*		various	16.954-54	54% of patients with lupus erythematosus, 41.3% with systemic sclerosis, 36.8% with antiphospholipid syndrome and 16.9% of controls (Early antigen, 2010 publication) [7]
2003*	Elazig	general population	99.4	99.4% of individuals in Elazig Province (anti-VCA, eastern Anatolia, 2003 publication) [8]
2007 - 2008	Eskisehir	patients - rheumatological	7-34	34% of patients with lupus erythematosus, 7% with rheumatoid arthritis and 12% of controls (Early antigen, 2007 to 2008) [9]

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Influenza

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

Influenza in Turkey

2006 - 12 cases (4 fatal) of human infection by H5N1 virus were confirmed. [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] No cases of human infection by H5N1 virus have been reported since 2006. [18]

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Mersin	children	29	29% of children ages 0 to 2 years with acute bronchiolitis (Mersin, 2010) [19]
2012 - 2014	Ankara	children	4.2	Survey of children with febrile neutropenia [20]
2016 - 2017	Multiple locations	children	13.1	Survey of children with febrile seizures [21]
2021*		children	12	12% of children with otitis media with effusion [22]
2013 - 2016	Izmir	infants	8.8	8.8% of infants below age 2 years hospitalized with acute bronchiolitis [23]
2013 - 2015	Izmir	infants	2.2	Survey of infants hospitalized for lower respiratory tract infection [24]
2002 - 2014	Izmir	patients	22.9-53.9	22.9% / 53.8% of children / adults with upper or lower respiratory tract infections (Izmir, 2002 to 2014) [25]
2010 -	Izmir	patients	6.6	6.6% of patients with flu-like symptoms (Izmir, 2010 to 2013) [26]

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Years	Region	Study Group	%	Notes
2013				
2015 - 2018	Bursa	patients	18.1	18.1% of inpatients with respiratory infection [27]
2015 - 2016	Istanbul	patients	41	Survey of patients with influenza-like illness [28]
2020 - 2021	Bursa	specimens	2.8	Survey of respiratory specimens [29]
2010 - 2011	Istanbul	children - respiratory	12.6	12.6% of children hospitalized with respiratory infection (2013 publication) [30]
2011*	Istanbul	children - respiratory	9.3	9.3% of viral lower respiratory tract infection in hospitalized children (Istanbul, 2011 publication) [31]
2011 - 2012	Ankara	children - respiratory	62.7	62.7% of children with respiratory tract infection during an "Influenza season" (Ankara, 2011 to 2012) [32]
2012*	Istanbul	children - respiratory	6.4	6.4% of pediatric acute respiratory tract infections (Istanbul, 2012 publication) [33]
2012 - 2016	Istanbul	children - respiratory	1.6	Survey of children hospitalized with lower respiratory tract infection [34]
2013 - 2014	Istanbul	children - respiratory	49.9	49.9% of children ages >2 years, with fever and respiratory tract symptoms (Istanbul, 2013 to 2014) [35]
2016 - 2018	Istanbul	children - respiratory	6.3	Survey of children hospitalized in an Intensive Care Unit for lower respiratory tract infection [36]
2016*	Gaziantep	children - respiratory	0-21.1	21.1% / 0% of children with acute lower respiratory tract infection and wheezing / controls [37]
2021*	Eskisehir	children - respiratory	36.3	Viruses were identified in 30.1% of children with malignancies and febrile neutropenia episodes; Adenovirus 18.4%, Influenza B 18.4%; Coronavirus 23.7%, RSV 9.1% [38]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Deaths	Pathogen	Notes
2009 - 2010	627	H1N1	An outbreak was reported. For comprehensive analyses of the H1N1 pdm09 pandemic see the Worldwide note. [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] [49]

Avian influenza - chronology

- 2005 - Avian influenza H5N1 was reported in birds. [50] [51] [52]
- 2006 - Avian influenza H5N1 was reported in birds. [53] [54] [55] [56] 2007 [57] [58]
- 2008 - Avian influenza H5N1 was reported in birds. [59] [60] [61] [62] [63] [64] [65] [66]
- 2015 - Avian influenza H5N1 was reported in birds. [67] [68] [69] [70]

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Intestinal spirochetosis

Agent	BACTERIUM. *Brachyspira pilosicoli* and *B. aalborgi* Anaerobic gram-negative spirochetes
Reservoir	Human, Fowl, Pig
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Spirochetes resemble "brush border' on bowel biopsy; identification of Brachyspira by PCR
Typical Adult Therapy	Metronidazole appears to be effective in some cases.[1]
Typical Pediatric Therapy	As for adult.
Clinical Hints	- Chronic diarrhea and abdominal pain in the absence of other identifiable etiology
Synonyms	Human intestinal spirochetosis. ICD9: 009.1 ICD10: A04.8

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Intra-abdominal abscess

Agent	BACTERIUM. Mixed anaerobic / aerobic, staphylococci, *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, etc
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Various imaging techniques (CT, Gallium scan, ultrasound, etc).
Typical Adult Therapy	Percutaneous or open drainage + antibiotics directed at known or suspected pathogen(s)
Typical Pediatric Therapy	As for adult
Clinical Hints	- 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
Synonyms	Abscess - Abdominal, Acute appendicitis, Appendicitis, Infected pancreatic necrosis, 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

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Intracranial venous thrombosis

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

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Kawasaki disease

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Diagnosis is based on clinical criteria only.
Typical Adult Therapy	Intravenous gamma globulin 2.0 g/kg over 10 to 12h X 1 dose. Plus aspirin 100 mg/kg/day X 14d (or until defervescence) - then 5 to 10 mg/kg/day until normal ESR Infliximab (a chimeric monoclonal antibody) 5 mg/kg has been successful in some studies. Glucocorticoids in addition to IVIG have been successful in some studies.[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Disease most common among children - Fever, conjunctivitis, stomatitis and an erythematous rash which desquamates - Occasionally complicated by coronary artery occlusion - Case-fatality rates of 1% to 4% are reported
Synonyms	Kawasaki's disease, Mucocutaneous lymph node syndrome. ICD9: 446.1 ICD10: M30.3

Kawasaki disease in Turkey

Case series:

- 1994 to 2009 - 24 cases of Kawasaki disease were treated at a university hospital in Ankara during January 1994 to June 2009. [4]
- 1994 to 2013 - 35 cases were treated at a hospital in Ankara. [5]
- 2002 to 2010 - 35 cases were treated at a university hospital in Istanbul. [6]
- 2004 to 2015 - 12 cases were treated at a hospital in Izmir. [7]
- 2010 to 2019 - 259 cases were treated at a hospital in Istanbul. [8]
- 2012 (publication year) - 33 cases were treated at a hospital in Ankara. [9]
- 2014 (publication year) - 44 cases were treated at a hospital in Bursa. [10]

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Kikuchi's disease and Kimura disease

Agent	UNKNOWN
Reservoir	Unknown
Vector	None
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Biopsy.
Typical Adult Therapy	Supportive Hydroxychloroquine and corticosteroids have been successful for Kikuchi's disease in some cases. Radiotherapy has been used in the treatment of Kimura's disease[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	Most patients of Asian origin Kikuchi disease: - Prolonged (1 to 12 months) cervical lymphadenopathy (rubbery, non-matted - may be tender) - Fever (40%), weight loss, "sweats', leukopenia Kimura disease: - Similar to Kikuchi disease - Salivary gland involvement, glomerulitis, painless subcutaneous masses and eosinophilia suggest Kimura disease - May be misdiagnosed as filariasis
Synonyms	Angiolymphoid hyperplasia, Angiolymphoid hyperplasia-eosinophia, Eosinophilic follicular lymphadenitis, Histiocytic necrotizing lymphadenitis, Kikuchi's disease, Kikuchi-Fujimoto disease, Kimura disease. ICD9: 289.3 ICD10: I89.8

Kikuchi's disease and Kimura disease in Turkey

Sporadic cases are reported. [3] [4] [5] [6] [7] [8]

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Kingella infection

Agent	BACTERIUM. *Kingella kingae*, et al A facultative gram-negative coccobacillus
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Culture of blood, joint fluid, CSF, etc. Alert laboratory if these organisms are suspected.
Typical Adult Therapy	Ampicillin usually effective For resistant organisms : Ampicillin/Sulbactam OR Amoxicillin/Clavulanate OR Cefazolin Dosage per severity/site[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Most cases reported among young children - May present as septic arthritis, endocarditis, meningitis and other localized or systemic infections
Synonyms	ICD9: 041.85 ICD10: A48.8

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Laryngotracheobronchitis

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

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Legionellosis

Agent	BACTERIUM. *Legionella pneumophila*, et al An aerobic gram-negative bacillus
Reservoir	Water
Vector	None
Vehicle	Water, Aerosols, Droplet, Respiratory or pharyngeal acquisition
Incubation Period	5- 6d (range 2-12d); Pontiac fever = 1-2d
Diagnostic Tests	Serology. Culture. Urine antigen (certain types). Nucleic acid amplification. Alert lab if organism suspected.
Typical Adult Therapy	Fluoroquinolone (Levofloxacin, Trovafloxacin, Pefloxacin, Sparfloxacin or Moxifloxacin). OR Azithromycin. OR Erythromycin + Rifampin OR Clarithromycin[1] [2] [3]
Typical Pediatric Therapy	Azithromycin. OR Erythromycin + Rifampin OR Clarithromycin
Clinical Hints	- Respiratory illness with extrapulmonary manifestations - Diarrhea, confusion, renal or hepatic dysfunction, relative bradycardia, etc. - Most cases reported during summer in temperate areas - Case-fatality rates of 5% to 25% are reported
Synonyms	Doenca dos legionarios, Legionarsjuka, Legionarssjuka, Legionella, Legionellose, Legionellosi, Legionnaire's disease, Pontiac fever. ICD9: 482.84 ICD10: A48.1,A48.2

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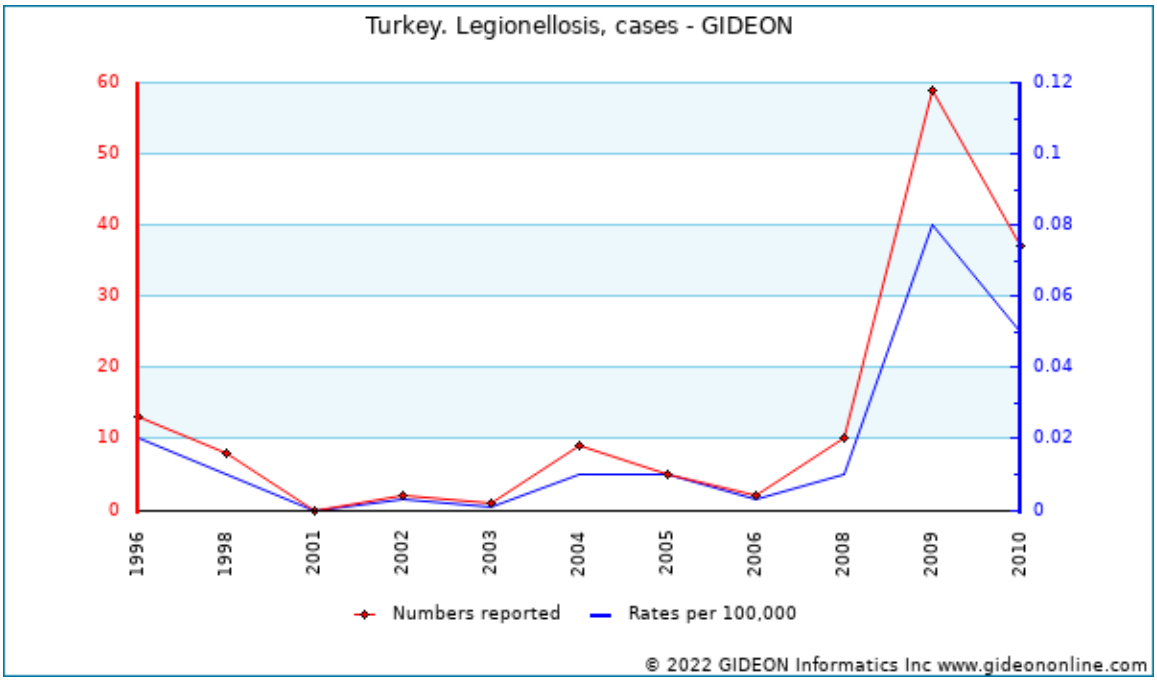
Legionellosis in Turkey



Graph: Turkey. Legionellosis, cases

Notes:
Individual years:
1996 - Official figures - conflict with outbreak (see below)

83 cases were acquired by European travelers to Turkey in 2002; 64 in 2003 (all non-citizens).

Eight cases (0.2 per 100,000) were reported nationwide in 1998; 0 in 1999.

Cross-border events
Does not include individual case reports

Years	Acquired by**	Originated in**	Setting	Cases	Notes
1996	Sweden	Turkey	travel	5	An outbreak (5 cases) was reported among Swedish tourists a hotel in Kusadasi, Turkey. [4]
1997	France	Turkey	travel	16	An outbreak (16 cases) was reported among French tourists to Turkey.

** Country or Nationality

Prevalence surveys

Years	Region	Study Group	%	Notes
2012*	Manisa	patients	1.6	1.6% of adults with community-acquired pneumonia (Manisa, 2012 publication) [5]
2015 - 2018	Bursa	patients	1.6	1.6% of inpatients with respiratory infection [6]
2007*	Alanya	water	18.9	18.9% of hotel water systems in Alanya (2007 publication) [7]
2010	Antalya	environmental - water	10.1-37.5	Survey of hotel water samples - 10.1% of samples / 37.5% of hotels. [8]
2020*		environmental - water	24	24% of swimming pool and biofield samples (FISH method) [9]

* indicates publication year (not necessarily year of survey)

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Notable outbreaks

Years	Region	Setting	Cases	Deaths	Source	Population	Notes
1996	Kusadasi	hotel	45			tourists	An outbreak (45 cases) was reported among tourists at a hotel in Kusadasi - including 5 tourists from Sweden [10]
1997	Istanbul	hotel	17	4		tourists	An outbreak (17 cases, 4 fatal) was reported among French tourists at a hotel in Istanbul.
2005*		hospital	31				[11]
2009	Alanya	hotel	6		water		An outbreak (6 cases) in a hotel in Alanya was associated with a contaminated water system [12]

* indicates publication year (not necessarily year of outbreak)

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Leishmaniasis - cutaneous

Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: *Leishmania tropica*, et al
Reservoir	Human, Hyrax, Rodent, Marsupial, Dog, Sloth, Anteater, Armadillo, Bat, Zoonotic
Vector	Sandfly (*Phlebotomus* for Old-world; *Lutzomyia* or *Psychodopygus* for New-world)
Vehicle	None
Incubation Period	2w - 8w (range 1w - months)
Diagnostic Tests	Identification of organism on smear or specialized culture. Nucleic acid amplification
Typical Adult Therapy	Local therapy: Cryotherapy; Laser ablation Pentavalent antimonials or Paromomycin. For complicated disease: Fluconazole or Miltefosine, PO Alternatives: Amphotericin B deoxycholate, Liposomal Amphotericin B, Pentavalent antimony IV, Pentamidine[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Chronic ulcerating skin nodule - May be painless (*Leishmania tropica*) or painful (*L. major*) - Diffuse infection or regional lymphadenopathy are occasionally encountered
Synonyms	Aleppo button, Antep boil, Baghdad boil, Bay sore, Bejuco, Biskra boil, Boessie-Yassi, Bolho, Boschyaws, Bosjaws, Bush yaws, Busi-yasi, Chiclero ulcer, Crithidia, Cutaneous leishmaniasis, Delhi ulcer, Domal, El-Mohtafura, Forest yaws, Gafsa boil, Granuloma endemicum, Hashara, Jericho boil, Kaal Daana, Kandahar sore, Leishmania aehiopica, Leishmania enriettii, Leishmania garnhami, Leishmania guyanensis, Leishmania killicki, Leishmania lainsoni, Leishmania lindenbergi, Leishmania major, Leishmania martiniquensis, Leishmania mexicana, Leishmania naiffi, Leishmania orientalis, Leishmania panamensis, Leishmania peruviana, Leishmania shawi, Leishmania tropica, Leishmania turanica, Leishmania venezuelensis, Leishmania waltoni, Leishmaniasis, Leishmaniose: Kutane, Leishmaniosi cutanea, Lepra de montana, Liana, Mundinia enriettii, Mundinia martiniquensis, Mundinia orientalis, Okhet, One-year boil, Oriental sore, Pendjeh sore, Pian bois, Saldana, Ulcera de Bejuco, Urfa boil, Uta, Yatevi, Year boil. ICD9: 085.1,085.2,085.3,085.4 ICD10: B55.1

Leishmaniasis - cutaneous in Turkey

Time and Place

Cutaneous leishmaniasis is most common in the southeast, with some cases in the center and west. [4]

- The local disease is known as Urfa boil, Antep boil, year boil, Halep boil, oriental sore and beauty scar. [5]
- 96% of cases are reported from Sanliurfa (45% of all cases) [6] , Adana, Osmaniye, Hatay, Diyarbakar, Icel and Kahramanmaras Provinces. [7]
- *Leishmania tropica* is found in southeastern Anatolia, and *Leishmania tropica* / *Leishmania infantum* in the East Mediterranean region.

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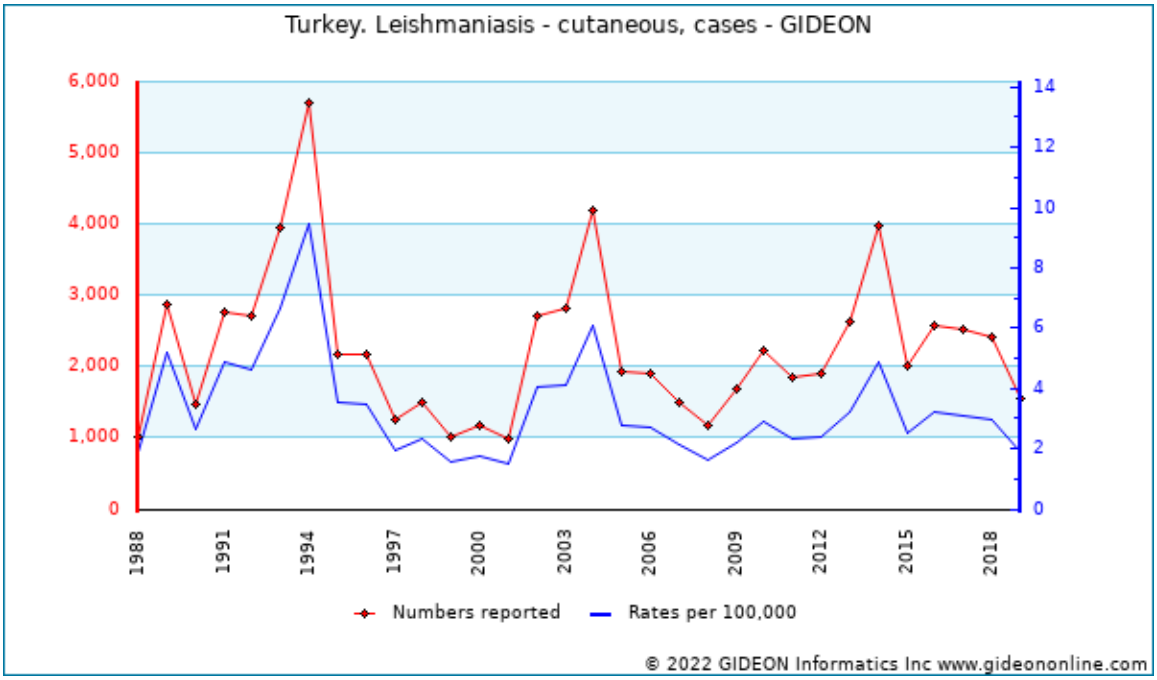

Graph: Turkey. Leishmaniasis - cutaneous, cases

Notes:

1. 46,003 cases were reported during 1990 to 2010. [8]
2. 2,465 cases per year were reported during 2003 to 2007 (true number estimated at 6,900 to 11,300 per year). [9]

3. 7,794 cases were reported among Syrian refugees in Turkey during 2012 to 2016. [10]
   Individual years:
   2013 - Included 3,094 imported cases
   2015 - Included 815 imported cases
   2016 - Included 1,089 imported cases (over 90% of the global total of imported cases) and 1,474 autochthonous cases.

Case series

- 1991 to 1992 - 1,550 cases were registered in the Cukurova region.
- 1991 to 2001 - 14,467 cases were reported in Saliurfa - 73% of these during 1993 to 1996; 411 cases in 1991; 4,185 in 1994 [11] ; 2,575 in 1995; during 2001 to 2006. [12]
- 2002 to 2006 - 1,990 cases were reported in Diyarbakier. [13]
- 2003 to 2005 - 40 cases were identified by a laboratory in Hatay. [14]
- 2005 to 2012 - 220 cases were reported in Antalya - 53.64% below age 20. [15]
- 2009 to 2015 - 88 cases were identified among Syrian refugees in Gaziantep City, accounting for 33.46% of patients with leishmaniasis. [16]
- 2010 to 2013 - 77 cases were identified among Syrian refugees in Nizip, accounting for 18.5% of tested refugees. [17]
- 2014 to 2018 - 12 imported cases of *Leishmania tropica* infection were treated at a hospital in Istanbul. [18]
- 2018 (publication year) - Five truck drivers were treated in Hatay for cutaneous leishmaniasis acquired in Turkmenistan, Syria, Saudi Arabia, Iran and Georgia, Uzbekistan and Azerbaijan. [19]
- 2019 (publication year) - 900 cases of cutaneous leishmaniasis were treated at a center in Gaziantep during a three-year period - including 845 (93.8%) in Syrian refugees. [20]

Additional Geographic Notes

- 2003 to 2013 - *Leishmania tropica* accounted for 41% of cutaneous leishmaniasis cases in southern Turkey, *L. infantum* 36.5% and *L. major* 21.5%. *L. infantum* accounted for 60.3% of visceral leishmaniasis cases, *L. donovani* 30.2% and *L. tropica* 9.5%. [21]
- 2008 (publication year) - Cutaneous leishmaniasis caused by *Leishmania infantum* and transmitted by *Phlebotomus tobbi* has been reported in southern Anatolia [22]

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- 2010 to 2011 - - *Phlebotomus sergenti* was identified as a vector for *Leishmania tropica* in Mersin Province. [23]
- 2011 to 2014 - *L. major* infection was identified in western to southeastern Anatolia, and along the Mediterranean coast. [24]
- 2012 to 2014 - *L. tropica* accounted for 100% of cutaneous leishmaniasis cases studied in Aydin region. [25]
- 2012 (publication year) - - A case of cutaneous leishmaniasis caused by *Leishmania infantum* was reported in Ankara. [26]
- 2013 to 2016 - *L. tropica* accounted for 84% of cutaneous leishmaniasis cases nationwide, *L. major* 7.9%, *L. infantum* 5..3% and *L. donovani* 2/8%. *L. tropica* was the most wide-spread species, while *L. infantum* and *L. major* were present in one-third of provinces. [27]
- 2014 - Cutaneous leishmaniasis due to *L. major* infection was first reported in Sanliurfa; all cases had previously been caused by *Leishmania tropica*. [28]
- 2015 (publication year) - *L. tropica* accounted for 48.6% / 2.5% of cutaneous / visceral leishmaniasis cases, *L. infantum* 35.8% / 56.3%, *L. donovani* 0% / 31.2%, and *L. major* 15.6% / 0% (southern Turkey) [29]
- 2017 (publication year) - *L. tropica* accounted for 98% of cutaneous leishmaniasis cases studied in Sanliurfa Province, and *L. major* for 2%. [30]
- 2020 (publication year) - *Leishmania infantum* accounted for five of 14 cases of cutaneous leishmaniasis in Sanliurfa Province. [31]

Prevalence surveys

Years	Region	Study Group	%	Notes
2010 - 2012	Sanliurfa	schoolchildren	0.14-0.41	0.41% of primary school children in 2010; 0.14% in 2011; 0.31% in 2012 [32]
2001 - 2017	Istanbul	patients	37.7	Survey of patients with clinical suspicion of leishmaniasis. [33]
2015*	Ege	cats	8.84	8.84% of domestic cats in the Ege region (*Leishmania tropica* and L. major, 2015 publication) [34]
2009 - 2010	Multiple locations	flies	8	8% of sandfly pools in Afyon and Nigde Provinces [35]
2010 - 2011	Mersin	flies	7	*Leishmania tropica* was identified in 7% of sand fly pools. [36]

* indicates publication year (not necessarily year of survey)

Vectors

- The local vectors are *Phlebotomus papatasi*, *Ph. (Paraphlebotomus) sergenti* [37] , *Ph. caucasicus* (northeastern and eastern region), *Ph. (Larroussius) major*, *Ph. perfiliewi*, *Ph. tobbi* (southern border) and *Ph. (Adlerius) halepensis* (eastern region). [38] [39]
- *Phlebotomus halepensis* was the predominant vector in Afyon and Nigde Provinces. Additional vectors in the area included *P. simici*, *P. papatasi*, *P. neglectus / syriacus*, *P. balcanicus*, *P. sergenti* and *Phlebotomus tobbi* (2009 to 2010). [40]
- *Phlebotomus sergenti* was identified as a vector for *Leishmania tropica* in Mersin Province. [41]
- *Phlebotomus neglectus/syriacus* was the most abundant sandfly vector in Antalya Province, followed by *P. alexandri* and *P. tobbi* (2012 to 2013) [42]

Notable outbreaks

Years	Region	Setting	Notes
1999*	Sanliurfa	urban area	[43] [44]

* indicates publication year (not necessarily year of outbreak)

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Leishmaniasis - visceral

Agent	PARASITE - Protozoa. Euglenozoa, Kinetoplastea. Flagellate: *Leishmania donovani*, *L. infantum*, *L. cruzi*; rarely, *L. tropica*
Reservoir	Human, Rodent, Dog, Cat, Fox, Hares, Zoonotic
Vector	Sandfly (*Phlebotomus* for Old-world; *Lutzomyia* for New-world)
Vehicle	Blood
Incubation Period	2m - 6m (10d - 12m)
Diagnostic Tests	Smear / culture of bone marrow, splenic aspirate, lymph nodes. Serology. Nucleic acid amplification.
Typical Adult Therapy	Liposomal Amphotericin B 3 mg/kg/d on days 1, 5, 14, 21 OR Miltefosine 0.8 mg/kg TID X 28d OR Pentavalent antimonials (Stibogluconate) 20 mg/kg/d X 28d. OR Paromomycin 15 mg/kg/d IM or IV X 21 days[1] [2] [3]
Typical Pediatric Therapy	Pentavalent antimonials (Stibogluconate) 20 mg/kg/d X 28d. OR Amphotericin B 1 mg/kg/QOD X 8w (or lipid complex 3 mg/kg/d X 5d) OR Paromomycin 11 mg/kg IM QD X 21 days OR Miltefosine 2.5 mg/kg daily (maximum 150 mg) X 28d
Clinical Hints	- Chronic fever, weight loss, diaphoresis - Hepatosplenomegaly, lymphadenopathy and pancytopenia - Grey pigmentation (Kala Azar = "black disease') may appear late in severe illness - Case-fatality rates vary from 5% (treated) to 90% (untreated)
Synonyms	Burdwan fever, Cachectic fever, Dum Dum fever, Kala azar, Leishmania donovani, Leishmania infantum, Leishmania siamensis, Leishmania tarentolae, Leishmaniose: Viszerale, Leishmaniosi viscerale, Ponos, Visceral leishmaniasis, Visceral leishmaniosis. ICD9: 085.0 ICD10: B55.0

Leishmaniasis - visceral in Turkey

Time and Place

The first case of visceral leishmaniasis in Turkey was reported in 1916, from Trabazon; and the second case from Izmir in 1918. [4]

- Cases are reported from the Marmara, Aegean, Mediterranean and eastern Black Sea coastal areas, notably from Manisha/Alasehir in the Aegean region. [5]
- A new focus has been reported in Kagizman during recent years. [6]
- Cutaneous leishmaniasis caused by *Leishmania infantum* and transmitted by *Phlebotomus tobbi* has been reported in southern Anatolia (2008 publication) [7] A case of cutaneous leishmaniasis caused by *Leishmania infantum* was reported in Ankara (2012 publication) [8]
- *Leishmania tropica* accounted for 41% of cutaneous leishmaniasis cases in southern Turkey, *L. infantum* 36.5% and *L. major* 21.5%. *L. infantum* accounted for 60.3% of visceral leishmaniasis cases, *L. donovani* 30.2% and *L. tropica* 9.5% (2003 to 2013). [9]
- *L. tropica* accounted for 48.6% / 2.5% of cutaneous / visceral leishmaniasis cases, *L. infantum* 35.8% / 56.3%, *L. donovani* 0% / 31.2%, and *L. major* 15.6% / 0% (southern Turkey) (2015 publication) [10]
- *Leishmania infantum* accounted for five of 14 cases of cutaneous leishmaniasis in Sanliurfa Province (2020 publication). [11]

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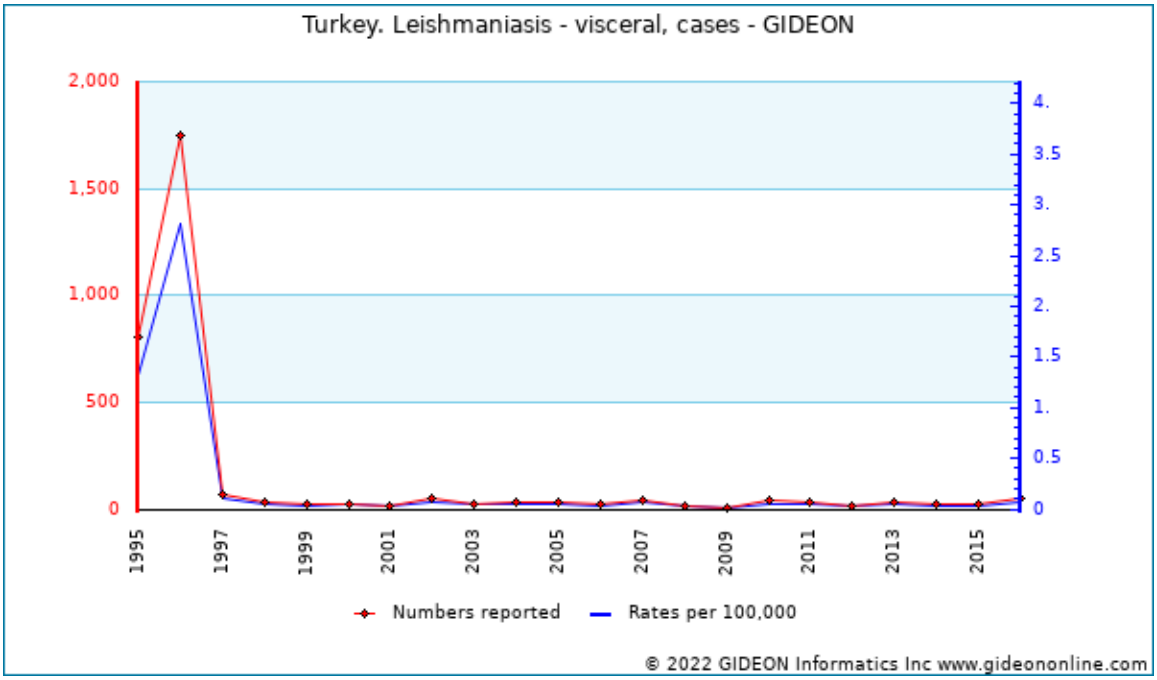

Graph: Turkey. Leishmaniasis - visceral, cases

Notes:

1. 82.3% of autochthonous visceral leishmaniasis cases in Europe occur in Turkey (2008 publication) [12]

Individual years:

2016 - Included 23 autochthonous cases and 14 imported cases.

Incidence

- 1954 to 1964 - 45 cases were reported
- 1974 to 1980 - 74 cases were reported.
- 1993 to 1997 - 37 cases were reported in Manisa district. [13]
- 2003 to 2007 - An average of 29 cases per year were reported (true number estimated at 60 to 120 per year). [14]

Prevalence surveys

Years	Region	Study Group	%	Notes
2015	Mersin	dogs	1.3	1.3% of canine plasma samples in Mersin Province (PCR, 2015) [15]
2017 - 2018	Mugla	dogs	6.87	[16]
2001 - 2017	Istanbul	patients	13.7	Survey of patients with clinical suspicion of leishmaniasis. [17]
2017 - 2021	Tekiradag	cats	0	Survey of house cats [18]
2021*	Aegean	cats	2.3	[19]
2018*	Karaburun	various	5-25	*Leishmania* was identified in 10% of sand flies, 25% of dogs and 5% of cats [20]
2012 - 2013	Antalya	flies	15	*Leishmania infantum* was identified in 15% of sandfly pools [21]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2008*	Multiple locations	children	4.2	4.2% of children 1 to 17 years of age in northwest Turkey (Eskisehir, Bilecik, Kutahya and Afyon provinces, 2008 publication) [22]

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Years	Region	Study Group	%	Notes
2005*	Ankara	dogs	2.58	2.58% of dogs in Ankara (2005 publication) [23]
2006 - 2008	Kirikkale	dogs	2	2% of dogs in Kirikkale (2006 to 2008) [24]
2009*	Antalya	dogs	8	8% of sheltered dogs in Antalya (2009 publication) [25]
2010*	Diyarbakir	dogs	0	0% of sheltered dogs in the Diyarbakir region (2010 publication) [26]
2010*	Erzurum	dogs	0	0% of sheltered dogs in Erzurum Province (2010 publication) [27]
2011 - 2013	Cukurova	dogs	27.18	27.18% of dogs in the Cukurova Plain (IFAT, 2011 to 2013) [28]
2016*	Hatay	dogs	0.8	0.8% of dogs from Hatay (2016 publication) [29]
2017 - 2018	Mugla	dogs	37.4	[30]
2006	Antalya	patients - dialysis	19.9	19.9% of hemodialysis patients (Antalya, 2006) [31]
2016*	Izmir	cats	15.2	15.2% of stray cats in Izmir (*Leishmania* spp., 2016 publication) [32]
2021*	Aegean	cats	15.6	[33]
1998 - 2001	Corum	various	0-28.26	0.16% of children, and 0% to 28.26% of dogs in rural Corum (northcentral Anatolia) (1998 to 2001) [34]
2006	Kars	various	0-7.2	0% of children and 7.2% of dogs in Kars Province (northeastern Turkey, 2006) [35]
2009*	Denizli	various	0-20.7	0% of children, 0.09% of adults, and 20.7% of dogs in Denizli (2009 publication) [36]
2009*	Izmir	general population	0.24	0.24% of individuals in Izmir District
2012*	Istanbul	blood donors	0.5	0.5% of blood donors in Istanbul (ELISA, 2012 publication) [37]
2004 - 2006	Ankara	patients - HIV / AIDS	1.2	1.2% of HIV-positive persons (Ankara, 2004 to 2006) [38]

* indicates publication year (not necessarily year of survey)

Vectors

Phlebotomus sergenti, *Ph. papatasi*, *P. major* and *Ph. syriacus* are the principal vectors, and dogs the main reservoir for *Leishmania infantum*. [39]

- *Phlebotomus major syriacus* has been suggested as the vector in the Western Black Sea region.
- *Phlebotomus simici* and *Ph. similis* are also implicated as vectors in the northwestern region. [40]
- *Phlebotomus transcaucasicus*, *Ph. neglectus*, *Ph. halepensis*, *Ph. tobbi*, *Ph. papatasi*, and *Ph. jacusieli* are present in the northcentral region. [41]
- *Phlebotomus kandelakii*, *Phlebotomus balcanicus* and *Phlebotomus neglectus* have identified as vectors in Kars Province, northeastern region (2006) [42]
- *Phlebotomus neglectus/syriacus* was the most abundant sandfly vector in Antalya Province, followed by *P. alexandri* and *P. tobbi* (2012 to 2013) [43]
- *Phlebotomus papatasi*, *Ph. perfiliewi*, *Ph. sergenti*, *Ph. major*, *Ph. neglectus*, *Ph. brevis*, *Ph. alexandri*, *Ph. galilaeus*, *Ph halepensis*, *Sergentomyia adleri*, *S. dentata*, *S. minuta*, *S. theodori*, *P. kazeruni* and *P. mascitti* are found in Sanliurfa province. [44]

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Leprosy

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

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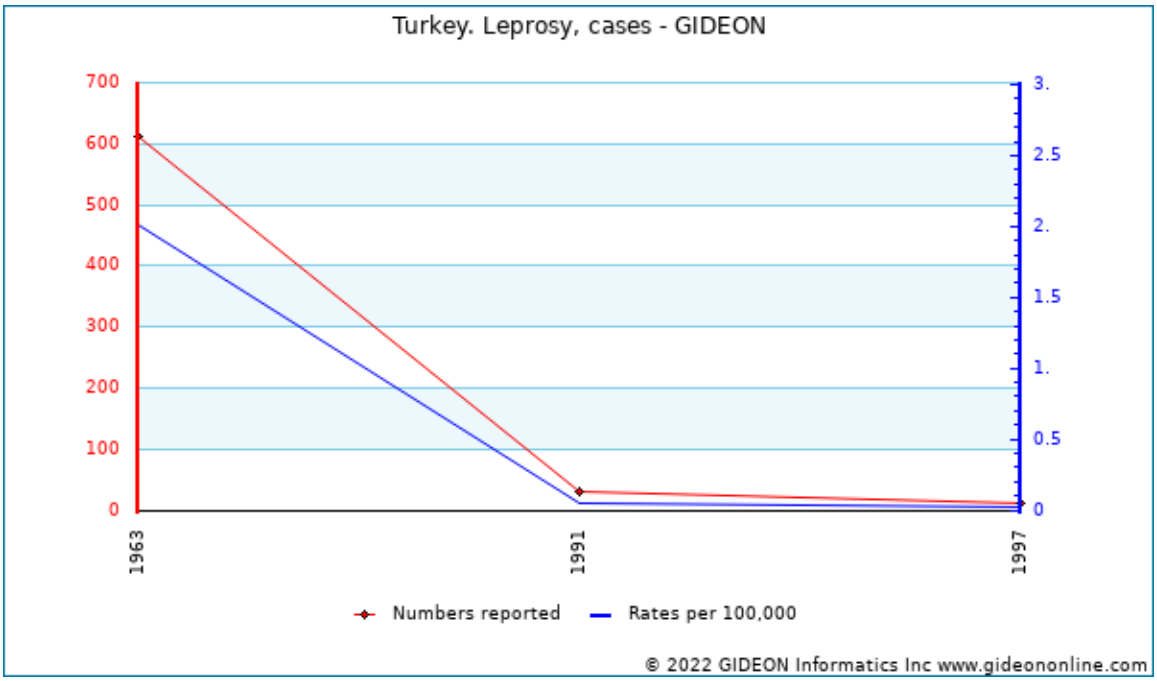
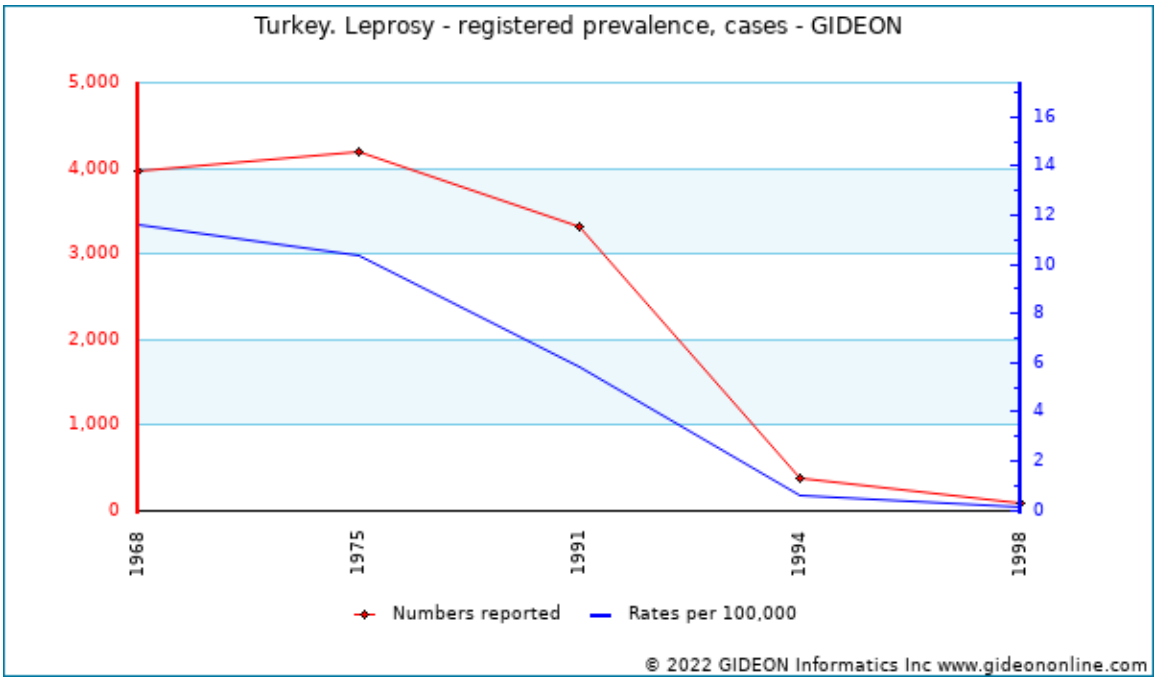
Leprosy in Turkey



Graph: Turkey. Leprosy, cases



Graph: Turkey. Leprosy - registered prevalence, cases

Two leprosaria and 12 "dispensaries" treat the disease nationwide.

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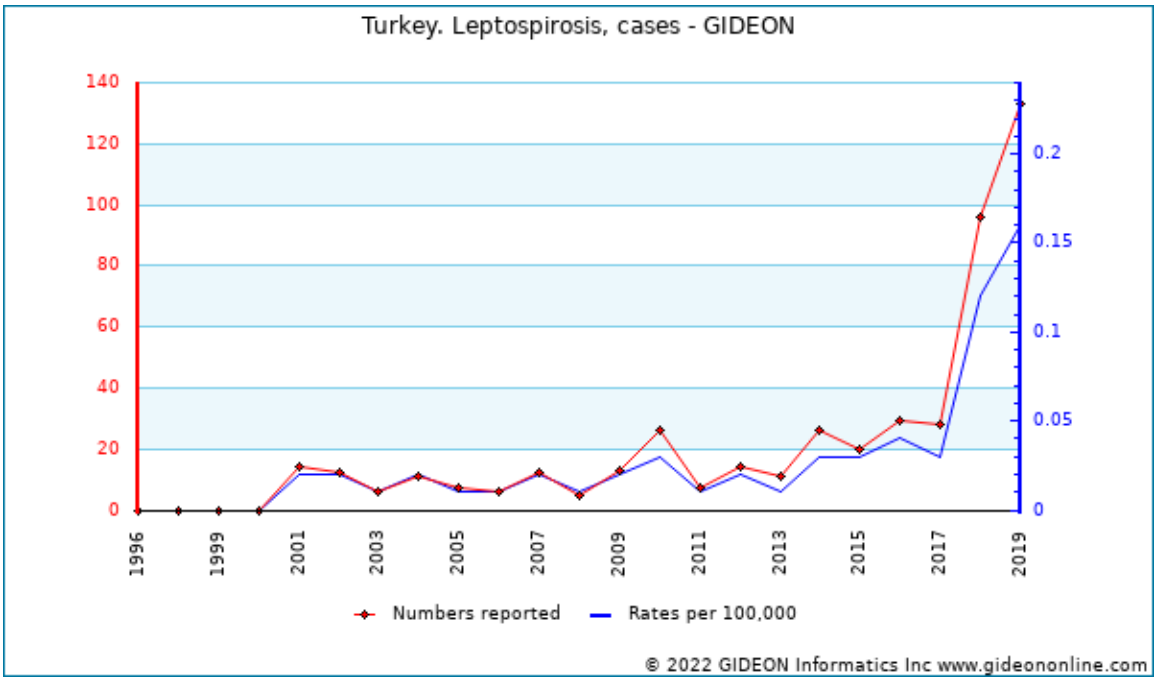
Leptospirosis

Agent	BACTERIUM. *Leptospira interrogans*, et al. An aerobic non-gram staining spirochete
Reservoir	Cattle, Dog, Horse, Deer, Rodent, Fox, Marine mammal, Cat, Marsupial, Frog, Zoonotic
Vector	None
Vehicle	Water, Soil, Urine contact, Breastfeeding
Incubation Period	7d - 12d (range 2d - 26d)
Diagnostic Tests	Culture on specialized media. Dark field microscopy of urine, CSF. Serology.
Typical Adult Therapy	Penicillin G 1.5 million units Q6h iv OR Doxycycline 100 mg BID X 5 to 7d OR Ceftriaxone 1g IV daily[1] [2] [3]
Typical Pediatric Therapy	Penicillin G 50,000u/kg q6h iv X 5 to 7d Age >= 8y: Doxycycline 2.2 mg/kg BID X 5 to 7d may also be used
Clinical Hints	- Often follows recent skin contact with fresh water in rural or rodent-infested areas - "Sterile" meningitis, nephritis, hepatitis, myositis and conjunctivitis - Case-fatality rates of 5% to 40% are reported
Synonyms	Andaman hemorrhagic fever, Canefield fever, Canicola fever, Field fever, Fish handler's disease, Fort Bragg fever, Japanese autumnal fever, Kelsch's disease, Leptospira, Leptospirose, Leptospirosen, Leptospirosi, Mud fever, Pre-tibial fever, Rat fever, Rice field fever, Swamp fever, Swineherd disease, Weil's disease. ICD9: 100 ICD10: A27

Leptospirosis in Turkey



Graph: Turkey. Leptospirosis, cases

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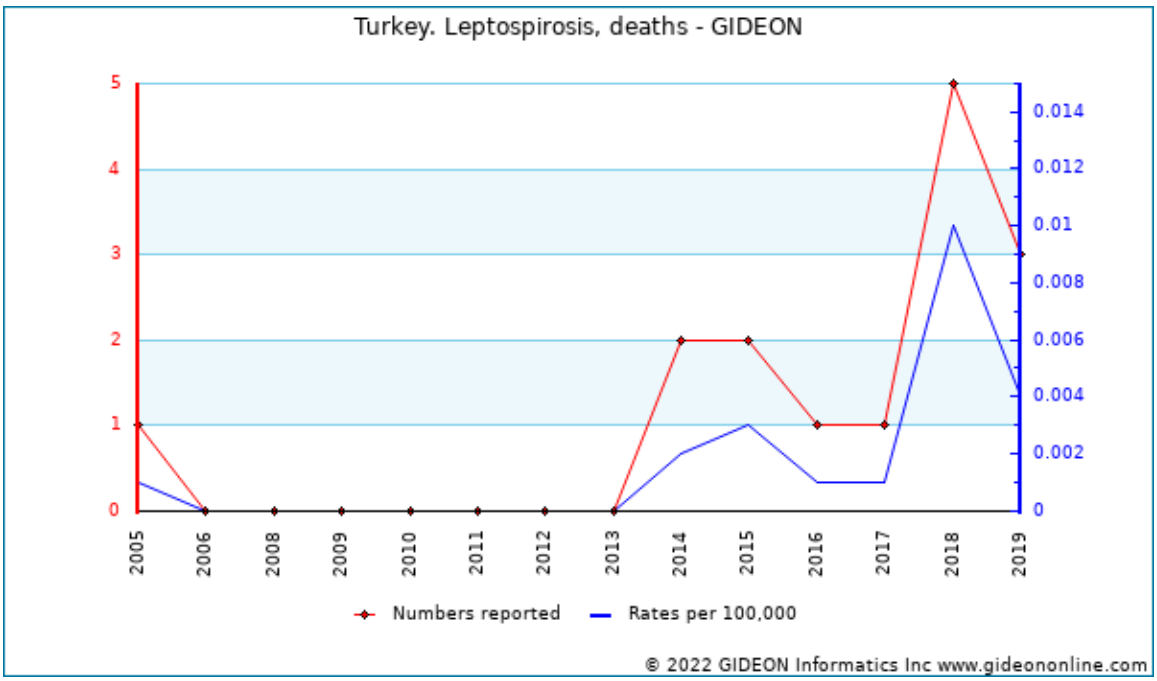

Graph: Turkey. Leptospirosis, deaths

Prevalence surveys

Years	Region	Study Group	%	Notes
2022*	Erzurum	cattle	7.14	Survey of kidney tissue samples from cattle [4]
2019	Konya	ruminants	13.6	*Leptospira* infection was associated with 13.6% of ruminant abortions [5]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1970 - 1973		dogs	17.4	17.4% of dogs (RMAT, 1970 to 1973) [6]
2005*	Ankara	dogs	43.96	43.96% of dogs in Ankara (2005 publication) [7]
2003*	Ankara	slaughterhouse workers	1.96	1.96% of slaughterhouse workers in Ankara (2003 publication) [8]

* indicates publication year (not necessarily year of survey)

-The principal reservoirs in this country are cattle, sheep, dogs and goats.

- *Rattus norvegicus* acts as reservoir of *Leptospira interrogans* in the Middle Black Sea region. [9]

The principal species are *Leptospira* serovars. Icterohaemorrhagiae and Grippotyphosa.

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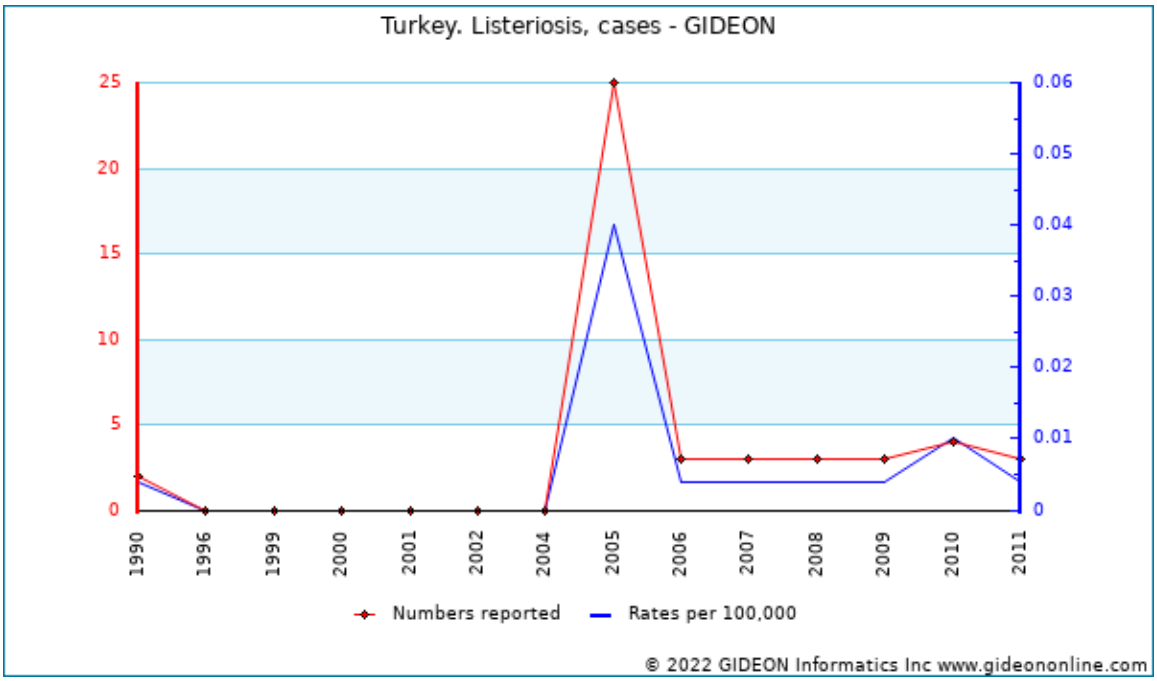
Listeriosis

Agent	BACTERIUM. *Listeria monocytogenes* A facultative gram-positive bacillus
Reservoir	Mammal, Human, Bird, Soil, Water, Zoonotic
Vector	None
Vehicle	Transplacental, Dairy products (eg, soft cheeses), Infected secretions, Vegetables, Poultry, Water, Fish, Shellfish
Incubation Period	3d - 21d (60d post-ingestion)
Diagnostic Tests	Culture of blood or CSF.
Typical Adult Therapy	Ampicillin 2g IV q6h X 2w (higher dosage in meningitis) + Gentamicin. Sulfamethoxazole / Trimethoprim recommended for Penicillin-allergic patients[1] [2]
Typical Pediatric Therapy	Ampicillin 50 mg/kg IV Q6h X 2w (higher dosage in meningitis). Sulfamethoxazole / Trimethoprim recommended for Penicillin-allergic patients
Clinical Hints	- Meningitis or sepsis, often in immune-suppressed patients (lymphoma, AIDS, etc) - Gastroenteritis - may follow ingestion of "over-the-counter" foods - Neonatal septicemia occasionally encountered
Synonyms	Listeria monocytogenes, Listeriose, Listeriosi. ICD9: 027.0 ICD10: A32

Listeriosis in Turkey



Graph: Turkey. Listeriosis, cases

Notes:
1. No fatal cases were reported in 2005; 0 in 2006

Prevalence surveys

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Years	Region	Study Group	%	Notes
2018*		various	2.5-3.4	2.5% of sheep and 3.4% of cattle carcasses [3]
1999*	Ankara	milk	0.94	0.94% of raw milk samples (1999 publication) [4]
2020*		food	19.7	19.7% of ready-to-eat food samples [5]
2008 - 2009		poultry - chicken	29.3	29.3% of chicken meat samples (2008 to 2009) [6]
2014*	Izmir	poultry - chicken	37.4	37.4% of samples from refrigerated fresh chicken breast fillet, turkey breast fillet, and ground beef (Izmir, 2014 publication) [7]
2020*		seafood	8.57	[8]
2010*		seafood - fish	10.4-30	30% of freshwater fish and 10.4% of marine fish (2010 publication) [9]
2017*	Kayseri	meat - pastrami	3.9	[10]
2015*	Aksaray	poultry - turkey	40.9	40.9% of raw turkey meat samples (Aksaray, 2015 publication) [11]
2014*		salad	6	6% of ready-to-eat salad samples (2014 publication) [12]
2009*	Multiple locations	patients - CNS	8.8	8.8% of acute meningitis cases above age 50 (2009 publication) [13]
2021*	Multiple locations	environmental - wastewater	14.5	*Listeria monocytogenes* was recovered from 14.5% of wastewater samples from cattle slaughterhouses [14]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2008	Adana	cattle	40.9	40.9% of cattle in Adana Province (2008) [15]
2010*	Kars	dogs	22.3	22.3% of domestic dogs in Kars Province (2010 publication) [16]
2010*	Diyarbakir	dogs	17	17% of shelter dogs in the Diyarbakir region (2010 publication) [17]
2010*	Erzurum	dogs	26.3	26.3% of shelter dogs in Erzurum Province (2010 publication) [18]
2018*		rabbits	0	0% of breeding rabbits from a farm [19]
2002	Ankara	pregnant women	21.5	21.5% of pregnant women 16 to 38 years of age attending a state hospital (Ankara, 2002) [20]
2008*	Ankara	animal contact	21.4-36	30.6% of veterinarians, 36% of veterinary technicians, 21.4% of animal lovers (Ankara, 2008 publication)
2008*	Malatya	dustmen	16	16% of dustmen (Malatya, 2008 publication)

* indicates publication year (not necessarily year of survey)

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Liver abscess - bacterial

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

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Lyme disease

Agent	BACTERIUM. *Borrelia* spp.: *Borrelia burgdorferi*; *B. afzelii* and *B. garinii* are also encountered (in Eurasia) A microaerophilic spirochete
Reservoir	Tick, Deer, Rodent, Bird, Zoonotic
Vector	Tick (*Ixodes*, *Amblyomma*)
Vehicle	None
Incubation Period	7d - 14d (range 2d - 180d)
Diagnostic Tests	Serology. Nucleic acid amplification. Culture of blood and body fluids available in some laboratories.
Typical Adult Therapy	Doxycycline, Ceftriaxone, Amoxicillin or Cefuroxime Dosage, route and duration according to nature and severity of disease Prophylactic antibiotics are often used in Lyme-endemic regions for disease prevention following tick-bite. [1] [2] [3] [4] [5]
Typical Pediatric Therapy	>= Age 8 years: As for adult < Age 8 years: Ceftriaxone, Cefuroxime or Amoxicillin. Dosage, route and duration according to nature and severity of disease
Vaccine	Lyme disease vaccine
Clinical Hints	- Patient may recall recent tick bite - Fever, circular erythematous skin lesion, arthralgia and lymphadenopathy - Later meningitis or myocarditis, and eventual destructive polyarthritis
Synonyms	Arcodermatitis chronica atrophicans, Baggio-Yoshinari syndrome, Borrelia A 14S, Borrelia afzelii, Borrelia americana, Borrelia bavariensis, Borrelia bissettii, Borrelia burgdorferi, Borrelia carolinensis, Borrelia garinii, Borrelia lonestari, 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 borreliose, Lyme borreliosis, Master's disease, Neuroborreliosis, Southern tick-associated rash illness, STARI, TAPOS, Tick-associated poly-organic syndrome. ICD9: 088.81 ICD10: A69.2

Lyme disease in Turkey

No cases of Lyme disease were officially reported in 1999.

- 2019 (publication year) - 75 reports of Lyme disease were published (36 reports) in Turkey to date. [6]

Case series

- 2009 (publication year) - Four cases of probable Lyme disease reported by a center in Ankara. [7]
- 2010 (publication year) - Three culture-positive cases were confirmed. [8]
- 2009 to 2013 - Ten cases were treated in Istanbul. [9]

Prevalence surveys

Years	Region	Study Group	%	Notes
1988 - 2009	Ankara	patients	0.9	Lyme disease was the cause of infectious uveitis in 0.9% of patients. [10]
2017 - 2021	Tekiradag	cats	21	Survey of house cats [11]
2011*	Istanbul	ticks	38.7	38.7% of questing *Ixodes ricinus* ticks in Istanbul and 11.4% in Kirklareli (*Borrelia burgdorferi*, 2011 publication) [12]
2013 - 2017	Istanbul	ticks	1.5	[13]

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Years	Region	Study Group	%	Notes
2014	Corum	ticks	0.31	*Borrelia afzelii* identified in 0.31% of ticks [14]
2016 - 2020	Multiple locations	ticks	0	[15]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2007 - 2008	Trabzon	adults	14.5	[16]
2008*	Duzce	forestry workers	2.6-10.9	10.9% of forestry workers and farmers and 2.6% of blood donors (Duzce, 2008 publication)
2008*		various	6-23.2	23.2% of dogs and 6% of horses (2008 publication) [17]
2008*	Denizli	general population	18.9	18.9% of humans in Denizli
2006 - 2007	Sinop	general population	1.5	1.5% of individuals in Sinop, central Black Sea region (2006 to 2007) [18]
2012*	Samsun	general population	4	4% of individuals in Tekkekoy, Samsun Province (2012 publication) [19]
2012	Van	general population	0.9	0.9% of individuals in rural Van Province (2012) [20]
2012	Manisa	general population	0.9	0.9% of individuals in Manisa (2012) [21]
2016*	Bolu	general population	4.6	4.6% of individuals in Bolu Province (IgG Western blot, 2016 publication) [22]
2019*	Ducze	general population	6	[23]
2010*	Erzurum	blood donors	2-2.5	2.0% of patients at risk and 2.5% of blood donors in Erzurum Province (2010 publication)
2010*	Multiple locations	blood donors	0	0% of blood donors in Ankara, Konya, Eskisehir and Zonguldak (2010 publication) [24]
2001	Northern Region	rodents	9	9% of wild mice (Apodemus sylvaticus) are seropositive toward *Borrelia afzelii* (2001) [25]
2015*	Western Region	patients - psychiatric	13.3	13.3% of patients with schizophrenia and 15.0% of controls (2015 publication) [26]

* indicates publication year (not necessarily year of survey)

2000 (publication year) - *Borrelia burgdorferi* has been implicated in the pathogenesis of morphea, cutis laxa and lichen sclerosus in Turkey. [27]

Vectors

- 2003 (publication year) - *Borrelia burgdorferi* has been identified in ticks (*Ixodes ricinus*) in Trakya (European Turkey). [28]

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Lymphocytic choriomeningitis

Agent	VIRUS - RNA. Arenaviridae, Mammarenavirus: Lymphocytic choriomeningitis virus
Reservoir	House mouse, Guinea pig, Hamster, Monkey, Zoonotic
Vector	None
Vehicle	Urine, Saliva, Feces, Food, Dust, Respiratory or pharyngeal acquisition
Incubation Period	8d - 12d (range 6d - 14d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, throat, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	- Headache, myalgia, meningitis and encephalitis - Photophobia or pharyngitis may be present - Preceding exposure to rodents - Infection resolves within 2 weeks, however convalescence may require an additional 2 months
Synonyms	ICD9: 049.0 ICD10: A87.2

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Lymphogranuloma venereum

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

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Malaria

Agent	PARASITE - Protozoa. Apicomplexa, Haemosporida: *Plasmodium* spp.
Reservoir	Human Primate (*Plasmodium knowlesi*, *P. cynomolgi*, *P. simium*), Zoonotic
Vector	Mosquito (*Anopheles*)
Vehicle	Blood
Incubation Period	7d -30d
Diagnostic Tests	Examination of blood smear. Serology, antigen & microscopic techniques. Nucleic acid amplification.
Typical Adult Therapy	Therapy: Resistant falciparum: Lumefantrine / Artemether OR Quinine + Doxycycline or Clindamycin OR Atovaquone / Proguanil OR Artesunate IV (severe malaria) If sens., Chloroquine 1g, then 500 mg 6, 24 & 48 hrs. If P. ovale or P. vivax - follow with Primaquine Severe malaria: Artesunate: 2.4 mg/kg IV at 0, 12, 24 and 48 hours Prophylaxis: Atovaquone / Proguanil, Chloroquine, Doxycycline, Mefloquine, Tafenoquine (see Drugs module for dosages)[1]
Typical Pediatric Therapy	Therapy: Resistant falciparum: Lumefantrine / Artemether OR Quinine + Clindamycin OR Atovaquone / Proguanil OR Artesunate (>age 8) IV (severe malaria) If sens, Chloroquine 10 mg/kg, then 5 mg/kg 6, 24, & 48 hrs. If P. ovale or P. vivax - follow with Primaquine Severe malaria, weight <20 kg: Artesunate: 3.0 mg/kg IV at 0, 12 , 24 and 48 hours Prophylaxis: Atovaquone / Proguanil, Chloroquine, Mefloquine, Tafenoquine (see Drugs module for dosages)
Vaccine	Malaria (RTS,S)
Clinical Hints	- Fever, headache, rigors ("shaking chills"), vomiting, myalgia, diaphoresis and hemolytic anemia - Fever pattern (every other or every third day) and splenomegaly may be present - Clinical disease may relapse after 7 (*ovale* and *vivax*) to 40 (*malariae*) years
Synonyms	Ague, Bilious remittent fever, Chagres fever, Estiautumnal fever, Marsh fever, Paludism, Paludismo, Plasmodium brasilianum, Plasmodium coatneyi, Plasmodium cynomolgi, Plasmodium falciparum, Plasmodium fieldi, Plasmodium inui, Plasmodium knowlesi, Plasmodium malariae, Plasmodium ovale, Plasmodium simiovale, Plasmodium simium, Plasmodium vivax. ICD9: 084 ICD10: B50,B51,B52,B53,B54

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

Malaria in Turkey

Time and Place

412,000 soldiers acquired malaria in Turkey during World War I, resulting in 20,000 deaths. [2]

- An extensive eradication campaign was initiated in 1957, and malaria had almost disappeared by 1968.
- The disease is sporadic, with highest rates during May to November.

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Areas of malaria risk have included Icel, Adana, Osmaniyeh, Hatay, Kahraman Maras, Gaziantep, Kilis, Adryaman, Sanliurfa, Elazig, Diyarbakar, Mardin, Bingol, Mus, Batman, Bitlis, Siirt, Sirnak, Van, and Hakkari provinces.

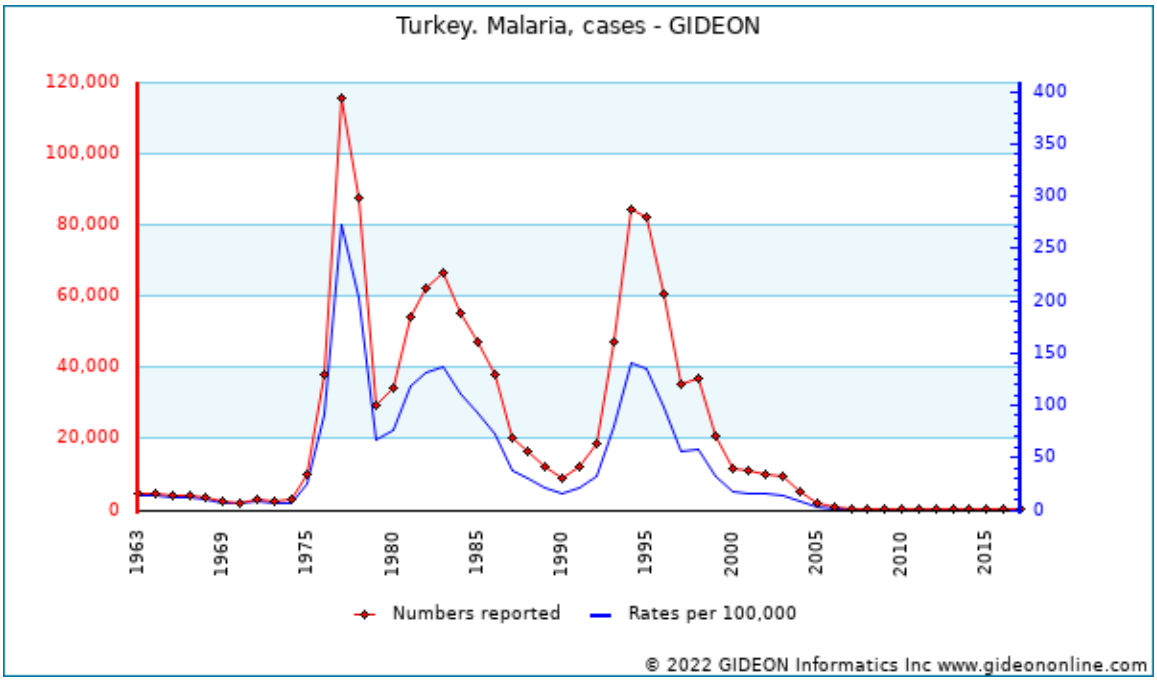
- Variables which have significant impact on the distribution of malaria in Turkey include latitude, minimum temperature, distance to seas and elevation. [3]
- Areas visited during typical cruise itineraries are not considered at risk.
- Most cases had been reported from Anatolia, Mersin and Cukurova (to the Iraq border).
- Curcurova and Amikova reported the country's highest rates of malaria prior to 1990.
- Southeastern Anatolia accounted for an increasing incidence noted during recent years - notably Diyarbakir, Batman, Sanliurfa, Siirt and Mardin districts.
- 15 million persons (23% of the Turkish population) once lived in endemic areas.
- An agricultural development program initiated in mid 70's in the Cukurova Plain caused a substantial migration of workers from the eastern areas where malaria at that time was more prevalent.
- Malaria rates in the eastern and south-eastern regions of Turkey are statistically related to the level of terrorist activity in these areas (1984 to 1998). [4]

Infecting species

Plasmodium vivax accounts for virtually 100% of cases.

- Some strains of *P. vivax* may be chloroquine-resistant. [5] [6]

2016 (publication year) - A Malaysian refugee in Turkey was treated for *Plasmodium knowlesi* malaria. [7]



Graph: Turkey. Malaria, cases

Notes:
1. Two fatal cases (in 1989 and 2007) were reported during 1978 to 2007.
2. Analysis of malaria elimination activities as of 2009. [8]
   Individual years:
   1969 - 26 imported.
   1971 - None imported.
   1983 - 50% in the Cukurova Plain
   1993 - 32% in Diyarbakir.

Additional Geographic Notes

- **Adana** reported 252 cases during 2002 to 2012. [9]
- **Adiyaman** reported 184 cases during 2000 to 2007; 0 during 2008 to 2011. [10]
- **Antalya** reported 66 cases during 2001 to 2011 (86% due to *P. vivax*) [11] ; 36 during 2012 to 2017 (80.55% during to *P. falciparum* [12]

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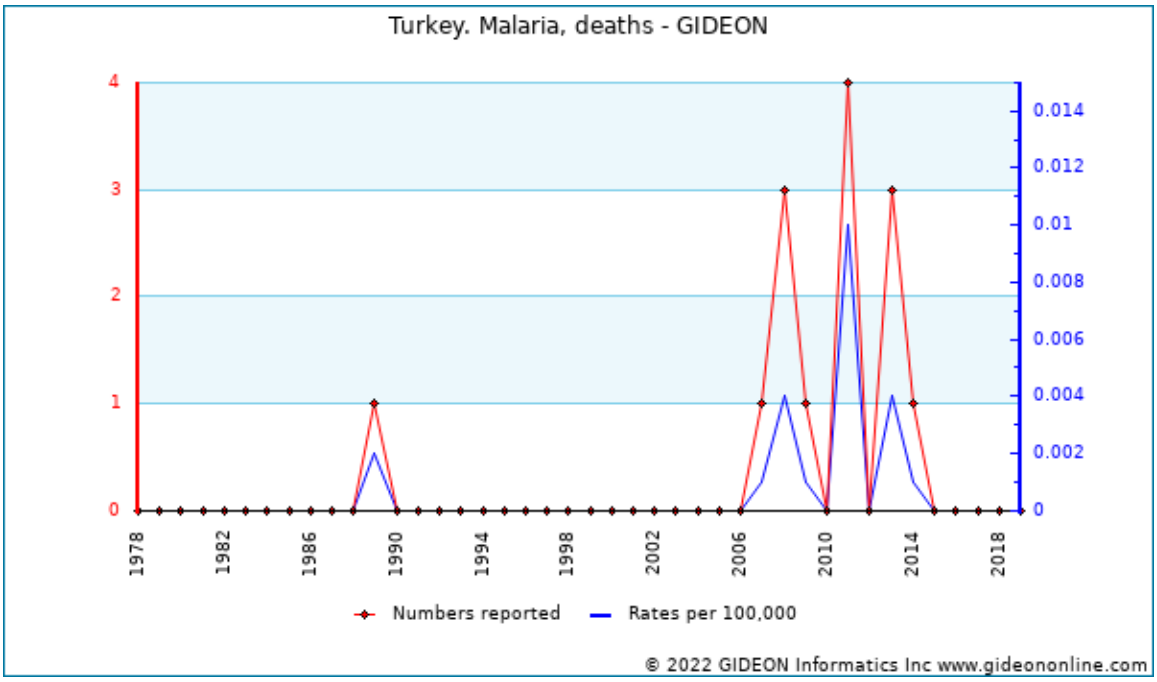
- **Bitlis** reported 659 cases during 1998 to 2008 (100% due to *P. vivax*) [13]
- **Bursa** reported 21 cases during 2009 to 2012. [14]
- **Elazig** reported 200 cases during 1996 to 2000. [15]
- **Gaziantep** reported 31 cases (24 imported) during 2005 to 2015. [16]
- **Kayseri** reported 47 cases during 2001 to 2013. [17]
- **Kocaeli** reported 63 cases during 1997 to 2007. [18]
- **Malatya** reported 189 cases during 1999 to 2005. [19]
- **Mersin** reported 73 cases during 2002 to 2011. [20]
- **Ordu** reported six cases during 2001 to 2011 - all imported. [21]
- **Sanliurfa** reported 4,394 cases (99.9% due to *Plasmodium vivax* during 2001 to 2011 (71.4% in Siverek County; 19.4% imported) [22]

As of 2016, the U.S. Centers for Disease Control no longer recommend malaria prophylaxis for travelers to Turkey.



Graph: Turkey. Malaria, deaths

Notes:
1. True mortality estimated at 169 deaths in 1980; 32 in 1990; 7 in 2000; 1 in 2010. [23]

Prevalence surveys

Years	Region	Study Group	%	Notes
1998 - 2008	Bitlis	specimens	0.75	0.75% of blood specimens in Bitlis (1998 to 2008) [24]
2001 - 2011	Antalya	specimens	0.0005	0.0005% of blood specimens in Antalya (2001 to 2011) [25]
2002 - 2011	Ordu	specimens	0.02	0.02% of blood specimens in Ordu (2002 to 2011) [26]

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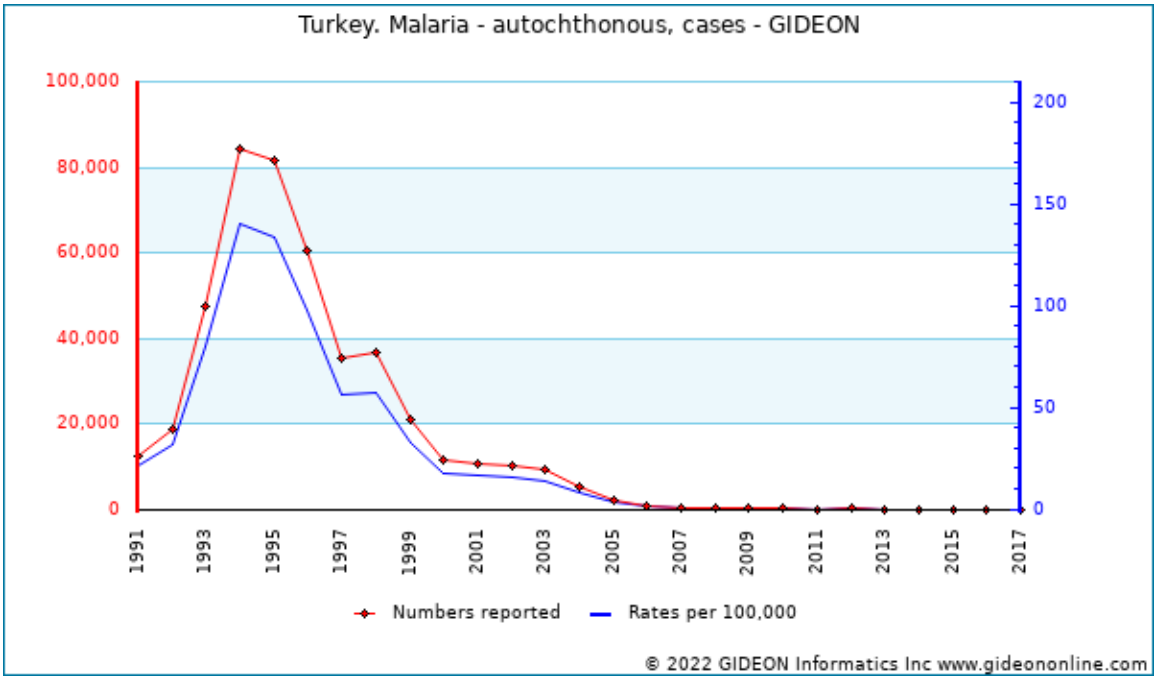
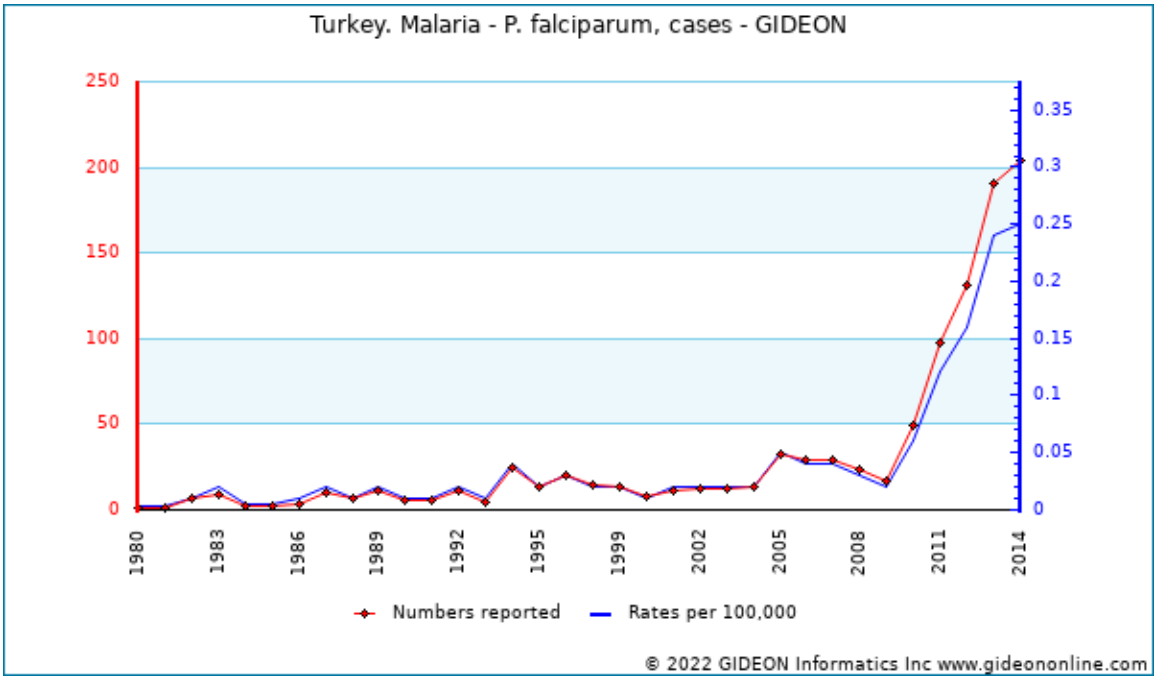


Graph: Turkey. Malaria - autochthonous, cases



Graph: Turkey. Malaria - P. falciparum, cases

Vectors

The principal vector is *Anopheles sacharovi* [27]

- *Anopheles superpictus* [28] , *An. pulcherrimus* (in the southeast) [29] and *An. subalpinus* are also active. [30]

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Malignant otitis externa

Agent	BACTERIUM. *Pseudomonas aeruginosa*: aerobic gram-negative bacillus (virtually all cases)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of otic exudate and biopsy material. Careful roentgenographic and neurological examinations.
Typical Adult Therapy	Early debridement Ciprofloxacin 400 mg iv Q8h Alternatives: Imipenem, Meropenem, Ceftazidime, Cefepime, Piperacillin Early debridement[1]
Typical Pediatric Therapy	Early debridement Early debridement Ciprofloxacin 10-15 mg/kg IV Q12h Alternatives: Imipenem, Meropenem, Ceftazidime, Cefepime, Piperacillin
Clinical Hints	- 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	ICD9: 380.2 ICD10: H60.2

Malignant otitis externa in Turkey

Case series

- 2006 to 2017 - 25 cases of malignant otitis externa were treated at a hospital in Izmir. [2]
- 2007 to 2012 - Ten cases of malignant otitis externa were treated at a hospital in Istanbul. [3]

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Measles

Agent	VIRUS - RNA. Mononegavirales Paramyxoviridae, Paramyxovirinae, Morbillivirus: Measles virus
Reservoir	Human
Vector	None
Vehicle	Droplet, Respiratory or pharyngeal acquisition
Incubation Period	8d - 14d
Diagnostic Tests	Viral culture (difficult and rarely indicated). Serology. Nucleic acid amplification.
Typical Adult Therapy	Respiratory isolation; supportive. Ribavirin 20 to 35 mg/kg/day X 7 days has been used for severe adult infection[1] [2]
Typical Pediatric Therapy	Respiratory isolation; supportive. Ribavirin 7.5-10 mg/kg PO BID X 5-7 d has been used for severe infection
Vaccine	Measles vaccine Measles-Mumps-Rubella vaccine Measles-Rubella vaccine
Clinical Hints	- Coryza, fever, headache, conjunctivitis, photophobia and a maculopapular rash after 3 to 5 days - Koplik's spots (bluish-grey lesions on buccal mucosa, opposite second molars) often precede rash - Encephalitis or viral pneumonia occasionally encountered
Synonyms	Masern, Massling, Mazelen, Meslinger, Morbilli, Morbillo, Rubeola, Rugeole, Sarampion, Sarampo. ICD9: 055 ICD10: B05

Measles in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

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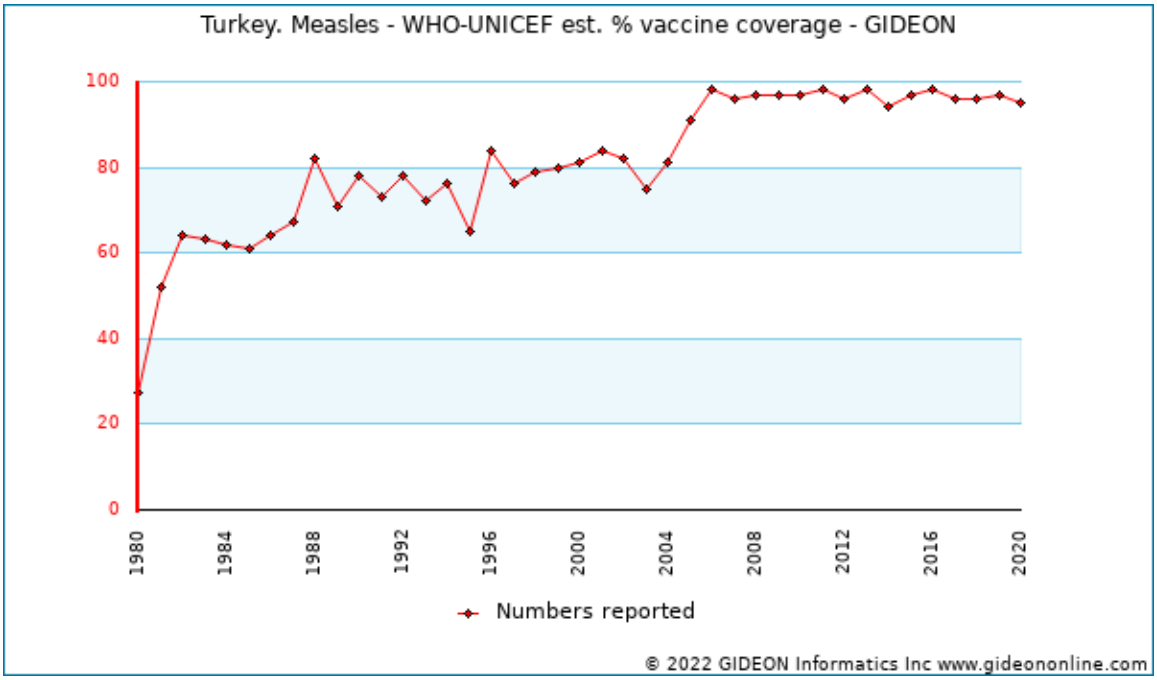
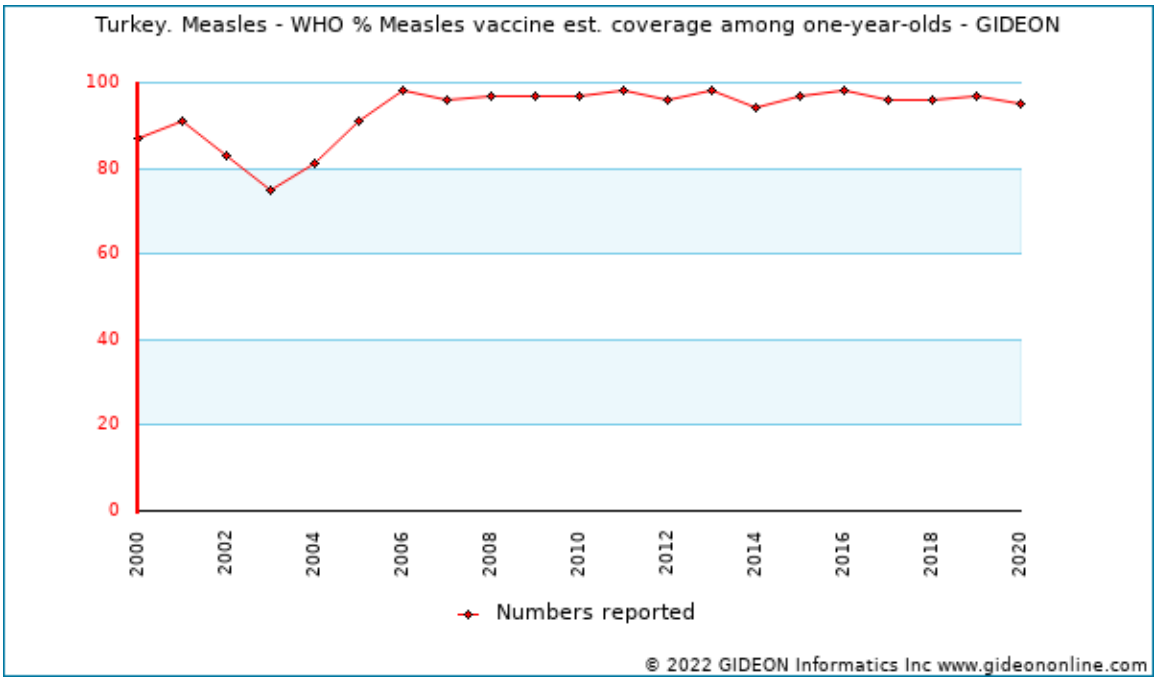


Graph: Turkey. Measles - WHO-UNICEF est. % vaccine coverage

Notes:
1. MCV-1 coverage was 60% during 1970 to 1997; 85% during 1998 to 2006. [3]



Graph: Turkey. Measles - WHO % Measles vaccine est. coverage among one-year-olds

Measles immunization was introduced in 1970. [4]

Seroprevalence surveys

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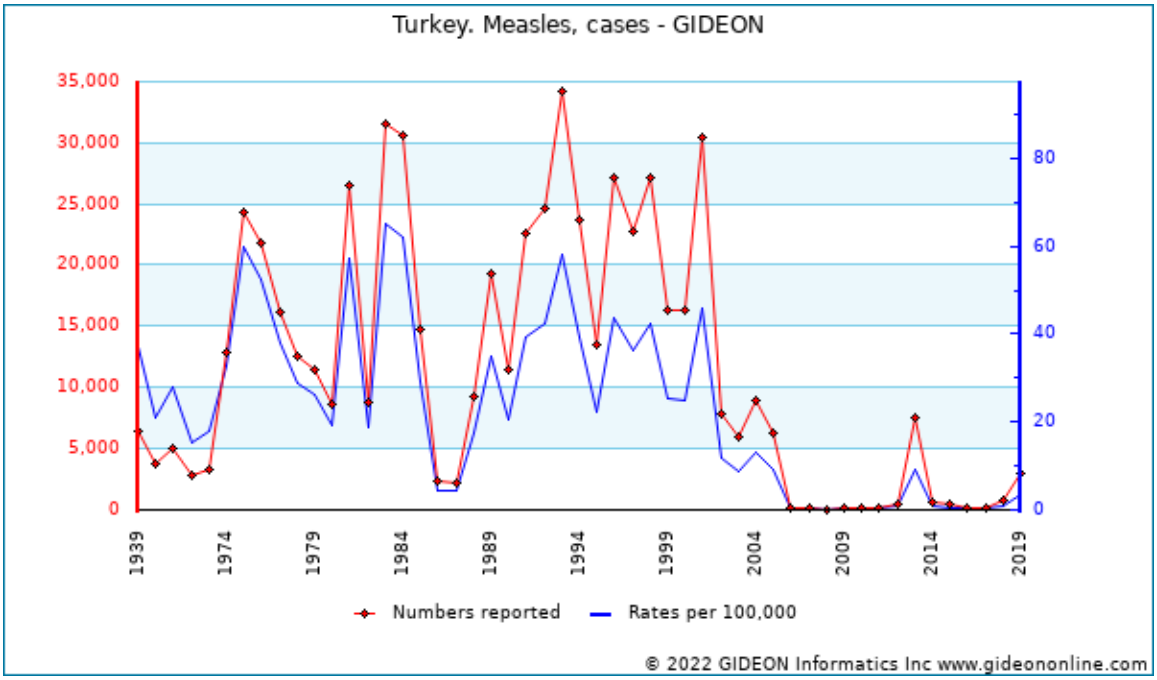
Years	Region	Study Group	%	Notes
2009*	Kocaeli	children	16.7	16.7% of children with acute lymphoblastic leukemia were found to have protective antibody levels prior to revaccination (Kocaeli, 2009 publication) [5]
2010*	Ankara	children	42	42% of children with acute lymphoblastic leukemia (Ankara, 2010 publication) [6]
2018*	Eskisehir	children	76.3	Survey of children with chronic neurological disease [7]
2018*		military personnel	96.2	96.2% of military recruits
2006*	Multiple locations	health care workers	98.6	98.6% of health care workers (2006 publication) [8]
2015 - 2016		health care workers	74.9	Survey of nursing students [9]
2015*	Yozgat	health care workers	82.8	82.8% of nursing students (Yozgat, 2015 publication) [10]
2007*	Istanbul	students - medical	97.8	97.8% of medical students (Istanbul, 2007 publication) [11]
2014	Manisa	general population	82.2	[12]

* indicates publication year (not necessarily year of survey)



Graph: Turkey. Measles, cases

Notes:

1. During 1960 to 2019, 1,050,567 cases of measles were reported in Turkey (32.03 per 100,000 population) [13]
2. Analysis of measles trends in Turkey during 1960 to 2014 - see reference [14]
3. Status of measles in Turkey as of 2003 - see reference [15]
4. Decreasing rates of measles in Turkey have paralleled increasing vaccine uptake (2011 publication). [16]
   Individual years:
   2018 - 44 cases were reported to May 8.
   2019 - 1,488 cases were reported to July 10. [17]

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Notable outbreaks

Years	Region	Cases	Deaths	Notes
1989	Multiple locations	19,273		[18]
1993		34,285		[19]
1997	Edirne	597		
2001	Multiple locations			[20]
2001	Sirnak	2,143		[21]
2011	Istanbul	111		[22] [23] [24]
2012 - 2013	Multiple locations	7,754	4	[25] [26] [27] [28] [29] [30] [31]
2019		2,666		[32]

Caase series

- 2019 - Case series of 38 children hospitalized with measles in Adana. [33]

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7. Hum Vaccin Immunother 2018 Apr 06;:1-17.
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9. Rev Esp Quimioter 2019 Oct 23;
10. Am J Infect Control 2016 Jan 01;44(1):e5-7.
11. Int J Adolesc Med Health 2006 Oct-Dec;18(4):615-22.
12. Public Health 2017 Jun ;147:51-58.
13. J Pak Med Assoc 2021 Jun ;71(6):1527-1531.
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Melioidosis

Agent	BACTERIUM. *Burkholderia pseudomallei* An aerobic gram-negative bacillus
Reservoir	Soil, Water, Sheep, Goat, Horse, Pig, Rodent, Monkey, Marsupial, Zoonotic
Vector	None
Vehicle	Water (contact, ingestion, aerosol), Breastfeeding, Sexual contact, Respiratory or pharyngeal acquisition
Incubation Period	3d - 21d (range 2d - 1y)
Diagnostic Tests	Culture of blood, sputum, tissue. Serology. Nucleic acid amplification.
Typical Adult Therapy	Ceftazidime or Meropenem or Imipenem IV X at least 14 days May be combined with Sulfamethoxazole / Trimethoprim PO Follow with Sulfamethoxazole / Trimethoprim +/- Doxycycline X at least 3 months.[1] [2] [3]
Typical Pediatric Therapy	Ceftazidime or Meropenem or Imipenem IV X at least 14 days May be combined with Sulfamethoxazole / Trimethoprim PO Follow with Sulfamethoxazole / Trimethoprim X at least 3 months.
Clinical Hints	- 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)
Synonyms	Burkholderia pseudomallei, Burkholderia thailandensis, Melioidose, Nightcliff Gardeners' Disease, Whitmore disease. ICD9: 025 ICD10: A24.1,A24.2,A24.3,A24.4

Melioidosis in Turkey

1959 (publication year) - A case of melioidosis was reported in Adana.

1998 (publication year) - *Burkholderia pseudomallei* was isolated from raw milk. [4]

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Meningitis - aseptic (viral)

Agent	VIRUS - RNA. Picornaviridae, enteroviruses
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Droplet
Incubation Period	Variable
Diagnostic Tests	Viral isolation (stool, CSF, throat). Serology.
Typical Adult Therapy	Supportive[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Lymphocytic meningitis, with normal CSF glucose level - Often follows sore throat - Typically occurs during late summer and early autumn in temperate regions
Synonyms	Aseptic meningitis, Encephalitis - viral, Meningite virale, Meningitis, viral, Meningo-encefalite virale, Viral encephalitis, Viral meningitis. ICD9: 047,048,049,320.2 ICD10: A87,G03.0

Meningitis - aseptic (viral) in Turkey

Notable outbreaks

Years	Region	Cases	Pathogen	Notes
1999	Multiple locations	176	Echovirus 30	Outbreak in Ankara and Antalya [2] [3] [4]

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2. Eur J Epidemiol 2003 ;18(8):823-6.
3. Pediatr Infect Dis J 2000 May ;19(5):490.
4. Turk J Pediatr 2002 Jul-Sep;44(3):237-9.

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Meningitis - bacterial

Agent	BACTERIUM. *Neisseria meningitidis*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, et al
Reservoir	Human
Vector	None
Vehicle	Air, Secretions
Incubation Period	Variable
Diagnostic Tests	CSF microscopy and culture. Blood culture. Note: Antigen detection is non-specific and rarely useful.
Typical Adult Therapy	If meningococcal meningitis is confirmed or suspected - respiratory isolation Bactericidal agent(s) appropriate to known or suspected pathogen + dexamethasone[1] [2] [3]
Typical Pediatric Therapy	As for adult
Vaccines	H. influenzae (HbOC-DTP or -DTaP) vaccine Haemophilus influenzae (HbOC) vaccine Haemophilus influenzae (PRP-D) vaccine Haemophilus influenzae (PRP-OMP) vaccine Haemophilus influenzae (PRP-T) vaccine Meningococcal vaccine
Clinical Hints	- Headache, stiff neck, obtundation, high fever and leukocytosis - Macular or petechial rash and preceding sore throat suggest meningococcal infection
Synonyms	Bacterial meningitis, Enfermedad meningococica, Haemophilus influenzae, Haemophilus influenzaes, HIB meningitis, HIBs, Infections a meningocoque, Meningite batterica, Meningite meningococcica, Meningococcal, Meningococcal infection - invasive, Meningokokken Erkr., Meningokokkose. ICD9: 036.0,320 ICD10: A39,G00,G01,G02

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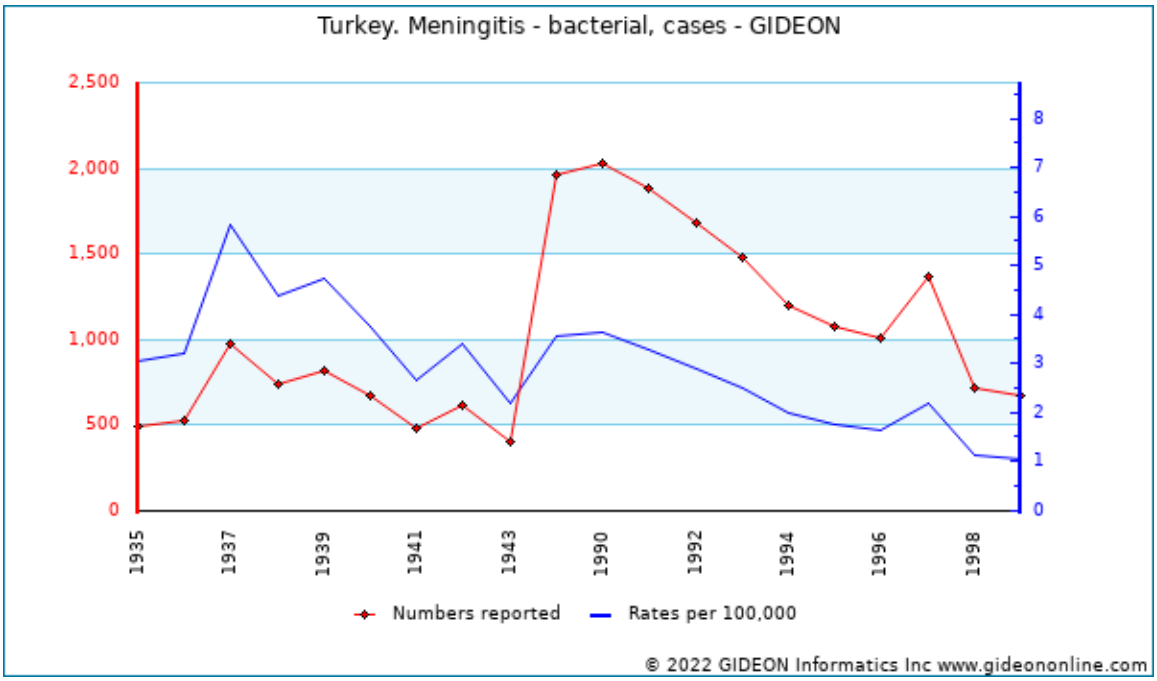
Meningitis - bacterial in Turkey



Graph: Turkey. Meningitis - bacterial, cases

Notes:
1. *Neisseria meningitidis* accounts for 56.5% of meningitis cases below age 17, *Streptococcus pneumoniae* 22.5% and Hib 20.5% (2005 to 2006) [4]
2. *Streptococcus pneumoniae* accounts for 69.2% of acute meningitis cases above age 50, and *Listeria monocytogenes* for 8.8% (2009 publication) [5]

Case series
- 1992 to 2011 - 389 cases (4 fatal) of bacterial meningitis were treated at a hospital in Istanbul - 17% due to *Neisseria meningitidis*, 13.6% *Streptococcus pneumoniae*and 6.4% *Haemophilus influenzae* type b. . [6]

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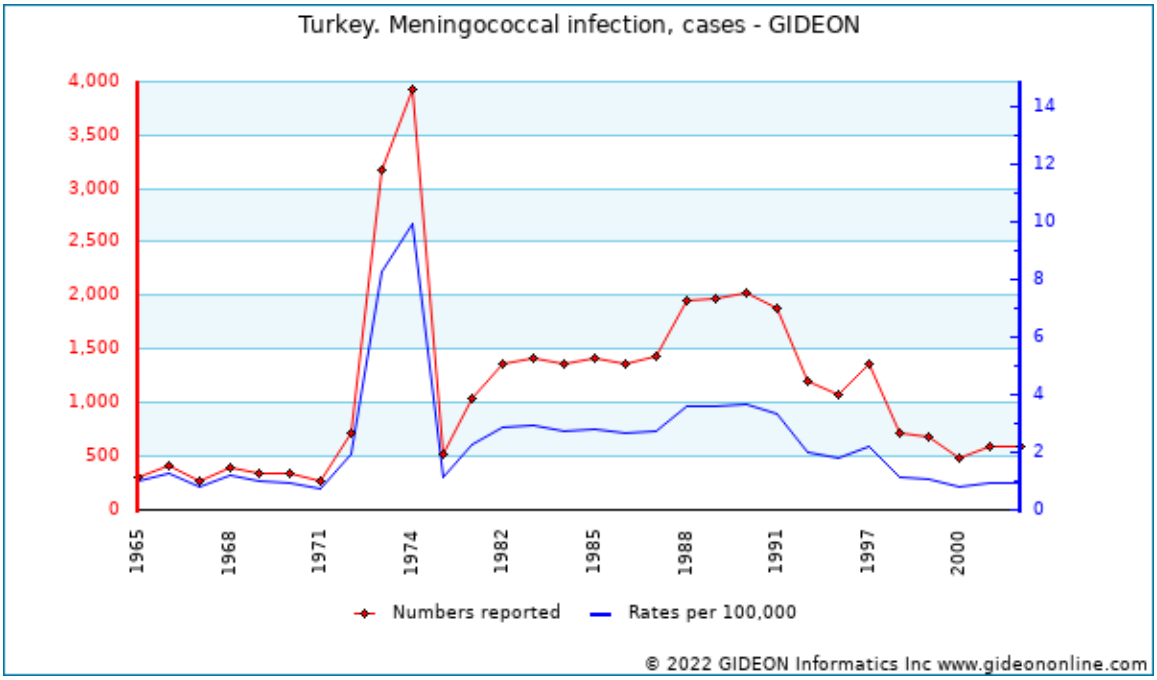
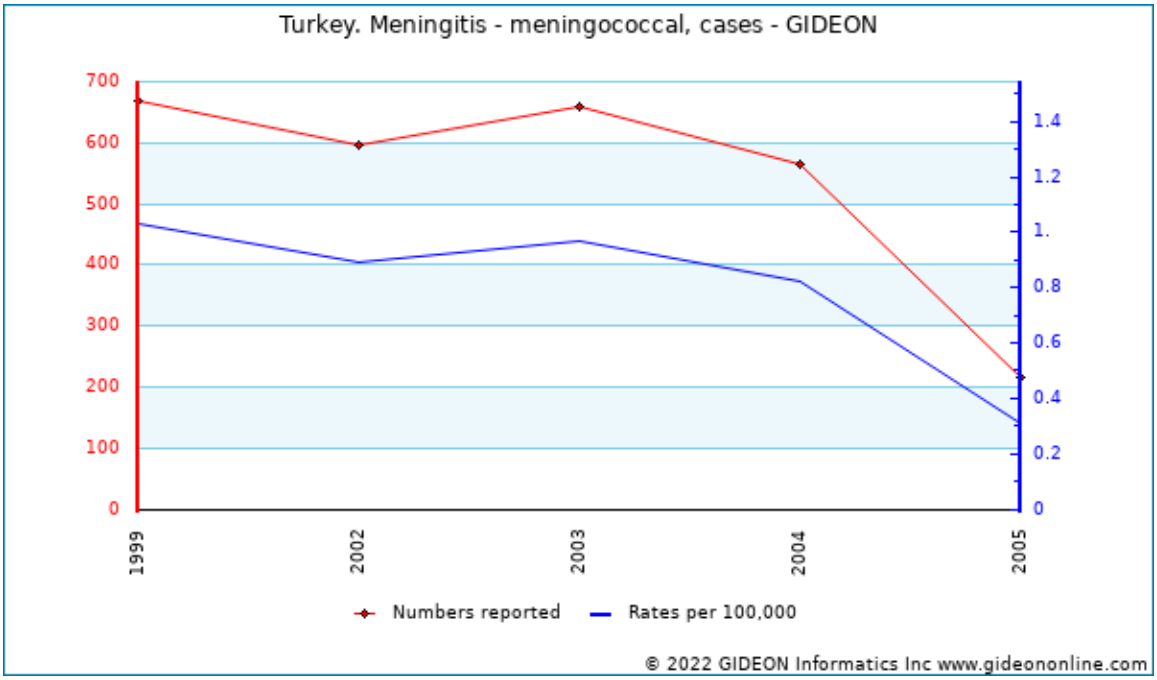


Graph: Turkey. Meningococcal infection, cases

Notes:
Individual years:
2000 - A Saudi strain of *Neisseria meningitidis* W135 was identified. [7]



Graph: Turkey. Meningitis - meningococcal, cases

Vaccine Schedule:

BCG - 2 months

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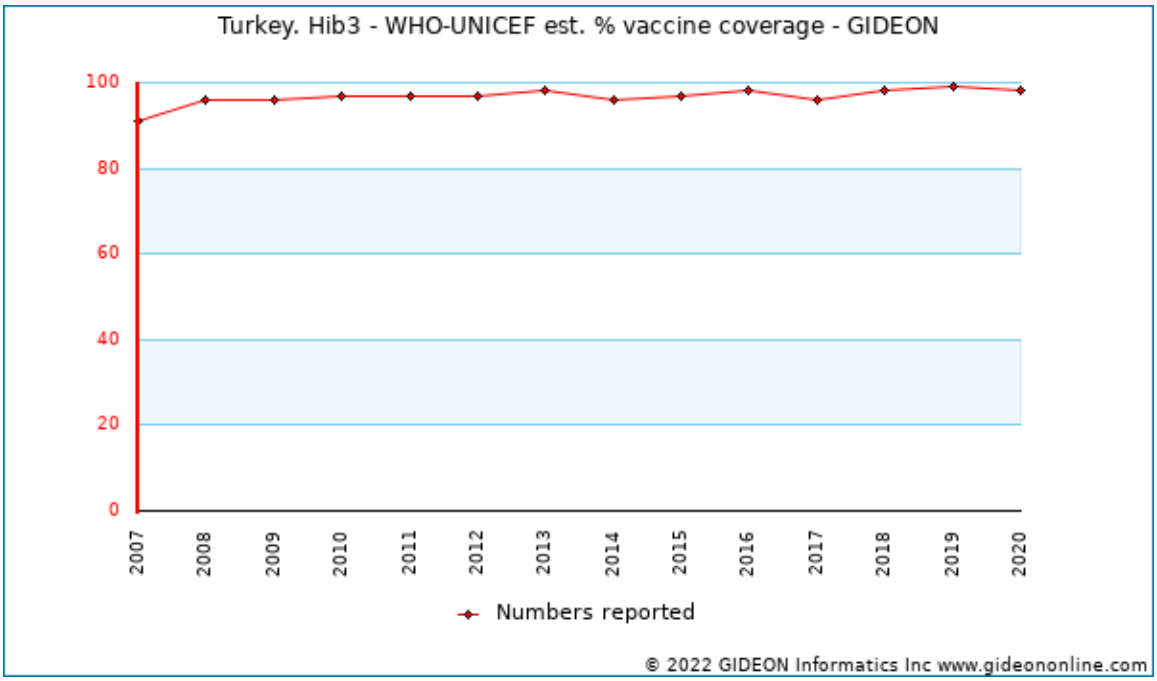
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months



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

2009 (publication year) - 16.7% of children with acute lymphoblastic leukemia in Kocaeli were found to have protective antibody levels against Hib prior to revaccination. [8]

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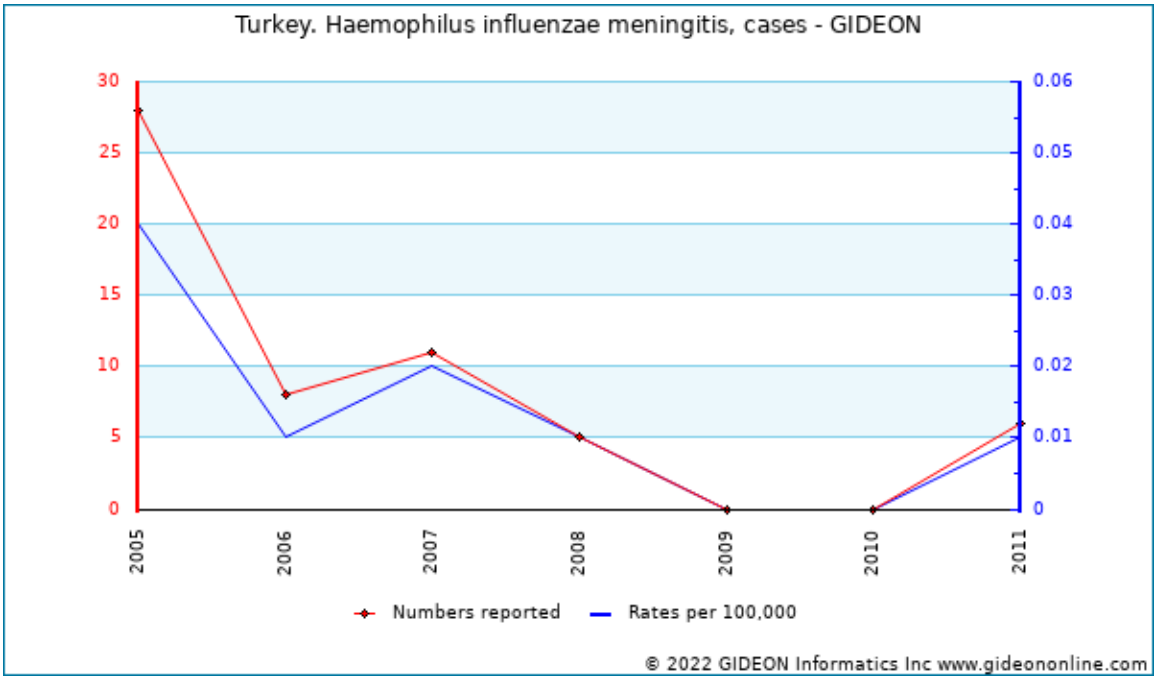

Graph: Turkey. Haemophilus influenzae meningitis, cases

Notable outbreaks

Years	Region	Cases	Source	Pathogen	Population	Notes
1975 - 1977	Ankara			meningococcus group B		[9] [10]
2001	Malatya	4	hyperalimentation	*Chryseobacterium meningosepticum*	neonates	Outbreak related to contaminated lipid infusion solution. [11]
2014*	Mersin	12	spinal anesthetic	*Serratia marcescens*		Outbreak associated with contaminated solutions used to administer spinal anesthesia [12]

* indicates publication year (not necessarily year of outbreak)

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MERS Coronavirus infection

Agent	Virus - RNA. Coronaviridae, Betacoronavirus.
Reservoir	Camel, Human, Bat, Zoonotic
Vector	None
Vehicle	Droplet, Fecal-oral, Respiratory or pharyngeal acquisition
Incubation Period	Mean 5.2 days (range 3d - 15d)
Diagnostic Tests	Identification of virus through PCR and direct immunofluorescence. Serology (ELISA)
Typical Adult Therapy	Isolation (respiratory and other secretions). Supportive.[1]
Typical Pediatric Therapy	Supportive. Isolation (respiratory and other secretions). Preliminary studies suggest that a combination of recombinant interferon beta-1b and lopinavir-ritonavir may be effective.
Clinical Hints	- Exposure in an endemic area or contact with known case - Fever, cough, respiratory difficulty or severe overt pneumonia
Synonyms	Betacoronavirus England 1, HCoV-EMC, Human betacoronavirus 2c EMC, Human betacoronavirus 2c England-Qatar, Human betacoronavirus 2C Jordan-N3, Human coronavirus Erasmus Medical Centre, London1 novel CoV 2012, MERS, Middle East respiratory syndrome, Novel CoV 2012, Novel human coronavirus. ICD9: 079.82 ICD10: U04.9

Although MERS Coronavirus infection is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

MERS Coronavirus infection in Turkey

Cross-border events

Years	Acquired by**	Originated in**	Setting	Cases	Deaths	Notes
2014	Turkey	Saudi Arabia	immigrant / expatriate	1	1	A Saudi expatriate died of MERS-CoV infection in Turkey. [2] [3]

** Country or Nationality

References

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2. Mikrobiyol Bul 2015 Jul ;49(3):414-22.
3. ProMED <promedmail.org> archive: 20141018.2876430

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Metagonimiasis

Agent	PARASITE - Platyhelminthes, Trematoda. Plagiorchiida, Heterophyidae: *Metagonimus yokogawai*
Reservoir	Snail (*Thiara*, *Semisulcospira*), Fish, Dog, Cat, Zoonotic
Vector	None
Vehicle	Fish (trout)
Incubation Period	14d
Diagnostic Tests	Identification of ova or adult in stool. Metagonimus yokogawai adult length 1.0 to 2.5 mm
Typical Adult Therapy	Praziquantel 25 mg/kg PO TID X 1d[1] [2] [3] [4]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Follows ingestion of raw fish - Mucous diarrhea and eosinophilia - Infestation may persist for more than one year
Synonyms	Metagonimus, Metagonimus katsuradai, Metagonimus yokogawai, Yokogawa's fluke. ICD9: 121.5 ICD10: B66.8

References

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Microsporidiosis

Agent	FUNGUS. Microsporidia: Enterocytozoon, *Encephalitozoon* (*Septata*), *Vittaforma* (*Nosema*), *Pleistophora*,*Trachipleistophora*, et al.
Reservoir	Rabbit, Rodent, Carnivore, Non-human primate, Fish, Dog, Bird, Zoonotic
Vector	None
Vehicle	Fecal-oral
Incubation Period	Unknown
Diagnostic Tests	Microscopy of duodenal aspirates. Inform laboratory if this organism is suspected. Nucleic acid amplification.
Typical Adult Therapy	Albendazole 400 mg PO BID X 3 weeks. Add Fumagillin for ocular disease S. intestinalis may respond to Albendazole and Fumagillin Nitazoxanide has been used for E. bieneusi.[1]
Typical Pediatric Therapy	Albendazole 200 mg PO BID X 3 weeks. Add Fumagillin for ocular disease S. intestinalis may respond to Albendazole and Fumagillin Nitazoxanide has been used for E. bieneusi.
Clinical Hints	- Self-limited diarrhea, traveler's diarrhea or asymptomatic carriage - Immunocompromised patients present with chronic diarrhea, cholangitis, cholecystitis, sinusitis or pneumonia - Ocular microsporidiosis is associated with keratoconjunctivitis - Hepatitis or myositis are reported in some cases
Synonyms	Anncaliia, Brachiola, Encephalitozoon, Enterocytozoon, Microsporidium, Nosema, Pleistophora, Trachipleistophora, Tubulinosema, Vittaforma. ICD9: 136.8 ICD10: A07.8

Microsporidiosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2006	Malatya	children	7.8	7.8% of children in Malatya (2006) [2]
2020*	Anatolia	horses	18.7	*Enterocytozoon bieneusi,* was identified in 18.7% of horses [3]
2020*		birds	3.5-14.7	*Encephalitozoon bieneusi* / *E. hellem* were identified in 3.5% / 14.7% of pet budgerigars (*Melopsittacus undulatus*) in Turkey [4]
2008*	Bornova	patients	6.1	6.1% of stool specimens from immuno-competent patients (Bornova, 2008 publication) [5]
2008*	Malatya	patients	5.6-10.9	10.9% of cancer patients and 5.6% of controls (Maltalya, 2008 publication) [6]
2011*		patients	19.7	19.7% of patients with urticaria and 2.8% of a control group (2011 publication) [7]
2012 - 2013	Kocaeli	patients - dialysis	2.1	2.1% of dialysis patients (Kocaeli, 2012 to 2013) [8]
2011*		rabbits	7.7	7.7% of rabbits in a breeding facility (*Encephalitozoon cuniculi*, 2011 publication) [9]
2020*	Anatolia	milk	2-18	*Enterocytozoon bieneusi* was found in milk samples from 4.5% of dairy cattle, 18.0% of sheep, and 2.0% water buffalo [10]
2009 - 2010	Izmir	shellfish	0	0% of mussels (*Mytilus galloprovincialis*) in the Gulf of Izmir (2009 to 2010) [11]

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Years	Region	Study Group	%	Notes
2020*	Nationwide	various (Literature Review)	13.4-15.2	13.2% of humans and 15.2% of animals (meta-analysis) [12]
2021*	Ankara	patients - immunocompromised	4	[13]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Study Group	%	Notes
2018*	rabbits	59	59% of breeding rabbits from a farm (*Encephalitozoon cuniculi*) [14]

* indicates publication year (not necessarily year of survey)

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9. Vet Parasitol 2011 Jun 30;179(1-3):234-7.
10. Int J Food Microbiol 2020 Aug 15;334:108828.
11. Saudi Med J 2016 Jun ;37(6):703-6.
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14. Vet Parasitol 2018 Oct 15;262:26-29.

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Molluscum contagiosum

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

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Mucormycosis

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

Mucormycosis in Turkey

Chronology

- 1995 to 2012 - 151 cases (82 fatal) of zygomycosis were reported in the literature from Turkey - including 91 rhinocerebral and 7 pulmonary. [3]
- 2011 (publication year) - 79 cases (39 fatal) of zygomycosis were reported in the literature from Turkey during a 10-year period - including 64 rhinocerebral and 6 pulmonary. [4]
- 2020 - Eleven cases of COVID-19 with rhino-orbital mucormycosis were treated at a center in Kayseri. [5]

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Mumps

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

Mumps in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

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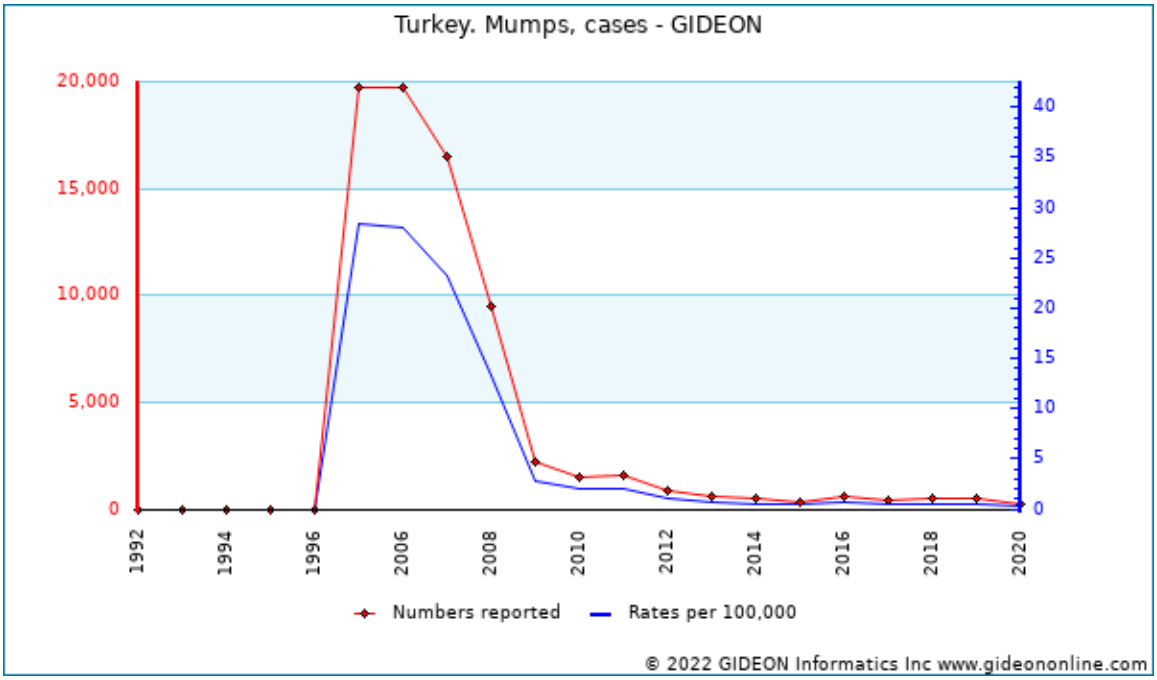

Graph: Turkey. Mumps, cases

Notes:
1. No cases were officially reported during 1992 to 1996.

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2006*	Eastern Region	children	29.9-88.8	29.9% of unvaccinated children ages 1 to 4 years, 88.8% ages 13 to 16 years (eastern Turkey, 2006 publication) [1]
2010*	Ankara	children	53	53% of children with acute lymphoblastic leukemia (Ankara, 2010 publication) [2]
2018*	Eskisehir	children	81.4	Survey of children with chronic neurological disease [3]
2003*	Ankara	adolescents	89.1	89.1% of adolescents in Ankara (2003 publication) [4]
2006*	Multiple locations	health care workers	92.2	92.2% of health care workers (2006 publication) [5]
2015 - 2016		health care workers	67.2	Survey of nursing students [6]
2015*	Yozgat	health care workers	83.3	83.3% of nursing students (Yozgat, 2015 publication) [7]
2007*	Istanbul	students - medical	96	96.0% of medical students (Istanbul, 2007 publication) [8]

* indicates publication year (not necessarily year of survey)

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Myalgic encephalomyelitis

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

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Mycetoma

Agent	BACTERIUM OR FUNGUS. *Nocardia* spp, *Madurella mycetomatis*, *Actinomadura pellitieri*, *Streptomyces somaliensis*, et al
Reservoir	Soil, Vegetation
Vector	None
Vehicle	Contact, Wound, Soil
Incubation Period	2w - 2y
Diagnostic Tests	Bacterial and fungal culture of material from lesion.
Typical Adult Therapy	Antimicrobial or antifungal agent as determined by culture. Excision as indicated[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Most patients are males age 20 to 40 (ie, occupational exposure) - Painless, chronic, draining, fistulous subcutaneous nodule - usually involving lower extremity - Osteolytic lesions may be noted on x-ray - Usually no fever
Synonyms	Actinomadura, Chaetomium atrobrunneum, Coelomycetes, Curvularia lunata, Cyphellophora, Diaporthe, Emarellia, Fusarium chlamydosporum, Fusarium subglutinans, Gloniopsis, Gordonia westfalica, Leptosphaeria tompkinsii, Madura foot, Madura-Fuss, Madurella, Medicopsis, Mycetom, Nigrograna, Paraconiothyrium, Peyronellaea, Pleurostomophora, Trematospheria, White grain eumycetoma. ICD9: 039.4,117.4 ICD10: B47

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Mycobacteriosis - M. marinum

Agent	BACTERIUM. Actinomycetes, *Mycobacterium marinum* An aerobic acid-fast bacillus
Reservoir	Fresh and salt water (swimming pools, aquaria), Fish (ornamental, salmon, sturgeon, bass), Zoonotic
Vector	None
Vehicle	Water (per areas of minor skin trauma), Contact
Incubation Period	5d - 270d (median 21d)
Diagnostic Tests	Mycobacterial culture from lesion. Alert laboratory when this organism is suspected.
Typical Adult Therapy	Clarithromycin 500 mg BID X 3-4m AND. OR Rifampin 600 mg/day OR Ethambutol 15 mg/kg/day X 3-4m OR Rifampin 600 mg/d + Ethambutol 15 mg/kg/d X 3-4m OR Minocycline 100 mg /day X 3m OR Sulfamethoxazole / Trimethoprim 160/800 mg BID X 3-4m[1]
Typical Pediatric Therapy	Sulfamethoxazole / Trimethoprim 5 mg-25 mg/kg BID X 6w. Alternative Minocycline (Age >= 8)
Clinical Hints	- Onset weeks after exposure to swimming pool, aquarium, other water source - Violaceous papule, ulcer, plaque, psoriaform lesion - Commonly involves the elbow, knee, hand or foot
Synonyms	Aquarium granuloma, Fish fanciers' finger syndrome, Fish tank granuloma, Mariner's TB, Mycobacterium balnei, Mycobacterium marinum, Mycobacterium scrofulaceum, Spam, Swimming pool granuloma. ICD9: 031.1 ICD10: A31.1

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Mycobacteriosis - M. scrofulaceum

Agent	BACTERIUM. Actinomycetes, *Mycobacterium scrofulaceum* An aerobic acid-fast bacillus
Reservoir	Water (lakes, rivers), Soil, Raw milk, Plant material
Vector	None
Vehicle	Water, Soil, Areas of minor trauma, Contact
Incubation Period	Unknown
Diagnostic Tests	Culture of tissue or aspirates.
Typical Adult Therapy	Excision. Drugs (Isoniazid - Rifampin - Streptomycin - Cycloserine) are rarely indicated[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Most common during early childhood. - Painless lymphadenopathy, most commonly unilateral and submandibular - In contrast, true tuberculosis involves the lower neck and produces a strongly positive tuberculin reaction and/or suggestive chest X ray
Synonyms	ICD9: 017.2 ICD10: A18.4

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Mycobacteriosis - miscellaneous nontuberculous

Agent	BACTERIUM. Actinomycetes, *Mycobacterium* spp. - over 130 species as of 2016 An aerobic acid-fast bacillus
Reservoir	Water, Soil, Fish, Mammal, Bird, Zoonotic
Vector	None
Vehicle	Air, Water, Milk (*M. bovis*), Contact, Ingestion, Trauma, Respiratory or pharyngeal acquisition
Incubation Period	Variable
Diagnostic Tests	Microscopy & culture of tissue, secretions, blood. Nucleic acid amplification. Inform laboratory if suspected
Typical Adult Therapy	Drug, route and duration appropriate to clinical setting and species (in Drugs module, scroll through upper left box)[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Pneumonia, or chronic granulomatous infection of various tissues - Systemic disease may complicate immune suppression - *Mycobacterium avium-intracellulare* infection characterized by aggressive course and resistance to most antimycobacterial drugs
Synonyms	Mycobacterioides abscessus, 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

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Mycoplasma (miscellaneous) infection

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

Mycoplasma (miscellaneous) infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Kahramanmaras	women	21	21% of women with unexplained infertility have vaginal colonization with *Ureaplasma urealyticum* (2007 publication) [3]
2018*	Istanbul	patients	48	*Mycoplasma / Ureaplasma* was found in 48% of infertile patients with leukocytospermia [4]
2003 - 2004	Ankara	patients - STD	3.17-6.34	6.34% of men with urethritis are infected with *Mycoplasma genitalium*, 4.76% *Ureaplasma urealyticum* and 3.17% *Mycoplasma hominis* (2003 to 2004, [5]
2004*		patients - STD	48	48% of patients with non-gonococcal urethritis were infected by *Ureaplasma urealyticum* (2004 publication) [6]
2018*	Ankara	patients - STD	0.6-10.3	*Ureaplasma urealyticum* was found in 10.3% of patients with "resistant discharge", *Mycoplasma hominis* 9.6% and *Mycoplasma genitalium* 0.6% [7]
2006*	Bolu	patients - vaginitis	4.4-48.4	48.4% of sexually-active women with abnormal vaginal discharge are infected with *Ureaplasma urealyticum*, 4.4% *Mycoplasma hominis* (Bolu, 2006 publication) [8]

* indicates publication year (not necessarily year of survey)

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Mycoplasma pneumoniae infection

Agent	BACTERIUM. Mollicutes. *Mycoplasma pneumoniae*
Reservoir	Human
Vector	None
Vehicle	Droplet, Respiratory or pharyngeal acquisition
Incubation Period	6d - 23d
Diagnostic Tests	Culture (sputum, throat). Serology. Nucleic acid amplification (sputum, blood).
Typical Adult Therapy	Azithromycin 500 mg, followed by 250 mg PO daily X 5 days. OR Doxycycline 100 mg PO BID X 7d OR Levofloxacin 750 mg PO X 7 d[1] [2] [3] [4]
Typical Pediatric Therapy	Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR Erythromycin 10 mg/kg PO QID X 10 d OR Clarithromycin 7.5 mg/kg PO BID X 10 d OR Doxycycline 2 mg/kg PO BID (maximum 200 mg/d) X 10 d
Clinical Hints	- Coryza, "hacking" cough and subsegmental pulmonary infiltrate - Bullous otitis media is often present - Most patients below age 30 - Cold agglutinins neither sensitive nor specific, and appear only during second week
Synonyms	Mycoplasma pneumoniae, Primary atypical pneumonia. ICD9: 041.81,483.0 ICD10: B96.0

Mycoplasma pneumoniae infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
1998 - 2000	Kirikkale	patients	0-9.6	0% of pediatric and 9.6% of adult respiratory tract infection (1998 to 2000) [5]
1999	Izmir	patients	17.6	17.6% of lower respiratory tract infections seen in-hospital (Izmir, 1999)
2004 - 2005	Istanbul	patients	30.2	30.2% of children aged 5 to 15 years seen at an outpatient clinic with lower respiratory infection; in 3.5% of cases, *Chlamydophila pneumoniae* serology (IgM) was also positive (Istanbul, 2004 to 2005) [6]
2006*	Istanbul	patients	27	27% of children hospitalized for pneumonia (Istanbul, 2006 publication) [7]
2006*	Izmir	patients	8	8% of children ages 3 months to 12 years hospitalized for respiratory infection (2006 publication) [8]
2010*	Trabzon	patients	13.8	13.8% of community-acquired pneumonia among adults (2010 publication) [9]
2011*	Gaziantep	specimens	3.3-9.1	6.7% of vascular samples from patients with atherosclerosis, 3.3% those without atherosclerosis, 9.1% of patients undergoing aortic valve replacement and 7.1% undergoing mitral valve replacement (2011 publication) [10]
2016 - 2018	Istanbul	children - respiratory	6.3	Survey of children hospitalized in an Intensive Care Unit for lower respiratory tract infection [11]

* indicates publication year (not necessarily year of survey)

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Myiasis

Agent	PARASITE - Insecta (Diptera) larvae
Reservoir	Mammal, Zoonotic
Vector	Arthropod
Vehicle	Fly eggs deposited by biting arthropod
Incubation Period	1w - 3m
Diagnostic Tests	Identification of extracted maggot. Dermatobia hominis larvae: length - 13 to 25 mm Cordylobia anthropophaga larvae: length - 11 to 15 mm
Typical Adult Therapy	Removal of maggot
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fly larvae seen in various body regions - Pruritic or painful draining nodule - Fever and eosinophilia may be present - Instances of brain, eye, middle ear and other deep infestations are described.
Synonyms	Calliphora, Cayor Worm, Chrysomya, Chrysomyia, Clogmia, Cochliomyia, Cordylobia, Cuterebrosis, Dermatobia, Eristalis, Fannia, Furuncular myiasis, Gasterophilus, Hypoderma, Lucilia, Lund's fly, Maggot infestation, Megaselia, Musca, Muscina, Oedemagena, Oestrus, Ophthalmomyiasis, Palpada, Parasarcophaga, Psychoda, Rectal myiasis, Sarcophaga, Screw worm, Telmatoscopus, Urinary myiasis, Vaginal myiasis, Wohlfarthia. ICD9: 134.0 ICD10: B87

Myiasis in Turkey

Etiology of Myiasis in Turkey

- **Cerebral myiasis** - *Hypoderma bovis* [1]
- **Gingival myiasis** - Calliphoridae [2] and *Wohlfahrtia magnifica* [3]
- **Nasal myiasis** - fruit fly (*Drosophila melanogaster*) larva [4]
- **Naso-ophthalmic myiasis** - *Oestrus ovis* [5] [6] [7] [8]
- **Oral myiasis** - *Hypoderma bovis* [9] , *Lucilia sericata* [10] and Calliphoridae larvae [11]
- **Otomyiasis** - *Wohlfahrtia magnifica* [12] [13] [14] [15] [16] and *Sarcophaga* (middle ear) [17]
- **Subungual myiasis** - Calliphoridae [18]
- **Urogenital myiasis** - *Eristalis tenax* [19] and *Psychoda albipennis* [20] [21] [22] [23] [24] [25] [26] [27] [28]
- **Wound myiasis** - *Lucilia sericata* [29] and *Sarcophaga carnaria* [30]

- Additional sporadic cases of myiasis due to *Wohlfahrtia magnifica* [31] [32] [33] [34] [35] [36] [37] and *Sarcophaga* spp. have been reported. [38] [39]

- 2009 (publication year) - Myiasis due to *Oestrus ovis* larvae is common among sheep in Kars Province. [40]

Case series

- 2017 to 2019 - 12 cases of wound myiasis, 8 due to Calliphoridae and 4 due to Sarcophagidae, in patients with diabetic foot ulcers in Aydin. [41]

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Necrotizing skin/soft tissue infx.

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

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Neutropenic typhlitis

Agent	BACTERIUM. *Clostridium septicum* (occasionally *Clostridium tertium*, *Clostridium sporogenes*, *Paeniclostridium sordellii* or *Clostridium tertium*)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Unknown
Diagnostic Tests	Typical findings in the setting of neutropenia. Ultrasonography may be helpful.
Typical Adult Therapy	Broad spectrum antimicrobial coverage, which should include clostridia and *Pseudomonas aeruginosa*; ie Piperacillin / Tazobactam (or Imipenem or Meropenem) OR Cefepime + Metronidazole Role of surgery is controversial[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Condition affects neutropenic (leukemic, genetic, etc) patients - Fever, abdominal pain, diarrhea (occasionally bloody) and right lower quadrant signs - Infection may spread hematogenously to the extremities - Case-fatality rate is 50% to 75%
Synonyms	Neutropenic enterocolitis. ICD9: 540.0 ICD10: A04.8

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Nocardiosis

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

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Onchocerciasis - zoonotic

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

Onchocerciasis - zoonotic in Turkey

As of 2013, *Onchocerca lupi*, a parasite of wolves, had been associated with three cases of human conjunctival infection in Turkey. [1] [2] [3]

2014 - Ocular infection by *Onchocerca lupi* was diagnosed in a German traveler who had returned from Tunisia and Turkey. [4]

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Orbital and eye infection

Agent	BACTERIUM OR FUNGUS. *Streptococcus pyogenes*, oral anaerobes, *Aspergillus* spp., facultative gram-negative bacilli, et al
Reservoir	Endogenous, Introduced flora (trauma, surgery)
Vector	None
Vehicle	Trauma, Surgery, Contiguous (sinusitis), Hematogenous
Incubation Period	Variable
Diagnostic Tests	Imaging techniques (CT or MRI). Culture of aspirates or surgical material.
Typical Adult Therapy	Local and systemic antimicrobial agents appropriate for species and severity[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Proptosis, chemosis, extraocular palsy, or hypopyon - Associated with sinusitis, bacteremia, eye trauma or surgery - Infection may involve the eye (endophthalmitis); periosteum (periorbital infection); orbit (orbital cellulitis); or multiple structures (panophthalmitis).
Synonyms	Bacterial keratitis, Ceratite, Cheratite, Endophthalmitis, Eye infection, Keratite, Keratitis, Orbital infection, Panopthalmitis, Queratitis. ICD9: 360.0 ICD10: H05.0

Orbital and eye infection in Turkey

Etiology

- 1988 to 2019 - Infectious diseases accounted for 15.1% to 16.8% of uveitis cases. Of the latter, toxoplasmosis was identified in 41.7%, herpetic anterior uveitis 39.2%, tuberculosis 7.1%, toxocariasis 1.2%, brucellosis 0.6%, Lyme disease 0.9% and CMV 5.9%. [4]
- 2021 (publication year) - Infectious diseases accounted for 12.7% of childhood uveitis cases (toxoplasmosis for 10.8%). [5]

Notable outbreaks

Years	Region	Setting	Cases	Clinical	Pathogen	Population	Notes
1994*	Kayseri		6	endophthalmitis	*Enterobacter*		cotton swabs. Outbreak associated with contaminated cotton swabs [6]
1996*	Ankara	ophthalmology unit	13	endophthalmitis			irrigation solution. Outbreak of postoperative endophthalmitis due to *Pseudomonas aeruginosa* and coagulase-negative staphylococci in Ankara was related to contaminated irrigation solutions. [7]
2003 - 2004	Ankara	ophthalmology department	3	endophthalmitis	*Aspergillus ustus*		[8]
2009*	Istanbul		8	endophthalmitis	*Fusarium*	patients - eye	cataract surgery. [9]
2010	Istanbul			conjunctivitis			[10]
2011*	Malatya	neonatal intensive care unit	24	conjunctivitis	Adenovirus 8	neonates	[11]
2011*	Istanbul		9	endophthalmitis	*Fusarium*	patients - eye	cataract surgery. [12]

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Years	Region	Setting	Cases	Clinical	Pathogen	Population	Notes
2012*	Izmir	neonatal intensive care unit	34	keratoconjunctivitis	Adenovirus	neonates	13
2012	Ankara	neonatal intensive care unit	43	conjunctivitis	Adenovirus	neonates	14

* indicates publication year (not necessarily year of outbreak)

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13. Ophthalmic Epidemiol 2012 Dec ;19(6):371-9.
14. Cutan Ocul Toxicol 2015 Mar ;34(1):12-5.

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Orf

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

Orf in Turkey

2017 - Orf virus infection was confirmed among cattle in multiple regions. [1]

Notable outbreaks

Years	Region	Cases	Population	Notes
1979 - 1980	Izmir	31		Outbreak followed extensive animal slaughtering during the "Feast of Sacrifice." [2]
2011*			various	Outbreak among humans and ovines on a farm [3]
2012	Gaziantep	13		[4]
2016	Anatolia		goats	Two outbreaks among goats in Central Anatolia [5]

* indicates publication year (not necessarily year of outbreak)

References

1. Comp Immunol Microbiol Infect Dis 2019 Aug ;65:1-6.
2. Hautarzt 1982 Jul ;33(7):384-7.
3. New Microbiol 2011 Jan ;34(1):37-43.
4. Euro Surveill 2013 Mar 14;18(11):20425.
5. Virusdisease 2017 Sep ;28(3):345-348.

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Ornithosis

Agent	BACTERIUM. Chlamydiaceae, Chlamydiae, *Chlamydia* (*Chlamydophila*) *psittaci*
Reservoir	Parakeet, Parrot, Pigeon, Turkey, Duck, Cat, Sheep, Goat, Cattle, Dog, Zoonotic
Vector	None
Vehicle	Bird droppings, Dust, Air, Aerosol from cat, Respiratory or pharyngeal acquisition
Incubation Period	7d - 14d (range 4d - 28d)
Diagnostic Tests	Serology. Culture (available in special laboratories) rarely indicated.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 10d. OR Azithromycin 1 g, then 0.5 g daily X 4 days OR Clarithromycin 0.5 g BID OR Erythromycin 500 mg PO QID X 10d. OR Levofloxacin 750 mg PO X 7 days[1] [2] [3]
Typical Pediatric Therapy	Azithromycin 10 mg/kg PO day 1; 5 mg/kg PO days 2 to 5 OR Erythromycin 10 mg/kg QID X 10d Alternative (Age >=8 years): Doxycycline 100 mg PO BID X 10d.
Clinical Hints	- Headache, myalgia and pneumonia - Relative bradycardia is common - Hepatomegaly or splenomegaly common - Onset 1 to 4 weeks following contact with pigeons, psittacine birds or domestic fowl - Case-fatality rate without treatment is 20%
Synonyms	Chlamydia abortus, Chlamydia gallinacea, Chlamydophila abortus, Chlamydophila psittaci, Ornitose, Papegojsjuka, Parrot fever, Psitacosis, Psittacosis, Psittakose. ICD9: 073 ICD10: A70

Ornithosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2006*	Istanbul	birds	34.4	34.4% of pet birds (Istanbul, 2006 publication) [4]
2007*	Ankara	birds	91.5	91.5% of fecal samples from caged birds (Ankara, 2007 publication) [5]
2020*	Multiple locations	birds - pigeon	6	Survey of pigeons (*Columbia domestica*) [6]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2006*	Izmir	children - respiratory	1	1% of children ages 3 months to 12 years hospitalized for respiratory infection (2006 publication) [7]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Cases	Population	Notes
2008*	2	family members	Outbreak involving a mother and child was ascribed to contact with pet parrots. [8]

* indicates publication year (not necessarily year of outbreak)

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2. Clin Microbiol Infect 2009 Jan ;15(1):11-7.
3. Semin Respir Infect 1997 Mar ;12(1):7-11.
4. Avian Dis 2006 Dec ;50(4):489-93.
5. Zoonoses Public Health 2007 ;54(6-7):237-42.
6. Mikrobiyol Bul 2020 Jan ;54(1):144-153.
7. Tuberk Toraks 2006 ;54(3):254-8.
8. Tuberk Toraks 2008 ;56(2):215-20.

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Osteomyelitis

Agent	BACTERIUM OR FUNGUS. *Staphylococcus aureus*, facultative gram-negative bacilli, *Candida albicans*, etc
Reservoir	Endogenous
Vector	None
Vehicle	Trauma, Surgery, Hematogenous
Incubation Period	Variable
Diagnostic Tests	Radiography, including bone scan. Culture of biopsy material.
Typical Adult Therapy	Systemic antimicrobial agent(s) appropriate to known or suspected pathogen. Surgery as indicated[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Limb pain or gait disturbance, often associated with obscure fever - May be preceded by infection of skin, soft tissues or joint; or result from bacteremia - X-ray changes are not apparent for at least 10 days in acute infection
Synonyms	Osteomielite, Osteomielitis, Osteomyelite, Paravertebral abscess. ICD9: 015,730.9 ICD10: M86

References

1. Rev Recent Clin Trials 2017 ;12(4):260-268.

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Otitis media

Agent	BACTERIUM OR VIRUS. *Haemophilus influenzae* & *Streptococcus pneumoniae* in most acute cases; RSV, Parainfluenza, et al
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Clinical findings. Culture of middle ear fluid if available.
Typical Adult Therapy	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): Amoxicillin / Clavulanate 1,000/62.5 mg BID X 3 days Alternatives: Cefdinir, Cefpodoxime, Cefprozil, fluoroquinolone[1] [2] [3] [4]
Typical Pediatric Therapy	If evidence of bacterial infection (severe otalgia >48 hours / fever >39 C): Amoxicillin / Clavulanate 45/3.2 mg/kg BID X 3 days
Vaccine	Pneumococcal conjugate vaccine
Clinical Hints	- Acute bacterial otitis media often represents the final stage in a complex of anatomic, allergic or viral disorders of the upper airways - Recurrent or resistant infections may require surgical intervention.
Synonyms	Otitis media aguda. ICD9: 382.0 ICD10: H65,H66

Otitis media in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

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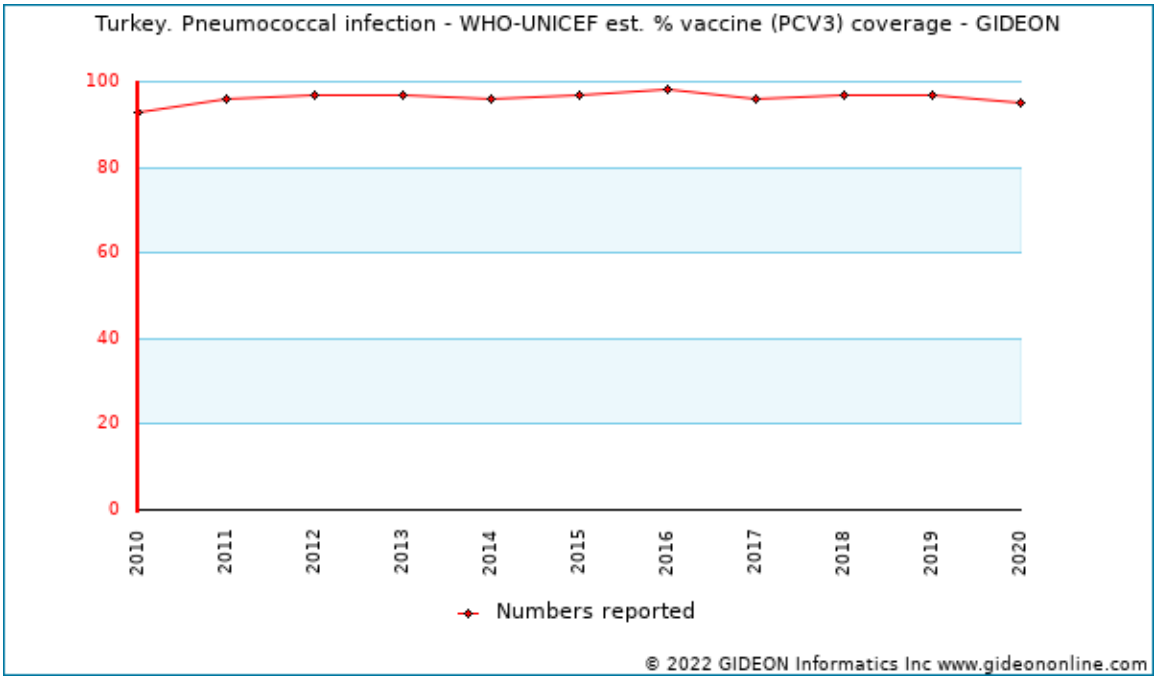
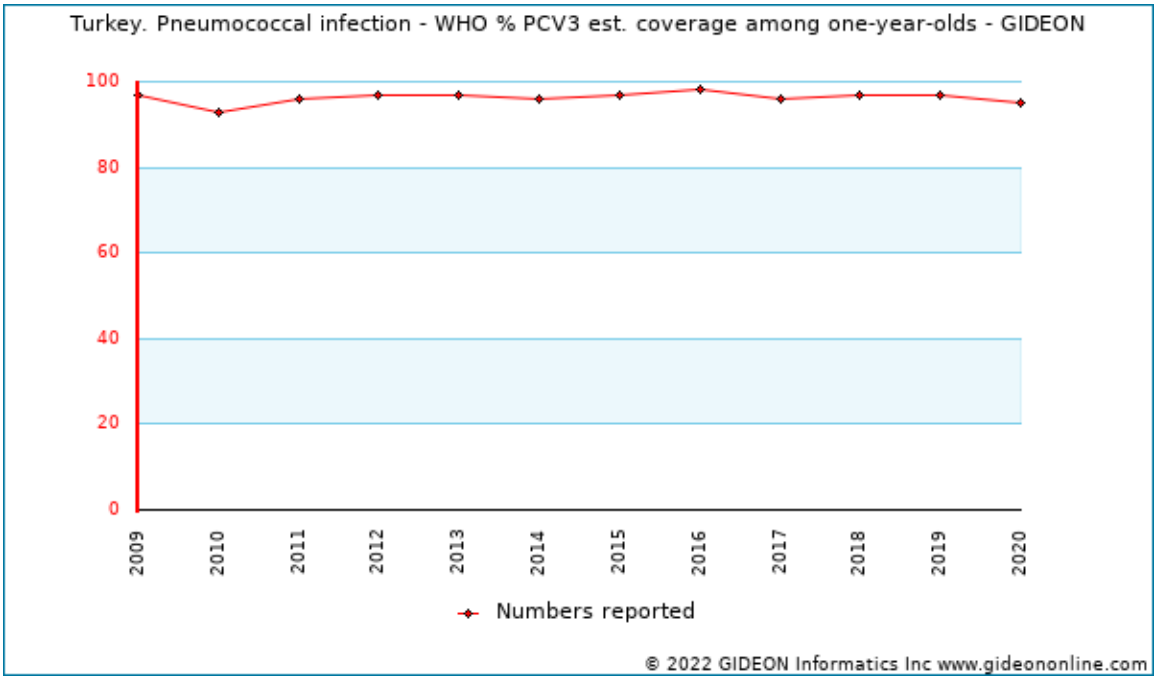


Graph: Turkey. Pneumococcal infection - WHO-UNICEF est. % vaccine (PCV3) coverage



Graph: Turkey. Pneumococcal infection - WHO % PCV3 est. coverage among one-year-olds

References

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2. BMJ Open 2018 Jun 08;8(6):e021133.
3. Pediatr Clin North Am 2018 02 ;65(1):105-123.
4. 2018 01 ;

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Parainfluenza virus infection

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

Parainfluenza virus infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Mersin	children	16.1	16.1% of children ages 0 to 2 years with acute bronchiolitis (Mersin, 2010) [1]
2012 - 2014	Ankara	children	4.2	Survey of children with febrile neutropenia [2]
2013 - 2016	Izmir	infants	5.6	5.6% of infants below age 2 years hospitalized with acute bronchiolitis [3]
1998 - 2000	Kirikkale	patients	9.2-10.4	9.2% of pediatric and 10.4% of adult respiratory tract infection (1998 to 2000) [4]
2002 - 2014	Izmir	patients	7.1-14.4	14.4% / 7.1% of children / adults with upper or lower respiratory tract infections (Izmir, 2002 to 2014) [5]
2010 - 2013	Izmir	patients	5	5% of patients with flu-like symptoms (Izmir, 2010 to 2013) [6]
2015 - 2018	Bursa	patients	5.8	15.1% of inpatients with respiratory infection [7]
1994 - 1995	Istanbul	children - respiratory	1.2	1.2% of children with acute lower respiratory infection during 1994 to 1995 (Istanbul) [8]
2002 - 2004	Manisa	children - respiratory	26.3	26.3% of community-acquired viral lower respiratory infection in young children (2002 to 2004) [9]
2006 - 2015	Ankara	children - respiratory	3.7	3.7% of children with respiratory tract infection [10]
2010 - 2011	Istanbul	children - respiratory	19.4	19.4% of children hospitalized with respiratory infection (2013 publication) [11]
2011*	Istanbul	children -	27.8	27.8% of viral lower respiratory tract infection in hospitalized children

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Years	Region	Study Group	%	Notes
		respiratory		(Istanbul, 2011 publication) [12]
2012*	Istanbul	children - respiratory	1.8	1.8% of pediatric acute respiratory tract infections (Istanbul, 2012 publication) [13]
2012 - 2016	Istanbul	children - respiratory	4.8	Survey of children hospitalized with lower respiratory tract infection [14]
2012 - 2016	Istanbul	children - respiratory	4.1	Survey of children hospitalized with lower respiratory tract infection [15]
2013 - 2014	Istanbul	children - respiratory	3.5	3.5% of children ages >2 years, with fever and respiratory tract symptoms (Istanbul, 2013 to 2014) [16]
2014 - 2017	Izmir	children - respiratory	18.7	18.7% of children receiving cancer chemotherapy, with acute respiratory infection [17]
2016 - 2018	Istanbul	children - respiratory	7.9	Survey of children hospitalized in an Intensive Care Unit for lower respiratory tract infection [18]
2016*	Gaziantep	children - respiratory	3.4-20	20.0% / 3.4% of children with acute lower respiratory tract infection and wheezing / controls [19]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Pathogen	Notes
2004 - 2005	Izmir	Parainfluenza type 3	[20]

References

1. Mikrobiyol Bul 2014 Apr ;48(2):242-58.
2. Turk J Pediatr 2017 ;59(5):511-519.
3. Glob Pediatr Health 2017 ;4:2333794X17714378.
4. Jpn J Infect Dis 2004 Apr ;57(2):33-6.
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9. Mikrobiyol Bul 2008 Jul ;42(3):429-35.
10. Turk J Pediatr 2018 ;60(6):642-652.
11. Ital J Pediatr 2013 Mar 27;39:22.
12. Turk J Pediatr 2011 Sep-Oct;53(5):508-16.
13. Indian J Pediatr 2013 Feb ;80(2):91-6.
14. Turk Pediatri Ars 2020 ;55(2):166-173.
15. Turk Pediatri Ars 2020 ;55(2):166-173.
16. Turk Pediatri Ars 2015 Dec ;50(4):217-25.
17. J Pediatr Hematol Oncol 2019 Jan 25;
18. Med Intensiva 2020 May 13;
19. Minerva Pediatr 2016 Nov 17;
20. Trop Doct 2007 Oct ;37(4):252-4.

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Parvovirus B19 infection

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

Parvovirus B19 infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2014 - 2018	Ankara	children	8.3	8.3% of children with pancytopenia associated with acute leukemia or aplastic anemia [1]
2014*	Ankara	specimens	21.4	21.4% of tonsillar tissue samples (2014 publication) [2]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1999	Istanbul	children	11.4	11.4% of children below age 12 years (Istanbul, 1999)
2012*		patients	30	30% of patients with essential hypertension, vs. 15.6% of controls (IgM, 2012 publication) [3]
2010*	Konya	general population	28.9	28.9% of individuals in Konya Province (2010 publication) [4]

* indicates publication year (not necessarily year of survey)

References

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2. Int J Pediatr Otorhinolaryngol 2014 Aug ;78(8):1288-93.
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Pediculosis

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

Pediculosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2006*	Afyon	children	0.8	0.8% of nursery children in Afyon (2006 publication) [5]
2007	Van	children	9.5	9.5% of children ages 12 to 15 years in Ercis district, Van Province (2007) [6]
2005	Kayseri	students	9.1	9.1% of primary school students in rural Kayseri Province (*Pediculus capitis*, 2005) [7]

* indicates publication year (not necessarily year of survey)

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1. J Eur Acad Dermatol Venereol 2017 Sep ;31(9):1425-1428.
2. Pediatr Dermatol 2016 Sep ;33(5):466-72.
3. Pediatrics 2015 May ;135(5):e1355-65.
4. Clin Dermatol 2015 May-Jun;33(3):347-54.
5. Korean J Parasitol 2006 Mar ;44(1):95-8.
6. Turkiye Parazitol Derg 2010 ;34(1):45-9.
7. Turkiye Parazitol Derg 2006 ;30(2):112-4.

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Pentastomiasis - Linguatula

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

Pentastomiasis - Linguatula in Turkey

Cross-border events

Years	Acquired by**	Originated in**	Setting	Cases	Notes
1991*	Germany	Turkey	animal	2	*Linguatula serrata* was identified in two stray dogs which had been imported from Turkey. [2]

***** indicates publication year (not necessarily year of event)
****** Country or Nationality

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

2. Tierarztl Prax 1991 Feb ;19(1):84-7.

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Pericarditis - bacterial

Agent	BACTERIUM. *Streptococcus pneumoniae*, *Staphylococcus aureus*, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Ultrasonography and cardiac imaging techniques. Culture of pericardial fluid (include mycobacterial culture).
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or anticipated pathogen. Drainage as indicated[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fever, chest pain and dyspnea - Patients are acutely ill and have overt signs such as venous distention - Enlarged cardiac "shadow" - Concurrent pneumonia or upper respiratory infection may be present - Case-fatality rate is 20%
Synonyms	Bacterial pericarditis, Pericardite. ICD9: 074.23,074.2,115.03,420 ICD10: I30

References

1. Cardiol Clin 2017 Nov ;35(4):615-622.

2. JAMA 2015 Oct 13;314(14):1498-506.

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Perinephric abscess

Agent	BACTERIUM OR FUNGUS. *Escherichia coli*, other facultative gram negative bacilli, *Candida albicans*, et al
Reservoir	Human
Vector	None
Vehicle	None
Incubation Period	Variable
Diagnostic Tests	Urine and blood culture. Renal imaging (CT, etc).
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or anticipated pathogen. Surgery as indicated[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Unexplained fever, leukocytosis and flank pain - Patients are typically over age 50, and often diabetic - Consider in the patient with nonresponsive "pyelonephritis" or a renal mass
Synonyms	ICD9: 590.2 ICD10: N15.1

References

1. Urologia 2014 Jul-Sep;81(3):144-7.

2. BJU Int 2011 Apr ;107 Suppl 3:20-3.

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Perirectal abscess

Agent	BACTERIUM. Various (often mixed anaerobic and aerobic flora)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of drainage material.
Typical Adult Therapy	Surgical drainage and antibiotics effective against fecal flora[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Anal or perianal pain with fever and a tender mass - Granulocytopenic patients commonly develop small, soft and less overt abscesses - often due to *Pseudomonas aeruginosa*.
Synonyms	ICD9: 566 ICD10: K61

References

1. Med Clin North Am 2014 May ;98(3):609-23.

2. Clin Colon Rectal Surg 2007 May ;20(2):102-9.

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Peritonitis - bacterial

Agent	BACTERIUM. Various (often mixed anaerobic and aerobic flora)
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Culture of blood and peritoneal fluid. Peritoneal fluid cell count may also be useful.
Typical Adult Therapy	Antimicrobial agent(s) appropriate to known or anticipated pathogens. Surgery as indicated[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Abdominal pain and tenderness - Vomiting, absent bowel sounds, guarding and rebound - Diarrhea may be present in children - Underlying visceral infection or perforation, trauma, hepatic cirrhosis (spontaneous peritonitis) etc.
Synonyms	Acute peritonitis, Bacterial peritonitis, Peritonite. ICD9: 567 ICD10: K65

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1. BMJ 2018 06 18;361:k1407.

2. World J Emerg Surg 2017 ;12:29.

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Pertussis

Agent	BACTERIUM. *Bordetella pertussis* An aerobic gram-negative coccobacillus
Reservoir	Human
Vector	None
Vehicle	Air, Infected secretions, Respiratory or pharyngeal acquisition
Incubation Period	7d - 10d (range 5d - 21d)
Diagnostic Tests	Culture & direct fluorescence (nasopharynx). Alert laboratory when suspected. Serology.
Typical Adult Therapy	Respiratory precautions. Azithromycin 500 mg PO X 1, then 250 mg daily X 4 days OR Clarithromycin 500 mg PO BID X 7 days OR Sulfamethoxazole / Trimethoprim 800/160 mg PO BID X 14 days[1]
Typical Pediatric Therapy	Respiratory precautions: Azithromycin (age 6 mo): 10 mg/kg PO X 1, then 5 mg/kg daily X 4 days OR Clarithromycin 15/mg/kg PO BID X 7 days OR Sulfamethoxazole / Trimethoprim TMP 4 mg/kg PO BID X 14 days
Vaccine	DTaP vaccine DTP vaccine
Clinical Hints	- Coryza, paroxysmal cough - May be associated with pneumonia or otitis - Prominent lymphocytosis - Most often diagnosed in young children, but may present as indolent cough in adults - Epistaxis and subconjunctival hemorrhage often noted - Seizures (below age 2) - Case-fatality rate is 0.5%
Synonyms	Bordetella holmesii, Bordetella parapertussis, Bordetella pertussis, Chincofe, Chyncough, Coqueluche, Keichhusten, Keuchhusten, Kichhosta, Kikhosta, Kikhoste, Kinkhoest, Kinkhost, Kirkhosta, Parapertussis, Pertosse, Syndrome coqueluchoide, Tos convulsa, Tos farina, Tosse convulsa, Tussis convulsa, Whooping cough. ICD9: 033 ICD10: A37

Pertussis in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

Diphtheria-Pertussis immunization was introduced in 1937; and DPT in 1968. [2]

Routine whole-cell pertussis immunization was introduced in 1968, and replaced by acellular vaccine in 2008. A booster at age 6 was added in 2010. [3]

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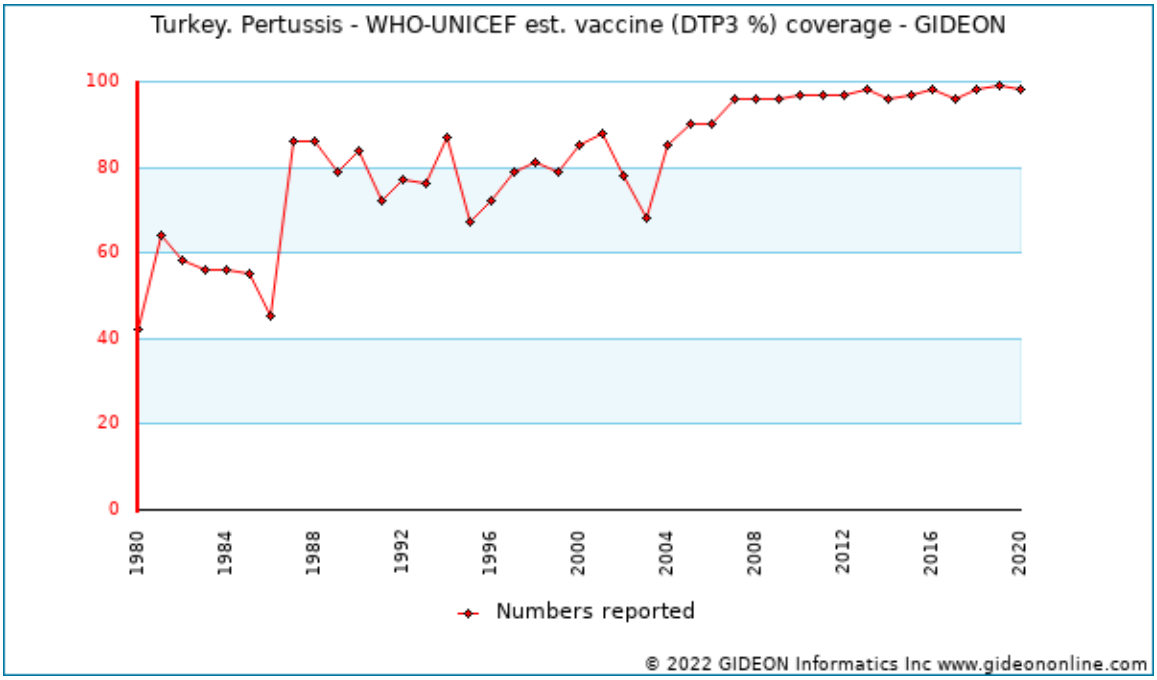
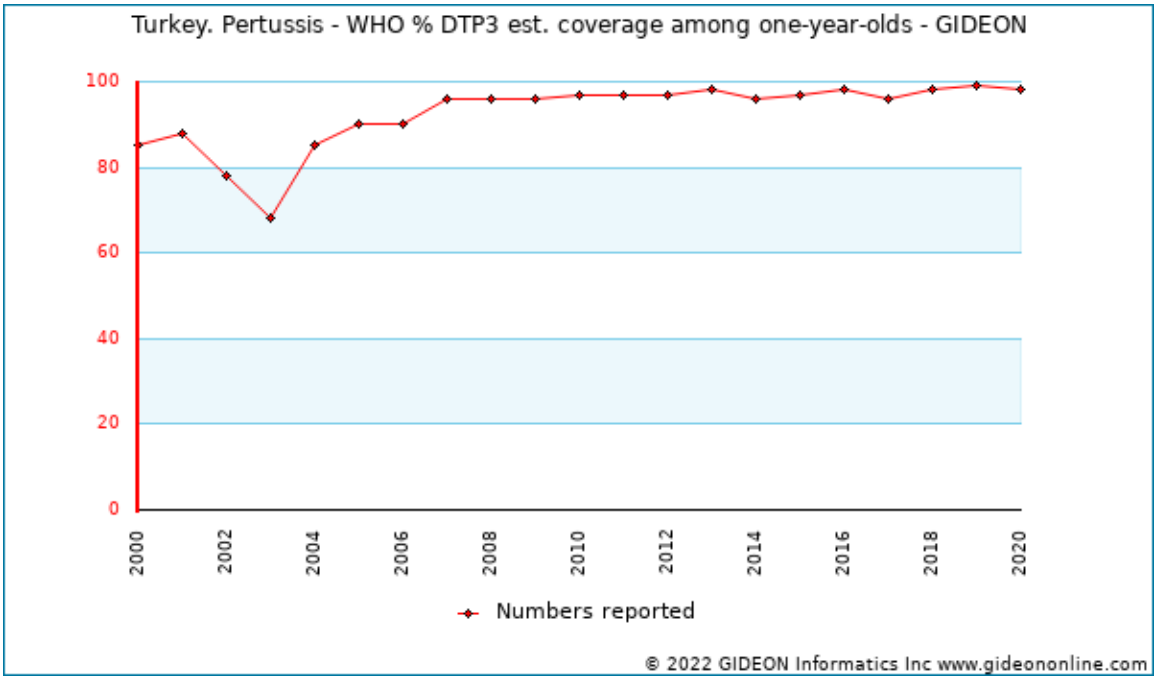


Graph: Turkey. Pertussis - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Turkey. Pertussis - WHO % DTP3 est. coverage among one-year-olds

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Ankara	children	16.9	16.9% of children aged <16 years with cough for more than 2 weeks (Ankara, 2007 publication) [4]
2008 - 2009	Samsun	children	48.3	48.3% of healthy children in Samsun (2008 to 2009) [5]

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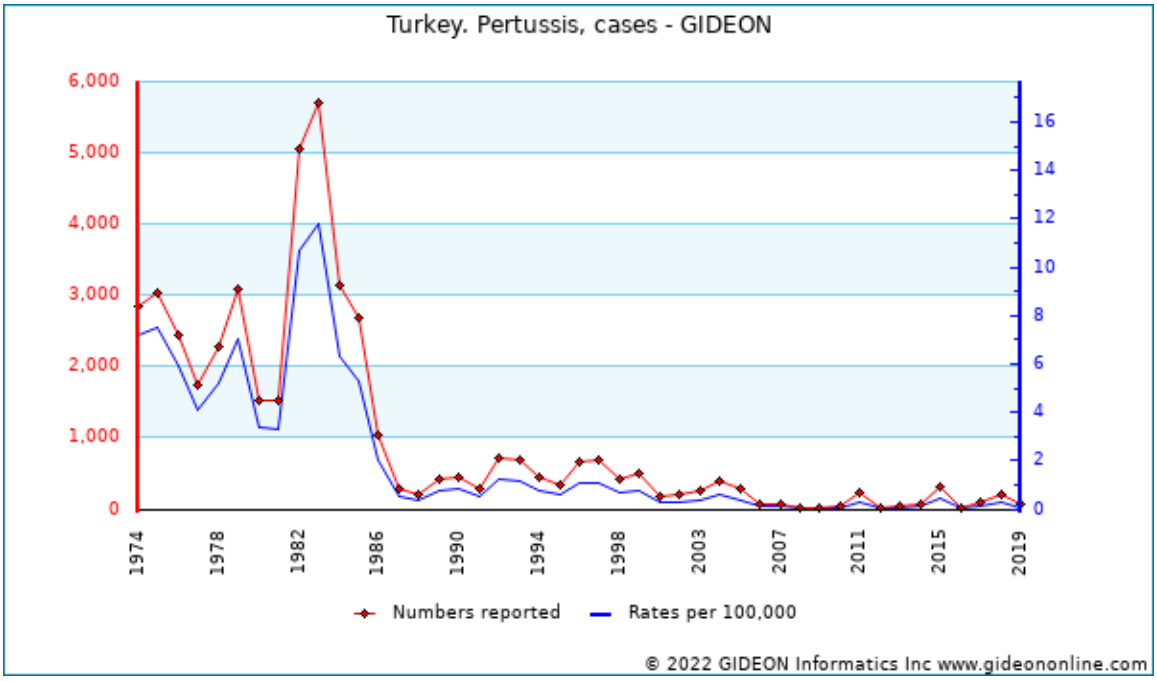
Years	Region	Study Group	%	Notes
2009 - 2010	Izmir	children	23.5	23.5% of children with persistent cough (2009 to 2010) [6]
2016*	Izmir	children	19.8	19.8% of children with chronic cough [7]
2014*	Antalya	adolescents	7	7% of adults and adolescents with chronic cough (nasopharyngeal swab PCR, 2014 publication) [8]
2017*	Bornova	infants	25.6	*Bordetella pertussis* infection was present in 25.6% of infants hospitalized for acute bronchiolitis [9]
2016*		patients	9.7	9.7% of adults with prolonged couth (2016 publication) [10]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005*	Eastern Region	children	30.1	30.1% of children ages 0 to 71 months in eastern Turkey (2005 publication) [11]
2007*	Ankara	children	16.6	16.6% of school children aged 6 to 14 years with cough for more than 2 weeks (central Ankara, 2007 publication) [12]
2009*	Ankara	children	59.3	59.3% of immunized school children (9 to 17 years) (protective antibody levels, Ankara, 2009 publication) [13]
2014*	Ankara	patients	10	10% of adult outpatients treated at a university hospital (2014 publication) [14]
2013*	Isparta	adults	12.8	12.8% of children ages 10 to 15 years, and 0% of adults (Isparta Province, 2013 publication) [15]
2017*	Istanbul	adults	39.6	[16]
2014	Manisa	general population	58.1	58.1% of the general population (antitoxin) [17]
2014*	Izmir	general population	91.5	91.5% of individuals in Izmir (2014 publication) [18]
2007*		pregnant women	50	As many as 50% of expectant mothers lack sufficient serum antibody titers (2007 publication) [19]

* indicates publication year (not necessarily year of survey)



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Graph: Turkey. Pertussis, cases

Notes:
1. Five deaths were ascribed to pertussis during 1987 to 1991.

- 2017 to 2019 - 18 cases (3 fatal) of pertussis were treated in a Pediatric Intensive Care unit in Istanbul. [20]

References

1. MMWR Recomm Rep 2005 Dec 09;54(RR-14):1-16.
2. Turk J Med Sci 2020 Oct 31;
3. Mikrobiyol Bul 2018 Apr ;52(2):180-189.
4. Scand J Infect Dis 2008 ;40(4):314-9.
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6. Mikrobiyol Bul 2012 Apr ;46(2):211-24.
7. Turk J Pediatr 2016 ;58(1):41-46.
8. Epidemiol Infect 2015 Sep ;143(12):2613-8.
9. Indian J Pediatr 2018 03 ;85(3):189-193.
10. Mikrobiyol Bul 2016 Jul ;50(3):361-70.
11. Public Health 2005 Jun ;119(6):550-5.
12. Tohoku J Exp Med 2007 Apr ;211(4):353-8.
13. Epidemiol Infect 2010 Feb ;138(2):299-303.
14. Eur J Intern Med 2014 Jul ;25(6):528-32.
15. Mikrobiyol Bul 2013 Jul ;47(3):507-13.
16. Mikrobiyol Bul 2017 Jan ;51(1):62-72.
17. Mikrobiyol Bul 2018 Apr ;52(2):180-189.
18. J Trop Pediatr 2015 Feb ;61(1):32-6.
19. J Clin Lab Anal 2007 ;21(3):154-61.
20. Turk Pediatri Ars 2020 ;55(1):54-59.

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Pharyngeal and cervical space infx.

Agent	BACTERIUM. *Streptococcus pyogenes*, mixed oral anaerobes, etc.
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Careful examination of region and X-ray (or CT scan). Smear and culture of pus if available.
Typical Adult Therapy	Surgical drainage and parenteral antibiotics effective against oral flora[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fever, painful swelling and displacement of the tongue, fauces and other intraoral structures - Dysphagia, dyspnea or jugular phlebitis may ensue in more virulent infections
Synonyms	Cervical space infection, Descending necrotizing mediastinitis, Lemmier's syndrome, Ludwig's angina, Post-anginal septicemia, Quinsy. ICD9: 682.0,682.1 ICD10: J36,J39.0,J39.1

References

1. Eur Arch Otorhinolaryngol 2009 Mar ;266(3):315-23.

2. Infect Dis Clin North Am 2007 Jun ;21(2):523-41, viii.

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Pharyngitis - bacterial

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

Pharyngitis - bacterial in Turkey

Notable outbreaks

Years	Region	Setting	Cases	Source	Notes
1988	Ankara	luncheon	37	food	[2]
2008	Aydin	hospital	252	dairy product	Outbreak associated with ingestion of a dairy dessert in a hospital cafeteria [3]

References

1. PLoS Negl Trop Dis 2018 03 ;12(3):e0006335.
2. Mikrobiyol Bul 1989 Oct ;23(4):302-11.
3. Infection 2012 Feb ;40(1):49-55.

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Philophthalmosis

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

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Phleboviruses - Old World

Agent	VIRUS - RNA. Bunyaviridae, Phlebovirus: Sandfly fever virus (at least three types) Dabie Mountain virus (tentative designation)
Reservoir	Rodent, Sandfly (*Phlebotomus*), Rodent
Vector	Sandfly (*Phlebotomus papatasi*, *Ph. perfilewi*, et al)
Vehicle	None
Incubation Period	3d - 4d (range 2d - 9d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Clinical Hints	- Disease is most common during summer in temperate regions - Myalgia, eye pain, arthralgia, vomiting, facial flush and leukopenia - Gastrointestinal symptoms common in Dabie Mountain virus infection - Fever resolves within 5 days; fatality and sequelae are not reported
Synonyms	Adana, Adria, Dabie Mountain virus, Grenada virus, Karimabad, Medjerda valley, Naples sandfly fever, Olbia virus, Pappataci fever, Phlebotomus fever, Provencia virus, Punique, Saddaguia, Salehabad, Sandfly fever, Sandfly fever Turkey virus, Sicilian virus, Tacheng tick virus, Three-day fever, Toscana. ICD9: 066.0 ICD10: A93.1

Phleboviruses - Old World in Turkey

Time and Place

Outbreaks of sandfly fever have been reported in the Mediterranean provinces of Adana, Izmir and the central province of Ankara - a new variant of Sicilian virus ("sandfly fever Turkey virus") was implicated. [1]

- 2008 to 2009 - Outbreaks were reported in the Ankara region. [2]

2010 - 14 cases of neurological infection due to Toscana virus were identified through survey of cerebrospinal fluid samples in Ankara and Izmir. [3]

2012 - Two cases of Toscana virus infection were identified among patients with febrile illness in Eastern Thrace. [4]

2012 (publication year) - A case of viral encephalitis due to Sandfly Fever Turkey Virus (SFTV) was reported. [5]

2014 (publication year) - An HIV-positive patient in Adana was treated for acute Toscana virus infection. [6]

Prevalence surveys

Years	Region	Study Group	%	Notes
2015	Mersin	dogs	1.3	1.3% of canine plasma samples in Mersin Province (Toscana virus, 2015) [7]
2012 - 2013	Anatolia	flies	0.88	0.88% of sandfly pools from southern Anatolia (2012 to 2013) [8]
2017	Multiple locations	flies	6.7	Toscana virus was identified in 6.7% of sandfly pools [9]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2013	Multiple	animals	4-40	40.4% of dogs and 4% of goats in Adana and Mersin Provinces (Toscana virus, 2013)

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Years	Region	Study Group	%	Notes
	locations			[10]
2012	Ankara	general population	2.1	2.1% of individuals in Ankara Province (Toscana virus, 2012) [11]
2010*	Multiple locations	blood donors	32.9	32.9% of blood donors in Ankara, Konya, Eskisehir and Zonguldak provinces (2010 publication) [12]
2011*		blood donors	74.2	74.2% of healthy blood donors in an endemic area (Toscana virus, 2011 publication) [13]
2011*	Ankara	blood donors	17.8	17.8% of healthy blood donors in Ankara (Toscana virus, 2011 publication) [14]
2012	Thrace	blood donors	14.4	14.4% of blood donors in Eastern Thrace (Toscana virus, 2012) [15]
2015*	Mersin	blood donors	66.8	66.8% of blood donors in Mersin Province - 51.6% Sicilian virus, 46.4% Naples virus, 43.7% Toscana virus and 47.3% Cyprus virus (2015 publication) [16]

* indicates publication year (not necessarily year of survey)

- Adana virus, a member of the Salehabad complex, has been identified in sandflies in Turkey. Seropositivity toward Adana virus was confirmed among humans, goats, sheep and dogs in the area. [17]
- *Phlebotomus major* has been identified as the vector for sandfly fever Turkey virus. [18]

Notable outbreaks

Years	Region	Cases	Pathogen	Notes
2009	Kirikkale	20		Outbreak in Kirikkale province, central Anatolia [19]
2010	Kahramanmaras	9	Sicilian sandfly virus	[20]

References

1. J Clin Virol 2010 Aug ;48(4):264-9.
2. J Infect 2011 Nov ;63(5):375-81.
3. J Infect 2012 Oct ;65(4):343-9.
4. Clin Microbiol Infect 2014 Apr ;20(4):319-25.
5. J Clin Virol 2012 May ;54(1):79-82.
6. Mikrobiyol Bul 2014 Jan ;48(1):168-73.
7. J Cell Physiol 1980 Jun ;103(3):447-53.
8. PLoS Negl Trop Dis 2016 Mar ;10(3):e0004519.
9. Med Vet Entomol 2020 May 19;
10. Am J Trop Med Hyg 2015 Apr ;92(4):690-7.
11. Zoonoses Public Health 2014 Nov ;61(7):480-91.
12. Clin Microbiol Infect 2011 Apr ;17(4):575-81.
13. Vector Borne Zoonotic Dis 2011 Jun ;11(6):781-7.
14. Zoonoses Public Health 2012 Mar ;59(2):148-54.
15. Clin Microbiol Infect 2014 Apr ;20(4):319-25.
16. Mikrobiyol Bul 2015 Jul ;49(3):403-13.
17. J Virol 2015 Apr ;89(8):4080-91.
18. Vector Borne Zoonotic Dis 2012 Aug ;12(8):690-8.
19. Mikrobiyol Bul 2010 Jul ;44(3):431-9.
20. Int J Infect Dis 2012 Apr ;16(4):e244-6.

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Pityriasis rosea

Agent	UNKNOWN. Human herpesvirus 7 has been implicated
Reservoir	Unknown
Vector	Unknown
Vehicle	Unknown
Incubation Period	Unknown
Diagnostic Tests	Clinical features.
Typical Adult Therapy	Supportive; ultraviolet B exposure is suggested Acyclovir 400 mg PO TID X 7 days has been used in severe cases[1]
Typical Pediatric Therapy	Supportive; ultraviolet B exposure is suggested
Clinical Hints	- Herald patch followed by crops of pruritic, salmon-colored macules and papules - Systemic symptoms are rare - Illness resolves after 3 to 8 weeks
Synonyms	ICD9: 696.3 ICD10: L42

References

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

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Plague

Agent	BACTERIUM. *Yersinia pestis* A facultative gram-negative bacillus
Reservoir	Rodent, Rabbit, Cat, Dog, Sheep, Wild carnivore, Zoonotic
Vector	Flea (*Pulex*; *Xenopsylla*)
Vehicle	Air, Contact, Respiratory or pharyngeal acquisition
Incubation Period	2d - 7d (range 1d - 14d)
Diagnostic Tests	Culture (blood, sputum, pus). Fluorescent (DFA) staining of pus. Nucleic acid amplification.
Typical Adult Therapy	Strict isolation. Ciprofloxacin 400 mg Q8h IV or 750 mg Q12h PO OR Gentamicin 2 mg/kg IV loading dose, then 1.7 mg/kg Q8h. OR Streptomycin 15 mg/kg q12h X 10d. OR Doxycycline 100 mg PO BID X 10d. OR Chloramphenicol 15 mg/kg PO QID[1] [2] [3]
Typical Pediatric Therapy	Strict Isolation. Ciprofloxacin 10 mg/kg Q8h or Q12h IV or 15 mg/kg Q8h or Q12h PO OR Gentamicin 2 mg/kg IV loading dose, then 1.7 mg/kg Q8h OR Streptomycin 10 mg/kg q8h X 10d. OR Chloramphenicol 15 mg/kg PO QID X 10d
Vaccine	Plague vaccine
Clinical Hints	- History of rodent contact or exposure to other cases - Suppurative lymphadenitis with septicemia - Hemorrhagic pneumonia in some cases - Case-fatality rates for bubonic plague without therapy are 50% to 60%
Synonyms	Black death, Black plague, Bubonic plague, Glandular plague, Hemorrhagic plague, Peste, Pneumonic plague, Saint Roch's disease, Yersinia pestis. ICD9: 020 ICD10: A20

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

Plague in Turkey

Turkey. Plague, cases: None reported between 1987 and 2018

Notable outbreaks

Years	Region	Cases	Deaths	Notes
1816				Outbreak affected primarily Constantinople and Izmir [4]
1947	Border Region	19	13	Outbreak along the Syrian border [5]

References

1. J Clin Microbiol 2018 Jan ;56(1)
2. Expert Rev Anti Infect Ther 2013 Aug ;11(8):817-29.
3. Clin Infect Dis 2020 May 21;70(Supplement_1):S3-S10.
4. Acta Med Hist Adriat 2017 Dec ;15(2):283-290.
5. Bull World Health Organ 1951 ;4(4):475-533.

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Plesiomonas infection

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

Plesiomonas infection in Turkey

Rare instances of *Plesiomonas shigelloides* infection are reported. [4]

References

1. Antimicrob Agents Chemother 1989 Sep ;33(9):1609-10.
2. Comp Immunol Microbiol Infect Dis 2004 Mar ;27(2):129-39.
3. J Antimicrob Chemother 2001 Dec ;48(6):803-11.
4. J Microbiol Immunol Infect 2010 Aug ;43(4):344-6.

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Pleurodynia

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

Pleurodynia in Turkey

Notable outbreaks

Years	Region	Notes
1963	Istanbul	1

References

1. Tip Fak Mecm 1964 ;27:184-9.

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Pneumocystis pneumonia

Agent	FUNGUS. Ascomycota, Archiascomycetes, Pneumocystidales: *Pneumocystis jiroveci* (now distinct from *Pneumocystis carinii*)
Reservoir	Human
Vector	None
Vehicle	Air, Respiratory or pharyngeal acquisition
Incubation Period	4d - 8w
Diagnostic Tests	Identification of organisms in induced sputum, bronchial washings, tissue. Serology. Nucleic acid amplification.
Typical Adult Therapy	Therapy: Sulfamethoxazole / Trimethoprim 25 mg/5 mg/kg QID X 14d. OR Pentamidine 4 mg/kg/d X 14d. OR Dapsone + Trimethoprim. OR Atovaquone OR Primaquine + Clindamycin Prophylaxis - similar, but at altered dosage. Dapsone also used.[1] [2] [3] [4]
Typical Pediatric Therapy	Therapy: Sulfamethoxazole / Trimethoprim 25 mg/5 mg/kg QID X 14d. OR Pentamidine 4 mg/kg/d X 14d. OR Dapsone + Trimethoprim. OR Atovaquone OR Primaquine + Clindamycin Prophylaxis - similar, but at altered dosage.
Clinical Hints	- Dyspnea, hypoxia and interstitial pneumonia - Usually encountered in the setting of severe immune suppression (AIDS, leukemia, etc) - Roentgenographic findings (typically bilateral alveolar pattern) may appear after several days
Synonyms	PCP, Pneumocystis carinii, Pneumocystis jiroveci. ICD9: 136.3 ICD10: B59

Pneumocystis pneumonia in Turkey

1955 (publication year) - *Pneumocystis* infection was first reported in Turkey. [5]

Case series

- 2011 to 2018 - 18 adult solid-organ transplant recipients were treated for *Pneumocystis jirovecii* pneumonia at a hospital in Izmir. [6]
- 2016 to 2018 - 96 immunocompromised patients were treated for *Pneumocystis jirovecii* pneumonia at a hospital in Mersin. [7]

Prevalence surveys

Years	Region	Study Group	%	Notes
2011 - 2018	Izmir	transplant recipients	2.6	Survey of adult solid-organ transplant recipients [8]
2001*		patients - cancer	62.5	62.5% of patients with hematological malignancies and pneumonia [9]
2008*		immunocompromised	14	14% of pulmonary infections among immunocompromised hosts with hematological malignancy (2008 publication) [10]
2011 - 2014		immunocompromised	50	50% of iatrogenically-immunosuppressed patients (colonization, 2011 to 2014) [11]
2013*		immunocompromised	14	14% of immunocompromised patients with respiratory symptoms (2013 publication) [12]

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Years	Region	Study Group	%	Notes
2015	Izmir	deaths	18.5	*Pneumocystis jirovecii* was identified in 18.5% of lung specimens obtained at autopsy [13]
2016 - 2018	Mersin	patients - immunocompromised	16.7	Survey of immunocompromised patients with signs of atypical pneumonia (PCR) [14]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Population	Notes
1955*	infants	[15]

* indicates publication year (not necessarily year of outbreak)

References

1. 2018 01 ;
2. Clin Chest Med 2017 Sep ;38(3):465-477.
3. Expert Rev Anti Infect Ther 2017 09 ;15(9):873-892.
4. Open Forum Infect Dis 2020 May ;7(5):ofaa112.
5. Turk Tip Cemiy Mecm 1955 Oct ;21(10):489-95.
6. Exp Clin Transplant 2020 Nov 27;
7. Mikrobiyol Bul 2020 Oct ;54(4):583-595.
8. Exp Clin Transplant 2020 Nov 27;
9. Turk J Haematol 2001 Jun 05;18(2):131-6.
10. Diagn Interv Radiol 2008 Jun ;14(2):75-82.
11. Mikrobiyol Bul 2015 Apr ;49(2):221-30.
12. Mikrobiyol Bul 2013 Jan ;47(1):195-7.
13. J Med Microbiol 2016 Oct ;65(10):1152-1157.
14. Mikrobiyol Bul 2020 Oct ;54(4):583-595.
15. Tip Fak Mecm 1955 ;18(4):838-60.

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Pneumonia - bacterial

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

Pneumonia - bacterial in Turkey

2008 (publication year) - Bacterial pneumonia accounted for 33.3% of pulmonary infections among immunocompromised hosts with hematological malignancy. [1]

2010 (publication year) - *Streptococcus pneumoniae* accounted for 14.7% of community-acquired pneumonia among adults, *Mycoplasma pneumoniae* 13.8% and Respiratory syncytial virus 10.1%. [2]

2012 (publication year) - *Streptococcus pneumoniae* was found in 25% of adults with community-acquired pneumonia in Manisa, *H. influenzae* and *M. pneumoniae* in 7%. [3]

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1. Diagn Interv Radiol 2008 Jun ;14(2):75-82.
2. Tuberk Toraks 2010 ;58(2):119-27.
3. Mikrobiyol Bul 2012 Oct ;46(4):523-31.

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Poliomyelitis and acute flaccid paralysis

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

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

Poliomyelitis and acute flaccid paralysis in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

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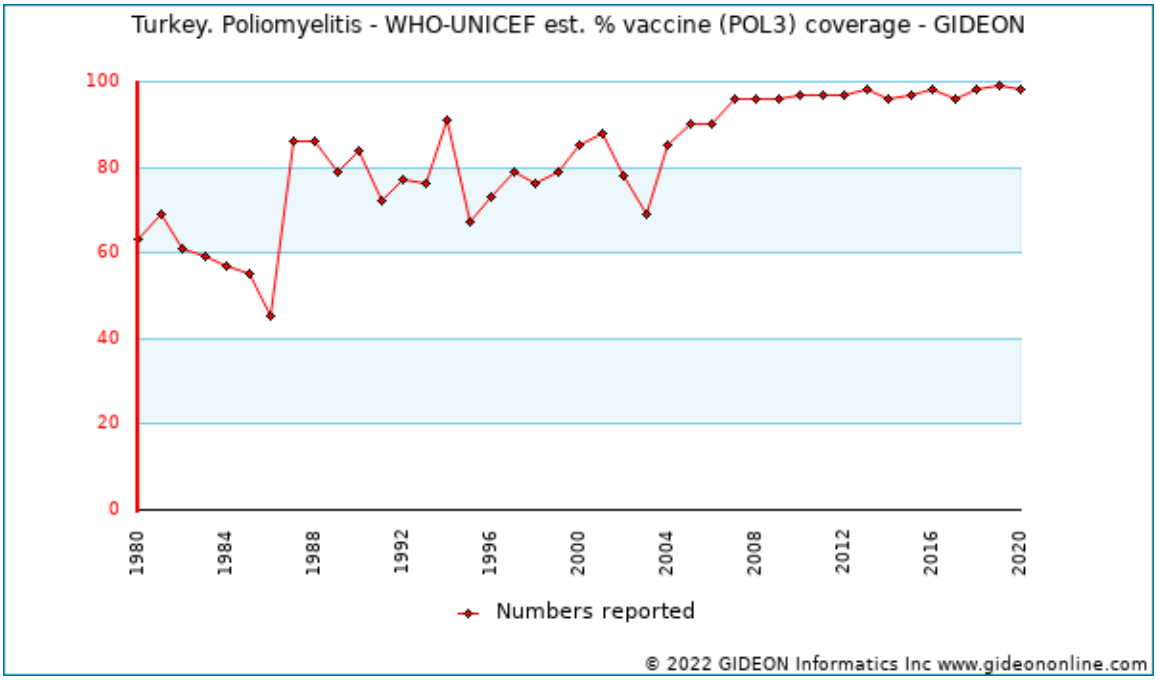
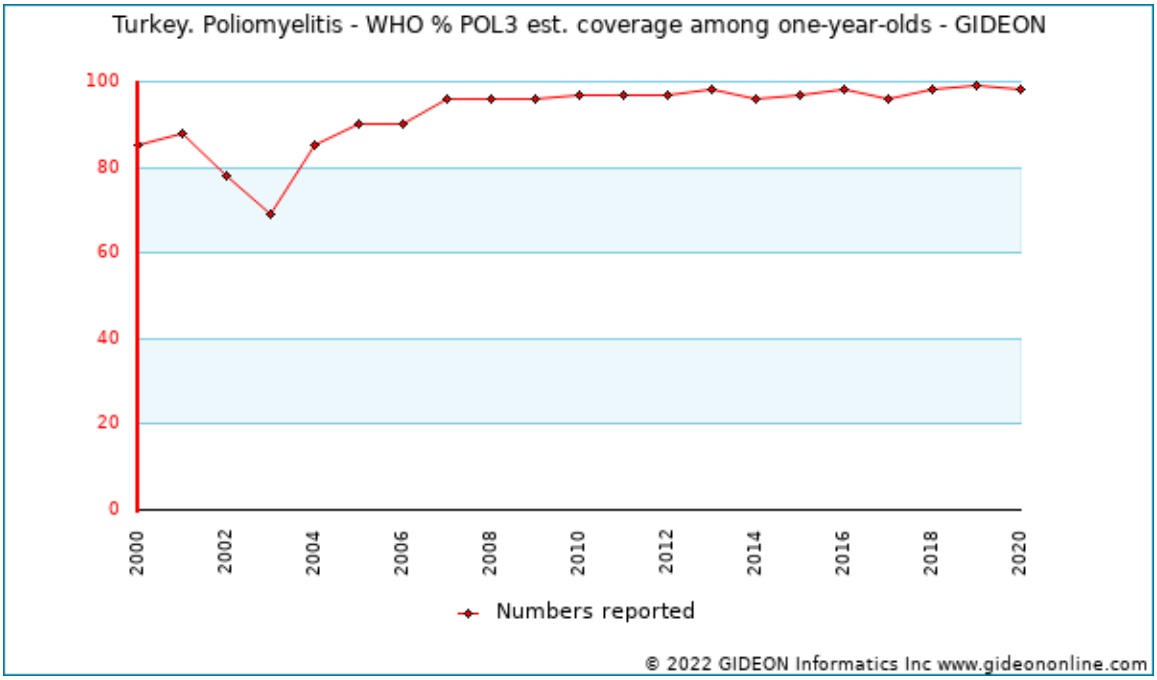


Graph: Turkey. Poliomyelitis - WHO-UNICEF est. % vaccine (POL3) coverage



Graph: Turkey. Poliomyelitis - WHO % POL3 est. coverage among one-year-olds

Live Polio immunization was introduced in 1963. [1]

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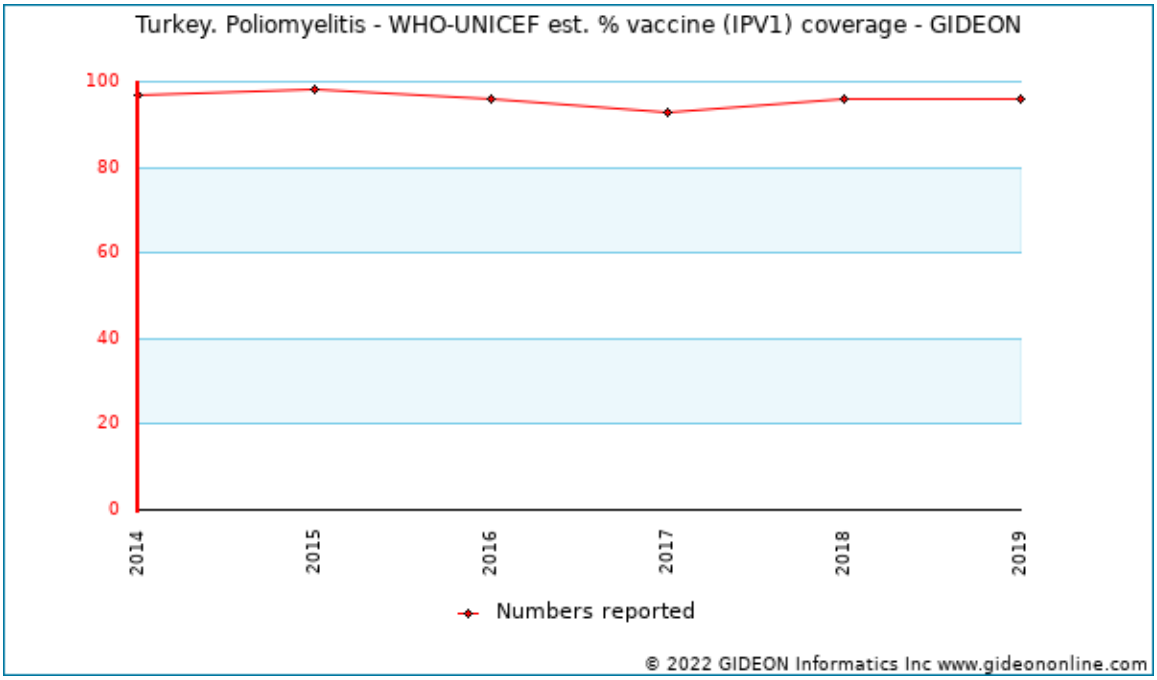

Graph: Turkey. Poliomyelitis - WHO-UNICEF est. % vaccine (IPV1) coverage

Seroprevalence surveys

Years	Study Group	%	Notes
1956*	children	86	86% at age 0 to 1 year are seropositive to at least one type [2]
1956*	children	73	73% at age 2 to 4 years [3]
1956*	children	94	94% at age 5 to 9 years [4]
1956*	general population	100	100% above age 9 years (1956 publication) [5]

* indicates publication year (not necessarily year of survey)

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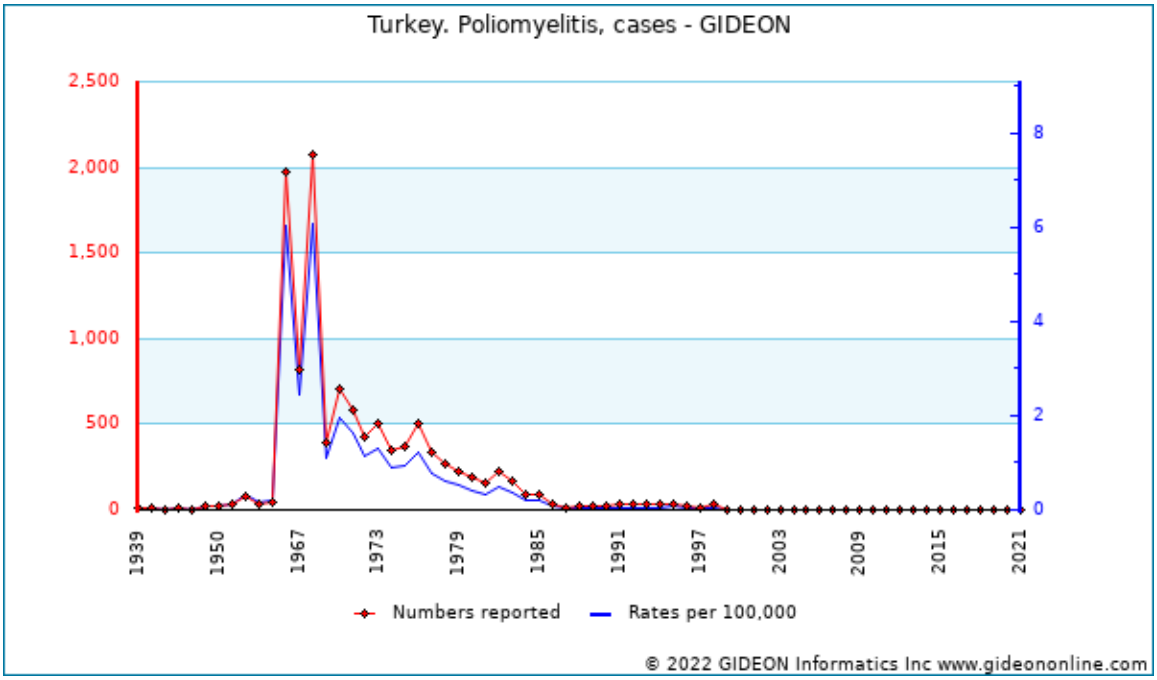


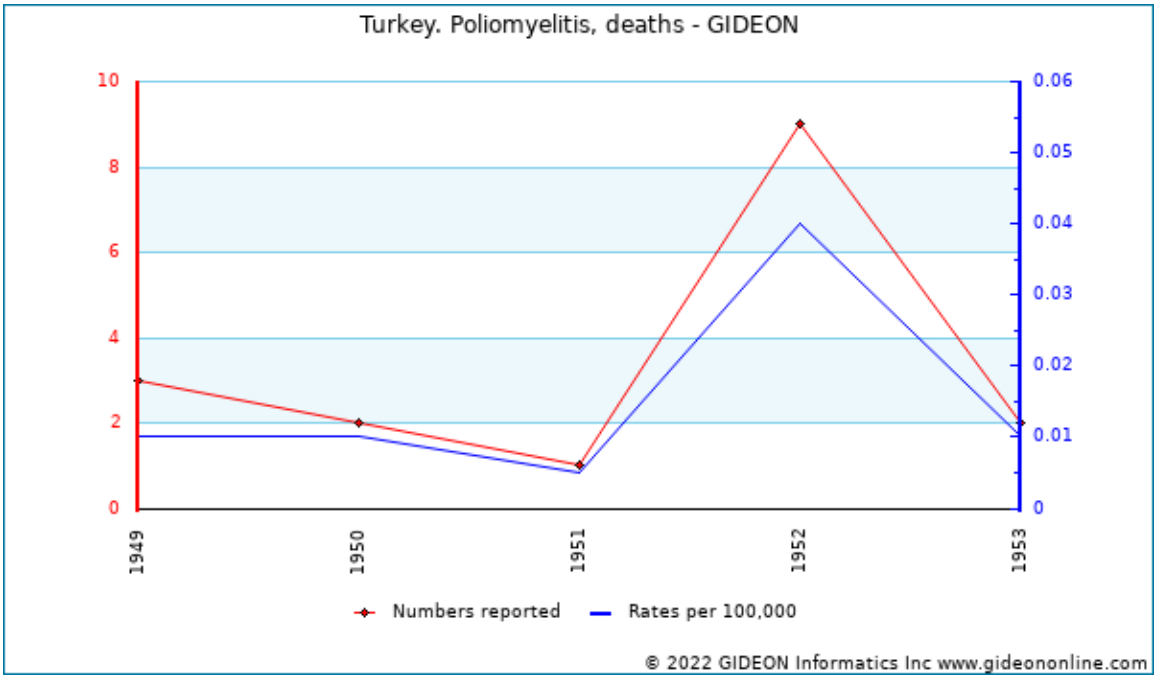
Graph: Turkey. Poliomyelitis, cases

Notes:

1. Historical data from references [6] [7]

Individual years:

1977 - A case of imported poliomyelitis - from Turkey - was reported in Australia. [8]
1996 - None due to wild virus.
1997 - All due to wild virus and confined to Mardin Province. [9]
1998 - All due to wild virus. Most cases in Sanli Urfa.



Graph: Turkey. Poliomyelitis, deaths

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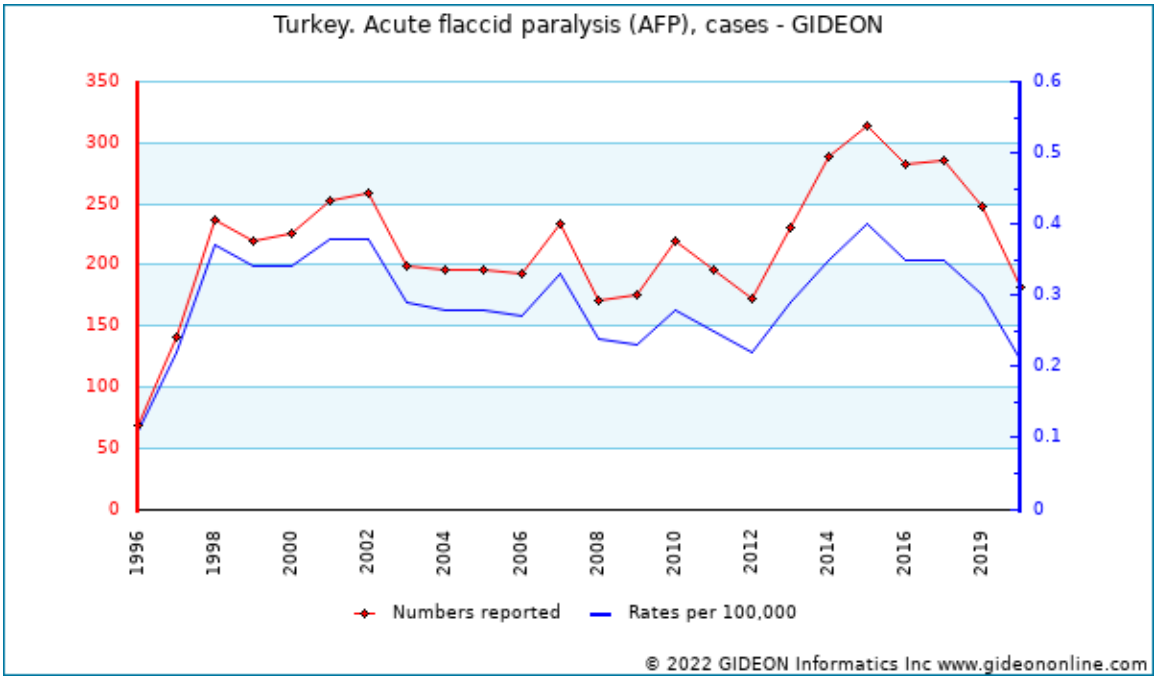
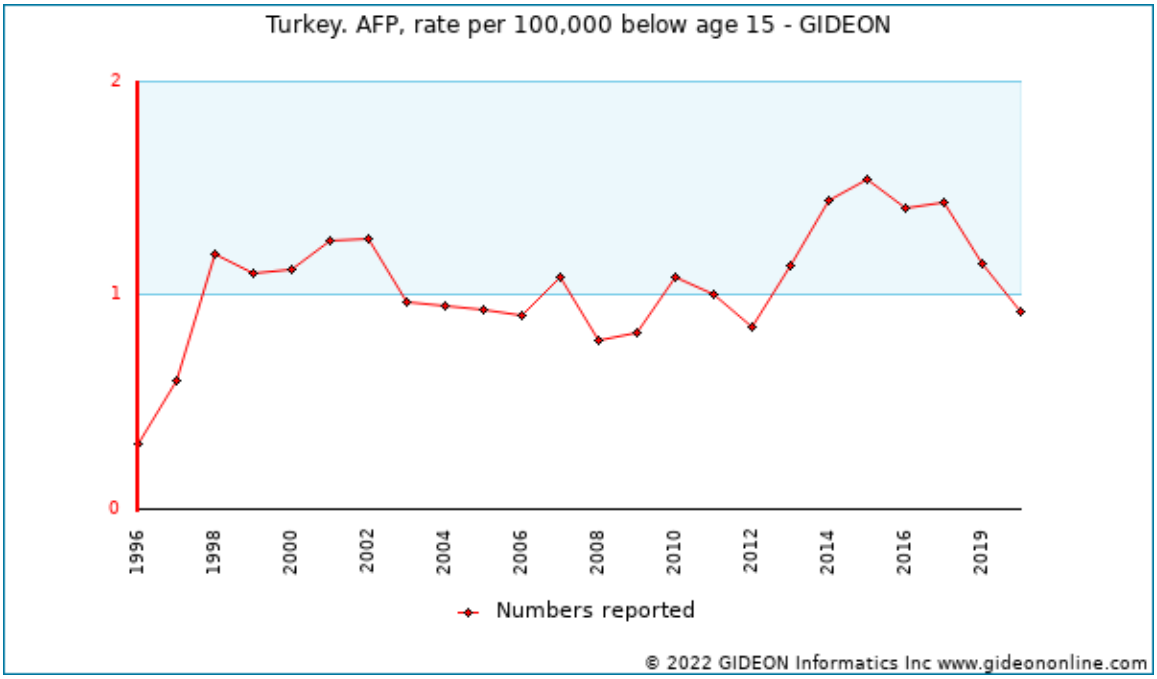


Graph: Turkey. Acute flaccid paralysis (AFP), cases

- 2000 to 2014 - Adenoviruses accounted for 2.3% of acute flaccid paralysis cases. [10]
- 2000 to 2019 - 915 isolates of Enteroviruses were identified from AFP patients and their contacts, including 204 Sabin-like polio viruses. Of the latter, 141 were from AFP cases and 63 from their contacts. The most frequently detected NPEV serotypes were Coxsackie A24, B3, and Echo 30. [11]



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

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Protothecosis and chlorellosis

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

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Pseudocowpox

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

Pseudocowpox in Turkey

2013 - Pseudocowpox was first reported in Turkey, in a woman engaged in milking an infected cow. [1]

References

1. Virusdisease 2014 ;25(3):381-4.

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Pseudorabies virus infection

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

Pseudorabies virus infection in Turkey

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2012	Northern Region	pigs - boars	23.7	[1]

- 2022 (publication year) - A report of the first isolation and genetic characterization of pseudorabies virus in Turkey, from a hunting dog in Bursa province exhibiting neurological signs. [2]

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Pyodermas (impetigo, abscess, etc)

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

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Pyomyositis

Agent	BACTERIUM. Usually *Staphylococcus aureus*
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Ultrasonography or CT scan.
Typical Adult Therapy	Antibiotic directed at confirmed or suspected pathogen (usually Staphylococcus aureus); drainage[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Pain, swelling and "woody" induration of a large muscle (usually lower limb or trunk) - Associated with fever and leukocytosis - Often follows trauma to the involved region - Lymphadenopathy uncommon; leucocytosis in most cases.
Synonyms	Purulent infectious myositis, Tropical pyomyositis. ICD9: 040.81 ICD10: M60.0

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Q-fever

Agent	BACTERIUM. *Coxiella burnetii* Intracellular organism related to Rickettsiae
Reservoir	Cattle, Sheep, Goat, Bird, Fish, Rodent, Rabbit, Tick, Bandicoot, Marsupial, Dog, Cat, Horse, Zoonotic
Vector	None
Vehicle	Air, Dust, Secretions, Dairy products, Respiratory or pharyngeal acquisition
Incubation Period	18d - 21d (range 4d - 40d)
Diagnostic Tests	Serology. Culture possible in specialized laboratories. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg BID X 2w OR Trimethoprim/Sulfamethoxazole 160/800 mg PO BID X 2w Add Hydroxychloroquine 600 mg per day if endocarditis[1] [2] [3]
Typical Pediatric Therapy	Age < 8 years: Trimethoprim/Sulfamethoxazole TMP 4-6 mg/kg PO BID X 2 weeks Age >= 8 years: Doxycycline 100 mg BID X 2 weeks
Vaccine	Q fever vaccine
Clinical Hints	- Proximity to farming or animals during 2 to 4 weeks preceding illness - Headache, myalgia, cough and hepatic dysfunction - Hepatosplenomegaly, "F.U.O." and endocarditis are encountered - Most infections resolve in 1 to 2 weeks - Case-fatality rate is 1.5%
Synonyms	Balkan grippe, Candidatus Coxiella massiliensis, Coxiella burnetii, Febbre australiana, Febre Q, Nine Mile fever, Q-Fieber, Q-koorts, Query fever, Red River fever. ICD9: 083.0 ICD10: A78

Q-fever in Turkey

- 1953 (publication year) - A review of the epidemiology of Q-fever in Turkey [4]

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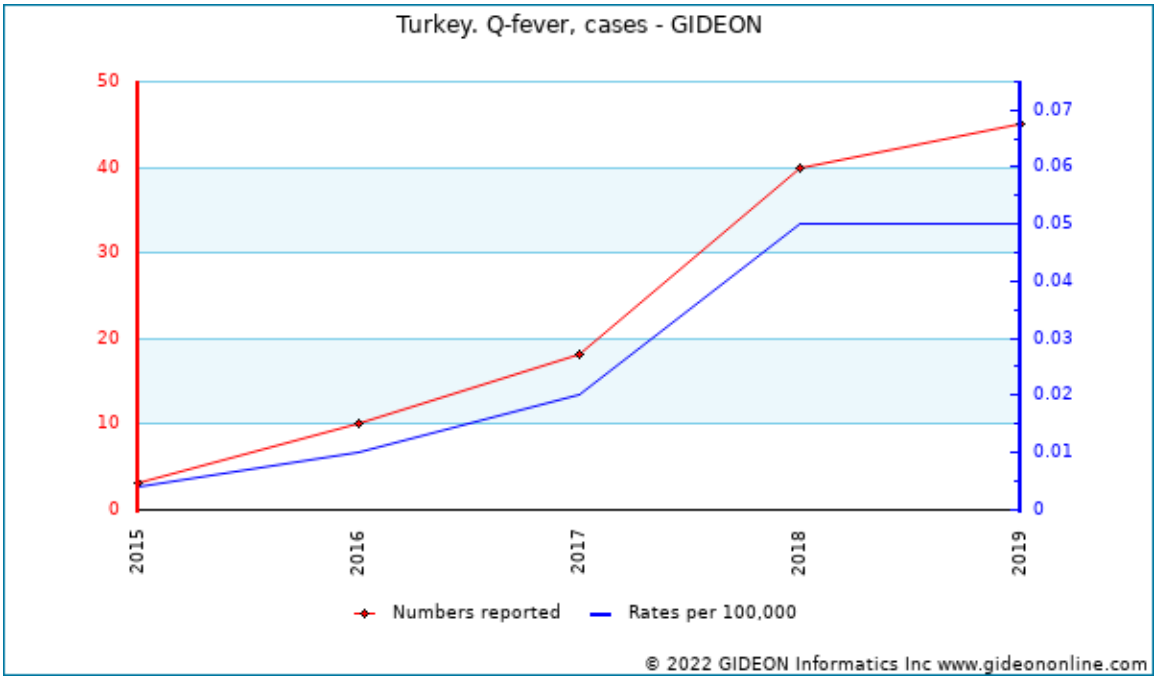

Graph: Turkey. Q-fever, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
2016*	Eastern Region	sheep	2	2% of aborted sheep [5]
2019	Konya	ruminants	1.6	*Coxiella burnetii* infection was associated with 1.6% of ruminant abortions [6]
2020*	Black Sea	various	0-2.96	2.7% of tick pools; and 2.96% of aborted fetuses from sheep, 0% from cattle, 0% from goats [7]
2013*	Black Sea	patients - fever	4	4% of patients ages 18 to 45, with acute fever (Tokat Province, 2013 publication) [8]
2014	Corum	ticks	0	[9]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2008*	Marmara	sheep	20	20% of sheep in southern Marmara region (2008 publication) [10]
2019*	Marmara	sheep and goats	10.24-14.19	14.19% of sheep and 10.24% of goats [11]
1951	Etlik	various	4.2-8.4	8.4% of cattle and 4.2% of sheep in Etlik (1951) [12]
1998	Eastern Region	various	8-10	8% of humans, 5% to 8% of cattle and 5% to 10% of sheep (Eastern Turkey, 1998) [13]
1953		general population	5.5	5.5% of the population (1953)
2008*	Ankara	general population	32.3	32.3% of individuals in Ankara (2008 publication) [14]
2010*	Samsun Tekkekoy	general population	8.1	8.1% of individuals in Samsun Tekkekoy (northern region, 2010 publication) [15]
2017*	Erzincan	general population	8.7	[16]

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Years	Region	Study Group	%	Notes
2017*	Multiple locations	general population	4.55-19.09	19.09% in rural areas and 4.55% in urban areas, of Sivas and Tika [17]
2013*	Aydin	pregnant women	4.5-27.8	27.8% of women who had experienced miscarriage vs. 4.5% of postpartum women (Aydin, 2013 publication) [18]
2008*	Ankara	animal contact	28.5-32	30.6% of veterinarians, 32% of veterinary technicians, 28.5% of animal lovers and 5% of a control group (Ankara, 2008 publication)
2017*	Ordu	animal contact	25.6	Survey of veterinarian, butchers and farmers [19]
2006*	Multiple locations	veterinarians	7-8	7% / 8% of veterinarians (endemic / non-endemic region) [20]
2006*	Aydin	risk groups	44.5	44.5% of individuals in high risk professions in the Aydin region (2006 publication)

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

- 1953 (publication year) - *Coxiella burnetii* was identified in ticks (*Ornithodorus lahorensis*). [21]

Notable outbreaks

Years	Region	Setting	Cases	Notes
1948*	Anatolia	village	20	[22] [23]
2002	Samsun			[24]

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

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Rabies

Agent	VIRUS - RNA. Rhabdoviridae, Mononegavirales, Lyssavirus: Rabies virus. Other human Lyssaviruses = Mokola, Duvenhage, European Bat (EBL)
Reservoir	Dog, Fox, Skunk, Jackal, Wolf, Cat, Raccoon, Mongoose, Bat, Rodent, Rabbit, Zoonotic
Vector	None
Vehicle	Saliva, Bite, Transplants, Air (bat aerosol), Respiratory or pharyngeal acquisition
Incubation Period	1m - 3m (range 4d to 19 years !)
Diagnostic Tests	Viral culture & direct immunofluorescence of saliva, CSF, corneal smears. Serology. Nucleic acid amplification.
Typical Adult Therapy	Strict isolation Supportive. The Milwaukee protocol (prolonged deep sedation and support) was apparently successful in some cases, but has since been abandoned.. See Vaccines module for pre- and post-exposure schedules[1] [2] [3] [4] [5]
Typical Pediatric Therapy	As for adult
Vaccine	Rabies immune globulin Rabies vaccine
Clinical Hints	- Follows animal bite (rarely lick) - often after months - Agitation, confusion, seizures, painful spasms of respiratory muscles - Progressive paralysis, coma and death - Case-fatality rate exceeds 99.9%
Synonyms	Aravan, Australian bat lyssavirus, Ballina, BBLV, Bokeloh bat lyssavirus, Duvenhage, EBL, European bat 1 Lyssavirus, European bat 2 Lyssavirus, European bat Lyssavirus, Gannorow bat lyssavirus, Hondsdolheid, Hydrophobia, Ikoma lyssavirus, Irkut, Khujand, Kotolahti bat lyssavirus, Lleida bat lyssavirus, Lyssa, Matlo bat lyssavirus, Mokola, Pteropus lyssavirus, Rabia, Rage, Raiva, Saint Hubert's disease, Shimoni bat virus, Taiwan bat lyssavirus, Tollwut, West Caucasian bat, Wutkrankheit. ICD9: 071 ICD10: A82

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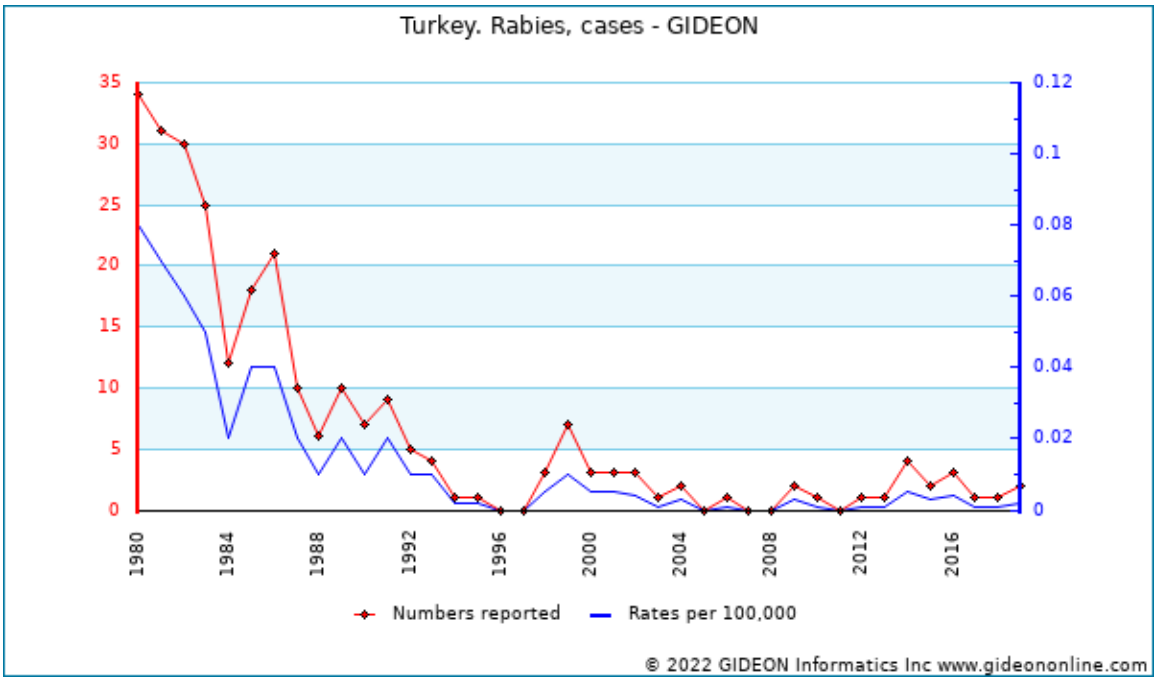
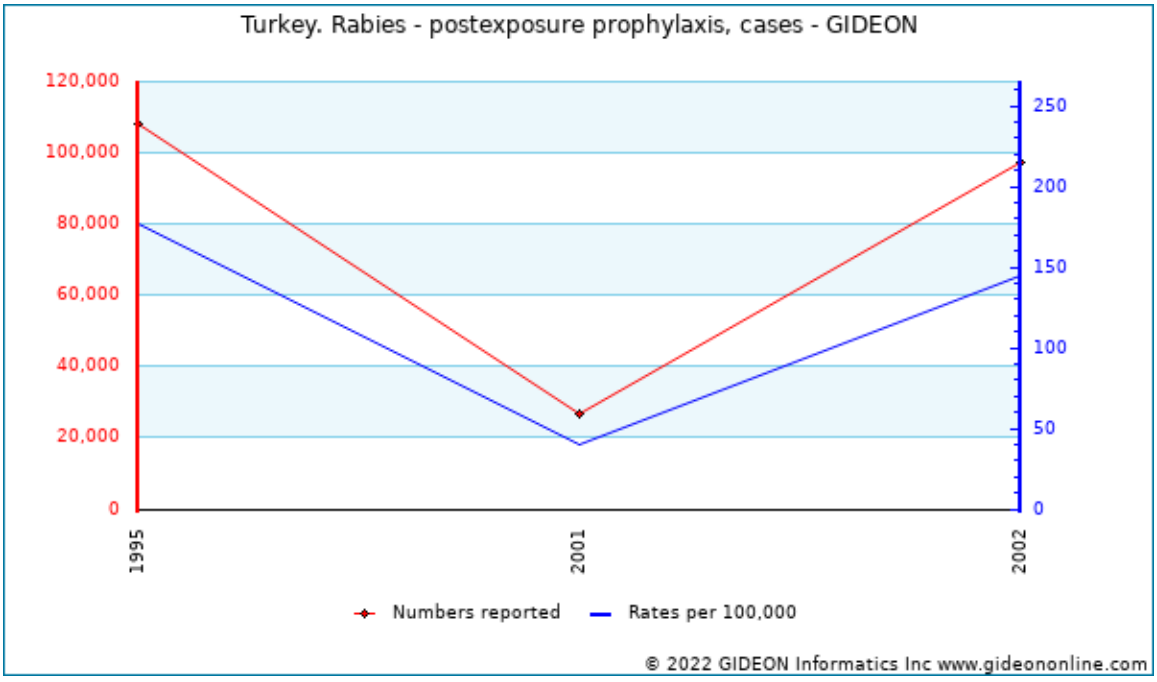
Rabies in Turkey



Graph: Turkey. Rabies, cases

Notes:
1. 39 cases of human rabies were reported during 1977 to 1990 (the true incidence was estimated at 30 to 60 per year).
2. 1998 to 2002 - Health Ministry data
Individual years:
1995 - Acquired from a dog.



Graph: Turkey. Rabies - postexposure prophylaxis, cases

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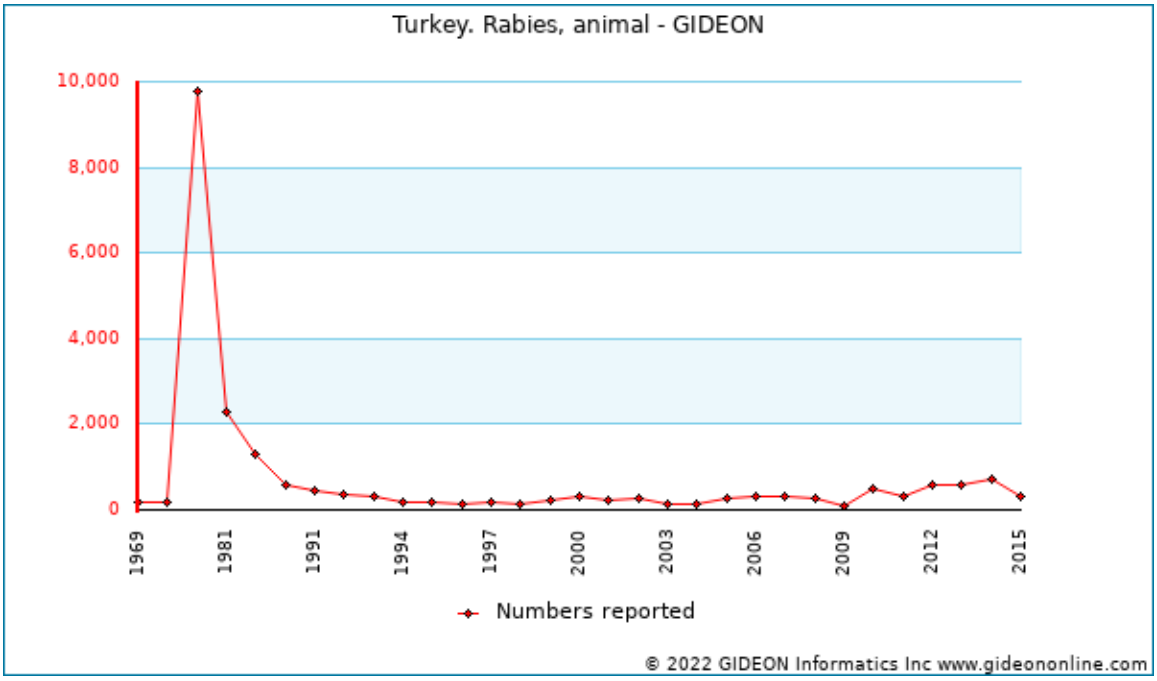
- 2010 to 2013 - Analysis of 2,513 patients presenting to a rabies vaccination center in Antalya - see reference [6]



Graph: Turkey. Rabies, animal

Notes:
1. Since 2001, rabies virus has been recorded among foxes and dogs in the previously rabies-free provinces of Manisa and Aydin. [7]
2. 2,856 rabid animals were reported during 1990 to 2000 - dogs accounted for 78%. [8]
3. 1,231 rabid animals were reported in the Aegean region during 1998 to 2007.
4. Vaccination campaigns were conducted in 2008, 2009 and 2010 in order to control fox rabies. [9]
5. Rates of bovine rabies vary from 0.10 to 3.87 per 100,000 cattle (2008 to 2011). [10]
Individual years:
1994 - All domestic animals.
1995 - Included four cats.
1996 - Included four cats.
1997 - Included six cats.

Cross-border events
Includes rabies in imported animals

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2021	Germany	Turkey	Rabies in imported dog	1	[11]

** Country or Nationality

No rabid bats were reported during 1990 to 2007.

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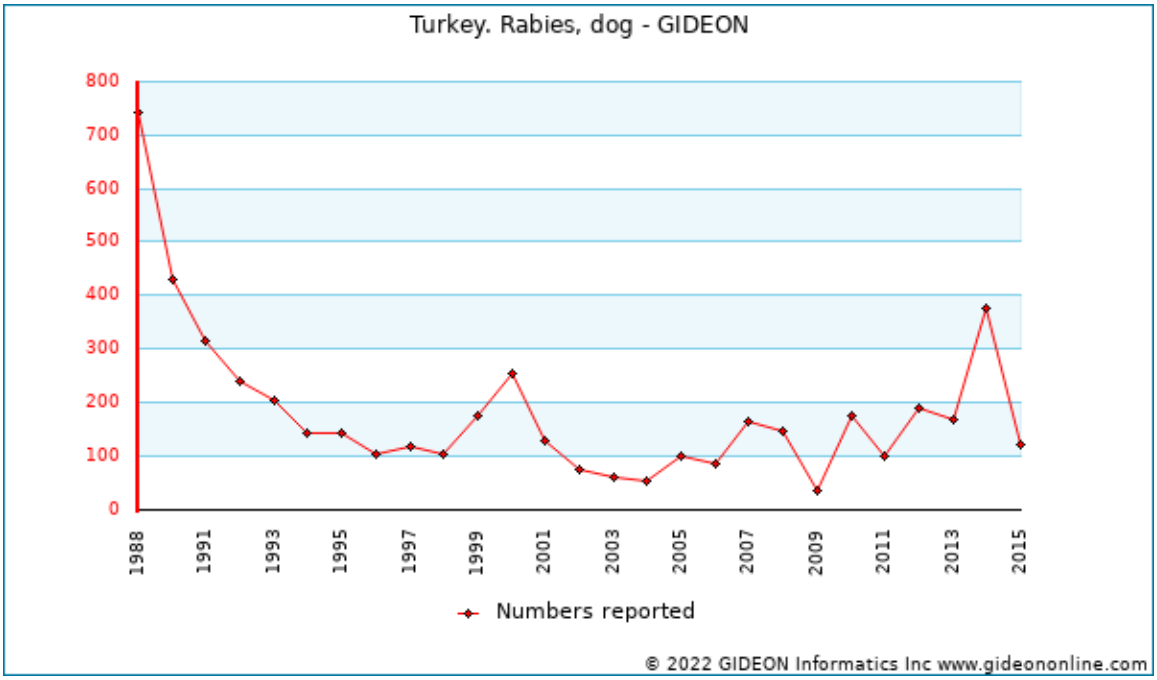
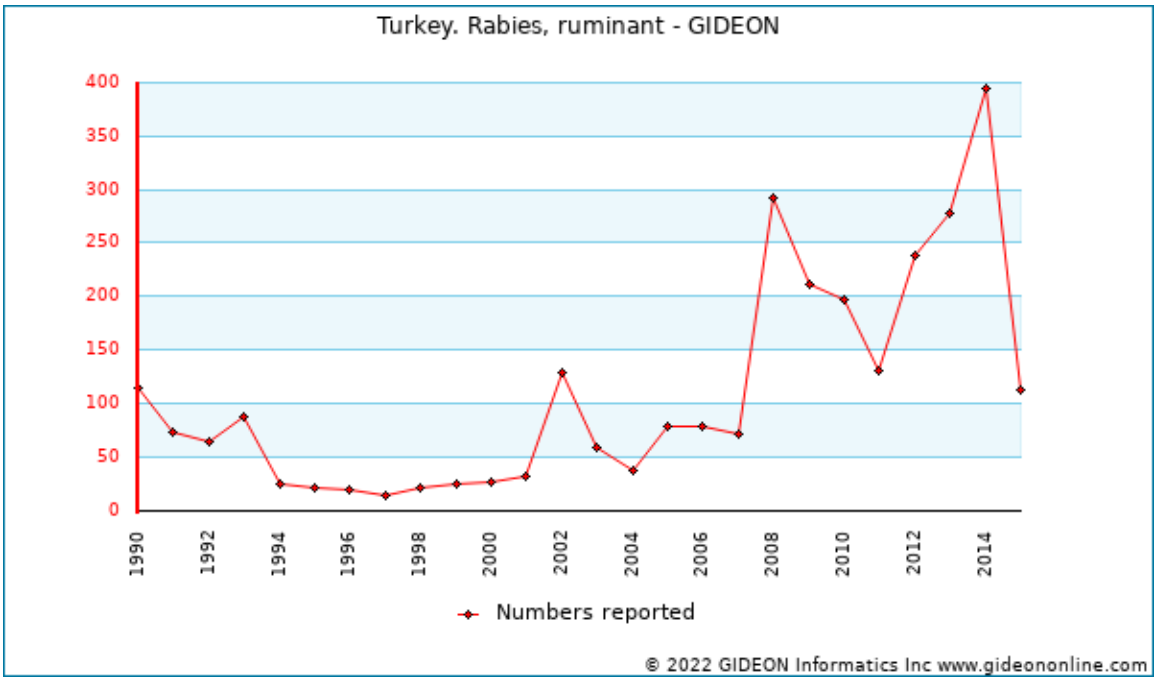


Graph: Turkey. Rabies, dog

Notes:
1. Turkey is the only European country in which urban dog-associated rabies persists as of 2009. [12]



Graph: Turkey. Rabies, ruminant

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Rat bite fever - spirillary

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

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Rat bite fever - streptobacillary

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

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Relapsing fever

Agent	BACTERIUM. *Borrelia* spp. A microaerophilic spirochete
Reservoir	Human, Tick, Rodent, Zoonotic
Vector	Tick (*Ornithodoros*), Louse (*Pediculus*)
Vehicle	Blood, Blood products
Incubation Period	7d - 8d (range 2d - 18d)
Diagnostic Tests	Examination of blood smears (thick and thin smears).- less sensitive for B. miyamotoi infection Some species (B. hermsii) may grow in BSK II medium.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 10d. OR Ceftriaxone 2 g IV daily X 10d Louse-borne infection: A single dose of Procaine Penicillin G 800000 units IM OR Tetracycline 500 mg PO OR Erythromycin 500 mg PO may suffice for louse-borne infection[1] [2] [3]
Typical Pediatric Therapy	>8 years Doxycycline 100 mg PO BID X 10d OR Ceftriaxone 50-75 mg/kg/d IV X 10d OR Penicillin G 50-100000 units/kg IV QID X 10d
Clinical Hints	- Headache, myalgia, hepatosplenomegaly and rash - Relapsing illness Louse-borne (vs. tick borne) infection characterized by: - higher case-fatality rate - fewer relapses - higher incidence of hepatosplenomegaly, jaundice and neurological complications
Synonyms	Bilious typhoid, Borrelia anserina, Borrelia braziliensis, Borrelia caucasica, Borrelia coriaceae, Borrelia crocidurae, Borrelia dipodilli, Borrelia duttonii, Borrelia graingeri, Borrelia hispanica, Borrelia latyschewii, Borrelia mazzottii, Borrelia merionesi, Borrelia microti, Borrelia miyamotoi, Borrelia parkeri, Borrelia persica, Borrelia queenslandica, Borrelia recurrentis, Borrelia theileri, Borrelia turicatae, Borrelia uzbekistana, Borrelia venezuelensis, Borreliosis, Candidatus Borrelia algerica, Candidatus Borrelia fainii, Candidatus Borrelia kalaharica, Famine fever, Febbre recidiva, Febbre ricorrente, Febris recurrens, Fiebre recurrente, Lauseruckfallfieber, Mianeh fever, Persistent syndrome, Ruckfall fieber, Tilbakefallsfeber, Tilbakefallsfever, Vagabond fever, Yellow famine fever, Yellow plague. ICD9: 087.9,087.0,087.1 ICD10: A68

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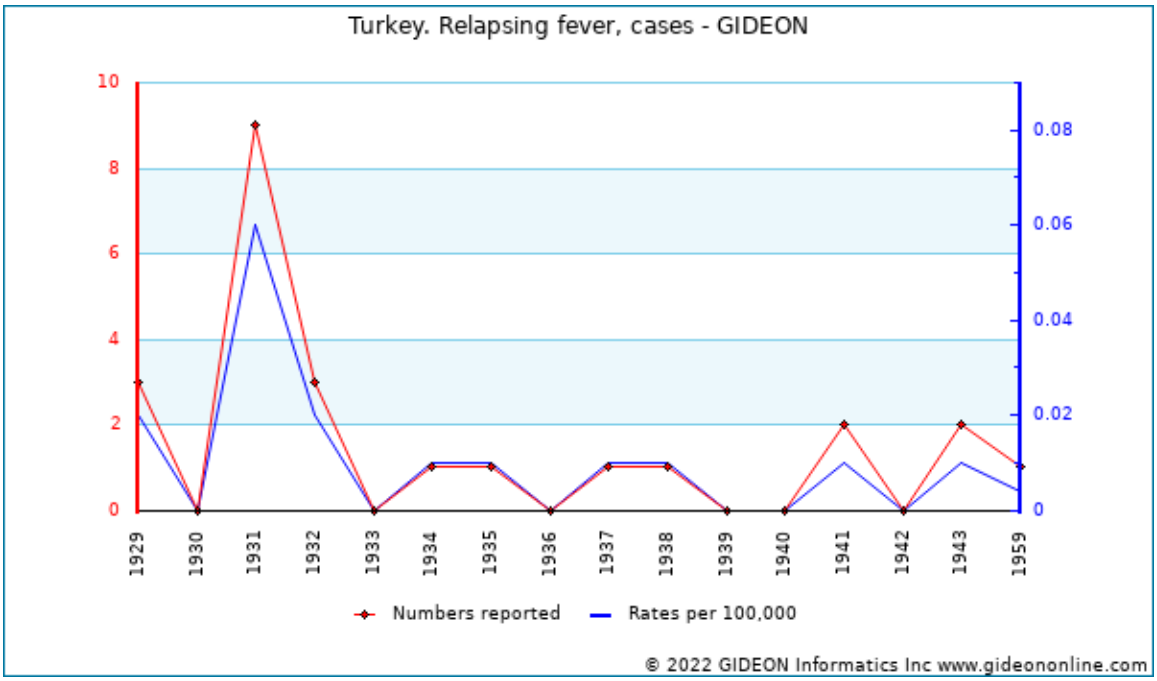
Relapsing fever in Turkey



Graph: Turkey. Relapsing fever, cases

The local species are *Borrelia crocidurae* (vector *Ornithodoros eraticus sonrai*) [4] and *Borrelia turcica* (vector *Hyalomma aegyptium*). [5]

- *Ornithodoros lahorensis* is also suspected as a vector.

Prevalence surveys

Years	Region	Study Group	%	Notes
2016*	Kirklareli	ticks	0.4	*Borrelia miyamotoi* was found in 0.4% of *Ixodes ricinus* ticks [6]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Notes
1918	[7]

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Respiratory syncytial virus infection

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

Respiratory syncytial virus infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2015*	Multiple locations	neonates	19.6	19.6% of newborns hospitalized with community acquired lower-respiratory infection (2015 publication) [6]
2000 - 2001	Istanbul	children	42.5	42.5% of children with bronchiolitis (Istanbul, 2000 to 2001)
2010	Mersin	children	33.9	33.9% of children ages 0 to 2 years with acute bronchiolitis (Mersin, 2010) [7]
2011 - 2012	Ankara	children	45.5	45.5% of infants below age 2 years, hospitalized for acute bronchiolitis (Ankara, 2011 to 2012) [8]
2012 - 2014	Ankara	children	7.2	Survey of children with febrile neutropenia [9]
2013 - 2015	Istanbul	children	35	35% of hospitalized children with the symptoms of influenza-like illness [10]
2013 - 2015	Istanbul	children	10.3	10.3% of hospitalized children with the symptoms of influenza-like illness [11]
2016 - 2017	Multiple locations	children	2.7	Survey of children with febrile seizures [12]
2016 - 2017	Multiple locations	children	2.7	Survey of children with febrile seizures [13]
2013 - 2016	Izmir	infants	40.1	40.1% of infants below age 2 years hospitalized with acute bronchiolitis [14]
2013 - 2015	Izmir	infants	38.4	Survey of infants hospitalized for lower respiratory tract infection3.1% [15]
1998 -	Kirikkale	patients	1.5-9.2	9.2% of pediatric and 1.5% of adult respiratory tract infection (1998 to 2000)

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Years	Region	Study Group	%	Notes
2000				[16]
2002 - 2014	Izmir	patients	7.1-24.5	24.5% / 7.1% of children / adults with upper or lower respiratory tract infections (Izmir, 2002 to 2014) [17]
2010 - 2013	Izmir	patients	43.3	43.3% of patients with flu-like symptoms (Izmir, 2010 to 2013) [18]
2015 - 2018	Bursa	patients	15.1	15.1% of inpatients with respiratory infection [19]
2010*	Trabzon	adults	10.1	10.1% of community-acquired pneumonia among adults (2010 publication) [20]
2020 - 2021	Bursa	specimens	2.2	Survey of respiratory specimens [21]
1994 - 1995	Istanbul	children - respiratory	39.2	39.2% of children with acute lower respiratory infection during 1994 to 1995 [22]
1995 - 1996	Istanbul	children - respiratory	35	35% of children with acute lower respiratory infection during 1995 to 1996 (Istanbul) [23]
2002 - 2004	Manisa	children - respiratory	31.5	31.5% of community-acquired viral lower respiratory infection in young children (2002 to 2004) [24]
2003 - 2015	Ankara	children - respiratory	13.9	RSV accounted for 13.9% of microorganisms associated with recurrent pneumonia among children [25]
2005*	Multiple locations	children - respiratory	29.5	29.5% of children below age 24 months hospitalized for lower respiratory infection (2005 publication) [26]
2005 - 2006	Kayseri	children - respiratory	32.5	32.5% of hospitalized children ages 0 to 24 months with lower respiratory tract infection (DFA, Kayseri, 2005 to 2006) [27]
2006 - 2015	Ankara	children - respiratory	6	6% of children with respiratory tract infection [28]
2010 - 2011	Istanbul	children - respiratory	32	32.0% of children hospitalized with respiratory infection (2013 publication) [29]
2011*	Istanbul	children - respiratory	55.6	55.6% of viral lower respiratory tract infection in hospitalized children (Istanbul, 2011 publication) [30]
2011 - 2012	Ankara	children - respiratory	15.6	15.6% of children with respiratory tract infection during an "Influenza season" (Ankara, 2011 to 2012) [31]
2011 - 2018	Izmir	children - respiratory	19	Survey of children hospitalized with acute respiratory infection [32]
2011 - 2013	Istanbul	children - respiratory	19	19% of children below age 2 years with lower respiratory tract infection [33]
2012*		children - respiratory	16.9	16.9% of children < 2 years of age hospitalized with lower respiratory tract infection (2012 publication) [34]
2012 - 2016	Istanbul	children - respiratory	33.1	Survey of children hospitalized with lower respiratory tract infection [35]
2012*	Istanbul	children - respiratory	8.2	8.2% of pediatric acute respiratory tract infections (Istanbul, 2012 publication) [36]
2013 - 2014	Istanbul	children - respiratory	9.2	9.2% of children ages >2 years, with fever and respiratory tract symptoms (Istanbul, 2013 to 2014) [37]
2013*	Bursa	children - respiratory	37.9	37.9% of children ages <= 2 years hospitalized for lower respiratory tract infection (Bursa City, 2013 publication) [38]
2015 - 2018	Ankara	children - respiratory	58.3	Survey of children ages <5 years hospitalized with acute lower respiratory infection [39]
2016*	Gaziantep	children - respiratory	0-3.3	3.3% / 0% of children with acute lower respiratory tract infection and wheezing / controls [40]
2016 - 2018	Istanbul	children - respiratory	36.5	Survey of children hospitalized in an Intensive Care Unit for lower respiratory tract infection [41]

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Years	Region	Study Group	%	Notes
2021*	Eskisehir	children - respiratory	9.1	Viruses were identified in 30.1% of children with malignancies and febrile neutropenia episodes; Adenovirus 18.4%, Influenza B 18.4%; Coronavirus 23.7%, RSV 9.1% [42]
2021*	Istanbul	children - respiratory	36.5	Survey of children with severe lower respiratory tract infections, admitted to a Pediatric Intensive Care Unit [43]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Population	Notes
2002	Ankara		35	children	Outbreak among children below age 2 years [44]
2008*	Istanbul	bone marrow transplant unit	3		[45] [46]
2009	Ankara	neonatal intensive care unit	11	neonates	[47]

* indicates publication year (not necessarily year of outbreak)

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Respiratory viruses - miscellaneous

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

Respiratory viruses - miscellaneous in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Mersin	children	1.6-33.9	RSV was identified in 33.9% of children ages 0 to 2 years with acute bronchiolitis, Rhinovirus 29%, hMPV 21%, Parainfluenza virus 16.1%, Adenovirus 8%, HBoV 4.8%, Enterovirus 1.6% (Mersin, 2010) [1]
2011 - 2012	Ankara	children	45.5-14.5	RSV was found in 45.5% of infants below age 2 years, hospitalized for acute bronchiolitis, Rhinovirus 16.4% and hMPV 14.5% (Ankara, 2011 to 2012) 45.5 [2]
2012 - 2014	Ankara	children	51.8	Viruses were identified in 51.8% of children with febrile neutropenia: Rhinovirus 13.3%, Adenovirus 3.0%, RSV 7.2%, Human Coronavirus 9.0%, Parainfluenza virus 4.2%, Human metapneumovirus 1.8%, Enterovirus 1.2%, Human Parechovirus 0.6% [3]
2013 -	Istanbul	children	59	Viruses were identified in 59% of hospitalized children with the symptoms of

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Years	Region	Study Group	%	Notes
2015				influenza-like illness; RSV 35%, Adenovirus 5%, HCoV 7.5%, Rhinovirus 4.5%, HMPV 4%, Human Bocavirtus 1.5% [4]
2016 - 2017	Multiple locations	children	82.7	At least one virus was detected in 82.7% of children with febrile seizures [5]
2013 - 2016	Izmir	infants	24.6-40.1	RSV was identified in 40.1% of infants below age 2 years hospitalized with acute bronchiolitis, and Rhinovirus in 24.6% [6]
2013 - 2015	Izmir	infants	3.1-38.4	RSV was identified in 38.4% of infants hospitalized for lower respiratory tract infection, Coronavirus 3.6%, Human metapneumovirus 3.1% [7]
2010*		patients	2.5-6.5	Human bocavirus (HBoV) was found in 6.5% of children and 2.5% of adults with acute respiratory disease (2010 publication) [8]
2010 - 2013	Izmir	patients	1.2-43.3	RSV accounted for 43.3% of patients with flu-like symptoms, Rhinovirus 21.4%, Parainfluenza virus 5%, HMPV 3.2%, 2.5% Coronavirus, 2% HBoV and Adenovirus 1.2% (Izmir, 2010 to 2013) [9]
2011 - 2013		patients	2.6	hMPV was found in 2.6% of upper respiratory tract samples from patients with respiratory illness (2011 to 2013) [10]
2013 - 2017	Istanbul	patients	45.4	Viruses were identified in 45.4% of patients at autopsy who had been considered to have respiratory tract infection; rhinovirus 13.2%, Adenovirus 4.7%, RSV 4% [11]
2013*	Antalya	patients	4.8	HBoV was found in 4.8% of adenoid tissue samples from patients below age 15, with chronic adenotonsillitis and serous otitis media (2013 publication) [12]
2015 - 2018	Bursa	patients	5.8-20.6	Human Bocavirus was identified in 20.6% of inpatients with respiratory infection, Rhinovirus 18.0%, RSV in 15.1%, Adenovirus 12.9%, Parainfluenza virus 5.8% [13]
2015 - 2016	Istanbul	patients	57	Viruses were identified in 57% of patients with influenza-like illness [14]
2021*		various	12.8-56	Viruses were identified in 12.8% of healthy individuals and 56% of children with otitis media with effusion [15]
2020 - 2021	Bursa	specimens	37.1	Survey of respiratory specimens; Influenza virus 2.8%, Rhino /Enterovirus 22.3%, RSV 2.2%, Coronavirus 3.1%, MPV 2.5% and Adenovirus 1.9 [16]
2020 - 2021	Bursa	specimens	1.9	Survey of respiratory specimens [17]
2013*	Mersin	patients - asthma	30.2	hMPV was found in 30.2% of patients with chronic obstructive pulmonary disease and 31.6% of patients with asthma (2013 publication) [18]
2002 - 2014	Izmir	children - respiratory	27.3-35.4	Viruses were identified in 35.4% / 27.3% of children / adults with upper or lower respiratory tract infections: RSV 24.5% / 7.1%, Parainfluenza virus 14.4% / 7.1%, Rhinovirus 8.6% / 6.8% and Adenovirus 5.5% / 11% (Izmir, 2002 to 2014) [19]
2003 - 2015	Ankara	children - respiratory	13.9-30.5	Rhinovirus accounted for 30.5% of microorganisms associated with recurrent pneumonia among children, Adenovirus 17.2% and RSV 13.9% [20]
2006 - 2015	Ankara	children - respiratory	27.3	Viruses were identified in 27.3% of children with respiratory tract infection; RSV 6%, Rhinovirus 5%, Parainfluenza virus 3.7%, Adenovirus 1.6% and Coronavirus 1.3% [21]
2009	Manisa	children - respiratory	11	Human metapneumovirus (hMPV) was found in 11% of children ages 0 to 10 years with lower respiratory tract infection (Manisa, 2009) [22]
2010 - 2011	Istanbul	children - respiratory	0.9-32	RSV was found in 32.0% of children hospitalized with respiratory infection, Adenovirus 26.2%, Parainfluenza 19.4%, Rhinovirus 18.4%, hMPV 12.6%, Coronavirus 2.9% and HBoV 0.9% (2013 publication) [23]
2011*	Istanbul	children - respiratory	5.6-55.6	RSV accounted for 55.6% of viral lower respiratory tract infection in hospitalized children, Parainfluenza virus 27.8%, Human metapneumovirus (hMPV) 13% and Adenovirus 5.6% (Istanbul, 2011 publication) [24]
2011 - 2012	Ankara	children - respiratory	0.9-15.6	RSV was found in 15.6% of children with respiratory tract infection during an "Influenza season", Rhinovirus in 13.7%, HBoV in 2.9%, coronavirus in 2.9%, and hMPV in 0.9% (Ankara, 2011 to 2012) [25]

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Years	Region	Study Group	%	Notes
2012 - 2016	Istanbul	children - respiratory	73.7	Viruses were identified in 73.7% of children hospitalized with lower respiratory tract infection; 33.1% RSV, 32.7% rhinovirus, 4.8% parainfluenza virus, 4.1% adenovirus, 2.8% HMP, 2.5% coronaviruses, 1.9^ bocavirus, 1.6% influenza virus and 0.3% enterovirus [26]
2013 - 2014	Istanbul	children - respiratory	78.6	Viruses were identified in 78.6% of children ages >2 years, with fever and respiratory tract symptoms, RSV 9.2%, Adenovirus 7.8%, Rhinovirus 7.1%, Coronavirus 7.1%, hMPV 5.7%, HBoV 5.7% and Parainfluenza virus 3.5% (Istanbul, 2013 to 2014) [27]
2013*		children - respiratory	0.9-14.7	RSV accounted for 8.2% of pediatric acute respiratory tract infections, Human metapneumovirus 3.6%, Rhinovirus 14.7%, Adenovirus 3.6%, Coronavirus 0.9% and Parainfluenzavirus 1.8% (2013 publication) [28]
2014 - 2017	Izmir	children - respiratory	55	Viruses were identified in 55% of children receiving cancer chemotherapy, with acute respiratory infection: Human Rhinovirus 33.1%, Parainfluenza virus 18.7% and Coronavirus 14.8% [29]
2015 - 2017	Istanbul	children - respiratory	4.5	Human Bocavirus was identified in 4.5% of children with respiratory tract infection [30]
2016 - 2018	Istanbul	children - respiratory	79.4	Viruses were identified in 79.4% of children hospitalized in an Intensive Care Unit for lower respiratory tract infection; RSV 36.5%, Rhinovirus 27.0%, Bocavirus 27.0%, Parainfluenza virus 4.8%, Adenovirus 4.8%, Metapneumovirus 3.2%, Enterovirus 1.6%, Coronavirus 1.6% [31]
2016*	Gaziantep	children - respiratory	0-36.7	Rhinovirus was found in 25.6% / 36.7%of children with acute lower respiratory tract infection and wheezing / controls; Parainfluenza virus 20.0% / 3.4%; Adenovirus 4.4% / 1.7% ; Coronavirus OC43 3.3% / 0% ; RSV 3.3% / 0%; Bocavirus, HMPV and Enterovirus 0% / 0% [32]
2021*	Eskisehir	children - respiratory	30.2	Viruses were identified in 30.1% of children with malignancies and febrile neutropenia episodes; Adenovirus 18.4%, Influenza B 18.4%; Coronavirus 23.7%, RSV 9.1% [33]

* indicates publication year (not necessarily year of survey)

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Reye's syndrome

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

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Rheumatic fever

Agent	BACTERIUM. *Streptococcus pyogenes* A facultative gram-positive coccus
Reservoir	Human
Vector	None
Vehicle	Droplet
Incubation Period	1w - 5w
Diagnostic Tests	Clinical diagnosis.
Typical Adult Therapy	Supportive; NSAIDs Eradication of GAS colonization: Benzathine Penicillin G 1.2 million units IM once OR Penicillin V 500 mg PO BID X 10d OR Azithromycin 500 mg PO daily X 3d[1] [2] [3]
Typical Pediatric Therapy	Supportive; NSAIDs Eradication of GAS colonization: Benzathine Penicillin G 50000 units/kg IM once OR Penicillin V 25 mg/kg PO TID X 10d
Clinical Hints	- In most cases, illness follows overt pharyngitis, after 1 to 5 weeks - Migratory arthritis, fever, carditis, chorea - Subcutaneous nodules, erythema marginatum and leukocytosis - An attack of rheumatic fever will persist for approximately 3 months
Synonyms	Febbre reumatica. ICD9: 390,391 ICD10: I00,I01,I02

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Rhinoscleroma and ozena

Agent	BACTERIUM. *Klebsiella pneumoniae* ssp *ozaenae* and *Klebsiella pneumoniae* ssp *rhinoscleromatis* Facultative gram-negative bacilli
Reservoir	Human
Vector	None
Vehicle	Secretions, Contact, Respiratory or pharyngeal acquisition
Incubation Period	Unknown
Diagnostic Tests	Culture. Biopsy. Nucleic acid amplification. Advise laboratory when this diagnosis is suspected.
Typical Adult Therapy	Rhinoscleroma: Ciprofloxacin 750 mg PO BID X 3 months Ozena: Ciprofloxacin 750 mg PO BID X 3 months or Sulfamethoxazole / Trimethoprim X 3 months[1] [2]
Typical Pediatric Therapy	Ciprofloxacin or Sulfamethoxazole / Trimethoprim for 3 months. Amoxicillin/Clavulanate has been used successfully.
Clinical Hints	Rhinoscleroma: - Chronic fetid nasal discharge - A crusting mass may develop in the nose - Infection may extend to the larynx, trachea of paranasal sinuses Ozena: - Chronic rhinitis progressing to atrophy of the nasal mucosa - Extension to the larynx and systemic infection have been reported
Synonyms	Klebsiella pneumoniae ssp ozaenae, Ozena, Respiratory scleroma, Rhinoscleroma. ICD9: 040.1 ICD10: J31.0

Rhinoscleroma and ozena in Turkey

Sporadic cases of rhinoscleroma are reported. [3] [4]

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3. J Otolaryngol 2006 Jun ;35(3):206-8.
4. Kulak Burun Bogaz Ihtis Derg 2008 Mar-Apr;18(2):110-4.

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Rhinosporidiosis

Agent	PROTOCTISTA *Rhinosporidium seeberi* (may in fact be *Microcystis*, a cyanobacterium)
Reservoir	Water, Soil, Vegetation
Vector	None
Vehicle	Aerosol from soil or water, Respiratory or pharyngeal acquisition
Incubation Period	2w - 6m
Diagnostic Tests	Histology of resected material (organism does not grow in-vitro).
Typical Adult Therapy	Excision Dapsone has been used in cases of disseminated disease, in some cases combined with Cycloserine and Ketoconazole[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Friable, painless vascular masses of nose, conjunctivae and larynx - Recurrence is common
Synonyms	Oculosporidiosis, Rhinosporidium seeberi. ICD9: 117.0 ICD10: B48.1

Rhinosporidiosis in Turkey

Three cases have been reported in southern Turkey as of 2008. [2] [3] [4]

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Rhodococcus equi infection

Agent	BACTERIUM. *Rhodococcus equi* An aerobic gram-positive coccobacillus
Reservoir	Farm animal, Farm soil, Zoonotic
Vector	None
Vehicle	Inhalation, Contact, Ingestion
Incubation Period	Unknown
Diagnostic Tests	Culture of blood, body fluids and secretions. Advise laboratory when these organisms are suspected.
Typical Adult Therapy	Two drugs from the following, administered for two months: Levofloxacin, Rifampin, Azithromycin, Ciprofloxacin, Imipenem, Vancomycin[1] [2]
Typical Pediatric Therapy	Two drugs from the following, administered for two months: Levofloxacin, Rifampin, Azithromycin, Imipenem, Vancomycin
Clinical Hints	- 40% of patients recall recent contact with farm or farm animals - Most often presents as pleuropulmonary infection in an immune-suppressed individual
Synonyms	Rhodococcus. ICD9: 027.9 ICD10: A92.8

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Rickettsia felis infection

Agent	BACTERIUM. *Rickettsia felis*
Reservoir	Opossum (*Didelphis marsupialis*), Flying squirrel, Raccoon, Cat, Flea, Dog, Zoonotic
Vector	Flea (*Ctenocephalides felis*, *Pulex irritans*)
Vehicle	None
Incubation Period	Unknown
Diagnostic Tests	Serology (IFA). Nucleic acid amplification. Note that Weil-Felix reaction may be positive (OX-19).
Typical Adult Therapy	Doxycycline 100 mg PO BID X 3 to 5d. OR Chloramphenicol 500 mg PO QID X 3 to 5d[1]
Typical Pediatric Therapy	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
Clinical Hints	- 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
Synonyms	California pseudotyphus, Candidatus Rickettsia asemboensis, Cat flea typhus, ELB agent, Flea-born spotted fever, Rickettsia asembonensis. ICD9: 081.1 ICD10: A79.8

Although Rickettsia felis infection is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Rickettsia felis infection in Turkey

2006 - *Rickettsia felis* was identified in a tick collected from a human in the region of Istanbul). [2]

Prevalence surveys

Years	Region	Study Group	%	Notes
2017 - 2021	Tekiradag	cats	26.3	Survey of house cats [3]

References

1. Am J Trop Med Hyg 2008 Dec ;79(6):907-10.
2. Vector Borne Zoonotic Dis 2012 Nov ;12(11):938-41.
3. Pathogens 2021 Aug 31;10(9)

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Rickettsia sibirica mongolotimonae infection

Agent	BACTERIUM. *Rickettsia sibirica mongolotimonae*
Reservoir	Unknown
Vector	Tick
Vehicle	None
Incubation Period	3d - 6d
Diagnostic Tests	Serology. Culture of dermal eschar. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 3 to 5d. OR Chloramphenicol 500 mg PO QID X 3 to 5d[1] [2]
Typical Pediatric Therapy	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
Clinical Hints	- May be a history of recent tick bite - Fever, headache, myalgia, maculopapular rash, and one or more dermal eschars - Painful lymphadenopathy and lymphangitis are common
Synonyms	Lymphangitis-associated rickettsiosis, Rickettsia mongolotimonae, Rickettsia sibirica mongolotimonae. ICD9: 082.2 ICD10: A77.8

Rickettsia sibirica mongolotimonae infection in Turkey

2016 - A Turkish man developed *Rickettsia sibirica mongolitimonae* infection following the bite of an infected *Hyalomma marginatum* tick in Adana. [3]

Rickettsia sibirica mongolitimonae was isolated from two *H. marginatum* ticks in the central Anatolian region.

Prevalence surveys

Years	Region	Study Group	%	Notes
2019*	Anatolia	various	1.9	1.9% of tick pools [4]
2014	Corum	ticks	1.2	[5]

* indicates publication year (not necessarily year of survey)

References

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2. Emerg Infect Dis 2008 Mar ;14(3):528-9.
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Rickettsialpox

Agent	BACTERIUM. *Rickettsia akari*
Reservoir	Mouse (*Mus musculus*), Dog, Mite, Zoonotic
Vector	Mite (*Allodermanyssus sanguineus*)
Vehicle	None
Incubation Period	9d - 14d (range 7d - 24d)
Diagnostic Tests	Serology. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 3 to 5d. OR Chloramphenicol 500 mg PO QID X 3 to 5d
Typical Pediatric Therapy	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
Clinical Hints	- 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
Synonyms	Kew Gardens fever, Rickettsia akari. ICD9: 083.2 ICD10: A79.1

Rickettsialpox in Turkey

2002 - The first documented case of rickettsialpox in Turkey was reported, in a child in Nevpehir (central region). [1]

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Rift Valley fever

Agent	VIRUS - RNA. Bunyaviridae, Phlebovirus: Rift Valley fever virus
Reservoir	Sheep, Ruminant, Zoonotic
Vector	Mosquito (*Culex*, *Aedes*, *Anopheles*, *Eretmapodites*, *Mansonia*, *Culicoides*, *Coquillettidia* spp.)
Vehicle	Respiratory or pharyngeal acquisition
Incubation Period	3d - 5d (range 2d - 7d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive. Animal studies suggest a possible role for Ribavirin.[1] [2]
Typical Pediatric Therapy	As for adult
Vaccine	Rift Valley fever vaccine
Clinical Hints	- May be history of contact with sheep or cattle during the preceding week - Headache, myalgia, photophobia, arthralgia and a maculopapular rash - Jaundice, hemorrhagic fever or retinitis with blindness in some cases - Case fatality rate is below 1%
Synonyms	Arumowot, Enzootic hepatitis, Gabek Forest, Gordil, Ntepes, Riftvalleykoorts, Zinga. ICD9: 066.3 ICD10: A92.4

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

Rift Valley fever in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2020*	Thrace	various	0	Survey of sheep, cattle, ticks and mosquitoes [3]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2000 - 2006	Multiple locations	animals	0-8.5	0% of gazelles, 1.3% of camels, 0 to 8.5% of camels [4] [5]
2013*	Northern Region	animals	0	0% of cattle, horse, sheep, goat and water buffalo (northern Turkey, 2013 publication) [6]

* indicates publication year (not necessarily year of survey)

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3. Vector Borne Zoonotic Dis 2020 May 12;
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6. J Arthropod Borne Dis 2013 ;7(1):90-3.

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Rotavirus infection

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

Rotavirus infection in Turkey

2005 to 2006 - Disease rates peak during winter months. [1]

Prevalence surveys

Years	Region	Study Group	%	Notes
2012*	Adana	children	42	42% of infants with necrotizing enterocolitis (2012 publication) [2]
2005 - 2008	Ankara	patients	6	6% of patients hospitalized with acute gastroenteritis (Ankara, 2005 to 2008) [3]
2007 - 2008	Istanbul	patients	18.7	18.7% of patients with vomiting and / or diarrhea (Istanbul, 2007 to 2008) [4]
2007 - 2008	Istanbul	patients	18.7	18.7% of patients with acute gastroenteritis [5]
2018	Istanbul	patients	16.3	Viruses detected in stool specimens from patients with diarrhea in Istanbul include rotavirus (16.3%), norovirus (7.6%), sapovirus (2.7%), astrovirus (1%), and adenovirus (0.5%) [6]
2008 - 2010	Izmir	specimens - stool	18.07	18.07% of fecal samples tested at a hospital in Izmir (2008 to 2010) [7]
2016 - 2018	Ankara	specimens - stool	18.3	[8]
1987 - 2016	Nationwide	children (Literature Review)	31.8	31.8% of children with diarrhea in Turkey [9]
2009 - 2016	Malatya	patients - CNS	5.1	Survey of children with acute ataxia [10]
1984 - 1990	Istanbul	children - gastrointestinal	25.4	25.4% of gastroenteritis in children (Istanbul, 1984 to 1990) [11]
1984 - 1985	Ankara	children - gastrointestinal	16.3	16.3% of diarrhea in children below age 2 years requiring hospitalization (Ankara, 1984 to 1985) [12]

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Years	Region	Study Group	%	Notes
1998 - 1999	Kayseri	children - gastrointestinal	32.1-32.4	32.1% to 32.4% of children with diarrhea in Kayseri (1998 to 1999)
1999 - 2002	Ankara	children - gastrointestinal	36.8	36.8% of pediatric diarrhea (Ankara, 1999 to 2002) [13]
2003*	Izmir	children - gastrointestinal	39.8	39.8% of diarrhea in children under age 5 in Izmir (2003 publication) [14]
2005 - 2006	Multiple locations	children - gastrointestinal	53	53% of children below age 5 years hospitalized for acute gastroenteritis (2005 to 2006) [15]
2006 - 2011	Ankara	children - gastrointestinal	28	28% of children with diarrhea (Ankara, 2006 to 2011) [16]
2007	Istanbul	children - gastrointestinal	25	25% of children ages 0 to 5 years, presenting to an urban emergency room with gastroenteritis (2007) [17]
2008	Mersin	children - gastrointestinal	32.2	32.2% of children ages 0 to 6 years, hospitalized with diarrhea (Mersin, 2008) [18]
2008 - 2013	Antalya	children - gastrointestinal	13.6	13.6% of children with gastroenteritis, in Antalya (2008 to 2013) [19]
2009	Istanbul	children - gastrointestinal	12.7	12.7% of children admitted for gastroenteritis to a pediatric emergency unit (Istanbul,2009) [20]
2009 - 2010	Ankara	children - gastrointestinal	21.1	21.1% of children ages 0 to 5 years with acute gastroenteritis (Ankara, 2009 to 2010) [21]
2011*	Bursa	children - gastrointestinal	21-28.5	21% of outpatient / 28.5% of inpatient acute gastroenteritis cases, and 0.35% of all outpatient diseases among children in Bursa (2011 publication) [22]
2011		children - gastrointestinal	20.9	20.9% of children hospitalized with diarrhea [23]
2011		children - gastrointestinal	7.4	7.4% of children hospitalized with diarrhea [24]
2012	Ankara	children - gastrointestinal	4	4% of children below age 5 years hospitalized with diarrhea (Ankara, 2012) [25]
2012 - 2016	Adana	children - gastrointestinal	46.8-53.3	46.8% / 53.3% of girls / boys with acute gastroenteritis [26]
2012 - 2013	Erzurum	children - gastrointestinal	33.1	33.1% of children ages 0 to 5 years, with acute diarrhea [27]
2015*	Rize	children - gastrointestinal	5.6	5.6% of children below age 5 years with diarrhea (Rize Province, 2015 publication) [28]
2015*	Malatya	children - gastrointestinal	33.6	33.6% of children with acute viral gastroenteritis (2015 publication) [29]
2019*	Erzurum	children - gastrointestinal	32.3	32.3% of children ages <5 years with gastroenteritis [30]
2019*	Erzurum	children - gastrointestinal	9.6	9.6% of children ages <5 years with gastroenteritis [31]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Cases	Clinical	Source	Pathogen	Notes
2005	Malatya	9,907		water		[32]
2008	Multiple locations	4,000	gastrointestinal infection	water		An outbreak of diarrhea in Askaray and Sereflikochisar caused by Adenovirus, Rotavirus, Norovirus and *Escherichia coli* [33]
2012	Erzurum			water	multiple pathogens	Outbreak of infections Norovirus, Astrovirus, Rotavirus and *Shigella sonnei* [34]

Case series

- 2013 to 2019 - An analysis of 34 cases of rotavirus infection in children requiring admission to a Pediatric Intensive Care unit in Ankara. [35]

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Rubella

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

Rubella in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

Rubella-containing vaccine was introduced into the routine immunization schedule in 1998. [1]

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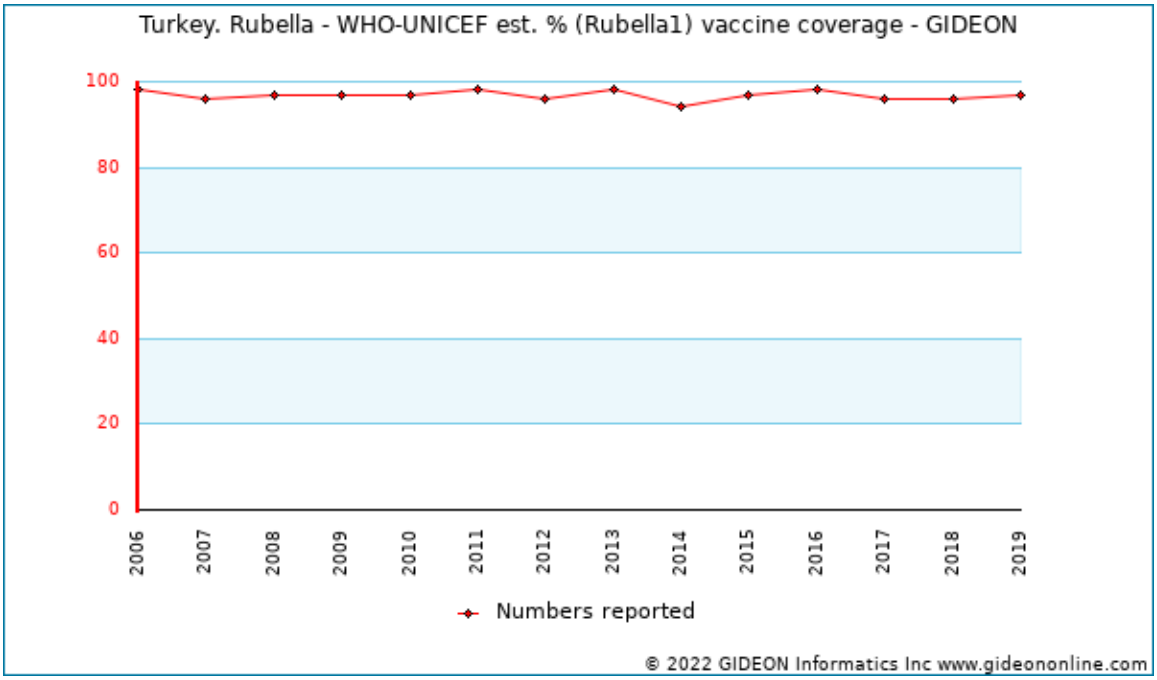
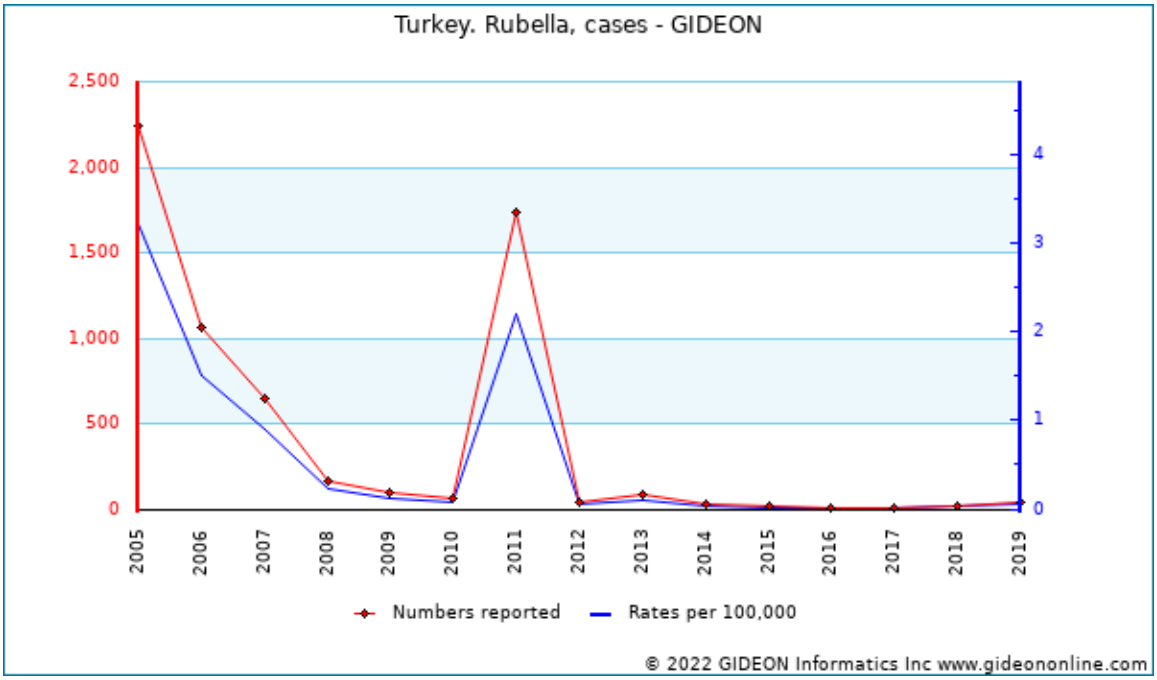


Graph: Turkey. Rubella - WHO-UNICEF est. % (Rubella1) vaccine coverage



Graph: Turkey. Rubella, cases

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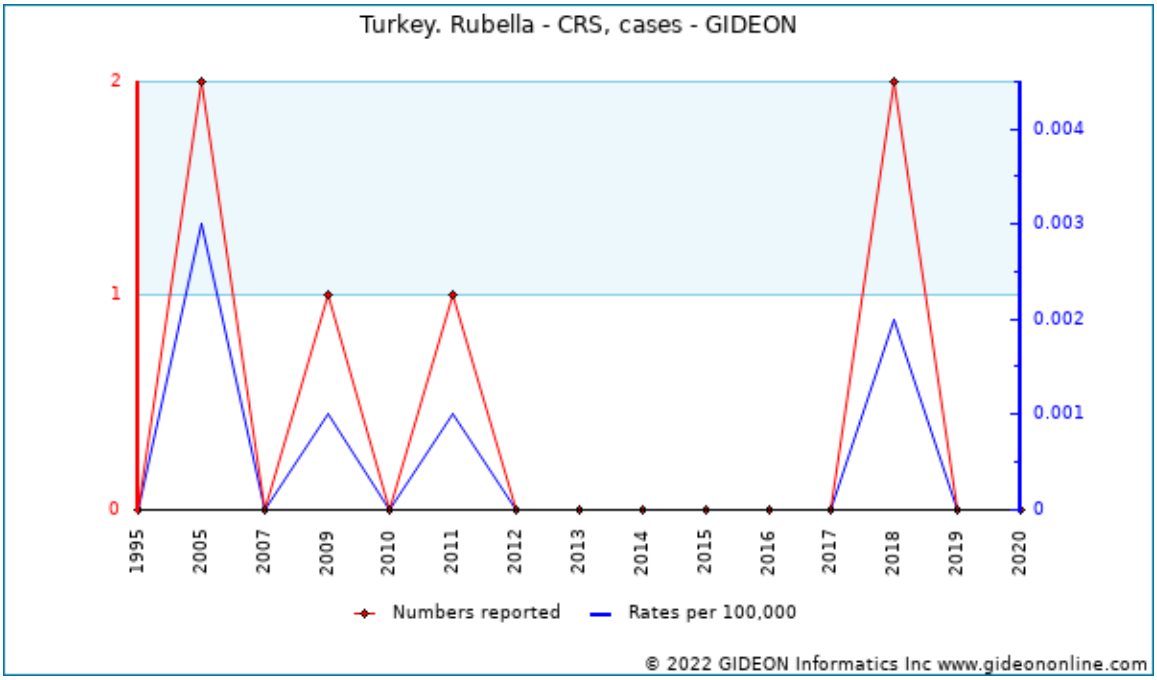

Graph: Turkey. Rubella - CRS, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
2010	Northeast Region	women	2.2-8.8	8.8% / 2.2% of febrile males / females below age 18 years (IgM, northeastern Turkey, 2010) [2]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2003*	Adana	children	92.5	92.5% of school girls in Adana region (2003 publication) [3]
2005	Dogankent	children	17.5	17.5% of children below age 5 years, in Dogankent (2005) [4]
2006*	Eastern Region	children	43.7-89.2	43.7% of unvaccinated children ages 1 to 4 years, 89.2% ages 13 to 16 years (eastern Turkey, 2006 publication) [5]
2010*	Ankara	children	73.7	73.7% of children with acute lymphoblastic leukemia (Ankara, 2010 publication) [6]
2018*	Eskisehir	children	93.7	Survey of children with chronic neurological disease [7]
2000	Ankara	adolescents	92.7	92.7% of non-vaccinated adolescents in Ankara (2000) [8]
2008*	Ankara	adolescents	92.6	92.6% of non-vaccinated adolescents in Ankara (2008 publication) [9]
2006*	Istanbul	students	66.7	66.7% of first grade primary students in Istanbul (2006 publication) [10]
1998	Izmir	women	85	85% of women ages 20 to 29 (Izmir, 1998) [11]
2004*	Istanbul	women	91	91% of women in Istanbul (2004 publication) [12]
2005 - 2006	Afyonkarahisar	women	18.5-80.9	18.5% in girls ages 0 to 1 year, 28.6% ages 2 to 6, 36.8% ages 7 to 17, 80.0% ages 18 to 20, 80.9% ages 21 to 30, 78.5% ages 31 to 40, 73.7% ages 41 to 50 and 78.1% above age 50 (Afyonkarahisa, 2005 to 2006) [13]
2006	Ankara	women	95.5-96.2	95.5% of women of age 15 to 49 years, and 96.2% of those that were pregnant. (Ankara district, 2006) [14]
2006*	Edirne	women	93.1	93.1% of adolescent females (ages 12 to 17) in Edirne (2006

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Years	Region	Study Group	%	Notes
				publication) [15]
2007*	Mersin	women	55	55.0% of women ages 15 to 49 in Mersin (2007 publication) [16]
2011*	Izmir	women	79.9-96.9	79.9% of persons ages 1 to 70, in Izmir - 96.9% of women of reproductive age (2011 publication) [17]
2015 - 2017	Bolu	women	94.2	Survey of women of childbearing age [18]
2017*		women	88	88% of attending gynecology and obstetrics outpatient clinics [19]
2006*	Multiple locations	workers	98.3	98.3% of health care workers (2006 publication) [20]
1991*	Konya	health care workers	86.04	86.04% of female nursing students (1991 publication) [21]
2011*		health care workers	83.1	83.1% of female nursing students (2011 publication)
2015*	Yozgat	health care workers	98.3	98.3% of nursing students (Yozgat, 2015 publication) [22]
2015 - 2016		health care workers	94.5	Survey of nursing students [23]
2007*	Istanbul	students - medical	96	96.0% of medical students (Istanbul, 2007 publication) [24]
2009	Hatay	various	93.6	93.6% of women and children in Hatay (2009) [25]
2010	Northeast Region	general population	72.3-81.8	81.8% of females and 72.3% of males below age 18 years (northeastern Turkey, 2010) [26]
1990 - 1993	Ankara	pregnant women	82.1	82.1% of pregnant women (1990 to 1993) [27]
2001 - 2008	Izmir	pregnant women	98.3	98.3% of pregnant women in Izmir (2001 to 2008) [28]
2004 - 2005	Samsun	pregnant women	94.3	94.3% of pregnant women in Samsun (2004 to 2005) [29]
2004 - 2006	Hatay	pregnant women	95	95% of pregnant women in Hatay (IgG, 2004 to 2006) [30]
2008 - 2013	Istanbul	pregnant women	95.7	95.7% of pregnant women in Istanbul (2008 to 2013) [31]
2009*	Western Region	pregnant women	96.1	96.1% of pregnant women in western Turkey (2009 publication) [32]
2009 - 2013	Istanbul	pregnant women	95	95% of pregnant women (2009 to 2013) [33]
2012 - 2013	Van	pregnant women	86.5	[34]
2012 - 2014	North-West Region	pregnant women	93.8	93.8% of pregnant women in north-western Turkey (2012 to 2014) [35]
2013 - 2015	Anatolia	pregnant women	94.2	[36]
2014 - 2016	Izmir	pregnant women	93.5	[37]
2018*	Ankara	pregnant women	89	[38]
2007 - 2017	Nationwide		93.47	93.47% of pregnant women (meta-analysis) [39]

* indicates publication year (not necessarily year of survey)

- 2003 to 2004 - 93.8% of pregnant women in Malatya had evidence of past infection and 0.6% evidence of recent infection. [40]

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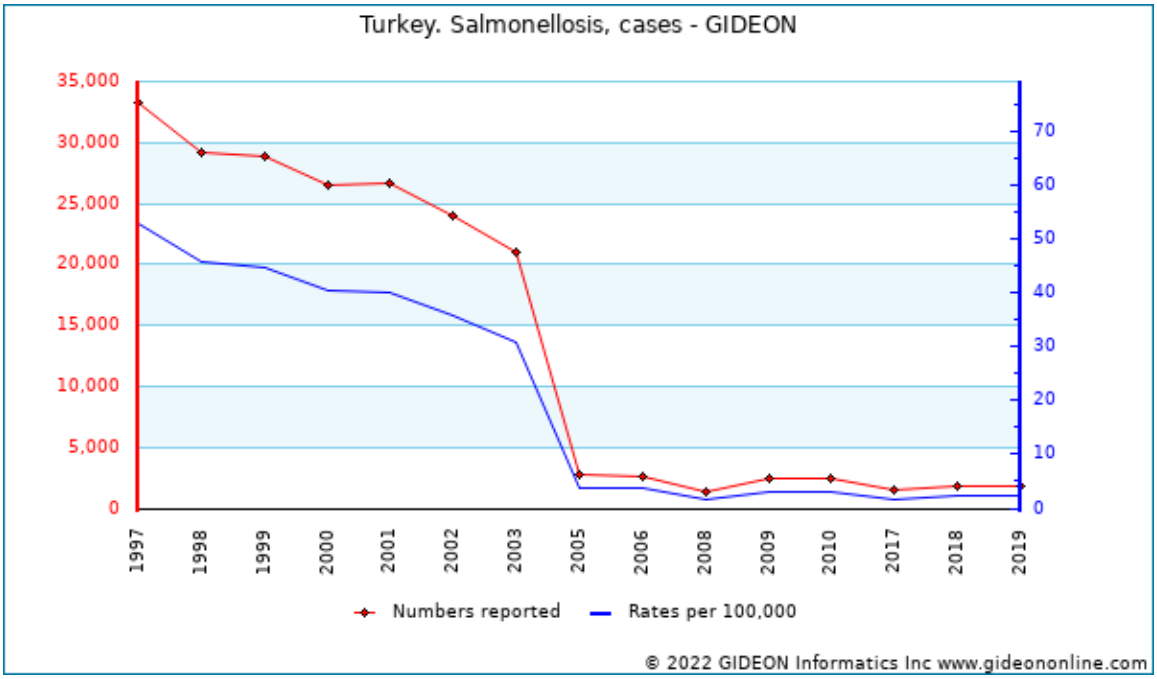
Salmonellosis

Agent	BACTERIUM. *Salmonella* A facultative gram-negative bacillus
Reservoir	Mammal, Bird, Reptile, Zoonotic
Vector	None
Vehicle	Food, Milk, Eggs, Poultry Shellfish, Meat, Vegetables, Fruit, Fecal-oral Breastfeeding, Fly
Incubation Period	12h - 36h (range 6h - 6d)
Diagnostic Tests	Culture (stool, blood, infected tissue). Serology.
Typical Adult Therapy	Stool precautions. Therapy not indicated for uncomplicated diarrhea; if necessary, treat per antibiogram[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Onset 12 to 24 hours after ingestion of eggs, meat, poultry - Fever, chills and watery diarrhea - Fecal leucocytes present - Fever resolves in 2 days; but diarrhea may persist for up to 7 days (occasionally weeks)
Synonyms	Salmonellosen, Salmonellosi. ICD9: 003 ICD10: A02

Salmonellosis in Turkey



Graph: Turkey. Salmonellosis, cases

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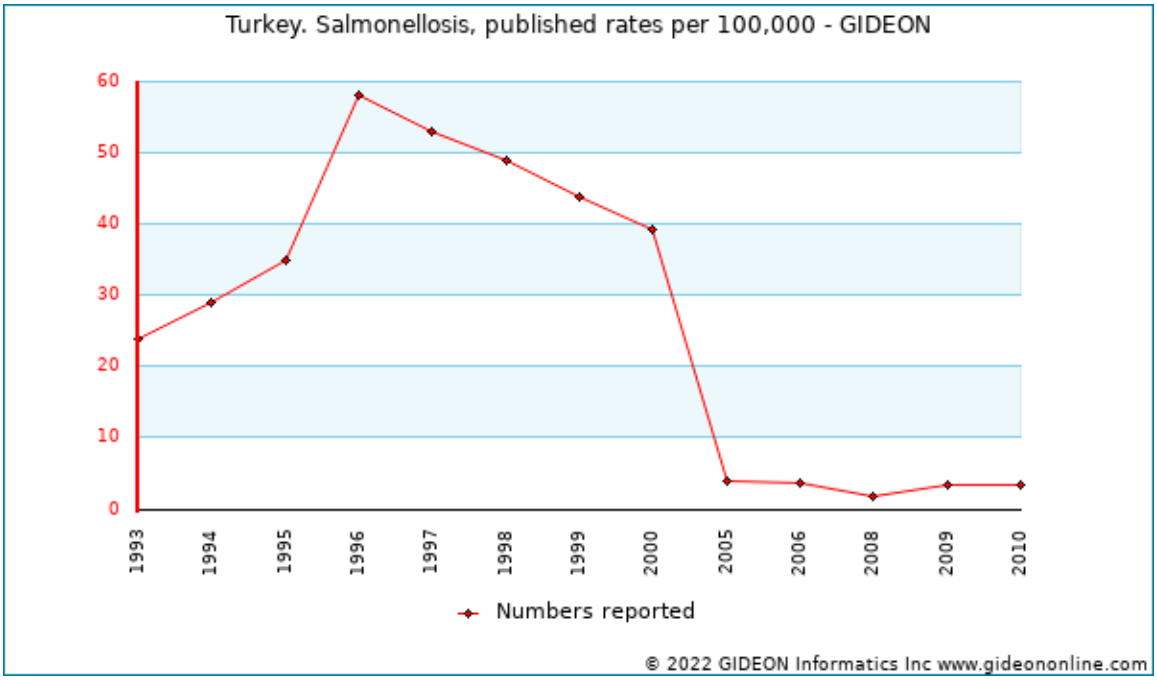

Graph: Turkey. Salmonellosis, published rates per 100,000

- 1995 to 1997 - 133 *Salmonella* serotypes were identified from human and animal sources during 1995 to 1997. Of these, *S. typhimurium* accounted for 48.8% of isolates and *S. enteritidis* for 41.0%.

Prevalence surveys

Years	Region	Study Group	%	Notes
1989 - 1990	Ankara	patients	1.6	Diarrhea below age 15 years requiring hospitalization [4]
2005 - 2008	Ankara	patients	1.2	Hospitalized with acute gastroenteritis [5]
2007*	Ankara	patients	2	Diarrhea episodes in kidney or liver transplant patients [6]
2009*	Sanliurfa	food handlers	0	[7]
2019*		milk	2.16	Survey of raw milk samples [8]
2011*	Ankara	shellfish	50	Stuffed mussels sold by street vendors [9]
2014*		salad	8	Ready-to-eat salad [10]

* indicates publication year (not necessarily year of survey)

Cross-border events

Imported disease vehicles are included; individual case reports not listed

Years	Acquired by**	Originated in**	Setting	Cases	Deaths	Notes
1999		Turkey	travel	275		An outbreak (275 cases) of *Salmonella paratyphi* B infection was reported among European tourists who visited Turkey during the summer of 1999. [11]
2001		Turkey	imported goods			Outbreaks of *Salmonella enterica* serovar Typhimurium DT 104 infection caused by a batch of imported Turkish halvah were reported in Australia and Sweden. Contaminated halvah was also identified in Germany, Norway and the United Kingdom. [12]
2008	Austria	Turkey	travel	103		An outbreak (103 cases) of *Salmonella enteritidis* infection was reported among Austrian tourists in Turkey. [13]
2008	United Kingdom	Turkey	travel	300		An outbreak (300 cases, approximate) of probable salmonellosis was reported among British tourists on tour in Turkey. [14] [15]

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Years	Acquired by**	Originated in**	Setting	Cases	Deaths	Notes
2009	United Kingdom	Turkey	travel	87		An outbreak (87 cases) of gastroenteritis cases caused by *Salmonella enteritidis* (47 cases), *Campylobacter* (2 cases) and/or *Cryptosporidium* (31 cases) were reported among British tourists returning from a resort in Sarigeme, Turkey.
2011	United States	Turkey	imported goods	53		n outbreak (53 cases) of *S. enteritidis* infection in the United States was associated with contaminated pine nuts imported from Turkey. [16] [17] [18]
2013	Denmark	Turkey	travel	121		An outbreak (121 cases) of *Salmonella enteritidis* infection was reported among Danish tourists in Turkey.
2013	United States	Turkey	imported goods	17	1	An outbreak (17 cases, 1 fatal) of infections due to *Salmonella enterica* serotypes Montevideo and Mbandaka in the United States was associated with contaminated tahini imported from Turkey. [19] [20] [21]
2013*	Denmark	Turkey	airplane	121		An outbreak (121 cases) of *Salmonella enteritidis* infection was reported among Danish tourists in Turkey. [22]

* indicates publication year (not necessarily year of event)
** Country or Nationality

Notable outbreaks

Years	Region	Setting	Cases	Deaths	Source	Pathogen	Notes
1965*	Antakya					Paratyphi B	[23]
1979*	Ankara	hospital	17			Typhimurium	infants. [24]
1979*			24			San Diego	[25]
1982*	Ankara					Typhimurium	[26]
1988*			42		meat - sausage	Typhimurium	Outbreak caused by contaminated sucuk (Turkish sausage flavored with garlic). [27]
1999	Mediterranean Coast		305			Paratyphi B	tourists. Outbreak among European tourists who visited Turkey [28] [29]
2003*	Edime		60			Enteritidis	military personnel. [30]
2005	Izmir	neonatal unit	22	2		Typhimurium	neonates. [31]
2008	Isparta		2,469		eggs	Enteritidis	military personnel. [32]
2008			103			Enteritidis	tourists. Outbreak among Austrian tourists in Turkey [33]
2008	Sarigerme		300				tourists. Outbreak among British tourists in Turkey. [34] [35]
2009	Sarigerme		87		fish - salmon	multiple pathogens	tourists. Outbreak caused by *Salmonella enterica* serovar Enteritidis (47 cases), *Campylobacter* (2 cases) and/or *Cryptosporidium* (31 cases) was reported among British tourists returning from a resort in Sarigeme, Turkey.
2011	Foreign Country		53		pine nuts	Enteritidis	Outbreak (53 cases) in the United States was associated with contaminated pine nuts imported from Turkey [36] [37] [38]
2013	Foreign Country		17	1	tahini	multiple pathogens	Outbreak (17 cases, 1 fatal) of infection by serotypes Montevideo and Mbandaka in the United States was associated with contaminated tahini imported from Turkey. [39] [40] [41]
2013			121			Enteritidis	tourists. Outbreak among Danish tourists in Turkey
2017	Manisa	barracks	1,046	1			military personnel. [42]

* indicates publication year (not necessarily year of outbreak)

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Sarcocystosis

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

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Scabies

Agent	PARASITE - Arthropod. Arachnid, Acari (Mite), Sarcoptidae: *Sarcoptes scabiei*
Reservoir	Human
Vector	None
Vehicle	Contact, Sexual contact
Incubation Period	1d - 42d
Diagnostic Tests	Identification of mites in skin scrapings. Dermoscopy PCR of skin flakes
Typical Adult Therapy	Isolation until treated. Towel, bedding precautions Permethrin 5% as single application OR Ivermectin 150 to 200 mcg/kg PO as single dose OR Ivermectin 1% as single application Second treatment course may be necessary[1] [2]
Typical Pediatric Therapy	Permethrin 5% as single application OR Ivermectin 200 mcg/kg PO (> 15 kg body weight) OR Ivermectin 1% as single application
Clinical Hints	- Intensely pruritic papules, vesicles and burrows - Nodular and bullous lesions are also encountered - Lesions prominent at interdigital webs, wrists, elbows, axillae, perineal region, buttocks and penis - Pruritus is most intense at night - Severe psoriaform infestation (Norwegian scabies) may affect debilitated and immunosuppressed individuals
Synonyms	Anthrenus dermatitis, Carpet beetle, Cheyletiella, Cheyletiella infestation, Escabiose, Escabiosis, Histiostomatid mites, Itch mite, Kraetze, Kratze, Mange, Ornithonyssus, Pyemotes, Sarcoptes scabiei, Sarna, Scabbia, Skabies, Tropical rat mite. ICD9: 133 ICD10: B86

Scabies in Turkey

- 2017 to 2019 - 1,952 cases of scabies were treated at a clinic in Erzurum. [3]

Prevalence surveys

Years	Region	Study Group	%	Notes
2006*	Afyon	children	0.4	0.4% of nursery children in Afyon (2006 publication) [4]
2017 - 2019	Erzurum	patients - skin	0.77	Scabies accounted for 0.77% of outpatients at a Dermatology Clinic [5]
2021	Kars	patients - skin	10.9	Survey of patients in a Dermatology Clinic during the COVID-19 pandemic [6]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Setting	Cases	Notes
2020*	transplantation unit	42	Outbreak involved 7 patients, 25 health care workers and 10 family members [7]

* indicates publication year (not necessarily year of outbreak)

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7. Transpl Infect Dis 2020 Apr 10;:e13284.

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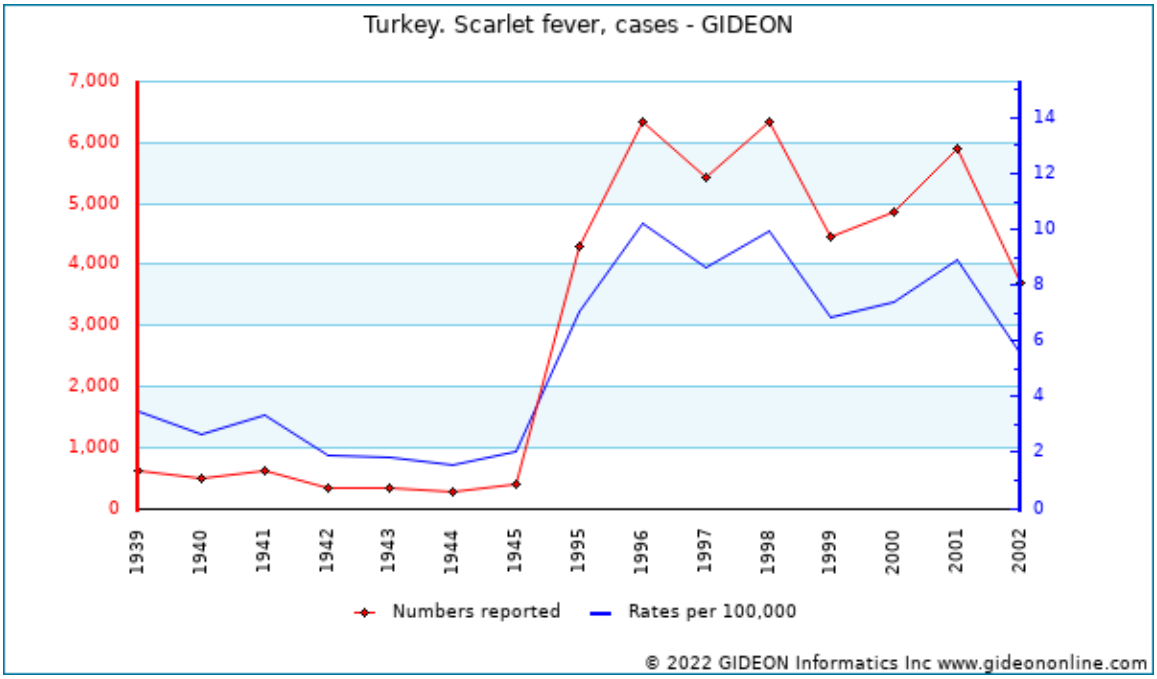
Scarlet fever

Agent	BACTERIUM. *Streptococcus pyogenes* A facultative gram-positive coccus
Reservoir	Human
Vector	None
Vehicle	Secretions, Food, Respiratory or pharyngeal acquisition
Incubation Period	1d - 4d
Diagnostic Tests	Typical clinical features associated with group A streptococcal pharyngitis.
Typical Adult Therapy	Benzathine Penicillin G 1.2 million units IM as single dose[1]
Typical Pediatric Therapy	Benzathine Penicillin G : Weight <14kg: 300,000 units IM Weight 14 to 28kg: 600,000 units IM Weight >28kg: 1.2 million units IM
Clinical Hints	- Overt exudative pharyngitis - Appearance of a florid desquamative erythematous rash within 24 to 48 hours - Facial flushing and circum-oral pallor - Lingual desquamation ("strawberry tongue")
Synonyms	Escarlatina, Lanhousha, Scarlattina, Scharlach. ICD9: 034.1 ICD10: A38

Scarlet fever in Turkey



Graph: Turkey. Scarlet fever, cases

Notes:
Individual years:
1944 - Included five fatal cases.

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1945 - Included ten fatal cases.

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Schistosomiasis - haematobium

Agent	PARASITE - Platyhelminthes, Trematoda. Strigeida, Schistosomatidae: *Schistosoma haematobium*
Reservoir	Snail (*Bulinus*, *Planorbarius*, *Ferrissia*), Baboon or monkey, Zoonotic
Vector	None
Vehicle	Water (skin contact)
Incubation Period	2w - 12w (acute illness)
Diagnostic Tests	Identification of ova in urine or stool. Serology. Antigen detection.
Typical Adult Therapy	Praziquantel 20 mg/kg PO BID X 1 day[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Early urticaria, fever and eosinophilia - Chronic disease associated with dysuria, hematuria and obstructive nephropathy - May evolve to bladder cancer in advanced cases - Parasite survives for decades in human host
Synonyms	Bilharziasis, urinary, Egyptian hematuria, Katayama fever [1], Schistosoma guineensis, Schistosoma haematobium, Schistosomal hematuria, Schistosomiasis, Vesicle bilharziasis. ICD9: 120.0 ICD10: B65.0

Schistosomiasis - haematobium in Turkey

1960 (publication year) - Schistosomiasis was reported from the Syrian border area (Nusaybin). [2]

Sporadic importations are reported. [3] [4] [5] [6]

1981 - 65 cases were reported.

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Schistosomiasis - mansoni

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

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

Schistosomiasis - mansoni in Turkey

Prevalence surveys

Years	Study Group	%	Notes
2009 - 2017	specimens - tissue	0.2	Survey of appendectomy specimens (*Schistosoma* spp) [3]

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Septic arthritis

Agent	BACTERIUM or FUNGUS. Gram positive cocci most common; gram negative bacilli, gonococci, mycobacteria, fungi, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Smear and culture of joint fluid. Cytological and chemical analysis of joint fluid also useful.
Typical Adult Therapy	Antimicrobial agent(s) directed at known or likely pathogen[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fever (60% to 80%) associated with swelling, erythema and tenderness - Usually involves a single joint, most commonly knee (elbow or ankle in children) - Mean fluid leukocyte count in acute bacterial forms is 50,000 per cu mm
Synonyms	ICD9: 015 ICD10: M00

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Septicemia - bacterial

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

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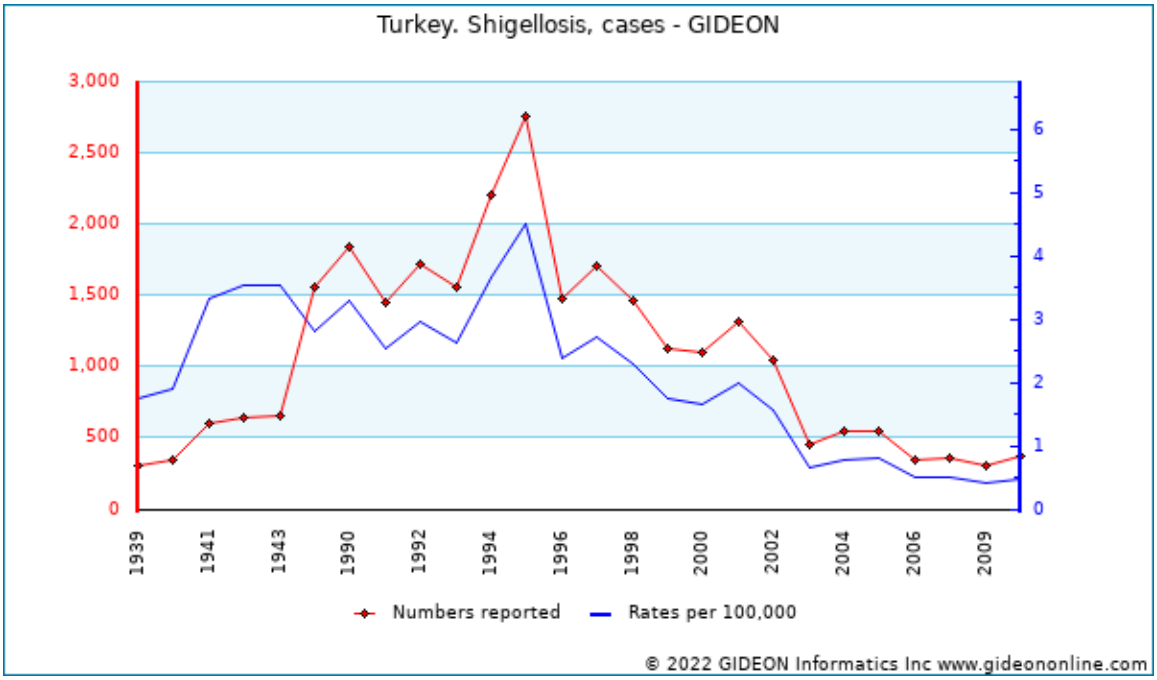
Shigellosis

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

Shigellosis in Turkey



Graph: Turkey. Shigellosis, cases

Notes:

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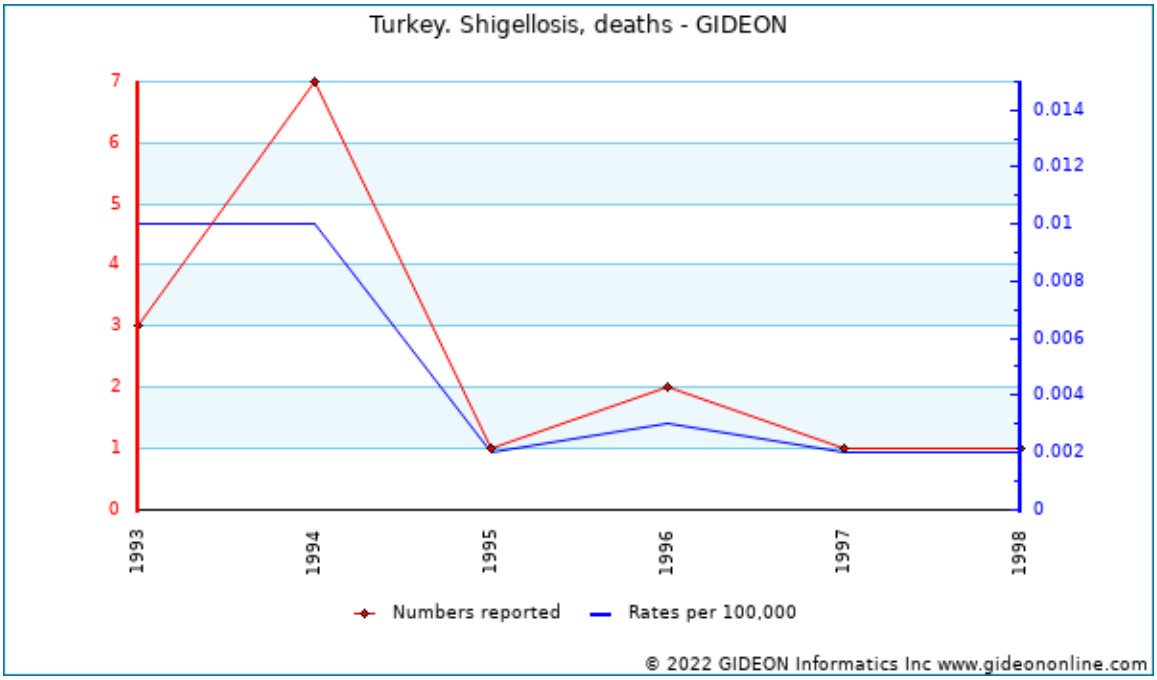
1. *Shigella* is the most common agent for diarrhea among children under age 14 years.
2. Cases for 1939 to 1943 were reported as "dysentery."

- 2002 - 198 cases were reported from a children hospital in Ankara. The species distribution was *S. sonnei* (83.3%), *S. flexneri* (10.1%), *S. dysenteriae* (5.1%) and *S. boydii* (1.5%). [5]

Shigella sonnei accounted for 64.1% of *Shigella* isolates in Ankara during 1987 to 1994; 71.5% during 1995 to 2002; 87.8% during 2003 to 2009. [6]



Graph: Turkey. Shigellosis, deaths

Prevalence surveys

Years	Region	Study Group	%	Notes
2007*	Ankara	transplant recipients	4	4% of diarrhea episodes in kidney or liver transplant patients. (Ankara, 2007 publication) [7]
2005 - 2008	Ankara	patients	0.6	0.6% of patients hospitalized with acute gastroenteritis (Ankara, 2005 to 2008) [8]
2009*	Sanliurfa	food handlers	0	0% of food-handlers in Sanliurfa (2009 publication) [9]
1989 - 1990	Ankara	children - gastrointestinal	3.8	3.8% of diarrhea below age 15 years requiring hospitalization (Ankara, 1989 to 1990) [10]
1993 - 1994	Ankara	children - gastrointestinal	13.8	13.8% of diarrhea among children under age 14 years (Ankara, 1993 to 1994) [11]
2003 - 2006	Ankara	children - gastrointestinal	30	30% of children hospitalized for bloody diarrhea (Ankara, 2003 to 2006) [12]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Source	Pathogen	Population	Notes
1965	Burdur					[13]
2012	Erzurum		water	multiple pathogens		Outbreak of water-borne infections by Norovirus, Astrovirus, Rotavirus and *Shigella sonnei* [14]
2013	Alanya	hotel			tourists	

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Sinusitis

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

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Small intestinal trematodes

Agent	PARASITE - Platyhelminthes, Trematoda. Plagiorchiida, Heterophyidae: *Heterophyes heterophyes*, *H. nocens*, et al
Reservoir	Snail (*Cerithidea cingulata*, *Pirenella conica*), Fish, Zoonotic
Vector	None
Vehicle	Fish (mullet and tilapia)
Incubation Period	7d - 14d
Diagnostic Tests	Identification of ova or adults in stool. Heterophyes heterophyes adult: length - 1.1 to 1.7 mm
Typical Adult Therapy	Praziquantel 25 mg/kg TID X 3 doses
Typical Pediatric Therapy	As for adult
Clinical Hints	- Onset 1 to 2 weeks after ingestion of undercooked fish - Abdominal pain and mucous diarrhea with eosinophilia - Infestation resolves spontaneously within two months
Synonyms	Acanthogobius, Apophallus, Ascocotyle, Brachylaima, Carneophallus, Cotyluris, Cryptocotyle, Diorchitrema, Gymnophalloides, Gynaecotyla, Haplorchis, Heterophyes, Heterophyid infections, Heterophyidiasis, Heterophyopsis, Paralecithodendrium, Phagicola, Phaneropsolus, Procerovum, Prosthodendrium, Pygidiopsis, Spelotrema, Stellantchasmus, Stictodora. ICD9: 121.6 ICD10: B66.8

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Smallpox

Agent	VIRUS - DNA. Poxviridae, Orthopoxvirus: Variola virus
Reservoir	Human
Vector	None
Vehicle	Contact, Secretions, Fomite, Respiratory or pharyngeal acquisition
Incubation Period	7d - 17d
Diagnostic Tests	Biosafety level 3. Culture and electron microscopy of skin lesions. Serology. Nucleic acid amplification.
Typical Adult Therapy	Strict isolation Brincidofovir 200 mg PO weekly X 2 doses OR Tecovirimat 400 to 600 mg PO once daily X 14 days Cidofovir is effective in vitro[1]
Typical Pediatric Therapy	Strict isolation Brincidofovir <48 kg: 4 mg/kg PO weekly X 2 doses OR Tecovirimat 13 to <25 kg: 200 mg BID 25 to <40 kg: 400 mg BID
Vaccine	Smallpox + Monkeypox Smallpox vaccine
Clinical Hints	- Fever, myalgia, headache with pustular or hemorrhagic rash - Disease resolves in 2 to 3 weeks - Reported case-fatality rate is 25% for severe form (variola major) and 1% for minor form; - The last naturally-acquired case was reported in Somalia in 1977
Synonyms	Alastrim, Eczema vaccinatum, Kopper, Smallpox, Vailo, Variola, Variola minor, Varioloid. ICD9: 050 ICD10: B03

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

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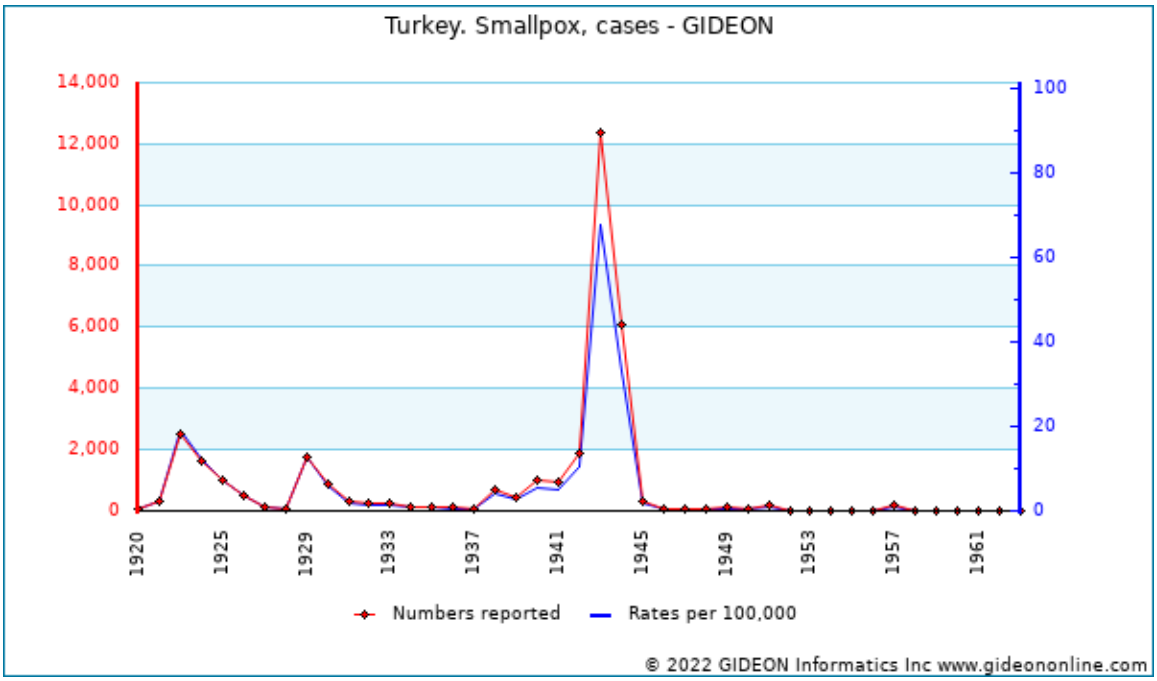
Smallpox in Turkey



Graph: Turkey. Smallpox, cases

Indigenous transmission ended in 1951

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Sporotrichosis

Agent	FUNGUS. Ascomycota, Euascomycetes, Ophiostomatales: *Sporothrix schenckii*, *S. brasiliensis* and *S. globosa* A dimorphic dematiaceous fungus
Reservoir	Soil, Vegetation, Wood
Vector	None
Vehicle	Trauma, Contact, Air, Respiratory or pharyngeal acquisition
Incubation Period	1w - 3m
Diagnostic Tests	Fungal culture. Serologic tests available in some centers.
Typical Adult Therapy	Itraconazole 100 to 200 mg PO daily X 3 to 6 months. OR Fluconazole 400 mg PO daily X 6 months. OR Potassium iodide 1 to 5 ml PO TID X 3 to 6 months OR Liposomal Amphotericin B (severe disease) 3-5 mg/kg/d IV, then Itraconazole 200 mg PO BID for at least 1 year[1]
Typical Pediatric Therapy	Itraconazole 2 mg/kg PO daily X 3 to 6 months. OR Fluconazole 3 mg/kg PO daily X 6 months. OR Potassium iodide 1-2 drops/year age (maximum 30-40 drops) PO TID X 3 to 6 months OR Liposomal Amphotericin B (severe disease) 3-5 mg/kg/d IV, then Itraconazole 3-5 mg/kg PO BID for at least 1 year
Clinical Hints	- Recent contact with flowers, thorns, trees or other plant material (occasionally cats) - Draining nodules which appear along the course of lymphatics - Eye, brain, testis, bone and other tissues may be involved
Synonyms	Rose gardener's disease, Schenck's disease, Sporothrix brasiliensis, Sporothrix chiensis, Sporothrix globosa, Sporothrix mexicana, Sporothrix schenckii, Sporotrichose. ICD9: 117.1 ICD10: B42

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Spotted fevers - Old World

Agent	BACTERIUM. *Rickettsia conorii* subsp. *conorii*, *R. aeschlimannii*, *R. helvetica*, *R. massiliae*, *R. monacensis*, *R. slovaka*
Reservoir	Dog, Rodent, Tick, Zoonotic
Vector	Tick (*Rhipicephalus sanguineus*, *Hyalomma* spp, *Boophilus* spp, *Dermacentor* spp, et al)
Vehicle	None
Incubation Period	6d - 7d (range 3d - 18d)
Diagnostic Tests	Serology. Demonstration of rickettsiae by immunofluorescence or culture. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 3 to 5d. OR Chloramphenicol 500 mg PO QID X 3 to 5d[1]
Typical Pediatric Therapy	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
Clinical Hints	- Patient may recall tick bite or dog contact during the preceding 1 to 3 weeks - Headache, myalgia, maculopapular rash - An eschar may be identifiable - Untreated disease resolves within two weeks - Case-fatality rates of 2% to 3% are reported
Synonyms	Boutonneuse fever, Candidatus Rickettsia kellyi, Candidatus Rickettsia tarasevichiae, Candidatus Rickettsia xinyangensis, DEBONEL, Febre escaro-nodular, Febre escaronodular, Indian tick typhus, Kenya tick typhus, Marseilles fever, Mediterranean spotted fever, R. aeschlimannii, Rickettsia aeschlimannii, Rickettsia conorii subsp conorii, Rickettsia conorii subsp indica, Rickettsia gravesii, Rickettsia helvetica, Rickettsia massiliae, Rickettsia monacensis, Rickettsia raoultii, Rickettsia slovaca, Rickettsia sp. XY99, Rickettsia tamurae, Thai spotted fever, TIBOLA, Tick-borne lymphadenopathy. ICD9: 082.1 ICD10: A77.1

Spotted fevers - Old World in Turkey

Seroprevalence surveys

Years	Region	Study Group	%	Notes
1998*	Antalya	general population	13.3	13.3% of individuals in the Antalya area [2]

* indicates publication year (not necessarily year of survey)

Case reports and series

- 2003 - Eleven cases were confirmed in the Trakya region (European section of Turkey) in 2003 [3]
- 2003 to 2009 - 128 cases were reported. [4]
- 2008 - A case of Mediterranean spotted fever associated with tick bite was reported in Bartin Province. [5]

Rickettsia conorii is prevalent among non-Ixodes ticks. [6]

Prevalence surveys

Years	Region	Study Group	%	Notes
2019*	Anatolia	various	5.8-13.7	*Rickettsia slovaca* was identified in 13.7% of tick pools, and *R. aeschlimannii* from 5.8% [7]
2013 - 2017	Istanbul	ticks	24.4	*Rickettsia* spp were found in 24.4% of ticks [8]
2014	Corum	ticks	0.31-19.5	*Rickettsia aeschlimannii*(19.5%), *R. slovaca* (4.5%), *R. raoultii* (2.2%), *R. hoogstraalii* (1.9%), *R. monacensis* (0.31%), [9]

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Years	Region	Study Group	%	Notes
2017	Sinop	ticks	0.52-7.55	7.55% / 0.52% of *Ixodes ricinus* adults / nymphs (*Rickettsia* spp) [10]

* indicates publication year (not necessarily year of survey)

Etiology

- The following species were identified in ticks collected from humans in the Istanbul region: *Rickettsia monacensis*, *R. aeschlimannii*, *R. conorii subsp. conorii*, *R. helvetica*, *R. raoultii*, *R. africae* and *R. felis* (2006) [11] [12]

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Staphylococcal food poisoning

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

Staphylococcal food poisoning in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2008*	Manisa	food handlers	0.77	*Staphylococcus aureus* was isolated from anterior nares of 0.77% of food-handlers in Manisa (2008 publication) [3]
2009*	Sanliurfa	food handlers	23.1	*Staphylococcus aureus* was isolated from anterior nares of 23.1% of food-handlers in Sanliurfa (2009 publication) [4]
2011*	Marmara	food	9.6	Enterotoxic *Staphylococcus aureus* was found in 9.6% of food samples from retail markets and dairy farms in the Marmara Region (2011 publication) [5]
2014 - 2016	Istanbul	food	0.019	0.019% of ready-to-eat food samples (single sample was toxin-positive) [6]
2011*	Ankara	shellfish	76.6	*Staphylococcus aureus* was found in 76.6% of stuffed mussels sold by street vendors in Ankara (2011 publication) [7]
2017*	Kayseri	meat - pastrami	2.6	[8]

* indicates publication year (not necessarily year of survey)

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Staphylococcal scalded skin syndrome

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

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Streptococcus suis infection

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

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Strongyloidiasis

Agent	PARASITE - Nematoda. Secernentea: *Strongyloides stercoralis* (*Strongyloides fulleborni* is occasionally implicated in systemic disease)
Reservoir	Human, Dog, Monkey (for *Strongyloides fulleborni*), Zoonotic
Vector	None
Vehicle	Skin contact, Soil, Feces, Autoinfection, Sexual contact
Incubation Period	14d - 30d
Diagnostic Tests	Identification of larvae (or ova, for Strongyloides fulleborni) in stool or duodenal aspirate. Serology.
Typical Adult Therapy	Ivermectin 200 micrograms/kg/d PO daily X 2d OR Albendazole 400 mg/d X 3d (7 days for hyperinfection syndrome) OR Moxidectin 8 mg PO once[1] [2]
Typical Pediatric Therapy	Ivermectin 200 micrograms/kg/d PO daily X 2d OR Albendazole 200 mg/d X 3d (7 days for hyperinfection syndrome) OR Moxidectin (age >12 years) 8 mg PO once
Clinical Hints	- Diarrhea - Gluteal or perineal pruritus and rash - Eosinophilia often present - Widespread dissemination encountered among immune-suppressed patients (case-fatality rate for this complication = 80%)
Synonyms	Anguilluliasis, Anguillulosis, Cochin China gastroenteritis, Diploscapter, Halicephalobus, Larva currens, Leptodera intestinals, Leptodera stercoralis, Lungworm, Metastrongylus, Micronema, Pseudo-rhabdis stercoralis, Rhabditis stercoralis, Rhabdonema intestinale, Rhabdonema stercoralis, Strongyloides fulleborni, Strongyloides stercoralis, Strongyloidose, Threadworm, Turbatrix. ICD9: 127.2 ICD10: B78

Strongyloidiasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
1997 - 2007	Van	patients	0.001	Survey of hospital outpatients [3]
2009 - 2010	Bursa	patients	0.44	0.44% of patients with gastrointestinal symptoms, in Bursa (2009 to 2010) [4]
1993 - 2000	Bursa	specimens - stool	0.006	0.006% of specimens examined at a parasitology laboratory in Bursa (1993 to 2000) [5]
2005	Hatay	specimens - stool	0.2	0.2% of stools examined at a university parasitology laboratory (Hatay, 2005) [6]
2003 - 2007	Eskisehir	parasites	0.4	0.4% of parasites found in stools at a university medical facility in Eskishir (2003 to 2007) [7]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2016*	Mugla	farmers	0.3	0.3% of individuals who gather mushrooms [8]
2013	Izmir	patients	0.92	Survey of hospitalized immunocompromised patients [9]
2019*		patients	4	4% of immunosuppressed patients were found to be seropositive [10]

* indicates publication year (not necessarily year of survey)

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Subdural empyema

Agent	BACTERIUM. *Haemophilus influenzae*, oral anaerobes, streptococci, et al
Reservoir	Human
Vector	None
Vehicle	Endogenous
Incubation Period	Variable
Diagnostic Tests	Imaging techniques (CT scan, etc).
Typical Adult Therapy	Antimicrobial agent(s) directed at known or likely pathogen[1] [2]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Fever, severe headache, vomiting - Signs of meningeal irritation and increased cerebrospinal fluid pressure - May follow head trauma, meningitis, otitis or sinusitis - Case-fatality rates vary from 15% (patient alert) to 60% (comatose)
Synonyms	ICD9: 324.9 ICD10: G06.1,G06.2

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Suppurative parotitis

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

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Syphilis

Agent	BACTERIUM. *Treponema pallidum* subsp. *pallidum* A microaerophilic gram-negative spirochete
Reservoir	Human
Vector	None
Vehicle	Sexual contact, Secretions, Respiratory or pharyngeal acquisition
Incubation Period	2w - 4w (range 10d - >8w)
Diagnostic Tests	Dark field microscopy (chancre). VDRL confirmed by antitreponemal test (FTA, MHTP). Nucleic acid amplification.
Typical Adult Therapy	Primary, secondary or early (< 1 year) latent: Benzathine Penicillin G 2.4 million units IM Other stages: Repeat dosage at one and two weeks Alternatives: Tetracycline, Ceftriaxone[1] [2] [3]
Typical Pediatric Therapy	Primary, secondary or early (< 1 year) latent: Benzathine Penicillin G : Weight <14 kg: 600,000u IM Weight 14 to 28 kg: 1,200,000u IM Other stages: Repeat dosage at one and two weeks
Clinical Hints	- Firm, painless chancre (primary syphilis) - Fever, papulosquamous rash and multisystem infection (secondary syphilis) - Late necrotic lesions of brain, aorta, bone or other organs (tertiary syphilis)
Synonyms	Canton rash, Chinese ulcer, Christian disease, French disease, German sickness, Harde sjanker, Lues, Neopolitan itch, Polish sickness, Sifilide, Sifilis, Spanish pockes, Syfilis, Treponema pallidum. ICD9: 090,091,092,093,094,095,096,097 ICD10: A50,A51,A52,A53

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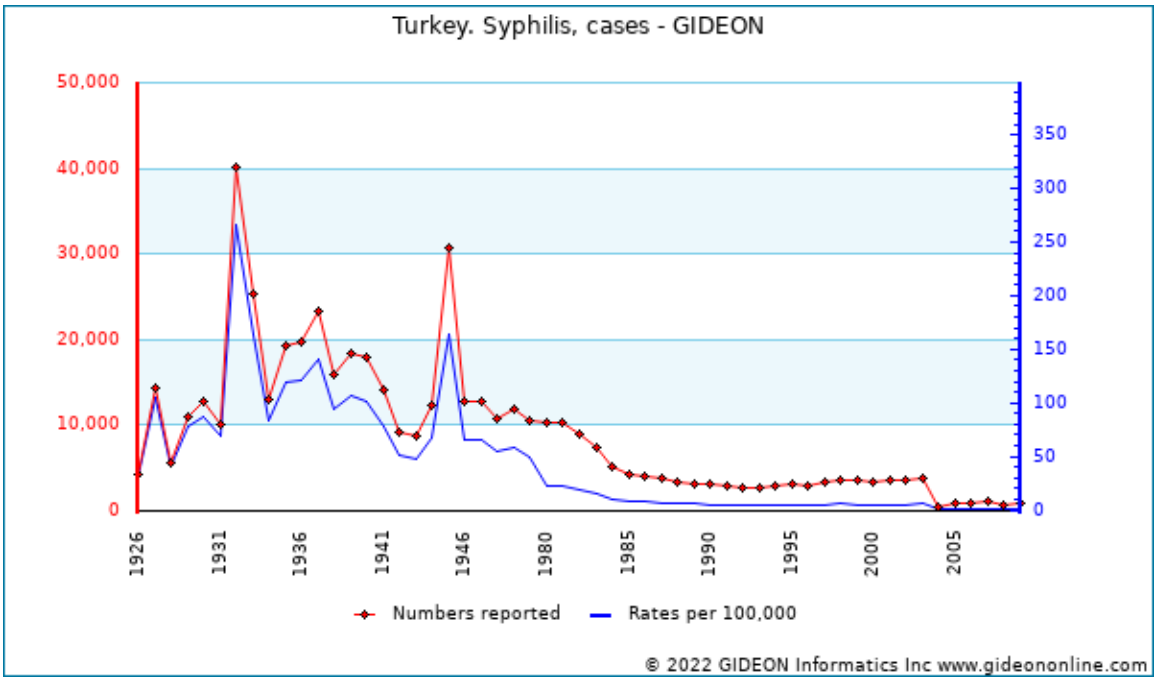
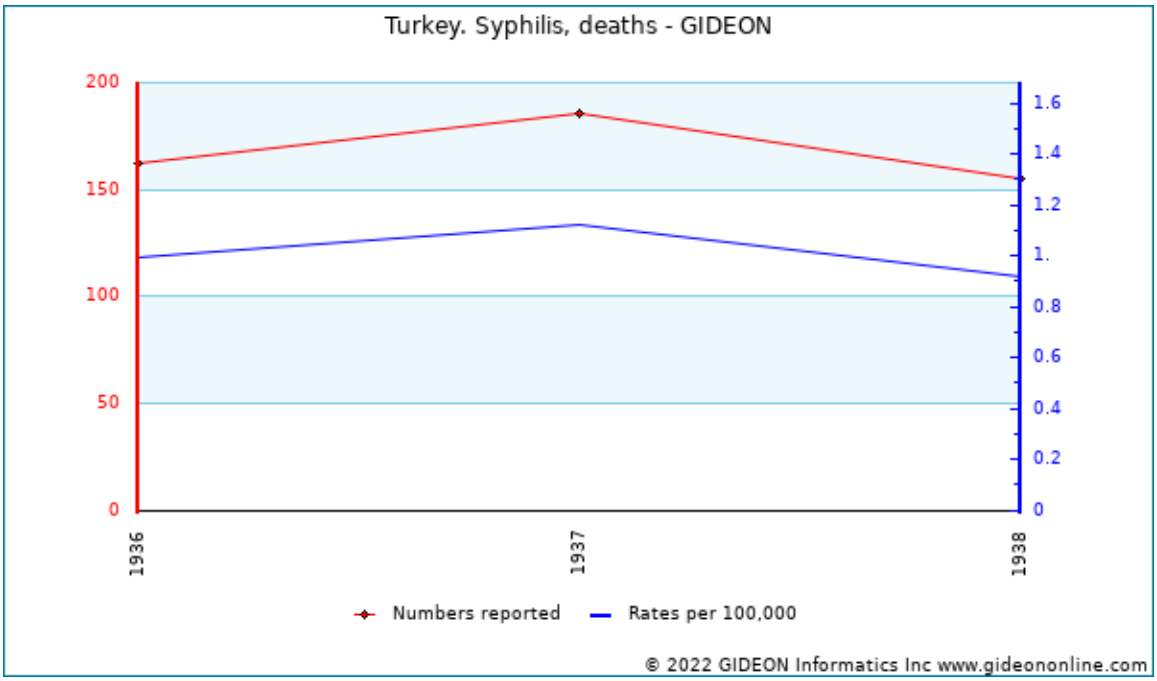
Syphilis in Turkey



Graph: Turkey. Syphilis, cases

Notes:
1. Historical data from reference [4]
2. Disease notification rates are 25.9% of actual disease incidence (Izmir, 2003) [5]



Graph: Turkey. Syphilis, deaths

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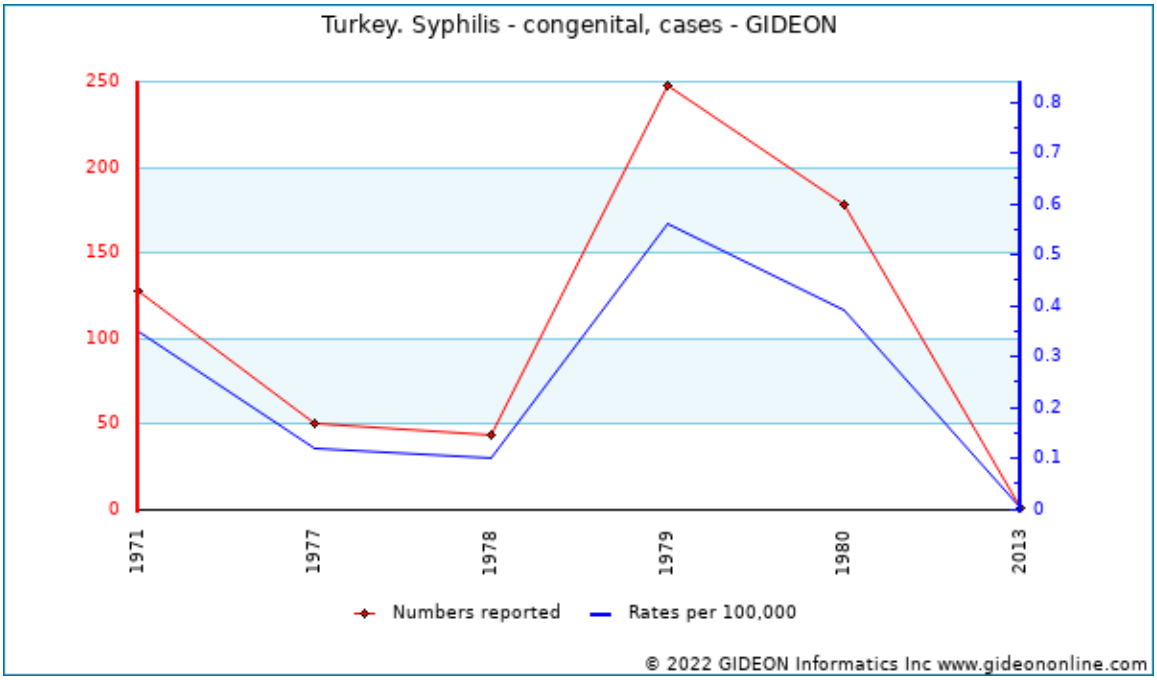

Graph: Turkey. Syphilis - congenital, cases

Prevalence surveys

Years	Region	Study Group	%	Notes
2012 - 2014	Ankara	patients	1.07	1.07% of patients with ocular inflammation (ocular syphilis, 2012 to 2014) [6]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2015*	Ankara	patients	3.1	3.1% of patients with condyloma acuminata (Ankara, 2015 publication) [7]
2009*	Sivas	adults	0.1	0.1% of persons engaged to be married, in Sivas (Antalya, 2009 publication) [8]
1991*	Elazig	sex workers	9.1	9.1% of CSW in Elazig (1991 publication) [9]
2010*	Ankara	sex workers	0	0% of CSW in Ankara (2010 publication) [10]
2008 - 2013	Istanbul	pregnant women	0	0% of pregnant women in Istanbul (2008 to 2013) [11]
2006 - 2013	Istanbul	patients - hepatitis	12.9	12.9% of HIV-positive patients in Istanbul (2006 to 2013) [12]
1987 - 2003	Istanbul	blood donors	0.04-0.2	0.04% of blood donors in 1987, 0.2% in 2003 (Istanbul) [13]
1987 - 1992	Kizilay	blood donors	0.041-0.092	0.041% of blood donors in 1987, 0.092% in 1992 [14]
1997 - 2000	Trabzon	blood donors	0.47	0.47% of blood donors (Trabzon, 1997 to 2000) [15]
1998 - 2007	Eskisehir	blood donors	0.168	0.168% of blood donors (Eskisehir, 1998 to 2007) [16]
1999 - 2002	Kocaeli	blood donors	0.02	0.02% of blood donors (Kocaeli, 1999 to 2002) [17]
2000 - 2010	Anatolia	blood donors	0.07	0.07% of blood donors (southeastern Anatolia, 2000 to 2010) [18]
2004 - 2010	Western Region	blood donors	0.04-0.07	0.07% of familial blood donors and 0.04% of voluntary blood donors in western Turkey (2004 to 2010) [19]

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Years	Region	Study Group	%	Notes
2013 - 2018	Istanbul	blood donors	0.3-0.5	0.3% of males and 0.5% of females [20]
2015*	Adana	blood donors	0.1	0.10% of blood donors in Adana (2015 publication) [21]
2007 - 2015	Izmir	transplant donors	0.5	0.5% of cornea donors (Izmir, 2007 to 2015) [22]
2018	Istanbul	patients - HIV / AIDS	19.3	Survey of HIV-positive males in Istanbul [23]
2018*		patients - HIV / AIDS	13.3	[24]

* indicates publication year (not necessarily year of survey)

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Taeniasis

Agent	PARASITE - Platyhelminthes, Cestoda. Cyclophyllidea, Taeniidae: *Taenia solium* & *T. saginata* (other species occasionally encountered)
Reservoir	Cattle, Pig, Zoonotic
Vector	None
Vehicle	Meat
Incubation Period	6w - 14w
Diagnostic Tests	Identification of ova or proglottids in feces.
Typical Adult Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide 2 g PO once[1] [2] [3]
Typical Pediatric Therapy	Praziquantel 10 mg/kg PO as single dose OR Niclosamide: weight 11-34 kg - 1 g PO as single dose weight >34 kg - 1.5 g PO as single dose
Clinical Hints	- Vomiting and weight loss - Often symptomatic or first recognized due to passage of proglottids - Parasite may survive for over 25 years in the human intestine
Synonyms	Bandwurmer [Taenia], Drepanidotaenia, Gordiid worm, Hair snake, Hydatigera taeniaeformis, Mesocestoides, Raillietina, Taenia asiatica, Taenia longihamatus, Taenia saginata, Taenia saginata asiatica, Taenia solium, Taenia suihominis, Taenia taeniaformis, Taeniarhynchiasis, Tapeworm (pork or beef), Tenia. ICD9: 123.0,123.2 ICD10: B68

Taeniasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2000	Sanliurfa	children	2.36	2.36% of school children in Sanliurfa shanty towns (*Taenia saginata*, 2000) [4]
2006*	Malatya	children	0.3	0.3% of primary school children in central Malatya (2006 publication) [5]
2006	Malatya	children	5.9	5.9% of children in Malatya (2006) [6]
2007*	Riza	children	1.3	1.3% of children (ages 1 to 6 years) in nurseries in Riza (2007 publication) [7]
2008*	Yozgat	children	1.6	1.6% of primary school children in Yozgat (2008 publication) [8]
2009*	Hatay	children	2.8	2.8% of orphans in Hatay (2009 publication) [9]
2009 - 2011	Multiple locations	cattle	0.24	0.24% of cattle at slaughter in Afyonkarahisar and Burdur Provinces (cysticercosis bovis, 2009 to 2011) [10]
2006*	Malatya	workers	0.8	0.8% of municipal sanitary workers in Malatya (2006 publication) [11]
2011*		workers	0.04	0.04% of administrators and workers in sanitary and non-sanitary institutions (2011 publication) [12]
1997 - 2007	Van	patients	0.2	Survey of hospital outpatients [13]
2003 - 2006	Istanbul	patients	2.4	2.4% of parasitic infections among hospitalized patients (Istanbul, 2003 to 2006) [14]
2006 - 2018	Sivas	patients	2.1	Survey of patients with gastrointestinal symptoms [15]
2012 - 2015	Bingol	patients	0.45	*Taenia* was identified in 0.45% of appendectomy specimens [16]
2014 - 2018	Erzincan	patients	0.4	Survey of patients undergoing appendectomy [17]

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Years	Region	Study Group	%	Notes
1976*	Ankara	general population	0.8	0.8% of individuals in poor districts of Ankara (1976 publication) [18]
2006*	Kayseri	general population	0.41	0.41% of individuals in the Kayseri Karpuzsekisi basin (*T. saginata*) (2006 publication) [19]
2007*	Utah	general population	0.44	0.44% of persons over age 15 years in Kutahya (*T. saginata*, 2007 publication) [20] [21]
2009 - 2011	Multiple locations	general population	0.1	0.1% of individuals in Afyonkarahisar and Burdur Provinces (2009 to 2011) [22]
2007*	Van	food handlers	0.27	0.27% of persons working in the food sector (*T. saginata*) (Van, 2007 publication) [23]
2009*	Sanliurfa	food handlers	10	10.0% of food-handlers in Sanliurfa (*T. saginata*, 2009 publication) [24]
1993 - 2000	Bursa	specimens - stool	0.089	0.089% of fecal samples processed at a university parasitology laboratory in Bursa (1993 to 2000) [25]
1993 - 2006	Sivas	specimens - stool	4.1	4.1% of fecal samples processed at a university parasitology laboratory in Sivas (1993 to 2006) [26]
1997 - 2001	Istanbul	specimens - stool	6.08	6.08% of fecal samples examined in Istanbul (1997 to 2001)
1999 - 2009	Istanbul	specimens - stool	0.2	0.2% of stool examinations from hospitalized patients (*T. saginata*, Istanbul, 1999 to 2009) [27]
2000 - 2006	Malatya	specimens - stool	2.2	2.2% of fecal samples analyzed in a single hospital in Malatya (2000 to 2006) [28]
2002 - 2004	Sivas	specimens - stool	0.6-0.8	0.6% of fecal samples and 0.8% of cello tape preparations processed at a university parasitology laboratory in Sivas (*T. saginata*) (2002 to 2004) [29]
2003 - 2005	Kocaeli	specimens - stool	3	3% of parasites detected in stool specimens from Kocaeli (2003 to 2005) [30]
2005	Hatay	specimens - stool	0.7	0.7% of stools examined at a university parasitology laboratory (Hatay, 2005) [31]
2005 - 2008	Kayseri	specimens - stool	0.12	0.12% of stools examined at a university parasitology laboratory (Kayseri, 2005 to 2008) [32]
2007 - 2009	Tokat	specimens - stool	7.9	7.9% of stool specimens examined by Tokat public health laboratory (*T. saginata*, 2007 to 2009) [33]
2009	Van	specimens - stool	0.03	0.03% of stools examined at a laboratory in Van (2009) [34]
2012 - 2014	Istanbul	specimens - stool	4.8	[35]
2012 - 2014	Istanbul	specimens - stool	2.42	Survey of specimens submitted to a hospital laboratory [36]
2000 - 2006	Antalya	specimens	1.1	1.1% of appendectomy specimens examined histologically (all inflamed). (Antalya 2000 to 2006) [37]
2005*	Sivas	specimens	1.6	1.6% of cellophane samples in Sivas (2005 publication) [38]
2003 - 2012	Ankara	parasites	3	3% of stool parasites identified by a University Parasitology laboratory in Ankara (2003 to 2012) [39]
2003 - 2007	Eskisehir	parasites	0.8	0.8% of parasites found in stools at a university medical facility in Eskishir (2003 to 2007) [40]
1999 - 2018	Malatya	specimens - tissue	0.07	Survey of appendectomy specimens [41]
2004 - 2005	Afyonkarahisar	environmental - wastewater	5.4	5.4% of untreated wastewater in Afyonkarahisar (2004 to 2005) [42]
2005*	Hatay	children - gastrointestinal	0.53	0.53% of children ages 0 to 14 with gastrointestinal symptomatology, in Hatay (2005 publication) [43]

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* indicates publication year (not necessarily year of survey)

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Tetanus

Agent	BACTERIUM. *Clostridium tetani* An anaerobic gram-positive bacillus
Reservoir	Animal feces, Soil
Vector	None
Vehicle	Trauma
Incubation Period	6d - 8d (range 1d - 90d)
Diagnostic Tests	Isolation of C. tetani from wound is rarely helpful. Serology (specimen taken before administration of antitoxin).
Typical Adult Therapy	Human antitoxin (see Vaccine module). Metronidazole 500 mg IV q6h OR Penicillin G (4 million u IV q4h) OR Doxycycline (100 mg IV BID). Diazepam (30 to 240 mg daily). Tracheostomy, hyperalimentation Active immunization should be started at the time of diagnosis[1]
Typical Pediatric Therapy	Human antitoxin (see Vaccine module). Metronidazole (30 mg/kg daily); OR Penicillin G (300,000 units/kilo daily). Diazepam. Tracheostomy, hyperalimentation Active immunization should be started at the time of diagnosis
Vaccines	DT vaccine DTaP vaccine DTP vaccine Td vaccine Tetanus immune globulin Tetanus vaccine
Clinical Hints	- Trismus, facial spasm, opisthotonus and tachycardia - Recurrent tonic spasms of skeletal muscle - Sensorium is clear - Disease may persist for 4 to 6 weeks - Case fatality rates of 10% to 40% are reported
Synonyms	Lockjaw, Starrkrampf, Stelkramp, Tetano, Tetanos. ICD9: 037,771.3 ICD10: A33,A34,A35

Tetanus in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

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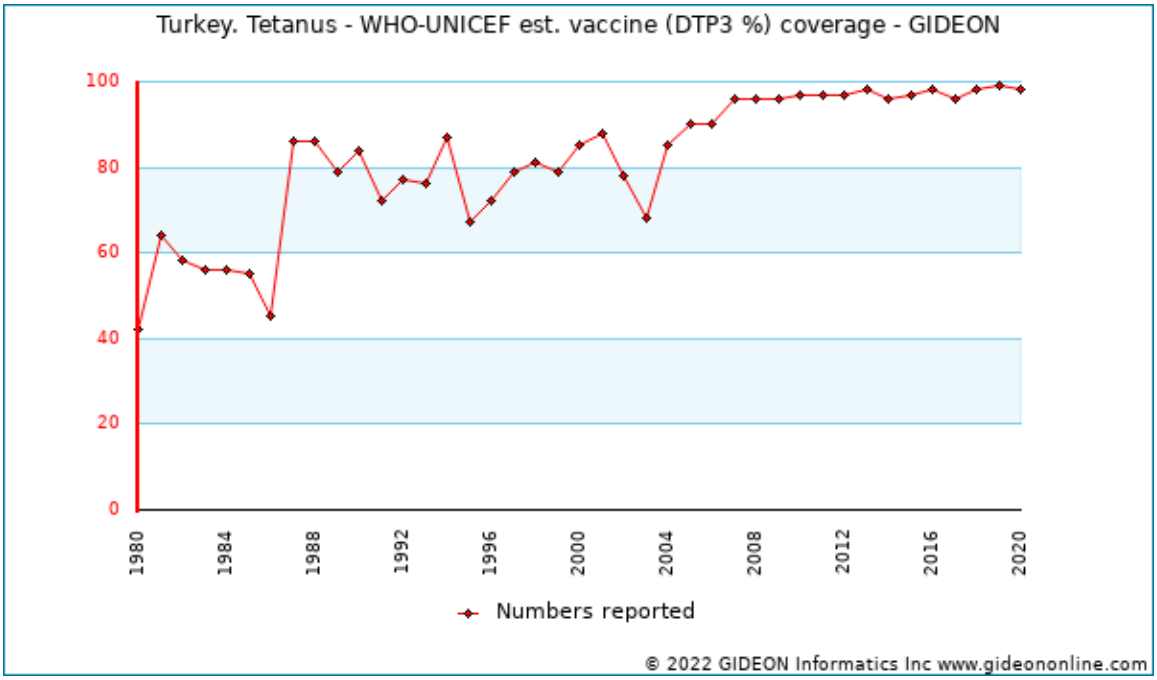
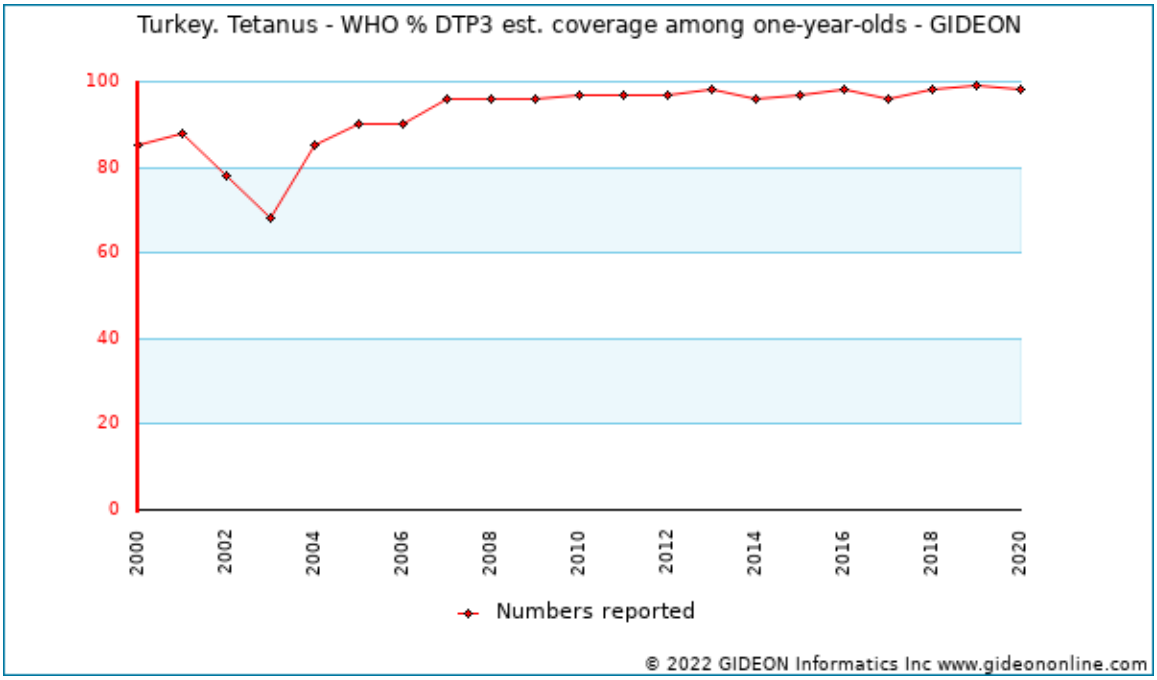


Graph: Turkey. Tetanus - WHO-UNICEF est. vaccine (DTP3 %) coverage



Graph: Turkey. Tetanus - WHO % DTP3 est. coverage among one-year-olds

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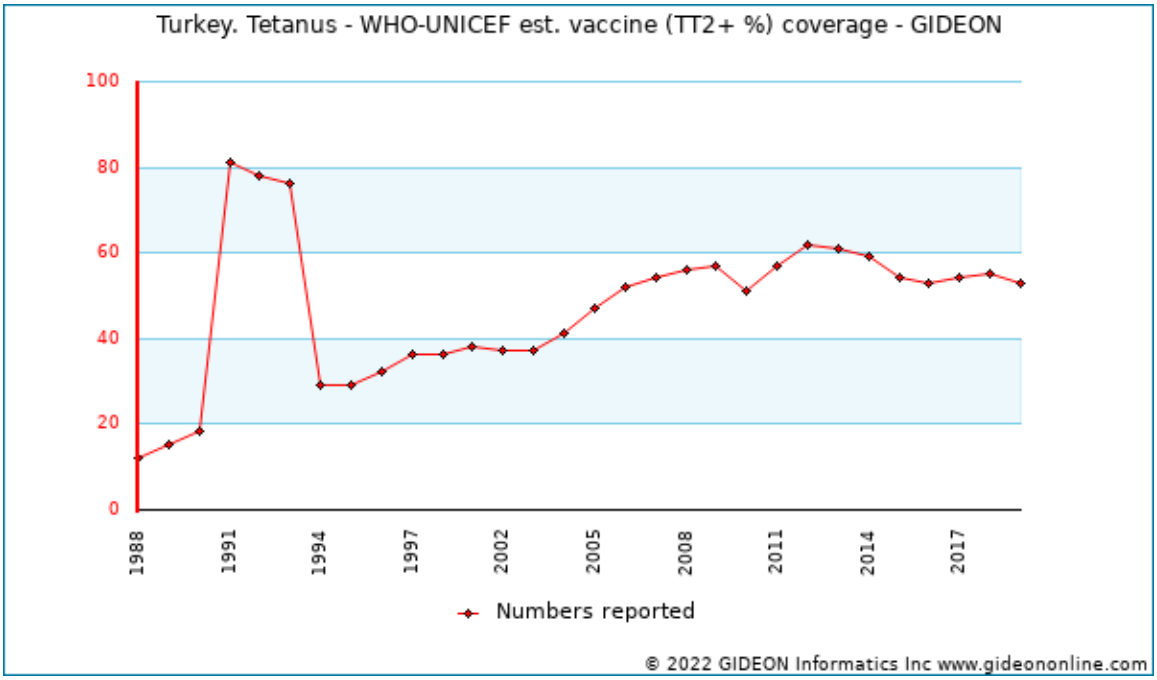

Graph: Turkey. Tetanus - WHO-UNICEF est. vaccine (TT2+ %) coverage

Notes:
1. See reference [2]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2000	Eastern Region	children	80	80.0% of children in Eastern Turkey (2000) [3]
2009*	Kocaeli	children	83.3	83.3% of children with acute lymphoblastic leukemia, prior to revaccination (Kocaeli, 2009 publication) [4]
2005*	Bolu	adults - elderly	15.7	15.7% of nursing home residents in Bolu (2005 publication) [5]
2007*	Ankara	women	54.8-86.6	54.8% to 86.6% of women of childbearing age (20 to 39 years old) (Ankara, 2007 publication) [6]
1974*	Multiple locations	patients	11	11% of patients with multiple sclerosis from Finland, Norway and Sweden (HSV-1, cerebrospinal fluid, 1974 publication) [7]
2014*	Ankara	patients	31	31% of adult outpatients treated at a university hospital (2014 publication) [8]
2014 - 2015	Izmir	patients	75	75% of trauma patients [9]
2014 - 2015	Ankara	adults	64-72	64% of rural and 72% of urban adults over age 18 in the Ankara region
2001*	Ankara	adults	68	68% of adults in Ankara (2001 publication) [10]
2003*	Anatolia	adults	25.3	25.3% of adults over age 40 in Anatolia (2003 publication) [11]
2005*	Kocaeli	adults	80	80% of adults in the Kocaeli region (2005 publication) [12]
2016*	Yozgat	adults	62.9	62.9% of adults in Yozgat (2016 publication) [13]
2000 - 2001	Multiple locations	general population	59.9-75	73.5% of individuals in Antalya, 59.9% in Diyarbakir and 75.0% in Samsun (2000 to 2001) [14]
2005*	Ankara	general population	16.3-90	90% of adolescents, and 16.3% over age 60 in Ankara (2005 publication) [15]

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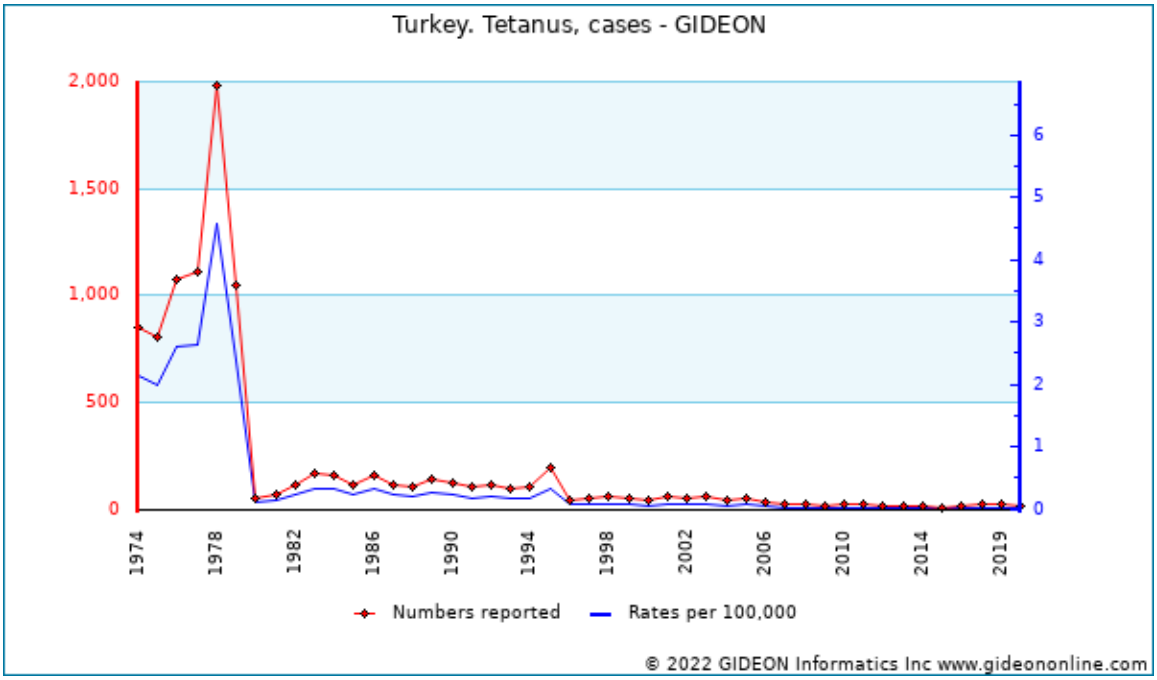
Years	Region	Study Group	%	Notes
2005*	Ankara	general population	66.5	66.5% of individuals in Ankara (2005 publication) [16]
2009 - 2010	Bursa	general population	75	75% of individuals in an Emergency Department (Bursa, 2009 to 2010) [17]
2009*	Edirne	general population	98.6	98.6% of individuals in Edirne (2009 publication) [18]
2010	Western Region	general population	33.9	33.9% of farming villagers in western Turkey (2010) [19]
2017	Ankara	general population	57.3-92	80.5% in the age group 3 to 5 years; 92.0% at 6 to 12 years; 57.3% at 50 years and older [20]
2001*	Ankara	pregnant women	69	69.0% of pregnant women in Ankara (2001 publication) [21]
2014*	Istanbul	mothers	58.3-94.5	58.3% / 94.5% of unvaccinated / vaccinated mothers (2014 publication) [22]

* indicates publication year (not necessarily year of survey)



Graph: Turkey. Tetanus, cases

Notes:
1. 114 deaths were ascribed to tetanus during 1987 to 1991.
2. 117 cases (38 fatal) of adult tetanus were treated at 25 medical centers (2017 publication) [23]

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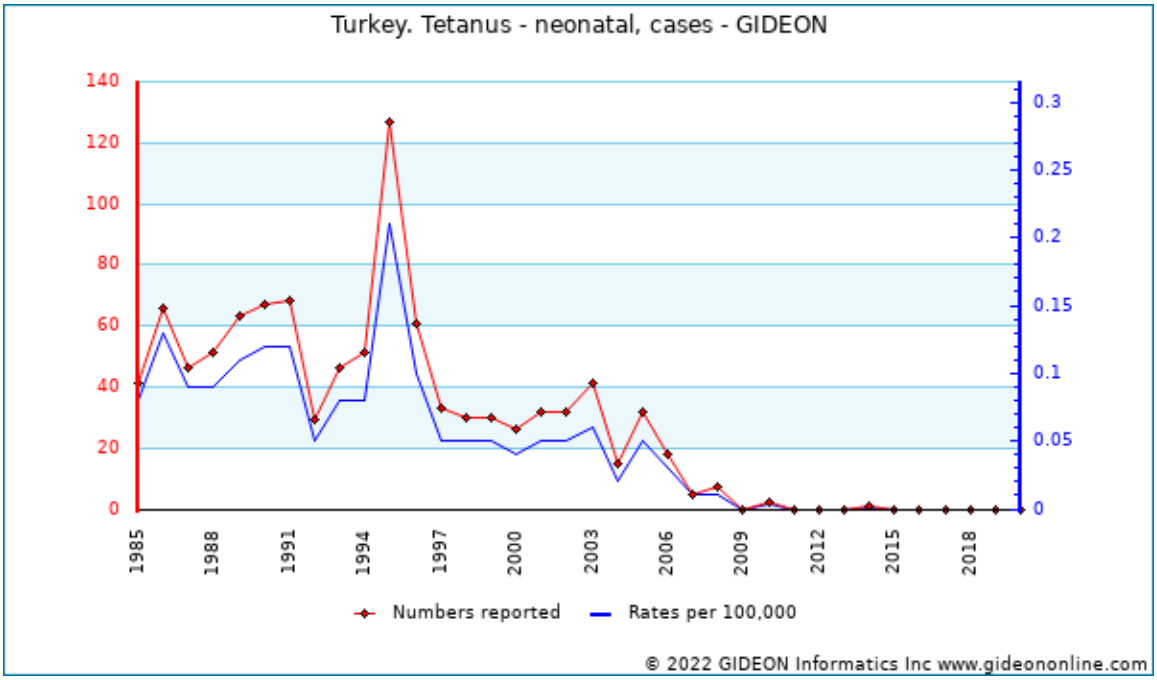

Graph: Turkey. Tetanus - neonatal, cases

Notes:
1. 89 deaths were ascribed to neonatal tetanus during 1987 to 1991.
2. 67 cases (28 fatal) of neonatal tetanus were treated at a single hospital in Diyarbakir during 1991 to 2006. [24]
3. As of 2009, the World Health Organization validated that Turkey had eliminated neonatal tetanus. [25]

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Tick-borne encephalitis

Agent	VIRUS - RNA. Flaviviridae, Flavivirus: Central European encephalitis virus
Reservoir	Rodent (*Apodemus flavicollis*, *A. sylvaticus*, *Microtus arvalis*), Tick, Bird, Cattle, Zoonotic
Vector	Tick (*Ixodes ricinus*)
Vehicle	Dairy products
Incubation Period	7d - 14d (range 4d - 20d)
Diagnostic Tests	Biosafety level 4. Viral culture (blood, brain tissue, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Tick-borne encephalitis globulin Tick-borne encephalitis vaccine
Clinical Hints	- Biphasic illness - Headache and myalgia followed by encephalitis - Onset 1 to 2 weeks after tick bite - Symptoms may persist for weeks following the acute infection - Case-fatality rate less than 2%
Synonyms	Central European tick encephalitis, Diphasic meningoencephalitis, Diphasic milk fever, Encephalite a tiques, European tick-borne encephalitis, Forest encephalitis, Fruhsommer-Meningoenzephalitis, FSME, Hanzlova, Hypr, Kumlinge, Langat, Neudorfl, Skogflattencefalitt, Tick-borne encephalitis: Central European, Zeckenzephalitis. ICD9: 063.2 ICD10: A84.1

Although Tick-borne encephalitis is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Tick-borne encephalitis in Turkey

1999 - No cases were reported.

- 2005 - One acute infection and seven seropositive individuals were identified in an area endemic for Crimean-Congo hemorrhagic fever. [1]
- 2011 (publication year) - Evidence for infection was subsequently documented in Zonguldak, Northern Anatolia. [2]

Prevalence surveys

Years	Region	Study Group	%	Notes
2020*	Thrace	various	0	Survey of sheep, cattle, ticks and mosquitoes [3]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2019*	Istanbul	children	0.45	0.45% of children with fever and / or arthritis (IgM) [4]
2006		patients	1.4	1.4% of persons with history of tick bite (2006)
2007*	Southeast Region	patients	10.5	10.5% of patients at two state hospitals (southeastern Turkey, 2007 publication) [5]
2006 - 2007	Sinop	general population	2.9	2.9% of individuals in Sinop, central Black Sea region (2006 to 2007) [6]

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Years	Region	Study Group	%	Notes
2012*	Samsun	general population	0	0% of individuals in Tekkekoy, Samsun Province (2012 publication) [7]
2012	Ankara	general population	0	0% of individuals in Ankara Province (2012) [8]
2010*	Ankara	blood donors	1.9	1.9% of blood donors in Ankara, Konya, Eskisehir and Zonguldak (2010 publication) [9]

* indicates publication year (not necessarily year of survey)

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Tick-borne encephalitis: Russian spring-summer

Agent	VIRUS - RNA. Flaviviridae, Flavivirus. Related viruses (Negishi and Tyuleniy) cause human disease in Russia and Japan
Reservoir	Rodent, Tick, Goat, Cattle, Zoonotic
Vector	Tick (*Ixodes persulcatus*)
Vehicle	Dairy products
Incubation Period	7d - 14d (range 4d - 20d)
Diagnostic Tests	Biosafety level 4. Viral culture (blood, brain tissue, CSF). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Tick-borne encephalitis globulin Tick-borne encephalitis vaccine
Clinical Hints	- Onset 1 to 2 weeks after a tick bite - Headache and myalgia, followed by encephalitis - Case fatality rate exceeds 20% - Over 50% suffer permanent neurological sequelae
Synonyms	Alma-Arasan, Alongshan virus, Far eastern tick-borne encephalitis, Jingmen virus, Jingmenvirus, Karshi, Manych, Meaban, Negishi, Russian endemic typhus, Russian spring summer encephalitis, Siberian tick-borne encephalitis, Tick-borne encephalitis: Siberian, Tyuleniy. ICD9: 062.3 ICD10: A84.0

Although Tick-borne encephalitis: Russian spring-summer is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Tick-borne encephalitis: Russian spring-summer in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2013 - 2018	Multiple locations	ticks	3.9	Jingmen tick virus was identified in 3.9% of tick pools from Anatolia and eastern Thrace [1]

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Toxic shock syndrome

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

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Toxocariasis

Agent	PARASITE - Nematoda. Secernentea: *Toxocara cati* and *T. canis*
Reservoir	Cat, Dog, Mouse, Zoonotic
Vector	None
Vehicle	Soil ingestion
Incubation Period	1w - 2y
Diagnostic Tests	Identification of larvae in tissue. Serology.
Typical Adult Therapy	Albendazole 400 mg BID X 5d. OR Mebendazole 100 to 200 mg PO bid X 5 days Add corticosteroids if eye, brain, heart or lung involvement is present.[1] [2] [3]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Cough, myalgia, seizures and urticaria - Hepatomegaly, pulmonary infiltrates or retrobulbar lesions may be present - Marked eosinophilia is common - Symptoms resolve after several weeks, but eosinophilia may persist for years
Synonyms	Ascaris suum, Toxocara canis, Toxocara cati, Toxocarose, Toxocarosis, Visceral larva migrans. ICD9: 128.0 ICD10: B83.0

Toxocariasis in Turkey

- Seroepidemilogy of human toxocariasis in Turkey (2020 publication) [4]

Prevalence surveys

Years	Region	Study Group	%	Notes
2006*		dogs	13.3	13.3% of military dogs (2006 publication) [5]
2006*	Van	dogs	13.9	13.9% of dogs in the Van region (2006 publication) [6]
2007*	Aydin	dogs	20	20% of fecal specimens from dogs in an animal shelter (Aydin Municipality, 2007 publication) [7]
2007*	Multiple locations	dogs	36.2-47.8	36.2% of stray dogs in Afyonkarahisar Province and 47.8% in Eskisehir Provinces (2007 publication) [8]
2008*	Kirikkale	dogs	21.56	21.56% of dogs (*Toxocara canis* eggs detected on their coats) (Kirikkale, 2008 publication) [9]
2013*	Aydin	dogs	11	11% of dogs in Aydin District (fecal PCR, 2013 publication) [10]
2017*		dogs	9.38	Survey of fecal specimens from sheep dogs [11]
2006 - 2007	Samsun	animals	8.6	8.6% of zoo animals in Samsun (*Toxocara* spp., 2006 to 2007) [12]
1988 - 2009	Ankara	patients	1.2	Toxacariasis was the cause of infectious uveitis in 1.2% of patients. [13]
2017*	Kirikkale	cats	48.9	[14]
2021*	Multiple locations	foxes	14.56	Survey of red foxes from 29 provinces [15]
2010*	Bursa	vegetables	1	1.0% of unwashed vegetables (Bursa, 2010 publication) [16]
2018	Karaman	environmental	19.4	Survey of soil and stool samples from children's playgrounds [17]
1998 -	Istanbul	environmental -	15.9	15.9% of playgrounds in Istanbul (1998 to 1999)

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Years	Region	Study Group	%	Notes
1999		soil		
2000*	Ankara	environmental - soil	17.6-30.6	17.6% to 30.6% of soil samples from public parks in Ankara (2000 publication) [18]
2003 - 2004	Kirikkale	environmental - soil	62.1	62.1% of playgrounds in Kirikkale (2003 to 2004) [19]
2005*	Aydin	environmental - soil	18.9	18.9% of soil samples from public parks in Aydin (2005 publication) [20]
2007 - 2008	Erzurum	environmental - soil	64.28	64.28% of soil samples from unfenced public parks and 0% from fenced public parks (Erzurum, 2007 to 2008) [21]
2010*	Kutahya	environmental - soil	10	10% of sand samples from playgrounds in Kutahya (2010 publication) [22]
2004 - 2005	Afyonkarahisar	environmental - wastewater	0.6	0.6% of untreated wastewater in Afyonkarahisar (2004 to 2005) [23]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
		children	11.9-47.2	47.2% of children ages 1 to 10 years in rural areas, and 11.9% in urban areas
2004*		children	18.8	18.8% of retarded children (2004 publication) [24]
2007*	Northwest Region	children	0.71-16.97	16.97% of children from rural areas and 0.71% of children from urban areas. (Northwest Turkey, 2007 publication) [25]
2007*	Northwest Region	children	12.95	12.95% of children in rural northwestern Turkey (2007 publication) [26]
2010*	Kutahya	children	7.6	7.6% of children ages 3 to 13 years, in Kutahya (2010 publication) [27]
2003*		patients	29	29.0% of patients with chronic urticaria (2003 publication) [28]
2010*	Erciyes	patients	21.4	21.4% of patients presenting to a parasitology department in Erciyes (2010 publication) [29]
2013*		patients	14.5	14.5% of patients with chronic urticaria (2013 publication) [30]
2013*	Elazig	patients	6	6% of patients with Parkinson's disease and 0% of a control group (2013 publication) [31]
2014*	Istanbul	patients	48.4	48.4% of patients with eosinophilia (Western blot, Istanbul, 2014 publication) [32]
2015*	Istanbul	patients	17.8	17.8% of patients with chronic urticaria vs. 0% of healthy controls (2015 publication) [33]
2008*	Aydin	general population	32.6	32.6% of persons with eosinophilia, and 20.3% of persons without. (Aydin, 2008 publication) [34]
2014	Anatolia	veterinarians	8	8% of veterinarians and animal husbandry workers (southern Anatolia, 2014) [35]
2008*	Elazig	patients - psychiatric	45.9	45.9% of hospitalized schizophrenic patients (Elazig, 2008 publication) [36]
2006*		patients - asthma	13.2	13.2% of adults with asthma (2006 publication) [37]
2007*	Ankara	patients - asthma	9.7	9.7% of patients with asthma (Ankara, 2007 publication) [38]

* indicates publication year (not necessarily year of survey)

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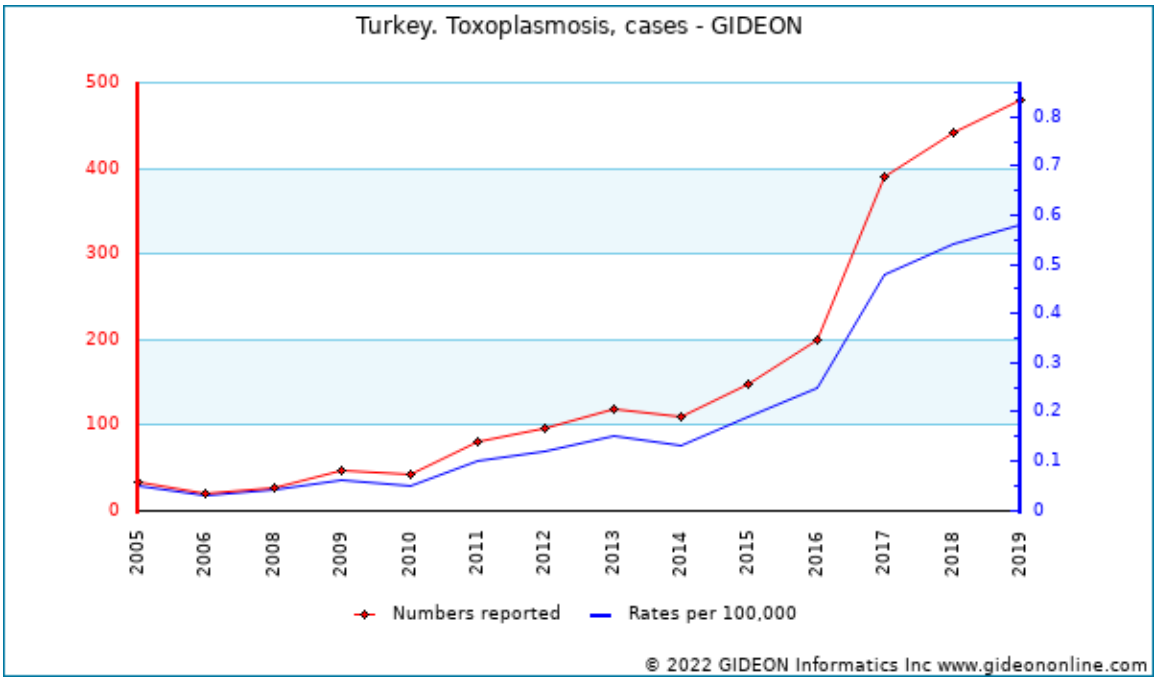
Toxoplasmosis

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

Toxoplasmosis in Turkey



Graph: Turkey. Toxoplasmosis, cases

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Notes:
1. No fatal cases were reported in 2005; 0 in 2006

Prevalence surveys

Years	Region	Study Group	%	Notes
2018*	Multiple locations	birds	89.6	Survey of wild birds in Izmir and Manisa \provinces [5]
2013*		transplant recipients	2.94	2.94% of allogeneic stem cell transplant recipients (cerebral toxoplasmosis, 2013 publication) [6]
1988 - 2009	Ankara	patients	41.7	41.7% of patients with infectious uveitis. [7]
2014*	Giresun	environmental	0-13.2	13.2% of environmental- and 0% of drinking-water samples in Giresun Province (2014 publication) [8]
2017 - 2018	Denizli	environmental - water	16.7	Survey of agricultural irrigation water samples from downtown Denizli [9]
2011*	Ankara	patients - eye	13.2	13.2% of childhood-onset uveitis cases (2011 publication) [10]
2021*	Southern Region	patients - eye	10.8	Survey of children with uveitis [11]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2015*	Southeast Region	farmers	58.3	58.3% of female farm workers of reproductive age in southeastern Turkey (2015 publication) [12]
2015*	Ankara	children	13.3	13.3% of children ages 2 to 12 years in Ankara
2018*		children	37.2	37.2% of children with Tourette syndrome vs. 9.2% of a control group [13]
2009*	Kayseri	prisoners	37.58	37.58% of prisoners in Kayseri (2009 publication) [14]
2008	Adana	cattle	56.06	56.06% of cattle in Adana Province (2008) [15]
2012	Kahramanmaras	refugees	49.7-80	80% / 49.7% of pregnant Syrian refugees / indigenous women in 2012 [16]
2011*	Kayseri	students	23.3	23.3% of foreign high school students in Kayseri (2011 publication) [17]
2005*	Ankara	dogs	62.06	62.06% of dogs in Ankara (2005 publication) [18]
2006*	Kocaeli	dogs	62.5-71.1	62.5% of pet dogs and 71.7% of stray dogs in Kocaeli Province (2006 publication) [19]
2006*	Kocaeli	dogs	69.8	69.8% of dogs in Kocaeli Province [20]
2008*	Ankara	dogs	40.3	40.3% of dogs in Ankara Province (dye test, 2008 publication) [21]
2010*	Diyarbakir	dogs	94	94% of shelter dogs in the Diyarbakir region (2010 publication) [22]
2010*	Kars	dogs	96.1	96.1% of domestic dogs in Kars Province (2010 publication) [23]
2007*	Ankara	horses	28	28% of horses bred for sporting use (Ankara, 2007 publication) [24]
2009*	Nigde	horses	7.2	7.2% of horses in Nigde (2009 publication) [25]
1995*	Malatya	women	39.9	39.9% of women of reproductive age in Malatya (1995 publication) [26]
2004 - 2009	Ankara	women	28.6	28.6% of married women (Ankara, 2004 to 2009) [27]
2006	Sanliurfa	women	69.5	69.5% of women in Sanliurfa (2006) [28]
2009	Hatay	women	59.9	59.9% of women and children in Hatay (2009) [29]
2009 - 2011	Kocaeli	women	28.5	28.5% of women of childbearing age in Kocaeli (2009 to 2011) [30]
2015 -	Bolu	women	22	Survey of women of childbearing age [31]

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Years	Region	Study Group	%	Notes
2017				
1999 - 2003	Elazig	patients	31.01	31.01% (0.77% IgM positive) of hospital inpatients. (Elazig, 1999 to 2003) [32]
2002 - 2008	Bursa	patients	2.02-29.2	29.2% of women and 2.02% of men with suspected toxoplasmosis, in Bursa (2002 to 2008) [33]
2004	Hatay	patients	76.5	76.5% of hemodialysis patients (2004) [34]
2005 - 2008	Kayseri	patients	33.4	33.4% of women presenting to an Obstetrics and children's hospital in Kayseri Province (2005 to 2008) [35]
2005*	Edirne	patients	67.5	67.5% of leukemia and lymphoma patients, 60% of controls in Edirne (2005 publication) [36]
2009 - 2016	Bursa	patients	30.7	30.7% of hospital patients [37]
2009 - 2019	Nationwide	patients	47.1	Survey of patient specimens submitted to the National Parasitology Reference Laboratory [38]
2010*	Afyonkarahisar	patients	44.1	44.1% of patients with Alzheimer's disease vs. 24.3% of controls (2010 publication) [39]
2010*		patients	50	50% of patients with Parkinson's disease (2010 publication) [40]
2006*	Yalova	sheep	66.66	66.66% of sheep in Yalova (2006 publication) [41]
2011*	Afyonkarahisar	sheep	98.9	98.9% of Pirlak sheep in Suhut district, Afyonkarahisar (2011 publication) [42]
2014*	Silopi	sheep	97	97% of sheep in Silopi District (2014 publication) [43]
2015	Erzurum	sheep	4.58	[44]
2017*	Nevsehir	sheep	10	[45]
2014*	Samsun	buffalo	87.79	87.79% of water buffaloes (*Bubalus bubalis*) in Samsun and Afyon Provinces (2014 publication) [46]
2016 - 2018	Bursa	students - medical	37.9	[47]
2014*	Izmir	cats	42-48	42% to 48% of stray cats in Izmir (2014 publication) [48]
2016	Ankara	cats	43.4	[49]
2009*	Kayseri	various	24-44.2	44.2% of patients with migraine, 26% of healthy individuals and 24% of patients with rhinosinusitis (Kayseri, 2009 publication) [50]
2009*		general population	37	37% of the general population (estimated)
2018*		rabbits	0	0% of breeding rabbits from a farm [51]
2004 - 2006	Hatay	pregnant women	52.1	52.1% of pregnant women in Hatay (IgG, 2004 to 2006) [52]
2004*	Sanliurfa	pregnant women	60.4	60.4% of pregnant women in Sanliurfa (2004 publication) [53]
2005*	Aydin	pregnant women	30.1	30.1% of pregnant women in Aydin Province (2005 publication) [54]
2008 - 2011	Antalya	pregnant women	33.4	33.4% of pregnant women in Antalya (2008 to 2011) [55]
2008 - 2013	Istanbul	pregnant women	31.4	31.4% of pregnant women in Istanbul (2008 to 2013) [56]
2008 - 2017	Ankara	pregnant women	22.3	[57]
2009 - 2016	Hatay	pregnant women	48.7	[58]
2009*	Western Region	pregnant	48.3	48.3% of pregnant women in western Turkey (2009 publication) [59]

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Years	Region	Study Group	%	Notes
		women		
2009 - 2013	Istanbul	pregnant women	23.1	23.1% of pregnant women (2009 to 2013) [60]
2012*	Antalya	pregnant women	32.4	32.4% of pregnant women in Antalya (2012 publication) [61]
2012 - 2017	Mersin	pregnant women	7.66	[62]
2012 - 2014	Northwest Region	pregnant women	43.9	43.9% of pregnant women in north-western Turkey (2012 to 2014) [63]
2012 - 2021	Kahramanmaras	pregnant women	41-64	41% of native Turkish pregnant women vs. 64% of Syrian refugee pregnant women. [64]
2012 - 2013	Western Region	pregnant women	28.8	28.8% of pregnant women in western Turkey (2012 to 2013) [65]
2012 - 2013	Van	pregnant women	37.6	[66]
2012*	Malatya	pregnant women	37.5	37.5% of pregnant women in Malatya (2012 publication) [67]
2013 - 2015	Anatolia	pregnant women	31	[68]
2013 - 2016	Erzurum	pregnant women	31	[69]
2013	Kahramanmaras	pregnant women	45.7-62.6	62.6% / 45.7% of pregnant women (refugees / indigenous) in 2013 (Kahramanmaras) [70]
2013*	Izmir	pregnant women	39.9	39.9% of pregnant women in Izmir (2013 publication) [71]
2014*	Ankara	pregnant women	28	28% of pregnant women (2014 publication) [72]
2014 - 2016	Izmir	pregnant women	32.3	[73]
2015*	Istanbul	pregnant women	24.9-37	24.9% of pregnant women and 37% of patients suspected of having toxoplasmosis, in Istanbul (2015 publication) [74]
2015*	Kilis	pregnant women	63.4	63.4% of pregnant women in Kilis (2015 publication) [75]
2018	Karabuk	pregnant women	14	[76]
2019	Mersin	pregnant women	28.7	[77]
2020*		pregnant women	47	Survey of pregnant Syrian refugees in Turkey [78]
2008*	Ankara	animal contact	16-50	28.4% of veterinarians, 16% of veterinary technicians, 50% of animal lovers and 30% of a control group (Ankara, 2008 publication)
2007 - 2017	Aydin	specimens - blood	31.5	Survey of specimens submitted for *Toxoplasma* serology [79]
2010 - 2016	Bolu	specimens - blood	21	21% of serum samples submitted to a hospital laboratory [80]
2006 - 2010	Manisa	specimens	23.3	23.3% of specimens submitted for *Toxoplasma* testing to a laboratory in Manisa (2006 to 2010) [81]
2013	Afyon	specimens	24	24% of sera tested at a hospital in Afyon (2013) [82]
2002	Kayseri	blood donors	19.5	19.5% of blood donors in Kayseri (2002)
2006*	Ankara	blood donors	42.5	42.5% of blood donors in Ankara (2006 publication) [83]
2007*	Kayseri	blood donors	20.25	20.25% of blood donors in Kayseri (2007 publication) [84]

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Years	Region	Study Group	%	Notes
2015	Ankara	blood donors	25.6	[85]
2004 - 2005	Konya	poultry - chicken	0.34	0.34% of layer hens. (Konya region, 2004 to 2005) [86]
2012*	Aydin	patients - thalassemia	19.4	19.4% of patients with beta thalassemia major (Aydin, 2012 publication) [87]
2014*	Izmir	shellfish	13.2	13.2% of mussels (*Mytilus galloprovincialis*) in coastal Izmir (2014 publication) [88]
2003 - 2004	Nigde	birds - pigeon	0.9-0.95	0.95% of domestic pigeons (*Columba livia domestica*) and 0.90% of wild pigeons (*Columba livia livia*) (2003 to 2004) [89]
2010*		patients - psychiatric	41	41% of persons who attempted suicide vs. 28% of controls (2010 publication) [90]
2010*		patients - psychiatric	47.62	47.62% of patients with obsessive-compulsive disorder vs. 19% of controls (2010 publication) [91]
2015*	Western Region	patients - psychiatric	33.3	33.3% of patients with schizophrenia and 21.7% of controls (2015 publication) [92]
2015*		patients - psychiatric	53.5	53.5% of patients with schizophrenia and 43.3% of healthy controls (2015 publication) [93]
2015*	Malatya	patients - psychiatric	46	46% of patients with schizophrenia (2015 publication) [94]
2017*		patients - psychiatric	31.7-35	35% of patients with obsessive-compulsive disorder and 31.7% with generalized anxiety disorder; vs. 10% of a control group [95]
2021*	Istanbul	patients - psychiatric	53.8	53.8% of schizophrenia patients, vs. 27.5% of a control group [96]
2008*	Malatya	waste collectors	24.6	24.6% of dustmen (Malatya, 2008 publication)
2006 - 2017		patients - HIV / AIDS	43.5	[97]
2011*		patients - HIV / AIDS	52	52% of HIV-positive patients (2011 publication) [98]

* indicates publication year (not necessarily year of survey)

2019 (publication year) - *Toxoplasma gondii* infection was identified in a Eurasian badger (*Meles meles*) in Izmir. [99]

Notable outbreaks

Years	Region	Setting	Cases	Notes
2002	Izmir	boarding school	171	[100]

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Trachoma

Agent	BACTERIUM. *Chlamydia trachomatis*, type A
Reservoir	Human
Vector	Fly
Vehicle	Secretions, Contact, Fly, Fomite
Incubation Period	5d - 12d
Diagnostic Tests	Culture or direct immunofluorescence of secretions. Serology. Nucleic acid amplification.
Typical Adult Therapy	Azithromycin 1 g po as single dose. Also administer topical Tetracycline[1] [2]
Typical Pediatric Therapy	Azithromycin 20 mg/kg as single dose. Also administer topical Tetracycline
Clinical Hints	- Keratoconjunctivitis with follicular hypertrophy, palpebral scarring and pannus formation - In later stages, eyelashes may protrude inward or outward - 0.5% of infections result in blindness
Synonyms	Egyptian ophthalmia, Granular conjunctivitis, Kornerkrankheit, Trachom, Tracoma. ICD9: 076 ICD10: A71

Trachoma in Turkey

Trachoma is prevalent in Eastern, Southern and Southeastern [3] provinces.

Prevalence surveys

Years	Region	Study Group	%	Notes
1997*	Erzurum	general population	1.9-3.2	3.2% of the population of Erzurum below age 30, and 1.9% above age 30 (1997 publication) [4]

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

1,083,729 cases were treated during 1992.

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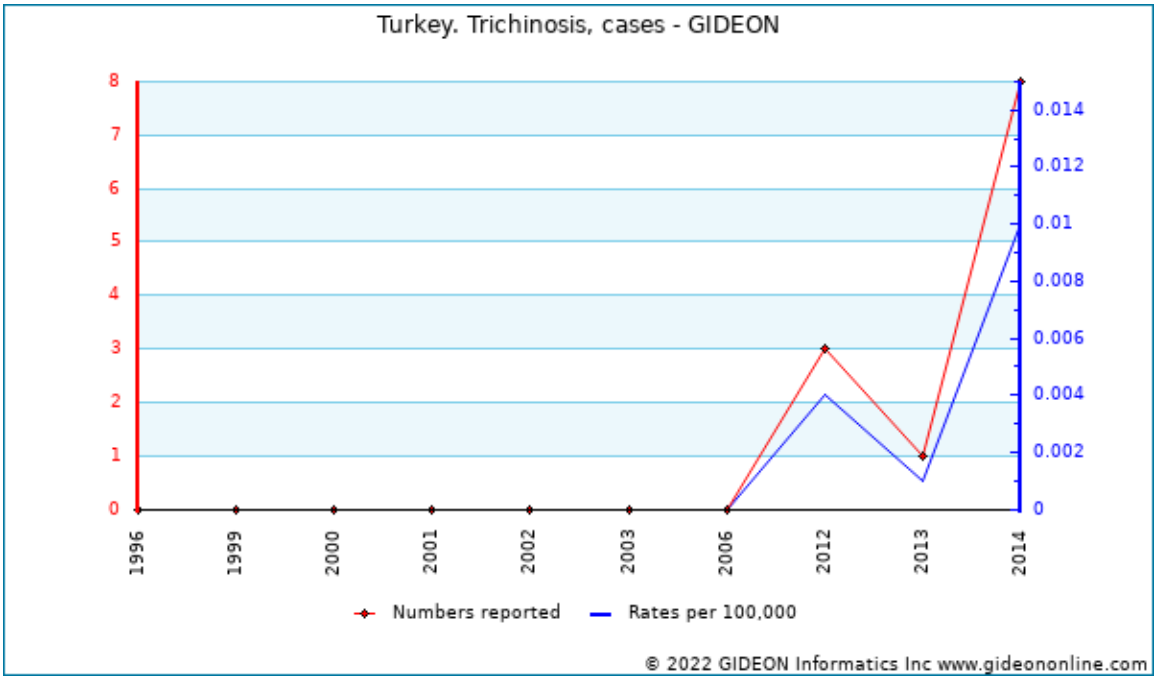
Trichinosis

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

Trichinosis in Turkey



Graph: Turkey. Trichinosis, cases

Notes:

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1. Only two cases of trichinosis were reported during 1950 to 2003.
2. 425 cases were reported by WHO during 2003 to 2004. [3]
3. Three outbreaks were reported in 2004.

Notable outbreaks

Years	Region	Cases	Source	Pathogen	Notes
2003 - 2004	Izmir	1,098	meat - pork	*Trichinella britovi*	Outbreak caused by "cig kofte", a delicacy usually prepared with uncooked veal - but in this case made with pork. [4] [5] [6] [7] [8] [9] [10]
2005*			meat - boar		[11]

* indicates publication year (not necessarily year of outbreak)

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Trichomoniasis

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

Trichomoniasis in Turkey

A systematic review of *Trichomonas vaginalis* in Turkey from 2002 to 2020 - see reference [2]

Prevalence surveys

Years	Region	Study Group	%	Notes
2005*	Gaziantep	women	4.5	4.5% of nonpregnant women (ages 18 to 45) with a clinical diagnosis of lower genital tract infection (2005 publication) [3]
2005*		women	6	6% of women (2005 publication) [4]
2006*	Sivas	women	3.2	3.2% of symptomatic women at a gynecology clinic in Sivas (2006 publication) [5]
2016 - 2017	Istanbul	transplant recipients	1.25	Survey of asymptomatic STD among renal transplant recipients [6]
1993*		patients	3.4	3.4% of gynecology clinic patients (1993 publication) [7]
2009*	Malatya	patients	4.6	4.6% of obstetrics and gynecology patients (2009 publication) [8]
1997 - 1998	Istanbul	adults	2.6	2.6% of family planning clinic clients (1997 to 1998) [9]
1996*	Ankara	sex workers	25	25% of CSW in Ankara (1996 publication) [10]
2010*	Ankara	sex workers	0.7	0.7% of CSW in Ankara (2010 publication) [11]
2011*	Istanbul	sex workers	0.9-1.1	1.1% of CSW at a venereal disease clinic and 0.9% of women at an Ob-Gyn clinic (Istanbul, 2011 publication) [12]
2011*	East Anatolia	men	2.5	2.5% of infertile males (PCR, East Anatolia, 2011 publication) [13]
2013 - 2014	Malatya	men	6.5	6.5% of males with suspected urinary tract infection [14]
1999 - 2001	Ankara	specimens	2.2	2.2% of vaginal cultures (1999 to 2001) [15]

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Years	Region	Study Group	%	Notes
2001 - 2010		specimens	0.2	0.2% of cervical smears (2001 to 2010) [16]
2004 - 2005	Denizli	specimens	0.7	0.7% of cervical smears (Denizli, 2004 to 2005) [17]
2005*		specimens	6	6% of Pap smears (2005 publication) [18]
2007 - 2011	Ankara	specimens	0.13	0.13% of cervical smears (Ankara, 2007 to 2011) [19]
2008*	Hatay	patients - STD	2.8	2.8% of male patients with urethritis (Hatay, 2008 publication)
2018*	Ankara	patients - STD	2.6	Survey of patients with "resistant discharge" [20]
2002 - 2020	Nationwide	general population (Literature Review)	2.87-6.17	2.87% of men and 6.17% of women [21]
1997*	Manisa	patients - vaginitis	13.1	13.1% of women with vaginal discharge (Manisa, 1997 publication) [22]
2000 - 2001	Malatya	patients - vaginitis	8.1	8.1% of women with vaginal discharge (Malatya, 2000 to 2001) [23]
2002 - 2004	Duzce	patients - vaginitis	1	1% of women with cervicovaginitis (2002 to 2004) [24]
2004	Ankara	patients - vaginitis	7	7% of women with vaginal discharge (Ankara, 2004) [25]
2005*	Manisa	patients - vaginitis	4.7	4.7% of women with vaginal discharge (Manisa, 2005 publication) [26]
2006*	Antakya	patients - vaginitis	2.18	2.18% of women ages 20 to 40 with vaginal discharge (Antakya, Hatay, 2006 publication) [27]
2008*	Kocaeli	patients - vaginitis	9.37	9.37% of women with vaginal discharge (Kocaeli, 2008 publication)
2009*	Kocaeli	patients - vaginitis	8.69	8.69% of women ages 20 to 48, with vaginal discharge (Kocaeli, 2009 publication) [28]
2012*	Konya	patients - vaginitis	9	9% of women ages 18 to 45 with vaginal discharge (Konya, 2012 publication) [29]
2015*		patients - vaginitis	0	0% of women with intrauterine devices and vaginal discharge (2015 publication) [30]
2015	Sanliurfa	patients - vaginitis	36	36% of vaginitis cases among Syrian refugee women in Turkey (Giemsa stain) [31]
2020*	Antalya	patients - vaginitis	1.9	[32]

* indicates publication year (not necessarily year of survey)

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Trichostrongyliasis

Agent	PARASITE - Nematoda. Secernentea: *Trichostrongylus colubriformis*, *T. orientalis*, *T. probolurus*
Reservoir	Herbivore, Zoonotic
Vector	None
Vehicle	Water, Food, Vegetation, Contact
Incubation Period	21d
Diagnostic Tests	Identification of ova in stool or duodenal aspirate. Trichostrongylus colubriformis adult: female - 3 to 10 mm; male - 2 to 8 mm
Typical Adult Therapy	Albendazole 400 mg PO X 1. OR Pyrantel pamoate 11 mg/kg (max 1g) PO once. OR Mebendazole 100 mg PO BID X 7d[1]
Typical Pediatric Therapy	As for adult
Clinical Hints	- Diarrhea, abdominal pain and weight loss - Eosinophilia is often present - Infestation may persist for years - Fatality and sequelae are not reported
Synonyms	Haemonchus, Marshallagia, Ostertagia, Teladorsagia, Trichostrongylus. ICD9: 127.6 ICD10: B81.2

Trichostrongyliasis in Turkey

Trichostrongylus species are found in sheep. [2] [3]

Prevalence surveys

Years	Region	Study Group	%	Notes
2008 - 2009	Nevsehir	cattle	28.3	28.3% of cattle in Derinkuyu district, Nevsehir (2008 to 2009) [4]
2005 - 2006	Sanliurfa	goats	13.25-54.21	13.25% of hair goats in Sanliurfa are infested by *Trichostrongylus vitrinus*, 54.21% *Marshallagia marshalli* and 39.79% *Haemonchus contortus* (2005 to 2006) [5]
2006 - 2010	Black Sea	deer	6.6-66.6	*Trichostrongylus axei* was found in 66.6% of roe deer (*Capreolus capreolus*) in the middle Black Sea region, *T. colubriformis* in 6.6% (2006 to 2010) [6]
1997 - 2007	Van	patients	0.001	Survey of hospital outpatients [7]
2009*	Van	sheep	19-85	85% of sheep in Van Province are infested *Marshallagia marshalli*, 40% *Haemonchus contortus*, 33% *Trichostrongylus axei* and 19% *Trichostrongylus probolurus* (2009 publication) [8]
2007*	Utah	general population	0.15	0.15% of persons over age 15 years in Kutahya (2007 publication) [9] [10]

* indicates publication year (not necessarily year of survey)

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Trichuriasis

Agent	PARASITE - Nematoda. *Trichuris trichiura*
Reservoir	Human
Vector	None
Vehicle	Soil ingestion, Sexual contact, Flies
Incubation Period	2m - 2y
Diagnostic Tests	Stool microscopy or visualization of adult worms Trichuris trichiura adult: female - 35 to 50 mm; male - 30 to 45 mm
Typical Adult Therapy	Mebendazole 100 mg PO BID X 3d. OR Albendazole 400 mg PO daily X 3 to 7 days OR Ivermectin 200 mg/kg PO daily X 3 days[1] [2]
Typical Pediatric Therapy	Albendazole 200 mg PO single dose OR Mebendazole 100 mg BID X 3 d (> age 2). OR Ivermectin 200 mg/kg PO daily X 3 days
Clinical Hints	- Abdominal pain, bloody diarrhea - Rectal prolapse or intestinal obstruction are occasionally encountered - The parasite may survive for as long as five years in the human host
Synonyms	Trichocephaliasis, Trichuris trichiura, Tricuriasis, Whipworm. ICD9: 127.3 ICD10: B79

Trichuriasis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2000	Sanliurfa	children	6.39	6.39% of school children in Sanliurfa shanty towns (2000) [3]
2003 - 2005	Van	children	0.7	0.7% of school children ages 7 to 15 in Van Province (2003 to 2005) [4] [5]
2007*	Sivas	children	0.6	0.6% of primary school children in Alahaci Central Village (Sivas, 2007 publication) [6]
2007	Sanliurfa	children	3.45	3.45% of children ages <= 6 years, in Sanliurfa (2007) [7]
2007*	Elazig	children	3	3% of primary school children in Elazig (2007 publication) [8]
2008*	Yozgat	children	0.5	0.5% of primary school children in Yozgat (2008 publication) [9]
1991*	Mardin	students	2	2.0% of primary school students in Mardin (1991 publication) [10]
1992*	Trabzon	students	42.12	42.12% of primary school students in Trabzon (1992 publication) [11]
2010*	Van	students	1	1.0% of primary school students in Van (2010 publication) [12]
1997 - 2007	Van	patients	0.3	Survey of hospital outpatients [13]
2006 - 2018	Sivas	patients	0.1	Survey of patients with gastrointestinal symptoms [14]
1976*	Ankara	general population	2.2	2.2% of individuals in poor districts of Ankara (1976 publication) [15]
2006*	Anatolia	general population	4.5	4.5% of individuals in southeastern Anatolia (2006 publication) [16]
2007*	Van	food handlers	0.4	0.4% of persons working in the food sector. (Van, 2007 publication) [17]
1993 - 2006	Sivas	specimens - stool	0.3	0.3% of fecal samples processed at a university parasitology laboratory in

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Years	Region	Study Group	%	Notes
				Sivas (1993 to 2006) [18]
1993 - 2000	Bursa	specimens - stool	0.018	0.018% of fecal samples processed at a university parasitology laboratory in Bursa (1993 to 2000) [19]
1997 - 2001	Istanbul	specimens - stool	2.2	2.2% of fecal samples examined in Istanbul (1997 to 2001)
2002 - 2004	Sivas	specimens - stool	0.01	0.01% of stools processed at a university parasitology laboratory in Sivas (2002 to 2004) [20]
2007 - 2009	Tokat	specimens - stool	0.05	0.05% of stool specimens examined by Tokat public health laboratory (2007 to 2009) [21]
2009	Van	specimens - stool	0.02	0.02% of stools examined at a laboratory in Van (2009) [22]

* indicates publication year (not necessarily year of survey)

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Tuberculosis

Agent	BACTERIUM. Actinomycetes, *Mycobacterium tuberculosis* An aerobic acid-fast bacillus
Reservoir	Human, Cattle, Zoonotic
Vector	None
Vehicle	Air, Dairy products, Respiratory or pharyngeal acquisition
Incubation Period	4w - 12w (primary infection)
Diagnostic Tests	Microscopy. Culture. Nucleic acid amplification. Inform laboratory when this diagnosis is suspected.
Typical Adult Therapy	Respiratory isolation. Typical pulmonary infection is treated with 2 months of Isoniazid, Rifampin & Pyrazinamide (with Ethambutol until results of sensitivity testing) , followed by 4 months of Isoniazid and Rifampin alone. MDR tuberculosis - 5 drugs (including Pyrazinamide and/or Ethambutol if possible) for at least 6 months, followed by 4 drugs for 18-24 months.[1] [2] [3]
Typical Pediatric Therapy	As for adult
Vaccine	BCG vaccine
Clinical Hints	- Cough, "night sweats" and weight loss - Most infections represent reactivation of old foci in lungs, brain, bone, kidneys etc - Often presents as prolonged fever (FUO) or infection of bone, meninges, kidneys or other organs
Synonyms	Consumption, Mycobacterium africanum, Mycobacterium bovis, Mycobacterium canettii, Mycobacterium caprae, Mycobacterium orygis, Mycobacterium pinnipedii, Mycobacterium tuberculosis, Oryx bacillus, Phthisis, TB, TB meningitis, Tuberculose, Tuberculose miliar, Tuberculosi, Tuberculous meningitis, Tuberkulose, White plague. ICD9: 010,012,013,014,015,016,017,018 ICD10: A15,A16,A17,A18,A19

Tuberculosis in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

As of 1992, there were 31 tuberculosis hospitals and 253 "tuberculosis dispensaries" in Turkey.

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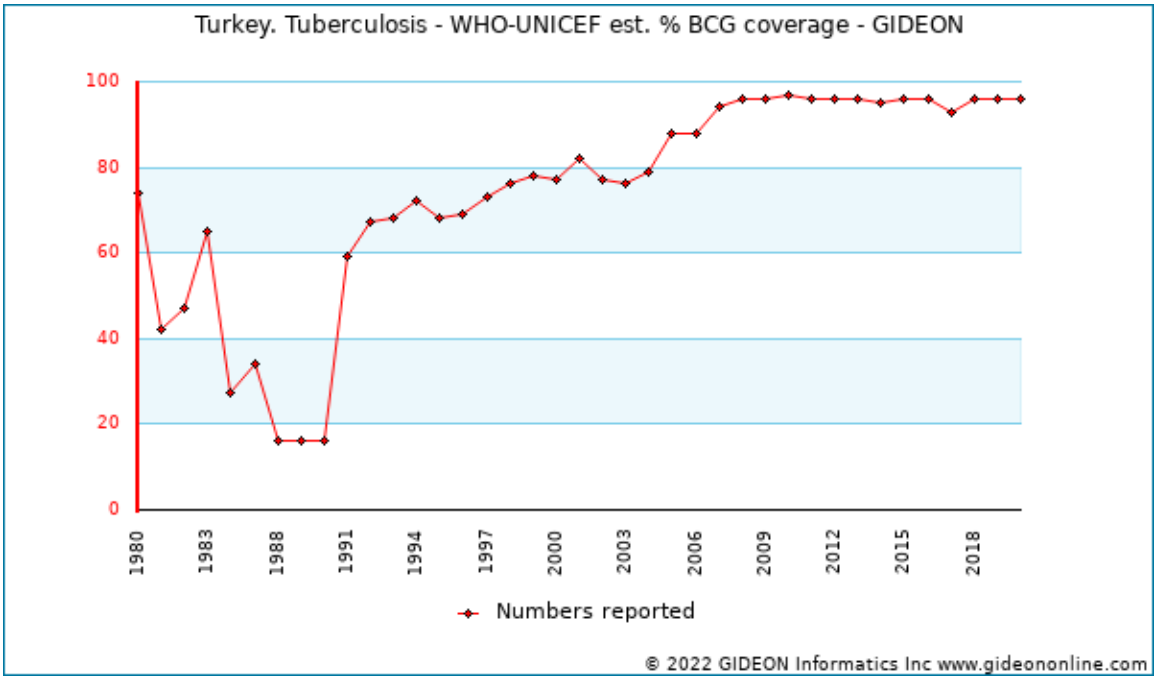
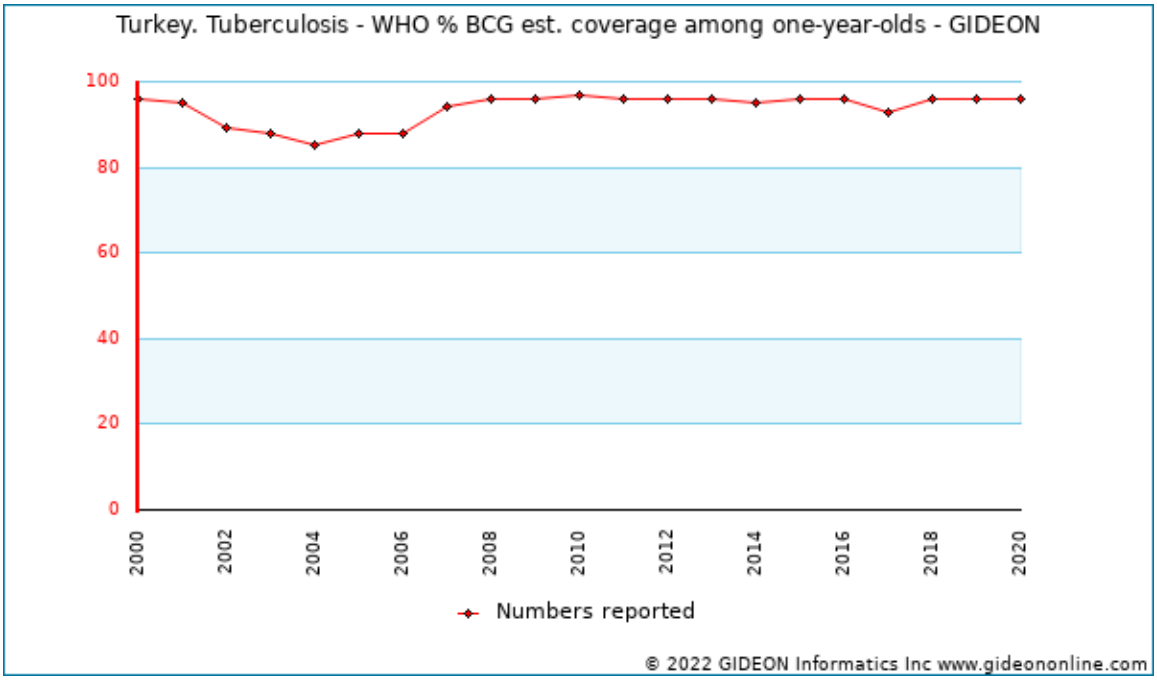


Graph: Turkey. Tuberculosis - WHO-UNICEF est. % BCG coverage



Graph: Turkey. Tuberculosis - WHO % BCG est. coverage among one-year-olds

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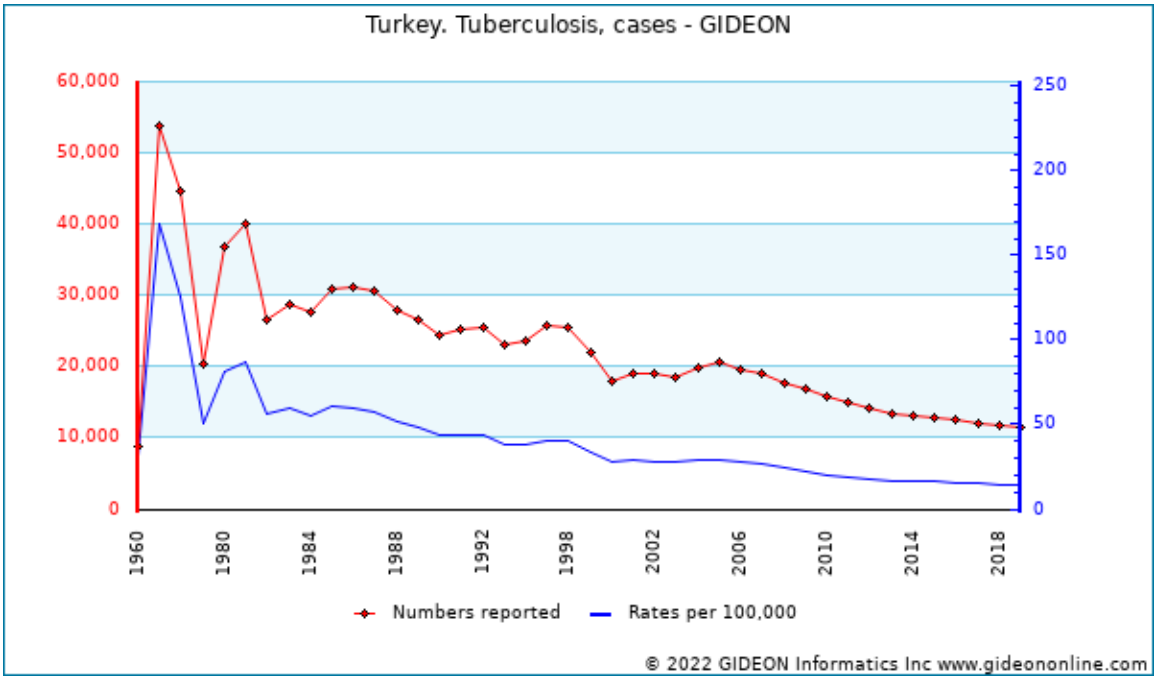
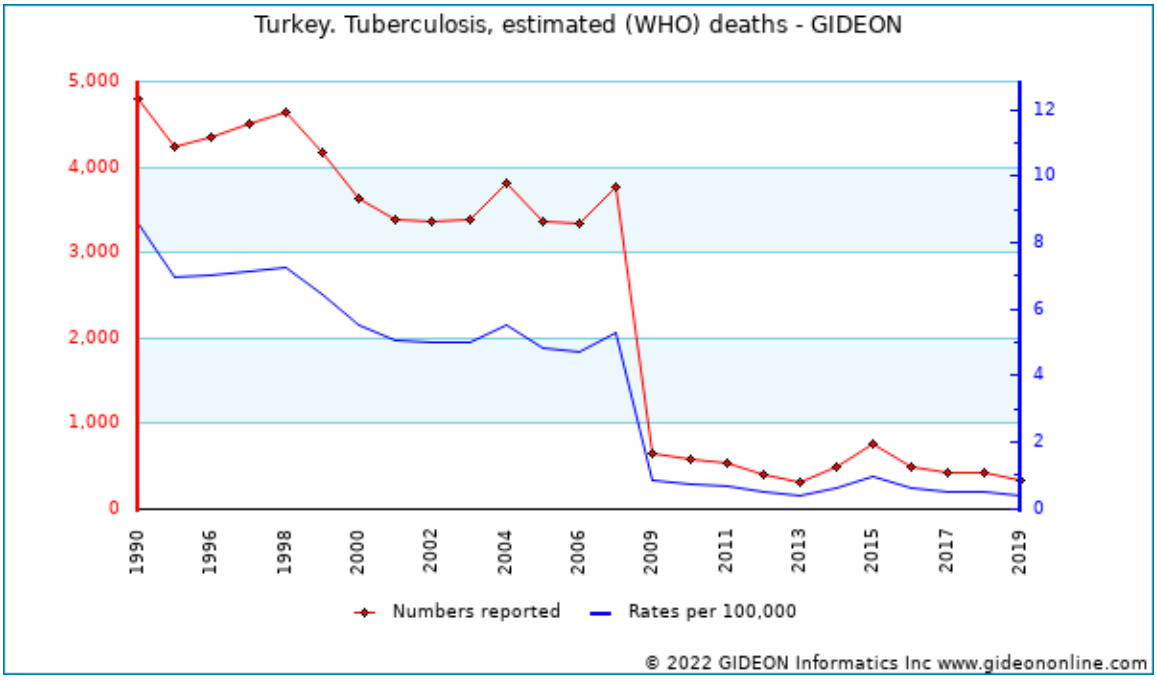


Graph: Turkey. Tuberculosis, cases

- 2012 to 2016 - 108 cases of active tuberculosis were reported among Syrian refugees in Turkey. [4]



Graph: Turkey. Tuberculosis, estimated (WHO) deaths

Prevalence surveys

Years	Region	Study Group	%	Notes
1988 - 2009	Ankara	patients	7.1	Tuberculosis uveitis was detected in 7.1% of patients with infectious uveitis. [5]

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Years	Region	Study Group	%	Notes
2008*		immunocompromised	3.5	3.5% of pulmonary infections among immunocompromised hosts with hematological malignancy (2008 publication) [6]
2008*	Multiple locations	patients - fever	13.6	13.6% of fever of unknown origin (2008 publication) [7]
2007*	Nationwide	patients - fever (Literature Review)	36.4	36.4% of infectious causes for fever of unknown origin (2007 publication) [8]

* indicates publication year (not necessarily year of survey)

- 2008 to 2011 - 6.75% of patients with tuberculous cervical lymphadenitis were found to be seropositive toward *Francisella tularensis*, vs. 0.33% of a control group. [9]

Drug resistance

- 1976 to 1997 - 39.2% of isolates recovered in Ankara were resistant to at least one drug (10.5% to INH) and 5.8% were multi-resistant.
- 1999 - 19.9% of primary isolates and 40.4% of isolates from pretreated patients in Istanbul were found to be resistant to at least one anti-tuberculous drug.

Notable outbreaks

Years	Region	Cases	Pathogen	Population	Notes
1990*		7	MDR TB	family members	[10]
2012 - 2014	Istanbul	7	MDR TB	family members	[11]

* indicates publication year (not necessarily year of outbreak)

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Tularemia

Agent	BACTERIUM. *Francisella tularensis* An aerobic gram-negative bacillus
Reservoir	Rabbit, Hare, Muskrat, Beaver, Tick, Wild bird, Dog, Zoonotic
Vector	Deer fly (*Chrysops* spp), Tick, Mosquito
Vehicle	Bite, Contact, Meat, Eye inoculation, Air, Dust, Water, Respiratory or pharyngeal acquisition, Organ transplantation
Incubation Period	3d - 5d (range 1d - 14d)
Diagnostic Tests	Culture or direct fluorescent staining of exudates. Serology. Nucleic acid amplification.
Typical Adult Therapy	Gentamicin or Tobramycin 1.7 mg/kg q8h X 7 to 10d OR (mild disease) Doxycycline 100 mg PO BID X 14-21d OR (mild disease) Ciprofloxacin 500 mg PO BID X 10-14d Add Chloramphenicol, Doxycycline or Ciprofloxacin if evidence for central nervous system infection.[1] [2]
Typical Pediatric Therapy	Gentamicin or Tobramycin 1.7 mg/kg q8h X 7-10d. Add Chloramphenicol if evidence for central nervous system infection.
Vaccine	Tularemia vaccine
Clinical Hints	- Often follows contact with small mammals (usually rabbits) or tick-bite - Fever, dermal eschar, lymphadenopathy, myalgia and diarrhea - May present as overwhelming septicemia or pneumonia - Case-fatality rates are 1% (treated) to 6% (untreated)
Synonyms	Conjunctivitis tularensis, Deerfly fever, Francisella hispanensis, Francisella novicida, Francisella philomiragia, Francisella salimarina, Francisella tularensis, Harpest, Hasenpest, Lemming fever, Market men's disease, Ohara's disease, Pahvant Valley plague, Rabbit fever, Tularamie, Water rat trapper's disease, Yao-byo disease, Yatobyo. ICD9: 021 ICD10: A21

Tularemia in Turkey

Time and Place

- 1936 - The first published tularemia outbreak in Turkey was reported from Thrace region (Luleburgaz town), and the second in 1945, from the same location. [3] [4]
- 1936 to 1953 - Four outbreaks of tularemia occurred in Turkey. [5]
- 1988 - Following an epidemiologically silent period, the disease re-emerged, with increasing incidence through the subsequent two decades.
- 1992 to 2012 - Turkey accounted for 13% of tularemia cases reported in Europe. [6]
- 2005 to 2012 - 4,773 cases were reported.

Additional notes

- Tularemia is more common in females than males.
- 52% of cases are reported during December to March (2014 publication) [7]
- Most cases are of the oropharyngeal form and due to ingestion of water contaminated by rodents. [8] [9]

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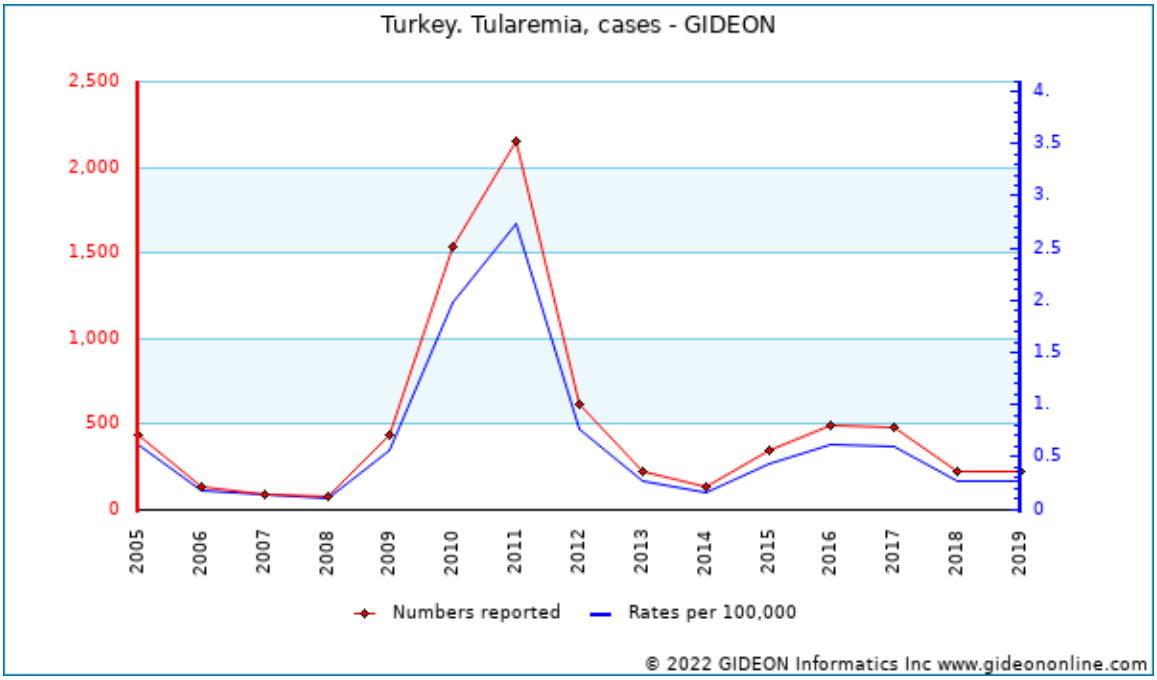

Graph: Turkey. Tularemia, cases

Notes:
1. Tularemia was designated a reportable disease in 2005.
2. 205 cases were reported from the Bursa region during 1988 to 1998. [10]
3. No fatal cases were reported in 2005; 0 in 2006.
Individual years:
2010 - 10 cases of oropharyngeal tularemia were treated at one hospital in Ankara during a three-month period. [11]

2009 - A series of three mild cases of tularemia was published from Hatay. [12]

Cross-border events

Years	Acquired by**	Originated in**	Setting	Cases	Notes
2011	Germany	Turkey	travel	2	[13] [14]

** Country or Nationality

Case series

- 2004 to 2005 - 16 cases of oropharyngeal tularemia were reported in Zonguldak. [15]
- 2009 to 2010 - 17 confirmed cases were treated at a hospital in central Anatolia. [16]
- 2009 to 2011 - 139 confirmed cases were treated at a hospital in central Anatolia. [17]
- 2009 to 2012 - Clinical features of 100 children treated for tularemia in Ankara [18]
- 2010 to 2016 - 525 cases were reported in Yozgat. [19]
- 2010 to 2017 - 154 cases were reported from Kayseri, central Anatolia. [20]
- 2016 to 2019 - A total of 88 cases were treated at two hospitals. [21]
- 2018 (publication year) - 26 cases of oropharyngeal tularemia were treated in the Eastern Anatolia region [22]

Francisella tularensis DNA was identified in mice from Thrace region (2012) [23]

Prevalence surveys

Years	Region	Study Group	%	Notes
2003 - 2008	Samsun	patients	17.9	17.9% of neck masses in Samsun (2003 to 2008) [24]

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Years	Region	Study Group	%	Notes
2009 - 2012	Amasya	patients	29.2	29.2% of patients hospitalized with sore throat, fever, malaise and/or presence of neck mass (Amasya, 2009 to 2012) [25]
2014	Corum	ticks	0	[26]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2011*	Erzurum	farmers	2.1	2.1% of individuals involved in farming and animal husbandry, in rural Erzurum (ELISA, 2011 publication) [27]
2010	Yozgat	hunters	6.3	6.3% of hunters in Yozgat Province, central Anatolia (2010 [28]
2008 - 2011	Multiple locations	patients	0.33-6.75	6.75% of patients with tuberculous cervical lymphadenitis vs. 0.33% of a control group (2008 to 2011) [29]
2012	Van	various	3.6-9.4	3.6% of humans and 9.4% of domestic animals, in Van (2012) [30]
2005*	Thrace	general population	0.3	0.3% of individuals in the Thrace region 0.3% (2005 publication) [31]
2012	Manisa	general population	7.1	7.1% of individuals in Manisa (2012) [32]
2016*	Kars	animal contact	7.46	7.46% of individuals in occupational groups with animal contact (Kars region, 2016 publication) [33]
2017*	Ordu	animal contact	0	Survey of veterinarian, butchers and farmers [34]

* indicates publication year (not necessarily year of survey)

Talking Points

- 1936 to 1953 - Four tularemia epidemics were reported. [35]
- 2005 to 2012 - Outbreaks of presumed water-borne tularemia were reported in Kocaeli (35 cases), Corum (54 cases) and Sivas (89 cases).

Notable outbreaks

Years	Region	Setting	Cases	Clinical	Source	Population	Notes
2000	Ducze		22	oropharyngeal			[36] [37]
2001	Western Black Sea	village	14	oropharyngeal			[38]
2004	Bursa		70				[39]
2004 - 2005	Kocaeli		188		water		[40] [41] [42] [43] [44] [45] [46] [47]
2005 - 2006	Sakarya		58	oropharyngeal	water		[48]
2005	Erdine		10		water		[49] [50]
2009*	Tokat		7		water	family members	[51]
2009*	Cankrir province		11		water	family members	[52] [53] [54]
2010 - 2011			442				[55]
2010 - 2012	Kayseri		110		water		[56] [57]
2010	Konya		35				[58]
2013	Denizli		7		water		[59]
2013 - 2014	Kahramanmaras		10				Outbreak in Afsin, Kahramanmaras Province [60]
2013	Sancaktepe		55	oropharyngeal	water		[61]

* indicates publication year (not necessarily year of outbreak)

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Typhoid and enteric fever

Agent	BACTERIUM. *Salmonella* serotype Typhi (certain other *Salmonella* species cause 'paratyphoid' fever) A facultative gram-negative bacillus
Reservoir	Human
Vector	None
Vehicle	Fecal-oral, Food, Fly, Water
Incubation Period	15d - 21d (range 5d - 34d)
Diagnostic Tests	Culture (blood, urine, sputum culture). Stool usually negative unless late, untreated infection. Serology.
Typical Adult Therapy	Stool precautions Ceftriaxone 2 g IV q12h to q 24h X 10-14d. OR Azithromycin 1 gram PO on day 1; then 500 mg days 2 to 7. Fluoroquinolone resistance is common - not recommended for empiric therapy. Add corticosteroids if evidence of shock or decreased mental status.[1] [2] [3] [4]
Typical Pediatric Therapy	Stool precautions Ceftriaxone 50 to 100 mg/kg IV daily X 10-14d. OR Azithromycin 15 mg/kg PO on day 1; then 7.5 mg/kg on days 2 to 7.
Vaccine	Typhoid - injectable vaccine Typhoid - oral vaccine
Clinical Hints	- Transient diarrhea followed by fever, splenomegaly and obtundation - Rose spots (during second week of illness), leukopenia and relative bradycardia are common - Intestinal perforation or hemorrhage may occur in third to fourth week of illness - Case-fatality rates are 0.8% (treated) to 15% (untreated)
Synonyms	Abdominal typhus, Abdominaltyphus, Buiktyphus, Enteric fever, Febbre tifoide, Febbre tifoidea, Fiebre tifoidea, Paratifoidea, Paratyfus, Paratyphoid, Salmonella serotype Typhi, Tyfoid, Typhoid, Typhoide. ICD9: 002 ICD10: A01

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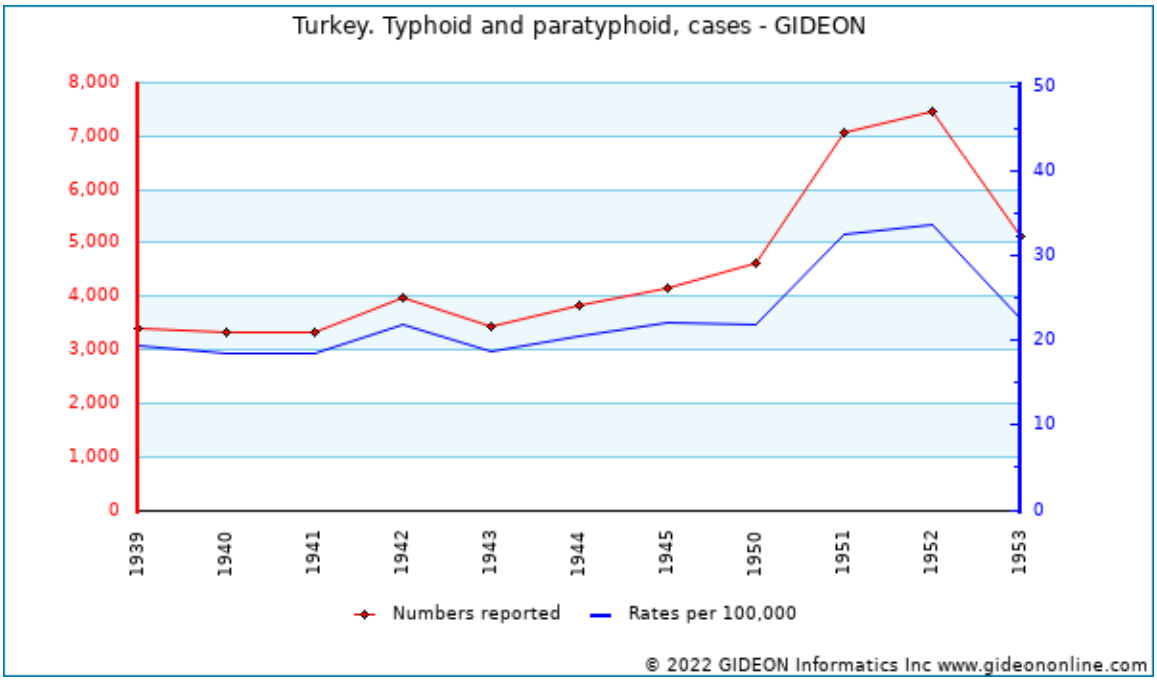
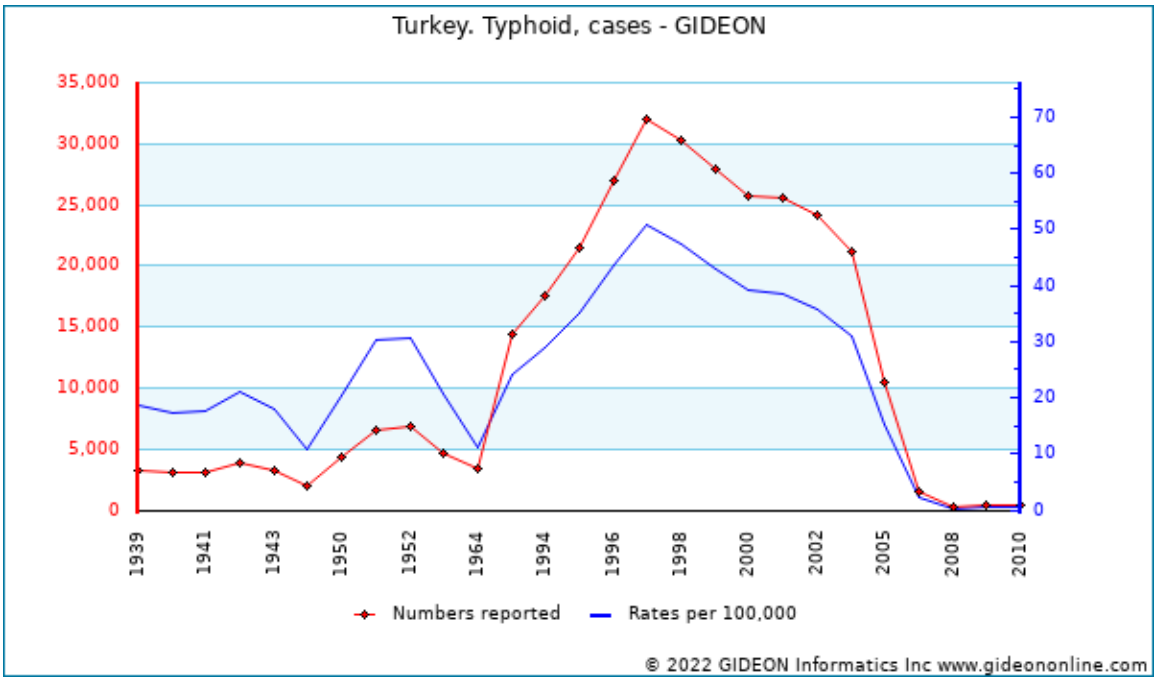
Typhoid and enteric fever in Turkey



Graph: Turkey. Typhoid and paratyphoid, cases

Notes:
1. 1944 - 261 fatal.
2. 1945 - 241 fatal.



Graph: Turkey. Typhoid, cases

Notes:

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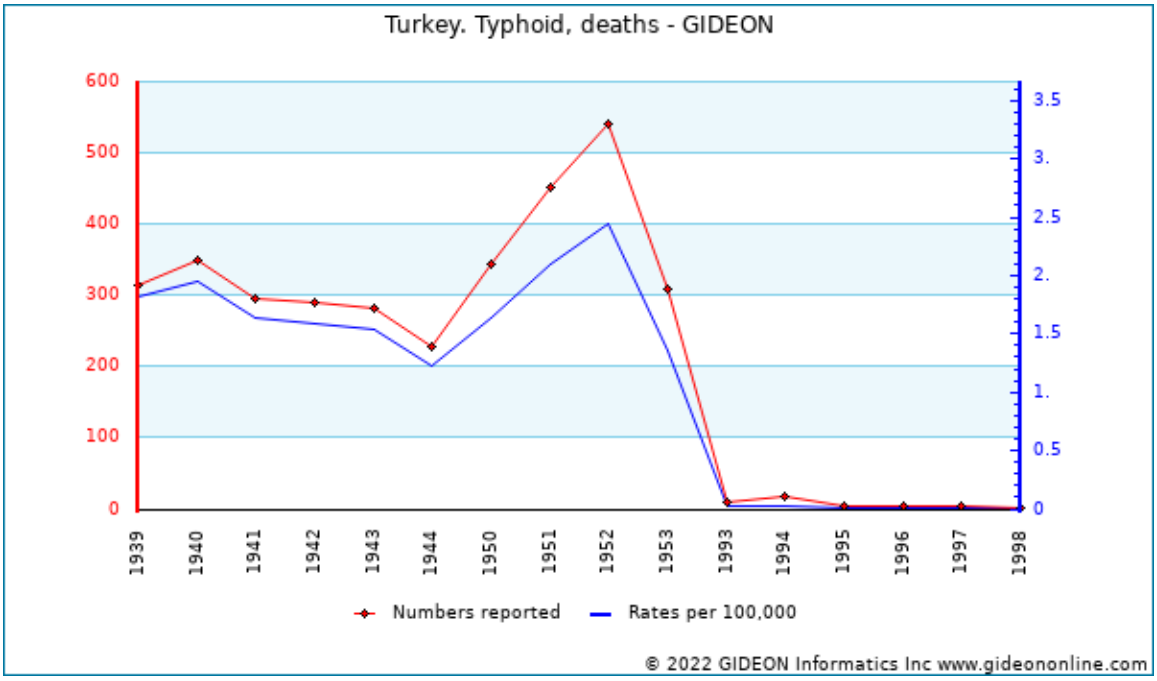
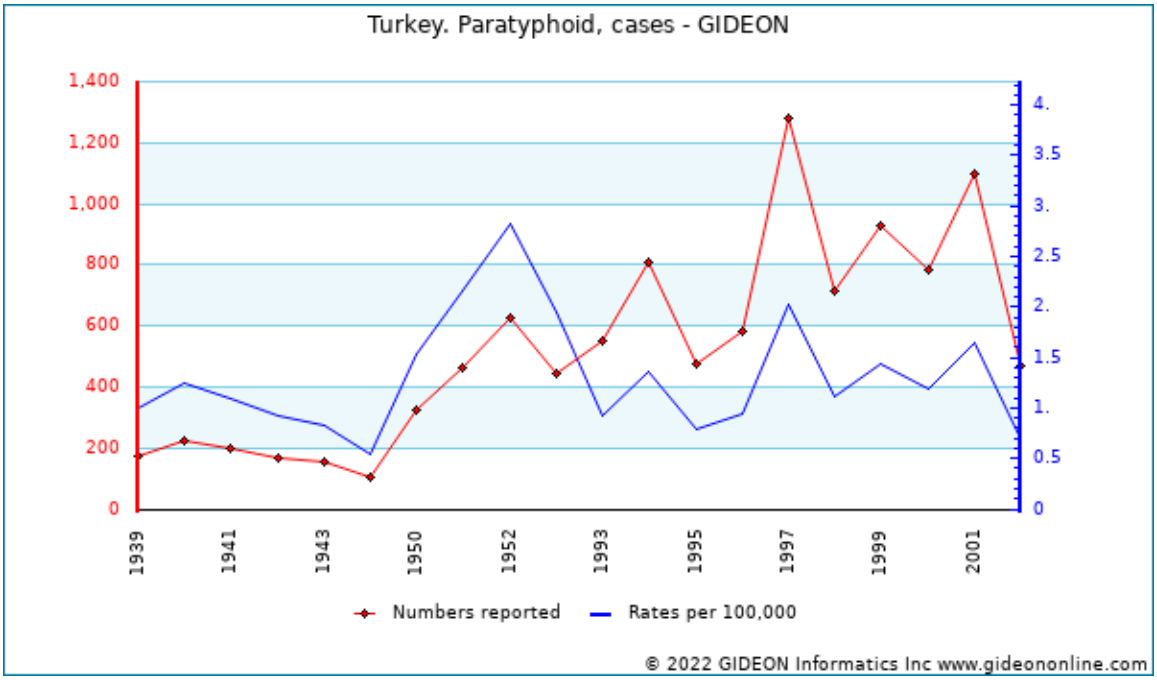
1. 34,526 cases of typhoid fever (52 fatal) were reported during 1987 to 1991.
2. Combined rates for typhoid and paratyphoid were 18.86 per 100,000 in 1991.



Graph: Turkey. Typhoid, deaths



Graph: Turkey. Paratyphoid, cases

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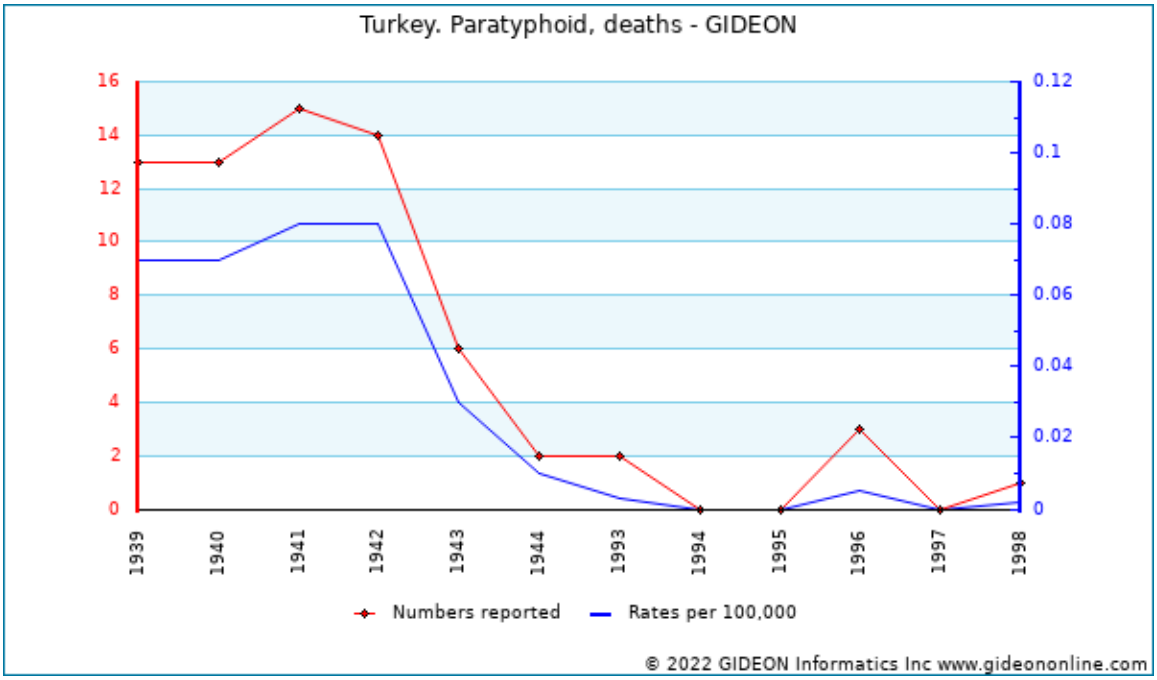

Graph: Turkey. Paratyphoid, deaths

Notable outbreaks

Years	Region	Cases	Source	Pathogen	Population	Notes
1967*	Istanbul					5
1985*	Ankara					6
1999	Antalya	305		Paratyphi B	tourists	Outbreak among European tourists who visited Turkey. Most cases in Alanya in the Antalya region. 7
2001 - 2002	Ergani-Diyarbakier	181	water			Outbreak in Ahmetli Village, Ergani-Diyarbakier 8
2007	Mus	70	water			9
2010*	Van	867				10 11

* indicates publication year (not necessarily year of outbreak)

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Typhus - endemic

Agent	BACTERIUM. *Rickettsia typhi*
Reservoir	Rat, Zoonotic
Vector	Flea (*Xenopsylla* or *Nosopsyllus* spp.)
Vehicle	None
Incubation Period	10d - 12d (range 4d - 18d)
Diagnostic Tests	Serology. Identification of rickettsiae in smear or culture of skin lesions. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg BID X 7d[1]
Typical Pediatric Therapy	Doxycycline 2.2 mg/kg BID X 7d (maximum 200 mg/day) OR Chloramphenicol 12.5 mg/kg QID X 7d
Clinical Hints	- Fever, headache and myalgia - Truncal maculopapular rash (present in 60%) appears on days 3 to 5 and persists for 4 to 8 days - Fever resolves after 12 to 16 days - Case fatality rate (untreated) is 2%
Synonyms	Endemic typhus, Murine typhus, Rickettsia typhi, Ship typhus, Tifo murino, Tifus pulgas, Vlektyphus. ICD9: 081.0 ICD10: A75.2

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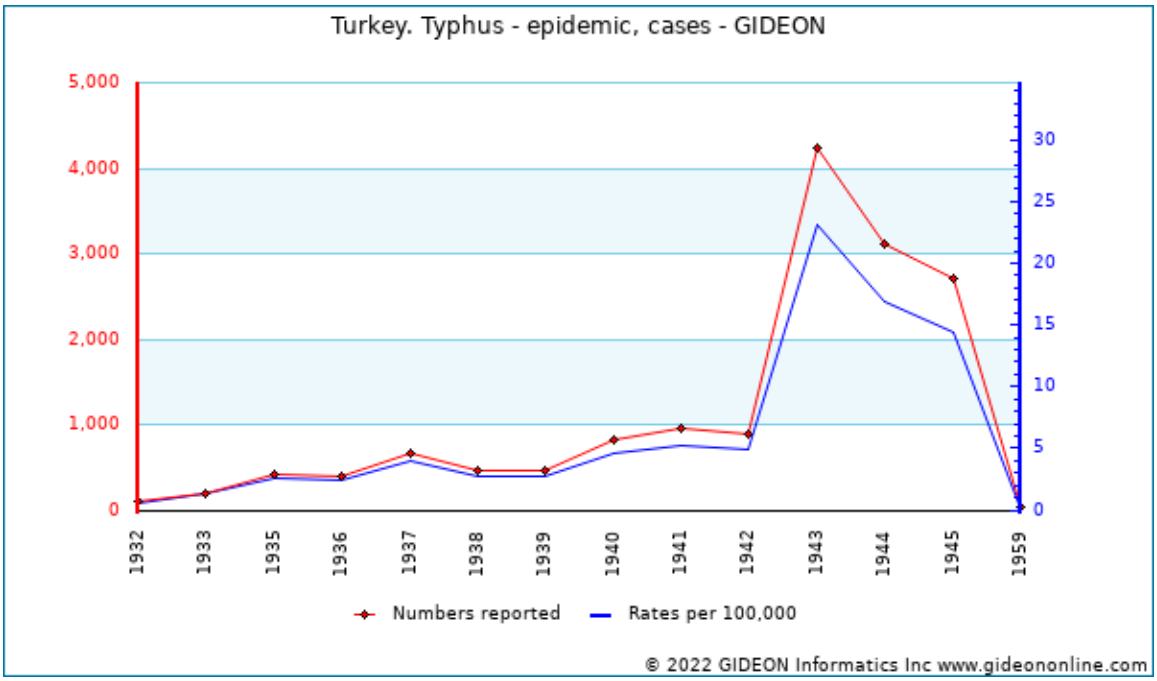
Typhus - epidemic

Agent	BACTERIUM. *Rickettsia prowazekii*
Reservoir	Human, Flying squirrel (*Glaucomys volans volans*, in the United States), Zoonotic
Vector	Louse (*Pediculus*), Squirrel flea
Vehicle	None
Incubation Period	10d - 14d (range 5d - 23d)
Diagnostic Tests	Serology. Identification of rickettsiae in smear or culture of skin lesions. Nucleic acid amplification.
Typical Adult Therapy	Doxycycline 100 mg PO BID X 3 to 5d. OR Chloramphenicol 500 mg QID X 3 to 5d[1]
Typical Pediatric Therapy	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
Clinical Hints	- 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%
Synonyms	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

Although Typhus - epidemic is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Typhus - epidemic in Turkey



Graph: Turkey. Typhus - epidemic, cases

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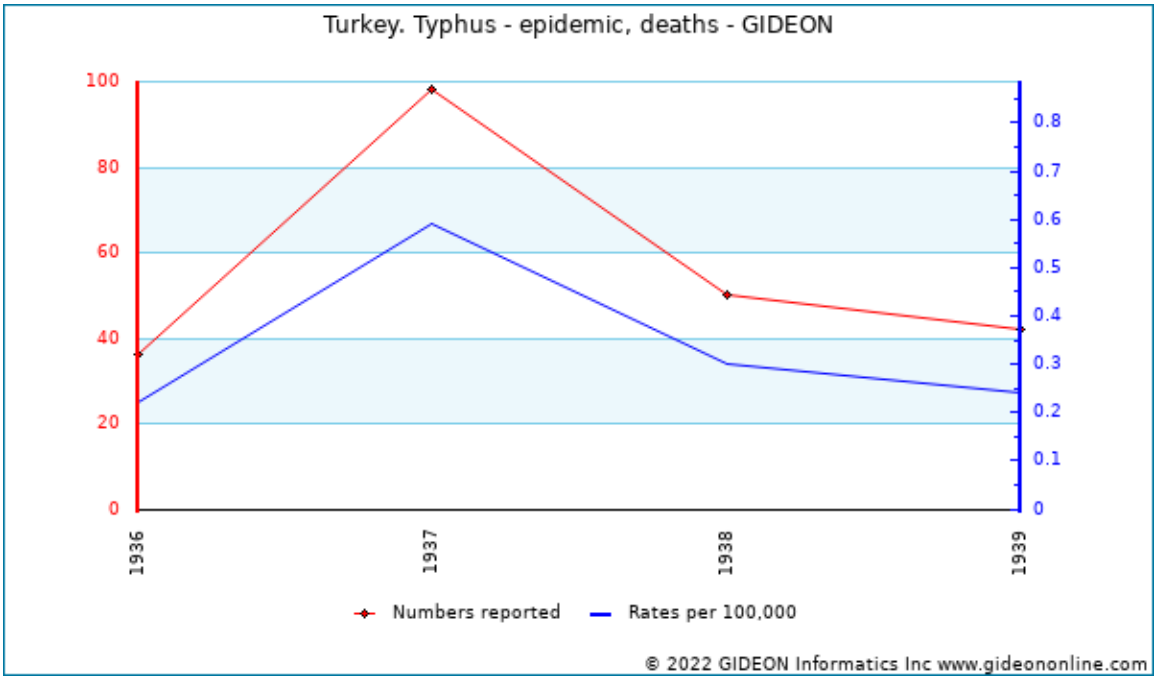
Notes:
1. Also see reference [2]



Graph: Turkey. Typhus - epidemic, deaths

During March 1915 to February 1916, 6,053 soldiers in the Third Ottoman Army died of typhus. [3]

Prevalence surveys

Years	Region	Study Group	%	Notes
2017*	Southeast Region	lice	17.4	Survey of *Pediculus humanus capitis* [4]

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

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Urinary tract infection

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

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Vaccinia and cowpox

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

Vaccinia and cowpox in Turkey

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2004	Altindere	rodents	0.3	0.3% of *Apodemus sylvaticus* in Altindere and Cosandere (Macka, Trabzon Province), Ayder, Ortan, and Yolkiyi (Camlihemsin, Rize Province), and Bozdag (Odemis, Izmir Province) in northeastern and western Turkey (2004) [2] [3]

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Variant Creutzfeldt-Jakob disease

Agent	PRION
Reservoir	Cattle
Vector	None
Vehicle	Meat
Incubation Period	Months to years
Diagnostic Tests	Brain biopsy
Typical Adult Therapy	None
Typical Pediatric Therapy	None
Clinical Hints	- Most cases of human disease have been related to ingestion of beef from cattle which had been infected through ingestion of offal from other infected animals - A progressive and invariably fatal degenerative disease of the brain.
Synonyms	Bovine spongiform encephalopathy, Mad cow disease. ICD9: 04611 ICD10: A81.09

Not currently endemic to any country.
Although Variant Creutzfeldt-Jakob disease is not endemic to Turkey, imported, expatriate or other presentations of the disease have been associated with this country.

Variant Creutzfeldt-Jakob disease in Turkey

2011 (publication year) - Probable variant Creutzfeldt-Jakob was reported in a Turkish resident who had previously lived overseas. [1]

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Varicella

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

Varicella in Turkey

Vaccine Schedule:

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 months

A single-dose varicella vaccine was introduced into the National Immunization Program in 2013. [3]

Incidence

- 2008 to 2010 - 824 children ages 0 to 15 years were hospitalized for varicella (5.29 to 6.89 per 100,000 children) - most during the spring and early summer months. (analysis of 27 health-care centers in 14 cities). [4]
- 2008 to 2013 - 1,939 children were hospitalized for varicella, including 36 who had been previously-immunized. [5]
- 2011 - 1,579 cases of varicella were officially-reported.

Prevalence surveys

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Years	Region	Study Group	%	Notes
2009 - 2015	Izmir	patients - CNS	0.46	Survey of patients with viral central nervous system infection [6]
2009 - 2016	Malatya	patients - CNS	2.6	Survey of children with acute ataxia [7]

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2005*	Erzurum	children	16.67-80	78% of the population below age 30: 16.67% by age one year, 57.58% by 4 years, 80% by age 8 years [8]
2005*	Erzurum	children	92.31	92.31% by age 10 years (Erzurum, 2005 publication) [9]
2006*	Eastern Region	children	26.8-90.3	26.8% of unvaccinated children ages 1 to 4 years, 90.3% ages 13 to 16 years (eastern Turkey, 2006 publication) [10]
2013	Manisa	children	92.8	Serosurvey of children ages >2 years, prior to introduction of vaccination [11]
2018*	Eskisehir	children	72.1	Survey of children with chronic neurological disease [12]
2013*	Izmir	adults	94.3	94.3% of adults in Izmir (2013 publication) [13]
2005	Multiple locations	health care workers	98	98% of health care workers (2005) [14]
2015 - 2016		health care workers	90.5	Survey of nursing students [15]
2015*	Yozgat	health care workers	100	100% of nursing students (Yozgat, 2015 publication) [16]
2011*	Izmir	general population	71.5	71.5% of individuals in Izmir (2011 publication) [17]

* indicates publication year (not necessarily year of survey)

Notable outbreaks

Years	Region	Setting	Cases	Population	Notes
2016	Izmir	preschool center	34	children	Outbreak involved three institutions for pre-school children [18]

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14. Am J Infect Control 2006 Nov ;34(9):583-7.
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Vibrio parahaemolyticus infection

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

Vibrio parahaemolyticus infection in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
2009*	Black Sea	seafood	27	27% of processed fish and mussel samples from the Middle Black Sea region (2009 publication) [1]
2016*	Black Sea	seafood	8-76	76% of mussel, 40.9% of seawater and 8% of fish samples from the Black Sea (2016 publication) [2]

* indicates publication year (not necessarily year of survey)

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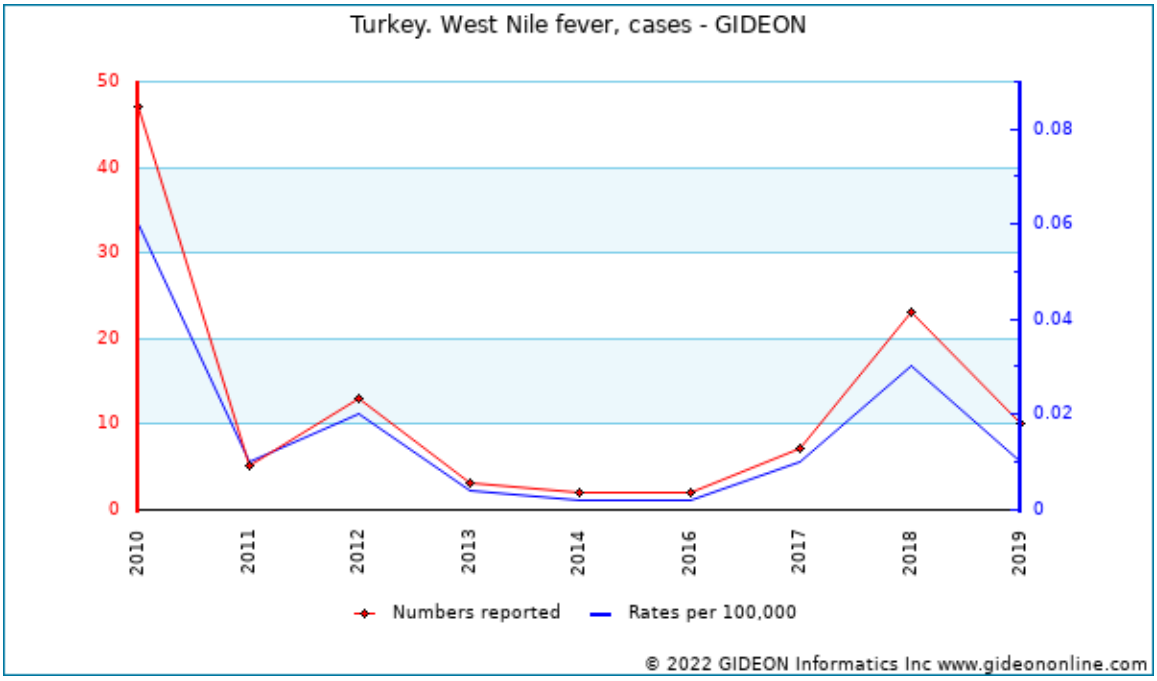
West Nile fever

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

West Nile fever in Turkey



Graph: Turkey. West Nile fever, cases

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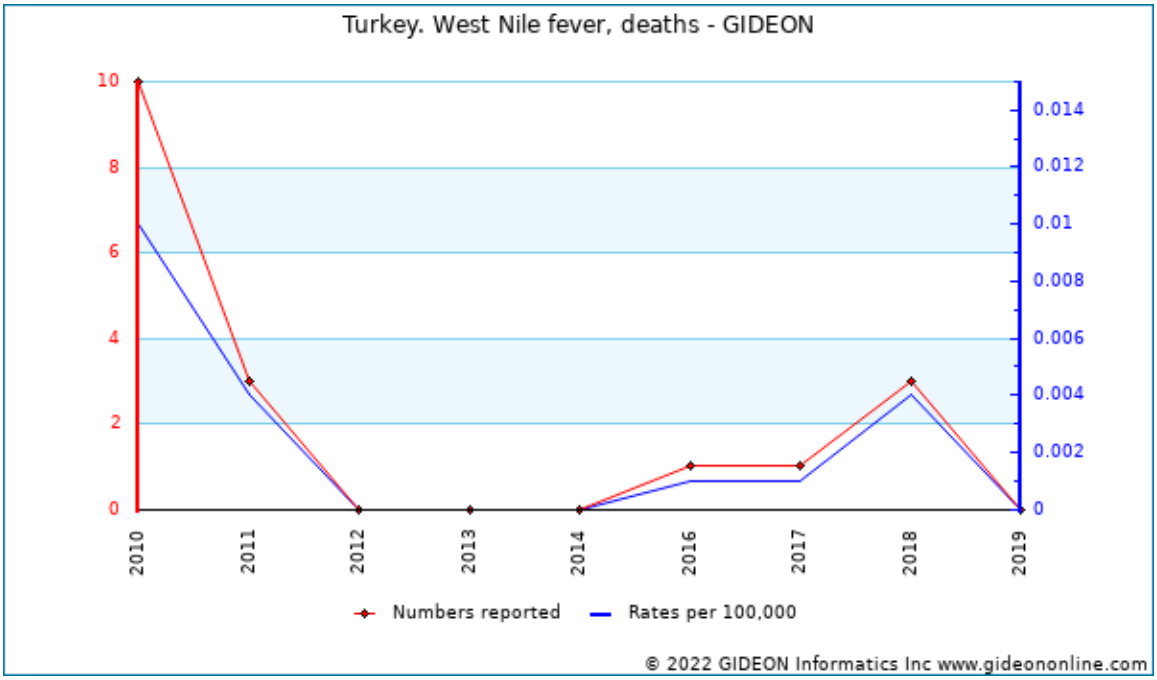

Graph: Turkey. West Nile fever, deaths

Chronology

- 2009 - A case of West Nile meningitis/encephalitis were confirmed in Ankara. [1]
- 2010 - 47 cases (0.19 per 100,000, 10 fatal, 40 neuroinvasive) were reported - with highest rates in western Turkey (1.39 per 100,000 in Sakarya Province). [2]
- 2010 - Two cases of neurological infection due to West Nile virus were identified through survey of cerebrospinal fluid samples in Ankara and Izmir. [3]
- 2011 - Three probable and 2 confirmed cases were reported. [4] [5] [6]
- 2012 - A case report of neurotrophic West Nile virus infection was confirmed in Ankara. [7]
- 2014 - An infected horse was identified in Bursa. [8]
- 2017 - Five cases (1 fatal) were reported to November 2.
- 2018 - Four cases of human infection were reported to November 219. Infected horses were identified. [9] [10]
- 2019 - Ten cases (0 fatal) of human infection were reported to November 28.

Prevalence surveys

Years	Region	Study Group	%	Notes
2012*	Black Sea	horses	0	0% of horses in the middle Black Sea Region (2012 publication) [11]
2020*	Thrace	various	0-0.4	0.4% of mosquito pools; 0% of sheep, cattle, and ticks [12]
2010*	Multiple locations	ticks	0	0% of tick pools (Samsun, Ordu, Giresun, Sinop, Amasya and Tokat, 2010 publication) [13]
2009	Ankara	blood donors	0	0% of healthy blood donors (blood PCR, Ankara, 2009) [14]
2015*	Western Region	blood donors	0	0% of blood donors in western Turkey (blood PCR, 2015 publication) [15]
2011 - 2013	Multiple locations	mosquitoes	1.5	1.5% of mosquito pools from Mersin, Sanliurfa, Van and Kars provinces (2011 to 2013) [16]
2012	Thrace	mosquitoes	15.6-36.8	15.6% of *Ochlerotatus caspius* (mosquito) pools and 36.8% of *Culex pipiens* pools in eastern Thrace (2012) [17]
2016 - 2017	Northeast Region	mosquitoes	7.7	7.7% of mosquito pools [18]

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Years	Region	Study Group	%	Notes
2010*	Anatolia	patients - CNS	9.2	9.2% of adults with aseptic meningitis/encephalitis of unknown etiology (Central Anatolia, 2010 publication) [19]
2019 - 2020	Istanbul	birds - corvids	24	WNV lineage-2 sequences were identified in 24% of corvids [20]

* indicates publication year (not necessarily year of survey)

Seroprevalence surveys [21] [22]

Years	Region	Study Group	%	Notes
2019*	Istanbul	children	0.55	0.55% of children with fever and / or arthritis (IgM) [23]
2013*	Northern Region	animals	0.57	0.57% of cattle, horse, sheep, goat and water buffalo (northern Turkey, 2013 publication) [24]
2007*	Southeast Region	patients	9.5	9.5% of patients at two state hospitals (southeastern Turkey, 2007 publication) [25]
2018	Anatolia	chickens	3.75	Survey of backyard hens in western Anatolia [26]
2011 - 2013	Multiple locations	various	10.5	10.5% of humans, horses, sheep and ducks from Mersin, Sanliurfa, Van and Kars provinces (2011 to 2013) [27]
2009	Zergan River Region	general population	25	25% of individuals in the Zergan River region, Mesopotamia (2009)
2009	Zergan River Region	general population	17	17% of persons from villages in the Zergan River region, Mesopotamia (2009) [28]
2012	Ankara	general population	5.3	5.3% of individuals in Ankara Province (2012) [29]
2012	Manisa	general population	4.3	4.3% of individuals in Manisa (2012) [30]
2009*	Anatolia	blood donors	0.99	0.99% of blood donors in central Anatolia (2009 publication) [31]
2010*		blood donors	2.4	2.4% of blood donors (2010 publication) [32]
2012	Thrace	blood donors	1.7	1.7% of blood donors in Eastern Thrace (2012) [33]
2015*	Western Region	blood donors	2.51	2.51% of blood donors in western Turkey (blood PCR, 2015 publication) [34]
2011*	Istanbul	patients - psychiatric	5.6	5.6% of schizophrenic patients and 3.1% of controls (2011 publication) [35]

* indicates publication year (not necessarily year of survey)

Vectors

- 2016 to 2017 - West Nile virus was identified in *Aedes albopictus* and *Culex pipiens* from Artvin, Rize and Trabzon provinces (Black Sea region). [36]

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Whipple's disease

Agent	BACTERIUM. Actinomycetes, *Tropheryma whipplei* A gram positive bacillus
Reservoir	Unknown
Vector	None
Vehicle	None
Incubation Period	Unknown
Diagnostic Tests	Identification of inclusions in lamina propria (other tissues). Tissue culture. Nucleic acid amplification.
Typical Adult Therapy	Ceftriaxone 2.0 g IV daily X 14d. OR Penicillin G 4 million u IV q4h X 14d. OR Meropenem 1 g IV TID X 14-28d Continue Sulfamethoxazole / Trimethoprim X 1 year[1] [2] [3]
Typical Pediatric Therapy	Disease is rarely, if ever, encountered in children
Clinical Hints	- Chronic multisystem disorder characterized by weight loss, diarrhea, abdominal and joint pain - Dermal hyperpigmentation, fever and lymphadenopathy are often present - *Tropheryma whipplei* has recently been recovered from the blood of patients with fever, headache or cough.
Synonyms	Intestinal lipodystrophy, Lipophagic granulomatosis, Mesenteric chyladenectasis, Steatorrhea arthropericarditica, Tropheryma whipplei. ICD9: 040.2 ICD10: K90.8

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Yellow fever

Agent	VIRUS - RNA. Flaviviridae, Flavivirus: Yellow fever virus
Reservoir	Human, Mosquito, Monkey, Marsupial, Zoonotic
Vector	Mosquito (*Stegomyia* (*Aedes*), *Haemagogus*, *Sabethes*)
Vehicle	Breast feeding
Incubation Period	3d - 6d (range 2.5d - 14d)
Diagnostic Tests	Biosafety level 3. Viral culture (blood, liver). Serology. Nucleic acid amplification.
Typical Adult Therapy	Supportive
Typical Pediatric Therapy	As for adult
Vaccine	Yellow fever vaccine
Clinical Hints	- Headache, backache, vomiting, myalgias, jaundice and hemorrhagic diathesis - Relative bradycardia and leukopenia are present - Illness is often biphasic - Case fatality rate is 10% to 60%, occurring within 7 days of disease onset
Synonyms	Bulan fever, Febbre gialla, Febre amarela, Fever of Fernando Po, Fever of the blight of Benin, Fiebre amarilla, Fievre jaune, Gelbfieber, Gele koorts, Gul feber, Gula febern, Inflammatory fever, Kendal's disease, Magdalena fever, Maladie de Siam, Pest of Havana, Stranger's fever. ICD9: 060 ICD10: A95

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

Yellow fever in Turkey

Yellow fever does not occur in Turkey.

Proof of vaccination is **NOT** required for travelers arriving from countries with risk for YFV transmission.

Seroprevalence surveys

Years	Region	Study Group	%	Notes
2010*	Multiple locations	blood donors	0.6	0.6% of blood donors in Ankara, Konya, Eskisehir and Zonguldak provinces (2010 publication) [1]

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

References

1. Mikrobiyol Bul 2010 Jul ;44(3):415-24.

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Yersiniosis

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

Yersiniosis in Turkey

Prevalence surveys

Years	Region	Study Group	%	Notes
1991*	Izmir	water	6	6% of drinking water samples in Izmir (1991 publication) [1]
1999*	Ankara	milk	6.63	6.63% of raw milk samples (1999 publication) [2]

* indicates publication year (not necessarily year of survey)

References

1. Int J Food Microbiol 1991 May ;13(1):69-73.

2. Cent Eur J Public Health 1999 Aug ;7(3):145-8.

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Zika

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

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

Zika in Turkey

2017 - The first cases of Zika virus infection were reported - a newly-married couple who acquired the infection in Cuba. [1]

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1. Mikrobiyol Bul 2018 Jul ;52(3):308-315.

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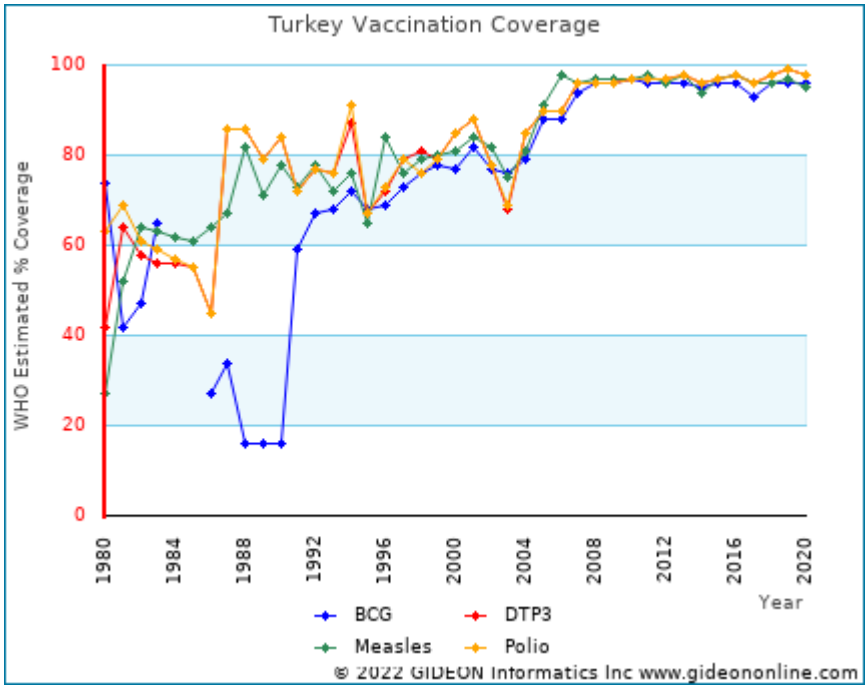
Vaccine Schedule and coverage for Turkey

BCG - 2 months
DTaPHibIPV - 2,4,6,18 months
HepA - 18, 24 months
HepB - birth 1,6 months
MMR - 12 months; 6 years
OPV - 6,18 months
Pneumo-conj - 2,4,6,12 months
Td - 13 years
TdaPIPV - 6 years
Varicella - 12 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 - Acellular pertussis
BCG - Bacillus Calmette Guerin
CBAW - Childbearing age women
D - Diphtheria
dT - Tetanus lower dose diphtheria
HCW - Health-care workers
HepA - Hepatitis A
HepB - Hepatitis B
Hib - Haemophilus influenzae type B
HPV - Human papillomavirus
IPV - Injectable polio vaccine
MenA-conj - Meningococcus type A conjugate
MenACWY - Meningococcus types A,C,Y and W
MenC-conj - Meningococcus type C conjugate
MMR - Measles, Mumps, Rubella
MMRV - Measles, Mumps, Rubella, Varicella
MR - Measles, Rubella
NA - Details not available
OPV - Oral polio vaccine
P - Pertussis
Pneumo - Pneumococcal vaccine
Pneumo ps - Pneumococcal polysaccharide

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

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GIDEON exists to advance the global effort against Infectious Disease.

- We help protect societies by providing reliable, timely epidemiological data.
- We save doctors precious time in diagnosing and treating infectious diseases.
- We provide state-of-the-art tools for training healthcare workers of tomorrow.

GIDEON platform

GIDEON platform is widely recognized as the most comprehensive infectious diseases database in the world – for research, education, and diagnostics. It is a one-stop resource for anyone with a professional interest in Infectious Diseases and Microbiology. Over the past three years, GIDEON contributed to 200+ diverse scientific publications. GIDEON is ideally suited for saving time in Point-of-Care settings while empowering clinicians to consider all possible scenarios. Additionally, it is an excellent teaching tool for Biology, Microbiology, Public Health, and Medical students and Residents. It is used in 164 countries by organizations such as the London School of Hygiene and Tropical Medicine, Public Health England, WHO, ECDC, NATO, Harvard Medical School, Stanford University, McGill University, and hundreds more.

GIDEON ebooks

GIDEON ebooks complement the GIDEON web application by expanding easy access to GIDEON's vast content without a subscription or continual internet access. Ebooks can be downloaded to a variety of devices and can be read anywhere. These ebooks summarize the status of individual infectious diseases, drugs, vaccines, and pathogens, in every country of the world.

Content

GIDEON's worldwide data sources access the entire world's literature and adhere to the standards of Evidence-Based Medicine. A team of highly regarded medical scientists tracks all infectious diseases in 235 countries and territories worldwide, updating the database every day. The data set includes:

- 26,000+ outbreaks, going back to 1348 AD
- 86,000+ prevalence and seroprevalence surveys
- 38,000+ graphs for visual epidemiological data analysis
- 23,000+ country notes for each disease
- 30,000+ vaccine and anti-infective drugs trade names
- 2,000+ pathogens
- 3,000+ images
- 260,000+ in-build references, saving years of manual research work

Users

GIDEON is used in hospitals, universities (colleges and medical schools), private practice, public health departments, and military installations - by physicians (emergency room, infectious diseases, pediatrics, and hospitalists), teachers, clinical microbiologists, and health professionals. It is an ideal teaching tool for health care and microbiology students, residents, and fellows.

Accuracy

The Infectious Diseases Diagnosis module has been tested in a blinded multi-center field trial of 495 patients. The correct diagnosis was displayed in over 94% of cases and was listed first in over 75%. GIDEON has been reviewed in numerous journals and is continually updated daily to maintain content and accuracy.

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