TB CHALLENGES: OCULAR TUBERCULOSIS

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2025 Wisconsin TB Summit
April 22nd, 2025
Virtual symposium

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LEARNING OBJECTIVES

- Epidemiology of extrapulmonary TB
  - primary focus on ocular TB
- Clinical features of Ocular TB
  - Clinical presentation and course
  - Prognosis and complications
- Diagnostic challenges
- Treatment

OUTLINE

1. Introduction and Case
2. Epidemiology of extrapulmonary and Ocular Tb
3. Diagnosis and Challenges
4. Treatment

CLINICAL CASE

- 52 y/o healthy African male seen in the Univ of Wisconsin Ophthalmology clinic with a 2-day h/o right eye redness, blurry vision, photophobia and “foreign-body” sensation.
- Ocular exam demonstrated:
  - ***Anterior chamber inflammation (4+ cells)***
  - ***1+ corneal keratic precipitates.***
  - No posterior synechiae or evidence of posterior uveitis.
- **Diagnosis:** ***Granulomatous anterior uveitis***
- Topical steroids drops prescribed 4x/day -→ increased to 6x/day at D5 for persistent blurry vision.
- Clinical improvement seen.

CLINICAL CASE- CONTD.

Past Medical History: HTN, hyperlipidemia …

and h/o R eye anterior uveitis 15 yrs ago s/p Tx with topical steroids.

- *No h/o prior TB testing, BCG vaccination, or abnormal chest imaging.*

Social history:

- U.S. born of immigrant Congolese parents.
- Resident of Indiana.
- Frequent lifetime travel to Africa and Europe for conferences, teaching
- No known contacts with TB.

CLINICAL CASE- CONTD.

Fam/hx:

- Mother with h/o +ve TB skin test (PPD) in younger years but had been asymptomatic.
- No known h/o family members with TB.
- No h/o immunosuppressive or autoimmune diseases.

- **Review of systems**: Negative, except for very mild R eye redness and foreign-body sensation.

Further workup:

- Three consecutive AFB sputum samples *(all negative)*
- HIV and hepatitis serologies- *negative.*
- CBC: *mild (chronic) leukopenia*
- lymphocyte and immunoglobulin subsets: *normal*
- Liver and renal function- *normal*
- CT chest w/wo contrast- *normal*
- Ocular sampling: *not done (deemed low-yield)*

DIFFERENTIAL DIAGNOSIS OF UVEITITIS

Uvea

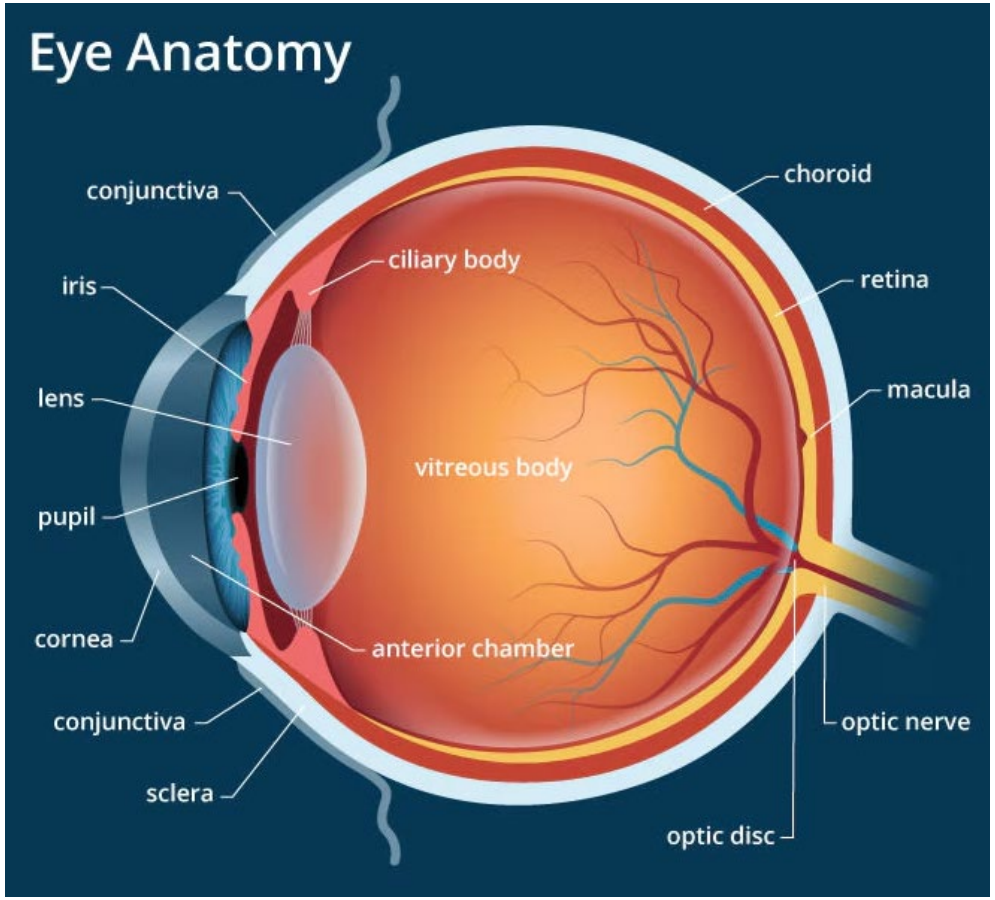
- essentially everything INSIDE the eye
- (i.e., all but the cornea, conjunctiva, sclera and lens)

Uveitis

- Inflammation of intraocular structures

Causes of uveitis

- **Infection:** **herpes viruses**, **toxoplasmosis,** COVID-19, **syphilis**, Cat Scratch disease, TB, West Nile virus, Zika, Ebola, others



- **Auto-immune disease**: sarcoidosis, vasculitis, juvenile idiopathic arthritis (JIA), Lupus, Sjögren's, Behçet syndrome, psoriasis, others
- **Drugs:** rifabutin, fluoroquinolones, cidofovir, BRAF kinase inhibitors, immune checkpoint inhibitors

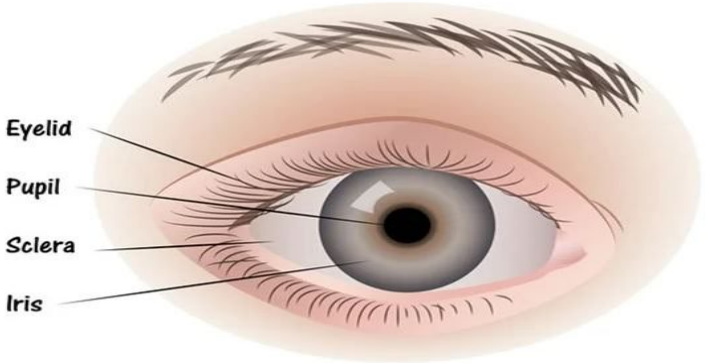
CLINICAL CASE- CONTD.

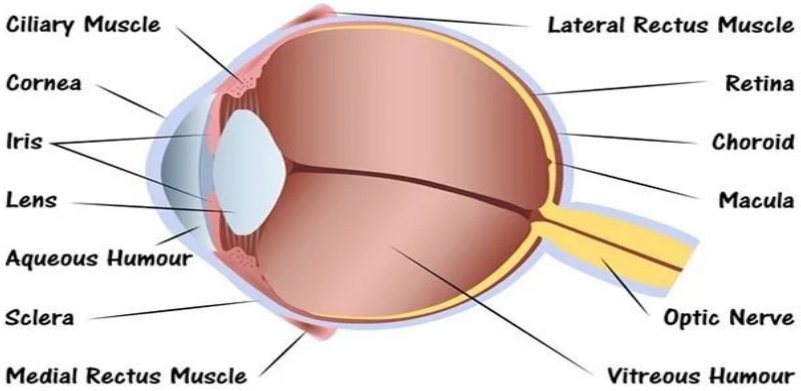
- **W/up for ocular TB and autoimmune diseases:**
  - ESR and CRP- Normal
  - ANA, anti-dsDNA, MPO and PR3 Abs- Normal
  - Rheumatoid factor- Normal
  - Angiotensin-converting enzyme- Normal
  - HLA-B27- Negative
  - QuantiFERON TB GOLD- strongly +ve (values ≥0.35 IU/mL).
    - TB1-nil=9.96IU/ml, TB2-nil=9.96IU/ml, mitogen-nil= 9.96IU/ml, Nil 0.04IU/ml.
  - Chest xray – Normal

OCULAR TB- A DIAGNOSTIC DILEMMA

- M.Tb can involve any ocular tissue, and disease can be focal or multi-focal.
- **accurate worldwide prevalence estimates of OTB are challenging due to**:
  - a) Varied definitions of OTB in literature.
  - b) Different regional prevalence of TB worldwide.
  - c) Lack of standardized diagnostic criteria
  - d) Difficulties with microbiologic diagnosis on account of:
    - OTB mimicking other infectious and noninfectious ocular diseases.
    - Paucibacillary nature of the disease.
    - Often occurs in absence of pulmonary or systemic TB disease.
    - Requirement for invasive /risky ocular procedures to reach a microbiologic diagnosis.
    - Scant quantity of diagnostic ocular samples (aspirated fluid or biopsied tissue).
    - Low sensitivity of molecular (PCR) assays on ocular samples

Human eye anatomy





Human Eye Diagram. Image Credit: Pablofdezr / Shutterstock

aqueous humor = "anterior chamber"
vitreous humor= "posterior chamber"

Ocular or Ophthalmic TB (OTB) can be categorized into:

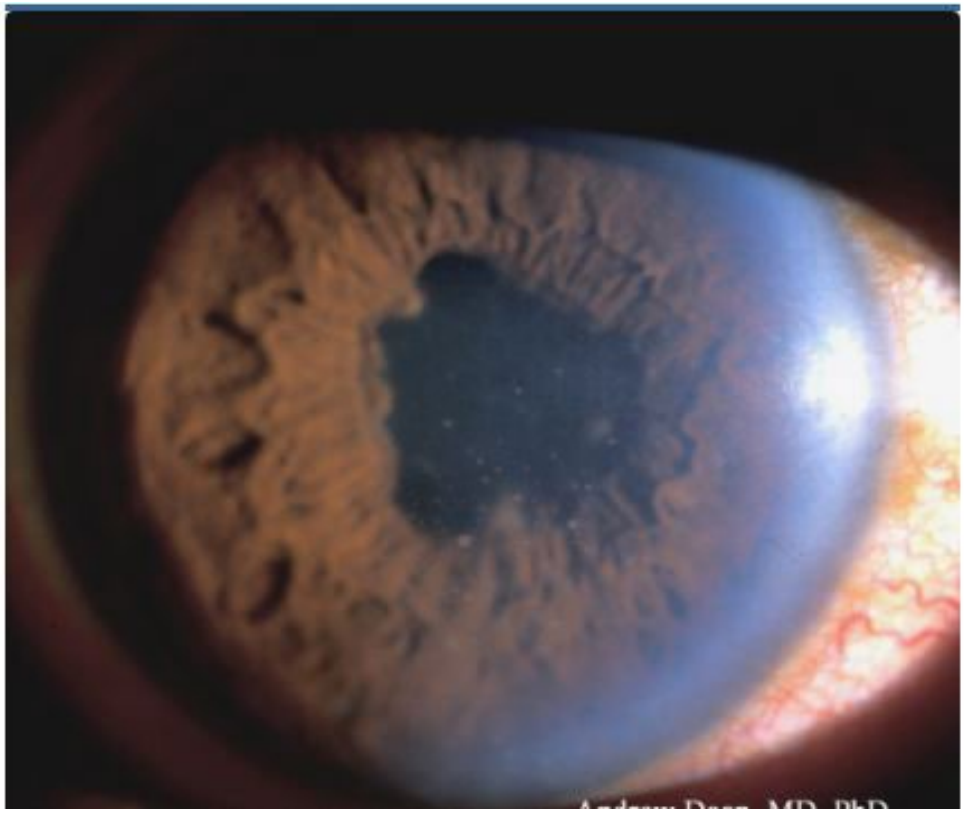
Primary OTB
Direct infection

Secondary OTB
Hematogenously-acquired
from a pulmonary or extrapulm TB site (EPTB)

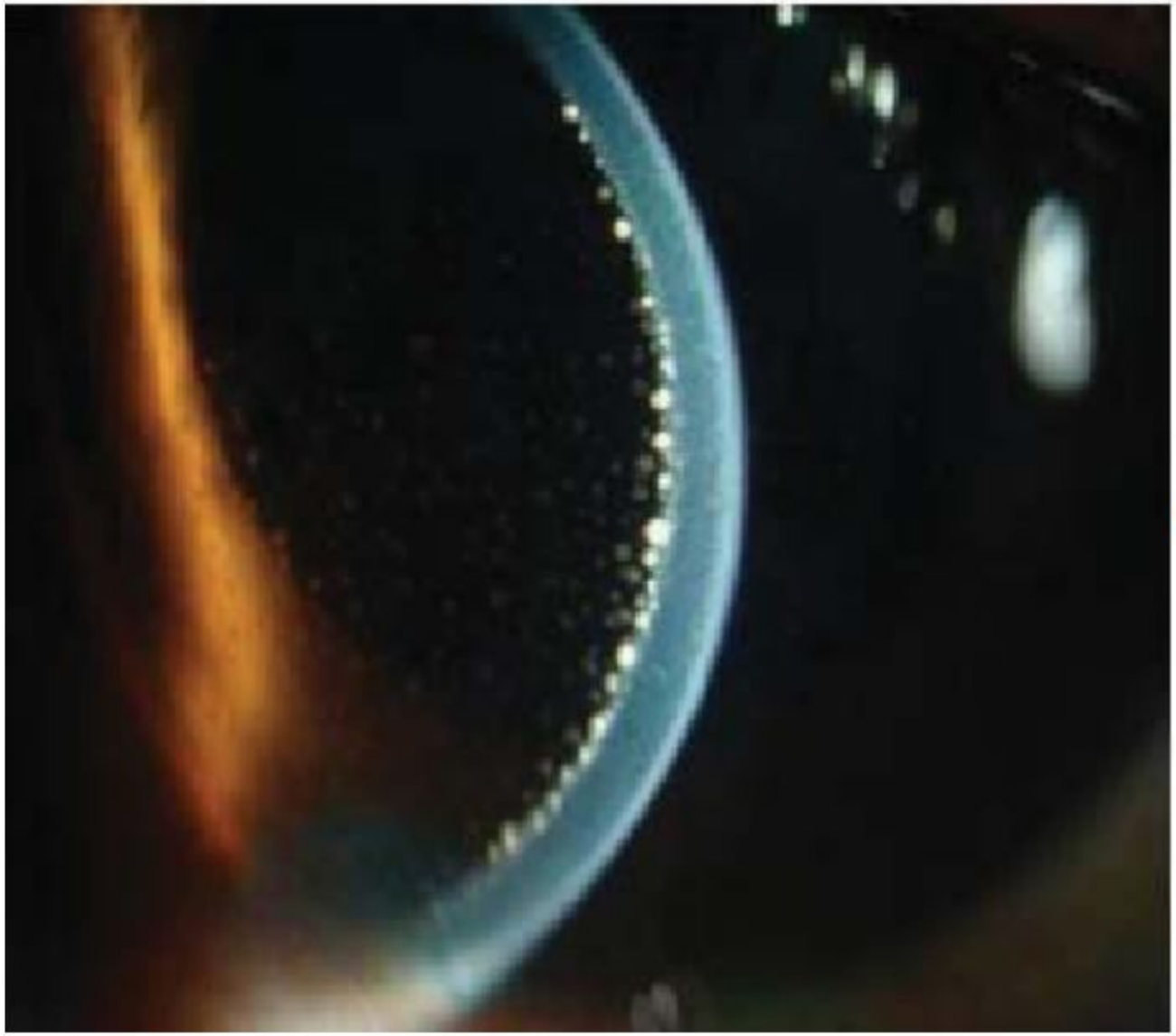
Immune-mediated

Ocular Tuberculosis. Treasure Island (FL): StatPearls; 2023

ANTERIOR GRANULOMATOUS UVEITIS IN OCULAR TB



Doan A, Farjo A: TB Uveitis.February 21, 2005; Available from: http://www.EyeRounds.org/cases/case6.htm.



Granulomatous acute anterior uveitis showing multiple mutton fat keratic precipitates clustered over the endothelium in a presumed case of ocular TB.

Khadka et al.Journal of Clinical research and Ophthalmology.6(1):011-020, DOI:10.17352/2455-1414.000057

ANTERIOR GRANULOMATOUS UVEITIS IN OCULAR TB

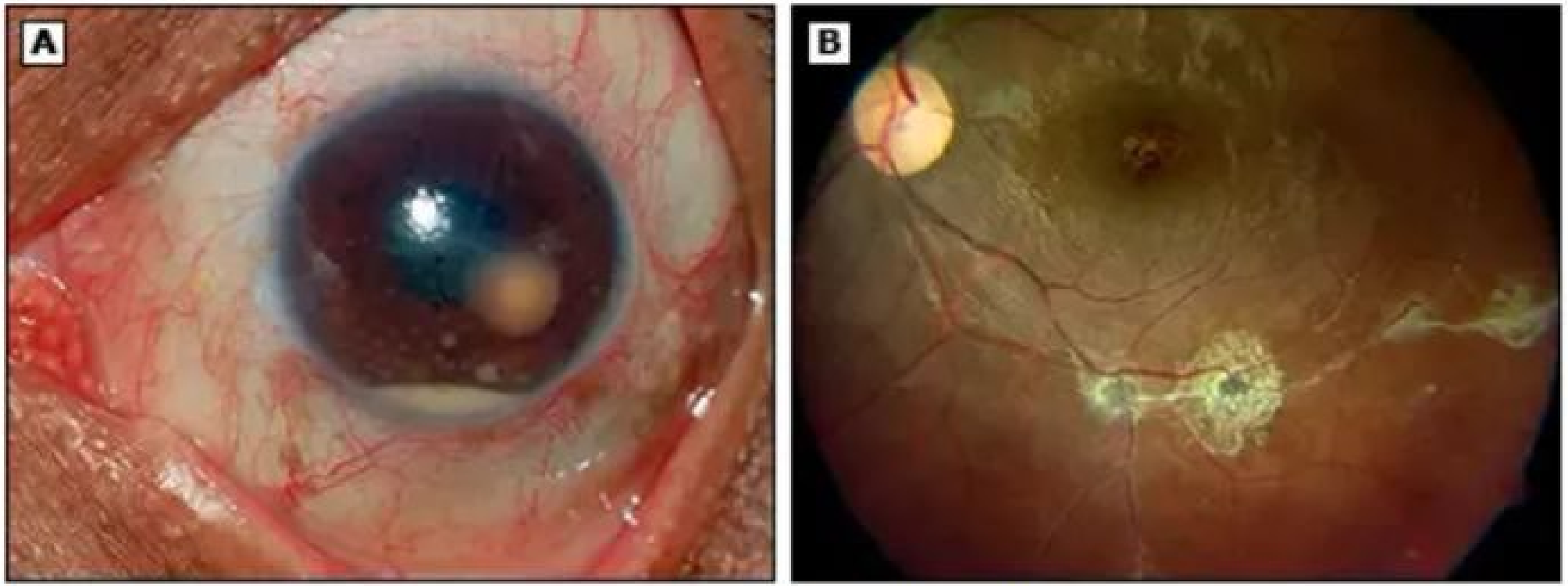


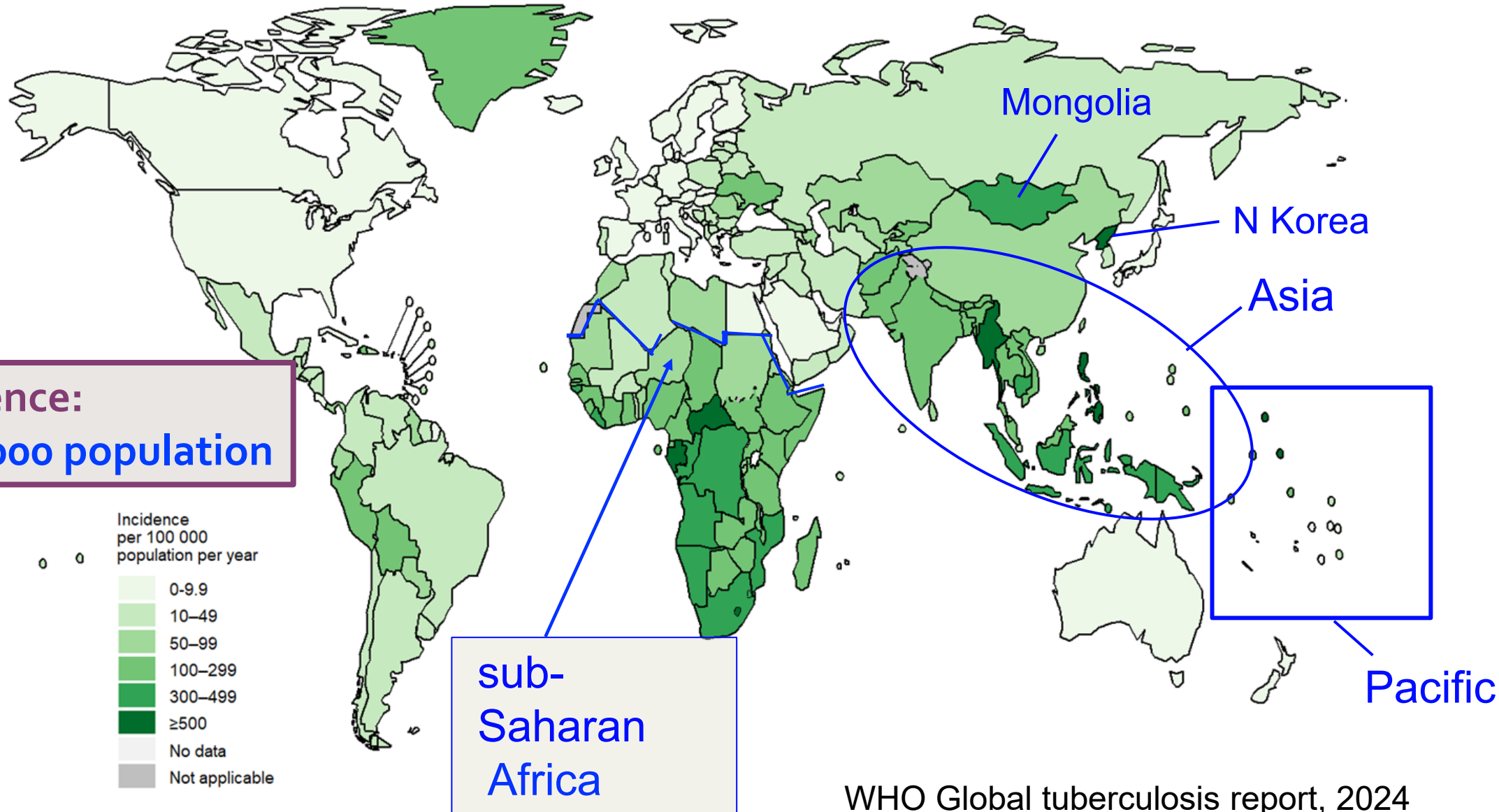
Figure2. Anterior chamber granuloma due to ocular TB. (Panel A) Anterior chamber granuloma with granulomatous keratic precipitates and **hypopyon**. Aspiration of the granuloma demonstrated acid fast bacilli in Ziehl-Neelsen stain. (Panel B) Following antituberculous treatment, the posterior segment demonstrates healed pigmented scars along the vasculature. (©2014 UpToDate®)

EPIDEMIOLOGY: TB, EPTB, AND OCULAR TB

How often do patients with ocular TB have TB in another part of the body?

A	50%
B	75%
C	20%
D	8%

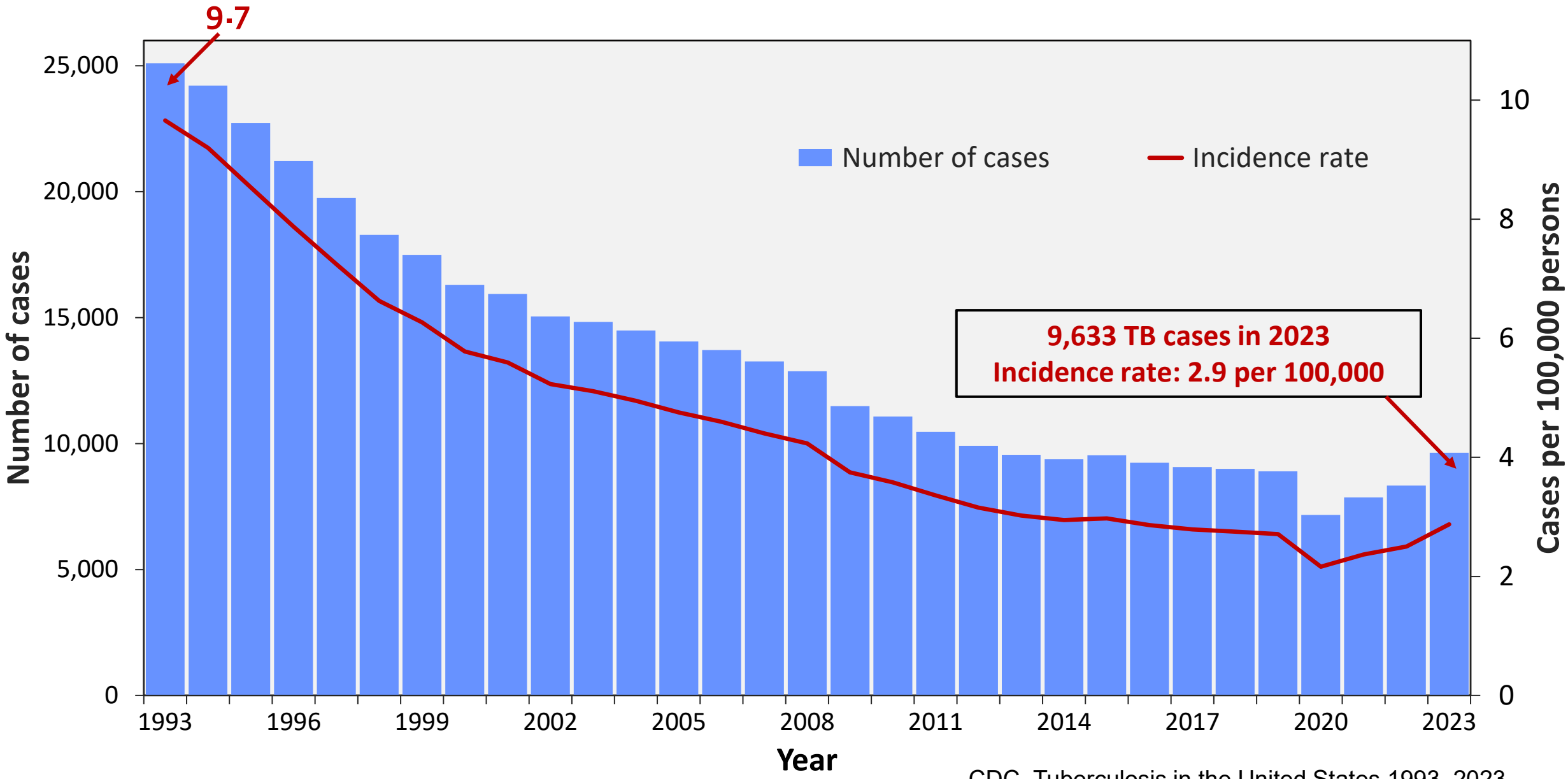
ESTIMATED TB INCIDENCE RATES, 2023



Global incidence:
134 per 100,000 population

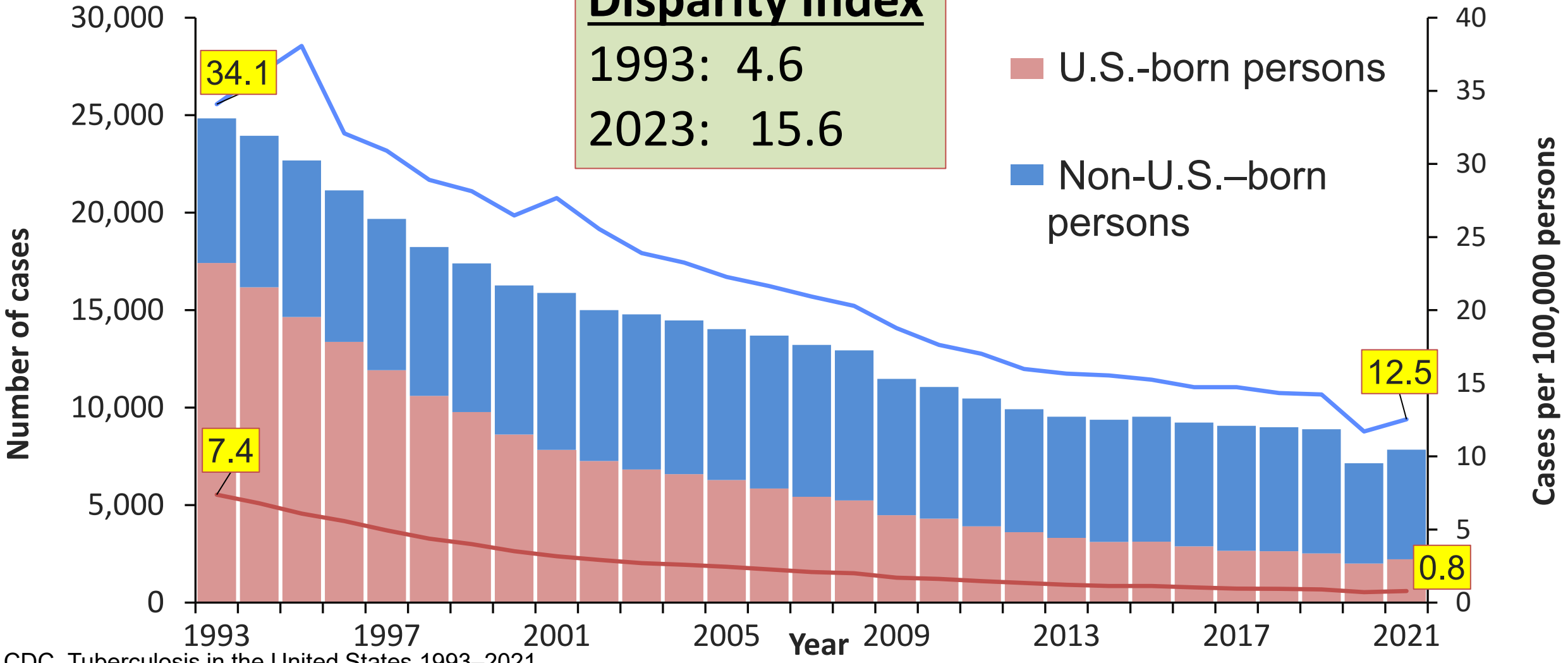
WHO Global tuberculosis report, 2024

TB CASES AND INCIDENCE RATES, U.S., 1993–2023



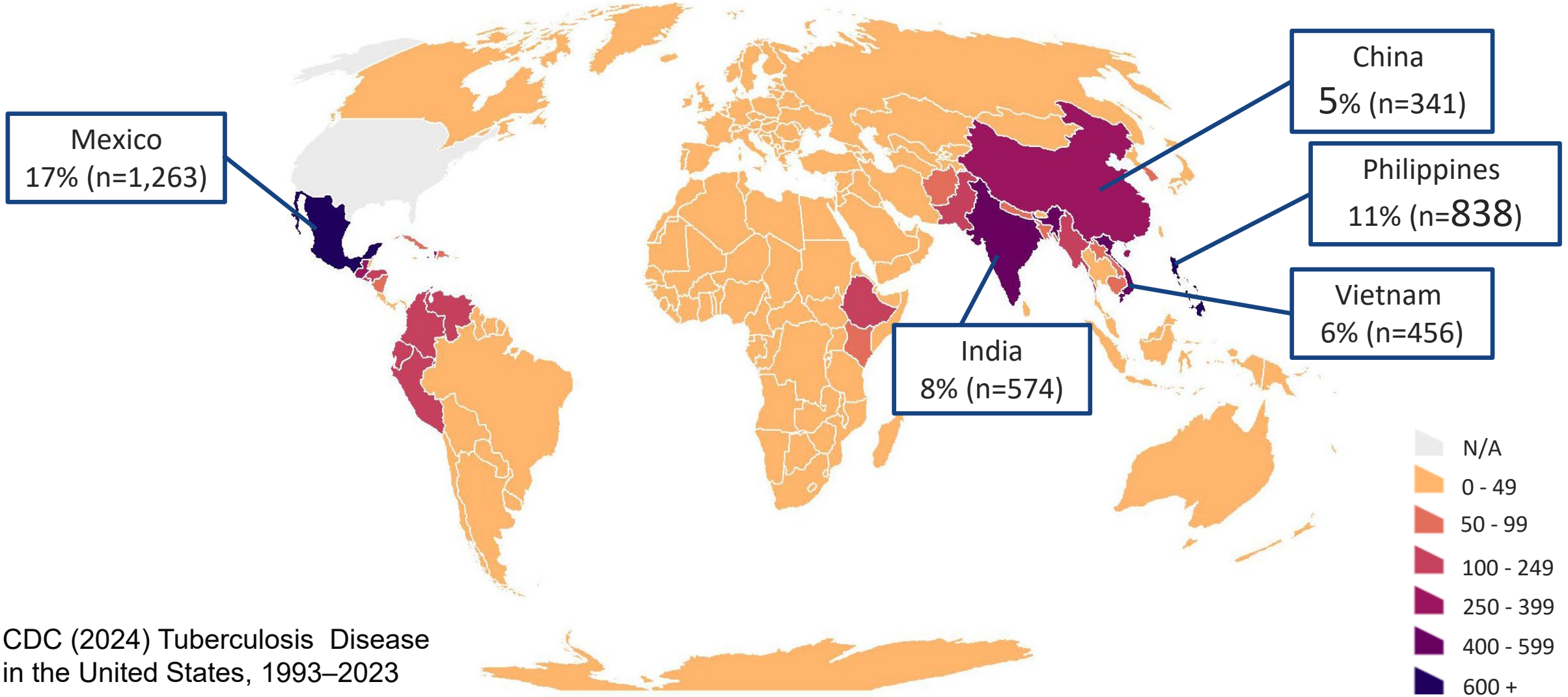
CDC. Tuberculosis in the United States,1993–2023

TB CASES AND INCIDENCE RATES BY BIRTH ORIGIN, UNITED STATES, 1993–2021



CDC. Tuberculosis in the United States,1993–2021.

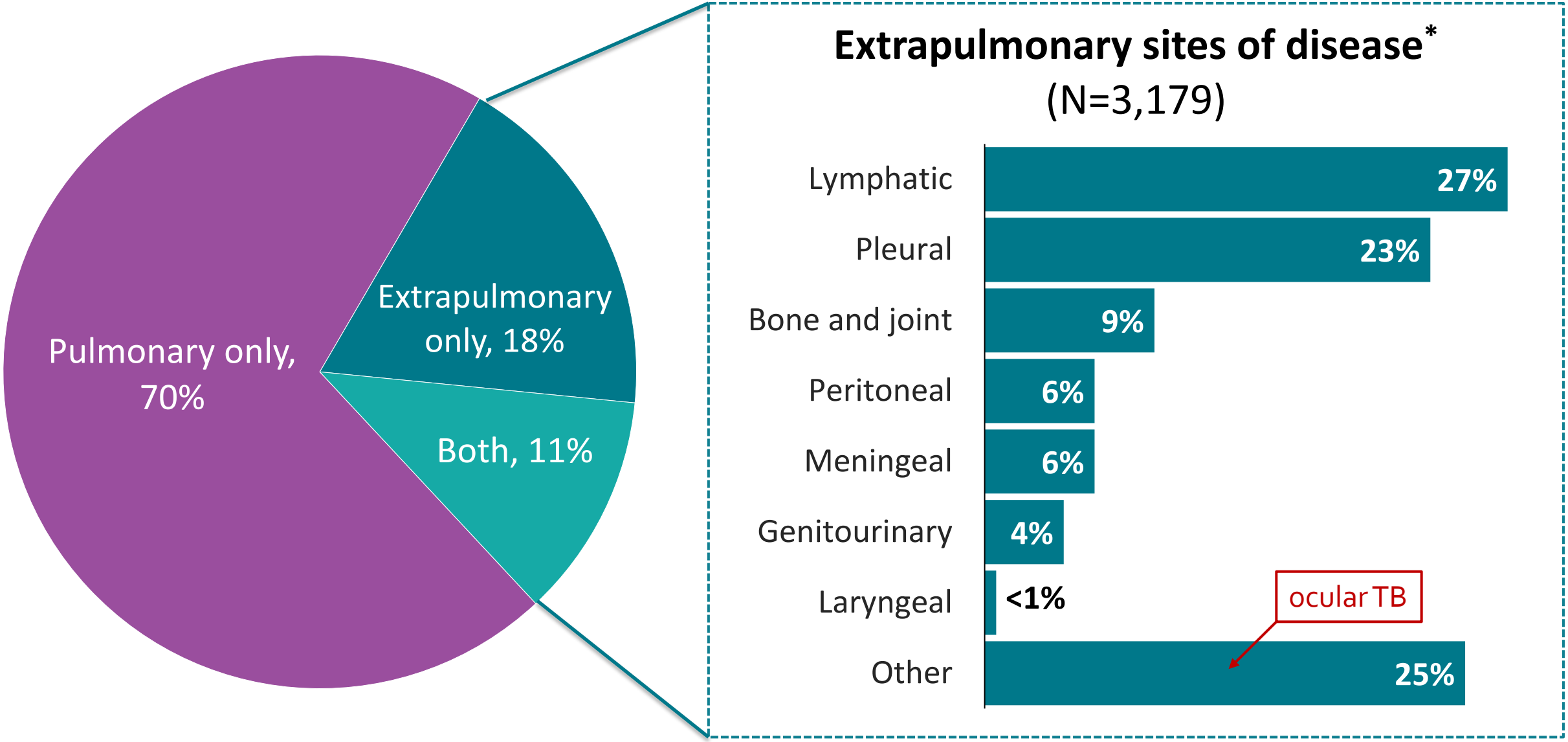
TB Cases by Countries of Birth Among Non-U.S.–Born* Persons, United States, 2023 (N=7,299)



CDC (2024) Tuberculosis Disease in the United States, 1993–2023

*Persons born in the United States, certain U.S. territories, or elsewhere to at least one U.S. citizen parent are categorized as U.S.-born. All other persons are categorized as non-U.S.–born.

Percentage of TB Cases by Site of Disease, United States, 2023



* Persons might have more than one extrapulmonary site of disease.

CDC slideset: Tuberculosis (TB) Disease in the United States , 1993–2023

OCULAR TB (OTB) GLOBAL EPIDEMIOLOGY

- **Proportions of TB uveitis, worldwide**
  - unknown
  - estimated to be 0.2% to 11.0% among all uveitis patients

- **Frequency depends on overall TB endemicity**
  - 0.2% to 2.7% in regions with low TB incidence (USA, Europe, Japan)
  - 5.6 % to 10.5% in endemic regions.

    Testi I (2020). Indian J Ophthalmol; 68(9):1808-1817

- **United States**
  - OTB represents <1% of all ***infectious*** uveitis cases

    Zhang Y (2020). PLoS One 2020; 15:e0237995; Alli HD (2022). Surv Ophthalmol ; 67:770–92

OCULAR TUBERCULOSIS, U.S.

Open Forum Infectious Diseases

MAJOR ARTICLE

Epidemiology and Clinical Characteristics of Ocular Tuberculosis in the United States, 1993–2019

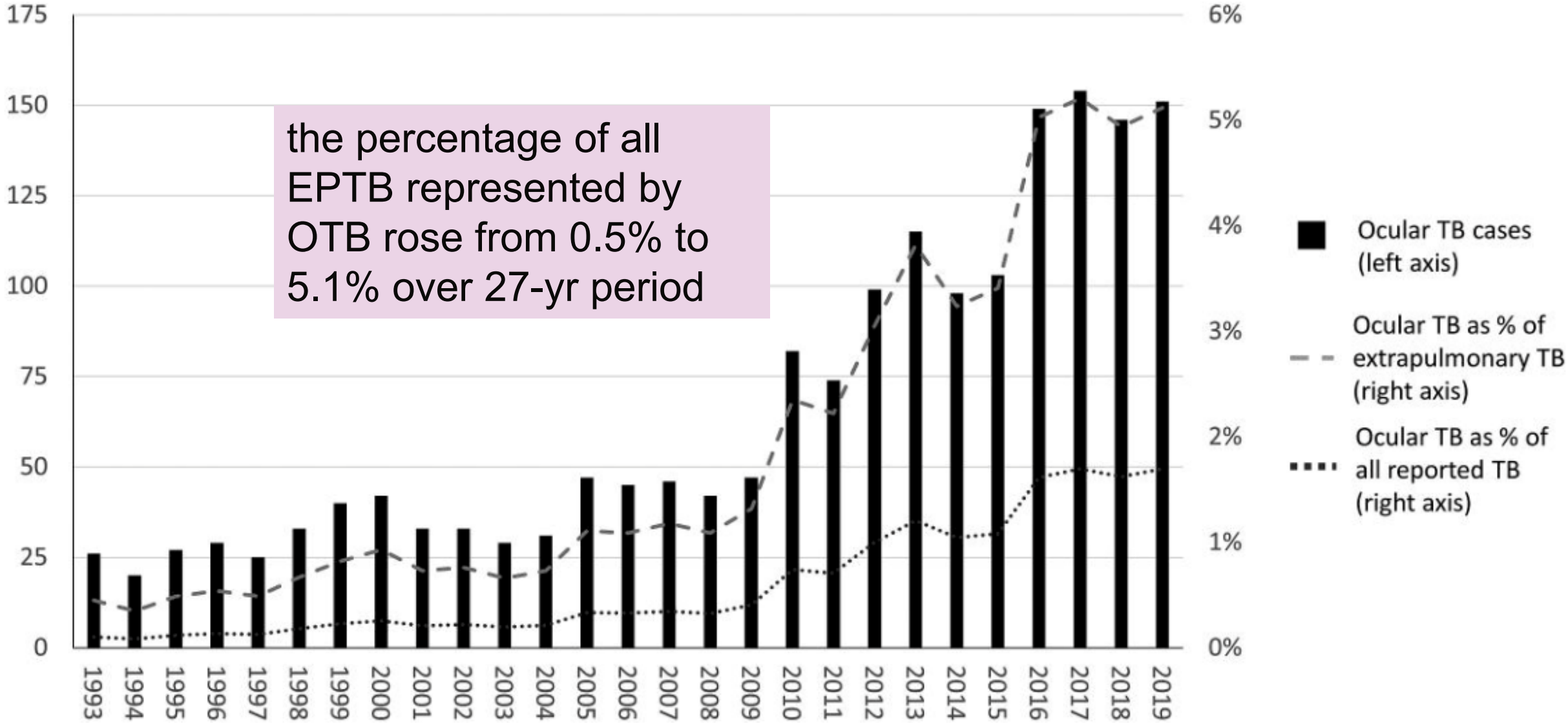
Thomas D. Filardo,[1,2] Aryn Andrzejewski,[3] Michael Croix,[3] Julie L. Self,[1] Henry S. Fraimow,[4] and Sonal S. Munsiff[3]

[1]Division of Tuberculosis Elimination, Centers for Disease Control and Prevention, Atlanta, Georgia, USA, [2]Epidemic Intelligence Service, CDC, Atlanta, Georgia, USA, [3]Division of Infectious Diseases, University of Rochester School of Medicine and Dentistry, Rochester, New York, USA, and [4]Division of Infectious Diseases, Cooper Medical School of Rowan University, Camden, New Jersey, USA

- utilized data from all verified cases of TB disease reported to the US Centers for Disease Control and Prevention's (CDC's) National Tuberculosis Surveillance System (NTSS)
- OTB case definition: site of disease was reported as "eye or ear appendages" or if a positive smear, nucleic acid amplification test (NAAT), or culture was reported from this anatomic site
- **1766 cases** total; only 1121 of these (2010-2019) included in demographic and risk factor analysis

Filardo TD (2024). Open Forum Infect Dis. 11(9):ofae476. DOI: 10.1093/ofid/ofae476

Ocular TB in the United States, 1993–2019



the percentage of all EPTB represented by OTB rose from 0.5% to 5.1% over 27-yr period

Filardo TD (2024). Open Forum Infect Dis. 11(9):ofae476. DOI: 10.1093/ofid/ofae476

OCULAR TB BY INDIVIDUAL STATES

Supplemental Table 3: Top Ten States Reporting Ocular Tuberculosis (TB) Cases, United States 2010–2019

State	Reported Ocular TB Cases[a]	Reported Ocular TB Cases as Percentage of All EPTB[b]	State Rank by Number of Reported EPTB Cases
CA	213	3.1%	1
TX	130	3.9%	2
MI	98	17.1%	15
IL	80	6.7%	5
NY	75	2.5%	3
FL	41	2.8%	4
NC	40	5.4%	14
GA	38	3.9%	7
PA	36	4.8%	13
MA	34	4.5%	12

Abbreviations: EPTB Extrapulmonary Tuberculosis

Filardo TD (2024). Open Forum Infect Dis. 11(9):ofae476. DOI: 10.1093/ofid/ofae476

OCULAR TUBERCULOSIS, U.S., STUDY RESULTS

- **The OTB group (n=1171) was compared to two groups**:
  - ***Extrapulmonary TB*** (EPTB, n= 29781) TB reported outside the lungs, with or without concurrent pulmonary disease)
  - ***Isolated pulmonary TB*** (PTB, n=65158). No TB outside the lungs
- 35% of OTB patients were US-born vs. 36% with PTB and 28% with EPTB
- OTB had **different** TB risk factors compared to EPTB and PTB cases.
  - ***more likely to have diabetes*** *and* ***less likely to have HIV***
- OTB much less likely to have concurrent pulmonary TB **(6%)** vs EPTB patients **(39%)**
- Fewer OTB cases (5%) were microbiologically confirmed compared to EPTB/PTB pts
- IGRA positivity was higher among OTB pts (96%) compared to EPTB/PTB (85%) pts

Filardo TD (2024). Open Forum Infect Dis. 11(9):ofae476. DOI: 10.1093/ofid/ofae476

DIAGNOSIS

- OCULAR MANIFESTATIONS
- MICROBIOLOGIC DIAGNOSIS
- IMMUNE CORROBORATION: EVIDENCE THAT THE IMMUNE SYSTEM HAS ENCOUNTERED TB BEFORE
  - positive IGRA or TST
  - chest imaging showing old or active TB

OVERVIEW OF OCULAR TB DIAGNOSIS

Most patients are diagnosed with presumed ocular TB based on local prevalence, consistent ocular pathology, and immunologic tests demonstrating exposure to TB, such as purified protein derivative (PPD) skin test and/or IGRAs

YOU NEED AN OPHTHALMOLOGIST, PREFERABLY A SAVVY ONE !

Testi I (2020). Indian J Ophthalmol 68(9): 1808–1817. doi: 10.4103/ijo.IJO_1451_20

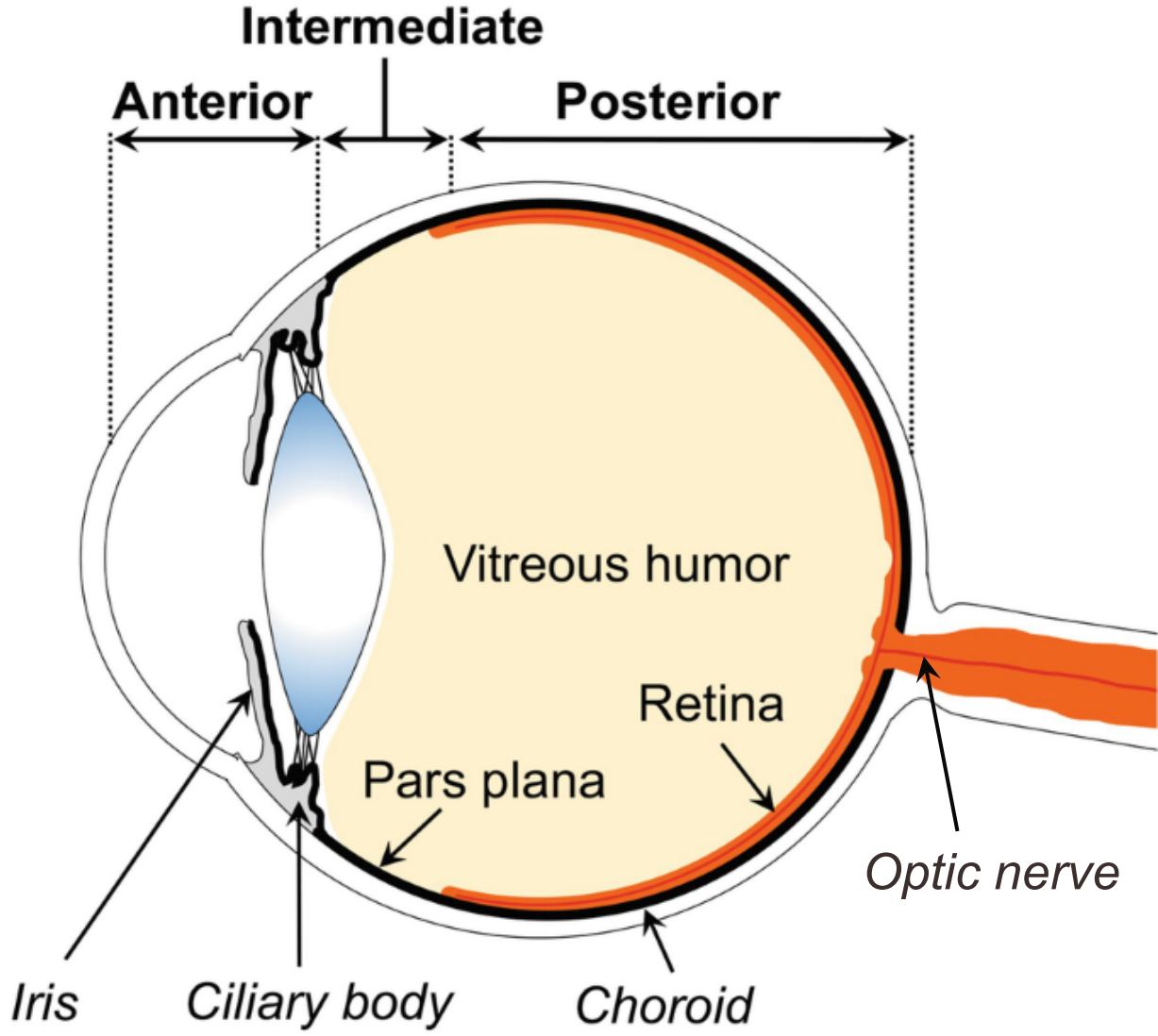
Which of the below eye findings are typical of TB uveitis?

A	mutton fat keratic precipitates
B	multifocal choroiditis
C	serpiginous-like choroiditis
D	all of the above

MANIFESTATIONS OF OCULAR TB OR TB UVEITIS

II. INTRAOCULAR SITES

- iris, ciliary body, choroid = uvea
- Inflammation of the uvea=uveitis
- uveitis can be
  - **anterior** (iris, ciliary body [CB])
  - **intermediate** (pars plana, vitreous)
  - **posterior** (retina and retinal **vessels**, choroid, optic nerve)
  - **pan** (all of above)



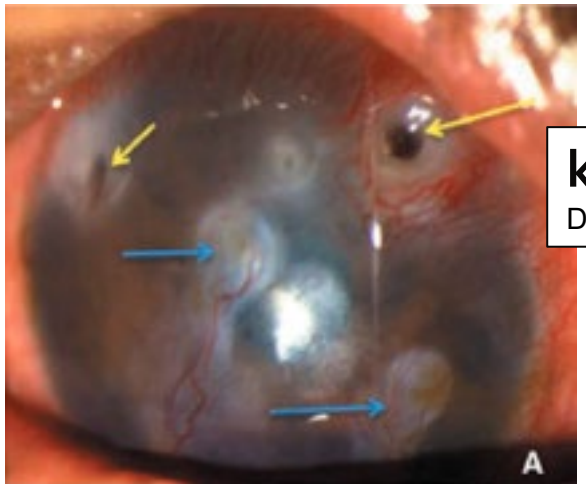
https://doi.org/10.1007/978-3-031-27327-8_7

MANIFESTATIONS OF OCULAR TB

I. EXTRAOCULAR TUBERCULOSIS

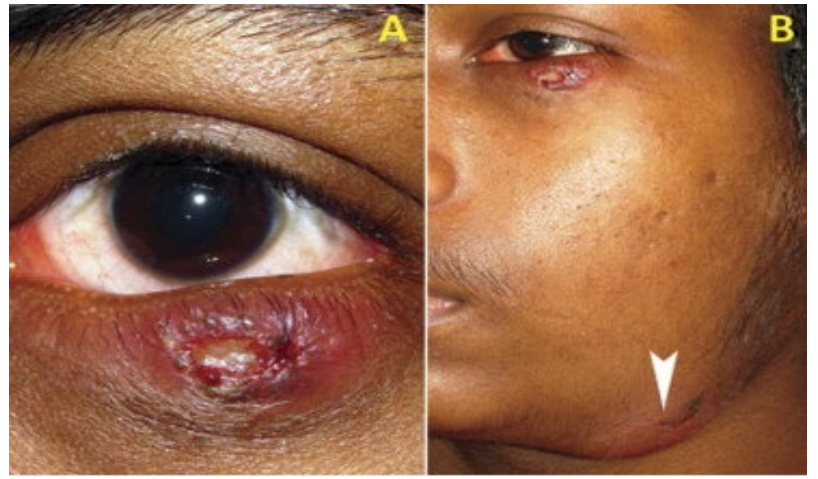
- Orbit, eyelid, lacrimal glands, conjunctiva
- cornea
  - Phlyctenular keratoconjunctivitis:

    (type IV HS response to bacterial antigens)
  - interstitial keratitis: inflammation of the cornea



keratitis with ulceration
DOI: 10.1080/09273948.2019.1568504

Phlyctenular keratoconjunctivitis



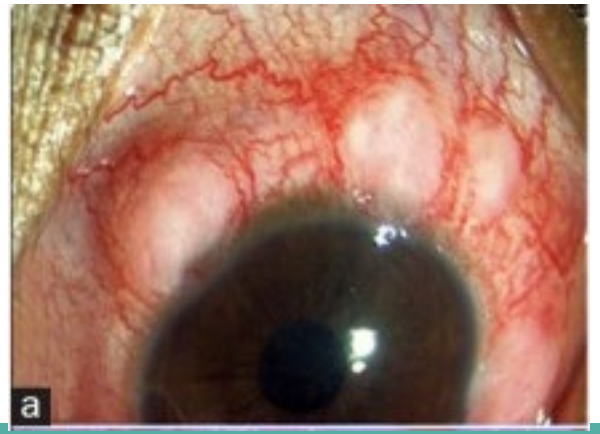
chalazion (stye)

enlarged lymph node

Mittal R (2013). Ophthalmology.120(5)

conjunctivitis

Solmaz N (2018). Turk J Ophthalmol. 48(1)

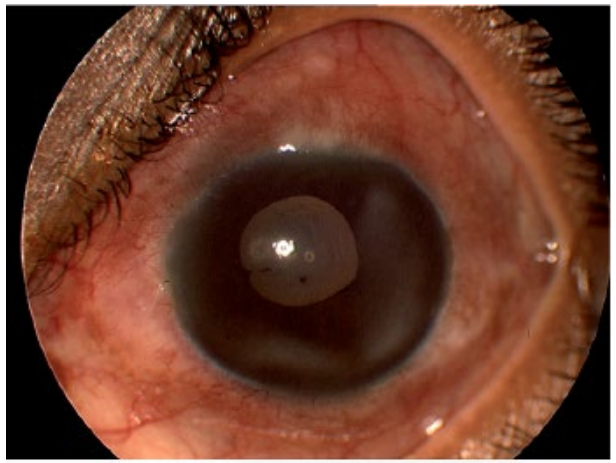


Balyan M (2019) Indian J Ophthal 67(7):1177.

MANIFESTATIONS OF OCULAR TB

I. EXTRAOCULAR TUBERCULOSIS, *continued*

- **sclera:** inflammation of the sclera



nodular scleritis & adjacent keratitis

doi: 10.3109/09273948.2014.986582

nodular sceritis

DOI: 10.3109/09273948.2011.628195

TB ANTERIOR UVEITIS

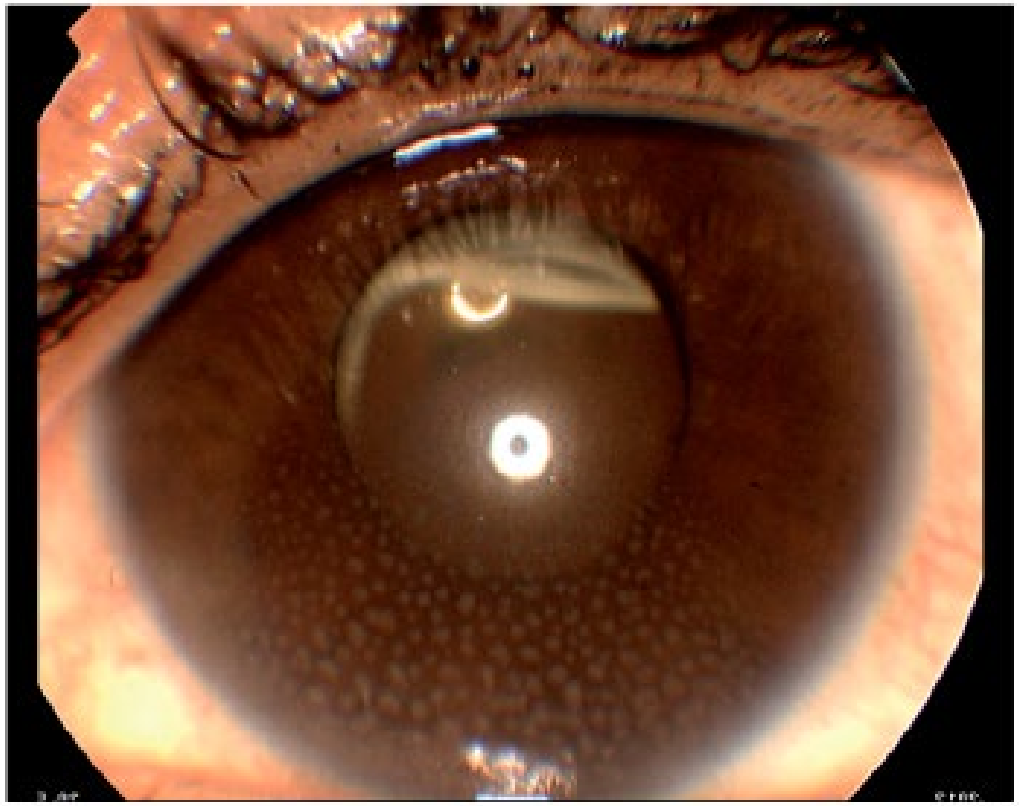
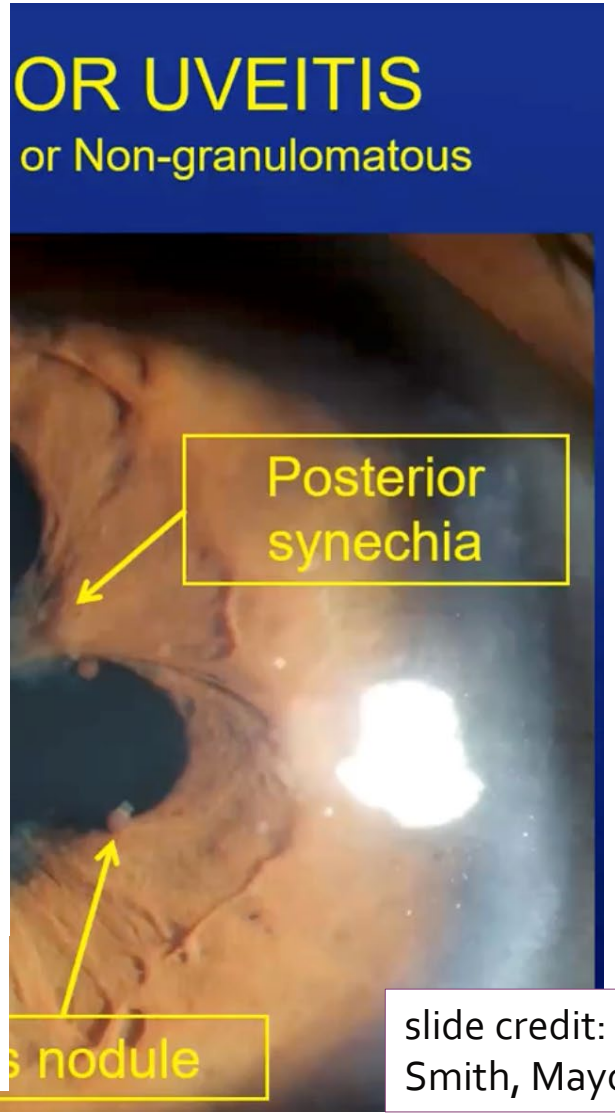


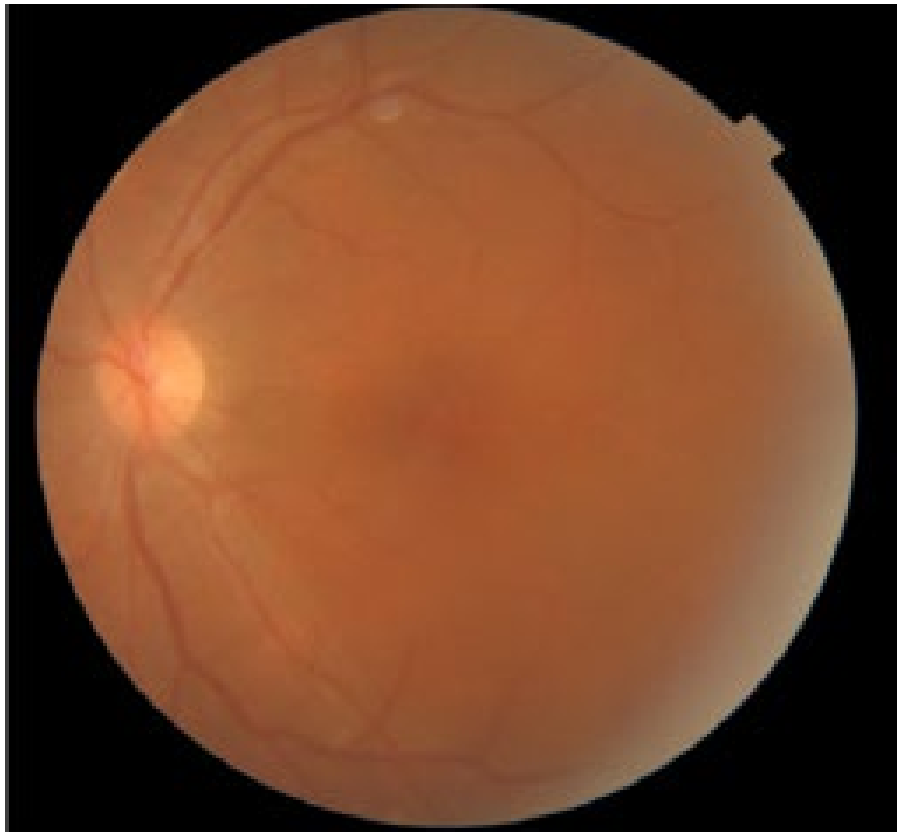
FIGURE 3. Anterior segment photograph showing granulomatous uveitis with mutton fat keratic precipitates.

Gupta V (2015) Ocular Immunology & Inflammation, 2015; 23(1): 14–24.



slide credit: Dr. Wendy Smith, Mayo clinic, 2023

INTERMEDIATE UVEITIS: VITRITIS



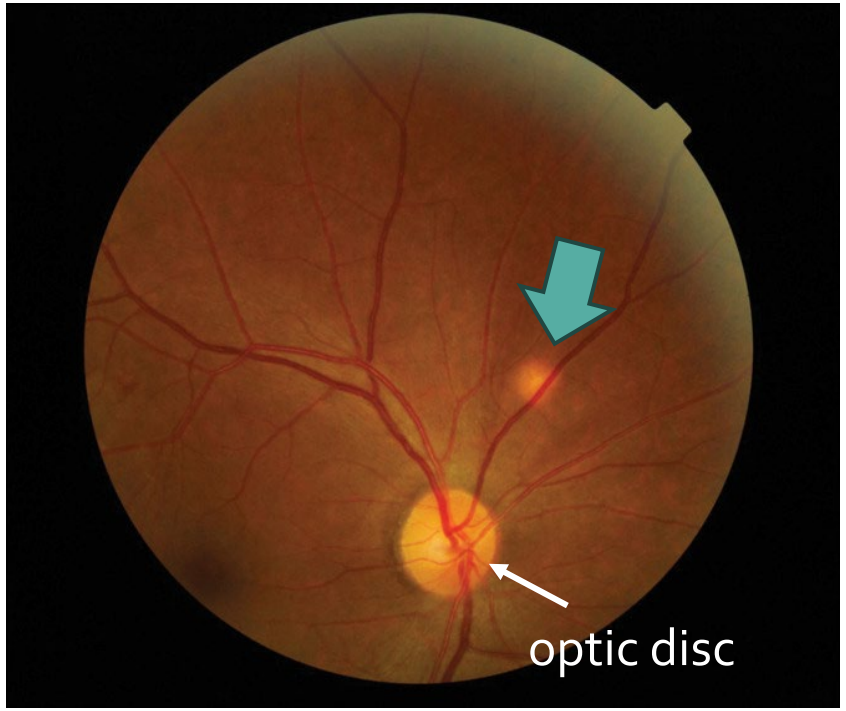
Baharani A (2023) Ocul Immunol Inflamm. 31(8):1594-1602.

- DOI: 10.1080/09273948.2021.1986544

POSTERIOR UVEITIS: CHOROIDITIS AND CHOROIDAL TUBERCLES

the highly vascular and richly oxygenated choroid is a prime site for TB bacteria

single choroid tubercle



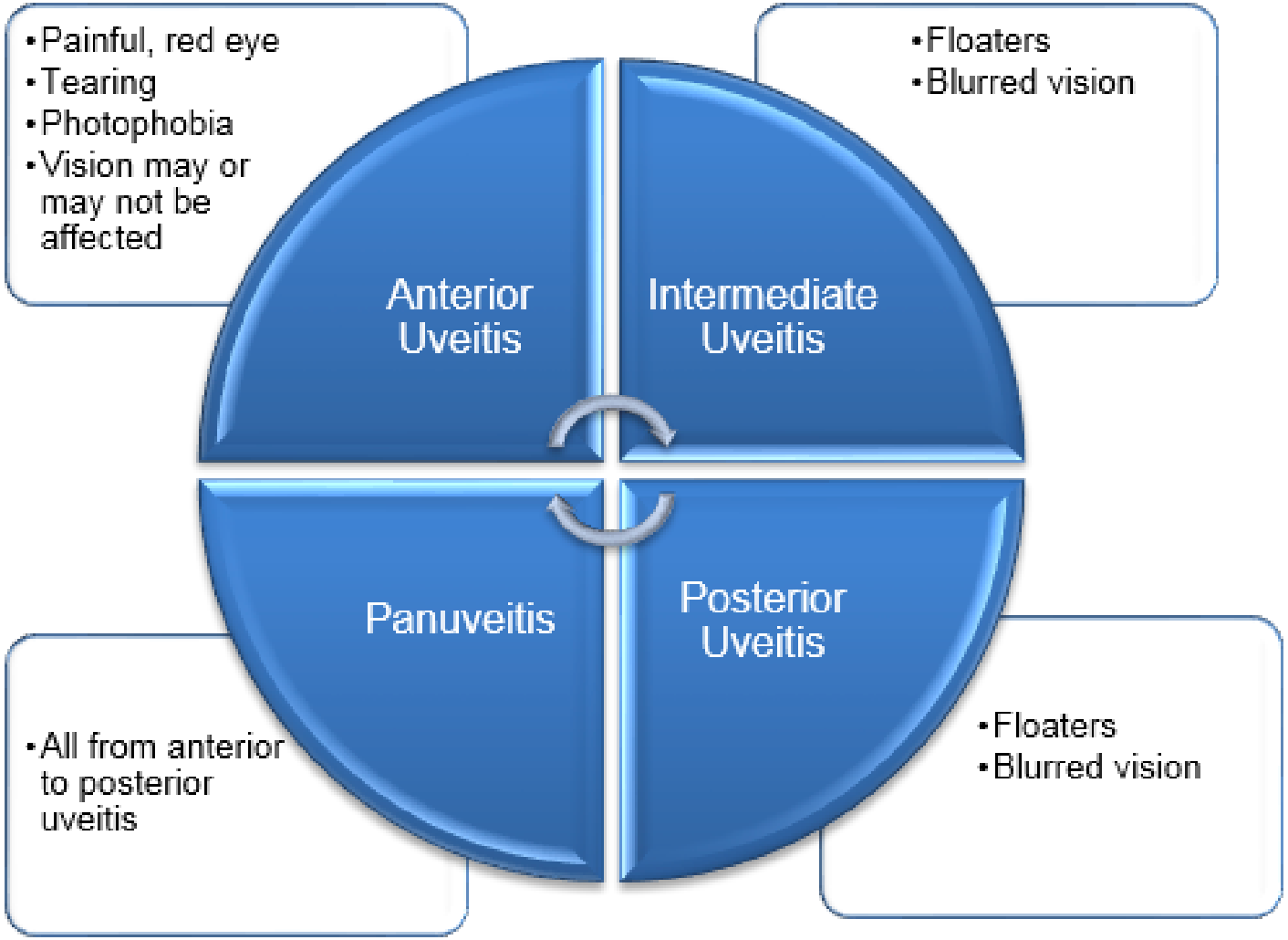
Heiden D (2016). *Lancet Infectious Diseases 16 (4):* 493–99.

Multifocal choroiditis

serpiginous-like choroiditis

Dalvin LA (2017). J Clin Tuberc Other Mycobact Dis.;7:13-21

SYMPTOMS OF UVEITIS



https://www.nuh.com.sg/health-resources/diseases-and-conditions/ocular-inflammation-uveitis

DESCRIPTIVE EPIDEMIOLOGY OF OTB- COTS1

- In 2004, a global Collaborative Ocular Tuberculosis Group comprising of uveitis specialists **began collecting and analyzing retrospective data** from patients with TB uveitis (TBU) from 25 international eye care centers.
  - **Goals:**
    - characterize the clinical features of TB Uveitis (TBU).
    - describe regional variation in the diagnosis and treatment of TBU.
    - address knowledge deficits of diagnosis and therapeutics in TBU
- A total of **945 patients** (Jan 2004-Dec 2014) were analyzed COTS-1.

Agrawal R (2017) JAMA Ophthalmol.; 135(12):1318-1327. doi: 10.1001/jamaophthalmol.2017.4485.
Testi I et al (2020). *Ocular Immunology and Inflammation;* 28(S1): 8-16. DOI: 10.1080/09273948.2019.1646774

COTS1 RESULTS

TABLE 4. Clinical features of ocular TB.

Choroidal involvement	45.4%
Occlusive retinal vasculitis	41.0%
Retinal vasculitis w/o occlusive features	31.5%
Disc hyperemia/edema	20.5%
Cystoid macular edema	17.6%
Snowballs	16.2%
Snowbank	6.1%

CHOROIDITIS

Phenotypes

Serpiginous-like (SLC)	46.1%
Tuberculoma	13.5%
Multifocal choroiditis	9.4%

Testi I et al (2020). Ocular Immunol and Inflamm; 28(S1): 8-16

COTS1 RESULTS

TABLE 2. Systemic disease and ocular TB.

Systemic involvement		
No prior history of TB		76.7%
Pulmonary involvement		16.4%
Extra-pulmonary involvement		6.3%
Symptoms		
No symptoms of active disease		92.0%
Weight loss		3.2%
Night sweats		2.5%
Chronic cough		2.8%
Hemoptysis		0.4%
Radiologic Findings		
Inactive/healed TB	**Chest X ray**	26.9%
	Chest CT	68.8%
Immunological Tests		
Positive result	**Tuberculin skin test**	87.0%
	Quantiferon	89.9%
	T-Spot.TB	92.1%

Testi I et al (2020). Ocular Immunol and Inflamm; 28(S1): 8-16

OTHER INSIGHTS FROM COTS-1

- **~ 60% of patients had bilateral involvement**
- **PCR was performed only in a 6.1% patients**
- PCR results did not influence decision to treat:
  - **more than half patients who were PCR-negative were treated for TB**
- **89.0% received concomitant systemic corticosteroid**
- 9.3% received a non-steroidal immunosuppressive agents.
- **treatment failure rate 12.7%** (in patients treated with with ATT).
- **some types of OTB were associated with higher risk of treatment failure**
  - choroidal involvement with vitreous haze
  - snow banking in patients with panuveitis

Agrawal R (2017) JAMA Ophthalmol.; 135(12):1318-1327. doi: 10.1001/jamaophthalmol.2017.4485. Testi I et al (2020). *Ocular Immunology and Inflammation;* 28(S1): 8-16. DOI: 10.1080/09273948.2019.1646774

DIAGNOSIS: STEPS-1

- Ophthalmologic evaluation
  - Assess for TB vs other causes of uveitis
- clinical evaluation for signs/symptoms of pulmonary or extrapulmonary TB
- History of TB exposure, risk factors, or residence in TB-endemic region
- chest imaging: CXR and/or chest CT
- immunologic evidence of TB exposure: IGRA, TST, or T-spot (1 or more tests)
  - some authors in non-endemic settings have reported **elevated interferon-gamma levels on IGRA assays among TB uveitis patients**
  - **higher cut-offs may be appropriate** (i.e., 4 IU/mL)

Distia Nora RL (2014). Am J Ophthalmol 57:754–761; Danjou W, et al. Br J Ophthalmol 2023;107:500–504.

DIAGNOSIS: STEPS-2

- collect material for AFB culture/smear, PCR, or histology
  - **challenges**
    - only small volumes are retrievable from ocular sites
    - morbidity
    - paucibacillary disease (smear/culture/PCR has low sensitivity)
    - disease may represent hypersensitivity to residual antigens, not actual infection

Since most patients do not have active TB in another site that could be sampled, uveitis specialists rely on ocular findings and evidence of prior TB encounter (imaging and immunologic tests)

APPROACH TO IGRA TESTING IN OTB DIAGNOSIS

- Immunologic testing for TB should be guided by the pre-test probability of the disease.
  - Trad S,et al. Ocul Immunol Inflamm. 2018;26(8):1192-1199; Gupta V et al. Ocul Immunol Inflamm. 2015 Feb;23(1):14-24.

➢ Non-endemic settings: high false-positive rates (22%) of IGRA testing
  - Pepple KL et al. Am J Ophthalmol. 2014 Apr;157(4):752-3.

➢ Endemic settings: False-negative IGRA results in TB-endemic countries should not be used to rule out OTB.
  - Studies show IGRA to be > specific than tuberculin skin test (TST).
  - **Negative predictive values for the IGRAs/TST combination ranged from 79% to 84%.**
    - ***for comparison, HIV 4th generation tests have NPV > 99%***
    - Dual test strategy (**IGRA+, then TST)** may be useful for TB-endemic settings in the context of ocular features suggestive of TB uveitis.
      - Ang M, et al. Ophthalmology. 2009 Jul;116(7):1391-6.; Ang M, et al. Eye (Lond). 2012 May;26(5):658-65.

how does the management of ocular TB differ from that of pulmonary TB?

A	RIPE (4 drug TB therapy) is not effective
B	systemic or topical steroids may be needed
C	duration of treatment may need to be extended if there is slow clinical response
D	B and C

TREATMENT

Collaborative Ocular Tuberculosis Study Consensus Guidelines on the Management of Tubercular Uveitis—Report 1

Guidelines for Initiating Antitubercular Therapy in Tubercular Choroiditis

https://doi.org/10.1016/j.ophtha.2020.01.008

Collaborative Ocular Tuberculosis Study Consensus Guidelines on the Management of Tubercular Uveitis—Report 2

Guidelines for Initiating Antitubercular Therapy in Anterior Uveitis, Intermediate Uveitis, Panuveitis, and Retinal Vasculitis

https://doi.org/10.1016/j.ophtha.2020.06.052

COTS CALCULATOR: CONGOLESE PATIENT

Findings

Clinical Phenotype:	Anterior uveitis	Recurrent Episode
Endemicity of patient (Patient from TB endemic or TB non-endemic region)	Endemic	
Tuberculin Skin Test/Mantoux Test:	Not Done / Unknown	
Interferon Gamma Release Assay (IGRA): T-Spot TB or QFT-Gold or QFT-Gold+	Positive	
Chest X-Ray / CT Scan: Negative (for any old or active signs of TB); Positive (for any healed or active signs of TB)	Negative	

Results

Median Score	IQR
3	2

Inference:

No consensus amongst experts to initiate or not to initiate Anti-tubercular therapy (ATT). (COTS Consensus study was not designed to achieve consensus about non-initiation of ATT).

** The COTS Consensus guidelines are based on expert inputs based on their experience along with their interpretation of the published literature about initiation of Anti-tubercular therapy (ATT) in patients with ocular tuberculosis. Physician discretion is advised adopting this tool in their clinical practice and it should be used as a guide by the treating physician in concurrence with clinical signs and laboratory and radiological investigations and after ruling out non-TB causes of intraocular inflammation**

Interpretation

Median Score

Median score 1	Very low probability for most experts to consider initiating Anti-tubercular therapy (<20%)
Median score 2	Low probability for most experts to consider initiating Anti-tubercular therapy (21–40%)
Median score 3	Mixed probability for most experts to consider initiating Anti-tubercular therapy (41–60%)
Median score 4	High probability to for most experts to consider initiating Anti-tubercular therapy (61-80%)

IQR

IQR 0	Represents absolute consensus, >90% of experts agreeing on the initiation of Anti-tubercular therapy
IQR 1	Represents moderate consensus, >80% of experts agreeing on the initiation of Anti-tubercular therapy
IQR 2	Represents weak consensus, >70% of experts agreeing on the initiation of Anti-tubercular therapy
IQR 3	Represents poor consensus, </=60% of experts agreeing on the initiation of Anti-tubercular therapy

BRITISH GUIDELINES FOR OCULAR TB-1

Tuberculosis

BMJ Open Respiratory Research

BTS clinical statement for the diagnosis and management of ocular tuberculosis

- very useful practice points, of which a sampling shown here

Summary of clinical practice points

General

- All patients suspected of OTB should be managed jointly by ophthalmic specialists and TB centres.

Respiratory/TB clinic tests for OTB

- Patients suspected of having OTB, should have an urgent CXR requested by ophthalmology.
- Consider CT thorax with contrast to guide sampling (eg, induced sputum, bronchoscopy or endobronchial ultrasound (EBUS)) in patients with suspected OTB.

Kon OM (2022).BMJ Open Resp Res;9:e001225. doi:10.1136/bmjresp-2022-001225

BRITISH GUIDELINES FOR OCULAR TB-2

- very useful practice points, of which a sampling shown here

duration of therapy

- ATT should be given for at least 6 months. Teams can consider giving treatment for longer (9–12 months), especially if there is slow improvement in eye disease or disease is severe initially.
- It is reasonable to replace ethambutol with a fluoroquinolone (moxifloxacin or levofloxacin). This decision should be made in conjunction with a specialist in OTB (or MDT). Consideration should be made of potential adverse effects of fluoroquinolones (QTc prolongation, tendon rupture and aortic aneurysm rupture).

empiric TB therapy and use of steroids

- Patients with chronic granulomatous anterior uveitis typical of OTB and a high clinical or epidemiological suspicion of OTB, should be managed with ATT and topical corticosteroids regardless of their IGRA or TST result.
- Consider ATT in patients with chronic anterior uveitis of unclear cause requiring more than two drops of corticosteroid per day and a positive IGRA or TST.
- ATT may also be considered for positive IGRA or TST patients with recurrent anterior uveitis, without other cause, who suffer more than two episodes per year.
- The use of systemic corticosteroids, local corticosteroid and other immunosuppressive therapy should be guided by the extent of the disease, evidence of structural damage and response to ATT.
- It is reasonable to use intravitreal steroids in the management of OTB.

Kon OM (2022).BMJ Open Resp Res;9:e001225. doi:10.1136/bmjresp-2022-001225

ADJUNCTIVE THERAPY

- **Steroids** (oral, intravitreal, topical for anterior/intermediate uveitis)
  - some forms of OTB, such as choroiditis, can undergo paradoxical worsening upon initiation of ATT
  - oral steroids are also recommended for retinal vasculitis
- **laser photocoagulation** (e.g., for retinal neovascularization)
- **Pars plana vitrectomy** for endophthalmitis
- **full thickness eye wall resection** with pars plana vitrectomy has been used for tuberculous granuloma
- **cataract surgery**

CASE CLOSURE

- After discussion between the patient, UW ophthalmologist and TB experts, we elected to initiate RIPE therapy with rifampin, isoniazid, pyrazinamide and ethambutol.
  - Topical steroids drops were continued along with RIPE.
  - Systemic steroids have not been needed to date.

Reasons for starting ATT:

- Recurrent uveitis with untreated 1st episode of presumed OTB.
- If treated for LTBI only, there would be risk for TB resistant infection with a future recurrence.
- Risk for development of ocular complications from an untreated OTB.

SUMMARY

- Ocular TB is a challenging diagnosis that is primarily presumptive and made by utilizing a combination of:
  - Ophthalmic findings
  - assessment of TB risk factors (country of origin, TB contacts, medical predisposition).
  - Immunologic tests (IGRA, tuberculin skin testing).
  - Microbiologic tests (culture/NAAT), *if ocular samples can be obtained*.
  - Radiology (chest xray/CT chest/other) to r/o concurrent other EPTB or PTB

    (negative in majority of ocular TB patients)
  - Excluding alternate diagnoses
- OTB requires multi-disciplinary care (ophthalmology + infectious disease experts)
- Anti-tuberculous therapy should be offered to:
  - ✓Most OTB patients, according to the clinical phenotype (*refer to COTS guidelines*)
  - ✓Recurrent uveitis of unclear cause + positive IGRA tests (esp. in nonendemic regions).
  - ✓Steroid usage to be dictated by ophthalmology *(dep.on disease severity, ATT response*).

THANK YOU
&
QUESTIONS