

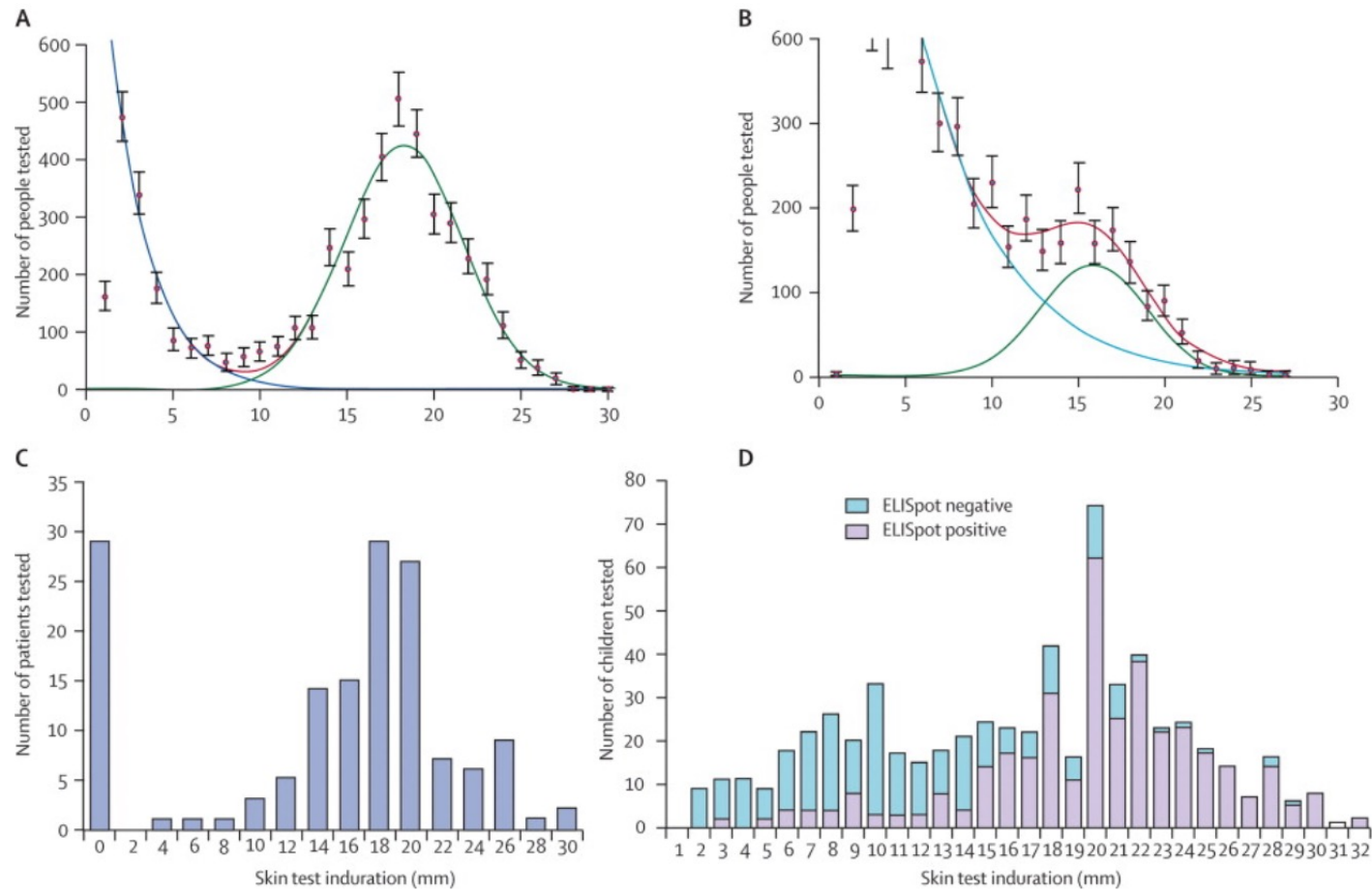
TB Burden

How is “burden” measured

- Incidence
 - Smear positive
 - Other
- Case notification rate
- Prevalence
- Case fatality rate
- Annual risk of infection

Incidence

- Disease
 - Number of new cases that occur per year
 - Not measured directly
 - Estimated from case notification rate adjusted for reporting accuracy
 - For TB, expressed as # per 100,000
- Infection
 - Annual risk of infection (ARI or ARTI)
 - Usually measured among children using TST or IGRA through TST surveys
 - $1-(1-p)^a$ where p is prevalence and a is age.



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Figure 3. Use of tuberculin skin test (TST) surveys to estimate the prevalence of infection

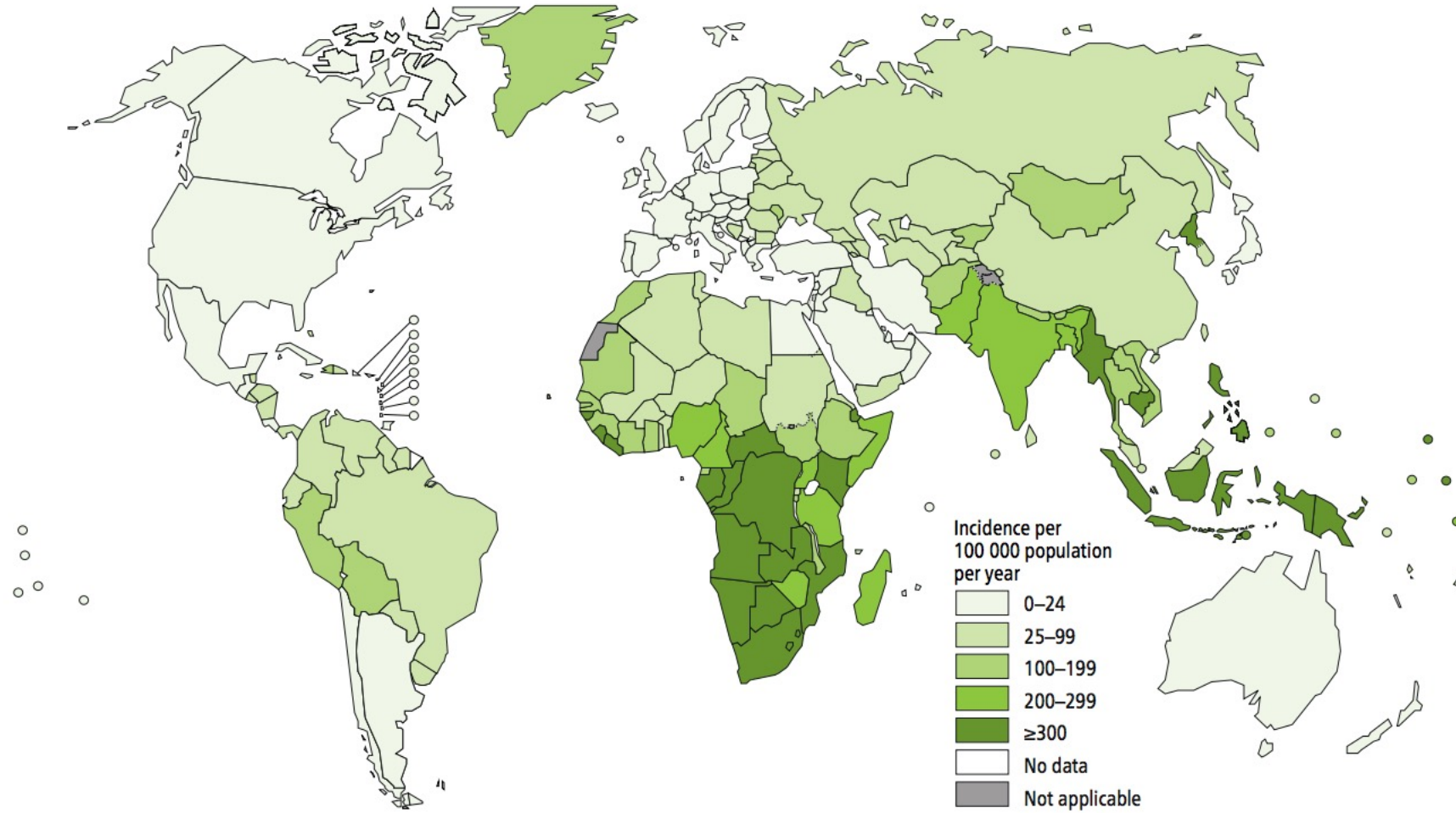


Assessing tuberculosis prevalence
through population-based surveys

Current burden

- 1/3-1/4 world infected
 - Based on crappy data. Useful for talks, introductions.
- 2016 data
 - Incidence: 10.4 million
 - Global incidence rate 140/100k
 - High SA (781/100k) to low (USA) 3.1/100k
 - CFR 16%
 - Trend 3% decline per year per WHO (But controversial)

FIG. 3.4
Estimated TB incidence rates, 2016



Indonesia

Population 2016

261 million

Estimates of TB burden*, 2016	Number (thousands)	Rate (per 100 000 population)
Mortality (excludes HIV+TB)	110 (75–150)	42 (29–58)
Mortality (HIV+TB only)	13 (6.2–23)	5.1 (2.4–8.7)
Incidence (includes HIV+TB)	1 020 (660–1 460)	391 (253–558)
Incidence (HIV+TB only)	45 (21–78)	17 (8–30)
Incidence (MDR/RR-TB)**	32 (19–45)	12 (7.3–17)

Estimated TB incidence by age and sex (thousands)*, 2016			
	0-14 years	> 14 years	Total
Females	28 (17–39)	294 (179–410)	323 (196–449)
Males	32 (19–44)	666 (405–928)	698 (424–972)
Total	60 (36–83)	961 (584–1 340)	1 020 (660–1 460)

TB case notifications, 2016	
Total cases notified	366 673
Total new and relapse	364 671
- % tested with rapid diagnostics at time of diagnosis	<1%
- % with known HIV status	13%
- % pulmonary	92%
- % bacteriologically confirmed among pulmonary	59%

Universal health coverage and social protection	
TB treatment coverage (notified/estimated incidence), 2016	36% (25–55)
TB patients facing catastrophic total costs	
TB case fatality ratio (estimated mortality/estimated incidence), 2016	0.13 (0.07–0.19)

TB/HIV care in new and relapse TB patients, 2016		Number	(%)
Patients with known HIV-status who are HIV-positive		4 330	9%
- on antiretroviral therapy		1 228	28%

Drug-resistant TB care, 2016		New cases	Previously treated cases	Total number***
Estimated MDR/RR-TB cases among notified pulmonary TB cases				11 000 (8 900–13 000)
Estimated % of TB cases with MDR/RR-TB		2.8% (2.2–3.5)	16% (10–20)	
% notified tested for rifampicin resistance		2%	173%	26 973
MDR/RR-TB cases tested for resistance to second-line drugs				1 060
Laboratory-confirmed cases				MDR/RR-TB: 2 720, XDR-TB: 37
Patients started on treatment ****				MDR/RR-TB: 1 879, XDR-TB: 52

Treatment success rate and cohort size		Success	Cohort
New and relapse cases registered in 2015		85%	331 703
Previously treated cases, excluding relapse, registered in 2015		67%	1 859
HIV-positive TB cases registered in 2015		60%	3 634
MDR/RR-TB cases started on second-line treatment in 2014		51%	1 271
XDR-TB cases started on second-line treatment in 2014		13%	30

TB preventive treatment, 2016	
% of HIV-positive people (newly enrolled in care) on preventive treatment	2%
% of children (aged < 5) household contacts of bacteriologically-confirmed TB cases on preventive treatment	1.4% (1.3–1.6)

TB financing, 2017	
National TB budget (US\$ millions)	185
Funding source: 29% domestic, 18% international, 53% unfunded	

* Ranges represent uncertainty intervals

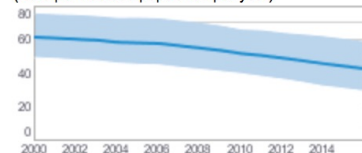
** MDR is TB resistant to rifampicin and isoniazid; RR is TB resistant to rifampicin

*** Includes cases with unknown previous TB treatment history

**** Includes patients diagnosed before 2016 and patients who were not laboratory-confirmed

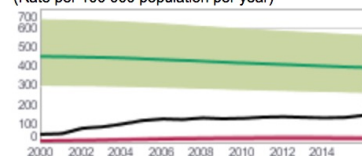
Tuberculosis profile

(Rate per 100 000 population per year)



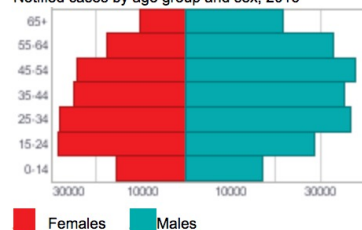
— Mortality (excludes HIV+TB)

(Rate per 100 000 population per year)



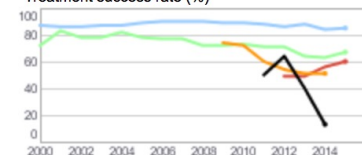
— Incidence
— Notified (new and relapse)
— Incidence (HIV+TB only)

Notified cases by age group and sex, 2016



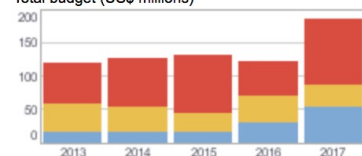
■ Females ■ Males

Treatment success rate (%)



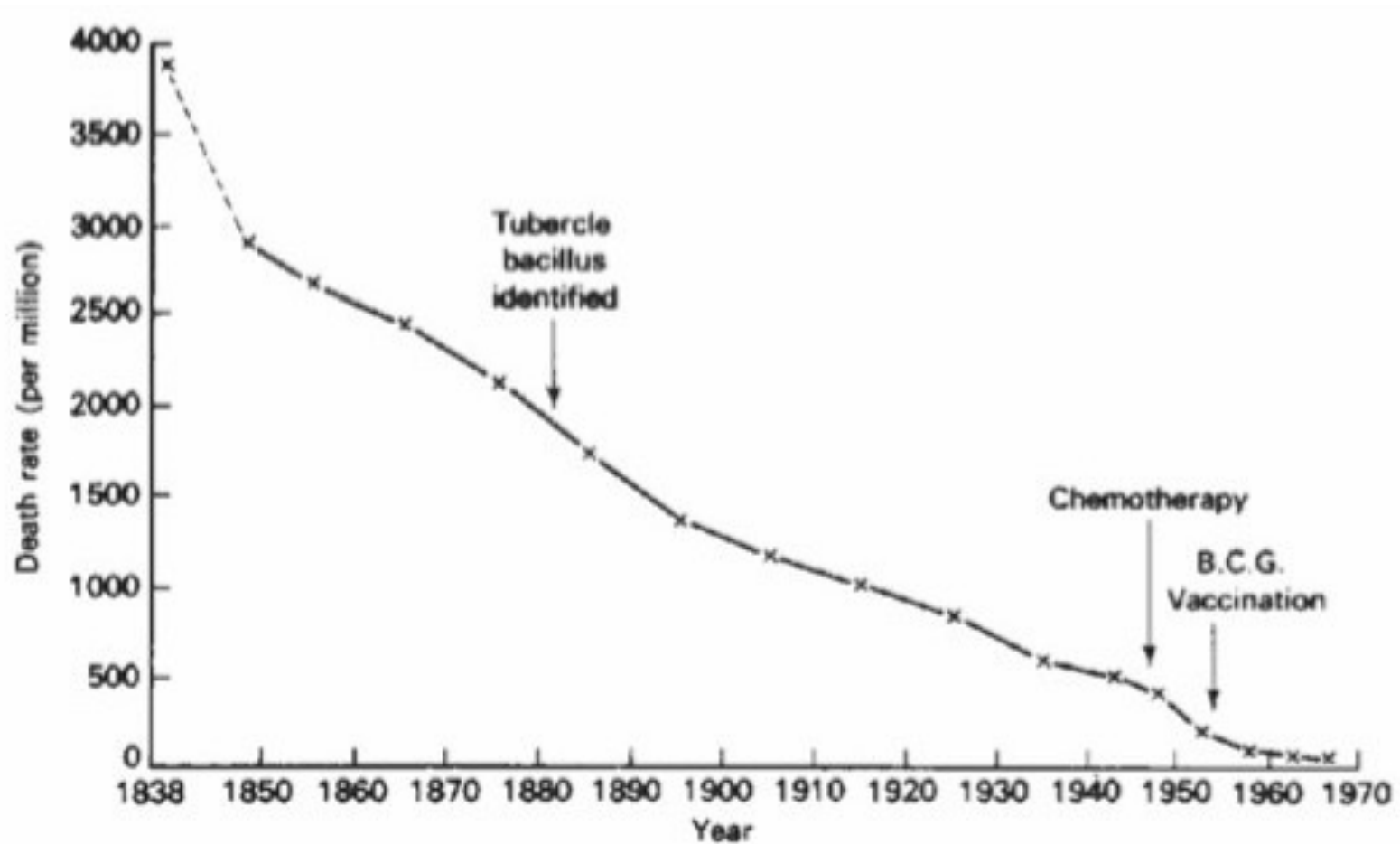
— New and relapse
— Retreatment, excluding relapse
— HIV-positive — MDR/RR-TB — XDR-TB

Total budget (US\$ millions)



■ Unfunded
■ Funded internationally
■ Funded domestically

Long term trends: McKeown



Regional trends in estimated TB incidence rates by WHO region, 2000–2016. Total TB incidence rates are shown in **green** and incidence rates of HIV-positive TB are shown in **red**. Shaded areas represent uncertainty intervals. The **black** lines show notifications of new and relapse cases for comparison with estimates of the total incidence rate.

