ANALYSIS AND USE OF HEALTH FACILITY DATA

Guidance for Managers and Analysts

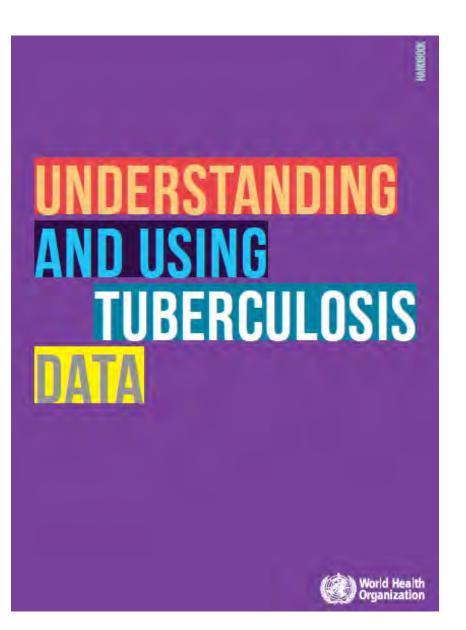
MODULE 3:

Guidance for tuberculosis programme managers

Notifications (numbers and rates)

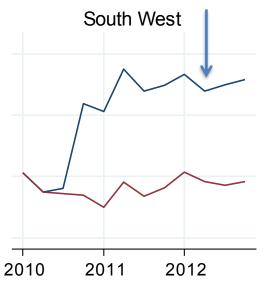


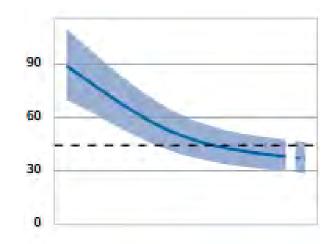
Curriculum informed by WHO guidance



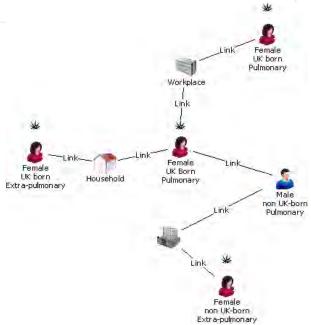
http://www.who.int/tb/publications/ understanding_and_using_tb_data/en/

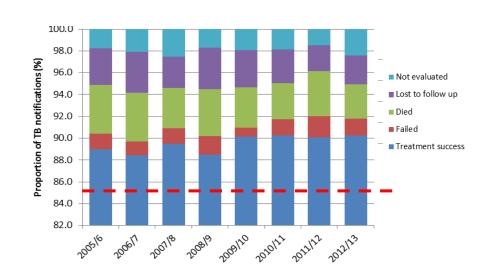
ance data are used for:



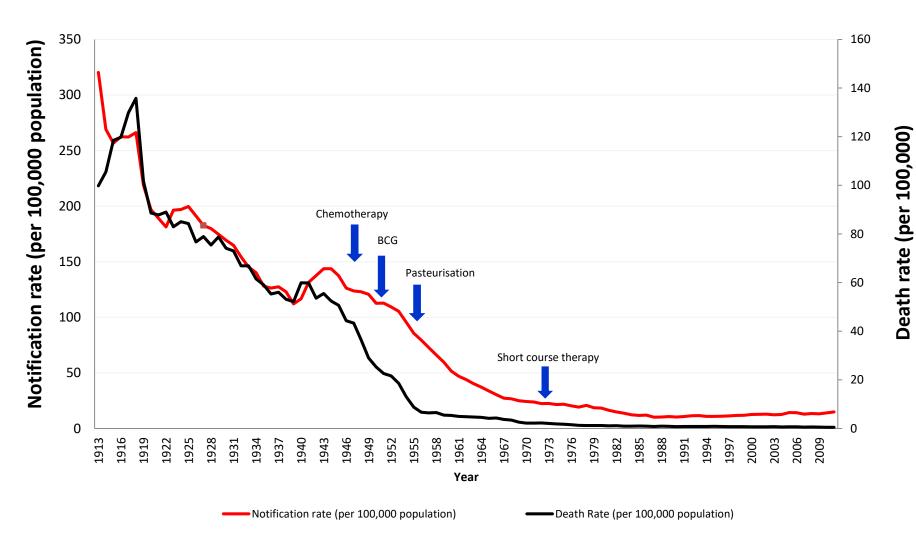








TB incidence and mortality rates in the United Kingdom



Notifications by time (trends)

TB epidemiology does not usually change quickly!

Is an observed trend real or is it due to other factors?

Is a trend real or due to other factors?

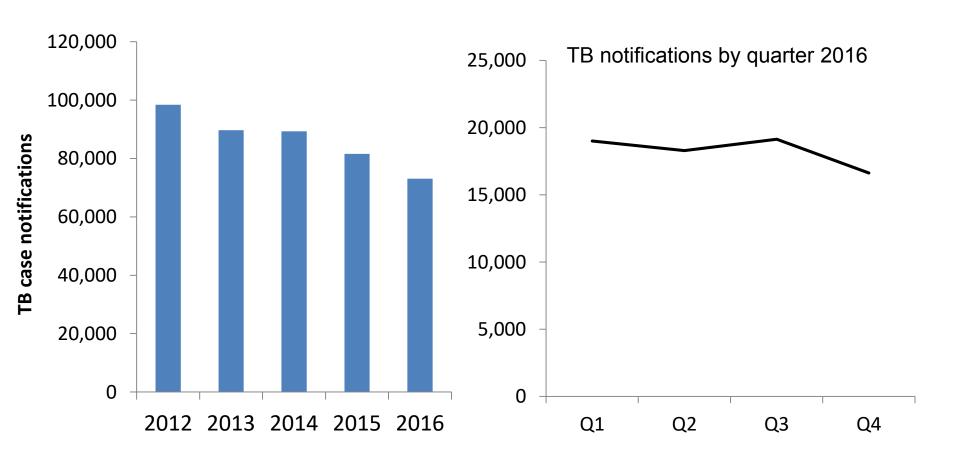
Need to understand causes

- TB epidemiology?
- Socio-economic? Urbanisation?
- Health, social or insurance services?
- Reporting process?

Is a trend real or due to other factors?

- Data entry errors
- Missing reports (disasters, security, remoteness...)
- Change in the number of treatment/reporting sites
- Change in case definitions

Kenya- was the drop real?

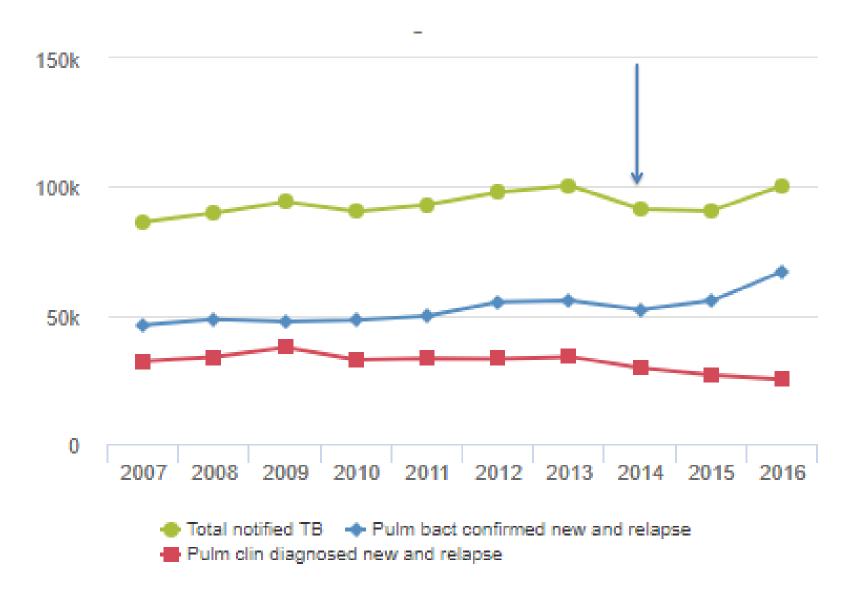




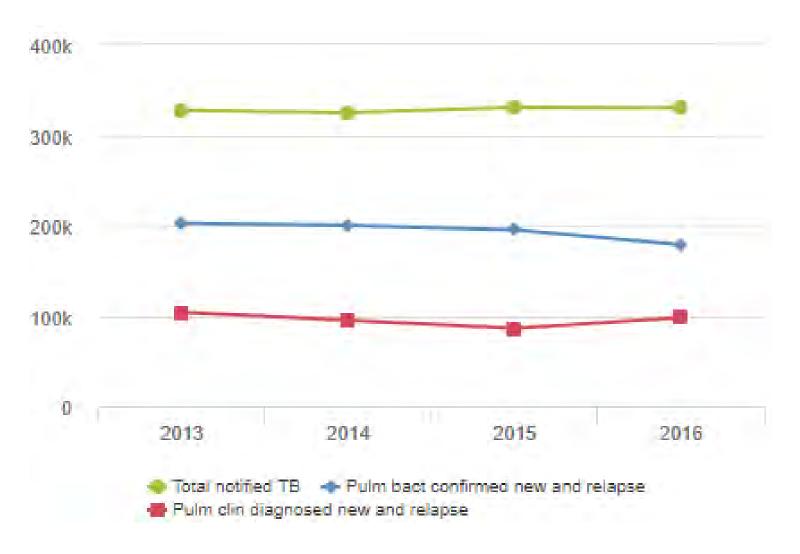
Reports not received or no TB cases diagnosed?

No way in their system to distinguish between zero cases and missing reports

Changes due to Xpert?



Changes due to Xpert?



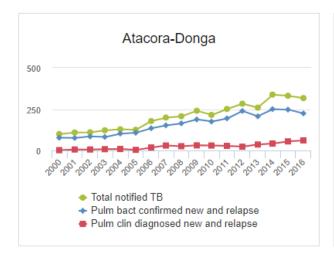
No changes due to Xpert?

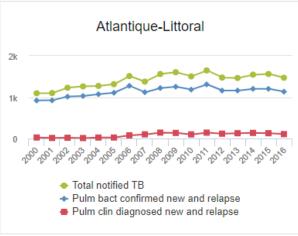
- ineffective screening algorithm?
- limited target group?
- incomplete implementation?
- poor recording of bacteriological confirmation?
- or even not yet adopted 2013 case definitions (still restricted to smearpositives)?

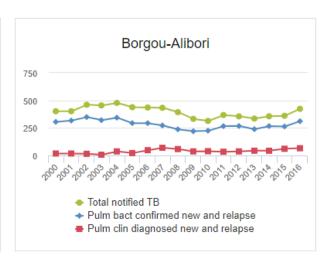
Notifications by place

Which areas have the highest case numbers? (useful for resource allocation)

Benin



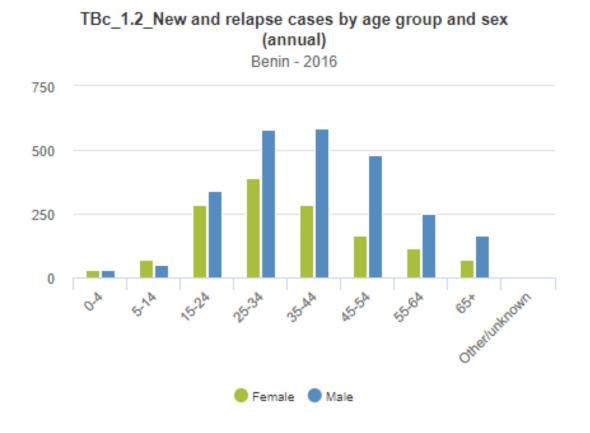




Notifications by age group and sex

Which have the highest number of cases:

- old or young?
- male or female?



2016

N	otifications	Population						
India	1,763,876	1.3 billion						
Lesotho	7,291	2 million						
United Kingdo	m 5,793	66 million						

Rates (cases per 100,000 population)

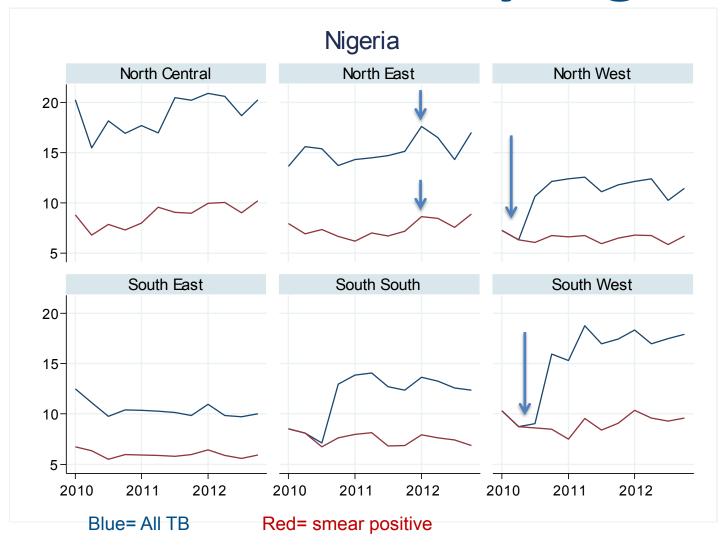
India	133	
Lesotho	331	
United Kingdom	9	

Comparing TB burden

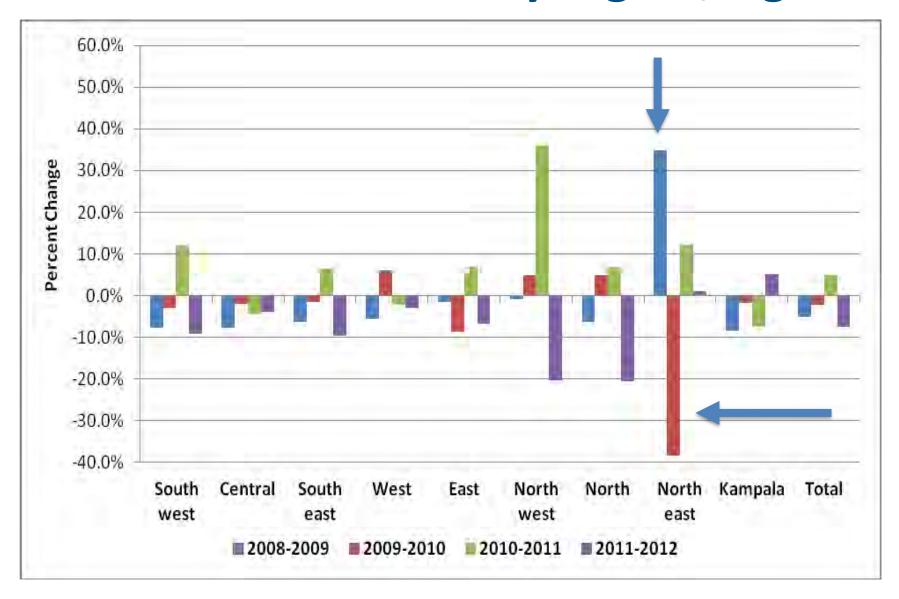
To compare TB burden between sub-national areas you need to look at rates!

(to see which areas have a higher risk of TB disease)

Compare sub-national TB rates over time by region

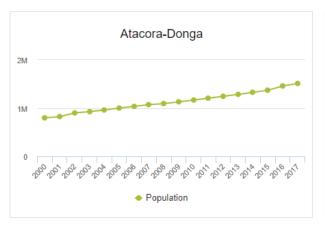


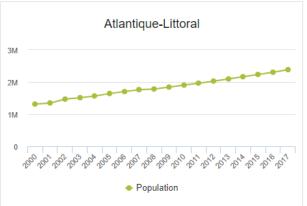
Year on year percentage change in TB case notification rates by region, Uganda

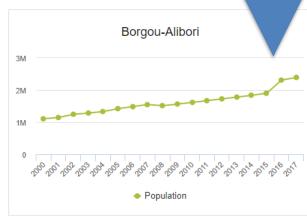


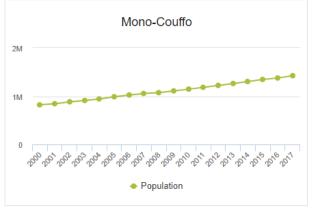
Population estimates

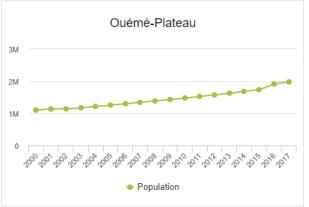
Benin

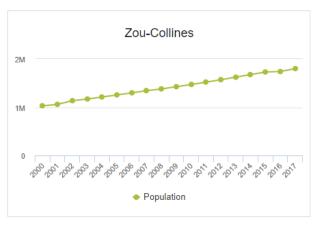




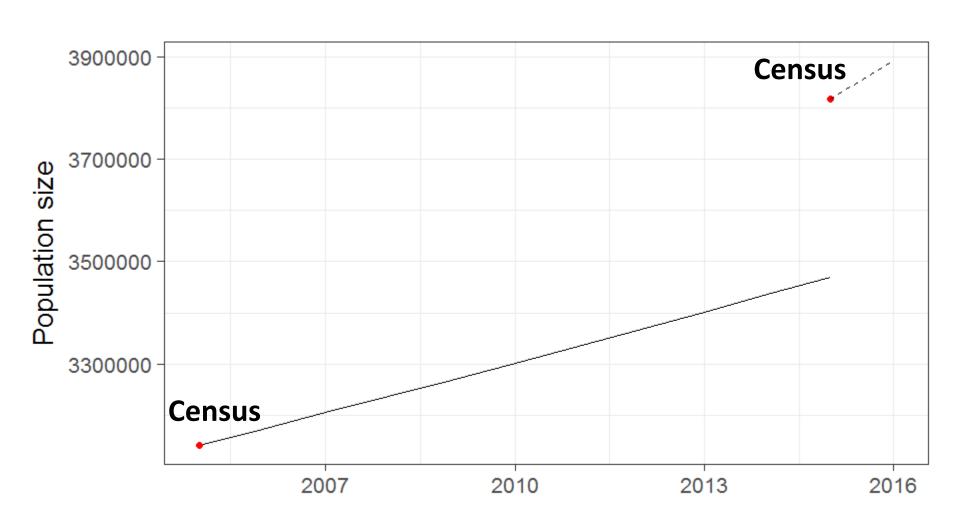




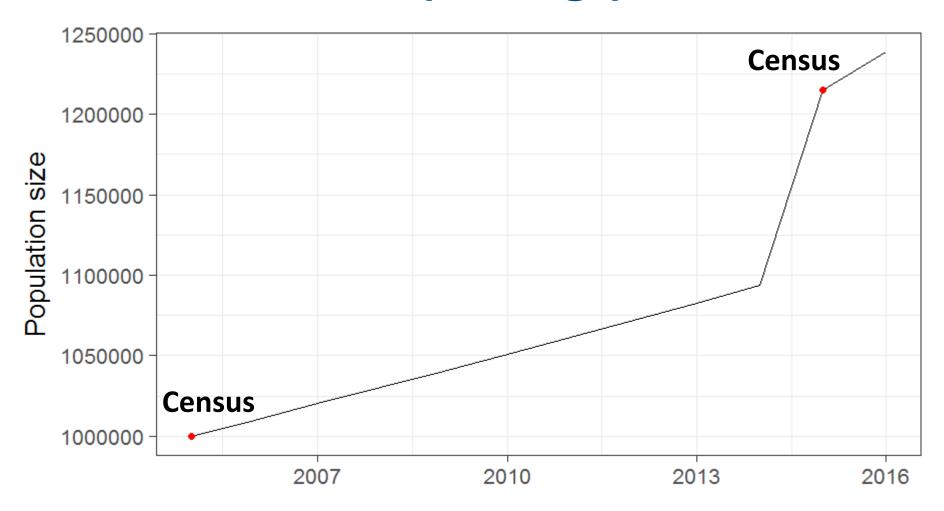




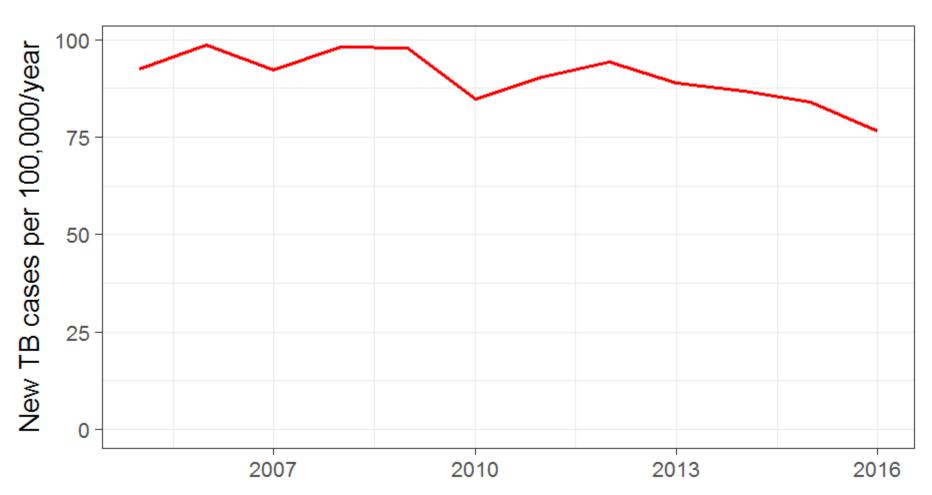
Updating population estimates



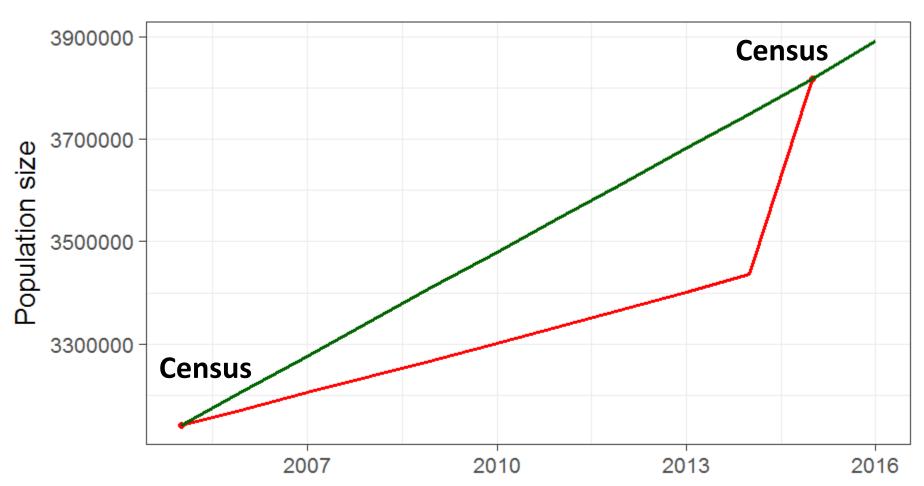
Updating population estimates (wrong!)



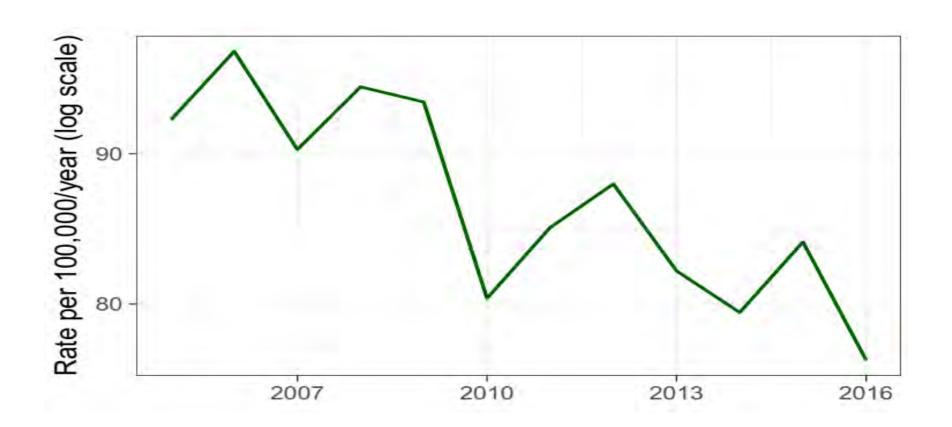
Trends in case notification rate (wrong!)



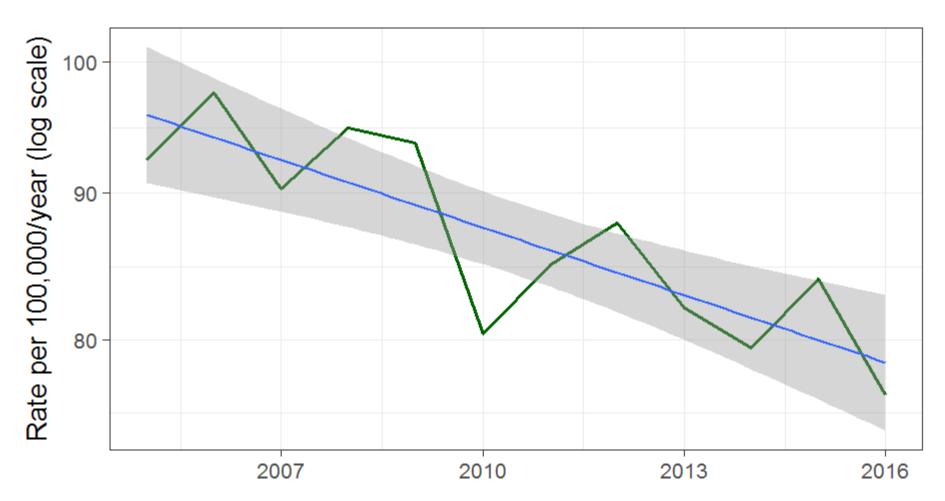
Updating population estimates (better!)



Trends in case notification rate (better!)



Trends in case notification rate (better!)



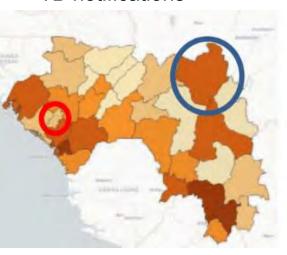
Population estimates

Ensure population estimates are retrospectively adjusted following a census in order to produce accurate time trends in rates.

Not TB programme's responsibility – HMIS!

Rates between areas

TB notifications



TB rates per 100 000 population



Population

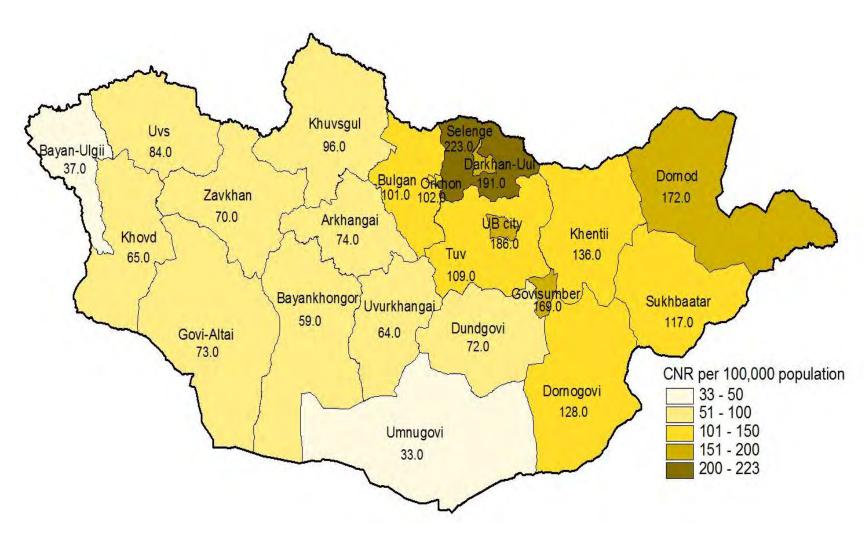


High number of cases / high population = low notification rate



Low number of cases / small population = high notification rate (high risk – needs special interventions?)

TB case notification rates by province, Mongolia 2014

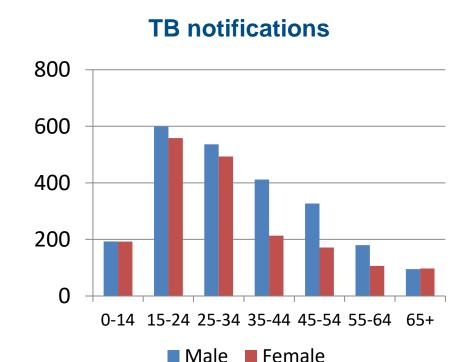


Population estimates by age group and sex

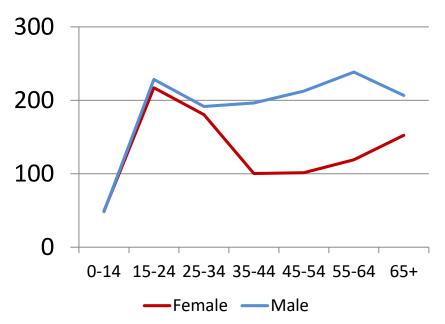
Important for assessing who is at risk and how this changes over time:

- Females or males?
- Young or old?

TB notifications vs TB rates by age group and sex in Mongolia

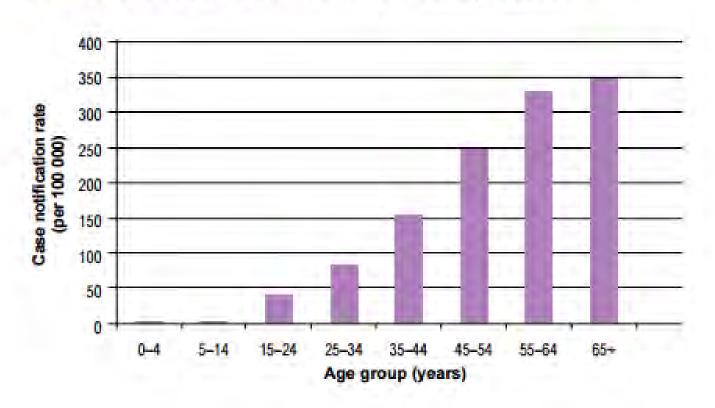


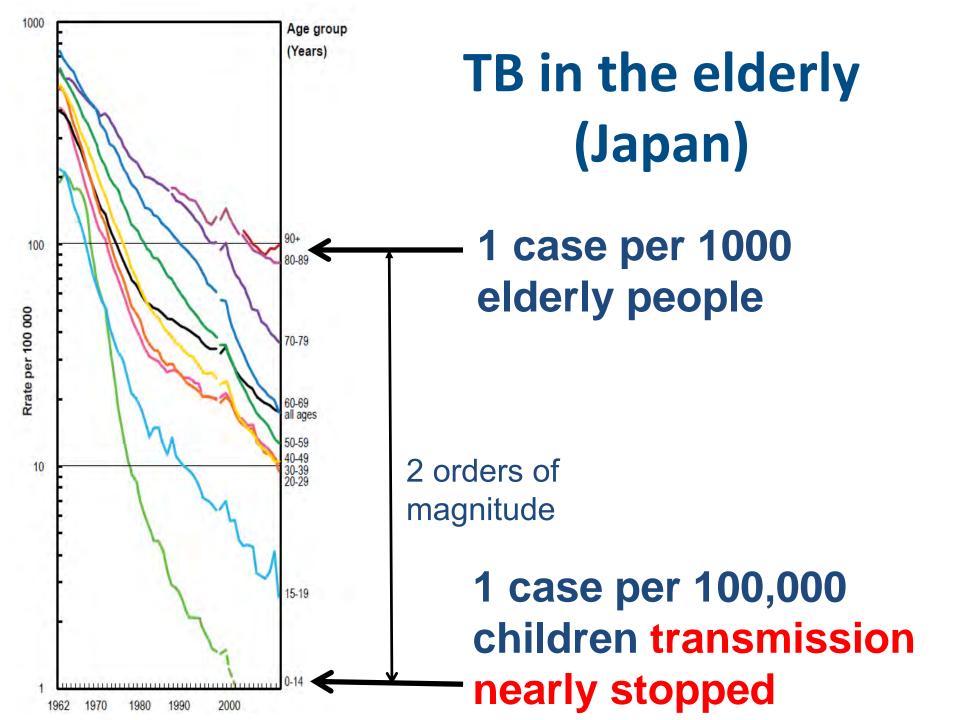
TB rates per 100 000 population



TB rates by age group

Case notification (all types) rate (per 100 000) by age group from Cambodia NTP, 2012. Source: WHO Global TB report 2013





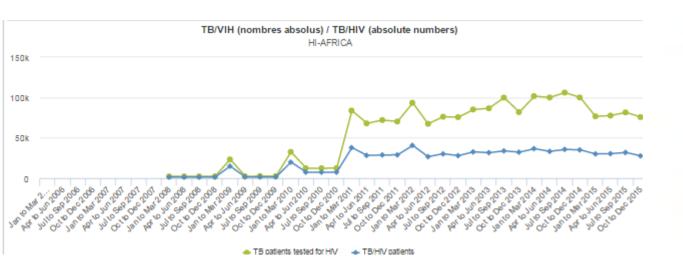
Notifications and rates dashboard

Examining the data should be a starting point for generating hypotheses and investigating the reasons behind the observations.

Visualisation

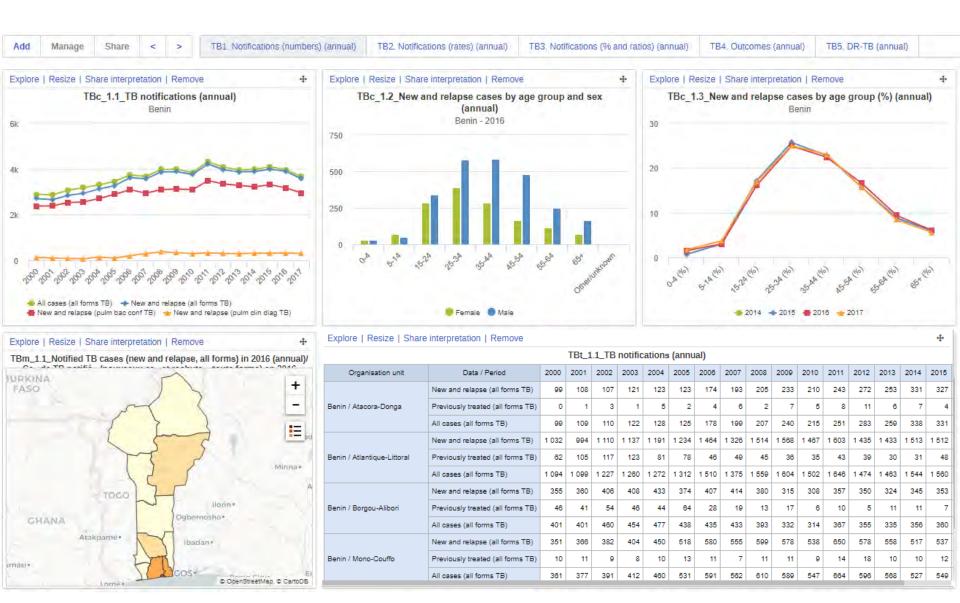
TB/VIH / TB/HIV											
Organisation unit	Data / Period	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
HI-AFRICA	Total notified TB	40 330	39 052	60 826	59 819	102 211	661 267	633 044	620 992	610 413	567 066
	Total new and relapse	37 292	36 260	54 109	53 048	91 953	592 529	570 119	554 234	551 741	531 210
	TB patients tested for HIV			9 002	30 836	69 906	293 973	312 595	353 481	407 811	311 531
	TB/HIV patients			5 341	19 420	42 351	123 866	125 568	130 426	140 670	120 098
	TB/HIV on CPT			140	17 027	40 381	96 277	97 308	101 364	111 721	101 985
	TB/HIV on ART			141	18 722	27 099	60 306	79 792	99 540	95 678	92 310
	Total notified TB						25 072	25 361	26 163	26 517	26 542
	Total new and relapse						23 415	23 744	24 501	24 942	24 961
	TB patients tested for HIV						20 226	20 811	21 371	22 857	23 986
Cameroon	TB/HIV patients						7 710	7 747	8 161	8 510	8 578
	TB/HIV on CPT										







Notifications dashboard



Rates dashboard





	TBt_2	.1_TB	notifi	cation	rate	per 1	00 000	popu	llation	i) (ann	ıual)								
Organisation unit	Data / Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	201
Benin	Rate - all cases (all forms TB)	46.8	45	45.4	45.6	45.7	45.7	47.6	45.2	48.4	46.9	43.8	47.6	43.5	40.9	39.8	39.7	35.8	31.
	Rate - new and relapse (all forms TB)	43.7	41.9	42	42.2	43.1	43.2	46.2	43.9	47.1	45.6	42.8	48.5	42.4	40	38.9	38.7	35.1	31.
	Rate - new and relapse (pulm bac conf TB)	38.4	37.5	37.4	36.6	37.5	38.2	39.4	36.2	37.7	36.7	35.2	38.4	35.7	33.9	32.2	32.1	28.6	25.
	Rate - new and relapse (pulm clin diag TB)	2.1	1.5	1.3	1	1.9	1.3	2.6	3.6	4.6	4	3.4	3.6	3.3	3	3.1	3.1	2.9	2.
Atacora-Donga	Rate - all cases (all forms TB)	12.4	13.2	12.2	13.2	13.3	12.5	17.2	18.6	18.9	21.3	18.4	20.8	22.7	20.2	25.5	24.2	21.7	17.
	Rate - new and relapse (all forms TB)	12.4	13.1	11.9	13.1	12.8	12.3	16.8	18	18.8	20.6	18	20.2	21.9	19.7	24.9	23.9	21.5	17.
	Rate - new and relapse (pulm bac conf TB)	9.7	9.2	9.5	8.8	10.6	10.7	13	14.2	15	16.7	15	16.1	19.2	16.1	18.8	18	15.4	13.
	Rate - new and relapse (pulm clin diag TB)	0,3	0.7	0.7	0.9	0.9	0.4	1.7	2.8	2.4	2.7	2.6	2.3	1.8	2.8	3.2	4	4.2	1.
Atlantique-Littoral	Rate - all cases (all forms TB)	83.3	81.5	83.7	83.4	81.2	79.9	88.8	78	87.5	87.1	79	83.8	72.6	69.8	71.3	69.8	63.8	56.
	Rate - new and relapse (all forms TB)	78.6	73.8	75.7	75.2	76.1	75.2	86.1	75.2	85	85.2	77.1	81.6	70.7	68.4	69.9	67.7	62.7	55.
	Rate - new and relapse (pulm bac conf TB)	70	68.5	69.1	68	68.5	67.5	74.9	63.4	68.5	68	62.3	66.6	57.1	55.4	55.5	53.8	49.2	44.
	Rate - new and relapse (pulm clin diag TB)	1.8	1	1.2	0.7	1.5	1.4	4.5	5.7	8	7.3	5.2	7.2	5.7	6.1	6.2	5.7	4.6	5.

Summary

- Absolute numbers most useful for
 - Budgeting, procurement of commodities
- Rates per population most useful for
 - Assessing and comparing the risk of disease
- Check the consistency of population estimates

But low rates are possible where access to care is low or where reporting is a problem!

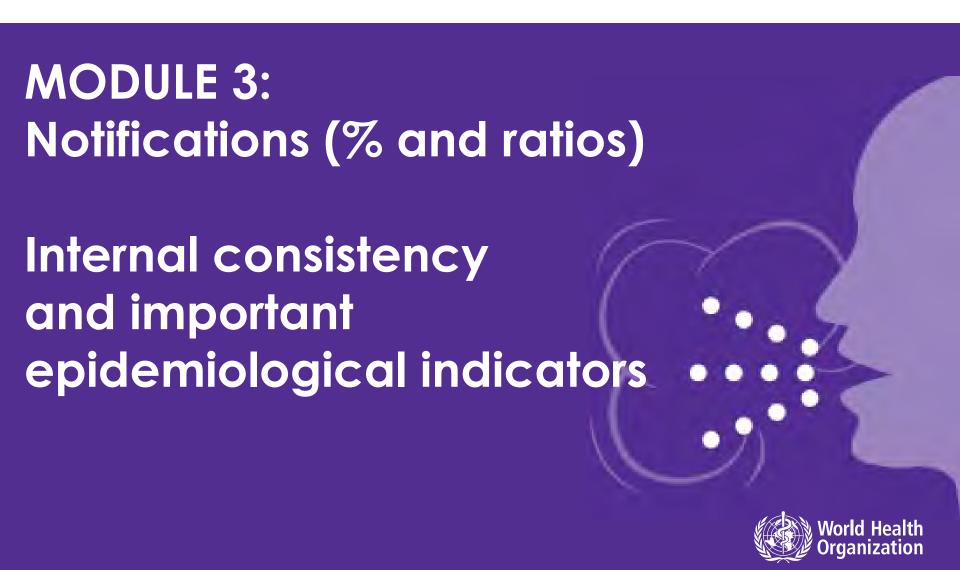
Summary

Is the trend real?

Use your knowledge!

ANALYSIS AND USE OF HEALTH FACILITY DATA

Guidance for Managers and Analysts



What does internal consistency mean?

- Measure of the reliability of the data
- Is there consistency in core variables over time?
- Is there correlation between TB notifications and mortality?

What are the causes of inconsistent data?

Recording and reporting

- Changes in reporting or inconsistencies in recording and reporting practises
- Introduction of a new reporting system
- Incomplete reporting form sub-national units

Changes in service delivery

- Changes in diagnostic practises or access to services
- Referral of cases to another centre

Interventions e.g active case finding or routine screening in a high risk group

Outbreak of TB cases or increased transmission in a setting/population

Changes in population due to migration, disease, displacement

Why detect inconsistencies or large changes in data over time?

Investigate the reasons to

- Explain trends
- Rectify problems with reporting, diagnostics or access
- Identify interventions with high impact and expand to other locations
- Take public health action to prevent ongoing transmission

Standards and Benchmarks assessment assessing quality and coverage of surveillance



http://www.who.int/tb/publications/ standardsand-benchmarks/en/

B1.7 Internal consistency standard

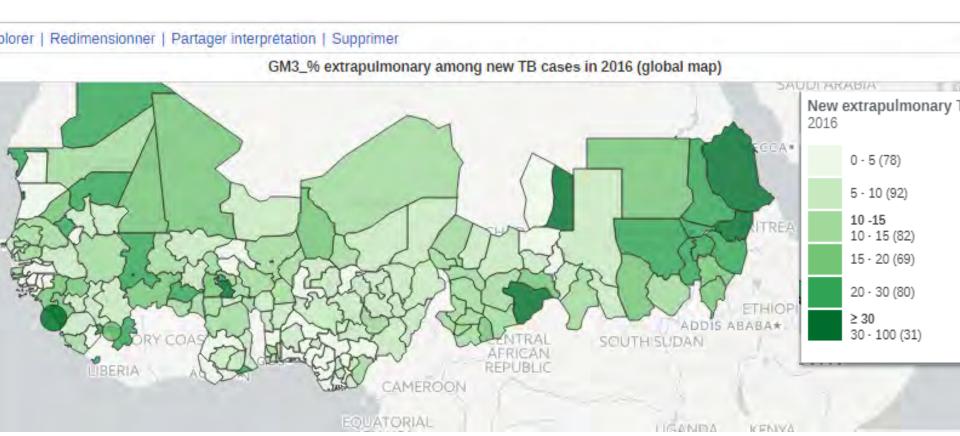


Which are the recommended indicators for internal consistency?

Ratio male;female (new and relapse, all forms TB	Previously treated (all forms TB) (%)	New extrapulmonary TB (%)	Organisation unit / Data	Period
1.3	5.3	10.1	Benin	2010
1.8	6.1	9,8	Benin	2011
1.0	6.9	8.3	Benin	2012
1.1	6.1	7.9	Benin	2013
1.8	5.7	9.6	Benin	2014
1.8	5.7	9.5	Benin	2015
1.8	5.7	10.8	Benin	2018
1,1	7.1	9.1	Benin	2017

0-14 year olds (new and relapse, all forms TB) (%)	Ratio 0-4:5-14 (new and relapse, all forms TB)	New (pulm bac conf TB) (%)	Previously treated incl rel (pulm bac conf TB) (%)
1.6		90.9	100
1.9		91	100
2		91.2	100
1.5		91.4	100
1.9		8.09	100
3.7	0.23	91	98.7
4.5	0.5	90.4	100
5.4	0.45	90.1	100

% of extra-pulmonary among new TB cases (national, sub-national)



% of extra-pulmonary (over time)

Region X

Period	New extrapulmonary TB (%)
2010	6.6
2011	6.2
2012	4.4
2013	4.1
2014	4.2
2015	5

Reasons for differences?

Reporting

Diagnostic capacity

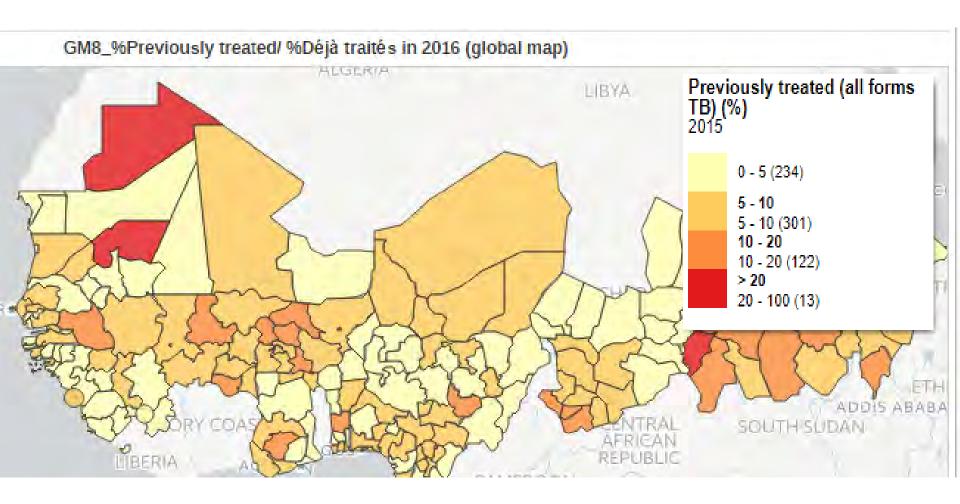
Region Y

Period	New extrapulmonary TB (%)
2010	18.7
2011	26
2012	26.4
2013	26.4
2014	11.5
2015	29.9

% of children or elderly

TB-HIV

% of previously treated (sub-national)



Low = not reported

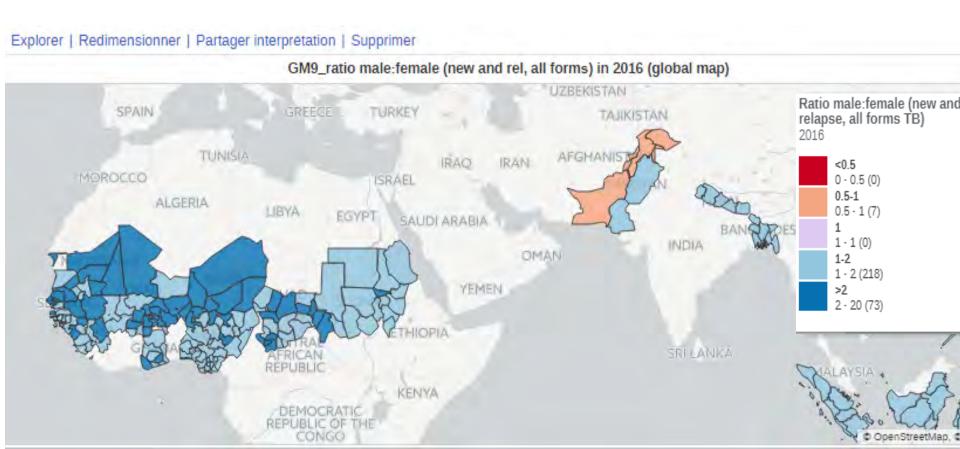
High=possible problems with treatment/patient management

% of previously treated (inter-country)

Country	% previously treated
Indonesia	3
Kenya	8.3
Namibia	20.8
South Africa	8.5

No expected range, but consistency over time is desirable (or if not there then should be explained)

Ratio of male:female TB cases



% of TB cases that are 0-14 years oldin Liberia (time series)

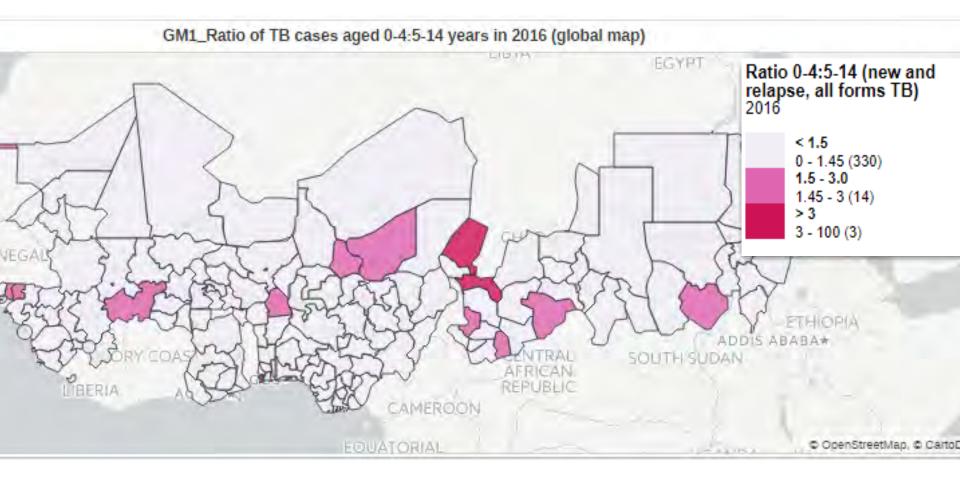
2013	12.8
2014	12.0
2015	11.4
2016	8.5

Expected range in middle/low income countries is between 5%-15%

% of TB cases that are 0-14 years old (subnational), Liberia

	2013	2014	2015
Bomi	14.2	6.3	4.7
Bong	10.1	8.2	5.5
Gbarpolu	11.5	13.0	0.0
Grand Bassa	14.2	12.7	12.8
Grand Cape Mount	4.5	2.4	5.6
Grand Gedeh	13.6	8.1	12.3
Grand Kru	3.8	0.0	0.0
Lofa	6.5	3.6	4.9
Margibi	15.5	9.5	9.7
Maryland	12.7	13.0	
Montserrado	12.7	12.6	13.3
Nimba	7.7	11.4	4.4
River Gee	2.7	4.0	30.0
Rivercess	10.8	13.3	7.7
Sinoe	8.3	16.7	13.5
Liberia	12.8	12.0	11.4

Ratio of cases 0-4:5-14



Expected range is between 1.5-3 0-4 year olds notified for every 5-14 year old

Under-diagnosis or under-reporting of children under 5 years old in most of West Africa

% of new and previously treated cases that are bacteriologically confirmed

Period	Organisation unit / Data	New (pulm bac conf TB) (%)	Previously treated incl rel (pulm bac conf TB) (%)
2010	Benin	90.9	100
2011	Benin	91	100
2012	Benin	91.2	100
2013	Benin	91.4	100
2014	Benin	90.8	100
2015	Benin	91	98.7
2016	Benin	90.4	100
2017	Benin	90.1	100

- % varies widely across the world
- Reflects diagnostic practises (e.g GeneXpert in previously treated cases only or for new cases)
- Prior to 2014 only smear positive previously treated cases were reported = 100% bact confirmed which is inaccurate

Summary

- Epidemiological indicators should be consistent over time or by geographical area, unless it can be explained
- Differences may indicate issues with recording and reporting or diagnosis and treatment of certain case types
- Differences could also be explained by true differences in epidemiology, co-morbidities or interventions targeting specific populations

ANALYSIS AND USE OF HEALTH FACILITY DATA

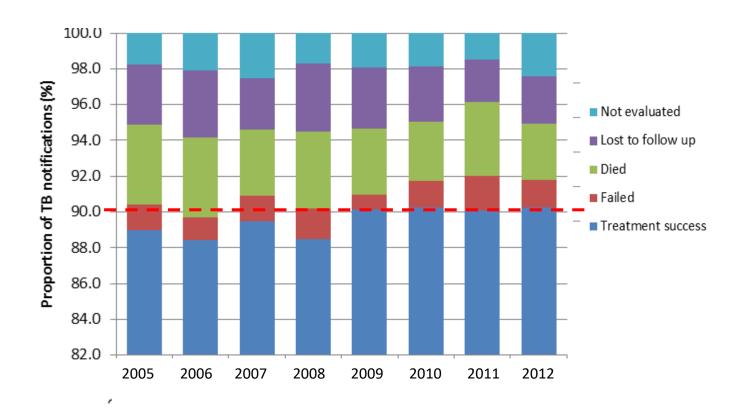
Guidance for Managers and Analysts

MODULE 3: Outcomes

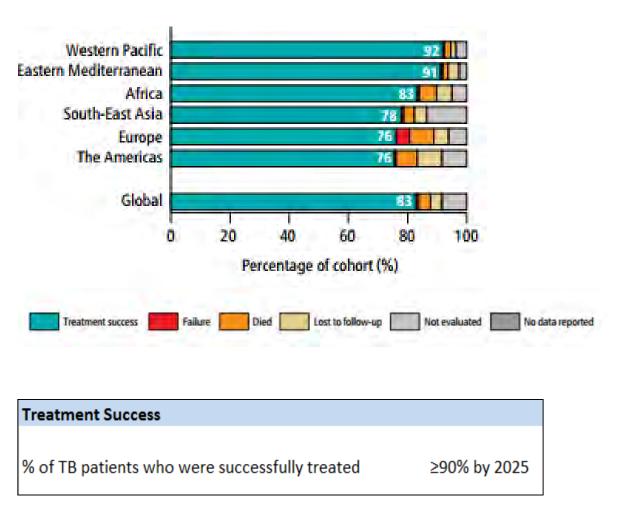


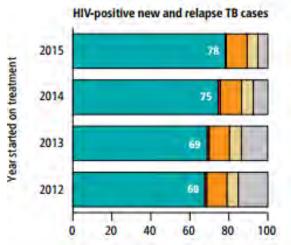
Why is it important to monitor treatment outcomes?

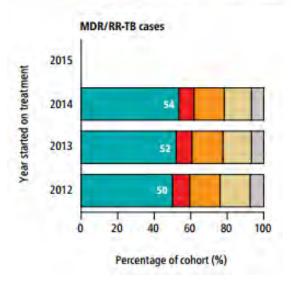
- Measure the National TB Programme's ability to maintain contact with patients over the course of six or more months
- Monitor progress towards meeting global and national targets



Treatment outcomes for new and relapse TB cases in 2015 for WHO regions and globally







What is the definition of treatment success?

 Numerator: Number of TB cases notified in a specified period time that were successfully treated (cured plus completed)

 Denominator: Number of TB cases notified in the same specified time period

Data Collection

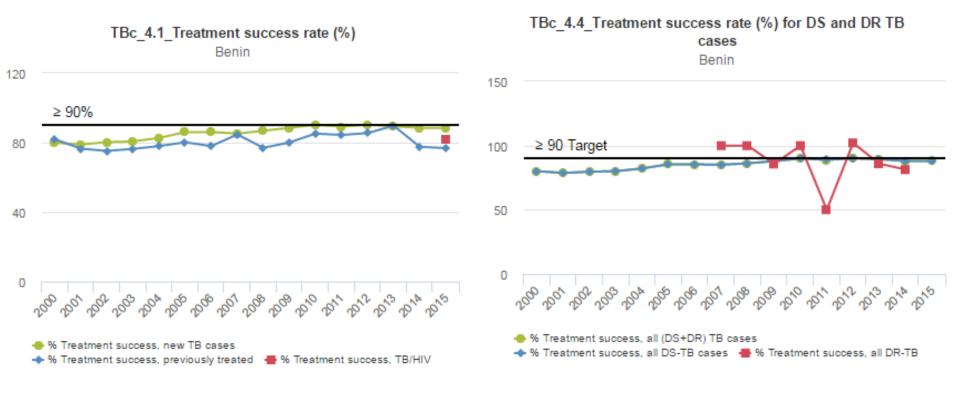
All TB cases registered (except for TB cases moved to second-line treatment)

	Cases registered (excludes cases moved	Treatment outco	ome				
	to second-line treatment)	Cured	Treatment completed	Treatment failed	Died	Lost to follow-up	Not evaluated
Bacteriologically confirmed, new and relapse	2	2	0	0	0	0	0
Clinically diagnosed, new and relapse	1		1		0	0	0
Previously treated (excluding relapse)	0	0	0	0	0	0	0
HIV-positive, new and relapse	0	0	0	0	0	0	0

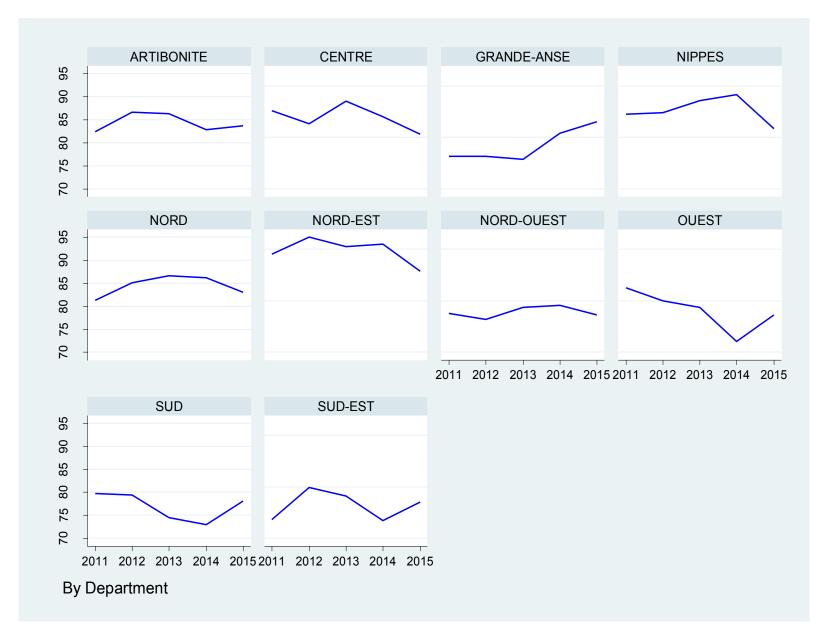
TB cases started on a second-line TB drug regimen

	Cases started on second-line TB treatment –	Treatment outc	ome				
		Cured	Treatment completed	Treatment failed	Died	Lost to follow-up	Not evaluated
All confirmed RR-TB/MDR-TB cases	2	2	0	0	0	0	0
HIV-positive RR-TB/MDR-TB cases							
All confirmed XDR-TB cases							

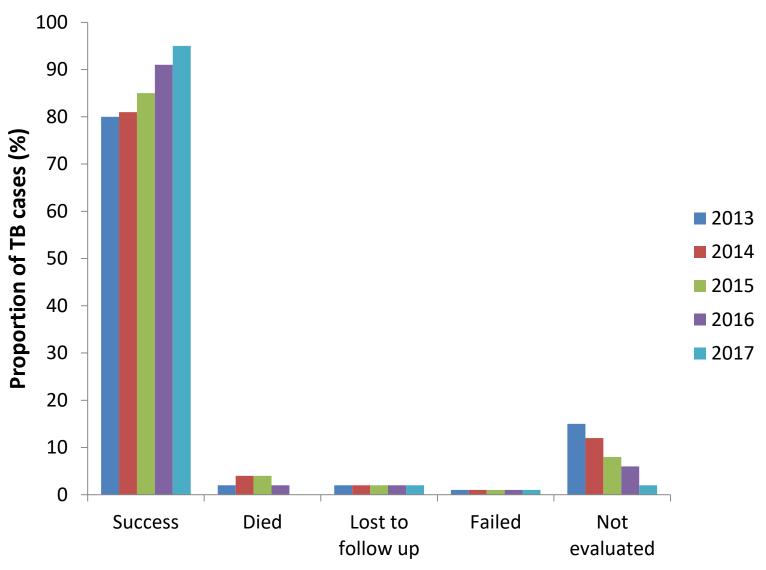
Trends over time



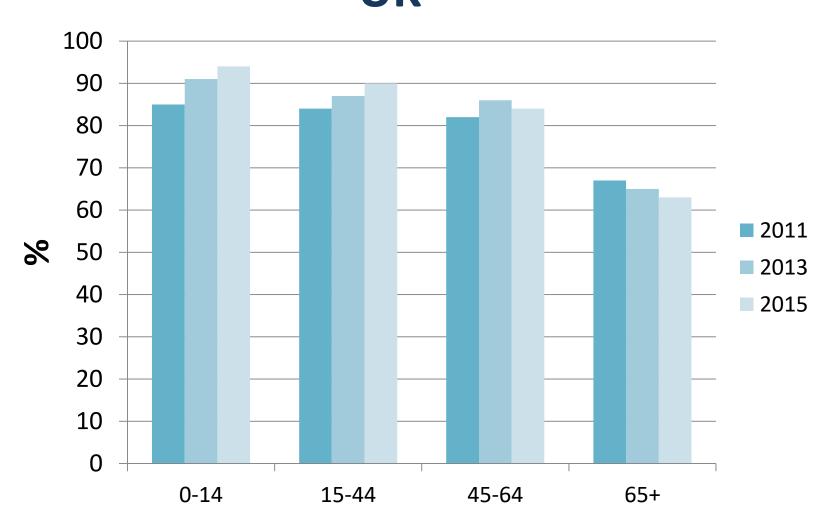
Sub-national trends over time, Haiti



How do we interpret treatment outcome data?



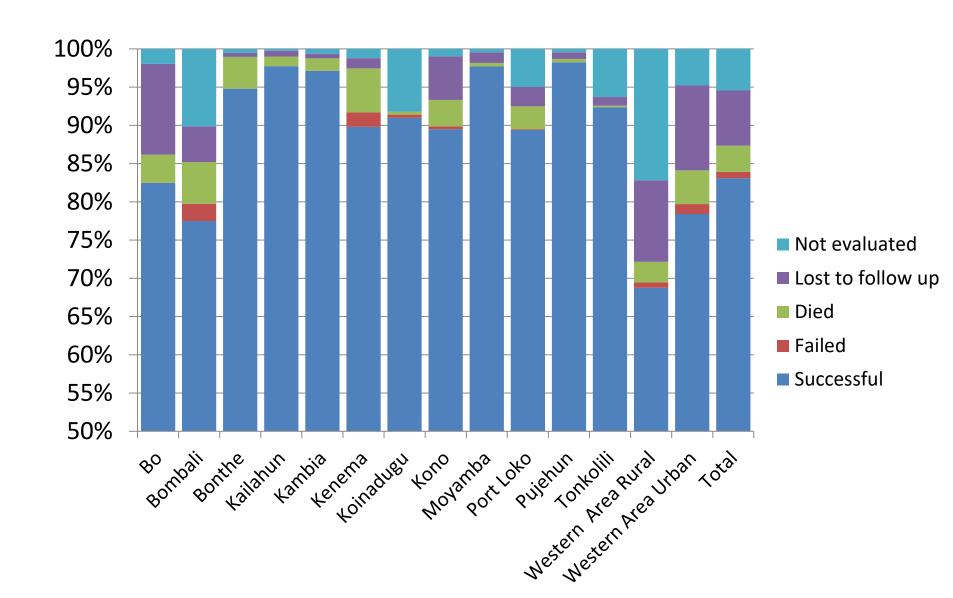
Treatment success by age group in the UK



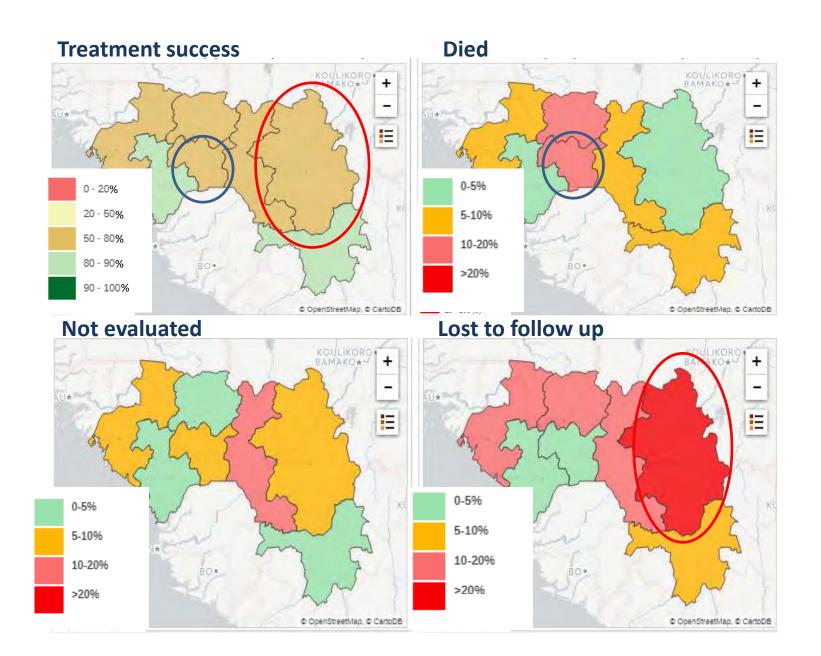
Deaths include all TB cases that die, not necessarily from TB

Source: Public Health England

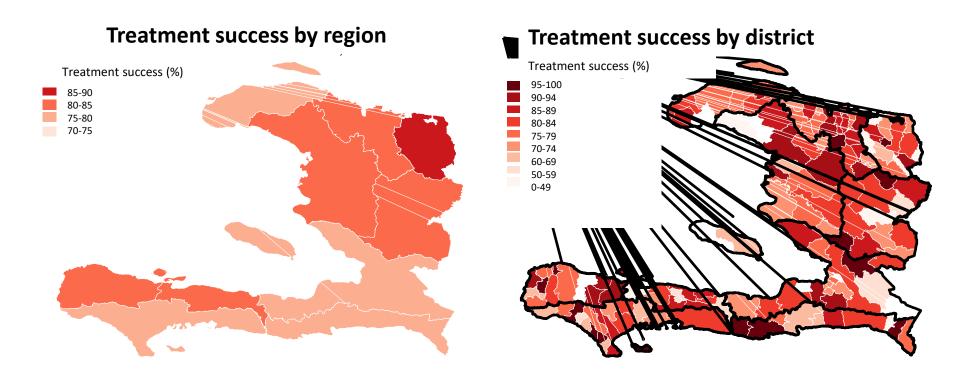
Comparing treatment outcome by district, Sierra Leone 2014



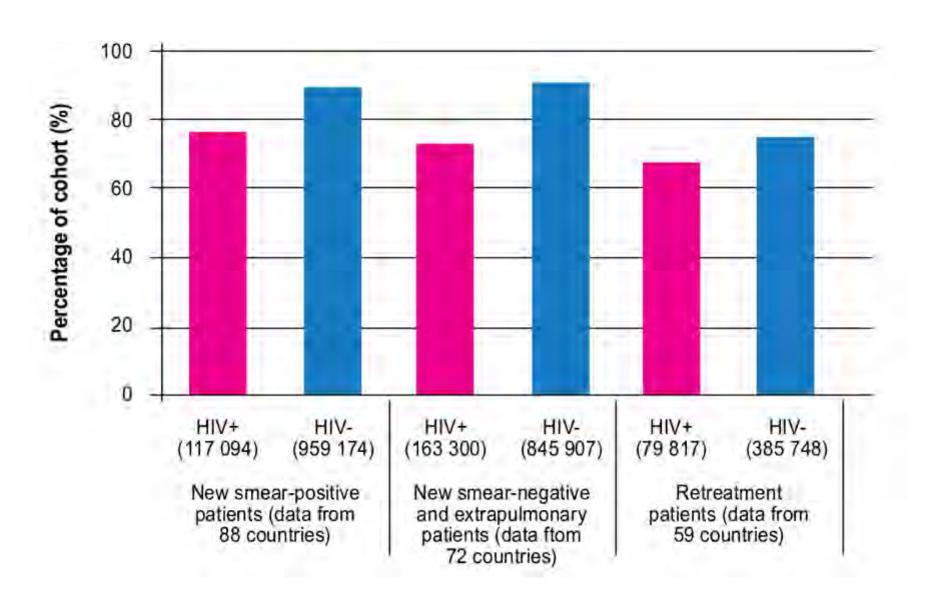
Comparing treatment outcome by district, Guinea 2015



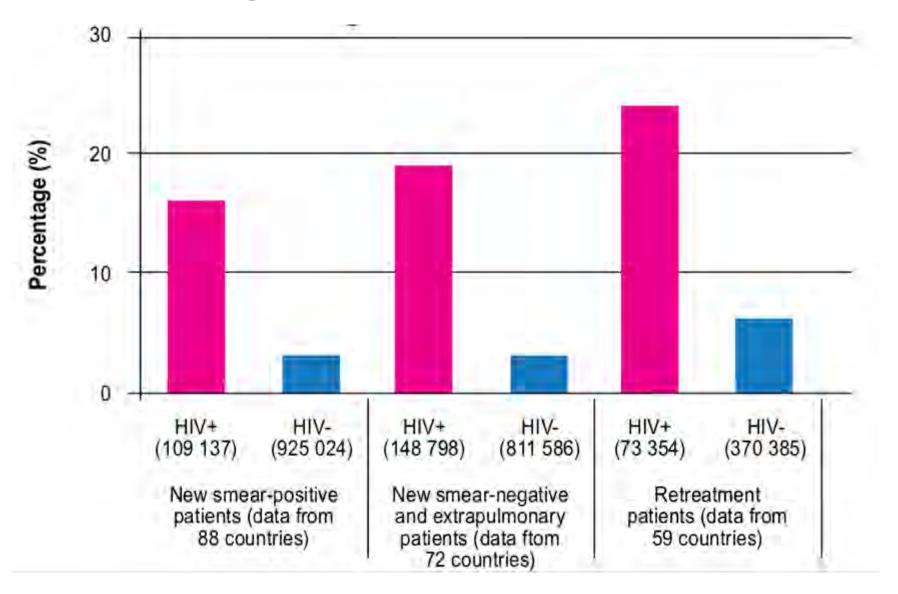
Comparing treatment outcome at different administrative levels, Haiti 2016



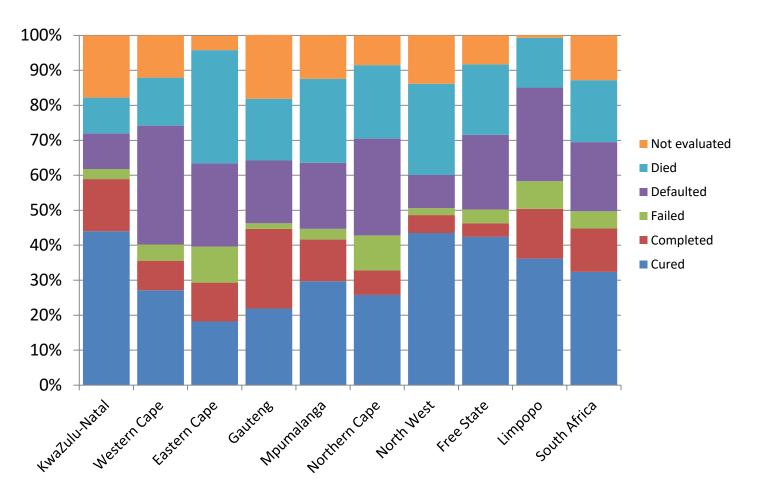
Treatment success by HIV status



High death rates in HIV+



MDR-TB outcomes at 24 months for South Africa, 2011

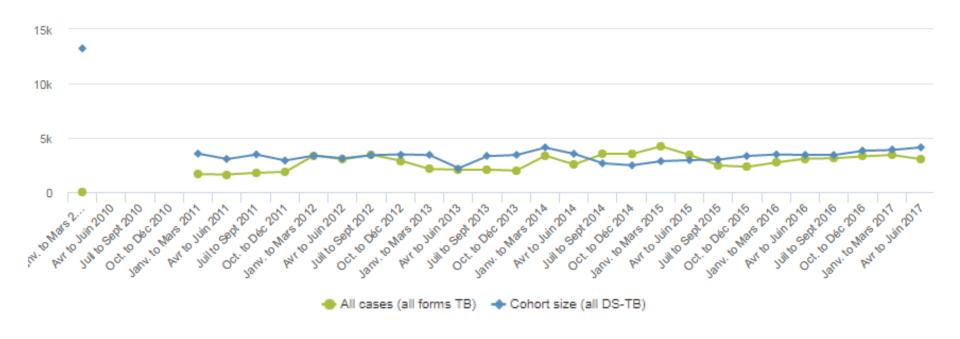


Source: Sicelo S. Dlamini (Director: Research, Information Monitoring, Evaluation & Surveillance (RIMES), National TB Control & Management Cluster) [as on 21.08.2014]

Treatment outcome cohort vs notification

	2011	2012	2013
Notified as a case	12943	13354	12334
Registered outcomes	12707	13431	12933
Missing or Extra cases	-236	+77	+599

Treatment outcome cohort vs notification



Blue line= All notified cases (should include DS and DR-TB)

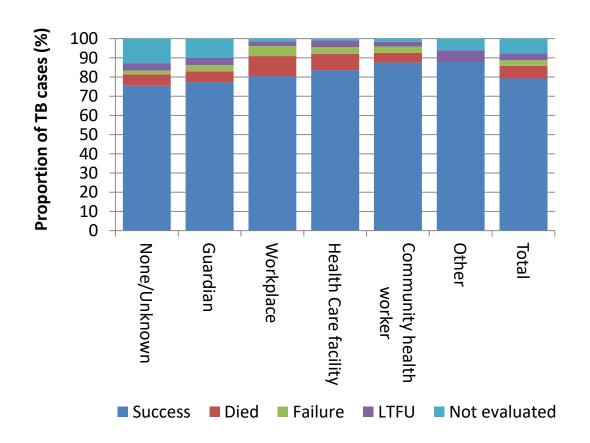
Green line= Cases with a registered treatment outcome (DS-TB)

Blue > Green = More notified cases. Investigate whether cases moved to second line treatment. Recode the remainder as not evaluated.

Green > Blue = More cases with treatment outcomes than original cohort. Suggests late notifications. *Investigate and retrospectively adjust notifications*.

DS-TB cohorts minus cases moved to second line treatment should match!

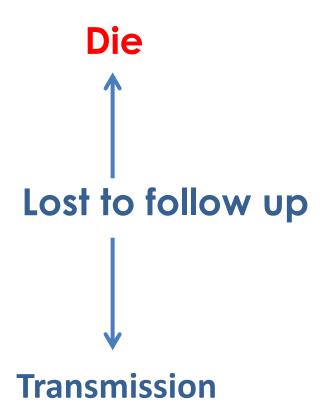
The impact of community-based treatment support, Namibia 2016



Community based Indicator: Treatment success of TB patients who received community based treatment support

Are treatment outcomes recorded as part of routine surveillance a good indication of TB mortality?

Why do some cases not start on treatment?



Why?

- Late diagnosis
- Wrong diagnosis

- Do not return for results (not same day)
- Sample referred from another clinic for diagnostics and result not followed up
- Patient referred to another clinic for treatment and doesn't arrive/no follow up
- Patient refuses treatment

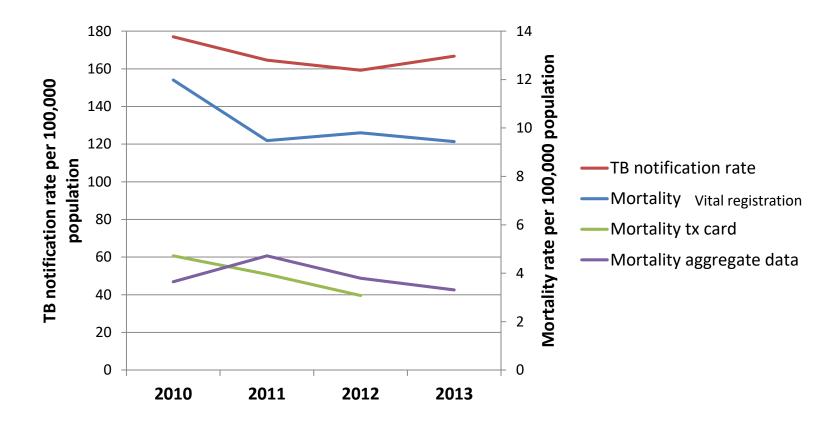
Why should we report these cases?

Why	Importance to TB programme
They are TB cases	Measure TB burden
Failure of programme to diagnose, engage patient in healthcare and treat	Evaluate programme performance
Some are TB deaths	Measure TB mortality
Some are a reservoir of infectious cases	Leads to transmission and increased incidence
To understand characteristics of patients	
who die and are lost to follow up	Take corrective programmatic action
Identify gaps in patient pathway of care	Take corrective programmatic action
Capture workload of lab and clinical staff	Resource planning

Where are these cases captured?

- Laboratory: microscopy and GeneXpert registers as bacteriologically confirmed cases
- Presumptive TB registers
- Vital registration system
- Autopsy records

Using mortality data from different data sources, Mongolia



Mortality data using ICD-10 codes vs deaths captured in the TB surveillance system

It is better to invest in and use a vital registration system which captures all deaths

Summary

- Treatment outcome monitoring allows you to assess the success of the TB program for managing and treating patients
- Important to monitor treatment outcome routinely at all geographical levels, by age, treatment history and TB-HIV in order to understand the reasons for poor outcome and identify districts who are under-performing and address it
- DS and DR-TB cohorts should be examined separately
- All TB deaths and primary loss to follow up should be notified
- Vital registration systems should be used for accurate recording of TB deaths and used to ensure all deaths are notified to the TB programme

ANALYSIS AND USE OF HEALTH FACILITY DATA

Guidance for Managers and Analysts

MODULE 3:

Guidance for tuberculosis programme managers

DR-TB



What is drug resistant TB?

- The tuberculosis bacillus is resistant to antibiotics used to cure disease
- Multidrug-resistant tuberculosis (MDR-TB)
 is a TB against which isoniazid and
 rifampicin, the two most potent antituberculosis drugs, are not effective

How does someone get drug resistant TB?

- Resistant bacteria are selected due to inadequate treatment (develops inside the infected individual)
- Resistant bacteria are transmitted directly from an infected individual to a susceptible individual

Definitions of drug resistance

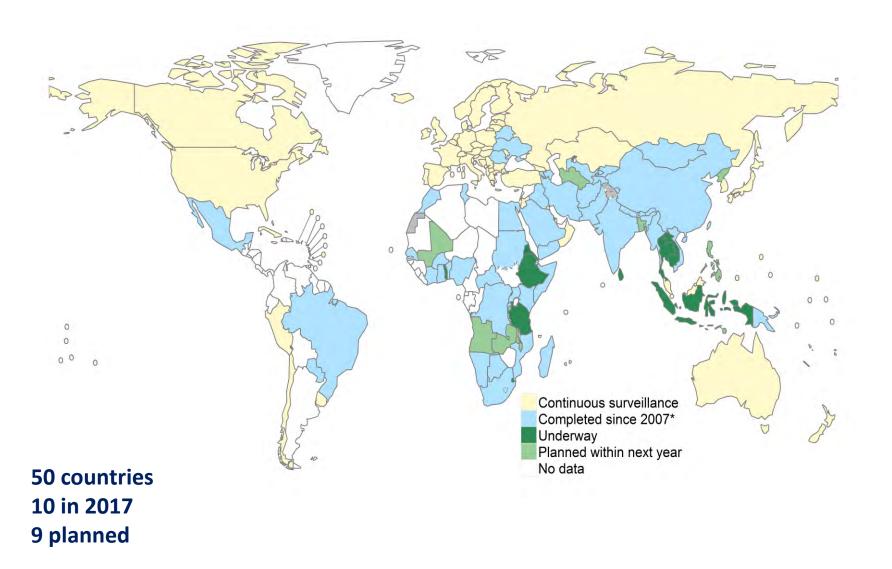
A.1.4 Classification based on drug resistance

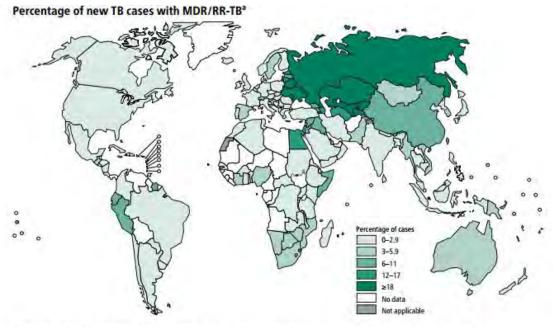
Cases are classified in categories based on drug susceptibility testing (DST) of clinical isolates confirmed to be M. tuberculosis:

- Monoresistance: resistance to one first-line anti-TB drug only.
- Polydrug resistance: resistance to more than one first-line anti-TB drug (other than both isoniazid and rifampicin).
- Multidrug resistance: resistance to at least both isoniazid and rifampicin.
- Extensive drug resistance: resistance to any fluoroquinolone and to at least one of three second-line
 injectable drugs (capreomycin, kanamycin and amikacin), in addition to multidrug resistance.
- Rifampicin resistance: resistance to rifampicin detected using phenotypic or genotypic methods, with
 or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether
 monoresistance, multidrug resistance, polydrug resistance or extensive drug resistance.

These categories are not all mutually exclusive. When enumerating rifampicin-resistant TB (RR-TB), for instance, multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB) are also included. While it has been the practice until now to limit the definitions of monoresistance and polydrug resistance to first-line drugs only, future drug regimens may make it important to classify patients by their strain resistance patterns to fluoroquinolones, second-line injectable agents and any other anti-TB drug for which reliable DST becomes available.

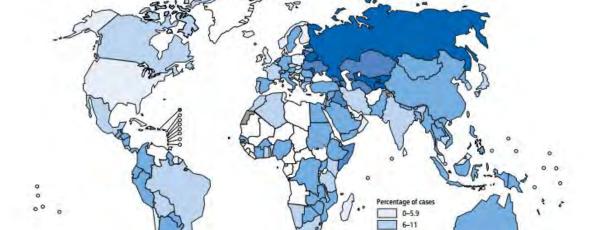
National surveys of drug resistance implemented since 2007 and underway or planned in the next year, and countries relying on continuous surveillance to monitor drug resistance





* Figures are based on the most recent year for which data have been reported, which varies among countries. Data reported before 2002 are not shown.

Percentage of previously treated TB cases with MDR/RR-TB^a



Percentage of new and retreatment cases with MDR/RR-TB

Assessing the situation for drug resistance surveillance and epidemiology

B2.1 Surveillance data provide a direct measure of drug-resistant TB in new cases

One of the two benchmarks should be satisfied to meet this standard:

- Rifampicin susceptibility status (positive/negative) documented for ≥75% of new pulmonary TB cases
- Rifampicin susceptibility status (positive/negative)
 documented for a nationally representative drug
 resistance survey of new pulmonary TB cases



Data sources: Tx card and laboratory register

		Registration Group				vious Tuberculosis Treatment Episodes			
ate of second-line treatment registration:		5		one only	District TB Register No.	(if unknown put year)		Outcome	
eatment Centre:		New			(i.e. BMU register numb				
atient Name:		Relapse			140000	-	3000011000017		
ACCES A PROPERTY.		After loss t	o follow-up						
ddress & Telephone:		After failure	of first treatment with first-line drugs						
istrict:		After failure of retreatment regimen with first-line drugs							
ex (circle one): M F		Other (previously treated without known outcome)							
e: DOB:		outer (prev	iousy source major nioni sucomey						
e: DOB:			(from another second-line treatment	Yes					
itial weight (kg):		programme) If yes name of center:		No					
eight (cm):				NO	Previous use of	second-line drug	s for more than one	month?	
te (circle one or both): Pulmonary Extrap	oulmonary	HIV INFOR	RMATION				o / Unknown		
extrapulmonary, specify site:	Johnson	HIV Testing	done (circle one); Y / N / Unkr	iown	Mr. Maria Marillandra I	Table about			
extrapulmonary, specify site:		Date of Test: Result:		If Yes, indicate in Table above					
		Started on	ART (circle one): Y / N Date:		Drug Abbreviations				
		Started on	CPT (circle one): Y / N Date:		First-line drugs second-line drug		second-line drugs	3	
					H=isonlazid	Am=amikacin		Bdq=bedaquilin	
leetings of review panel (medical commission	on, selection co	committee, consilium)			R-rifampicin	Km=Kanamycin	Pto-Prothionamide	Cir-clarithromyo	
The second secon				R-ethambutol	cm-capreomycin	Cs=cycloserine	Cfz=clofazimine		
Meetings of the review panel; da		dates and decision	The second secon		S=streptomycin	Ifx=levofloxacin	"Pas=p-amino- salveilic acid"	DIm=delamanid	
Date	Decision		Next Date		Z+Pyrazinamide	Mfx=Moxifloxacin	salycilic acid	tpm+imipenem	
					Otx-offer	Ofx-ofloxacin	Amx/cCv-amox-	Lzd-linezolid	
						Gfx-gatifloxacin	Killiny Clavillation	Mpm=meropene	
						Gfx-gatifloxacin	icillin/ davulanate		

Patient name: Date of birth: Patient address: Beason for examination: Diagnosis. If diagnosis, presumptive RR-TB/M	Telepho			
Patient address:	Telepho			
Reason for examination:	Telepho	ne:		
Reason for examination:		ne:		
☐ Diagnosis. If diagnosis, presumptive RR-TB/M				
	DR-TB?: □	Yes 🗆 N	lo	
OR				
HIV infection? ☐ Yes ☐ No ☐ Unknow	'n			
Previously treated for TB? \square Yes \square No \square Unknow	'n			
Specimen type: ☐ Sputum ☐ Other (s	pecify):			
Test(s) requested: ☐ Microscopy ☐ Xpert M	TB/RIF			
☐ Culture ☐ Drug susceptibility ☐ Line probe assay				
Microscopy results (to be completed in the laboratory)				_
Date sample Specimen Laboratory Visual appearance		Result (tick o	ne)	
collected type serial (blood-stained,	1-9/100	+	++	+++
(filled by requestor) saliva) (0 AFB/ 100 HPF	HPF (scanty; report no.	(10–99 AFB /100 HPF)	(1–10 AFB/ HPF)	(>10 AFB/ HPF)
	of AFB)			

Four groupings of RR-/MDR-TB indicators

1. Testing coverage

% of all cases with drug susceptibility test results for at least rifampicin

2. Detection

% of tested with laboratory confirmed RR-/MDR-TB

3. Enrolment

% of confirmed RR-/MDR-TB enrolled on tx

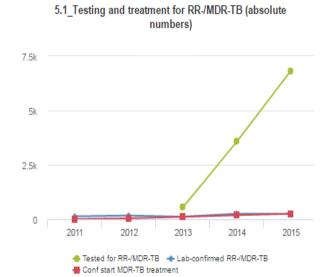
4. Treatment outcomes

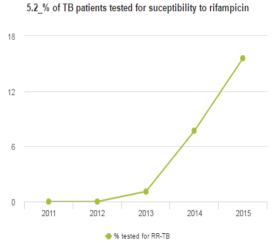
% successfully completing treatment

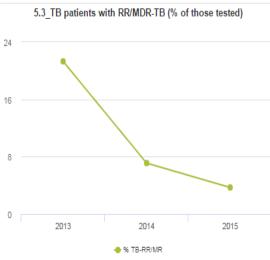
DR-TB Dashboard

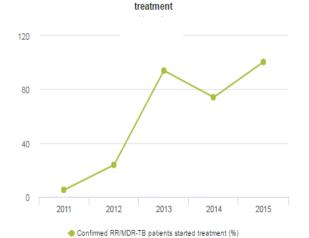
_5.1_Drug resistance

Organisation unit	Data / Period	2011	2012	2013	2014	2015
	Tested for R susceptibility, new cases			92	1 958	3 329
	Tested for R susceptibility, previously treated			397	737	1 454
Country X	Tested for R susceptibility, unknown history			60	874	2 044
	Tested for RR-/MDR-TB			549	3 569	6 827
	Lab-confirmed RR-/MDR-TB	135	172	117	255	252
	Lab-confirmed MDR-TB	71	89	82	152	252
	Conf start MDR-TB treatment	7	41	110	189	253
	Unconf start MDR-TB treatment	0		89	24	0







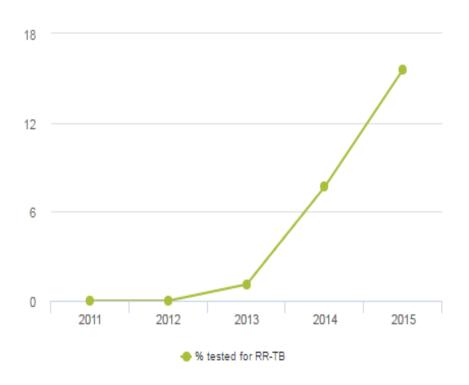


5.4_% of laboratory-confirmed RR-TB patients who started

How can we interpret this?

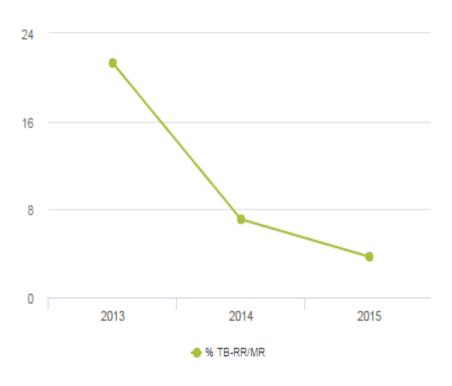
Increased RR-TB testing due to roll out of Xpert

5.2_% of TB patients tested for suceptibility to rifampicin



Expanded testing to all cases and not just high risk groups (e.g prev TB) which leads to a decrease in % of DR-TB

5.3_TB patients with RR/MDR-TB (% of those tested)



How can we interpret this?

TBc_5.4_Laboratory-confirmed RR/MDR-TB cases started MDR treatment (%) (annual)



DR-TB in Guinea

GeneXpert register from the lab

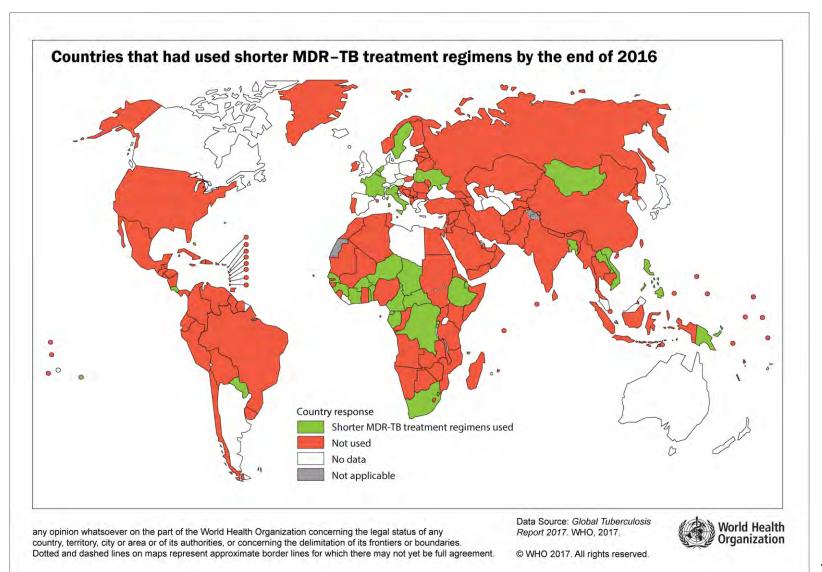
	2	014	
	n	%	
Cases tested with GeneXpert?	362		
GeneXpert RR	106	29	High
Confirmed by first line DST	50	47	Low
Confirmed MDR-TB	47	94	Most are MDR
Resistant to all 4 first line drugs	31	66	Very high

MDR-TB treatment register

	2012	2013	2014	
Total number of DR 🤌				
cases in register	93	135	124	
Number of MDR-TB	74	78	59	Different number
Resistant to all first line	56	49	47	XDR-TB?
drugs	(76%)	49 (63%)	(80%)	Λ υ Ν-1 υ :

No second line antibiotics in country until 2014

Countries using short treatment regimen (9-12 mois)



Summary

- Drug resistant TB can develop through inadequate treatment or be acquired through transmission
- Important to provide and monitor expansion of rapid testing for all cases to ensure DR-TB cases are treated with a correct regimen in a timely way
- Aggregate data are from the lab and clinical registers and may not always match; it is better to move to a case based system for DR-TB to evaluate quality of care in patients
- The short regimen should lead to better treatment outcomes

ANALYSIS AND USE OF HEALTH FACILITY DATA

Guidance for Managers and Analysts

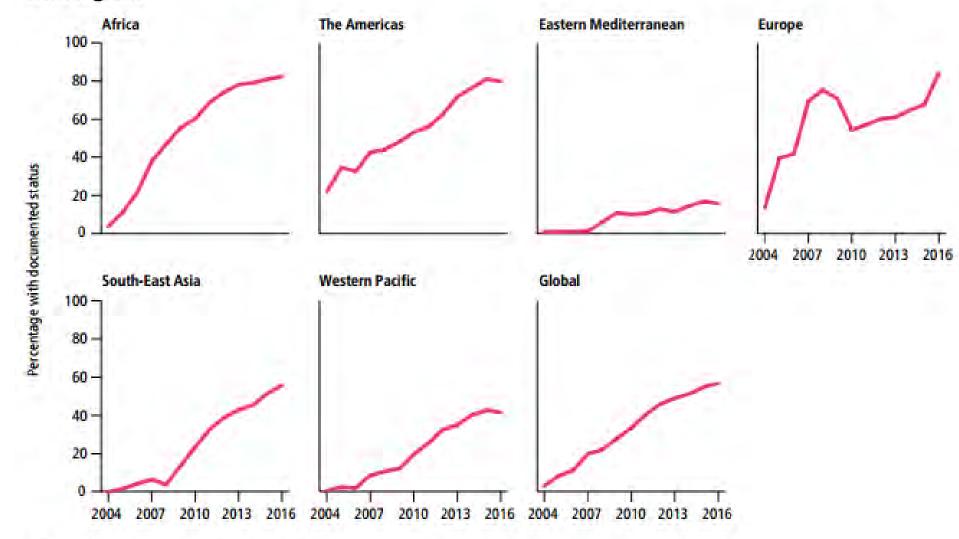
MODULE 3:

Guidance for tuberculosis programme managers

TB/HIV

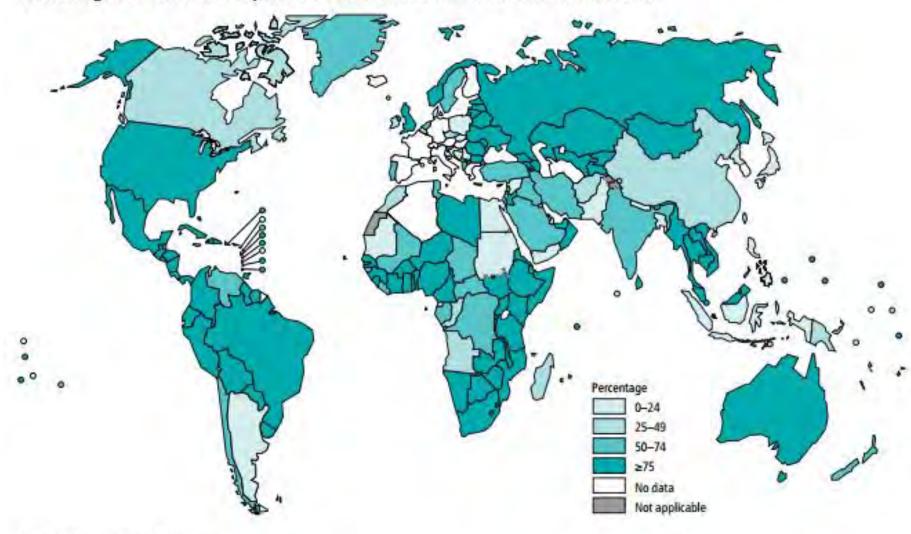


Percentage of new and relapse TB cases with documented HIV status, 2004–2016, globally and for WHO regions



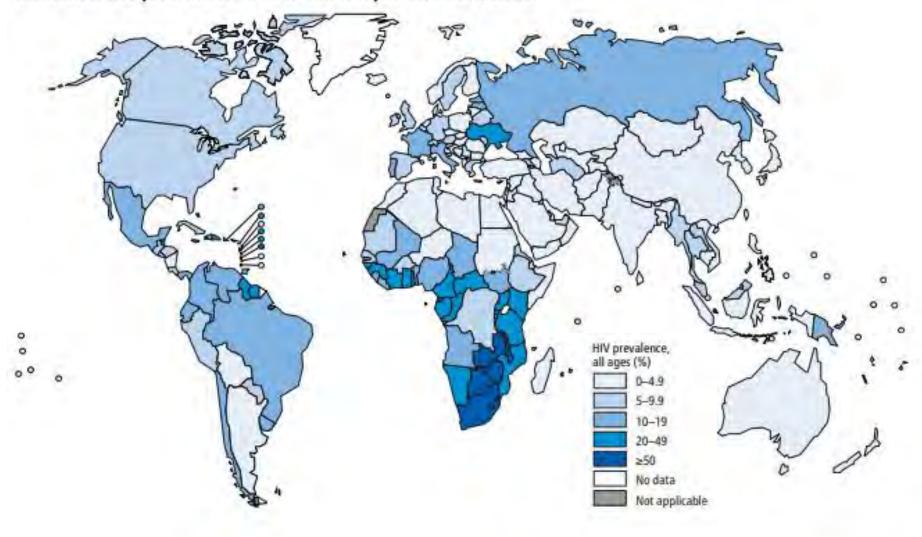
The calculation is for all cases in years prior to 2015.

Percentage of new and relapse TB cases with documented HIV status, 2016a

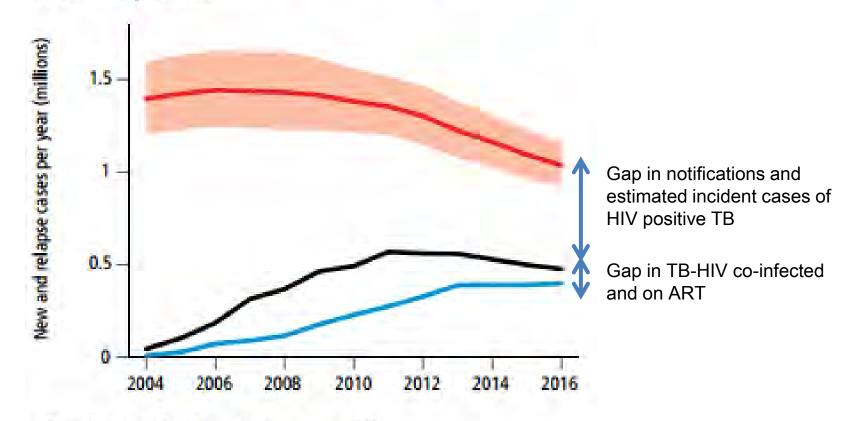


 ²⁰¹⁵ data were used for 9 countries.

Estimated HIV prevalence in new and relapse TB cases, 2016



Global numbers of notified new and relapse cases known to be HIV-positive (black), number started on antiretroviral therapy (blue) and estimated number of incident HIV-positive TB cases (red), 2004–2016. Shaded areas represent uncertainty bands.



The calculation is for all cases in years prior to 2015.

How do we measure the burden of HIV-Associated TB?

Sources of data on HIV-associated TB

- 1. Routine testing for HIV in new TB
- 2. Routine testing for TB in HIV
- 3. Surveys in a sample of newly notified TB

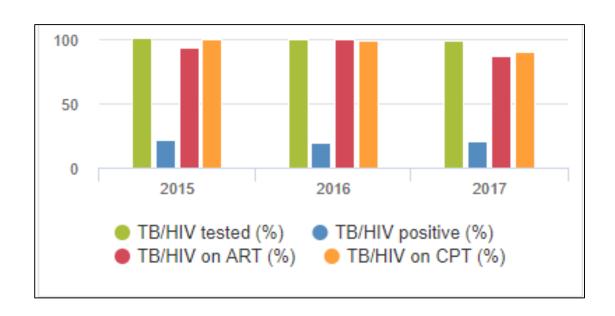
In good surveillance systems 1 and 2 should match but often don't due to

- Under-reporting
- Miscommunication between HIV and TB teams
- Misinterpretation of indicators
- No unique identifiers to link patients between registers

Why is it important to measure HIV in new and relapse TB cases?

- •TB is a stage III event in HIV indicating the need to improve ART in HIV positive cases
- Provides benchmark for ART needs- newly detected TB-HIV cases should begin ART within 8 weeks of TB treatment
- Measures the gap between detected and estimated cases (incident cases)
- Measure the trends in infection over time when combined with testing data

The care cascade



- 1. Percentage of new and relapse TB cases with a known HIV status
- 2. Percentage of *new and relapse* TB cases with HIV positive status (out of those with a known status)
- 3. Percentage of HIV positive new and relapse TB cases on ART
- 4. Percentage of HIV positive new and relapse TB cases on CPT
- 5. Percentage of HIV positive *new and relapse* TB patients that successfully complete treatment

Targets

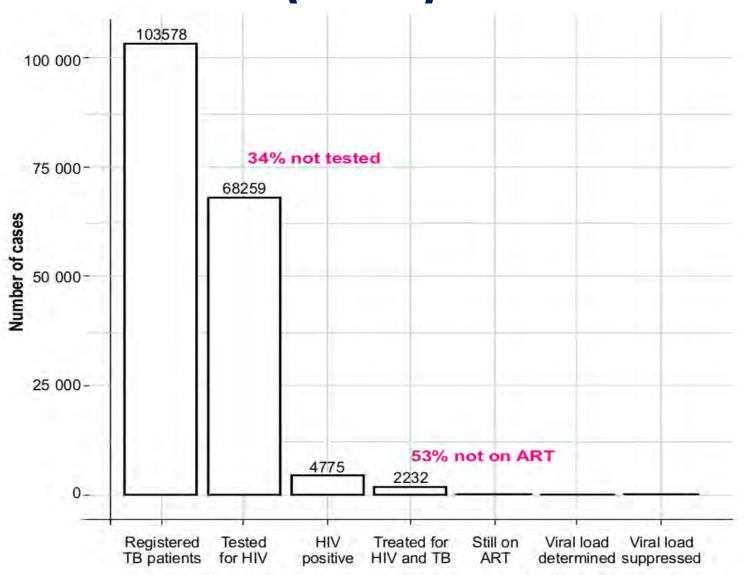
The End TB Strategy

• 100 % of new and relapse TB patients with documented HIV status

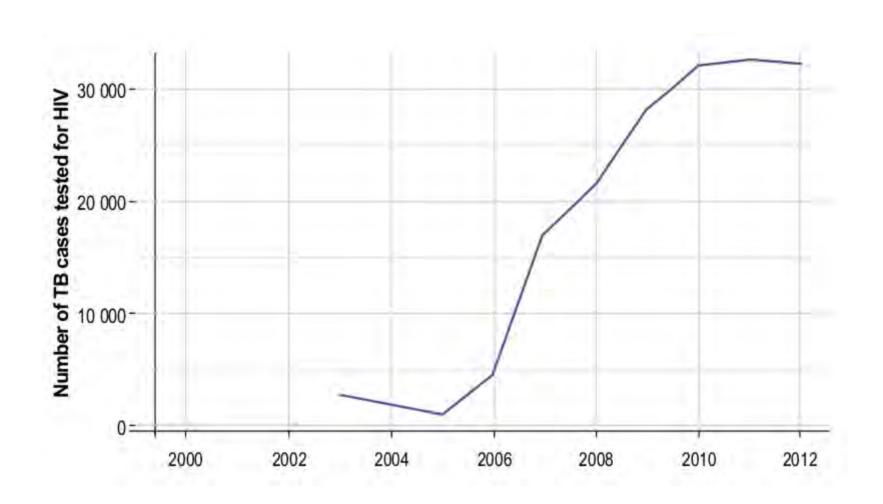
Standards and Benchmarks assessment; B2.2

- HIV status (Positive/Negative) documented for >80% of all notified TB cases
- HIV status is available from a representative sample from all TB cases notified in settings with a low-level epidemic state where it is not feasible to implement routine surveillance Low-level epidemic state: HIV prevalence has not consistently exceeded 5% in any defined subpopulation.

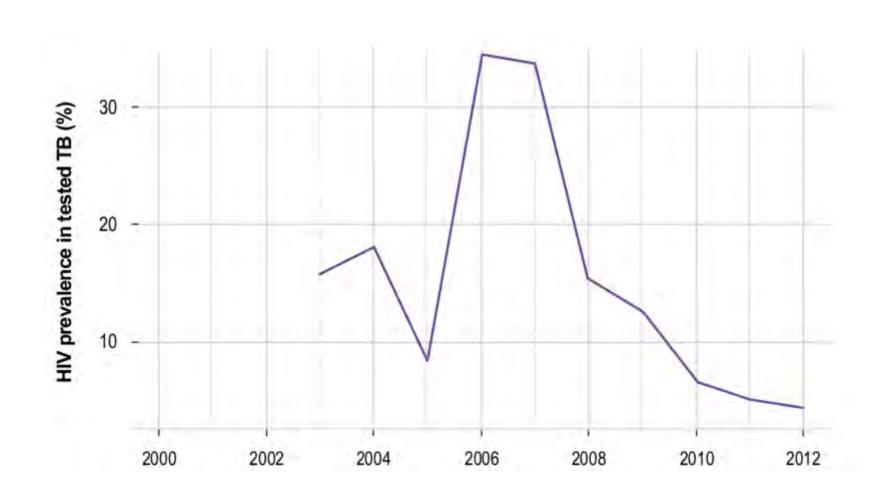
The TB care cascade in Vietnam (2012)



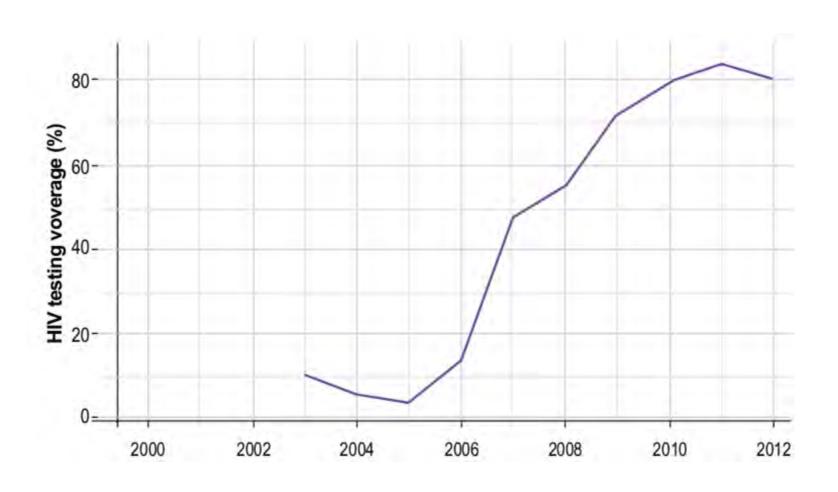
TB cases tested for HIV in Cambodia



HIV prevalence among tested TB cases, Cambodia



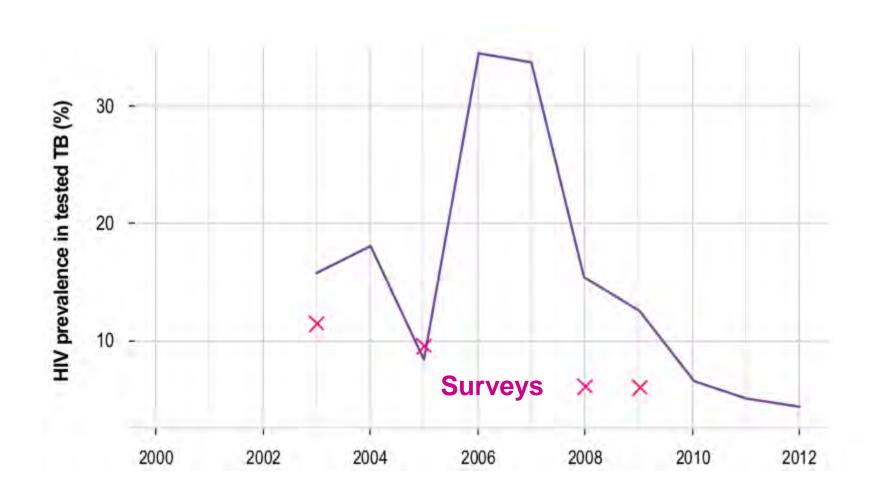
HIV testing coverage in TB, Cambodia



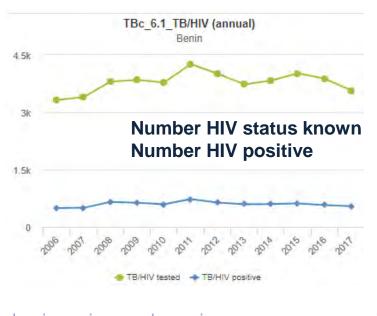
HIV serosurveys among TB cases in Cambodia

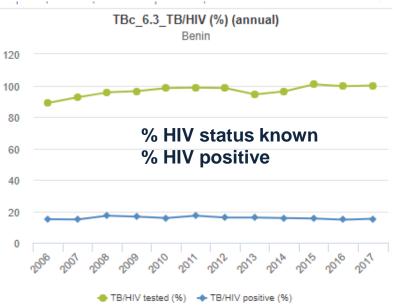
	2003		2	2005
	HIV-pos (%)	95% CI*	HIV-pos (%)	95% CI*
All TB tested	11.8	10.5 – 13.2	9.9	8.8 - 11.1
Males	13.5	11.7 – 15.6	10	8.4-11.6
Females	9.9	8.2 – 11.9	9.8	8.2 – 11.5
Age group				
0-14	15	7.1 – 26.6	7.7	0.4 - 14.9
15-24	9.7	6.1 – 14.5	6.2	3.1 – 9.3
25-34	27.2	22.6 - 32.2	24.8	20.6 - 28.9
35-44	16.9	13.8 – 20.5	17.5	14.5 – 20.6
45-54	5.7	3.8 - 8.4	5.2	3.3 – 7.2
55-64	4.7	2.9 – 7.4	1.7	0.5 - 2.9
65+	4.3	2.2 - 7.4	0,5	0 – 1.3

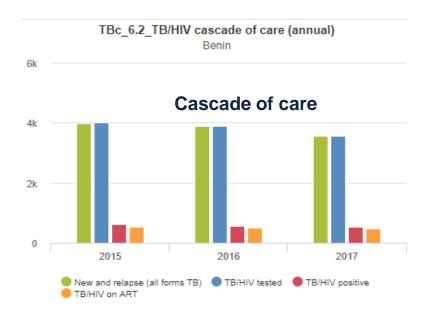
HIV prevalence in TB by data source (Cambodia)

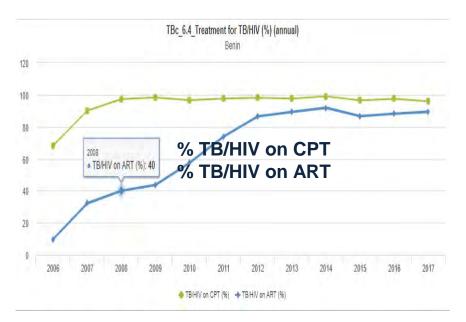


TB-HIV DHIS2 dashboard (cascade over time)

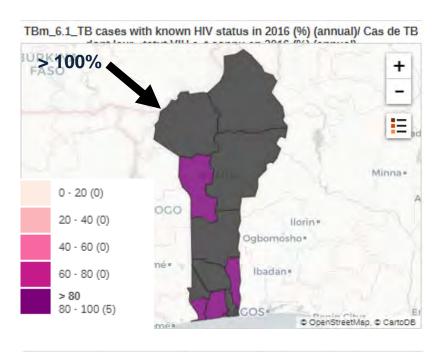


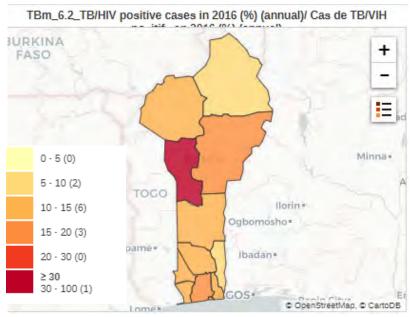


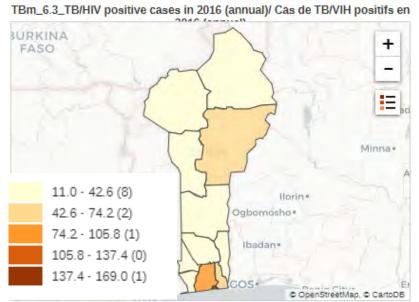


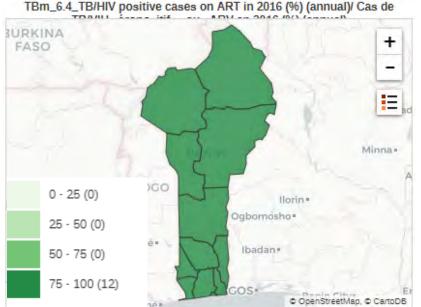


TB-HIV DHIS2 dashboard (compare sub-national data)





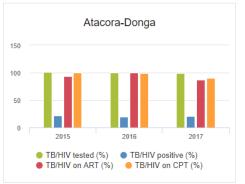


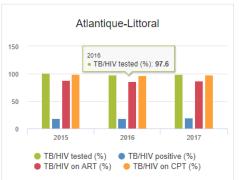


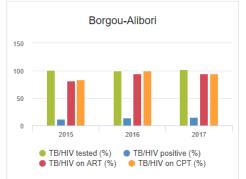
Comparison at sub-national level

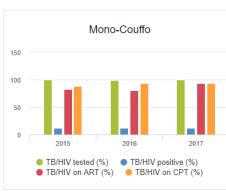
TBc_6.2b_TB/HIV cascade of care (%) (annual)

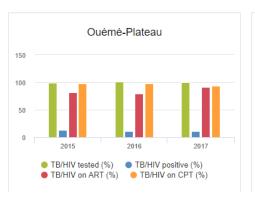
Benin

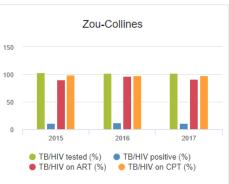












Compare the are cascade by region or district to evaluate the performance of testing and treatment of TB/HIV co-infection at the sub-national level

Reporting of TB/HIV activities

Quarterly report on TB treatment outcomes in the basic management unit

Name of BMU:	Facility:	Patients registered during ^a	_ quarter of year
Name of TB Coordinator:	Signature:	Date of completion of this form:	

Block 1: All TB cases registered during the quarter (except for TB cases moved to the second-line treatment register)

	Number of cases registered	Treatment outcomes					
TB patient type		Cured	Treatment completed	Treatment failed	Died	Lost to follow-up	Not evaluated
Bacteriologically confirmed, new and relapse						-	
Clinically diagnosed, new and relapse				1			11 2
Retreatment (excluding relapse)							
HIV-positive, new and relapse							

Block 2: TB/HIV activities (all new and relapse TB cases registered during the quarter)

HIV-positive TB patients	HIV-positive TB patients on ART	HIV-positive TB patients on CPT

TBt_6.2_TB/HIV recorded at the time of case notification and treatment outcome (annual)

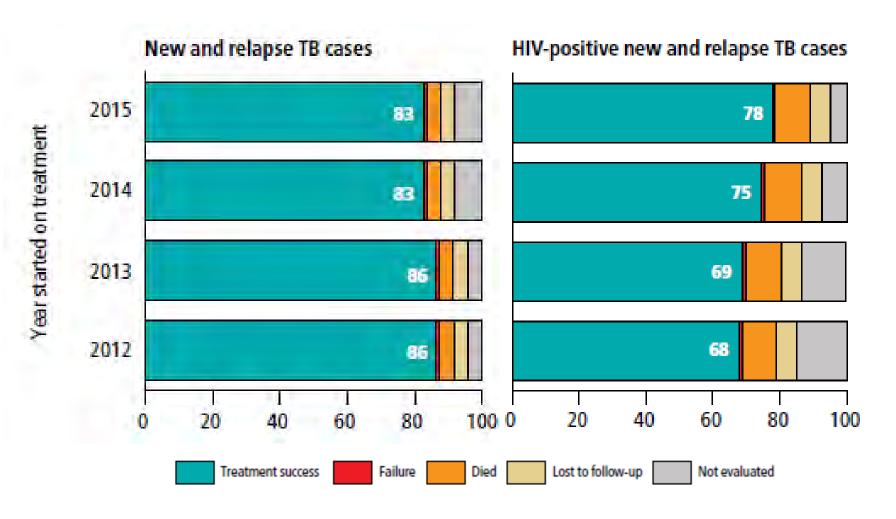
	TB/HIV tested \$	TB/HIV tested at \$ outcome	TB/HIV positive [‡]	TB/HIV positive at \$	TB/HIV on \$ ART	TB/HIV positive on ART \$ at outcome	TB/HIV on \$ CPT	TB/HIV positive on CPT \$ at outcome
2013	749 481	24 803	243 130	8 457	152 596	6 069	195 935	7 866
2014	948 050	28 505	263 245	10 245	183 055	8 502	217 527	9 790
2015	882 576	27 888	221 667	12 393	162 109	10 452	180 297	11 336
2016	598 031	36 792	96 454	13 583	72 722	11 802	79 481	12 111

Numbers at treatment outcome should be higher than at notification as some cases are tested and diagnosed as HIV positive during TB treatment

Wrong

Registration period is based on date of registration of cases in the TB register, following the start of treatment. Q1: 1 January – 31 March; Q2:1 April – 30 June; Q3: 1 July – 30 September; Q4:1 October – 31 December.

TB treatment outcomes for new and relapse TB cases and new and relapse HIV-positive TB cases, globally, 2012-2015

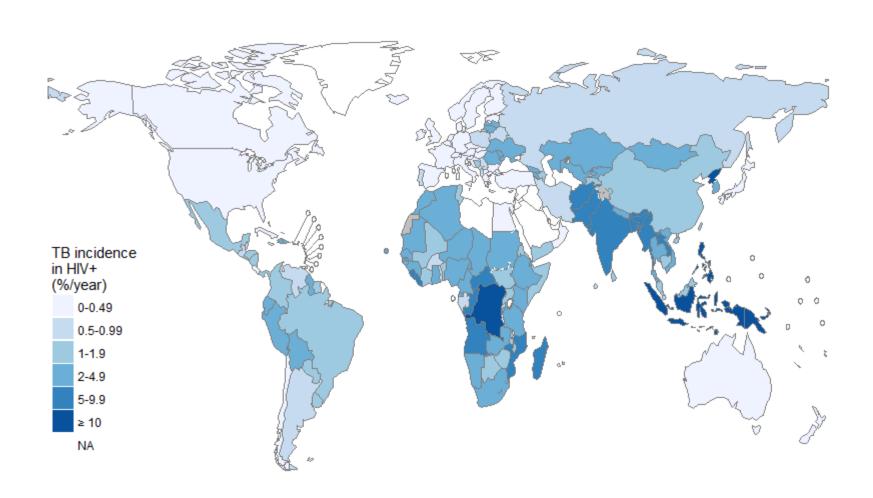


TB mortality (2016)

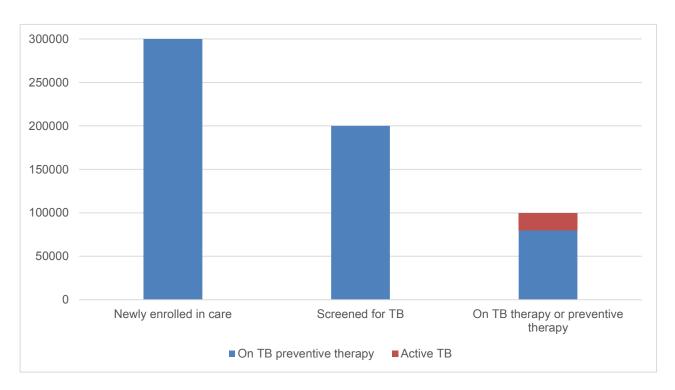
	HIV-	HIV+
Incident cases	9.3m	1.04m
TB deaths	1.3m	374 000
Case fatality ratio (CFR)	1.3 / 9.3 = 14%	0.374 / 1.04 = 36%

What are the TB/HIV indicators collected by HIV surveillance?

TB incidence in HIV+ (per 100 person-year)



Cascade for prevention of TB in PLWH



HIV indicators

Indicator 2. Number and proportion of PLWH newly enrolled in HIV care who have been screened for tuberculosis

Indicator 3. Number and proportion of PLWH newly enrolled in care with active tuberculosis disease

TB indicator

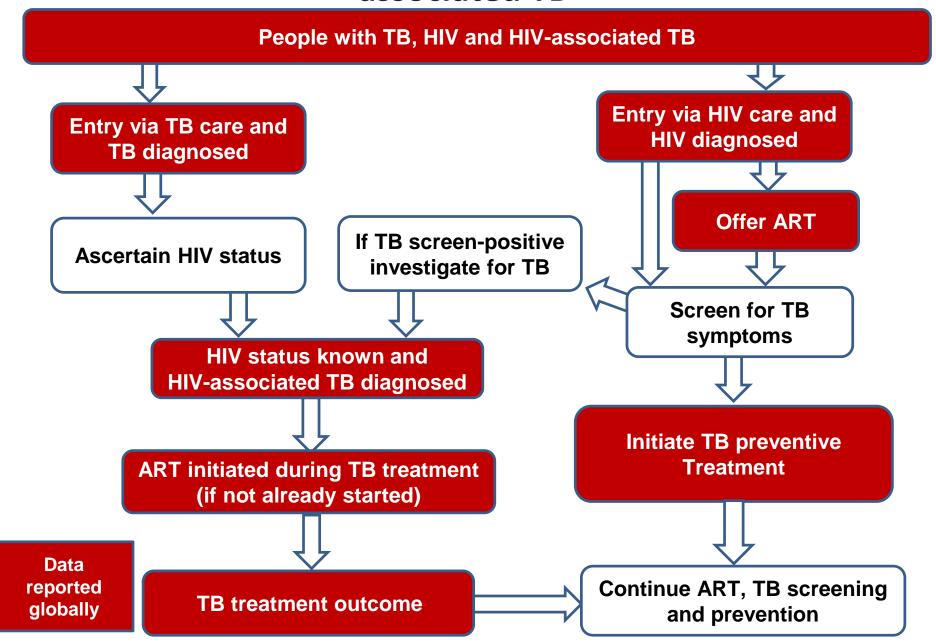
LTBI treatment coverage; % of PLWH newly enrolled started on LTBI treatment out of those eligible

Table 2.2 Summary of data source and data elements required for monitoring the joint management of HIV-associated TB

HIV patient card	Status at start of ART	Confirmed TB On TB treatment		
		TB-exposed infant		
	TB status	No signs or symptoms of TB Presumptive TB Unconfirmed/confirmed TB Type of TB TB/MDR-TB Rx (record month and year of starting TB/MDR-TB treatment and registration number)		
	TB preventive therapy	 Start/complete 		
	Other medicines dispensed	 Record TB / MDR-TB treatment regimen 		
	Investigations	 Xpert MTB/RIF, LF-LAM, TB sputum microscopy, CXR test and results 		
ART register (page 1)	TB confirmation	Active TB at start of ART		
	TB prevention	TB preventive therapy start and complete (month/year)		
	TB treatment	TB treatment start month/year and TB registration number		

http://www.who.int/hiv/pub/guidelines/person-centred-hiv-monitoring-guidelines/en/

Routine data on the cascade of care to address HIVassociated TB



Comparison of data reported on ART treatment for HIV-associated TB

List of countries with difference of >1000

	GTB	UNAIDS	Difference
India	23641	78 631	- 54 990
United Republic of Tanzania	7572	21 148	- 13 576
Uganda	4782	17 835	- 13 053
Nigeria	5902	12 064	- 6 162
Zimbabwe	2695	8 642	- 5 947
Cameroon	2010	6 5 1 5	- 4 505
Haiti	185	2 953	- 2768
Indonesia	325	3 059	- 2734
Central African Republic	0	1 979	- 1 979
Vietnam	1497	3 396	- 1 899
Ghana	491	1 617	- 1 126
Malawi	4519	2 061	2 458
South Africa	69959	57 755	12 204

^{*} Data from 2011

Important to cross reference HIV and TB registers and share data between programmes!

Summary

- The TB/HIV cascade is complex, resulting in worse outcomes for TB/HIV patients
- Close scrutiny of the cascade over time and at sub-national level is key for identifying the gaps in access and for improving patient follow-up
- Review of TB/HIV indicators in both the TB and HIV recording and reporting systems is crucial for verification of data
- DHIS2 and unique patient identifiers provide a great opportunity for simplification