Decoding Hidden Messages in the Indicators for Monitoring and Evaluating National Tuberculosis Programs in High TB Burden Countries

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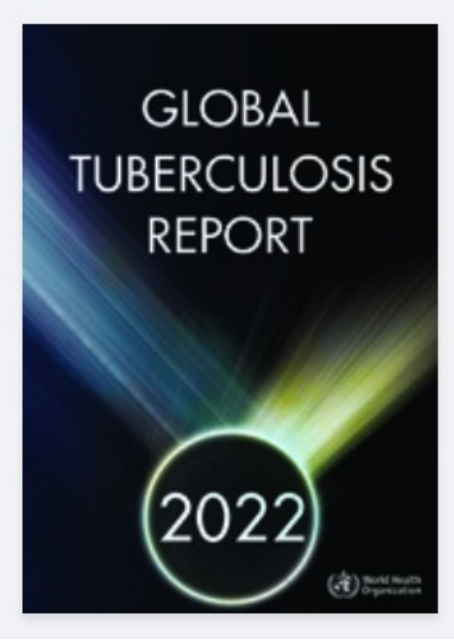
Presentation outline

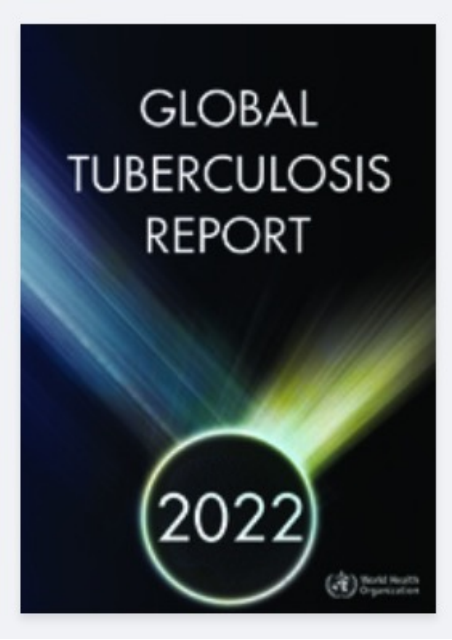
- The context
- Tuberculosis treatment outcome categories: A recap
- Indicators used for Global Reporting on TB
- Hidden messages from Indicators used for Global Reporting:
  - TB case detection rate
  - Treatment success rate
  - DOTS coverage
  - Surveillance of multidrug-resistant TB
  - HIV seroprevalence among TB patients

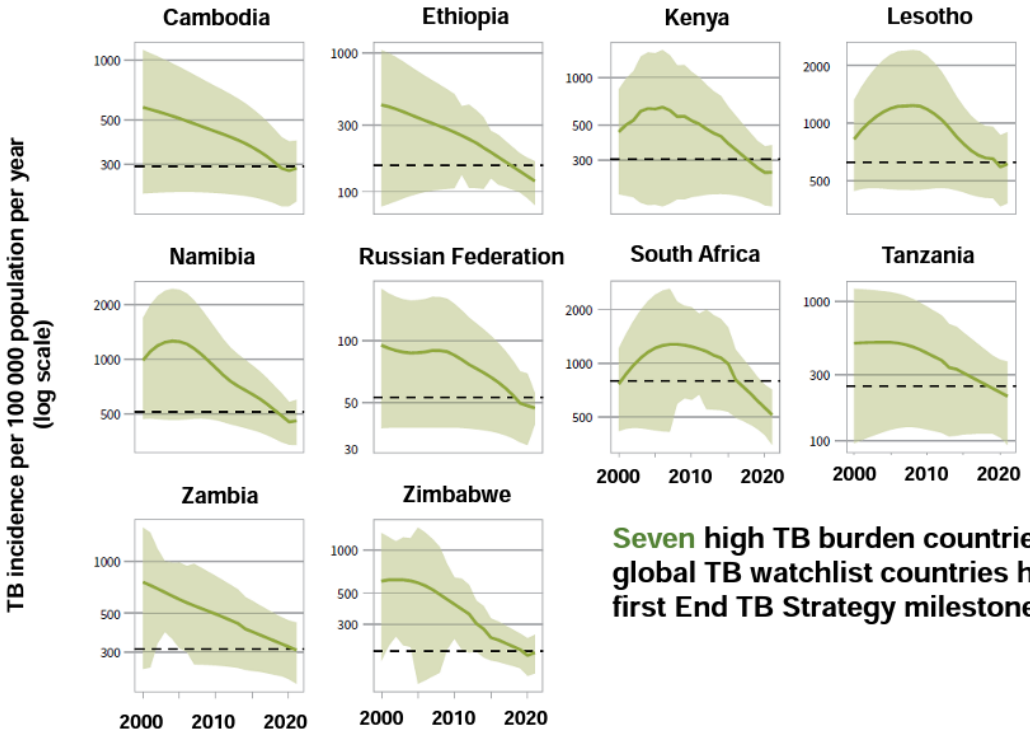
The context



Progress made in the years up to 2019 (Before COVID) has slowed, stalled or reversed, and global TB targets are off track.

The context…



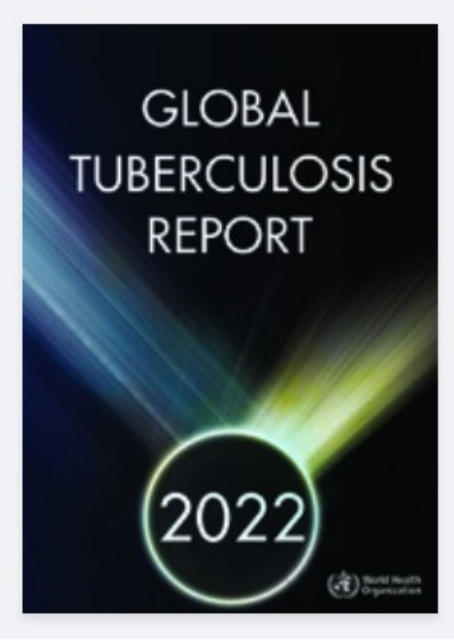


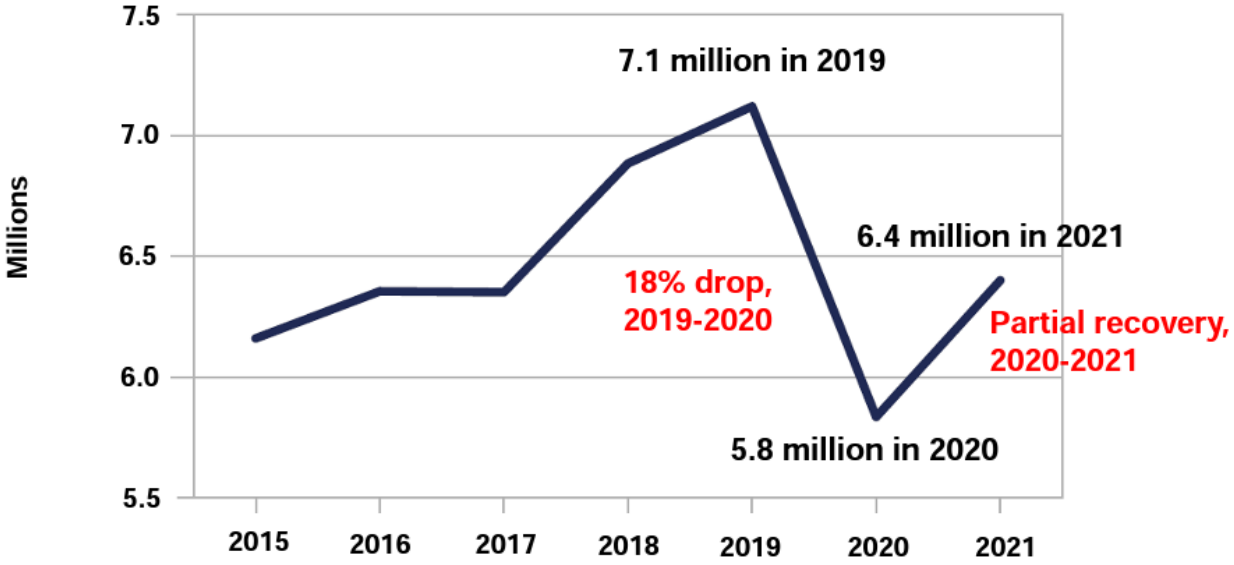
Seven high TB burden countries and all three global TB watchlist countries have reached the first End TB Strategy milestone (dashed line)*

World Health Organization

Until 2020, progress on containing TB was rapidly progressing in multiple countries, including the African Region…

The context…

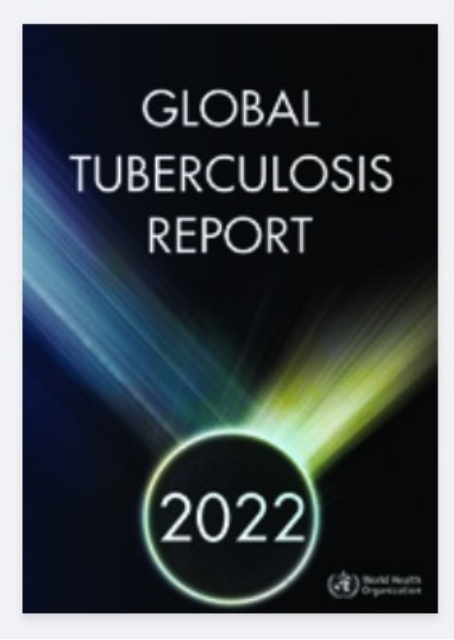


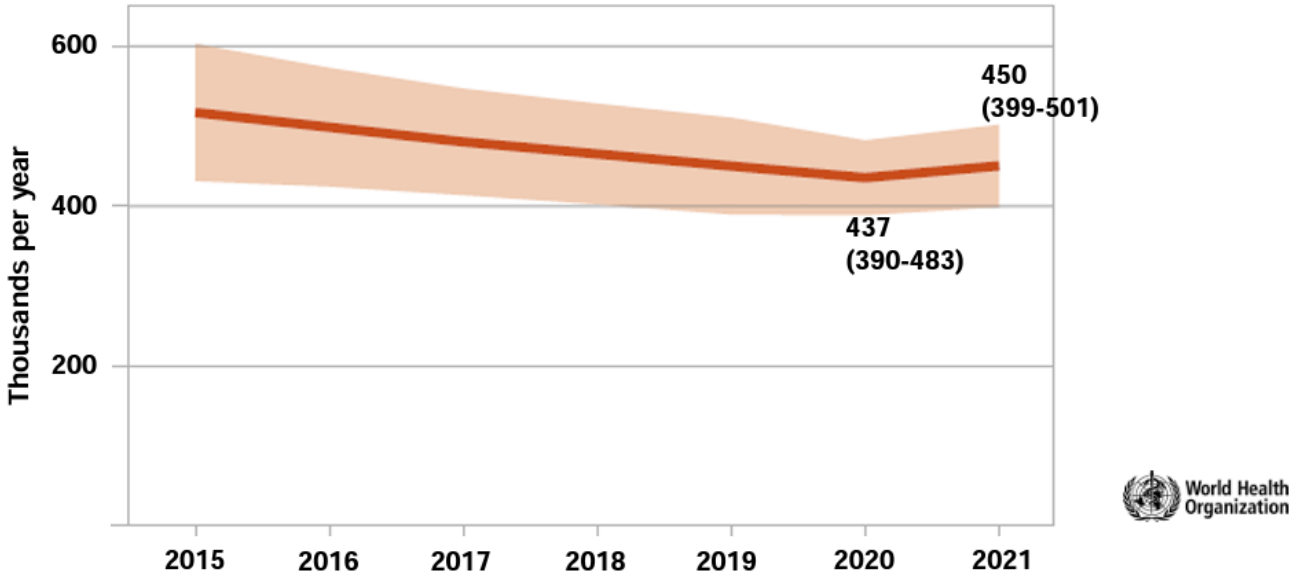


World Health Organization

The number of people with undiagnosed and untreated TB has grown since COVID…

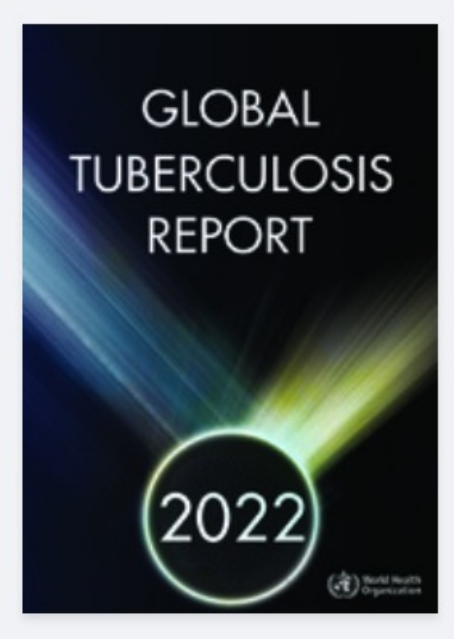
The context…



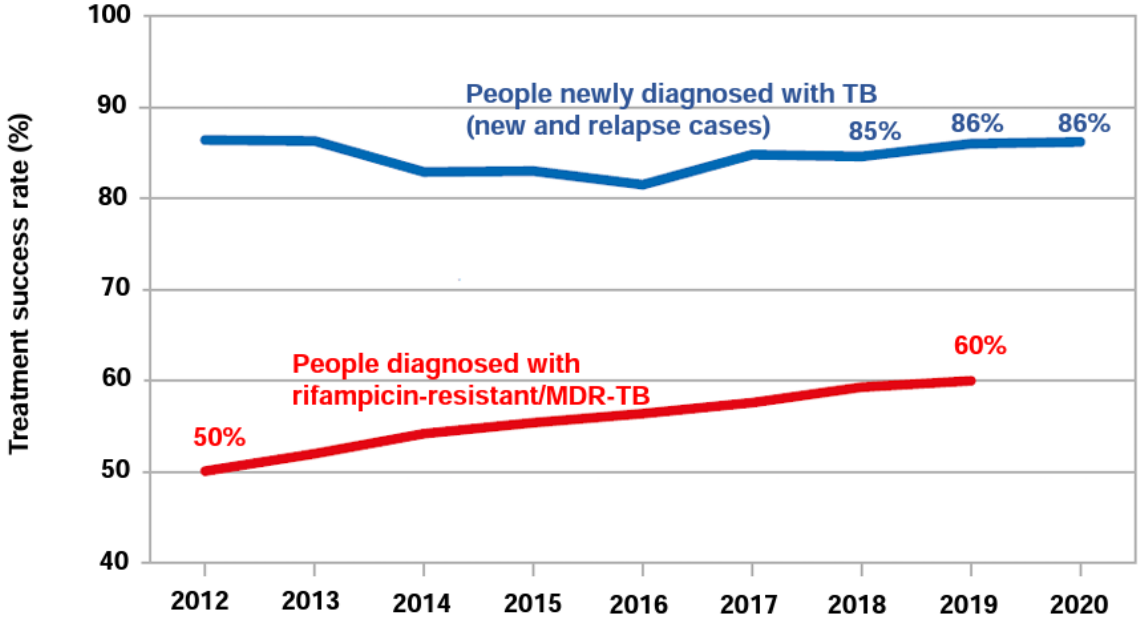


Number of people developing MDR/RR-TB has also increased

The context…



Some positive findings…..



World Health Organization

Tuberculosis treatment outcome categories: A recap

Tuberculosis treatment outcome categories

Treatment outcome	Definition
Cured	
Treatment Completed	
Treatment success	
Died	
Treatment failed	
Lost to follow-up	
Transfer	
Not evaluated	
Still on treatment	

Source: Holden, I. K., Andersen, P. H., Wejse, C., Lillebaek, T., & Johansen, I. S. (2020). Review of tuberculosis treatment outcome reporting system in Denmark, a retrospective study cohort study from 2009 through 2014. *BMC health services research*, *20*(1), 83.

Tuberculosis treatment outcome categories

Treatment outcome	Definition
Cured	TB confirmed by culture at the beginning of treatment and culture negative in the last month of treatment and on at least one previous occasion.
Treatment Completed	TB treatment completed without evidence of failure, but without fulfilling the above mention criteria
Treatment success	The sum of cured and treatment completed
Died	
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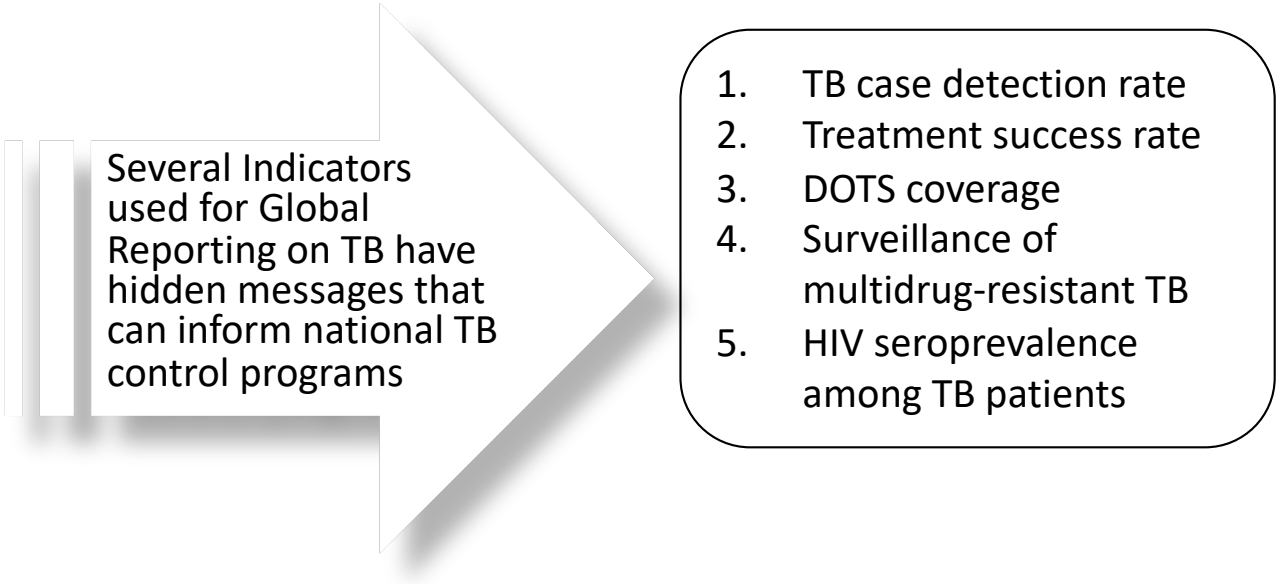
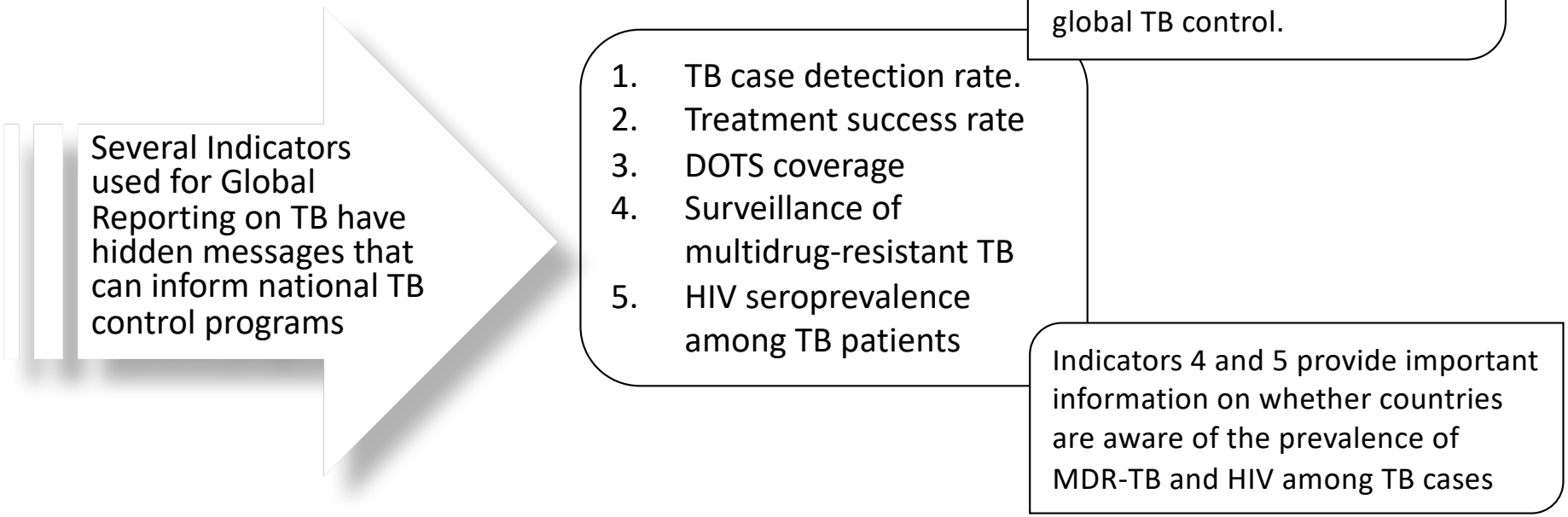
Source: Holden, I. K., Andersen, P. H., Wejse, C., Lillebaek, T., & Johansen, I. S. (2020). Review of tuberculosis treatment outcome reporting system in Denmark, a retrospective study cohort study from 2009 through 2014. *BMC health services research*, *20*(1), 83.

Indicators used for Global Reporting on TB

Several Indicators used for Global Reporting on TB have hidden messages that can inform national TB control programs


Several Indicators used for Global Reporting on TB have hidden messages that can inform national TB control programs
1. TB case detection rate
2. Treatment success rate
3. DOTS coverage
4. Surveillance of multidrug-resistant TB
5. HIV seroprevalence among TB patients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2. Treatment success rate
3. DOTS coverage
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5. HIV seroprevalence among TB patients
Indicators 1 to 3 are reported to WHO every year by national TB programs and are included in the annual WHO report on global TB control.
Indicators 4 and 5 provide important information on whether countries are aware of the prevalence of MDR-TB and HIV among TB cases

Indicators For Monitoring And Evaluating National Tuberculosis Programs

Indicators 1,2 & 3 allow the following comparisons between countries:

- Monitoring trends in TB case reporting and age/sex distribution of pulmonary smear-positive cases,
- Measure NTPs progress towards international targets for case detection, treatment success, and DOTS coverage.
- Comparisons of the results of DOTS with other strategies in routine conditions.

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Inconsistent reporting of these indicators may imply the following:

- Inconsistent TB case reporting means new TB cases are spreading without control [Each TB case leads to x new cases]
- Without case reporting and monitored treatment through DOTS, progress on treatment success is unknown
- Strategies for TB control in routine conditions needs constant check for effectiveness and coverage

Indicators 4 and 5

- Indicators 4 and 5 provide important information on whether countries are aware of the prevalence of MDR-TB and HIV among TB cases.
- MDR-TB cases make TB drugs less effective.
- HIV increases the risk of TB infection.
- Some countries are making strides in reducing new infections but are failing to control MDR cases.
- The threat of TB/HIV syndemic is not yet under control in many many developing countries

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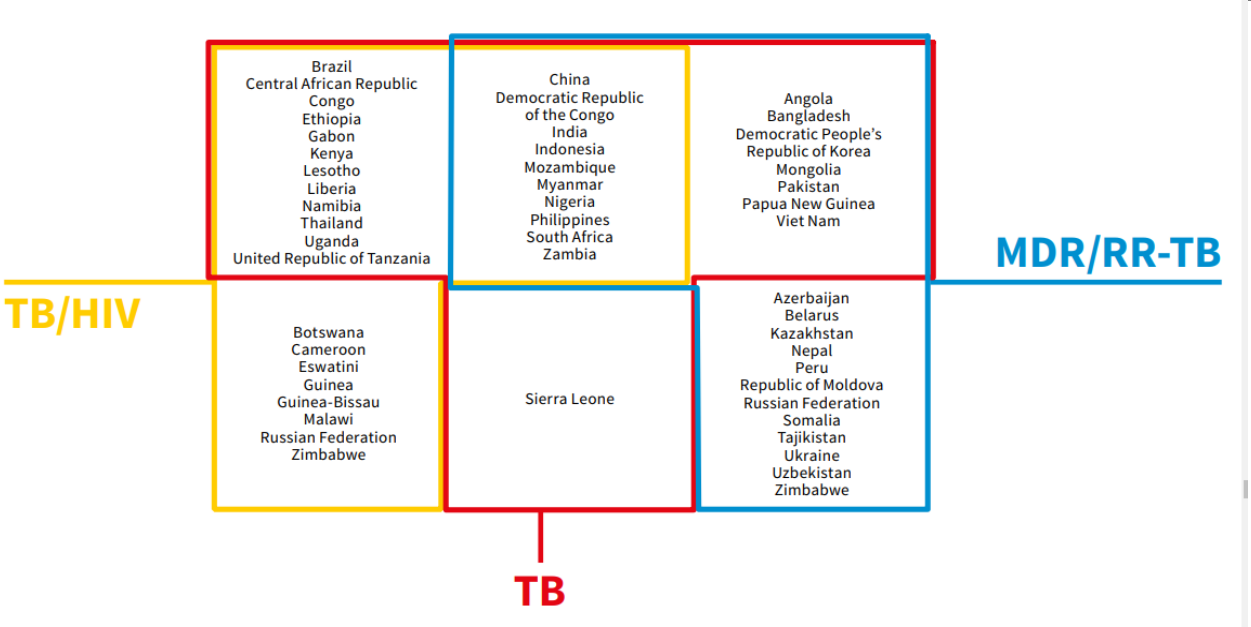

Hidden messages from Indicators used for Global Reporting

TB Case Detection Rate

1. Case detection rate: all forms

$$\frac{\text{Number of new TB cases detected}}{\text{Estimated number of new TB cases countrywide}} \times 100$$

2. Case detection rate: new smear-positive cases

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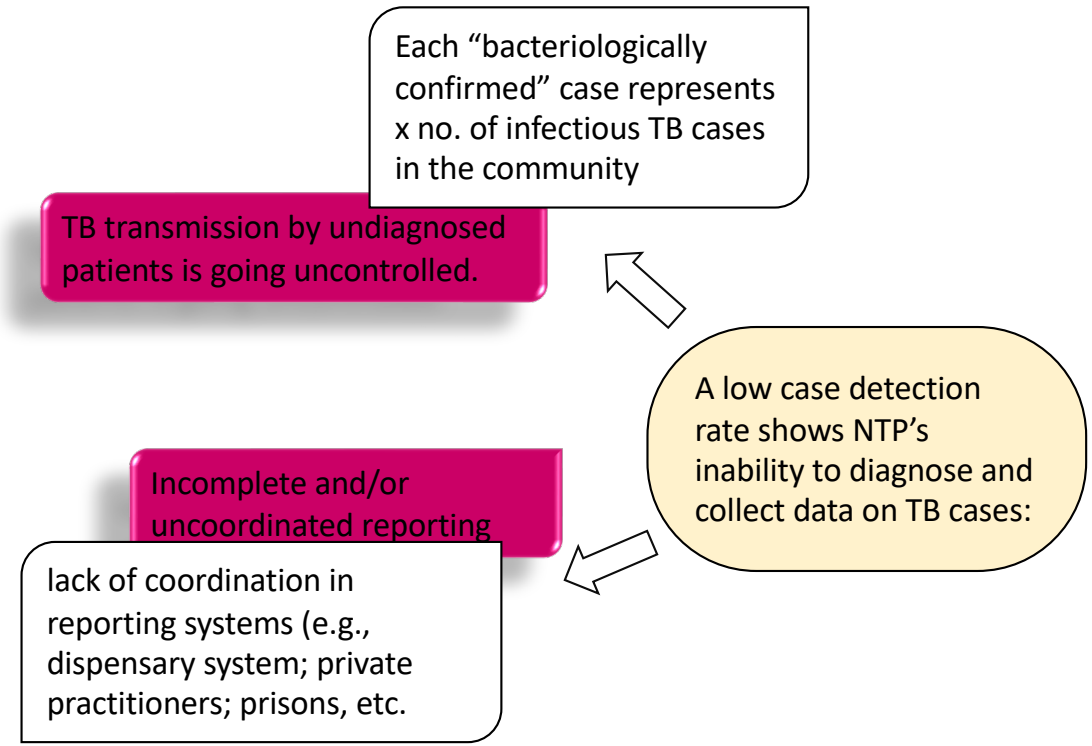
Definition: The percentage of TB cases detected (diagnosed and reported to the national health authority) among the total number of TB cases estimated to occur countrywide each year.

NB: This indicator can be analyzed in terms of all forms of TB (pulmonary and extrapulmonary) or in terms of smear-positive TB cases only.

What it tells national infection control programs:



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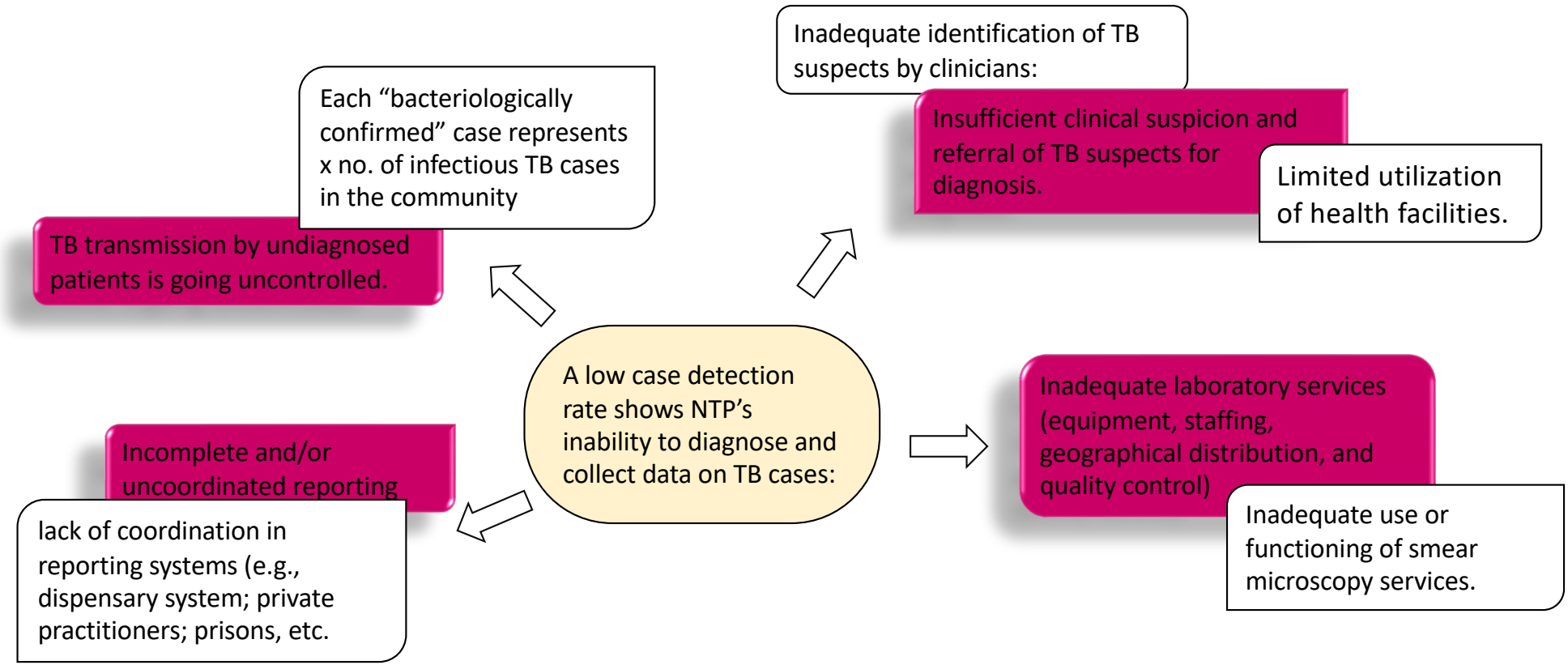
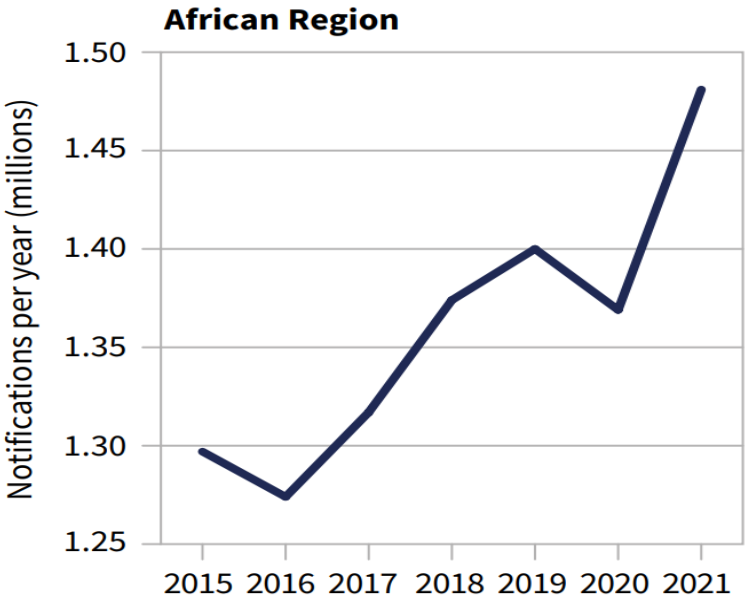
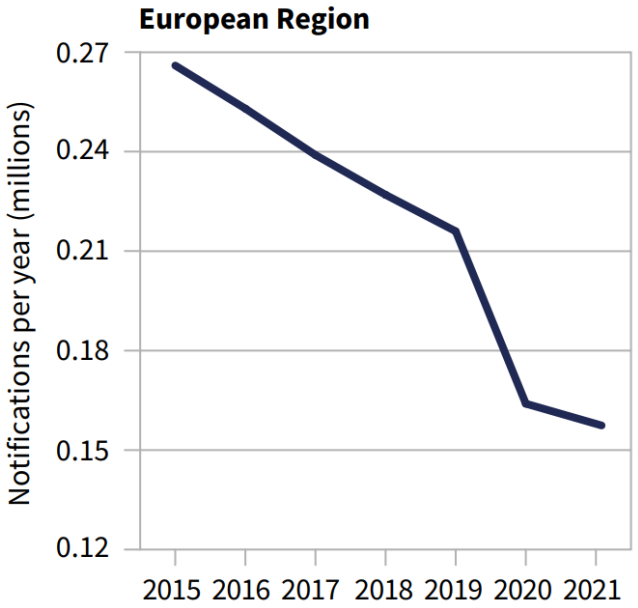
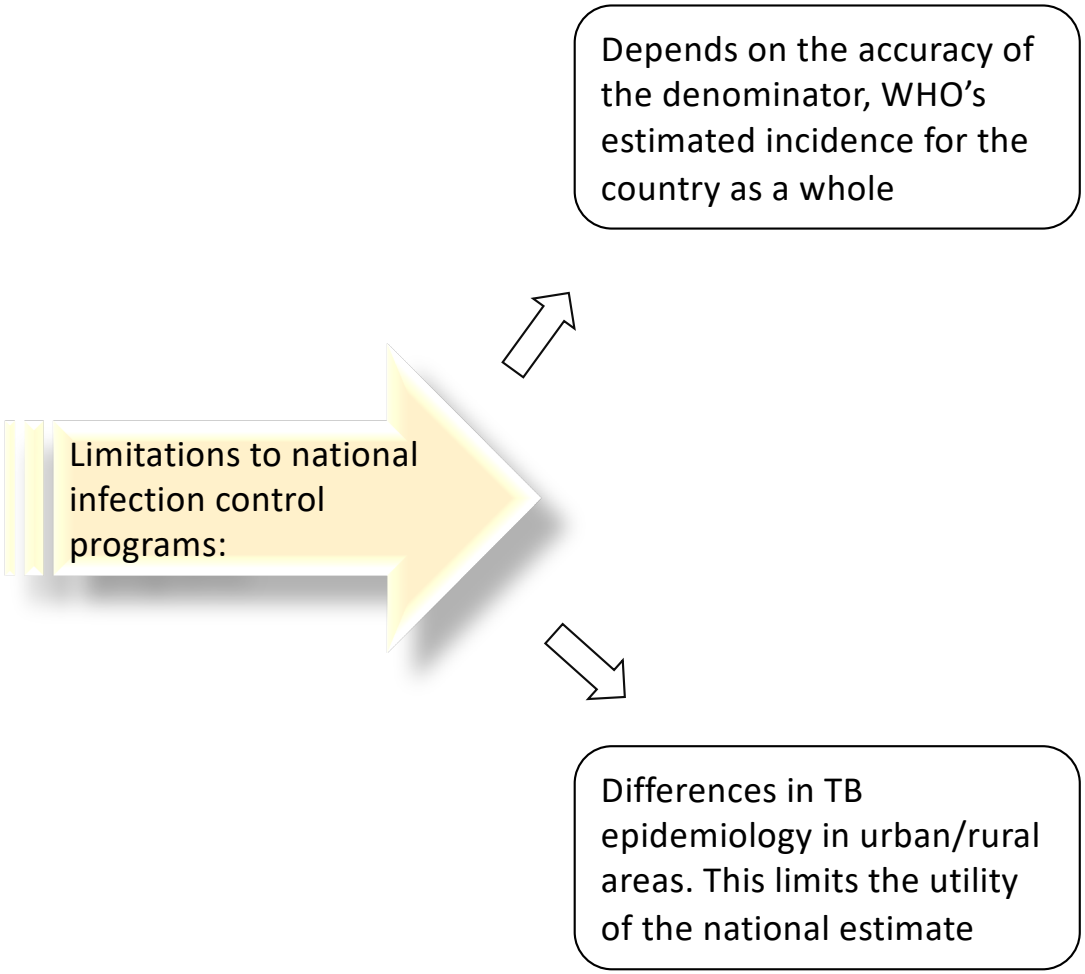


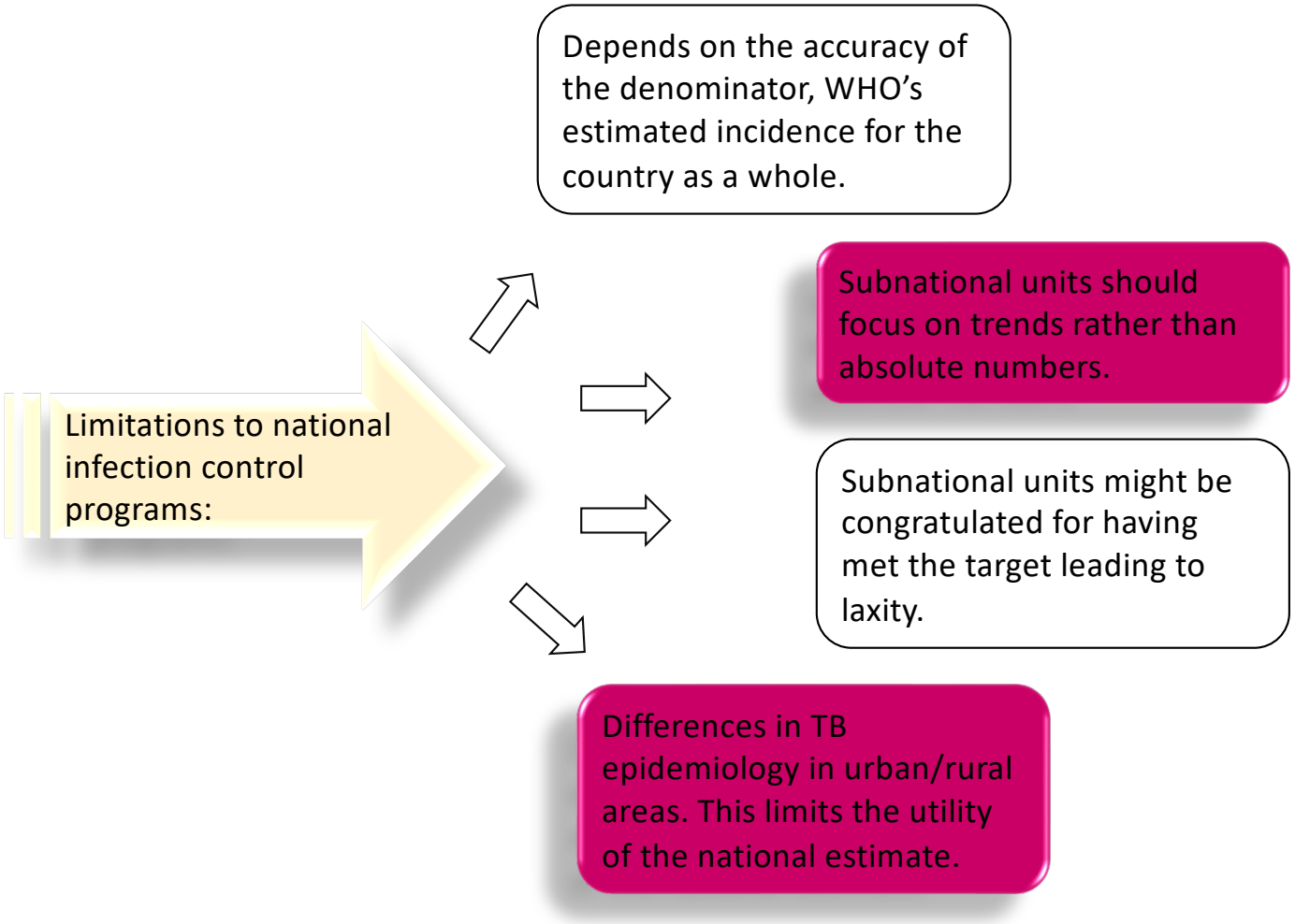


The trend of TB notifications in the African region sometimes wobbles down significantly. The implications are serious



The threat of TB epidemics is ever present anywhere in the world!


Limitations to national infection control programs:
Depends on the accuracy of the denominator, WHO's estimated incidence for the country as a whole
Differences in TB epidemiology in urban/rural areas. This limits the utility of the national estimate


Limitations to national infection control programs:
Depends on the accuracy of the denominator, WHO's estimated incidence for the country as a whole.
Subnational units should focus on trends rather than absolute numbers.
Subnational units might be congratulated for having met the target leading to laxity.
Differences in TB epidemiology in urban/rural areas. This limits the utility of the national estimate.

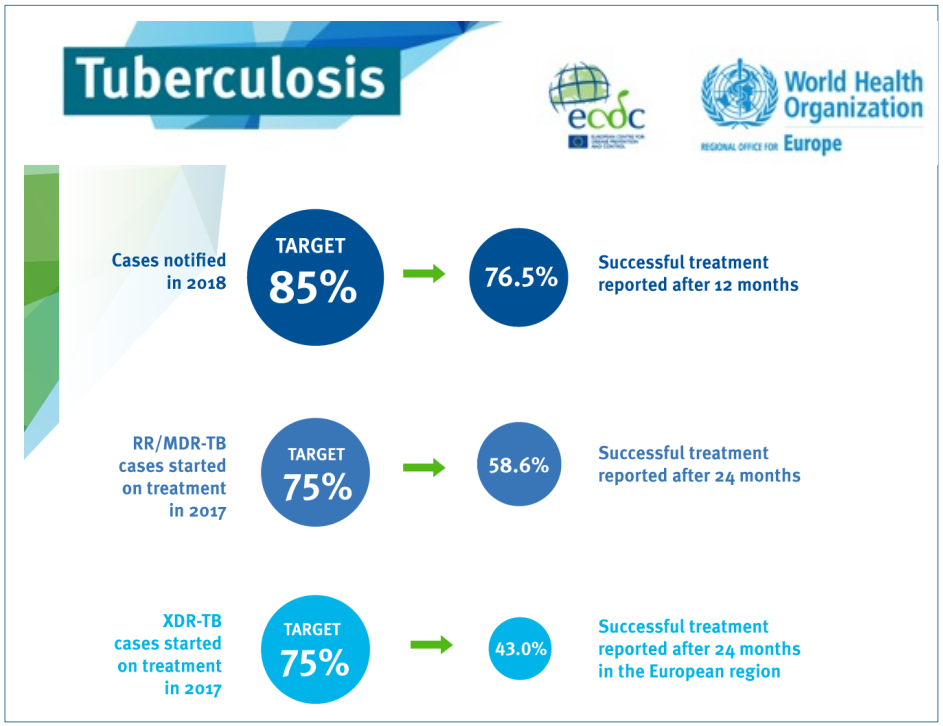
Treatment Success Rate

$$\frac{\text{Number of new smear-positive pulmonary TB cases registered in a specified period that were cured plus the number that completed treatment}}{\text{Total number of new smear-positive pulmonary TB cases registered in the same period}} \times 100$$

Definition: The percentage of a cohort of TB cases registered in a specified period that successfully completed treatment, whether with **bacteriologic evidence** of success ("cured") or without ("treatment completed").

“Successful treatment” without bacteriologic evidence is commonly reported globally

Treatment outcomes in the European region



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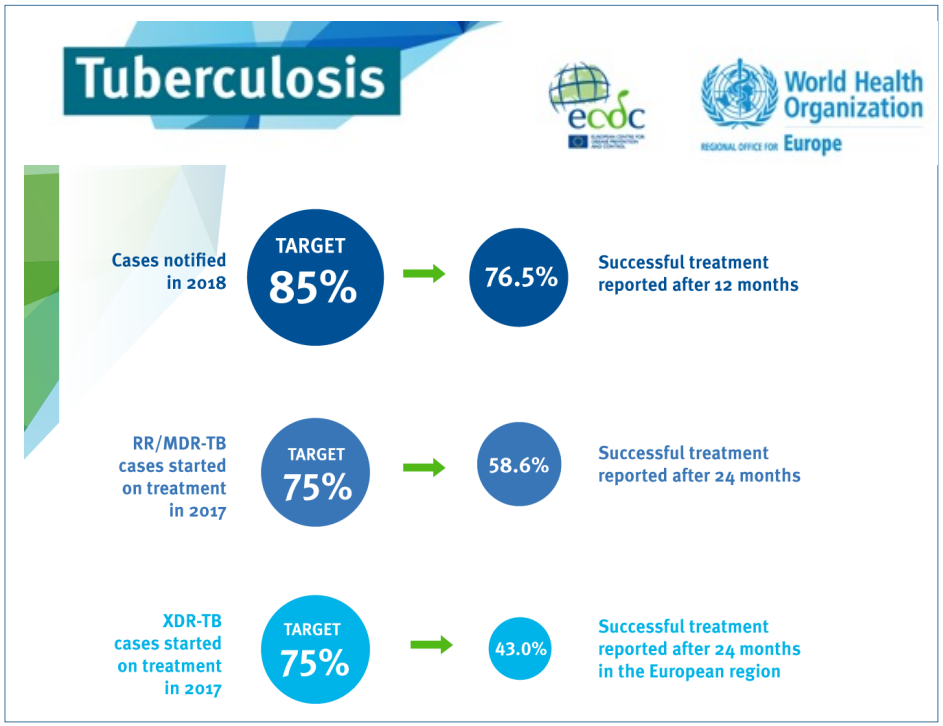


Treatment success in the African Region

Treatment success rate among adult patients in Sub-Saharan Africa with tuberculosis is about 76 per cent, which is less than the WHO target of at least 90 per cent

WHO data shows that in Africa, **Angola in 2019 had the lowest TB treatment success rate of 34 per cent and Burundi has the highest success rate of 92.**

Researchers analysed 31 studies with a total sample size of 18,194 participants from seven countries in Sub-Sahara Africa including Ethiopia, Nigeria, Uganda and Zimbabwe.

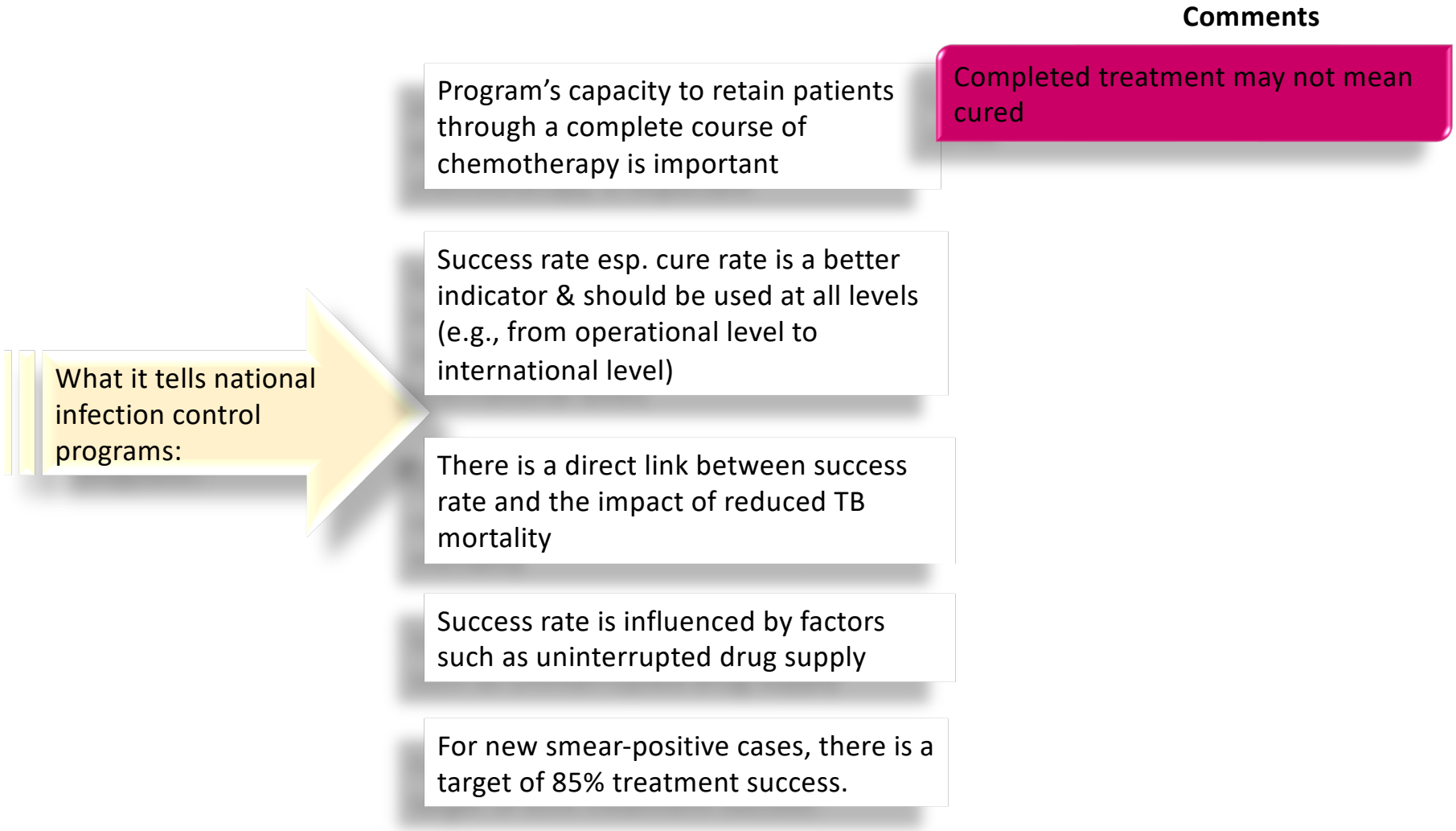
"They found a pooled **cure rate of 64 per cent** that varied from 55 to 73 per cent which is substantially lower than **WHO recommended cure rate of 85 per cent"**.

Source: Jonathan Izudi et al. Treatment success rate among adult pulmonary tuberculosis patients in Sub-Saharan Africa: a systematic review and meta-analysis (*BMJ Open*, 6 September 2019)

Comments

What it tells national infection control programs:

- Program's capacity to retain patients through a complete course of chemotherapy is important
- Success rate esp. cure rate is a better indicator & should be used at all levels (e.g., from operational level to international level)
- There is a direct link between success rate and the impact of reduced TB mortality
- Success rate is influenced by factors such as uninterrupted drug supply
- For new smear-positive cases, there is a target of 85% treatment success.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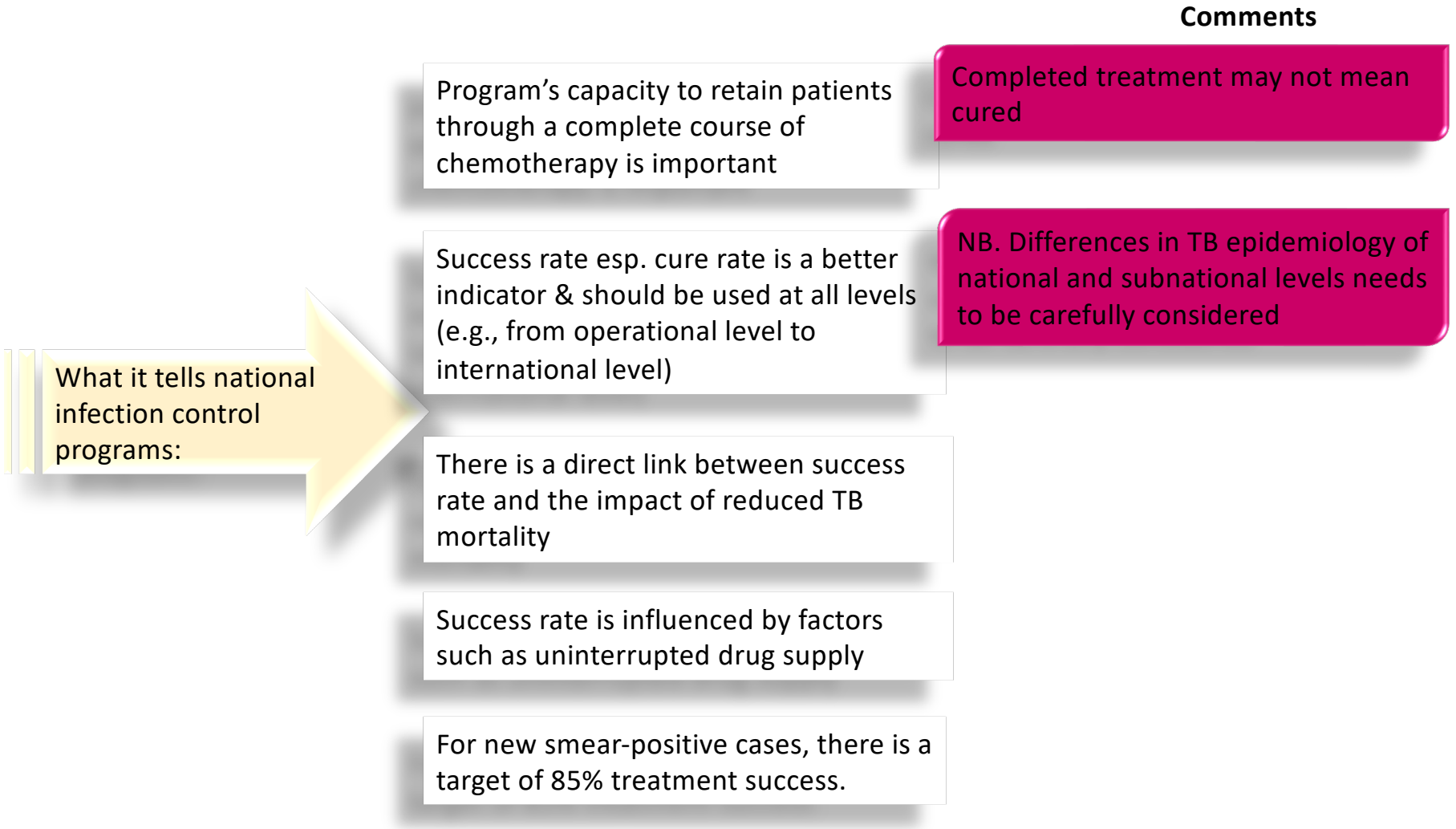
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What it tells national infection control programs:

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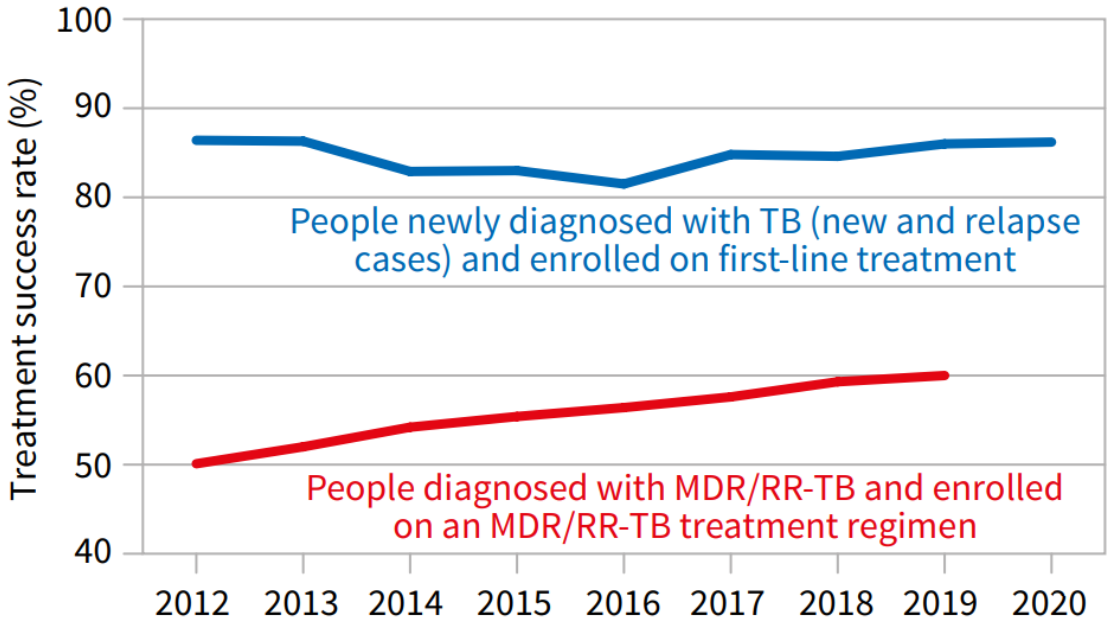
Program's capacity to retain patients through a complete course of chemotherapy is important	Completed treatment may not mean cured
Success rate esp. cure rate is a better indicator & should be used at all levels (e.g., from operational level to international level)	NB. Differences in TB epidemiology of national and subnational levels needs to be carefully considered
There is a direct link between success rate and the impact of reduced TB mortality	
Success rate is influenced by factors such as uninterrupted drug supply	Treatment interruptions need to be tracked and reported in quarterly cohort reports
For new smear-positive cases, there is a target of 85% treatment success.	

Global success rates for people treated for TB (2012-2020) shows that we need to focus more on cure rate



World Health Organization

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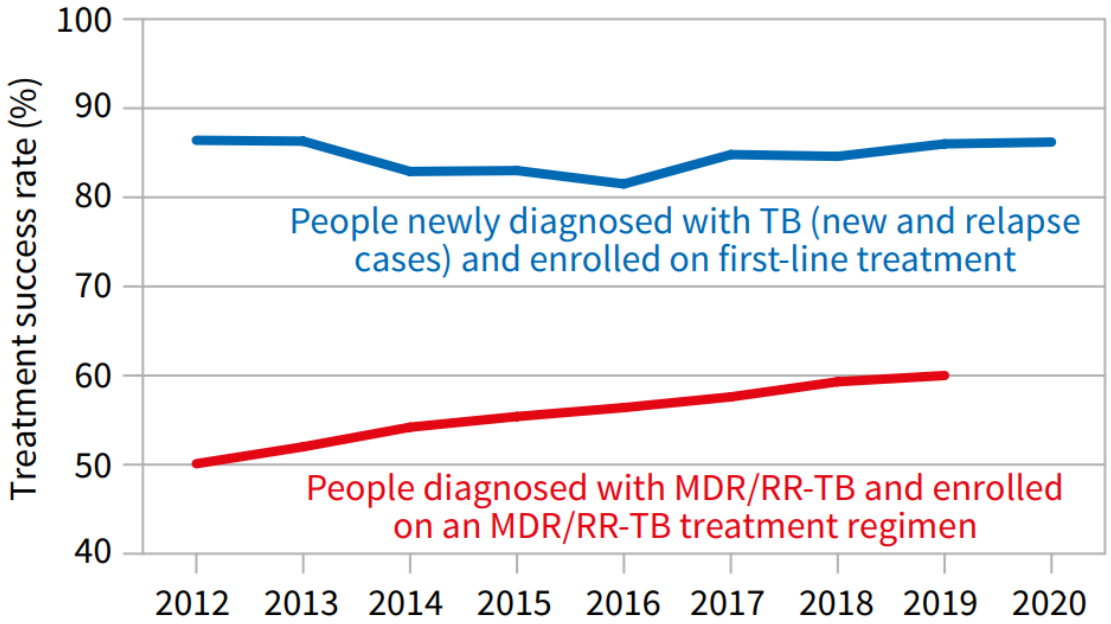
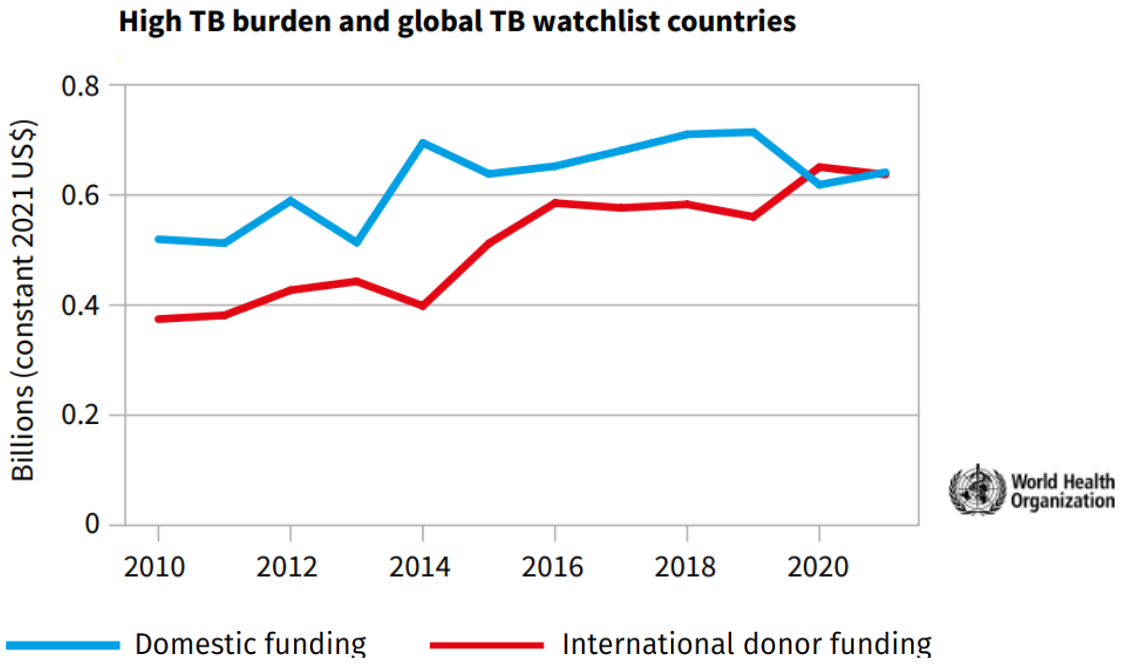


NB. Perhaps MDR cases are crippling up while the globe is celebrating treatment success without evidence of cure.

World Health Organization

Domestic funding of TB prevention, diagnostic and treatment services in 136 low and middle-income countries (2010–2021)



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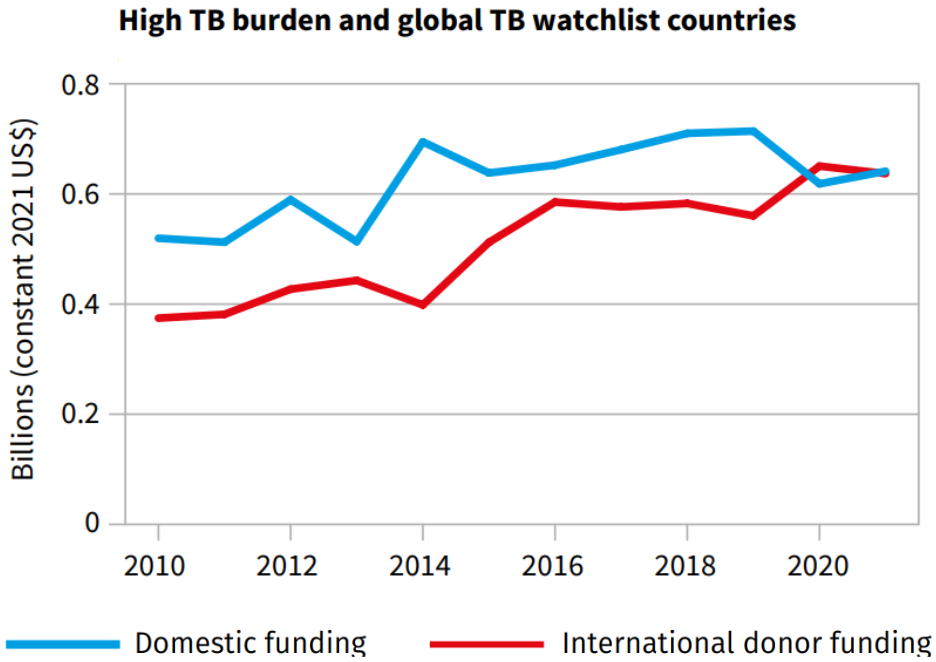

In 2018, WHO member countries committed to increasing access to rapid tests and investigations to diagnose TB disease and TB infection (such as Xpert MTB/Rif, chest radiography, urine LAM, TST/IGRA). Progress?

World Health Organization

Low domestic funding of TB prevention, diagnostic and treatment services in 136 low and middle-income countries (2010–2021) is a threat to global TB control (MDR will likely increase!)

Some words of caution on treatment success

Some cases with failure or default may go on to be cured (after reregistration for retreatment); Some cured cases may go on to relapse.

All outcomes except death are not permanent. NTPs must take note of this (and the implications on budgets).

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Success is an outcome of treatment regimens, not patient results.

To obtain outcomes of regimens, more sophisticated relational linkages must be introduced into the record-keeping systems (e.g. bioavailability of drugs, etc.)

Dots Coverage

$$\frac{\text{Population living in the area of basic management units implementing the DOTS strategy}}{\text{Total population}} \times 100$$

Definition: Percentage of the population living in the area of basic management units of implementing the program.

What you can't measure, you can't manage!

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Recommendations

2.1.4 The following treatment administration options may be offered to patients on TB treatment:

a) Community- or home-based DOT is recommended over health facility-based DOT or unsupervised treatment (Conditional recommendation, moderate certainty in the evidence).

b) DOT administered by trained lay providers or health-care workers is recommended over DOT administered by family members or unsupervised treatment (Conditional recommendation, very low certainty in the evidence).

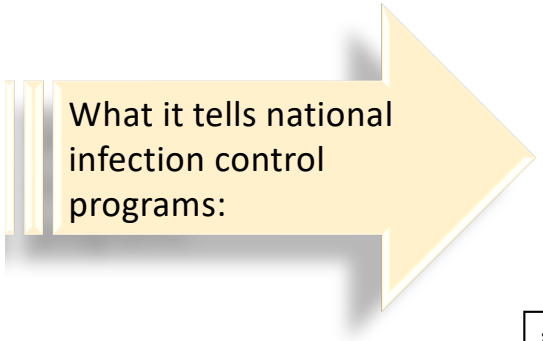
c) Video observed treatment (VOT) may replace DOT when the video communication technology is available and it can be appropriately organized and operated by health-care providers and patients (Conditional recommendation, very low certainty in the evidence).


What DOTS Measures:
the extent of a country's population "covered" by the implementation program. The goal is to cover 100% of the population.

What it tells national infection control programs:

program population “coverage” does not measure “access” to care and program performance.

Infection control programs should use other methods to ensure access to care such as community treatment monitoring



program population “coverage” does not measure “access” to care and program performance.

Infection control programs should use other methods to ensure access to care such as community treatment monitoring

it does not provide information on geographic distance or financial or other barriers to care

Facility based DOT needs wider access to facilities which is far off in developing countries

Surveillance of Multi-drug Resistant TB

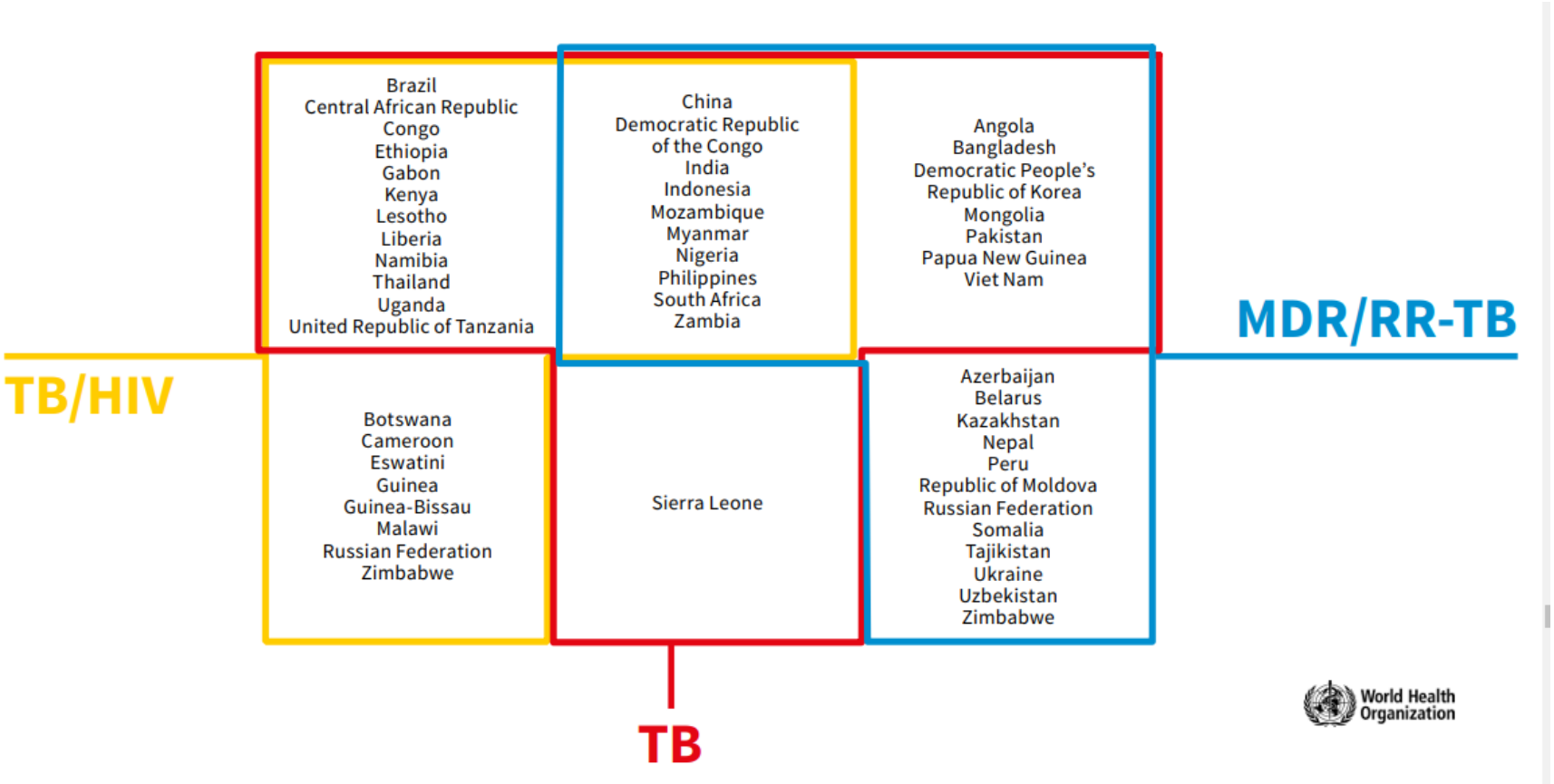
This is a yes/no indicator in the global reporting

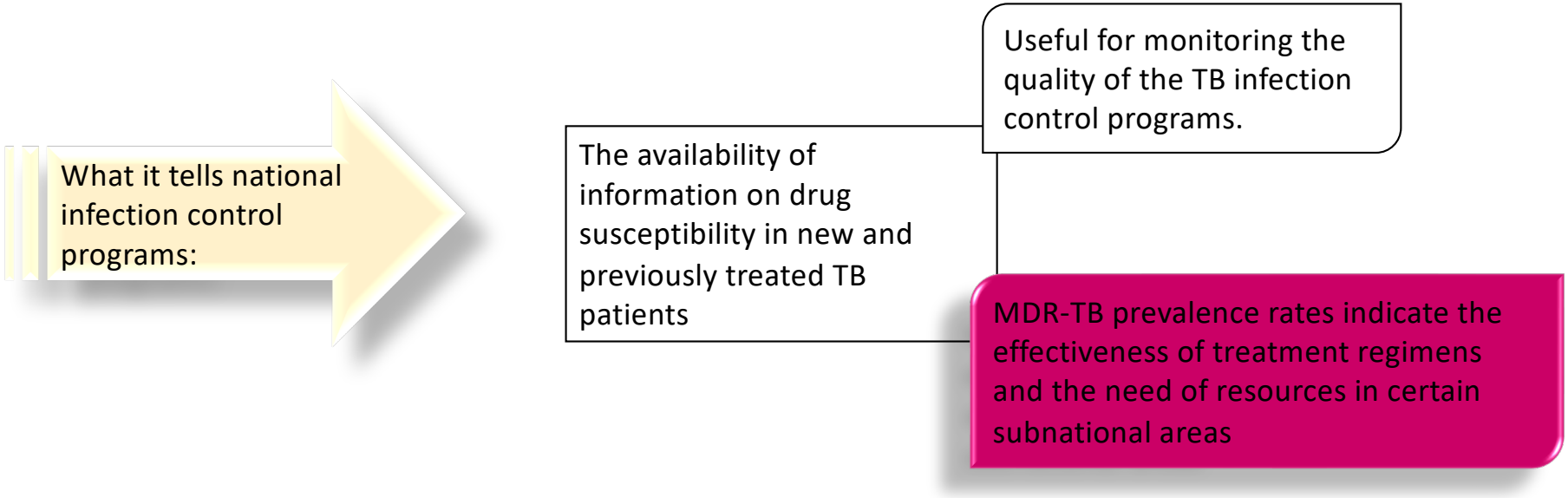
Definition: The national TB control program should assess the prevalence of multidrug-resistant TB at least once within a 5-year period.

Very few developing countries can afford this exercise every five years.

More countries need to develop capacity for whole genome sequencing of MTB isolates, leveraging on the COVID equipment.

The three global lists of high-burden countries for TB, HIV-associated TB and MDR/RR-TB to be used by WHO in the period 2021–2025, and their areas of overlap

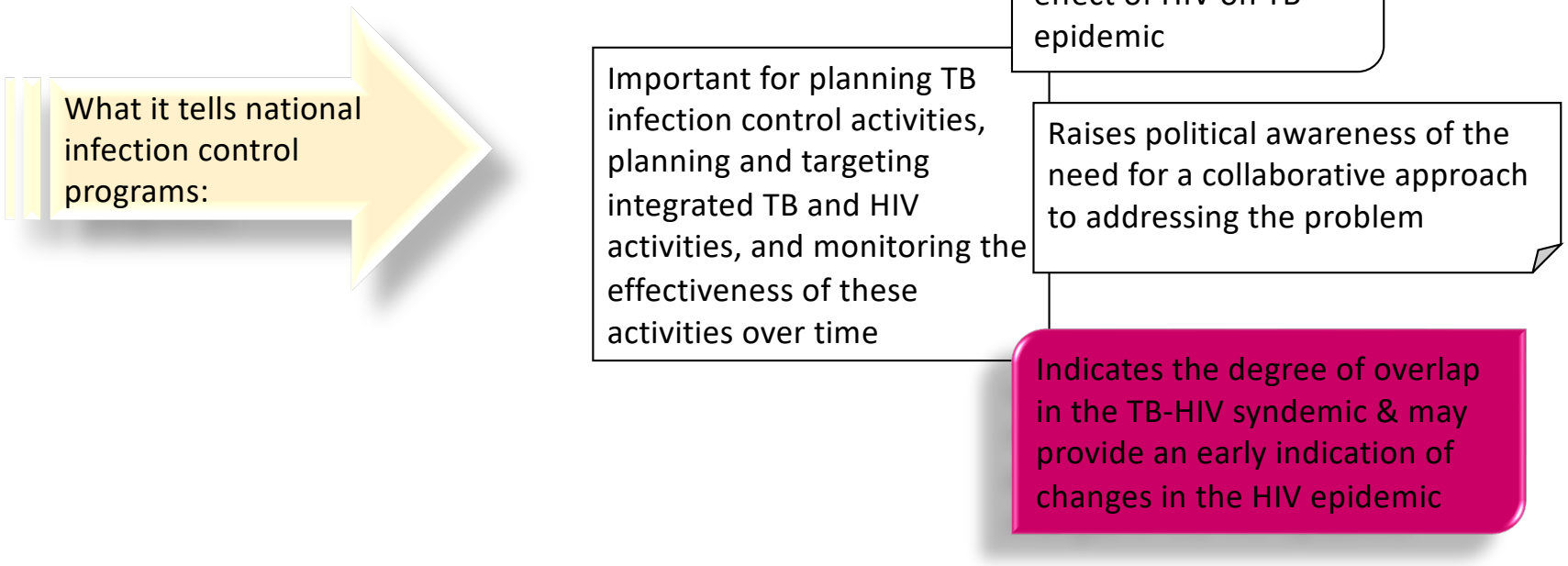



What it tells national infection control programs:
The availability of information on drug susceptibility in new and previously treated TB patients
Useful for monitoring the quality of the TB infection control programs.
MDR-TB prevalence rates indicate the effectiveness of treatment regimens and the need of resources in certain subnational areas

HIV Sero-prevalence among TB Patients

$$\frac{\text{Total number of newly registered TB patients (registered over a given period of time) who are HIV positive}}{\text{Total number of newly registered TB patients (registered over the same given time period) who were tested for HIV and included in the surveillance system}} \times 100$$

Definition Number of all newly registered TB patients who are HIV positive, expressed as a percentage of all registered TB patients


What it tells national infection control programs:
Important for planning TB infection control activities, planning and targeting integrated TB and HIV activities, and monitoring the effectiveness of these activities over time
Is an indication of the effect of HIV on TB epidemic
Raises political awareness of the need for a collaborative approach to addressing the problem
Indicates the degree of overlap in the TB-HIV syndemic & may provide an early indication of changes in the HIV epidemic

Take home message

- The threat of TB infection is not yet under control in many developing countries
- Several Indicators used for Global Reporting on TB have hidden messages that can inform national TB control programs
- The global TB indicators tell an important story that urges us to take extra action to contain TB

Thank you!

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www.webbertraining.com/schedulep1.php

September 28, 2023	*(FREE Teleclass)* **MENTAL HEALTH, HEALTHY LIFESTYLE BEHAVIORS AND ORGANIZATIONAL WELLNESS SUPPORT DURING THE COVID-19 PANDEMIC IN INFECTION PREVENTION PROFESSIONALS: IMPLICATIONS FOR ACTION** Speaker: **Bernadette Mazurek Melnyk**, The Ohio University
October 12, 2023	**MANAGEMENT PRACTICES TO SUPPORT INFECTION PREVENTION** Speaker: **Ann Scheck McAlearney**, Ohio State University College of Medicine
October 19, 2023	*(FREE Teleclass)* **CBIC UPDATE 2023** Speaker: **Prof. Elaine Larson**, CBIC President, 2023
October 20, 2023	*(FREE Teleclass)* **SPECIAL LECTURE FOR CLEAN HOSPITALS DAY** Speaker: **Prof. Didier Pittet**, University of Geneva, Faculty of Medicine
October 26, 2023	**PULLING THE PLUG ON THE SINK DRAIN** Speaker: **Prof. Jean-Yves Maillard**, Cardiff University

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