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*Regional workshop on accelerating the uptake of the latest WHO guidance on
the management of DR-TB in the African region,
Dar es Salaam (2-3 July 2024)*

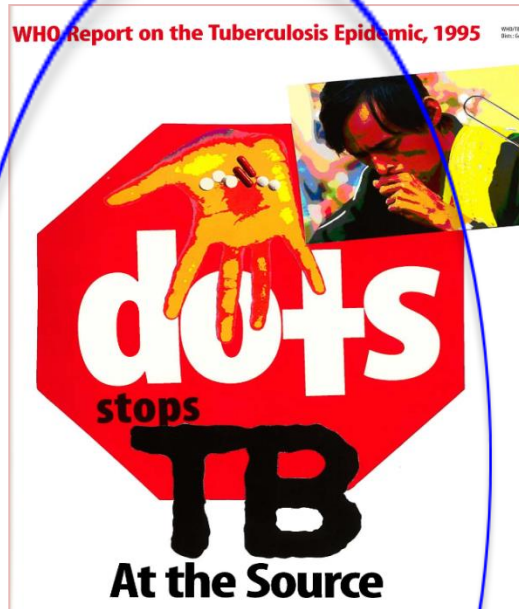
WHO consolidated guidelines on TB diagnostics – focus on DR-TB diagnosis

By Jean de Dieu IRAGENA

iragenaj@who.int

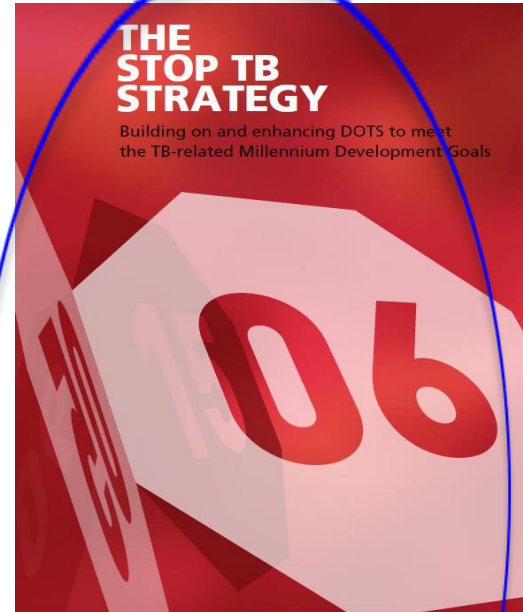
HQ/GTB and AFRO/HTH and STI Programme

Evolution of WHO strategies and targets



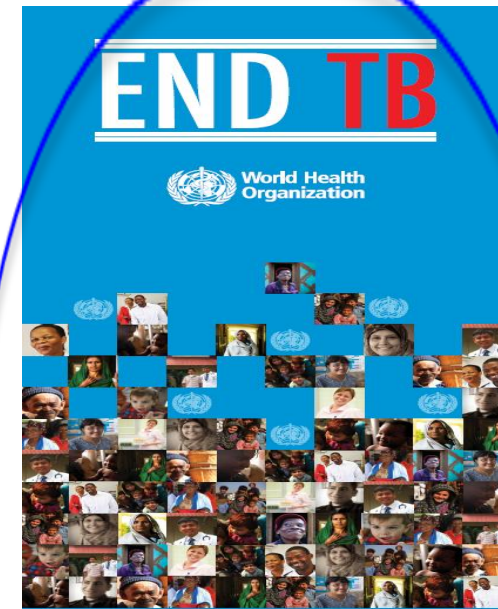
1994-2005

70% case detection
85% Rx success



2006-2015

Incidence reduced (MDG)
Prevalence & death: by
50% vs 1990



2016-2035

<10 TB cases per
100,000 population



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**GLOBAL TB
PROGRAMME**

END TB

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WHO guidelines on diagnostics for TB



1994-2005

2006-2015

- 2007:
 - Automated liquid culture
 - Rapid speciation
- 2008:
 - 1st line LPA
 - DST to 2nd line drugs
- 2010:
 - LED microscopy
 - Non-commercial DST methods
 - Xpert MTB/RIF
- 2011: TB IGRAs

- 2013: Xpert MTB/RIF Update
- 2015:
 - TB-LAMP
 - Urine LAM

2016-2035

- 2016:
 - 1st line LPA (update)
 - 2nd line LPA
- 2017: Xpert MTB/RIF Ultra
- 2019: Urine LAM (update)
- **2021: Consolidated guidelines on TB Diagnosis**
 - Includes TrueNAT

WHO guidelines on diagnostics for TB, 2024



<https://iris.who.int/handle/10665/376221>

WHO
consolidated
guidelines on
tuberculosis

Module 3: Diagnosis
Rapid diagnostics for
tuberculosis detection

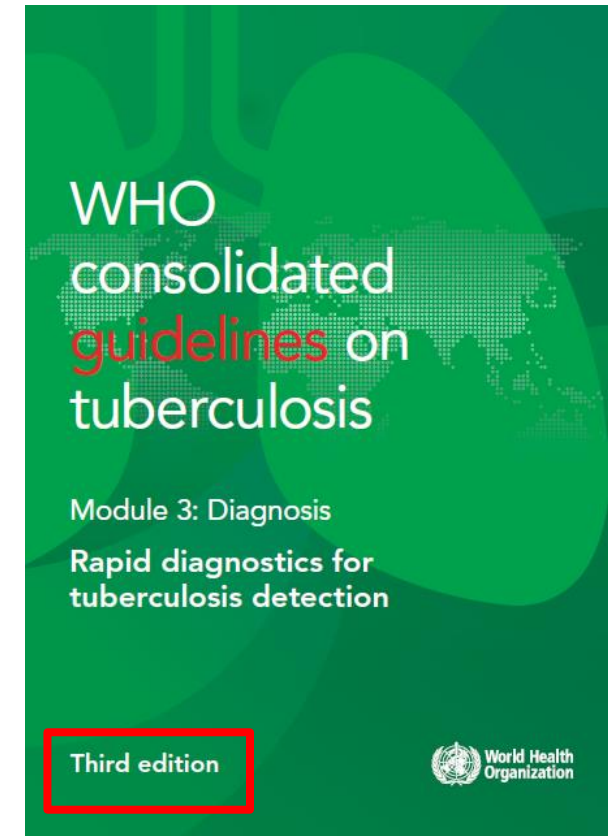
Third edition

World Health Organization

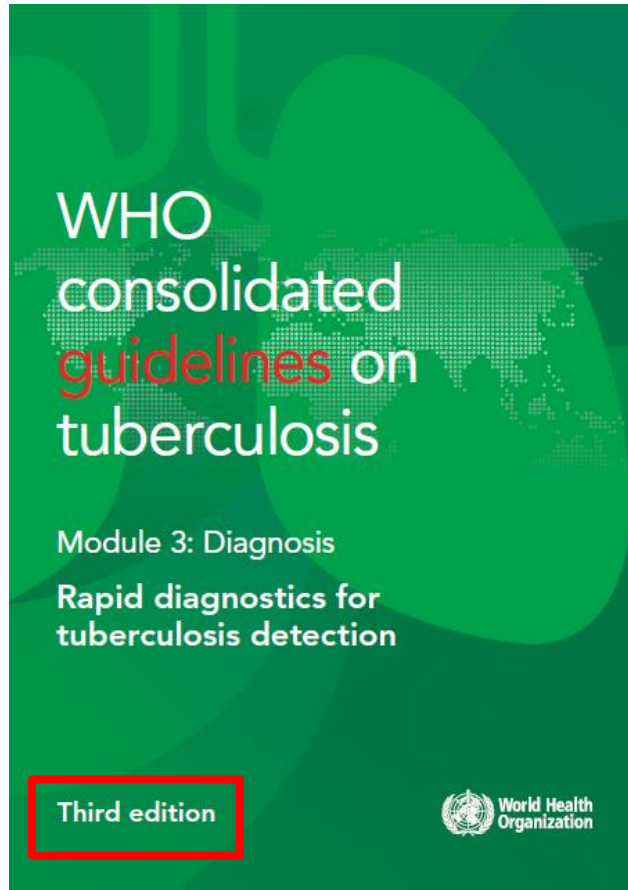


Restructuring & New recommendations, 2024

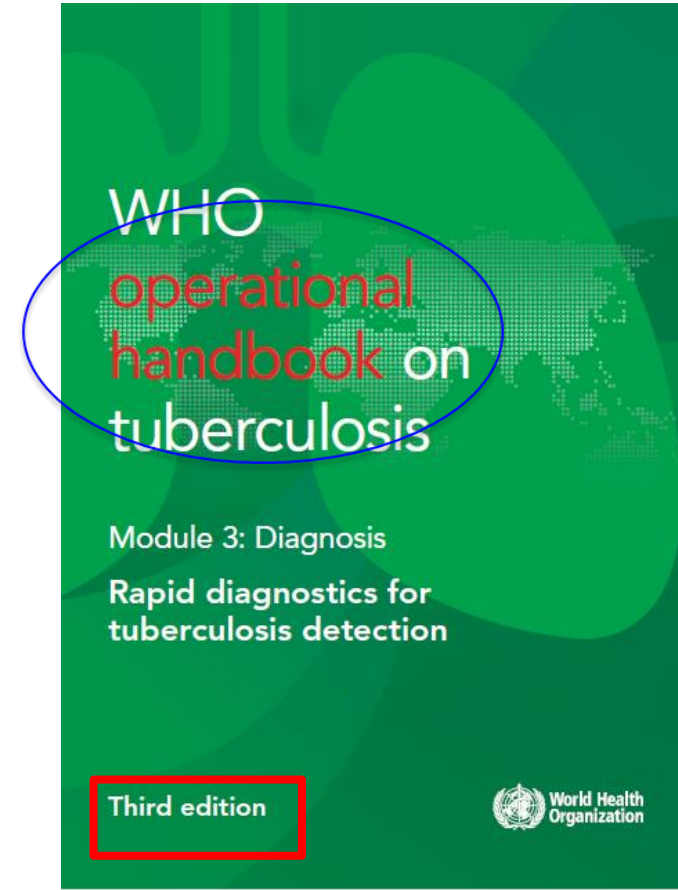
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Xpert MTB/RIF and Xpert MTB/RIF Ultra assays	5
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WHO guidelines on diagnostics for TB: Update 2024



NEW: Consolidated Guidelines and Operational Handbook





WHO TB KNOWLEDGE SHARING PLATFORM
<https://openwho.org/courses/DXTB-EN>


Rapid diagnostics for tuberculosis detection


OpenWHO


Cours est disponible


 Apprentissages


 Discussions

 Progrès

 Certificats

 Espace de collaboration

 Détails du cours


 Documents

 Annonces

#END TB Channel E-LEARNING COURSE ON RAPID DIAGNOSTICS FOR TUBERCULOSIS DETECTION




 Partager


 Partager


 Mail

Ensuring universal access to TB care relies on the rapid diagnosis of TB, detection of drug resistance, and on the timely initiation of an effective treatment regimen. These require access to rapid and accurate tests, including drug susceptibility testing for all people with TB.

This course will provide you with the knowledge and skills needed to implement WHO-recommended TB tests and algorithms. It includes the latest recommendations for novel tests for TB diagnosis and detection of drug resistance, as well as the most recent WHO policy guidance for the use of those tests. The course also describes the processes and steps for implementing a new diagnostic test for routine use within the TB diagnostic network.

 En mode autodidacte

 Langue: English

 # Advanced (Avancé), Tuberculosis

Inscrivez-moi pour ce cours

Initial tests for diagnosis of TB with drug-resistance detection



- Xpert MTB/RIF assay



- Xpert MTB/RIF Ultra assay



- Truenat MTB, MTB Plus and MTB-RIF Dx assays



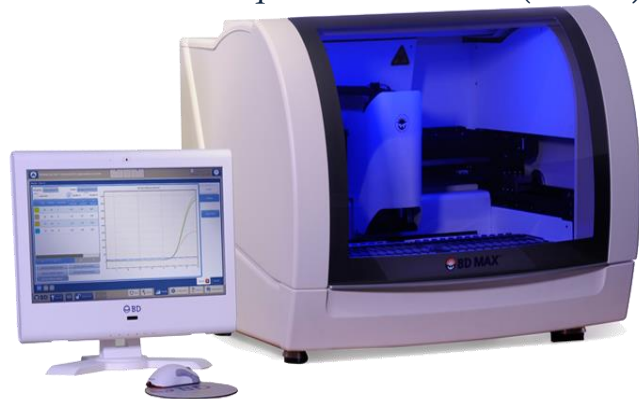
Initial tests for diagnosis of TB with drug-resistance detection (2)



➤ Moderate complexity automated NAATs



Cobas Taqman MDR TB (Roche)



BD MAX MDRTB (BD)



Realtime MTB Rif/Inh (Abbott)

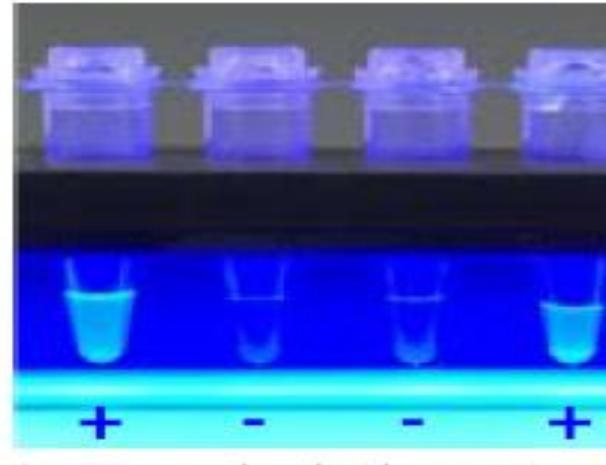


Hain FluoroType MTBDR (Bruker-Hain)

Initial tests for diagnosis of TB without DR detection



- TB-LAMP assay



- Urine LF-LAM



Follow-on diagnostic tests for detection of additional drug resistance



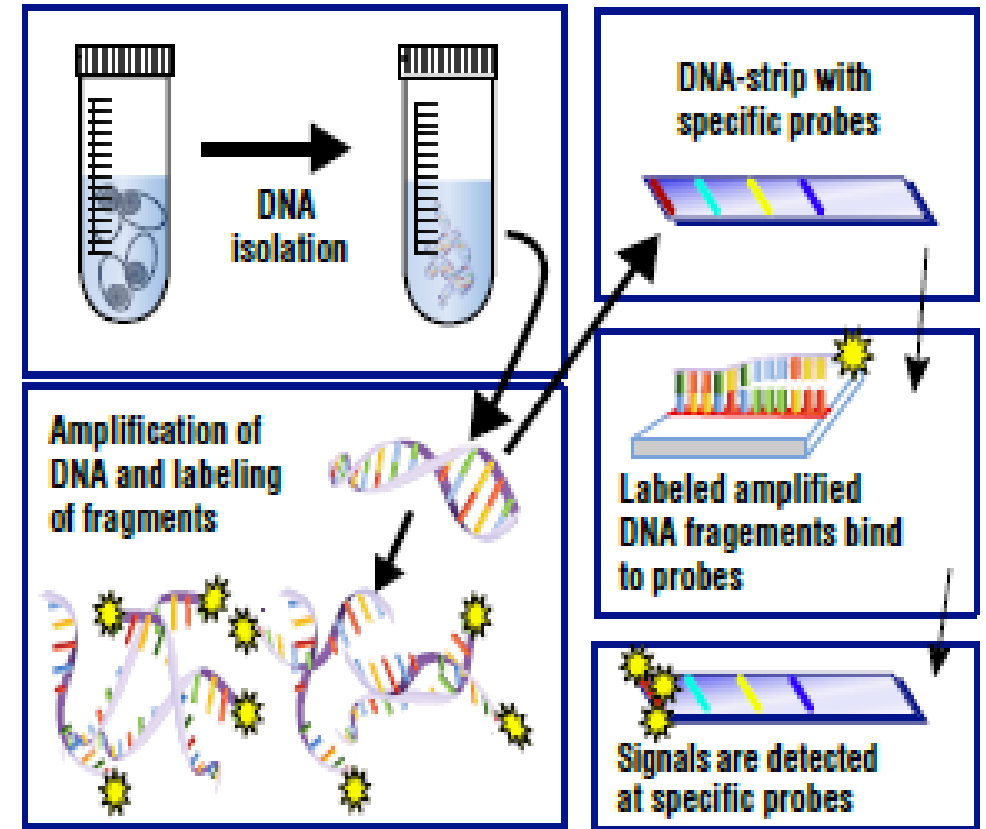
- **LPA**s for detection of resistance to
 - RIF and INH
 - FQs and second-line injectable agents
- low complexity automated NAATs for the detection of resistance to
 - INH, FQs, ETO and AMK (ex: **Xpert MTB/XDR**)
- high complexity reverse hybridization NAAT for the detection of resistance to
 - **PZA**
- **targeted NGS** tests, to detect mutations associated with resistance to many anti-TB
 - **Deplex® Myc-TB (GenoScreen)**: RIF, INH, PZA, EMB, FQ, BDQ, LZD, CFZ, AMK and STR
 - **AmPORE TB (Oxford Nanopore Technologies)**: RIF, INH, FQ, LZD, AMK and STR;
 - **TBseq® (ShengTing Biotech)**: EMB



Follow-on diagnostic tests for detection of additional drug resistance

- ◆ **1st line LPAs: INH and RIF**
 - ◆ GenoType MTBDR*plus*
 - ◆ NTM+MDR-TB Detection Kit
 - ◆ For people with a smear-positive sputum specimen or a cultured isolate of MTBC

- ◆ **2nd line LPAs: FQs and AMK**
 - ◆ GenoType MTBDR*s*/
 - ◆ For a person with confirmed MDR/RR-TB



Low complexity: Xpert MTB/XDR Assay



- For the detection of resistance to:
 - INH, FQs, ETO and
 - second-line anti-TB agents (AMK, kanamycin, and capreomycin).
 - reflex test to complement existing technologies that only test for RIF resistance:
 - RIF-susceptible TB (resistance to INH and FQ)
 - RR-TB (resistance to FQ, INH, ETO and AMK) .



High complexity: Genoscholar PZA-TB



- ◆ **GenoScholar PZA-TB:** detection of resistance to PZA
 - ◆ same principle as the FL-LPA and SL-LPA
 - ◆ targets a 700 base pair (bp) fragment covering the entire *pncA* gene (resistance mutations are widespread)
 - ◆ faster results than phenotypic DST and is based on molecular detection



A rich pipeline of TB diagnostics



2025+

New sampling approaches



- Absorbent strips in face masks**
- Sensitivity mask < sputum
 - Simple and acceptable
 - Picks up asymptomatic cases
 - Bi-direction screening

Breath tests & skin patches



TB Laboratory network capacity building

LABORATORY PREPAREDNESS

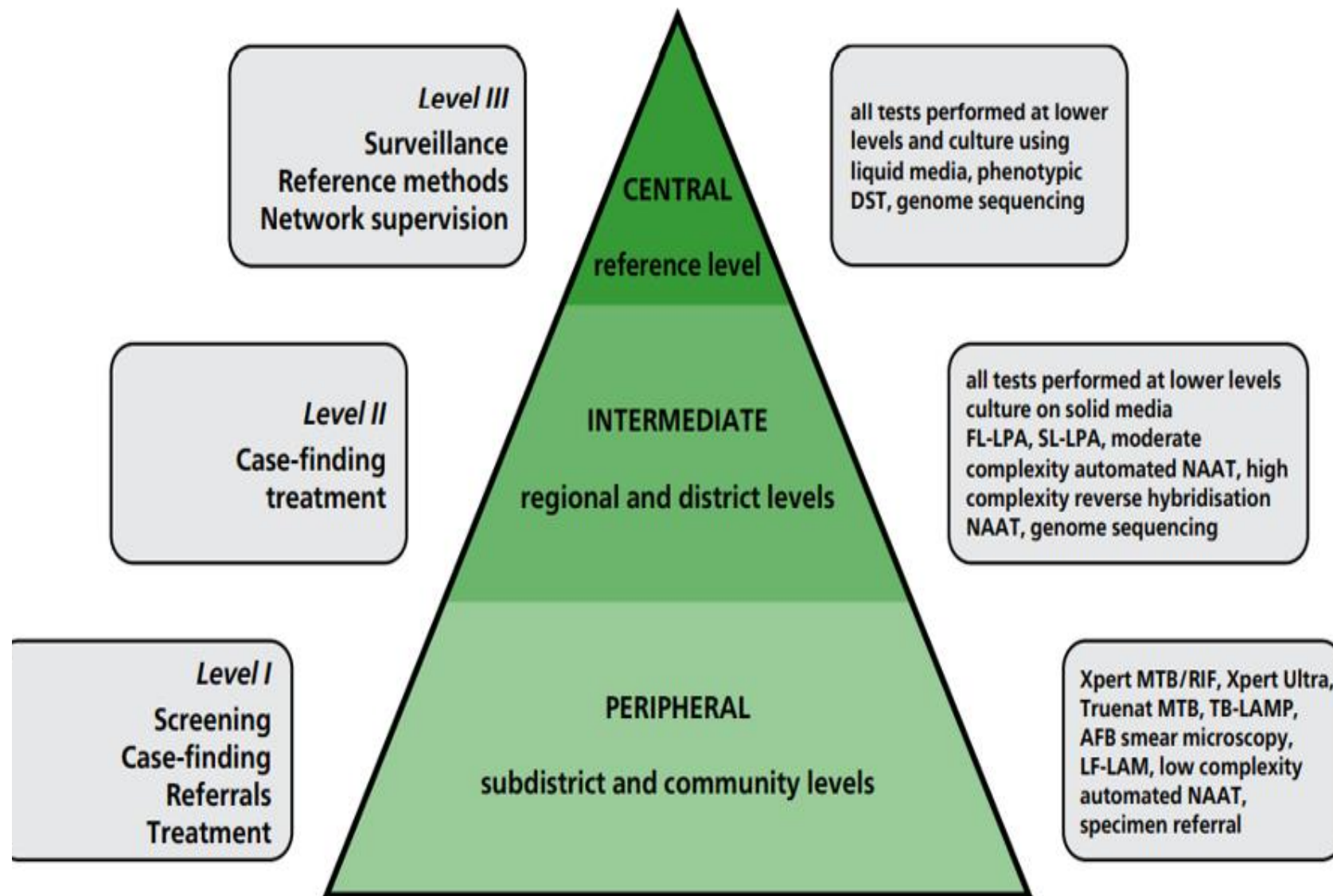
- Laboratory assessment
- Infrastructure upgrade
- Creation of Standard Operating Procedures
- Policy reform

TECHNOLOGY TRANSFER

- Equipment and supplies
- Procurement
- Training
- Quality assurance
- Laboratory validation

ROUTINE TESTING AND MONITORING

- Monitoring and evaluation
- Impact assessment



Impact of TB diagnostics on the current TB Situation in the African Region, in 3 strategy era

- DOTS
- Stop TB
- End TB

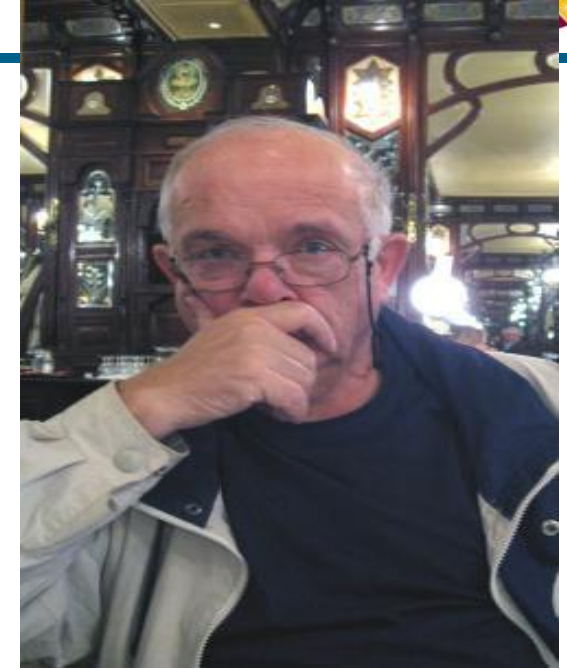
Collaboration scheme: Birth of WHO-SRL network



1994

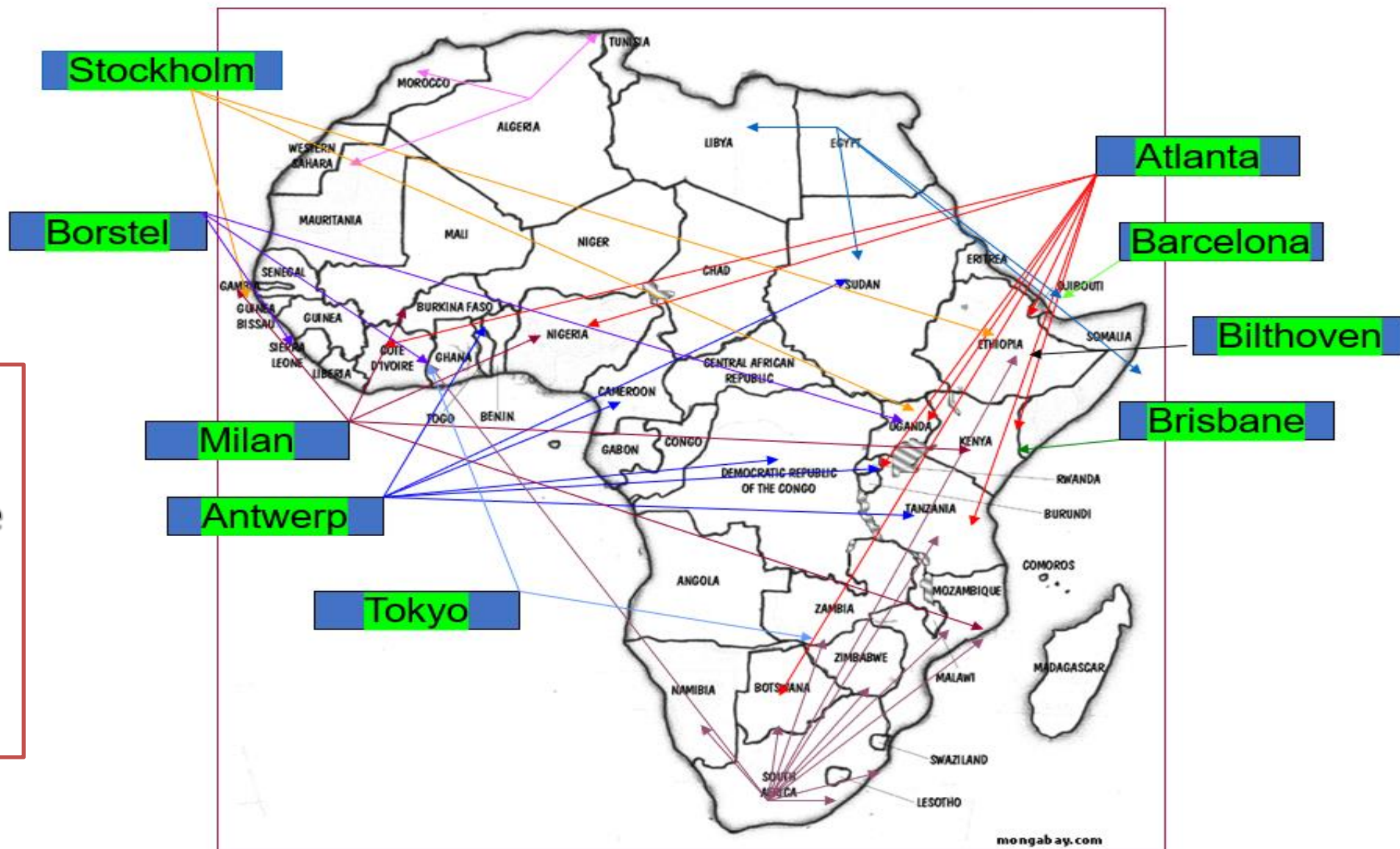


Mainz, 13 June 1994: a dozen laboratories, under the leadership of Albert Laszlo, gave birth to the SRL network of WHO/Union



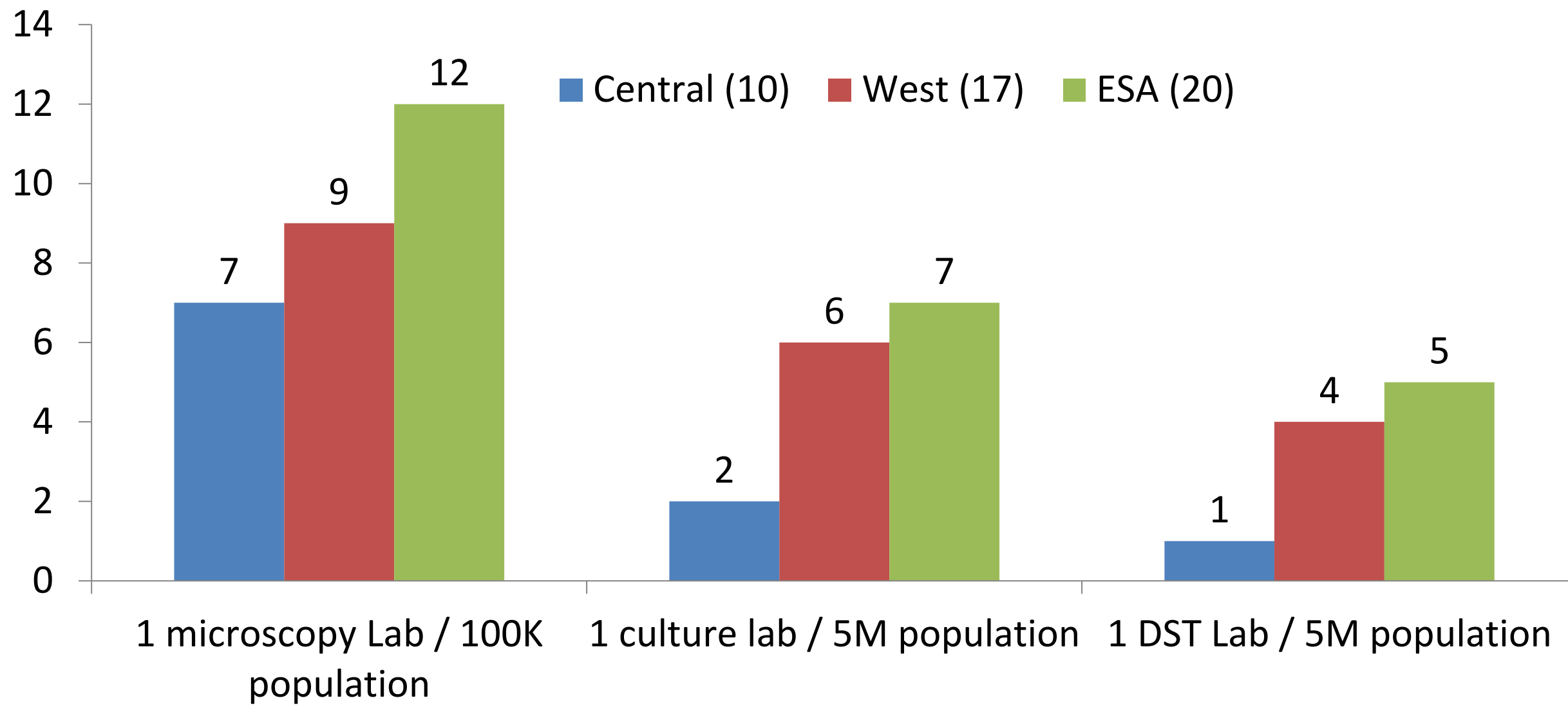
During the period **1994-1997**, some **22 SRLs** were established under the direction of: Laszlo, Abe, Crawford, Boulahbal, Dawson, de Kantor, Drobniewski, Feldmann, Hoffner, Jain, Källenius, SJ Kim, Martin-Casabona, Pereira, Portaëls, Rüsck-Gerdes, Sticht-Groh & Bretzel, Urbanczick, van Klingereren, Vincent, Weyer.

WHO SRL network mapping for Africa, 2012

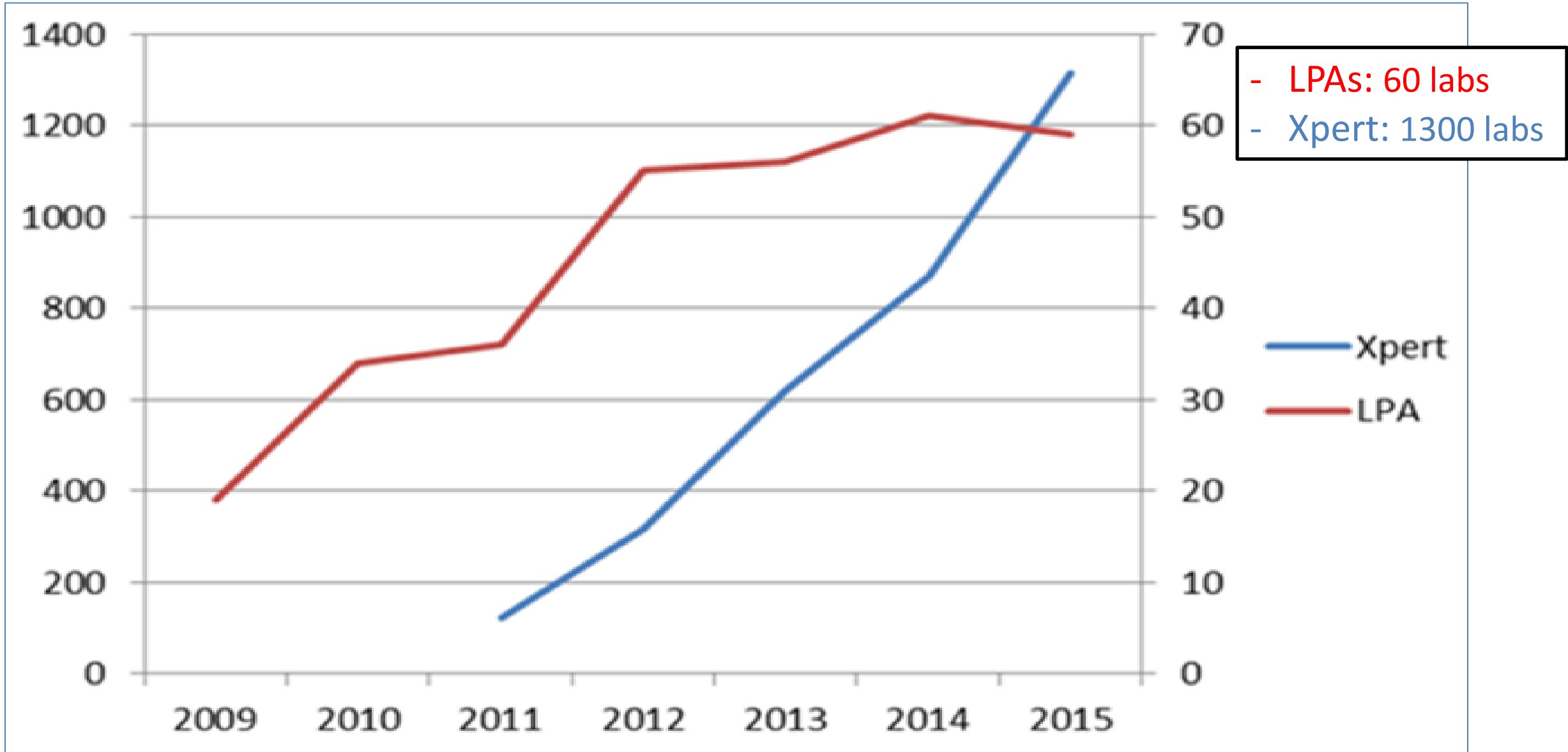


Note: Support was limited to quality assurance in anti-TB drug susceptibility testing (DRS) till 2015

Stop TB Strategy: Microscopy, Culture and DST Labs, of 2015 in African Region

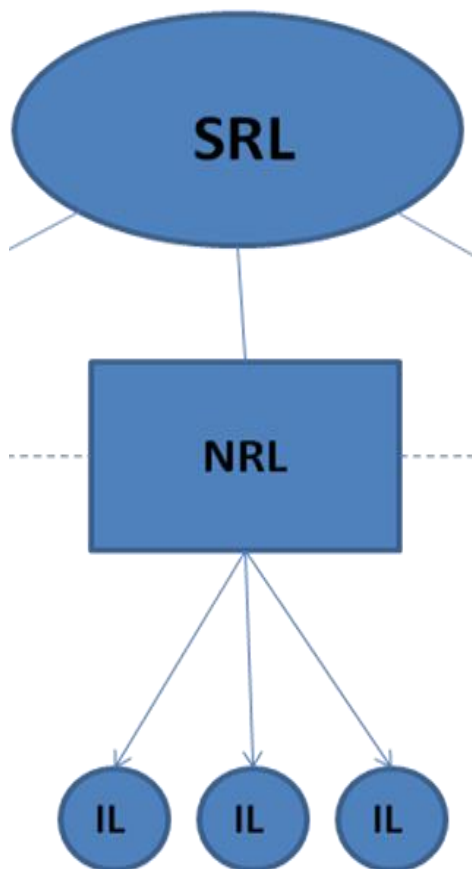
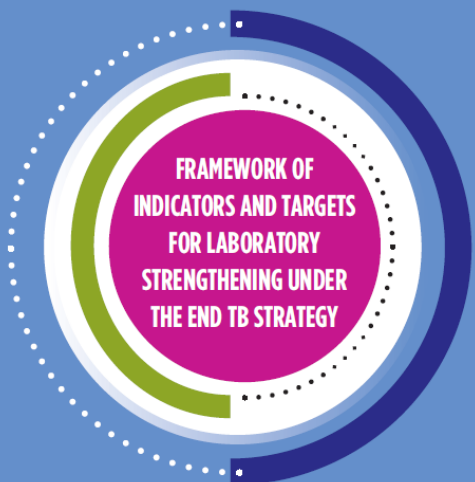


Stop TB Strategy: mWRDs (LPA and GeneXpert), of 2015 in African Region



End TB Strategy: Laboratory objectives for

Increase access to rapid and accurate detection of TB



Reach universal access to DST

Strengthen the quality of laboratory services

<https://www.who.int/publications/i/item/9789241511438>

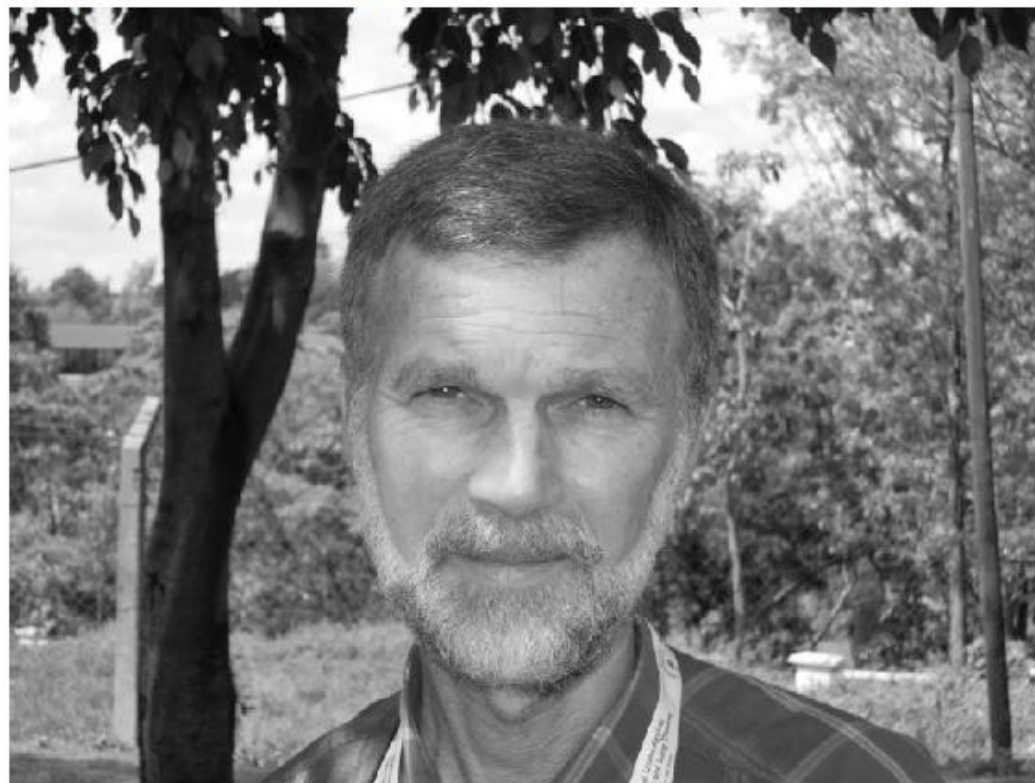
Legacy of Dr Armand Van Deun: passed away on 21 Sept 2023

INT J TUBERC LUNG DIS 28(1):68–69.

©2024 The Union <http://dx.doi.org/10.5588/ijtld.23.0520>

OBITUARY

Armand Van Deun – pioneering public health physician (1953–2023)

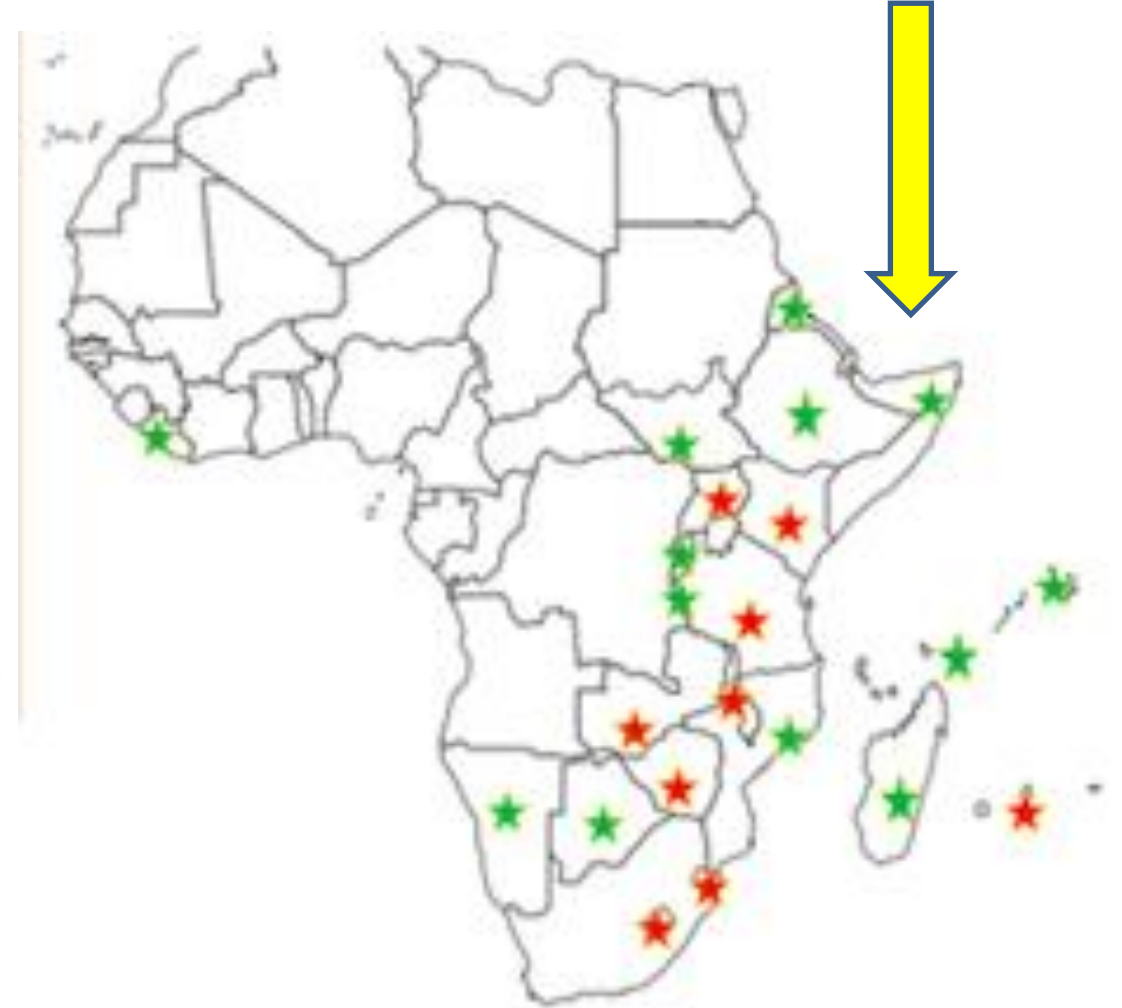


Uganda SRL nomination, 2013



Supranational[®]
Reference Laboratory
Timely Accurate Diagnostics for a TB-Free Africa

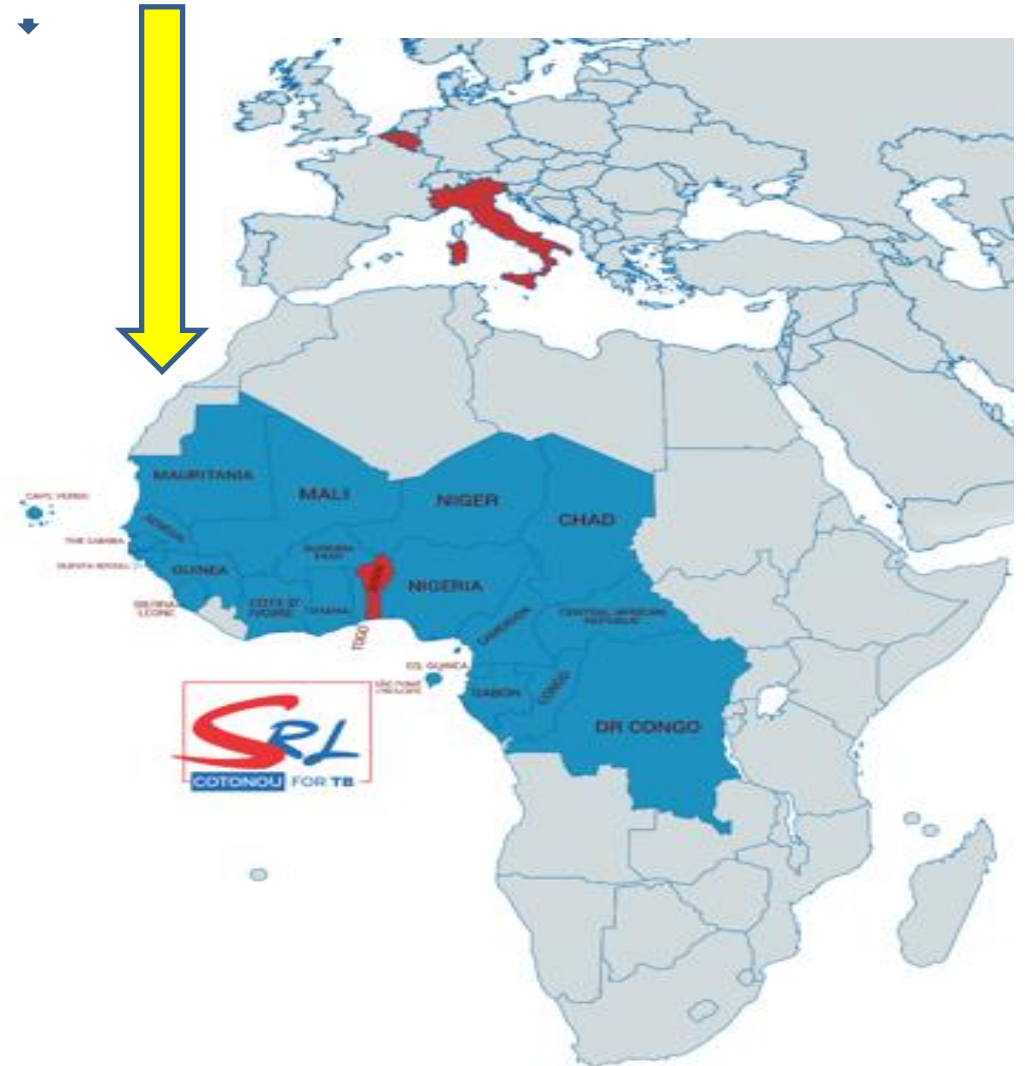
Supported countries by the SRL Uganda since 2015



Benin SRL nomination, 2017

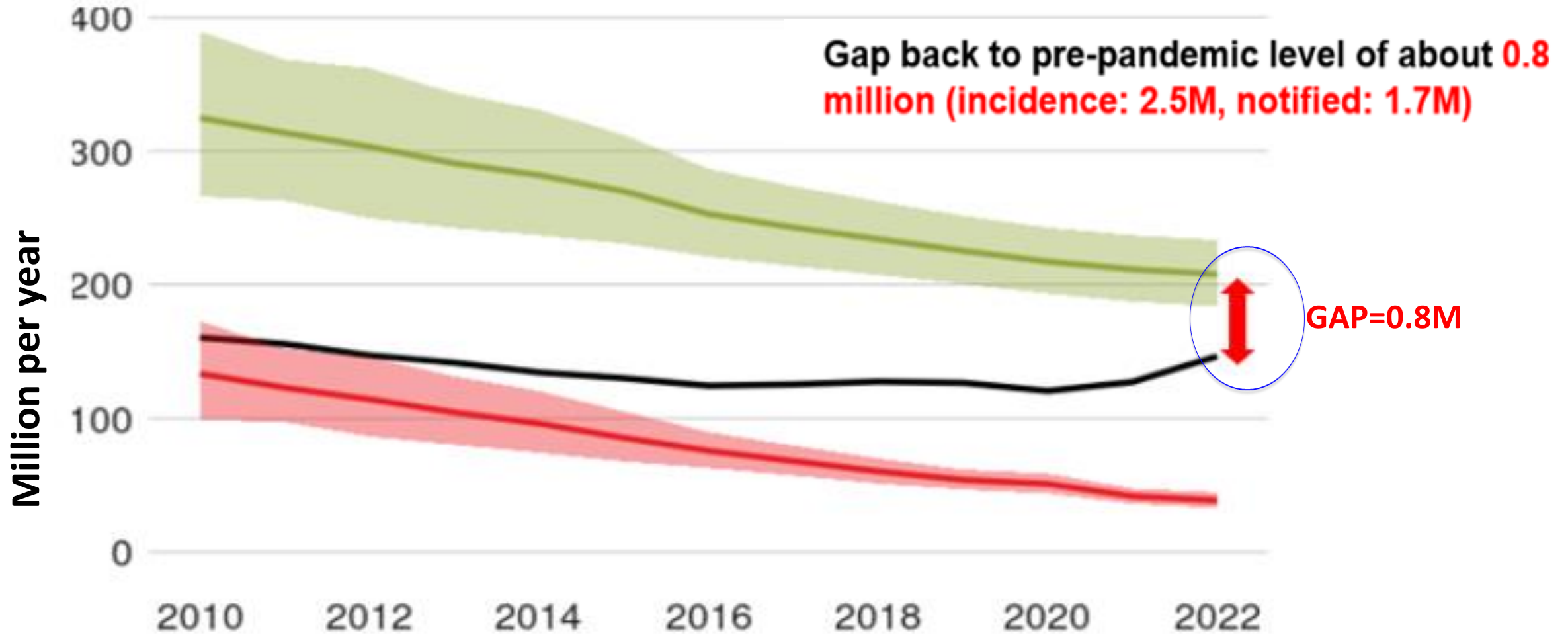


Supported countries by the SRL Benin since 2019

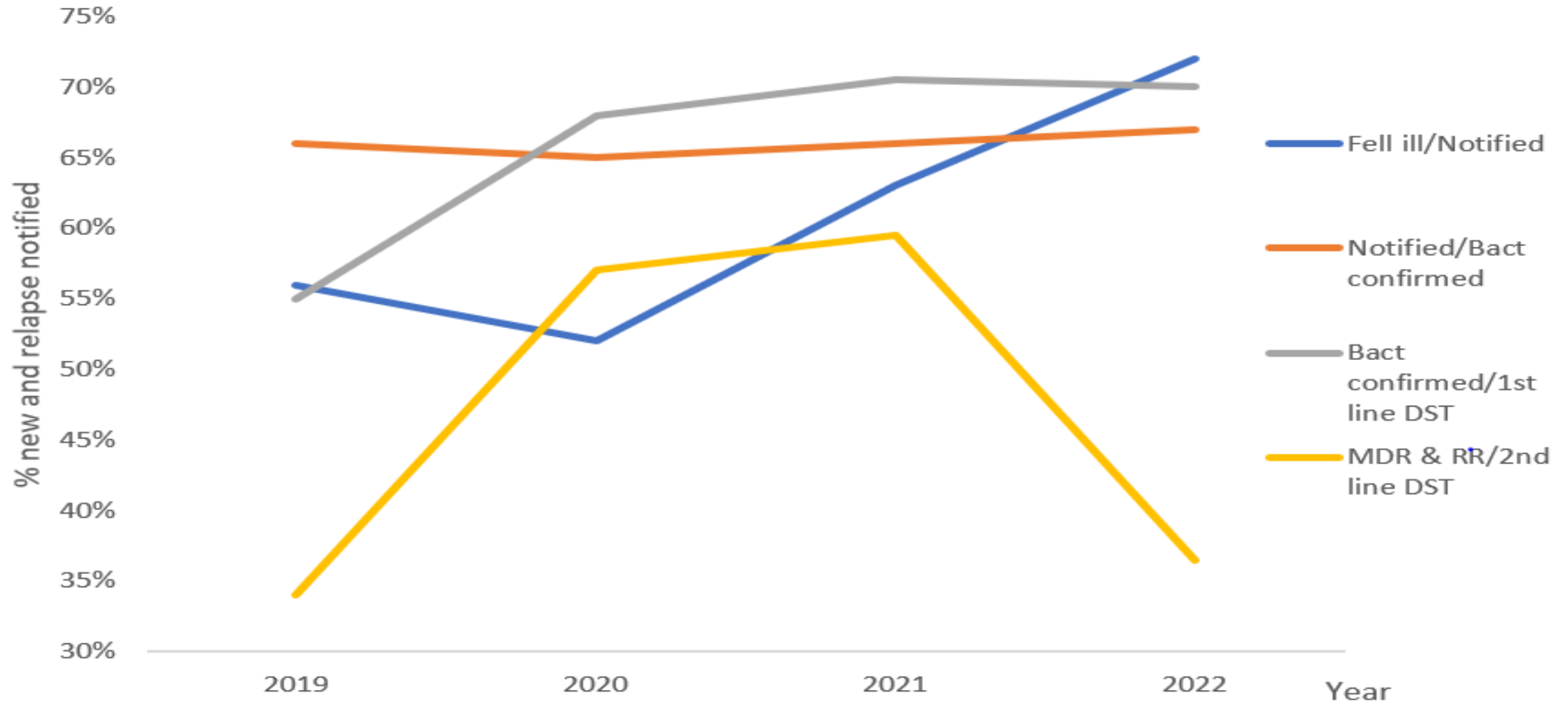


Narrowed gap: people falling ill with TB & reported number of TB, of 2022

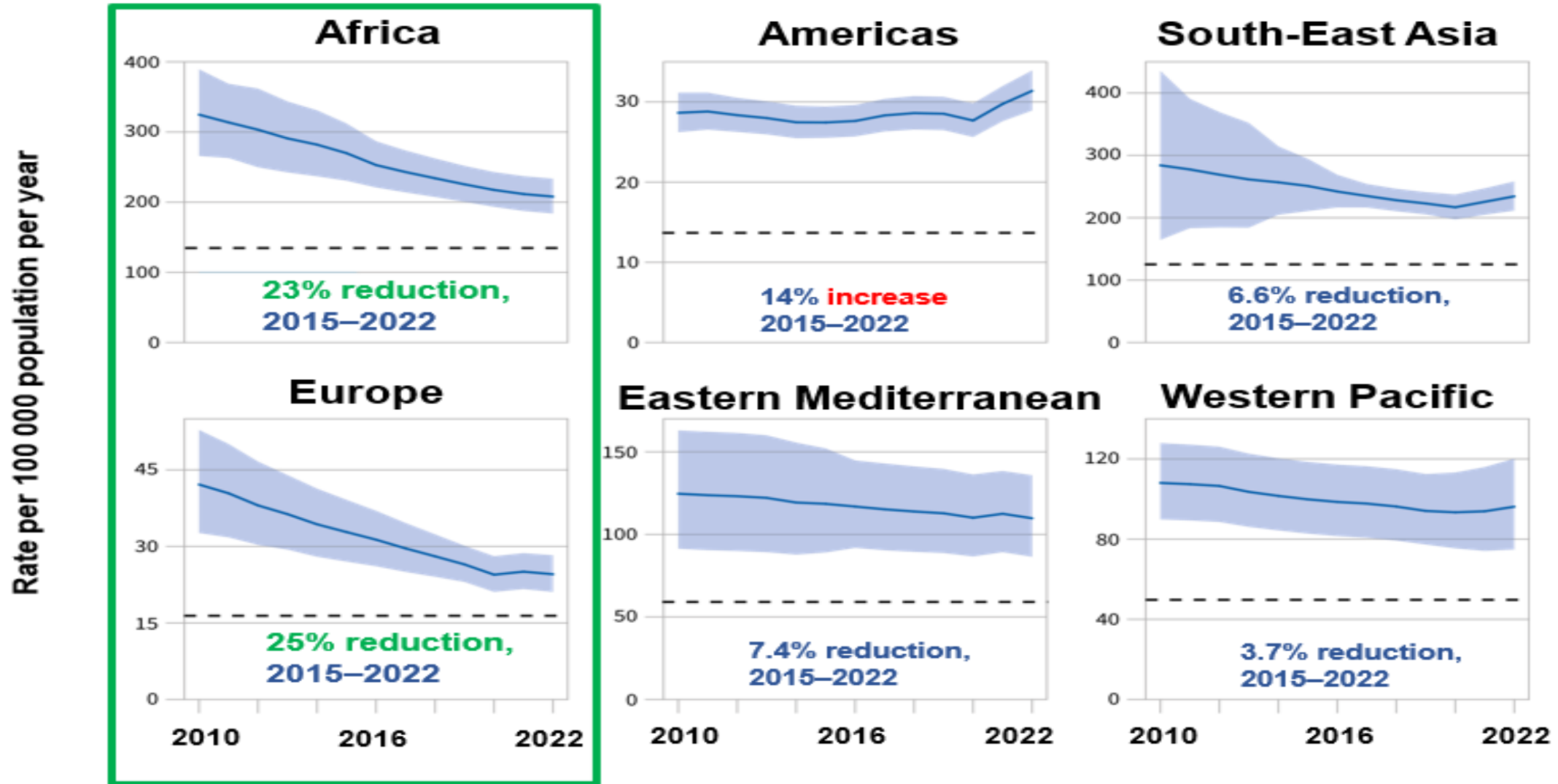
WHO African Region



GAP: notification, B+, 1st and 2nd line DST



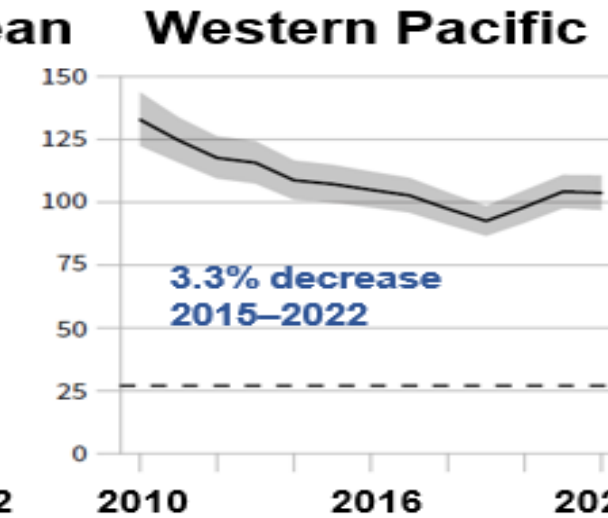
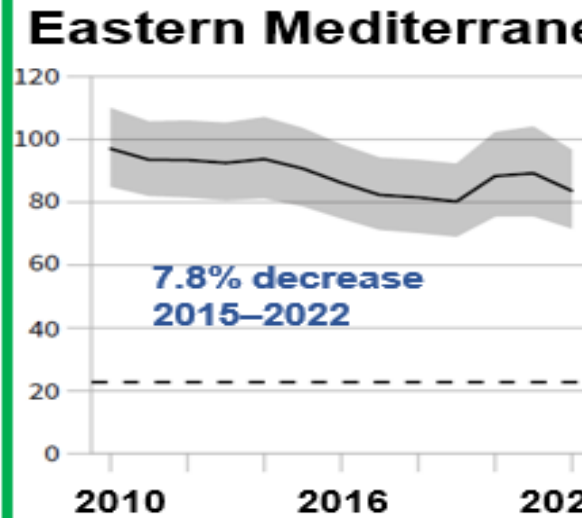
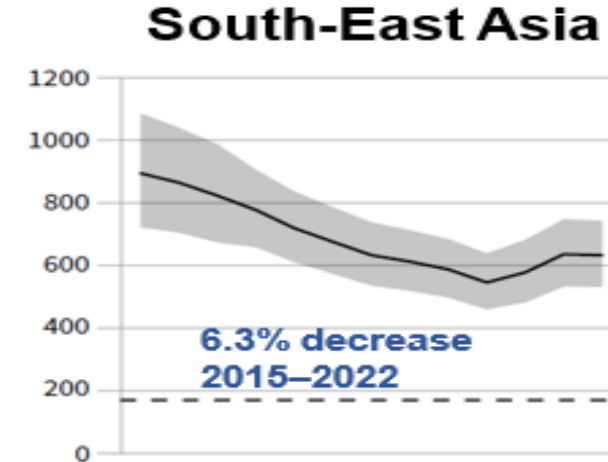
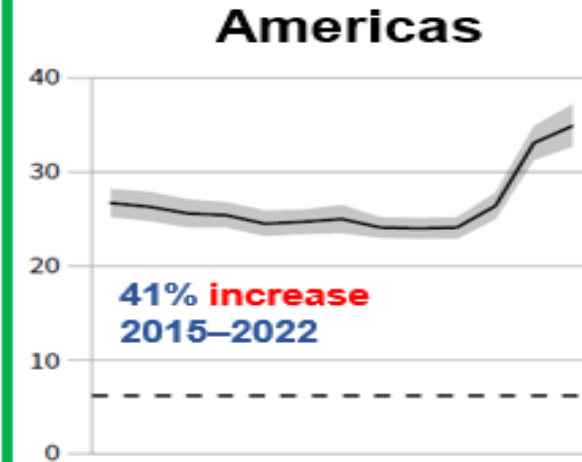
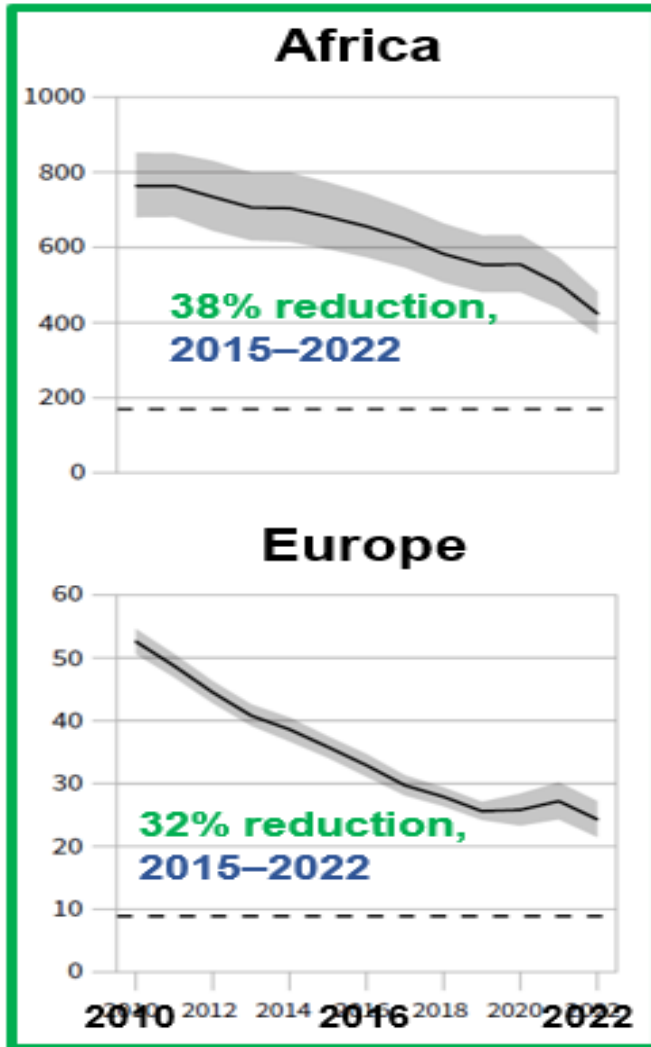
TB incidence in Africa versus other WHO Regions, of 2022



African Region and European Region estimated to have passed first Strategy milestone (20% reduction from 2015)

TB death in Africa versus other WHO Regions, of 2022

Total TB deaths per year (thousands)



African Region estimated to have passed first Strategy milestone (35% reduction from 2015). European Region is close

Diagnostic delay is a big contributor to catastrophic cost

www.nature.com/scientificreports

scientific reports **2022**

Check for updates

OPEN A systematic review and meta-analysis of the catastrophic costs incurred by tuberculosis patients

Ramy Mohamed Ghazy¹, Haider M. El Saeh², Shaimaa Abdulaziz³, Esraa Abdellatif Hammouda³, Amira Mohamed Elzorkany³, Heba Khidr³, Nardine Zarif³, Ehab Elrewany¹ & Samar Abd ElHafeez⁴

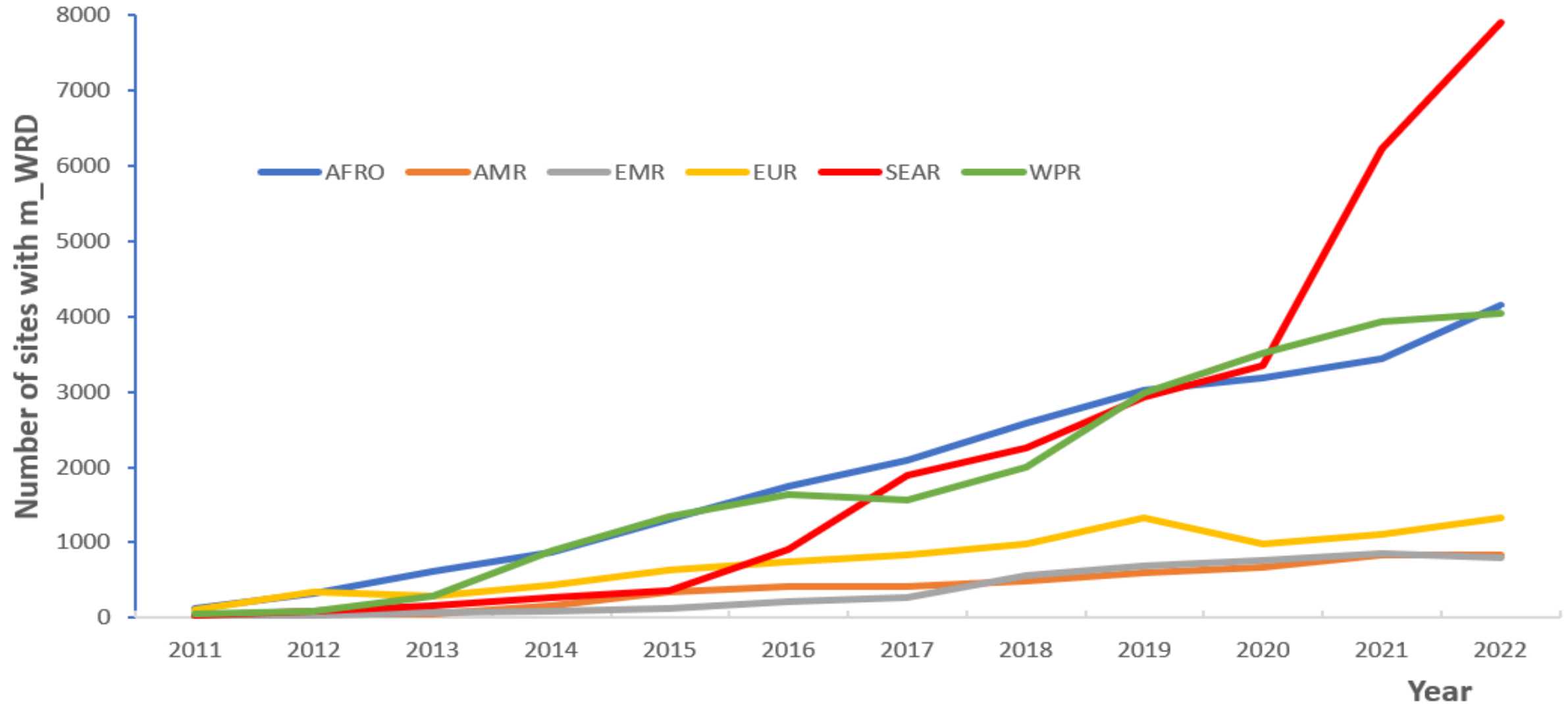
Active Case Finding **12%**

Versus

Passive Case Finding **30%**

Increase access to rapid and accurate detection of TB

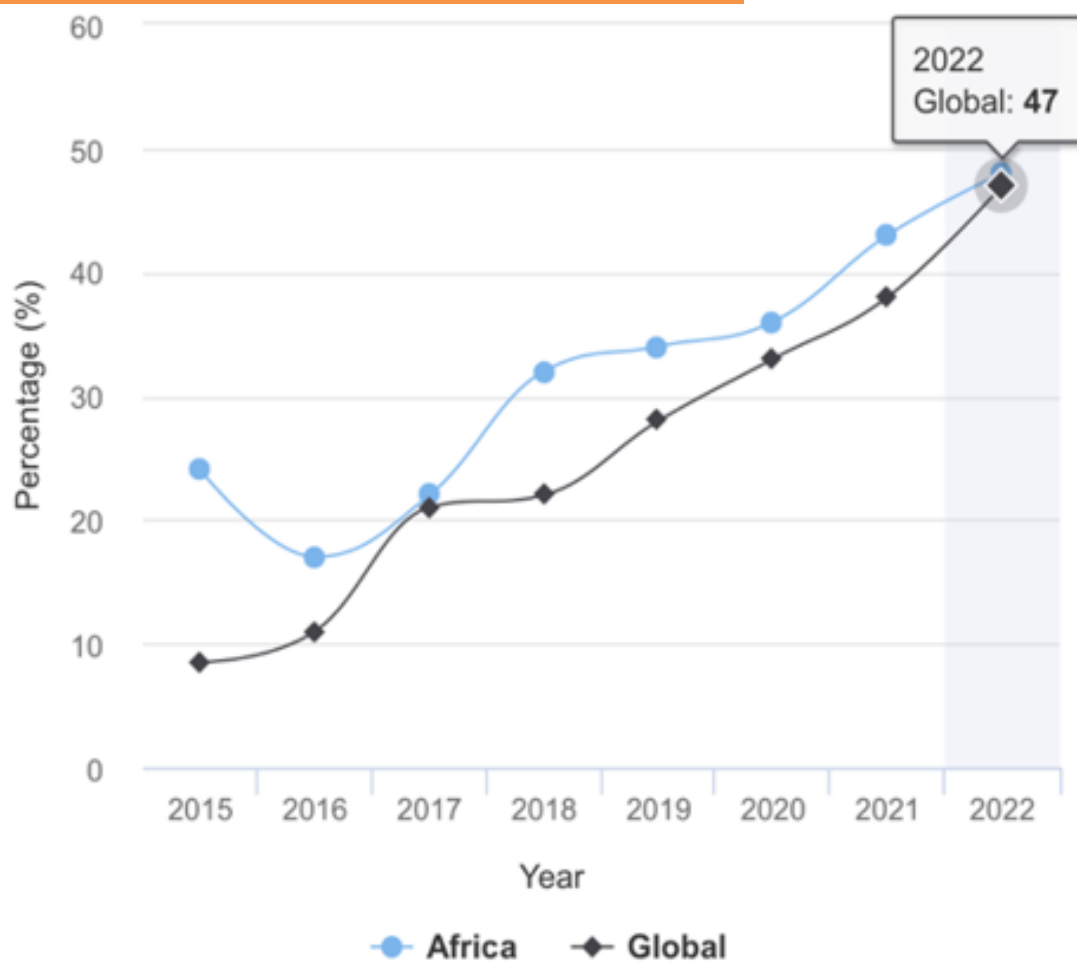
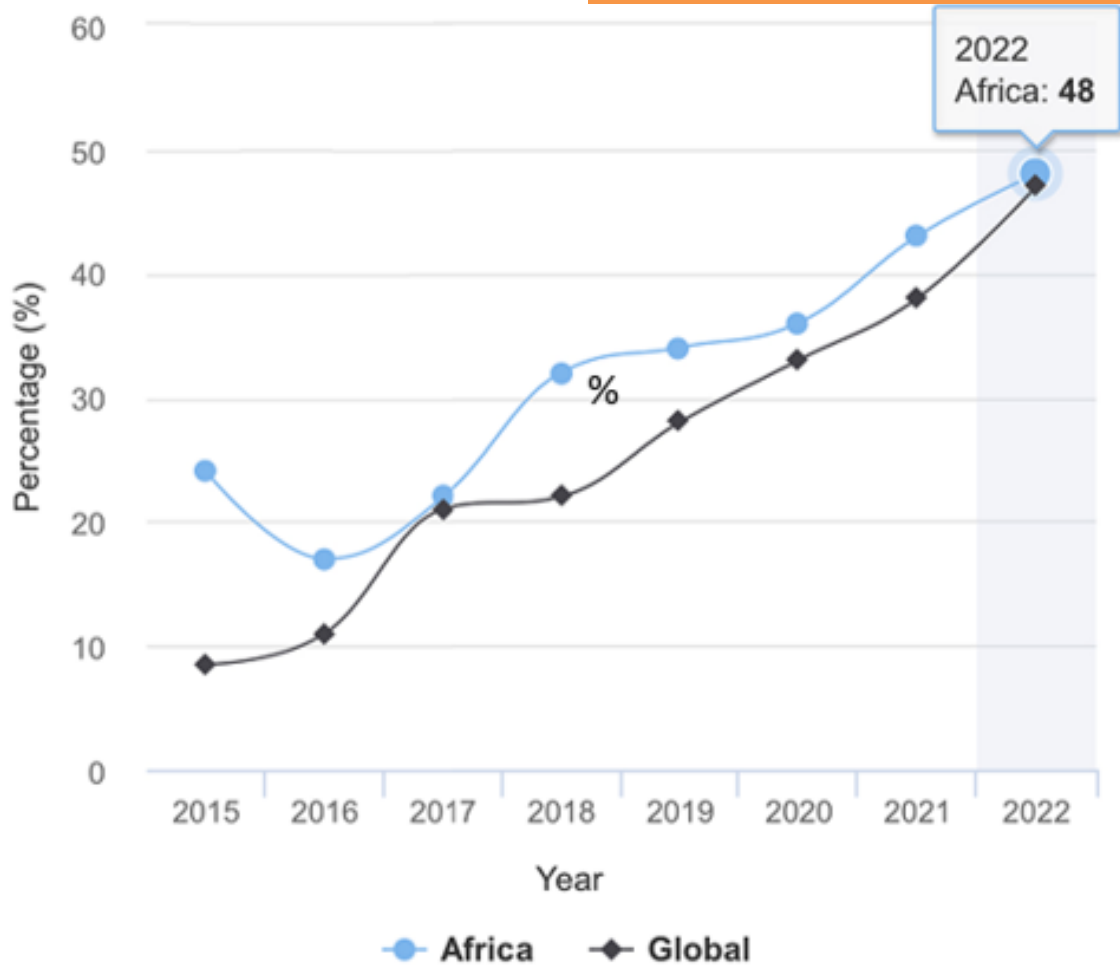
Labs providing TB diagnostic services using mWRD)



% of new & relapse tested with rapid diagnostics at diagnosis (WRD)

Africa=48% > Global =47%

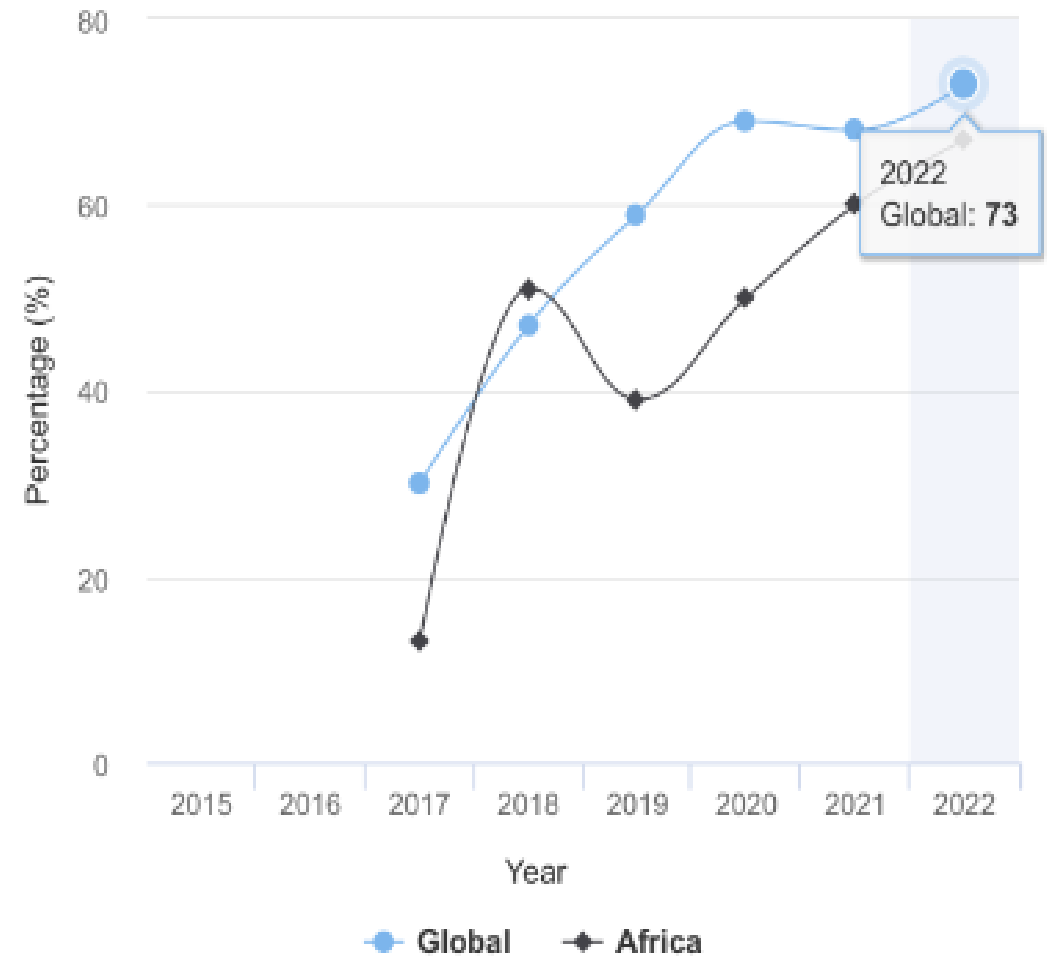
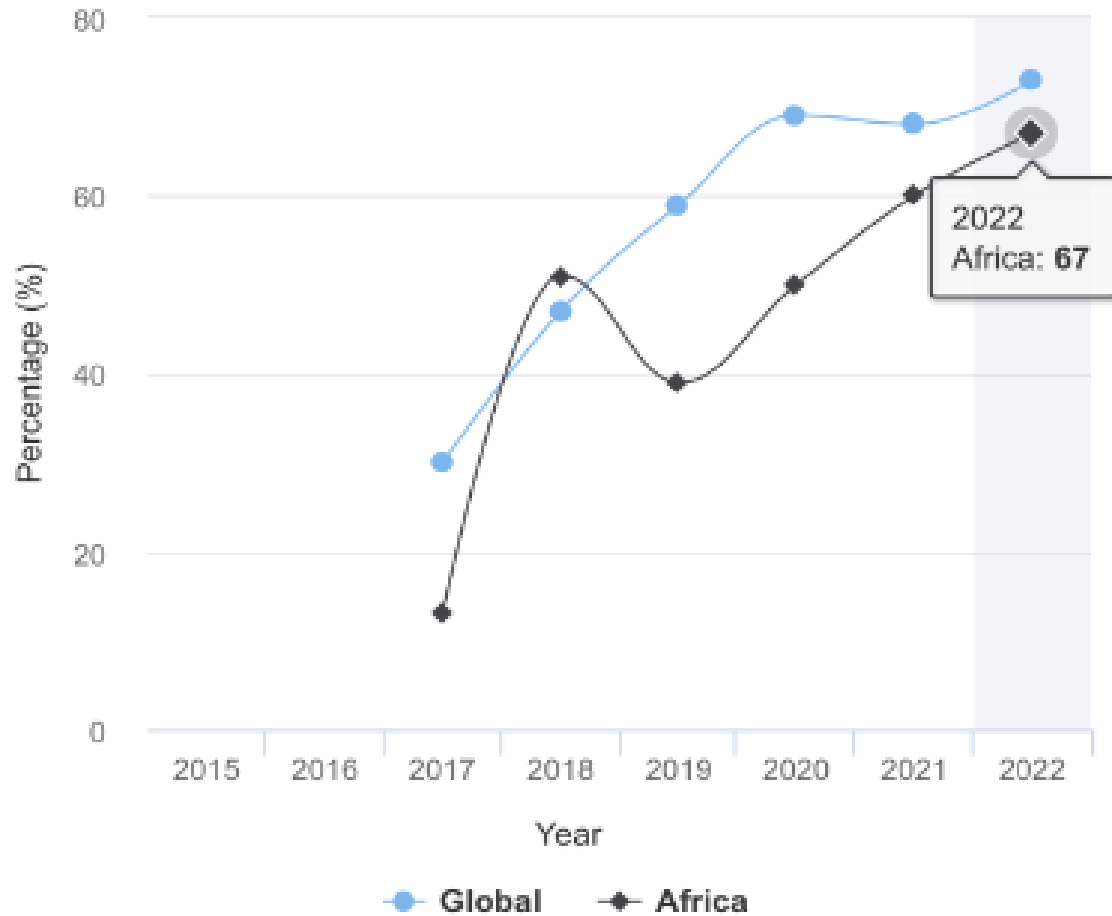
Target: 100% by 2027 set in UNHLM 2023



Reach universal access to DST

% new pulmonary B+ notified cases tested for RR

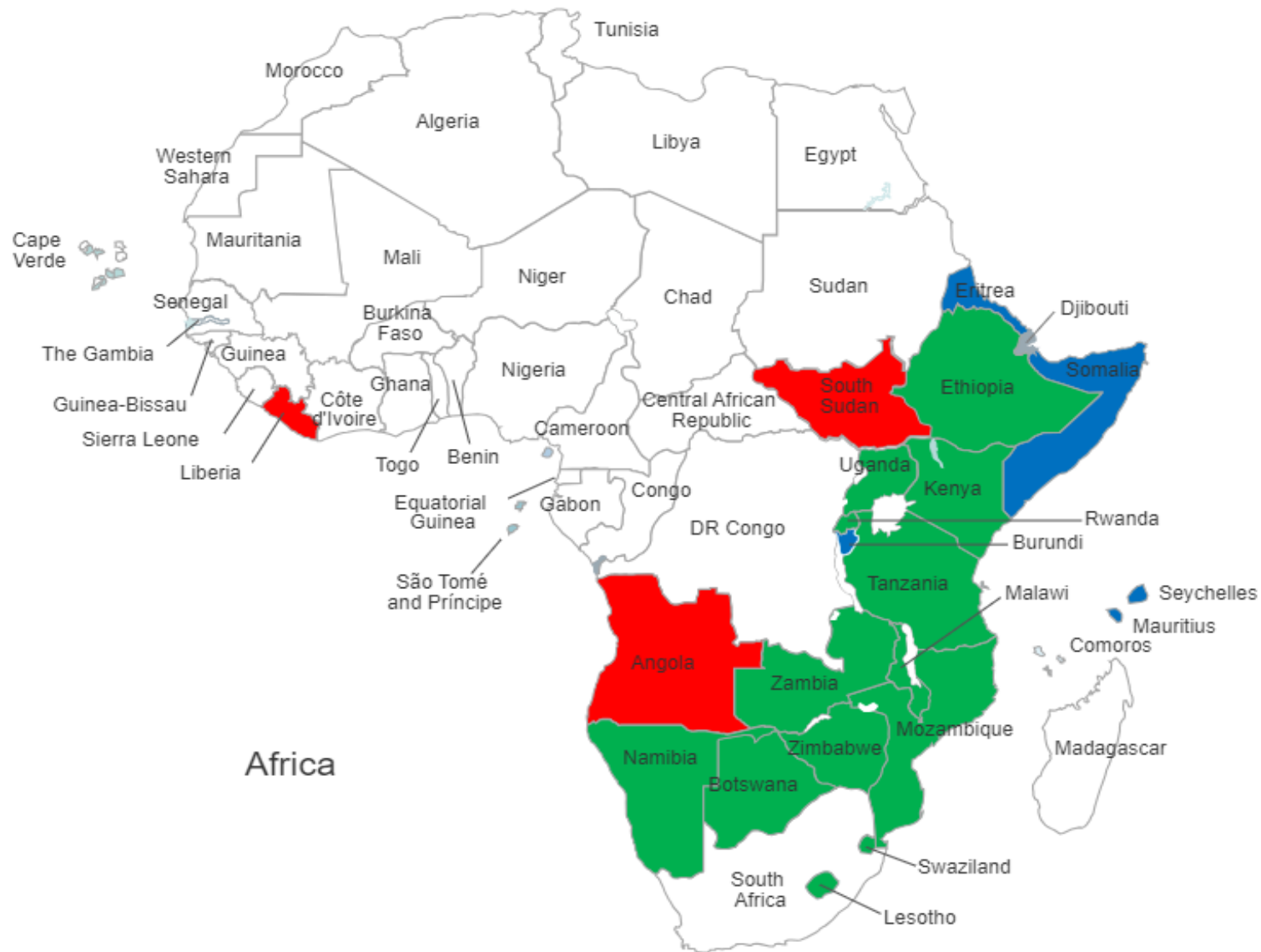
Africa=67% < Global =73%



Strengthen the quality of laboratory services

Quality Management Systems (QMS), 2023

Supported **13 countries** to attain ISO 15189 accreditation



Challenges (to be addressed)



- Slow uptake of innovations in disease diagnosis
- Inadequate access to diagnostic services
- Non-sustainable financing mechanisms for diagnostics



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Acknowledgements

- ◆ WHO/GTB Diagnostic Team
 - ◆ Alexei Korobitsyn
 - ◆ Carl-Michael Nathanson
 - ◆ Cecily Miller
- ◆ WHO/AFRO/HTH

Thank you

It's time for action
It's time to **END TB**

