

Making informed and smart choices: evidence-based optimisation of national strategies to end TB

CARE CASCADE ANALYSIS

What happens, Where and Why?

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Conflict of interest disclosure

I have **no**, real or perceived, direct or indirect conflicts of interest that relate to this presentation.

Delivering quality TB care

- Quality TB services require systems able to deliver an entire pathway of care
- The Care Continuum or Care Cascade

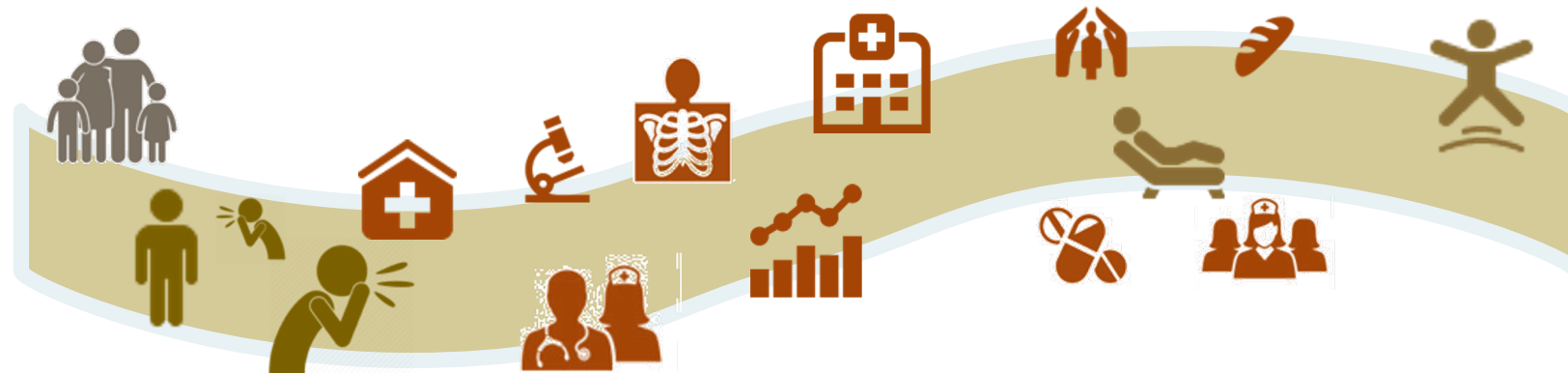
People with TB infection or disease, not in the health system	People with TB infection or disease, not identified or diagnosed	People treated for TB infection or disease, not symptom- or relapse-free
Health promotion Disease prevention	Screening Diagnosis	Treatment Disease management Rehabilitation Palliative care

- Identifying the size and nature of gaps along the care continuum requires data about each part of the TB care cascade

Care Cascade Analysis

WHAT HAPPENS WHERE ALONG THE CARE CONTINUUM?

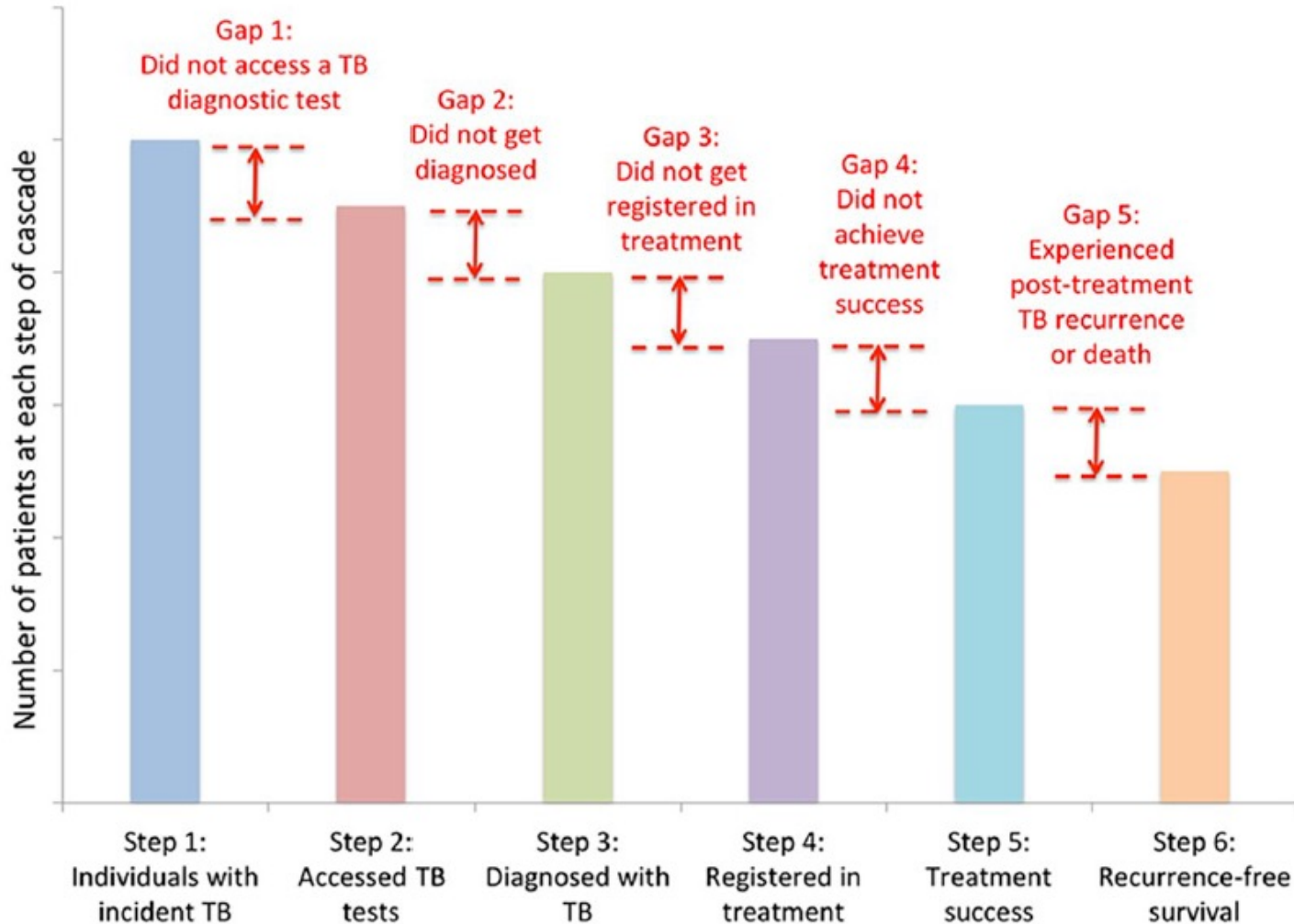
- Offers a simple, visual way to illustrate what happens where, i.e. where losses occur in the care continuum



People with TB infection or disease, not in the health system	People with TB infection or disease, not identified or diagnosed	People treated for TB infection or disease, not symptom- or relapse-free
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Source: WHO People centered framework

Care Cascade Steps and Gaps



Broken pathways

A better understanding of the care cascade can provide the evidence needed on where gaps (patient losses) exist in the cascade, hence where to target interventions that reduce losses (patients retained)

Source: Subbaraman R, Nathavitharana RR, Mayer KH, Satyanarayana S, Chadha VK, Arinaminpathy N, et al. Constructing care cascades for active tuberculosis: A strategy for program monitoring and identifying gaps in quality of care. *PLoS Med*; 2019; 16(2)

Typical TB care cascade Indicators

- Estimated number of people with TB who have not accessed the health system
- Estimated number and proportion of people with TB who have accessed health services but were not screened
- People with TB who were screened for TB
- People with TB who were identified with presumptive TB
- People with presumptive TB who were tested for TB
- Patients diagnosed with TB
- Patients notified
- Patients with bacteriologically-confirmed TB
- Patients started on (dst-based) anti-TB treatment ←
- Patients who were successfully treated ←
- Patients who achieve 1-y recurrence-free survival

The historical focus on treatment success rates failed to reflect upstream losses

As much as possible collect data disaggregated for age, sex, new and previously treated, Susceptible and Resistant TB and HIV-associated TB

When to conduct TB care cascade analysis?

NOT ROUTINELY

- When you want to identify which TB interventions to prioritize to improve TB prevention and care efforts and/or quality of care
- When there is a large gap between WHO incidence estimates and those reported by the national TB program
- When there is evidence that patients among the general population or people at risk and key populations for TB are missed from routine surveillance systems
- When you want to test a new approach/ intervention

Quote: 'Capturing data for each step in the cascade can be challenging, unless a robust, integrated and preferably electronic, case-based recording and reporting system is in place' (WHO 2018 Global Tuberculosis Report Page 94)

Scale for TB care cascade analysis

TO ASSESS QUALITY OF CARE ALONG THE CASCADE

- Global – largest scale evaluations
 - National – large scale evaluations
 - Sub-national – small scale evaluations
 - Facility – smallest scale evaluations
 - Community – smaller scale evaluations
- Multi-site studies provide more accurate information on steps in the cascade
 - Cohort-based evaluations minimize risk of bias and achieve higher internal consistency

Global cascade visuals

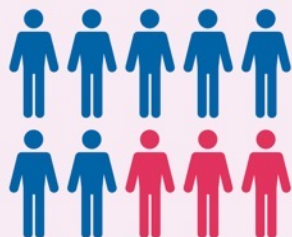
MORE PEOPLE REACHED WITH QUALITY TUBERCULOSIS CARE

IN 2018, AN ESTIMATED

10 MILLION PEOPLE FELL ILL WITH TB*

7 MILLION PEOPLE REPORTED TO HAVE ACCESS TO TB CARE, UP FROM 6.4 MILLION IN 2017

3 MILLION WERE UNDIAGNOSED OR NOT REPORTED



Better reporting, diagnosis and access to care will close this gap

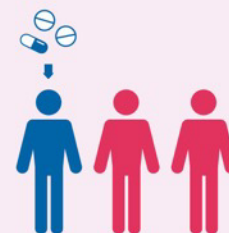
*The 95% uncertainty interval for TB incidence is 9.0-11.1 million.

DRUG-RESISTANT TUBERCULOSIS REMAINS A PUBLIC HEALTH CRISIS

IN 2018

ABOUT 0.5 MILLION PEOPLE FELL ILL WITH DRUG-RESISTANT TB*

ONLY ONE IN THREE PEOPLE ACCESSED TREATMENT



OF THOSE TREATED, ONLY **56% WERE TREATED SUCCESSFULLY**

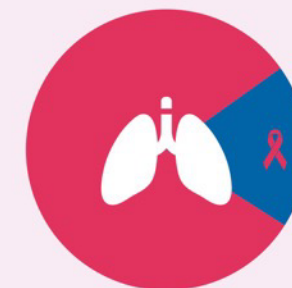
*The 95% uncertainty interval for the incidence of rifampicin-resistant TB is 420 000 - 560 000. About 80% of these cases had multidrug-resistant TB.

TUBERCULOSIS IS THE TOP INFECTIOUS KILLER IN THE WORLD

IN 2018

1.5 MILLION* PEOPLE DIED FROM TB

INCLUDING 251 000 PEOPLE WITH HIV



TB is the leading killer of people with HIV and a major cause of deaths related to antimicrobial resistance

*The 95% uncertainty intervals are 1.4-1.6 million for TB deaths and 223 000 - 281 000 for TB/HIV deaths.

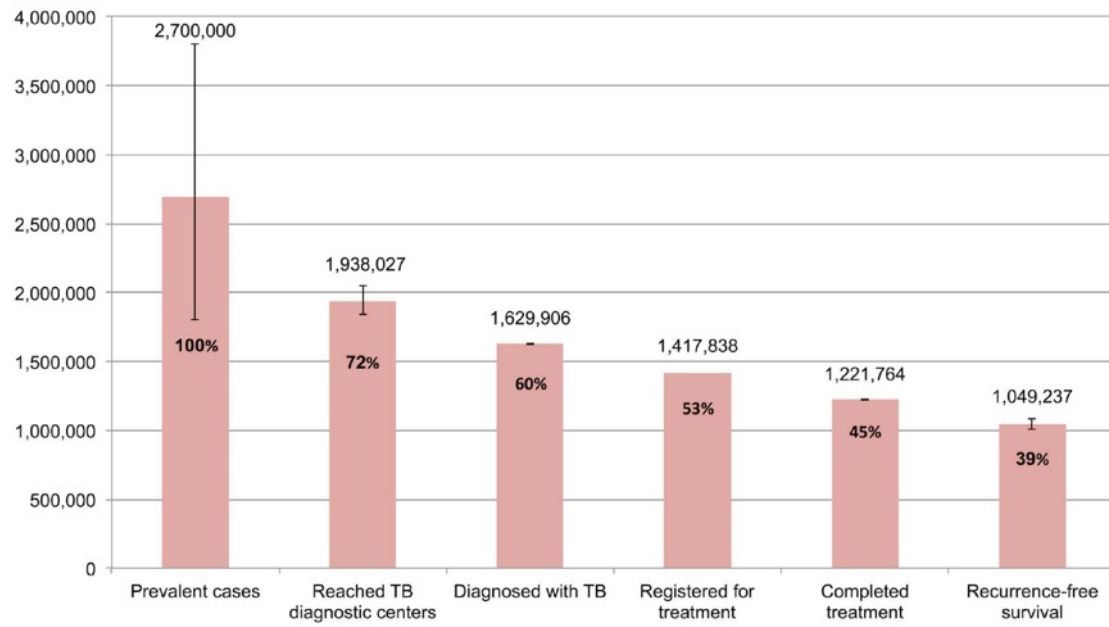


Source: WHO Global Tuberculosis Report 2019

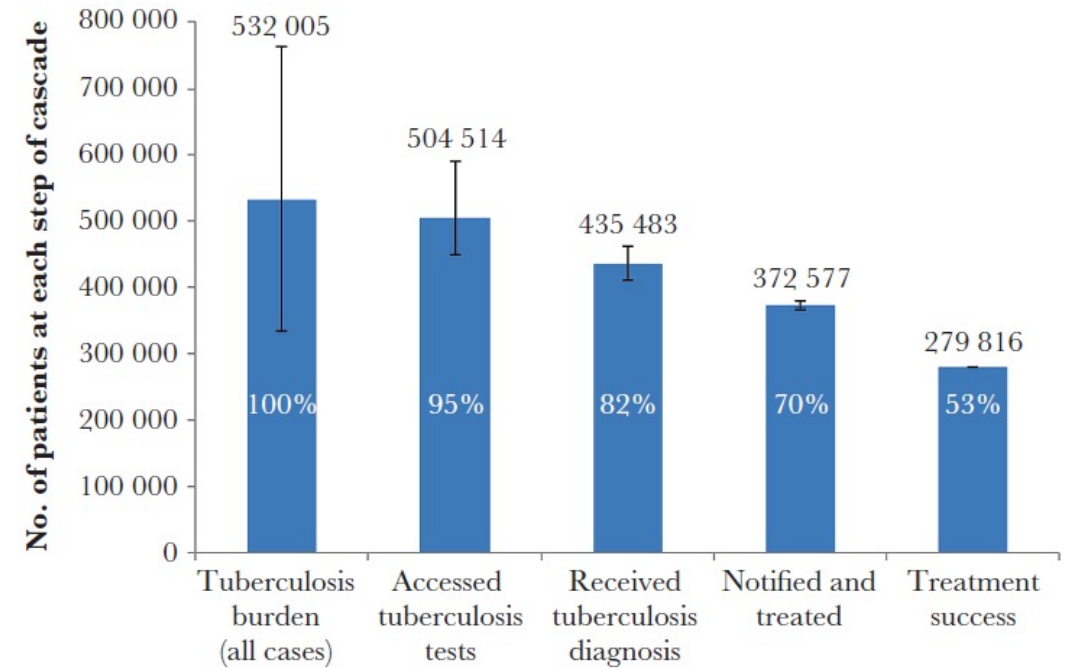


TB Cascades of Care

India*



RSA**



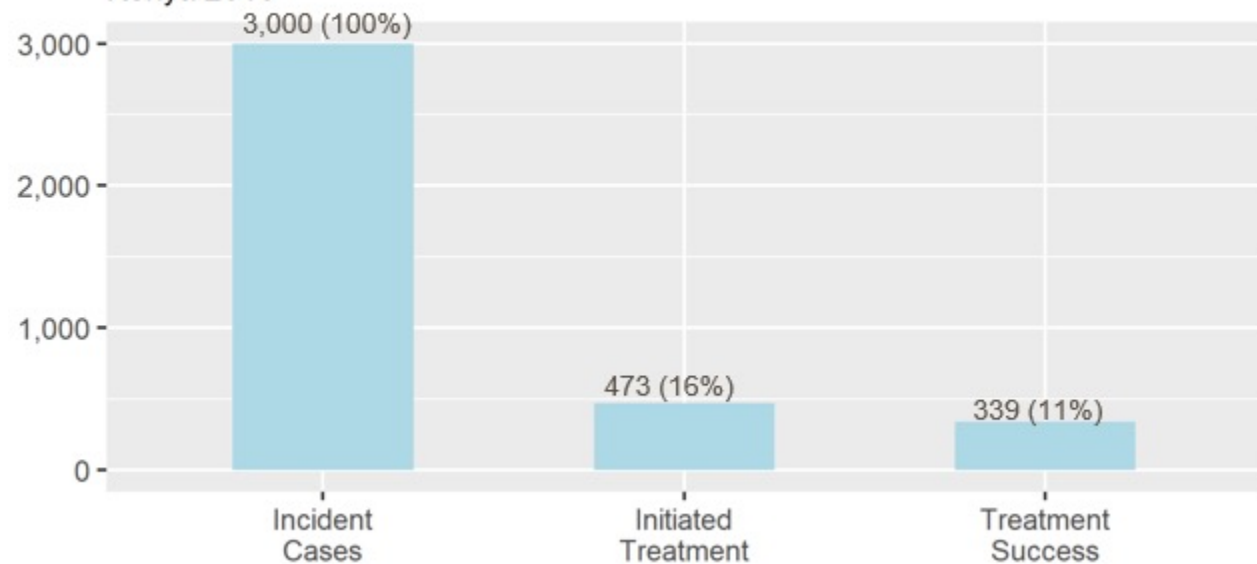
*Source: Subbaraman R, Nathavitharana RR, Satyanarayana S, Pai M, Thomas BE, Chadha VK, et al. The Tuberculosis Cascade of Care in India's Public Sector: A Systematic Review and Meta-analysis. PLoS Med; 2016;13(10)

**Source: Naidoo P, Theron G, Rangaka M, Chihota VN, Vaughan I, Brey ZO, Pillay Y. The South African Tuberculosis Care Cascade: Estimated Losses and Methodological Challenges The Journal of Infectious Diseases; 2017; 216(S7):S702-13

National Treatment cascades

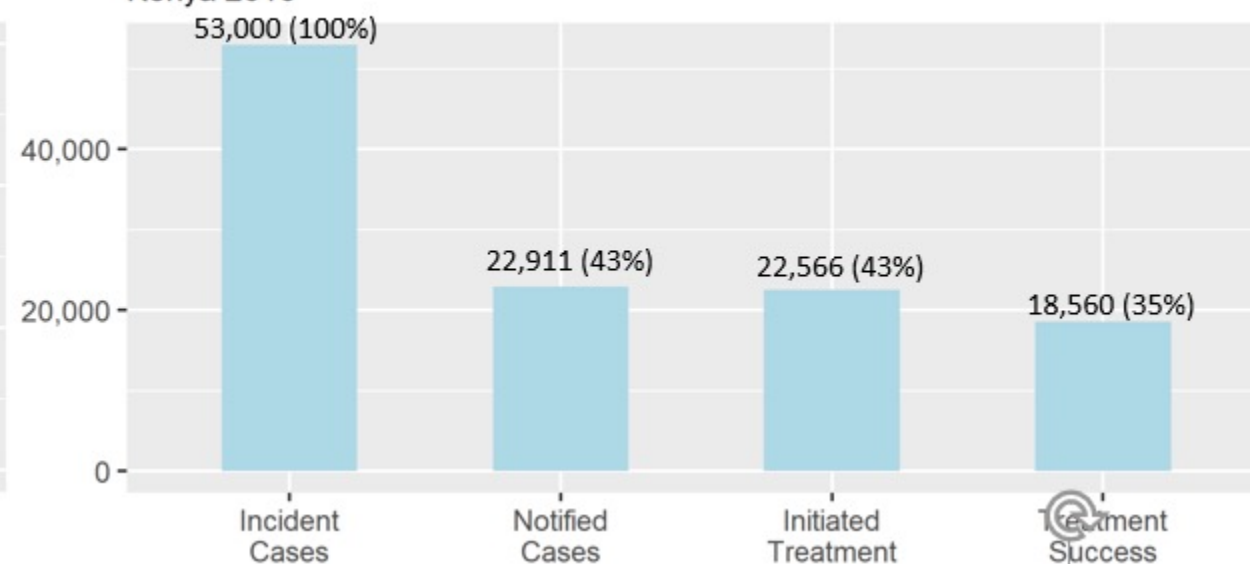
RR/MDR-TB Treatment Cascade

Kenya 2016



HIV+TB Treatment Cascade

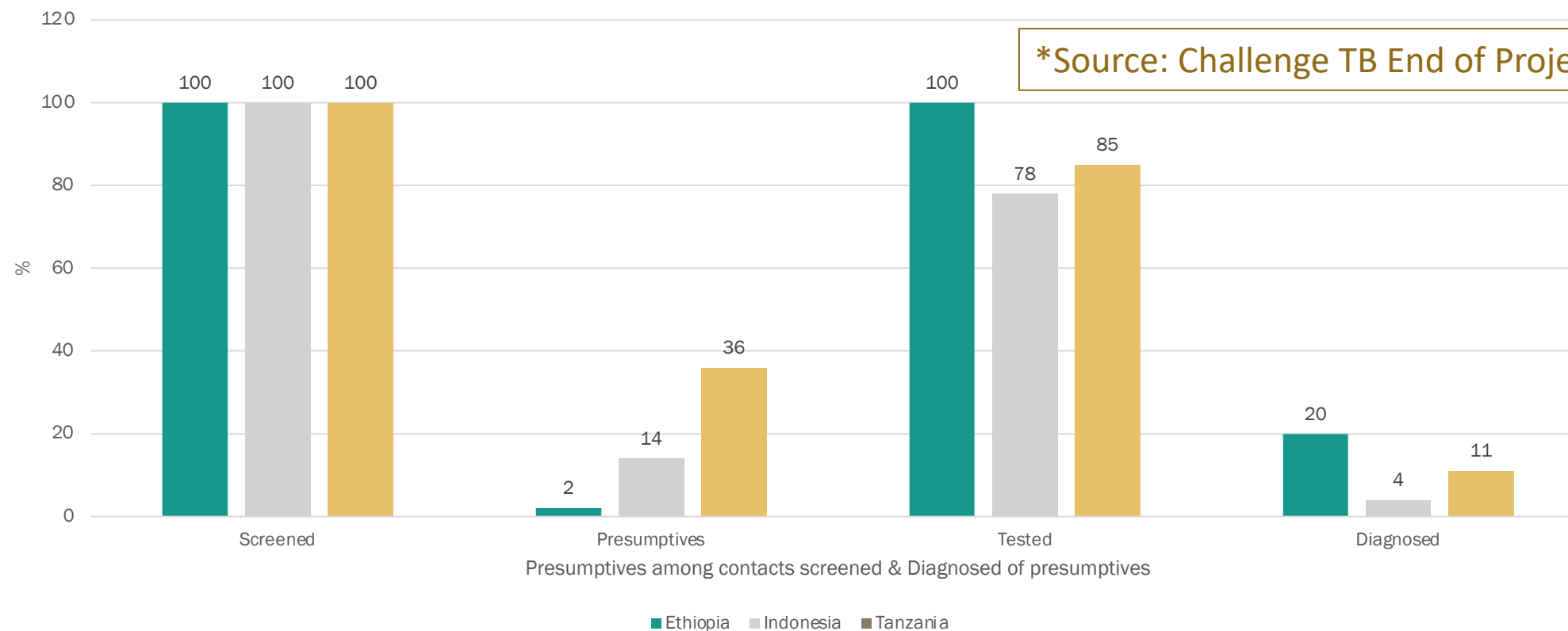
Kenya 2016



*Source: Kenya NTP

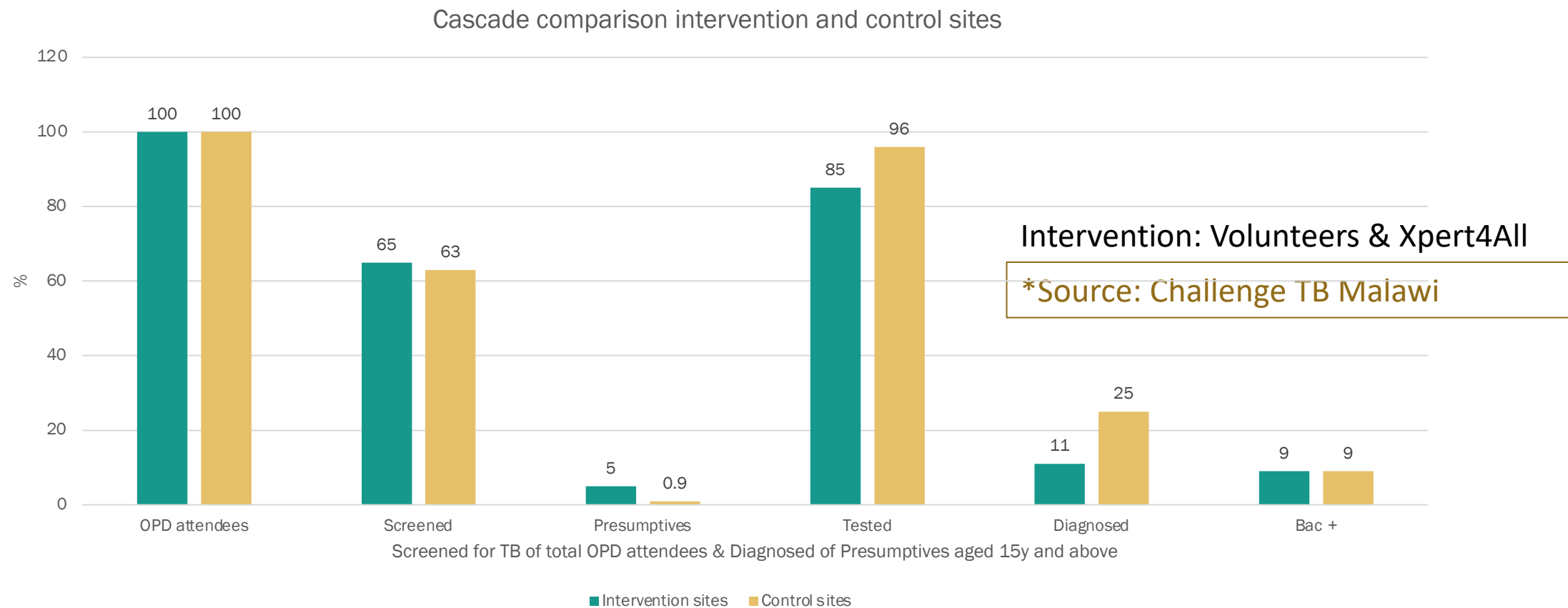
National Contact investigation cascades

Cascade comparison Contact investigation 2018



	Contacts	Screened	Presumptives	Tested	Diagnosed
Ethiopia	104928	102915	1789	1789	362
Indonesia	87071	87971	12135	9422	448
Tanzania	63170	60748	21799	18466	2488

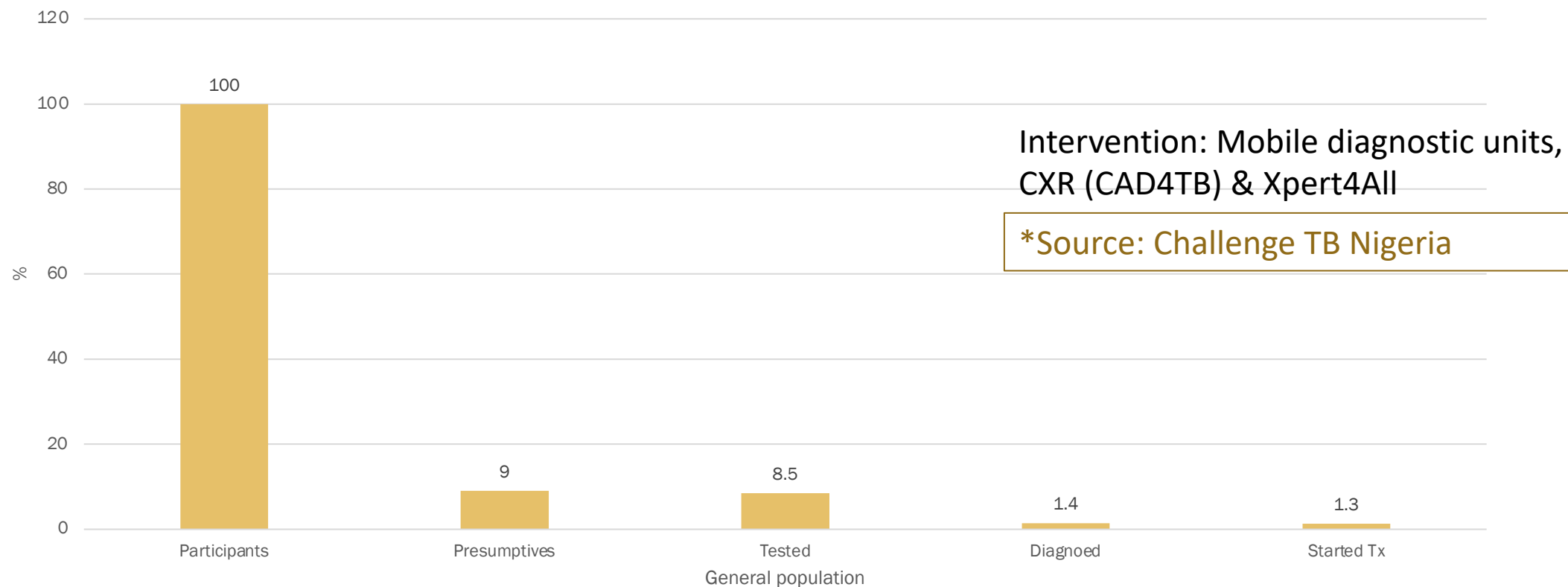
Facility Case finding cascades



	OPD attendees	Screened	Presumptives	Tested	Diagnosed	Bac +
Intervention	336581	219872	11190	9539	1279	1010
Control	478319	303406	2814	2701	706	258

Community Case finding cascades

Active case finding 2018

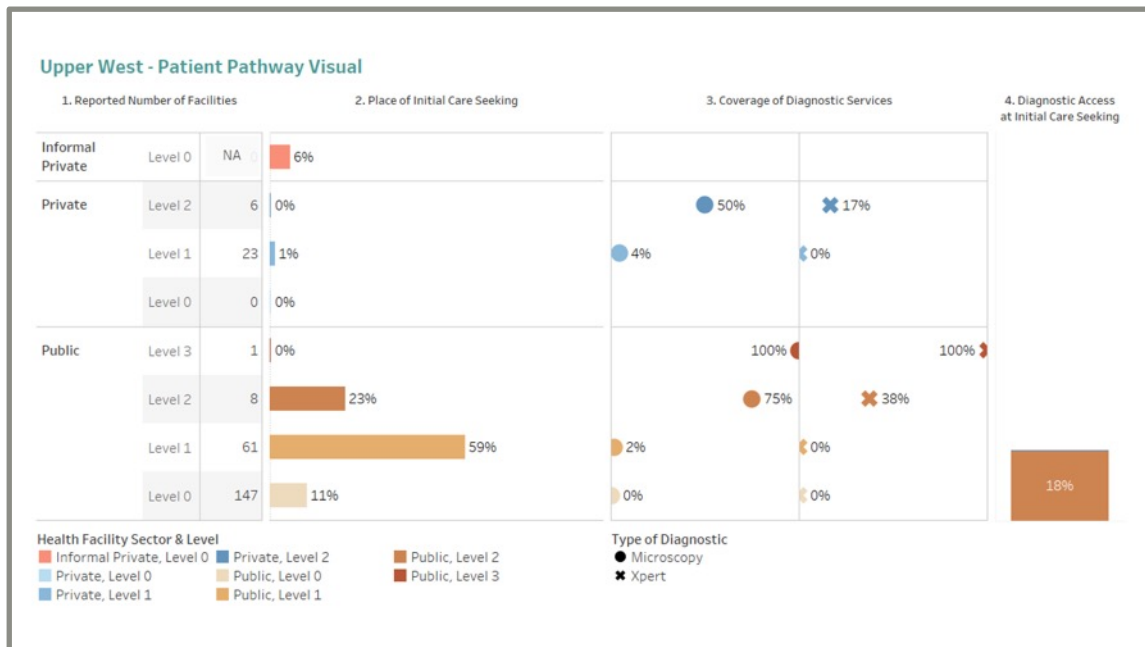


Participants	Presumptives	Tested	Diagnosed	Started Tx
56783	5152	4853	813	763

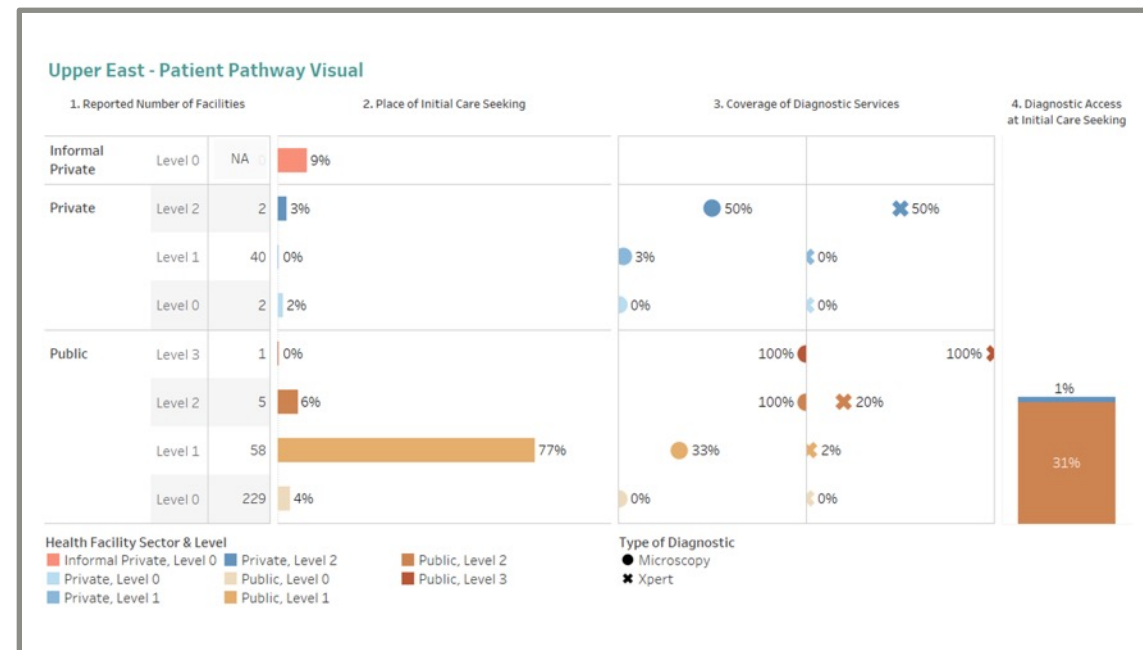


Subnational Care seeking vs diagnostic services availability

Upper West






Upper East



*Source: Ghana NTP

Care cascade analyses complement Epi analyses

- Traditionally, programmatic effects and outcomes have been defined primarily by epidemiological measures
- Such a focus, however, overlooks additional operationally relevant people and systems evidence tied to improving quality of care and accelerating progress by closing gaps along the care continuum:
 - *patient perspectives, priorities and preferences*
 - *health and social systems related gaps*

	People with TB infection or disease, not in the health system			People with TB infection or disease, not identified or diagnosed			People treated for TB infection or disease, not symptom- or relapse-free		
	People with TB infection, high-risk for disease	Asymptomatic disease, not seeking care	Symptomatic disease, not seeking care	Presenting to health facilities, not diagnosed	Diagnosed by non-NTP, not notified	Diagnosed by NTP, not notified	Diagnosed, not started on treatment	Notified, not successfully treated	Successfully treated (not relapse free)
 Evidence on Epidemiology	Data	Data	Data	Data	Data	Data	Data	Data	Data
 Evidence on People	Data	Data	Data	Data	Data	Data	Data	Data	Data
 Evidence on Systems			Data	Data	Data	Data	Data	Data	Data

Source: WHO People centered framework

Guiding questions to consolidate Epi, People & Systems evidence

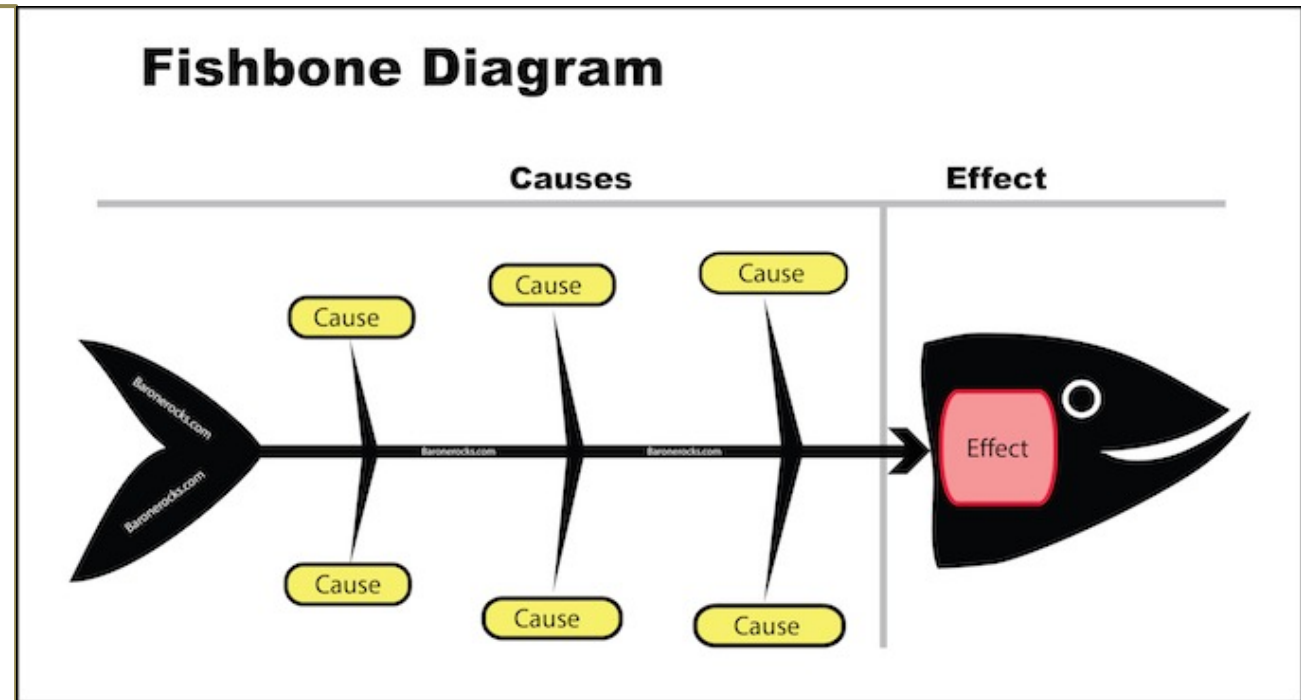
People with TB infection or disease, not in the health system			People with TB infection or disease, not identified or diagnosed			People treated for TB infection or disease, not symptom- or relapse-free		
People with TB infection/ high risk for (progression to) TB disease	People with asymptomatic TB disease, not seeking care	People with symptomatic TB disease, not seeking care	People presenting to health services, not identified or diagnosed	People seeking care from non-NTP service providers, not diagnosed	People seeking care from NTP service providers, not diagnosed	People diagnosed, but not started on treatment	People started, but not successfully treated	People successfully treated, but not symptom- / relapse-free

Question	What are the best available latest (estimated) data and 5-year trends for each of the steps in the care continuum?
Burden	Knowing your Epidemiology provides evidence on the burden of TB disease, including its distribution (e.g. by age and sex) and trends, for both drug-susceptible and drug-resistance TB.
Question	Are there any differences or variations in patient preferences and pathways for each of the steps in the care continuum?
Risk profiles	Knowing your People provides evidence on risk profiles (e.g. age, sex, socioeconomic status, HIV status), TB literacy, perceptions, expectations and behaviour of people with TB or at risk of developing TB.
Question	Are there any health systems or social protection related gaps affecting each of the steps in the care continuum?
Coverage & Quality	Knowing your System provides evidence on the capacity, performance, limitations and distribution of health and social services, both TB-specific and general.

What happens Why?

ROOT CAUSE ANALYSIS OF KEY GAPS (LOSSES)

- What is known about the factors contributing to this problem?
- What additional evidence is needed to better understand the root cause of this problem?
- Of the possible root causes, which would be the most feasible and impactful to address?



Measuring quality of TB care

Using the cascade of care as an organising framework,

national TB programs can

measure quality of TB care

with a set of indicators

that represent key

Steps in the Care Cascade

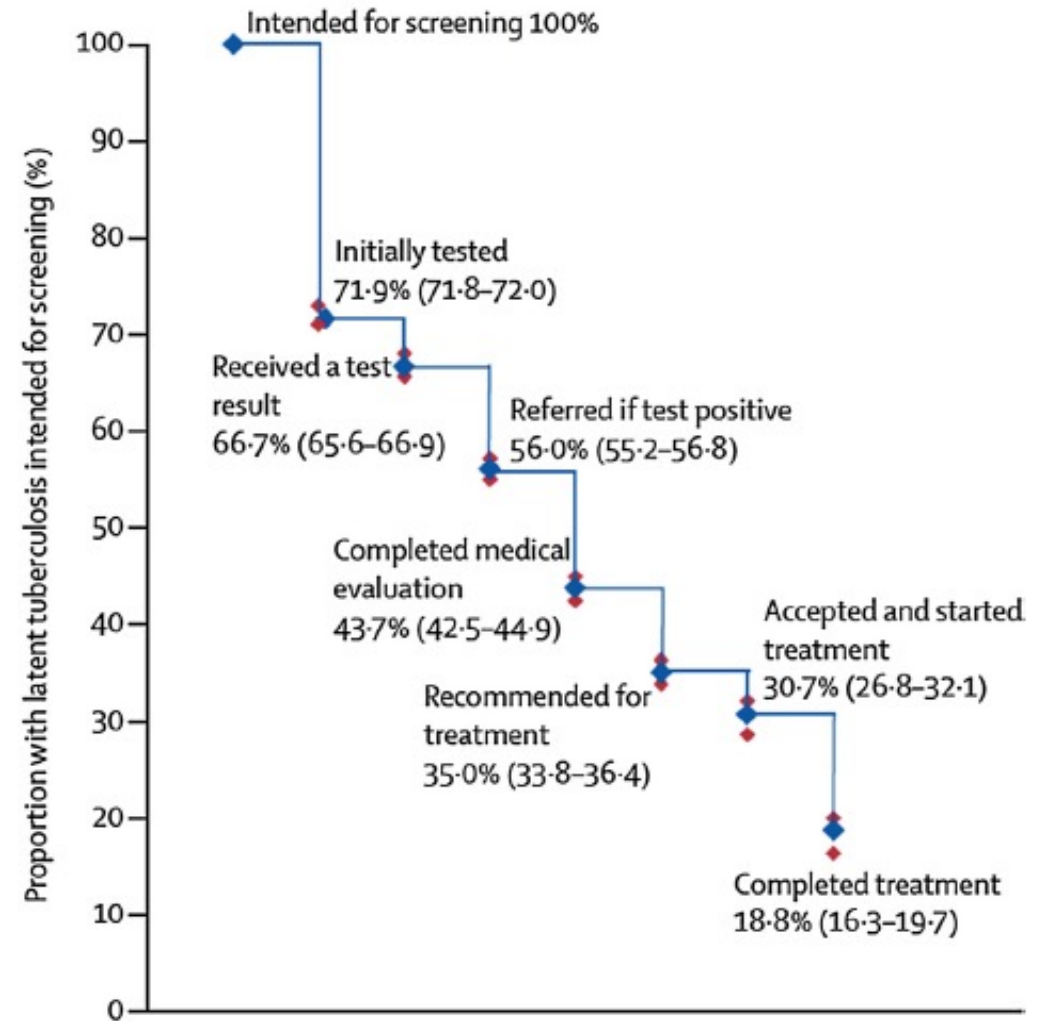


Fig: LTBI care cascade*

*Source: Cazabon D, Alsdurf H, Satyanarayana S, Nathavitharana R, Subbaraman R, Daftary A, Pai M. Quality of tuberculosis care in high burden countries: the urgent need to address gaps in the care cascade. Int J Infect Dis; 2017; Mar; 56: 111-116.

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