



Demonstration of ACF using CAD enabled Ultraportable CXR in Community Settings
William J Clinton Foundation (WJCF)

September 19, 2025

Agenda

1.Overall Project Overview

1.1. Project Design

1.2. Performance and Insights

2.ACF vs PCF - Analysis from Gujarat and Tamil Nadu

3.Approach

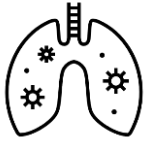
- Service Delivery Elements
- TB Screening Algorithm
- Beneficiary Workflow at Camp

4. Performance & Insights

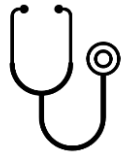
5. Best Practices & Challenges

SECTION 1: Overall project overview

Problem Statement



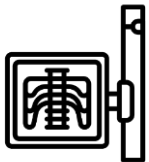
HIGH DISEASE BURDEN: India has **26%** of global TB cases in 2023
(WHO Global TB Report 2024)



TB-SYMPTOM SCREENING IS BROKEN: **42.6%** of TB confirmations would have been missed without Chest X-ray (National TB Survey 2019-21)



POOR CARE SEEKING: **63%** of people with chest symptoms did not seek care (NATBPS 2019-21)



LIMITED X-RAY AVAILABILITY: X-rays only available at CHC and above with **~55%** CHCs had a functional X-ray (Rural Health Statistics 2022-23)



LIMITED AVAILABILITY OF RADIOLOGISTS: **~20,500** Radiologists for 1.4B people → **~15 per million**; (IRIA records, 2024)



OUR SOLUTION

Adopt an Active Case Finding (ACF) approach using AI enabled Ultraportable X-ray devices targeting high-risk groups.

41 devices are being operationalized under the Express Health Camp Initiative



Project Outputs

The Global Fund C19RM grant aims to

[Phase 1](#) Procure 50 Ultraportable CXR

1. Operationalise through Express Health Camp initiative
 - 35 Ultraportable Xray+CAD - 27 Districts, 10 States
 - 6 Fixed Xray in MDU + CAD - 6 Districts of TN
2. Handover of 15 Ultraportable Xray+CAD CXR devices to State Government

[Phase 2](#): Procure 175 Ultraportable CXR

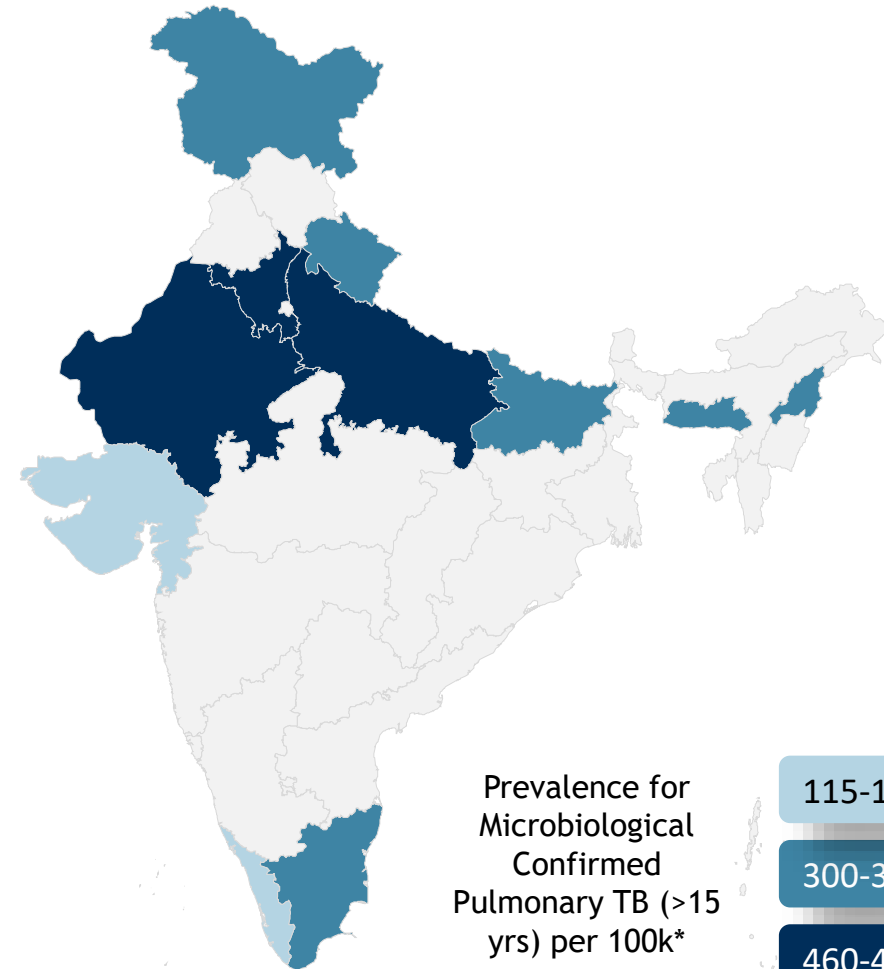


Project Objectives

- Demonstrate the operational feasibility of ultraportable CXR and CAD in various settings like community ACF, facility based ACF, Prisons, workplace settings, special homes etc.
- Develop Operational handbook and SOPs to transition this learning.

Project Geographies- Operational

WJCF selected the geographies in consultation with NTEP



*Source: National TB Prevalence Survey

SECTION 1.1 : PROJECT DESIGN

Integrated Health Camp: Service Delivery Elements



What is a Camp?

- **Provisional set up of health services** to serve near-by community
- The camps are positioned as “**Express Health Camps**”
- These Health camps are designed to provide **CXR, BP, RBS, BMI and Anaemia** screening services.
- Additional services can be integrated basis local requirements.



Where are these camps being conducted?

- **Community camps-** in proximity to the Key Vulnerable Population Groups (KVPs).
- **Facility camps-** located inside primary health care facilities, with high footfall or targeted mobilization of a segment
- **Occupational Screenings-** focuses on Formal/Informal industry with increased association with lung health risks
- **Others-** Prisons, Special Juvenile Homes, Rehab centres, Old-age homes etc.



How are the Camp sites being identified?

- **Area Prioritisation exercise** is conducted to identify Presence of Key & Vulnerable Population.
- **Advance Monthly schedules** is prepared to finalise camp location and alignment with Govt stakeholders.
- **Exact camp site** identified with support from Local administration (PRI), Community Members and Primary Health Facility staff.



What are the Logistics Required?

- Ultraportable CXR is stored at the Government facility
- CXR Transported from **Facility-> camp site->Facility** via a vehicle (*presence of Project Radiographer*)
- A **pre-identified room** is set up, dedicated for CXR.
- **External battery** is provided to offset intermittent electricity supply



How is the Project managing Data?

Radiological Information System (RIS) developed to capture ACF care cascade.

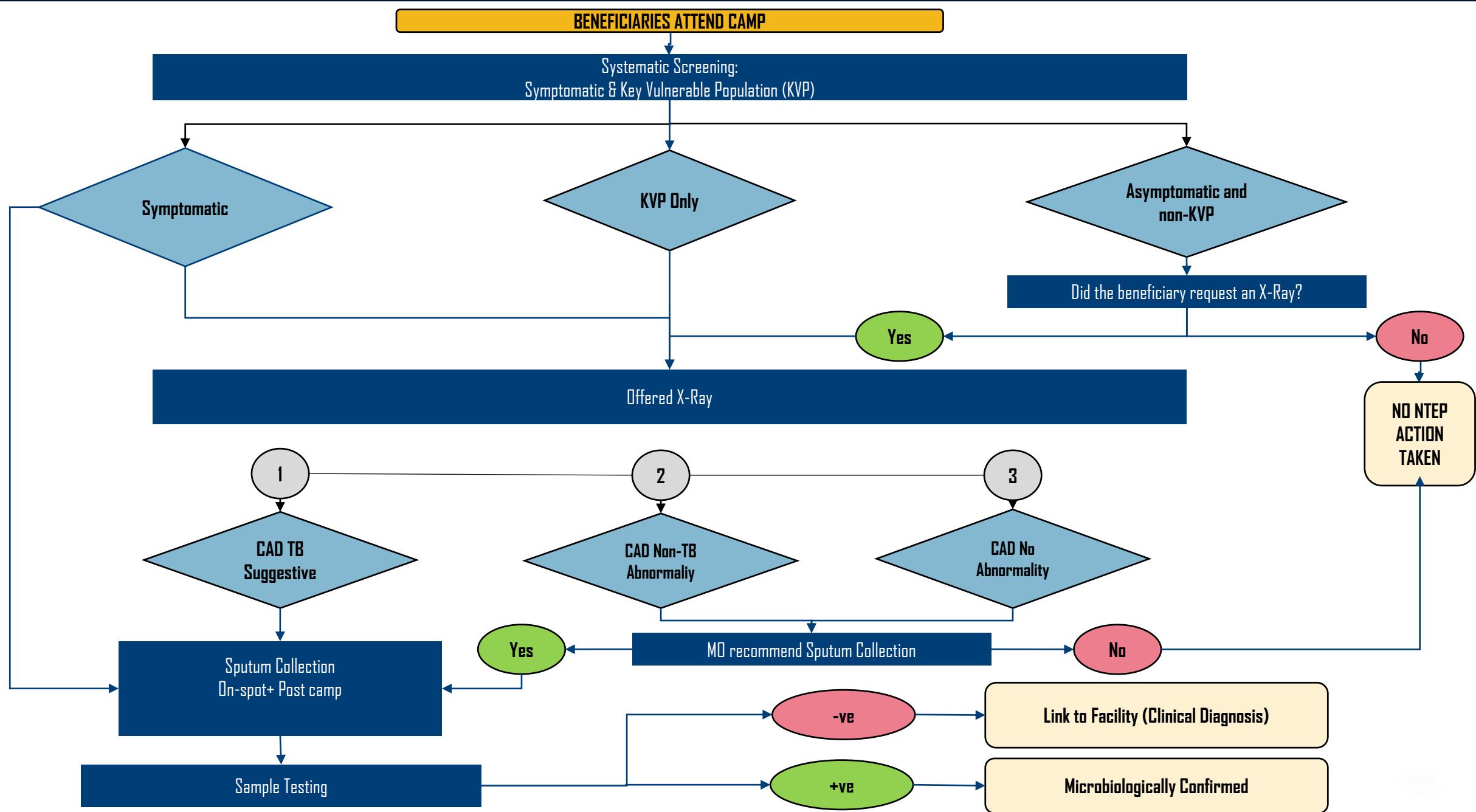
Works offline during camp.

Multiple devices can enter beneficiary data via web browser

Data synced to cloud post-camp.

- Details of Camp set up (including Lat-Long coordinates)
- HR presence (project/govt.)
- Type of Mobilisation efforts
- Basic Beneficiary Details
- Symptom & Vulnerable profile
- CXR Image (PACS)
- CAD Interpretation
- Sputum Collection Status
- Confirmatory Result

Express Camp: TB Screening Algorithm (Data reported till March'2025)



SECTION 1.2: PERFORMANCE & INSIGHTS

Key Definitions/ Acronyms

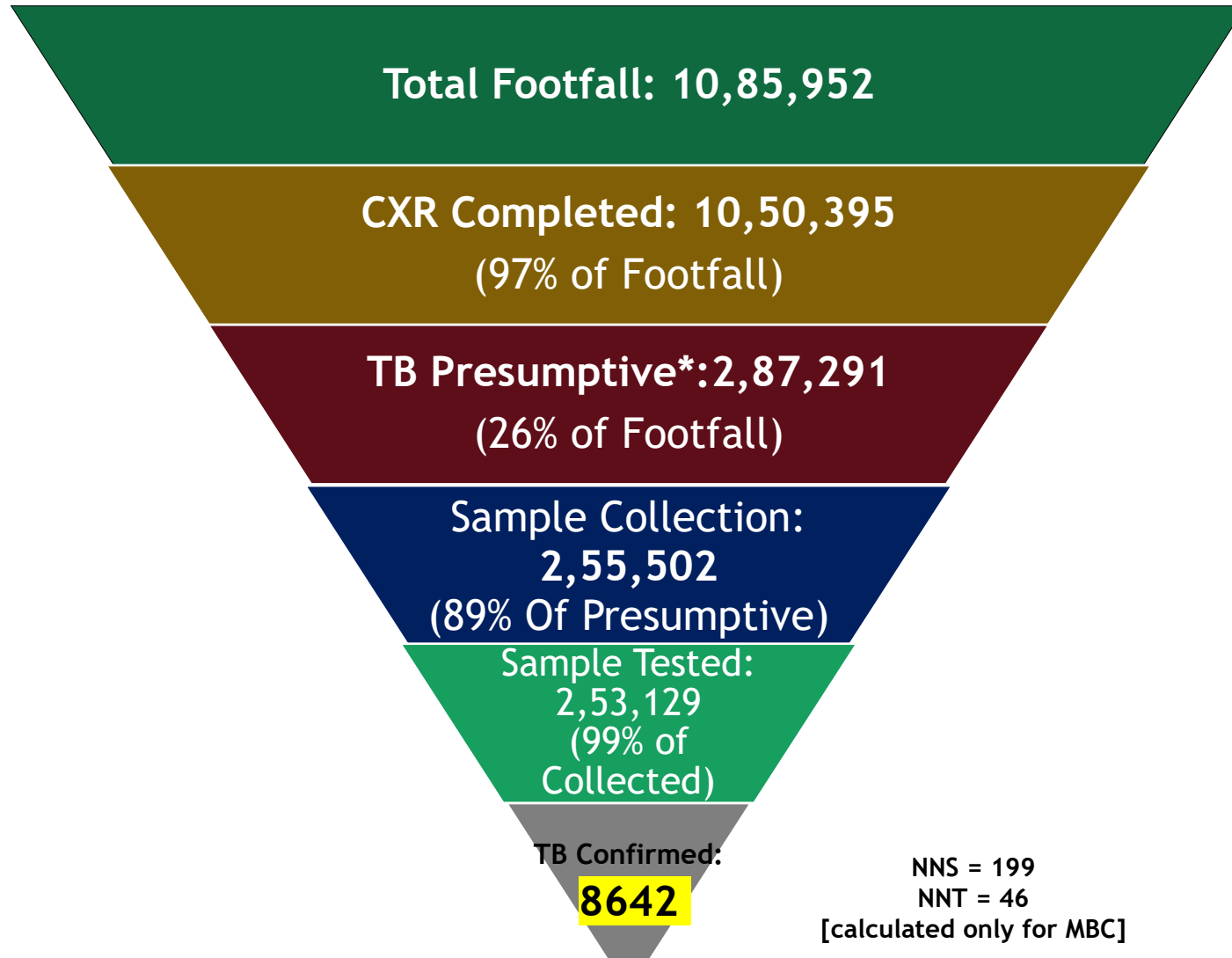
- **Active Case Finding (ACF):** A systematic attempt to find an individual having Tuberculosis outside the Health facility. [Health System triggered]
- **Passive Case Finding (PCF):** A patient led initiative to seek care at health facility and is subsequently diagnosed with TB [Individual triggered]
- **Target group:** Are High Risk groups (HRG), Key Vulnerable population (KVP) and TB symptom positive individuals
- **Body Mass Index (BMI):** Weight in kg/ Height in m²
- **Mobilization:** An activity to spread awareness about an event with an intention to maximize participation
- **Footfall:** Number of people who registered at camp on the information system (RIS)
- **TB Presumptive:** Any individual who have either the classical six TB symptoms or are suggested by AI to be TB presumptive
- **Sample collected:** By design, the project attempts to collect spot samples when an individual is confirmed to be TB Presumptive
- **Sample tested:** Testing of a sample is done by the health system through NAAT (wherever possible)
- **Microbiological confirmation (MBC):** Diagnosis of TB through sputum smear microscopy, molecular methods or Culture
- **Clinically Diagnosed (CD):** Diagnosis of active TB based on clinical symptoms chest X-ray findings, and epidemiological context, in the absence of microbiological confirmation

Performance Summary:

1M+ Attended camp & 8642 TB patients diagnosed during April 2023-June 2025

Data Reported for 41 Handheld CXR operational since Jan' 24 and 6 Mobile Diagnostic Units in Tamil Nadu since Apr'23

13,699 Camps



What do we screen for?

Symptom + Risk factors: 17%
Risk factors/Vulnerable only: 76%
Symptom only: 3%
Neither: 4%

What are the CAD Results?

CAD- TB Suggestive: 10%
CAD Other Chest Abnormalities : 17%
No Abnormality: 73%

What are the presumptive cohorts?

CAD Suggestive : 22%
CAD + Symptom: 19%
Symptom only: 56%
Medical Officer: 3%

Where are samples collected?

At Camp: 86%
Post Camp: 3%
Not collected: 11%

How are samples tested?

TrueNat: 47%
GeneXpert: 17%
Smear Microscopy: 35%

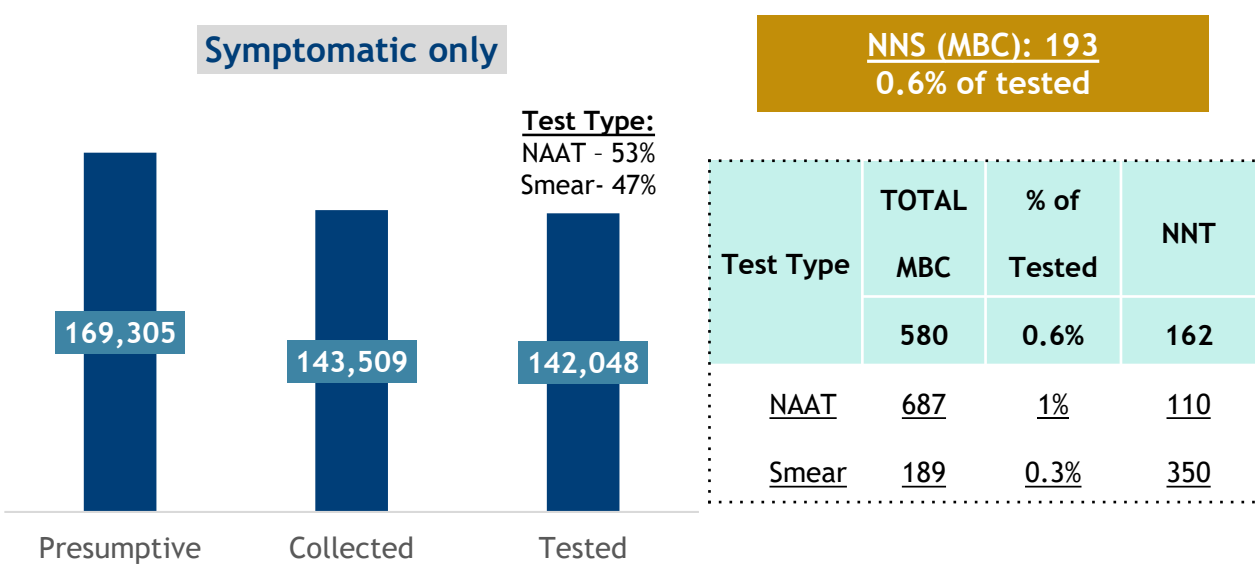
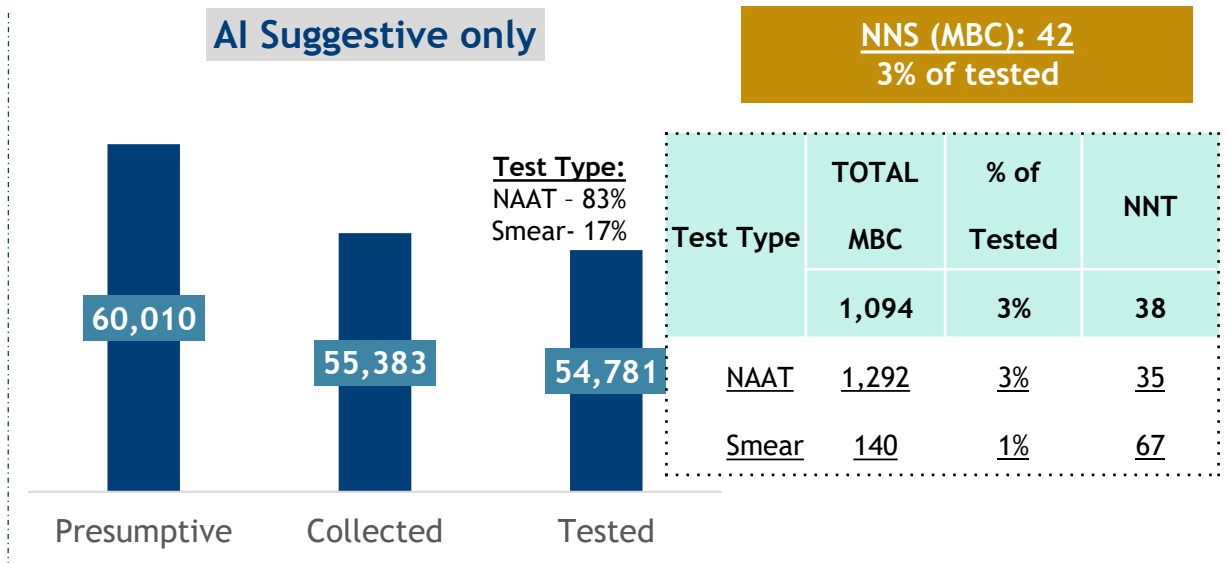
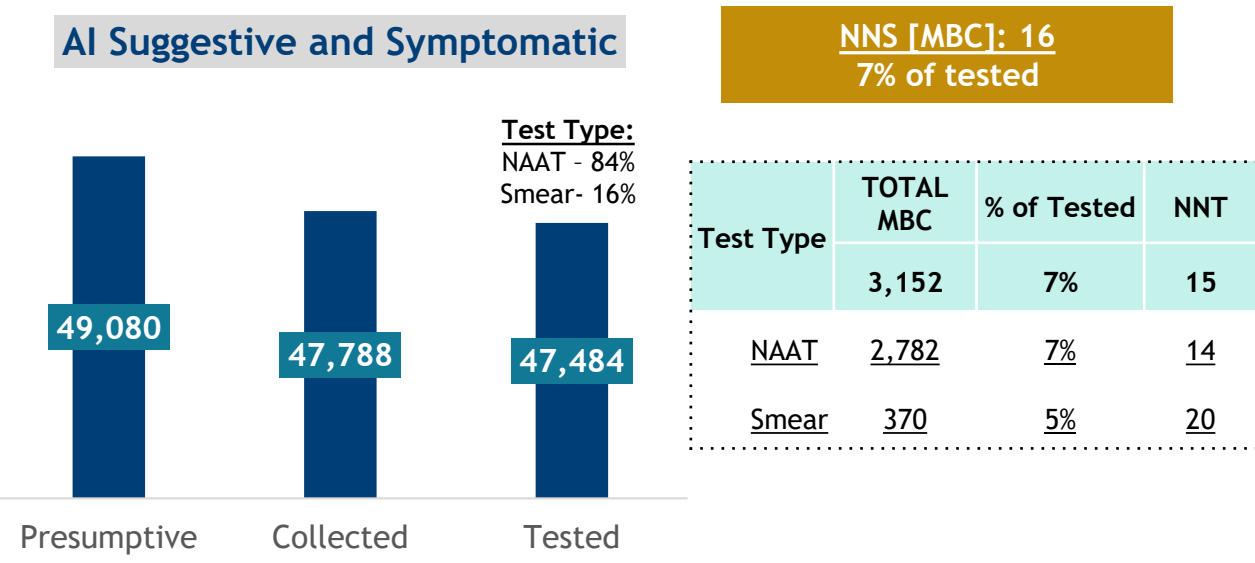
How many TB confirmations?

Total MBC: 5460 (63%)
(NAAT: 88%, Smear Microscopy 12%)
Clinical Diagnosis: 3182 (37%)

* Symptom and/or AI Suggestive or Medical Officer

'AI Suggestive+Symptom' & 'AI Suggestive' Cohorts should be prioritized for NAAT Testing

Analysis of Microbiological Confirmations



- AI Suggestive (With/without Symptoms) have a higher case detection rate as compared to “Symptom only” cohort.
 - AI suggestive (with/without Symptoms) has a better NNS and (24) NNT (22) as compared to Symptomatic only with NNS (193) and NNT (162)
- In limited NAAT capacity settings: project is prioritising AI Suggestive cohorts for NAAT testing over Symptom only cohorts.

Analysis | Symptoms and KVP Groups

Symptoms	% of footfall	NNS	NNT
Blood in sputum	1%	22	20
Unintended Weight Loss	3%	32	29
Night Sweat	2%	38	34
Chills	4%	45	41
Fever	7%	46	42
Cough	17%	50	43

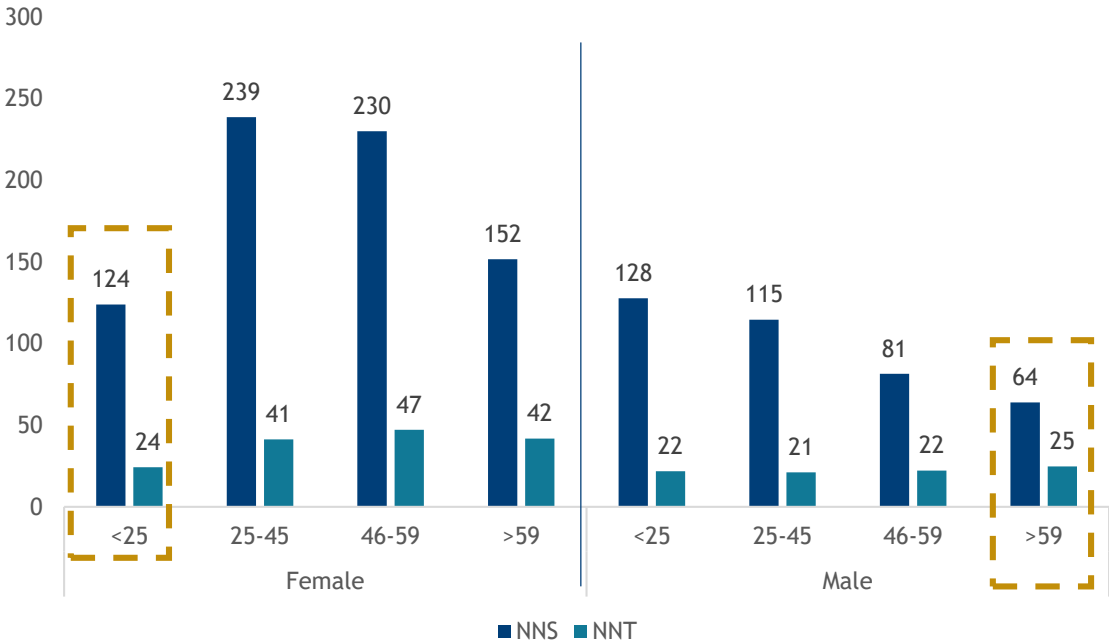
Social Risk Factors	% of footfall	NNS	NNT
Tribal	7%	169	29
Urban slum	19%	244	37
Migrant	3%	271	36
Factory/Construction Worker	7%	271	39
Healthcare Worker	2%	1,587	134

TB Determinants	% of footfall	NNS	NNT
BMI <18.5 & Alcohol	1%	42	18
BMI <18.5 & Tobacco	4%	55	22
BMI <18.5 & Diabetes	1%	63	26
BMI <18.5	15%	73	26
Diabetes and Alcohol	1%	116	39
Alcohol & Tobacco	8%	123	33
Alcohol Consumption	10%	131	35
Tobacco	26%	147	36
Diabetes and Tobacco	3%	155	41
TB HHC	9%	177	37
Diabetes	13%	241	61

* Not mutually exclusive
NNS, NNT Calculated for MBC only

- Although Blood in Sputum was the least commonly reported symptom, it had the lowest NNS & NNT across symptom cohorts
- Amongst Social Risk factors reported, Tribal were found to have lowest NNS
- Low BMI with alcohol consumption gives us the lowest NNS at 42 followed by Low BMI & Tobacco at 55

Age-Gender



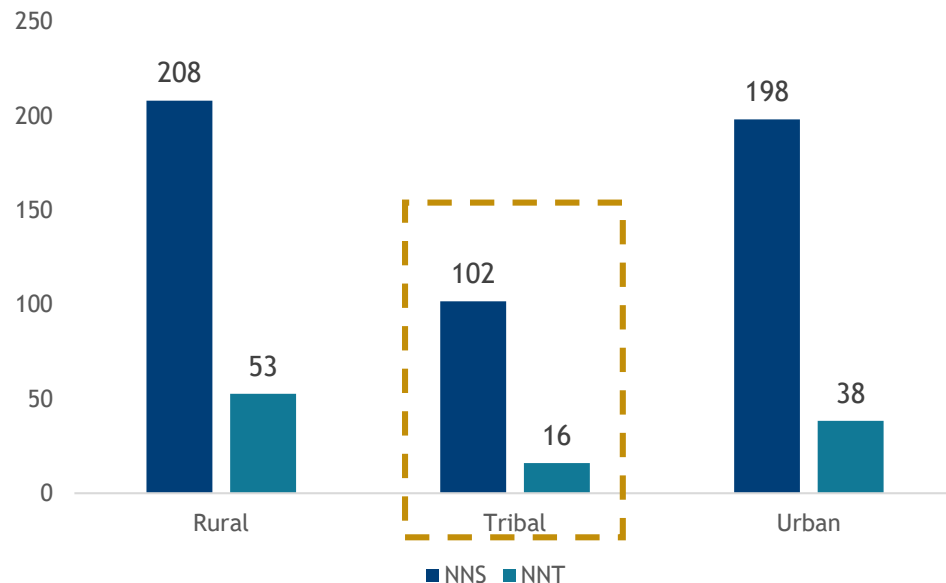
Gender	Age group	% of footfall	% of Total TB Confirmation
Female	<25	7%	7%
	25-45	22%	12%
	46-59	14%	8%
	>60	15%	12%
	Female (all ages)	58%	39%
Male	<25	7%	6%
	25-45	13%	14%
	46-59	9%	14%
	>60	13%	26%
	Male (all ages)	42%	61%
Total		1,085,952 (100%)	8,642 (100%)

- Amongst Females, the lowest NNS & NNT was seen for <25 yrs
- Amongst Males, the lowest NNS was seen for >60 yrs

32% TB patients diagnosed, did not exhibit any symptoms but belonged to KVP

TB Confirmation by Area Type

	Rural	Tribal	Urban
Camps	8,902 (65%)	396 (3%)	4,401 (32%)
TB Confirmations	5,548 (64%)	345 (4%)	2,749 (32%)



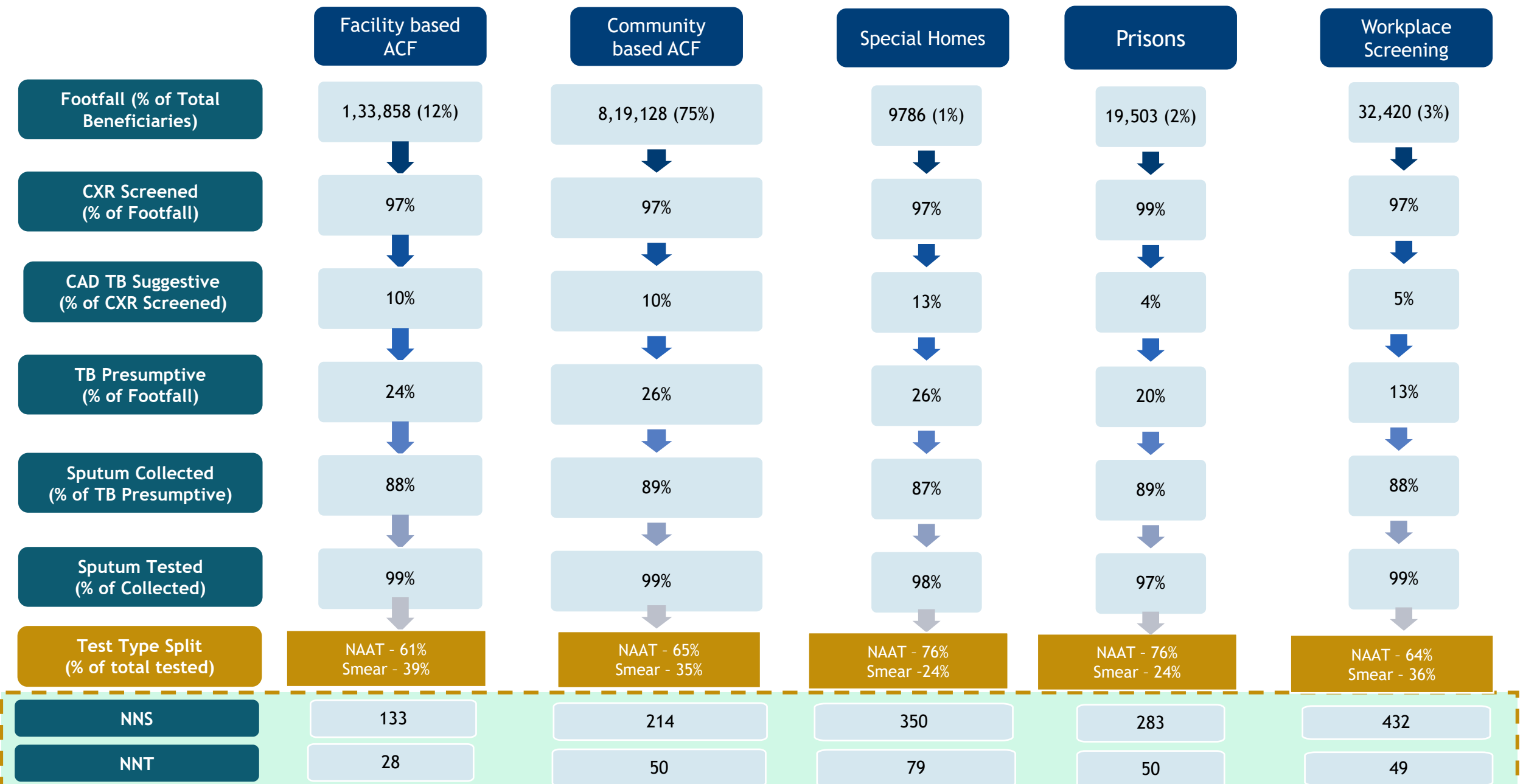
- Tribal camps had the lowest NNS & NNT

TB Confirmation by Beneficiary Profile

Beneficiary Profile	Total footfall (%)	TB Confirmations (% of Total)
Symptomatic only	3%	7%
Vulnerable only (Asymptomatic)	76%	32%
Symptomatic and Vulnerable	17%	61%
Neither	4%	0.5%
Total	<u>10,85,952</u> (100%)	<u>8,642</u> (100%)

- ‘Vulnerable only’ (asymptomatic) were offered CXR, basis AI suggestion, were eligible for sputum testing.
- ‘Vulnerable Only’ cohort contributed 32% of all total TB Confirmations, following symptom & vulnerable that stand at 61%

Despite lower NAAT Testing, Facility Camps reported relatively better NNS



ACF YIELDS: ACROSS 2 APPROACHES

RISK GROUPS	ACF cycles 2021*- Symptomatic screening & Sample collection (NNS)	ACF with X-ray + AI (NNS- MBC only)
BMI < 18.5	1,172	73
ASTHMA & COPD	1,890	104
DM & HTN	1,259	242
ELDERLY >60 YRS	615	158
OCCUPATION	1,677	336
OLD AGE HOMES/ORPHANAGES	379	350
PRISON INMATES	717	283
SLUM	3,580	270
Overall	2824	199

* Shewade HD et.al, Quality of active case-finding for tuberculosis in India: a national level secondary data analysis. Glob Health Action. 2023 Dec 31;16(1):2256129



SECTION 2: ACF vs PCF - Analysis from Gujarat and Tamil Nadu

Period of Analysis- Beginning of Operations to April 2025

GUJARAT: PCF has a higher yield with an NNS of 61 and higher NAAT testing

PCF* (116

camps)

Total Footfall: 3,241

CXR Completed: 3,122
(96% of Footfall)

TB Presumptive: 724
(22% of Footfall)

Sample
Collection:
672
(93% Of
Presumptive)

Sample
Tested
(100%): 672

45% NAAT
55% Smear

**TB
Confirmed:
70**

MBC=53
CD=17

NNS= 61
NNT= 13

ACF (2019

Total Footfall: 1,60,313

CXR Completed: 1,56,191
(98% of Footfall)

TB Presumptive: 25,187
(16% of Footfall)

Sample
Collection:
21,214
(84% Of
Presumptive)

Sample
Tested
(97%):
20,661

43% NAAT

**TB
Confirmed:
1100**

MBC=696
CD=404

NNS= 230
NNT= 30

**No Mobilization + Camp at health facility (All Health facility minus HFC)*

TAMIL NADU: Tamil Nadu has more NAAT testing for ACF camps and higher yield for PCFs

PCF* (585

camps)

Total Footfall: 23,047

CXR Completed: 21,879
(95% of Footfall)

TB Presumptive: 11,690
(51% of Footfall)

**Sample
Collection: 10,463**
(90% Of
Presumptive)

**Sample
Tested: 10,459**
(99.9% of
Collected)
61% NAAT
39% Smear

MBC=184
CD=49

**TB
Confirmed:
233**

NNS= 125
NNT= 57

ACF (2104

Total Footfall: 1,25,570

CXR Completed: 1,13,882
(91% of Footfall)

TB Presumptive: 52,158
(42% of Footfall)

**Sample
Collection: 41,125**
(79% Of
Presumptive)

**Sample Tested:
41,047**
(99.8% of
Collected)
67% NAAT
33% Smear

MBC=547
CD=129

**TB
Confirmed:
676**

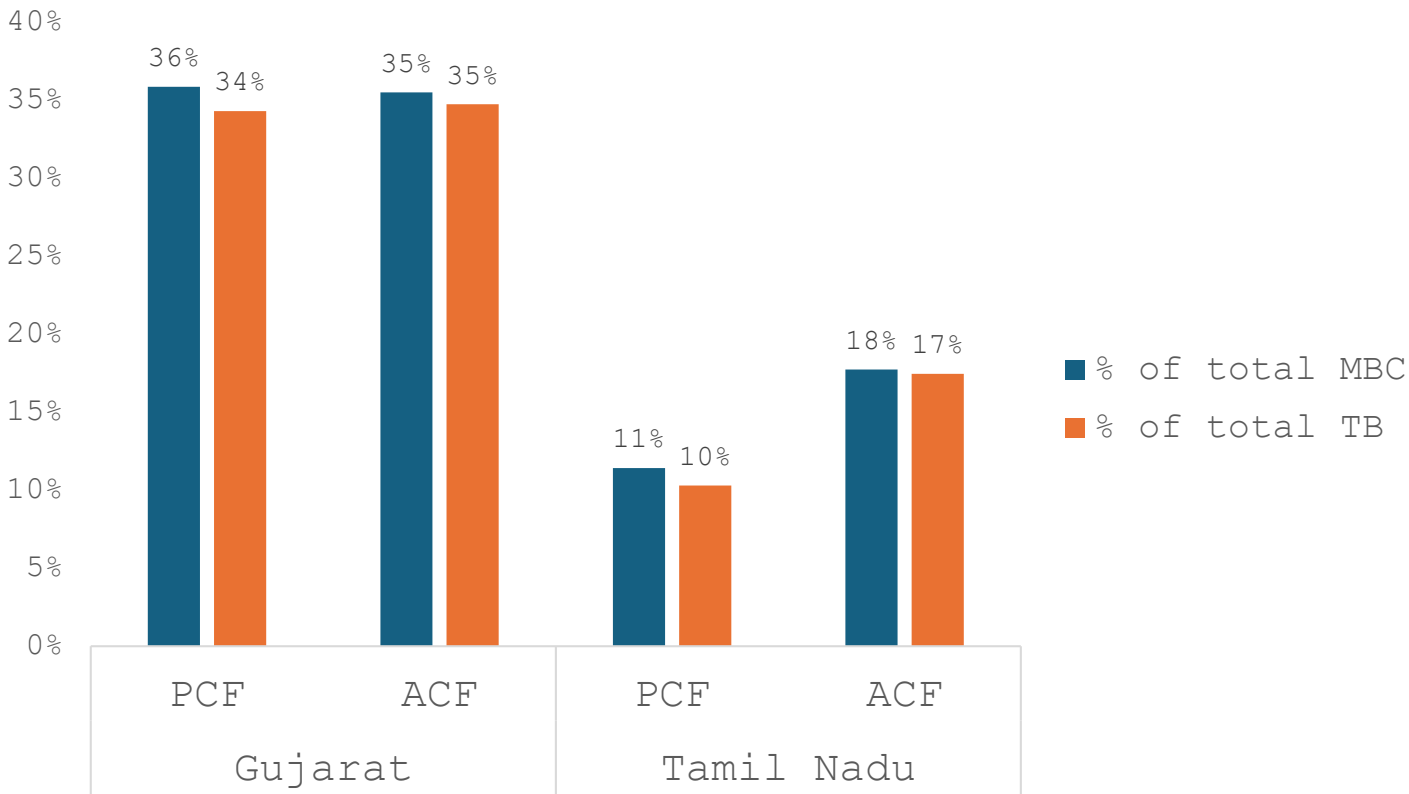
NNS= 230
NNT= 75

**No Mobilization + Camp at health facility (All Health facility minus HFC)*

Asymptomatic

	PCF					ACF				
State	Camps	Footfall	Asymptomatic Footfall as % of footfall	Asymptomatic MBCs as % of MBCs	Asymptomatic TB as % of Total TB	Camps	Footfall	Asymptomatic Footfall as % of footfall	Asymptomatic MBCs as % of MBCs	Asymptomatic TB as % of Total TB
Gujarat	116	3,241	83% (2,700)	36% (19)	34% (24)	2,019	1,60,313	90% (1,44,234)	35% (247)	35% (382)
Tamil Nadu	585	23,047	65% (14,990)	11% (21)	10% (24)	2,104	1,25,570	70% (87,311)	18% (97)	17% (118)

Share of asymptomatic TB cases



- Asymptomatic TB cases detected in **Tamil Nadu** PCFs are lower than those detected at ACF camps.
- In **Gujarat**, asymptomatic case numbers in PCF and ACF are similar.

Age-gender profiles

		GUJARAT								TAMIL NADU							
		PCF				ACF				PCF				ACF			
Gender	Age group	% of footfal l	% of Total TB Confirm ations	NNS	NNT	% of footfal l	% of Total TB Confirm ations	NNS	NNT	% of footfal l	% of Total TB Confirm ations	NNS	NNT	% of footfal l	% of Total TB Confirm ations	NNS	NNT
Female	<25	9%	7%	60	11	8%	10%	158	15	3%	5%	99	45	3%	2%	269	73
	25-45	23%	17%	82	15	22%	11%	498	42	13%	7%	298	111	16%	5%	784	172
	46-59	10%	6%	154	25	12%	6%	566	54	16%	7%	411	165	18%	4%	1199	324
	>60	8%	6%	91	25	16%	9%	459	59	17%	5%	392	176	20%	10%	502	172
	Female (all ages)	50%	36%	85	16	59%	36%	384	38	49%	24%	314	130	57%	21%	667	188
Male	<25	9%	11%	38	7	5%	9%	114	12	5%	3%	537	203	3%	3%	276	67
	25-45	20%	23%	54	10	13%	20%	131	16	12%	21%	68	28	9%	12%	164	45
	46-59	10%	13%	62	15	9%	14%	154	27	14%	23%	71	34	12%	28%	100	37
	>60	11%	17%	40	13	14%	21%	185	45	21%	30%	78	45	18%	37%	113	55
	Male (all ages)	50%	64%	48	11	41%	64%	147	25	51%	76%	79	39	43%	79%	122	47
NNS, NNT Calculated for MBC only		3.241	70	61	13	1.60.313	1.100	230	30	23.047	233	125	57	1.25.570	676	230	75

GUJARAT

- NNS is lowest among males below 25 yrs of age at both PCF and ACF camps

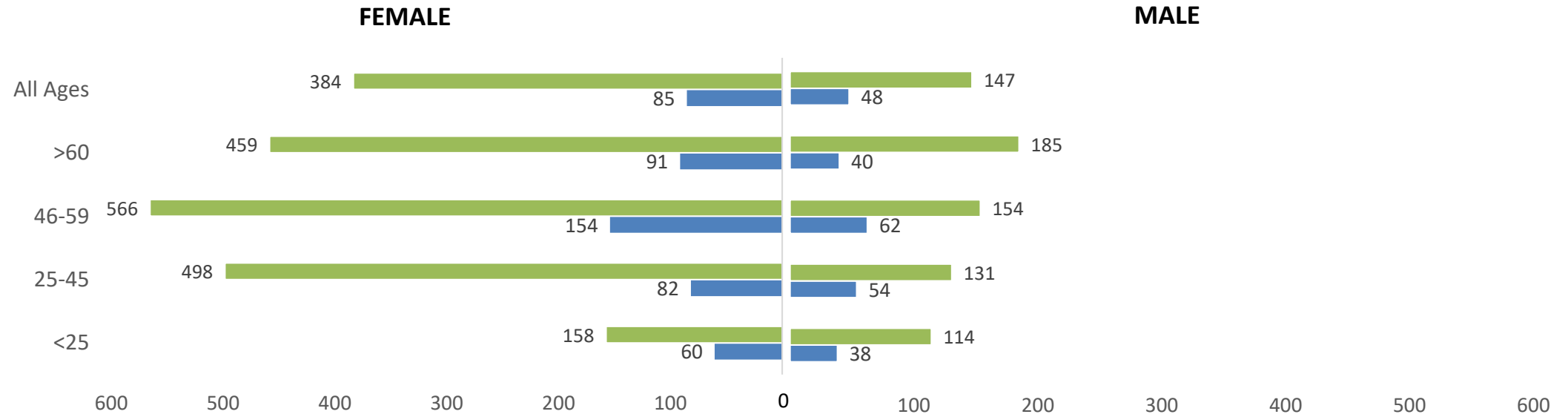
TAMIL NADU

- Males have a higher footfall at PCF camps.
- NNS is lowest among males in the age group 46-59 yrs at ACF and for 25-45 yrs at PCF

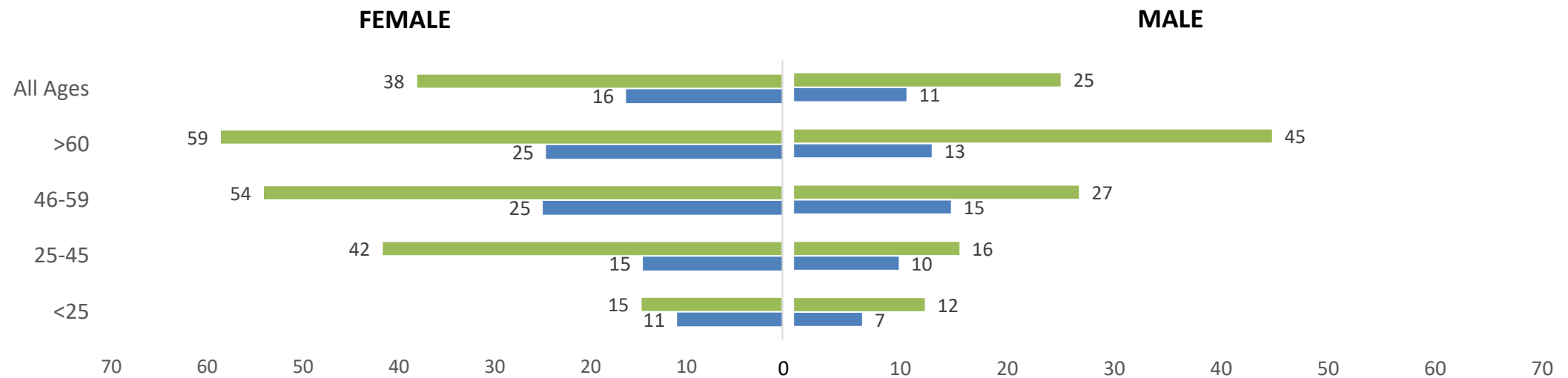
Age-gender profiles in Gujarat

ACF
PCF

NNS



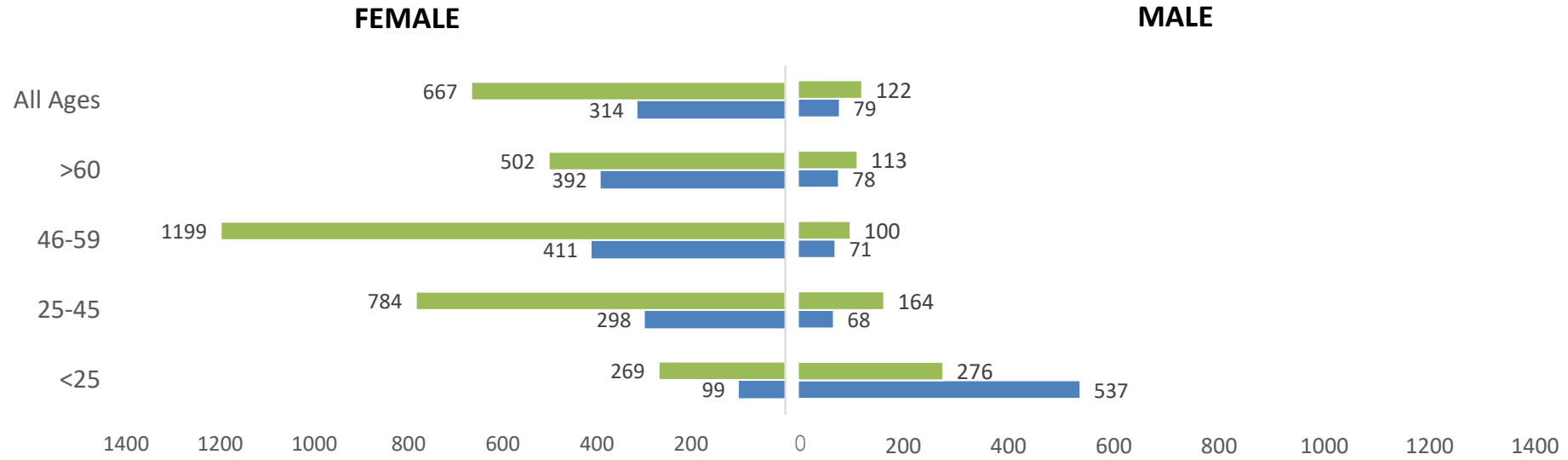
NNT



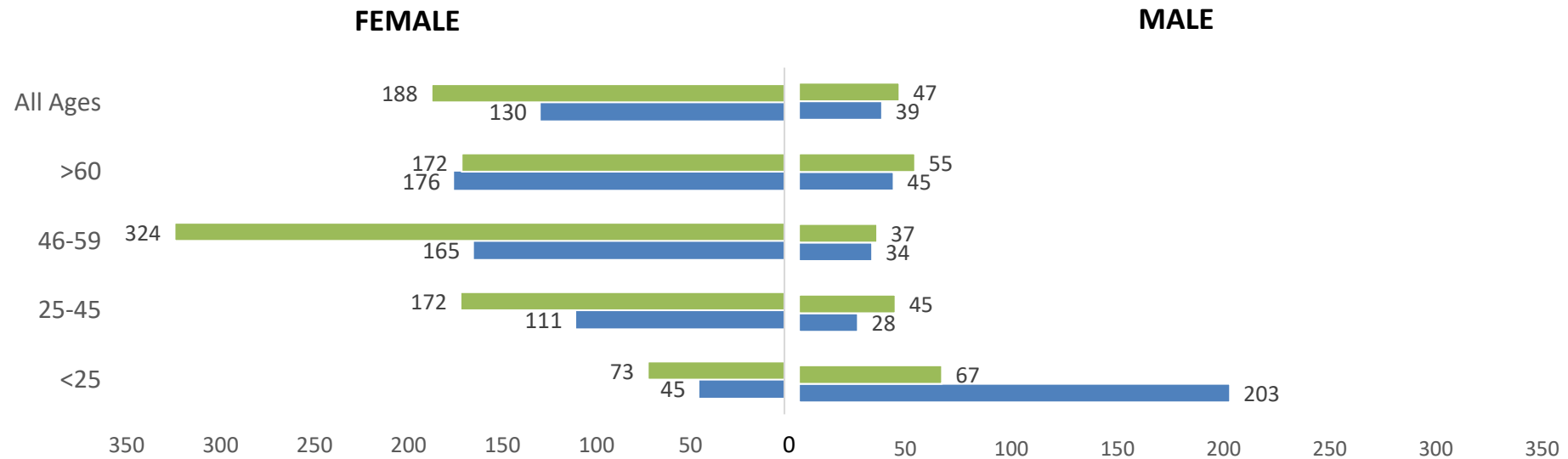
Age-gender profiles in Tamil Nadu

ACF
PCF

NNS



NNT



KVP Groups | Symptoms

SYMPTOMS	GUJARAT										TAMIL NADU									
	PCF					ACF					PCF					ACF				
	% of footfall	% of MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of MBCs	% of Total TB Confirmations	NNS	NNT
Blood in sputum	0.4%	6%	7%	4	4	0.1%	2%	1%	16	15	0.3%	4%	3%	9	8	0.2%	1%	1%	41	34
Unintended Weight Loss	2%	26%	33%	6	5	1%	19%	18%	17	15	2%	20%	21%	12	11	2%	13%	16%	32	22
Fever	3%	23%	24%	8	8	2%	20%	19%	24	20	4%	17%	18%	32	31	2%	10%	11%	56	52
Night Sweat	1%	6%	7%	8	8	1%	6%	6%	20	17	1%	5%	6%	15	13	1%	5%	5%	23	21
Cough	15%	62%	61%	15	14	9%	60%	58%	35	30	34%	88%	88%	48	42	29%	80%	80%	83	62
Chills	4%	9%	10%	23	21	2%	12%	12%	33	28	2%	6%	7%	45	39	3%	9%	9%	63	48

* Not mutually exclusive
NNS, NNT Calculated for MBC only

Beneficiaries with symptoms are more likely to visit a health facility even without mobilization so PCF yields are better in both states

KVP Groups | Social Risk

SOCIAL RISK	GUJARAT										TAMIL NADU									
	PCF					ACF					PCF					ACF				
	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT
Factory/Construction Worker	8%	11%	10%	41	11	5%	8%	7%	138	18	5%	2%	3%	284	72	6%	4%	4%	387	79
Urban slum	50%	30%	30%	101	19	47%	40%	35%	272	31	1%	1%	1%	124	57	2%	2%	3%	181	62
Migrant	7%	2%	3%	232	41	12%	12%	11%	232	28	0.3%	0%	0%	–	–	0.2%	0%	0%	–	–
Healthcare Worker	4%	0%	0%	–	–	3%	0%	1%	2308	73	2%	0%	0%	–	–	2%	0%	0%	2183	539
Tribal	0.03%	0%	0%	–	–	3%	1%	1%	665	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

* Not mutually exclusive
NNS, NNT Calculated for MBC only

- In **Gujarat**, factory or construction workers at PCFs have a lower NNS and NNT compared to populations facing other social risks
- In **Tamil Nadu**, urban slum populations have a higher yield compared to other cohorts.

KVP Groups | Health Risk

HEALTH RISK	GUJARAT										TAMIL NADU									
	PCF					ACF					PCF					ACF				
	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT	% of footfall	% of Total MBCs	% of Total TB Confirmations	NNS	NNT
BMI < 18.5 & Alcohol	1%	6%	4%	6	4	1%	5%	4%	38	13	2%	11%	11%	19	13	2%	12%	12%	34	19
BMI < 18.5 & Tobacco	2%	13%	11%	9	5	4%	19%	16%	55	17	2%	15%	15%	19	13	3%	14%	14%	43	22
BMI < 18.5	15%	47%	40%	19	7	14%	47%	45%	67	16	11%	39%	40%	36	20	11%	35%	37%	74	32
Diabetes and Tobacco	2%	4%	3%	26	5	3%	3%	3%	267	40	4%	7%	6%	74	34	3%	6%	7%	125	51
Alcohol & Tobacco	3%	6%	7%	29	9	4%	10%	8%	97	20	9%	20%	19%	57	28	10%	22%	22%	105	42
Alcohol Consumption	3%	6%	7%	31	10	5%	10%	8%	102	20	13%	26%	24%	65	31	14%	26%	26%	122	47
Household TB contact	8%	13%	10%	36	7	4%	6%	7%	163	21	4%	4%	3%	101	36	2%	2%	2%	168	56
Tobacco	16%	26%	29%	38	9	30%	40%	37%	174	28	16%	29%	28%	68	32	18%	30%	31%	136	51
Diabetes	7%	9%	7%	43	8	11%	6%	7%	384	43	37%	29%	27%	163	73	28%	27%	27%	234	86
BMI < 18.5 & Diabetes	0.2%	0%	0%	-	-	0.5%	1%	2%	128	35	2%	8%	8%	34	19	2%	7%	8%	57	28
Diabetes and Alcohol	0.1%	0%	0%	-	-	0.3%	1%	1%	124	26	3%	6%	5%	62	30	3%	6%	7%	97	42
**High Yielding Cohort	39%	72%	66%	34	9	50%	75%	72%	153	24	9%	24%	13%	103	47	53%	70%	72%	173	64

*Not mutually exclusive

NNS, NNT Calculated for MBC only

*****High Yielding Cohort includes combinations of alcohol/tobacco consumers, low BMI, household TB contact and diabetics***

- In **Gujarat**, persons with household TB contact have a higher footfall at PCFs compared to ACFs while for people with low BMI footfall across both camps are comparable.
- In **Tamil Nadu**, low BMI cohorts have a higher footfall at PCFs.

SECTION 3: Learnings from dipstick survey on health seeking behaviour

Survey Findings for Tamil Nadu

Description/ Variables	Value of 'n'	Visited any health facility during last 1 year for OWN treatment	Visited any health facility during last 1 year for OWN treatment MORE THAN 5 times	Visited any health facility during last 1 year for OWN treatment only ONCE	Individuals who visited PHC	Individuals who visited CHC	Total beneficiaries = 3991
Low BMI Individual	416	44%	17%	6%	30%	5%	
Non Low BMI Individual	3575	50%	15%	7%	36%	4%	
Self Reported Diabetic Individual	1282	53%	18%	5%	35%	1%	
Non-Self Reported Diabetic Individual	2709	47%	14%	8%	31%	2%	
Self Reported Hypertensive Individual	1320	50%	15%	6%	32%	4%	
Non Self Reported Hypertensive Individual	2671	49%	16%	8%	33%	4%	
Tobacco Consumer	882	55%	18%	10%	40%	5%	
Non Tobacco Consumer	3109	47%	15%	6%	30%	4%	
Alcohol Consumer	744	47%	12%	9%	36%	4%	
Non Alcohol Consumer	3247	50%	16%	7%	35%	4%	

- Diabetes and Hypertension have made people visit a health facility in the last 1 year for their own treatment; including tobacco consumers
- Tobacco consumers have had to visit a PHC most in number

Survey Findings for Other states (*Gujarat, Haryana, Kerala, Nagaland, Rajasthan, UP, Uttarakhand*)

Description/ Variables	Value of ‘n’	Visited any health facility during last 1 year for OWN treatment	Visited any health facility during last 1 year for OWN treatment MORE THAN 5 times	Visited any health facility during last 1 year for OWN treatment only ONCE	Individuals who visited PHC	Individuals who visited CHC	Total beneficiaries = 1722
Low BMI Individual	268	51%	18%	1%	24%	9%	
Non Low BMI Individual	1454	52%	18%	6%	23%	5%	
Self Reported Diabetic Individual	287	71%	34%	5%	16%	6%	
Non-Self Reported Diabetic Individual	1435	48%	15%	7%	11%	4%	
Self Reported Hypertensive Individual	443	73%	33%	5%	18%	6%	
Non Self Reported Hypertensive Individual	1279	45%	13%	8%	9%	4%	
Tobacco Consumer	628	49%	19%	6%	10%	6%	
Non Tobacco Consumer	1094	54%	17%	7%	13%	4%	
Alcohol Consumer	196	48%	11%	8%	11%	4%	
Non Alcohol Consumer	1526	53%	19%	7%	12%	5%	

- Diabetes and Hypertension have made people visit a health facility in the last 1 year for their own treatment
- Diabetic individuals usually have had to visit a health facility quite often in the last year (more than 5 times)

Annexure

Best Practices and Learnings (1/2)

Project Design

Camp Positioning

- The camps are positioned as Health camps and not TB camps
- Targeted mobilization leveraging FLWs

CXR Device

- Source should have ability to irradiate **100+ scan per day for 24 days** to maximise output for ultraportable devices
- Adequate **hardcase protection** for all CXR units + Detector etc.
- **Power Banks** could assist in conducting camps with intermittent electricity supply

Integrated Radiology Information System (RIS)

- **End to end data management system. Takes 2-3 minutes to register + screen a beneficiary**
- **An integrated RIS system acts as a One-point-solution** for Beneficiary Data, CXR image acquisition, AI interpretation, Remote Radiology, Sample Collection Status, Testing & Results
- Works in Offline & Online Mode, to mitigate internet challenges

Utilising Remote Teleradiology

- Gujarat has on-boarded **2 Medical Colleges** to remotely read the CXR via **RIS system** - new case diagnosis
- Increased confidence of the health system on AI reading

Best Practices and Learnings (2/2)

On Ground Implementation

Sample Collection and Prioritization

- Timely Sputum Sample Collection & Transportation critical.
- Prioritized AI suggestive samples (with or without symptoms) for quality collection and NAAT testing in settings where NAAT testing capacity is limited

NCD and Other Tests Integration

- State Governments have proactively aligned their NCD cell to Express Health Camps and is actively monitoring following up of Presumptive beneficiaries
- The camp can be utilized as a platform for integrating other services like mental health screening, HIV, Hepatitis screening etc.

Advance Tour Plan

- **Advance monthly schedules** are prepared in alignment with NTEP and GHS team and circulated downstream to all stakeholders.
- Camp location is selected basis on high-burden, TB notifications, hotspots.

Involvement of FLWs and Community Stakeholders

- **Involvement of FLWs, ASHA/ANM** helps in optimising for more camps by saving C-19 team's efforts on ground
- Coordination with presence of health system eco-system and community groups (SHGs, KOLs, NGOs) helps in building confidence of the community.

Key Challenges

Camp	Planning	Administrative reasons, camp days/location get altered, leading to sub-optimal mobilisation
	Male footfall	Reliance on HWC and NTEP staff, camps cannot be initiated early mornings or late evenings-> leading to lower male footfall.
	Sputum Quality	In camps where NTEP staff is not present, there is limited ability to check for quality sample-> leading to eventual sample rejection by LT
	NTEP Presence at Camp	Limited NTEP resources per block, multiple responsibilities apart from ACF
	Collection & Transportation	Currently, Express Health camp staff plays an active role in collection & transportation of samples. For 15% beneficiaries who could not expectorate at camp, only 3% samples could be collected post-camp
Program	Testing	Project has limited control over testing conducted, as it is dependent on Distance to Lab, Lab capacity, Lab HR & consumables availability
	Reporting	- The TAT on reporting of results can vary between 3 - 14 days, depending on the geography - The TAT on notification can go as high as 45 days since day of diagnosis - Negative Samples are often not reported on Nikshay

Photos from the ground (1/3)



Door-to-door interactions on pre-camp day and distribution of flyers in Gujarat



Community mobilisation in rural Bihar



Poster on a wall in Kerala



Beneficiary interactions in Uttarakhand

Photos from the ground (2/3)



Camp setup in Ladakh



Basic tests done for beneficiaries in Nagaland



ASHA workers at the campsite in Uttar Pradesh



ASHA workers and NTEP staff at a campsite in Bihar

Photos from the ground (3/3)



Camp mobilisation in Nagaland



Camp conducted in PHC in Nagaland



Camp conducted
in a Pradhan's
house in Haridwar



ASHA being mobilised in
Gujarat

THANK YOU

RIS (PROJECT MIS)

1. GEOGRAPHICAL LEVEL DATA

- Geographical data is collected prior to the commencement of ACF activities
- Beneficiary level data (at one camp)- share common geographical indicators, thereby need for multiple data entries
- *"Test Available at camp"* provide ability to customize inputs, making the data entry more relevant and easier to use.
- *"Mobilisation Strategy"* is also tracked as an input indicator
- *"Health Staff Present"* showcases the support extended by Government Health System

All fields marked as (*) are mandatory.

State *	District *	Tuberculosis Unit (TU) *	Headquarter PH *
Area Type *	Block / Ward *	Perchayat Name *	Village Name *
Hamlet Name	Type of Camp *	Nearest Health Facility (PHC/Sub-Centre/HWC)	Pincode *
Population of catchment area *	No. of Expected Beneficiaries	Latitude	Longitude
		26.0001883	77.274267

Type of Mobilization done for Camp
☐ Door to Door Mobilization
☐ Flyers/Pamphlets
☐ Posters
☐ Camp Tickets
☐ Advocacy through Key Opinion Leaders (KOLs)
☐ Loudspeaker activity
☐ Others
☐ None Of the Above

Tests Available at Camp
☐ BP
☐ Diabetes
☐ Height
☐ Weight
☐ HIV
☐ Hemoglobin
☐ TB (TST / Cy-TB / IGRA)
☐ Others
☐ None Of the Above

Health Staff Present at Camp		
☐	STS	0
☐	STLS	0
☐	LT	0
☐	TBHV	0
☐	IIV	0
☐	ASHA	0
☐	ANM / MPIIW / Village Nurse	0
☐	CHO / MHP	0
☐	Staff Nurse	0
☐	Medical Officer (MO)	0
☐	Others	0

2. COMPREHENSIVE BENEFICIAIRY LEVEL SCREENING

The comprehensive Beneficiary level screening at camp comprises of:

1. Symptom screening
2. Most common risk factor
3. Clinical risk factor
4. Social & occupational risk factor

Camp ID * CDR20240307050100970	Beneficiary Name * 	Gender * Select	Age *
Contact Number * 	Nikesh ID 	Street Name 	
Height (Cm) * 0	Weight (Kg) * 0	BMI (Kg / m²) 0	Blood Sugar (mg/dl) *
Systolic BP (mm) * 	Diastolic BP (mm) * 	Hemoglobin (g/dL) 	

1. Symptom Screening	
Cough (Persisting for a period of 2 weeks)	☐ Yes ☐ No ☐ Dont Know
Chills (Persisting for a period of 2 weeks)	☐ Yes ☐ No ☐ Dont Know
Fever (Persisting for a period of 2 weeks)	☐ Yes ☐ No ☐ Dont Know
Night Sweats	☐ Yes ☐ No ☐ Dont Know
Unintended Weight Loss	☐ Yes ☐ No ☐ Dont Know
Blood In Sputum	☐ Yes ☐ No ☐ Dont Know
None Of the Above	☐ Yes ☐ No

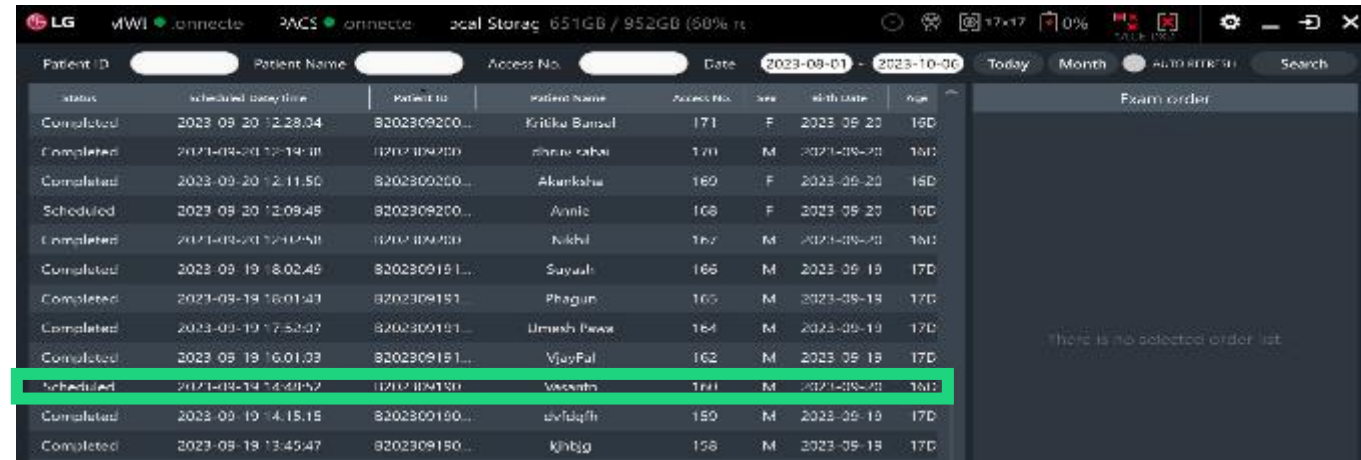
2. Most commonly found risk factor in the population	
Diabetes	☐ Yes ☐ No ☐ Dont Know
Hypertensive	☐ Yes ☐ No ☐ Dont Know
Tobacco	☐ Yes ☐ No ☐ Dont Know
Alcohol consumption	☐ Yes ☐ No ☐ Dont Know
Household contact of Known TB Patients	☐ Yes ☐ No ☐ Dont Know
Close contact of Known TB Patients	☐ Yes ☐ No ☐ Dont Know
COVID Recovered Patients	☐ Yes ☐ No ☐ Dont Know
COPD	☐ Yes ☐ No ☐ Dont Know
Bronchial Asthma	☐ Yes ☐ No ☐ Dont Know
Cardiovascular Disorders	☐ Yes ☐ No ☐ Dont Know
Past TB less than 5 years	☐ Yes ☐ No ☐ Dont Know
Past TB more than 5 years	☐ Yes ☐ No ☐ Dont Know
None Of the Above	☐ Yes ☐ No

3. Clinical Risk factor	
Renal Impairment	☐ Yes ☐ No ☐ Dont Know
Liver Impairment	☐ Yes ☐ No ☐ Dont Know
Cancer	☐ Yes ☐ No ☐ Dont Know
Organ Transplantation	☐ Yes ☐ No ☐ Dont Know
Palliative care patient on Immunosuppressants	☐ Yes ☐ No ☐ Dont Know
Anti-TNF Treatment	☐ Yes ☐ No ☐ Dont Know
Dialysis	☐ Yes ☐ No ☐ Dont Know
Silicosis (Work in stone crushing units)	☐ Yes ☐ No ☐ Dont Know
All Beneficiaries of TB Preventive Therapy	☐ Yes ☐ No ☐ Dont Know
Clinical - None of the Above	☐ Yes ☐ No

4. Social Risk factor	
Migrant	☐ Yes ☐ No ☐ Dont Know
Factory/Construction Workers (glass,weavers etc.)	☐ Yes ☐ No ☐ Dont Know
Miner	☐ Yes ☐ No ☐ Dont Know
Health Care Worker	☐ Yes ☐ No ☐ Dont Know
Prison	☐ Yes ☐ No ☐ Dont Know
Refugee	☐ Yes ☐ No ☐ Dont Know
Urban Slum	☐ Yes ☐ No ☐ Dont Know
Tribal	☐ Yes ☐ No ☐ Dont Know
Residents of special homes	☐ Yes ☐ No ☐ Dont Know
None Of the Above	☐ Yes ☐ No

3. CXR IMAGE ACQUISITION & INTEGRATION

The Beneficiary details flow seamlessly into the X-Ray detector Console; thereby eliminating any Human Data-entry error



status	scheduled body time	patient id	patient name	Access No.	Sex	Birth date	Age
Completed	2023-09-20 12:28:04	8202309200...	Kritika Bansal	171	F	2023-09-20	16D
Completed	2023-09-20 12:19:10	8202309200...	Shruti Sabu	170	M	2023-09-20	16D
Completed	2023-09-20 12:11:50	8202309200...	Akanksha	169	F	2023-09-20	16D
Scheduled	2023-09-20 12:09:45	8202309200...	Anita	168	F	2023-09-20	16D
Completed	2023-09-20 12:09:50	8202309200...	Nikhil	167	M	2023-09-20	16D
Completed	2023-09-19 18:02:45	8202309191...	Sayash	166	M	2023-09-19	17D
Completed	2023-09-19 16:01:43	8202309191...	Phagun	165	M	2023-09-19	17D
Completed	2023-09-19 17:52:07	8202309191...	Umash Pawar	164	M	2023-09-19	17D
Completed	2023-09-19 16:01:03	8202309191...	VijayPal	162	M	2023-09-19	17D
Scheduled	2023-09-19 14:40:42	8202309190...	Vasanth	161	M	2023-09-20	16D
Completed	2023-09-19 14:15:15	8202309190...	Divyadip	159	M	2023-09-19	17D
Completed	2023-09-18 13:45:47	8202309190...	Kishu	158	M	2023-09-18	17D



4. ARTIFICIAL INTELLIGENCE INTEGRATION

- ✓ RIS acts as the single interface for the user, with AI integrated at the backend
- ✓ Therefore, there is a simpler *"one-system"* approach

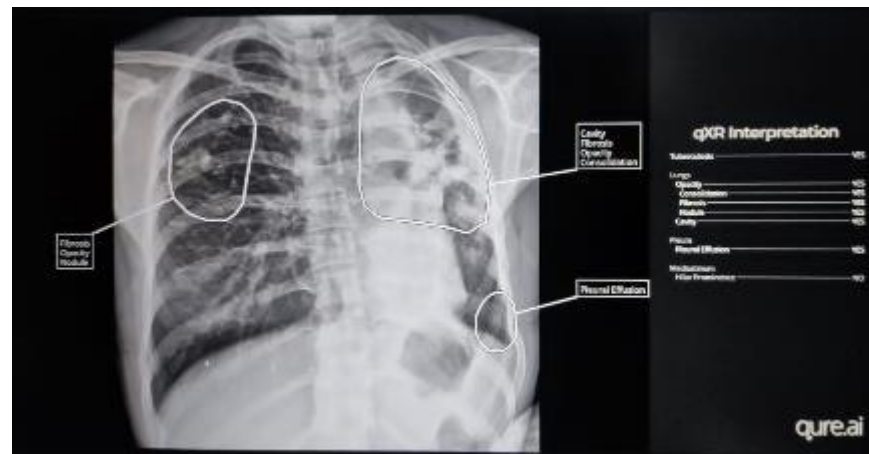
🏠 TB Screening

All fields marked as (*) are mandatory.

Camp Id *	Beneficiary Id *	Beneficiary Name *	Gender *
CBR202403070539412175	B202403071219116721	Fulena ram	Male
Age	Eligible for X-ray *	X-ray Taken ? *	Patient requested for X-ray
48	Yes	Yes	Select
AI Result* Re Test	Radiologist Result	Medical Officer Result	Sputum Eligibility ?
TB Related Abnormalities	Select	Select	Yes
Sputum Collected at Camp*	Eligible for TBI testing (TST / Cy-TB / IGRA) *		
Yes	No		

[View Image](#) Update

AI Suggestive Interpretation



5. REMOTE TELERADIOLOGY

🏠 TB Screening

All fields marked as (*) are mandatory.

Camp Id *	Beneficiary Id *	Beneficiary Name *	Gender *
CBR202403070539412175	B202403071219116721	Fulena ram	Male
Age	Eligible for X-ray *	X-ray Taken ? *	Patient requested for X-ray
48	Yes	Yes	Select
AI Result* Re Test	Radiologist Result	Medical Officer Result	Sputum Eligibility ?
TB Related Abnormalities	Select	Select	Yes
Sputum Collected at Camp*	Eligible for TBI testing (TST / Cy-TB / IGRA) *		
Yes	No		

[View Image](#)

Update

Radiologists can remotely interpret the CXR image and provide their interpretation (*can override AI suggestive result*)

7. PICTURE ARCHIVING AND COMMUNICATION SYSTEM (PACS)

- ✓ Considering the challenges of internet in rural areas - the RIS has an added advantage to operate in an offline/intranet setting.
- ✓ Once internet is available, the beneficiary data can be synced to a central cloud based PACS

Show Sync List

Search Criteria

From Date
06-Mar-2024

To Date
06-Mar-2024

Pacs Synced
Not Synced

Ris Synced
Not Synced

Search

Sync Data

Sync Data

Show 10 entries

Search:

☐	Camp Id	Beneficiary Id	Beneficiary Name	Gender	Age	Contact No.	IsRisSync	IsPacsSync
☐	CGJ202403060414446147	B202403060735463583	Kantaben Himmat lal dhandhukiya	Female	70	9978935469	Not Synced	Not Synced
☐	CGJ202403060414446147	B202403060727329060	Anjuben anilbhai karsadiya	Female	57	9999999999	Not Synced	Not Synced
☐	CHR202403060423400421	B202403060725464754	Rajwati	Female	59	9818410539	Not Synced	Not Synced
☐	CHR202403060423400421	B202403060723428832	Kaushlya	Female	59	9818410539	Not Synced	Not Synced
☐	CGJ202403060414446147	B202403060723004000	Gitaben lad	Female	47	9099049788	Not Synced	Not Synced
☐	CGJ202403060414446147	B202403060718409938	Binita Jignesh parmar	Female	33	8141381398	Not Synced	Not Synced
☐	CHR202403060423400421	B202403060713312135	Ramita	Female	35	8810301569	Not Synced	Not Synced

8. CORRECTIVE & MAINTENANCE RESOLUTION

- ✓ The RIS has a dedicated module that tracks the health of the equipment and software related issues
- ✓ The ticketing system ensures TAT adherence and reduces impediments to ACF operations

[Report Issue List](#) / [Report Issue](#)

 Report Issue

All fields marked as (*) are mandatory.

User Name*	Contact No*	Email Id*	Type Of Issue*
mgr	12345678		Select an Option
Platform*	Module*	Priority*	
Select an Option	Select an Option	Select an Option	
Summary	Description	Attachment (pdf/jpeg/jpg/png) - 5MB Max	
		Choose File No file chosen	

9. DATA ANALYTICS

✓ Dashboard*

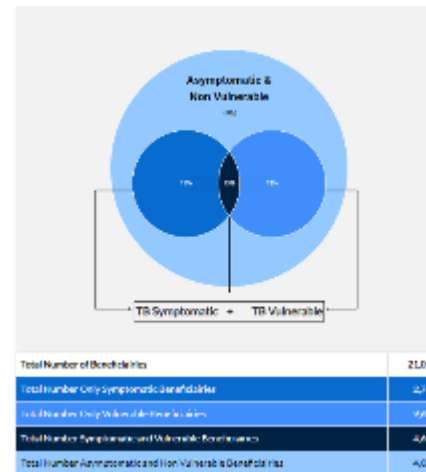
Summary Highlights



Sputum Level Classification



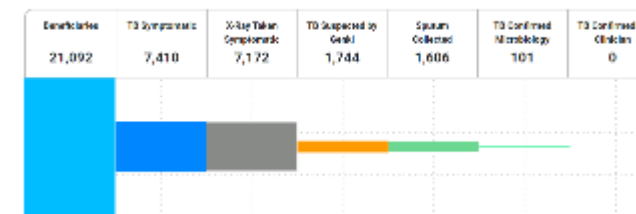
No. of Symptomatic and Vulnerable Beneficiary Distribution



Test Available Analysis - Feb 24

Test Availability	% of Camps	Number of Camps
BP	19%	69
Diabetes	21%	73
Height	32%	115
Weight	33%	116
HIV	2%	6

Symptomatic Level Classification



✓ Detailed Reports

- Complete Beneficiary Dataset
- Camp level Data
- Post Camp NCD Report (*to be shared with Health & Wellness Centres*)
- Post Camp Sputum Collection Report (*to be shared with TB vertical*)