The Union

International Union Against Tuberculosis and Lung Disease

Health solutions for the poor

Tuberculosis-Diabetes in India : Advocacy, Operational Research and Program Implementation

Dr Ajay Kumar MV

Deputy Director (Research)

International Union Against Tuberculosis and Lung Disease

Acknowledgements: Prof AD Harries

Outline

- Burden of TB and DM
- TB-DM success story: Advocacy and Operational Research leading to national policy change
- From Policy to Practice: Successes, challenges and research needs

Burden of DM and TB: India

Diabetes Mellitus: 2015

- **69.2 million people living with DM – more than half undiagnosed**
- **1 million people die**
- **Escalating Epidemic (123.5 million by 2040)**

[IDF Diabetes Atlas 2015]

Tuberculosis: 2014

- **2.2 million new cases in the year – about one-thirds not notified**
- **0.25 million people die**
- **Declining Epidemic (Slow)**

[WHO- Global TB Control 2015]

302,000 cases with TB-DM in 2012 (15% PAF)

INDIA

International

World Diabetes Foundation

The Union

WHO

National

NTP (RNTCP) / MOH

National program - Cancer, Diabetes, CVD & Stroke

National experts

(Oct 2011)
Stakeholders meeting

↓

(Nov-Dec 2011)
Protocol Development, Ethics approval, Training

↓

(Jan 2012)

Bi-directional Screening

(8 tertiary & 60 peripheral centers)

↓

(Sept 2012)

Results presented to stake holders

Screen DM patients for TB?

Screen once a quarter when DM patients come to clinic

Ask: “Has TB been diagnosed during the quarter”

If no, screen for positive symptoms of TB

Refer those with positive symptoms for TB diagnosis and care

Example: Screening DM Patients for TB in India

DM patients	Q2-2012
Number seen in the quarter	12237
Number diagnosed with TB in the quarter from elsewhere	**74**
Screened for TB symptoms in the DM clinic in the quarter	6393 (52%)
Positive TB symptom screen	135 (2%)
Referred for TB investigations	128 (95%)
Number who reached TB diagnostic centre	?? 50%
Diagnosed with a new episode of TB	**11**
Total number with new TB and TB from elsewhere	85
Known to have started or to be on anti-TB Treatment	80
TB cases per 100,000 DM patients seen per quarter	**695**

India DM-TB study group TMIH 2013; 18: 646-654

Challenges of screening

- Diabetes doctors not interested – extra work
- Low yield of new TB [NNS high]
- Poor sensitivity of sputum smear microscopy
- No structured recording systems in DM clinics

NEED TO KNOW:-

- Are new diagnostic algorithms effective/efficient?
- How often to screen?
- Should a more targeted approach be used?
- Should we screen for latent TB?

Screen TB patients for DM?

Is there is a known diagnosis of DM?

No known diagnosis - screen first with RBG

If RBG ≥ 6.1 mmol/l, screen with FBG

If FBG ≥ 7.0 mmol/l, then diagnose DM and refer to DM care

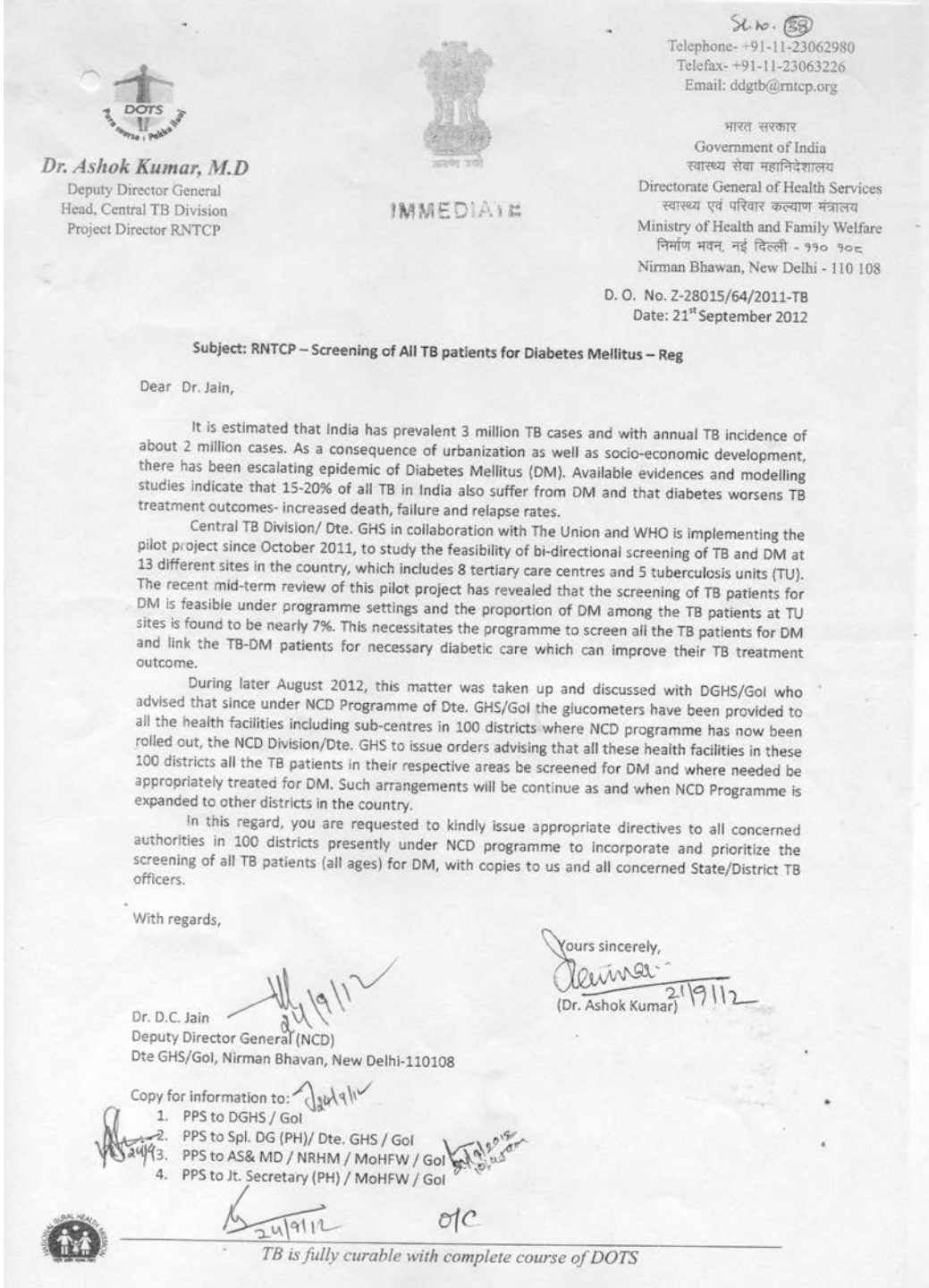
Example: Screening TB patients for DM in India

Indicator	TOTAL
Number of patients with TB registered and enrolled	8269
Number (%) with known diagnosis of DM	**682 (8)**
Number needing to be screened with RBG	7587
Number (%) actually screened with RBG	7467 (98)
Number with RBG ≥110 mg/dl and needing to be screened with FBG	2838
Number (%) screened with FBG	2703 (95)
Number (%) with FBG ≥ 126 mg/dl (newly diagnosed with DM)	**402 (5)**
Number (%) with known and newly diagnosed DM	**1084 (13)**
Number (%) with known / newly diagnosed DM referred to DM care	1033 (95)

India TB-DM study group TMIH 2013: 18: 636-45

Screening TB patients for DM in India

- directive from India TB Programme to screen TB patients for DM and link them to diabetes care
- directive from India NCD programme to use glucometers to screen TB patients for DM



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Dr. Ashok Kumar, M.D
Deputy Director General
Head, Central TB Division
Project Director RNTCP

Telephone- +91-11-23062980
Telefax- +91-11-23063226
Email: ddgtb@rntcp.org

भारत सरकार
Government of India
स्वास्थ्य सेवा महानिदेशालय
Directorate General of Health Services
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Ministry of Health and Family Welfare
निर्माण भवन, नई दिल्ली - ११० १०८
Nirman Bhawan, New Delhi - 110 108

IMMEDIATE

D. O. No. Z-28015/64/2011-TB
Date: 21st September 2012

Subject: RNTCP – Screening of All TB patients for Diabetes Mellitus – Reg

Dear Dr. Jain,

It is estimated that India has prevalent 3 million TB cases and with annual TB incidence of about 2 million cases. As a consequence of urbanization as well as socio-economic development, there has been escalating epidemic of Diabetes Mellitus (DM). Available evidences and modelling studies indicate that 15-20% of all TB in India also suffer from DM and that diabetes worsens TB treatment outcomes- increased death, failure and relapse rates.

Central TB Division/ Dte. GHS in collaboration with The Union and WHO is implementing the pilot project since October 2011, to study the feasibility of bi-directional screening of TB and DM at 13 different sites in the country, which includes 8 tertiary care centres and 5 tuberculosis units (TU). The recent mid-term review of this pilot project has revealed that the screening of TB patients for DM is feasible under programme settings and the proportion of DM among the TB patients at TU sites is found to be nearly 7%. This necessitates the programme to screen all the TB patients for DM and link the TB-DM patients for necessary diabetic care which can improve their TB treatment outcome.

During later August 2012, this matter was taken up and discussed with DGHS/GoI who advised that since under NCD Programme of Dte. GHS/GoI the glucometers have been provided to all the health facilities including sub-centres in 100 districts where NCD programme has now been rolled out, the NCD Division/Dte. GHS to issue orders advising that all these health facilities in these 100 districts all the TB patients in their respective areas be screened for DM and where needed be appropriately treated for DM. Such arrangements will be continue as and when NCD Programme is expanded to other districts in the country.

In this regard, you are requested to kindly issue appropriate directives to all concerned authorities in 100 districts presently under NCD programme to incorporate and prioritize the screening of all TB patients (all ages) for DM, with copies to us and all concerned State/District TB officers.

With regards,

Yours sincerely,

(Dr. Ashok Kumar) 21/9/12

Dr. D.C. Jain 24/9/12
Deputy Director General (NCD)
Dte GHS/GoI, Nirman Bhawan, New Delhi-110108

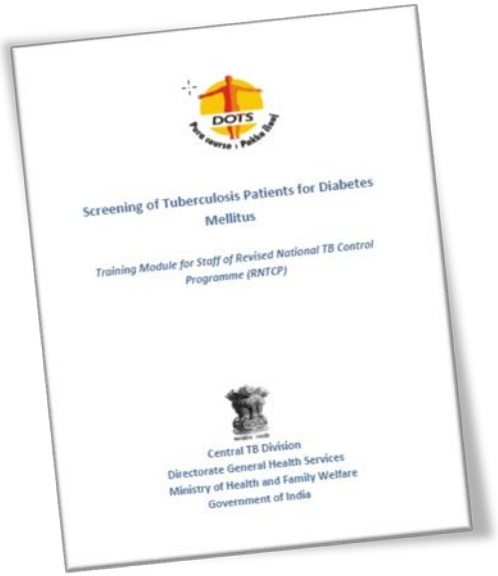
Copy for information to: 24/9/12

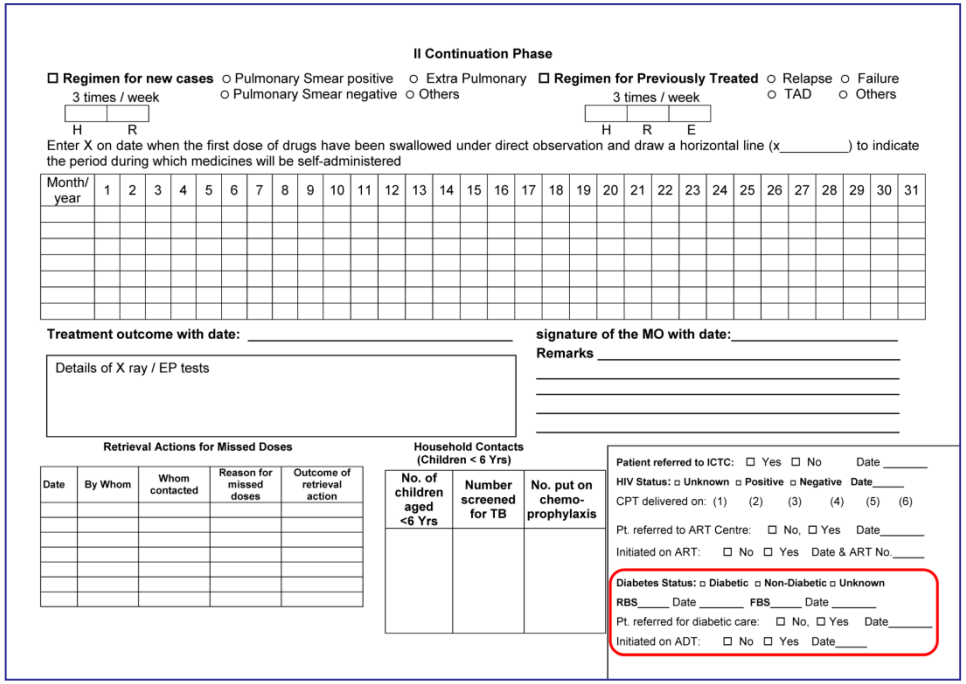
1. PPS to DGHS / GoI
2. PPS to Spl. DG (PH)/ Dte. GHS / GoI 24/9
3. PPS to AS& MD / NRHM / MoHFW / GoI 24/9/2012
4. PPS to Jt. Secretary (PH) / MoHFW / GoI

24/9/12 O/C

TB is fully curable with complete course of DOTS

Implementation, training, R&R





II Continuation Phase

☐ **Regimen for new cases** ○ Pulmonary Smear positive ○ Extra Pulmonary ☐ **Regimen for Previously Treated** ○ Relapse ○ Failure
○ Pulmonary Smear negative ○ Others ○ TAD ○ Others

3 times / week: H R — 3 times / week: H R E

Enter X on date when the first dose of drugs have been swallowed under direct observation and draw a horizontal line (x_____) to indicate the period during which medicines will be self-administered

Month/ year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Treatment outcome with date: _____

signature of the MO with date: _____

Remarks _____

Details of X ray / EP tests

Retrieval Actions for Missed Doses

Date	By Whom	Whom contacted	Reason for missed doses	Outcome of retrieval action

Household Contacts (Children < 6 Yrs)

No. of children aged <6 Yrs	Number screened for TB	No. put on chemo-prophylaxis

Patient referred to ICTC: ☐ Yes ☐ No Date _____

HIV Status: ☐ **Unknown** ☐ **Positive** ☐ **Negative** **Date**_____

CPT delivered on: (1) (2) (3) (4) (5) (6)

Pt. referred to ART Centre: ☐ No, ☐ Yes Date_____

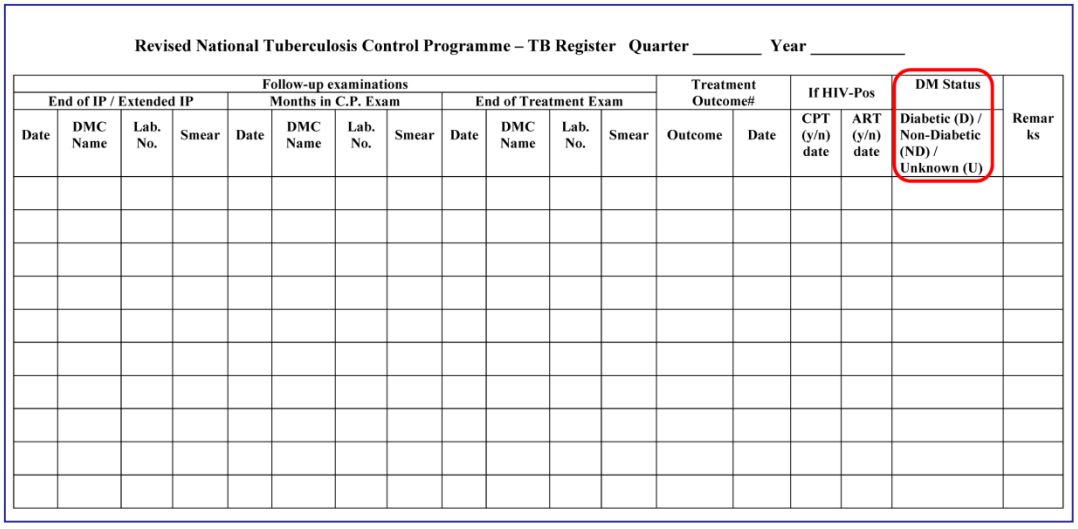
Initiated on ART: ☐ No ☐ Yes Date & ART No._____

Diabetes Status: ☐ **Diabetic** ☐ **Non-Diabetic** ☐ **Unknown**

RBS_____ Date _____ **FBS**_____ Date _____

Pt. referred for diabetic care: ☐ No, ☐ Yes Date_____

Initiated on ADT: ☐ No ☐ Yes Date_____

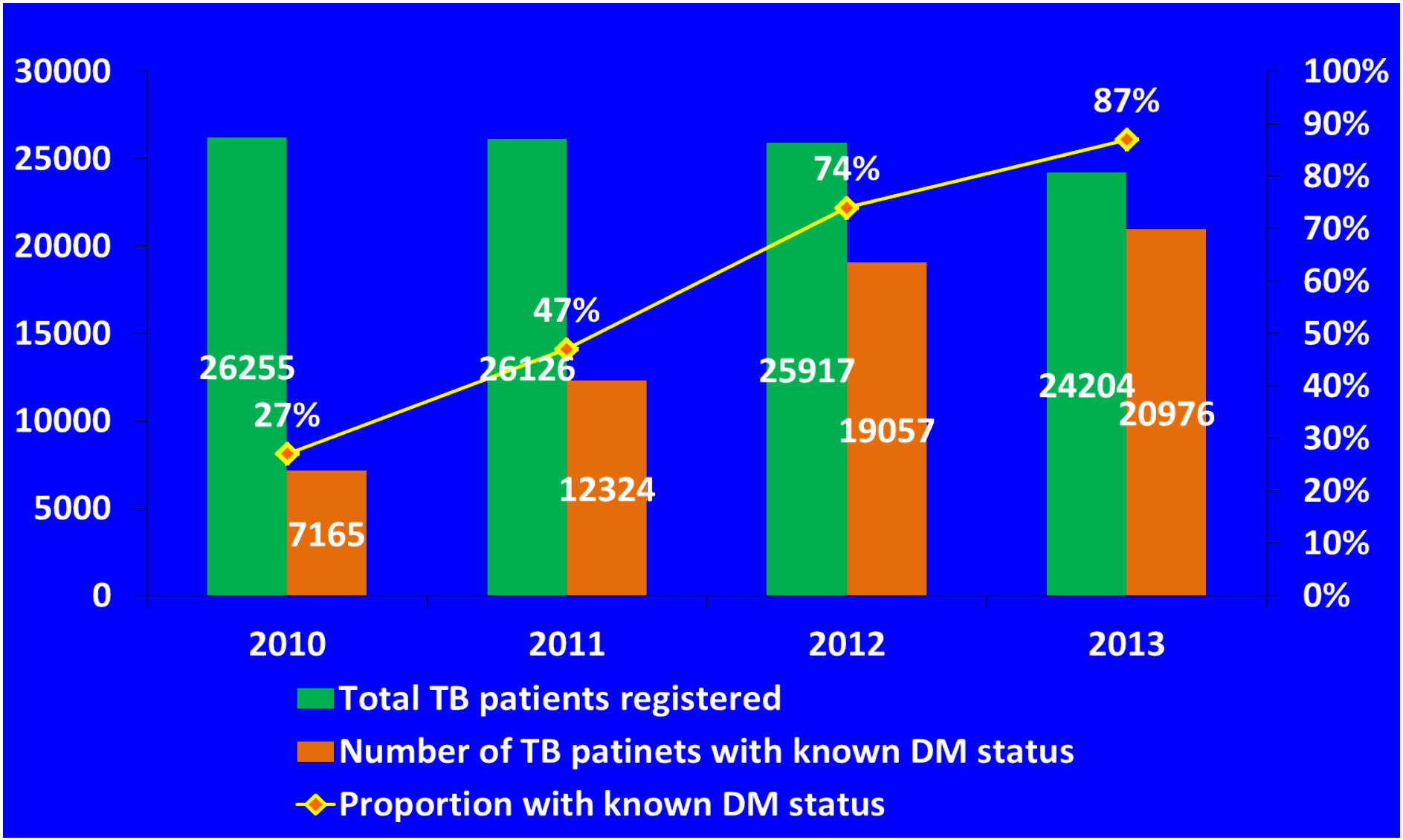


Revised National Tuberculosis Control Programme – TB Register Quarter _____ Year _____

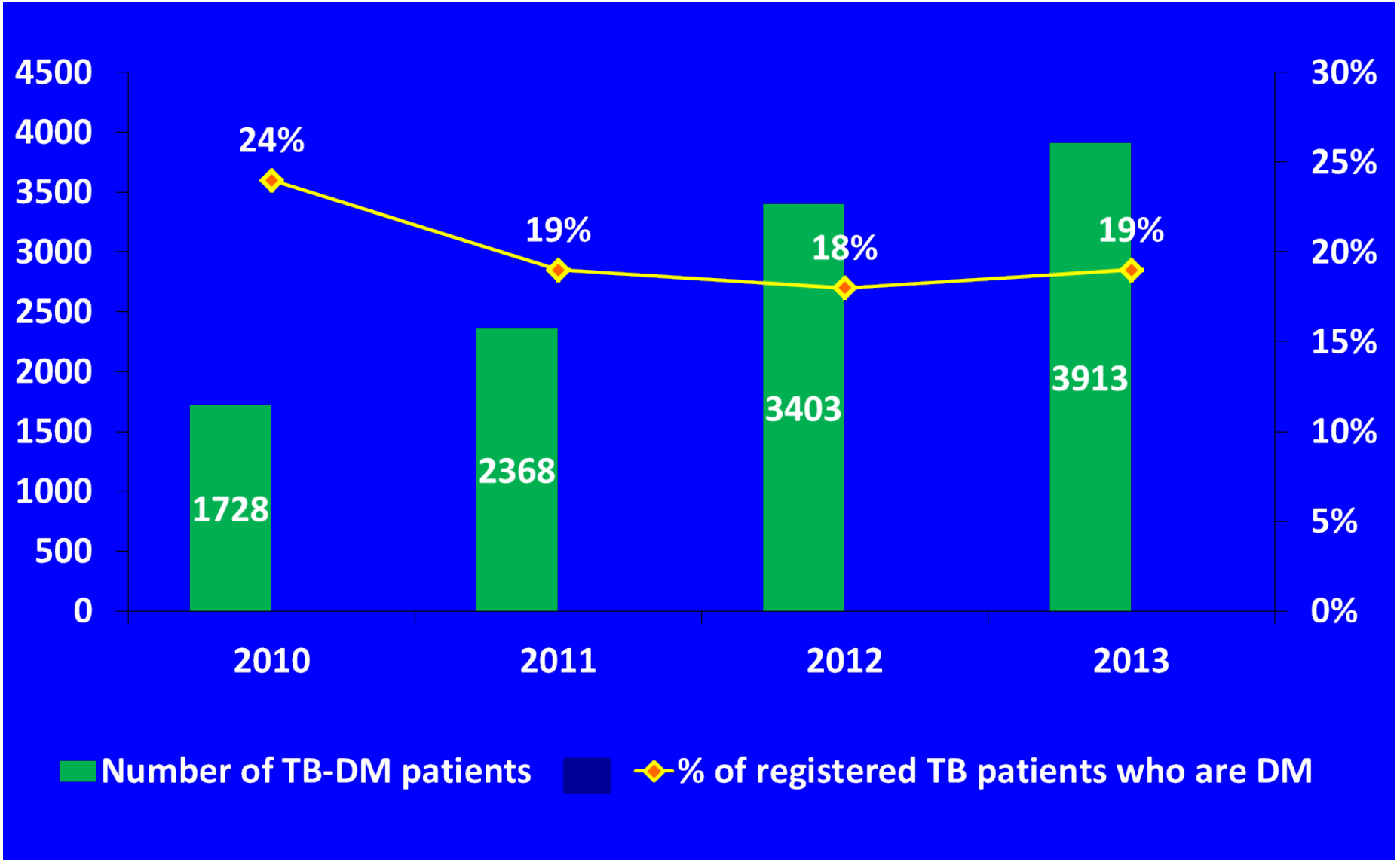
Follow-up examinations												Treatment Outcome#		If HIV-Pos		DM Status	Remarks
End of IP / Extended IP				Months in C.P. Exam				End of Treatment Exam									
Date	DMC Name	Lab. No.	Smear	Date	DMC Name	Lab. No.	Smear	Date	DMC Name	Lab. No.	Smear	Outcome	Date	CPT (y/n) date	ART (y/n) date	Diabetic (D) / Non-Diabetic (ND) / Unknown (U)	

- Number of TB patients registered
- Number **screened for DM**
- Number **diagnosed with DM**

Trends in Number (%) of registered TB patients with known Diabetes Mellitus status in Kerala state, India, 2010-2014



Trends in Number(%) of registered TB patients who have Diabetes Mellitus in Kerala state, India, 2010-2014



Challenges to TB-DM integration

- Mismatch between TB and DM programmes
  - TB program: Nationwide, decentralised up to the community level
  - DM program: ONLY in 100/650+ districts; centralized
- Lack of uniform and standardized technical and operational guidance on DM
- Inadequate knowledge and skills of health workers
- Unavailability of system for continuity of DM care
- Frequent stock outs of DM diagnostics/drugs
- Poor DM data management (no cohort analysis; need electronic systems?)

Challenges of screening

When to screen

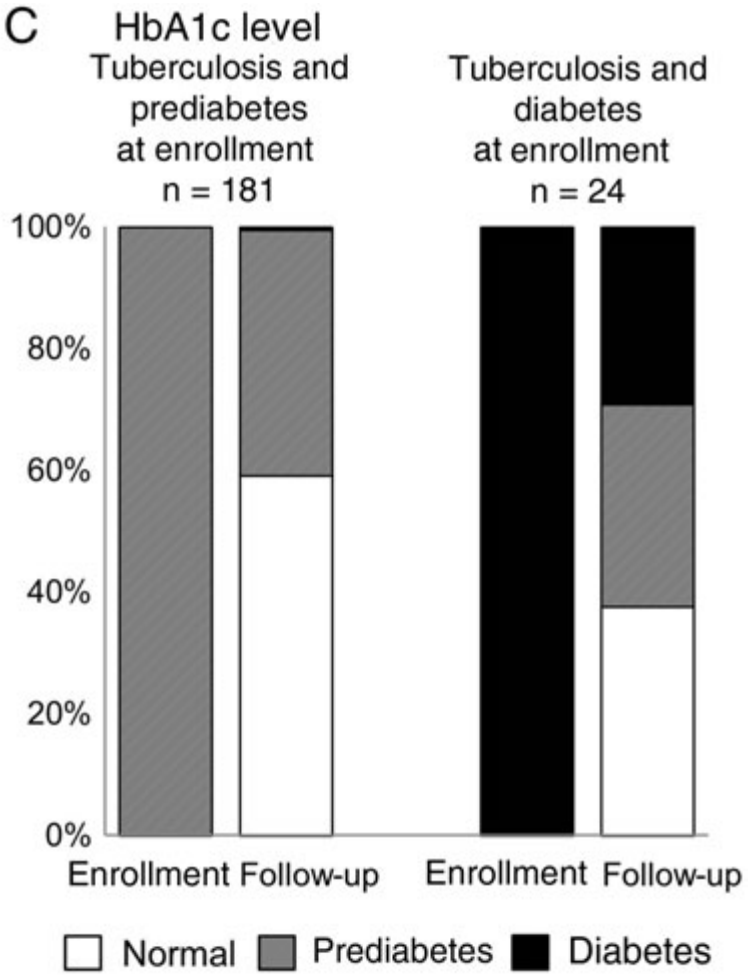
- At registration
- At end of initial phase
- At end of treatment

Need to balance false positive diagnosis against opportunity to act on glycaemia

How to screen

- Clinical
- Urine dipstick
- Random Blood Glucose
- **Fasting Blood Glucose**
- **HbA_{1C}**
- **OGTT**

DM or Transient Hyperglycemia?



- Study from Tanzania
- Half of TB-DM patients become normoglycaemic by the end of treatment
- DM needs confirmation after TB treatment
- But, those hyperglycaemic at baseline (fasting glucose) had increased risk of death or treatment failure.
- So, screening at diagnosis is crucial

Boillat-Blanco N et al. J Infect Dis. 2016 Apr 1;213(7):1163-72.

Screening presumptive TB patients for DM?

- Hospital-based cross sectional study from Puducherry, India
- 570 presumptive TB patients
  - 121 (20%) had DM: 52 newly diagnosed
  - 146 (25%) had pre-DM
  - 47% prevalence among TB patients
  - 15% prevalence among those without TB
- Early detection of DM and pre-diabetes

Shidam UG et al. Int J Tuberc Lung Dis. 2015 Oct;19(10):1163-8.

DM-TB is “similar” to HIV-TB

HIV-TB

- Increased TB cases
- Increased death
- Increased recurrent TB
- Increased failure

DM-TB

- Increased TB cases
- Increased death
- Increased recurrent TB
- Increased failure

Harries AD et al, Int J Tuberc Lung Dis 2011; 15: 1436 - 1444

Need to tackle the upstream issues

HIV prevention/control

- Behaviour
- Condoms
- Male circumcision
- Early use of ART
- ART as HIV prevention

DM prevention/control:

- Healthy diets
- Exercise
- Obesity
- Early detection of IGT

If TB, HIV and Diabetes can collaborate with each other so well,

Why can’t we?

Acknowledgements

- Revised National Tuberculosis Control Programme, India
- National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke, India
- World Health Organization India country office
- World Diabetes Foundation