Module 9b

COMMUNITY-BASED CHILD TB MANAGEMENT

International Union Against Tuberculosis and Lung Disease

World Health Organization

A few points to keep in mind…….

- Tuberculosis (TB) in children is common wherever TB is common in adults
- TB is an important cause of illness and death in children
- An understanding of the risks for infection and disease due to TB in children is critical for improved diagnosis and preventive management

National TB control data

- *This slide could include recent data of TB control indicators from the National TB control programme*

Risk factors for TB infection and disease in children

For TB infection

- Contact with source case
  - Closeness of contact
  - Duration of contact
- Source case characteristics
  - Smear positivity
  - Cavities on CXR
- Increased exposure
  - Living in high TB endemic communities
  - Children of families living with HIV

For TB disease

- Young age
  - < 5 years of age
- Immunosuppression
  - HIV
  - Malnutrition
  - Post-measles
- Not BCG vaccinated
  - Risk of disseminated disease

Common scenarios for community health worker in management of child TB

1. Child with symptoms and the diagnosis of TB is suspected

2. Child who is a household or close contact of an infectious case of TB i.e. usually a case with sputum-smear positive disease

Suspect diagnosis of TB in a child

- Common forms of TB in children are pulmonary TB and lymph node TB
- History of contact is important
- At initial assessment, decision needs to be made about need for referral for further investigation and/or immediate management – or whether the need is for further follow-up assessment
- Children with suspected pulmonary TB that can provide sputum (usually > 5 years) should have sputum taken for microscopy

Diagnosis of PTB

Typical symptoms

- Cough especially if persistent and not improving
- Weight loss or failure to gain weight
- Fever and/or night sweats
- Fatigue, reduced playfulness, less active

Especially if symptoms persist (>2 weeks) without improvement following other appropriate therapies (e.g. broad-spectrum antibiotics for cough; anti-malarial treatment for fever; or nutritional rehabilitation for malnutrition)

Diagnosis of TB adenitis

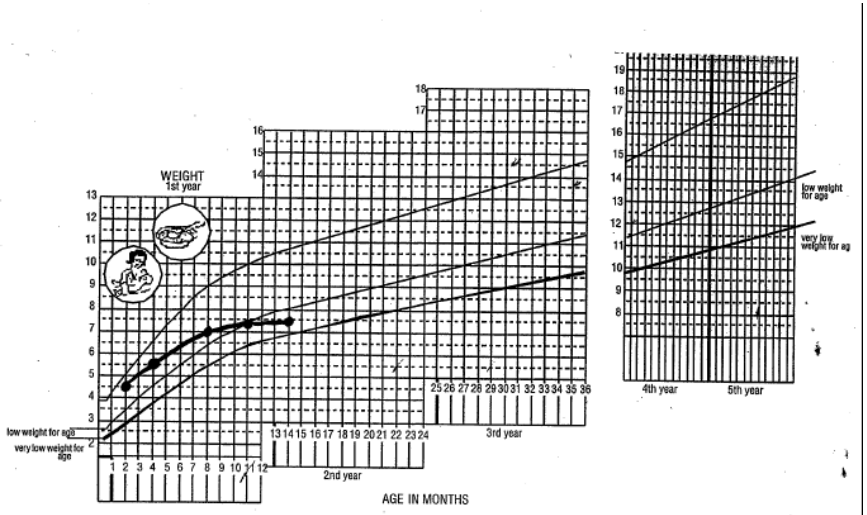
- TB adenitis is most common in cervical region. Lymph node enlargement is painless and asymmetrical, often multiple, discreet or matted.
- Nodes are typically large (>2 x 2 cm) i.e. visibly enlarged not just palpable.
- Lymph node enlargement is persistent (>1 month) and not responsive to other treatment such as antibiotics.
- Sinus and discharge may develop.
- Usual age is 2-10 years.
- May or may not be associated with other symptoms of TB.

History of contact

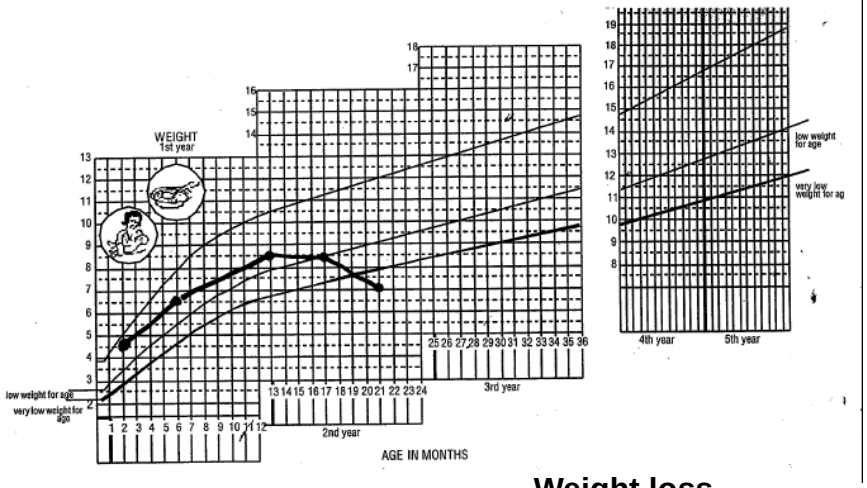
note the following…….

- Closeness of contact
- Sputum smear result of index case (if known)
- Timing of contact
  children usually develop TB within 2 years after exposure and most (90%) within the first year
- If no source case is identified, always ask about anyone in household with cough – if so, request assessment of that person for possible TB

Check weight, record weight and compare to previous weights



Growth faltering or failure to thrive



Weight loss

Clinical approach to TB diagnosis

Note that clinical assessment should include decision for hospitalisation or referral to health facility depending on severity of clinical signs or need for other appropriate management

INDICATIONS REQUIRING REFERRAL

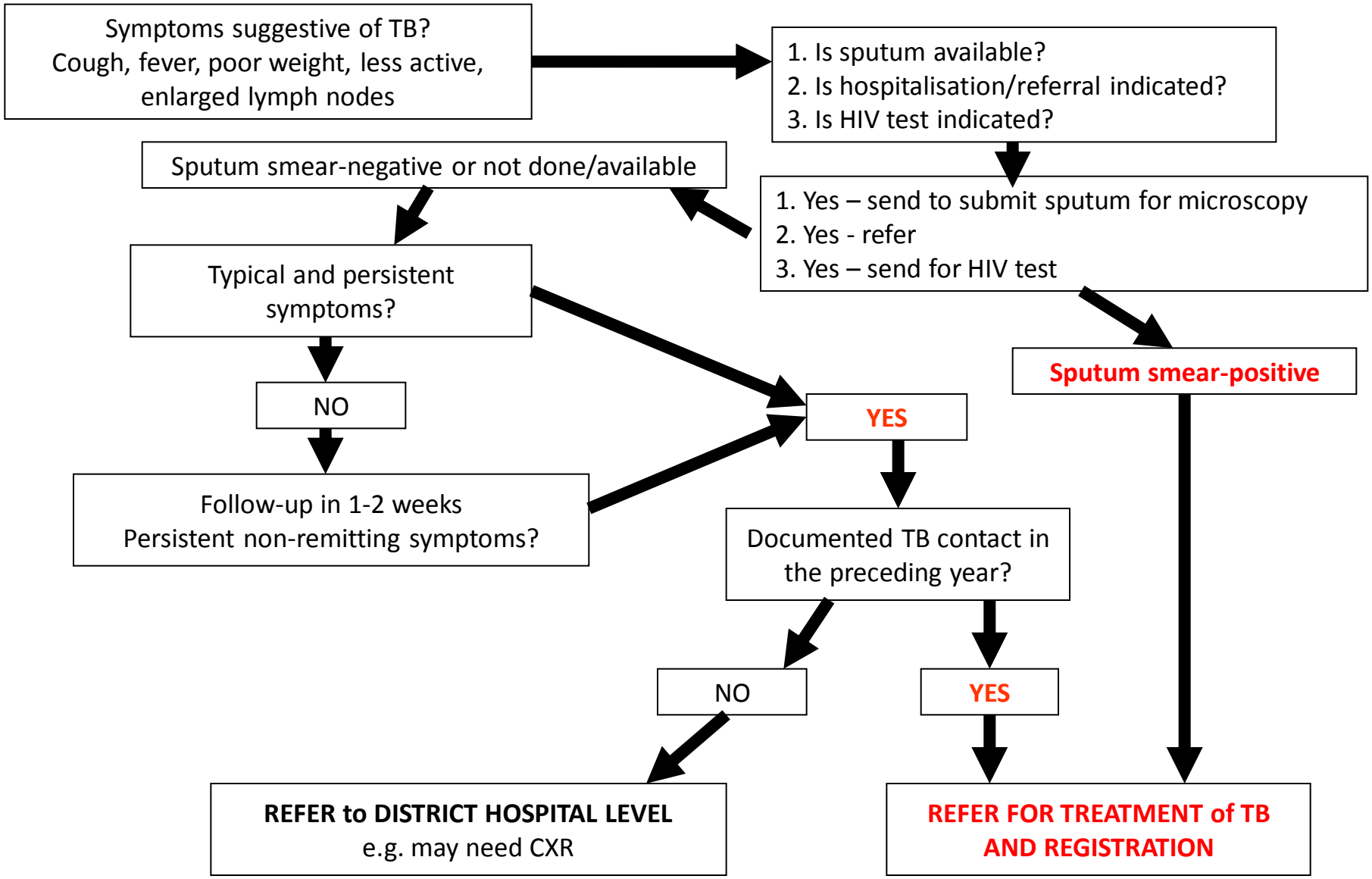
- Need for further investigation and initial management that cannot be done at primary level facility
- Severe malnutrition for nutritional rehabilitation
- Signs of severe pneumonia (i.e. chest in-drawing) or respiratory distress
- Other co-morbidities e.g. severe anaemia

Referral should also be considered if

- Diagnostic uncertainty requiring further investigation at referral level
- Necessary for HIV-related care e.g. to commence ART

Children with symptoms that might suggest TB such as cough who appear otherwise well (do not have any of the above indications for referral) could be reviewed in 1-2 weeks to see whether symptoms are **persistent**.

Guidance for the management of children at community level who present with symptoms suggestive of TB



Treatment of TB in children in community

Drug dosages should be consistent with national guidelines
Children tolerate TB drugs well with lower risk of toxicity compared to adults

Treatment response is usually noted within 1-2 months of treatment – symptom resolution and weight gain*

Weight should be monitored during treatment and dosages adjusted accordingly
Adherence to the full course is a challenge especially continuation phase

Importance of supervision by parent/guardian and so they need to understand the importance of adherence and completing the full course

All children should registered with NTP: include age, TB type and outcome

* Note that lymph node enlargement often persists for months even with effective treatment

Community-based management of a child who is a household or close contact of an infectious case of TB

Available approaches to prevent TB in children	
Improved case-finding and management	Early identification and effective treatment of infectious TB cases will reduce the burden of child TB
BCG	Neonatal BCG immunisation is used widely but efficacy is variable The main proven benefit of neonatal BCG is protection against severe disseminated forms of TB in children

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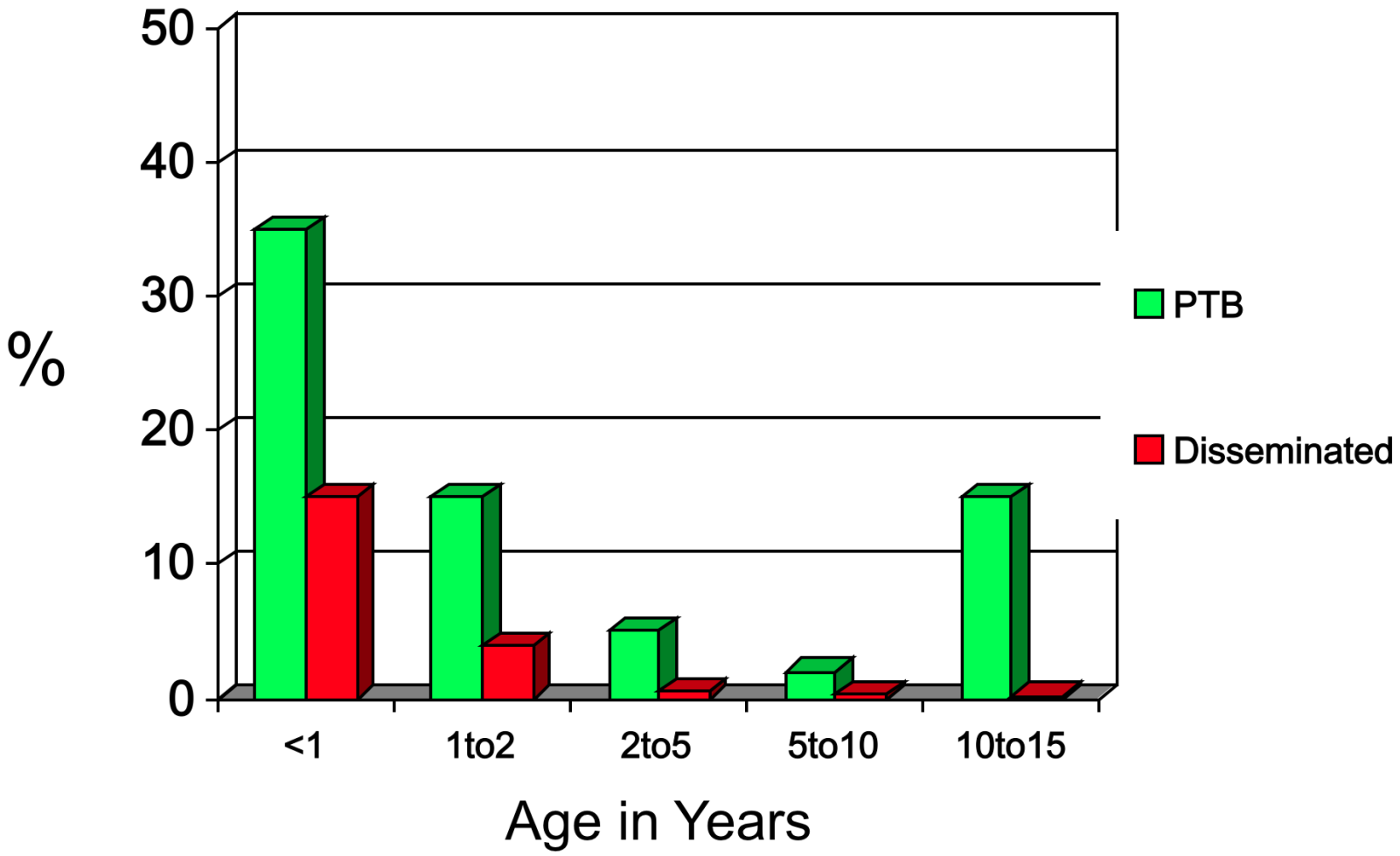
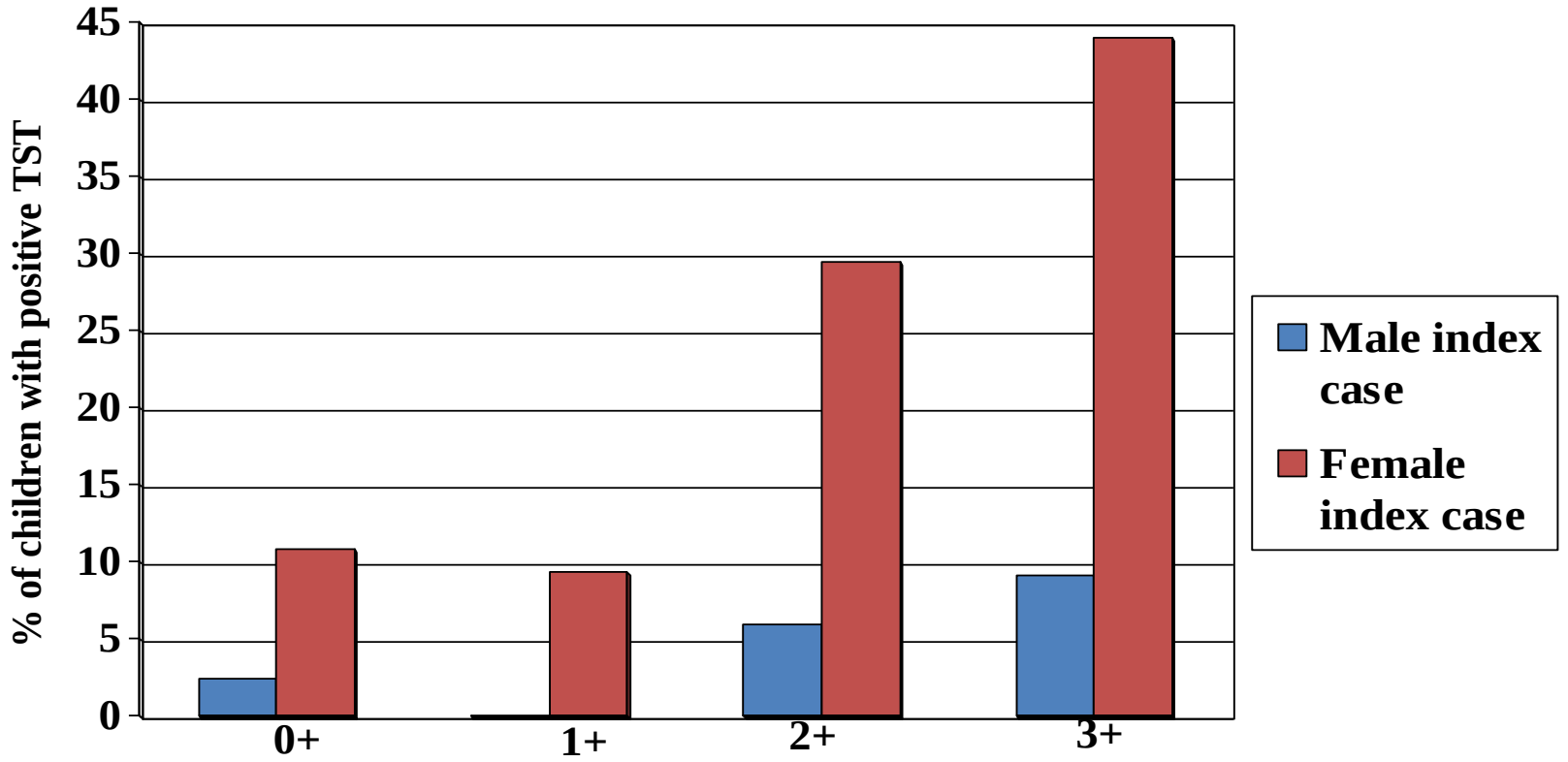
BCG	Neonatal BCG immunisation is used widely but efficacy is variable The main proven benefit of neonatal BCG is protection against severe disseminated forms of TB in children
Contact screening and management	This has huge potential to reduce the burden of TB in children Focus is on individuals infected with TB that have greatest likelihood of developing active TB disease following infection – this includes infants, young children and HIV-infected children of any age Focus is on contacts of the most infectious cases, usually those with sputum smear-positive disease Widely recommended but uptake by families and implementation by NTP are poor

Risk of TB disease following infection by age



Proportion of children with TB infection (positive TST) by degree of smear positivity of the source case

Kenyon TA et al, Int J Tuberc Lung Dis 2002



Management of childhood contacts

- Recommended but rarely happens
- Addressing policy-practice gap Hill PC, et al. PLoS Med Oct 2011
  - Lack of knowledge of rationale by health workers
  - Symptom-based screening
    - TST and CXR not necessary, rather barriers
  - Community-based – integrated family-based approach
  - Focus on high-risk source cases
- Management issues
  - Isoniazid alone availability
  - Poor adherence

Why is child contact screening important? Prevent child morbidity and mortality

- The prevalence of TB infection is high among child contacts

- Children living in households with TB cases reported significant increase risk of all-cause mortality (66% higher) in Guinea-Bissau compared to children living in non-TB households in same community, especially if the mother had TB (8-fold increase risk of death)

  AF Gomes et al, Thorax 2011

- Missed opportunities for IPT are very common in children that later present with confirmed TB disease

  K Du Preez et al, Ann Trop Paediatr 2011

Studies of child contacts in Asian countries

Study	Location	No. of child contacts	Proportion with TB infection	Proportion with TB disease
Andrew et al	India	398	39 %	5.5 %
Narain et al	India	790	24 %	NR
Kumar et al	India	142	NR	3 %*
Singh et al	India	281	34 %*	3 %*
Rathi et al	Pakistan	151	27 %	NR
Salazar et al	Philippines	153	69 %	3 %
Tornee et al	Thailand	500	47 %	NR
Nguyen et al	Lao PDR	148	31 %	NR
Okada et al	Cambodia	217	24 %*	9 %*

* Data only for < 5 years; NR: not recorded

From Triasih R et al (in press)

Why is contact screening important? Increased case-finding

- The prevalence of TB infection and disease is high among contacts

  J Morrison, et al. Lancet Infect Dis 2008

  - All TB cases 4.5% (95% CI 4.3-4.8)
  - Confirmed cases 2.3% (95% CI 2.1-2.5)
  - Latent TB infection 51.4% (95% CI 50.6-52.2)

- Malawi

  R Zachariah et al, Int J Tuberc Lung Dis 2003

  - 189 TB cases (HIV prevalence 69%) and 985 household contacts
  - TB prevalence with active case finding among contacts (1.74%, 1735/100,000) was significantly higher than passive case finding 0.19% (191/100,000) - p=0.01

- The Gambia
  - Incidence of TB disease among contacts was 603 per 100,000 (95% CI 370-830)

    PC Hill et al, PLoS ONE 2008
  - 33 TB cases identified from 2174 contacts of 317 adults with smear-positive PTB: prevalence of 1518 per 100,000

    D Jackson-Sillah et al, Trans R Soc Trop Med Hyg 2007

The prevalence of active TB cases among contacts – meta-analysis

	Included studies	Contacts investigated	Cases found	Prevalence (%) [95% CI]
All*	77	883,213	22,803	3.1% (2.3-4.2)
Close contacts	62	847,646	22,032	3.6% (2.6-5.1)
Household contacts	60	843,606	21,930	3.6% (2.5-5.1)

…….in other words, the rate of active TB identified by screening of close or household contacts is around 3,600 per 100,000 population!

The prevalence of sputum smear-positive cases among contacts – meta-analysis

	Included studies	Contacts investigated	Cases found	Prevalence (%) [95% CI]
All	30	818,171	1,083	0.9% (0.6-1.3)
Close contacts	26	805,462	1,068	1.0% (0.6-1.6)
Household contacts	25	805,110	1,022	0.9% (0.6-1.4)

…….and the rate of sputum smear-positive TB identified by screening of close or household contacts is around 1,000 per 100,000 population!

The prevalence of active TB cases among contacts – meta-analysis

	Included studies	Contacts investigated	Cases found	Prevalence (%) [95% CI]
All contacts	78	898,619	38,209	3.5% (2.3-5.4)
Child contacts <5y	21	6,617	856	9.6% (5.5-16.0)
Contacts 5-14y	11	5,366	300	4.5% (1.6-12.3)
HIV+ contacts	5	282	79	28.4% (9.8-59.2)

The prevalence of active TB is significantly higher if the contact is a young child (< 5 years) or HIV-infected

Recommendations for the Investigation of Contacts of Persons with Infectious Tuberculosis

WHO, 2012

Recommends contact investigation for household and close contacts when the index case;

- **has sputum smear positive pulmonary or laryngeal tuberculosis;**
- **has M/XDR TB (proven or suspected);**
- **is a person living with HIV;**
- **is a child < 5years of age**

Recommends that clinical evaluation of household and close contacts for active tuberculosis be prioritized to the following contacts:

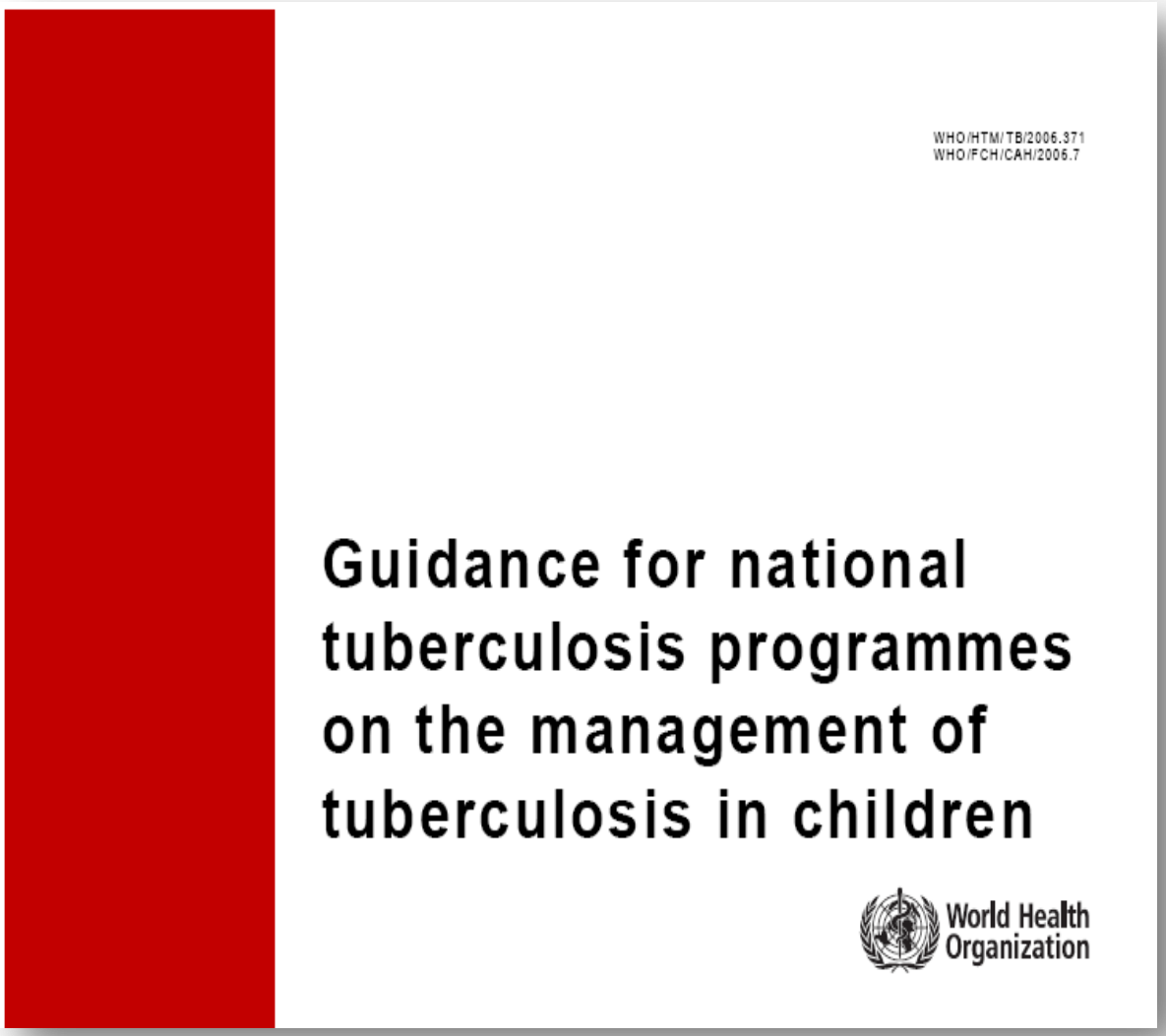
- **Persons of all ages with symptoms suggestive of TB,**
- **children < 5 years of age**
- **persons with known or suspected immunocompromising conditions (especially HIV)**
- **contacts of index cases with M/XDR TB (proven or suspected)**

Recommends that children < 5 years of age or HIV-infected of any age who are household or close contacts and who, after an appropriate clinical evaluation, do not have active TB should be treated for presumed LTBI per existing WHO guidelines

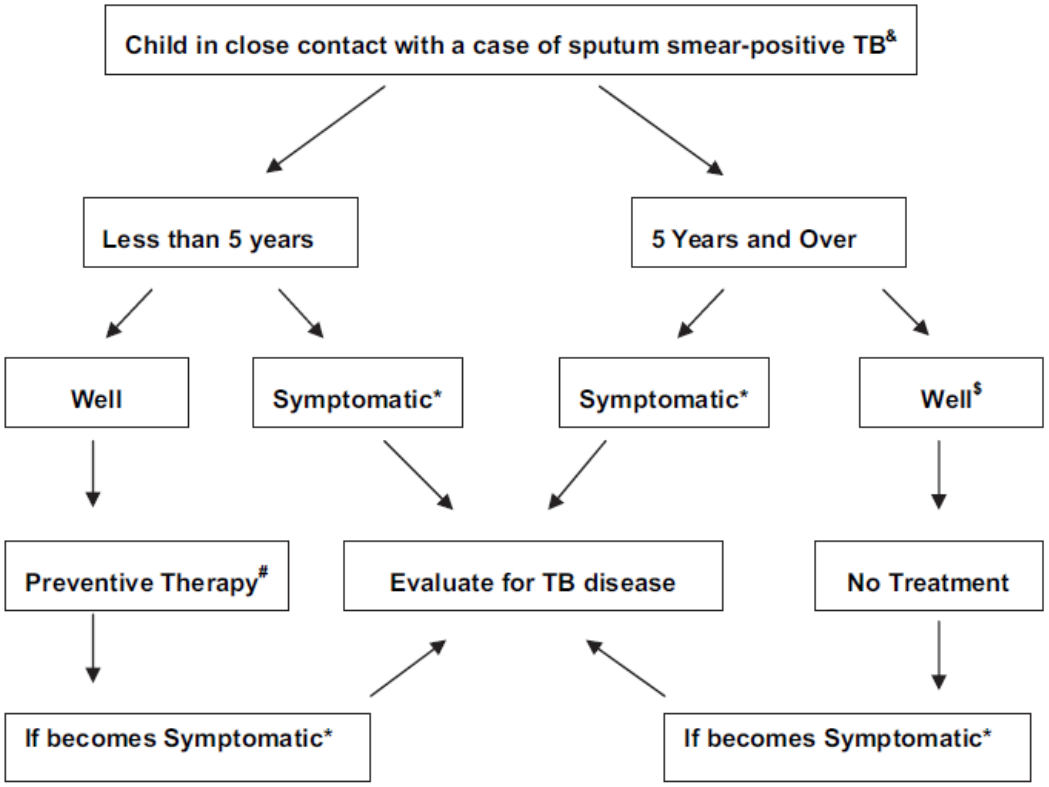
Screening of child contacts

- Widely recommended but rarely happens
- Focus is on contacts of smear-positive source cases
- Uptake by families and implementation by health workers are poor
- TST and CXR were often advised but
  - Resource intensive and limited access
  - Limited role in clinical decision making
- Symptom-based screening now advised

Symptom-based screening is also recommended in the WHO 2006 guidance



Symptom-based screening



&Also consider if the mother or primary caregiver has sputum smear-negative pulmonary TB

*Symptomatic: If TB is suspected, refer to local guidelines on diagnosis of childhood TB

Isoniazid 10/mg/kg daily for 6 months

$ Unless the child is HIV-infected (in which case isoniazid 10/mg/kg daily for 6 months is indicated)

Management of child contacts

- **Decentralise**: symptom-based screening provides opportunity to undertake an integrated family-based approach in the community around the source case receiving DOT rather than requiring referral to health facility for all cases

- **Adherence**: to IPT for 6 months is a challenge

- **Enhanced case-finding**: Note that symptom-based screening also aims to identify symptomatic contacts of any age for investigation for possible TB disease

Management of child contacts

List close contacts

- What is the age of the contact?
- Is the contact HIV-infected?
- Does the contact have any symptoms suggestive of TB?

Checklist of main symptoms

- Persistent cough for more than 2 weeks
- Weight loss or failure to gain weight
- Persistent fever for more than 1 week and/or night sweats
- Fatigue, reduced playfulness, less active

Sample contact screening register

Name	Age (years)	TB symptoms (Y/N)	Anti-TB treatment (Y/N)	Isoniazid preventive therapy (Y/N)	TB registration number	Treatment outcome	HIV status[a]

Management of child contacts

Criteria for contacts to receive IPT

- **No active TB disease – no symptoms suggestive of TB**

  AND

- **At high risk of disease following TB exposure**
  - **< 5 years**
  - **HIV-infected**

Management of contacts	Response	Action
Symptomatic Sputum smear positive	TB treatment	Register
Symptomatic Sputum smear-negative or not available	Refer	Refer
Asymptomatic and high risk	IPT	IPT register
Asymptomatic and not high risk	No treatment	Advise to return if symptoms develop

Sample IPT register

No.	Name of TB contact treated with IPT	Age	Sex	HIV-infected (Y/N)	IPT started on (date)	IPT completed (Y/N)