Strategy for TB high risk and vulnerable populations

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• Universal and equitable access as a core of the Regional Strategy to Stop TB (2011-2015)

• Progress since the TAG 2010

• WPRO’s TB high risk group ‘triad’
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  – National workshop package
Tuberculosis – a social disease

“Tuberculosis is a social disease, and presents problems that transcend the conventional medical approach...

It is the consequence of gross defects in social organization, and of errors in individual behaviour.”

Are we doing any better now?

With diagnostic tools, drugs and DOT, are we doing better now to address inequitable distribution of disease?

Probably not.

Contrary, TB concentrates more and more among the poor, the vulnerable and the most marginalized.
Regional Strategy to Stop TB in the Western Pacific 2011-2015

**Vision:** Elimination of TB as a public health problem

**Goal:** To reduce prevalence and mortality from all forms of TB by half by 2015, relative to 2000 level, in all countries with a high burden of TB, by moving to universal access to diagnosis and treatment of all forms of TB, including smear negative and M/XDR-TB.

**Strategic Priorities**

1. **Promoting universal and equitable access to quality TB diagnosis and treatment for all people**
2. Strengthening TB Laboratory capacity
3. Scaling up the programmatic management of drug-resistant TB
4. Expanding TB-HIV collaborative activities
5. Strengthening TB programme management
Too many TB patients undiagnosed

• Case detection stagnating
• TB concentrates among high risk populations
• Emerging challenges
  – Migrants
  – Urban poor
  – Emerging risk factors for TB
    Aging, tobacco, diabetes
  – Increasing role of private sector and diverse treatment seeking
• Low diagnostic sensitivity
• Infectious patients with minor symptoms may not seek care
Diagnostic sensitivity too low

- Viet Nam 2006-7:
  - Only 29% of prevalent cases would be diagnosed by routine programme settings

- Cambodia 2002:
  - Similar finding
  - Only 38% of smear +ve TB cases were “TB symptomatic”

(Data from Draft Report National Prevalence Survey in Viet Nam 2006-7)
Actions for improved case detection

Minimizing physical, financial and social barriers

Access delay

Engaging all care providers

Improved diagnostic tools

Improved health communication

Symptoms recognized & patients take action

Health care utilization

Patient pathway

Active Case Finding (TB Screening)

Active TB

Infected

Contact investigation
- Children
- Household
- Workplace

Clinical risk groups
- HIV
- Smokers
- Diabetics
- Previous TB
- Malnourished
- Drug abusers

Risk populations
- Prisoners
- Urban poor dwellers
- Migrants
- Workplace (HCW)
- Elderly

Regional Strategy to Stop TB in the Western Pacific (2011-2015), WHO WPRO
Adapted and modified from “Action framework for higher and earlier TB case detection”, WHO
TB high risk and vulnerable populations

TB high risk groups
- Increasing case detection
- Reducing transmission through early detection
- Mitigating institutional amplifiers

Vulnerable and marginalized
- Service delivery to increase access to quality care
- Addressing health inequity
- Expanding health system reach through TB programme

World Health Organization, Western Pacific Regional Office
Progress since the last TAG meeting

Global and Regional progress
(policy and support)

- RCM endorsed Regional Strategy
- Global Policies
  - Rapid advice on childhood TB
  - TB contact investigation (in pipeline)
  - TB screening (ACF) guidelines group
- TB REACH wave-2
- WHO-CIDA initiative

- ACF prioritization tool
- National workshop package
- Operational Research Grant

Country response and progress

- Successes in planning and implementing various initiatives
  - Assessments and studies on migration and TB
  - Success in TB REACH applications
  - Health in prison assessment
  - Hospital linkage
    … and so many other things
- National workshops on TB risk populations
- Engaging multiple sectors
TB contact investigation (CI)

- Overall yield from a literature review:
  - 4.5% for all TB
  - ~2% for bac confirmed
  - High yield among children
- Heterogeneity in yield among studies (location, background, methodologies)

![Graph showing yield of active tuberculosis cases through contact investigation, a systematic review](image)

*Figure 2: Forest plot of the yield of contact investigations for all active tuberculosis (confirmed and clinical/radiological diagnoses)
Symbol size is proportional to sample size of study.*
Pilots and studies on contact investigation

- **CATCH TB in Philippines:**
  - Enhanced CI in Metro Manila
  - Screened >7000 contacts of 2772 index cases in 1 year
  - Yielded >240 TB cases (3%)

- **Viet Nam CI study**
  - ACT1: Pilot in Hanoi completed
  - ACT2: A Nationwide intervention trial with periodic screening

- **Documenting “retrospective CI” in Cambodia**
  - 6-year experience in community based ACF among contacts (adult and children)
  - Upgraded strategy under TB REACH

- **Some more in pipeline**
  - Neighborhood factors (social determinants) analysis in Manila
  - More potential for CI data analysis – China and Mongolia
Diabetes

- TB risk (relative to general pop)
  - Diabetes: 3.1 times higher TB risk
  - Dose response relation: poor control → higher TB risk
- Delayed sputum conversion, death during TB treatment, and relapse

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<thead>
<tr>
<th></th>
<th>DM prevalence*</th>
<th>PAF**</th>
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<tbody>
<tr>
<td>Cambodia</td>
<td>4.2%</td>
<td>8.1%</td>
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<td>China</td>
<td>9.4%</td>
<td>16.5%</td>
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<tr>
<td>Lao</td>
<td>6.2%</td>
<td>11.5%</td>
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<tr>
<td>Mongolia</td>
<td>8.7%</td>
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<td>PNG</td>
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<td>Philippines</td>
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<tr>
<td>Viet Nam</td>
<td>6.9%</td>
<td>12.7%</td>
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</tbody>
</table>

* WHO Global Health Obserbertory, ** Population Attributable Fraction based on a relative risk of 3.1 for active TB among diabetics.

Cumulative hazards for active TB by diabetic status, among a cohort of clients (>65yrs) registered with an elderly health service in Hong Kong

TB-DM collaborative framework

Diabetes clinic

Case finding:
• Intensify detection of TB among DM patients
Care delivery:
• Ensure TB infection control
• Ensure high quality TB treatment and management
Outcome:
• Better control for DM by detecting and treating TB early

Establish mechanisms for collaboration

TB DOTS clinic

Case finding:
• Screen TB patients for diabetes
Care delivery:
• Ensure high quality diabetes management
Outcome:
• Better TB cure, less relapse by controlling DM

Effective Referral and coordination

World Health Organization, Western Pacific Regional Office

(Stop TB, WHO WPRO, based on “Collaborative Framework for Care and Control of Tuberculosis and Diabetes”, WHO/IUATLD, 2011)
Progress in TB control among DM patients and TB-DM collaboration

Policy and meetings
- TB-DM collaborative framework
- TB-DM meeting in China in May 2011
- Cambodia National Workshop on TB high risk populations embarked discussion for collaborative activities

TB ACF among DM patients
- Shandong, China
  Community-based enrolment and ACF in local health facilities
  (supported by WPRO TB OR grant)
- Manila, Philippines
  Diabetes clinics in tertiary hospitals
  (Under CATCH TB Project)
Migration: diverse populations, diverse issues

**Internal migrants**
- Mainly rural to large cities
- Issues: access to services, care delivery
- Focus areas: Large cities and industrial areas

**Cross-border population movement**
- Mostly economically driven (but inc refugees)
- Issues: legal issues (detention, repatriation), high-risk behaviours, health access and care delivery
- Focus areas: Mekong countries including China

**Floating population**
- Homelessness, urban slums, mining communities, etc
- Issues: access to services, care delivery
- Focus areas: Large cities and development areas (mines, etc)

**Labour immigration**
- Endemic to less endemic countries
- Issue: importation of infectious diseases, international referral, access to services
- Focus areas: Intermediate burden countries and areas

(Stop TB, WHO WPRO)
TB ACF Project for deported Cambodian migrants in Poipet

- Annually ~100,000 Cambodian irregular migrants deported from Thailand and Malaysia
  - 20% spent > 1 month in detention
- Many are without legal documents
- No health screening for this highly vulnerable populations

- CENAT – IOM – WHO joint project to conduct ACF with Xpert
- Funding by TB REACH wave-2 approved
Other pilots and initiatives on migration and TB

**Internal migrants**
- Various studies on migrant TB in China
  - Migrant TB needs assessment
  - Study on delays and treatment outcome
  - Effect of subsidy for migrant TB patients
- Study on TB among migrants in Viet Nam (in pipeline)

**Labor immigration and TB**
- Consultation with Malaysia
- Consultation for low/intermediate burden countries (Nov 2011)

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Data from Zhang, L.X. et al., 2006. *Int J Tuberc Lung Dis*, 10(9).
Migrant TB burden in Malaysia
Number and % of migrant among all TB cases, by State, 2008
Elderly

- Higher disease burden observed among older populations
- PDR analysis often shows low detection among elderly
- Limited access to health care → potential for increased case detection
Exploring entry points: Initiatives for TB control among elderly

- “Geriatric Cough Centre” in Veteran’s hospital (under Dep. Defense) supported by Philippines NTP

- Intensified TB screening for institutionalized elderly, Philippines (under Dep. Social Welfare)

- National workshop for TB high risk populations in Cambodia opened up discussion for “Pagoda screening” in collaboration with Ministry of Religion
TB concentrates in prisons: Selected published data from surveys in prisons

Source:
Epidemiological insight: Why TB high risk strategies? Prison TB as an example...

If you want to put water cleaner, where to set-up??

Conventional DOTS approach is facing limitations!

Prisons:
- Receive TB
- Spread TB
- Worsen TB
- Finally, export TB

Concentration of TB in lower segment of society
Epidemiological insight:
Transform an issue into an opportunity!

General population

Concentration of TB in lower segment of society

Prisons can:
Receive prisoners with TB
Treat and care TB
Return health individuals back in the society!
Progress in TB control in prisons

- Health in Prisons (HIP)
  - TB control in prisons can provide an entry point for wider health issues
  - WPRO developed “health in prison assessment” tool

- HIP Assessment in Mongolia (Nov 2011)
  - Good documentation of achievement in the past 10 years

- TB REACH Wave-2 project granted for Viet Nam

- In plan:
  - Health in prison assessment in Cambodia in Q4 2011
  - Evaluation of pilot prison TB control project in Philippines in Q1 2012
  - WPRO hopes to be engaged in more countries
  - Fundraising for Regional and in-country activities
Progress in TB control in prisons:
It’s doable and brings high impact!

- Substantial increase in TB case finding in 7 pilot prisons and jails, Philippines

- Visible reduction in TB burden in Mongolia
Public-Private and Public-Public Mix inc Hospital Linkage

PPM
- Steady progress in PPM in all countries in the Region
- TB REACH project in Lao PDR engaging GPs
- Large scale PPM expansion in plan in Viet Nam

Hospital linkage – high level of successes!
- WHO-CIDA project in Viet Nam
- CATCH TB in Philippines
- Expansion of TB designated hospitals in China
WPRO’s TB high risk group ‘triad’

- ACF targeting and strategy selection tool
- Interim Regional Framework
- National Workshop package
Targeted case finding and service delivery: some critical questions

- Who are potential targets? How to prioritise them?
- Strategies – passive or active?
  - Systematic TB screening (ACF)
  - Promoting early visit (enhanced case finding)
- What is the right options for diagnostic algorithm?
  - Yield: how many can be diagnosed?
  - A cost-effectiveness

A tool to assist decision making
- Target prioritization
- Selection of diagnostic algorithm
  Based on cost-effectiveness

- How to ensure treatment uptake and completion
  - Treatment under routine programme or special supporting mechanism?
- Effective partnership: Who should we collaborate?
A tool for ACF targeting and strategy selection

- Guidance was needed to support formulating ACF projects (e.g. TB REACH)
- An electric tool for ACF targeting developed

What factors determine the yield and cost-effectiveness of ACF?

Factor 1. TB prevalence among the target
  - Higher prevalence → higher yield

Factor 2. Diagnostic algorithms
  - More comprehensive screening
    → higher cost & yield

Increased TB case detection
Factors determining ACF strategy
1. TB Prevalence among the target

- Number needed to screen (NNS) shoot up as TB prevalence goes down
- Finding populations with high prevalence is the first key to success
- Roughly, ACF can be cost-effective for a target > 0.5% prevalence
- Nevertheless, NNS cannot tell exactly as the cost depends on diagnostic algorithms
2. Diagnostic algorithms

Model algorithms

1. Symptom $\rightarrow$ microscopy
   (routine programme model)
   low cost & low yield
2. Symptom $\rightarrow$ microscopy + x-ray
3. X-ray + symptom $\rightarrow$ microscopy
4. X-ray + symptom $\rightarrow$ microscopy + culture (prevalence survey model)
   high-cost & high-yield
5. X-ray + symptom $\rightarrow$ Xpert
   High cost model for Xpert
6. Symptom $\rightarrow$ x-ray $\rightarrow$ Xpert
   Low cost model for Xpert
Electric tool for ACF targeting and strategy selection

Now available online!
Pre-testing version
http://www.tuberculosisresearch.org/ACF
Version 1.0 soon available
http://www.innovationsinpublichealth/ACF
An example of the tool outputs:
Diagnostic cost per case detected

Prevalence > 2%
- Cost effective for all strategies including prevalence survey models (culture or Xpert)

Prevalence 1-2%
- X-ray screening (strategy 3) may be still cost-effective
- Culture probably feasible but requires careful planning

Prevalence <1.0%
- Up to strategy 1 & 2 acceptable (i.e. routine procedure)

* Cut-off of USD 200 are arbitrary. TB REACH criteria employ USD 350 per case detected and successfully treated.
General observations from the tool outputs

- ACF is a costly exercise (esp in low prevalence settings)
- Conservative algorithm (standard DOTS approach) almost always acceptable
- The higher the prevalence
  → Extensive approach acceptable
  → Yielding more cases (minimizing missed opportunities)
- Some strategies are sensitive to local settings (e.g. X-ray cost)
  → Value of the interactive online tool for national, sub-national level planning
Narrowing down the target: **Risk x Risk approach**

(Elderly x smokers)

Dilemma…
- Very high risk groups → small
- Lower risk groups → larger size and difficult to target

- So the key is to find a high risk target with a good pop size

- **Risk-by-Risk** (combining multiple risks) to manipulate a risk profile and a target size
  - e.g. Geographical targeting x TB contacts (Cambodia Retro CI)
  - e.g. Deported migrants x detention history (A TB REACH project in Cambodia)

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Neighborhood factor analysis for geo-targeting

- Neighbourhood factor analyses using socio-economic characteristics have a potential to guide geo-targeting

- Risk micro-stratification to identify target area/population

- Risk x Risk approach
  - e.g. poor neighborhood x malnourished or DM
  - e.g. densely populated area x contact investigation
## Risk-by-Risk Table

<table>
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<tr>
<th>Target population (venue)</th>
<th>Entire group</th>
<th>HIV</th>
<th>Smokers</th>
<th>Malnourished</th>
<th>TB contact history</th>
<th>Alcoholics</th>
<th>Diabetes</th>
<th>Elderly</th>
<th>Previous TB</th>
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TB risk

Evidence of high risk
Significant TB risk factors:
• HIV
• TB contact
• Institutional transmission
• Elderly

Moderate TB risk
• Diabetes
• Malnourished
• Smokers
• Poor
  • (male dominant)
  • (older age profile)

TB risk low or unknown
• (female dominant)
• (younger age profile)

Additional priority criteria
• Limited health access
• Highly marginalized
• Under detection by routine programme

Contextual criteria
Resource-rich
Institutional setting
Treatment can be ensured

Strategy

Active Case Finding (TB screening)
• Extensive screening for highest yield
• With culture or Xpert

Enhanced (passive) case finding
• ASCM
• Community information campaign etc

Not suitable for ACF
• At least with X-ray screening
• Symptom screening with microscopy

World Health Organization, Western Pacific Regional Office
National workshop on TB high risk and vulnerable populations

• Participants
  – All stakeholders in country engaged in TB control activities targeting high risk populations
  • TB partners / Non-TB health programmes / Non-health sector partners

• Objectives:
  – Review global and in-country evidence;
  – Share experience of the work targeting TB high risk populations;
  – Discuss on potential areas of collaboration for improved access to TB services for TB high risk populations.

• Outcomes:
  – Strengthening and establishing partnerships (inc inter-ministerial discussion)
  – Nurturing innovative approaches
  – All partners’ effort harmonized under NTP
National workshop ‘package’ to accelerate TB control for high risk populations

- The origin of idea:
  - TB risk factor meeting in China in May 2010
- Complete package will include:
  - Presentations and documents
  - Tools
  - Regional Framework
- The first workshop:
  - National workshop in Phnom Penh, Cambodia, July 2011
- Ready for dissemination from Q4 2011 onwards!
Conclusions and the way forward

- Let’s congratulate our progresses in TB control among high risk and vulnerable populations
- It is only start – many of them are pilots and initiatives. Continue to:
  - Document
  - Share experiences
  - Generate high quality evidence
- WHO WPRO continues to play a vital role in guidance and innovations.
- WHO WPRO always happy to assist NTPs and partners in this important area of TB control.

“Tuberculosis is a social disease, and presents problems that transcend the conventional medical approach … It is the consequence of gross defects in social organization, and of errors in individual behaviour.”


After 100 years of efforts of all partners, we are glad to declare that the famous passage by Dubos does not hold truth anymore today.

– WHO WPRO, 2052.
THANK YOU!