Findings of 1st Nationwide TB Prevalence Survey in Mongolia, 2014/15

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Background

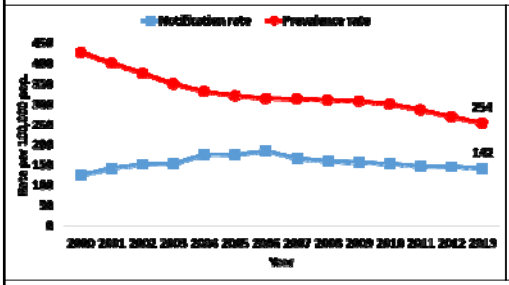
- Although Mongolia is not included in the list of 22 global focus countries, the country is considered one of the highest TB burden countries in the Western Pacific Region.
- 4th highest TB burden country in the Western Pacific Region
- Even the global MDG and regional targets for TB control are met.
- TB is considered as 6th leading cause for population mortality and the 1st leading cause of mortality due to communicable diseases in Mongolia.

Justification and Rationale

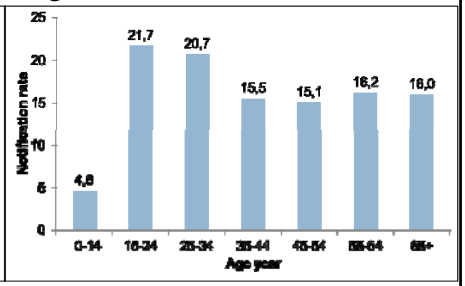
- TB burden based on WHO estimation
- Estimates of incidence and prevalence based on routine surveillance, which is not reliable
- No previous systematic surveys conducted to measure TB disease burden
- Need to understand the real situation of burden and public health needs
- The survey was the dream of all generations of NTP staffs

TB situation in Mongolia

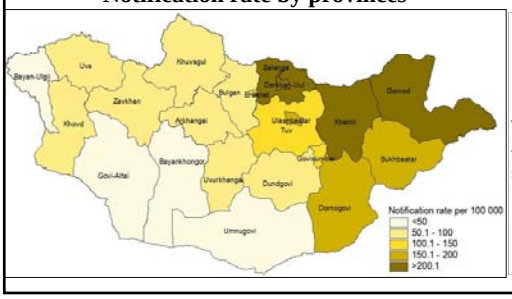
Prevalence vs notification rate for all form TB



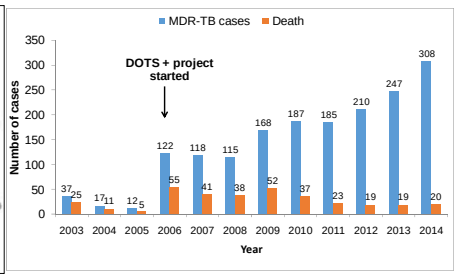
Age distribution of notified all form TB



Notification rate by provinces



MDR-TB



Main Objective

- To estimate the burden of disease caused by TB among the population of Mongolia and to identify ways to improve the implementation of the National TB control program.

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Methodology

- **Design:** Population-based cross-sectional study
- **Sample size:** 49'200
- **Sampling:** Two-staged stratified cluster sampling
  Strata-1: 51 urban clusters (city)
  Strata-2: 15 provincial center clusters
  Strata-3: 32 soum clusters
- **TB screening:**
  1. Interview (Symptom, health seeking, contact, history of TB and others)
  2. Chest X-ray (direct digital chest x-ray)
- **Eligibility to sputum submission:**
  1. Symptom: cough for more than 2 weeks
  2. Chest X-ray: any abnormality in the lung field
  3. Other: due to disability, refused to take CXR (pregnant, other reason)
- **All specimen tested in single laboratory:**
  - Smear, **Gene-Xpert,** Culture (Ogawa), Identification,

City

Provincial center

Rural soum (sub-provinces)

Survey quality

Operation:

- Sampling frame: 100% covered
- Cluster operation: 100% covered
- Participation rate: 83.8% (target was 85%)

Screening:

- Screening positive rate: 20.6% (10359/50309)
- Sputum submission rate: 92.1% (9546/10359)
- Submitted 2 specimen: 99.2%

Laboratory testing at NTRL:

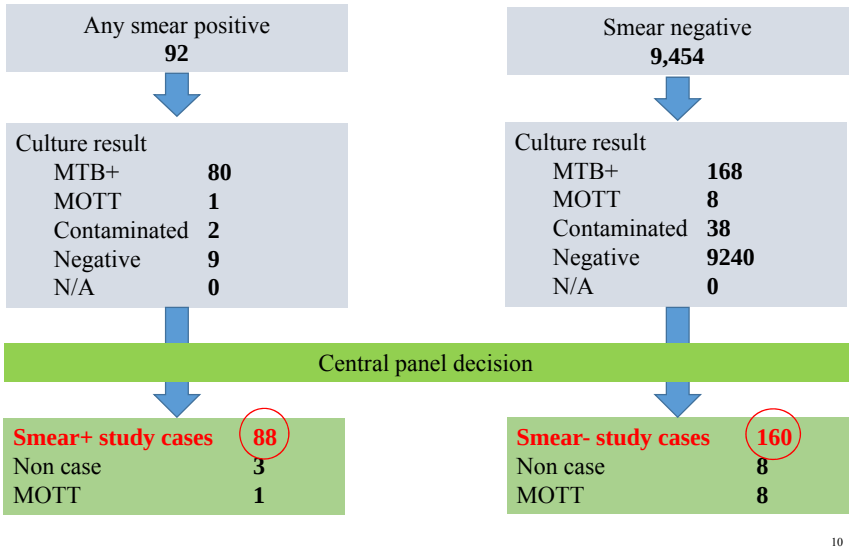
- Availability of lab. results is 100%
- Overall recovery rate was 89.7%,
- Overall contamination rate was 0.4%

Participants

	City	Provincial center	Sub-province	Total
Cluster	51	15	32	**98**
Enumerated	46,785	11,969	27,106	**85,860**
Eligible to participate	33,690 (72.0%)	8,358 (69.8%)	17,983 (66.3%)	**60,031 (69.9%)**
Participate	27,112 (80.5%)	7,260 (86.9%)	15,937 (88.6%)	**50,309 (83.8%)**
Eligible to submit sputum	5,718 (21.1%)	1,662 (22.9%)	2,979 (18.7%)	**10,359 (20.6%)**

Bacteriological test result and study cases

Total of bacteriologically confirmed study cases was 248



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Bacteriologically confirmed TB cases by strata

Strata	S+ TB	S-C+ TB	Total
City	47 (33%)	95 (67%)	**142 (100%)**
Provincial center	13 (36%)	23 (64%)	**36 (100%)**
Sub-province	28 (40%)	42 (60%)	**70 (100%)**
Total	**88** (35%)	**160** (65%)	**248 (100%)**

Study cases

Characteristics	Smear positive	Bacteriologically confirmed
Gender		
• Male	68 (77.3%)	160 (64.5%)
• Female	20 (22.7%)	88 (35.5%)
Cough for 2+ wks		
• Yes	**30 (34.1%)**	**51 (20.6%)**
• No	58 (65.9%)	197 (79.4%)
CXR abnormality suggestive of TB		
• Yes	74 (84.1%)	143 (57.7%)
• No	14 (15.9%)	105 (42.3%)

Prevalence estimation

Prevalence of PTB per 100,000 population aged above 15 y.o., in Mongolia

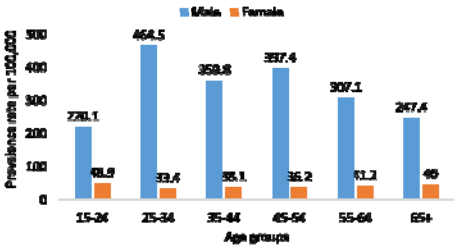
Study cases	Prevalence	95% C.I.
Smear positive	**204**	**143-265**
Bacteriologically confirmed	**560**	**455-665**

Prevalence of PTB per 100,000 population aged above 15 y.o. by stratum

Strata	Smear positive		Bacteriologically confirmed	
	Estimate	95% CI	Estimate	95% CI
City	**191.2**	**125.8-256.7**	**585.9**	**447.4-724.3**
Non-city:	**221.0**	**107.7-334.3**	**524.3**	**362.0-686.6**
- Provincial center	195.1	34.4-355.8	513.2	216.4-810.0
- Sub-province	232.8	84.9-380.8	529.3	335.7-722.9

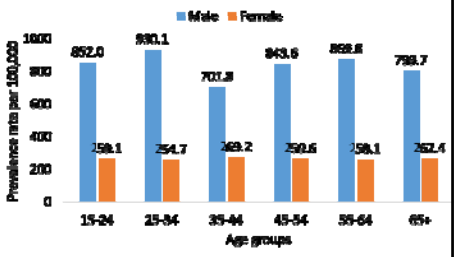
Prevalence of PTB per 100,000 population aged above15 y.o. by age and gender

Smear positive TB



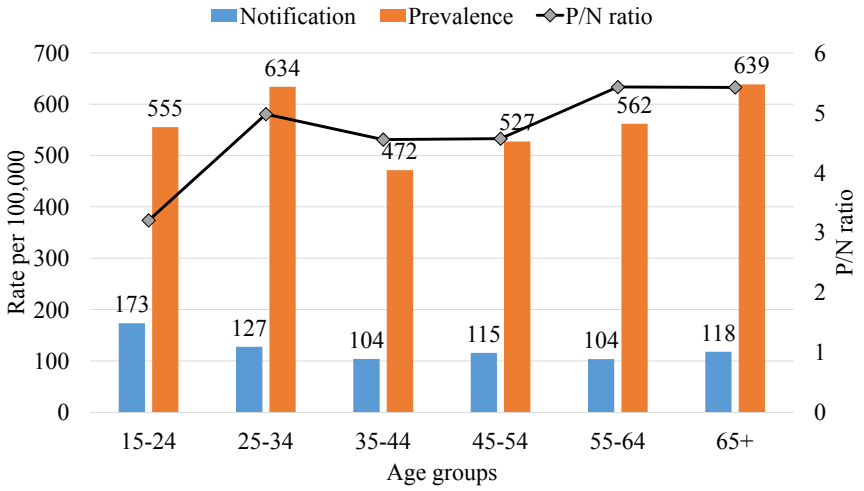
M:F ratio for S+TB = **5.1**

Bacteriologically confirmed TB

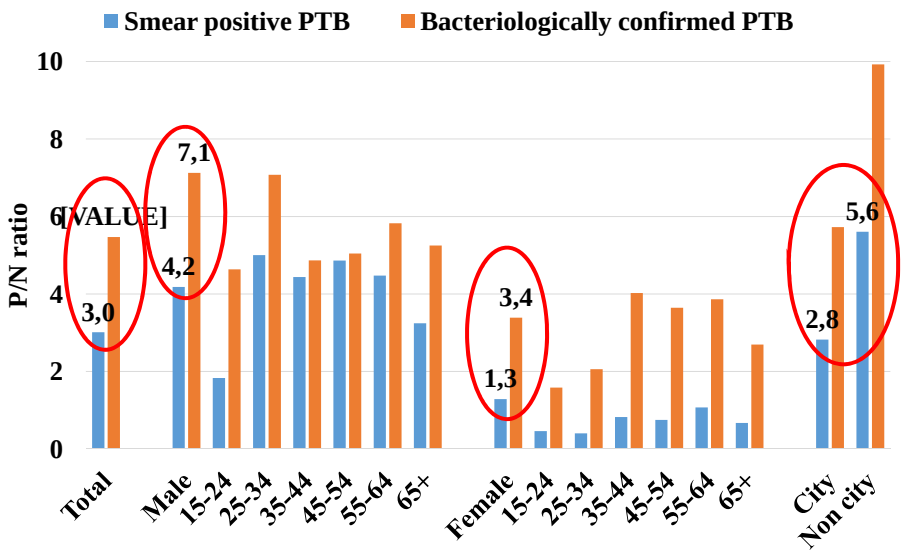


M:F ratio for Bacter. Confirmed TB = **2.8**

Prevalence and notification rate ratio of PTB by age groups



Prevalence and notification rate ratio of PTB



Extrapolation to ALL FORMS of TB and ALL AGE GROUPS

- Pulmonary TB prevalence, all ages (rate per 100,000) was **441 (366 – 515)**
- Prevalence of all forms of TB for all age groups is **757 (620-894)** per 100,000 population in 2014-2015.
- TB prevalence rate was much higher (**3 times higher**) than what is estimated by the WHO for 2013, which was 254 (119-438) per 100,000 population.
- Number of prevalent all forms of TB cases among all ages was **22,000 (18,000 – 26,000)** in 2014-2015.
- The estimated number of incident TB cases is **12,692 (6,540 – 20,803).**

Limitations

- Fewer participation in younger male
- Some positive subjects may be missed by screening especially those with milder symptoms without detectable CXR abnormality (at field level)
- Few percentage of TB suspects did not submitted specimen
- No cross check with TB registry

Major Findings

- Observed TB prevalence were:
  - **Smear positive TB: 204 (143-265)**
  - **Bacteriologically confirmed TB: 560 (455-665)**
- **No significant difference** of prevalence between **urban and rural area.**
- Understanding that the TB burden in Mongolia is **three times as higher as WHO previously estimated**
- Ratio of prevalence of Bacteriologically confirmed to smear positive is similar with other countries in Asia

Summary of findings

- TB prevalence in Mongolia is high
- Higher prevalence in males, especially for S+ (suggesting challenges in access and poor healthcare seeking behavior in men)
- TB prevalence in all ages is relatively high (suggesting active transmission of TB in the community)
- High prevalence in both city and non-city (suggesting challenges in access in rural settings)
- High P:N ratio, especially in men and rural settings (suggesting limitations in case finding strategy)

Discussion

Current symptom-screening strategy

- is **effective for detecting S+TB cases with chronic cough,**
- but overall is inadequate because S+TB accounts for only 1/3 of PTB and chronic cough is found in only 1/3 of S+TB cases.

Comparison with high TB Burden countries

Country	Year	Age	Smear positive	Bacter+ positive	S+/B+
Cambodia	2011	15+	272 (209-354)	820 (691-971)	33.2%
Indonesia	2013	15+	257 (210-303)	759 (590-961)	33.9%
Philippines	2007	10+	260 (170-360)	660 (510-810)	39.4%
Myanmar	2009	15+	242 (186-315)	613 (502-748)	39.5%
Lao PDR	2011	15+	278 (199-356)	595 (457-733)	46.7%
Mongolia	**2014**	**15+**	**204 (143-265)**	**560 (455-665)**	**35.5%**
Viet Nam	2007	15+	197 (149-254)	307 (248-367)	64.2%
Ethiopia	2011	15+	108 (73-143)	277 (208-347)	39.0%
China	2010	15+	66 (53-79)	119 (103-135)	55.5%

Main recommendations

- Strengthen HR and lab capacity for scaling-up current DOTS strategy, especially in rural settings
- Introduce novel technologies (GeneXpert MTB/RIF) suitable for diagnosis of S-C+TB in rural and other settings with limited lab capacity for culture examination
- Enhance HR capacity and infrastructure for CXR examination
- Pilot new approaches to TB screening
  - Mobile services (ACF or screening) in rural settings
  - CXR screening during army recruitment
  - Active case finding among males, the elderly, TB contacts

Thank you for your attention