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Title: Preliminary Results Prevalence of Pulmonary Tuberculosis among Adult Population of Pakistan, during 2010-2011

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Background

Pakistan has the 4th highest burden of tuberculosis (TB) globally with WHO estimated prevalence of all forms of TB of 364 per 100,000 (95% Confidence Interval (CI): 154-611). The real burden of TB remains unknown. A nationwide prevalence survey was conducted to estimate the prevalence of bacteriologically confirmed pulmonary TB. In order to get a more precise understanding of the TB burden in Pakistan a new prevalence survey was conducted as more than two decades had passed since the last TB prevalence survey in Pakistan in 1987.

Objectives

The primary objective of the survey was to determine the prevalence of bacteriological confirmed pulmonary tuberculosis among the adult population (≥15 years) in Pakistan during 2010-2011 in a nationwide representative survey.

Survey case definitions

A definite survey TB case (Bacteriologically-confirmed survey TB case) is defined as:

- A culture positive TB case with five or more colonies; OR
- Culture positive with less than five colonies either with positive smear or abnormal chest X-ray result consistent with TB; OR
- Smear positive case with positive nuclear acid amplification test (WHO – endorsed NAAT test)

An AFB-S positive survey TB case (smear-positive TB survey case) is defined as:

- At least two positive smears; OR
- One positive smear AND abnormal chest X-ray result consistent with TB (probable TB case); OR
- One positive smear plus a positive culture (definite TB case).

Methods

The survey design was household cross sectional survey with multistage cluster sampling based on probability proportional to size. The survey was conducted from August 2010 to December 2011 in 95 clusters. Although a nationwide survey was envisioned the following areas were excluded from the sampling frame because of security threats: Federally Administrative Tribal Area, district Dera Bugti in Balochistan and 17 tehsils of Khyber Pakhtoon Khwa. The population included all residents aged ≥15 years or more living in households within the selected clusters (nationals or not) who had slept in the household the night before census by the survey team and who gave consent to participate in the survey. Household census was
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done in clusters and eligible adults were invited to cluster site for screening on cough, current TB treatment and chest X-ray was done to all participants who consented. All TB suspects, defined as any survey participant with CXR abnormalities consistent with TB, or coughing for more than 2 weeks or currently on TB treatment, submitted sputum specimens for smear examination and culture. To estimate the prevalence of bacteriologically confirmed TB, population weights were used to adjust for the cluster design. The point prevalence and 95% CI were estimated with STATA version 11.2SE.

Results

The preliminary results showed that 103,387 of 129,827 eligible individuals participated in at least one screening method (79.6%). Participation rate among females (86.4%) was higher than among males (72.0%). Out of total eligible individuals 98,761 (76.1% ) participated in verbal screening which is slightly higher than the number of eligible individuals that were subjected Chest X-ray (n=97,783; 75.3%) which is to be expected because participants may not have provided consent for Chest X-ray screening and pregnant women were excluded from Chest X-ray screening. Out of 103,387 survey participants 11,787 (11.4%) TB suspects and 266 bacteriologically confirmed TB were identified (weighted prevalence: 256 per 100,000 adult population (95% CI: 214-298)). TB prevalence was higher among males compared to females: 330 (95% CI: 262 – 399) versus 207 (163 – 252) and increased with age from 139 (95% CI: 98-179) in those aged 15-24 to 1011 (95% CI: 750-1273) in individuals aged ≥65 years.

Discussion

This findings are slightly higher compared to the prevalence of bacteriological confirmed pulmonary TB in the 1987 survey which was 170 per 100,000 adult populations. WHO estimated the prevalence of all forms of TB 364 per 100,000 population (95% CI 154 - 611) but this prevalence estimate is not only limited to bacteriologically confirmed pulmonary TB cases which makes comparison more difficult. During the preparation of the prevalence survey WHO’s 2006 estimate of smear positive pulmonary of 213 per 100,000 adult population was used as basis for the sample size calculation.

Conclusion and recommendations

The estimate of the TB prevalence was based on those 266 bacteriologically confirmed TB cases among 103,837 individuals that participated in at least one screening. The estimate of the prevalence of bacteriologically confirmed TB cases exceeds the estimate of smear positive pulmonary TB. More detailed discussion on the prevalence estimate will be conducted in the final analyses.