Do changes in notifications over time reflect TB incidence?

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Framework for estimation and measurement of TB incidence using surveillance data

- Are data reliable and complete?
  - Good coverage, with no missing reports
  - No duplicates
  - No misclassification
  - Data internally consistent
  - Data externally consistent
  - If not, IMPROVE surveillance system

- Do changes in notifications over time reflect trends in incidence?
  - Assess changes in case-finding effort or in case definitions
  - Assess changes in TB determinants
  - Examine historical and political events with possible impact on TB and/or reporting

- Do notifications include all incident TB cases?
  - Capture-recapture studies
  - Apply “onion” model to identify where cases may be lost/missed
  - Cross-validate estimates of TB incidence with TB deaths recorded in vital registration system
  - If appropriate, CERTIFY or VALIDATE surveillance data

- Evaluate epidemiological TRENDS and IMPACT of TB control

- Update estimates of burden
**Question 1:**
Have TB notifications been increasing, decreasing or stable over time?

**Question 2:**
Were there any changes in case-finding effort and/or recording and reporting that might have affected notifications over time?

**Question 3:**
How have factors that may influence TB incidence changed over time, and have they had an impact on underlying TB incidence?

**Question 4:**
Based on the information discussed questions 1 through 3, how do you think true underlying incidence has changed over time?
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1. Have TB notifications been increasing, decreasing or stable over time?

Graph showing trends in TB notifications over time. The y-axis represents the number of cases, and the x-axis represents the years from 1995 to 2005. The categories include New cases, Retreatment cases, New pulmonary cases, New extrapulmonary cases, New smear-positive, New smear-negative, New smear-unknown/not-done, and Relapse. The trends are indicated with arrows showing an increase. Myanmar

Workbook, page 3.2, 3.3
Graphbook, page 1.1-1.3, 2.1-2.6
1. Have TB notifications been increasing, decreasing or stable over time?

Tasks:

√ looked at the notifications (new cases, new pulmonary cases (also by smear), new extrapulmonary cases), assess their change over time using and indicate the direction and years of the changes in the boxes

√ Please discuss the reasons for any differences in trends between pulmonary and extra-pulmonary notifications. These could be changes in the programme, diagnosis or epidemiology.

√ Do the notifications trend in the same direction or are SS+ notifications moving in a different direction or pace than SS- notifications? Please describe possible reasons for any divergences.
2a. Were there any changes in case-finding effort that might have affected notifications over time?
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Indonesia

1. Number of slides per pulmonary case
2. Number of suspects per respiratory case
3. Number of new cases per suspect
4. Smear+ among culture+ (%)
5. Non-NTP cases among all (%)
6. Active case finding cases among pulm (%)
7. Foreign cases among all (%)

Workbook, page 3.4, 3.8
Graphbook, page 9 & 10
2a. Were there any changes in case-finding effort that might have affected notifications over time?

The following factors are likely to affect notifications over time as they have an impact on case detection.

√ The number of laboratories doing smear and/or culture

√ The number of NTP staff

√ Expenditure on TB control

√ Suspect rate (examined for TB/TB suspect)

√ Number of slides per patient to diagnose one TB patient

√ Proportion of all pulmonary cases diagnosed through active case finding

√ Proportion of population screened for TB through active case finding

√ Proportion of all notified cases reported by non-NTP

Task: Please depict how these factors may have affected notifications in your country in the same way you depicted the changes in notifications in the first exercise.
Were there any changes in recording and reporting that might have affected notifications over time?

**Tasks**: If there have been any changes in the recording and reporting system in your country?

- √ Expanded coverage of recording & reporting system
- √ Began notifying retreatment cases
- √ Began notifying SS- cases
- √ Began notifying extra-pulmonary cases
- √ Began notifying SS+ cases in children
- √ Began notifying SS-/extra-pulmonary cases in children
- √ Stopped notifying tuberculin positive individuals (including children) as active TB cases
- √ System changed from paper to electronic or electronic to internet-based
- √ Began checking for and correcting duplications and misclassifications
- √ Other
3. How have factors that may influence TB incidence changed over time, and have they had an impact on underlying TB incidence?
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**Task 1**: Discuss if any of the following had an affect on TB incidence?

- √ HIV prevalence
- √ GDP
- √ ARV treatment
- √ Other risk factors (such as malnutrition, smoking, alcoholism, diabetes, indoor air pollution)

**Task 2**: Explore if the age-sex structure and trend of notified smear-positive TB cases support your assumption of TB incidence?

- √ Has the age distribution of cases changed over time in your country?
- √ Has the mean age of cases gotten older or younger?
- √ What age range has the highest rate of TB notifications?
4. Based on the information we have discussed in questions 1 through 3, how do you think true underlying incidence has changed over time? Draw a line on the notifications chart below indicating how you think incidence has changed over time relative to notifications?