Exercise 9: Undetected cases in the community

Early and late tuberculosis risk among close contacts, a study in Hong Kong

Answers:

1. Calculations:
   a. 1.91%
   b. RR=
      i. 0.47
      ii. 0.47
      iii. 0.47
      iv. 0.31
      v. 0.09
   c. Incidence contacts in 1st year=0.99% X Incidence general population=0.0854.

1. To review an approach for assessing the potential contribution of contact investigation to case detection and identification of people with high-risk of TB
2. To enumerate possible reasons why TB cases do not have access to health care in your country
3. To discuss possible methods to assess to what extent TB cases do not have access (or have late access) to health care in your country

Topics for discussion:

- Recent meta-analysis results: pooled yield among household contacts was 4.5% (95% CI: 4.3-4.8%) active TB, 2.3% (95% CI: 2.1-2.5%) for confirmed TB and 51.4% (95% CI: 50.6-52.2%) for latent TB, but substantial heterogeneity across studies.
- Recent meta-analysis conclusion: "Contact investigation should merit serious consideration as a means of improve early case finding aiming to decrease transmission (specially of drug-resistant TB) and to identify high-priority candidates for treatment of latent infection (specially in areas of high HIV prevalence), in high-incidence areas."
- Meta-analysis is an statistical method for combining the results of a number of studies. It attempts to combine results into a single summary estimate to make an overall assessment. Studies have to be sufficiently similar. Bias includes poor quality issues of the studies, publication bias.
- Contact investigation is recommended by the International Standards for TB care.
- Should low and middle-income countries keep on focusing solely on detection and treatment of active TB cases?
• Household contacts are a particularly high risk population for latent and active TB.
• The risk of progressing from infection to active TB varies with age, but it is generally highest soon after infection.
• Transmission depends on closeness and duration of contact with the infectious source.
• How to assess the potential contribution of contact investigation to case detection and identification of people with high-risk of TB?
  o It is important to compare among populations with different parameters for closeness and duration of contact with the infectious source, as well as with different rates of TB and HIV.
    ▪ Number of contacts per house
    ▪ Number of rooms per house
    ▪ …
  o It is important to have an idea why TB cases do not have access to health care or why is diagnostic and treatment initiation delayed in your country?
    ▪ Late patient presentation?
    ▪ Failure of clinical services to investigate and treat appropriately?
    ▪ …
• Which should be the best targets for contact investigation activities in settings where resources are limited?
  o Children:
    ▪ Investigation for active TB among children < 5 years of age produces the highest yield among all age groups.
    ▪ Diagnosis of TB in children is particularly challenging.
    ▪ CFR is high.
  o Drug resistant TB:
    ▪ Avoid transmission as much as possible.
    ▪ CFR is high.
  o Characteristics of index case:
    ▪ Cavity and chronic cough in index cases are independent risk factors in early TB cases and smear + in late.
  o History of TB in other family members.
Important to consider that active cases detected in community are less symptomatic and more prone to a high initial default rate, and that active case finding can potentially identify a substantial portion of the existing case load at an earlier stage of disease, therefore reducing the risk of transmission.
• How would you measure the community impact of contact investigation?
In the USA, contact investigation has contributed to a 44% decrease in TB incidence rates from 1993 to 2004.

- Trends over time. Consider possibility of using control group.
- It is important to combine with cost-effectiveness analysis.

- Methods to assess why and to what extent TB cases do not have access (or have late access) to health care in your country
  - Communication and social mobilization - intervention and control (delayed intervention) areas?
  - Contact tracing
  - Active case finding in population with higher risk (HIV, institutionalized people).
  - Study about health-seeking behavior of TB incident cases to measure the extent to which identified cases had already had contact with health services. Pros and Cons (only cases that do have access).
  - Study reasons for diagnostic delay and severity of TB cases at diagnosis.
  - Surveys of TB prevalence? Pros and Cons.
  - Surveys of TB infection to identify areas with high risk of Tb transmission? Pros and Cons.
  - Capture-recapture methodology.