Assessing the global burden of LTBI – need and considerations
13th March 2015, Rein Houben and Richard White, LSHTM

Background
The global burden of latent TB infection (LTBI) is regularly reported to be approximately ‘1/3 of the world population’. The most recent estimation exercise was done in 1997 as part of the WHO Global Surveillance and Monitoring Project (1), which estimated the global prevalence of LTBI at 32%, with strong regional variation. This work was based on the best data and knowledge then available. The prevalence of LTBI was estimated through deriving an annual risk of infection (ARI) from TB incidence estimates (using the ‘Styblo rule’) and applying this to a mathematical function that calculated the cumulative proportion infected given this ARI, assuming the ARI was constant across all age groups (see (1) for details).

Need for re-estimation
The reduction of the LTBI reservoir will be key to achieve the targets of the “End TB Strategy”. An updated estimate of the size and distribution of LTBI in the population is needed to inform discussions on how the TB community will address this issue. A revised estimate is also timely given changes in population structure, availability of new data and new scientific insights since the last estimation. See below for an initial, non-exhaustive list.

The presentation at the TIM meeting (30th March-2nd April 2015) will consider possible methods to re-estimate the global LTBI burden, present some examples of model-based estimates of LTBI burden in selected settings, and highlight for discussion a number key issues around definitions, data and methods that will need to be addressed.

Changes to consider in population structure, data and scientific insights

Population changes
- Global and age population distribution has changed between the WHO regions, and within countries. As prevalence of infection varies by region and by age, this impacts on global LTBI prevalence.
- TB prevalence has changed within countries, and in many areas the ARI is falling rapidly (e.g. China), which will impact on LTBI prevalence, in particular in young people.
- HIV prevalence has changed, as has the composition of the HIV positive population (e.g. maturing epidemic, ART roll-out).

Data
- National TB disease prevalence surveys, as well as surveys for LTBI infection have yielded large amounts of new data that could help inform estimation models. (2)

Scientific insights
- The Styblo rule for the association between incident TB and the ARI has been shown to not hold in DOTS settings. (3) A revised method underlying the LTBI burden is needed.
- The development blood based tests for LTBI infection has provided more an alternative source of data, although discussions are ongoing as to what exactly each test measures, and how results can be used in estimation models.
- Recent publications have shown that within some populations, the ARI varies strongly with age. (4) Incorporating age structure into the models could impact on estimates, and also inform LTBI control policies.

Other questions
- Should the re-estimation exercise aim to provide an estimate of the global burden of MDR LTBI, or LTBI in HIV positive individuals, in anticipation of discussions of appropriate interventions?
- Should the re-estimation exercise account for the potential of self-cure of LTBI?

References