Tuberculosis contact-tracing among Syrian refugees
Report from early experience in Jordan

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Setting
- Until 2012, tuberculosis (TB) incidence was declining in Syria (18/100,000) but any national efforts to reduce the yield of TB infection since then have been seriously hampered by the escalating violence (I).
- Syrian refugees are exposed to overcrowded conditions, malnutrition as well as significant interruptions in healthcare that facilitate the spread of TB (Figure 1).
- In response to the influx of more than 600,000 forcibly displaced Syrians since 2011 (II), the Jordanian National Tuberculosis Program (NTP) has implemented a specific TB reduction strategy, including contact-tracing (CT) activities (III).

Objectives
The objective of this study was to determine the prevalence and risk factors for active TB disease and latent TB infection (LTBI) amongst the contacts of Syrian refugees diagnosed with pulmonary TB (PTB). The CT program efficiency was also assessed, using CDC performance indicators (IV).

Methods
We performed a cross-sectional study of close contacts (N=481) of all PTB cases diagnosed amongst Syrian refugees between March 2011 and May 2014 (N=76). Contact screening was performed using a combination of verbal screening of TB-related symptoms, tuberculin skin test (TST) and chest X-ray. Twenty-four variables were extracted from patients’ and contacts’ files and recorded for descriptive, uni- and multivariate analysis.

Results
- Global prevalence of active TB amongst contacts was 2.1% (Figure 2). It was two times higher in children under five (5.3%) compared to adults (2.5%). Global prevalence of LTBI was 24.1% and up to 26.2% in children under five.
- Risk factors for positive TST (Figure 3) included smear-positive index case (IC) (OR: 6.01) and previous TB infection in the family (OR: 4.38) in multivariate analysis.
- The implemented program achieved 3 out of 4 efficiency objectives defined by CDC guidelines (Figure 4).

Conclusions
- We found a high prevalence of active TB and LTBI amongst contacts of PTB cases, emphasizing the urgent need for host countries to implement active screening strategies for the refugee populations, including contact tracing.
- Our results underscore the high prevalence of active disease amongst children aged under live in contact with smear-positive IC, highlighting the need for specific actions focusing on this group.
- Our results showed that a CT program can be properly implemented in refugee populations and perform to international standards. Nevertheless, given the specific TB epidemiology of Syrian refugee population as well as the good infrastructure of the Jordanian NTP, further studies should be conducted in high prevalence and resource-limited settings.

Figure 1 – Impact of population displacement on TB transmission

Figure 2 – Prevalence of active TB & LTBI amongst contacts

Figure 3 – Factors associated with LTBI among all contacts in multivariate analysis

Figure 4 – CT Program performance