Pre-entry screening for tuberculosis: the need for better evidence

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Invited Commentary on 'Pre-entry screening programmes for tuberculosis in migrants to low-incidence countries: a systematic review and meta-analysis' by R. W. Aldridge et al.

Migrant screening for tuberculosis (TB) is increasingly recognised as an intervention that may help to reduce the burden of imported TB in low-incidence countries. However, migrant screening requires an understanding of the complex interplay between the natural history of TB, migration patterns and the yields (i.e. diagnoses of active or latent TB achieved), and thus cost-effectiveness, of screening.[1] As a consequence, several questions are being actively investigated including whether to screen for active or latent TB (or both), which migrant groups to screen, when to screen and how to screen. Our previous work documented the high levels of heterogeneity in migrant screening practices across[2] and within[3] high-income countries and the relative importance countries accord to identifying active TB in migrants. Although it has previously been established that the yields for port-of-arrival chest x-ray screening are low,[3] up until recently, there has been little data on the yields for pre-entry screening specifically. This issue has recently been addressed by a systematic review and meta-analysis of studies of pre-entry TB screening undertaken between 1980 and April 2014.[4]

The authors undertook a comprehensive review of the available literature on pre-entry screening for active TB; 15 studies with data on 3,739,266 migrants who were screened pre-entry were included. Yields for culture-confirmed active TB increased with TB prevalence in country of origin from 19·7/100,000 individuals screened (countries with a prevalence of 50–149 cases/100,000) to 335·9/100,000 (countries with a prevalence >350/100,000 population). The authors conclude that targeting countries with the highest prevalence of TB would result in the highest yields for active TB.

Data from this meta-analysis provides useful point estimates for screening yields and, therefore, parameterisation of health-economic models. However, the data is based on a small number of studies and it is not entirely clear whether these studies were undertaken as part of routine immigration processes or specifically designed to answer research questions pertaining to pre-entry migrant screening for active TB. Amongst the included studies it is also clear that there was a high level of heterogeneity in the selection of which migrant groups to screen, the specific screening methodology employed and the case definitions of active TB (the primary outcome) raising the question of whether it is meaningful to systematically collate such disparate studies. Moreover, the meta-analysis in the paper was limited to only six studies that reported data on culture-positive TB and it is not entirely clear that these studies used similar methods in assessing culture positivity.

Quality of the studies included in the meta-analysis for each of the different outcomes was very low and the risk of bias was serious. This makes it very difficult to draw any firm conclusions from the meta-analysis and any tentative conclusions are unlikely to be generalisable.

Yields for active TB were found to be highly variable across the studies analysed although yields were higher in the highest incidence countries than in lower incidence countries. It was also noteworthy that, at an operational level, the proportion of migrants actually identified with active TB varied from 0.0 to 28.8% although, in general, yields were less than 0.5%. This substantially impacts the cost-effectiveness of pre-entry migrant screening. It would have been useful if the authors had been able to stratify screening yields and screening prevalence by the type of migrant (documented migrant versus asylum seeker) and, if available, by age at the time of migration.

In summary, Aldridge and colleagues have undertaken a useful study which reviews the currently available evidence on the yields for pre-entry screening. It is clear, however, that at present the evidence base on which this review was based remains limited, of low quality and prone to bias. Drawing firm conclusions on the impact of pre-entry screening is therefore difficult and there is an urgent need for prospective cohort studies to objectively evaluate the impact and cost-effectiveness of pre-entry migrant screening programmes. This study also highlights the need for more harmonisation of screening methodologies and algorithms across countries in order to enable more meaningful and reliable comparisons of studies between countries.

Although it is likely that countries will continue to prioritise pre-entry screening for active pulmonary

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TB because it effectively prevents arrival of new migrants with infectious active pulmonary TB, it is unlikely on its own to have a major impact on TB control. Given that the majority of active TB in foreign-born persons in low-incidence countries arises from reactivation of latent TB infection acquired many years previously in the country of origin,[3,5] screening new-entrants for latent TB infection remains the cornerstone for controlling imported TB. This in turn should comprise one element of a comprehensive holistic screening package which aims to identify other communicable (e.g., hepatitis B, hepatitis C and HIV) and non-communicable diseases that are more common in migrants from the developing world than in the new host countries.

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Conflicts of interest AL is inventor for several patents underpinning T cell based diagnosis. The ESAT-6/CFP-10 IFN-gamma ELISpot was commercialised by an Oxford University spin-out company (T-SPOT.TB, Oxford Immunote plc), in which Oxford University and AL have minority shares of equity and entitlement to royalties.

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