

applauded.<sup>9</sup> Similarly, efforts to add moxidectin, a new treatment for onchocerciasis, to the currently inadequate therapeutic armamentarium for strongyloidiasis should be supported.<sup>10</sup> The epidemiology of strongyloidiasis should be defined, including its endemicity and areas at high risk, which will also aid to forecast the amount of drug needed, before a well designed control strategy can be implemented.

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We declare no competing interests.

- Jourdan PM, Lamberton PHL, Fenwick A, Addiss DG. Soil-transmitted helminth infections. *Lancet* 2018; **391**: 252–65.
- Henriquez-Camacho C, Gotuzzo E, Echevarria J, et al. Ivermectin versus albendazole or thiabendazole for *Strongyloides stercoralis* infection. *Cochrane Database Syst Rev* 2016; **1**: CD007745.

- Buonfrate D, Salas-Coronas J, Muñoz J, et al. Multiple-dose versus single-dose ivermectin for *Strongyloides stercoralis* infection (Strong Treat 1 to 4): a multicentre, open-label, phase 3, randomised controlled superiority trial. *Lancet Infect Dis* 2019; published online Sept 23. [https://doi.org/10.1016/S1473-3099\(19\)30289-0](https://doi.org/10.1016/S1473-3099(19)30289-0).
- Bisoffi Z, Buonfrate D, Sequi M, et al. Diagnostic accuracy of five serologic tests for *Strongyloides stercoralis* infection. *PLoS Negl Trop Dis* 2014; **8**: e2640.
- Levecke B, Mekonnen Z, Albonico M, Vercruysse J. The impact of baseline faecal egg counts on the efficacy of single-dose albendazole against *Trichuris trichiura*. *Trans R Soc Trop Med Hyg* 2012; **106**: 128–30.
- Torres JR, Isturiz R, Murillo J, Guzman M, Contreras R. Efficacy of ivermectin in the treatment of strongyloidiasis complicating AIDS. *Clin Infect Dis* 1993; **17**: 900–02.
- WHO. The selection and use of essential medicines: report of the WHO Expert Committee, 2017 (including the 20th WHO Model List of Essential Medicines and the 6th WHO Model List of Essential Medicines for Children). Geneva: World Health Organization, 2017.
- Palmeirim MS, Hürlimann E, Knopp S, et al. Efficacy and safety of co-administered ivermectin plus albendazole for treating soil-transmitted helminths: a systematic review, meta-analysis and individual patient data analysis. *PLoS Negl Trop Dis* 2018; **12**: e0006458.
- Freeman MC, Akogun O, Belizario V Jr, et al. Challenges and opportunities for control and elimination of soil-transmitted helminth infection beyond 2020. *PLoS Negl Trop Dis* 2019; **13**: e0007201.
- Barda B, Sayasone S, Phongluxa K, et al. Efficacy of moxidectin versus ivermectin against *Strongyloides stercoralis* infections: a randomized, controlled noninferiority trial. *Clin Infect Dis* 2017; **65**: 276–81.

## Tuberculosis testing and migrant health

Global migration is increasing. Current estimates suggest that some 244 million people, representing 3.3% of the world's population, are living as international migrants.<sup>1</sup> Migration has important implications for tuberculosis control because a high proportion of tuberculosis cases in low-incidence countries are in people who have migrated from countries where the disease is more frequent.<sup>2</sup> Countries with a low incidence of tuberculosis have adopted policies for targeted testing of prospective migrants for active or latent tuberculosis infection, but these policies are inconsistent in their specification of migrant countries of origin, the categories of migrants to be tested, and the tuberculosis tests to be used.<sup>3</sup> In the UK, a system of pre-entry screening for active pulmonary tuberculosis is used,<sup>4</sup> together with testing for latent infection in individuals aged 16–35 years arriving from high-incidence countries.<sup>5</sup> Policies for tuberculosis testing in migrants need to be informed by better evidence, but randomised controlled trials are seldom feasible and non-randomised studies require large sample sizes and long follow-up. Tuberculosis testing also needs to be understood in the broader context of communicable disease control. In its 2018 guidance on infectious diseases in newly arrived migrants, the

European Centre for Disease Prevention and Control made recommendations for testing for HIV, hepatitis, and parasitic and vaccine-preventable diseases, in addition to tuberculosis.<sup>6</sup>

In *The Lancet Infectious Diseases*, Luis Berrocal-Almanza and colleagues<sup>7</sup> use for epidemiological analysis a substantial dataset derived from migrant tuberculosis testing and primary care registration in the UK. The study cohort included 224 234 migrants who tested negative on pre-entry screening for active tuberculosis between Jan 1, 2011, and Dec 31, 2014, with follow-up until Aug 31, 2017. This cohort was compared with a group of 118 738 new migrants identified from the population-based system of health-care registration in England who were not screened for active tuberculosis. The study included 2451 participants who were tested for latent tuberculosis infection through a programme of migrant testing being rolled out in England,<sup>5</sup> of whom 1404 had also been tested for active tuberculosis infection. Analysis of 1771 incident active tuberculosis cases that were identified during follow-up revealed several important findings. First, socioeconomic conditions after arrival were associated with tuberculosis risk: migrants who were able to live in the least deprived areas in the UK had a lower risk of active



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Published Online  
August 27, 2019  
[http://dx.doi.org/10.1016/S1473-3099\(19\)30314-7](http://dx.doi.org/10.1016/S1473-3099(19)30314-7)  
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tuberculosis than those living in the most deprived areas (multivariate incidence rate ratio 0.74, 95% CI 0.62–0.89;  $p=0.002$ ). Second, delayed access ( $\geq 1$  year) to primary medical care services after migration was associated with an increased risk of active tuberculosis (2.96, 2.59–3.38;  $p<0.0001$ ).<sup>8</sup> Third, migrants who were not tested for active tuberculosis were more likely to develop the disease than those who were tested (1.49, 1.33–1.67;  $p<0.0001$ ). Testing for latent tuberculosis infection was done in 2451 migrants, with 421 (17%) positive tests and no subsequent diagnoses of active tuberculosis.

Berrocal-Almanza and colleagues' findings add to the body of evidence that testing for active tuberculosis in migrants before entry to a country with a low incidence of tuberculosis might be associated with a reduced risk of active tuberculosis diagnosis following migration,<sup>9</sup> despite the low yield of this intervention ( $<0.4\%$  of new-entrant migrants<sup>2</sup>). The study provides preliminary evidence with respect to the effectiveness of latent tuberculosis infection testing, but additional data are needed because only a small number of participants in the study underwent testing for latent tuberculosis. The results are important for drawing attention to social determinants of tuberculosis risk, including social and material deprivation and health-care access. Berrocal-Almanza and colleagues argue that improving migrants' access to primary medical care would probably improve tuberculosis control in the UK. This concept is plausible because delayed diagnosis is common, and comorbidities that are prevalent in migrants, such as diabetes,<sup>10</sup> are associated with tuberculosis risk and treatment outcomes. The present findings imply that people who are not tested for tuberculosis, are not registered in primary care, and live in deprived circumstances might be a particularly high-risk group that future research should aim to include.

It is important to consider the perspectives of people who live as migrants and to recognise the financial,

legal, organisational, and social barriers to accessing health care that they experience.<sup>11</sup> The results remind us of Virchow's remark that "medicine is a social science, and politics nothing but medicine at a larger scale".<sup>12</sup> Tuberculosis control not only requires the detection of infections and delivery of antimicrobial treatment—it also requires establishing conditions in which people can protect and preserve their health.

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We declare no competing interests.

- 1 International Organization for Migration. World migration report 2018. Geneva: International Organization for Migration, 2018.
- 2 Pareek M, Greenaway C, Noori T, Munoz J, Zenner D. The impact of migration on tuberculosis epidemiology and control in high-income countries: a review. *BMC Med* 2016; **14**: 48.
- 3 Garner-Purkis A, Hine P, Gamage A, Perera S, Gulliford MC. Tuberculosis screening for prospective migrants to high-income countries: systematic review of policies. *Public Health* 2019; **168**: 142–47.
- 4 Department of Health. Tuberculosis screening. London: Department of Health, 2018. <https://www.gov.uk/guidance/tuberculosis-screening> (accessed May 31, 2019).
- 5 Department of Health and Social Care. Latent TB infection: testing and treatment. London: Department of Health and Social Care, 2019. <https://www.gov.uk/government/publications/latent-tb-infection-ltbi-testing-and-treatment> (accessed May 31, 2019).
- 6 European Centre for Disease Prevention and Control. Public health guidance on screening and vaccination for infectious diseases in newly arrived migrants within the EU/EAA. Stockholm: European Centre for Disease Prevention and Control, 2018.
- 7 Berrocal-Almanza LC, Harris R, Lalor MK, et al. Effectiveness of pre-entry active tuberculosis and post-entry latent tuberculosis screening in new entrants to the UK: a retrospective, population-based cohort study. *Lancet Infect Dis* 2019; published online Aug 27. [http://dx.doi.org/10.1016/S1473-3099\(19\)30260-9](http://dx.doi.org/10.1016/S1473-3099(19)30260-9).
- 8 Tudor Hart J. The inverse care law. *Lancet* 1971; **297**: 405–12.
- 9 Aldridge RW, Yates TA, Zenner D, White PJ, Abubakar I, Hayward AC. Pre-entry screening programmes for tuberculosis in migrants to low-incidence countries: a systematic review and meta-analysis. *Lancet Infect Dis* 2014; **14**: 1240–49.
- 10 Girardi E, Sañé Schepisi M, Goletti D, et al. The global dynamics of diabetes and tuberculosis: the impact of migration and policy implications. *Int J Infect Dis* 2017; **56**: 45–53.
- 11 Abarca Tomas B, Pell C, Bueno Cavanillas A, Guillen Solvas J, Pool R, Roura M. Tuberculosis in migrant populations. A systematic review of the qualitative literature. *PLoS One* 2013; **8**: e82440.
- 12 Mackenbach JP. Politics is nothing but medicine at a larger scale: reflections on public health's biggest idea. *J Epidemiol Community Health* 2009; **63**: 181.



## Increased mortality in survivors of Ebola virus disease

Long-term sequelae of Ebola virus disease—including myalgia, arthralgia, ocular diseases, and mental confusion—have come to light in survivors of the 2014–16 Ebola outbreak in west Africa. The frequency

and duration of these sequelae, which are collectively referred to as post-Ebola virus disease syndrome, have since been reported.<sup>1</sup> However, information about subsequent mortality in survivors of Ebola is scarce.

Published Online  
September 4, 2019  
[http://dx.doi.org/10.1016/S1473-3099\(19\)30429-3](http://dx.doi.org/10.1016/S1473-3099(19)30429-3)  
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