IMPROVING SURVEILLANCE OF TUBERCULOSIS TRANSMISSION IN THE NEW GLOBAL SCENARIO

Dario García de Viedma¹,²

¹Clinical Microbiology and Infectious diseases Department, Gregorio Marañón Research Institute, Madrid, Spain
²CIBER Enfermedades Respiratorias (CIBERES)

Molecular epidemiology, and more recently genomic epidemiology, improve our understanding about the transmission dynamics of Mycobacterium tuberculosis. However, in many countries, including many of those with a high burden of TB, systematic genomic epidemiology cannot be implemented. Trying to find a solution to this situation, we propose an alternative, which tries to conciliate the discriminatory power of WGS with the speed, low cost and simplicity of PCR-based approaches. The cost of this shortcut is that it sacrifices the complete knowledge of all the transmission clusters in a population, because it needs to focus on the strains that deserve special attention because they are actively transmitted, or correspond to high-risk MDR/XDR strains. This short-cut strategy has proved to be efficient to survey actively transmitted strains, to fast track outbreak-strains, to update the presence of high-risk strains in a population or to give an urgent answer to public-health alerts, such as to rule out secondary cases due to the importation of XDR-TB cases.

More recently, we are integrating this strategy to optimize the characterization and tracking of transnational transmission events. We have activated a decentralized multinational network of surveillance nodes. This network simultaneously analyzes the cross-border distribution of relevant strains by means of sharing the same set of strain-specific PCRs. For the last five years we have implemented our novel surveillance approach in different epidemiological settings involving Europe, LatinAmerica and Africa. The results obtained have allowed us to i) differentiate transmissions after arrival of migrants to the host countries from independent importations of infections acquired in their countries of origin, ii) describe intercontinental transmission of MDR-TB between LatinAmerica and Europe, determining the role of prisons as reservoirs of MDR-TB and evaluating the impact of the MDR strains on the host populations, once exported, and iii) describe the impact, on different European countries, of en-route transmission between patients sharing the migratory route through Africa towards Europe. Integrative multinational efforts supported on novel simplified strategies can transform the way in which we survey TB transmission in a new global scenario.