

# The city, its people, their health and tuberculosis

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**Citation style for this article:**

Falzon D. The city, its people, their health and tuberculosis. *Euro Surveill.* 2014;19(9):pii=20721. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20721>

Article submitted on 28 February 2014/ published on 06 March 2014

City life appears destined to dominate the future of mankind in both the developed and developing world. If current trends persist into the coming decades, all population growth at global level will occur in towns and cities [1]. The number and size of big cities are set to increase. The proportion of the world's population living in cities is forecasted to go up from 52% in 2011 to 67% in 2050 [2]. In more developed regions, including much of the European Union (EU), close to 90% of the population is expected to become urbanised by 2050.

Economic pressures of different forms fuel these trends. For many people, however, the benefits of resettlement in cities and towns come at a price of greater risk to security and health through social exclusion. The rapid urbanisation that followed the Industrial Revolution led to a deterioration in public health in a number of western European cities. Homelessness, poverty, migration, overcrowding, and substance abuse are common in cities today and these risks often overlap in the same individuals, contributing to their descent into ill health. Tuberculosis (TB) tends to be barometric of this trend.

It has been known for a number of years that the risk of TB in many western European countries was higher for persons dwelling in a big city than those in rural areas; this was documented in a study of 20 cities in 11 European countries in 2003 [3]. However, the paper by De Vries et al. in this issue of *Eurosurveillance* presents a more recent roundup of European data from more cities and more countries [4]. It also reflects the realities of a more diverse EU, which has expanded eastwards since 2004 to encompass countries which generally had higher rates of TB than most of the EU15 countries before the enlargement. The data from this study thus allowed the authors to comment on observations which are better profiled than before. One of these is the inverse relationship between overall TB national case rates and the ratio of TB case rates in cities and towns compared with the rest of the country. This finding lends evidence to the widely held belief that as TB becomes rarer, the epidemic becomes more concentrated in place and population. It is also noteworthy that most cities with a rate ratio larger than 2.0 had a population of less than 1 million. The

finding that TB presents a challenge beyond just the capital cities, including settlements which do not come anywhere close to mega-cities, is important. It clearly has implications for the allocation of resources for TB control within a country's borders. The authors also comment on time trends in population rates of TB in some of the bigger cities: this is a challenging exercise given that year-on-year fluxes may not be accurately captured in the population estimates of large conurbations, particularly among mobile individuals expected to be at greatest risk of TB, such as the homeless and recent migrants. Nonetheless, any over-estimation in rates due to inexact statistics is unlikely to invalidate the conclusions drawn on the broad overall patterns observed in the last two decades. Otherwise, just as the TB notification rates in a country mask important disparities in risk of infection and disease within a country, the frequency of TB in a city is not expected to be homogeneously distributed within its precincts. The application of geographic information system (GIS) techniques such as the heat maps illustrated in the article by De Vries et al., are useful to describe the spatial distribution of TB disease within a city and can be helpful for field epidemiology and for the matching of investment with existing need. For European countries to achieve TB elimination (less than one TB case per million population per year) [5], they will need to rope in information technology methods such as these to locate individuals at risk of disease, to ensure that TB (including its drug-resistant forms) is detected early and fast, and to ensure reliable delivery of treatment.

A number of these innovations are put forward as solutions in a second article on this subject in this issue of *Eurosurveillance* [6], which proposes a multi-pronged action framework for TB prevention and care in the bigger cities of the EU. This welcome development is the end product of efforts by leading TB experts and technical partners which snowballed steadily over the last decade. The consensus achieved in this respect implies more statements than one.

Firstly, it represents a high-level recognition of the crucial position that urbanisation occupies and will continue to have among the different focused approaches to TB control. Secondly, it grounds its proposals for the way forward in the most recent knowledge and best

available information on TB epidemiology in Europe and elsewhere, with the authors identifying critical points for priority action. Thirdly, it is pragmatic in nesting these recommendations within initiatives which are already in place and seeks opportunities to actively improve impact, such as targeting at-risk individuals at any health service encounter. This is crucial given that the clients often belong to hard-to-reach population groups. Fourthly, the approach shows innovation in attempting to harness factors which lie outside the traditional territory of the TB practitioner, including the social factors, educational measures and legal dimensions through a conceptual model of 'structural and intermediary determinants'. One inadvertent victim of this approach, however, appears to be the domain of drug-resistant TB, which is mentioned in the context of infection control but afforded little focus in other respects, such as early diagnosis and effective treatment. The circumstances of TB patients in an urban setting may predispose to the propagation of drug-resistance as a result of inadequate case holding while on treatment and the higher population density; moreover the EU includes some countries with very high levels of multidrug resistance among TB cases.

Finally, another aspect of the paper by van Hest et al. worth highlighting is that evidence and recommendations were rated according to the Scottish Intercollegiate Guidelines Network (SIGN; [www.sign.ac.uk](http://www.sign.ac.uk)), a system which takes into account considerations other than quality of evidence when formulating recommendations but differs from the Grading of Recommendations Assessment, Development and Evaluation (GRADE) method used by the World Health Organization and others ([www.gradeworkinggroup.org](http://www.gradeworkinggroup.org)). It is important to note in this context that, as in many other fields of TB care, none of the evidence on which this consensus statement was based came directly out of randomised controlled trials (which at times are impossible or inappropriate to answer questions which are relevant to this topic) and nearly all of it would be judged to be of low or very low quality by the GRADE method.

In conclusion, these two complementary papers represent an important addition to the TB bibliography of Europe and beyond. Public health specialists and decision makers at municipal as well as national levels should find the conclusions and directions of particular value. The timing of these publications is also apposite given that it comes a couple of weeks ahead of World TB Day on 24 March [7], which this year is focused on the three million TB patients estimated to be missed annually by the national health systems in the world because of under-reporting or lack of access to reliable diagnosis [8].

### Conflict of interest

None declared.

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