Fighting poverty to prevent tuberculosis

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Published Online
December 22, 2015
http://dx.doi.org/10.1016/S1473-3099(15)00434-X

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Tuberculosis kills as many people as a jumbo jet crashing every hour,[1] and makes more people ill daily than Ebola virus has over the entire past decade.[1] Despite advances in modern biomedical care, the estimated number of tuberculosis cases is increasing and innovative approaches are needed if the disease is to be at least controlled, let alone eliminated.[1] Andrew Siroka and colleagues[2] investigate one such approach in their report in *The Lancet Infectious Diseases* on an analysis of social protection spending and global tuberculosis burden.

Large reductions in tuberculosis incidence occurred in high-income countries during the 20th century before the development of any vaccine, tests, or antibiotics.[3] Then improvements in socioeconomic development controlled tuberculosis in high-income countries in a way that we have been unable to emulate over recent decades in resource-constrained settings, using mainly biomedical interventions.[3] Findings from several studies have shown that countries' tuberculosis burden rises and falls in line with socioeconomic development, whereas biomedical care has had no detectable effect on tuberculosis burden.[4,5] Thus, so-called tuberculosis-control programmes are actually misnomers. They are, in fact, tuberculosis-treatment programmes, substantially improving health and preventing deaths. But why aren't they eliminating tuberculosis?

Tuberculosis is mainly a social disease, inequitably affecting poor people especially in resource-constrained regions.[6] Not only do poverty-related factors such as poor living conditions and undernutrition increase the likelihood of infection and subsequent progression to active disease but, even when tuberculosis medications are provided free of charge, the associated expenses and lost income can impede care, deepen impoverishment, and increase the risk of adverse outcomes and recurrence.[6,7] This synergy between tuberculosis and poverty transcends economics, as the associated stigma, marginalisation, depression, and despair amplify poverty in its broader sense, increasing associated suffering and hampering tuberculosis elimination.[6] Therefore, unsurprisingly, the quick, partial fix of tests and pills alone are impotent for creating a world free from tuberculosis unless socioeconomic factors are also addressed.

Concordant with increasing interest in the social determinants of health in general, and of tuberculosis in particular, the Sustainable Development Goals and WHO's new End TB Strategy place emphasis on social protection and poverty-alleviation programmes.[8] This new strategy aligns tuberculosis-control policies with global attempts to address HIV and AIDS, maternal and child health, and other public health priorities, which already integrate social protection with biomedical interventions.[3] In the context of tuberculosis, social protection interventions can be tuberculosis-specific, designed exclusively for people living with active tuberculosis disease;[9,10] tuberculosis-inclusive, for which broader interventions include tuberculosis disease in their eligibility criteria; or tuberculosis-sensitive, for which interventions include activities aimed at reducing tuberculosis risk.[11] These complementary approaches might incentivise and enable patients with tuberculosis, and people at risk of developing tuberculosis, to equitably access biomedical care while preventing so-called catastrophic costs,[7] reducing impoverishment, and addressing risk factors for tuberculosis disease.[10]

So how can we tackle the social determinants of tuberculosis sufficiently to support its elimination? One answer might lie with findings from Siroka and colleagues' global ecological analysis,[2] which showed that countries' social protection spending was inversely associated with tuberculosis prevalence, incidence, and mortality (r=0·55). This association was strongest for countries that spent less than 11% of their GDP on social protection and the findings support similar findings from studies in Europe.[12]

Siroka and colleagues' rigorous analysis was adjusted for confounding factors such as wealth (GDP) and HIV, but association cannot prove causation. For example, countries that invest more in social protection might have other characteristics not studied in the present analysis that could partly account for the observed association. Furthermore, these country-specific data could not be used to analyse regional inequalities within countries, which can be profound and important. Ecological studies have inevitable weaknesses and will be questioned, not least because the inadequate investment in tuberculosis control creates substantial

uncertainty about how many people have tuberculosis and die from the disease each year.

The findings from Siroka and colleagues' overdue study[2] delineate the inadequate investment in research assessing social protection interventions for strengthening tuberculosis control, and present an opportunity for strong leadership to ensure that research addressing the social determinants of tuberculosis receives at least similar funding to biomedical research. The findings from their study suggest that existing social protection interventions aiming to reduce poverty have the advantage of also preventing tuberculosis. Future research should determine which forms of social protection interventions are most strongly associated with improvements in tuberculosis burden. These findings would then facilitate the optimisation of such interventions to more efficiently strengthen tuberculosis care, cure, and prevention. Furthermore, when the pioneering work of the International Labour Organization is extended, it will also be possible to analyse how temporal trends in social protection spending might predict changes in tuberculosis burden.

The results of Siroka and colleagues' important study support recent changes in global tuberculosis policy,[8] and show that governments should invest not only in diagnosing, treating, and supporting people living with tuberculosis, but also in fighting poverty through social protection to prevent the disease. Such approaches have the capacity to transform tuberculosis control, support other public health priorities, and ultimately contribute to sustainable development.

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CAE receives grants from the Joint Global Health Trials scheme (Wellcome Trust, UK Medical Research Council, and UK Department for International Development) and The Wellcome Trust. MJS and CAE receive grants from Innovation for Health and Development and the Bill and Melinda Gates Foundation. We declare no competing interests.

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World TB Day 2016—advancing global tuberculosis control efforts

Since WHO declared tuberculosis a global health emergency in 1993,[1] important strides have been made in global tuberculosis control efforts. Tuberculosis-associated mortality has halved and 45 million lives have been saved.[2] Despite these advances, an estimated 9·6 million people developed tuberculosis worldwide in 2014, of whom 1·5 million died. Of the estimated 480 000 cases of multidrug-resistant tuberculosis, three quarters remained undetected and untreated.[2] Tuberculosis is now the leading cause of death worldwide surpassing malaria and HIV.

To reduce this continuing unacceptable burden of tuberculosis, the WHO End TB Strategy was adopted by the World Health Assembly in May 2014.[3] It has