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policy brief

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Accelerating tuberculosis control: Addressing the structural drivers of the disease in South Africa

Summary

Although efforts to address the burden of tuberculosis (TB) have yielded notable progress, the disease remains a major health problem in South Africa and other countries with a high TB burden. In seeking to end the global TB epidemic by 2030, the World Health Organisation (WHO) has expanded efforts to address the disease beyond the biomedical approaches by explicitly highlighting the need to address structural factors closely linked to TB. Drawing on international and national literature, we discuss the burden of TB in South Africa, highlight the impact of structural factors in driving and sustaining the disease burden, and conclude with recommendations for strengthening current policies to address these structural drivers as part of efforts to eliminate TB in the country.

Introduction

Although TB is a preventable – and in most cases a curable – disease, it remains a major public health burden in South Africa that causes significant levels of morbidity and mortality. The decline in both the prevalence and incidence rates of TB, even after the Millennium Declaration and the establishment of the Millennium Development Goals in the year 2000, has been slow. Significant efforts and policies have been directed toward improved diagnostics, a more efficacious vaccine, improved case detection, treatment retention and successful treatment outcomes. However, despite evidence demonstrating the impact of improved social and economic conditions on the burden of TB, relatively little attention has been directed towards the structural and other drivers (including risk behaviours and limited correct knowledge) of TB in South Africa and other high burden countries.

South Africa's response to the TB epidemic

The national response to the TB epidemic in South Africa is guided by the National Strategic Plan (NSP) which for the period 2012–2016 (1) included goals and targets related to TB for the first time. In addition, the 2012–2016 NSP was specifically aimed at addressing the social, economic and behavioural factors driving the HIV and TB epidemics – a poignant inclusion since it is now well established and

accepted that without addressing these structural drivers, the optimisation of current tools and the invention of new ones (in the absence of a protective TB vaccine) will not succeed in controlling the TB epidemic (2 & 3). Furthermore, the acknowledgement in the National Development Plan 2030 (NDP) (4) of poverty as a risk factor for disease provides a much needed framework for the practical and accelerated expansion of efforts to strengthen policy on the structural drivers of TB. This approach in the NDP is also aligned with the WHO's END TB Strategy (5) and the STOP TB Partnership's Global Plan to End TB 2016–2020 (3). The second pillar of the END TB Strategy includes a component addressing social protection, poverty alleviation and actions on other determinants of TB. The Global Plan to End TB also calls for investment in socio-economic actions to reduce the impact of TB on communities. Thus, while significant and notable progress has been made with regard to TB control in South Africa, failure to meet the TB-related targets for the period of the NSP (2012–2016) (1) indicates a need to strengthen and review the policies on TB (including those targeting the structural drivers of TB).

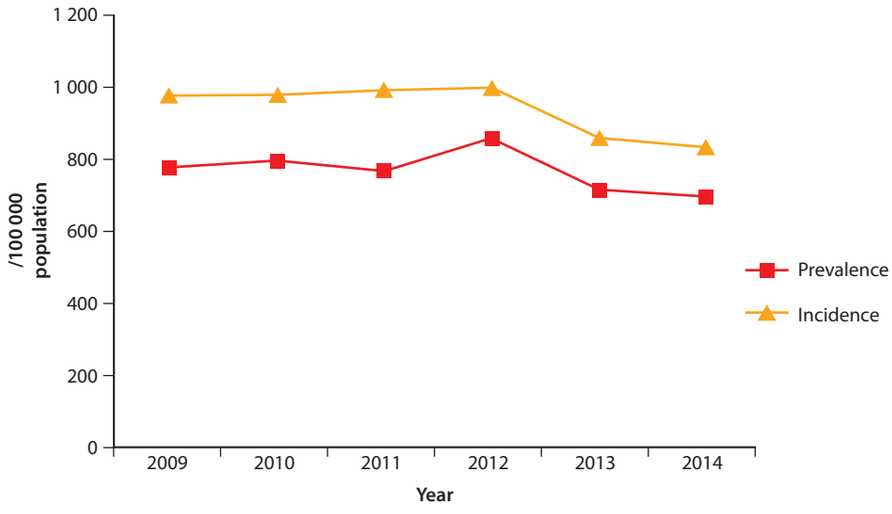
The TB burden in South Africa

South Africa appears in all three of the recently published lists of high TB burden countries: the 30 high TB burden countries, the 30 high HIV/TB burden countries and the 30 high multidrug resistant TB (MDR TB) burden countries (6 & 7). In 2014, there were an estimated 450 000 new TB cases in South Africa, which translates to an incidence rate of 834/100 000 population. A total of 318 193 cases were notified and prevalence was estimated at 696/100 000 population (8). In the same year nearly 96 000 people died from TB, with 75% of these deaths occurring in TB patients co-infected with HIV (8). Both TB incidence and mortality remained unchanged in 2015 (incidence 834/100 000 population and 98 000 TB deaths) (7). Notably, TB is a major cause of death among people in the economically active age groups in South Africa (9). In 2013, TB was the leading cause of mortality among young South Africans, with 10 962 TB deaths among youths aged 15 to 35 years (9). The number of documented laboratory confirmed cases of MDR TB has increased, partly due to improved diagnostics and recording but also due to the increasing direct transmission of resistant strains between individuals. In 2015, there were 19 613 and 1 024 laboratory confirmed cases of MDR TB and extensively drug resistant TB (XDR TB) respectively (7).

Figure 1 shows TB prevalence and incidence estimates in South Africa for the years 2009 to 2014. Although both prevalence and incidence have declined since 2009, the pace of decline has been slow. These slow gains mirror the global trend, with TB incidence estimated to have declined by only 1.5% per annum between 2000 and 2013 (10) – a rate that pushes the reality of eliminating TB far into the future. The reasons for the slow decline in the incidence of TB (10) include the high burden of HIV in the country, an overburdened health system, patient factors that impede early diagnosis and successful treatment outcomes, and weaknesses in addressing the structural factors that increase the risk of acquisition of TB infection and development/progression to active TB disease in many South Africans.

Therefore, in seeking avenues to accelerate the gains against TB, there is a need to bolster efforts to expand TB control beyond the clinical and biomedical sphere (2 & 5 & 11) since it will not be possible to achieve the vision of a world with zero deaths and suffering from TB without addressing the structural drivers of the disease. These drivers are underpinned by poverty and thus mainly affect the poorest of the population, resulting in a large disease burden in this population group. In 2008, the poorest 20% of the South African population accounted for more than a third of the TB burden in the country (12). These factors drive and sustain the TB disease burden by (i) increasing exposure to the causative agent Mycobacterium tuberculosis (*M.tb)*, (ii) accelerating progression from infection to active disease and (iii) impeding access to care, adherence to treatment and retention in care.

Figure 1: TB prevalence and incidence estimates, South Africa 2009–2014



Source: Data derived from global TB reports from 2010 to 2015

Increased exposure to M.tb: The impact of crowding and poor ventilation

M.tb is expelled into the air when an individual with untreated TB breathes, talks, coughs, sneezes and so on. The mycobacteria are inhaled into the lungs, where they are either cleared or contained by the immune system to remain dormant with the concerned individual developing latent tuberculosis infection. The dormant bacilli are re-activated under certain conditions, such as when immunity wanes, and the individual then develops active TB. The risk of exposure to *M.tb* is high in crowded and poorly ventilated settings. Both crowding and poor ventilation are common in many South African township communities. For example, Khayelitsha (one of the largest townships in Cape Town) is home to an estimated 400 000 people, 55% of whom live in informal dwellings (13). Furthermore, many homes in townships across the country are built of corrugated iron or cardboard material and have very small or no windows, thus limiting ventilation.

Crowding and poor ventilation are also experienced in modes of public transport (minibus taxis, buses and trains) used by the majority of South Africans on a daily basis. Andrews, Morrow and Wood (14) found that the transmission of TB infection is effectively sustained by the three main public transport modes (minibus taxis, buses and trains) used by South Africans. The annual risk of infection was the highest among minibus taxi commuters. This is a significant finding, since minibus taxis are one of the most commonly used modes of public transport.

In South Africa, the risk of exposure to and acquisition of *M.tb* are also particularly high in crowded settings because of the high numbers of undiagnosed cases in communities. South Africa is one of the 10 countries accounting for 74% of missed cases (undiagnosed or not reported) globally (15). It is estimated that about 96 000 of all missed cases in 2013 were in South Africa (15). Undetected and untreated TB patients sustain the TB burden, with each infectious case estimated to infect between 11 and 22 people per year (16).

Progression from latent TB infection to active TB: The impact of HIV infection

Since the late 1980s, the TB burden has been driven and exacerbated by the HIV epidemic in the country. HIV infection increases the risk of TB disease from a 5 to 10% lifetime risk to 5 to 15% per year (17) in the absence of antiretroviral therapy and Isoniazid preventive TB treatment. While HIV affects all segments of the population, data has shown that those in the lower socioeconomic bracket are most affected by HIV and are therefore at greater risk of TB (18). In 2012, individuals in households that reported 'not having enough money for basic things like food and clothes' had a higher HIV prevalence than those from households that had 'money for extra things such as holidays and luxury goods' (18).

Delayed case detection: The impact of limited financial resources and stigma

Delays in seeking healthcare for TB means that individuals with TB continue to transmit *M.tb* for long periods before initiating treatment, causing infections in a notable number of other people who are then at risk of developing the disease. A number of structural factors contribute to poor and delayed case detection in South Africa, including lack of money to access healthcare facilities, limited knowledge about TB and stigmatisation of TB (19 & 20). Although TB treatment is free, the poorest individuals incur higher costs for diagnosis (19), including transport costs for the patient and the accompanying individual to get to a healthcare facility.

A Cape Town study evaluating barriers and enablers to early MDR TB diagnosis and treatment initiation found that while some patients knew the symptoms of TB, they did not attribute their own symptoms to TB (20). This suggests incorrect understanding and/or purposeful minimisation or denial of TB symptoms, which in turn could be due to the stigma associated with TB.

Although TB has been part of human existence for a very long time, it is still a disease that is shrouded in stigma – which has been further magnified by the HIV stigma given the high levels of co-infection in South Africa. Stigma can contribute to delayed care seeking (21) and thus increase community transmission of TB. The stigma index survey conducted among people living with HIV in 2014 (22) showed that 36% of the respondents reported having been teased, insulted or sworn at because of their TB status and 41% reporting having been gossiped about because of their TB status. In addition, 27% of this population group reported internal feelings of stigmatisation (22).

Behavioural factors: Alcohol consumption and cigarette smoking

Alcohol use has been shown to be a risk factor for TB. South Africa has one of the highest rates of alcohol consumption, with an estimated average per capita consumption of 11 litres of pure alcohol among adults (15 years and older) for the period 2008 to 2010 (23). The data also show high levels of alcohol use among TB patients (24). Alcohol use has been shown to increase the risk of loss from treatment among patients with MDR TB (25). Furthermore, drinking places can be sources of TB transmission: Munch et al. (26) showed a positive correlation between TB case load and the number of shebeens in an area. Tobacco smoking also increases the risk of TB (both the risk of being infected with *M.tb* and the risk of developing active TB) (27 & 28). With an estimated

17.6% of adults smoking tobacco products (29) in South Africa, smoking is also a significant contributor to the TB burden in the country.

Addressing the structural drivers of TB

In this context, it is encouraging that the NDP seeks to 'progressively improve TB prevention and cure' (2). The plan highlights the critical roles of cross-sector collaborations to ensure that policies impacting the daily lives of South Africans support health. In the case of TB, this requires that policies are also directed at minimising the risk of acquiring TB, supporting access to care and attaining successful outcomes for TB patients. Therefore, the following policy recommendations are made.

Recommendations

1. *Strengthen and increase social protection for TB patients and their families in the short and long term.*
   In poor communities, economic support for patients assists in covering indirect costs such as transport costs to reach healthcare facilities and financial support for the family when the illness is associated with temporary or permanent loss of income. Without social protection, TB can worsen the poverty in families. This inevitably creates a vicious circle where the risk of TB (within the household and the community) can increase further. Providing social support in the form of temporary social grants to patients during TB treatment in South Africa is commendable.

   Of concern, however, is the process to administer the grants to those who need them most. In a study on the economic burden of TB diagnosis and treatment in South Africa, Foster et al. (20) found that a low proportion of TB patients accessed the social grants for which they were eligible. Poor access to grants could be due to a number of factors, including patients not having the relevant documentation (birth certificates and identity documents), clinicians being overloaded and not having time to complete the necessary assessments and documents for the grants, and problems with the grant system itself since the grants are administered together with all other social grants (30). Current processes to reform the grants system (to increase efficiency and accuracy) are commended and a dedicated branch that will deal with TB-related support should be considered in the short term.

   Recognising the context of TB in South Africa, efforts to address the burden should also include measures to support the livelihoods of patients and families in the long term. In rounds 7 and 10 of an analysis of economic support for HIV and TB grants, Ritcher et al. (31) found that with most TB grants, economic support was directed at supporting treatment and adherence only, with only a few grants also providing support 'to lessen the economic burden of the illness on the family.' This was in contrast to HIV grants, where economic and upliftment support was more common and is known to have made a notable difference in the lives of many individuals and families of people living with HIV (31).

2. *Mainstream accurate messages about TB.*
   In a cross-sectional survey of adults ≥15 years, only about 20% knew at least three out of six TB symptoms (32). Limited and/or incorrect knowledge about TB could be partly due to limited communication about TB (in contrast to HIV), messaging that uses language that might not be easily accessible to the general public, and stigma. Sustained communication using simplified key messages could enhance accurate TB knowledge and encourage early presentation of suspects, and also impact on behaviours that drive transmission and poor treatment outcomes. Communication should also directly target behaviours that increase the risk of developing TB, including alcohol use and smoking which are very prevalent in South Africa. Other critical aspects to be targeted include actions to increase ventilation in homes and public spaces and good cough etiquette.

3. *Address TB stigma.*
   The levels of stigma related to all forms of TB (with and without HIV) are unknown in South Africa. The existing data is only on HIV-infected individuals, who are a key population group at greater risk of TB and stigmatisation. There is, however, a need to determine the level and nature of TB stigma even among HIV-negative individuals and to develop stigma reduction messages as part of a sustained communication campaign to address stigma in both population groups.

4. *Initiate and strengthen inter- and intra-sectoral partnerships to implement cross-cutting interventions that impact TB.*
   Other measures to address the risk of infection and transmission of TB in households and workplaces and at public transport settings fall in the ambit of different departments and require medium- to long-term interdepartmental collaborations to develop relevant policies, strategies and guidelines. These include (i) accelerating the pace of providing quality housing for all South Africans, with the houses adhering to regulated standards for ventilation and airflow, and

(ii) improving ventilation in public transport. This requires innovations that are compliant with international and national vehicle manufacturing and/or modification standards.

The eradication of TB in South Africa requires a paradigm shift, as advocated in the Global Plan to End TB 2016–2020 (2), and thus extensive efforts within and beyond the health sector because medical interventions alone will not succeed. The excellent national and international frameworks pertaining to TB and health in general present a poignant opportunity for addressing the structural drivers of TB. Therefore, despite the formidable challenges posed by TB in South Africa, swift efforts to address the structural issues can drastically reduce the TB burden.

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