TUBERCULOSIS AND DRUG RESISTANT TUBERCULOSIS IN SOUTH AFRICA

MARK DAKU

SUMMARY

• The emergence of drug-resistant tuberculosis (TB) in South Africa represents a unique policy challenge primarily because of the HIV/AIDS epidemic.

• Current TB management needs strengthening to deal with drug-resistant TB while, at the same time, new management approaches should be pursued.

• The implementation of TB programs should be undertaken by provincial governments in South Africa.

South Africa is currently burdened with one of the world's worst Tuberculosis (TB) epidemics, despite its relative wealth, strong health care system, and commitment to combating the disease. Within a population of 50 million, approximately 400,000 new cases are reported each year (World Health Organization (WHO), 2011).

TB is not a virus, but rather a bacterium that reproduces slowly in the body. It is an air-borne disease and is most often spread when an infected person coughs and the bacterium is inhaled by another. Most people who are exposed to TB are able to fight off the infection, although TB can survive in the body for many years after the initial infection has been brought under control by the body's immune system. In some cases, the latent TB becomes active again, an occurrence that is more common in individuals with compromised immune systems. When active, TB is extremely contagious. TB induces frequent coughing in an infected individual, whose sputum will contain active TB. TB treatment is available and relatively inexpensive; however combating the disease is still a major problem for South Africa and much of the rest of Sub-Saharan Africa.

South Africa has made considerable efforts to combat its TB epidemic, as

ABOUT THE AUTHOR

Mark Daku

Mark is a doctoral student at the Institute for Health and Social Policy and comes to an interest in global health policy from a background in computer programming and political theory. His current research focuses on comparative HIV/AIDS policies, automated content analysis of the media, and the role of leadership in shaping health policies.

evidenced by the attention devoted to TB in the National Strategic Plans (NSP) on HIV/AIDS, sexually transmitted infections (STIs) and TB (South African Ministry of Health, 2000, 2007). In fact, the NSP currently being developed has been criticized for devoting too much attention to TB at the expense of HIV/AIDS and other STIs.

Complicating the response to TB, however, is that in addition to the large TB problem, the country is also heavily burdened with Multi Drug-Resistant TB (MDR-TB) and Extensively Drug-Resistant TB (XDR-TB)[1]. In 2010, approximately 1.8 percent of all new TB infections were multi-drug resistant. This number jumps to 6.7 percent for those cases of TB that were being re-treated (World Health Organization, 2011). While there are no official national numbers on XDR-TB available, 511 cases were found to be XDR-TB in 2010 in South Africa, the highest absolute number of infections recorded globally to date.

SOUTH AFRICA'S UNIQUE VULNERABILITY TO DRUG-RESISTANT TUBERCULOSIS

Mortality rates of more than 70 percent have been observed in MDR/XDR-TB outbreaks, so an epidemic in any country would be devastating if it were not adequately controlled. However, there are several reasons why South Africa is particularly vulnerable to a widespread drug-resistant TB epidemic (Goldman, Plumley, and Laughon, 2007; Raviglione, Snider Jr, & Kochi, 1995). South Africa has over 4.4 million people living in urban informal settlements (Misselhorn, 2010). As TB is spread easily in unventilated, unsanitary or overcrowded spaces, nearly 10 percent of the population is at an elevated risk of TB infection (SANAC, 2011).

More importantly, South Africa's large HIV-positive population of approximately 5.6 million people presents an acute risk. Globally, TB is the most common opportunistic infection associated with HIV/AIDS, and it is also the leading cause of death among HIV-infected patients in Sub-Saharan Africa (Chaisson and Martinson, 2008). HIV-positive individuals also have the shortest incubation period for TB, thus outbreaks among this

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1   MDR-TB is defined as TB which is resistant to, at a minimum, isoniazid and rifampin, while XDR-TB is a subset of MDR-TB which is also resistant to "any fluoroquinolone and at least one of three injectable second-line drugs (i.e., amikacin, kanamycin, or capreomycin)" 11/14/2011 2:36:00 PM.

group may be seen as "canaries in the mine shaft' for a larger epidemic"[2] (Basu and Galvani, 2008; Wise, 2006).

At least one major outbreak has already been seen in South Africa. The small town of Tugela Ferry in KwaZulu-Natal, has the unfortunate distinction of being the site of the worst outbreak of XDR-TB seen yet. Fifty-three cases were identified in 2005, representing approximately 25 percent of all global cases at the time. Of those who were infected, 44 were co-infected with HIV. The prevention, treatment, and control of MDR/XDR-TB is justifiably a major public health issue for the South African government.

SOUTH AFRICA'S RESPONSE: THE TYPICAL SEQUENCE OF IDENTIFICATION OF DRUG-RESISTANT TB

The typical sequence in the identification of drug-resistant TB in South Africa is described as follows:

1 Patients are given treatment that presents as ineffective;

2 Patients are given a new drug, which is often also ineffective;

3 Patients are then given drug susceptibility testing, which takes over a month to receive the results; and,

4 Patients are then sent to (usually urban) hospitals for group quarantine (Basu and Galvani 2008).

All of this assumes that the patient survives the infection for the months of ineffective treatment, which, for patients who are HIV positive, is often an unlikely prospect. It becomes clear that poor diagnostic tools and the length of time it takes to determine which variant of TB an individual is carrying are major problems. But it is also problematic that individuals are being quarantined during a point in the infection where they are not particularly infectious.

Quarantine and forced isolation are not the most desirable options for patients. Quarantine can last months, or in the cases of drug-resistant TB, years, while patients have legitimate concerns about the welfare of their families, and the risk of becoming unemployed. Not surprisingly there have been several escape attempts by patients from quarantine, which have

2   An expression used to refer to a thing or person that serves as an early warning system.

resulted in legal challenges and court-ordered returns to isolation.

Quarantine is not the best solution. It overburdens health care systems, particularly when there is a serious shortage of space in specialized hospitals and quick and effective service delivery to other patients is jeopardized (TAC, 2011). The recent spike in cases of MDR-TB and XDR-TB suggests that national and provincial strategies must be reassessed. Responding to drug-resistant TB requires a new approach from typical responses to TB. Although MDR-TB and XDR-TB programs face similar problems as normal TB programs, simply strengthening existing TB programs is not enough to control a drug-resistant outbreak in South Africa. . First, both MDR-TB and XDR-TB require treatment that is "less effective, more toxic and costlier" than first-line treatment (Wise, 2006). In addition, second-line treatment is lengthier and requires more time in hospital (TAC, 2011). This places additional burdens on the health care system and patients: removal from family and support networks is longer, and the increased side effects may be overbearing.

IMPROVING SOUTH AFRICA'S RESPONSE

Effective policy responses to South Africa's TB problems must continue to address the existent TB epidemic, but also must make efforts to prevent the emergence of other drug-resistant strains. Policy makers should take note that drug-resistant cases of TB originate in three main ways:

1 Resistance is often acquired when patients do not finish their entire drug regimen. This is a common concern, as patients often feel better long before their drug regimen is complete.

2 Even in cases where patients complete their regimen, if the treatment is improperly applied, patients can find themselves infected with strains of TB that exhibit amplified resistance.

3 Drug-resistant TB can be spread to others the same way as regular TB is spread, a process known as 'primary infection'.

Ensuring that individuals complete their drug regimens has been the focus of the WHO's Directly Observed Therapy Short Course (DOTS) program for TB management since its inception. The NSP that is currently under development commits South Africa to pursuing an expansion of DOTS

(SANAC, 2011; WHO, 2006, 2010). While dollar amounts are not yet available, the NSP places improving TB screening and TB vaccine research within its first pillar of research focus (SANAC, 2011). The focus on improved screening may also contribute to better outcomes, but data on this will not be available for some time.

What is more promising is the prospect of decentralizing the response. Releasing those who are infected from quarantine and back into public once they are past the highly infectious phase may increase adherence to medication (Basu and Galvani, 2008). Permitting individuals—who would otherwise be sent to urban centres for months or years of quarantine— to remain under the care of their family in their own community should create a more positive environment for individuals requiring treatment. This would likely increase adherence to drug regimens and may have the effect of an increase of individuals getting tested earlier, as the threat of long-term isolation is removed. It is also expected that it would reduce primary infection of various strains of drug-resistant TB, as the time spent in enclosed spaces with other TB patients would be reduced.

The South African government is currently developing a decentralized strategy for MDR-TB management based on the "promising results from pilots in Khayelitsha and Tugela Ferry" (SANAC, 2011). These pilot projects are contributing to the formation of a national framework that deinstitutionalizes and decentralizes the treatment of MDR-TB to the levels of the community and the clinic (SANAC, 2011). Such an approach has been lauded by civil society and has the potential to be highly effective in controlling future outbreaks (TAC, 2011).

A national framework for combatting drug-resistant TB through decentralization and deinstitutionalization is promising. Decentralization of the TB response is designed to give local practitioners and care providers the power and the flexibility to adapt to local contextual realities. In the case of South Africa, it is clear that the federal government has made combating TB a priority. It is also worth noting that the country's federal system gives significant power to the provinces when it comes to implementation of federal priorities. The TB epidemic in South Africa varies region by region, and so too does the origin and nature of the outbreaks of drug-resistant TB. The province of KwaZulu-Natal, for instance, has one of the highest rates of TB in the world (1,054 per 100,000), and has the highest number of

drug-resistant cases in South Africa (Office of the Premier, 2007). Variation in provincial responses becomes increasingly relevant as imbalances grow both in terms of infection rates and in the quality of health care available among provinces. Currently, the support demonstrated by the national government coupled with the autonomy given to the provinces in TB-related health policy implementation show promising signs for curbing infection rates and hopefully the eventual eradication of TB in South Africa.

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