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LIMITATIONS ON HUMAN RIGHTS IN THE CONTEXT OF DRUG-RESISTANT TUBERCULOSIS: A REPLY TO BOGGIO ET AL.

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ABSTRACT

Recent attention to multidrug-resistant and extensively drug-resistant tuberculosis (MDR- and XDR-TB) has increased discussion and debate over the extent to which limitations to human rights can be justified in the name of public health. In their recent article “Limitations on human rights: Are they justifiable to reduce the burden of TB in the era of MDR- and XDR-TB?” Andrea Boggio et al. argue that involuntary treatment and other compulsory measures for patients with tuberculosis (TB) can be justified as a “last resort” under international human rights law, particularly the Siracusa Principles. Although there is little international disagreement with this position in theory, in practice TB policies that limit individual freedoms and restrict rights are not always determined on an individual basis or as a “last resort.” Particularly in the case of drug-resistant TB, some countries have adopted rights-limiting measures before offering appropriate and proven programmatic interventions that respect human rights. For example, the implementation of compulsory isolation in South Africa, which is unnecessary from a scientific standpoint and dangerous from a programmatic perspective, fails to meet the protections envisioned under human rights law. By contrast, programs in Lesotho and elsewhere have demonstrated that community-based treatment models that respect rights can provide clinically effective and cost-effective care. For this reason, we argue that the “choice” presented by Boggio et al. between public health goals and human rights in the case of drug-resistant TB is largely a false one. Although there may indeed be rare cases in which restrictions on rights are necessary, greater emphasis must be put on ensuring access to effective, sustainable, and rights-respecting community-based treatment when responding to MDR- and XDR-TB.

INTRODUCTION

Concern over drug-resistant tuberculosis is justifiably increasing in many parts of the world. The rise in the number of cases of multidrug-resistant tuberculosis (MDR-TB) and the growing identification of extensively drug-resistant tuberculosis (XDR-TB) in recent years have potentially devastating public health consequences, particularly when coupled with HIV/AIDS. MDR-TB, caused by TB strains resistant to two of the four key first-line anti-TB drugs, isoniazid and rifampin, is estimated to infect at least 500,000 additional people worldwide annually.¹ XDR-TB — a form of MDR-TB that is also resistant to fluoroquinolones and at least one of the second-line injectable anti-TB drugs — has been identified in all regions of the world and among individuals never previously treated for TB.²

The difficult treatment options, high reported mortality, and evidence of primary transmission of drug-resistant TB have led to widespread fear, forcing governments to act in response to sensationalistic press

and to rely on incomplete scientific understanding. Historically, in times of epidemic disease, these elements — fear, ignorance, and infectious disease — have often led to the imposition of blunt and drastic measures, including quarantine and isolation, as government leaders have championed public health over liberty.³ However, although quarantine or isolation of those who are infected with a deadly, contagious disease can be a legitimate public health approach under certain circumstances, the efficacy of these strategies is often limited. Treatment approaches that are respectful of human rights and that the World Health Organization (WHO) has deemed the most effective are currently given short shrift by some countries when choosing a course of action against drug-resistant TB.⁴ Arguably, in many cases the appearance of action is prioritized over actual impact.⁵

In their recent *Health and Human Rights* article Andrea Boggio et al., like others previously, argue that involuntary detention may legitimately be used in a limited number of cases when patients infected with drug-resistant strains of TB refuse treatment; such an argument is in accordance with the Siracusa Principles on the Limitation and Derogation of Provisions in the International Covenant on Civil and Political Rights.⁶ In theory, few would disagree. In practice, however, some countries have invoked sweeping rights-limiting policies that affect TB patients who have not been offered the global standard of care. Such policies — for example, adopted by some provinces in South Africa — need to be assessed carefully to determine whether they in fact pass muster under international law.

When it comes to restrictions on human rights in the name of public health, the details matter enormously. Moreover, the very existence of less-restrictive, proven, and internationally accepted treatment delivery alternatives leads to a more fundamental, and perhaps controversial, question not addressed by Boggio et al.: When should a tuberculosis program be able to invoke rights-limiting measures as a “last resort” in order to protect the public good? Drawing from the experience of community-based treatment of MDR- and XDR-TB in Lesotho, we argue that treatment approaches that involve neither coercion nor detention can be very successful in curing patients in addition to being less costly to implement and administer.⁷

REQUIREMENTS FOR RIGHTS-LIMITING MEASURES

Boggio et al. examine restrictions on human rights in the face of drug-resistant TB in relation to criteria laid out by the Siracusa Principles, a non-binding document adopted by the UN Economic and Social Council in 1984. The Siracusa Principles are certainly a well-recognized source for examining the justification of rights-limiting measures. The Human Rights Committee, the expert body charged with examining state compliance with the International Covenant on Civil and Political Rights, has since issued a General Comment on derogations in states of emergency (General Comment 29) and another on freedom of movement (General Comment 27), both of which support and further explicate the Siracusa Principles.⁸

The Siracusa Principles and the two general comments state that restrictions on human rights in the name of public health or public emergency must meet standards of legality, evidence-based necessity, proportionality, and gradualism. The Siracusa Principles specifically state that restrictions must, at a minimum, be:

- provided for and carried out in accordance with the law;
- directed toward a legitimate objective of general interest;
- strictly necessary in a democratic society to achieve the objective;
- the least intrusive and restrictive available to reach the objective;
- based on scientific evidence and neither arbitrary nor discriminatory in application; and
- of limited duration, respectful of human dignity, and subject to review.⁹

Restrictions on rights in the case of public emergency must be subjected to a very high degree of scrutiny. The state of emergency must be publicly proclaimed and requires a threat “to the existence of the nation,” defined as affecting “the whole of the population.” In contrast, restrictions for public health threats can be applied when there is a “serious threat to the health of the population or individual members of the population.”¹⁰ However, in both cases, any emergency measures restricting rights must be “limited to the extent strictly required by the exigencies of the

situation,” and restrictions stemming from public health threats will be more limited than those allowed during a public emergency.¹¹ In either case, the burden of justifying rights limitations lies with the state; the Siracusa Principles also state that “[d]ue regard shall be had to the international health regulations of the World Health Organization.”¹²

WHY SOME NATIONAL TB POLICIES FAIL THE SIRACUSA TEST: THE CASE OF SOUTH AFRICA

The WHO has estimated that there were 14,034 MDR-TB cases in South Africa in 2006, accounting for 2.6% of all TB cases in the country.¹³ The 2004–2007 routine laboratory data from South Africa (non-nationally representative) reported 996 XDR-TB cases, equivalent to 5.7% of all MDR-TB cases tested.¹⁴ A 2006 study of TB prevalence in the South African province of KwaZulu-Natal found that 33% of patients presenting with signs and symptoms of tuberculosis had active culture-positive TB; of these, 39% were MDR-TB and 6% were XDR-TB positive.¹⁵ HIV is also highly prevalent in the country: 5.4 million adults were estimated to be living with HIV in South Africa in 2007.¹⁶ Compounded, the two diseases have the potential to be extraordinarily deadly. In one instance in Tugela Ferry, a town in KwaZulu-Natal, an XDR-TB outbreak in HIV-positive patients killed 52 of 53 people infected.¹⁷

Under South African law, authorities may detain an individual suffering from an infectious disease until the disease ceases to present a public health risk; draft government policy guidelines call for the isolation of all MDR- and XDR-TB patients in a specialist facility for a minimum of six months.¹⁸ This authority has been used to isolate individuals with drug-resistant TB for as long as two years, often in conditions closely resembling prisons.¹⁹ In other locations, XDR-TB patients are discharged after six months to “make room for new patients.”²⁰ In both cases, no assessment of infectiousness is made, and throughout their confinement, most patients do not have access to many second-line drugs, resulting in almost universal mortality.²¹ In March 2009, the AIDS Law Project reported that approximately 1,700 people, including children, were then detained in TB isolation facilities, many of them in substandard conditions that violated South African constitutional rights and national health legislation.²²

Paradoxically, while patients are being diagnosed with drug-resistant tuberculosis (a process that can take many weeks, during which time the patient is in the community and infectious), they are typically not isolated immediately. This inconsistency is largely a consequence of the long waiting lists at the facilities, often with more than 70 prospective patients waiting for second-line inpatient therapy.²³

Given this state of affairs and the fact that patients are more likely to face death than discharge, even those in favor of isolation for drug-resistant patients acknowledge that convincing patients of the necessity of isolation is a tall order.²⁴ Patients forcibly isolated in South African facilities miss their families and fear for their families’ welfare, since they can no longer provide for them. To add insult to injury, until February 2009 patients in isolation routinely had their social assistance grants terminated for various reasons, even though these grants often supported multiple family members.²⁵ Not surprisingly, patients have repeatedly attempted to escape confinement.²⁶

Does the South African approach to drug-resistant TB treatment pass the test set out in international law, as laid out in the Siracusa Principles? We don’t think so.

First, with respect to legality, the substantive and procedural safeguards prescribed as necessary by the Siracusa Principles for such rights-limiting measures are lacking. Although the government regulation creating the terms of involuntary confinement very generally describes the circumstances under which a “medical officer” may order involuntary confinement, routine procedural protections to allow detained individuals legal representation, to challenge their detention in the courts at regular intervals, and to ensure that the measures are carried out safely and humanely, are omitted.²⁷ Health care workers are in the position of making ad hoc decisions on patient isolation without procedural or legal guidance.²⁸ Some detainees have gone to court to mount challenges to their detention as inconsistent with the rights granted by the South African Constitution, but such challenges have proven so time-consuming as to be ineffective (two of an original four patients in one such suit have died pending a final outcome).²⁹ No rapid review procedure has been put in place, and the burden of challenging the detention falls on the patient. International law requires that the review of

detention should be automatic, and the burden of proof in each hearing should be on the authorities to justify the need for continuing detention.³⁰ TB-related isolation provisions instituted in Europe have been criticized for failure to comply with human rights requirements of due process.³¹ Current isolation of patients infected with drug-resistant tuberculosis in South Africa deserves similar criticism.

Second, from the perspective of evidence-based necessity, as Boggio et al. note, limitations are only permissible if strictly necessary to achieve a given objective.³² Ambulatory and community-based treatment models for MDR- and XDR-TB have been successfully implemented in a number of settings — ranging from Lesotho to Latvia, Estonia, Georgia, Peru, the Philippines, Nepal, and the Russian Federation — without having to resort to extraordinary measures that infringe on a patient's human rights.³³ Since the patients detained in South Africa are not generally refusing treatment and since ambulatory or community-based treatment programs provide a viable alternative to wholesale forced isolation, this forced isolation is not strictly necessary to achieve public health goals.

Third, health officials have deemed the design and implementation of the South African program counter-productive to public health imperatives on a number of levels. The head of the nongovernmental organization Médecins Sans Frontières (MSF) in South Africa, Eric Goemaere, has deemed isolation generally to be “not effective and . . . unacceptable for patients.”³⁴ Not only do public health experts contend that incarcerating the sick discourages diagnosis, but the current system creates the potential for widespread infection prior to isolation since determining an individual's drug-resistant TB diagnosis can take up to eight weeks (during which time no treatment measures are undertaken) and the subsequent wait for an isolation ward bed can be four to six additional weeks.³⁵ Public health experts note that holding MDR- and XDR-TB patients in overcrowded hospitals with inadequate ventilation increases the risk of nosocomial disease transmission and cross-infection.³⁶ Since only patients who enter the public health system face the risk of incarceration, those who turn to private sector providers for TB care are not placed in isolation but are instead treated at home. This

is a discriminatory and arbitrary application of the restrictive measures, since the ability to pay for health care is not a rational basis for deciding who should be deprived of liberty and who should not.

Last, and perhaps most importantly, the South African approach does not meet the requirements of proportionality and gradualism. Although protecting the public from drug-resistant TB is clearly a legitimate and important objective, freedom of movement is also a fundamental individual right. Reliance on compulsory detention, when less intrusive and less restrictive measures have proven feasible and effective, is not consistent with human rights principles.

The Siracusa Principles require countries to pay close attention to WHO regulations; a close look at these regulations reveals that the actions taken by South Africa are neither required nor strictly recommended by the WHO. Although the WHO recommends that patients with XDR-TB be isolated from other patients and individuals at risk until no longer infectious, this recommendation does not mean that XDR-TB patients should be incarcerated.³⁷ Options exist for patients to be kept at home, with proper infection control measures in place. In fact, the WHO recognizes that managing drug-resistant TB must be balanced with the patient's rights and dignity. Guided by international human rights law and the Siracusa Principles, the WHO states that forcibly isolating people with drug-resistant TB must be “used only as the last possible resort when all other means have failed, and only as a temporary measure.” Forced isolation must also only occur under transparent, accountable, evidence-based conditions in which patients are provided with high-quality care, are treated with respect, and are given adequate information on the decision and their rights and responsibilities. Indeed, when isolation is found to be necessary on a case-specific basis, it should only be implemented on a clinically necessary basis and accompanied by patient-centered steps.³⁸

The 2008 WHO guidelines for drug-resistant TB urge national TB control programs to adopt and support community-based care in national plans, as this can enable outpatient treatment of drug-resistant TB, reducing hospital costs and freeing hospital beds for those who require inpatient care.³⁹

The WHO has noted that “[a]lthough early in the history of [drug-resistant] TB treatment, strict hospitalization of patients was considered necessary, community-based care provided by trained lay and community health workers can achieve comparable results [to strict hospitalization] and, in theory, may result in decreased nosocomial spread of the disease.”⁴⁰ A recent article by Sanjay Basu et al. in the *Proceedings of the National Academy of Sciences* concurs, stating that “under the public health conditions of many South African communities . . . [i]ntensified community-based [XDR-TB] case finding and therapy appears critical to curtailing transmission.”⁴¹

ALTERNATIVES TO RIGHTS-LIMITING MEASURES: THE EXAMPLE OF LESOTHO

The effectiveness of community-based models of MDR-TB and XDR-TB treatment has been demonstrated in projects pioneered more than ten years ago in Peru, the Philippines, and Siberia.⁴² Most recently, Lesotho has embarked on a similar effort; this effort provides a useful counterpoint to South Africa’s approach.

Lesotho developed a model of community-based drug-resistant TB treatment under particularly adverse epidemiologic and structural circumstances. As in South Africa, drug-resistant TB and HIV are omnipresent in Lesotho.⁴³ Lesotho has the fourth-highest TB rate in the world, with an adult HIV prevalence rate of approximately 25% and a life expectancy of less than 35 years.⁴⁴ In some parts of the country, close to 90% of individuals with TB are co-infected with HIV.⁴⁵ Circular migration to South Africa for work, particularly in the mining industry, has likely contributed to the spread of drug-resistant TB in Lesotho. Between 1992 and 1999, the rate of TB infection in the population doubled, and the number of patients more than doubled.⁴⁶ The WHO reports that 1.5% of the 14,529 people in the country with TB have MDR-TB, although other sources have estimated this figure as high as 10%.⁴⁷ In 2008, the first case of XDR-TB was officially documented in Lesotho.⁴⁸

Yet, despite the bleak picture painted by these numbers, drug-resistant TB treatment in the community using outreach workers has had promising results

in terms of effectiveness, affordability, and sustainability.⁴⁹ Since 1991, the government of Lesotho has been providing free treatment for TB across the country by means of a DOTS (directly observed treatment, short-course) strategy organized around home visits and educational meetings.⁵⁰ Partners In Health (PIH) began working in Lesotho in 2006 at the invitation of the Lesotho government, based on PIH’s experience in providing clinical support, health worker training, and medication for TB and HIV/AIDS treatment in rural, hard-to-reach areas, and on PIH’s particular knowledge of drug-resistant TB. In 2007, responding to increasing numbers of MDR-TB cases and high HIV/TB co-infection, PIH launched Lesotho’s first treatment program for MDR-TB.⁵¹

The Foundation for Innovative New Diagnostics, in partnership with PIH, refurbished the national TB laboratory. Meanwhile, PIH converted a former leprosy clinic in Lesotho’s capital into a new MDR-TB hospital, offering round-the-clock care to critically ill MDR-TB and MDR-TB/HIV patients.⁵² However, treatment is provided primarily at the community level by paid, trained community health workers who visit patient homes twice daily to provide medication, support, counseling of family members, and accompaniment of very ill patients to hospitals. This is coupled with the training of “expert patients” who act as role models for the success of community-based MDR-TB programs.⁵³ In this model, hospitalization is used only for patients who require immediate, acute clinical care, and hospitalization is followed by discharge upon improvement or by clinical visits in the capital until patients have been stabilized and can return to treatment within their own community. PIH now offers community-based MDR-TB treatment to individuals all over the country, including rural mountain areas.⁵⁴

By July 2008, PIH Lesotho was treating 155 MDR-TB patients throughout the country, a number projected to grow to 450 in 2009.⁵⁵ Early results indicate the success of this program and its underlying model. The program boasts high patient and staff retention: in September 2008, treatment adherence was reported to be close to 100%.⁵⁶ The community treatment approach has allowed many individuals to stay with

their families and remain productive members of the community.⁵⁷

Researchers in Lesotho have concluded that “[b]y consciously enabling, educating, and supporting patients, public health officials can assist individuals in choosing to remain compliant, thus respecting both the individuals’ interest in self-determination and the community’s interest in protecting public health.”⁵⁸ Results in Peru, the Philippines, Russia, and elsewhere have been similar, as long as treatment adherence support is provided to patients with drug-resistant TB to allow them to make it through the long and difficult treatment.⁵⁹ In a New York City outbreak of MDR-TB in the early 1990s, public health officials similarly determined that the few “non-adherent” MDR-TB outpatients could be offered monetary incentives, transportation vouchers, and housing for the homeless to enable them to complete treatment, resulting in less than half of non-adherent patients being detained.⁶⁰

CONCLUSION

The South African Medical Research Council has argued that long-term isolation without adequate safeguards could violate South African constitutional rights, including the right to dignity and the right to freedom of movement.⁶¹ In March 2009, the AIDS Law Project, in a report on TB isolation in South Africa, concluded that community-based treatment programs needed to be expanded alongside reform of the isolation system.⁶² Although the South African health department’s head of tuberculosis noted in 2007 that forced isolation was a last resort, greater attention and resources need to be provided to ensure that community-based treatment is a viable first resort.⁶³ Two pilot programs in the country have seen community health workers dispensing daily medication to MDR- and XDR-TB patients in a decentralized manner.⁶⁴ One of these pilot programs, in KwaZulu Natal, treats 13 XDR- and 24 MDR-TB patients in their homes; some of these patients had previously spent many months in hospital isolation and were grateful to be able to remain at home. The study is promising; it has so far shown very low rates of transmission.⁶⁵ Furthermore, the costs of community-based treatment are much lower than inpatient treatment in isolation hospitals. In this treatment trial, the cost for treating one group of patients was \$10,000/month compared with the

approximately \$300,000/month that the same group would have cost in a Durban isolation facility.⁶⁶

Given the early indications of success of Lesotho’s community-based treatment program and the documented evidence of successful community-based models in other urban and rural settings, any assumption that isolation and other compulsory measures are necessary and effective for the treatment of drug-resistant TB must be reconsidered. Theories of public health and human rights must be informed by practice. Boggio et al. fairly describe the relationship of rights and health in theory and have attempted to provide a framework for any limitations of human rights. However, a narrow reading of their argument, coupled with their lack of explicit reference to what constitutes a “last resort,” risks absolving nations and health programs of their responsibility to offer programmatic solutions that uphold the rights of patients and affected communities before turning to more coercive measures.

Successful MDR- and XDR-TB treatment in Lesotho and elsewhere indicates that the bar for limiting a patient’s human rights must be set very high. Indeed, the so-called opposition between public health and human rights proves to be a red herring: public health goals of treating and preventing the transmission of TB and the human rights interests of individuals can be reconciled in most cases of drug-resistant TB. Only in exceptional cases, where patients resist treatment after all feasible programmatic solutions have been exhausted, should detention — with proper checks, balances, and safeguards — be considered.

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29. Section 35(2) of the South African Constitution provides minimal requirements for persons detained without their consent and grants the right to challenge his or her detention. . Although the National Department of Health bears the responsibility of informing the patient of his or her rights and providing a legal practitioner at state expense, in reality patients who have challenged their isolation have not been adequately so provided. AIDS Law Project (see note 18), p. 28; “TB ‘detention’ case awaits decision,” *The Cape Argus* (June 4, 2008), p. 3.

30. International Covenant on Civil and Political Rights, Article 4 (see note 11). African Charter on Human and Peoples' Rights, OAU Doc. No. CAB/LEG/67/3 rev. 5 (1981), reprinted in *International Legal Materials* 21 (1982), p. 58. Available at <http://www1.umn.edu/humanrts/instree/z1afchar.htm>.
31. British detention provisions have been criticized on the grounds that they may be exercised by a justice of the police acting *ex parte*, that the power to detain may not be time limited, that the detention may result in an unnecessary deprivation of liberty, and that these provisions may breach the right to private and family life. A. Harris and R. Martin, "The exercise of public health powers in an era of human rights: The particular problems of tuberculosis," *Public Health* 188 (2004), pp. 313–322. Furthermore, the laws designed to enable the detention of individuals with tuberculosis who pose a threat to public health (in that instance in England and Wales) may not hold up upon scrutiny under the European Convention on Human Rights because the duration of detention was arbitrary, those ordered to be confined did not have adequate time to prepare a defense, detainees had no automatic right to legal representation, and detainees had no automatic right to appeal under the statute. Coker (see note 3), p. 266.
32. Boggio et al. (see note 6), pp. 3–4.
33. S. Keshavjee, I. Gelmanova, A. Pasechnikov et al., "Treating multi-drug resistant tuberculosis in Tomsk, Russia: Developing programs that address the linkage between poverty and disease," *Annals of the New York Academy of Sciences* (2007a); S. Keshavjee, K. Seung, H. Satti et al., "Building capacity for multidrug-resistant tuberculosis treatment: Health systems strengthening in Lesotho," *Innovations* 2/4 (2007b), pp. 87–106; V. Leimane, V. Riekstina, T. H. Holtz et al., "Clinical outcome of individualised treatment of multidrug-resistant tuberculosis in Latvia: A retrospective cohort study," *Lancet* 365/9456 (2005), pp. 318–326; S. S. Shin, A. D. Pasechnikov, I. Y. Gelmanova et al., "Treatment outcomes in an integrated civilian and prison MDR-TB treatment program in Russia," *International Journal of Tuberculosis and Lung Disease* 10/4 (2006), pp. 402–408; C. D. Mitnick, S. S. Shin, K. J. Seung et al., "Comprehensive treatment of extensively drug-resistant tuberculosis," *New England Journal of Medicine* 359/6 (2008), pp. 563–574; S. Keshavjee, I. Y. Gelmanova, P. E. Farmer et al., "Treatment of extensively drug-resistant tuberculosis in Tomsk, Russia: A retrospective cohort study," *Lancet* 372/9647 (2008), pp. 1403–1409.
34. "South Africa: XDR-TB: Is forced isolation the cure?" (see note 18).
35. Dugger (see note 20); "South Africa: XDR-TB: Is forced isolation the cure?" (see note 18); R. Koenig, "In South Africa, XDR TB and HIV prove a deadly combination," *Science* 319 (2008), pp. 894–897.
36. Dugger (see note 20); S. Basu, G. H. Friedland, J. Medlock et al., "Averting epidemics of extensively drug-resistant tuberculosis," *Proceedings of the National Academy of Sciences* 106/18 (2009), pp. 7672–7677; I. Y. Gelmanova, S. Keshavjee, V. T. Golubchikova et al., "Barriers to successful tuberculosis treatment in Tomsk, Russia; non-adherence, default, and the acquisition of multi-drug resistance," *Bulletin of the World Health Organization* 85/9 (2007), pp. 703–711.
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39. *Ibid.*, pp. xv, 120, and 126.
40. *Ibid.*, p. 121.
41. Basu et al. (see note 36), p. 1.
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54. Partners in Health (see note 44); Keshavjee et al. (2007b, see note 33).
55. Richards (see note 53).
56. Telephone interview of Salmaan Keshavjee by Françoise Girard (September 23, 2008).
57. Richards (see note 53).
58. George (see note 46), p. 97.
59. Keshavjee et al. (2007a, see note 33).
60. Andrews et al. (see note 21), p. 771. For a discussion of the laws in effect related to tuberculosis control in New York during this period and the requirements for such laws under American constitutional law, see R. G. Reilly, "Combating the tuberculosis epidemic: The legality of coercive treatment measures," *Columbia Journal of Law and Social Problems* 27 (1993–1994), pp. 101–150.
61. Baleta (see note 26), p. 771.
62. AIDS Law Project (see note 18), p. 2.
63. Baleta (see note 26), p. 771. Some organizations, such as Médecins Sans Frontières, have instead called for decentralization of drug-resistant TB programs in South Africa, through leaving patients in their home environments or providing isolation close to patients' homes. "South Africa: XDR-TB: Is forced isolation the cure?" (see note 18).
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