Chapter 10
Access to Effective Diagnosis and Treatment for Drug-Resistant Tuberculosis: Deepening the Human Rights-Based Approach

Remmy Shawa, Fons Coomans, Helen Cox, and Leslie London

Abstract The lack of access to effective diagnosis and treatment for drug-resistant tuberculosis (DR-TB) remains a persistent ethical, human rights and public health challenge globally. In addressing this challenge, arguments based on a Human Rights-Based Approach (HRBA) to health have most often been focused on the Right to Health. However, a key challenge in multidrug-resistant (MDR-) and extensively drug-resistant (XDR-) TB is the glaring absence of scientific research; ranging from basic science and drug discovery through to implementation science once new tools have been developed. Although the Right to Enjoy the Benefits of Scientific Progress and its Applications (REBSP) is a little theorised human right, it has the potential to enrich our understanding and use of the Rights-Based Approach to health. In this chapter, we argue that States' duties to *respect, protect* and *fulfil* the REBSP within and outside their borders is an important vehicle that can be drawn on to redress the lack of research into new drug development and appropriate use of existing drugs for DR-TB in high burden settings. We call for urgent attention to minimum core obligations for the REBSP and the need for a General Comment by a UN human rights monitoring body to provide for its interpretation. We also note that conceptualization of the REBSP has the potential to complement Right to Health claims intended to enhance access to treatment for DR-TB on a global scale.

R. Shawa (✉)
School of Public Health and Family Medicine, University of Cape Town, Cape Town, South Africa

F. Coomans
Department of International and European Law, Maastricht University, Maastricht, The Netherlands

H. Cox
Division of Medical Microbiology and Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Cape Town, South Africa

L. London
Division of Public Health Medicine, University of Cape Town, Cape Town, South Africa

© The Author(s) 2020

E. Jamrozik, M. Selgelid (eds.), *Ethics and Drug Resistance: Collective Responsibility for Global Public Health*, Public Health Ethics Analysis 5,
https://doi.org/10.1007/978-3-030-27874-8_10

Keywords Drug resistance · Human rights · Tuberculosis · Scientific progress · Rights-based approach

10.1 Introduction

In this chapter we explore how the Right to Enjoy the Benefits of Scientific Progress and its Applications (REBSP), a little theorized human right found in both the Universal Declaration of Human Rights (UDHR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR), can deepen our understanding of a Human Rights Based Approach (HRBA) to health, taking access to effective treatment for drug-resistant tuberculosis (DR-TB) as an example. We bring attention to the slow progress in research, development and implementation of new and repurposing of existing drugs for treating DR-TB. Further, we attempt to frame poor access to effective diagnosis and treatment as a human rights problem, not only with respect to the right to health, but also with respect to the REBSP. In locating DR-TB within this right, we articulate what we mean by scientific progress, or lack of, in DR-TB, and discuss the broad context in which scientific progress must occur. Finally, we highlight some of the challenges in the conceptualization and realization of the REBSP, and make recommendations calling for urgent attention to minimum core obligations for the right and the need for a General Comment by a UN human rights monitoring body to provide for its interpretation.

Tuberculosis remains the world's deadliest communicable disease, responsible for more than 1.6 million deaths in 2017 alone (WHO 2018). More than a century after the bacterium causing TB was first identified, it continues to kill millions of people because diagnostic tools remain poor and current life-saving, essential medicines require a minimum of 6 months to effect cure. TB is particularly difficult to both diagnose and treat when TB bacteria have become resistant to available drugs. While standard care for drug-sensitive TB requires 6 months of treatment, DR-TB treatment may take up to 2 years. Access to diagnostic tools for DR-TB remains limited with currently available technology, despite some progress such as the GeneXpert MTB/RIF (a relatively rapid test that can, in some cases, quickly diagnose TB and some types of resistance) (Evans 2011), for which accessibility is limited due to the slow pace of implementation and high costs. In 2016, only 25% of the estimated number of multidrug-resistant (MDR-) or rifampicin-resistant (RR-) TB patients emerging that year were diagnosed, and even fewer started on treatment(WHO 2017). Of those who received treatment, only 54% of MDR/RR-TB patients are successfully treated and only 26% of those treated for extensively drug-resistant (XDR-) TB were successfully treated(WHO 2017). Current treatments for RR-TB (which includes MDR- and XDR-TB) are long, and have debilitating and often severe side effects, including irreversible hearing loss in more than a third of patients (Seddon et al. 2012). Other drugs included in the currently recommended

MDR/RR-TB regimen have been known to cause renal failure, cardiac arrhythmias, and psychiatric disturbances (Skrahina et al. 2016).

As much as DR-TB is a public health problem, it is also a human rights problem because it compromises the rights and dignity of the individuals who get infected. DR-TB highlights the glaring divide that exists between high-income countries (HICs) and low-middle income countries (LMICs), as well as the divide between the rich and the poor within countries. The majority of those who get TB and DR-TB reside in LMICs (WHO 2016). In HICs, TB and DR-TB are predominantly among the vulnerable and marginalized such as migrants and refugees (Figueroa-Munoz and Ramon-Pardo 2008). This skewed burden of TB disease effectively makes it a disease of the poor, who have little capacity to pay for medical care. Eliminating TB will require special attention to these marginalized populations as part of the moral duty of HICs and LMICs alike. Therefore, framing poor access to effective treatment for DR-TB as both a public health and human rights issue calls for solutions beyond public health, into the sphere of human rights. Moreover, human rights and public health are irrevocably inter-related; the promotion of one significantly contributes to the realization of the other, while, conversely, the infringement of human rights has negative effects on public health (Mann et al. 1994).

10.2 Access to Effective DR-TB Diagnosis and Treatment

Access to effective diagnosis and treatment for DR-TB is constrained by multiple problems; three of which are discussed in this chapter. The first problem is slow, or lack of progress and innovation in TB with regard to the development of new drugs or diagnostic technology. For example, since the introduction of the inexpensive and effective four-drug (isoniazid, rifampicin, pyrazinamide and ethambutol) treatment regimen, in the 1970s (Zumla et al. 2013), there were no novel drugs developed until the appearance of bedaquiline in 2012 (Cox et al. 2015); this is in spite of TB being one of the oldest diseases, spanning centuries (Daniel 2006). The current vaccine for TB, BCG, is almost 100 years old, and is considered effective in reducing severe and disseminated TB in young children but is not effective in adults (Kernodle 2010).

In most high TB burden settings the mainstay of TB diagnosis remains sputum smear microscopy, a test essentially unchanged in a century (Steingart et al. 2006). The slow or absent innovation in TB diagnosis and treatment arises from major challenges at different stages of the research continuum from basic science through to product availability. TB drug research is hugely underfunded, and key players in the pharmaceutical industry have been withdrawing from or cutting down on their investment in TB research and drug development, predominantly due to the real or perceived lack of a profitable market (Frick 2016). While treatment of drug sensitive TB still relies on the four drug combination developed more than 40 years ago, treatment of DR-TB has utilized both older drugs previously replaced in TB treatment due to lower efficacy and/or high side effects, along with drugs that were

originally meant to treat other illnesses, repurposed for TB (Zumla et al. 2013). Currently, these repurposed drugs, together with some of the new drugs on the market are being used to improve treatment success rates for MDR-TB (Ndjeka et al. 2015).

The second problem is inadequate evidence-based guidance on effective use of new or repurposed drugs. New drugs need to be registered through clinical trials, which are often lengthy and costly; and guidance on use of new drugs is restricted until further clinical trials are conducted. For example, bedaquiline is not registered for use by the FDA and other agencies in pregnant women, children or people living with HIV who are co-infected with MDR-TB (Mase et al. 2013) because there were no clinical trials on its use in these populations. Yet, in many high burden countries, co-infection with HIV and TB is very common, and in reality bedaquiline is being used in these populations (Ndjeka et al. 2015). Similarly, for repurposed medicines, the evidence base to inform guidelines for their use is inadequate (London et al. 2016; Mafukidze et al. 2016). The third problem, which is often a result of the first two, is the high cost and complexity of diagnostics and treatment, and the lack of feasible models of care for scale-up in high burden settings.

10.3 Rights Based Approach to DR-TB

To appreciate a rights-based approach to DR-TB, one needs to have an appreciation for human rights in general. Human rights are entitlements and freedoms that people have simply because they are human. They refer to moral principles or norms, which describe certain standards and moral beliefs that people have. For example, the right to food was a result of the moral belief that people should not die of starvation. Similarly, moral beliefs have been significant in defining human rights, "from resisting torture and arbitrary incarceration to demanding the end of hunger and of medical neglect" (Sen 2005). This view of human rights as morally justifiable claims entails that, if a moral claim is that no person should be enslaved to another, then the claim not to be enslaved is, by a matter of law, a human right (McFarland 2015). Likewise, the moral belief that everyone deserves equal opportunities to be in a state of mental, physical and emotional wellbeing, gives credence to the right to health. But the right to health alone is not adequate to fulfill this moral belief. Without scientific progress in prevention, treatment, or in addressing determinants of ill-health, the aspiration of good health cannot be realized. Similarly, without good trade policies, proper housing adequate food or adequate infrastructure, securing good health becomes an unrealistic aspiration.

A human rights-based approach (HRBA) to health is a way of analysing health through the framework of human rights. It entails examining the impact of health policies and programmes on human rights, and likewise, how promotion or violation of human rights impact public health. A rights-based approach to health focuses on equity of health outcomes by analyzing and addressing the inequalities, discriminatory practices (*de jure* and *de facto*) and unjust power relations which are often at the center of health problems. Under a rights-based approach, health is anchored in

a system of the recognition of individuals as right-holders and states as duty-bearers. A State has obligations to realize the human rights of its people, governed by international law. Perhaps, even more importantly, a rights-based approach to health means that citizens have the power and means to hold their governments accountable to their duties and responsibilities, and in turn, governments account to their citizens in a just and transparent manner.

The right to health is included in the ICESCR, which is a legally binding treaty. Article 12(2d) provides for an obligation for States to take steps for the creation of conditions which would assure medical services and medical attention to all in the event of sickness. The United Nations Committee on Economic, Social and Cultural Rights summed up the obligations of the State as the obligation to respect, protect and fulfill. Each treaty body adopts its interpretation of the provisions of its respective treaty in the form of "general comments" or "general recommendations". The Committee's guidance on the right to health in General Comment no. 14 provides an authoritative interpretation of the right to health), and unpacks state obligations and what this right looks like in real terms.

The emergence of the rights-based approach to health in recent years brought with it a paradigm shift in the fields of public health and human rights, owing, in part, to the HIV epidemic, but also to stronger civil society movements working on both health and human rights. But what does a rights-based approach to health mean for access to effective treatment of drug-resistant tuberculosis? And what human rights, other than the right to health can this approach be anchored in? Previously, public health concerns focused on the epidemiology of diseases, analysis of risk factors and interventions to control morbidity and prevent mortality. Particularly for TB, a communicable disease, the concern was around infection control and protecting the health of the public rather than those affected (London 2008). In this "public health view" of the TB disease, the State embarks on efforts to respond to TB because it is a public health threat, and not because the State is obligated to provide for the right to health of its citizens.

10.4 The Right to Enjoy the Benefits of Scientific Progress

The REBSP is proclaimed in article 15 paragraph 1(b) of the ICESCR; that [everyone has the right] to enjoy the benefits of scientific progress and its applications. This right is closely related to other rights contained in article 15; namely, the right to take part in cultural life (article 15, paragraph 1(a); the right of everyone to benefit from the protection of moral and material interests resulting from any scientific, literary or artistic production of which they are the author (article 15, paragraph 1(c)); and the right to freedom indispensable for scientific research and creative activity (article 15, paragraph 3).

Although it is proclaimed in these two important human rights documents, the REBSP is one of the least theorised human rights, and consequently, one of the least realized. Despite its textual existence dating back to the 1940s, in the UDHR, this right is relatively new in terms of its conceptualisation (Shaver 2015). Even human

rights activists and lawyers are all too often unaware of the existence of the REBSP, much less of its meaning (Chapman 2009). As such, the REBSP is one right whose conceptual content needs to be interrogated and further developed (Shaver 2015). Despite its lack of clarity, the REBSP cannot be isolated from other human rights; because of the interdependent nature of human rights (United Nations 2005), but also because science is a vehicle that is used in almost every sphere of human development (UNDP 2012). This interrelation is best exemplified in debates about unequal access to the benefits of scientific progress – not only in relation to access to essential medicines (the right to health) (FM't Hoen 2002) but also in access to seed technology (the right to food) (Dommen 2002) to scientific discoveries that can improve environmental protection (the right to a safe environment) (Maskus 2002) and to information and communication technologies (right to privacy and access to information).

Three types of obligations result from the right to enjoy the benefits of scientific progress.

10.4.1 The Obligation to Respect

For the REBSP, the State's obligation to respect this right means that the State must desist from curtailing, or interfering with people's ability to access the benefits of scientific progress. In relation to access to treatmemt for DR-TB, the state must therefore not interfere with the production of medicines and technology necessary for treatment and prevention of DR-TB. Such interference can take many forms, from having overly bureaucratic procedures for acquiring ethical clearance for research in drug development to unnecessary delay in approval of new drugs that have already been approved in other countries. Another interference might be in the form of patent protection laws and policies that prioritise protection of patents resulting from research and development ahead of access to treatment. The World Trade Organization adopted rules on intellectual property rights, which impose obligations on states to protect patents on new and existing medicines. Such rules often act as obstacles to making medicines available and accessible to all.

10.4.2 The Obligation to Protect

While a State may not engage in deliberate efforts to violate the REBSP, a failure to protect people from third parties constitutes a potential infringement on the right, and a violation of its obligation to protect. High pricing of life-saving medicines by private corporations through, for example, anti-competitive protectionism, requires the State to act in defence of people's REBSP. For example, where a pharmaceutical company holds a patent of essential TB drugs, the State can incorporate into its

laws, some of the TRIPS[1] flexibilities, such as compulsory licensing. In both South Africa and Kenya, the States compelled pharmaceutical companies holding patents to Antiretroviral drugs (ARVs), to enter into "voluntary" licencing agreements with local producers (Musungu et al. 2006).

10.4.3 Obligation to Fulfill

The obligation to fulfill is the third obligation. It speaks to the State's duty to adopt positive measures, and create an enabling environment for human rights to be realised. These measures may include "legislative, administrative, judicial, promotional and other measures" (CESCR 2006). Some of the challenges in drug development, or in research and development in general, are lack of infrastructure and unfriendly regulatory policies. For the state to fulfill the REBSP for TB patients, therefore, it has to take deliberate steps, within its means, to create an environment for science to thrive. These steps do not necessarily require financial expenditure, but would entail mobilising political will for agenda setting and intentional policies to encourage the sharing of scientific knowledge.

For DR-TB, the State's duty to respect, protect and fulfil, does not solely apply to the state with the burden of the disease; countries with a low DR-TB burden, but whose multinational corporations manufacture drugs for use in high burden countries, have an ethical obligation to protect citizens of in other countries from exploitation by their multinational corporations. This speaks to what others have termed 'extraterritorial obligations'- human rights obligations that a state has beyond its borders (Coomans and Kamminga 2004). And in the context of extraterritorial obligations, states that have the skills and resources to develop better and effective medicines, need to also put in place deliberate measures that would make access to such drugs possible outside their jurisdiction.

10.4.4 Realising the REBSP

Crucial to the realisation of the REBSP is the understanding of who the right holders and duty bearers of the right are. Primary duty bearers of any given right are the States, but also the International community (other States and international agencies); they have the duty to respect, protect and fulfil rights. The people, as individuals and as a collective, are therefore rights holders, in that they have individual and collective rights, and hold claims to entitlements provided for in a particular right. One of the most important issues in human rights is to understand different actors and the relationship between rights holders and duty bearers. A distinction should

[1] Trade-Related Aspects of Intellectual Property Rights.

be made between duties and responsibilities. For example, under the right to health, the state has the duty to provide health care to the people, and may do so through private and public health providers; in that case, health providers assume the responsibility to provide health care, but the State still holds the duty under international law. Similarly, under the REBSP, the state has a series of obligations such as creating an enabling environment for scientific progress to thrive, ensuring that people benefit from such scientific progress; non-state actors, such us the private sector (corporations), and academic institutions, have the responsibility to meaningfully contribute to scientific progress through their work. Under international law non-state actors, such as companies or private health providers, do not have legal obligations, only responsibilities. The legal nature of the latter is much weaker.

10.4.5 Minimum Core Obligations

Core obligations are important in realising human rights as they provide a frame of reference in determining what the State needs to do, at the bare minimum (and not subject to progressive realisation[2]). Minimum core obligations require the State to demonstrate that it has made every effort to use all available resources to satisfy, as a matter of priority, those core obligations. In the General Comment on the interpretation of the nature of ICECR obligations, General Comment No. 3 (1990), the Committee on Economic, Social and Cultural Rights stated that "States parties have a core obligation to ensure the satisfaction of minimum essential levels of each of the rights enunciated in the Covenant." Core obligations should be framed as both positive steps to be taken by the State, and actions that the state will need to refrain from.

Unfortunately, for the REBSP, there are, as yet, no defined core obligations, making the application of the right difficult. As a result, there is no standard or benchmark against which people and Civil Society can compel the State's immediate efforts to realize the right. Secondly, the State lacks guidance on what it has to prioritise within its minimal resources. There is therefore an urgent need for agreed minimum core obligations under the REBSP, which would also apply to scientific progress in DR-TB.

For example, minimum core obligations in REBSP could be used to prevent harmful effects of science, to promote access to benefits and to encourage international cooperation:

(a) To monitor the potential harmful effects of science and technology, to effectively react to the findings and inform the public in a transparent way; for

[2] Given the resource and knowledge restraints faced by many countries, the CESCR recognizes that the fulfillment of economic and social rights can only be achieved over time, and calls for the *progressive realization* of ESCR.

instance, where drug development for TB poses threats to the people, the state does not need to wait before it intervenes and prevents such harm.

(b) To promote access to the benefits of science and its applications on a non-discriminatory basis including measures necessary to address the needs of disadvantaged and marginalized groups. This includes ensuring that TB patients, especially the poor and marginalized, benefit from scientific progress that informs the development of new drugs, the use of repurposed drugs as well as the application of such drugs in high burden settings;

(c) To take measures to encourage and strengthen international cooperation and assistance in science and technology to the benefit of all people and to comply in this regard with the States' obligations under international law. This includes, inter-alia, the state entering into international agreements that fosters exchange of knowledge and products of such knowledge. It also implies that states push for better patent laws, which promote access to scientific knowledge even for those in LMICs.

10.5 Lack of Scientific Progress in DR-TB

A critical element of scientific progress is research and development (R&D), which is key to ensuring access to effective medicines, especially when coupled with deliberate policies to address access-related challenges for the poor and the marginalized. In the current environment, research can either be for-profit or not, regardless of whether it is meant to add value to people's health. Unfortunately, investments in not-for-profit research tend to be significantly lower than investments in for-profit research. Modern research is largely driven by funding external to the researchers/scientists and that how research is financed will determine how the knowledge arising from it will be used (Yamey 2008).

While not being the only element of the right, access to the benefits of scientific progress is one that is most controversial as it involves navigating the political landscapes in the production of science itself (Besson 2015a, b) and foregrounds the need for universal agreement on what defines scientific progress (Donders 2015). Moreover, the context in which the production of science takes place, often stretches beyond national jurisdictions (Besson 2015a, b). For example, for pharmaceutical companies based in HICs to test the effectiveness of new and repurposed drugs for TB, they need to conduct clinical trials in high burden settings like South Africa. Therefore, defining scientific progress is not the responsibility of one state, but requires a shared understanding by both those on the giving and receiving end of scientific development. Progress in TB is not just about the development of new drugs. It is also about the discovery and sharing of knowledge; and ensuring that such knowledge is accessible to those who need it the most.

Nevertheless, one of the main barriers is that countries from the North and the pharmaceutical companies domiciled there are reluctant to share and transfer knowledge with and to the South because of economic competition and return upon

investment reasons. To counter the current static positions, the WHO, in partnership with United Nations Conference on Trade and Development (UNCTAD) and the International Centre for Trade and Sustainable Development, initiated a project on Improving Access to Medicines in Developing Countries through Technology Transfer and Local Production. One of the findings of the project has been that local production has the potential to enhance access to affordable medicines if supported by appropriate and accessible technology (WHO 2011).

Furthermore, the benefits of scientific progress, as opposed to the protection of scientific discoveries and production have not been well explored. The latter has been a topic of thorough discussion and debate under intellectual property rights and law (Besson 2015a, b). This has arguably led to a situation where attention (and legal protection) is typically given to creation of scientific knowledge most likely to benefit the innovators (Yamey and Torreele 2002), while knowledge to address key public health problems of significant magnitude, particularly for poor populations unable to purchase the applications of scientific progress, have been neglected. Or if pursued, the scientific discoveries have been too costly to benefit the majority in need (Yamey 2008). International treaties and agreements on the development, sharing and use of science need to account for the fact that, although the capacity of most LMICs to contribute to scientific progress is more limited than for high income countries, their need to benefit is far greater than that of high-income countries. This imbalance in need versus capacity should be factored into the discourse on intellectual property rights, particularly in terms of impact on access to essential life-saving medicines.

10.6 Intellectual Property Rights and Access to Essential Medicines

The dominant paradigm in scientific development favours the strengthening and protection of Intellectual Property Rights (IPRs) in efforts to encourage and reward innovation. This paradigm was institutionalised after the introduction of patents, which in turn made scientific research more lucrative (Timmermann 2014). A patent is a "government-granted limited property right to exclude others from making, using or selling the patented invention" (Clark et al. 2000).

Patents can have a dramatic impact on access to medicines when they are used to prevent competition. A drug company that holds patents on a medicine has the right to prevent others from manufacturing it and therefore can charge an artificially high price. When a company is selling commodities such as computer components, for example, this might be of no great significance. But when life-saving treatments for diseases such as HIV or cancer become unaffordable to those that need them, the consequences can be – and are – devastating. In many LMICs, where people pay for drugs out of their own pockets and very seldom have health insurance, the high price of medicines becomes a question of life and death.

To advance the protection of intellectual property rights, the Member States of the World Trade Organization (WTO) agreed on the Trade-Related Aspects of Intellectual Property Rights (TRIPS) legal regime that progressively became effective from 1994 onwards (Correa 2007). TRIPS elicited a challenge from developing countries and from Civil Society across the globe, who saw them as an impediment to access to essential medicines. Prior to TRIPS, patent protection on pharmaceuticals was almost non-existent in developing countries and the absence of patents led to the flourishing of generic medicine production in these countries, which significantly lowered the cost of essential medicines. While rewarding innovation is important, it should not occur at the expense of access to the benefits. What is needed is a system for balancing promotion of innovation and access to benefits, which is what the REBSP potentially provides.

For example, in 2001, developing countries initiated negotiations on the interpretations of TRIPS Agreement because they restricted access to drugs for patients with HIV infection, the majority of whom live in developing countries (Correa and WHO 2002). Although the TRIPS agreement itself did not change, a compromise was reached in Doha[3] in the form of a Declaration that clarified that TRIPS should not prevent developing states from dealing with public health crises, that they should not restrict universal access to essential medicines and provided for mechanisms to bypass potential IP obstacles when public health was at stake. This is a case where the right to health was used as a basis to facilitate international trade agreements that would favour access to life-saving medicines, thereby also opening opportunities for realising the benefits of scientific progress.

10.7 Creating an Enabling Environment

In order for scientific progress in TB to thrive, states need to create an enabling environment for research. State duties to meet this right might include those proposed by London, Cox and Coomans (2016): – (i) measures to ensure that researchers have access to infrastructure and equipment to conduct research such as drug development; (ii) adoption of research policies and strategies that foreground research to develop applications for neglected diseases of the poor; (iii) shaping of research funding opportunities to make more attractive research that has lower commercial opportunity; (iv) capacity building of researchers; but also, (v) Public-Private Partnerships to encourage the public sector to contribute to access to treatment; (vi) strengthening collaboration with other countries, especially those contributing to R&D; (vii) reprioritising resources from other sectors such as military to health; and (vi) putting in place more efficient regulatory laws and policies, for providing approval for both research and new drugs.

[3] Declaration on the TRIPS Agreement and Public Health, adopted 14 November 2001 by the Ministerial Conference of the World Trade Organisation.

However, for the realisation of the REBSP, there has to be a vehicle or pathways for benefits to be derived from this progress and its applications. Put simply, such a system needs to ensure access to effective treatments for people needing treatment. Where appropriate, the State should make use of the TRIPS flexibilities to develop domestic policies that foster scientific progress in TB as a neglected disease. The case of South Africa and Kenya, which made use of TRIPS flexibilities to enforce compulsory licencing of patents to local producers (Musungu et al. 2006) is an example of the State ensuring access to ARVs. Others efforts can take the form of subsidies for researchers, and tax benefits to encourage research in DR-TB.

10.8 International Cooperation to Improve Access to DR-TB Drugs

International cooperation is integral to the international human rights framework, requiring states to recognise the role of international cooperation in realising human rights globally.. Article 2 of the ICESCR sets out that governments are obligated to "[…] take steps, individually and through international assistance and co-operation, […] to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant […]. The REBSP is not exempted from the international cooperation. Science is too broad to be pursued within the confines of one country, and its benefits, particularly in TB, are far reaching. The new drugs bedaquiline and delamanid have a larger market in LMICs than in high-income countries in which they were developed. Similarly, with ARVs, the market is larger in less-developed countries hit by the HIV epidemic, than it is in the high-income countries, where most R&D takes place. The REBSP, like other social and economic rights, has collective dimensions, in that its realization requires functioning social systems involving population-wide application rather than being a right exercised for any particular individual. This is further underscored by the international dimensions of cooperation across communities and territories. Furthermore, while the REBSP can benefit from international cooperation, it can also be a vehicle to promote such cooperation through the sharing of knowledge and its application.

Some initiatives have been established, proposing how this global ethical responsibility might actually be operationalised in the DR-TB response. One of such initiatives is the 3P project,[4] which seeks to encourage the development of affordable, effective new drugs to treat TB. It makes use of an open collaborative approach to conduct drug research and development (R&D), and recommends some new ways of funding and coordinating the drug research and development process. The

[4] https://www.msfaccess.org/sites/default/files/MSF_assets/TB/Docs/TB_briefing_3P-2016_EN.pdf.

process has identified significant weaknesses in the process that hamper development of new regimens and proposes three interventions to address the weakness, these are

- Push funding to finance R&D activities upfront (i.e. through grants);
- Pull funding to incentivise R&D activities through the promise of financial rewards on the achievement of certain R&D objectives (i.e. through milestone prizes)
- Pooling of data and intellectual property to ensure open collaborative research and to ensure fair licensing for competitive production of the final products.

10.9 Conclusion

In conclusion, the REBSP offers great potential for deepening the rights-based approach to health, as well as for enhancing access to effective diagnosis and treatment of DR-TB, and by extension other neglected diseases of the poor, by promoting the development of new drugs, and research in the use of existing regimens in high burden settings. However, the right needs clarity and a universal understanding of the entitlements it confers on right-holders and corresponding obligations of duty bearers. There is also need for clarity on the application of the right beyond national borders, to account for the broad scope of science or global trade-related policies. A thorough conceptualisation of the REBSP will require more than the attention of human rights experts, but also trade experts as well as research and development practitioners.

Despite progress made to advance the right to health, health inequality continues to undermine human rights. For DR-TB, health inequality is apparent at multiple levels; the burden of disease is higher in poorer countries, while access to effective treatment is lower. The moral belief that every human being has the right to health entails a collective global responsibility to those people or countries with poor health outcomes. Therefore, "Everyone with TB should have access to the innovative tools and services they need for rapid diagnosis, treatment and care" (WHO 2015) particularly with DR-TB, ensuring access to products and services will not only benefit patients of TB, but will also benefit global health security. This requires a closer look at how other human rights can, together with the right to health, advance health for all. The REBSP is such a right.

The responsibility to ensure scientific progress in DR-TB and access to such progress cannot lie on most affected countries alone. DR-TB will require a global response and a collective responsibility in an effort to advance the right to health. States' duties to respect, protect and fulfill the REBSP within and beyond their borders is an important vehicle to redress the lack of research into new drug development and repurposing existing drugs for DR-TB and their use in high burden settings. REBSP provides some practical ways in which countries can strengthen their rights based approaches to DR-TB. This includes creating an enabling

environment for R&D, promoting public-private partnerships, strengthening international cooperation, prioritizing resources to DR-TB, and implementing more efficient regulatory process for new drugs.

References

Besson, S. 2015a. Mapping the issues. *European Journal of Human Rights* 2015: 403–411.

———. 2015b. Science without borders and the boundaries of human rights: Who owes the human right to science ? *European Journal of Human Rights* 2015: 462–486.

CESCR. 2006. *General comment 17: The right of everyone to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he or she is the author*. New York: United Nations Economic and Social Council.

Chapman, A.R. 2009. Towards an understanding of the right to enjoy the benefits of scientific progress and its applications. *Journal of Human Rights* 8: 1–36.

Clark, J., et al. 2000. *Patent pools: A solution to the problem of access in biotechnology patents?* Washington, DC: United States Patent and Trademark Office.

Coomans, F., and M.T. Kamminga. 2004. *Extraterritorial application of human rights treaties*. Antwerp: Intersentia.

Correa, C. 2007. *Trade related aspects of intellectual property rights: A commentary on the TRIPS Agreement*. Oxford: Oxford University Press.

Correa, C.M., and WHO. 2002. *Implications of the Doha Declaration on the TRIPS Agreement and public health*. Geneva: World Health Organisation.

Cox, H.S., et al. 2015. The need to accelerate access to new drugs for multidrug-resistant tuberculosis. *Bulletin of the World Health Organization* 93: 491–497.

Daniel, T.M. 2006. The history of tuberculosis. *Respiratory Medicine* 100 (11): 1862–1870.

Dommen, C. 2002. Raising human rights concerns in the World Trade Organization actors, processes and possible strategies. *Human Rights Quarterly* 24 (1): 1–50.

Donders, Y. 2015. Balancing interests: Limitations to the right to enjoy the benefits of scientific progress and its applications. *European Journal of Human Rights* 2015: 486–504.

Evans, C.A. 2011. GeneXpert – A game-changer for tuberculosis control? *PLoS Medicine* 8 (7): e1001064.

Figueroa-Munoz, J.I., and P. Ramon-Pardo. 2008. Tuberculosis control in vulnerable groups. *Bulletin of the World Health Organization* 86 (9): 733–735.

FM't Hoen, E. 2002. TRIPS, pharmaceutical patents and access to essential medicines: Seattle, Doha and beyond. *Journal of International Law* 3: 39–68.

Frick, M. 2016. *2016 report on tuberculosis research funding trends, 2005–2015: No time to lose*. New York: Treatment Action Group.

Kernodle, D.S. 2010. Decrease in the effectiveness of Bacille Calmette-Guérin vaccine against pulmonary tuberculosis: A consequence of increased immune suppression by microbial antioxidants, not over attenuation. *Clinical Infectious Diseases* 51 (2): 177–184.

London, L. 2008. What is a human-rights based approach to health and does it matter? *Health and Human Rights* 10: 65–80.

London, L., et al. 2016. Multidrug-resistant TB: Implementing the right to health through the right to enjoy the benefits of scientific progress. *Health & Human Rights: An International Journal* 18 (1).

Mafukidze, A., et al. 2016. An update on repurposed medications for the treatment of drug-resistant tuberculosis. *Expert Review of Clinical Pharmacology* 9 (10): 1331–1340.

Mann, J., L. Gostin, S. Gruskin, T. Brennan, Z. Lazzarini, and H.V. Fineberg. 1994. Health and human rights. *Health and Human Rights* 1 (1): 6–24.

Mase, S., et al. 2013. Provisional CDC guidelines for the use and safety monitoring of bedaquiline fumarate (Sirturo) for the treatment of multidrug-resistant tuberculosis. *Morbidity and Mortality Weekly Report: Recommendations and Reports* 62 (9): 1–12.

Maskus, K.E. 2002. Regulatory standards in the WTO: Comparing intellectual property rights with competition policy, environmental protection, and core labor standards. *World Trade Review* 1 (2): 135–152.
McFarland, S. 2015. Culture, individual differences, and support for human rights: A general review. *Peace and Conflict: Journal of Peace Psychology* 21 (1): 10.
Musungu, S.F., et al. 2006. *The use of flexibilities in TRIPS by developing countries: Can they promote access to medicines?* Geneva: World Health Organisation.
Ndjeka, N., et al. 2015. Treatment of drug-resistant tuberculosis with bedaquiline in a high HIV prevalence setting: An interim cohort analysis. *The International Journal of Tuberculosis and Lung Disease* 19 (8): 979–985.
Seddon, J.A., et al. 2012. Hearing loss in patients on treatment for drug-resistant tuberculosis. *European Respiratory Journal* 40 (5): 1277.
Sen, A. 2005. Human rights and capabilities. *Journal of Human Development* 6 (2): 151–166.
Shaver, L. 2015. The right to science: Ensuring that everyone benefits from scientific and technological progress. *European Journal of Human Rights* 2015: 411–431.
Skrahina, A., et al. 2016. Bedaquiline in the multidrug-resistant tuberculosis treatment: Belarus experience. *International Journal of Mycobacteriology* 5: S62–S63.
Steingart, K.R., et al. 2006. Sputum processing methods to improve the sensitivity of smear microscopy for tuberculosis: A systematic review. *The Lancet Infectious Diseases* 6 (10): 664–674.
Timmermann, C. 2014. Sharing in or benefiting from scientific advancement? *Science and Engineering Ethics* 20: 111–133.
UNDP. 2012. *MDG report 2012: Assessing progress in Africa toward the Millennium Development Goals*. Addis Ababa: Economic Commission for Africa.
United Nations. 2005. *Economic, social and cultural rights: Handbook for national human rights institutions*. New York: United Nations.
WHO. 2011. *Local production for access to medical products: Developing a framework to improve public health*, 32–36. Geneva: World Health Organisation.
———. 2015. *The end TB strategy*. Geneva: World Health Organisation.
———. 2016. *Global tuberculosis report*. Geneva: World Health Organisation.
———. 2017. *Multidrug- resistant tuberculosis (MDR) TB 2017 update*. Geneva: World Health Organisation.
———. 2018. *Global tuberculosis report*. Geneva: World Health Organisation.
Yamey, G. 2008. Excluding the poor from accessing biomedical literature: A rights violation that impedes global health. *Health and Human Rights* 10: 21–42.
Yamey, G., and E. Torreele. 2002. The world's most neglected diseases. *The British Medical Journal* 325: 176–177.
Zumla, A., et al. 2013. Advances in the development of new tuberculosis drugs and treatment regimens. *Nature Reviews Drug Discovery* 12 (5): 388–404.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.