
Some Global Policies for Antibiotic Resistance Depend on Legally Binding and Enforceable Commitments

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Introduction

This article assesses which policies for addressing antibiotic resistance (ABR) as part of a multi-pronged approach would benefit from legalization through an international legal agreement. Ten candidate policies were identified based on a review of existing literature, especially *The Lancet Series on Antimicrobial Resistance (AMR)*,¹ *The Lancet Infectious Diseases Commission on AMR*,² and the World Health Organization (WHO) Global Action Plan for AMR.³ These policies were then grouped under the headings of access, conservation, and innovation.⁴

Each of the ten policies were assessed using four criteria developed by Hoffman, Røttingen, and Frenk to help consider why their legalization may be helpful, necessary and/or justified.⁵ These criteria are: (1) the problem has a significant transnational dimension; (2) the goal justifies the coercive nature of law; (3) the outcome is likely to be beneficial; and (4) legalization represents the best commitment mechanism among competing alternatives.⁶

Using these criteria as analytic benchmarks, we explore how several global policies for ABR depend on legally binding and enforceable commitments, how additional policies would benefit from legalization, and how other policies could helpfully contribute to a

grand bargain that galvanizes support for the implementation of these provisions. Of course, international law can also helpfully articulate principles or recommend national policies for states to consider adopting, but such use of international legal agreements is not the focus of this article.

Global Access Policies

Two policies fall under the access pillar; both address the underprovision of antibiotics, diagnostic tools, and infection control practices.

1. Mobilizing Financial Resources for Laboratory, Surveillance, and Health System Infrastructure in Resource-Poor Countries

Development assistance is still necessary for health systems strengthening in many low- and middle-income countries (LMICs). Strong health systems are the backbone of reducing the global threat of ABR. For example, stronger laboratory and surveillance systems and infection prevention programs would lower the prevalence of infectious disease and improve the quality of information on the spread of ABR. The inclusion of this policy in an international legal agreement could ensure that resource-poor countries have access to the finan-

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Table I

Global Policies for ABR

		Significant transnational dimension	Justifies coercive nature of treaties	Reasonable chance of achieving benefits	Best commitment mechanism
Access Policies	1. Mobilizing financial resources for infrastructure	•	•	•	
	2. Funding for access	•	•	•	
Conservation Policies	3. Prohibiting use of antibiotics for growth promotion or routine prevention	•	•	•	•
	4. Designating human-only classes of antibiotics	•	•	•	•
	5. Regulating antibiotic prescription and availability for humans	•	•	•	•
	6. Educating on effective use		•	•	
	7. Strengthening infection control practices	•	•	•	
	8. Strengthening and coordination of surveillance	•	•	•	•
	9. Prohibiting the marketing and promotion of antibiotics	•		•	
Innovation Policies	10. Funding and incentives for antibiotic technologies	•	•	•	

cial capacity necessary to ensure appropriate access to antibiotics and implement antibiotic conservation efforts. While this policy could also be pursued effectively outside an international legal agreement, such as through bilateral arrangements or existing pooled funding mechanisms, it is a key component of a global response to ABR and could therefore benefit from legalization. This financing could be used to incentivize states to implement crucial conservation ABR policies – by either providing the funds needed to be compliant (the approach adopted in Article 44 of the International Health Regulations) or by conditioning the availability of these funds on implementation of ABR conservation policies (an approach used controversially yet regularly by the International Monetary Fund).

2. Funding for Access to Appropriate Antibiotics, Diagnostics, and Related Technologies in Resource-Poor Countries

When pursued in conjunction with conservation measures, policies for increasing appropriate access to antibiotics, diagnostics and related technologies could reduce the rate of ABR in a just and equitable manner

by diminishing the transmission of resistant bacteria.⁷ The broad and ambitious scope of this policy could be too vast to include as part of an international legal agreement; its equity focus and redistribution consequences would also be nearly unprecedented in international law. There could also be potential harms and trade-offs, including how inappropriate access quickens resistance, and there may be better alternative commitment mechanisms through which states and non-state actors could advance this policy (e.g., development goals, codes of practice, global funds).⁸ However, like financing for health systems and infrastructure, this policy on funding access to antibiotics could be helpful in an ABR legal agreement to address vital equity imperatives and incentivize states to implement conservation policies. In this instance, an international legal agreement that creates (or that references external) pooled funding mechanisms could ensure adequate financing needed for access and conservation goals.

Global Conservation Policies

Seven policies fall under the conservation pillar, which together aim to reduce the incidence and spread of ABR and ensure appropriate antibiotic use.

3. Prohibiting Antibiotics for Growth Promotion and Routine Prevention in Animals

Overuse, misuse, and abuse of antibiotics in the agriculture industry facilitate the spread of ABR.⁹ An international legal agreement that encourages and enforces minimum national regulatory standards could ensure action in all states to mitigate ABR and conserve the effectiveness of existing antibiotics. Antibiotic use in animal husbandry amounts to 80% of all use in the United States, and is projected to increase by 67% worldwide.¹⁰ There is therefore danger that resistance in animals may spread to humans without global implementation of rational use regulations in agriculture.¹¹ Global rules could also minimize any competitive disadvantages that would be experienced by livestock industries within states that adopted regulations on their own. In order to effectively reduce the negative effects of irrational antibiotic use, where individual private benefits do not offset total social costs, this policy is exactly of the kind that most benefits from international legalization.

4. Designating Human-Only Classes of Antibiotics

There is a clear tension between the potential for private gains in using antibiotics in the agriculture sector and the negative impacts this may have on public health. Using international law to restrict the use of certain antibiotics could slow the development of resistance to these medicines and promote the use of alternative therapies and preventive measures — closing the gap between the private and public costs of this enterprise. Including this policy in an international legal agreement could help promote its adoption since countries would only benefit from it if implemented by all countries simultaneously. The key factor that points towards the need for international law to support this policy is that near-complete global compliance is needed for it to be effective. This is the result of high levels of trade and travel that facilitate the international spread of resistant bacteria. International law — the strongest way through which states can make commitments to each other — lessens concerns about non-compliance and free ridership compared with alternative commitment mechanisms (albeit not fully eliminating them).¹²

5. Regulating Antibiotic Prescription and Availability for Humans

Currently, there is a lack of accepted global guidance and context-specific guidelines for the prescription of antibiotics by health professionals. In fact, two-thirds of antibiotics sold have not been prescribed by a physician.¹³ The establishment of best practice guidelines that are adaptable and differentiated to each particular country context is necessary to mitigate the potential negative effects of antibiotic misuse and overuse by humans. For countries with an adequate supply of physicians and strong health system infrastructure, antibiotic prescription guidelines can be put in place or strengthened to discourage their irrational use. For the many LMICs where drug prescription systems are infeasible, alternative regulations can be pursued, such as antibiotic use legislation, monitoring and surveillance efforts, pharmacist training, and public awareness campaigns.¹⁴ Including an adaptable and differentiated regulation on antibiotic availability in an international legal agreement could encourage countries to do their part toward collective responsible use without unduly limiting access to these life-saving medicines. An international legal agreement that required all countries to have one particular system for limiting antibiotic availability — such as a prescription system — would be inappropriate and could have disastrous health consequences.

6. Providing Education on Effective Antibiotic Use to Health Professionals and Patients

To reduce unnecessary use and prescription of antibiotics, effective education needs to be offered to both health professionals and patients. Professional training and awareness campaigns can be effective demand-reduction measures,¹⁵ especially in countries where one can obtain antibiotics without a prescription.¹⁶ This policy supports the goal of conservation, as it could work alongside other policies for reducing irresponsible antibiotic use at both the individual and systems levels. Funds mobilized through an international legal agreement or external pooled funding mechanisms could aid in the implementation of ABR education measures. Including this policy in an international legal agreement could help encourage global negotiation of regulatory standards, development of clinical and public health guidelines, and sharing of best practices for optimizing education efforts.

7. Strengthening Infection Control Practices

Infection control is an important public health strategy that is costly and that yields significant benefits for parties other than the payer. Neighboring countries, for example, may collectively benefit more from strong infection control practices than the implementing country. This positive externality results in underutilization of infection control practices given the local benefits to implementers may not exceed their costs — even when the global benefits surely would exceed

likelihood that other states will be able to benefit from them too.

9. Prohibiting the Marketing and Promotion of Antibiotics

Along with public awareness campaigns, a further demand-side policy that could be included in an international legal agreement is imposing marketing bans on antibiotics worldwide. This policy includes provisions such as banning industry and retailers from advertising antibiotics, restrictions on using price or

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costs. Requiring infection control practices as part of an international legal agreement could help ensure states implement these policies for the betterment of all (and in turn benefit from other countries' implementation of these policies). If the burden of costs could be shared equitably among state parties, the international legalization of this policy could also aid in the striking of a grand bargain.¹⁷

8. Strengthening and Coordination of Surveillance Systems and Laboratory Capacity

National ABR surveillance systems remain fragmented and lack regional and global coordination. The lack of global standards for laboratory methodologies has reduced the ability to collect, analyze, and compare data, inhibiting the potential impact of this data in improving evidence-informed policies everywhere.¹⁸ This dearth of data and coordination from many countries affects the ability of all countries to address ABR effectively — especially considering how much of the ABR threat comes from the unknown transmission of resistant bacteria from other countries. Creating international legal obligations to gather and share data could help ensure that states actually undertake these responsibilities, and it maximizes the

packaging for promotions, and regulating the location, size, and type of drug retailers.¹⁹ This approach has been used to some degree of success in the Framework Convention on Tobacco Control, with more than 50% of ratifying countries having restricted these marketing measures for cigarettes to some extent.²⁰ Globally accepted marketing bans could be especially helpful in today's age of the Internet and advanced mobile communications technologies given that many forms of media spread seamlessly across national borders. The international legalization of this policy could therefore decrease harmful antibiotic marketing messages and help protect states that have banned antibiotic promotion efforts from being subjected to cross-border promotion efforts.

Global Innovation Policies

One policy falls under the innovation pillar, which involves research and development for antibiotics, diagnostics, and related technologies for the detection, prevention, and treatment of infectious diseases.

10. Funding and Incentives for Developing New Technologies Addressing ABR

Currently there is insufficient funding and incentives for developing new antibiotics and other related technologies. However, most existing funding allocations by states across issues are voluntary; there are very few instances where states legally bind themselves to funding requirements (with membership dues to international organizations representing an important exception).

That being said, if states were ambitious, internationally legalizing this policy – or at least the principles underlying it, such as increasing funding, universal participation, and differentiating state contributions by development status – could be used to change norms about global responsibilities of high-income countries in this area and mobilize participation among LMICs in any international legal agreement. The latter might be especially effective if LMICs were promised access to research funding and the fruits of new innovations at-cost if they comply with conservation provisions.

While the dearth of funding and incentives for new ABR technologies could be solved outside of an international legal agreement through the concerted efforts of a few wealthy states,²¹ including it would solidify interconnections and commitment across the access, conservation, and innovation imperatives and help solve the political-economy challenges facing the global antibiotics regime.²²

Conclusion

An international legal agreement could effectively support global collective action towards several ABR goals. Of the ten candidate policies examined, each could benefit to a certain extent if included in an international legal agreement. It is clear that while some policies may only be effective if internationally legalized, other policies would be more effective if legalized, and still other policies would benefit at least marginally from inclusion in an international legal agreement. Yet even when expected benefits from international legalization are marginal, including such policies may be useful anyway in supporting implementation of the other policies, changing norms, or incentivizing states to participate.²³ States can theoretically include every possible ABR policy in an international legal agreement as recommended actions; but some of the policies depend on legally binding and enforceable commitments, whereas others can have an impact without such a high level of obligation.

By legalizing the necessary policies, effective action is more likely to be undertaken to meet the access, conservation, and innovation imperatives needed to fully address the global threat of ABR. An international legal agreement is most helpful for promoting

universal implementation of needed conservation policies, with access provisions supporting them, and innovation requirements helping mold a delicate grand bargain.

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