ESRC Research Brief

Antimicrobial Resistance

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International Relations

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1. Introduction

The growing prevalence of pathogens resistant to existing antibiotics, antifungals, antivirals, and antimalarials has become an increasingly prominent issue in global health and security policy discussions. Many fear that the spread of resistant microbes could pose a worldwide threat to human and national security – ushering in a 'post-antibiotic era'. AMR is thus rapidly emerging as a major global challenge.

To meet this challenge, governments and international organizations are calling for concerted action. The UK's Chief Medical Officer, Dame Sally Davies, released a report in 2013 highlighting the threat antimicrobial resistance (AMR) posed to the UK. The issue was subsequently placed on the government's National Risk Register, making it a cross-government priority, and came to the fore again with the publication of the 'O'Neill Report' in 2016 (Review on Antimicrobial Resistance 2016). In the United States, Barack Obama similarly identified AMR as 'one of the most pressing public health issues facing the world today'. Like many other countries, the United States has developed a national strategy to address the problem. The World Health Organization (WHO), meanwhile, has also launched a *Global Action Plan* designed to galvanize and guide the international response to this looming crisis.

Whilst much of the AMR discussion to date has focused on the scientific challenges of developing new drugs (and the associated policy challenge of stimulating R&D to that end), it is clear that AMR is an inherently *global political* challenge because:

- the resistant pathogens have the potential to move globally;
- many of the underlying drivers of the AMR challenge are international and transnational in scope;
- the pharmaceutical companies producing new medicines operate internationally and within a global political economy;
- there are particular AMR challenges in low- and middle-income countries; and
- meaningful collective action will require coordinated international responses to succeed.

The engagement of International Relations (IR) as a discipline with the AMR issue has been relatively limited to date (see Section 1, below). However, the situation is changing and over the course of 2016 members of the United Kingdom IR community with an interest in the global politics of health have begun to map out the contours of IR's potential contribution to academic and policy discussions over the AMR challenge. This effort has included a one-day ESRC-supported workshop on 'The Emerging Global Crisis of Antimicrobial Resistance: Towards a Research Agenda for International Relations' held at the University of Sheffield in February 2016, as well as a roundtable panel at the annual conference of the British International Studies Association (BISA) in Edinburgh in June 2016, organized by its Working Group on Global Health.

In this Research Brief we build upon these ongoing discussions in order to:

a) Briefly highlight the work that has previously been done on AMR within IR (Section 2). Given that this is an emerging issue of study, this represents at best a contemporary snapshot of what is a potentially very dynamic research area.

b) Set out six thematic areas in which IR's existing strengths could contribute to debates around AMR (Sections 3-8). Each of these thematic sections provides a brief discussion of potentially relevant research areas, and suggests some potentially fruitful research questions around AMR and IR. These lists are not, and are not intended to be, exhaustive. Rather, they are provided as an illustration of the types of issues that can be illuminated by examining AMR through the lens of IR.

c) Discuss the potential connections that research on AMR could build between IR and other academic disciplines both within and beyond the ESRC's remit.

2. AMR and International Relations: A Review of the Existing Literature

The field of International Relations (IR) has only had a comparatively limited engagement with AMR to date. That said, the issue of AMR does often arise as an illustrative example within broader scholarly debates about: globalization and health, global health governance, and the international challenges of disease containment and control. Here scholarship in the areas of security studies, international law, as well as international political economy (IPE) and development has made contributions of particular relevance to IR's engagement with the topic.

2.1 Security Studies

In the security studies literature, AMR features principally within broader debates on the threat posed by emerging and re-emerging infectious diseases (ERIDs) to national and international security. Here the issue has arisen in a number of different ways. First, the resurgence of known diseases in drug-resistant forms has often been cited alongside examples of the emergence and spread of other viruses, such as HIV or novel strains of influenza, in arguments focused on demonstrating why ERIDs constitute a national security challenge (Price-Smith 2002; Price-Smith 2009). Second, it has been raised in discussions as to how infectious diseases have increasingly come to be recognised as security concerns, and the costs and benefits of 'securitizing' health (Amon 2015: 295-6; Davies 2008; Elbe 2011b; McInnes 2009: 46). Third, AMR has featured in discussions on the link between health and broader conceptions of human security, specifically in relation to the rise of drug resistant forms of tuberculosis (Elbe 2010: 104-6). Fourth, the issue of AMR has surfaced in discussions about the threat of biological weapons and bioterrorism to the extent that the possibility of pathogens being genetically engineered to be more drug resistant also constitutes a security concern (Elbe 2010: 74; Enemark 2007a: 176; Fidler 2003: 821). Finally, AMR has been raised in discussions on the efficacy of pharmaceutical defences in addressing the security implications of infectious diseases due to the

possibility of drug resistance emerging with the widespread use of antivirals (Elbe 2011a: 863; Enemark 2007b: 140).

2.2 Global Health Governance and International law

Whereas research on the global governance aspects of AMR has been limited in IR narrowly defined, scholars in the closely related area of international law have made significant contributions. Here scholarship has focused on the (potential) contribution of international law to combating AMR within the context of ERIDs generally (Fidler 1996; Fidler 1996-7; Fidler et al. 1997), and also as an issue in its own right (Fidler 1998; Hoffman et al. 2015a; Hoffman et al. 2015b; Outterson 2005-2006). Indeed, legal scholars have assessed the role of international law in disease control strategies addressing AMR in a number of areas: 1) in strengthening surveillance and reporting mechanisms, particularly in resource-poor settings (Behdinan et al. 2015: 68; Fidler 1998); 2) in negotiating the balance between individual rights and community protection in controlling the spread of infectious disease (Fidler 1998); 3) in tackling AMR through the promotion of the right to health and universal access to medicines (Daulaire et al. 2015); 4) on the role of Intellectual Property law in pharmaceutical innovation in combatting AMR (Fidler 1998: 174-5; Outterson 2005-2006); and 5) on the development of strategies and international legal arrangements to overcome global collective action problems (Behdinan et al. 2015; Hoffman et al. 2015a; Hoffman et al. 2015b). In Section 6, below, we further examine the potential contribution of IR-based research on Global Health Governance and the ways in which that work potentially interfaces with ongoing research in international law.

2.3 International Political Economy and Development Studies

Within the development studies and international political economy literature, AMR has been cited in broader discussions on the global distribution of health risks and the role of actor interest in setting priorities in the delivery of health aid and disease control activities (Michaud 2009; Schrecker 2009: 33; Steele 2011). Multi-drug resistant tuberculosis (MDR-TB), for example, has featured as one of four case studies in Joshua Michaud's (2009) analysis of the level to which the international system provides the surveillance, reporting and response capacities needed to combat EIDs. On the basis of his analysis, Michaud concludes, significant disparities exist

between EID surveillance capacities in the developed and developing world, with surveillance coverage frequently lacking in the latter. In the case of MDR-TB this is despite the known threat to human health posed by the disease and the fact that it is disproportionately concentrated in the developing world (Michaud 2009: 134).

Here the AMR issue has also been referenced in broader discussions on the links between disease and poverty, and in debates surrounding access to medicines. For example, the rise of AMR has been cited as an example of how poverty functions as a determinant of global infectious disease to the extent that the inability to afford essential medicines, or follow through on drug treatment regimes, may contribute to the rise in antimicrobial resistance (Davies 2010: 102). AMR has also been referenced in discussions on the debate between increasing the production of generic drugs to address access to medicine issues, versus building up health care delivery systems in combating drug resistance (Davies 2010: 162-3). Beyond these broader debates, however, little IR scholarship has focused explicitly on the issue of AMR in this context.

In sum, to date there has been comparatively little systematic research on AMR carried out in the field of IR. However, and as the brief review of the literature indicates, there are a number of avenues for further research and areas where IR can make a meaningful contribution to the study of AMR moving forward. In the subsequent sections of these report, we highlight six areas of IR research (both within and beyond global health) which suggest that IR can make a significant contribution around understanding and conceptualising AMR as a global challenge, and discussing and analysing potential responses at the supra-national level.

3. Global Health Diplomacy: Diplomatic Strategies for Achieving International Collective Action on AMR

AMR is ultimately a global challenge. The genes that confer resistance to antimicrobials can cross borders and rapidly travel to different parts of the world. Many of the systems driving the consumption of antimicrobials – such as their use in complex food production systems – are also increasingly international in scope. The problem of AMR thus points to a deep epidemiological interdependence between the many populations living around the world. A number of organizations – from the World Health Organization (WHO), the World Economic Forum (WEF), and the Group of 7 (G7), through to the Wellcome Trust and the O'Neill report research team – recognize that when it comes to AMR no country is an island. Robust plans at national and local level will certainly be needed to successfully tackle the problem; but ultimately AMR also has a strong global dimension that needs to be addressed collectively by the international community.

Managing that global dimension to the AMR problem poses a significant political challenge however. The international political system remains fragmented, with nearly 200 states enjoying legal sovereignty over their territory. Those states do not recognize a higher authority, and there is no world government with centralized political powers to implement and enforce any actions regarding the use of antimicrobials. The challenge around AMR is therefore how to encourage and persuade these many different governments around the world to engage in international collective action. That is likely to be particularly difficult given the significant variations between countries in terms of the threat perceptions about AMR, the differing level of resources at their disposal, and so forth. To date the international community has developed *a Global Action Plan* on AMR under the auspices of the World Health Organization, and is also planning to discuss the issue at the G20 and the United Nations. However, it has yet to resolve the question of how sustainable, decisive and concerted international collective action on AMR can be achieved in practice.

In the discipline of International Relations there is a significant body of scholarship analysing diplomatic efforts aimed at achieving such international collective action. AMR is clearly not the first international issue to require such

international diplomatic efforts. Though not a perfect match, climate change is another important global issue requiring collective international action (Bulkeley and Newell 2015). So is world trade (Weiss and Wilkinson 2013). Climate change and global finance are thus two crucial areas where countries have already successfully achieved significant levels of international cooperation (but also experiencing important setbacks). Indeed, there is an opportunity to work together with scholars in the global politics of climate change and international finance to identify similarities and differences between the these areas of international diplomacy, and to analyse which lessons can be usefully applied to the challenge of AMR.

In addition to those wider global challenges, there is also a growing IR scholarship focusing specifically on the international diplomacy around global health issues. Whilst international health issues were largely ignored by the discipline during the Cold War, there has been a remarkable transformation over the past two decades. During this time the international politics of health has emerged as a flourishing area of specialization, and even as a burgeoning subfield, in the discipline. Global health diplomacy and global health governance (see Section 4, below) have thus emerged as important interdisciplinary fields in which to study the international political diplomacy surrounding key global health challenges (Davies, Kamradt-Scott, and Rushton 2015; Kickbusch, Lister, Told and Drager 2012).

That literature has already advanced detailed studies of the diplomacy around specific health challenges demanding wider international collective action – such as the international politics of HIV/AIDS (Seckinelgin 2007), tobacco control (Cairney, Studlar and Mamudu 2011), non-communicable disease, and pandemic preparedness (Kamradt-Scott 2015). It has also explored issues around the creation of new norms in global health, the role of legal instruments (including treaties) in supporting such efforts (Coggon, Syrett and Viens 2015; Hoffman and Behdinan 2016; Hoffman et al 2015a, 2015b), as well as an array of wider ethical considerations (Langlois 2013; Stoeva 2009) and the impact of the rise of BRICS countries (Bliss 2010; Alexander, Dhumale and Eatwell 2005). There are opportunities here to explore this literature on global health diplomacy with a view to identifying the most promising strategies for harnessing international diplomatic co-operation on AMR.

Moving forward the key research questions here include:

- What are the most effective diplomatic means and mechanisms for achieving a sustainable global response to AMR?

- Beyond the Global Action Plan, what other instruments of global health diplomacy could be used to build greater support for collective international action on AMR?
- What can also be learned from other areas of international diplomacy (especially climate and finance) and other global health issues about achieving meaningful and sustainable international collective action?

4. AMR, Global Health Governance and Global Health Policy

As noted in Section 3, given that AMR is a global challenge, it seems certain that an effective response will require collective international action to meet the challenges of innovation, conservation and access. Whilst there is no 'world government' above the level of legally sovereign states, nevertheless forms of 'global governance' have emerged in health and in many other policy areas. Thus AMR is both a challenge for global governance as well as for individual national governments – requiring an understanding of the international political and policy landscape, the functioning of the institutions and fora within which any global agreement(s) will have to be made, and analysis of the types of governance mechanism that might be effective in delivering policy coordination.

Over the last fifteen years, a significant body of literature examining such issues in the field of 'Global Health Governance' has emerged from International Relations (e.g. Davies 2010; Harman 2012; Kay & Williams 2009; Rushton & Williams 2011; Youde 2012; Zacher & Keefe 2011), from Public Health (e.g. Buse, Hein & Drager 2009; Dodgson, Lee & Drager 2002; Lee 2003; Lee, Buse & Fustukian 2002), and from collaborations between the two disciplines (e.g. McInnes & Lee 2013; McInnes et al 2014). That literature has engaged with a series of questions and issues that have direct relevance for the AMR issue.

The first is around the complexity of the current global health governance 'system', in which a wide variety of actors and institutions play a variety of roles - often with unclear or overlapping mandates (Lee et al. 1996) and frequently with a lack of coordination between different actors. Indeed over the last 20 years the governance landscape has become increasingly complex as new global health institutions have been created (including Public-Private partnerships of the type referred to above, but also philanthropic foundations such as the Gates Foundation), existing institutions such as the G7/8 have begun to engage more seriously with global health issues, and the traditional global health institutions, including the WHO, have increasingly found their leadership come under challenge. The picture is more complex still in the case of AMR, as the range of relevant actors involved goes far beyond human health, including the policy spheres of agriculture and food production, global trade, and possibly others. Significant IR research challenges,

therefore, exist in mapping the range of actors and interests who are stakeholders in the AMR challenge; learning the lessons of previous attempts at institutional innovation for the purpose of addressing particular global health issues; and understanding the global governance fora within which progress on this significant collective action problem can most effectively be made.

This leads on to a second set of questions around the highly varied nature of what has come to be called 'global health policy' (Brown, Yamey & Wamala 2014). Whilst there have been a small number of formal international agreements concluded between member states on particular global health challenges – the International Health Regulations (Fidler & Gostin 2006; Davies, Kamradt-Scott & Rushton2015; Kamradt-Scott 2015) and the Framework Convention on Tobacco Control (Collin et al 2002; Mamudu and Glantz 2009) being the two that have been most widely examined in the literature – global health policy is more commonly found in 'softer' forms of regulation such as international norms, statements, guidelines - and also through the allocation of funding. The potential for achieving international 'buy-in' for these various kinds of regulatory mechanism, and the likelihood of compliance with global health policy, has been addressed to some extent in the Global Health Governance literature, but more fully in the wider global governance literature.

Third, addressing AMR is in many respects a global collective action problem – something which has been a longstanding focus of IR as a discipline, and that has resulted in a series of theoretical debates that have addressed a wide range of empirical challenges. Stimulating innovation, conserving the effectiveness of existing drugs, and promoting access to antimicrobials for those who do not currently have it are all issues that raise questions of coordination and policy alignment, as well as the potential for free riding and the non-compliance of individual actors undermining the effectiveness of global efforts.

Moving forward, the key research questions coming from this area include:

- Which international actors (public, private and Third Sector) are relevant stakeholders? Which institutions are best-placed to play a leading role?
- What are the different interests in play, and what are the prospects of potentially conflicting interests being reconciled?
- In what fora might global collective action be pursued?

- What form might such an agreement take? An international treaty? Some form of ‘softer’ global commitment?
- Is a new institution required specifically tasked with addressing the AMR challenge? If so, what can be learnt from previous attempts at institutional innovation within and beyond health?
- How does the contemporary ‘system’ of global health governance relate to other policy spheres, including agriculture and trade?

5. AMR and Global Health Security

In a clinical setting antimicrobials can be critical to people's health, and in some cases even to their survival. However, antimicrobials are also important for a number of other things. In many societies the ability to deploy antimicrobials is also essential for sustaining a much wider way of life – the way people live together in dense urban areas, the way that work patterns are organized, how children are educated in schools, how people travel internationally, and so forth. What would happen to those societies if they begin to lose the capability to control lethal microbes? The ramifications could potentially be severe, which is why some analysts are beginning to also draw links between AMR and security. The economic implications of AMR may be increasingly well modelled, but our understanding of the potential security vulnerabilities remains comparatively understudied.

In the United States, President Obama issued an executive order describing AMR as a national security priority (Obama 2014), and further research is now under way to probe the links between AMR and security (Builder 2015). In the United Kingdom, AMR has been incorporated into the 2015 National Risk Register making it a cross governmental responsibility (Cabinet Office 2015). AMR is also explicitly mentioned in the 2015 *National Security Strategy and Strategic Defence and Security Review*. The association between AMR and security raises a number of additional research questions about security and global health that continue to be vigorously debated in the discipline of International Relations (Elbe 2010; Rushton and Youde 2014).

One such set of questions revolves around identifying the most likely links between AMR and security. That is both an empirical and conceptual question. It is empirical in terms of tracing the complex and multifaceted use of antimicrobials in society, thus gaining a more nuanced understanding of the potential vulnerabilities associated with their demise. There is, however, also a closely associated conceptual question involved here in terms of the competing meanings of security that the problem of AMR touches upon. Indeed, there are currently many different concepts of security in circulation – like national security, human security, global health security, global security, international security and so forth. Analysing the potential security implications of AMR thus cuts across both empirical and conceptual issues.

A second set of questions arises around whether AMR should become 'securitized'. A number of global health issues have recently been framed as security threats – or 'securitized'. The United Nations Security Council, for example, designated HIV/AIDS as a threat to international peace and security in 2000 – thus setting an important precedent for framing international health issues as security challenges. Since that time other health-related threats – like pandemic flu – have similarly become perceived as security threats. More recently, the United Nations Security Council again designated the Ebola outbreak in West Africa as a threat to international peace and security. There is an extensive scholarly debate in the discipline of International Relations about the implication of securitizing health issues in this manner. Those debates revolve around the respective benefits, but also the possible drawbacks, associated with the use of security frameworks for responding to global health challenges (Elbe 2006; Davies 2008). Here there is an opportunity to explore the extent to which a security framework would likely help or hinder international efforts to respond to the challenge of AMR.

A third set of questions pertains to the new institutional architecture that has been erected by some states around the notion of global health security. There are now a number of institutions and initiatives dedicated specifically to addressing the links between global health and security. These range from comparatively small groupings such as the Global Health Security Initiative (GHSI), to much larger alliances like the Global Health Security Agenda, and the European Union's Health Security Committee. Such initiatives seek to coordinate international action on global health security challenges, share lessons on how to best respond, facilitate cooperation on surveillance (Elbe and Ostergard 2007; Wenham 2015), and so forth. Those processes are increasingly well studied, mapped and evaluated. Here there is an opportunity to explore how this institutionalized global health security architecture could also assist in addressing the challenge of AMR.

Moving forward, there are a number of research questions that recent efforts to frame AMR as a security issue provoke:

- How, if at all, does AMR touch upon issues of security?
- Which concepts of security are most relevant for understanding the threat posed by AMR?

- Would framing AMR as a security issue help or hinder international attempts to address the challenge of AMR?
- What lessons can be learned from previous ‘securitizations’ of health issues for how to best frame the challenge of AMR?
- How can the institutional architecture around global health security contribute to addressing the challenge of AMR?

6. States & Markets: Harnessing Public-Private Partnerships to Develop New Antimicrobials

Much can be done to conserve the proper working of existing antimicrobials. However, to some extent the emergence of anti-microbial resistance is also a natural phenomenon. In some instances, the eventual rise of antimicrobial resistance may even be inevitable. The development of new generations of antimicrobials will therefore need to form part of a comprehensive response. In most high-income economies the task of developing such new pharmaceuticals is today carried out by the private sector, which largely allocates resources according to commercial market logics. Unfortunately, there are a number of complex economic reasons that mean the development of new antimicrobials has not been a commercial priority for many large pharmaceutical companies. The question of how the commercial development of new antimicrobials can be better encouraged in future is therefore pivotal.

Public-private partnerships are one significant avenue for pursuing the development of new antimicrobials. They essentially enable the risks and/or costs (or indeed both) of pharmaceutical development to be shared. Many new public-private partnerships have already formed across an array of health (Mitchell 2008) as well as non-health issues (Roehrich, Lewis and George 2014). There is now a body of scholarship analysing and evaluating the workings of such public-partnerships in practice (e.g. Buse and Harmer 2004, 2007). That literature is contributing to a better understanding of the many kinds of partnership models that exist, and delineating the different things that private and public actors seek to gain from participation in such partnerships. It is also generating a better understanding of the conditions under which such partnerships can be successful, and where they tend not to be. Finally, the literature is beginning to explore the participating of new pharmaceutical and vaccine producers from low-income countries like India and China in such partnerships (Roemer-Mahler 2014). So far, however, that body of scholarship has not been systematically applied to the problem of AMR. There is thus an opportunity to explore the prospects of using public-private partnerships to accelerate the development of new antimicrobials in future, as well as considering their most appropriate design.

In addition to the literature on public-private partnerships more generally,

partnerships in the area of health security are particularly pertinent in the case of AMR. That is because health security is another key policy area where governments would urgently like to see the commercial development of new medicines, but where companies again view the financial incentives for pharmaceutical development as too weak. Very similar problems with weak commercial incentives for developing new medicines can thus be found in areas like pandemic preparedness, bioterrorism, and emerging infectious diseases (Roemer-Mahler and Elbe 2016). In all of these areas (though for different reasons) it is proving very challenging for large pharmaceutical companies to construct a viable business model around investment.

Here too there is an opportunity to learn from those health security initiatives to see what lessons might also be applied to the case of AMR. The United States government, for example, has constructed a new pharmaceutical regime for medical countermeasures over the past decade to facilitate new partnerships between the government and biotechnology companies (Elbe, Roemer-Mahler and Long 2015). That medical countermeasure enterprise has already seen the successful development of a number of new pharmaceutical products against bioterrorist and pandemic threats. There is thus scope to explore the extent to which lessons from this area of global health can also be applied to the area of AMR in future.

Moving forward, the key research questions coming from this area include:

- What are the key attributes of successful public-private partnerships?
- What have been the most successful public-private partnerships for developing pharmaceuticals in the area of global health security?
- What lessons can be learned from these partnerships to support such partnerships in the area of AMR?
- What lessons can be learned from AMR for the experience of the Biomedical Advanced Research and Development Authority (BARDA) in the United States?
- What scope is there for international cooperation in developing new antimicrobials?

7. AMR as a Multi-Scalar Issue

Although AMR is in many respects a global issue, it is perhaps best understood as a multi-scalar problem – with action needed at every level from the global down to the individual healthcare setting. IR has a contribution to make in addressing such multi-level issues, but has in general been weak in looking 'below' the level of the national state – opening up opportunities not only for IR to make a contribution to the study of AMR, but also for the study of AMR to make a reciprocal contribution to theorizing IR.

In terms of existing strengths, IR (as well as cognate disciplines such as International Law, as discussed in the literature review, above) has a long history of investigating and theorizing the likely determinants of national compliance with international law and other international agreements, although unresolved theoretical debates continue (Raustiala & Slaughter 2002). National-level factors which make individual states more or less likely to comply with their international commitments have been investigated through a variety of methodologies, from rational choice-based approaches (Guzman 2008), some of which have utilised formal game theoretical modelling that seek to determine when states are likely to see it as within their interests to comply (or, conversely, to 'cheat') (Trachtman and Norman 2005), through to social constructivist-inspired approaches that view states' interests as being socially constituted, opening up the possibility of those interests changing over time through states' interactions with other states (Simmons 1998). The latter approach has been particularly prevalent in studies of global health politics (but by no means universally adopted), although states are regularly seen to breach their international commitments in a range of cases. Such questions are crucial in the AMR case where the challenges relate not only to reconciling varying interests between international actors, but also to encouraging compliance with whatever commitments are made in the absence of the type of enforcement mechanisms that are found at the national levels and below.

Work in political science on multi-level governance arose primarily from scholars with an interest in the European Union and the potential effects of European law and integration on member states (Hooghe 1996). Over time, however, IR

scholars have begun to examine the potential for the concept of multi-level governance to shed light on the distributed authority that characterizes the international system, and on the complex forms of governance that are seen in practice in many policy fields, bringing in not only supranational organizations but also civil society (Welch & Kennedy-Pipe 2004; Zürn 2012).

Where IR has been less strong is in understanding the relationship between 'the global' and the sub-national levels, particularly down to the level of individuals. That is not to say that individuals have been entirely absent from IR research and theorizing (still less from political science more widely), but that the connections between levels have been generally under-explored. As relevant to the case of AMR, for example, there remains a limited understanding within IR of the ways in which individuals relate to these types of global challenges, and of how individual behaviours are conditioned by policy prescriptions coming from supra-national bodies.

Moving forward, the key research questions coming from this area include:

- What are the relationships between different 'levels', sites and forms of governance that are relevant to the AMR issue?
- How can compliance with international policy frameworks be encouraged?
- How do individuals view their own behaviour in relations to the 'global challenge' of AMR?

8. AMR, Ethics and Global Justice

Historically, IR as a discipline tended to focus on concepts and issues such as power and the use of force. However, more recent years have brought a reorientation of the discipline and a greater engagement with such issues as ethics and justice (Frost 1996). Particularly in the post-Cold War era, IR has been increasingly active in looking back to the history of political theory's attempts to grapple with such questions, and in attempting to apply some of those insights to the arena of international politics. As a result, energetic debates have arisen over issues such as the ethical use of force (seen in debates around just war, the responsibility to protect, and respect for international human rights instruments) and the democratization of the international system (seen in debates over UN reform, and the potential for global deliberative democracy). From these debates a series of issues open up over both the impact of global processes on individual human beings, but also the relationship of individuals to global action to tackle transnational threats.

IR's engagement with human rights, and with human rights abuses, for example has opened up an examination of the relationship between global level agreements (such as the Universal Declaration on Human Rights and the subsequent International Covenants) and the treatment of individuals within nation states, leading to a reconceptualization of sovereignty (most often captured in the 'Annan doctrine') in which the behaviour of governments in respect of their own citizens becomes a matter of international concern – a significant shift from historical understandings of 'Westphalian' sovereignty, and a shift that has underpinned significant recent developments including the development of the Responsibility to Protect (International Commission on Intervention and State Sovereignty 2001). Crucially, this also brings individuals within the purview of IR, and has led to attempts to understand the relationship between the global, national and individual levels (Foot 2000; Risse et al 1999), and how global norms and rules become localized within domestic political contexts (Acharya 2004). This has great significance for discussions of both 'bottom up' and 'top down' policy responses to AMR. For example, at the national level, scholars such as Enemark (2013) and Amon (2015) have looked at how national policy responses align with global human rights norms –

and have examined cases in which the treatment of individuals infected with MDR-TB in some cases falls foul of those global rules.

IR has, however, tended to pay less interest in the relationship between individual human beings and international-level agreements outside of the human rights field. Here again a potential comparison between AMR and climate change opens up, where behaviour change amongst individuals, as well as of health professionals, industry and governments, is required for effective solutions to be found. IR scholars have examined the negotiation (or, in some cases, failed negotiation) of a succession of global climate change agreements, but these are inter-governmental processes in which individual human beings seem remote, with research from sociology and elsewhere suggesting that individuals find it challenging to connect their own behaviours with these high-level processes. AMR could be a case with much to contribute to IR here, opening up an area for greater analysis of the relationship between individual behaviours and perceptions of global threat.

Importantly, as has been pointed out in some of the existing analyses of potential international agreements on AMR (Hoffman et al 2015a, 2015b), conservation via reducing the use of antimicrobials is only one aspect of the AMR problem: also pressing is the inability of much of the world's population to access antibiotics when needed, leading to high levels of morbidity and mortality from relatively easily curable conditions, particularly amongst the poorest communities. Issues of global justice are raised here – issues that have come to the fore in previous debates over access to medicines (most notably, around antiretroviral treatments for HIV/AIDS). Here IR's engagement with cosmopolitan political theory offers a number of avenues of potential research (Beardsworth 2013; Brown and Stoeva 2014).

Key questions arising from this area include:

- How can any future international agreements on AMR mitigation incorporate concerns for global justice?
- How might such concerns impact on international negotiations, in particular where the problems and interests of different states diverge?
- How can the interests of individuals – including from the Global South – be represented in global processes designed to address AMR.

- How can issues around access to AMRs be reconciled with the policy imperative of conserving the effectiveness of antimicrobials?
- How can security-driven responses to the AMR challenge (at all levels) avoid breaching ethical and human rights principles, especially in relation to patients who may come to be seen as a source of AMR threat?

9. Conclusions

IR's engagement with AMR has been comparatively limited to date. However, the situation is beginning to change. In fact, there are at least three reasons why the discipline is well positioned to help find solutions to this challenge in the future. First, there has been a growing interest in global health issues within the discipline. Global health politics has emerged as a significant sub-field or sub-discipline over the past decade. As we have seen above, this has produced an extensive array of scholarship on the international politics of health – much of which will also be of relevance specifically to the international politics of AMR. Secondly, and beyond its work focusing empirically on health, the discipline also has a much longer history of working with and through key concepts like 'power', 'interests', 'inequality', and 'justice'. Developing effective and sustainable policy responses, with wide buy-in from the international community, will require careful reflection on all of those issues as well. Finally, the traditionally porous boundaries of the discipline also mean it is historically accustomed to drawing upon a wide array of influences from other disciplines. IR can serve as a creative hub where different stands of thought converge in productive ways – giving rise to new perspectives and approaches to global issues. There is consequently considerable potential for IR scholarship to make a significant contribution to meeting the AMR challenge in the years ahead.

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