

“Securitization and Risk Management: The Global Fight Against Antimicrobial
Resistance”

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Presentado por:

Carlos Andrés Padrón barrios

Dirigido por:

Oscar Julián Palma Morales

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Securitization and Risk Management: The Global Fight Against Antimicrobial Resistance

Carlos Andrés Padrón Barrios

Abstract:

The widespread use of antibiotics as a weapon against microbial-driven disease has led to a world crisis of antimicrobial resistance, with consequences that could only be addressed in a global fashion due to its transnational extent. The international public health regime has made significant efforts to address the situation through a scheme that could be analyzed as a securitization process, identifying such resistance as a threat to international security under the scope of Human Security. Nevertheless, the recent increasing trends in pathogen resistance, as well as a slow pace in the development of new antibiotics prove these efforts to be failing. This paper intends to expose the disconnection between the efforts made by the regime and the worrying results in antimicrobial resistance trends. In order to do this, the text argues that the international process of securitization has failed to address the threat of Anti-Microbial Resistance as a security issue due to its absence of an appropriate risk management approach to implementation.

Key words: antimicrobial resistance; securitization; risk management; public health regime; Human Security.

Resumen:

El uso masivo de antibióticos como un arma frente a las enfermedades causadas por patógenos ha causado una crisis mundial de resistencia antimicrobial, con consecuencias que solo queden ser abordadas en un sentido global debido a su extensión transnacional. El régimen sanitario internacional ha hecho esfuerzos significativos para enfrentar la situación a través de un marco que puede ser comprendido como un proceso de securitización, identificando la resistencia como una amenaza a la seguridad internacional bajo el ámbito de la Seguridad Humana. Aun así, las tendencias crecientes en resistencia antimicrobial, así como el lento avance de en el desarrollo de nuevos tipos de antibióticos demuestran un evidente fallo de estos esfuerzos. Este texto pretende exponer la desconexión existente entre los esfuerzos hechos por el régimen sanitario y los resultados preocupantes en cuanto al preocupante patrón de resistencia. Con este objetivo, se argumentará que el proceso internacional de securitización ha fallado en el intento de resolver la amenaza de la resistencia antimicrobial como un problema de seguridad debido a la ausencia de métodos de implementación basados en la administración de riesgos.

Palabras clave: resistencia antimicrobial; securitización; administración de riesgos; régimen sanitario; Seguridad Humana.

“The cautious seldom err.”

-Confucius

Introduction

St. Mary’s Hospital, in London, witnessed the fortuitous but outstanding discovery of penicillin, when a piece of mould contaminated a petri dish in Alexander Fleming’s laboratory in 1928. Such a unique finding not only would improve our management of microbes as a species, but it drastically changed the human ability to address the threat of infection. Medicine as a science was a matter of diagnostics before antibiotics emerged as a solution, and soon just about every bacteria-related disease came to be administered through penicillin and the like.

Certain microbial strains had been at war with us from time immemorial, and entire communities and countries registered fewer deaths by war and crime than those of infectious disease. In these circumstances, antibiotics were our newest and most effective weapons against bacteria. The chance of eliminating the complete microbial population of certain dreadful strain in our organism meant a nuclear-like solution to a conspicuous menace to human health.

But warfare of any kind, even in the smallest scale, adapts to the tide of conflict. The response from our microbial foes rested on the most fundamental dynamic of life on earth: evolution. Random mutations and natural selection in the antibiotic battleground ensured that a small but ominous population of some bacterial infections would survive the treatment, with a proven resistance to our state-of-the-art weapons which made them futile as antimicrobial warfare. This phenomenon, driven by antibiotic use and mutation, is known as antimicrobial resistance (AMR).

Just as microbes responded with evolution, humans responded with science and technological advance. Since the discovery of penicillin, medical research has been in the non-stop development of new and more powerful antibiotics, stepping up the ever-growing threat of resistant bacteria. After Fleming’s achievement, many more powerful antibiotics were discovered, such as vancomycin, methicillin or erythromycin. However, the advance of

antimicrobial technology fails to keep the pace of bacterial mutation and development of resistance. The measures taken by the international public health regime (as the global governance scheme for health care will be identified), have not been effective. Even though multiple efforts have been recently made to address AMR at a structural level, the numbers are evidence of widespread failure.

This text seeks to consider the reasons behind the failure of the international public health regime in effectively managing the problem of Anti-Microbial resistance. First, it is necessary to establish the conceptual margins of the problem, while establishing a deeper understanding of the AMR conundrum. After describing the main subject, the objective is to characterize AMR both as a global threat and as a problem within the spectrum of international security. Such analysis will be framed through the recent advances in the broad sense of security pioneered by Barry Buzan and further developed by authors more related to the field of public health.

It is an unavoidable assumption, within the AMR dilemma to link its development to the establishment and due processes of the international public health regime, under the theoretical veil of global governance. However, bearing in mind the trends of AMR worldwide in the last years, it is at least inaccurate to consider such a regime's role as successful in the issue at hand.

Thus, the question is raised: why has the international public health regime failed to properly address the phenomenon of antimicrobial Resistance as a security issue?

To grasp this inquiry, it must be stated that the regime has developed what can be read as securitization. Within the international security threat assessment academic arena, securitization remains a standard model of action. Its process, specially carried out by political units, is often the prelude to extraordinary and specialized measures which seek to address the individual threat. These threats, within the scope of the Copenhagen School (led by Barry Buzan and Ole Wæver), are constructed collectively around a perceived subjectivity. Even though this paper's intention is not to take threats as given objective

phenomena, it should be stated that the widespread practice among the relevant actors in the international public health regime is to consider (quite explicitly) AMR as such.

Nevertheless, this paper argues that the international process of securitization has failed to address the threat of antimicrobial resistance as a security issue due to its absence of an appropriate risk management approach to implementation. Such hypothesis needs a proper definition of both the process of securitization in a public health-based approach and the risk management proposal.

A fundamental aspect to be analyzed is the disconnection between the securitization process based on a speech act, and the preventive nature of risk management as an implementation method against the issue of AMR. The theoretical and practical difference between these notions will be key to argue the structural failure of global governance efforts towards the mitigation of resistance.

As of the structural portion of the argument, it should be mentioned that the scope of the investigation is made on a global level. Due to the geographical extent of the biological issue at hand, and thanks to the availability of figures in a world-population basis, it is safe to say that AMR is an issue that can be analyzed in such fashion. The institutional efforts and discourse described in following sections consider the problem in a global manner, and the theoretical argument implies a world-level structural failure in addressing AMR. Few exceptions, such as the measures recently taken by the United Kingdom, will be helpful to diagnose the wider scale of the issue.

As of the structure of the argument, it will be divided in three main parts. Initially, AMR will be identified within the scope of Human Security, while identifying its main causes and consequences under the scope of healthcare. Such an assessment of Resistance will shed light on the evidence used to classify AMR as a threat to international security. Secondly, its identification as such a threat will be traced within the international public health regime through a process of securitization, based on the concepts provided by the Copenhagen School. Then, the risk management approach will be exposed as the appropriate method to implement the measures widely accepted as the solution to the growing trends in AMR. The

last section will present the argument that encompasses the main disconnection between the securitization process and the risk management implementation measures, thus explaining the inherent disconnection between the problem and the solution within the regime.

AMR within the scope of Human Security

A logical step in our analysis must be to locate the microbial arena under the spectrum of threats to international security, thus considering public health within the boundaries of security studies. In retrospective, such approach to a global concern would have been alienated to mainstream international relations before the ending of the Cold War, after the security studies opened themselves to non-military threats and the realm of low-politics merged into the stream of global governance (Lo Yuk-ping & Thomas, 2010). A wider range of threats to our species well-being were considered, while the concept of security broadened to encompass a conspicuous transition in the international system, masterfully described by Barry Buzan in his *New Patterns of Global Security in the twenty-first century* (Buzan, 1991).

In this context, a helpful concept to grasp the issue at hand would be that of Human Security. The emergence of the concept of Human Security is best represented in its institutional recognition in the 1994 Human Development Report published by the United Nations Development Program. On its second chapter, the report considers four main aspects that characterize a human approach to security: it is a universal concern, based on real threats in a wide range of intensity; its components are interdependent, where consequences are unlikely to be isolated or confined to national borders; it is easier to ensure through early prevention rather than later intervention; and it is people-centered, rather than the classical State-centered approach to security (United Nations Development Programme, 1994).

By all means, public health is a stellar concern of Human Security. The UNDP report explicitly mentions it, and a progressive construction of its theoretical basis within the joint fields of public health and international security between 1994 and 2005 established a widely recognized status for the idea of global health security (Weir, 2015). And in the realm of

public health, microbes have an undeniable leading role, as they both cause and catalyze widespread disease in their global and overwhelmingly populated capacity:

Whether naturally occurring or intentionally inflicted, microbial agents can cause illness, disability, and death in individuals while disrupting entire populations, economies, and governments. In the highly interconnected and readily traversed 'global village' of our time, one nation's problem soon becomes every nation's problem as geographical and political boundaries offer trivial impediments to such threats (Smolinski, Hamburg, & Lederberg, 2003)

Nevertheless, the focus of AMR lies not on the effect of certain microbes on human health, but on a reciprocal process of adaptation that aims to protect each side of this biological dyad from each other. Within the spectrum of international security, AMR is best described as a specific lack of human capacity to respond to every individual threat to public health.

The World Health Organization defines antimicrobial resistance as "(...) the ability of a microorganism (like bacteria, viruses, and some parasites) to stop an antimicrobial (such as antibiotics, antivirals and antimalarials) from working against it. As a result, standard treatments become ineffective, infections persist and may spread to others." (WHO, 2017).

Its practical effects on society are not negligible. This microbial ability renders most treatment useless, leading to consequences such as: causing the majority of 99,000 deaths/year from infections acquired in hospitals only in the United States (just one microbe, the methicillin-resistant *Staphylococcus aureus* or MRSA, kills more Americans per year than emphysema, HIV/AIDS, Parkinson's disease, and homicide combined), generating healthcare costs ranging from \$21 to 34 billion/year (Klevens RM, 2007); causing more than 51% of hospital infections in Peru and Bolivia (WHO, 2017); responsible for around 80,000 deaths per year in China and 25,000 in Europe (World Economic Forum, 2013) and a projection of about 10 million deaths worldwide along with a global GDP reduction of more than 100 trillion dollars (Taylor, et al., 2014).

The process and consequences of such a threat are contained within the non-traditional security challenges that globalization and the process of modernization develop in global affairs. The ease of travel and tourism, porous borders, legal and illegal immigration and a

wide arrange of regulations in an all-encompassing public health system set the stage for microbe proliferation and the internationalization of national biological security threats.

Transcontinental contagion could almost be considered a natural consequence of human interaction. Hence, considering the spread of bacteria throughout the international arena as a threat is hardly an innovative concept. Even though asserting that globalization has accelerated or catalyzed such phenomena is most likely accurate, the worrying feature of AMR as an international issue is not the worldwide proliferation of disease itself, but the fact that the broad transnational use of antimicrobials is the drive of such a problem. The cooperative capacity of all actors in the Global Health Regime is the vector¹ for AMR advance.

Perhaps the case of cephalosporin-resistant gonorrhea can be illustrative of this feature. Cephalosporins are one type of antimicrobial drug. They are a naturally-originated kind of antibiotic, under the Beta-Lactam classification, which means that, just as penicillin, its modus operandi involves inhibiting the biosynthesis of the bacterial cell wall (Mehta & Sharma, 2016). Certain generations of this antibiotic have been frequently used to treat a long-time foe of ours: *Neisseria gonorrhoeae*, a very common sexually-transmitted infection that can increase the risk of acquiring or transmitting HIV. Gonorrhea is responsible for at least 78 million infections worldwide every year (World Health Organization, 2016), generating significant socioeconomic consequences in public health management.

This pathogen has managed to develop resistance to nearly all antimicrobials used to treat the disease since the 1930s, and until recently, the only last-resort treatment that remained effective was the use of extended-spectrum cephalosporins (ESCs), an advanced and powerful generation of the antimicrobial (Unemo, 2015). However, in mid-2017, the World Health Organization reported not only a worrying rise in drug-resistant gonorrhea, but an emergence of cephalosporin-resistant *Neisseria gonorrhoeae*, reported 51 countries by the WHO Global Gonococcal Antimicrobial Surveillance Programme (Wi, et al., 2017), which analyzed 77 States in total.

¹ A vector in biology is defined as an organism that is responsible for the transmission of disease.

In the study, almost every region involved (Africa, Americas, Europe, Southeast Asia and Western Pacific) reported evidence at some level of ESC resistant gonorrhea (Wi, et al., 2017). These figures are highly concerning to public health, bearing in mind that 3rd generation cephalosporin-resistant *Neisseria gonorrhoeae* is within the Global Priority List of 12 bacteria that pose the greatest risk to human health, according to the World Health Organization (World Health Organization, 2017). The increased resistance demonstrated by gonorrhea drives it closer to becoming an untreatable disease.

At this point, it is relevant to clarify that gonorrhea is not a new threat to public health. The disease is nowhere near newly-discovered, nor is it enclosed to a single region. Leviticus, a book contained both in the Bible and the Torah, hints on its effects as a sexually transmitted disease, and it has been on governmental public health agenda for long time. Nevertheless, the recent threat to public health comes from its antimicrobial resistant feature, which has come not from a spontaneous gonorrhea epidemic, but from the widespread (and often irresponsible)² use of cephalosporins. The common factor for all regions and countries reported by WHO is the ESC treatment, and the measures taken to treat the once susceptible bacteria. The threat to international security from cephalosporin-resistant gonorrhea comes from our globally coordinated failure to use our antimicrobial weaponry against an already widespread disease.

AMR Securitization process

The figures mentioned in the last section arise from patterns in the institutional attention given to AMR. As a public health concern, it has been known almost as long as there have been antibiotics. Back in 1945, in his Nobel Laureate lecture on penicillin, Alexander Fleming warned the scientific community on the possibility of resistance:

The time may come when penicillin can be bought by anyone in the shops. Then there is the danger that the ignorant man may easily underdose himself and by exposing

² An irresponsible use of antimicrobials could involve either unnecessary (applying a drug where there is no diagnosed necessity for its use) or inaccurate use (using the wrong quantity or type of antimicrobial).

his microbes to non-lethal quantities of the drug make them resistant. Here is a hypothetical illustration. Mr. X. has a sore throat. He buys some penicillin and gives himself, not enough to kill the streptococci but enough to educate them to resist penicillin. He then infects his wife. Mrs. X gets pneumonia and is treated with penicillin. As the streptococci are now resistant to penicillin the treatment fails. Mrs. X dies. Who is primarily responsible for Mrs. X's death? Why Mr. X whose negligent use of penicillin changed the nature of the microbe. Moral: If you use penicillin, use enough. (Fleming, 1945).

Even so, it was seen then as an individual concern, rather than a threat to international security.

The Copenhagen School of security studies identified certain common phases to securitization, that is, the process by which a threat is elevated in the scheme of the security agenda, effectively identifying it as such. In the international arena, thus, the first phase requires an actor to identify an existential threat to their existence, in a declaratory nature generally considered as a speech act. Subsequently, the act must be accepted by the targeted audience, convinced of its existential threat potential. The third phase encompasses a response to such a threat, embodied in an extra-ordinary, extra-budgetary reallocation of resources. The final phase represents a process of de-securitization that involves either a solution for the problem or a reallocation of the issue to the general policy environment, essentially turning back to earlier priorities in terms of resources (Buzan, Wæver, & De Wilde, 1998) (Lo Yuk-ping & Thomas, 2010).

Even though the Copenhagen School wasn't specifically focused on public health, the process of securitization is not far from the specific dynamics of this scheme. As far as Thucydides' opus, issues such as widespread disease have been elevated to the political agenda through speech acts in the name of security. In *History of the Peloponnesian War*, the Greek historian narrated the breakout of a deadly disease called The Plague of Athens in the second year of the war. Confronted by an assembly of angry Athenians, Pericles (Athenian General and, in this case, the actor responsible for both the identification of the treat and the formulation of extra-ordinary measures) expressed:

... For before what is sudden, unexpected, and least within calculation, the spirit quails; and putting all else aside, **the plague has certainly been an emergency of this kind.**

Born, however, as you are, citizens of a great state, and brought up, as you have been, with habits equal to your birth, you should be ready to face the greatest disasters and still to keep unimpaired the lustre of your name. For the judgment of mankind is as relentless to the weakness that falls short of a recognized renown, as it is jealous of the arrogance that aspires higher than its due. **Cease then to grieve for your private afflictions, and address yourselves instead to the safety of the commonwealth.** (Thucydides, trans. 1974)

However, identifying a public health threat as a relevant issue in the scope of international security has only taken shape within the international system as late as the ending of the Cold War. Issues such as widespread disease and pandemics became part of the international security agenda only when such agenda was broadened. Even though every country carried out a specific approach towards public health issues, international public health affairs have been most clearly securitized from an institutional perspective, bearing in mind the triviality that borders represent to pathogens.

The key role, thus, of identifying threats in the realm of international public health, would fall on its international regime. This would be the referential institutional point from which securitization processes and general action on issues must be analyzed. To comprehend the extent and framework of this standpoint, Stephen D. Krasner's definition of a regime should provide conceptual clarity. In his words, regimes "(...) can be defined as sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations." (Krasner, 1982). Such a framework in the public health realm is often dated back to the port regulations raised during the Bubonic Plague in the XIV century, and its evolution has been shaped both by scientific breakthroughs (such as the discovery of anti-microbials) and by structural milestones in the international system (such as the ratification of the World Health Organization constitution).

Needless to say, the public health regime (PHR) hasn't been impervious to the issue of AMR, and just as the major challenges in the global health governance arena, its assessment has been done in an institutional perspective due to its widely transnational attributes. Even though it has been a problem all along, its identification as a threat to international security can be best illustrated in the process of securitization carried out since early 2000s. In this regard, the most outstanding speech act that triggered the securitization of AMR must be the

United Nations' 2004 Report of the Secretary-General's High-Level Panel on Threats, Challenges and Change (HPTCC), titled *A more secure world: Our shared responsibility*.

The report's goal was to put forward "(...) a new vision of collective security, one that addresses all of the major threats to international peace and security felt around the world" (HPTCC, 2004), and on its second part, focused on collective security and prevention, it clearly classifies "(...) the spread of resistance to a growing number of mainstay antibiotic drugs" (HPTCC, 2004) as one of the threats that may lead to large-scale death or lessening of life chances, undermining States as the basic unit of the international system.

Such a threat identification was both preceded and echoed by numerous calls to action by United Nations' specialized bodies to address the issue, bearing the World Health Organization (WHO) as the main responsible for these affairs, due to their technical nature.

In this context, the WHO's main decision-making body, the World Health Assembly, has played a fundamental role in the identification of threats to what it considers 'Global health security'. Its resolutions have become more salient on the AMR issue since its landmark document from the fifty-first session: *Emerging and other communicable diseases: antimicrobial resistance* (Resolution WHA51.17, 16 May 1998). The resolution expresses concern about the emergence and spread of human pathogens resistant to available antibiotics, and states its awareness of the increasing trend in AMR (Fifty-first World Health Assembly, 1998). Its operative section, calls Member States on the urgency of the threat, and requests the Director-General of the Organization to implement some measures to support States.

Subsequent resolutions from the Assembly, such as *Global health security: epidemic alert and response* (WHA54.14, 21 May 2001), *Improving the containment of antimicrobial resistance* (WHA58.27, 25 May 2005) and *Antimicrobial resistance* (WHA67.25, 24 May 2014), call for awareness and action regarding the problem of AMR. These documents, approved by an intergovernmental assembly, should also be recognized as part of the speech act that intends to securitize our war against microbe evolution.

In 2011, the WHO, on the occasion of the World Health Day, introduced the Policy Package to Combat Antimicrobial Resistance, essentially describing the appropriate measures States have to engage in order to successfully tackle AMR as a global threat. Its policy recommendations were composed by six cluster strategies that should be appropriated by national governments and public health actors in the international arena: commit to a comprehensive, financed national plan with accountability and civil society engagement; strengthen surveillance and laboratory capacity; ensure uninterrupted access to essential medicines of assured quality; regulate and promote rational use of medicines, including in animal husbandry, and ensure proper patient care; enhance infection prevention and control; and foster innovations and research & development for new tools (World Health Organization, 2011).

Institutional efforts towards the mitigation of AMR carried on, seeking both the reduction of the rising trend in bacterial resistance and the improvement of current antimicrobials, hopefully by discovering more of them. The problem, so to say, was thus addressed. In order to generate enough momentum for the effective solution to the menacing trend, the target audience -that is, States and their policy makers in the international system- had to accept the identification of the threat and comply to the extraordinary measures.

Despite the measures recommended by the action plan and the conspicuous awareness of the PHR on the issue, progress has not been evident in the global trend of AMR. WHO figures, as well as US-based Center for Disease Control and Prevention (CDC), and several independent studies, all show an overall increasing trend in the mayor antibiotic-resistant strains.

As a matter of fact, the scientific community has classified AMR not only as a growing trend, but as a global threat (Roca, et al., 2015; Builder, 2014; Dubourg, Abat, & Raoult, 2017; Ferri, Ranucci, Romagnoli, & Giaccone, 2017) and even an all-out crisis (Ventola, 2015; Rossolini, Arena, Pecile, & Pollini, 2014; Institute of Medicine of the National Academies, 2010) in the health care sector.

At this point, it should be mentioned that one of the elements of the AMR crisis is the overarching void of new types of antibiotics. Even though a catalyzer of the issue is the overuse of antibiotics in public health, agriculture and other instances, the discovery of new classes of antimicrobials would certainly give us advantage to fight back against microbial evolution. Albeit several measures should be taken into account, a proliferation of new types of antibiotics (and their due usage) is a must in order to not only halt but also reverse the growing trend in AMR.

In contrast with the growing trend in antimicrobial resistant pathogens worldwide, the development of new types of antibiotic for widespread use is in a worrying status: there is a discovery void, in which no new major types of antibiotics have been developed since 1987, when the synthetic Oxazolidinones antibacterial was discovered³ (Slee, et al., 1987; WHO, 2015).

Another worrying trend would be that of the reduction of the gap between antibiotic discovery and the identification of a pathogen with resistance to such antibiotic. Penicillin, first discovered in 1928, developed penicillin-resistant *Staphylococcus* in 1940 (even before its commercial introduction in 1943); tetracycline, introduced in 1950, developed the tetracycline-resistant *Shigella* in 1959; erythromycin, introduced in 1953, found its nemesis in 1968, with erythromycin-resistant *Streptococcus*; methicillin, first introduced in 1960 developed resistance only 2 years later, when methicillin-resistant *Staphylococcus* first appeared; the powerful vancomycin, introduced in 1972, had vancomycin-resistant *Enterococcus* discovered in 1988; levofloxacin, a kind of fluoroquinolone, encountered resistance on the same year of its introduction, in 1996; linezolid, introduced in 2000 under the new oxazolidinones type, found resistance in 2001; ceftaroline, one of our only weapons against MRSA, found its corresponding ceftaroline-resistant *Staphylococcus* in 2011, only one year after its introduction (Ventola, 2015).

In 2014, an analysis of these trends' projection towards 2050 was made by RAND Europe and KPMG LLP, under the commission of United Kingdom's Independent Review on

³ Even though a new type, Teixobactin, was discovered in 2016, its development is still under research, and hasn't been approved for widespread use as of December 2017.

Antimicrobial Resistance. The methods for this examination were based on a theoretical dynamic general equilibrium model, exploring different global scenarios for AMR and their effects on global mortality and economy. The findings were staggering:

(..) we estimate that failing to tackle AMR will mean that the world population by 2050 will be between 11 million and 444 million lower than it would otherwise be in the absence of AMR. The lower bound is a result of a scenario where resistance rates have been successfully kept at a relatively low rate while the upper bound reflects a scenario for a world with no effective antimicrobial drugs. (Taylor, et al., 2014)

Moreover, according to the results, the world Gross Domestic Product would suffer a cumulative loss that ranges between \$2.1 trillion and \$124.5 trillion. It should be stressed that these figures are restricted to three hospital-acquired infections (*Escherichia coli*, *Klebsiella pneumoniae* and *Staphylococcus aureus*) and three infectious diseases (HIV, Tuberculosis and Malaria), not considering several other pathogens and new strains that may sprout in the near future.

The Risk Management approach

The global trends mentioned, the extension in AMR strains, the rise in AMR-related mortality rates and the shrunken development of new types of drugs demonstrate the structural failure of the implementation of the measures contained in AMR securitization within the PHR. Global Health Governance, and more specifically, the institutional framework around antimicrobial affairs have not yielded sufficient results to halt the current crisis, let alone reversing it. In the international security scheme grounded on the securitization process carried out by the aforementioned actors, the human-microbe war at the evolutionary level is far from being properly de-securitized due to its solution.

The international system, thus, is set to linger ever closer to the post-antibiotic world, a scenario that is suitable for dystopian-future-based science fiction narratives. The estimates vary, but there is a general consensus that the AMR global trend is set to worsen if not properly tackled. However, the ‘properly tackled’ portion of the recipe, unlike several other

unsolved securitized threats (such as terrorism, nuclear weapons or the war against drugs) is not a widely debated notion.

Appropriate measures to tackle AMR are as available as WHO, CDC and scientific community reports and policy briefs. World Health Assembly resolutions provide accurate action plans (including the Global Action Plan) that should encompass a basis for international regulation.

Implementation, however, is a much more complex issue. AMR policy recommendations, which are condensed in the Global Action Plan, are based on three main strands of action: contain current infections, ensure appropriate use of current antimicrobials in all fields and improve research & innovation of new drugs. The first strand, based on containment, is mainly focused on the improvement of sanitary conditions worldwide for the purpose of reducing contagion and infection of the deadliest pathogens, such as HIV, Tuberculosis, *Escherichia coli* or *Klebsiella pneumoniae*; the second strand, based on the appropriate use of existing drugs, is focused on awareness, prevention, resilience, surveillance and regulation in the widespread use of antibiotics, mainly in healthcare and agriculture.

Finally, the last strand's goal is to end the antibiotic void and proliferate the discovery of new antibiotics. This notion shouldn't be interpreted as increasing the use of antibiotics in general, due to the positive correlation between antibiotic use and AMR. However, increasing the amount of existing types of antimicrobials should provide variety to the weaponry used against pathogens, generating an environment for them that hinders adaptation, and thus, resistance.

Due to the nature of evolution, however, antimicrobial resistance is not a threat that can be plausibly eliminated altogether. Bacteria have acquired resistance long before antibiotics existed, and our antimicrobial input has only catalyzed the process. Is securitization, then, the appropriate process of threat assessment? Is the process of threat identification enough for the capable actors to engage on 'properly tackling' the AMR conundrum? The Copenhagen School had a broad-spectrum approach to international security, but the

analysis made by more specialized scholars have proven to cast doubt on the effectiveness of securitization in public health affairs:

However, what the Copenhagen School does not address is the politics of a disease threat. In conceptualizing a rational-actor model—where policy-makers logically respond to threats because they threaten human existence—the securitization model ignores real-world situations where, for domestic reasons, securitizing actors can deliberately choose not to securitize an existential health threat or may securitize the threat via a speech act but choose not to allocate emergency resources to resolve it. The model—located within a state structure—is also vague as to how it can be applied in international organizations or across state borders. In identifying and resolving health threats, understanding the implications of these political distortions on emergency responses is critical. (Lo Yuk-ping & Thomas, 2010)

The consequences and processes within securitization in the public health regime represent a conundrum in the context of international security. Civil-society-dependent dynamics, geographical and environmental elements, institutional structures and non-human biological processes establish a complex stage for politics and threat assessment.

Jeremy Youde and Simon Roushton⁴, editors of the Routledge Handbook of Global Health Security, expressed about the concept of securitization in the grounds of the PHR that, even though some scholars see the general securitization of health as having the potential to improve awareness and response by bringing attention to certain issues,

(...) others have been concerned that linking health and security could bring negative side effects. It could promote anti-democratic responses to health challenges, it might lead to attacks on the human rights and civil liberties of individuals suffering from a particular disease, or it might distort the global health agenda in inequitable ways. (Youde & Rushton, 2015)

In this sense, even though there is little debate on which should be the specific policies and regulations carried out by stakeholders, there is a serious debate on how should the relevant

⁴ Simon Rushton is a Faculty Research Fellow in the Department of Politics at the University of Sheffield, UK. He is editor of the journal *Medicine, Conflict & Survival* and an Associate Fellow of the Centre on Global Health Security at the Royal Institute of International Affairs, Chatham House.

Jeremy Youde is an associate professor of political science at the University of Minnesota Duluth, USA. He is author of three books on global health issues and on the editorial board of the journal *Global Health Governance*.

actors engage on implementing the threat assessment, in order to maximize results and avoid the distortion of the global health agenda.

It should be noted, that the measures recommended by the relevant institutions have indeed proven certain results where properly applied. Even though the global trend carries little optimism, some specific cases demonstrate that the three strands of action, incorporated in national regulations and public health campaigns, can result in a stabilization in the AMR trend.

For example, in the United Kingdom, public health services declared a MRSA epidemic in the late 80's and in the 90's. The challenge proved to be capable of collapsing much of the healthcare institutions in the country, bearing in mind the fact that *Staphylococcus aureus* has been long recognized as a main cause of healthcare and hospital-associated infections worldwide. The situation caused such public media attention due to its high mortality rate that control of MRSA became a political priority.

On March 1998, two months before the landmark fifty-first session of the World Health Assembly, the House of Lords Select Committee on Science and Technology report 'Resistance to antibiotics and other antimicrobial agents', commissioned the NHS to set MRSA controlling targets through hospital management practice and resource redirection. This State-sanctioned initiative was followed by several others in the following years, generating survey infection control teams, antimicrobial resistance national action plans, performance standards, systematic reviews, outcome-based cleanliness standards, mandatory minimum datasets and resource allocation towards clinical pharmacy initiatives around antimicrobial prescribing. As a result, the number of MRSA blood stream infections reported in England dramatically reduced from ~5500 cases per year in 2003, to less than 1000 in 2012 (Duerden, Fry, Johnson, & Wilcox, 2015).

These measures, as well as the policy recommendations made by WHO, are based on risk management processes that aim to prevent and control, rather than search and destroy. In the 1980's epidemic MRSA outbreak, the initial strategy of hospitals in England was this 'search

and destroy’ approach: patient isolation, staff and patient screening and decolonization⁵ treatment. As a matter of fact, UK institutions started their improvement in the AMR issue by abandoning ‘search and destroy’ measures and improving risk management practices.

The concept of risk management will be very useful to comprehend the failure of the PHR failure in addressing AMR through securitization. Nevertheless, it is not common in international security studies concept, most notably because risk management is more frequently used in healthcare and other disciplines.

Fiona Moss, consultant physician at Central Middlesex Hospital, defined risk management as a set of programs aimed at “reducing the likelihood of errors that are costly in terms of damage (...) through detecting, reporting, and correcting actual or potential deficiencies in the process of care that, however small, could lead to a significant and costly mistake” (Moss, 1995). These methods appropriately encompass the policies recommended to tackle AMR at a public health level, due to the containment, prevention and resilience scope that they entail. It is safe to say that, according to Flemings’ lecture, a proliferation of costly errors in prevention on the antibiotic assessment process is responsible of the overuse in antibiotics, which gave microbes an evolutive advantage.

It is on that culture of prevention that the securitization initiatives fail. Even though attention has been given to the AMR conundrum, just as securitization processes intend, there is not a proper implementation of the preventive measures because securitization is not fundamentally made on the basis on prevention, but rather on a ‘search and destroy’ dynamic. Basically, securitization entails a reactive strategy, while AMR desperately calls for preventive practices and resilience-building risk management methods.

Elizabeth Wishnick⁶, analyzing the SARS and avian influenza outbreaks in China and State response, contrasts both methods (securitization and risk management) in order to assess the failure of the Chinese strategy in certain aspects of the public health crisis. Her findings conclude that the “reactive mobilization involved in securitizing a disease runs counter to

⁵ In healthcare, decolonization is the process of eradicating or reducing asymptomatic carriage of a pathogen.

⁶ Associate Professor of Political Science, Montclair State University, New Jersey.

the preventive risk management strategy that is required to address infectious diseases” (Wishnick, 2010). The author goes to the extent of arguing that, due to their incompatibility, when securitization has occurred, risk management has failed.

Securitization has failed, then, because it intends to ‘search and destroy’ a threat that, by nature, can only be prevented and controlled. The speech acts carried out by the main institutions in the PHR are able to complete the identification portion of the securitization process, but it has not been able to develop effective structural extra-ordinary measures because AMR policies should not be extra-ordinary, but ordinary in nature: controlling and developing surveillance in existing practices.

Even though WHO strands of action are highly related to the risk management approach, their institutional methods do not replicate discourse onto national regulations. Thus, the structural issue is maintained, and a lot is said but not done.

A counterargument to this notion could be made by illustrating the idea that the WHO, in its leading role on Global Health Governance, has no direct or binding ability in national regulations worldwide. Thus, the issue would be reduced to a lack of capacity, or even to an argument for the inexistence of PHR’s legal extent.

This argument, however, would be limited by the fact that, even though World Health Assembly resolutions are not legally binding, the WHO does have an ace under the sleeve (Fidler & Gostin, 2006). The International Health Regulations (IHR) are an international legal instrument that aim to prevent and respond to acute public health risks that have cross-border potential and represent global threats. These Regulations are binding on 196 countries, including all the Member States of WHO. First adopted in 1969, they were amended in 1973 and 1981 and only focused on addressing a handful of diseases, but in 2005 they elevated their purpose and scope “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.” (World Health Organization, 2005).

However, even though their regulations try to encompass several global health threats, and its method of action is close to that of risk management, its focus is more related to the expansion of communicable disease than the ability of their pathogens to develop resistance. It should not come as a surprise, then, that the Regulations in their latest edition were motivated by the 2003 Severe Acute Respiratory Syndrome global outbreak (Fidler & Gostin, 2006). Hence, its scope -while wide and apparently comprehensive- is based on the spread of epidemics in an international basis.

An emphasis on epidemics, in the scheme of AMR, has a fundamental flaw when it comes to risk management implementation: measures are focused on symptoms, not causes. The first Annex in the 2005 Regulations illustrate the algorithm that would determine the mandatory methods to activate surveillance systems. It covers the most severe communicable diseases, including smallpox, poliomyelitis, human influenza, SARS, Cholera, Pneumonic plague, yellow fever, Ebola, West Nile fever and even regionally-based concerns, but when it comes to other risks to public health, the process relies on an event-based approach. The approach basically goes like this: if there is any event of potential international public health concern, States should evaluate if its impact is serious, if it is unusual or unexpected, if there is significant risk of international spread, and if it represents a significant risk for international travel or trade. If these inquiries follow an affirmative pattern, the event shall be notified to WHO under the Regulations.

In this scheme, antibiotic resistance would be placed under the ‘has the event the potential to have a high public health impact?’ portion of the algorithm (World Health Organization, 2005), which perfectly illustrates the inherent flaw of such a mechanism in the risk management arena, because while recognizing AMR as a threat, it only triggers action and surveillance on a high-impact event basis. Thus, the specific methods of the Regulations to address AMR as a global threat are, again, based on a reactive mobilization ‘search and destroy’ approach appropriate for a securitization process, but failing to engage on risk management measures based on prevention.

Due to the context of their formulation, of course, the Regulations are reactive in nature. They are designed to respond to epidemics and widespread disease, in a way that shouldn’t

be harmful for trade and travel. Their criteria are based on the unexpectedness of pandemics in the international context. Nevertheless, AMR is not an unexpected or unusual issue. Even more, resistance is more than expected in microbes after a while: the antibiotic introduction versus acquired resistance trend proves it. Whenever a high public health impact event produced by AMR is detected, a mistake has already been made, either by misuse, overuse, lack of information, reckless prescription or ingestion. This proves the reactive approach as defective in addressing resistance, only dealing with consequences rather than the core causes of the crisis.

This inherent flaw in the Regulations, thus, mean that while possessing a broadly accepted and legally binding instrument for State-level implementation of public health risk measures, the WHO, in its capacity as leading institution in the PHR, fails to connect its securitizing speech act with befitting risk management measures on the ground. This is the core failure of the institutional failure to structurally address AMR at a global level. The solution, then, depends on individual State initiatives hopefully based on expert-based measures and depending on non-binding recommendations through mere political will and private sector initiatives.

It should be stated, however, that even though the failure in the implementation process regarding the AMR issue is based on a securitization strategy without a risk management approach, this paper does not necessarily imply that securitization is an immediate cause of risk management denial. They are inherently different, but evidence does not suggest they are irreparably incompatible. Maybe their interaction is closer to health care, in the sense that both causes and consequences could be simultaneously addressed just as disease and symptoms can be medicated in tandem.

Conclusion

The regime-based solution to antimicrobial resistance is then flawed due to its method of political implementation in the international security field, not necessarily for considering it a threat, but because it tries to securitize what can only be prevented, not destroyed. A lack

of risk management in addressing AMR has led to under-regulated use of antibiotics and their extensive and intensive use not only in healthcare but in agriculture and industrial production. By enabling this mistake-prone environment, we have set the battlefield for microbial victory.

Yet, the issue is not that of a lack of capacity. International institutions in the PHR have previously demonstrated success in addressing several global health threats. The WHO response in the 2014 Ebola crisis in West Africa proved the supranational capacity of institutions to appropriately respond to deadly sprouts of disease, learning from mistakes and even motivating scientific innovation through the discovery of new vaccines (Callaway, 2015). However, its preventive capacity is still questioned. The institutional role of WHO in the PHR is fundamental in the consolidation of risk-management-based policies in global health governance, and their adaptation to real risks and global threats.

Just as the Copenhagen School, international regulations have not yet successfully incorporated the international security perspective into threats to global health, and the failure of the securitization process in AMR is proof of such a void. The academic debate over the securitization of health is thus valid, and both international security studies and PHR stakeholders should engage in a culture of risk management in threat assessment. Political environments widely vary between the international security and health care arenas, but perhaps other disciplines could enhance their analysis and implementation of measures from risk management methods. Too often the role of mistakes is underestimated in international politics and security studies.

The world is at a critical point in which a post-antibiotic era could be avoided by mitigating the rate at which microbes generate resistance. In 2015, a group of scientists discovered Teixobactin, a new type of antibiotic that brings hope to our war against AMR. Still under research, the new antimicrobial could generate a conspicuous advantage against *Staphylococcus aureus* and *Mycobacterium tuberculosis*, both deadly weapons from the microbial perspective (Piddock, 2015). Even though it is still in development, such initiatives must encourage the human species to engage in wider caution. More types of antibiotics will be useless if misuse and overuse are perpetuated further.

Much is still yet to be learned in the complex scheme of antimicrobial resistance. Both in the biological scope and in the realm of policy, the PHR is still learning from experimentation, analysis and mistakes. It is relevant to mention that these sort of contemporary issues, currently being studied in the realm of international relations, are scarcely considered in Colombian academia. Global health security is young in the scheme of security studies, but its reciprocal contribution to health care is of the utmost importance for the due development of the regime in a context where health is not only about health care, just as security is no longer just about its traditional sense.

Many questions still arise from the considerations in this text. For example, the role of political motivations in the implementation of PHR measures could be an interesting starting point to comprehend the overall performance of the regime in terms of threat assessment. How intensive is the role of State sovereignty in the regulation of public health? Which interests obstruct the way of supranational regulation of health affairs for the AMR threat? Where do sovereign States draw the line in terms of data surveillance for the prevention of threats? The securitization of health brings several questions to the public health arena that would indeed enrich the global health governance debate mentioned by Youde and Rushton. Further research on this issue would be necessary to strengthen the bond between international security studies and public health. Hopefully, this interdisciplinary expansion would shed light in many more intriguing failures and crisis in the international system, in order to find the disconnection between speech and action in the most pressing issues of the XXI century.

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