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The Silenced Pandemic? Reconstructing History and Spatiality of EU's Biopolitics on Antimicrobial Resistance.

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Content

1 Introduction

1.1 Cross-border enzymatic hazards: Outline of the project[1]

In 1910, Paul Ehrlich and Sahachiro Hata discovered the anti-syphilitic effect of Salvarsan (arsphenamine), that led to race for new drugs against old diseases (Kirchhelle 2020:20). Alexander Fleming's discovery of the antibacterial effect of penicillium (Fleming 1929) and the subsequent introduction of marketized antibiotics in the early 1940s (e.g., Coates, Halls and Hu 2011) has not only revolutionized the treatment of a broad number of otherwise often deadly infections such as tuberculosis, it has also enabled cancer therapies and made operations safer. Moreover, it fundamentally changed modern agriculture and made mass meat production possible by preventing animal diseases and, then, unexpectedly, by accelerating the fattening process and extending the shelf life of meat (Dibner and Richards 2005). However, the overuse of this group of "magic bullets" (Kirchhelle 2020:20) has led to a severe health crisis that numerous health organizations today identify as a major global threat: the increasing and accelerating development of resistances of bacteria against the mode of action of antibiotics. Antibiotics are substances that deactivate certain targets, i.e. bacteria by, inter alia, inhibiting protein synthesis, alteration of cell wall synthesis, interference with DNA and disruption of the integrity of cell membranes (see Vikesland et al. 2019). Modes of resistances, in turn, range from alterations of cell membranes to mechanism that keep antibiotic concentration below inhibitory level (ibid.). The term antimicrobial resistance (AMR) refers to properties of microorganisms that disable the mechanism of action of antibiotic drugs by producing certain enzymes. Even though knowledge of resistances has rapidly grown during the last decade, Fleming had already observed that the antibiotic he detected tended to lose its efficacy over time (Williamson 2018).

Today, antibiotic resistances are predicted to become one of the most important causes of death[2], thus, are increasingly seen as a biopolitical threat to human health. Moreover, the World Health Organization has begun referring to this specter as of "the next pandemic". Building on the very same vocabulary, the World Economic Forum stated that antimicrobial resistances have become a "bigger killer than HIV/Aids and malaria"[3]. And finally, McKinsey, a well-known global management consulting firm, argues that COVID-19 was far from the last pandemic and, hence, a re-imagination of public healthcare systems is needed to prepare for the next[4]. Also, beyond this narrowly economic framing, antimicrobial resistance is also widely perceived through a rather dystopian imaginary of a future without antibiotics and characterized by the proliferation of untreatable superbugs. As the narrative goes, this silent pandemic will catapult humanity back into premodern times. With the coming of widespread AMR, modernity's promissory progress comes to an end (Brown and Nettleton 2017).

This Working Paper contributes to an interdisciplinary body of research on spatializations under the global condition. It is based on the assumption that since roughly the middle of the 19th century, global interconnectedness has proceeded to such a point that we cannot conceivably return to a segmented mode of living. This global condition is both structured by agents, processes and institutions and has itself structuring capacities insofar as agents, processes and institutions are constantly challenged to deal with it.

The project investigates which spatializations play a role in the development and implementation of strategies to combat antimicrobial resistance (AMR) *as a global threat to humanity in the 21st century*. It is based on the observation that awareness of *risks and* dangers resulting from the emergence

1 Tom Schwarzenberg contributed to the project outline.

2 https://www.rki.de/EN/Content/infections/antibiotic/brochure_IHME_RKI.pdf, 28.01.2023.

3 https://www.weforum.org/agenda/2022/11/antimicrobial-resistance-week-the-silent-pandemic-solutions/, 24.01.2023

4 https://www.mckinsey.com/industries/public-and-social-sector/our-insights/not-the-last-pandemic-investing-now-to-reimagine-public-health-systems, 24.01.2023.

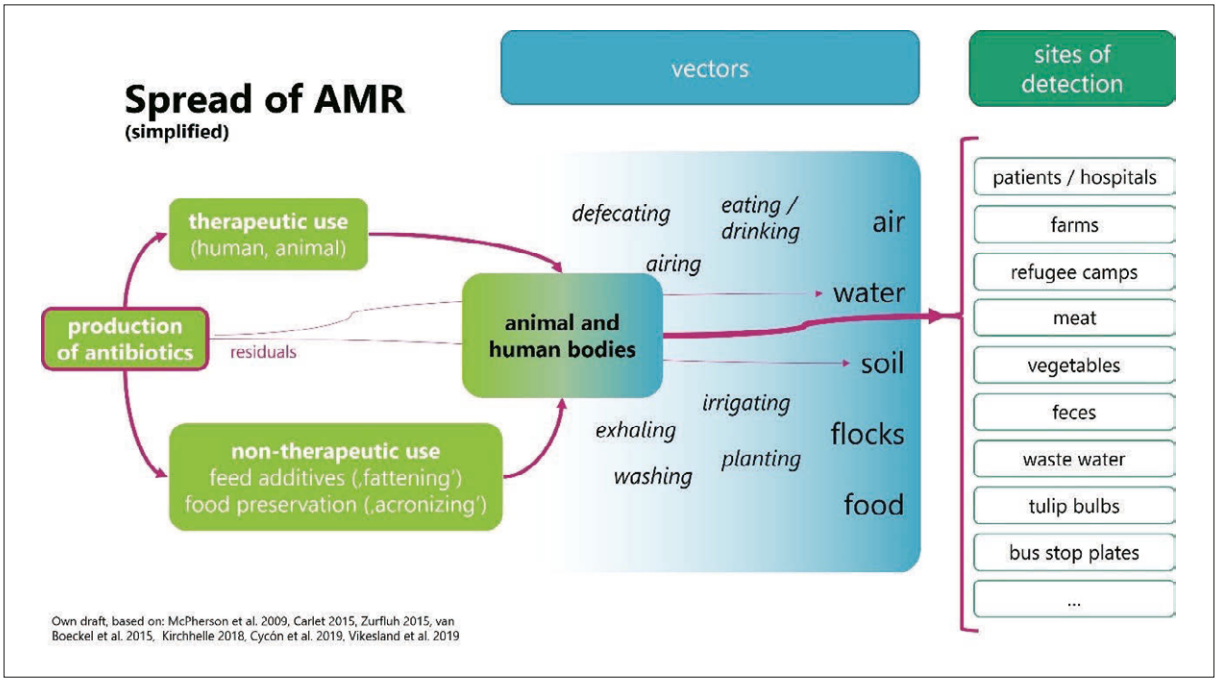

Figure 1: *Spread of AMR and sites of detection (simplified schematic representation)*

and spread of AMR has been driven by various international political actors (e.g., WHO, EU) over the last 20 years, as well as physicians and scientists. Because AMR is both multicausal and ubiquitous, and is associated with the (global) mobility of people and goods alike, it is, hence, understood as a fundamentally global problem that must be contained by global means. Global action plans on climate change (IPCC) seemingly offer a blueprint for the coordination of such effort (Pitchforth et al. 2022). Strategies of combating AMR refer to the assumption that worldwide contestations are inevitable (global condition) and whose unintended effects have to be averted. The project investigates the following questions: (1) Which spatializations are made by actors in the nexus of scientific evidence construction, media attribution of meaning as well as political-institutional strategies in dealing with AMR? (2) How are established, routinized and discursively effective spatial formats of state and supra-state territorialization (e.g., the EU) as well as spatial formats of contestation perpetuated and reconfigured in the governmental and biopolitical practices of combating AMR? (3) How is a global spatial order with its territorial as well as non-territorial elements negotiated in the process, given AMR's often unknown routes of diffusion and concomitant 'topographical disorientation'?

Since the early 2000s, AMR has been the subject of global health policy debates and measures. The focus of health policy interest is primarily on secondary resistance, i.e., resistance to antibiotics that were originally able to combat these microorganisms. In the meantime, a large number of germs are known to have become resistant to certain groups of active substances. The mechanisms of action differ considerably in detail. Therefore, a multifactorial, multilocal picture of causation and facilitation is currently being assembled: Excessive prescribing of antibiotics, especially in wealthy countries, the use of antibiotics in animal fattening, inadequate wastewater treatment and hygiene, especially in poorer countries, and irrigation of crops with contaminated wastewater are identified by the WHO, among others, as facilitating factors (Carlet 2015; Zurfluh et al. 2015).

In addition to health policy action plans at the national level, it is transnational institutional actors such as the WHO or the European Commission that are seeking responses to what is seen as a genuinely global phenomenon and, consequently, an equal threat to people everywhere. These transnational strategies are justified in four ways (see WHO 2018; European Commission 2017a): First, with the integrity of the individual body, as the spread of AMR increases the risks of life-threatening complications during treatments (worldwide, approximately 700,000 AMR-induced deaths / year,

European Commission 2017b); second, elongated hospital stays, expensive treatment in intensive care units, and a greater need for specialized cleaning could place a heavy financial burden on public budgets; third, AMR represents a prospective biopolitical problem, as future possibilities of effective disease control are at risk (biopolitical loss of control); and fourth, AMR threatens the realization of the UN's Millennium Development and Sustainable Development Goals, here is therefore a clear and pressing global-governmental need to deal effectively with AMR. For about 20 years (transnational) strategies for combating and dealing with AMR have been developed on the one hand while on the other hand with increasing knowledge about the multiple causes it has become clear that there is no primary starting point for combating the causes.

The project is based on four theses, which take into account both the Collaborative Research Centre's overarching research interest in spatialization processes under conditions of globalization and the potential for networking with other projects:

(1) International organizations (WHO, EU) emphasize the need to respond to the spread of pathogens with transnational forms of regulation; they design the imagination of globally circulating enzymatic hazards – in the sense of a "deeply held, collective understanding of socio-spatial relations" (Davoudi 2018: 101) – whereby an outbreak can be expected at any time and in any place. The uncertainty of a topographic inventory of resistant microbes leads to a simultaneous activation of different regulative contexts. In particular, transnational structures for AMR detection and control have been established since the early 2000s. In addition to the emergence of AMR, pathways of spread are increasingly being focused on and causally linked to globalization phenomena such as medical tourism (Vila 2015; Wilson 1995). The need to map globally circulating enzymatic hazards and thus generate agency and a starting point for policies is reflected in the naming of resistant genes after the location of their first detection.

(2) These observations suggest that strategies for dealing with AMR draw on familiar schemes of transnational establishment of surveillance and control, namely primarily scaling (e.g., global, European, national) and networking within scalar practices (Belina 2008). Established modes of response include the formation of networks based on existing international organizations, action plans, and strategies of implementation. This suggests a trans-scalarity of practices in combating AMR.

(3) The (re)construction of causation models, the representation of what is happening and the propagation of regulative responses presumably differ in terms of their implicit spatializations. The emergence of AMR creates a compulsion to act under conditions of uncertainty: live is at risk here and now, even if it is not clear where the multiresistant germ came from. The diagnosis of resistance therefore requires ad hoc decisions to prevent it from spreading; but at the same time, resistance makes visible a posteriori that there must have been a chain of causation. AMR thus intertwines two dis-positives: a medical dispositive of diagnosis and treatment that refers to the materiality of enzymes and bacteria as well as biochemical processes and an expanded public health dispositive that attributes to multidrug-resistant germs the potential to become a global 'superbug.'

(4) An essential hinge between established scales of response and the local, situational identification of a "problem" is the diagnostic infrastructure; the international organizations therefore assign a crucial role to its collection and documentation (e.g., standardized data collection / analysis, field manuals, report protocoling, expert networks). The diagnostic infrastructure is implemented as a global form of knowledge, which in turn is assigned a central role in the regulation of transboundary enzymatic hazards. The current state of research on AMR is heterogeneous: in addition to a plethora of media coverage and policy reports, there is a growing body of work in medicine, biology, and biochemistry on the causes, dissemination patterns, and modes of action of various resistances. Research on mechanisms of action is mostly anchored in nation-state narratives, so that – depending on the recorded occurrence of a resistance – it is written, for example, about an

"emergence" (Brink et al. 2012), "discovery" (Poirel 2011) or of "first cases" (D'Andrea et al. 2011) in the respective country. Attempts to spatially fix the phenomenon are rarely discussed critically, despite the inherent potential for delimitation. Spatializations in the medical-technical approach to the problem on site and institutional forms of combating it seem to fall apart. Here, the project draws on existing geographic literature in the context of pandemic spreads. In the sense of a "social anxiety" described by Everts (2012, 2013), technical-medical assessments of the risks of AMR are to be separated from the broader public health *dispositif* (e.g. Bührmann and Schneider 2008), in which AMR is figured as an "emerging disease" (Füller 2014) and thus evokes a state of collective sensitization. The anticipated danger of the public health *dispositif*, however, eludes a congruent territorialization – as described, for example, by Müller-Mahn and Everts (2012) with the concept of "riskscapes" – and thus a fixing, sense-making narrative of the (unequal) distribution of health hazards in the sense of a distinction between Global North and South, or between endangered and causative states (Ingram 2005) (Ingram 2005; Everts 2012). Accordingly, in dealing with AMR only limited use can be made of existing patterns of pathologization of specific regions and population groups – as in the case of the 'Mexico flu' (H1N1; Sparke and Anguelov 2012). Referring to a configuration of pathogens (Fidler 2003), political-regulatory uncertainty reveals a hitherto little-noticed dimension of the (re)spatialization of health threats.

The study is therefore relevant for two reasons: on the one hand, the study of strategies for dealing with AMR shows high social topicality, which is expressed in media problematizations of the recent past ("antibiotic apocalypse", McKie 2017) and threatening statistical estimates. Second, the dialectic between nation-state biopolitics and global advocacy that is constitutive of cross-border health care is fundamentally challenged in the context of AMR: while the global nature of the phenomenon is unanimously emphasized in the course of the public health *dispositif*, the effectiveness of existing medical-technical interventions in this regard is ostensibly local-preventive and limited in its impact (e.g., hygiene regulations in hospitals, more restrictive prescribing of drugs, etc.). The "topographical disorientation" in dealing with AMR consequently calls for a seamless control system in response to the imagination of globally circulating enzymatic dangers which reorders the governmental status quo of an oscillation of global health policy between de-territorialized claims and territorialized modes of regulation. Researching the handling of AMR therefore promises empirical insights into the reconfiguration of regulative practices in transnational medicine and thus exhibits a case-specific knowledge potential for the concomitant reconfiguration of relevant spatial formats and spatial orders.

1.2 The EU's biopolitics on antimicrobial resistance: An Introduction

Triggered by the Covid19-Pandemic, societies of the Global North came to reflect on the condition of their healthcare systems. In this context all sorts of (sub)domains were able to communicate their specific problems within the structural constitution of the overall system in a more effective way since there was a heightened perceptibility (Monnet and Harbarth 2020). The tenor of reporting encompassed a damning assessment which operated according to disaster semantics. Then, in 2022, a documentary was released called *The Silent Pandemic*[5], the title of which followed the WHO's prior decision to label the health problem of antimicrobial resistance (AMR) in this way. If you do a quick search on the term *silent pandemic* in *PubMed*, you'll find that it has already been used in the 1990s and occurred more frequently since 2020 but in combination with all sorts of diseases from Hepatitis to psychological ones and also non-disease, societal problems such as violence against women. Nevertheless, from 2020 onwards nearly half of all entries have referred exclusively to AMR. Use of

5 Michael Wech 2022: The Silent Pandemic. The global fight against microbial resistance. Broadview Pictures. The film follows the first documentary by M. Wech on the topic: "Resistance Fighters – The Global Antibiotics Crisis" from 2019.

the phrase in this way is misconceived for a number of reasons. First, AMR is arguably not a pandemic in the biological sense whereby a pandemic refers only to *one* pathogen while resistance occurs in many *different* organisms (see, however, controversial positions: Kelly 2011); secondly, it means a bundle of mechanisms that enable microbes to evade a biological inhibition resp. lethal effect of biochemical agents and does not include an obligatory pathogenicity and thirdly, the current health issue of AMR is a clear and long-known effect of the mere usage of antibiotics (and disinfectants) that induced evolutionary pressure on microbes.

Therefore, the term "silent" is plausible. Though not clearly defined medically "silent pandemic" is described as a pandemic production of patients without a uniform clinical appearance. Furthermore, the sustained increase of global mobility of goods, people, medicinal practices and – resistance genes, especially since the 1990s, promotes the impression of a *global* problem (*similar* to a pandemic). Yet the term is misleading after all. A disaster frame lent by the Covid-19 discourse in addition with 'silence' raises associations of an increased insidiousness compared to the latest pandemic event – an even less controllable, all the more obscure danger. One might assume that this narrative turn, starting with research papers, and adopted by the WHO in 2020, serves as stimulation of media and societal interest and therefore the mobilization of crisis awareness for the purpose of compliance with regulatory measures on the one hand and a deflecting of responsibility away from the political-administrative system on the other hand (see Ansari et al. 2021).

Insofar as there is a clear discursive connection with the Covid19 pandemic and its overall framing as a natural catastrophe a question arises that refers to one of the core questions in environmental studies: if AMR were a danger to humankind as significant as SarsCov2 is assumed to be, how do we explain the gap between the long known scientific knowledge on modes of resistance depending on practices of using antibiotics and the still overall high level of antibiotic usage in combination with seemingly lax regulatory standards? The scientific community started its warnings about the inherent mechanism of resistance building about 70 years ago – so if it a case of a "regulatory failure" (Kirchhelle 2018a), then one might ask if it is not more appropriate to speak of a discursively *silenced* instead of a *silent* pandemic? This working paper cannot give a full answer to this complex question. But from a combined historical sociological and human geographic perspective it may ask:

1. How did the EU's awareness of the AMR issue form amidst the nexus of politics, science and media? What has been the institutional response? Which were the pushing and restraining actors?
2. In consideration of the global nature of AMR: Which spatializations play a role in both biopolitics and linked imaginaries?
3. Since the EU only made comprehensive restrictions on veterinary prescription practices in the late 2010s while the agricultural sector today uses more antibiotics than human medicine: Are there actually asymmetries concerning regulatory measures or problem framing when it comes to humans and animals?

A look into historical science research shows that there is a gap concerning EU's biopolitics on AMR though there is some groundbreaking literature on the UK and US (Kirchhelle 2020; Podolsky 2015; Podolsky 2018) as well as on Germany (Kirchhelle 2016). There are also some internationally focused papers (Kirchhelle 2018a; Overton et al. 2021; Wernli et al. 2017) that include EU regulations in broader questions. But a single history of the EU's AMR politics has to be worked upon yet and the present contribution can only give a rough outline and suggest further research questions.

This working paper draws mainly on Reiner Keller's S*ociological Discourse Analysis* (Keller 2011) and Foucauldian *Genealogy* from a biopolitical and historical-sociological perspective to explore the question of the genesis of a European perspective on AMR. Complementary, Foucault's explanations of modern security *dispositifs* in their relationship to spatiality serve as a theoretical anchor for the understanding of EU's biopolitics on securing a perceived public health threat that is accompanied

by evolving imaginaries of space regarding among others the scale of the problem as well as the relations between humans and microbes. As Foucault understands it, the new kind of security technology associated with the rise of the liberal state no longer aims at "drawing, fixing, or locating lines of demarcation, but above all and essentially at permitting, guaranteeing, securing circulations." (Foucault 2004:52) (own translation). In other words,

> *"A security dispositif can work well only under the condition that something is assigned to it, namely freedom in the modern sense that this word assumes in the 18th century: No more freedom from taxes and privileges tied to a person, but the possibility of movement, conversion, processes of circulation of both people and things." (Foucault 2004:78) (own translation)*

Partly due to the structure of secondary literature and methodical restrictions concerning language resources the main focus lies on UK and Germany which, by virtue of their economic position alone, are (resp. were in the case of the UK) among the most influential countries in the EU and also two of the main consumers of animal protein within the EU and therefore a quite plausible choice.

Soviet and post-soviet central and eastern European states were included as far as the secondary literature allowed in order to reduce this bias towards Western Europe. To create a first foundation, the EEC's and EU's main policy documents on AMR were determined on the basis of a compilation by Overton et al. (2021) and Wernli (2017) and then coded with *MAXQDA*. The coding scheme included the following topics: 1) (suggested) type of measure (e.g. surveillance, research, hygiene standards, restriction of dosage or chemical agent); 2) bindingness for member states; 3) animal medicine / human medicine; 4) spatializations; 5) economic argumentations; 6) health argumentations. In view of the large number of documents no claim is made to completeness; instead, only an initial review of central aspects within the cornerstones of EU policy can be provided here. Thus, the evaluation cannot be carried out in a comprehensively systematic manner within the framework of this working paper and is integrated into the text body.

To obtain a picture of media coverage of AMR a preliminary study in the form of a newspaper analysis was conducted for the UK and Germany. For both countries two publication bodies on national level and two on regional level were selected according to their circulation strength and maximum contrast and also by accessibility of their online archives. With regard to the significance of the results it should be emphasized that the online archives of the selected media in some cases go back very different lengths of time. For Germany: Welt / Welt am Sonntag from 1997, BILD from 2006, Die Zeit from 2010, Berliner Zeitung from 2000, Stuttgarter Zeitung from 2004. For the UK: Daily Express from 2007, Daily Mail from 2012, The Scotsman from 2002, Manchester Evening News from 2010. Articles with only peripheral coverage of the topic were left out of the content analysis. Firstly, a frequency of articles on AMR per year was determined. Then, a frame analysis was performed including the following guiding questions: 1) Which causes and solutions are mentioned? 2) In what way does the article refer to the spatiality of the problem? 3) Does it concern human or veterinary medicine? 4) What else is referenced that seems relevant?

Thirdly, a secondary literature on the history of AMR in UK, Germany, USA and on international policy was compiled to reconstruct and provide a long-term overview. In addition, data about animal protein consumption and antibiotic consumption in both human and livestock production in the EU and worldwide was used to supplement the overall analysis. By the latter, we aim to gain insights on either symmetries or asymmetries in relation to the discursive framing of the topic and material realities. The text is chronologically structured in accordance with Overton et al. (2021) and Podolsky (2018) to ensure a certain comparability to their reconstruction of AMR surveillance and control in the US and UK, respectively. The findings are composed of two main parts, one pre-EU resp. EEC regulatory history, and secondly EU regulatory history which is subdivided into four parts. The sociological, biopolitical and human geographical contextualization of the regulative dimension are interwoven with the historical textual level and elaborated once again at the end of the paper.

2 The EU's emerging biopolitics of AMR

2.1 Pre-EU times: Infrastructural expansion and few compromises

2.1.1 Contested optimism: 1940s–1950s

The introduction of the first 'real'[6] antibiotics around 1940 was received as a major progress in medicine and followed by a proliferation of application fields. Prontosil, patented by the German company Bayer in 1935 (Landecker 2019:5), already marked a historic break because it was the culmination of the scientific quest, triggered in the 1910s by Paul Ehrlich's and Sahachiro Hata's research for a substance "that only targeted prokaryotic bacteria cells while leaving eukaryotic animal cells unharmed" (Kirchhelle 2020:17). First tested on allied soldiers during the Second World War (Landecker 2019) a broad market introduction of *Penicillin,* could be established by 1945. Sulfonamides were subsequently displaced from the market "as bacteria became resistant to Prontosil" (Uddin et al. 2021:1752).

Soon, antibiotics were not only used in human medicine but also in veterinary medicine and livestock production (Kirchhelle 2018a). It was the beginning of a period of intensification in both these areas partly triggered by this new biotechnological application. Today's standards of invasive medicine and low child mortality[7] would not be possible without the large output of new substances from ca. 1940 to 1970 – the retrospectively so-called "golden era of antibiotics" (Podolsky 2018; Uddin et al. 2021). The perpetuation of antibiotic use can thus be seen as a new biopolitical resource of the Western welfare state's security dispositif after the Second World War. For within a very short time antibiotics became an important part of the expanding health care system that was part of a "golden age" in Western Europe, also in the economic and welfare sense. This postwar prosperity is known to be due to:

> *"catch-up effects of reconstruction and the imitation effects of imported innovations, a labor supply that was as resilient as it was elastic (initially domestic, later imported), and consistently undervalued currencies in the context of an open world economy 'embedded' by international financial and trade regimes" (Less 60, own translation)*

In agriculture antibiotics firstly served as "lubricants" but would soon become "essential" (Kirchhelle 2018a) as "infrastructures" (Chandler 2019) for the industrialization of meat and dairy production. This development accelerated after the random discovery of the growth promoting effect of low dosed fermentation products of antibiotic residues in 1949 in the United States. The following steady flow of these new *antibiotic growth promoters* (AGPs) provided by the US pharmaceutical industry[8] complemented "the end of rationing [and] falling drug prices" (Kirchhelle 2018a) in Europe. By the mid-50s, West Germany, France, the UK and the Netherlands had AGPs licensed and the general use of antibiotics would increase quickly (Kirchhelle 2018a:3). On this basis, the field of highly effective animal production could even spawn two "powerful symbols of Cold War competition" – the factory farm and "rising meat consumption" (Kirchhelle 2018a). Thus, antibiotic research became a target of espionage. China and the Soviet Union had been building their own penicillin factories since the 1940s, and the latter also produced its own, supposedly lower-quality antibiotics. During a brief period

6 Before that, there were already precursors of what we now call antibiotics (Landecker 2019). The first 'antibiotic', mycophenolic acid, was isolated from P.glaucum by Italian microbiologist Bartolomeo Gosio in 1893 (Uddin et al. 2021:1752–53).

7 There are of course different standards for the global North and South due to lower availability of antibiotics in the latter resp. hampering patent law in countries of the global North.

8 World War II weakened the German pharma industry (Kirchhelle 2018a:2) so US companies had a double advantage in the US administered sector after 1945.

of open scientific and technological exchange between 1945 and 1947, the United States shared new knowledge on penicillin and "non-commercial pilot plants were provided to Italy, Belarus, Ukraine, Poland, China, Czechoslovakia, and Yugoslavia" by the "US, Britain and the United Nations Relief and Rehabilitation Agency (UNRRA)" and by the end of the 1950s the factory farm model was spreading throughout the Soviet Union (Kirchhelle 2018a:4). US companies were further encouraged in their export activities by the fact that

> *"[c]oncerned about overpopulation and hunger-fuelled communism, American policymakers and researchers came to see the global export of yield-increasing technologies like antibiotics as a way of defending Western values" (Kirchhelle 2018a:4)*

Although it was only shortly after the introduction of *Penicillin* in 1941 until the first emergence of resistant organisms like *staphylococcus aureus* (and also several *streptococci* and *gonococci)* in clinical contexts[9] and A. Fleming's "public warning against the overuse of antibiotics" (Uddin et al. 2021:1755) general expectations remained highly positive since the rate of finding new substances was giving reason to think of the respective own pharmaceutical industry as mighty enough to handle these setbacks. Consequently "there was little coordinated effort to combat antibiotic resistance on anything more than a local scale" (Podolsky 2018:2). The microbiological infrastructure that would have been necessary for larger-scale or even transnational surveillance was also not yet in place. It was not until 1952 that the "lack of international standardization of laboratory equipment and protocols in relation to antibiotic sensitivity testing" appeared in the medical literature (Gradmann 2013b:563). The worldwide outbreaks of Staphylococus aureus (Staph 80/81) in hospitals in 1953 contributed to the fact that the standardization of diagnostic technology subsequently "became a pressing issue" (Gradmann 2013a:563). In particular it was the observation of "epidemic mastitis in neonatal care units that doctors became aware that resistance had evolved into a global phenomenon where one and the same resistant strain would infect breast-feeding mothers in Europe and Australia alike. (Gradmann 2013a:560)

Landecker (2019) argues for looking not only at the clinical context but also at two other settings in their historical role in the development of resistance, because "it is clear that the history of prophylaxis is a strong undercurrent to the history of treatment", which has been the focus so far. During the mobilization of troops in the United States in the 1940s there was an increasing reliance on the prophylactic use of penicillin because meningitis caused by haemolytic streptococci was widespread. At the same time, it was recognized that poor sanitary conditions were the cause of the spread, and a massive disinfection effort was initiated with new substances called QACs: "[Q]uaternary ammonium compounds offered an alternative method of disinfection when access to sufficient hot water was limited. "Within a few months, it was found that bacteria no longer reacted to the agent – studies were conducted that cautiously advised careful consideration of prophylactic use. Nevertheless, on the contrary, the army organization relied all the more on widespread use in the camps (Landecker 2019:8). Something similar happened at the same time in the emerging mass livestock farming of poultry and cows or milk production in the 1940s – the combination of prophylactic use of sulfonamides and QACs. As Bud (2008) and Kirchhelle (2018a) also point out, it was farm animals whose bodies were "the first bodies to have [penicillin] and other antibiotics routinely used subtherapeutically and prophylactically." (Landecker 2019:9)

But 1955 was the year of the first *international* report on AMR[10] (Overton et al. 2021:4), interestingly on AMR in agriculture, and in 1959 the WHO held a meeting with experts from the US and the UK but

9 According to Overton et al. (2021:6) "various approaches to preserving antibiotic efficacy have been trialled since the 1940s".

10 National Academy of Sciences – National Research Council (1955): Proceedings of the first International Conference on the use of antibiotics in agriculture. Washington (DC).

they could not even agree on a definition of resistance and rejected a coordinating role in international surveillance (Podolsky 2018:2).[11] The prevailing local scope in that time also reflects the dominant framing of further – international – reports of "maximizing antibiotic value" by "ensuring efficient or appropriate ('rational') antimicrobial use in distinct locales (hospitals, farms and community clinics)" and thereby "[m]irroring postwar consumer movements" (Overton et al. 2021:6) in Western Europe and the US: While the industrialization of the farm as factory model continued[12], the 1950s were simultaneously a decade of public scandals and protest regarding food contamination by antibiotic residues in both West Germany and the US. Framings revolved around poisoning and cancer and were connected to the *hygiene* discourse of the early 20th century and its 19th century roots in fear of the so-called *degeneration*.[13] Subsequently, new laws were adopted like the German *Lebensmittelgesetz* in 1958 that banned the use of antibiotics as preservatives and for the US in 1960 a national monitoring program for penicillin residues in milk was introduced that was following several ineffective attempts to control the problem by implementing stricter rules for farmers. Whereas West German and US "public concerns and regulatory action tended to center on antibiotic residues" (Kirchhelle 2018a:5), UK regulators were more concerned about the selection of AMR in agriculture even though the *Times* praised antibiotic preservatives in 1956 as "the greatest advance in the field of processing perishable foods since the advent of refrigeration"[14]. The situation in Scandinavia was somewhat different due to its "medical conservatism" as an inherent element of the "efficacy requirements" of the *Nordic Welfare State* (Kirchhelle 2018a:8). Norway for example adopted a law to restrict the use of antibiotics already in the 1940s (Podolsky 2018:4). Yet, this conservatism did not apply to antibiotic use in the growing agri- and aquaculture business until the 1970s (Kirchhelle 2018a:8).

On the bottom line, the newly gained security resource of antibiotics became fragile to some extent only 10 years later. But the regulatory answer on the civil society's objections remained on the exact level of their argumentation – food contamination by *residues*. The fact that the use of antibiotic technology was quite fundamentally associated with the side effect of resistance formation, as had already been discussed within the life sciences, did not become an element of broader social debates until the end of the 1950s. This can certainly be explained in part by Podolsky's thesis of an "persisting optimism" (Podolsky 2018:1) regarding antibiotics in conjunction with the general social mood of renewal and belief in unlimited growth, as well as hope in novel – this time biological – technology, which compensated for the twofold collapse of faith in progress due to the negative consequences of the use of technology in World War I and World War II (or perhaps 'European war').

This kind of compromise between democratic objections and the needs of a rapidly growing economy, thereby points to a fundamental constitution of the modern welfare state as a "political-economic-social [...] crisis manager" in the form of a "normative, functional and 'technical' instance" that tries to balance the "consistent inconsistency, the crisis in impermanence, a single succession of economic accumulation, political legitimation and social security crises (or of corresponding social crisis interpretations)" of modern societies (Lessenich 2008:55f.). Following Polanyi (Polanyi 1944), the formation of this special "arrangement of social crisis handling" (Lessenich 2008:57) in the process of the enforcement of industrial capitalism can thus be interpreted as a "social reaction" in the form of a "responsibility and design space of the public ('visible') hand for the 'social'", which buffered the social consequences of the permanent accumulation of capital (Lessenich 2008:55):

11 However, there was also held the *Joint FAO/WHO Expert Committee on Food Additives* (JECFA) in 1956.

12 E.g. West Germany, the UK and Italy started importing US poultry breeds and confined housing systems; antibiotic use spread to other sectors like plant protection and fishing (as preservatives, e.g., for whaling in Norway and Iceland (Kirchhelle 2018a:3&6)).

13 Kirchhelle claims this only for Germany (2018a:5), but it is safe to assume that the US were also strongly marked by *hygiene* and eugenics discourses (see Kühl 1997) and therefore to presume that there were at least similarities of framings in the 1950s.

14 Times, 11.04.1956: New Method Of Food Preservation, p. 13. Cited after Kirchhelle (2018a:5).

> *"Social risks are the building blocks of welfare regimes. [...] They can [...] be internalized in the family, allocated to the market, or absorbed by the welfare state" (Esping-Andersen 1999: p. 40, cited after (Lessenich 2008:66))*

What S. Lessenich calls (not with glorifying intent) the "systemic feat" of the postwar Keynesian welfare state is its constructive role in resolving the conflictual opposition between capital and labor, or at least successfully bridging it. Accordingly, the welfare state's effort to achieve a "balance between the logics of capitalism and democracy" laid out in the "Keynesian theory of circular (or cyclical-sequential) equilibrium," was also a key pillar of the aforementioned 'golden age' (Lessenich 2008:61f.) Hence, in this context, the interventionism of the welfare state is not to be evaluated as simple patronage (as later critics like to claim), because this theory "makes the social the means of 'reinflating' the economic when the latter is at risk of being affected by weak demand." Following Claus Offe's "political economy 'state equation' (welfare state = [accumulation + legitimation] × interest" (Lessenich 2008:56)). Lessenich summarizes:

> *"The 'invention' of the welfare state and the progressive institutionalization of its programmatic can be explained by the interplay of functions, interests, and institutions: of requirements of the capitalist economy (in the sense of producing public infrastructure, regulating competition, securing the supply of labor, etc.), demands of an increasingly politicized and organized society (in the direction of guaranteeing social security, guaranteeing co-determination rights, providing public employment, etc.), and the emerging logic of state-administrative action (as manifested in the electoral ambitions of political elites, the task-securing efforts of public administration, or the acquisitive interests of the social professions" (Lessenich 2008:55)*

With the help of these remarks, it should be made clear that the state's "dual social responsibility [...] for regulating the economic with social intent as well as the social with economic intent" (Lessenich 2008:62) represented a fundamental disposition also for AMR policy, at least in Western Europe. The state after all operated in the mode of a practically impossible intermediary position "between the fulfillment of economic needs and social demands [...], between the stools of capitalist accumulation needs and democratic legitimation constraints" (Lessenich 2008:70). And on the basis of Offe's theorem of a welfare state "contradiction model", the lurching development of the coming decades can be anticipated:

> *"Its expansion constantly extracts values from the accumulation process, but is nonetheless indispensable, for the welfare state serves not only (as Luhmann thinks) social consumption interests, but in its infrastructural and labor-political (and now and then also repressive) activity just as much economic production interests, for the public consideration of which it in turn requires political legitimation, which it „buys" by way of social compensation payments-and so on and so forth." (Lessenich 2008:70)*

2.1.2 Despite their objections: 1960s–1980s

The 1960s would then become a decade of more extensive doubts expressed by both the scientific community and civil society over both application fields of agriculture and human medicine. As for the USA, new intersections of "intraprofessional antibiotic anxieties" in life science with "FDA, media and congressional reform efforts" resulted in liberal senator's "Kefauver's hearings on the pharmaceutical industry between 1959 and 1962." (Podolsky 2015:4) This event not only led to the introduction of standardized clinical trials as part of the drug approval process (Podolsky 2015:4), but the extensive public monitoring of these hearings, "increased interest in drug safety, and drug regulation began to

be internationalized" (Gradmann 2013a:572). After concentrating on identifying resistant strains in the 1950s, research of this new decade "focused on the determination of their degree of sensitivity to a given antibiotic" (Gradmann 2013a:562) and the WHO played a crucial role in supporting this agenda as the commissioned a comprehensive study in 1962 on the harmonization and standardization of bacterial sensitivity testing methods (Gradmann 2013a:563).

The before mentioned heightened awareness of the UK administration towards AMR in agriculture was accompanied by more comprehensive bacteriological surveillance structures like the Public Health Laboratory Service (PHLS) whose data gave rise to an investigation of AMR proliferation in agriculture in 1960. The final report of the *Netherthorpe Committee* 1962 came to the conclusion that antibiotics already in use deemed no problem but "recommended restrictions for future antibiotics", whereby Kirchhelle suggests, that this "compromise" was "[s]trongly influenced by power struggles between British veterinarians and farmers" (Kirchhelle 2018a:5). But in the same year, a milk scandal shook British consumer's trust. Shortly afterwards, Rachel Carson's widely received *Silent Spring* (published in the UK 1963) and Ruth Harrison's bestseller *Animal Machines* (1964) denounced the whole system of modern animal production and its environmental impact, including AMR selection, which intensified public pressure on the administration (Kirchhelle 2018a:5). It even rose further when British researchers Naomi Datta and Ephraim Saul Anderson built upon to 1950s Japanese research on *horizontal gene transfer* of resistance information by Tsutomu Watanabe (Kirchhelle 2018b:333f.). Their findings had incisive implications on the understanding of AMR because they substantiated the assumption of an existing resistance transfer mechanism across bacterial "strains and even species" (Podolsky 2018:3) and therefore challenged the previous *vertical* model of proliferation and related containment strategies (Kirchhelle 2018a:5). Anderson showed further on that the "putative spread of resistant bugs […] from animals to humans" (Bud 2008; Podolsky 2018:3) had already become reality concerning Salmonella typhymurium that had "caused severe food-poisoning outbreaks" in the UK (Kirchhelle 2018a:5). As in the UK, international reports were "reviewing AMR threats of individual – mostly agricultural – practices from the mid-1960s onwards" (Overton et al. 2021:4).

Against this scientific background and the boost of environmental awareness by discursive events like *Silent Spring* in western industrialized societies medical literature now partly understood AMR as "environmental pollution with resistant microbes" (Podolsky 2018:3). Thus, imaginations of spatiality concerning biological spheres started changing:

> *"Popularized amid growing general environmentalism, horizontal – or "infective" – resistance transfer further eroded the supposed divide between resistance selection in agricultural and medical settings." (Kirchhelle 2018b:334)*

This element of connectivity may have significantly contributed to the fact that the scientific discussion about AMR became increasingly charged with apocalyptic semantics which spilled over to public discourse. Podolsky (2018:3) points out that the term "superbug" was most likely introduced in a 1966 article of *Look* magazine:

> *"What causes bacteriologists great concern is the prospect that such a bug might get loose and create an epidemic of invulnerability to drugs among germs throughout the world. This could conceivably happen if the spread of these multiple-resistant germs is not checked… Suppose that a few of Dr. Anderson's Superbugs were lurking in a mass of bacteria sensitive to tetracycline. Administration of that antibiotic would kill the sensitive germs all right, but a host of Superbugs would be spawned as a consequence" (Osmundsen, 1966, p. 141 cited after (Podolsky 2018:3))"*

The immense public concern in the UK in the mid-1960s led to the installation of another committee in 1968 whose expert composition seemed to be the result of a triumph of the Ministry of Agriculture over E. S. Anderson and his ongoing critique of agricultural practices in his role as a leading expert

in this public health issue until then: "Comprising two agriculturalists, three veterinarians, and two medical scientists, the new committee was weighted slightly in favor of agricultural interests" (Kirchhelle 2018b:342). This *Swann Committee* (named after its chairman Michael Swann) now endorsed, inter alia, "the restriction of medically relevant antibiotics to veterinary prescription" (ibid.) but did not take into account that in reality „veterinarians could simply switch to therapeutic overprescribing", therefore its impact was only moderate according to Podolsky (2018, S. 3). Moreover, UK officials were able to avoid "expensive residue monitoring by dubiously claiming that they were unaware of problems" (Kirchhelle 2018a:5) but the scientific doubts were now publicly established.

The hegemonial attitude against antibiotic use in Europe had changed over time, integrating a certain skepticism, thus making possible that the beginning of the 1970s was marked by (only a few) "precautionary restrictions of medically relevant AGPs like penicillin and the tetracyclines" (Kirchhelle 2018a:5) not only in the UK but also Switzerland and the EEC. In 1973 they passed a regulation (70/524/EEC) that reduced the number of allowed AGPs to 'only' 18 (without counting *coccidiostats* which were not listed as antibiotics in that document) and made some restrictions on mixing substances regarding their affiliation to a chemical group and dosing. In the introductory justification for the necessity of such regulation reference is made only marginally to human health, while the main starting points are that „satisfactory, results depend to a large extent on the use of appropriate good-quality feeding-stuffs" and „the existence of rules concerning feeding-stuffs is essential to an increase in agricultural productivity" (70/524/EEC: p.840). Just a few years later, in 1977, Sweden followed suit by implementing AGP restrictions "Swann-style" (Kirchhelle 2018a: 8)

In a broader sense, this development was most likely influenced by an increasing societal awareness for global connections between the post-war paradigm of unlimited growth and prosperity and its unintended negative side-effects on human's well-being[15]. Despite these official acknowledgements of scientific and public opinion EEC regulation of the flourishing black market for farmers and veterinarians was insufficient – regulation towards US products conversely strict. This protectionism came along with a series of exceptions on the new rules for European biotech companies, on the one hand and missing self-evaluation mechanisms for the recent regulations on the other hand (Kirchhelle 2018a:6). This refers to Podolsky stating that "actual responses" to the problem of AMR "remained muted" during the 60s and 70s (Podolsky 2018, S.3). Although the findings about *horizontal gene transfer* were widely received, international reports on "resistance [were] rarely portrayed as a shared, global concern" (ibid.). In a deepening geopolitical bloc confrontation process this would have been an unlikely option, one should add in retrospective. Both Soviet and US policies on AMR were designed for maximum production effectivity and competitiveness in animal production and did not react neither to public scandals nor to scientific concerns[16] until much later. The two economies profited massively from the ongoing export of their similar antibiotic dependent *farm as factory* model (Kirchhelle 2018a:2). In the Soviet Union, "critical discussions of AMR and residue problems remained academic" (Kirchhelle 2018a:7) due to the rejectionist attitude within the administration, while the US pharmaceutical industry had built an influential counter science which the Congress was apparently profoundly irritated by so it even imposed a moratorium "on statuatory AGP restrictions by calling for more research" (Kirchhelle 2018a:6) in 1979. In contrast policy in Western Europe must have made the impression to civilians as much more comprehensive in protecting public health. But in reality, there was little assessment on the *effectiveness* of the measures taken and the administrative willingness to adapt policy albeit scientifically indicated was low. While UK "officials continued to preach the

15 E.g. by decisive discursive events like the 1972 *Limits of growth. A Report for the Club of Rome's Project on the Predicament of Mankind* by the *Club of Rome* and an international convention at Alma Ata in the Soviet Union in 1974 which "declared that primary health care and social and economic should be the foundations of international public health" which, among others, has "been cited as evidence of a "third public health revolution" (King 2004:62 f.).

16 Regarding the USA: The industry apparently prevented any regulation. Instead, the focus remained on "irrational" prescribing and furthermore, Podolsky sees „American medical literature (especially the throwaway medical journal literature) awash with protestations by general practitioners against the advice of seemingly "ivory tower," would-be reformers asking such practitioners to reconsider their (over-)prescribing habits" (Podolsky 2018:3).

'Swann gospel' of partial AGP bans abroad" they kept studies under lock which stated the non-effectiveness of recent bans following the *Swann Report* (Kirchhelle 2018a:6f.) West Germany immediately "pressed for EEC-wide monitoring from 1973 onwards" as soon as the mass-monitoring of meat was implemented which no longer had been avoidable after a milk contamination scandal (Kirchhelle 2016). It appears to have been common practice in Western European countries to redirect public attention away from one's own reliability by looking outwards:

> *„Once an antibiotic policy package had been enacted, officials were often missionary in their zeal to foster reforms' adoption abroad but lacklustre when it came to evaluating their own policies." (Kirchhelle 2018a:6f.)*

If one reflects on the global economic situation in the 1970s and its accumulation crisis, it becomes clear that European economies got under such pressure that it seems right to assume a little interest of national administrations in impeding their pharmaceutical and agricultural industries (despite potential far-reaching consequences for biopolitical governance in the long run) – just like in the US and the Soviet Union.

The next decade would not bring a lot new or different policy and was marked by mutual attributions of responsibility by human and veterinary practitioners. An exception was Scandinavia: With a concerned civil society as a background, Swedish author Astrid Lindgren and a pressing media achieved a ban on all AGPs in 1986 and a reformed animal welfare law in 1987 – the so-called *Lex Lindgren*. Norway reduced its consumption of antibiotics in the area of aquaculture by a factor of ten from 1987 to 1993, which had been accelerated over the last decades and had clearly led to a rise of AMR incidences (Kirchhelle 2018a:8). Not only in Scandinavia, a heightening perceptivity towards environmental issues and food contamination laid the ground for the development of a new branch in the agricultural sector since the 1970s that tried to create an alternative for concerned consumers – resp. those of them who could afford alternative prices (Kirchhelle 2016:125ff; Kirchhelle 2020:143). In contrast to the more or less *policy-wise* global standstill, the 1980s constituted a momentous turn in the scientific community's interpretative pattern: Disturbed by the fact that there were no substantial forthcomings in research for new substances for human medicine but rising AMR incidences, scientists nervously repeated the by now old warning call of "of an imminent post-antibiotic era" (Kirchhelle 2018a:7). Some of them, mainly situated in the US, launched reformist activities during the 1980s, the best known of which is the *Alliance for the prudent use of antibiotics* (APUA). This explicit *international* organization was the result of a conference (*Molecular Biology, Pathogenicity, and Ecology of Bacterial Plasmids*) in 1981, hosted by Stuart Levy, which Podolsky considers as more influential regarding *globalizing* the issue than WHO meetings on AMR earlier in the late 1970s (Podolsky 2018:3). In their „Statement Regarding Worldwide Antibiotic Misuse", 147 scientists from 27 countries criticized:

> *"antibiotic use without prescription, use as agribusiness growth promoters, usage when not effective or required, antibiotic overpromotion as "wonder drugs," and the marketing of particular antibiotics differently in different parts of the world – mandating a coordinated, diverse array of responses by the global community." (Podolsky 2018:3)*

They demanded to counter this "worldwide public health problem [...] at all levels of usage [...]", meaning "consumers, prescribers, dispensers, manufacturers, and government regulatory agencies" (Statement Regarding Worldwide Antibiotic Misuse (1981), p.679 cited after (Podolsky 2018:3)). It seems safe to say that the hereby established perception of AMR as a "shared global concern" (Podolsky 2018:3) in the scientific community must also have been influenced by findings on environmental issues and furthermore a generally and globally growing environmental awareness in the context of an increasing density of discursive events around chemical industry pollution, acid rain and forest

dieback, ozone hole and climate change[17] or nuclear accidents[18] in the 1980s[19] – in a way that it deepened the understanding of biological spheres as connected – what no longer meant only agriculture and human hospital environments, but their transnational linkages as well. The timing of this recognition of the AMR issue as a global one coincides with a new globalization push building up[20] which can be seen as an essential factor in scaling up the AMR phenomenon. In the aftermath of saturated markets and economic turbulences during the 1970s, the systemical search for new accumulation modes and areas comprised the need for new sales markets, societal areas to accommodate, including the ensuing need for new raw material sources, and thus facilitated the globalization surge – including neocolonial arrangements – since the late 1980s. A post-Fordist mode of production began to take root (already since the 1970s) meaning a forming just-in-time-production and maximum flexibility paradigm when it came to requirements for employees. It was also the turning point to what has been called neoliberal governmentality that provides for a therefore needed subjectivity mode of self-governance on the one hand and encompasses understandings of welfare and security different from the old post-war welfare state on the other hand. In the following transition from a clear geopolitical system of two blocs to a rather convoluted situation, a changed, increasingly medicalized (Elbe 2011) and individualized security dispositif would become powerful.

The fact that the double *externalization* (for *externalization society* see (Lessenich 2017)) of the global North would become fragile in this process plays an ambivalent role. By double externalization is meant: 1. the outsourcing of environmentally and health damaging production, both agricultural and industrial, to the periphery of the world system in recent decades, and 2. the necessary socio-psychological externalization of the knowledge that Western consumption and living standards are responsible for negative side effects of the production (in both center and periphery) necessary for them. On the one hand the environmental – or perhaps *industrial* scandals – promoted that the previous cultural repression mechanism could not be continued without further ado. On the other hand, this created the need for another kind of justification: 'rational' consumer choice.

This will be further discussed in the next section, as will be a second, maybe more tangible impact factor on the globalizing of the scientific AMR discourse: the HIV/AIDS crisis and other so-called *emerging diseases*. As the AIDS pandemic arrived at its peak in 1988, the acknowledged US expert for bacterial genetic exchange (Nobel prize 1958), Joshua Lederberg, could successfully push for the topic of "confronting infectious diseases as a shared global concern" (Podolsky 2018:4).

2.2 European Union: Precarious externalizations

2.2.1 Updating legitimacy: 1990s – 2000s

To get hold of the further development of the AMR discourse in the now forming European Union, it is helpful to stick to the United States a little bit further because major impulses came from exactly there around 1990. Besides Lederberg's contributions, the 1989 conference *Emerging Viruses: The Evolution of Viruses Viral Disease* hosted by virologist Stephen S. Morse can, according to King (2004), be seen as the origin of a conceptualized uptake of the "centuries old" term *emerging diseases*, that appeared in the medical literature of the 1960s (King 2004:64). In subsequent articles Morse stated that

> *"[l]ike every other kind of traffic, viral traffic is increasing … As deforestation progresses worldwide, as humans continue to alter the environment, as population influx into Third World cities continues*

17 1988: The *Intergovernmental Panel on Climate Change* (IPCC) was founded.
18 1986: Tschernobyl accident.
19 1987: Brundtland Commission on sustainability.
20 I refer here to the globalization phases according to I. Wallerstein (2007).

> *unabated, as every part of the world becomes more accessible, one would expect disease emergence to accelerate."*[21]

Thus, Lederberg's agenda on future plagues fell on fruitful ground as the follow up of the 1992 report *Microbial Threats to Health in the United States* of the *Institute of Medicine* (IOM), which he was head of, showed. The report itself was still focusing on viral pathogens and their growing resistances against medication but much of the reaction took up the topic of AMR, declaring either *The Microbial Wars* (*Science* Magazine 1992) or *The End of Antibiotics* (*Newsweek* 1994) (Podolsky 2018:3–5). According to King (King 2002), the IOM report can be seen as the "centrepiece of a major public health campaign" (768) and the starting point of an ideological transformation of the public health discourse into what he calls *Emerging Diseases Worldview* during the 1990s. While the identified causes of numerous emerging diseases have been located on a global scale, the "report focused more narrowly on the consequences at national scale" (King 2004:67):

> *"As the human immunodeficiency virus (HIV) pandemic surely should have taught the context of infectious diseases, there is nowhere in the world from which we remote and no one from whom we are disconnected. Consequently, some infectious eases that now affect people in other parts of the world represent potential threats to the United States because of global interdependence, modern transportation, trade, changing social and cultural patterns"*[22]

With further regard to the spatiality of the discourse, it is worth noting that two of the most influential journalists in the progress of media coverage took up the aspect of national threat in a certain way, namely by making a shift regarding the attribution of danger and responsibility. The IOM report stated that increasing connectivity was the cause of the problem, but the attribution of responsibility is done rhetorically in a rather neutralizing way whereas Laurie Garret and Richard Preston emphasized human *transgression*, even violation, of ecosystem boundaries by humans[23]. Whether they made explicit distinctions there between humans of the global North and South would have to be clarified. The question of interest here is whether they painted the picture of an inadequate, wounded and thus weak global South by subsuming the societies affected by the externalization of the side costs of the Western way of life under an *ecosphere* destroyed by a globalized "human race" – which once again would conceal the origin of the causer. It would not be surprising if this was the case, considering for one thing, Morse's implications on 'overpopulation' as apparently only happening in the 'Third World' and secondly, that King's comparison of colonial and post-colonial ideologies and knowledge regimes around public health in the US (despite differences) shows continuities between the past *colonial healing* resp. civilizing mission ideology and the new one of *international development*. Firstly, the divide between an endangered center and a "contaminated" periphery remained an important structural element: The „obsession with boundaries – between races, between classes, and between nation-states – persist[ed]", as did the imagination that the US "can be biomedically insulated" (King

21 Morse, (1990): Defining the Rules. Cited after King (2004: 65).

22 Lederberg / Shope / Oaks Jr. (1992): Emerging Infections: Threats to Health in the United States. Cited after King (2004:67).

23 Laurie Garret, (1994) The Coming Plague: Newly Emerging Diseases in a World Out of Balance (New York, 1994), 618–9: "Rapid globalization of niches requires that human beings everywhere on the planet go beyond viewing neighborhoods, provinces, countries, or hemispheres as the sum total of their personal ecospheres. Microbes, and their vectors, recognize none of the artificial boundaries erected by human beings … In this fluid complexity human beings stomp about swagger, elbowing their way without concern into one ecosphere after another. The man race seems equally complacent about blazing a path into a rain forest with bulldozers and arson or using an antibiotic "scorched earth" policy to chase unwanted microbes across the duodenum." Cited after King (2004:72).
Richard Preston, The Hot Zone (1994), 287–8: "The emergence of AIDS, Ebola, and any number of other rainforest agents appears a natural consequence of the ruin of the tropical biosphere. The emerging viruses facing from ecologically damaged parts of the earth …. In a sense, the earth is mounting an immune response against the human species. It is beginning to react to the human parasite, the flooding infection of people, the dead spots of concrete […]" Cited after King (2004:71).

2002:773). But it was being acknowledged that globalization cannot be reversed, thus, the established „vast networks" were seen as both „conduits of infection but also prophylactic tools" (ibid.) – tools to update the former ideal of an "utopian medical micro-colony" into an "utopian biomedical macro-colony", kept under control by permanent *preventive* surveillance. And whereas colonial public health discourse was soaked with fear of contamination of *specific* groups of people, „postcolonial anxiety revolves around the contamination of space itself by mobile bodies and motile environments" (ibid.):

> *"This is not the horror of matter (or bodies) out of place, which presupposed the identification of a place for matter; instead, it is the horror of places no longer mattering, of a 'third-worlding' at home." (ibid.)*

Against the background of the 1990s as a period of geopolitical and economic transitions towards increasingly intertwined global societies and the awareness for growing risks from border-crossing pathogens, the former US public health episteme of *separation* shifted towards an episteme of *integration*. International actors such as the World Bank started investing in health systems abroad on a higher scale as they came to the point that "spending on health can be justified on purely economic grounds" (World Bank 1993, cited after King 2002:781), because poor health could hinder economic development. This represents a turning away from the former presumption of international development organizations, that economic investment in industry and agriculture automatically triggers improvements in public health. Instead of specialized medicine, a basic health care should now be strengthened, e.g., in the areas of infectious disease control, immunization and nutrition (King 2002: 781). A second, no less noticed IOM report in 1997, called *America's Vital Interest*, agrees on this statement and a WHO *Working Document* from 1994 (WHO/CDS/BVI/95.7) alsonotices economic consequences of the AMR issue. King argues that the emphasis on development was not new, on the contrary as it "indicates the persistence of a colonial 'transition narrative'" – but the colonialist focus on "questions of culture and health belief system" (King 2002:781) was not present anymore:

> *"Where colonialists anticipated eventual victory in the international conflict between competing medical systems, the emerging diseases worldview idealizes a smooth terrain of global capitalist exchange" (ibid:779.)*

This kind of exchange certainly comes along with a cultural impetus, one might add, as King himself points out later:

> *"[...] the goal is no longer to bring modern Western medicine to primitive cultures, but rather to furnish them with Western medical technologies in an effort to foster the integration of underdeveloped nations into the world capitalist economy [Anderson (2000): 235]" (King 2002:780)*

King's still rather clear distinction between an allegedly vanished colonial entitlement of knowledge transfer as "tools of empire" (King 2002:779) and a now established concern mainly for the efficient circulation of western medicinal products (ibid: 776 ff.) should surely be questioned. But it probably marks a tendency in discourse, which did not quite correspond to the actual policy in the United States. Despite the scientific recognition of AMR as an "escalating (human) health concern" not only in the US but increasingly on an international level (Overton 2021:4) business-friendly governments around 1990 did not consider their warnings as a cause for legislative changes and the first IOM report can thus be seen as a response to public health funding cuts by taking an argumentative stance at the national level, which fit the hegemonic political baseline of the time. Funding was raised though in the following years during Bill Clintons' Presidency. (Podolsky 2018:3–5) This and the fact that Vancomycin (a reserve antibiotic) resistant enterococci (VRE) were found in meat samples in Denmark, Germany and the UK, led to a shift of leadership of the AMR discourse to Europe for these

countries took effective regulative action (Podolsky 2018:4). Moreover, Sweden, Finland and Denmark had launched national educational programs in the middle of the decade whose goal it was „to preserve clinical utility" of antibiotics already on the market. Especially Sweden played a crucial role in the upcoming process of pushing for a ban on AGPs altogether within the EU, out of its concern "about having to abandon its stricter laws to comply with more permissive EU feed regulations after its 1995 accession" (Kirchhelle 2018s:8) Scandinavian policy would serve as a model for the later internationally established *antimicrobial stewardship*, a term first used in a scientific paper in 1996 (Overton 2021:6) that criticized the ineffectiveness of merely educational efforts on antibiotic prescribing and missing control mechanisms of actual practices of antibiotic use in hospitals and moreover, missing research trials on the linkage between use and the occurrence of resistant organisms (McGowan and Gerding 1996). In fact, the Scandinavian conservationist approach mirrors a rough tendency from the mid-1990s onwards towards a new framing of "AMR as a problem of resource scarcity that was characterized by a lack of new drugs" and corresponds "with a broader reorientation of international debates towards issues of sustainability following the 1987 Brundtland Commission and 1992 Rio Climate Conference" (Overton 2021:6).[24] According to the underlying focus within the problem analysis that it is first of all a lack of working drugs, a problem of an "empty antibiotic pipeline", which had been addressed "by industry and Northern policy reports" in the early 1990s and began to reappear in reports "from the early 2000s", the stewardship concept is then a "two-pronged approach to addressing AMR (antibiotic innovation and preservation)" (Overton et al. 2021:6f.; see also Wernli et al. 2017). As Dyar et al. (Dyar et al. 2017) point out, this concept puts an "over-emphasis on individual prescriptions" and "an under-emphasis on the societal implications of antimicrobial use". The international surge in data at that time (Overton 2021:9) suggests a significantly heightened awareness and indeed, Denmark invited other EU members to a conference on *The Microbial Threat* in 1998 whose resulting *Copenhagen Recommendations* would become the basis for the *Council Resolution on antibiotic resistance: A strategy against the microbial threat* (1999/C 195/01) and the subsequent European Union's *Community Strategy against antimicrobial resistance25* in 2001. In these documents, the conceptual basis for the later policies, which were actually oriented more towards an integrated view of human, animal and environmental relationships, can already be seen in broad outline. Also, the *European Antimicrobial Resistance Surveillance Network* (EARSS) was founded in 1998 on the initiative of a report by the UK House of Lords (Podolsky 2018:4), initially funded by the European Commission's Directorate-General for Health and Consumer Protection and the Dutch Ministry of Health, Welfare and Sport[26].

In retrospect, it took about six decades for European countries to agree on a *common* strategy toward the natural effect of resistance development after scientists recognized the problem, four decades after strong scientific assumptions on the capacity of bacteria to 'infect' other organisms with antibiotic resistance genes had been made, potentially even crossing species borders, and two decades after researchers agreed on the global nature of the AMR problem. We already discussed economic aspects and those concerning internal structures of Western health systems (e.g., invasive medicine depending on antibiotics) that were hindering a strong regulative answer until 1990. Now we take a look at the forming process of the European Union and reflect on three important aspects.

First, the incipient integration process was accompanied by a high commitment of resources to institutional, territorial, and collective identity restructuring which did not leave much capacity for the meanwhile "only" academically discussed, possibly necessary political action. Second, although concerning the last two aspects at the same time, the collapse of the Soviet Union partly resulted in the reactivation of national identities as the extreme examples of Germany (racism wave in Germany 1992) and former Yugoslavia (war 1991–2001) show and nationalism in principle undermines efforts

24 Brundlandt Commission (1987): Our Common Future.

25 Communication from the Commission on a community strategy against antimicrobial resistance COM(2001) 333.

26 https://www.ecdc.europa.eu/en/about-us/networks/disease-networks-and-laboratory-networks/ears-net-data.

towards cross-border cooperation. Third, the EU found itself in an irresolvable dilemma: From a biopolitical perspective it was in need to control antimicrobial resistance to keep their citizens able to biologically reproduce and to produce surplus value – and to build political legitimacy by providing security as well. And in the 1990s there was strong evidence suggesting that infectious diseases would no longer be a problem only for people in the global periphery, not only because they could come 'to us' through growing interconnectedness, but also because our own technology could fail, which had allowed this kind of diseases to be pushed out of societies. But the founding moment of the EU was the neoliberal consolidation of national economies into a countervailing power against the now former bloc states which entailed a concentration on major economic sources of revenue such as agricultural products and the strengthening of circulation of (bio)materials, workforce and products. The EU was thus forced to find a modus operandi that creates a stable boundary state between the two logics of health provision and profit orientation, positioning itself economically favorably for a hitherto unclear reorganization of the global economy. The enormous rise of European animal production during the 1990s did not come along with a generally increased antibiotic use, though, as in "most European countries a decrease in sales of antibacterial substances has been observed in both the growth promoters and the therapeutic sector". Although data was hard to obtain, due to not yet existing monitoring requirements, the *European Agency for the Evaluation of Medicinal Products* (EMEA) stated that, according to sales figures by pharmaceutical companies, an overall *rise* of animal health products in Europe and worldwide could be observed. The decreasing use of antibacterial agents was particularly noticeable in Scandinavian countries, which were the only ones submitting data to the EU on a voluntarily basis. But this was not contradictory to the above assertion because "it mainly reflects the increasing importance of the pet sector with the number of companion animals increasing in many countries" Instead, the EU-wide trend went toward preventive measures such as vaccines and other biologicals.[27]

The neoliberalist constitution of the EU also implied a momentous shift toward the privatization of social security and health care:

> *„At the center of the new mode of governance is the tendential transition from public to private security, from collective to individual risk management, from social insurance to individual responsibility, from state provision to self-care." (Lessenich 2008:82) (own translation)*

This mode of governance required a new mode of *subjectivation*, which Bröckling (2007) has described as "entrepreneurial self", meaning the combination of "rationally economic" self-leadership with a "moral-social" (Lessenich 2008:83) one. However, the government program "aims to endow this (autonomous) subjectivity with political imperatives" (Lemke 2014:256) because subjects do not become entrepreneurial selves on their own, they need political leadership to do so (Lessenich 2008:83). With additional consideration of Luhmann's conceptual separation of *risk* and *danger*[28], this governance model would be able to circumvent a potential attribution of risk to the EU by its citizens, since it operates in the governmental mode of individual responsiveness.

This can be illustrated by the example of German social and health policy: Even before the financial crisis from 2007 onwards the final turn away from the old welfare state model was made when the Red-Green coalition under Gerhard Schröder took a big step towards austerity policies. For the underlying paradigm of welfare, this meant that the welfare state should no longer distribute and redistribute

27 EMEA (1999): Antibiotic Resistance in the European Union Associated with Therapeutic Use of Veterinary Medicines Report and Qualitative Risk Assessment by the Committee for Veterinary Medicinal Products, p. 29 f. (https://www.ema.europa.eu/en/documents/report/antibiotic-resistance-european-union-associated-therapeutic-use-veterinary-medicines-report_en-0.pdf).

28 "The distinction is therefore to be found at a different level: between harm attributable to decisions coming from inside social systems (risk) and harm that comes from the outside (danger). As [Luhmann] puts it, 'only in the case of risk does decision making (that is to say contingency) play a role. One is exposed to dangers' (Luhmann, 1993: 23)." (Battistelli and Galantino 2019:67).

'unconditionally' and 'from above', but rather 'encourage' citizens to take initiative and responsibility. This so-called 'activating welfare state' aimed to transform supposedly passive welfare recipients into mobilized 'clients' of their own state, who would constantly strive to give something back to society by successfully freeing themselves from poverty through their own efforts, or at least by constantly trying to do so. Symbolic for this turn is the so-called Hartz 4 law of 2003, still controversially discussed today, which among other things introduced enormous sanction possibilities (up to 100% reduction of benefits) in case of 'refusal' of the broadly interpreted *obligation to cooperate* even for underage recipients of these social 'services'. The fact that this was also connected to an "economization of the social" (Bröckling 2000) (own translation) becomes clear when looking at the fat campaign of the federal government, whose starting point was the potential social costs of a lifestyle that was marked as unhealthy and whose campaigns were mainly directed at the lower classes as a target group (Lessenich 2008: 122–128).

Nevertheless, the growing EU had to further expand its legitimacy base and initiated a change in its antibiotics policy towards more restrictive regulation at the turn of the century. This must be reflected with regard to several aspects. First, the EU had come under particular pressure from Scandinavian stewardship campaigns and the BSE scandal (Kirchhelle 2018a:8) which, after its origin in the UK in the early to mid-1990s, also spilled over into Germany and led not only to the destruction of entire animal production stocks but also to a massive loss of confidence in meat production among the population and a discursive linkage of BSE to AMR even in more conservative media[29]. The export volume of beef in the UK fell from almost 97 thousand tons in 1995 to just below 4 thousand tons in 1997. After this steep drop the low level was manifested for a longer period of time by the EU export ban in 1996 until its lifting in 2007. Except for chicken meat all other meats were apparently affected by the massive damage to the image of British meat hence there were similar drops in the following years (FAO Stat) even though the administration adopted stricter requirements for the slaughter and feeding of animals in 1996. In Germany, the beef volume dropped from about 88 thousand tons in 2000 to about 54 thousand tons in 2001, although exports stabilized again by 2004[30]. In the year 2000, the *Scientific Committee on Veterinary Measures relating to Public Health* concluded that the 1992 regulation to control a few food-borne zoonoses were inadequate due to incomplete data collection and lack of comparability. In the same year, the *European Medical Agency* (EMA) published a (non-binding) guidance document[31] on improving drug manufacturing, which included the recommendation of protocols to control potential resistance caused by antibiotic products. What is presented by the EU itself as important steps in antibiotic regulation is consistent with the neoliberal mode of governance though, as EMA's *Points to Consider* and the Council's 2001 *Recommendations on the Prudent Use of Antibiotics in Human Medicine* are a non-binding documents that mainly represented a continuation of the *rational use* demands from the 1950s / 60s and did only address AMR in clinical contexts. The focus on clinical environments may, besides the fact that most incidents of AMR happened there, also be related to the discourse in the UK (a pushing country[32]), where AMR "became framed as part of a larger crisis affecting the NHS hospitals" as Robert Bud has pointed out (Gradmann 2013: 572.) But the *Recommendations* were adopted by all EU ministers, more and more countries were working out national plans around that time. Taking up on the Scientific Committee's report on food-borne zoonoses and the mentioned year-long campaigning of some member countries, Council and Parliament finally agreed on a *ban* on antibiotics as feed additives (1831/2003) in 2003 (Bans of the last few substances would come into force in 2006) and a *binding* EU-wide surveillance system (2160/2003). All member states were now required to monitor resistance, assess trends and

29 Die Welt (1997): „Bakterien gefährlicher als BSE", „Tierfutter macht Krankheitserreger resistent", „Neue Gefahren durch resistente Bakterien".

30 https://www.bmel-statistik.de/ernaehrung-fischerei/versorgungsbilanzen/fleisch.

31 EMA (2000): Points to Consider on Pharmacokinetics and Pharmacodynamics in the development of antibacterial medicinal products.

32 The UK adopted a national action plan on AMR in 2000.

submit annual reports under harmonized conditions. Additionally, a new scientific framework for food security and a corresponding EU agency should be established by that regulation. Although it appears that EU antibiotics policy is picking up steam at that point, a regulatory decision in a related area needs to be mentioned, and that is one in environmental policy. In a Communication on the *Precautionary Principle*, which had been part of EU policy since 1993 and that was being strengthened on the one hand by a reiteration of the ability to invoke the *Precautionary Principle* before scientific proof of environmental harm was established, was also being linked to a *proportionate* principle and the use of cost-benefit analyses on the other hand (Prakash and Kollman 2003:623). This decision will become relevant during the further process and is discursively connected to a shift toward a framing of AMR as an *economic risk* for national economies and global markets alike as we will see in the following paragraphs.

Second, apart from the internal EU processes, the incipient regulatory policy must also be seen in a broader context. Fears in Western countries of smallpox attacks in the aftermath of the destruction of the World Trade Center in 2001 led to an increased societal need for *biosecurity*. This need had already grown over the 1990s, as described above, due to *emerging diseases* in different parts of the world, mainly the Global South, but also due to AMR incidents 'at home' in the UK, Scandinavia and Germany. Also, the 2001 WHO's *Global Strategy for Containment of Antimicrobial Resistance* entailed additional pressure, first, by their public visibility, and second, by their reference to potential economic consequences in the event of inaction. That the economic dimension of public health was coming into further international focus at this time is also evident from the 2001 DOHA declaration on the TRIPS Agreement and Public Health of the World Trade Organization (WT/MIN(01)/DEC/2), which introduced a degree of flexibility into its members' trade agreements – including patent law on medicines – because the "TRIPS Agreement does not and should not prevent Members from taking measures to protect public health" and therefore "the Agreement can and should be interpreted and implemented in a manner supportive of WTO Members' right to protect public health and, in particular, to promote access to medicines for all."[33] As Wernli et al. (2017) pointed out, a security frame has thus been established in policy documents – with an eye to the international AMR discourse – over the course of the 2000s that stems from the process of 'securitization of global health issues' in the 1990s and has been reinforced by 9/11. A culmination of this process is thus that "the WHO secretariat prepared a report entitled 'Antimicrobial resistance: a threat to global health security'" (Wernli et al. 2017:5). On the one hand, the increased perceptibility for biological threats (and their economic dimension) must have had a positive impact on EU's administrational attitudes toward taking action. On the other hand, as Overton et al. (2021:8) have shown, international reports´ attention for the AMR issue dropped after 9/11 and several outbreaks of infectious diseases (in the Global South) at that time, in favor of a focus on *pandemic preparedness* and *bioterrorism*.

In this context the SARS-Cov1 outbreak in southern China at the end of 2002 was of enormous importance, which is assessed by the WHO as a zoonosis. This is because the rapid spread was not limited to Asian countries neighboring China, but also affected Canada, the USA and the United Kingdom. This pandemic demonstrated that the now highly developed global interconnectedness can pose major problems in safeguarding public health. Moreover, what was happening in the countries of the global North was interpreted in such a way that the 1990s fear of emerging diseases had its justification and that pandemic threats were indeed relevant on a planetary scale (Elbe 2011), but more importantly that they could reach the North from the South. The same is true for other dangerous infectious diseases that appeared in African countries at that time, and zoonotic transmission events from the so-called avian influenza virus A/H5N1 to humans recognized in Asia starting in 2003. While the AIDS pandemic mainly raging in queer communities in the late 1980s had not been enough of a reason apparently, US security analysts were integrating *global health* into their concepts of

33 https://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm.

national security since viruses had the potential to endanger core institutions of the state – military and government (Elbe 2011:851). The linkage of security, health, and economic policy discourses can further be seen in a highly regarded statement by British economist O'Neill, who coined the term BRICS (Brazil, Russia, India, China, South Africa) as early as 2001 and named those countries as "areas of particular concern" with respect to drug consumption (Overton et al. 2021:9). The global North thus increasingly turned its attention to public health structures in the global South in the 2000s: The antibiotic stewardship concept gradually began to include the global South since 1996 (Overton 2021: 6f.) which also occurred in a 2005 reform of the international framework for global health security (IHR), making it a "target space of HIC dominated international intervention" (ibid.). That this engagement of the global North was not increased out of pure helpfulness should become clear at the latest when one looks at the British election campaign of 2004/2005. Tory politician Michael Howard asked at the time:

> *"Do you remember the British Disease? It once described Britain's economic and industrial weakness when the trade unions were out of control. The last Conservative government cured it. Today, there is a new British disease. But this time it is in our hospitals ..." (The Guardian, 2004, cited after (Brown and Nettleton 2017:498))*

Antimicrobial resistance was elevated to a major campaign issue, with the Conservative Party using the potential threat to citizens – as biological bodies and in the form of their subject invocation as part of a former great power – by "superbugs" to mobilize popular political support. Rather than calling for a strengthening of political control over healthcare institutions, however, the campaign placed the emphasis on a neoliberal solution:

> *"Microbial resistance will be purified from the British body politic only through competitive market logics which drive standards of cleanliness up resulting from newly constituted healthcare consumers exercising their right to choose: ‚The superbug is a British disease. The Right to Choose is the cure' (The Guardian, 2004, cited after ibid:499)*

Furthermore, the "resistant 'superbug' of 'red tape' and 'paperwork'" was identified in the "interfering bureaucracy of left wing 'centralization' and the lack of 'freedom for the professionals who know best..." (ibid.), while the central point of reference in this invocation of subjects was the bygone cultural imagination of hospitals as "comfortingly clean sanctuaries of security" (ibid.) Now, however, an interdiscursive linkage between the political AMR discourse and that on migration policy was beginning to form. In Howard himself, this is still recognizable as simple juxtaposition ("taxes are up, crime up, immigration up, waiting times up, MRSA up, take home pay down, pensions down, productivity growth down, manufacturing employment down" (Telegraph, 2005, cited after ibid:500), while the more right-wing conservative parties or MPs "were busy trying to fuse race, immigration and hospital infections" (Brown and Nettleton 2017:500). For example, the British National Party was "claiming that immigrants were the primary cause of MRSA" (ibid.), symbolizing a political atmosphere where immigrants could be framed "as vectors of disease" (Craig, 2007:273 cited after ibid.) Well, despite a rather emotional campaign, Howard famously did not win the election. But this little digression is meant to point to a partial shift in the discourse towards AMR as a threat from the global South, which is also evident in the implementation of the concept of One Health that now follows, which first appeared conceptually in 2004 (Podolsky 2018:4), the same year that China invested massively in buying animal factories that had previously been owned by foreign companies – of the global North (Kirchhelle 2018a:7).

EXCURSUS

From Global Health to One Health

By Manuel Harms

Before the conceptualization of One Health midway through the first decade of the 21st century, the scope of the field was widened from Public to Global Health, which focusses on the health of populations across the globe, particularly in low- and middle-income countries, and addresses issues such as communicable and non-communicable diseases, health disparities, and access to healthcare. There is, however, a great debate on the vagueness of the concept itself. In a systematic literature review, Salm et al. (2021) find that Global Health is often described as a well-established term, but one of its 'key attributes' is an enduring vagueness. In a similar vein, Koplan et al. (2009) state that Global Health is "fashionable" (p. 1993) and try to establish a definition of the term, stressing that "if we do not clearly define what we mean by global health, we cannot possibly reach agreement about what we are trying to achieve" (id.). They emphasize that the "global in global health refers to the scope of problems, not their location" (id.), and that "the rapid increase in speed of travel and communication, as well as the economic interdependency of all nations, has led to a new level and speed of global interconnectedness [...], which is a force in shaping the health of populations around the world" (p. 1994).

Contemporaneously, Critical Global Health emerged, which questions not only the root causes and power structures, but also the metrics of efficacy and evidence, and that – while "global health today is frequently premised upon universalist notions of humanity" (Adams 2016:187) – the implementation is not as universal. Instead, it focusses on "neoliberal solutions, [and] health economists, as opposed to health care practitioners" (id.) and relies heavily on private-sector solutions and NGOs. Further criticism of Global Health states that it aims at perpetuating / securitizing post- / neo-colonial power structures to 'keep disease in the Global South', which often leads to Janus faced policy implementations. With an example in the context of AMR, this means on the one hand outsourcing polluting industries of active pharmaceutical ingredients (leading to emergence of AMR clusters in the surrounding areas (Changing Markets Foundation 2018; Changing Markets Foundation 2020; Larsson 2014; Lübbert et al. 2017; Pulla 2017), and on the other hand attempting to regulate antibiotic misuse in the same regions (Biehl and Petryna 2013; cf. Fischer et al. 2014). In short: "drug resistance constitutes a global threat with a distinctly uneven distribution of causes, vulnerabilities and responsibilities" (Hinchliffe 2022:5).

Not only from these critical considerations, but also from an increasing recognition of the interdependence of human, animal and environmental health, as well as the development of computational methods to analyze large data sets from around the globe, One Health emerged in the early 2000s. While the term is novel, precursors of environmental disease emergence / modification date back to Hippocrates. However, but the term also makes recurrence to the idea of 'One World', which health actors took up during the 1990s, when potential wildlife origins of the HIV/AIDS pandemic and the global scale were increasingly recognized and other infectious diseases emerged and re-emerged (cf. Atlas and Maloy 2014). One Health follows the overall trajectory in global policy to approach problems through increased securitization (Holst and van de Pas 2023; Rushton and Williams 2012) and further widens the scalar and ontological angles:

> *"One Health and other technologies such as veterinary forensic science are built on the idea of security, protection, and immunization, albeit at a different scale, one that has expanded in the types of subjects and populations it enacts, protects, disciplines, and controls." (Ticktin 2019:16)*

Here, Ticktin already hints at another tendency that is to blame for the seeming impossibility to adequately tackle the 'super wicked problem' (Littmann and Simonsen 2019) of AMR: Albeit the angles are constantly widened in policy and regulation, most local-scale approaches aim at a responsibilization of the individual. While this strategy can be relatively effective in countries where access to antimicrobials is tightly regulated and professional allopathic healthcare practitioners are the sole prescribers, such approaches are more difficult – if not impossible – to be implemented in contexts of the Global South where regulatory efforts not even reach through to state levels. Instead, either (supra-)national regulation is not implemented on a polity level, or regulations fall short of the everyday realities of patients and healthcare practitioners.

An example for the former is the (lack of) implementation of National Action Plans on state levels. As an example, in India, only three states have implemented a State Action Plan, and private / NGO sector commentators remark it is specifically the state governments that "have power to influence the drivers of antimicrobial resistance in various ways"(ReAct 2022). In this context, Charani et al. (2023) state in an analysis of currently existing national action plans that the "[d]evelopment of national, regional, and local antibiotic policies" was "the most consistently discussed feature across all the NAPs reviewed" (471), but the effectiveness of their implementation within the local communities remains subject to further investigation.

There are numerous examples for the latter case, especially regarding the informal medical sector, which, in many countries of the Global South, "provides the bulk of health care, particularly for the poor" (Sudhinaraset et al. 2013). Ahmed, Hossain and Chowdhury (2009) attribute the "[i]rrational use of drugs, including antibiotics" (468) to a lack of training and capacity to provide basic curative services rationally" (id.) – and not only training (Das et al. 2016; Mukherjee and Heinmüller 2017), but also treatment quality (Das et al. 2012; Das et al. 2015), patient-healthcare-provider relationship (Sheehan H. 2009; Yellapa et al. 2017), and market dynamics (Ravindra Goyal 2013; Roy, Madhiwalla and Pai 2007) are among the social and environmental factors that go beyond the mere regulatory approach of leveraging individual behavior. Chandler succinctly summarizes:

> *"Given this rhetoric of AMR as a One Health issue, advocating for recognition of complexity and connectedness that requires a multi-sectoral response, it is curious then to observe that the behaviour change of individuals is so frequently cited as a key solution to AMR. (Chandler 2019:7)*

Thus, the One Health approach is subject to similar criticism like Global Health:

> *"One Health projects are often literally built on the infrastructures of old colonial health outposts; One Health programs run by French NGOs, for instance, are mostly located in France's former colonies, often in the same precise geographic locations. The implied geopolitics of One Health thus might actually do the opposite of reimagining the possibilities for interconnected care. According to Steve Hinchliffe (2015), One Health could produce two distinct and unequal worlds, a global North (where this conceptual world is made) and a global South (Braun 2007), where the ontological commitments are about bounded objects (like 'health' or 'disease') rather than entanglements." (Ticktin 2019:12)*

One could even go further and state that these entanglements are further disregarded, when the 'bounded objects' are atomized, e.g. when antimicrobials are being used neither to promote health nor

stave off disease, but rather in a mechanical mode to upkeep one's ability to perform labor in a twilight state of being just healthy *enough*, or as a growth promoter in animal husbandry for infection *prevention*. In this context, Abimbola et al. (2021) cite several studies showing "that knowledge plays a role in how farmers, patients and / or prescribers use antimicrobials (Abimbola, Otieno and Cole 2021:3)". However, they also acknowledge that this might not lead to the shift required, since an "increase in knowledge does not always translate to a change in behavior as is often expected (Abimbola et al. 2021:3)".

This increasing focus on human / animal / environment interfaces and a widening of the ontological scope is also visible in policy. A content analysis of the GLASS (Global Antimicrobial Resistance Use and Surveillance) Report shows a steady increase of the usage of the term from 2018, coupled with calls for increased integration, which is institutionalized in the "Tricycle" analysis tool (cf. WHO 2021b). Exemplary, a Tripartite (WHO, FAO, OIE) statement from 2021 recognizes AMR as emerging from within the connection of human and natural systems: "Rooted in recognition of the interdependence of human and natural systems, [...] the One Health framework works to address the interface between human–animal–environmental health by addressing environmental contamination, habitat use conflicts, biodiversity loss, emerging infectious diseases, antimicrobial resistance and ecosystem function degradation" (WHO 2021a:4).

EXCURSUS END

After the World Economic Forum put the risk of a global influenza pandemic on a par with terrorism in its Global Risks Report 2006 (Elbe 2011:852)and the USA in its updated National Security Strategy in the same year emphasized that "public health challenges like pandemics (HIV/AIDS, avian influenza) [...] recognize no borders" (Elbe 2011:853) the financial crisis and the accompanying shock about the fragility of the capitalist system created an enormously heightened sensitivity for possible future impacts of such scenarios on the global economic system from 2007. In the following year, the World Bank predicted a global recession in an internal report if a worldwide pandemic were to occur (Elbe 2011:852) and the United Kingdom did the same as the United States, integrating pandemics into its National Security Strategy as a "threat to national and international stability" (Elbe 2011:850). It was also that year that the German Bundestag adopted its first national action plan on AMR, the *German Antibiotic Strategy (DART)* and in which the Global South becomes a larger topic in international reports on AMR (Overton et al. 2021:5f.; see also Wernli et al. 2017 & Brandt et al. 2014), which is certainly plausible if one considers that the WHO published its One World – One Health approach at about the same time, which also addressed AMR. Increased activities can also be traced in the EU. Thus, the first *European Antibiotic Awareness Day* took place (Earnshaw et al. 2009), but its mobilization potential has remained low to this day, as even a brief glance at the marginal call-up numbers of educational films on YouTube reveals.

However, the scientific authorities responsible for AMR in the EU increasingly extended their focus to animal husbandry[34], following up on the agenda set by the European Councils' *Conclusions on Antimicrobial Resistance* of 2008 which had been influenced by international documents such as the WHO / FAO *Guide on Food Safety Risk Analysis* (FAO Food and Nutrition Paper 87 / 2006) and by the *Principles and guidelines for the conduct of microbiological risk management* of the Codex alimentarius committee (CAC/GL 63 – 2007). The Councils' (non-binding) document represented a significant shift in policy because it promoted a more globally orientated and more integrated view

34 ECDC / EFSA / EMEA (2009): Joint Opinion on antimicrobial resistance (AMR) focused on zoonotic infections; EFSA (2009): Assessment of the Public Health significance of meticillin resistant Staphylococcus aureus (MRSA) in animals and foods. Scientific Opinion of the Panel on Biological Hazards.

of human, animal and environmental sectors alike to a disproportionately greater degree than had previously been the case. In particular, it suggested to strengthen cooperation between EU institutions regarding antimicrobial use in the livestock sector and subsequently "consider further control options", especially for those substances, that are "also used to treat infections in human medicine and veterinary medicine". (4) Apart from that, it continued to rely on a combination of monitoring / surveillance, research / development of new antibiotics, the improvement of hygiene standards for more effective infection management and the education of both professionals and general public. In 2009, the *European Surveillance of Veterinary Antimicrobial Consumption* (ESVAC) project was launched, a network that would be slow to increase its membership. With the European Council Conclusions on *innovative incentives for effective antibiotics* (2009/C 302/05), which was accompanied by the drug development-focused *Joint Technical Report* on *The bacterial challenge: time to react*[35] by ECDC and EMEA, the EU was now also responding to the "Empty Pipeline Problem" to which scientists had been drawing attention since the 1980s. This policy document was the starting point for directing significantly more financial resources into research into new antibiotics or alternatives to them in the future. With the EU-US Summit in 2009 for bilateral cooperation on AMR, the EU also took a step towards internationalizing its policy. Attention then peaked in 2009/2010 when a mutation causing resistance to the antibiotic class of carbapenems became known: a Swedish citizen had become ill from an infection with the bacterium Klebsiella pneumoniae, which he had contracted during a stay in an Indian hospital. The authors describing the case named the enzyme responsible for the resistance function after the geographic location of the hospital in question-New Delhi metallo-beta-lactamase 1 (NDM-1) – although it remains unclear to this day whether this was in fact the site of origin. This event is assessed by Overton et al. (2021) as the "key to legitimising and unlocking finance for IOs' shift to governance-based approaches" (ibid:6) and thus also as a symbolic prelude to the development of global North-dominated, international reports by scientific and public health stakeholders from 2010 onward, in which AMR was framed "as a problem for the North but of the South" and "LMICs were seen as part of the problem (mis-use / over-use) and as central to pan-national solutions" (ibid:5). Against this backdrop, a major step toward institutionalizing internationally oriented policies apparently took place – "governance-like international policy" – because the "documents they now publish[ed] produce[d] 'real' action plans, guidelines, and surveillance infrastructures." (ibid.)

2.2.2 De-Silencing? 2010s–2020s

An important component in understanding the described development has already been hinted at but must now be made explicit. After China had begun to buy up factory farms on their territory in 2004, which Thai and U.S. companies had built and operated after the opening of China's economy to the liberal world market in the wake of Mao's death in 1979 their productivity increased steadily (as it had before) – so much so that China produced eight times more pigs than the USA in 2008 (Kirchhelle 2018a:7). The picture is similar for the rest of the BRICS countries, which in 2009 also came together under this very name to form their first summit. The fact that these *emerging countries*, so-called in the global north, were able to put the animal production of the former 'export world champion' USA and some EU countries such as Germany under such competitive pressure was, of course, also related to the unregulated use of antibiotics (in addition to lower wage levels and environmental standards). The model, which had been exported from there for decades and from which their large corporations had profited so far, was simply continued without their participation and economically-rationally optimized. In 2010 China was already the world's largest consumer of antibiotics and took over the lead in pig production in 2013 (Kirchhelle 2018a:7). Thus, it is reasonable to presume

35 ECDC / EMEA (2009): Joint Technical Report. The bacterial challenge: time to react. A call to narrow the gap between multidrug-resistant bacteria in the EU and the development of new antibacterial agents.

that the increasing engagement of international development organizations, academia, and health policy actors dominated by the Global North during this period from the turn of the millennium onward was also an expression of a classic social-psychological projection mechanism in form of a *European universalism* (Wallerstein 2010). The combination of disaster semantics emerging from scientific-activist discourse (e.g. in APUA's 2005 *Shadow Epidemic Report*: "our interconnected, high-tech world may find itself back in the dark ages of medicine, before today's miracle drugs ever existed"), which are then taken up by political discourses in the manner of externalizing the threat (see 2004 / 05 UK election campaign and upscaling of risk level to terrorism-like by World Bank etc.), and the fact that the EU agricultural market is being pressured by the increasing meat production of BRICS countries (FAO Stat), while EU regulators were not willing or able to implement more effective AMR restrictions, will probably have contributed to the focus on the global South as a producer of 'dirty' meat as it was semantically implied. The EU's own production sites can thus be upgraded by the actually or supposedly more restrictive regulatory policies, at least for the domestic market, whereas the BRICS put 'our biosecurity' and the basis of it – 'our prosperity' and 'our modernity' – at risk. This cultural projection had to be accompanied by a disruptive social reflection on what counts as *progressive* in order not to lose this kind of self-description. For the imagination 'cheap meat = progress' could not possibly continue unbroken in this process, of course.

Thus, at least in Germany 2011 seems to have been a turning point in agricultural policy as far as the conditions of factory farming are concerned, which went hand in hand with increasingly critical reporting even by tendentially conservative, farmer-friendly media such as the newspaper *Die Welt*, in which lurid titles such as "The methods of torture in German pigsties" or "Antibiotic fattening begins as early as the chick stage" were only the prelude to a new focus on agricultural "antibiotic abuse" (2012). From the Nestlé Nutrition Study 2011, in which 36 percent of the participants named "'species-appropriate animal husbandry' as a decision criterion for a purchase," the author deduces that "consumers now care about the circumstances under which the animals they eat have lived"[36] (own translations). Starting from Lower Saxony's CDU Minister of Agriculture Lindemann and above all CSU Federal Minister of Consumer Protection Aigner and their reform plans for reduced antibiotic use, Saxony and Thuringia signaled that they wanted to follow this direction. But this was only apparently an independent progressive initiative, since the EU had already published the *5-year Action Plan* in the same year (which had of course been in preparation for some time), which was also intended to tackle this previously neglected area. This 5-year-action plan und the *Council Conclusions on AMR* from 2011[37] would take up impulses from science and international development organizations to implement the *One-Health*-Paradigm by strengthening the focus on animal production, its environmental impact and the probable cycle connections also with human health. A year before, the Council had released allegedly new targets for "the fight against AMR", that were more or less a reformulation of already outlined policy programmatics of the *Prudent Use* paradigm, as they comprised 1. "appropriate use" including "promoting microbiological diagnosis", 2. "prevent microbial infections and their spread", 3. "Developing effective antimicrobials or alternatives", 4. "Joining forces with international partners" and 5. "reinforcing research" [38]. But in addition, the Council also pressed for restrictions on new or critically important antimicrobials for humans and a ban of cephalosporins in veterinary medicine as well as to take into further consideration both environmental pollution and transmissibility between humans and animals in direct contact. Certainly, the 2008 strategic framework on animal-human-ecosystems-interfaces by WHO / FAO / OIE / Unicef / World Bank / UN *Contributing to one world, one health* and the related concept note of WHO / FAO / OIE in 2010 on a *Collaboration*

36 https://www.welt.de/dieweltbewegen/article13747376/Die-Foltermethoden-in-deutschen-Schweinestaellen.html.

37 Council conclusions on the impact of antimicrobial resistance in the human health sector and in the veterinary sector – a "One Health" perspective (2012).

38 Communication from the Commission to the European Parliament and the Council: Action plan against the rising threats from Antimicrobial Resistance. (COM 2011 / 748): 4.

on animal-human-ecosystems-interfaces aiming at joint work on AMR, rabies and zoonotic influenza altogether, were highly influential in that matter. As a look at the players involved shows, the cooperation of international organizations addressing human *and* animal health emerging at late 2000s reflected the substantive thrust of these documents.

Another discourse event comes into play in this development of upscaling the problem, namely the analogization of AMR with *climate change* in terms of both the level of threat and the dimension of geographical reference. The impetus for this double upgrade was statements by UK Chief Medical Officer Sally Davies in 2013, in the wake of which the UK undertook this risk upgrade at the national level (Podolsky 2018:5). The G7 countries and the USA also dramatized their assessment of the AMR threat situation in the same year (Wernli et al. 2017:5). For the EU, it can be noted that efforts actually intensified at this time, also in terms of advancing restrictions. The central – binding – regulation in the area of veterinary and agricultural use of antibiotics was initiated in 2014, adopted in 2018 – but did not come into force until the beginning of 2023. At the same time, around 2013 / 14, a new animal protection law was drafted which aimed to reduce the emergence of resistance through more appropriate husbandry conditions, the New Drugs for Bad Drugs Program from 2013, which was the world's largest public-private partnership research project and was intended to refill the antibiotic pipeline, and expansions in the area of monitoring. Finally, with the Decision on serious cross-border hazards, the EU strongly expanded its hazard response structure which are also valid for AMR. Thus, it must be acknowledged that despite its involvement in potentially neocolonialist-tinged public health discourses about the Global South, which as mentioned above was identified in the 2010s as a source of the AMR problem for the North (whose contribution was arguably overemphasized given the somewhat similarly high antibiotic consumption in the centers of the global economy), the EU also began to expand its own policy. In 2014, the Commission proposed stricter regulation of veterinary production processes[39], and in the field of human medicine, adjustments were soon made, the starting point of which was the *Council Conclusions on patient safety and quality of care* 2014, and which were aimed primarily at optimizing hygiene protocols in hospitals and care facilities in order to reduce hospital-acquired infections and the development of resistances.

In the course of all these measures, which were initiated and accompanied by an increasing number of scientific studies (see Fig.4 in Overton et al. 2021:5), also by the own research institutions such as EFSA and ECDC, UK and German media had also turned to the topic. For Germany, the analysis of two regional newspapers and three with a national focus shows that the previously sporadic reporting increased from 2009 onwards and reached its peak in 2014 / 15 (see Figure 1). During the Covid years 2020 / 21, the topic then experienced a general slump. It is striking that the spatial reference of the articles is only focused to a very small extent on the Global South (max. 3 articles per year per publication, see Figure 2), although this would have been expected, mainly on the Global North (Figure 3) and significantly less on the global level (Figure 4) with a ratio of 2:1 (223 to 112 mentions between 1997 and 2019). The distinction between regionally and nationally received media shows that on average the topic has been taken up significantly more often in the nationally focused media. If we look at the ratio of topic setting with regard to human or veterinary medicine / livestock, 258 articles on human medicine and 176 articles on veterinary medicine / livestock result in a factor of just under 1.5 for the period 1997 to 2019 (see Figures 5 & 6). For the UK, the starting point of increasing coverage can also be dated to 2009, followed by the peak in 2016 and the drop by 2019. It can be seen that a very similar picture emerges for the coverage of AMR in relation to the geographical reference level of the media (see Fig. 7). However, the spatial framing of AMR is somewhat different than in Germany. Similarly, the Global South is hardly in focus (max. 1 article per year per publication, see Fig. 8), whereas the global level is addressed much more – almost as much – than the Global North, in contrast to Germany (83 to 75 mentions between 1997 and 2019, see Fig. 9 & 10). The analysis of

39 European Commission (2014): Proposal for a Regulation of the European Parliament and of the Council on veterinary medicinal products COM(2014) 558.

the ratio of human to veterinary medicine / livestock is also more pronounced: With 119 mentions to human medicine to only 22 for livestock, the factor is approximately 5.4 (see Fig. 11, 12, 13).[40]

The peak in reporting around 2014 / 15 is largely due to the reception of WHO surveys on the level of knowledge of the population on the subject at that time as part of its first Antibiotic Awareness Week[41] and to the resolution for a Global Action Plan on AMR by the World Health Assembly and the subsequent publication of an actual WHO Global Action Plan just one year later, which further pushed the institutionalization of the "global clinic" (King 2002) in general and in the form of the Global Antimicrobial Surveillance System (GLASS) in particular. In the FAO the issue of zoonotic diseases from animal production is now receiving more attention as shown for example by the first systematic review of the AMR literature with reference to Southeast Asia. The trend reversal at this time in the direction of animal production, which is apparent in the media analysis, finds its counterpart in real manifestations of the proclaimed One Health Policy: In 2015, EFSA, EMA and ECDC published their 1st *Joint Report* on antibiotic consumption and AMR in both veterinary and human medicine[42], and the Commission and Parliament agreed to apply the prudent use approach (based on voluntary insight) to the veterinary sector as well[43]. The Bundestag adopted the continuation of the *German AMR Strategy* (DART 2020), which had been a success insofar as antibiotic use in agriculture decreased by more than 60% between 2011 and 2017, especially strongly from 2014 to 2015. A year before, in 2014, the major newspaper *Die Zeit* even published a whole series on the topic (cover story: " That's what happens – revenge from the stable"), which focused strongly on agricultural use and offensively questioned meat consumption in general ("Can we still eat meat despite MRSA?") and established a relation to the thousands of deaths in European and German hospitals. What is articulated here resonates with a change in consumption behavior already taking place in society: Since the media preoccupation with the conditions of mass animal production and its systematic antibiotic "abuse" around 2010 / 11, per capita meat consumption in Germany had declined significantly after it had grown again to about 90 kg since a low of less than 83 kg / year in 2002. While (West) Germany had already passed its peak meat in 1988, this did not occur in the UK until 2006 – with a value of just under 86 kg / year only slightly less than in Germany. Since then, consumption has fallen to 75 kg / year in 2014. Both countries are exemplary for an overall Western European development. For Eastern Europe on the other hand the picture is quite different. In parallel with the economic decline in many post-Soviet countries after 1990 per capita consumption fell massively until 2000, from 74 kg / year to 47 kg / year, only to rise quite steadily since then. In southern Europe the situation was initially similar to that in the west. There, the 'peak meat' in 2002 was at 91 kg / year and consumption shrank until the 2010s. The figures for Northern Europe are somehow remarkable given the policy history: Meat consumption has only been declining since around 2010 in most countries in this region. This can be interpreted as influenced by a potentially higher consumer trust into the administration's capacities and / or the meat production industry in contrast to Germany. Its neighboring country Denmark makes an exception though as the year 1998 marks an erratic drop from 108 kg / year to 68 kg / year in 1999 (followed by a leveling in at just below 80 kg / year). In parallel, total antibiotic consumption

40 A more precise comparison of the total numbers between the two countries is, as described at the beginning, not meaningful without restrictions because the selection of the publications also depended significantly on the accessibility of the online archives and for Germany 3 instead of 2 national media were analyzed. Thus, it can be assumed that a more comprehensive evaluation which includes further media would come to the result of a similar level. Nevertheless, the country comparison in terms of geographic coverage and human/animal ratio illustrates the tendency that the topic of livestock production was significantly less associated with the emergence of AMR in the UK than in Germany (Fig. 13).

41 Daily Mail (2015): "Antibiotics DON'T cure flu and bacteria NOT humans become resistant, say WHO experts – as they warn of 'post-antibiotic era' where common infections will kill again"; Die Welt (2015): "So little do people know about antibiotics"; Berliner Zeitung (2015): "More and more ineffective antibiotics; WHO launches global week of action to raise awareness" (own translations).

42 ECDC/EFSA/EMA (2015): First joint report on the integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals.

43 European Commission (2015): Guidelines for the prudent use of antimicrobials in veterinary medicine (2015/C 299/04).

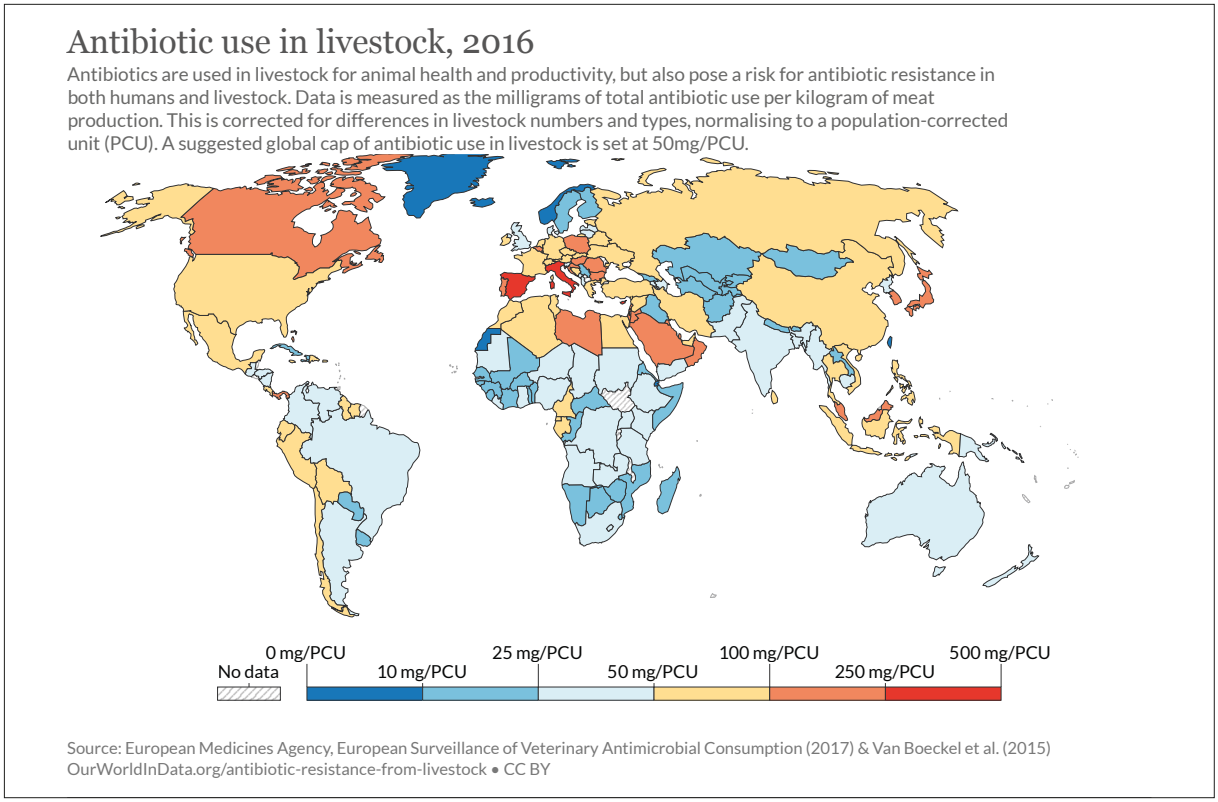

Figure 14: *Global Antibiotic Use in Livestock in 2016*

in the EU decreased in the 2010's, not only in the agricultural sector[44] but also in the human medical sector. Surveillance data from ECDC, EFSA and EMA[45] (2017) found large regional differences though: In all Northern European countries as well as in the UK, Austria, Ireland, Luxembourg and Slovenia, the overall consumption of antimicrobials in the livestock sector in 2017 is extremely low, whereas Cyprus, Spain and Italy exceed it many times over and are thus also at the top worldwide in 2016 (see Fig. 14). Above-average consumption is seen primarily in countries in south-eastern Europe such as Hungary, Bulgaria, Romania, Belgium as well as in Poland. The values for Germany lie in the average range. The human medicine statistics show significantly smaller differences between the countries. Northern European countries are also around the average value here, while the major consumers Spain and Cyprus also reach high (Cyprus) to particularly high values (Spain), with Greece taking the top position with over 200 mg / kg of estimated biomass. Germany is noticeably below average and the UK slightly above. France, as a below-average consumer in the livestock sector, has well above-average values for the human sector.

With respect to the data collected according to the defined daily dose (DDD) methodology of the WHO for the development of antibiotic prescription volumes *for human treatment* in the EU a decline in the total consumption (community and hospital sector) of antibacterials for systemic use (ATC group J01) of 2.9% was recorded for the EU as a whole between 2011 and 2020. However, this is only due to the decrease in the community resp. primary sector, as no significant trend was detected for the hospital sector. Opposite trends for this survey variable occurred only in Bulgaria (+2.4%) and Cyprus (+0.8%). Greece and Romania both showed a slight downward trend, but remain at a compar-

44 EMA (2022): Sales of veterinary antimicrobial agents in 31 European countries in 2021. Trends from 2010 to 2021. Twelfth ESVAC report (EMA/795956/2022).

45 ECDC, EFSA and EMA (2017): Third joint inter-agency report on integrated analysis of consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food- producing animals in the EU/EEA.

atively very high overall level. The overall higher level for Southeastern European countries could be due to the comparatively much higher prescription volumes in the primary care sector, as the values for the hospital sector are in the middle range and thus comparable to those of Sweden or France. However, a look at the use of broad-spectrum antibiotics shows that they have increased by 2.4% on average for the EU as a whole which can be attributed to national trends, especially in Bulgaria and Hungary (approx. +11%), but also in the Baltic states, Italy, Slovenia and Slovakia[46]. As of 2017, the trend towards a decrease in meat production in Germany can be seen, for which there are several reasons, of which only a few suspected ones can be mentioned here. The Federal Ministry of Agriculture and stakeholders in meat production state that the ban on imports of German pigs by China due to the outbreak of the so-called *African swine flu* (ASF) in 2020 (even though raging in China as well) and the Covid-19 related restrictions both had a major effect[47]. Besides the continued shrinking of profit margins in the face of increasing pressure from the ever more productive BRICS countries, the generally already emerging more difficult world situation for trade regarding e.g. supply chain security and the decreasing meat consumption also play an important role as can be assumed. This might especially be the case with regard to the start of the *Fridays for Future* protests in 2015, which also addressed the issue of climate change appropriate nutrition particularly among the younger generation and subsequently also carried this issue into the parents' and grandparents' generations. In 2018, even the more conservative medium *Die Welt* asks the question about animal consumption ("Can you actually still eat fish?").

Contrary to these first policy and political 'successes' and the increasing attention to the issue of AMR including its connection to animal husbandry in Western media, science and politics in the 2010s, meat production, consumption and thus the use of antibiotics as well as the human consumption continued to increase in other parts of the world (overall world meat consumption per capita: from almost 23 kg / year in 1961 to almost 42 in 2015[48]). This was increasingly thematized as a threat in the North and coincides with the media event in 2015 around MCR1 – quasi the 'Chinese NDM-1', which in contrast to the 'Indianized' NDM-1 apparently made less waves in the German media than in the UK[49]. Despite the "shock discovery"[50] of this gene encoding a colistin resistance in pigs in that year, it "was detectable in strain collections from more than 30 countries and was already circulating in China in the mid-1980s" (Overton et al. 2021:9). According to Wernli et al. (2017:5), studies on the topic under the slogan "overusage in agriculture" vs. "last resort" for humans increased awareness for the environmental factor and they also seem to have triggered certain bans in Brazil and China.

Ultimately, moreover, it must be suspected that the peak in 2014/15 was also quite substantially embedded in another, much larger discourse event – the EU Border Crisis, which foreseeably manifested itself in the early to mid-2010s and during which (almost) all media had to report permanently for months about how big the danger of this "wave" or " flood" of potentially risky individuals or groups of people for "our social systems" – like, e.g., our health care system – could be. An example of the interdiscursive linkage of the two fields Border Crisis and AMR can be found in the new edition of the UK aid program for 'developing countries' in 2015, *Tackling global challenges in the national interest51,* which defended the apparently previously criticized high level of spending on development programs with the argument that "the great global challenges – from the root causes of mass migration and

46 ECDC (2021): Antimicrobial consumption in the EU/EEA (ESAC-Net) – Annual Epidemiological Report 2020. Stockholm.

47 https://www.ble.de/SharedDocs/Downloads/DE/BZL/Daten-Berichte/Fleisch/2022Bericht-Fleisch.pdf?__blob=publicationFile&v=2; https://www.schweine.net/news/deutlicher-rueckgang-der-deutschen-fleischexporte.html ; https://www.lebensmittelverarbeitung-online.de/branchennews/fleischproduktion-geht-in-den-vergangenen-fuenf-jahren-um-14-prozent-zurueck.

48 https://ourworldindata.org/grapher/per-capita-meat-consumption-by-type-kilograms-per-year.

49 Daila Mail (2015): "Superbug resistant to ALL antibiotics reaches Europe: Danish patient becomes infected with untreatable form of salmonella that is 'probably already in Britain'".

50 Daily Express (2015): "Resistance to last-resort antibiotics spreads WORLDWIDE: Scientists in shock discovery".

51 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478834/ODA_strategy_final_web_0905.pdf.

disease, to the threat of terrorism and global climate change," including "risks such as antimicrobial resistance," would "directly threaten British interests. A link is openly made between the strengthening of "UK trade and investment opportunities" and the goal of limiting migration, especially from Syria and the entire unstable MENA region (p.3). In this document, a leadership claim is formulated in this regard – "The UK has led the global fight against antimicrobial resistance" (p. 16)[52] – which was only realized by a 2014 review commissioned by then Prime Minister David Cameron from former Goldman Sachs economist Jim O'Neill to quantify the consequences of AMR in medical as well as economic terms (Podolsky 2018:5). Here, too, fostering international development was framed as protection against national decline caused by instabilities of 'underdeveloped' countries, which were thereby marked as a threat, and justified as an investment in the country's own biotechnology sector. Cameron jumped on the bandwagon of the 2004 election campaign by taking up the fear of "being 'cast back'" in a media-effective way. One parliamentarian commented his AMR policy proposals as follows: '... increasing the unit price of antibiotics and tackling their growing misuse in developing countries is absolutely vital if we are not to face a return to the medical dark ages' (Sturdy MP, House of Commons, 15 July 2014)." (Brown / Nettleton: 500) Regarding this context, Overton et al. (2021) state that:

> *„Underlining the role of soft power interests within international AMR governance, the initiative was explicitly framed as a way for 'Britain to lead the way, using its international leadership and world-class pharmaceutical sector (...) to battle against antimicrobial resistant infections and bring new drugs to the world market'" (D. Cameron 2014, cited after Overton et al. 2021:9)*

This report, published in 2016, is described in an expert survey by Overton et al. (2021) as the most influential report on AMR policy (Overton et al. 2021:7). It provided the prelude to the now incipient increase in political thrust toward international policy structures as it "advocate[d] supra-national entity to set global priorities, monitor performance and accountability" (Birgand et al. 2018:8) and cited correspondingly alarming figures by Richard Smith and Joanna Coast although these were based on very rough calculations (Smith and Coast 2013). Only ranked number 7 in the list by Overton et al., it is important to mention the UN Political Declaration on AMR in 2016, as it is linked to various programs and transnational cooperation in subsequence[53], like the UN Interagency Coordination Group (IACG), created shortly after the declaration, "which seeks to generate a common direction across sectors, industry and nations globally" (Chandler 2019:2). The desired involvement of the industry met with a biotechnology sector that was positive in this respect and at the same time agreed on a catalog[54] that called for funding and planning security and promised to help with the anti-AMR policy in return. Although it appears that this would amount to a major step towards breaking down the spatial formatting of EU AMR policy the actual development of the legislation has lagged behind the scale of the many action plans and promises of international cooperation. Significantly it was not until 2017 that EFSA, EMA and ECDC published a set of indicators for assessment of progress in reducing use AMR in the EU itself, which reinforces Kirchhelle's thesis of a neglect of effectiveness review. Due to the lengthy legislative processes in the EU and assumingly also strong lobbying activities of pharmaceutical and agricultural industries, Parliament and Council only adopted the *Resolution on prudent use in livestock* (2019/6) in 2018 as a result of what the Commission had initiated in 2014 (Proposal for regulation of veterinary products). Main points of this regulation were: prohibition of reserve antibiotics in animal husbandry, preventive use of antibiotics now only allowed in exceptional cases, which must be justified by a veterinarian, and explicit prohibition of antibiotics for the purpose of fattening. This

52 Further examples are "The UK leads the world on international development" (p.5), "Continue to lead the response to humanitarian emergencies" (p11); "UK's world-leading expertise in public health and medical research" (p. 9).

53 E.g., Antimicrobial Resistance Multi-Partner Trust Fund (MPTF) (2019).

54 AMR Industry Alliance (2016).

regulation is considered very drastic, especially by farmers and veterinarians[55], and it must be said that it is an impediment due to enormous bureaucratic extra work mainly by documentary requirements. And excluding reserve antibiotics was indeed a historical caesura. But the fundamentals of the still large number of antibiotic prescriptions have not been addressed: The progressive concentration of agricultural production on ever larger farms and the associated increase in the number of animals per space unit puts veterinarians in the impossible situation of having to prescribe fewer antibiotics while the pressure of infection or the burden of disease naturally continues to rise. In this context, the prohibition of preventive use is not completely ineffective but it can always be circumvented to some degree by the argument of animal welfare in – a surprisingly large number of – *individual* cases. This absurdity points to the still mainly individualistic responsiveness of recent measures. Chandler (2019) points out that despite the new direction of the One Health approach, which focuses on "interconnectedness (sectoral, disciplinary, countries, human-nature), the strategies of most actors are strongly oriented towards individual-behaviorist programs (users, farmers, physicians), in continuation of the antibiotic stewardship paradigm. This is evident for Germany's new label on animal husbandry, which provides a scale from A to D for differences in animal welfare to enable consumers to make an informed decision. Further examples are the Government commissioned *National Food Strategy* in the UK which stipulates that Britons should "try to cut their meat consumption by about 30% within the next decade", the *Keep Antibiotics Working* campaign by *Public Health England*, which "specifically 'focuses on the personal risks of antibiotic resistance' in an attempt to reduce demand for antibiotic prescriptions from doctors" (Chandler 2019:7). This kind of narrative is also present in a recent WHO campaign, as can be seen from a poster for Antibiotic Awareness Week 2017. There a hand is seen reaching into a bowl full of colorful candy – and pills. The message of the campaign is: Misuse of antibiotics puts us all at risk. Taking Antibiotics when you don't need them speeds up antibiotic resistance. Antibiotic resistant infections are more complex and harder to treat. They can affect anyone, of any age, in any country. […]"(see fig.2 in ibid:8) Correspondingly, in the EU there are only isolated attempts at the *national* level to take a closer look at *structural conditions*, as can be seen in Spain's decision to limit the number of animals in livestock buildings or in the Netherlands' decision to actively promote the reduction of food animals by buying up farms, compensating farmers and supporting them in their professional reorientation[56]. In the current biopolitics of the EU, it thus seems to be true that the human body is rather "a body understood in terms of a general economy of exchange and circulation" (Braun 2007, p. 15)

As has become evident from media analysis and *Pubmed* entry analysis, and confirmed by Overton et al. (2021), the Covid19-pandemic seems to have temporarily subtracted the awareness of AMR, which has now grown considerably. In its new framing as a *Silent Pandemic* it now emerges all the stronger, as societal perceptibility for anything related to zoonotic pandemics is now higher than ever. As early as June 2, 2020, WHO effectively linked the two issues in the way that overuse of antibiotics or AMR posed an additional risk to Corona patients[57]. In 2022, the BILD newspaper picked up an alarming statement by the WHO: "MORE VICTIMS THAN WITH MALARIA OR HIV – deadly threat from killer germs", evoking the fear of a "third-worldering" of Germany as both diseases are broadly associated with African countries. AMR Headlines dealing with large numbers of victims[58] have increased compared to pre-Covid-times, mirroring the medial normalization of juggling with death tolls during the Corona years. This discursive build-up has even been critically assessed by scientists from the

55 https://english.fleischwirtschaft.de/economy/news/eu-parliament-dispute-over-reserve-antibiotics-51033.

56 https://www.fwi.co.uk/news/environment/dutch-announce-forced-buyout-of-farms-to-cut-emissions.

57 https://www.brusselstimes.com/185473/eu-parliament-rejects-plan-to-ban-some-antibiotics-for-animal-use; https://www.agrarzeitung.de/feedmagazine/feedmagazine-news/antibiotics-eu-parliament-against-tightening-97500.

58 Die Zeit (2022): "35,000 people die annually due to antibiotic resistance"; "At least 1.3 million people die annually from bacteria that have built up resistance to antibiotics"; "Multi-resistant germs cause millions of deaths worldwide"; "So-called "superbugs" were responsible for the deaths of nearly five million people in 2019" (own translations).

AMR field, since, as with the climate change issue, there is a danger that the disaster semantics will lead to the psychological effect of resignation (Brown and Nettleton 2017).

Apparently, however, the EU's alarm level is still not as high as the now widespread alarmist rhetoric would suggest. Although the *European Green New Deal* was adopted in 2020, which also provides for the halving of antibiotic use in agriculture by 50% by 2030 within the framework of the *Farm to Fork Strategy*, the proposal by a Green MEP to reserve five further substances for humans, which are still used massively in animal husbandry, failed due to a conservative parliamentary majority. The EU is not alone in this, however, as "the growing complexity and number of international AMR reports has not necessarily reflected mobilization, but almost evidence of policy paralysis", as Overton et al. (2021:7) note. A look at the actual global financial investments of the last few years shows that the OH approach remains rather of imaginary character, since

> *„a disproportionate amount of the US$ 8.2 billion invested in AMR-related research and development projects since 2017 has targeted industry and innovation (almost US$ 3.4 billion) with most international investment focusing on human health (US$ 7352 million) rather than animals (US$ 956.2 million), the environment (US$ 234.8 million) or plants (US$ 85.6 million)." (ibid.)*

This corresponds to the fact that reporting currently focuses on the human and animal domain, whereby the "environmental domain is mostly conceived in terms of wildlife, while other components such as soil and water remain neglected" (ibid:2&6). Nevertheless, a new concept emerged following in the One Health's footsteps and seeking to focus attention on precisely this area: Planetary Health.

EXCURSUS

Planetary Health

By Manuel Harms

The most recent step in increasing ontological integration is Planetary Health (PH), a relatively novel and emerging field that is based on the recognition that changes to the structure and function of environmental systems are an acute and rising threat to human health. Human health is – by most metrics – better today than at any other time in history, but this progress has come at the expense of the depreciation of 'natural capital', enabled and reinforced by an ontological separation of nature and society, and is thus jeopardized by continuous unsustainable use of resources and a global labor system built on and perpetuating inequalities, where humans are considered as exploitable commodities. This has now moved towards a tipping point, where "disruptions in the atmosphere, oceans, and across the terrestrial land surface are not only driving species to extinction, they pose serious threats to human health and wellbeing" (Myers 2017:2860).

While the debate surrounding planetary health has gained traction during and in the aftermath of the COVID-19 pandemic it has been conceptualized some years before. The term was coined by Richard Horton, editor-in-chief of the Lancet, who wrote in an 2014 article:

"Planetary Health is an attitude towards life and a philosophy for living. It emphasizes people, not diseases, and equity, not the creation of unjust societies. We seek to minimize differences in health according to wealth, education, gender, and place. We support knowledge as one source of social transformation, and the right to realize, progressively, the highest attainable levels of health and wellbeing." (Horton et al. 2014)

Myers (Myers 2020) provides further detail to the specific areas under consideration, stating that

> *"[t]he scale of the human enterprise now surpasses our planet's capacity to absorb our wastes or provide the resources we are using. Human activities are driving fundamental biophysical change at rates that are much steeper than have existed in the history of our species [...] These biophysical changes are taking place across at least six dimensions: disruption of the global climate system; widespread pollution of air, water, and soils; rapid biodiversity loss; reconfiguration of biogeochemical cycles, including for carbon, nitrogen, and phosphorus; pervasive changes in land use and land cover; and depletion of resources including of fresh water and arable land. Each of these dimensions interacts with the others in complex ways, altering core conditions for human health: the quality of the air we breathe, the water we drink, and the food we can produce." (p. 7)*

While these statements already hint at the strong overlap between planetary and environmental health, and both fields' object of enquiry is the relationship between human health and external (environmental) conditions, Planetary Health adds the importance of Earth's natural systems to human health to debate and policy. Consequently, the disruption of these systems is understood to be deleterious and oftentimes irreversible on civilizational timescales. Thus, it is important to note that the ontological expansion towards 'the planetary' is not for its own sake, but rather to preserve the conditions for *human* health, instead of promoting a 'biospheric egalitarianism' (cf. Naess 1973).

Human-nature-relationships can be broadly classified as: instrumental, quantifying the benefits nature provides to people; intrinsic, venerating the natural world in abstraction from human needs; and relational, emphasizing the human relationship with the natural world and valuing it (cf. Arias-Arévalo, Martín-López and Gómez-Baggethun 2017). Planetary Health is in alignment with the instrumental and relational approach since the concept does recognize anthropogenic planetary changes but still has a strong anthropocentric orientation. Thus, a more appropriate term could even be '*anthroposphere* health'.

To better understand the instrumentalization of 'biospheric egalitarianism', it is helpful to look at the possibly most prominent precursor of planetary health thinking: Gaia. While Planetary Health is not a direct successor of Gaia, it stems from a similar lineage of systems thinking. The concept was coined by James Lovelock in the late 1960s and proposes that biological life played a key role in regulating the overall state of the Earth to keep a planetary homoeostasis and maintain the optimal conditions for life (cf. Brooke 2014). While it is accurate that "Gaia has lately become something of a mascot for posthumanist approaches to environmental politics (Aronowsky 2021:326)", Haraway (2016) succinctly describes its importance as an ontological shift: "Gaia is not about a list of questions waiting for rational policies; Gaia is an intrusive event that undoes thinking as usual" (p. 44).

The idea has been expanded upon (Clarke 2020; Margulis 1998) taken as a starting point and metaphor for further deliberations and debates, (Haraway 2016; Haraway 2018; Latour 2017; Ward 2009) and – most importantly for the discussion of Planetary Health – heavily debated. Industry actors, and (debatably) Lovelock himself, (mis)appropriated and deployed the idea to obfuscate path dependencies and responsibilities of industrial pollution. Aronowsky argues that "before climate change denialism had become a well-funded, well-oiled public relations machine, Lovelock sowed the seed of skepticism in the form of a novel claim about the nature of pollution itself." (Aronowsky 2021:318).

While a shift to the global scale is required in terms of policy and governance, it at the same time blurs a regulatory perspective on important human / animal / environment interfaces and other "forms of care that, while concerned with 'the human', do not let it take center stage." (Ticktin 2019). And already the terminological evolution seems to hint at this de-centering: Whereas Global Health semantically widens the scope to encompass the entire (still nationally fragmented) 'globe', One Health ties humans, animals and the environment together as 'one'. Finally, the term Planetary Health

seems to acknowledge a humbleness towards Earth as an inhabited celestial body – and (with some room for interpretation) humans as transient short-lived 'wanderers' (gr. Πλανήτης: planḗtēs) on it.

Semantics aside, it remains to be seen how much of Planetary Health turns out to be an epistemic smoke screen that obfuscates industry responsibilities of continuous unsustainable food production by further shifting the blame to the individual, while proclaiming a planetary perspective. Indications for this are a very strong focus on ethics instead of specific policy, increasing the difficulties of implementing the agendas. This focus on the individual is also visible in one of the cornerstones of Planetary Health, the proposition of a 'Planetary Health Diet' by the EATforum, a commission of the Lancet and the 'strategic partnerships' of this commission with big industry stakeholders such as Nestlé, Danone, or the Compass Group.

EXCURSUS END

Until the 1970s, the majority of international reports on AMR focused on this sector of food animal production. Subsequently, the importance of the topic of food production was relativized to a certain extent, initially for the obvious reason that over the years other areas also became the subject of scientific research. In addition, it can be assumed that habituation effects play a role against the background of the change from an agrarian to a service society with a spatial order strongly based on the separation of humans and animals. Only with the increase in scientific and political attention for AMR as a whole from the 2000s onwards, and enormously intensified from the 2010s onwards, does the topic once again become a relevant part of societal communication. Finally, it must be underlined that this "de-silencing" from the 2010s onwards took place at the same time as the migration crisis and the AMR incidences in India and China. The connections and possible reasons for this are certainly manifold and require a far more comprehensive consideration than was possible within the framework of this working paper. As far as the current development is concerned, it is important to note that the still rather intense preoccupation with pandemic zoonoses against the background of climate change, compared to the exuberant preoccupation with behaviorist approaches (WASH), medicalized solutions (vaccinations) and national solutions (border closures), has brought about societal self-reflection regarding environmental degradation on a global scale, including a focal shift of transnational players on zoonoses[59].

59 As seen in subject matters of OHHLEP: One Health High-Level Expert Panel created by WHO, FAO; UNEP, OiE .

3 Conclusions and Outlook

Looking back at the development of EU policy on antimicrobial resistance, several conclusions can be drawn with regard to the research questions posed at the beginning. From the fact that the infrastructural expansion of antibiotic use in the human medicine and livestock production sectors was closely linked to the economic rise of European countries and the effectiveness of the mutually associated health care system, it follows that a serious regulative, including legislative confrontation with AMR could only be implemented when it was widely recognized that the negative consequences of this process could also severely damage the people's body of the EU (in a biopolitical sense of the 'Volkskörper') and endanger this transnational project as a whole.

For this to happen, the systemic dependency on this biotechnology that had been culturally and politically repressed for a long time had to be brought into consciousness which involved several stages. First of all, the unintended side effects of the production of consumer goods had to become increasingly noticeable in the 'habitat' of the people living on European soil in the 1980s. This implied the partial loss of faith in the previous belief in progress and industry as a guarantor of rising living standards as well as changing spatial imaginations of the human-environment and human-technology relations, including a heightened sense for both the vulnerability and interconnectedness of biological spheres – especially after the poisonous cloud from Chernobyl reached the west of Europe. The 1990s gave rise to even more far-reaching changes: First and foremost, the intensified neo-colonial exploitation of the periphery became not only manifested in poverty and environmental destruction *there*, but began to take the form of infectious diseases that had the potential to make their way into the centers through the very infrastructural connections that made this exploitation possible. This was accompanied by a biological-spatial imaginary of an infection that bears the *precariousness* of the periphery, which then manifested fears of a 'third-worlding'. In response, a health policy update was applied to both security policy programmatics and the legitimization of asymmetric global trade relations. Subsequent policies involved spatial scripting in national and international terms, e.g. National Health Security concepts in the USA and Global Health Security concepts by the WHO that started to re-frame public health as a global-local interplay with the local scale as being a globally responsible actor. Second, rising AMR incidences in Scandinavia, Germany and the UK in the same decade amplify the perception of antibiotic technology as an *internal* problem of the European region (at least in these countries), and – provoked by the BSE scandal – also to the (renewed) questioning of animal production. It is worth investigating whether the decline in consumption in Western Europe after 1990 (resp. around the turn of the millennium), after years of steadily growing consumption, is at least in some way related to this. Another potential influencing factor for the later meat skepticism that may already have set in here could also be the emerging discussion about the health consequences of meat consumption[60]. The 2000s and its key events, 9/11 and the SARS-COv1 pandemic of 2002/2003, raised fears of a home invasion by infectious agents either escaping or deliberately translocated from the global South. This fear led to a new level of threat perceptions, while at the same time the BSE bump in Western European meat consumption statistics recovered, albeit not to the level of before the outbreak. At that time European regulators were working on AMR regulatory documents, both for the human and the animal sector, and started to transform what had been national policies into a European format. The fact that this was done under pressure from states already recovering from scandals points to the still high relevance of the nation states in the further course as well, as evidenced in the role of the UK and D. Cameron's push for "leadership" in AMR research and policy. Nevertheless, joint processing at the transnational level may very well have been

60 https://www.bmel-statistik.de/archiv/nachrichtenarchiv/startseite-news-details?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=221&cHash=2c7cc47ea0641804f97b5196caef33d5.

effective in the context of the progressing European integration process, not only because it created institutionalized community structures but also because it strengthened the ability to think about problem solving beyond the scale of the national state.

The next decade sees the linking of AMR with two other globally scaled discourses of danger, that of climate change and migration, which contributed to further awareness in different ways. As far as climate change is concerned, it is likely that European citizens' increasing awareness of the self-inflicted nature of this problem became influential. However, with the on balance racially charged discourse further reproduced, it must be assumed that the opposite was the case for the migration discourse: A considerable part of society was not averse to seeing migrants as a threat to our social systems, rather than as threatened by the Western way of life. The fact that the anonymous "waves" of refugees were not framed in the hegemonic discourse as a consequence of global social inequality, without which the economic success of the EU is unthinkable, indicates that there was little reflection on one's own role in this situation. This might explain why subsequent policy was advanced on the basis of increasingly globalized spatial scripts (see the emergence of the One Health concept) which was realized, among other things, in the spatial formatting of surveillance structures in the direction of a "global clinic" but the causes of rising antibiotic consumption in the countries of the global South which also resulted from increasing integration into the asymmetrical global market and corresponding economic constraints were virtually not addressed as they would have pointed to exactly this uneven relationship between 'North' and 'South'. This appears to be an externalization operation that makes it possible not to have to question the preconditions of one's own system.

At the same time, however, spatial perceptions of two AMR settings changed remarkably at a European scale. The cultural imagination of the hospital as a safe place – already abolished in the UK during the election campaign in 2004 – was now passé at a European scale, or at least had received severe cracks. Germs were no longer conceived as being isolated in sick individuals from otherwise healthy patients in this respect, but as highly mobile objects that could go on the move at any time. The same applied to livestock production: The germs that could be contracted even before from insufficiently heated meat now seemed to have 'gone mad'; they became superbugs, a kind of modern supervillain, that seeks imperialistic reproduction. Precisely this may be an important reason for the disruption of the previously valid cultural valuation of meat = progress: the technology that once seemed to guarantee the minimization of health risks and the safeguarding of the food supply of a growing population has itself become a potential risk. It can be assumed that gender relations which have been changing for decades have also had a major influence as they have certainly accompanied the process of individualization of health care insofar as the biopolitically increasingly desired self-caring tends to carry feminized attributions. In addition to gender, however, a second dimension of social inequality is most likely relevant for the reversal of the semantics of progress, namely class: a central support milieu of the health policy change in Germany from the 2000s onwards, the economically aspiring middle-class Green voters, pushed a new view of meat consumption (see e.g. the *Critical Meat Atlas* of the *Heinrich Böll Foundation*), which has increasingly extended beyond this milieu to all 'high achievers' of society. This implied a milieu-specific cultural re-evaluation process in the course of which cheap meat became associated with social 'weakness'. Clearly, this would need to be examined in relation to other countries in the EU and other milieus. Moreover, a third dimension of social inequality – race – seems relevant, and this one is epistemologically tightly connected to the migration discourse and its fear of the 'Other'. There has been a long history of 'Western' self-description as progressive and it always evolved over time with only few disruptions and subsequent return to old certainties. At that point, when one's very own technology seemed to lose efficacy on a greater scale due to accelerating negative feedback, there had to be made an adaption that could rescue the culturally inherent need for being ahead of things in contrast to the less 'developed' parts in the world. Interestingly, this point in time coincided with a growing perception of BRICS as closing in on the success of 'the West' which had been imagined as being on the brink of the abyss during the financial crisis.

All these changes corresponded with a significant increase in policy activity, which, in addition to an emerging globalizing scripting and formatting, was mainly focused on the EU scale, and *had* to dedicate itself to this scale – at least for reasons of credibility. But still policy activity did not address the systemic-structural foundations of the problem and deflected a good part of administrative responsibility to the meat and pills demanding 'consumer' by awareness campaigns in civil society and professional communities as well, even though legislative projects such as improving animal health were brought on their way. The enormous thrust of policy internationalization towards the end of the 2010s can now be assessed, on the one hand, as a responsible reaction of the EU and other transnational organizations to a problem that is considered global in the scientific community. The institutions appeared very committed by participating in such a comprehensive project of global reach. On the other hand, it is precisely this upscaling of both institutional response and problem framing that makes it possible to deflect attention from actual backward steps or insufficient regulations, such as exemptions for the monitoring of antibiotic administration in poultry. Similar conclusions can be drawn with regards to another vehicle of discursive acceleration: The increasing use of death figures functions as a semantic carrier of both urgency and severeness of the problem in the discourse, whereby science is motivated to do so not only out of genuine concern, but also for reasons of economic pressure for funding through third-party funding. In a similar way, politics is bound to the cycles of democratic elections, so it can be useful to be an advocate for more security against hostile germs. And the fact that, in the context of the attention economy of the media system, 'bad news is good news' does not need to be elaborated further here. Now, despite the boost that the Covid pandemic ultimately had on the now heightened attention to the issue, the current officially cited number of actual EU citizens dying due to AMR infection is 35,000 per year, many times lower than Covid-19 at its peak. This points to the central role of extrapolations in the discursive construction of AMR as an epistemic object, which is similar to the social processing of the Covid19 problem and which obviously has to be placed in the larger context of the advancing securitization of health and the accompanying increasing demands for control of risk in this regard.

Yet, it is only through the existential disruptions that Covid has brought that a more profound spatial assemblage seems to be established that puts a stronger focus on crucial nodes of the antibiotic infrastructure, such as water (waste water scandals) and the overall environment. This comes along with a re-imagination of the human being, its body and its bodily and metabolic relation to the environment, while human's self-relationship is determined by a permanent bodily precariousness. Nevertheless, the tendency towards imagining and scripting on a global scale is still confronted with a gap in the actual spatial formatting of AMR policy, which is expressed in particular in the absence of responsibility structures on polity level – analogous to climate change.

However, this absence is largely due to what is often seen as a weakness of democratic constitutions, namely the fact that while governments seem to bear the main responsibility – at the national or EU level – they do not have a central controlling unit that could address and solve emerging community problems in a conflict-free manner. Drawing further on Luhmann's systems theory (Luhmann 2004), it is also not possible to respond effectively to the increased ecological risk awareness in science and society for two further reasons: The system logics in the health and economic systems are contradictory to each other and, analogous to climate change, there is no simple causal or attribution principle. The application of the *polluter pays* principle in the liberal legal system is not really easy in these cases – who bears the blame? The poultry farmer who keeps his animals in a confined space to pursue his right to profit, the veterinarian who prescribes an antibiotic to every sick chicken in that coop, the EU parliamentarian who votes against tightening rules to protect his national agribusiness, the shareholders of the pharmaceutical industry, who earn money from the supply of important medicines, the medical profession that has the social mandate to get sick workers back on their feet as quickly as possible, the patients who want to get back to work quickly so as not to fear any disadvantages, or the meat eaters who have been subjectivized by a culture that has an instrumental relationship with nature? Or is it the citizen who votes for anti-democratic, anti-EU

parties that frame those EU regulatory policy that doesn't fit a conservative way of living as a threat to national sovereignty, capitalism personally or European universalism which prioritizes addressing the barbarism of others over abolishing the barbarism at home?

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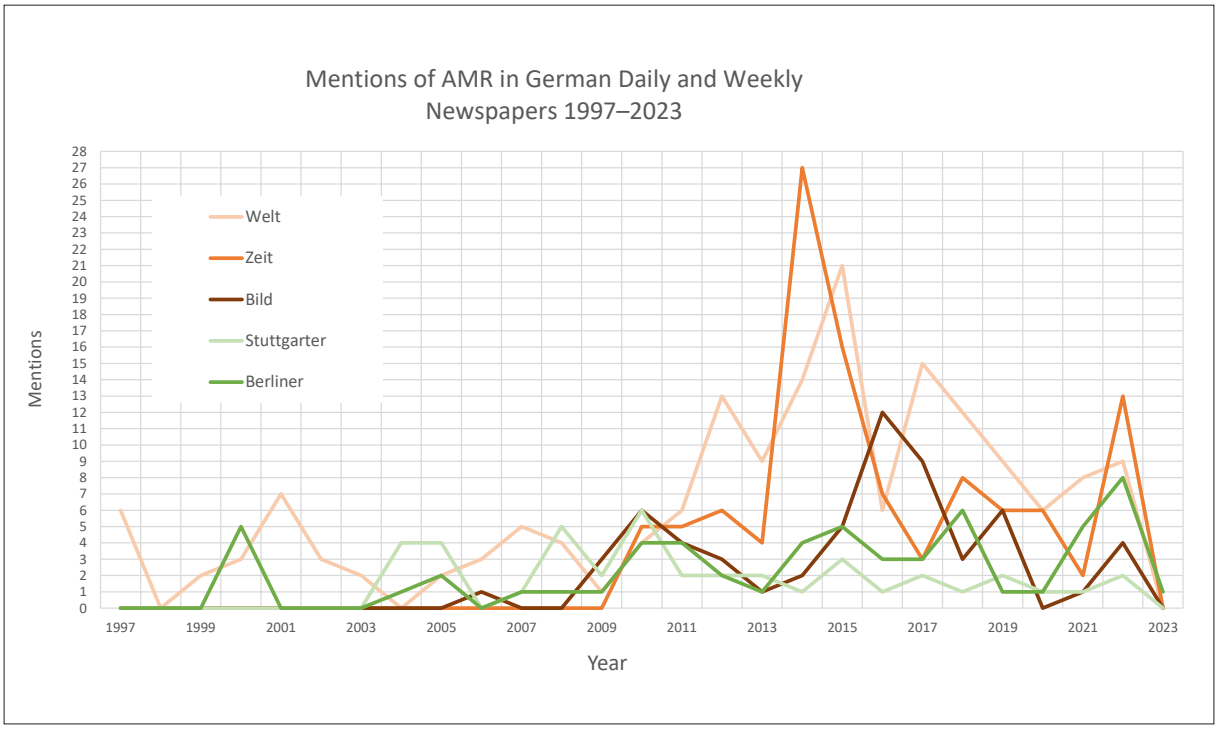
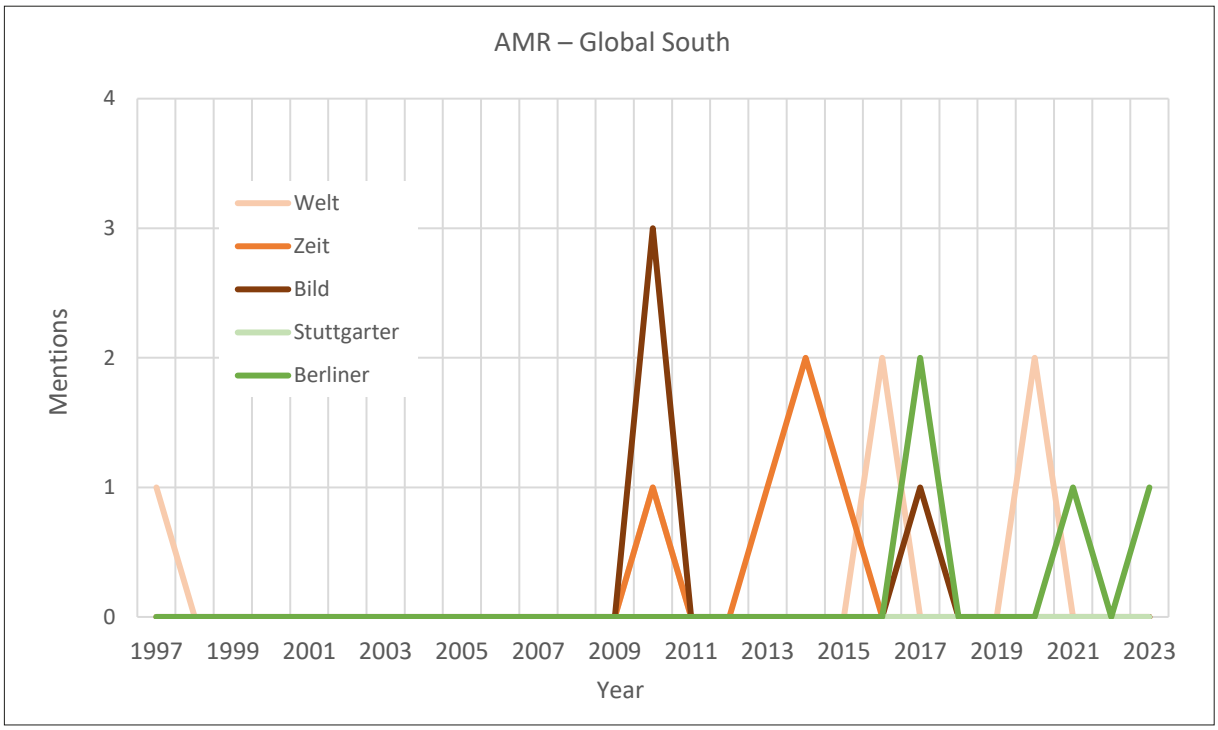
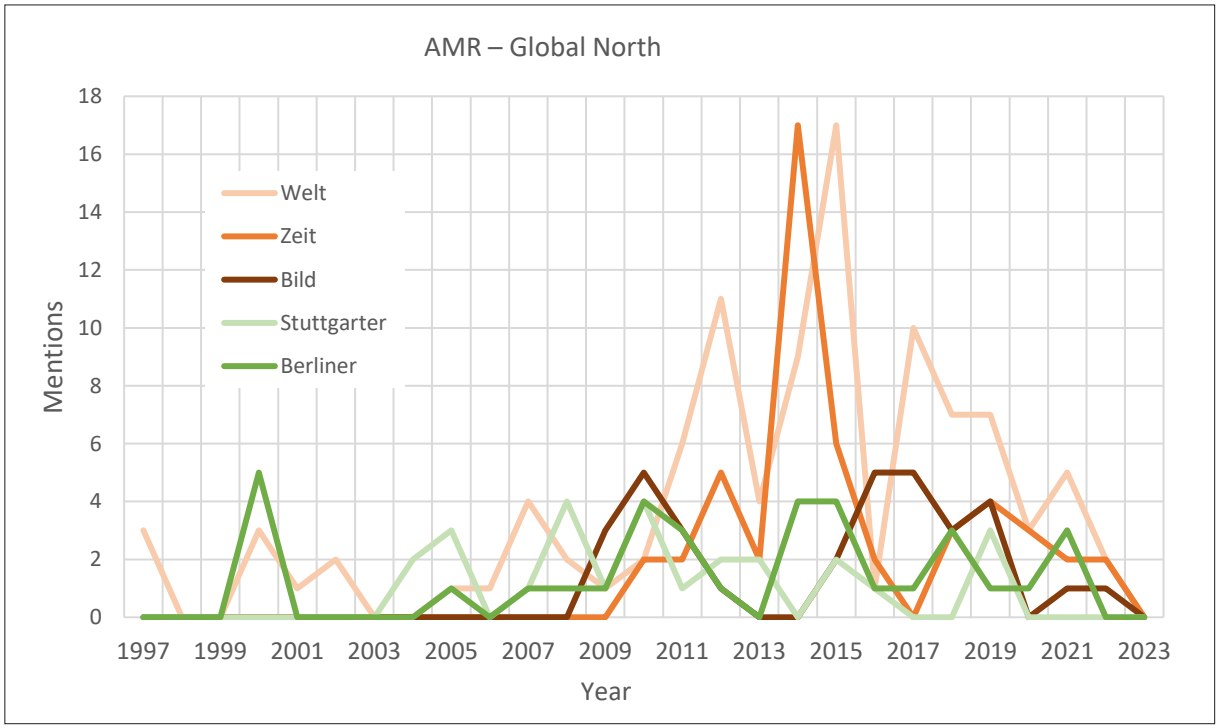
5 Appendix

Figure 1: **Mentions of AM in German Daily and Weekly Newspapers 1997–2023**



Figures 2, 3 & 4: **Spatial Connotations of AMR in German Newspapers 1997–2023**




AMR – Global North
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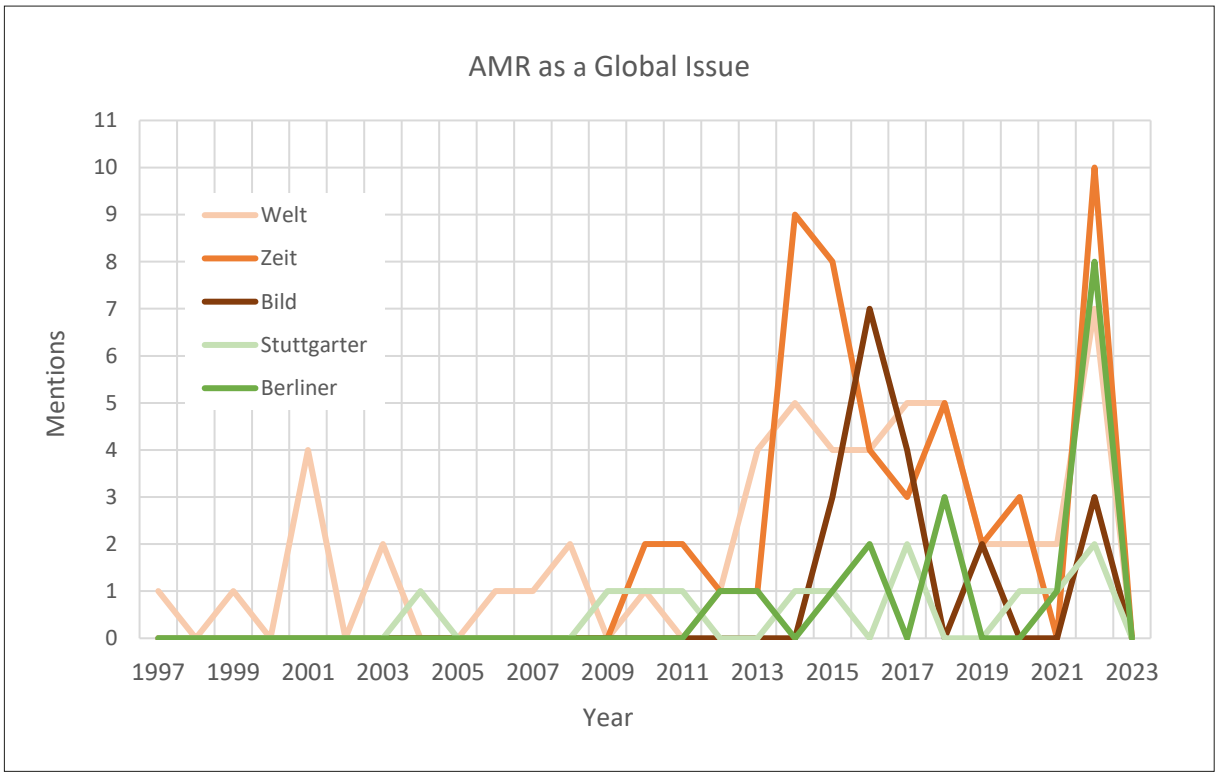
AMR as a Global Issue
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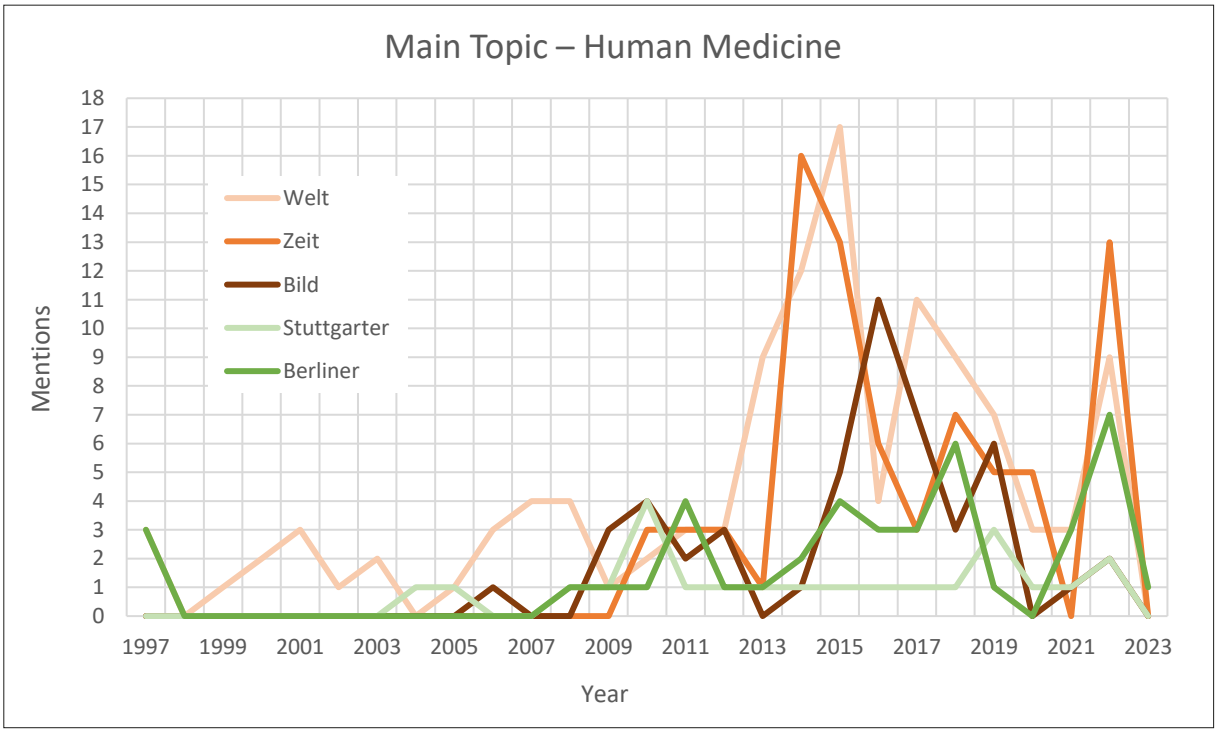
Figures 5 & 6: **Main Topic on Animals or Humans in German Newspapers 1997–2023**



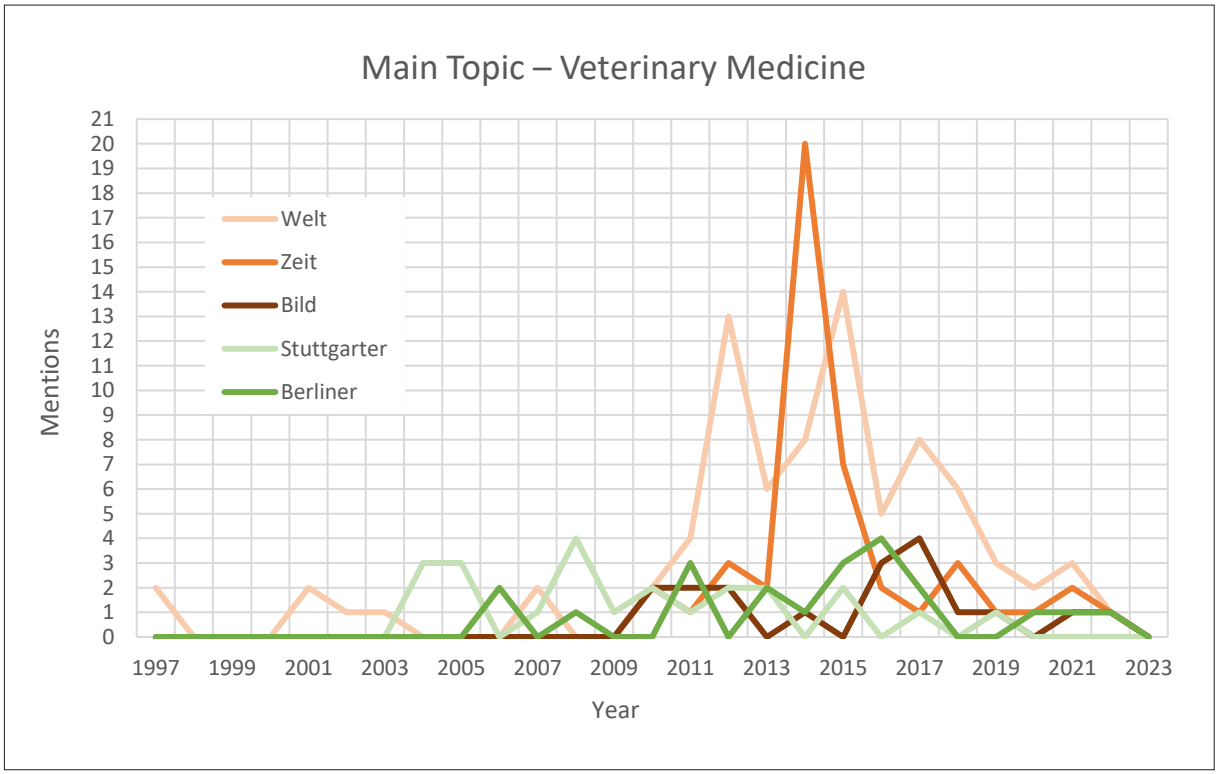
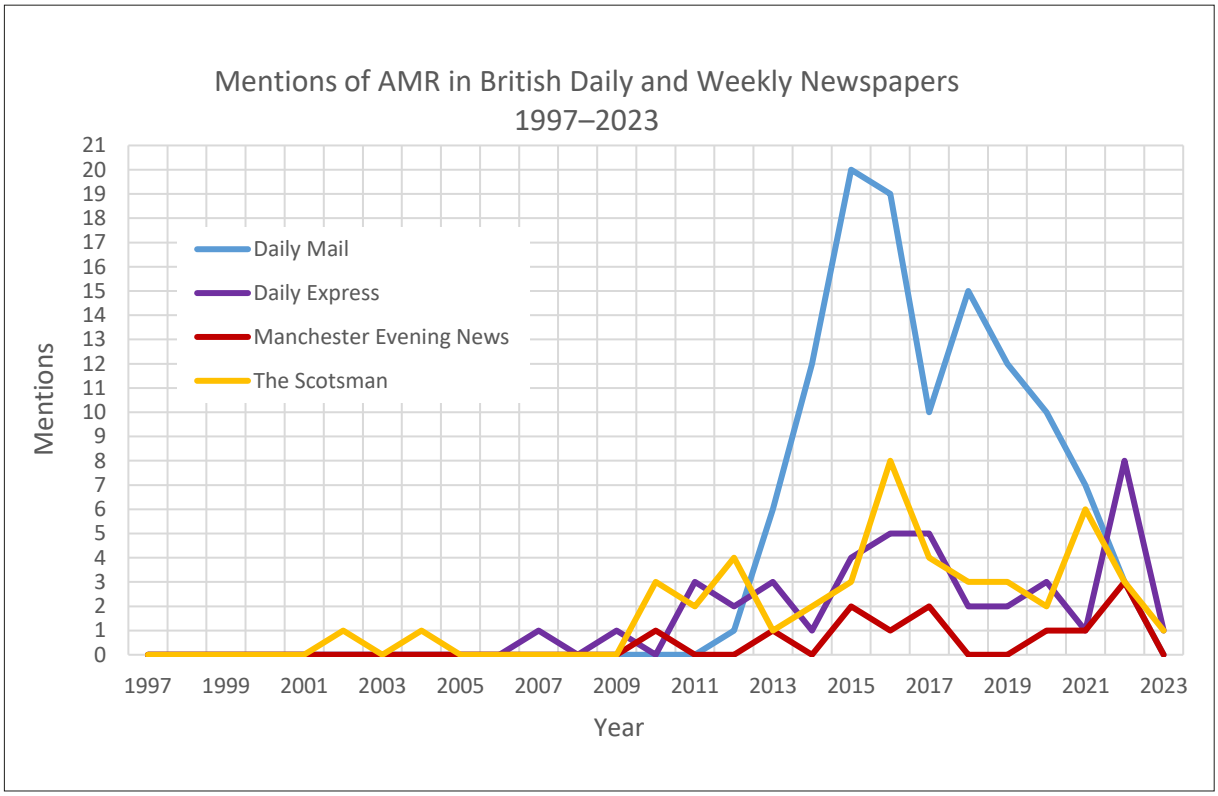
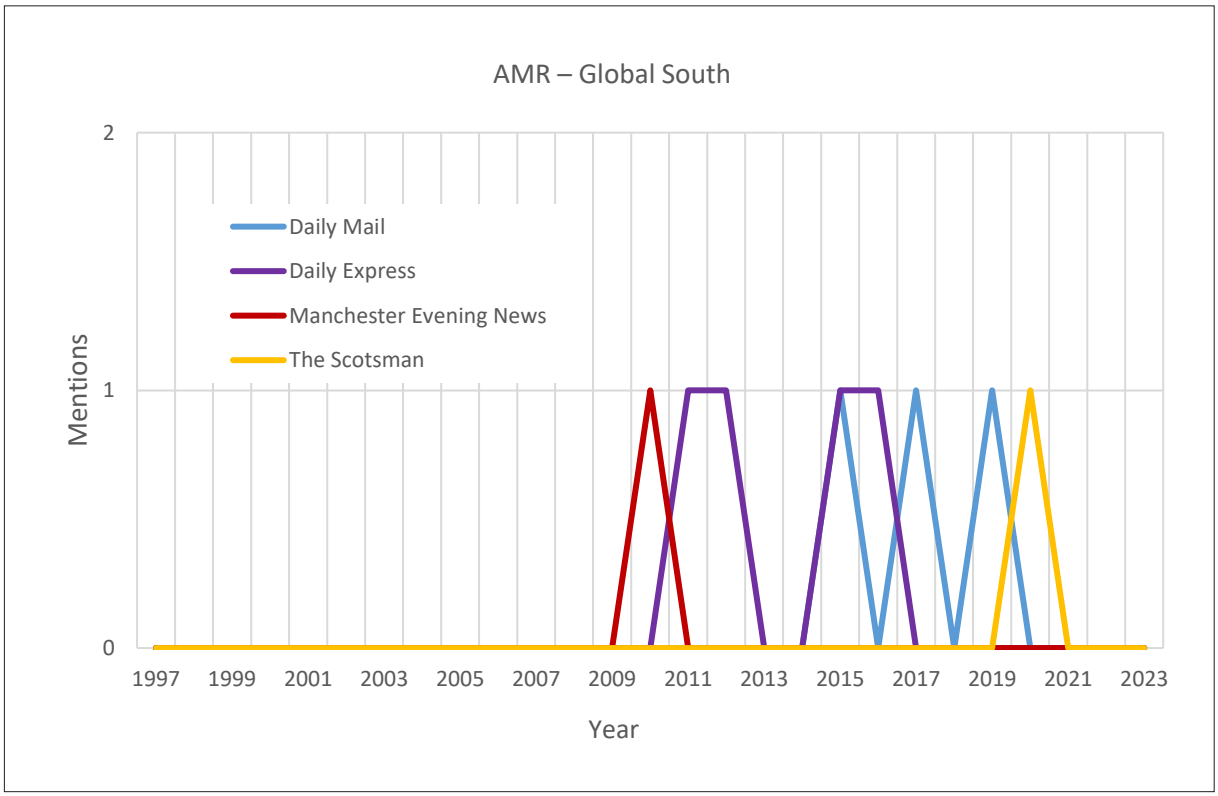
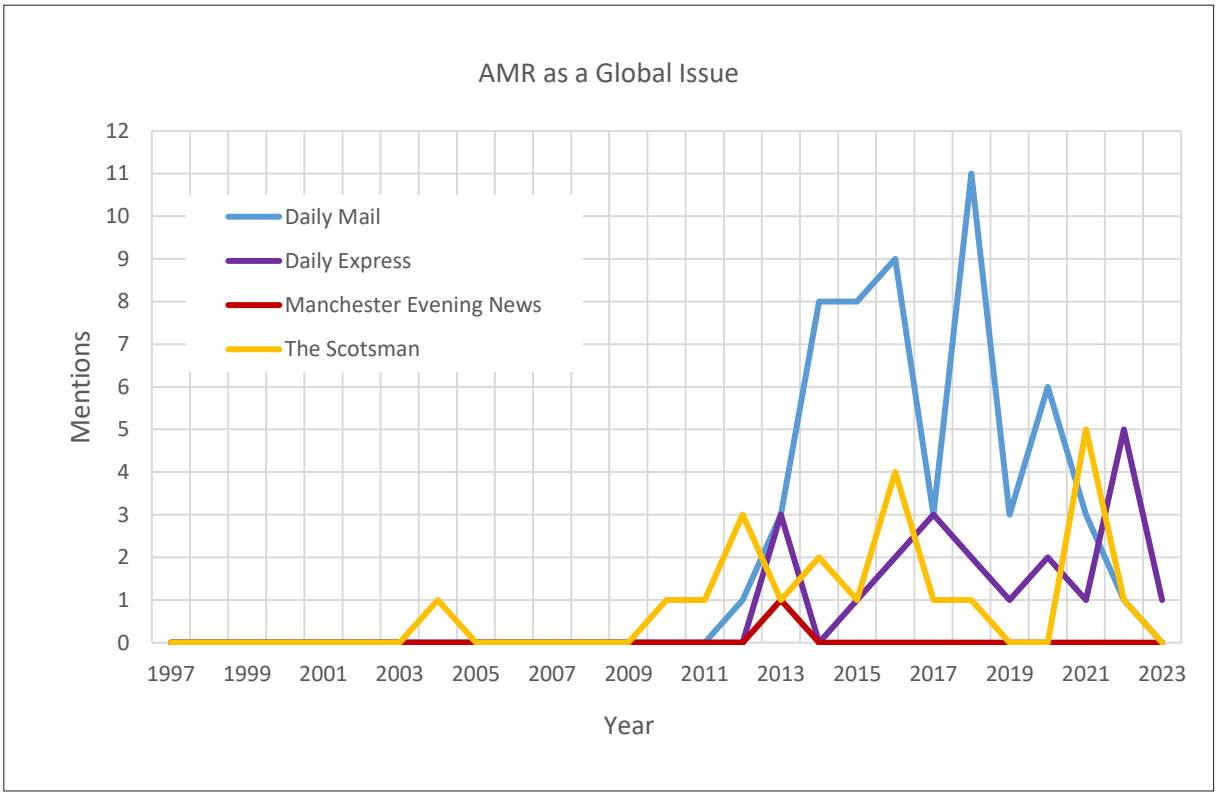


Figure 7: **Mentions of AMR in British Daily and Weekly Newspapers 1997–2023**



Figures 8, 9 & 10: **Spatial Connotations of AMR in British Newspapers 1997–2023**




AMR as a Global Issue
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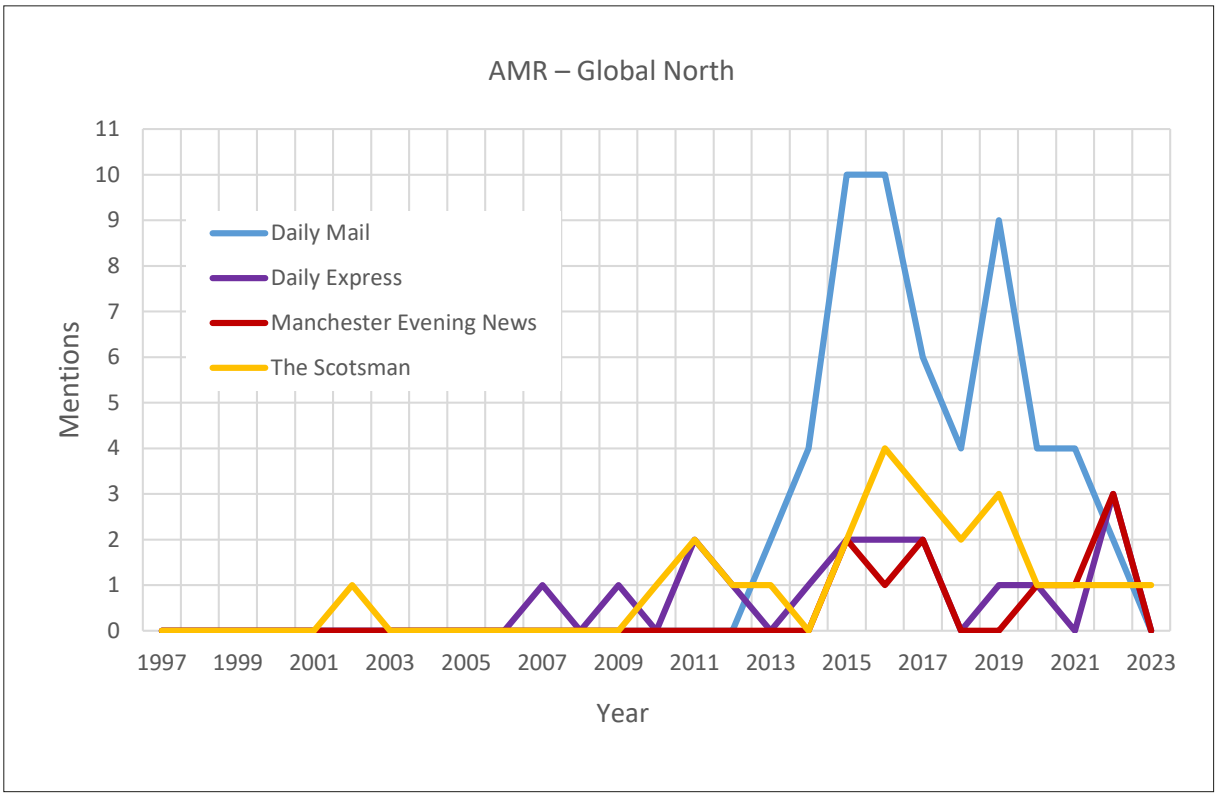
AMR – Global North
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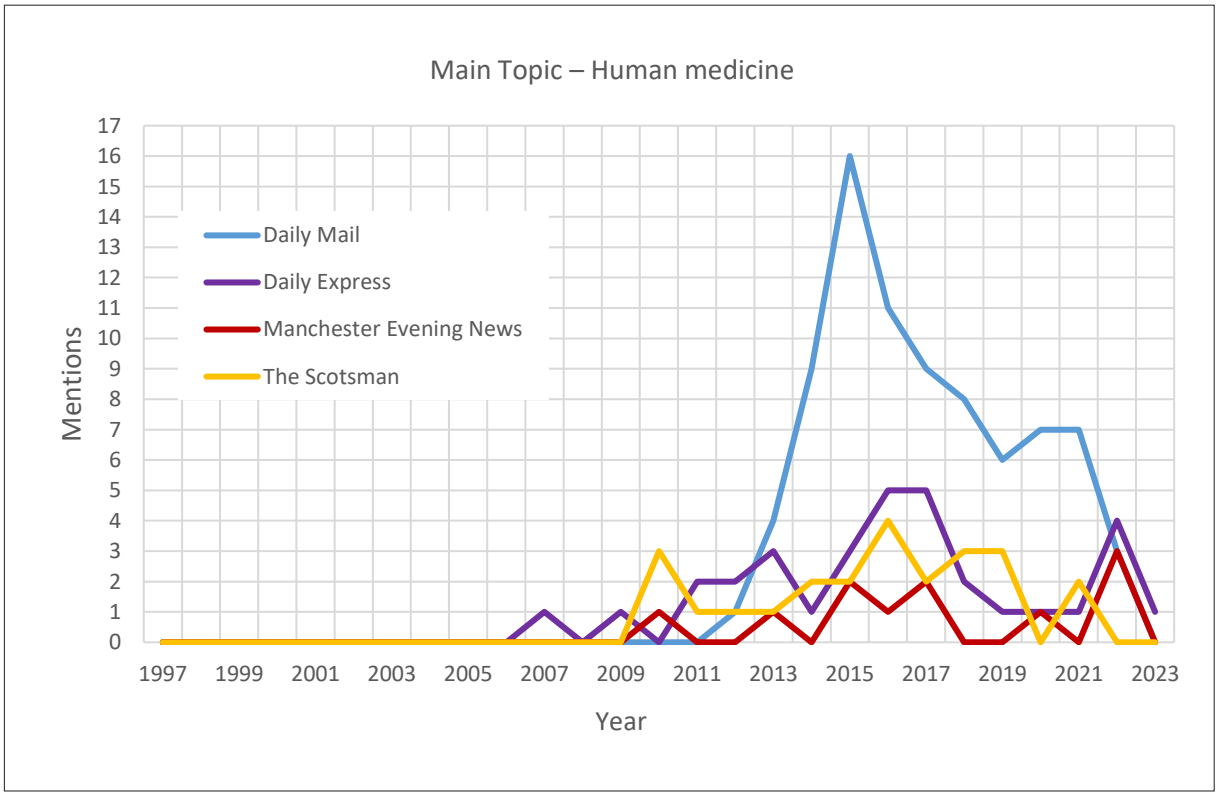
Figures 11 & 12: **Main Topic on Animals or Humans in British Newspapers 1997–2023**



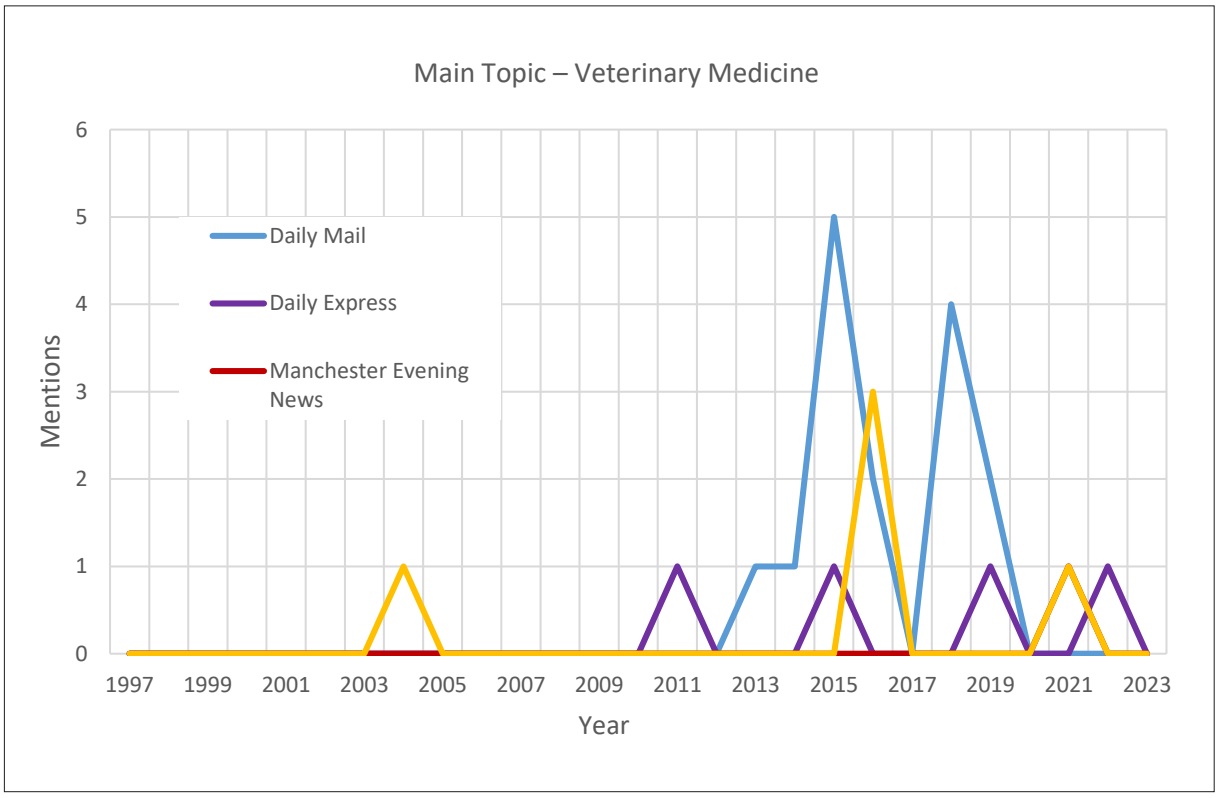
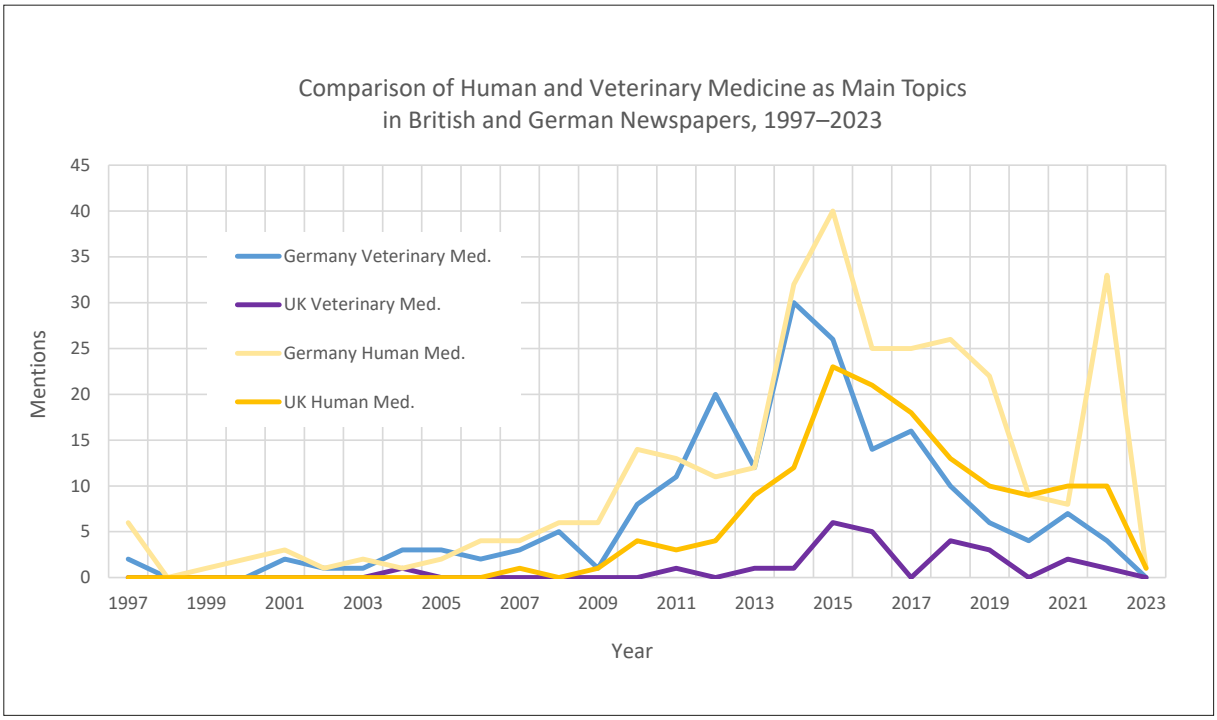


Figure 13: **Comparison of Human and Veterinary Medicine as Main Topics in British and German Newspapers, 1997–2023**



Notes

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