



# THE WEIGHT OF MICROBES THAT BURDENS THE WORLD

## ABSTRACT

Antimicrobial resistance (AMR) is an issue that is impacting the world at different scales, from the microscopic scale of a bacterial infection, to the local and global consequences of resistance, threatening “the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi” (World Health Organization, 2020). As a way of tackling the complex issue of AMR from a design perspective, we present the project titled *The Parliament of Species*, where we invite citizens to explore the different scales under which they can contribute through their knowledge and imagination. In this paper we aim to answer the following underlying question: *How can we understand how citizens engage and relate to AMR under the scope of different scales?* Given that the issue of AMR affects us on different scales, we set here to disclose our understanding of scale from three different scopes: 1. *human and non-human* 2. *governance* and 3. *collective collaboration*.

## INTRODUCTION

Antimicrobial resistance (AMR) is an issue that is connected to scale in different ways. According to the World Health Organization, AMR “threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi” (World Health Organization, 2020). In order to tackle this complex issue from a design perspective we thought it would be pertinent to allow citizens to understand and open to the challenges of AMR through imaginaries minus the negative connotations that can be attached to the subject (Brenthel & Hansson, 2017).

For this, we created a digital platform: a tool for citizen collaborative future policymaking – *The Parliament of Species*. The goal of the project is to aid citizens in imagining the future of AMR by co-creating future policies, and is presented as a proposal to an alternative democratic structure of policymaking. These policies are collected in the digital platform, an archive of citizen perspectives, values and knowledge regarding AMR the futures it might create. In parallel to creating a proposal of an alternative way of implementing policies, the platform allows us to answer the underlying question, “*How can we understand how citizens engage and relate to AMR under the scope of different scales*”. Moreover, this project postulates the term “multispecies collaborative policy-making”, referring to a synthesized combination of citizen science, multispecies worlding and the emergent practice of collaborative future-making.

This paper understands scale through three different scopes: 1. *human and non-human* 2. *governance* and 3. *collective collaboration*. One of the intrinsic complexities of tackling the subject of AMR lies in the fact that it affects our world on a number of scales, ranging from microscopic organisms such as bacteria, to

a macro perspective encompassing the wide range of species (human and non-human) that inhabit it. Given the negative connotation attached to the subject of AMR, opening a space for dialogue and reflection was crucial in order to go beyond personal fears and stir the conversation towards collective expressivity and governance. Finally, the collaborative scope focuses on how the citizens' policies build upon each others', implying that each citizen may take an individual or collective approach for their policy-making.

## THEORETICAL BACKGROUND

The issue of AMR is fundamentally complex, involving a multiplicity of human and non-human actors across multiple scales (Brenthel & Hansson, 2017). As such, anthropocene narratives fail to afford proper understanding of the problem space, as evidenced by the predominance of apocalyptic futures (ibid) in contemporary cultural discourse. To facilitate future-making outside of the prominent narrative we explored Haraway's (2016) concept of *multispecies worlding*: the exploratory act of imagining worlds where humans and other species live together. Westerlaken (2020) argues that such acts of worlding are particularly useful in imagining alternative presents that question and play with the uncertainties and potentials of complex multispecies problems. The multispecies point of view can only be seen through engagement- and becoming with the plethora of species we co-inhabit this earth with. Therefore, Westerlaken (2020) maintains that multispecies worlding consequently explores potentials inherent in the present. Imaginaries around AMR offer a dark and worrying vision of the future (Brenthel & Hansson, 2017) as the scientific predictions mention massive amount of deaths, a reduction of the life expectancy, or the regression of the life quality (eg. comparing the future to the European Middle ages). We adopt a transformative posture regarding this uncertainty (Akama et al., 2018) by proposing to enrich and reinvent collectively new imaginaries about the future and therefore opening alternatives in this emotionally loaded topic.

*The Parliament of Species* situates itself in an experimental tradition where non-human actors are treated as concrete project stakeholders (Zsolnai 2006). This multiplicity of interests is not limited to various scales of biological species, but also extends to water, the atmosphere and ecosystems as such. This eco-holistic stance synergizes with the approach of multispecies worlding and affords project participants a concrete way into the otherwise sometimes abstract mind space required for such activities. It also makes visible the complexities that together constitutes the research topic. The practice is particularly informed by Puig de la Bellacasa's (2019) account of how direct engagement with the imaginaries of soil might enhance

not only the imaginaries of situated experts, but also the general public. The engagement with citizens relates to the practice of *collaborative future-making* (Hillgren et al., 2020), which explores the act of "how to envision, elaborate and prototype multiple, inclusive, and sustainable futures". This suggests ways in which design researchers can combine "critical perspectives" from the humanities into their situated practices.

Citizen participation in discussions and decisions encompassing the evolution of AMR is generally reduced to awareness-raising rather than consultation. Forms of knowledge can vary, and the notion of expertise itself is oriented by existing power-relations (Haraway, 1988). Moreover, the future-oriented approach we are aiming for acknowledges the uncertainty of the future (Light, 2015), therefore implying that there is no expertise about the future. However, citizens' participation can support "scientific knowledge" as contributors of science-based data (Shirk et al., 2011), as well as suggesting policies. In this project, participatory design is understood as a political practice (Beck, 2002) by placing at the root of our policy making platform a critical stance on political representation in policy making and the legitimacy of the decisions taken in the name of non-humans. We investigate ways of subverting subject-object relationships existing between humans and non-humans (Teubner, 2004) towards an acknowledgement of non-humans as "actants" (Bennett, 2004) therefore fostering a "sense of interconnectedness" (ibid).

## METHODOLOGY

Three primary design methodologies were employed in order to navigate the multiple scales of AMR. We combined elements of participatory design (through a process workshops and discussions with three expert stakeholders to find, define, and analyze the platform) with elements of collaborative future-making and multispecies worlding. Six future projections were formulated in workshops with three expert stakeholders. These served as the foundation for *The Parliament of Species*, grounding the future-making in contemporary research. Iterative user testing of the platform was conducted to improve the usability of the policy-making, with particular attention to the graspability of the situated context.

## A PLATFORM FOR MULTISPECIES COLLABORATIVE POLICY-MAKING

*The Parliament of Species* proposes an alternative democratic approach to citizens on an individual, smaller scale, influencing the larger scale of governance through policy-making. It does not aim to replace the "regular" kind implemented in contemporary parliamentary democracies but rather proposes an

alternative way of collaborative policy-making and implementation.

By employing multispecies collaborative policy-making we want to formulate space for a multiplicity of citizens to co-create together. The goal with the digital platform is to aid citizens to imagine futures that deal specifically with the issues of AMR at different scales, through collaborative policy-making by making the digital platform a “physical and mental space for learning and experimentation” (Avelino et al., 2017). We hope that these policies could inspire, influence, and/or aid scientists, governance, and other human or non-human stakeholders. All policies are archived on the digital platform, creating a rich whole of perspectives, values, and knowledge from a multiplicity of citizens, so as to raise a voice for humans and non-humans alike from different scales.

The four entities (Aqua, Fauna, Flora and Homo sapiens) represent different domains of the multispecies world as a concrete stakeholder. These are used as devices to provoke the participating citizens to imagine futures through the goggles of both humans and other kinds from different scales. The distinction of entities in the Parliament does not intend to evoke a feeling of “us against them”, but a radical togetherness where the entities play important roles. By making the multispecies relations and their complex relations to the issues of AMR explicit, citizens are given the tools needed to “investigate the happenings of the social world” (Marres, et. al., 2018). A diverse approach to stakeholders was identified as essential to this type of project, from micro- to macroscopic. In addition to the participating citizens and the multiplicity of species, noted above, the project was also enriched by a set of “expert stakeholders” engaging with the issues of AMR in a professional capacity professionally. These included researchers from the country’s Public Health Agency and a University.

The primary design goal of *The Parliament of Species* is to facilitate citizens to imagine futures of different scales and iteratively co-create policies. This is done through a linear process where each subsequent step narrows the contextual scope. This movement could be conceptualized as a cone funneling citizens through the otherwise overwhelming complexity of the issues addressed by the project. In this process, the participating citizen: **1.** Chooses an “Entity” to represent. **2.** Is given a projection, a possible future as imagined by the expert stakeholders. **3.** Is given a policy addressing that projection, previously proposed by another citizen. **4.** Reflects upon how the policy might affect their entity. The reflection is saved in the *Archive of Futures* and updates the *Balance of this World*. **5.** Gets the option to propose an altered version of the policy for evaluation by other entities. This

derived policy is saved in the archive, along with a reference to its parent policy.

After a citizen has engaged in policy-making they are able to further explore the topic by browsing the *Archive of Futures*. This open chronicling of steps **2.** through **5.** affords an understanding of projections and scales that the user did not encounter during their initial use of the platform while simultaneously providing the involved expert stakeholders with insights. The website also features quantitative “Balance of the World” that reflects how citizens addressed previously proposed policies (**2.**). The balance, visualized through a bar graph, is anchored to the top of the page and updates in real time as other citizens go through the process.

## DISCUSSION

*The Parliament of Species* addressed the issue of AMR through scopes that enable citizens to approach the subject at different scales. The microscopic scale of AMR is introduced by explanatory texts as part of the collaborative policymaking. While it is vital to afford a general understanding of how bacteria are becoming resistant, our focus was to translate between all the scales of AMR. The platform tackles the topic from a systemic point of view and aims to address the complexity forming in AMR discourse: health, environment, and food. Acknowledging non-humans as part of this network is significant as there is a shortage in literature and practise that tackle AMR from multispecies scales and perspectives. The default “global scale” we encountered in the discourse implies an anthropocentric definition of the “global”. *The Parliament of Species* uses a radically different global scale that acknowledges the conflictual interests and power relations related to each citizen’s individual ability to act in detriment to other’s interests. The Entities are literal representations of the necessary multispecies collaboration needed to tackle the multiple scales of AMR. The shift in scope from the default anthropocene mode enabled participating citizens to imagine new perspectives that they described as positive. Simplifying the scales into discrete entities adds a new granularity to the topic that invites specific and practical preoccupations. This manifested as concern about others, both of fellow citizens but also of other entities. As such, the platform fostered a feeling of togetherness and mutual caring both *in* and *to* *The Parliament of Species*.

The overall response to the platform was positive, citizens found the material engaging and mentioned how the multispecies worlding successfully translated the scales of micro- and macroscopic. As the platform was populated by policy suggestions the “Balance of the World” proved to be remarkably stable, a development we attribute to the platform successfully fostering multispecies togetherness. User interviews were

conducted to gather citizen insights after the policy-making process. A small set of participating citizens expressed a lack of confidence in their ability to formulate policies due to the complexities of the topic. These cases could be argued as failures of a platform whose primary goal is to afford understanding of the multiple scales of AMR. Deeper interviews with these participants identified the use of an academic or otherwise unfamiliar vocabulary as the primary source of these insecurities. This highlights the difficulty of writing in a way that is accessible without banalizing a complex topic. While we understood a concept like multispecies worlding as inherently inclusive, it might instead be experienced as alienating by a participant without previous exposure to non-anthropocene perspectives. These kinds of implicit power relations are of utmost importance to discuss and reflect upon when creating any kind of design addressing collaborative future-making or policy.

## CONCLUSION

This project explores the complex issue of AMR while considering the scales of human and non-human, governance and collective collaboration. *The Parliament of Species* serves as an online tool for citizens to co-create policies regarding the future of AMR. We approach the scale of human and non-human by exploring the interconnectedness of the microscopic scale of bacteria and the macro scale of a wider range of entities (human and non-human) in relation to the causes and impact of AMR.

The *Parliament of Species* proposes an alternative democratic approach to policy-making that allows citizens to participate at an individual scale while building upon one another's knowledge and imagination to influence the larger scale of governance. To address the underlying question — *How can we understand how citizens engage and relate to AMR under the scope of different scales* — we shift the scope away from the default anthropocene mode by using the method of multispecies worlding to allow citizens to consider the different scales of the impact of AMR through the different perspectives of Aqua, Fauna, Flora and Homo-sapiens. This approach acknowledges the conflicting interests and power relations that exist between both humans and interspecies and is addressed by giving agency to the non-human actors.

While this project tackles the issue of AMR, *The Parliament of Species* provides an alternative approach of collaborative policy-making that has the potential to be implemented to address different complex global issues that impact both humans and non-humans by giving agency to different entities and allowing for multispecies collaborative policy-making.

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