The Microbiopolitics of Human-Microbe Relationships: Hospital-Acquired Infection Control in Latvia

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Declaration

I confirm that the work submitted is my own and that appropriate credit has been given where reference has been made to the work of others.

Dedication

In loving memory to my Granny Rasma Linde - you taught me so much. Your zest for learning and love of storytelling live on.

Acknowledgments

This has been a long journey, but my heart is full of gratitude.

I am thankful to the University of Leeds for funding my PhD studies and for giving me the opportunity of a lifetime to fulfil this dream of mine.

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Abstract

Despite infection control being a quintessential element of biomedicine, the problem of hospital-acquired infections (HAIs) is the most common patient safety problem worldwide. Regardless of the high priority on the global health agenda, evidence shows suboptimal results in terms of providing safe healthcare, free from these infections. Healthcare and research responses have focused upon behaviour change of medical personnel and organisational barriers/facilitators to address the gap between how HAI control should and is done.

The research aims to understand the phenomenon of HAI control, by looking at how it is negotiated and navigated within and between different settings and people in Latvia. I achieved this by utilising a conceptual framework of the microbiopolitics of human-microbe relationships and multi-sited ethnographic approach to trace HAI control through media, policy, and hospital settings. In this study, I have offered a recalibration of the HAI problem: instead of scrutinising the imperative of insufficient HAI control, I have steered my research towards ethnographically examining the phenomena of HAI control itself and how it is assembled in the first place.

The study reveals that process of achieving germ-free and safe healthcare goes far beyond the individual and isolated behaviour of compliance and non-compliance with HAI control requirements. Instead, research illustrates the phenomenon of HAI control has local and historical embeddedness and it is an instance of dynamic epistemic and socio-material assemblages of human and non-human entities. The study therefore demonstrates that context- and situational-dependent recognition and understanding of microbes and management of microbial encounters manifest in different approaches to HAI control. Moreover, achieving HAI control not only depends on levels of compliance with HAI control policy but also on the quality of policy itself. As study revealed, HAI control can not only produce recognition and management of HAI risks but also spaces of neglect and exclusion.

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Chapter 1. Introducing Research Problem and Research Context

Just this evening my doctor told me that pneumonia is back again. Another complication. I feel hopeless, helpless, and way too tired to keep the fight going. It's so hard to breathe, partly because it's the end of July and the weather is hot, but partly because air in the intensive care unit where I have spent already a month always smells like disinfectants, seems full of desperation, and now on top of that – pneumonia. Again. This means more antibiotics; this means that somebody will come and continue poking holes in my lungs to get the fluid out; this means that I am not going to get out of here any time soon. And possibly ever. Is this it?

I should fight for my life. My current surgeon who is stuck with me now keeps on saying that I should find some fire in me not to give up. He smiled the other day when I woke up from another surgery and checked how far they have opened my stomach this time. I made a snarky comment how much farther will they cut me open because the ICU already did not have a dressing big enough to cover the incision site and had to use two separate pieces now. My snarky comment made the surgeon laugh and hopeful because being emotionless is a dangerous state of mind, like you are giving up on yourself and life. As far as my surgeon was concerned, this meant that I was not giving up. That's why he urged me to be angry, annoyed, and mad instead. He asked me not to see the current situation as the end. Fight.

I tried… I really did. But I think it's time for me to face the reality. On the front, doctors and nurses are full of fighting spirit. We have been together a long time now. I know that my surgeon's favourite food is pancakes, and one of the nurses loves gerberas. They all know that when my pain gets really bad, I can be best distracted by talking about my two dogs. However, getting to know each other means that I have been here long enough to notice a glaring desperation in the eyes of doctors and nurses. On top of that, I have seen tears in their eyes and the looks they share. My inner discussion on the merits of fighting or giving up tonight is interrupted by the same gerberas-loving nurse with the nightly dose of morphine.

The story has a good ending though. Few weeks later, I leave the hospital, with a lengthy recovery ahead of me, but with a second chance of life, and an inner mantra that everything bad will perish and only the good will persist from this time.

Looking back at the experience in the rearview mirror, I notice couple of things that didn't let me give up. One of them was my relationships with doctors and nurses, rooted in many lengthy conversations, both deeply personal and professional. We talked about everything, from the latest test results and my next procedure to the pride of my doctor – his newborn son, patiently waited for such a long time. These were hard but open and much-needed conversations about my course of treatment and the possibility that things might not go my way. These were also light chit chats about food, flowers, hobbies and, of course, dogs. Each of these conversations, regardless of the topic and duration, helped me to claw my way back into life. And I dare to believe that they helped all of us, including doctors and nurses, allowing to see that we are not alone and that we share these experiences.

My connection, as unconventional and unbreakable it is, with the field of healthcare and people working in it resulted in a research interest in healthcare, and I still feel passionate about it 15 years later. Little did I know back then that a part of my complications will be called hospital-acquired infections and I will be sharing this experience with one in ten patients in hospital care and one in three patients in intensive care. And little did I know that years later I will be writing PhD thesis on hospital-acquired infection control. Life is funny that way.

1.1. Research Problem: Global Epidemics of Hospital-Acquired Infections

Over the last ten years patient safety, which includes hospital-acquired infection (HAI) control, has been promoted as a fundamental principle of all healthcare systems.[1] Moreover, patient safety has become one of the foundations of patient rights and a significant international indicator for measuring quality of healthcare systems (e.g. The Organisation for Economic Co-operation and Development's (OECD) patient safety indicators (OECD, 2019)); thereby creating new forms of power, governance and subjectivities (Shore and Wright, 2015). According to the World Health Organization's (WHO) (2010, p. 3) definition, patient safety is 'freedom for a patient from unnecessary harm or potential harm associated with health care.'

Among medication, diagnostic and treatment errors and failures, HAIs present the most common patient safety risk in healthcare worldwide (Council of the European Union, 2009; World Health Organization, 2013). HAIs are infections caused by all types of microbes and gained within healthcare settings[2] or as a result of received care. HAIs are considered 'unintended consequences' of healthcare where in the fight over diseases, more diseases are produced (Gee, 2001). A large number of HAIs are caused by such multi-drug resistant organisms as Clostridium difficile, methicillin-resistant Staphylococcus aureus, vancomycin-resistant Enterococci, Acinetobacter baumannii, and multi-resistant Gram-negative bacilli (Al-Tawfiq and Tambyah, 2014), most often leading to urinary tract infections (usually catheter-associated), surgical site infections, blood stream infection (usually intravascular device-associated), and pneumonia (usually ventilator-associated). Out of all these listed, surgical site infections constitute the second-largest category of adverse events in hospital care (Burke, 2003), as the opening story illustrated. Moreover, one in three cases the bacteria associated with HAIs is also resistant to antibiotics (European Centre for Disease Prevention and Control, 2018a). It is estimated that every day, approximately 1.4 million patients worldwide acquire these infections within hospitals alone (Pittet, 2009, p. 293); and there are 8.9 million HAIs occurrences in European hospitals and long-term care facilities every year (European Centre for Disease Prevention and Control, 2018a). Other sources add that overall, 5-10% of patients admitted to acute care hospitals suffer one or sometimes more treatment-related infections (Burke, 2003). The European Centre for

[1] For more of an overview on the development of global patient safety policy, please see WHO (2010).

[2] At first, the prevalence of HAIs was articulated as a hospital-specific problem. Later evidence has shown that the problem of HAIs exists in all healthcare settings and facilities (e.g. primary care settings, long term care homes, etc.) The situation is triggered even more by HAI transmission between community and healthcare settings, as well as resistance transmission between environment, animals and humans.

Disease Prevention and Control (ECDC) (2018a) estimates that on any given day, 1 in 15 patients in hospitals suffer from at least one HAI, while 98,000 patients have at least one HAI.

HAIs complicate patient care, regardless of the healthcare system and available resources; thus putting a strain on healthcare, while subjecting medical practitioners to occupational health risks (World Health Organization, 2002b, 2011). The problem of HAIs leads to unnecessary deaths, prolonged hospital stays, long-term disability, as well as extra financial and other resource burdens on healthcare systems. For example, it is estimated that in Europe, HAIs lead to 16 million additional days of hospital stays, directly cause 37,000 deaths and contribute to other 110,000 deaths every year, with the annual financial losses amounting to approximately €7 billion (World Health Organization, 2011, p. 21).

Despite the omnipresence of HAIs across the globe, there is an inadequate amount of reliable data on the prevalence and effects of HAIs (World Health Organization, 2014). For example, a 2011 systematic review found that in 66% of developing countries there is very limited or no data at all (WHO (2011, p. 3). Data from developed countries provides some insights on the problem, but data from developing countries is limited or questionable. Studies report different rates of HAI prevalence, in amplitude from 5.7% to more than 40% in hospitals (Raka, 2009; World Health Organization, 2011; B.-E. Ider et al., 2012). The official HAIs statistics in post-Soviet countries often do not exceed 1%, nor do they reflect the real prevalence of the problem; this is due to underreporting and other factors. Published information on HAIs is scarce; because the topic of infections in many countries is still politically charged, and infection control data is thus not publicly disclosed (B.-E. Ider et al., 2012, p. 281). An ECDC point prevalence study from 2016-2017 concluded that the HAI prevalence in Latvia was 4.9% (Suetens et al., 2018).

It is assumed that HAIs are preventable via such measures as evidence-based standards of hand hygiene and antibiotic stewardship[3], patient screening and isolation, active surveillance of infections, education of medical personnel (Collins, 2008; Johnston and Bryce, 2009; European Centre for Disease Prevention and Control, 2018a). Nevertheless, there is no agreement among experts as to *what* extent these infections are preventable. For example, it is being argued that more than 50% of HAIs are preventable (European Centre for Disease Prevention and Control, 2018a), while others claim between 30–70% (Umscheid et al., 2011); but other studies have recently voiced the view that

[3] Antibiotic stewardship is an analysis of antibiotic consumption as well as measures for prudent use of antibiotics; e.g. limited access to certain antibiotics, or guidelines for antibiotic use in surgical prophylaxis.

potentially all HAIs are preventable, thus arguing for a 'new normal' in HAI control (Srinivasan, Craig and Cardo, 2012; Jeeva and Wright, 2014; Kahn and Battles, 2014).

Within the global health policy arena, HAI control is part of patient safety, infection control, health care quality and antibiotic resistance policies (the latter has become one of the strategic areas of the global health security agenda). For example, the HAI control shapes a part of the WHO's Patient Safety programme, Infection control and prevention programme; it is one of five strategic objectives of the Global Action Plan on Antimicrobial Resistance (AMR). It was initially expected that by 2017, every country would have a multi-sectoral action plan on antimicrobial resistance that includes comprehensive HAI control policy (World Health Organization, 2015). However, current data shows that progress is slow (please see table 1).

Table 1. Progress of development of national AMR plans

Number of WHO Member States invited to develop AMR plans	**194**
Number of countries responding	154
Number of countries with developed AMR plans	100
Number of countries with plans under way	51
Number of countries with funding for the activities of the plan	10

Source: (World Health Organization, 2018)

Despite the high priority of this theme on the global health agenda, it is widely recognised that there has been insufficient progress in providing high-quality and safe healthcare that is simultaneously free from these infections. For example, hand hygiene is considered to be one of the most effective measure for preventing these infections, but low levels of compliance with hand hygiene are commonly reported worldwide (WHO, 2009). For example, the cross-infection of patients by healthcare workers with contaminated hands persists as a major cause of HAIs (Burke, 2003; Allegranzi and Pittet, 2009). However, despite ongoing educational efforts, healthcare personnel still fall short in terms of their adherence to the standards of such HAI control measures as hand hygiene. Moreover, in developing world contexts, HAI control often is described as ineffective or non-existent (Raza et al., 2004; Allegranzi et al., 2011; Aveling et al., 2015). Within the post-Soviet context, this issue has not yet reached the political and public agendas. A review on infection control systems in 19 post-Soviet countries, including Latvia, draws the conclusion that infection control systems in these countries are still in the process of transition, with varying levels of development in this area (B.-E. Ider et al., 2012).

Policy and healthcare responses towards HAI problem have been concentrated upon a 'top–down' approach towards implementing initiatives in healthcare settings. Such measures as behaviour change interventions, implementation projects, audits of compliance and non-compliance, HAI surveillance are used as part of ongoing efforts to improve currently suboptimal levels of HAI control (Edwards, Sevdalis, et al., 2012; Huis et al., 2012; Jones et al., 2014; Battistella, Berto and Bazzo, 2017; Gilmartin et al., 2018). Research indicates that bundles or multi-modal interventions can improve HAI control, especially in the case of outbreaks (Chen et al., 2011; Carmona et al., 2012; Gramatniece et al., 2019). The sustainability of such change is a challenging issue, with only some exceptions reported (Pronovost et al., 2010, 2014). Nevertheless, there are still discussions and tensions as to how to fill the gap between how HAI control should be and is done (Edwards, Charani, et al., 2012; De Bono, Heling and Borg, 2014; Shah et al., 2015). For example, some researchers have pointed out that the current intervention approach to improving HAI control behaviour does not take into consideration contextual factors, and thus fails to uncover and address deeper factors of non-compliance or compliance with HAI control protocols (Shah et al., 2015; MacBeth et al., 2016; Clack et al., 2018). Others have criticised the 'top-down' approach as counterproductive towards promoting individual accountability and encouraging positive responses towards the requirements imposed (Edwards, Charani, et al., 2012; De Bono, Heling and Borg, 2014; Gould et al., 2016). In other studies, efforts to fill the gap between requirements and clinical practice were linked to contradictions. For example, audits of compliance and non-compliance were reported as lacking in meaning, and were not seen as drivers for improving HAI control performance (Dawson, 2015); they can also be problematic when performed overtly and covertly without assessing the potential ethical risks (Pan et al., 2013). Thus, HAI control remains enmeshed in tensions and debates about how to fill the gap between how HAI control should be and is done. This has resulted in the representation of HAI control as an imperative of deficit in contemporary healthcare. Therefore, the thesis considers that taking an alternative gaze might offer in terms of broadening understanding and suggesting alternative ways of implementing and addressing HAI control.

1.2. Situating the Research in Latvia[4]

Latvia is one of three Baltic States located in the North-Eastern Europe. The statehood of Latvia dates back to 1918 when Latvia declared its independence as a democratic republic following

[4] For broader information on Latvian healthcare settings please see Appendix 1.

World War I. The country's independence was interrupted soon after World War II when Latvia was incorporated by force into the Soviet Union which was followed in 1941 by the invasion and occupation by Nazi Germany in 1941 and subsequent re-occupation by the Soviet Union in 1944. Latvia restored its de facto independence from the Soviet Union in 1991. The current population of Latvia reaches 1.9 million people. Latvia is a Member State of several international organizations, like European Union (EU), North Atlantic Treaty Organization (NATO), United Nations (UN), OECD, World Trade Organization (WTO) and others. As a result of almost century-long political turmoil and change of ruling, HAI standards in Latvia have also faced changes and shifts.

The research contributes to fill in a knowledge gap on HAI control in developing contexts that has been broadly identified (Raza et al., 2004; Raka, 2009; B. E. Ider et al., 2012; B.-E. Ider et al., 2012; Galadanci, 2013; Aveling et al., 2015). In-depth research in Latvia also brings in the post-Soviet context; this is an underrepresented region in the current landscape of HAI control studies. Furthermore, previously conducted research in Latvian context showed that the implementation of global HAI prevention and control policy and practice standards has created resistance towards 'new' standards in both clinical and political settings (Linde-Ozola, 2016). These studies indicate that in-depth investigation is needed towards exploring this subject matter in the post-Soviet context.

Patient safety standards, including HAI control, reached Latvia after joining the EU in 2004. However, even today, the issue is not a priority in the public or political agenda. That has led to a situation where policy and coordination of infection control on a national level does not exist, with the exception of basic legislation for HAI control. In a handful of hospitals, there are groups of enthusiastic specialists which have contributed towards the implementation of practice standards. The whole scenery shifted in 2013, when a committee was established on a national level to develop an action plan on combating antimicrobial resistance in Latvia. However, the draft action plan has been awaiting approval from the Ministry of Health for more than four years already (please see Chapter 6).

Since national policy standards are still lacking, current HAI control practices within hospitals are fragmented in character. Elsewhere, I have called and described the current situation 'DIY[5] approach to HAI control' (Linde-Ozola, 2016). For example, hospitals assign HAI control to different specialists (e.g. head nurses, surgeons) as an additional task to their main job. Only in a few hospitals has a department of infection control has been introduced as a separate unit. HAI control practice

[5] 'Do It Yourself.'

standards can differ not only between hospitals, but also between units within the very same hospital. Consequently, Latvia is a good setting for studying HAI control, as this is still a process-in-the-making with developing policies and practices.

1.3. Research Aims and Objectives

The research aims to understand the phenomenon of HAI control by looking at how HAI control is negotiated and navigated within and between different settings and people in Latvia.

The research objectives are:

1. To analyse how HAI control is conceptualised in public discourse.

2. To explore how different actors (e.g. state officials, health professionals and patients) negotiate and assemble HAI control as a policy issue.

3. To analyse how different actors manage HAI control and engage with each other when dealing with HAIs and their management in everyday hospital practices.

4. To develop policy and practice implications for improving HAI control policy and practice in the Latvia.

1.4. Structure of the PhD Thesis

This PhD thesis is presented in eight chapters, starting with an introduction where I outline the problem of HAIs; contextualising this topic in terms of data, consequences, and impact on overall healthcare. Chapter 2 moves onto my conceptual approach to HAI control, drawing on available literature in the field. The chapter gives insights into the current scholarly debate on HAI control, followed by the existing conceptualisation of the topic. Thereafter, I explain my point of conceptual departure from the current body of literature on HAI control, providing more details on the PhD research theoretical approach.

In the next chapter, methodology, I address the research design and methods, in order to trace the phenomenon of HAI control. In this chapter, I set out my epistemological position, and explain my approach towards knowledge production. Thereafter, I introduce the ethnographic research design and move onto the methodology; giving detailed information on the research sites, research phases, data collection, coding and analysis.

Before moving onto the findings chapters, I address in a transitional chapter the historical development of HAI control. In the chapter, I introduce the Soviet and Western approaches towards

HAI control. Once this contextual information has been provided, I examine the introduction of the Western model in Latvia after the country regained its independence from Soviet occupation. This chapter intended as a way to introduce Latvian context and empirical analysis. Here I wish to clarify that the results chapters do not specifically address separate aspects involved in understanding of HAI control but rather focus on relationships of these aspects and elements (e.g. patients, role of gender) *with* HAI control.

In Chapter 5, which is the first findings chapter, I address the leading and silent voices in shaping the public discourse on HAI control, while addressing how the public discourse on HAI control has been assembled. Thereafter, I move on towards identifying and addressing in detail the leading discursive frames of HAI control; this discussion makes it possible to analyse current understandings of microbes and existing modes of managing human-microbe relations in case of HAI control.

Chapter 6 scrutinises the development of hospital infection control policy, looking through the prism of negotiating stakeholder-microbe relationships. In this chapter, I take a closer look at how the phenomenon of HAI control is assembled into a policy, setting a direction and set of standards for how HAI control should be done. I start with looking at the HAI-AMR connection on the global health agenda and in the Latvian context, thereafter moving towards discussing stakeholder-microbe relationships, each divided into four policy realms with their own development processes, challenges, and implications. The chapter strives towards reflecting the dynamic, contested and highly relational process of developing HAI control policy.

Chapter 7 is the last findings chapter, where I turn my focus towards the management of human-microbe relationships in hospitals. I begin this chapter by introducing specialists who are responsible for developing, implementing and coordinating HAI control in hospitals, analysing how they are positioned in the hospital internal structures. Next, I explain HAI control policy, addressing what human-microbe relationships in a hospital should be and how they should be managed. Thereafter, I address social infrastructure, which is a significant element in the management of human-microbe relationships in hospitals. Next, I analyse how the risk of infections is made – and imagined – visible in day-to-day hospital routines. Next, I take a closer look at making HAIs visible through three stages of visibility work, followed by control of human-microbe relationships through three distinct hospital mediums. Finally, I analyse patient involvement in HAI control practices.

In the final chapter discussion, I bring together findings from all previous chapters; contextualising the phenomenon of HAIs both in the light of existing scholarly debates and knowledge, and the specific insights produced by this PhD thesis.

Chapter 2. Conceptualising Hospital Infection Control: Re-Imagination of the (Micro)Biological/Social Divide

Introduction

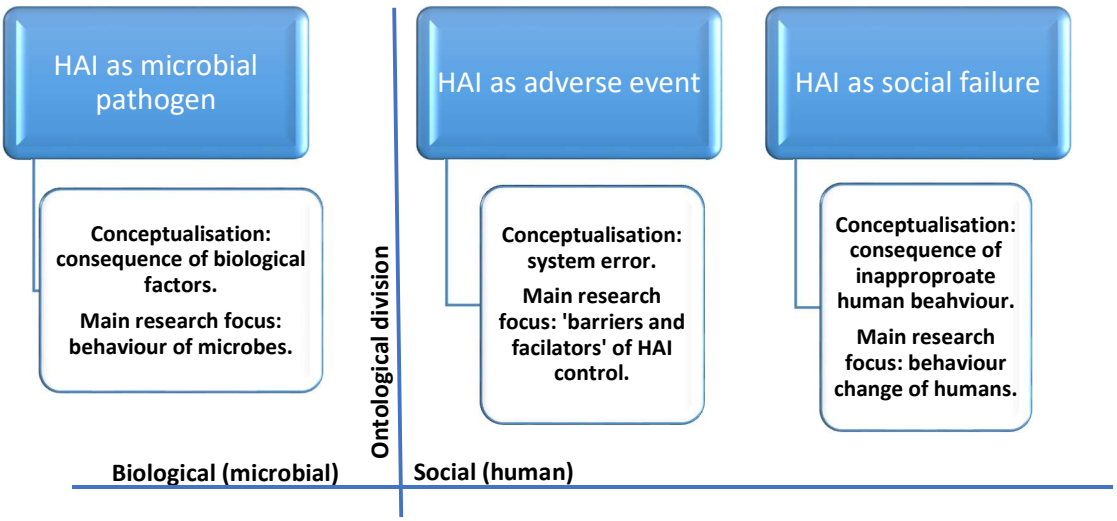
In this chapter, I review the conceptualisation of HAI control in current scholarly debates, while also offering my own conceptualisation of the subject matter. I focus on how HAI control is conceptualised in the literature; this is important, because modes of conceptualisation have long-lasting effects on how the issue in question is then operationalised in health policies, interventions, and research. My aim has not been to provide a systematic review, but rather to identify and analyse the main lines of reasoning in the field (for similar approach in the patient safety scholarship please see Ovretveit, 2009; Waring et al., 2016); as well as to identify a new perspective on the specific conceptualisation of HAIs that has guided my study.

The chapter begins with addressing how HAI control is being analysed in the current literature. Thereafter, I discuss in detail my points of departure from the current conceptualisation. Finally, I describe my conceptual approach towards studying and analysing the phenomena of HAI control.

2.1. Current Scholarly Debate on HAI Control

The interdisciplinary field of HAI control studies has grown rapidly in the past ten years. Interdisciplinary research interest in HAI control has brought in a broad spectrum of research methods too. Different disciplines, e.g. sociology, medicine, social psychology, share a common focus on HAI control as their object of research. However, when looking closer, divergences in the formulation of the subject matter become clear. In Figure 1, I have identified the main conceptualisations of HAIs, along with corresponding research directions to be found in the current literature.

Figure 1. The main identified conceptualisations of HAIs within the current interdisciplinary scholarly debate



Although these conceptualisations engage with the subject matter in different manners, they are organised in a certain conceptual manner: the HAI control scholarship is divided along the lines of biological and social dualism. This is rooted in Western thought, where on a conceptual level nature/culture (social/biological) are kept separate as research practices (Descola and Pálsson, 1996). I take this ontological separation as a form of relations and also as the main organising principle of the current scholarly debate on HAI control. Consequently, in the current HAI control literature, the subject matter is studied within the biologically (microbial) and socially (human) separated realms. The research focus in HAI literature is directed towards both realms as separate and enclosed entities that do not interfere with each other; at least on a conceptual level. The biological side of dualism conceptualises the HAI problem as a part of the biological world, focusing research exclusively on the behaviour of microbes; whereas the social side of dualism in this scholarship conceptualises the problem of HAIs as a social issue, thereby problematising social factors – either institutions or human behaviour. As a result, HAI control is conceptualised and thus studied in literature either as a biological or social entity and not as an interconnected phenomenon.

Despite this conceptual division within HAI scholarship, work on both sides of the divide does include some similarities. Firstly, the HAI control literature is almost exclusively focused on hospital settings as the main destination of this scholarship. So firstly, other health care institutions (long-term care homes, primary care institutions) are receiving much less research attention in this area (Lee et al., 2019). This strong focus on hospital settings in the literature has produced an assumption that the problem of HAIs and their control is bounded by the symbolic walls of a hospital. Secondly, this

research approach has resulted in a lack of studies analysing policy of HAI control beyond hospital settings: as a part of regional, national or global policies. With a few exceptions (Stone et al., 2015; Padoveze et al., 2017; Nogueira-Jr and Padoveze, 2018), comprehensive (e.g. national) HAI control policy analysis is rarely conducted; thereby reproducing the assumption of HAI control as being a matter of hospitals, rather than of national policy agendas. Recent global policy developments regarding AMR epidemics make this gap in knowledge explicit, thus creating a necessity to mobilise further policy analysis contributions towards the development, implementation and evaluation of HAI control and broader AMR policies (Buckley et al., 2015; Gelband and Laxminarayan, 2015; Wallinga, Rayner and Lang, 2015).

Another commonality is that both conceptual directions take behaviour as the central subject of existing studies; however, these directions differ in terms of whose behaviour they study – microbes or humans. Nevertheless, behaviour is predominantly studied as an isolated phenomenon, without seriously taking into consideration the relational and contextual networks within which such behaviour is embedded and shaped. This being so, it is now necessary to turn to how ontological separation is maintained in HAI literature. First, I look how HAIs in literature are conceptualised in the biological realm; and then in the social realm.

2.1.1. Biological Conceptualisation

The biological (microbial) ontological entity is mostly maintained by microbiological medical and public health literature, which focuses on in-depth exploration of HAI-causing pathogens. From a microbiological 'perspective,' HAIs are conceptualised as infections caused by non-human factors; the focus is primarily on the nature and behaviour of the pathogenic microbes causing HAIs. Humans, environment, and material 'things' are conceptualised as static 'reservoirs,' i.e. as transmission vectors or destinations for microbes (World Health Organization, 2002a, p. 6), rather than as agents interacting with microbes. In this perspective, a host (patient) is conceptualised as a passive medium on which a pathogen can manifest itself; for example, by colonising or infecting the medium. The sole link with the host is established in literature when the host is differentiated by some specific characteristics, like immunosuppressed host or host in a certain age group. In accordance with this conceptualisation, biomedical interventions are designed to prevent and control these infections (Alp et al., 2011; Lixandru et al., 2015; Akturk et al., 2016; Kokate, Rahangdale and Katkar, 2017).

However, some of the ontological borders of the subject matter in this perspective have been challenged by knowledge developments on microbial behaviour among other microorganisms and the broader environment. For a long time, microorganisms were considered as living separately from other microbes; but recent studies argue that microbe behaviour and life is tremendously social in character, functioning via cooperation and communication with other organisms (West et al., 2007; Damore and Gore, 2012). The microbe characteristics are not static – they acquire and change their properties according to the surrounding conditions and context. Microbes also form biofilms which are often labelled as 'cities' by organising themselves in communities (Ingram, 2011, p. 101). There are also studies exploring unprecedented microbial behaviours, e.g. marine microbes conducting suicides (Schrader, 2017).

A more sophisticated and holistic understanding of microbial behaviour has also been proposed, by examining the changing patterns of pathogens that cause HAIs. These pathogens have already posed a challenge to the more rigid analytical focus on pathogen-infection links only. Exerting more clinical pressure to improve diagnostic speeds is no longer an adequate strategy, as deeper forms of analysis have the potential to challenge current microbiological diagnostic technologies, in terms of establishing the connection between a pathogen and its corresponding infection. For example, it is now necessary to identify movements of HAI-causing pathogens by using genomic 'fingerprinting' (Struelens, Denis and Rodriguez-Villalobos, 2004; Zhang et al., 2015). The ontological borders of the subject matter within this perspective are further challenged by a recently identified lack of understanding about certain microbial behaviour patterns (e.g. the transmission routes of microbes) that leads to HAIs in hospital settings (Doan et al., 2014; Mallaret et al., 2017). For example, Zhang et al (2011) point out that current HAI control literature lacks an adequate understanding of the mechanisms and interaction between the pathogen, the patient and attached devices, like catheters. Thus, the microbial complexity of HAIs is pushing this stream of scholarship to expand its ontological borders and to not only investigate microbes as static, isolated entities but as organisms that interact, move and rapidly evolve not only with each other but also with its hosts and surrounding environments.

2.1.2. Social Conceptualisation

The angle of the social ontological entity is maintained by the social sciences, where HAIs are conceptualised as a part of human affairs. Although within pathogen-infection link a patient usually is

understood as a host that is impacted by the infection, the voice of the patients (the hosts) is rarely studied in the HAI control literature in general (Brown, Tanner and Padley, 2014; Jorm et al., 2015; Seale et al., 2015). Instead, the 'social' perspective in HAI control literature is built upon studies about the infection control behaviour of medical personnel. In this research paradigm, microbes are conceptualised similarly to how 'hosts' are within the microbiological perspective: they are not seen as active agents participating in human affairs. Microbes in this perspective are not made explicit as a part of HAI control studies and are only mentioned as the background; for example, by mentioning that the hands of the medical staff are the main microbial transmission route in hospitals, while nonetheless, the actual analytical focus is directed, in a homogenous manner, towards the medical personnel's infection control behaviour patterns (Borg, 2014). As a result, a conceptual dichotomy between pathogenic/host or biological/social is both retained and maintained.

Within this paradigm, HAIs are conceptualised either in terms of the 'adverse events' of healthcare systems, or as being a result of individual 'inappropriate' infection control behaviour. These bodies of knowledge occasionally overlap when the research focus on HAIs as adverse events often addresses inappropriate human behaviour, but not the other way around. Similar tendencies are observed in mainstream patient safety scholarship (Rowley and Waring, 2011). Research on system thinking and healthcare workers' behaviour is extensive; such studies have played a role in determining policy and practice formulation in relation to patient safety and controlling HAIs. One is designing 'safe' healthcare systems (Waring et al., 2016), or modelling 'appropriate' infection prevention behaviours (Flodgren et al., 2013; Gould et al., 2017).

Conceptualisation of HAIs as adverse events is linked with the patient safety movement within the health care system. In patient safety literature, an adverse event is conceptualised as a negative consequence (adverse event) of organisational and techno-systematic processes; e.g. when medicines with very similar labels are stored next to each other or very close to each other, thereby creating a risk of administering the wrong medicine (Pittet and Donaldson, 2006; Jensen, 2008; Iedema, Jorm and Lum, 2009). This research direction has diverted the focus away from blaming and punishing individual healthcare workers when adverse events happen, towards framing adverse events as a consequence of systemic factors (e.g. distribution of workload). Viewing medical personnel behaviour as conditioned and as enabled by multiple organisational, systemic factors of health care institution has allowed researchers to approach patient safety risks as linear effects of specific processual and systematic causes; for example work stressors, workload scheduling, resource availability and

management (Waring et al., 2016, p. 202). However, Rowley and Waring (2011, p. 6) have observed a rather paradoxical tendency in the mainstream patient safety approaches: while systemic factors are acknowledged as key targets for improving safety, in practice much more attention is directed towards improving the behaviour of medical personnel. This patient safety movement has also promoted organisational learning culture within health care systems when adverse events are being reported, analysed and learnt from, in order to improve the safety of care.[6]

Although HAIs are often identified as the most common adverse event in healthcare, and as one of the most central challenges for patient safety (Pittet et al., 2008; World Health Organization, 2009), the conceptualisation of HAIs as an adverse event is narrower than that which is to be found in broader patient safety scholarship. In HAI control literature, the problem of HAIs is not approached the same way as other patient safety risks (e.g. mixing medicines with similar labels) when the root-cause analysis is applied or organisational learning is utilised but rather analysed through the framework of organisational 'barriers and facilitators' (Fukuda et al., 2009; Jansson et al., 2013, 2018; Borg, Waisfisz and Frank, 2015; Yanke et al., 2018, 2015; Jun, Kovner and Stimpfel, 2016; Kulkarni et al., 2016; Safdar et al., 2016; Barker et al., 2017; Ngam et al., 2017). Such organisational shortcomings as high patient turnover, lack of clinical leadership, high staff turnover are considered as risk factors for HAIs (Castro-Sánchez and Holmes, 2015). However, conceptualising the HAI problem within the framework of barriers and facilitators, this creates risks of producing static and reductionist accounts about the problem; i.e. that it can be mechanically and technically fixed by removing the organisational 'barriers' (Szymczak, 2016). Another issue with this approach is associated with the fact that the framework of barriers and facilitators produces 'prescription' HAI control accounts, especially directed towards developing contexts (Gould et al. 2016; Allegranzi and Pittet 2007; B-E Ider et al. 2012; Bat-Erdene Ider et al. 2012; Rosenthal 2011). The 'prescription' HAI control here means the particular sets of recommendations which developing contexts must follow to establish efficient HAI control. It has already been argued by several scholars (Gould et al., 2016; Pelzang, Johnstone and Hutchinson, 2017) that HAI control interventions and programmes that work in one context often fail in other contexts. Most of the HAI control literature has been produced in a few high-income countries, with their own specific contextual characteristics (De Bono, Heling and Borg, 2014, p. 5).

From the 'social' perspective, the other mainstream conceptualisation focuses on HAIs as being a result of inappropriate human behaviour, so it mainly relies on behaviour change

[66] For more critical analysis on the mainstream patient safety debate, please see (Waring et al., 2016).

interventional research. Linking the problem of HAIs with the 'wrong' kind of infection control behaviour is an extensively studied area in HAI control literature. This literature branch is rooted in the behavioural deficit model (Jackson and Griffiths, 2014), arguing that the behaviour of medical personnel fails to comply with the policy requirements, and thus requires interventions to help reach better infection control compliance. Thus, the change of healthcare workers behaviour is identified as the main challenge of HAI control (Pittet, 2004; Whitby et al., 2007). For example, Michael Borg (2014, p. 161) argues that

> [d]espite dealing with biomedical practices, infection prevention and control (IPC) is essentially a behavioural science.

The analytical scope of this approach has some gaps. One of these unintentional analytical gaps is that this approach overlooks some more mundane, taken-for-granted and invisible everyday healthcare practices that already prevent the risk of HAIs and maintain safety of care (Mesman, 2012; Gould et al., 2016). For example, in the research subfield of hand hygiene, it is assumed that globally, the hand hygiene compliance rate is 40% (Erasmus et al., 2010); but in the research, there has been little attention devoted to exploring how these hand hygiene practices, which are already safe, are embedded in daily healthcare routines. The current lack of knowledge about these effective and safe infection control practices is considered to represent a loss of valuable information (Gould et al., 2016, p. 376). Furthermore, research rooted in the deficit approach has reported that non-compliant behaviour tends to be blamed on others, while personnel's own non-compliance practices are being rationalised (Jackson, Lowton and Griffiths, 2014; Shah et al., 2015; Sadule-Rios and Aguilera, 2017). However, a small body of literature that avoids the deficit approach but focuses on embedded safety practises contradicts these results (Gould et al., 2016; Hor et al., 2017; Szymczak, 2018). These unintended consequences that have been produced by the behaviour deficits research approach also contradict the overall patient safety approach that promotes a 'blame-free' learning culture as a precondition of providing safe health care.

Another research gap is linked with a tendency for the behavioural studies solely to focus on two specialities among the hospital staff – mostly nurses and then physicians, but the rest of the hospital staff is left outside this study scope, although it is generally assumed that HAI control must be implemented and followed by *all* hospital staff ('from hospital board to ward') (Duerden, 2009). For example, only a couple of studies have specifically studied the HAI control perceptions and behaviours of hospital cleaners (Messing, 1998; O'Neill et al., 2010; Cross et al., 2019). This research

tendency unintentionally represents and reproduces the professional hierarchies inscribed in hospital structures. This point also reminds research to include within the discussion the general lack of other voices that are usually no more than glanced over by the mainstream research; for example, the voices of patients, caregivers, hospital visitors (Landers et al., 2012; Brown, Tanner and Padley, 2014; Jorm et al., 2015; Seale et al., 2015).

The relations between behaviour and context are also under-researched (Edwards, Charani, et al., 2012; MacBeth et al., 2016). Here, two approaches can be identified. One is the hospital's inner context, and how that shapes infection control behaviour. There are a few studies addressing these hospital inner contextual factors, such as the quality of communication among medical staff (Edwards, Sevdalis, et al., 2012; Farrugia and Borg, 2012), informal networks (Szymczak, 2016, 2018), and social control (Tarrant et al., 2017); as a result, it becomes possible to take a look at the individual HAI control behaviours not as an isolated entity, but as co-produced and collectively enacted practices. The relational aspects of HAI control both capture and make the everyday dynamics that frequently fall outside the research accounts of compliance and non-compliance of individual behaviour (Clack et al., 2018). Furthermore, these factors 'are crucial to the messy social reality' (Szymczak, 2018, p. 764) of daily hospital practices. Some critical scholars (Allen et al., 2016; Waring et al., 2016) from the field of patient safety warn against operationalising the context as mechanically changeable and receptive to change. In the patient safety literature, the context often becomes a category to which everything associated with non-compliant behaviour is attributed.

The other aspect of the contextual knowledge gap is a lack of studies exploring HAI control from broader perspectives that go beyond the inner hospital context. However, the medical anthropologist Cecil Helman (2007, p. 94) makes the point that neither healthcare system nor hospitals are lonely islands isolated from broader economic, societal and cultural environments; rather, they reflect the social organisation, values and roles of context they are embedded within. Furthermore, when studying other infection diseases, critical social science scholarship has demonstrated that broader economic, cultural, historical, and political contexts not only shape how healthcare is organised, but also determine infection diseases themselves (Harper, 2006; Koch, 2013a). For example, Paul Farmer (1999, 2004, 2009) has extensively studied how economic and political inequalities or, as he puts it himself, 'structural violence' drive infectious disease presence among the most marginalised communities. In the context of HAIs, the burden of problem falls heavier on developing countries; but in the current HAI literature this is a neglected field of research, without sufficient critical research

attention about how the presence of HAI problem is being shaped by global and local economic and politic constraints and inequalities.

2.1.3. Point of Conceptual Departure

Briefly summarising the current scholarship on HAI control, one can see that the scholarship is developed along the conceptual lines of biological and social domains and maintained as ontologically separate entities. Although conceptual binaries (biological-social, object-subject, nature-society) inscribed in the Western worldview and social thought have often been criticised as reductionist, Marilyn Strathern (2011) points out that how we look at these binaries depends on our perspective. Looking from different perspectives, binaries can be seen as an analytically fertile endeavour as well. The social-biological binary has been productive in building the current body of HAI control literature, resulting in multiple lines of conceptualisation (HAIs as microbial, organisational, and behavioural affairs). However, the division between biological and social spheres does not allow researchers to bring these conceptual entities into analytical relationships and exploring dynamics between them. One way out of this conceptual conundrum is to rethink this biological-social division itself and to explore what conceptual and analytical possibilities can be produced when applied to the subject matter of HAI control (Orzech and Nichter, 2008; Helmreich, 2009; Paxson, 2012; Ingold and Palsson, 2013; Koch, 2013b, 2016). HAI control is extensively studied from the standpoint of biological and social binaries, but the body of studies lacks researches that bring HAI control as a subject matter beyond this binarism. In order to address this gap, I contribute to the HAI control scholarship by studying HAI control not as a biologically or socially separated and bounded entity but as a relational phenomenon. Here I am interested, when putting aside the previous ontological 'infrastructure', to explore what analysis, connections, possibilities, realities come to the fore and become visible (Schiller, 2016, p. 136).

The relational perspective brings back into ontological relationships the pathogen and host or, in a border context, microbe and human; thus allowing me to conceptualise the problem of HAI as a relational effect. Furthermore, the relational approach allows me to address some of the conceptualisation gaps in HAI control literature, such as the problem stemming from the fact that HAI control is studied exclusively as a matter of specific settings or as a matter of a certain professional groups. Or in other words, who is the current scholarship for and whose voices does it represent? (Schiller, 2016). This shifts my conceptual approach away from HAI control as something fixed towards

HAI control that is open and unfolding – a relational process, not a static set of practices. As a result, I am positioned to address the field of HAI control as something that 'mutually shapes and is shaped by its manifold field of unfolding relationships' (Ingold, 2000, p. 187). Therefore, the relational approach allows to place HAI control in a broader network where it is seen as a part of a broader assemble of elements. This give me a critical angle to problematise the current and familiar ways in thinking and dealing with the problem of HAIs, showing that the issue can be redefined and reconfigured in terms of boundaries of the problem (Porter, 2005; Harper, 2006, p. 65; Ovretveit, 2009) and offering other ways viewing the problem of HAIs.

2.2. Research Theoretical Approach: The Microbiopolitics of Human-Microbe Relationships

In this section, I introduce an alternative approach in conceptualising HAI control that enables me to study the subject matter not as a biological or social entity, but as an interconnected phenomenon. Here I expand the mainstream HAI literature debate by adding a scholarship on relationality. I conceptualise HAI control as microbiopolitics of human-microbe relations. This conceptualisation is rooted in relationality stemming from the actor-network theory (ANT) (Latour, 1987, 1993, 2005; Law, 2004), British social anthropology tradition (Strathern, 1995; Ingold, 1996; Moore and Sanders, 2014), and Foucauldian social theory (Foucault, 1978a, 1978b, 2003). This conceptualisation of the subject matter serves as a tool for unveiling and analysing different relational aspects of HAI control. This enables me to explore HAI control not as an entity or a thing to be studied, but instead as relationality; for example what kind of relationships are inscribed in this subject matter (e.g. human-microbe relationships, historical relationships, patient-physician relations), what kind of relationships the subject matter has with other entities and forces (e.g. how HAI control forms a part of larger-scale healthcare systems and networks) or what kind of relations the subject matter rearranges (e.g. between healthcare providers) or what news ones it produces (e.g. between policy stakeholders). Through such reconceptualisation, it becomes possible to rethink HAI control not as a given entity, but as something that emerges through relationships (Kazimierczak, 2018).

In order to explain relationality more, I provide three examples. Firstly, relationality makes explicit that practices (e.g. infection control) and identities (e.g. patients) do not exist outside social relationships and social imaginaries (Putniņa, 1999, p. 23). For example, even the most ordinary

practice, like prescribing penicillin or becoming a patient, becomes possible only in patient-physician relationships.

Secondly, from this perspective, interconnections between different fields and scales become clear when dealing with HAI prevention and control. For example, a physician relies on a laboratory worker, a policy maker relies that a physician complies with policy guidelines, international organisations rely on national governments to manage the issue in certain ways, a laboratory relies on the national policy decision in terms of what kind of microbial standard will be used in analysing microbes, an international surveillance system relies on data received from a national laboratory. Therefore, within this perspective, it becomes possible to look at HAI control not as place-based (e.g. hospital) or group-based (e.g. nurses) subject matter but, instead, as negotiable, co-produced, and re-definable. The negotiable nature of the subject matter also implies that multiple ontologies exist as distinct realities; and they are not given or concrete substances 'out-there,' but rather dynamic and co-produced between humans and non-humans, between culture and environment. Here I join John Ovretveit's (2009, pp. 1780–81) idea that multiple perspectives create new opportunities on how to imagine the nature of an object that is studied.

Thirdly, social relationships cannot be disentangled from non-human agents (e.g. microbes) (Latour, 1988; Helmreich, 2009; Paxson, 2012; Cousins, 2017) which become distinctively visible in case of HAIs and their control. For example, when a healthcare worker makes encounter with a patient, e.g. listens to the patient's heartbeats or inserts a central line, the third party in the form of a microbe is always present in these human encounters. In case of HAIs, patients are infected, and microbes spread through human hands, or the instruments used by medical personnel, medical devices attached to or used on patient body. In other words, HAIs makes explicit that whenever interactions between humans are made within healthcare settings, the encounter is also made with microorganisms. HAIs are an explicit example of the entangled relationships between humans and microbes.

In the further text, I introduce my conceptualisation of HAI control: firstly, I address the human-microbe aspect; that is, how to bring into social analysis the subject of non-human (microbe) and meaningfully study human and non-human connection; then I move on to human-microbe relationships with an emphasis of the notion of relationships; lastly, I turn my attention to microbiopolitics which enable me to critically analyse human-microbe relationships.

2.2.1. Human-Microbe Connection

For the needs of my research, ANT gives me conceptual tools about how to incorporate microbes in a meaningful manner in my analysis. The ANT was established back at the beginning of 1980s, and Bruno Latour, John Law, and Annamarie Moll are some of the most visible authors representing the theory. ANT emerged from the discipline of science and technology studies with a shared tradition of developing its theoretical ideas through an extensive base of qualitative case studies (Law and Singleton, 2013). Although the very name of the ANT includes word 'theory', it is not defined as a programmatic theory with defined key theoretical principles, as ANT was instead intended as a fluid body of work (Barry, 2013). As one of the founders of the theory, John Law (2004, p. 157), pointed out, the ANT is rather a 'loose intellectual toolkit', allowing to sensitise scholars to realities that are versatile and consisting of many moving parts (Nimmo, 2016, p. 109). John Law and Vicky Singleton (2013, p. 486) position the ANT approach like this:

> *[...] in ANT theory is not reified, separate or abstract. It does not pre-exist, waiting to be applied. Instead it is created, recreated, explored and tinkered with in particular research practices.*

ANT as a conceptual toolkit re-defines ontological relations between binaries, like social/biological, human/non-human, as symmetrical; a toolkit where social and natural realms co-exist in always-moving networks of relationships. ANT does not propose abandoning these ontological binaries altogether, but rather invites us to switch our focus towards imagining different forms of relations between them, and to deal with some of epistemological 'blind spots' that previous dualisms have produced (see for example (Tsing, 2014; Delanty and Mota, 2017)). Latour's symmetrical approach treats the representation of humans and nonhumans in tandem, while keeping them within the same analytical framework. To this end, the ANT does not rely on nature/culture as an explanatory framework (e.g. explaining something with genetic or cultural reasoning). Instead, ANT's authors see these frameworks as outcomes of networks which are sets of relations. ANT scholars are more interested in how these binaries are set up in the first place. For Latour, culture/nature division is an invention of Western modernity, not a pre-given ontological order (Latour, 1993, 2005). In other words, ANT scholars:

> *[...] force us to look afresh at the categories, divisions, and boundaries that frequently divert our attention away from the nonhuman multitudes which make up our world.* (Murdoch, 1997, p. 753)

As a result, ANT scholars have argued that there is a lack of a non-human presence in the social science research. Human affairs cannot be fully understood without taking an analytical gaze to make visible the significance of non-humans in social life. This means that neither social relationships nor practices should be seen in isolation, but instead they should be addressed as existing in broader relationships between humans and non-humans which need to be recognised and made visible. The theory addresses how different parts of the world co-exist and 'how different actors, objects, and things are assembled' (Bengtsson, Borg and Rhinard, 2019, p. 5). This means that in the ANT a network becomes an instrument for describing a phenomenon, rather than being something that has to be explained (Murdoch, 1997). Therefore, for it to be possible to study HAI control more comprehensively avoiding ontological separations, it is necessary to include in the social analysis non-humans too, and in case of HAIs, these non-humans are microbes. This means that the ANT offers a conceptual method to include non-humans (e.g. microbes) into social scientific accounts.

The research agenda that cuts across the biological/social, culture/nature dualism in order to explore relationships between people and other species currently flourishes as a movement in social sciences. This movement in social sciences is known as a post-humanist perspective or multi-species approach for overcoming anthropocentrism in scientific endeavours.[7] Within this perspective, there is growing analytical interest in theories without dualisms that would permit the reconceptualisation of non-humans from subjects into objects, from cultural symbols into active participants of shaping human lives, thereby moving away from passive representations of non-humans towards human relations with non-humans (Wilkie, 2015, p. 329). The post-humanist movement has produced multiple conceptual approaches on how to bring non-humans into social accounts, e.g. companion species (Haraway, 2003), or post-humanist performativity (Barad, 2003). In my research, I adopt the ANT approach towards defining the agency of non-humans in terms of their action. ANT scientists expand the notion of agency, as not being exclusively associated with humans in the sense of intentionality and subjectivity. Furthermore, agency is not a property of humans or non-humans, but instead it's a property of networks. For ANT, the notion of agency is linked with the ability to make a difference with its actions. As long as an entity (either human or non-human) makes a difference for another entity or in broader relationships, that is enough for the ANT to conceptualise an agency (and action) of that entity (Latour, 2005). Latour (2005, p. 71) puts the question about the actor in this way:

[7] The symmetrical tendency of emerging research practices without social/biological and other dualisms can be observed in the 'biological' side of the literature as well; please see (Benezra, DeStefano and Gordon, 2012; Hill, 2018).

Does it make a difference in the course of some other agent's action or not? Is there some trial that allows someone to detect this difference?

In Latour's argumentation, if the answer is yes, the entity has an agency, regardless of whether it is a human or non-human. I take on this notion of the agency of non-humans as a starting point to make visible and to analyse the complexity of relations between humans and microbes in my research. This conceptualisation of non-humans (microbes) also allows to take into account how through human actions (e.g. hospital care, infection control) certain microbes, specifically HAI-causing pathogens, come to matter in policy settings, healthcare, and public discourses (Ingram, 2011, p. 103). For example, HAI-causing microbes make a difference to how healthcare is organised and delivered; these microbes also demand the attention of different stakeholders and mobilise new alliances between different organisations, thus expressing their agency in human-microbe relationships. Here I want to point out that I do not necessary position my research as multi-species research, because I do not focus on microbes as objects of my research specifically; therefore, I depart from current scholarly debates[8] and research on human and non-human agency, as my research interest does not lie in the agency itself. Instead, I am more interested in relations between humans and non-humans. As a result, this allows me to conceptualise HAI control not so much as a pre-defined and bonded entity but as an unfolding assemble of relations which take priority over the entities themselves; that is, the ANT helps me to address how various conceptual entities fit and work together, and how effects are produced out of networks between human and non-human entities (Latour, 1988, 1993). This leads to the next aspect of my conceptualisation – the notion of relations.

2.2.2. The Notion of Relations

When conceptualising relations, I borrow from the ANT's understanding of 'networks.' Latour (2005) argues that term 'network' should not be perceived as a framework of connections providing 'transportation without transformation' but rather as a 'semiotic network' (Schölzel and Nothhaft, 2016, p. 62) of modifications and translations between heterogeneous elements. This idea makes visible the transformative potential of connections. However, in my research I do not utilise the concept of network in the logic of the ANT any further. Instead, I stay with the concept of relations as

[8] For more about the recent debates on notion on agency in the context of the post-humanist movement, please see (Kirksey and Helmreich, 2010; Kirksey, 2014; Wilkie, 2015; Kazimierczak, 2018).

a better suited tool for analysing HAI control. Moreover, I put relations as the central unit of analysis in my research.

My considerations for not utilising the notion of network further in my research relates with the problem of network as an analytical category. Within the ANT logic, network is 'unending' (everything is connected) and thus analysis is ever-expanding also. Strathern (1996, p. 523) makes a critical point that ANT's understanding of network is without '…a stopping place.' Although ANT is not interested in the idea of 'cutting the network' (ANT scholars have not specified when and how to stop the analysis), it becomes important when carrying out research; specifically, whenever one should decide where there is a stopping point for analysis (but not necessarily a stopping point for the network itself). Thus, I focus my research around relations as a more *manageable* analytical category for this study. However, this does not mean that I address only human-microbe relationships; as I do not view these relations in isolation from broader assembles of relations. Instead, the concept of relations enables me to 'cut the network' (Strathern, 1996) whenever it is necessary to contain the focus and organisation of my analysis, rather than letting it spin out into the distance.

For the purposes of my research, I conceptualise relations not as vectors connecting various entities, but instead as a dynamic connection that can take various shapes and forms, dynamics and have transformative effects; like giving new meanings and revealing new capacities of entities, or forming new relations, roles, identities (Murdoch, 1997; Strathern, 2014b). Furthermore, I see human-microbe relations as a connection in the making, and not something that is pre-given or pre-fixed in a tandem (e.g. pathogen-host). As a result, these relationships are constantly negotiated, navigated, and contested and context-dependent in terms of how they are established, negotiated and cut, and also in terms of what kind of effects they produce.

This conceptualisation of relations is rooted in anthropology; specifically the British tradition of social anthropology, along with its disciplinary interest in relationships as a central unit of analysis and as a form of knowledge production practice (Strathern, 1995; Ingold, 1996; Holbraad and Pedersen, 2017).[9] Caroline Gatt (2013, p. 350) summarises that

> *[anthropological practices] rely on continuously gathering, articulating and re-specifying relations. Of course the particulars are multiple but all take relational form.*

[9] For more on the anthropological debates on the notion of relations, see (Venkatesan et al., 2012; Holbraad and Pedersen, 2017)

Strathern (1995), as one of the central relationality scholars, proposes abandoning the notion of society; and using instead an analytical category of relations, as they come with no pre-given shape or form. She also argues that anthropological practices trace, connect, and analyse relationships between two types of relations: relations between concepts and relations between people. Here I add the third category – relations with microbes as material relations (Gatt, 2013; Kazimierczak, 2018). Strathern (1995, 2014a) points out that it is not enough to simply mobilise these types of relations; and that anthropological practice requires us to keep them within an analytical site, while simultaneously focusing on their interactions. Thus, relationships are containers of important knowledge systems that allow to get access to in-depth understanding of social world. This conceptual/social/material relationality also works as a 'conceptual toolkit' (Edwards and Petrović-Šteger, 2011) to produce interconnected knowledge systems: epistemic or conceptual, interpersonal and material. Firstly, by focusing on material relations, it gives access to knowledge on how people relate to and engage with microbes (for example, by washing hands, avoiding to touch certain surfaces). Secondly, routing connections through persons (with specific histories) it gives access to information how people relate to each other when dealing with HAIs (for example, roles, expectations, communication, behaviour standards). Thirdly, the analytical mobilisation of material and social relationships gives access to information about how people make connections between the concepts, ideas and social imagination forming one's own viewpoint on the issue (Strathern, 1995). For example, when we talk about infection control, we talk about ways in which people interact with each another and microbes when dealing with HAIs (prescribing medicines, ordering diagnostic test, drafting guidelines); and the ways in which particular concepts, like how we should live together with each other or governmentality, are inherent to those relationships. Thus, this conceptual work allows to mobilise human-microbe relations as plural: epistemic, social and material.

One of the research outlets where the understanding of plural human-microbe relations is brought together and critically analysed is so-called 'post-Pasteurian' practices, such as probiotics,[10] human microbiomes,[11] and alternative food-making practices: e.g. raw cheese, fermented milk (Dethlefsen, McFall-Ngai and Relman, 2007; Paxson, 2012; Ironstone, 2018; Lorimer, 2019). Although germ theory within medicine and science has produced a hegemonic conceptualisation of human-

[10] Non-pathogenic microorganisms originating from the human gastrointestinal tract and intended to provide health benefits (Mikelsaar, 2011, p. 465).

[11] "Genomic traces of ecosystems of trillions of microorganisms or microbiota living on and in the human body" (Ironstone, 2018, p. 4).

microbe relations (e.g. the pathogen-host connection) where microbes should be disciplined and eliminated (Houf, 2017), alternative and broader conceptualisations of human-microbe relations are gaining ground. Interestingly, this re-conceptualisation of human-microbe relations is happening symmetrically in biological and social research practices (Hedvig Gröndal, 2018, p. 1130).

The developments of gene sequencing have made it possible to map the human microbial flora and make visible the active and versatile microbial life in, on and around the human body, while redefining human-microbe relationships as inseparable. The body of literature in the area make visible human-microbe hybridity where an individual is seen made of 'bacteria, viruses, fungi, archaea and even a few animals invisible to the naked eye' (Lorimer, 2017, p. 544). When looking relationally, human nature has become a web of interspecies relations (Kirksey, Schuetze and Helmreich, 2014). Furthermore, this area of research has expanded in a notion of human-microbe relationships making visible the diverse forms which these relationships can take and what consequences they can produce; for example most encounters between human and microbes do not lead to infection (Dethlefsen, McFall-Ngai and Relman, 2007, p. 811). The notion of harmful microbes causing infectious diseases is increasingly complemented by a line of thought where microbes are seen as beneficial – and even necessary – for human body function, health and immunity (Ingram, 2011). The expansion of conceptualisation has resulted in studies that focuses on 'absent' human-microbe relations (Lorimer, 2017, 2019), 'unstable' human-microbe relations (Wolf, 2016), 'misbalanced' human-microbe relations (Wolf-Meyer, 2017).

Another contribution of newly established research interest in human-microbe relations across biological and social sciences are contextual, situational and thus plural forms of human-microbe relations. For example, Jamie Lorimer (2017) shows how one microorganism, the hookworm, can take on multiple roles (pathogen; disease consequences when it is absent; mediator of medical therapy) depending on the context and relations it is embedded in. Lorimer (ibid.) takes his argument further by arguing that no microbe is inherently pathogenic or beneficial, but this rather depends upon the political and ecological situations and relations it is a part of. Furthermore, the emerging analytical and conceptual interest in human-microbe relationships has had a transformative effect on understanding how humans and microbes live together as gendered beings (Houf, 2017), how these relationships (re)shape notions of health and illness, body, identity, agency and what it means to be human (Gee, 2001; Dethlefsen, McFall-Ngai and Relman, 2007; Wolf-Meyer, 2017; Ironstone, 2018).

As a result, human-microbe relationships are explored on a broader level – not only from the standpoint of a host-pathogen connection, but also proceeding into the realm where human-microbe relationships are much more complex and vast, and yet to be explored. Currently, human-microbe relationships are studied on a broader level than previously allowed by germ theory, which was previously the main outlet for conceptualising and debating human-microbe relations. Although this emerging research on human-microbe relations is being explored and debated within the context of post-Pasteurian endeavours, the case of HAI control and its grounding in the 'old' conceptualisation of human-microbe relations enables us to bring the subject matter to this newly emerging scholarly debate and analytically problematise it anew. A small but emerging body of literature shows that 'old' Pasteurian relations are neither solved nor fixed, but instead they require further critical analysis. Sociologist Hedvig Gröndal's (2018) analysis of recent medical controversy around the treatment of the 'old' throat infection caused by bacterium Group A Streptococcus makes the instability of the 'old' human-microbe relations explicit. Two studies (Mikelsaar, 2011; Wolf-Meyer, 2017) analysed one of the most common HAI-causing microbe – *Clostridium difficile* – not as a pathogen to be eradicated, but as an effect of 'misbalanced' human-microbe relations in the patient's gut. Here, studies examined HAI control beyond the borders of pathogen-host and infection control practices. Both studies discussed that HAI control should not only include the management of pathogen-host relations when treating hospital infections, but should also maintain and protect other microbial relations at the same time, as localised in the patient's body. The complexity of HAI and broader antibiotic resistance epidemics show that even pathogen-host relations are neither stable nor sufficient, requiring us to expand and rethink current infection control practices.

Currently human-microbe relationships are explored within new outlets as microbiome or probiotic practices where relations with microbes are redefined as not only harmful, but also as welcomed and celebrated; but some scholars argue for more careful debate. For example, Heather Paxson (2014), one of the first scholars contributing to the research area of post-Pasteurian practices, distances her work from the anti-Pasteurian movement (for example, anti-vaccination campaigns), arguing that post-Pasteurian practices are only possible to discuss and explore because of the successful history of Pasteurian practices (e.g. hygiene, antibiotics use, vaccination) before. For Paxson (ibid.), the post-Pasteurian movement is the practice of cultivating more nuanced encounters with microbes where harmful ones are eliminated, but beneficial ones are preserved. The relational geographer Mrill Ingram (2011, p. 101) observes that while recent scientific interest in human-microbe relations has produced more diverse, comprehensive and inclusive understandings of the

relevant relations, in many cases this interest falls under the idea of gaining 'ultimate control' of microbes and manipulating encounters with microbes in the name of human health, wellbeing and ultimately comfort. This newly established interest in microbial encounters is not necessary associated with the protection of microbes, as a part of biodiversity that should be carefully preserved. This argument brings me to the last part of my conceptualisation: the presence of power in human-microbe relations, along with the embedded practices of regulating and managing these encounters.

2.2.3. Microbiopolitics

In addition to the concept of human-microbe relationality, I bring microbiopolitics into my conceptual perspective, making visible the power[12] and control that is inscribed in human-microbe relationships. Jonathan Murdoch (1997) and Olli Pyyhtinen and Sakari Tamminen (2011) in their analysis on relationality in both Foucault's and Latour's work show that both have a shared notion of power; one where power is conceptualised as a property of relations and networks, and not as a property of actors. But if Foucault's social theory centres on the concept of power, ANT has been criticised for not addressing the notion of power in a more comprehensive manner (Murdoch, 1997; Law and Singleton, 2013). For example, Donna Haraway (1997) points out that ANT's approach does not address how inequalities of gender, class, ethnicity or race work in and around networks of multiple elements. This points out that human-microbe relationships are not being shaped equally; and thus, they are not universal. Therefore, ANT does not critically address how dynamics, formations and effects of networks or relations both produce and reproduce power relations and broader inequalities. Jonathan Murdoch (1997, p. 268) also challenges the ANT approach as politically naïve, insofar as ANT researchers tend to avoid representing and defending the voices of those whom they study.

In order to critically analyse human-microbe relations, I adopt Paxson's (2008, 2012) conceptual lens of microbiopolitics. Paxson developed this conceptualisation from Foucault's (Foucault, 1977, 1978a, 2003) theory of biopolitics to analyse current food safety policies and practices in the United States. Foucault (1978b) analysed the rise of 'bio-power' in Europe, whereby human life became the new object of power and governance. Foucault identified the governance of

[12] Here I adopt Foucault's understanding of power, where it is seen everywhere: embedded in discourse, knowledge and other truth regimes.

health, illness, birth, death, reproduction of individuals and populations as biopolitics. Here Foucault (1980) also specified that biopower operates as a tandem of power and knowledge practices: production of truth discourses about different aspects of human life, exercising this knowledge in order to govern individual and population subjects in the name of life.

Where biopolitics focuses on governing individuals and populations, microbiopolitics is about regulating human encounters with microbes. Paxson (2012, p. 160) argues that microbiopolitics 'entails creating and popularising categories of microscopic biological agents (*Penicillium, E. coli*, *L. monocytogenes*, HIV, etc.); evaluating such agents through an anthropocentric lens (are particular microbes 'good' or 'bad' for humans?); and promulgating appropriate human behaviours and practices in the view of our interrelationships with microorganisms that enable (or possibly derail) human digestion, infection, and inoculation.' The microbiopolitics turns an analytical gaze to 'recognition and management, governmental and grassroots, of human encounters with the vital organismic agencies of bacteria, viruses, and fungi' (Paxson, 2008, p. 18).

When applying these conceptual lenses to HAIs, it becomes clear how elements of microbiopolitics play out in this case: establishing categories of microbes causing HAIs, evaluating them from a human perspective, promoting appropriate practices and behaviours for how we should have our encounters with these microbes. The public, medical, and political recognition of microbes causing HAIs is vast; especially within the contexts of hyperhygienic everyday practices, antibiotic resistance, patient safety, and quality of healthcare. For example, *K. pneumoniae*, a major source for causing multiple HAIs, has been categorised as one of the seven most dangerous pathogens in global terms (World Health Organization, 2014). And the British media compares MRSA (possibly the most commonly reported category of HAIs) to Spanish influenza or the Black Death (Gauthier, 2011, p. 271); or else it is used as a point of reference in marketing strategies for selling everyday cleaning products.[13] However, wherever social links with microbes are imagined, microbial categorisation goes beyond evaluations of good/bad. For example, additional qualities are imagined and added to these microorganisms, like certain human behaviours (dancing, waving, hiding), nationalities (Gothenburg strain; or, *A. baumannii* is often referred to as an Iraqi or Afghan microbe) or aesthetic qualities. These categories of microbes also become political when international surveillance systems, like HAI-Net, are established; or when policies are developed to govern specific microbes. The central premise of

[13] For a while, Marks & Spencer were selling hospital pyjamas branded as clothing protecting against the MRSA superbug: http://news.bbc.co.uk/2/hi/health/7118482.stm

HAI control policy and practices are the management and governance of human encounters with these microorganisms within healthcare settings. The main elements of HAI control – surveillance, risk management and interventions, are written in action plans and public health strategies on global and local levels; in guidelines and protocols; in posters and booklets implying how different agents (e.g. medical specialists or patients) should have an encounter with these biological agents. E.g. standardised HAI risk management practices such as hand hygiene policy and screenings of priority pathogens, or indeed evidence-based interventions such as guidelines on antibiotic stewardship, are all embedded in specific rationalities and techniques through which human-microbe relationships are being governed.

The concept of microbiopolitics enables me to focus on the specific logic of relationality: power and governance dynamics within human-microbe relations. I adopt this concept to show how specific categories of HAI-causing microbes are made visible and then regulated within human-microbe encounters. On a more conceptual level, this also calls for attention towards how humans *should* be living with microbes at individual and collective levels (Paxson, 2008). In other words, microbiopolitics is not only about managing human-microbe relations, but it also orders what kind of relations come to exist as a result of these regulation practices (McVeigh, 2013). As an analytical category, microbiopolitics brings a critical perspective that is especially necessary when analysing HAI control policy and practices. Power dynamics run through not only humans and microbes, but also through social relations (e.g. within patient-physician relations), between policies and policy subjects when HAI control is taken upon and enacted.

The concept of microbiopolitics has been a productive analytical lens through which to explore dynamics of human-microbe encounters. While Paxson (2012) has analysed how post-Pasteurian microbiopolitics is produced in the case of raw-cheese making practices, where specific relations with microbes were cultivated and governed in and around cheese-making, other researchers have brought this concept to other analytical endeavours. E.g. Penelope Ironstone (2018) develops 'affirmative' microbiopolitics focusing on such medical practices where the microbial presence in patient body is not eliminated but strategically supplemented. Another example is 'post-paleo' microbiopolitics, the analysis of how some microorganisms who are labelled as extinct in 'Western lifestyle' settings are restored and engage in fresh encounters with humans (Lorimer, 2019).

2.2.4. Applying Conceptual Approach to the Research

The last point of introducing the conceptualisation is to describe the manner in which I have applied it throughout the research. As I trace human-microbe relations in the context of HAI control across historical, media, political, and medical settings, it was important for my conceptual tools to 'travel' flexibly along the subject matter in and out these settings. Here I adopted the ANT's approach towards application of conceptual and analytical tools as 'sensibility to materiality, relationality, and uncertainty of practices, as a way of asking how it is that people and animals and objects get assembled in those practices' (Law and Singleton, 2013, p. 491). I took on this approach as a way how to think with, through and sometimes against my empirical data. This epistemological 'sensibility' allowed me to make visible materiality (non-humans), heterogeneity (plurality of ontologies), relations (across the board of human/non-human, medical/public/policy conceptual/material realms), and uncertainty (ambiguities, contestations, negotiations) of the practices that also compose HAI control.

Summary

In the chapter I analysed how HAI control is conceptualised in the current scholarly debates and literature. HAI control is extensively studied from the standpoint of biological and social binaries, but the body of studies lacks researches that bring HAI control as a subject matter beyond this binarism. I developed a conceptual framework that allowed to study HAI control more comprehensively. My research diverges from the current debate; insofar as it does not focus either on systematic factors, nor on exclusive behaviours (either microbes or humans) to fill the knowledge gap in the current scholarship; to accomplish this, the thesis focuses on HAI control at the intersections of biology, medicine, culture and politics and bringing a more holistic conceptual approach that has been less popular in the current HAI control studies. I borrow analytical tools from ANT, science and technology studies, anthropology, and Foucauldian social theory. At first, I bridge the biological and social divide; then I move on to grounding my conceptualisation of HAI control in relationality; then finally, I apply the concept of microbiopolitics. This approach gives me an analytical toolkit to analyse and make visible different relational aspects of HAI control. Taking a more comprehensive perspective, it permits a reconfiguration of the boundaries of the problem, in order to reach deeper understandings about HAI control. When dealing with HAIs, this perspective also enables me to avoid the trap of looking at the policy, medical, public fields as isolated entities (with

their own worlds, rules), instead switching one's focus towards interconnections between these settings. Placing human-microbe relationships and their regulation at the centre of HAI control policy and practice allows me to see different perspectives on how infection control, patient safety, and quality of healthcare is assembled and enacted when managing HAIs.

Chapter 3. Tracing the Phenomenon of HAI Control: Research Design and Methods

Introduction

This chapter sets out the strategies I have employed to address my research aim and objectives. Following a reminder of this study objective, I reflect upon my research aim and objectives. Then I move on to my epistemological and ontological positionality. I then address my ethnographic research design and positionality in the field. Following this, I describe in detail my research methods. Then I address some research quality issues; followed by a discussion of the limitations of my study, as well as some ethical considerations.

3.1. Research Aims and Objectives

The research aimed to understand the phenomenon of HAI control by looking at how HAI control was negotiated and navigated within and between different settings and people in Latvia. The specific research objectives of this thesis were:

1. To analyse how HAI control is conceptualised in public discourse.

2. To explore how different actors negotiate and assemble HAI control as a policy issue.

3. To analyse how different actors manage HAI control and engage with each other when dealing with HAIs and their management in everyday hospital practices.

4. To develop policy and practice implications for improving HAI control policy and practice in the Latvia.

In this chapter I address some methodological issues surrounding research objectives.

3.2. Epistemological Positionality

Before I turn my focus towards my research methodology, this section explains my epistemological assumptions. These have formed the foundation of my research methodology, as they fed into the production of knowledge and into the various concrete ways research was done, along with what was seen as data, and how data was collected and analysed (Cunliffe, 2011).

My approach to knowledge production is rooted in 'intersubjectivity as ontology,' where a way of being in the world is fundamentally relational in character (Ricoeur, 1992; Law, 2004; Merleau-Ponty, 2005). Ann Cunliffe (2011, p. 657) summarises this way of being as follows: 'we are always

selves-in-relation-to-others.' Our being, selfhood, agency, identity, understanding, meanings come into existence in relation with others, and are thus shared phenomena. As already discussed in Chapter 2, this ontological position considers that we come into being not only in relation to other humans, but also in relation to non-humans. The world is imagined as being composed of shared trajectories and connections of humans and non-humans, where the customary lines between self and others, subject and object are blurred (Tsing, 2014).

This ontological position has fuelled numerous deconstructive, critical, discursive, reflexive modes of knowledge production that put social relations as the main technology of knowledge production (Ingold, 1996; Cunliffe, 2011). The literature chapter discussed theoretical considerations drawn from science and technology studies. Research conducted in the area of ANT shares these ontological assumptions. These standpoints have not only shaped my decisions about which research methods to use, but have also helped determine what kind of questions I have sought to answer in the first place. Thus, in this research thesis, theory and method have been intertwined from the beginning; of course, this is a common characteristic of social science research (Moore and Sanders, 2014, p. 6). My epistemological position on how to study HAI control has thus been already surveyed by way of the chosen conceptual framework in Chapter 2, and indeed my general way of viewing the topic being researched. Firstly, I view HAI as a complex phenomenon. But at the same time, HAIs are simultaneously a biological, a social, and a political issue. It is also a problem invisible to the human eye, which nonetheless places a heavy and unnecessary burden on the life and health of patients, as well constraining funding and human resources for healthcare systems. Secondly, I view HAI prevention and control as a relational process between nonhumans (e.g. the microorganisms causing these infections), humans (e.g. patients, physicians, policy-makers, etc.) Thirdly, I was interested in certain ways of studying HAI control that are themselves linked with this viewpoint: multi-layered, complex, mobile, dynamic, but nevertheless exciting enough to deserve investigation.

Over the course of this research, I adopted relationality as the epistemological foundation of knowledge production (Desmond, 2014). This positionality is grounded in the British tradition of social anthropology (Strathern, 1995; Ingold, 1996; Moore and Sanders, 2014); as well as in science and technology studies, and particularly in ANT (Latour, 1987, 1993). More specifically, relations are a key factor in understanding how HAI control is negotiated and navigated, and also indicate what kinds of improvements are possible in this area. Therefore, in this research, there is a threefold significance of the relations under discussion: as a source for data, as a topic for analysis, and as a resource for

improvements. For as Marilyn Strathern (1995) points out, social relationships are storers of important knowledge systems which permit an in-depth understanding of social world. In Chapter 2 I stretched this understanding a little further, in order to include not only relations between people, but also relations between humans and microbes, with the latter also serving as storers of knowledge. By studying the British kinship system and the societies of Papua-New Guinea, Strathern developed relationality as a knowledge production tool. This 'conceptual toolkit' (Edwards and Petrović-Šteger, 2011) makes it possible to produce interconnected knowledge systems: epistemic or conceptual, interpersonal, material. This 'perspectival exchange' (Castro and Goldman, 2008, p. 24) between principles of social order and interactions between human and non-human actors was applied as a central epistemological tool for the research. From this standpoint, knowledge is co-produced within specific relational networks of humans and non-humans.

3.3. Ethnographic Research Design

The overall research design is ethnographic in character. Ethnographic research is defined as a form of 'social research based on the close-up, on-the-ground observation of people and institutions in real time and space in which the investigator embeds herself near (or within) the phenomenon, so as to detect how and why agents on the scene think and act the way they do' (Wacquant, 2003, p. 5).

The decision-making process on the methodological approach was led by three main factors: research aim and objectives; epistemological standpoint; and theoretical framework (see Chapter 2). Firstly, the research objectives required data on different perspectives and scales, information on dynamics of concepts and practices, and points of connection and disconnection in dealing with HAIs. Ethnographic research design provided the potential for an in-depth investigation into connections and interrelations of multiple accounts, scales, and discourses (Latour, 1987; Rapport, 2004; Bernard, 2006; Pope and Mays, 2006); research tasks which might otherwise difficult to accomplish, but which are nonetheless of crucial importance for fulfilling the aims and objectives of the research.

Secondly, my epistemological position automatically brought an ethnographical research approach into play; or as Signe Howell (2017, p. 15) points out, 'anthropology and ethnography are two sides of the same coin.' Thus, the theoretical framework I employed not only provided conceptual tools for studying HAI control policy and practice, but has also had a direct impact on how I designed my study. Thirdly, it is a well-established assumption in literature (Ingold, 1996; Moore and Sanders,

2014) that if the research's central unit of analysis is social relationships, as is the case with this PhD research, then ethnography is suggested as the most suitable research design.

Although the decision about the methodology was fairly straightforward, alternative methodologies could still have been considered; particularly phenomenological, case study or grounded theory research designs. If an ethnographic research focuses on practices, meanings and context, then the central focus of the phenomenological research methodology makes it possible to explore the meaning-making process of lived experience (Merleau-Ponty, 2005). Since the research was interested not only in the meaning-making process but also in contextualised practices, the phenomenological approach in this case would have ended up narrowing the research methodology. The methodological approach of a case study would also not be applicable for this PhD thesis, as this research focuses more upon interactions between different settings, and less upon particular or bounded events, processes or institutions (Marvasti and Silverman, 2008, pp. 162–164). Grounded theory methodology was not considered, because the theoretical framework was introduced in early stages of the research, and so that kind of research design was not feasible for the research project at hand.

3.3.1. Multi-Sited Ethnography

I selected multi-sited ethnographical research design as the most suitable for attaining my research goals: by focusing on public, hospital, and policy settings where HAI control was navigated and negotiated within and across these sites. Multi-sited ethnography also addressed my conceptual positioning of exploring HAI control as a relational phenomenon. For the purposes of this research, my understanding of "multi-sitedness" exceeds a way of data collection only as it is also an epistemological position enabling putting forward interconnections between different scales, settings, accounts, and concepts to build a different kind of understanding of HAI control. There was also a strategic decision not to locate my research field in a particular group (e.g. infection control specialist) or place (e.g. hospital); this was in order to avoid the risk of studying HAI control as a group- or place-bounded (and thus static and monolithic) entity, thereby reproducing 'naturalised' perceptions and categories about this area.[14] George Marcus (1998, p. 33) points out that situating

[14] During data collection I still encountered common knowledge and taken-for-granted perceptions where certain specialists and institutions were referred as the main body of responsibility of HAI control. Thus, the chosen research strategy enabled me to use this data more critically.

the research within a bounds of community or place creates a 'fiction' of a 'fully-probed micro-world' that prevails over the ultimate purposes of the inquiry (like a phenomenon of HAI control).

The main difference between conventional, one-site ethnography and multi-sited ethnography is that the latter 'moves out from the single sites and local situations [...] to examine the circulation of cultural meanings, objects, and identities in diffuse time-space' (Marcus, 1998, p. 81). It involves looking at different settings and actors, in order to represent the existing multiplicity of HAI control. In Erin Koch's (2013a) ethnography on tuberculosis control in Georgia, the multiplicity of tuberculosis was represented by conceptualising tuberculosis as a zone of contacts, rather than a purely biological or social disease. For Koch, tuberculosis control could be only understood by looking at it from multiple angles, along with differently related agents and sites. This approach included analysing the subject matter through healthcare reform projects, laboratory work and observations in prison settings. In this study I adopted a multi-sited ethnography, in order to open up the phenomenon of HAI control in a way that previous research did not permit.

In general, there is a certain tendency in social science research whereby different forms of 'multi' ethnography have multiplied in the last decade (e.g. multi-species ethnography (Kirksey and Helmreich, 2010), or multi-scalar ethnography (Xiang, 2013)). This is a reaction to self-critical and self-reflexive debates in anthropology, sociology, human-geography, science and technology studies; as well as a response to calls to seek for better ways to grasp and chronicle the messy, complex, and conflicting realities of today's world (Law, 2004). Currently, there are rather heated debates among scholars about different forms of ethnography; as well as their nature, application, effects on conventional forms of ethnography and the abovementioned disciplines in general. For example, there is currently an ongoing debate over whether multi-sited ethnography is something truly innovative, or whether traditional ethnography in the anthropological sense has always moved around in investigating its subject of study, and has thus been multi-sited all along; such multi-sitedness having merely been forgotten along the way. See for example the debate between Marcus and Okely (2007). At the moment, there is no clear consensus on the main issues surrounding different forms of ethnography. So for the purpose of this PhD research, I conceptualised my research as a multi-sited ethnography; because doing so enabled me to follow HAI control through places, personal accounts, meetings, medical training sessions, conferences, policy documents and mass media articles; and ultimately to bring these different scales, discourses, accounts and meanings together in

an analytical framework that gave me a chance to think about and explore HAI control from a more comprehensive perspective.

I planned and started my fieldwork with quite a clear notion of multi-sited ethnography. But when I began reflecting more on the methodological issues encountered during the fieldwork, the notion of multi-sited ethnography started to become challenging. These issues related with this form of ethnography are also addressed in the literature (Hage, 2005). In line with the research goals and theoretical framework, I believe that the decision to focus on public, medical, and policy scales was strategically on point. However, two specific challenges related to this particular form of ethnography became clear over time. The first of these was practical in nature. Gaining access to a research site for the purposes of ethnographic research is always a complicated task, requiring time and patience; it also means gaining trust and rapport from the informants (Bernard, 2006). I started my fieldwork by negotiating access to one hospital, and it took a couple of months to build up trust and a rapport with the hospital personnel, in order to get access to data I needed for my research. But at the same time, I had to do the same in other locations. At times, this was just impossible, because I couldn't be at two or three places at once; nor could I invest the time and energy required to gain access to these fields. If I had had more time available for my fieldwork, I could probably have covered all three sites in more detail, while also gaining more comprehensive access to each one. During the fieldwork, I made the decision to approach multi-sitedness by focusing on each individual field, one at a time, rather than approaching all the fields all at once. I was probably limiting my ethnographic gaze, in order to follow the circulation of HAI control in a more dynamic manner: but this way, I had more control over the quality and depth of the data I collected. As Hannerz (2003) has pointed out, the challenge of doing this type of ethnography lies in following the ideal of the multi-sitedness in the fieldwork.

This leads us to the second challenge I encountered: the balance between the depth and breadth of the data. With regard to this matter, there are no good answers for ethnographic research, either one- or multiple- sited. The main strength of single-site ethnography is its ability to go into depth; but often enough, this approach is criticised for focusing on a single locality, and therefore lacking the broad scope required for adequately generalising its research results. On the other hand, the kind of multi-sited ethnography which aspires towards greater breadth is criticised for a lack of depth in terms of its ability to produce in-depth research results, when compared to the kind of ethnography that is localised in one particular place or community. As Hammersley and Atkinson

(2007, p. 31) point out, the researcher 'must make a trade-off here between breadth and depth of investigation.' As I have been interested in expanding current understandings of HAI control, here I also want to point out that single-site ethnography does not automatically lead to better analysis or understanding of the subject studied.

Rather that studying HAI control as a single-sited phenomenon, as previous research has done, I have attempted to highlight how we can see the phenomenon differently by looking outside of our constructed boundaries and notions of it. In order to do so without limiting the depth of my research, I made sure that all these sites/scales were represented by multiple data sources and perspectives. As already mentioned above, sometimes this created time scheduling conflicts with regard to tracing HAI control across multiple settings (the question of breadth). As the issue of breadth was embedded in the research design from the beginning, I weighed my decision carefully in such situation, and so I opted to focus on deepening the data.

Another methodological challenge I want to address is the relationship between producing ethnographic research results as a theoretically neutral technique, versus using ethnographic research for particular political, practical or ethical commitments (Hammersley, 2006, pp. 10–11). Hammersley (2006) warns that doing research to serve the agendas of certain political or marginalised or dominated groups creates a risk of systematic bias. However, my research does have certain political and practical commitments, as stated in the discussion of my research objectives: i.e. I am seeking ethnography-informed recommendations to improve HAI control policy and practice in Latvia. Therefore, to minimise the kind of bias where the research risks serving a specific political agenda, the process of selecting a suitable theoretical approach was crucial. I found that the theoretical approach chosen here, the microbiopolitics of human-microbe relationship, made it possible to conduct an inclusive study of HAI control, by enabling one to include those voices and perspectives that have been excluded in previous research. I was driven by the assumption that we all have relationships with microbes that we also in some ways manage. Furthermore, I wanted to find a perspective that allowed me to perceive what people are actually thinking, doing, experiencing, but without implying any values or meanings from outside about what *is* the right way or what people *should be* thinking, doing, experiencing when dealing with HAIs. The latter problematic approach has been commonly employed in previous research. Instead of trying to 'solve' this gap, I have attempted to highlight the ways in which such HAI control has been produced in the first place.

3.4. Methods

This subsection includes a description of the research sites and the process undertaken to carry out our research phases; while also providing more details on this study methods selected.

3.4.1. Research Sites

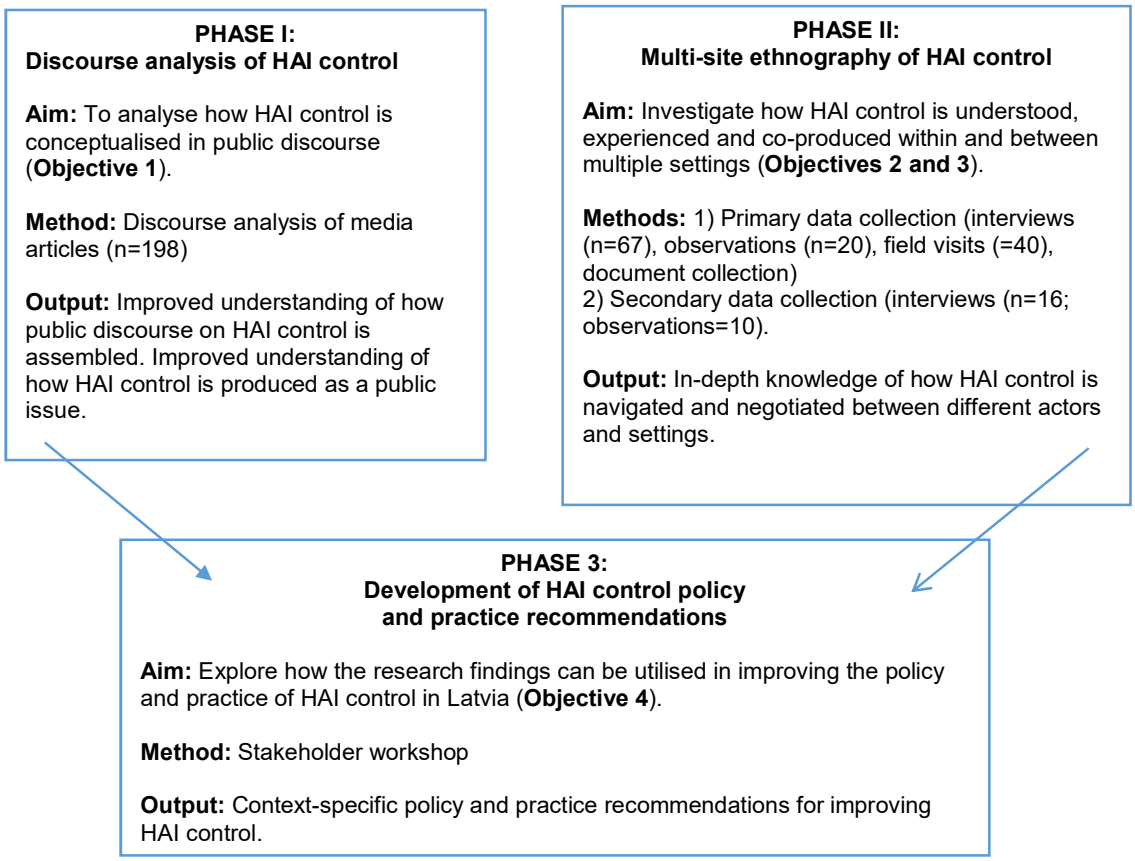
As stated before, I had three research sites: public, hospital and political. For the purposes of this study, I define "sites" as a place, either physical or discursive, where the subject of inquiry is managed and negotiated. I also understand these sites not as bounded places, but as fundamentally interrelated to each other. In the public site, I studied media articles and accounts from journalists. In the policy site, I explored policy documents, accounts and practices of policy-makers, state officials and other stakeholders from different governmental and other organisations. In the medical site, I explored medical documents, accounts and practices of hospital staff (medical, support, management), patients and caregivers. This was the place I maintained an in-depth focus on one multi-speciality hospital. However, I also collected data from other multi-speciality, specialised, and regional hospitals to create a comparative perspective. I also explored the dynamics between these settings and people on various different levels: such as meetings, conferences, training sessions and many more. Due to the high risk of identifying my research sites, I have omitted any identifying information.

Here I wish to clarify that the actual field settings (e.g. hospitals, government bodies) of my ethnography were not the actual subject of my study. Given my research aim, as well as my theoretical and epistemological positions, I conceptualised my research site as relations (imagined and enacted) within and between these settings and people amidst them. As Clifford Geertz (1973, p. 22) points out, 'The locus of study is not the object of study. [...] Anthropologists don't study villages… they study *in* villages..' Therefore, the research strived not to depict these settings as physical localities, organisational structures or bodies; but rather to travel deeper into the myriad relational links shaping and connecting these settings.

3.4.2. Phases of Research

To ensure that data collection and analysis takes place according to a clear plan, the research was divided into three interrelated phases, each with its own corresponding aims, methods and outputs (Figure 2).

Figure 2. Research phases



The research phases are described in detail in the next three sections.

3.4.3. Research Phase 1: Discourse Analysis of HAI Control

The aim of this research phase was to identify how the phenomenon of HAI has been assembled as a public issue. Tracing the phenomenon through electronic media texts, discourse on HAI control also showed what kind of modes of conceptualisation are available for people to think and act with.

This research phase was initially intended to include policy and communication documents from two main international organisations as well: the WHO and the EU, both of which are significant stakeholders who are shaping public discourse on the subject matter. However, after selecting the documents and beginning to analyse them together with relevant media texts, I realised that their different formats were too mismatched to help me carry out a comprehensive analysis; so I decided

to focus on the media texts only, and integrate the selected policy documents into an ethnographic data set. These documents fit better with Chapter 6, which covers policy analysis.

Selecting the Data

For the discourse analysis, articles and comments from readers were selected from the main seven Latvian electronic media sources. This included four main news websites: delfi.lv, tvnet.lv, apollo.lv, lsm.lv.[15] There are also the three main newspaper electronic: Diena, Neatkarīgā Rīta Avīze, Lauku Avīze.

Articles from the media sources were selected by using narrow and wide spectrum search words: 'hospital acquired infection' 'intra-hospital infection,' 'MRSA,' 'resistance,' 'antibacterial,' 'bacteria,' 'microbe,' 'hygiene.' The following criteria for an article to be included in the analysis were applied:

- Publicly available media materials. Materials available only for free (without subscription/registration).
- Media materials were included only from media sites in Latvian. Media sources in Russian were not included in this analysis, due to the language barrier.
- Format of press release, news, interview, opinion, analytical articles. In general, advertorial articles (with a clearly identified product and company advertised in the article) were excluded. Most of these cases involved various probiotic products that were being advertised. But there were also some cases where antibacterial products, like door knobs and window panes, were advertised. However, in Latvian media, there are blurred lines between paid and regular content: so articles where there was a suspicion of paid content were still included, due to the lack of reliable alternative criteria for assessing them. Reflecting back on this decision, I would probably now include advertorial articles as well, as they also shape public discourse on the matter.
- Relevance (content related with human-microbe relationships/health care/infection control). To assess the relevance of the articles, I read their titles and headlines first. Where necessary, I read the full article. I was most likely to read through the whole article when highly general research words like 'hygiene,' were used. For example, articles about hand hygiene were included, because

[15] After the fieldwork, apollo.lv and tvnet.lv was merged under one website. Apollo.lv ceased to exist.

this topic is related with infection control; but articles about hygiene in other areas, like dental hygiene or pregnancy hygiene, were excluded.

- If the same article was published by different media sources, it was still included, because of the comments from readers. Out of the 198 articles selected, 37 articles were circulated in at least one other media source. Some articles circulated not only between news sites but also between different years.

In analysis, 198 articles[16] were included, covering the time period 2000-2016.[17] Article searches were conducted from 27/09/2016 until 4/10/2016. The number of selected articles per media source is represented in Table 2.

Table 2. Number of selected articles per media source

Media source	Number of articles
Apollo.lv	68
Delfi.lv	32
Diena	26
Latvijas Avīze	16
LSM.lv[18]	12
Neatkarīgā Rīta Avīze	6
TVNET.lv	38
Total	198

Coding and Analysing the Data

Both the articles and the reader comments were included in the coding process, forming 430 Microsoft Word pages of material. Selected data were uploaded to NVivo software for the purposes of coding, managing and analysing the data.

I approached discourse analysis in line with Foucault's (1978b, 1981) understanding, whereby a discourse is a systematically organised sets of statements about a given topic, practice, area; and which sets what is possible to say and not to say about the topic of inquiry that is at issue. Thus, the discourse analysis focused on the structures and manners in which HAI control is debated and formed as public issue in media texts (Fowler, 1991, p. 42). This approach to discourse analysis is similar to ANT's method of analysing written texts. We can say that ANT's understanding of texts is similar to Foucault's: they are not simply representations of reality, but also enactments of it. Media articles are

[16] List of analysed media articles available in Appendix 2.
[17] Included electronic media sources were established starting from 1999.
[18] Established in 2012.

the means by which certain 'versions' of reality are brought into being, while others are made invisible (Nimmo, 2016, p. 114). A discourse then generate a space of what is said about the topic, but it is also a matter of what is made visible about it. As result, it also defines the boundaries of what can be done with the topic or what cannot be done with it (Kendall and Wickham, 1999).

My analytical approach has also been shaped by the theoretical framework that was mobilised from the start of implementing this research phase (e.g. by choosing search words). I started the process of analysis by developing initial coding system that included codes of agents (e.g. microbes and stakeholders) involved in creating a discourse; how these agents are represented (e.g. active, passive, responsible); what meanings (e.g. positive, negative, social) are added; and what practices and behaviours are attached in the governing of human-microbe relationships (e.g. war on microbes, co-existence of microbes and humans). Then I worked with the codes to start identifying how they could be organised into different frames or perspectives. After developing these discursive perspectives, I revised my codes; sorting them out accordingly with the frames they represented.

3.4.4. Research Phase 2: Multi-Site Ethnographic Research of HAI Control

The aim of this research phase was to investigate how HAI control was understood, experienced, and co-produced within and between multiple settings, by applying multi-sited ethnography. This subsection covers description and reflection on accessing the field, along with the data collection process; and it lays out a data analysis.

Accessing the Field

Gaining access to the necessary data is an important factor for an ethnographic study, and is an issue that needs to be constantly dealt with throughout the fieldwork (Hammersley and Atkinson, 1983, p. 54). Specific challenges with accessing research fields within multi-sited ethnography have been addressed in section 3.3.1. My previous research and collaboration experience[19] have helped me to understand ways in which I could conduct my fieldwork and to identify gatekeepers and

[19] During 2011-2012 I conducted HAI control policy analysis (document analysis, observations, interviews with infection control specialists) as part of research project on biosafety and biotechnologies (University of Latvia, 2010-2012).

strategies for gaining access to the field. For accessing each fieldwork site (broader public, policy and medical settings), I relied at first on previously selected gatekeepers.

Within policy settings, I planned to focus on work done by the National Commission on Limiting Antimicrobial Resistance, as well as key specialists in the field of antimicrobial issues. But over the course of the fieldwork, the Commission's work was postponed; due to the chief specialist taking maternity leave. Therefore, accessing this policy setting via a gatekeeper was not realistic anymore. Instead, I accessed this field by using publicly available contact information. However, over time a lot of specialists from the field referred me back to the initial gatekeeper, who then agreed to help with directions and suggestions about whom I should talk to in the field, and how to get better access.

Within broader public settings, my initial plan and main strategy was to access patients via the intermediation of a patients' rights organisation. The organisation had headquarters in Riga, with units in almost every hospital providing support and consultations to patients and their relatives on patients' rights. Some units worked closely with hospital administrations in improving healthcare quality and patient-centred health services. At that time, my naïve plan was to engage with people in these units, in order to gather data on their daily activities and experiences, as well as get access to recruiting the patients. As I learned soon after launching my fieldwork, the organisation was suddenly dissolved. I still tried to reach out to them, but the organisation had already taken down its website and disconnected its emails and phones. When visiting hospitals, the only reminder of the organisation was the signs on closed doors in hospitals where the organisation had its offices. I managed to interview a former employee who at that time had started to work in a governmental institution; but my informant did not feel comfortable talking about the closing of the organisation. The closing down of this organisation later became one of the 'hot topics' discussed among research participants. Instead of getting access to a patient segment via this organisation, I used various alternatives strategies, described in detail in the section on recruiting research participants.

Within medical settings, I strongly relied on gatekeepers, whether previously known or met during the fieldwork. Previous experience in this field was a bonus for entering the field in question, as I did not have to prove myself once again to certain specialists; especially considering I do not have medical expertise or skills. When I first entered this field in a previous research context, I had to prove my 'legitimacy' for studying and talking about this area from a social science perspective. At first, I was met with a rather sceptical attitude from specialists towards my abilities to conduct policy analysis and to produce study results without any medical and technical knowledge about the subject. Only

over time and after various presentations did my 'soft' science viewpoint gain the kind of trust that resulted in extended collaboration with these specialists. This time around, I was free to skip this 'initiation' process and to access hospital settings more quickly. At the hospital settings where I conducted my research, the genuine interest the gatekeeper had in research and support was a successful trigger for opening up this field site for data collection. For example, they provided information on practical steps to help me gain hospital permission for conducting the research, as well as information on other people I should talk to. The gatekeeper even offered to get into touch with the specialists in order to facilitate the field-entry process. However, I did not have to use the gatekeeper's assistance this way, since in most cases, the people I contacted were willing to participate in the research. I also wanted to approach the potential research participants myself to avoid any suspicion of bias towards specific people or organisations. It should however be noted that the fact that the gatekeeper was informed about the research and had given 'informal approval' often helped me in the recruitment process; and this was even more important than the hospital's official permission.

As Hamersley and Atkinson (1983, p. 65) point out, gatekeepers may have certain interests directing the researcher in one or the other direction; for example representing an issue, place, group of people in a certain way. This was often a topic in my reflections in the field diary. I often wondered about the rationales behind certain invites to participate in events or to talk to somebody. Rather often I found these recommendations very helpful in gathering data and in expanding my understanding and awareness of the field. But I also paid attention to those topics, areas and people which were not included in the gatekeepers' recommendations and advice. For example, on one occasion I asked a gatekeeper whether it was possible to talk to different hospital personnel and patients. I received informative and helpful advice about personnel; but in the case of patients, the gatekeeper said that 'our patients will not be the best choice for talking to, maybe I should try person X's patients at their hospital.' I still followed up this advice, but it also didn't result in my gaining any access to patients. Later on, I started to realise how patients were perceived and positioned within HAI control practices and physician-patient relationships; this helped provide contextualised explanations to this comment and to my unsuccessful attempts to recruit patients in hospital settings. As indicated in the literature, gaining access is not only a practical matter but also data-informative: negotiating access provides valuable research information on that setting and on the people involved (Bernard, 2006).

Reflecting on accessing the field, it would appear the gatekeeper approach worked better in those cases where our gatekeeper-researcher relationships were mutually beneficial: when I was able to provide something back immediately (e.g. consultation in my area of expertise, or on one occasion I helped to develop hospital department's service assessment survey); or potentially (e.g. recommendations for improving the area, popularising the topic). On those occasions when my research and expertise were not seen as useful by the gatekeeper (e.g. I did not have the necessary training or knowledge), it did not result in a successful collaboration.

Data Collection

For this phase of the research, I collected ethnographic fieldwork data from December 2016 to July 2017. Most of the data were collected in Riga and nearby areas, with some exceptions: interviews and observations that were carried out in Western Latvia. Data were gathered from semi-structured interviews (n=67) with patients/caregivers, hospital staff, policy-makers, representatives from state institutions, NGO, and media; all with regard to their experiences, understandings and perceptions of HAI control. I also conducted observations of various professional and public events (n=20) covering the subject matter, professional meetings where various issues of HAI control were discussed, trainings on HAI control for medical staff, and daily HAI control routines of medical and support staff; as well as my own participant observation while visiting hospital settings for interviews. In addition, I collected documents during my fieldwork. I also utilised secondary qualitative research data: an anonymised data set from 16 interview transcripts with infection control specialists, along with observational fieldnotes from 10 policy-panning meetings from this study on infection control I previously conducted. The secondary research data complemented the data I collected during fieldwork. For example, during the fieldwork no official policy-making meetings were held; but secondary data from the observational field notes of policy-making meetings provided insights into these discussions on HAI control policies. The combination of primary and secondary data sources not only provided a comparative perspective; thereby increasing data validity; but also allowed me to interpret certain perspectives from the various informant groups (e.g. infection control specialists) in a dynamic manner. In line with one particular ethnographic tradition (Hammersley and Atkinson, 2007), I collected data from sources that were as diverse as possible.

Interviews

Semi-structured interviews provided a way to access the experience, understandings, and perceptions of HAI control among various actors (Bernard, 2006). In the following text I discuss the selection of research participants for interviews, introduction of research participants, and the interview process.

Selection Process

The potential groups of research participants and the potential size of the sampling scenario were identified before the fieldwork. The research participant groups included patients (and their family members, where possible), health professionals, laboratory specialists, hospital support staff, hospital administration members, policy makers, state officials, NGO and media representatives. These groups were purposely selected, because they brought their own unique perspectives regarding HAI control into the focus of the research (please see Table 3).

Table 3. Information on Research Participants

Group of informants	**Gender of informants[20]**		**Total number of informants**
	Female	**Male**	
Patients/ caregivers	4	1	5
Patients' and other non-governmental organisations	3	0	3
Journalists	2	0	2
Policy-makers and state officials	10	0	10
Hospital support staff	3	6	9
Laboratory specialists	4	1	5
Infection control specialists (physicians and nurses)	9	4	13
General hospital staff (nurses and physicians)	4	6	10
High and middle level hospital managers	6	4	10
Total:	**46**	**21**	**67**

Patients and their caregivers: provided the perspective of being directly affected by HAIs/ being involved in infection control practices while receiving healthcare. None of the informants were aware if they had previously had any HAI experience. Four of the informants had had a recent patient experience in hospital, and all had been treated multiple times before. One informant was a long-time caregiver to a family member with a severe medical condition and a long history of receiving health care in a hospital.

[20] In Latvia 26% of women work in health, education and social work sectors. Only 5% of men work in these sectors (European Institute for Gender Equality, 2018, p. 2).

Patient NGOs/ other organisations: although representatives from these organisations did not work directly with HAI control, they were indirectly involved through the organisation's profile and/or the activities they carried out. I was also interested in their knowledge about broader issues about the quality and safety of healthcare.

Media representatives: journalists who on a daily basis cover healthcare issues were interviewed to gain broader information on the quality and safety of healthcare. Both journalists had reported about issues related to HAI control.

Policy-makers and state officials: provided a national HAI control policy developing/ implementing/monitoring perspective. This category of informants consists of specialists from five different governmental institutions who were all involved in some capacity with various HAI control policy processes. The informants held various positions: heads of units, departments, institutions; project managers; specialists. During the fieldwork I discovered that 8 of the medical specialists/middle level hospital managers interviewed were actively involved in the national infection control policy-making processes. However, those 8 are not included in this category.

Hospital support staff: provided perspective on everyday HAI control support practices within healthcare settings, particularly 'non-medical' practices involved with providing HAI control. This category of informants consists of specialists involved in organising and providing cleaning services, infectious waste management, technical support, decontamination of medical instruments, quality management, in-house education and training, clinical pharmacy, and infrastructure management. Each of these specialists had already had various encounters with HAI control; for example, when carrying out repair work in hospital units (especially in high risk units, workers had to manage infection transmission risk with dust).

Laboratory specialists: provided information on everyday practices when working with HAI laboratory samples. I interviewed three heads and two workers of five microbiology laboratories.

Infection control specialists: provided an everyday perspective on developing/implementing/monitoring each hospital's HAI control policy. The infection control specialists also were involved in patient treatment, training and other activities. This category includes eight infection control physicians and five infection control nurses.

General medical staff: provided everyday HAI prevention/control practices (treatment of patients with HAIs, precautions measures, antibiotic stewardship, etc.) This category includes two nurses from

therapeutic and intensive care units, six surgeons from various specialities, one therapist, and one intensive care physician.

Hospital high- and middle-level managers: provided a clinic's HAI control policy perspective. In this research, 'high-level managers' mean hospital board members and hospital head nurses/physicians; but 'middle-level managers' mean head nurses/physicians of a specific hospital unit. It should be noted that in the Latvian context, the hospital's middle-level managers are also nurses and physicians at the same time, and are often actively practicing clinically. This category includes four high- and six middle-level managers.

To get an in-depth understanding of the HAI control in the Latvian context, I strove not to exclude even a single group of informants, so that all the relevant voices could be included. The size of each sample was decided according to the purpose of the research, the access to informants and the time allocated for the fieldwork. As a result, 67 participants made up an aggregated number of balanced and inclusive samples from each of the groups that were mentioned above.

Approaching Research Participants

I employed a similar recruitment strategy for all research participant groups; except for patients, with whom I applied a different strategy. Initially the recruitment process started with a purposive sampling, based on my knowledge of respondents' roles in HAI with identified key informants. But as the fieldwork progressed, I applied a 'purposive snowballing' approach, meaning that new research participants were identified through the advice given by the previous informants; especially those with whom my informants had previously had any type of collaboration, either real or wishful (i.e. in cases when they had wished to cooperate, but had not been able to up until then). In total, I approached more than 130 people from various medical, policy and public settings, from which 67 people agreed to participate.

In the case of patients, I used various recruitment strategies, since the original approach was not feasible anymore (please see section on accessing the field). In general, the criterion for selection was patients and their caregivers with recent experience of receiving treatment in a hospital; not particularly those with experience of HAI treatment. Firstly, I tried patient recruitment via various gatekeepers in hospital settings. As discussed in the section on accessing the field, gatekeepers were not open to facilitating and providing open access to patients; especially when I learned that most of

these gatekeepers were involved in the treatment of patients with HAIs who were in a severe condition. And those patients in a less severe condition were not available as well; as there was limited visiting access due to HAI control prevention measures. Then I tried to focus on gaining access to patients with less severe conditions but with a recent hospital experience. After meeting with and interviewing an informant who was the manager of a day surgery unit, I approached the informant with a question about whether it would be possible to place patient recruitment fliers in the unit. However, nothing came of this, and no answer was given. Then, after a process of repeated negotiations with one of the key informants, my patient recruitment fliers were accepted for distribution among the informant's patients. Over the course of two months, this strategy helped me recruit one patient. I once accidentally met the said key informant who then explained that recently the informant has only had 'wrong patients,' meaning that they were 'aggressive' and 'dissatisfied' with the healthcare services; therefore, they were seen as ineligible for participation in my research. In the meantime, I also placed public announcement fliers in three locations (community centres) in the suburbs of Riga. After one month, this approach had not rendered any results. Reflecting back on this recruitment strategy, maybe an announcement in a local newspaper would have been a more successful strategy. I also used various personal contacts (even through students in medical anthropology course at my former workplace) to reach out to people who themselves had hospital experience or who knew somebody with such an experience. This approach allowed me to recruit three patients and one caregiver.

Interviewing Process

I collected 67 interviews, lasting from 20 minutes to over two hours. All the interviews were conducted in Latvian. 57 of the interviews were audio-recorded. In 10 cases research participants were not comfortable with recording the interview; I took notes instead. During the fieldwork I had repeated interviews and conversations with several research participants. Furthermore I stayed in touch, with a couple of key informants after the data collection period as well.

I developed interview guides for the policy makers and state officials; hospital staff; patients; journalists and NGOs (please see the interview guide example in Annex 3). Nevertheless, when interviewing various informants, e.g. laboratory workers or hospitals board members, I adjusted the interview guides; while taking into consideration their job specifics. During the fieldwork I also adapted my interview guides according to new findings or developments, in order to avoid the kind

of situation where I might approach the field inflexibly, in a mechanical manner. For all research participant groups involved in the HAI control in any professional capacity, I started interviews with general questions about how long they had been working in their respective workplaces and what their main duties were. Then I moved to a block of questions regarding general perceptions about HAIs and the situation in their country/workplace. The next question block dealt with the informant's involvement/experience with HAI control. Then I moved my focus towards questions concerning perceptions of and experience with collaboration within a specific institution and beyond. The next question block included questions validating these perceptions of HAI control; that is, these questions covered the same things already addressed before, but this time with different questions. The last question block gave the informant a chance to ask any questions or to address any matters not covered by my questions; and it also gave me a chance to seek advice with whoever I needed to talk with, or which documents had to be reviewed.

All audio-recorded interviews were transcribed verbatim. For interviews lacking audio recordings, I took notes during the interviews and latter produced full field notes. The field notes were also produced for audio-recorded interviews. It enabled me to check and compare data from transcripts and field notes. For the purposes of efficient time management, interview transcripts and field notes were not translated into English; however, codes and further analysis were developed in English. Only the empirical data included in results chapters as quotes were translated into English. Reflecting on this approach, I can see it did save me a lot of time, and I did not feel any analytical challenges as a result of my approach.

Observations

In line with an ethnographic research approach (Fox, 2004), observations were used where appropriate to the research. Various forms of observations provided crucial insights into the practices and processes of the research informants, with regard to how HAI control was negotiated between different specialists. In the following text, I provide information on selecting observational research units, characterisation of observations and observational process.

Selection of Observational Research

In ethnographic research, the question of what to observe comes gradually and it is not a straightforward process (Emerson, Fretz and Shaw, 2011). However, I tried to identify those practices, processes, and events where HAI control issues could be discussed between stakeholders, thereby

giving access to knowledge how this topic was negotiated and navigated. I applied certain strategies to get access to observational research. I regularly checked 'news and events' sections on websites, social media accounts of different governmental, educational, professional organisations (in total 12) involved in the area of health care, wherever these had shown previous experience of organising, or the potential to organise, a public event about HAI control or some related topic. Sometimes informants themselves pointed out some public events I could attend. During my fieldwork, I was able to observe 6 publicly available events (conferences, awareness rising campaign) where HAI control was covered and discussed.

Another source for observational research was my informants, when they invited me to meetings, training sessions, and other events I could participate in. Sometimes invitations came spontaneously. E.g. once, while going to an interview, I ran into another informant who offered me a chance on the spot to join the informant in a meeting that was about to take place. In almost all cases, the informants themselves were organisers of the events they invited me to attend. In other cases, I sought permission to attend the event from the organiser, either in person or via email. I also asked for advice from a couple of key informants with regard to selecting relevant meetings and events for observational research. I was able to collect 8 observational accounts of meetings and training sessions with HAI control on their agenda. Although during the fieldwork, no policy-making meetings on HAI control were organised, I analysed secondary observational field notes from the previous policy planning meetings.

Access to observations of managing HAI control on daily basis was also granted by informant invitations, usually after an interview had already taken place. The informants themselves or some properly instructed employees participated in some activities I was invited to observe. The observational research focused on the hospital settings where navigating HAI control practices is the most intense task. I was introduced to the work premises and to the organisation of work in different hospital units; I was also able to shadow some of the hospital staff for a couple of hours. I engaged in informal conversations with the participants, by actively asking about the activities they were doing or describing at that moment.

Units of Observational Research

Throughout the fieldwork, I carried out 20 observational accounts, lasting from 15 minutes to 8 hours, adding up to approximately 56 hours of observations (please see Table 4). The form of observations varied from non-participant to participant observations. Observations were carried out in public and professional settings. When possible, I engaged in ethnographic interviewing (informal), asking direct and non-direct questions, like what was going on, about the subject matter, etc. Data gathered during such informal conversations enabled me to contextualise the ongoing process and were

included as a part of my fieldnotes. To minimize the potential impact of Hawthorne Effect, it was important to maintain critical reflexivity throughout the observation work (e.g. write field notes, fieldwork diary) and carry out data triangulation during data analysis.

Table 4. Observations

No.	Event	Form of observ.	Length
1	International interdisciplinary conference	Participatory observation	8 h
2	Introduction to work premises and organisation of work in day surgery unit	Non-participatory observation	15 min
3	Introduction to work premises and organisation of work in intensive care unit	Non-participatory observation	30 min
4	Training session for new hospital staff on infection control	Non-participatory observation	1 h
5	National level specialists meeting	Participatory observation	5 h
6	Meeting between hospital specialist and state official about hospital-acquired infection case	Non-participatory observation	1 h
7	Shadowing hospital support staff: cleaning practices	Non-participatory observation	3 h
8	Shadowing hospital support staff: infectious waste management	Non-participatory observation	3,5 h
9	Training seminar for medical personnel on infectious waste management	Participatory observation	3 h
10	University annual conference, infection control section	Non-participatory observation	1,5 h
11	Awareness rising event about hand hygiene for medical professionals and hospital visitors	Participatory observation	2 h
12	Training course for medical staff on infection control	Non-participatory observation	3,5 h
13	Medical specialists conference	Non-participatory observation	8 h
14	Medical specialists conference	Non-participatory observation	1,5 h
15	National level specialists meeting	Participatory observation	4 h
16	Two training sessions for new medical staff and new support staff	Participatory observation	1,5 h
17	Meeting between specialists and intensive care unit's nursing staff about infection control practices in the unit	Non-participatory observation	2 h
18	Medical specialists conference	Non-participatory observation	1 h
19	Introduction to work premises and organisation of microbiology laboratory	Non-participatory observation	30 min
20	Shadowing daily practices of infection control specialist	Non-participatory observation	6,5 h
	Field visits for interviews (with particular focus on medical settings)	Participatory observation	>40 visits

In addition, every time I had an interview in a hospital, I treated the whole process – arriving at the hospital, finding the office, duration of the interview, and leaving the premises of the hospital – as

part of the observations. I paid attention to the spaces, people, objects, behaviour. These small insights were valuable additions to things people told me in the interviews (Emerson, Fretz and Shaw, 2011). For example, every time I entered a hospital unit, I looked for a hand sanitiser holder; sometimes I couldn't find it, and sometimes they were empty. From time to time this kind of experience contrasted with what people told me in interviews. Overall, I made more than 40 visits to different hospitals. During these visits I also used my own participant observations as a visitor at the hospital (in field notes I focused on how it felt to visit this particular hospital or particular unit).

The management of my personal appearance in different settings also become a source of data, especially during the field visits and observations in hospitals. Even if I didn't participate in daily practices within the healthcare settings, I still tried to follow certain personnel appearance policies that were crucial to HAI control and also part of the hospital policies.[21] To be more precise, when visiting these hospital settings, I didn't wear any nail polish or jewellery, except a hand watch; I wore simple clothes and kept my hair pulled back. I wanted to feel in my own skin how it felt to follow this policy, and also to be ready in case of an unplanned field visit. I had to wear a hand watch there wasn't always a clock in each room, yet I was often instructed at the beginning of the conversation how much time the informant had; therefore, I needed a hand watch to discreetly monitor the time. However, I often felt that a hand watch was a little out of order, especially when it got in the way while I was washing or disinfecting my hands. With the exception of the hand watch, I did follow this policy; because I thought it would be strange to sit in front of my informants and ask about them about personnel appearance issues with regard to HAI control (at the time, problems with medical personnel wearing nail polish were an issue) while presenting these very same 'problems' myself. This practice turned out to be a valuable data source. I had a chance to experience on my own skin how it feels to follow this policy: hand hygiene practice, and so on. One time, I had forgotten to pull back my hair, then after an interview, the informant asked if I wanted to see how HAI control was organised in their unit (intensive care unit). Before entering the unit, I was asked to disinfect my hands and wear a disposable hospital coat. I apologised that my hair was down, and I tried to cover it my coat to prevent it from moving about freely. The informant responded that there wouldn't be a problem with this: we would just look around without getting being close to patient beds or causing any safety risk to them. During the visit I tried not to move quickly, to keep my hair in order. I felt some physical discomfort at not being able to follow the hospital policy, and creating at least a theoretical risk of HAI

[21] Standards of dress, uniform and personal appearance policy.

transmission. I always brought with me disposable shoe covers and a pocket-size hand sanitizer. From time to time they did indeed come in handy.

Observation Research Process

Whenever possible, I took notes during the observations and then wrote up my field notes immediately afterwards. Before the fieldwork, I had developed observational protocol that focused on 7 aspects (space, objects, actors, events, behaviour, interactions between actors, language) of observations, adopted from Spradley (1980). After the first observation, I realised that the structured format of documenting observations did not suit me well; so I switched to producing unstructured observational field notes, but tried to keep my focus on 7 aspects of observation when writing the field notes. I also produced analytical notes as my first ideas about data analysis. I also kept reflections on methodological issues (e.g. reflections about getting access, approaching research participants); some of these methodological reflections were helpful in producing parts of this chapter. For a more systematic approach, I indexed my field notes in three categories: descriptive, analytical, methodology/theory, as suggested in literature (Bernard, 2006). At first, I tried to produce notes by hand, which were later type-written. At that time, this format was not convenient for me, so I produced all my field notes by hand; then after the fieldwork, I typed them up to facilitate a more effective data analysis.

Document Collection

I also collected published and unpublished documents, like policy documents, reports, local guidelines, flyers, booklets, and information sheets that included any relevant information, as part of my task of gathering comprehensive data sources. Some of the informants gave me documents (e.g. newspaper's articles, performance reports) they thought were helpful to me for understanding the context of HAI control in Latvia. This document review was necessary for helping me contextualise the data generated by other sources.

Field Diary

In ethnographic research, a field diary is essential for navigating the fieldwork (Sanjek, 1990; Bernard, 2006). During the fieldwork I kept a field diary to record my personal reflections on the whole fieldwork process, documenting everyday reflections on my own emotions, feelings, and perceptions

when in the field. As Bernard (2006) points out, this becomes an important tool during data analysis, to facilitate more accurate data interpretation and enable awareness of any personal biases. This field diary also served as the place where I processed any emotions, feelings and thoughts that eventually built up during the fieldwork. This exercise of writing the field diary helped me to maintain my capacities as a researcher.

Data Analysis

The mix of primary and secondary interview transcripts, observational notes, selected documentary sources, and field diary was my data corpus, which was approached as a whole 'to get a basis for explanation about the observable fact' (Nurani, 2008). Interview transcripts, observational notes, field notes were uploaded onto NVivo software for managing, coding, and analysing empirical data. The analysis of data corpus was utilised in writing chapters 6 and 7 that explored the phenomenon of HAI control in policy and hospital settings. A small part of the data was integrated into Chapter 4 as part of my historical analysis of HAI control.

Ethnographic research design already enabled the process of data analysis during the data collection stage (Hammersley and Atkinson, 2007; Emerson, Fretz and Shaw, 2011). As mentioned earlier, my data analysis process started with producing analytical field notes during the fieldwork. The benefit of this practice was approaching data as materials to think *with* and *through*, thereby avoiding the rather mechanical approach of just managing the data (Hammersley and Atkinson, 2007, pp. 158–168). For example, analytical notes allowed me to quickly identify the role of gender in HAI. Although empirical data went through processes of coding and analysis, I still returned back to re-reading and immersing into 'raw' data (transcripts, field notes) to continue the practice of thinking *with* and *through* the data. This exercise was especially helpful when I felt stuck in my thinking during intense data analysis periods.

Overall, my analysis approach was a combination of deductive (analysis guided by conceptual framework) and inductive (analytical categories gradually obtained from data) coding process (Pope, van Royen and Baker, 2002). For example, analytical categories covering microbiopolitics were developed, based on a conceptual framework. Here I want to make the point that I took an ethnographic approach to deductive coding: I did not mechanically sort out the data in accordance with my theoretical framework. Rather, I was led by the data; in order to develop, identify, expand and refine the concepts of my choice (Emerson, Fretz and Shaw, 2011, p. 175). I treated chosen

concepts as 'road signs,' and not as boxes to be filled in with data. As already mentioned, I used an inductive approach as well: for example, the categories and (later on) my analysis of the dynamics of the visibility/invisibility of HAI control were identified and developed inductively. This combination of both approaches complemented the process of reaching an in-depth analysis of the phenomenon.

Coding is a crucial step of analysis, through which important concepts and analytical insights are conveyed (Emerson, Fretz and Shaw, 2011, p. 175). In order to avoid becoming overwhelmed with the sheer amount of data, I developed a preliminary thematic code as a way of easing my task of data management. For example, the code 'Infection control people' included all data about the profession itself; or the code 'Collaboration' included data about some practices and experiences of *doing things together* when dealing with HAI control. This code also included instances when lines of cooperation were cut. The code 'Infection control – history' covered informant accounts about HAI control during the Soviet period. This was the only code that was incorporated in the historical account of HAI control in Chapter 4.

In order to answer the second research objective (developed as Chapter 6), after separating data for policy analysis, I reviewed preliminary codes and developed more focused codes, guided by my conceptual framework. For this particular analysis, I prioritised observation notes from the policy development process, and used data from interviews and documents to supplement the analysis and contextualise observational data. As my observations relate to a homogenously covered policy development process, the coding and analysis process was straightforward, guided by a coherent conceptual framework. Concepts of relationality, microbiopolitics and human-microbe relations furnished me with some preliminary working categories. These working categories gave me some clues about what I was looking for in the data, but without any pre-given content; how this category would be organised within and between was the task of the coding and analysis process. This meant working *with* and *throug*h my chosen concepts and data. An example of this coding process is represented in Table 5.

Table 5. Example of coding system I

Analytical category	Elements of analytical category	Codes
Assembling new microbiopolitics	Laboratory-microbe connection	Microbial position_lab
		Role of connection_lab
		Negotiations_lab
		Result of negotiations_lab

Patient-microbe connection	….

To address the third research objective (as elaborated in Chapter 7), coding and analysis process was similarly approached as for Chapter 6. Theoretical concepts provided some preliminary guidance about what to identify in data, while still permitting an open approach to organisation. The preliminary coding system stimulated me to work with and through the concepts and data; as a result, initial codes were revised. In Table 6 an example of coding for this chapter is shown.

Table 6. Example of coding process II

Analytical category	Elements of analytical category	Codes
Microbiopolitics in hospital settings	Making HAI risk into object of control (mediums of HAI visibility)	HAI data
		Laboratory
		Samples
		Screening
		Patients*
	Mediums of HAI control:	Cleaning
		Hospital trash
		Disinfectants
	1.Space	ICU
		Hospital unit
		Hospital environment
		Isolation
		Cleaning stuff
	2.Tools	Catheters
		Instruments
		Decontamination/cleaning
	3. People	Clothing
		Appearance
		Personal protective equipment
		Hand hygiene
		Body of personnel
		Vaccination
		Gender*
		Patients*
		Visitors*
****code incorporated in other analytical categories***		

I want to emphasise that the visual representation of the coding system example does not reflect dynamics of specific analytical category not only within but also between other analytical categories. This particular analytical category is neither bounded nor static, as other analytical categories, such as 'medical gaze' or 'social infrastructure' did also shape the analytical category of microbiopolitics.

Looking back on the data analysis process, I can draw out some lessons and reflections. As already demonstrated in this subsection on data analysis, there was something of a learning curve in figuring out the various relationships between my theory and data, between abstract and concrete elements of my analysis. As I later realised, this is the question *every* ethnographic analysis has to deal with (Venkatesan et al., 2012). I started my analysis with the presumption that I had figured out what kinds of relationships I would maintain between the abstract (theory; analytical category) and the concrete (codes and data). However, I soon realised that I had to re-figure these relationships anew every time I started to analyse new site (media, policy or hospital) and to proceed to write a whole new chapter. Tracing the phenomenon of HAI control through different settings required me to treat the relationships between theory and data dynamically as well. For example, human-microbe relationships in media analysis transformed into the public's relationships with microbes; in the policy chapter, these relationships were negotiated between stakeholders and microbes as policy subjects. However, this learning experience enabled to develop a critical awareness of the dynamics of phenomenon of HAI control.

Another common struggle that accompanied me during the analysis and writing-up stage was how to manage the need to present research results in a coherent order without losing the complexity and messiness of the phenomenon. From the very beginning, I was driven by my interest in the *dynamics* of the phenomenon, so much as framing my research through the unstable and diffuse practices of negotiations and navigations. At the same time, the more I focused on developing and re-developing the coding systems and analytical categories, the more I felt my analytical focus on the dynamics slipping away. Eventually I returned back to the research epistemological 'roots' of this study by re-reading the work of Strathern, Latour, Law, to recalibrate my perspective towards whatever I was seeking in the analysis. I also took this as a learning experience: patiently practicing working *with* my theoretical and methodological instruments (e.g. training to search for connections, see relationally) eventually led to a better analysis.

The coding and analysis processes for policy and hospital settings had their own challenges. Data from the policy setting was more easily manageable, as it fit under one main theme of policy-development. However, this 'neatness' hindered me from going beyond obvious surface of what the data represented and from exploring it more critically. To deal with this challenge, I relied on ANT's methodologic sensibility towards relationality, which invites a slow process of knowing how different

elements (human and non-human) get assembled in this practice of policy making (Law and Singleton, 2013).

I encountered different challenges when dealing with data from the hospital settings. Opposite from the policy settings, these data were more complex and diverse. Here my struggle was related where to start or to find a 'thread' for understanding HAI control. At the beginning, it felt that the phenomenon could be found everywhere and nowhere in the data. Later, I discovered that this sense of being everywhere and nowhere was also allocated to microbes in the hospitals. Initially, this train of thought led me to develop an argument about the dynamics of the visibility and invisibility of phenomenon. To find a way of dealing with this challenge overall, I started by focusing on those codes and categories that I could initially identify first, worrying how they would might coherently fit into the fabric of analysis. One of the first codes and categories I identified was social relationships in hospitals. Secondly, I employed a methodological sensibility towards materiality (Law and Singleton, 2013) by noticing how not only microbes, but also hospital things in general, tended to feature prominently in data about HAI control. This ultimately led me to develop argument about microbiopolitics as an assemblage of visibility work, space, devices, and people.

On Process of Writing

To write an ethnographic account is to represent the particular world by way of navigating an account between the concrete (specifics of data, local meanings) and the abstract (scholarly debates, analytical categories) (Emerson, Fretz and Shaw, 2011, pp. 201–202). When producing the results chapters, I maintained the same relations. The analytical categories developed here served as the main organising principle for writing the results chapters.

Reflecting on the writing process, writing was not only the way the thesis actually materialised into chapters, but also a crucial instrument for thinking, creating and re-creating: exploring ideas, arguments, codes, categories, analysis and other crucial research elements that eventually led to a written piece of work. Thus, writing was not only a necessary step for finishing the thesis, but also a way of thinking through my positionality or determining how to reach findings and formulate arguments. Thus, writing was a central form of thinking *about* the research.

Presenting my data at conferences and seminars also stimulated the writing process. Writing a conference paper or preparing a presentation added a fresh perspective in terms of explaining and

formulating the ideas for different audiences. Thinking about the audience while presenting stimulated me to think about the reader of the thesis as well. Here, I want to point something out about writing, in terms of language. My English writing style can appear vague sometimes, something that can be linked to the influence of my first language, Latvian. The Latvian language is descriptive: thoughts or ideas are expressed in a descriptive (and thus textually longer) manner; while in English, I have found that ideas and thoughts can be expressed more concisely and certain individual words already hold the meaning I am trying to convey. For example, the word 'negotiate' in Latvian would be translated in a descriptive manner; e.g. 'attempt to reach an agreement.' I have tried to deal with this issue by having my work proofread.

3.4.5. Research Phase 3: Development of Recommendations

The aim of research phase 3 was to develop policy and practice recommendations in collaboration with the research participants. Recommendations were developed (please see Chapter 8) but without organising a stakeholder workshop that was not feasible. However, I have presented parts of my research findings in multiple conferences/seminars in Latvia (please see Appendix 6), giving me a chance to discuss the research results with research participants and other relevant stakeholders; and I have received valuable feedback from all these. My relationship with the field will continue after PhD studies with more opportunities to present and discuss my research, and ultimately to conduct further work on improving HAI control policy and practices.

3.5. My Positionality in the Field

In qualitative research, the researcher is also a research instrument (Bernard, 2006). Therefore, my positionality (gender, age, educational background, etc.) was an important feature that I recognised reflexively in my field diary: in particular, how my positionality (both my own and the one allocated by the research participants) impacted what kind of relationships I had with the field, with the research participants also influencing what kind of data I got.

Doing ethnographic fieldwork at home certainly had its advantages and disadvantages. There is no shared consensus on whether there are more benefits or disadvantages to studying one's own culture (Bernard, 2006). In my personal experience, the advantages were knowing the language and having some 'indigenous' knowledge about the Latvian context. It allowed me to get access to the

field at a faster pace, without the necessity of seeking information on the broader political, economic, and cultural background. Previous research and collaboration experience in the field of HAI control has certainly helped me develop a time-efficient strategy for conducting my fieldwork. However, there certainly were some disadvantages to doing the fieldwork at home: like taking some patterns for granted, which would certainly have jumped out at other researchers lacking my pre-assumed local knowledge. To minimise this shortcoming, I followed a fellow anthropologist's advice and capitalised on the 'freshness' of my point of view from having studied abroad for a while; then, at the beginning of the fieldwork, I recorded everything that seemed unusual or interesting in field notes in order to notice any broader contextual patterns. Before leaving for my fieldwork, I started to train my ethnographic gaze to notice and record in my daily life here in Leeds some moments where human-microbe microbiopolitics played out (e.g. the use of antibacterial products, or discussions with people around me about these matters). So at least in the beginning of the fieldwork, I was able to benefit from a useful comparative perspective.

As far as I can tell upon reflection, during the fieldwork I did not feel that my age had any significant effect in terms of accessing field sites, research participants and produced data. However, at times I felt that my gender affected to what extent people disclosed their experiences to me; especially in cases of certain female patients who so far as I could tell, spoke about certain specific or sensitive illness experiences more openly than they would have with a male researcher.

In terms of my ethnicity, this did not have a direct impact on my relationships with research participants of other ethnicities. In the Latvian medical context, this is common enough; one's ethnic background generally does not have any major influence. However, the one thing that did have an effect was the research participants often considered it important that I was a 'local,' in the sense of having previous knowledge on the Latvian context. For some of the informants, it was important to know if I had received any education in Latvia; in which case they could skip explaining any basic knowledge about the Latvian context that was relevant to this study.

As Hamersley and Atkinson (1983, p. 77) point out, informants tend to locate the researcher according to their own experiences. During the fieldwork, I positioned myself as a PhD student, and I felt that research participants also perceived me as such throughout the fieldwork. In the Latvian context, PhD students are 'put in strict boxes' in terms of the disciplines they belong to, such as 'PhD student in medicine, PhD student in anthropology.' Thus, I was often asked about my 'belonging' to a specific discipline. On various occasions there were informants (especially medical professionals) who

assumed that I am a PhD student in medicine. So at the beginning of the interviews, they asked me some medicine-specific questions about specific treatment protocols and practices in the UK, like why does this or that kind of post/pre-operative surgery protocol require this or that course of antibiotics. On the one hand, this did show me that they used all these protocols on a daily basis; but on the other hand, they were all obviously disappointed when I informed them that I have no medical training and I am mainly interested in their daily experiences and opinions about HAI control, and in how this particular area of medicine is built-up/organised in general.

Sometimes the informants asked why I chose to study in Leeds; they were surprised that someone like me had this kind of scientific and academic interest about healthcare policy and organisation. At times, the fact that I had studied abroad also played a role in helping me get access to research participants. There were multiple informants who admitted that their children were also studying abroad; this motivated them to respond positively, hoping this good deed would in turn benefit their children when they needed help with their research.

Research participants often were interested about whether I planned to return and work in Latvia. Three informants even made me some job offers at governmental and academic institutions. The problem of brain-drain and shortage of human resources in healthcare and governmental institutions came up on multiple occasions during the fieldwork; at one point, it was even publicly declared as a human resources crisis in the healthcare system, requiring an immediate national level policy response. The lack of medical personnel, especially of nursing and cleaning staff, was often named as a crucial barrier towards providing good HAI control. I quite often heard in interviews and conversations that you cannot expect a nurse to follow hand hygiene protocol if she is left alone with 30-60 patients, especially during night shifts. Noteworthy, the same narrative circulated when I conducted research in this field in 2011-2012.

Although I kept my identity as a PhD student rather stable throughout the fieldwork, I had to carefully maintain a neutral position towards other field sites and informants while I was in contact with research participants from different sites; especially when they criticised other people and organisations. Here I tried to maintain 'fair dealing' in Dingwall's (1992) terms, by attempting to be non-partisan towards certain group of people and organisations. The fact that I talked to a wide range of people, along with constantly exercising reflexivity, helped me to effectively navigate this neutral position.

3.6. Assessing Quality in Ethnographic Research

Assessing the quality of ethnographic and qualitative research in general requires one to focus around two opposing positions. One of these argues that the same quality criteria should be applied to both quantitative and qualitative research. The second argues that there should be separate quality criteria for each research direction (Mackenzie, 1994; Pope and Mays, 2006, pp. 84–85). The validity and reliability of the research are the central points of these debates. While there are some quite different approaches to these quality issues, in the following discussion I make sure to explain what concrete steps I took for improving the quality of my research project. These steps traverse the boundaries of both positions with regard to assessing the quality of ethnographic research.

Data triangulation as a technique for ensuring the validity of the research is a standard practice in ethnographic research; this means obtaining data from as wide a range of sources as possible (Brewer, 2000, p. 75). It ensures that none of the data is taken at face value, but is perceived via a constant juxtaposition of different sources and accounts. Interpretation is conducted in this manner, to enable the construction of appropriate themes and categories (Creswell and Miller, 2000). The triangulation of research methods, research data and findings were applied to help ensure the validity of the research. Different data collection methods were used to provide multiple perspectives on the same phenomenon; this was especially helpful when I could compare people's accounts and practices. Various accounts and perspectives of different informant groups enhanced the comprehensiveness of the research data, as well as providing inclusiveness for various voices.

Transparency of data collection and of the process of analysis is another crucial step for ensuring the quality of ethnographic research (Pope and Mays, 2006, pp. 89–90). I have tried to provide transparent account of the data collection and analysis process. In line with this the requirement for transparency, another crucial feature of ethnographic research is appropriate reflexivity with regard to how relationships between the researcher and the fieldwork affect the data collected (Pillow, 2003). As Dona Haraway (1991) argues, reflexivity is an ever-present concern within the context of multi-sited ethnography, given that such fieldwork is always carried out with a keen awareness of the need to maintain one's focus on the mobile object of study, as well as the researcher who is constantly moving between sites. I have already described how my positionality (both my own and the one that was allocated by the research participants) shaped what kind of relationships I had

with the field and research participants, as well as what kind of data I got. Keeping field notes and a field diary was a crucial exercise to keep reflexivity in balance and work on any potential biases.

3.7. Study Limitations

I have already addressed a couple of study limits related to the research design issues in the previous sections. Here I want to discuss three limitations regarding data collection and the approach I took to minimise them.

Firstly, the time available for the fieldwork. During the fieldwork no policy-planning meetings or other policy-related events were organised, so I was not able to carry out any observations at this particular field site. To compensate for this shortcoming, I used secondary observational research data from policy-planning meetings in 2013-2014 where HAI control issues were discussed.

Secondly, my lack of training in medicine/public health limited my options for traditional participant observation in hospitals and other settings. However, this helped me to examine medical accounts without taking them as self-evident, but rather to question them more critically. I was interested in many places that were generally not available to non-specialists (governmental office, laboratory, intensive care unit); but with limited time resources, I couldn't get long-term access to these sites. If I'd had more time available, I could probably have accessed them. For example, after some long negotiations, I was able to manage a one-off visit to the hospital's microbiological laboratory, where I had the chance to see how a laboratory sample of a potential HAI case travels through laboratory; and how, through its various different stages, is transformed into a piece of paper or a data system entry, as a positive or negative HAI result. When I was not able to observe certain daily routines in the hospital settings, I compensated for this shortcoming with interviews about daily routines and experiences.

3.8. Ethical Considerations

I obtained research approval from the Faculty of Medicine & Health ethics committee at the University of Leeds, as well as Riga Eastern Clinical University Hospital Ethics Committee in Latvia.[22]

[22] In Latvia there are multiple medical ethics committees as a part of hospital or university structures. I chose this committee as it had the most transparent procedure for the review process (form, requirements, review process).

Furthermore, I also obtained institutional approval from a hospital where I focused on a significant part of the fieldwork (please see Appendixes 4 and 5). The approval was initially granted for a period of 3 months; later renewed for another 3 months, as I returned to this field site periodically to collect some additional data. Over the course of the research, I also relied on two specific ethical codes of practice, as detailed by the American Anthropological Association and the Association of Social Anthropologists, UK; these effectively set the framework for conducting this ethnographic fieldwork.

I approached most of my research participants via e-mail, attaching an information sheet and an informed consent form; both of which had been approved by the aforementioned ethics committees. In cases where I approached potential research participants on the phone, I verbally provided them with some information from the information sheet. Regardless of the recruitment approach, the information sheet was always presented to the research participant before the interview, along with the informed consent form. To secure informed consent, I obtained both written and verbal consent. In those cases where a research participant did not feel comfortable signing the consent form or when it was not appropriate (e.g. during informal interviewing), consent was verbal. With the permission of the informants, most of the interviews were audio-recorded and then transcribed verbatim. Due to the high sensitivity of the topic, some of the informants did not allowed to record the interview with any digital apparatus; in such cases, notes were taken instead.

With regard to non-public observation, I always sought approval for my attendance from the person or institution organising the event. At the site, I explained my position and research aims whenever I had a chance. And during informal conversations, I applied the same strategy.

Throughout the research, I paid special attention to my responsibility to preserve the anonymity and confidentiality of my informants. However, anonymising particular research settings and groups of informants was challenging, because the community of infection control specialists and other informants actively involved in this area is rather small; and so, conventional anonymisation steps (change of name, place) would not have been enough. Therefore, I have excluded any specific characteristics of places and people that might have potentially revealed their identities. I have also kept the description of the research settings rather vague, in order to attain a certain level of anonymity. For a couple of informants in unique positions, I avoided using their gender or any other demographics that could risk giving away their identity.

Summary

In this chapter, I have described my methodological approach to the research. A multi-sited ethnographic study design was utilised, in order to successfully achieve the research aim of understanding the phenomenon of HAI control by looking at how HAI control was negotiated and navigated within and between different settings and people in Latvia. In line with the chosen methodology, data were collected using a variety of methods including informal interviews, semi-structured interviews, observational and field notes, document review, and field diary.

Chapter 4. Historicising Hospital Infection Control: The Soviet, the Western and the Latvian Approaches

Introduction

Although HAIs are usually linked with highly sophisticated modern medicine, post-traumatic wound infections and their prevention have been described in writings dating back to ancient times. By the 18th century the main healthcare facility – the hospital – was developing in a tandem with an unintended side effect: HAIs, which were known at that time as hospitalism or hospital fever. The discovery of microbes and the introduction of antibiotics founded a new era in HAI control: it was believed that this problem would soon be history. However, HAI have never disappeared; rather, they are still producing a host of whole new challenges to contemporary medical practice (Ayliffe and English, 2003).

In this chapter, I look closely at the historical development of two approaches to HAI control that emerged at the beginning of 20th century and in relation to developments in hospital care, bacteriology, public health, and medicine; I have labelled these two approaches as Soviet and Western. Whenever possible, I have included in the chapter my empirical data from the experience narratives of my respondents, in order to illustrate this historical analysis of HAI control. It is important to historicise these models, as both of them are contributing towards shaping the current landscape of Latvian HAI control policy and practice. I present these models in the same order as they arrived in the Latvian context. The Soviet model was introduced in Latvia with the Soviet occupation of Latvia in 1940.[23] After Latvia regained independence in 1991, it opened opportunity to implement the Western approach to HAI control that also served as basis for critiquing the Soviet model. In this chapter, I also introduced the Latvian context and some ethnographic material which is to follow in the following chapters.

[23] After WWI, the country had already lost almost 1 million of its population out of 2.5 million (Odiņa and Millere, 2013, p. 54). In 1918 Latvia proclaimed its independence. After WWII, Latvia was occupied by the Soviet Union in 1940; then for a short period of time by Nazi Germany; and then occupied again by the Soviet Union until its collapse in 1991.

4.1. 'Soviet' Approach to HAI Control

Soviet healthcare was shaped by multiple considerations, including the 19th century hygiene movement, epidemic situation, socialist ideology, and Cold War politics (Maier and Martin-Moreno, 2011, pp. 43–44) where a close relationship between the hygiene movement and the Socialist ideology were formed. The spread of infectious diseases and epidemics posed a significant challenge to the Soviet regime, endangering its ideological ambitions and its competition with capitalism. Thus, its work on disease control, and its special focus on infectious diseases, was one of the top priorities of the Soviet healthcare system (Bazylevych, 2011, p. 440). The hygienic movement, so popular in Europe, was also adopted in the Soviet Union as the main public health policy for fighting infectious diseases. Unlike in the rest of Europe, hygiene in the hands of the Soviet regime exceeded the boundaries of public health and became a significant political instrument for reaching the Soviet utopia. The Soviet ambition was to reach absolute socialism where life would be completely stateless and classless, and diseases would eventually disappear. Hygiene as an idea of cleanliness was a good way not only of dealing with diseases, but also as a way of transforming people into Soviet citizens in order to reach absolute socialism. If socialism was associated with cleanness and order, then everything in opposition to it (e.g. capitalism) was associated with dirt and disorder (Sigerist and Older, 1947, pp. 26–27; Starks, 2008). Every aspect of life was formulated in categories of cleanness and order: there was hygiene of health, labour, catering, politics, culture, body, leisure, kindergarten, school and so on (Zabludovskis, 1968, pp. 210–214). For example, there was heavy propaganda regulating how many hours a Soviet citizen must sleep, work, rest in order to create a 'perfect' Soviet citizen; often also listing 'undesirable' activities and personal traits that might harm the *status quo* of the regime. If people complied with the Soviet hygienic requirements, all aspects of life were made clean and put in good order; thereby preventing poverty, inequality, disease, then reaching the ultimate goal of the Soviet socialism. Heavy propaganda was carried out to promote 'the Soviet hygienic lifestyle.' The Soviet regime not only borrowed the concept of hygiene from public health, but also its techniques of control (Starks, 2008). The same approach, and often the very same infrastructure, was used not only to control disease and epidemics, but also to inspect all other aspects of life; and to prevent any kind of medical, social or political 'disorder.' Tricia Starks (2009:36), studying the role of hygiene in socialist projects, points out:

> *[...] washing hands could well be the most political act of a Soviet citizen.*

Within the Soviet framework, hand hygiene, as one of the most central tools of HAI control, became a political act; it was not only a public health policy, but also a heavily politicised instrument for carrying out Soviet ambitions and keeping the totalitarian regime intact.

Relationships embedded in Soviet healthcare also help in explaining Soviet HAI control. Although Soviet healthcare was centrally planned and administered and (in theory) built on equal relationships enabling citizens to access healthcare free-of-charge and on equal grounds (Rechel and McKee, 2009, p. 1189). In reality, access to healthcare was problematic. Special high-quality healthcare services were available to so called nomenclature[24] for instance, whilst other patient groups were entitled to limited health care services (Kaser, 1976, p. 16). Under-the-table payments were an integral part of the Soviet system in order for one to receive healthcare (Garrett, 2001, p. 223). The geographical distribution of healthcare services was unequal along the lines of the urban-rural division. For example, in Soviet Latvia, access to healthcare in rural areas was in a much worse situation than in cities with healthcare provided by physician's assistants (*feldshers)* or nurses in polyclinics. Even in the mid-20th century, rural hospitals without water, sewerage, laboratory or X-ray machines were not a rarity (Eimuss, 2013, p. 33).

4.1.1. The Curative and Preventive Soviet Medicine

Soviet healthcare was divided into curative and preventive medicine with hierarchical relationships between two of them. Curative medicine was heavily hospital-centred and there was an emphasis on building hospitals for specific factories, professions and social groups. In Latvia, for example, hospitals for railroad workers and sailors were built and long-term hospitalisation was a typical healthcare practice. The architecture and infrastructure of the Soviet hospitals were more rooted in economy of space and materials (e.g. large multi-patient rooms), less in germ theory (e.g., sufficient space between patients beds, isolation cubicles or individual patient rooms as part of infection prevention) (Vansteelandt et al., 2015).

The numbers of medical professionals in hospitals were high, but their salaries were kept low by employing women in healthcare positions with lower positions and payments (Fotaki, 2009, p.

[24] 'Nomenclature' was used as a term to describe the Soviet government and party officials as a special kind of group of people in authority. In Latvia, luxurious hospitals were built specially for the nomenclature. After gaining independence, the Latvian government struggled to figure out what to do with these facilities; but in the end, they were closed altogether.

223). Although there was no shortage of human resources in healthcare, other resources (e.g. funding, pharmaceuticals, equipment) were lacking. For example, until the mid-1960s, Soviet Union healthcare received less than 5% of the annual gross national product, steadily falling 1-2% by the collapse of the Soviet Union in 1991. Although the funding was highly centralised, the already limited resources were not distributed evenly; neither among the population, nor among healthcare practitioners (Koch, 2004, p. 55). In the mid-1980s, it become apparent that the healthcare system was inadequately managed, with insufficient resources and low quality of care (Garrett, 2001, p. 226; Fotaki, 2009, p. 223).

If hospitals were the main infrastructure for curative medicine, for preventive medicine it was the sanitary-epidemiological stations (SES or SANEPID), which were separate from the rest of the healthcare system and had their own budget. The main responsibilities of the SES services were to control infection diseases and to monitor environmental conditions. SES organised and implemented infection prevention programs, while controlling and inspecting sanitary conditions in the public sector (not only in the health sector but also in food, housing, schools, water and manufacturing). This meant that employees from SES went to inspect not only certain public facilities like schools and cafeterias, but also private houses in order to check the living conditions there. SES employed specifically trained physicians and mid-level specialists including epidemiology specialists, bacteriologists and sanitary hygienists. One of the most successful SES programs was the vaccination program, which showed far better results than in countries on the other side of the Iron Curtain. However, the Soviet public health system was unable to respond to non-communicable diseases and grew into an excessively large, corrupted, fragmented and slow bureaucratic apparatus, with limited controlling abilities (Glass, 1976; Gotsadze et al., 2010; Maier and Martin-Moreno, 2011).

Soviet public health programs, e.g. vaccination campaigns, were similar to programs in the Western and other contexts (Starks, 2008, pp. 5–6); however, Soviet public health approaches were known for their authoritative and coercive style of implementation. For example, informed consent was not taken into consideration. Not only the general public, but also medical professionals were subordinated to the controlling scrutiny of the SES inspectors. Sanitary and infection control activities and gaining access to relevant public and private spaces fell under a parallel political control system, which was implemented in order to prevent any activities that might endanger the Soviet totalitarian regime:

> *SanEp had powers akin to the KGB[25] It spied on doctors, looking for deviant behaviour, both medical and political. (Garett, 2000, p.126 quoted in Koch, 2004, p.57)*

For those of my research participants who had experienced the Soviet regime, memories of SES repressions were still alive. They used such terms as 'fear,' 'penalties,' 'policing,' 'punishing' to describe their memories of SES. Some former inspectors from the SES currently work as infection control specialists in local and regional hospitals.

Medicine and public health within the Soviet regime also intersected with the Soviet belief in the organism-environment connection and in keeping this connection in balance, and thereby keeping healthy. Within this division, medicine was responsible for the health of the organism (the Soviet body), but public health was in charge of the environment in a broader sense; that is, the organism's surrounding environment, which included any type of living, housing, working, catering, healthcare and any other spaces. As soon as any kind of 'pollution' (environmental, cultural, political) was detected, public health got involved to prevent the particular form of pollution in question (Zabludovskis, 1968, pp. 125–126). It was believed that the Soviet regime would produce the perfected organism (the Soviet citizen) and its environment (Starks, 2008, p. 22). However, in terms of power, medicine's field of responsibility and influence was much narrower (the diseased body) than public health's authority (any environment with human in it); thus, it had the upper hand over medicine.

4.1.2. The Soviet HAI Control: Maintaining Cleanness and Invisibility of the Problem

Soviet HAI control was one of the areas where curative and preventive medicine intersected; and indeed, it was built upon on these intersections. HAI was interpreted as a problem of curative medicine, but it was preventive medicine that carried out controls to help solve this problem. The problem of HAIs was perceived as environmental pollution at healthcare facilities and was not associated with any specific health practices or patients suffering from these infections. The premise of preventing HAI was to keep hospitals clean, as a part of keeping the broader environment clean. In the Soviet approach to HAI control, organism-environment relationships were prioritised over human-microbe relationships. The Soviet regime was interested in the microbe causing HAI as far as the

[25] The KGB was the main Soviet security agency. In Latvia this was the main agency (previously under the name of the Cheka) who carried out deportations, torture, and the killing of Latvian citizens during the occupation.

microbial agent could be used as an indicator for environment cleanness. If specific microbes were found in hospital settings, it was immediately interpreted as a dirty environment that must be cleaned. There was no scientific or medical interest in exploring in-depth human-microbe relationships, microbes and their characteristics or movements as a way of better controlling these relationships. Instead, there was an interest in studying microbe-environment relationships in terms of environmental conditions and controlling just such conditions; e.g. temperature, exposure to light. Scientific and medical interest was directed towards environmental cleanness and was rooted in the belief that by extensive environmental control (washing, ventilation, humidity and temperature control), it was possible to reduce the microbial presence in hospitals. For example, there was mechanical cleaning that included washing hospital premises, bodies, ventilating hospital air, exposure to sunlight; there was also physical cleaning such as boiling, burning, drying of different hospital instruments, use of UV rays; chemical cleaning included use of different disinfectants, like chlorine (Bļugers, 1984). For a while, environmental cleanness was a central focus of HAI control on the other side of the Iron Curtain too (Smith, Watkins and Hewlett, 2012, p. 40).

Under Soviet rule, medical personnel, patients and even microbes had to give up their agency to the Soviet system and to follow the Soviet order, whether or not it was possible or feasible. Everyone had to give up their agency to the Soviet system. For example, the Soviet microbial ordering was present in the strict segregation policy of infections and those at risk of infection. Patients with the same disease were sorted into similar hospitals or wards, as it was believed this would limit the transmission of the disease. It was assumed that infection-causing microbes were naturally going to obey this segregation policy and that other microbes would not 'show up' in the wrong settings or place (Garrett, 2001, pp. 216–218). As there was no clinical reason for an in-depth exploration of the microbes causing infection, laboratory methods for diagnostics were basic; for example, laboratories did not have the capacity to evaluate the resistance of pathogens. Hospital laboratories focused more on identifying microbes in the environment than in cases of disease. As mentioned before, access to antibiotics was limited (Garrett, 2001, p. 218; Kantāne, 2013, p. 43).

SES inspected hospitals for HAI. They collected swabs from the environment, surfaces, and the staff's hands and noses; and if they found a certain microbe, e.g. staphylococcus, then the person-, unit- or hospital-in-question was determined to be polluted and dirty. After that, HAI control manifested as extensive cleaning of hospital premises: surfaces, walls and floors. This practice required enormous human resources. For example, those among my informants who witnessed the

Soviet period still had vivid memories of cleaning campaigns, and of how hard it was for the hospital staff when the SES inspections came to the hospital and made them clean absolutely everything. In addition, whoever was found 'guilty' for the pollution outbreak was punished either with a reprimand, a fine, the temporary closing of the hospital or unit, or dismissal (Nettleman et al., 1994, pp. 201–202).

Soviet HAI control, like the rest of the Soviet healthcare practices was not evidence-based in the 'Western' sense.[26] However, it was nonetheless rooted in certain Soviet scientific rationalities. Scientific knowledge production was the highest mode of inquiry, whereas other knowledge-production disciplines had to be subordinated to science. Soviet science was orientated towards problem-solving. Almost every single sphere had some kind of scientific rationality that manifested itself in narrowly specialised scientific institutions and research. For example, there were scientific institutions, university departments and staff scientists who focused solely on labour hygiene, nutrition hygiene, communal hygiene etc. However, even science was not allowed to object and contradict the Soviet ideology, nor to represent the regime in an unfavourable light (Sigerist and Older, 1947; Kojevnikov, 2008). Thus, there was no point in questioning the evidence behind the Soviet HAI control; it was expected that microbes, patients, medical personnel and public specialists all subject themselves to the Soviet infection control order, purely because it was in their best interests.[27] One of my informants shared this memory:

> *I recall the days of SES when they came and took samples, tried to catch some air, although I do not know what they were trying to catch; they did not help us in our work, did not explain what it was. At the time, nobody knew anything, nobody was isolated, unless it was proven or a wound was bursting open. It was awful back then, we had no equipment, no tools, we had to sterilise several times, which was a risk itself. The more there are single-use products, the smaller the risk of*

[26] Soviet knowledge was produced in isolation from the rest of the world; there was no access to broader knowledge, research methods and results from the rest of the world. The Soviet notion of evidence was not rooted in empiricism. The Western world largely followed the idea of feasibility developed by Karl Popper, whereby evidence was gathered and studies were conducted in order to question or disapprove a certain hypothesis. By contrast, the Soviet model followed a more ideology-based approach, where it conducted experiments and gathered evidence to support the hypothesis or approach; because disapproving it would mean that were doubts as to the ideology under which the hypothesis was developed (Vucinich, 1968; McKee, 2007; Rechel and McKee, 2009, p. 1198).

[27] The interesting example is the Soviet satellite state of Czechoslovakia, which had the same HAI control regime. Local medical specialists expressed their resistance against the Soviet regime by refusing to follow the Soviet policy; they invented their own, which was similar to the 'Western' approach (Garrett, 2001, p. 223).

infections. It was awful. They came with a mission to punish and find something, and not to help or give advice.

Although infection control and hospital care were the central features of Soviet healthcare, HAI control was never prioritised; neither in infection control nor in hospital care. The Soviet system in general was based on very narrow medical specialties. The occupation of an infection specialist was subdivided into various specialities. E.g. there were special tuberculosis doctors, called pthisiologists. However, in the field of curative care, there was not a distinctive hospital staff position dealing with HAIs; so this a good example of the invisibility of HAI control in Soviet healthcare. The closest matching position was the epidemiologists (hygienists) working for the SES; however, they were never recognised as having specific knowledge about public health, as their official position mainly meant controlling hospital cleanliness. Instead, other types of infections were prioritised over hospital infections. For example, the Soviet regime ordered Latvia to prioritise control of gastro-intestinal infections. A Latvian infection control specialist shared a memory where one gastro-intestinal infection (salmonella) had to be prioritised over other hospital infections which had to be ignored; one had to pretend the others did not exist:

[…] because then it was most important, well, if there was salmonella, salmonella seemed to be the worst microbe of all, resistance or something other was not important to anybody. But it looked like a wound, and how can there be a wound infection?! They [hospital infections] could not 'exist', as sex or drugs could not 'exist' in the Soviet period, they also could not 'exist' [officially] and we couldn't 'see' them.

An active search for HAI would mean problematising the Soviet hospital care and questioning the quality of such; such a critical analysis would mean questioning the Soviet regime itself, an action which would have to represent a clear threat to both the regime and to the safety of those asking such critical questions (Garrett, 2001, p. 226). The official data on HAI prevalence was problematic, because statistics and other data often did not reflect actual realities. Therefore, data produced during the Soviet times has to be regarded with due diligence and a great deal of caution. For example, it was rather common in the Soviet Union that data representing the Union in an unfavourable light disappeared or was significantly altered, in order to show the regime in a better light (Vlassov, 2000, p. 740). And when it comes to hospital infections, these were rarely reported. On the one hand, their existence was uncomfortable for the Soviet regime; on the other hand, reporting created the risk of

penalties (Nettleman et al., 1994, p. 202; Garrett, 2001, p. 219; Hryniewicz, Grzesiowski and Ozorowski, 2001, p. 95; Ider et al., 2010, p. 210).

The problem of HAIs was hidden and invisible to the broader public; but even so, the problem did not go away (Kaser, 1976, p. 64; Garrett, 2001, p. 221). In 1978, the Soviet regime issued a directive specially designed to combat and control hospital-acquired infections. The directive provided for special infection committees to be established within hospitals and programmes striving to fight infections. These were also expected to employ epidemiologists in the hospital staff for them to work with these matters. This directive resonated with similar activities on the other side of the Iron Curtain. However, the directive was never implemented (Nettleman et al., 1994, p. 201), possibly due to the initial stages of the decline of the Soviet regime.

As I have demonstrated, Soviet HAI control was not only an issue of preventive and curative medicine, but also an ideologically and politically charged area; one where HAI was less associated with health risks for patients and medical staff, and more with political and job risks for those involved. The relationship between politics and microbes was of central importance for the Soviet regime, as shown by the emphasis on infection control, hygiene, public health, and the central role of hospitals; however, these relationships were rather ambivalent. This is clearly demonstrated by HAI control, where any 'undesired' infections were not allowed to exist to the public eye, as they were in absolute contradiction with the dominating ideology whereby Soviet healthcare was presented as incapable of harming its own people.

4.2. 'Western' Approach to HAI Control

Parallel to the Soviet model, on the other side of the Iron Curtain in Europe an alternative approach to HAI control was developed that I have named the Western model. Unlike the highly centralised Soviet model, the Western approach, at least at the beginning, developed as a decentralised and narrow hospital- and microbe-specific infection control regime. If in the Soviet model emphasis was put both on the environment and on cleaning said environment as the core practice of HAI control, then in the Western model, HAI control was focused on the human-microbe relationships: host, agent and transmission between those two. In comparison with the Soviet approach, where HAI control was mostly managed by a public health authority outside the hospital (SES epidemiologists and sanitary physicians), in the Western model, HAI control stayed as a narrow

and internal matter for the hospital, where specific infection control physicians and nurses were eventually appointed.

I have divided up the Western approach to HAI control into three main periods of development: the post-war period up to the 1950s, the period up to the 2000s and the beginning of 21th century. The first phase was optimistic in terms of predictions about the ability to control HAI; the second phase came with the realisation that HAI was staying, and that the microbes causing them were continuing the process of evolution. Through the introduction of hygienic, sanitary and antiseptic routines, HAI control lost the status of emergency from the previous centuries, but instead became a part of mundane hospital routines, thus losing the previous visibility. However, in the third phase, HAI control gained a truly global profile, in a tandem with the patient safety movement and AMR policy.

4.2.1. The Phase of 'Euphoria' in HAI Control

The first period of HAI control development can be characterised as a phase of 'euphoria,' when a belief that introduction of bacteriology, aseptic methods, hygienic techniques, hospital reforms, and antibiotic therapy would end the problem of HAI altogether (Williams, 1960, p. 1; Ayliffe, Collins and Taylor, 1982, p. ix; Forder, 2007, p. 1161). Up to the 1950s, the problem of HAI was mainly associated with maternity and surgery wards and the streptococcus bacterium was considered to be the main cause. Intense inquiry into streptococcus lead to the realisation that HAI was a problem for all types of wards and hospitals (Williams, 1960, pp. 9–13), streptococcus consisted of a number of specific strains of bacteria whose movement could be tracked and interrupted and could be carriers of the bacteria. This period also provided the first ideas about the contamination of the patient zone (clothes, beddings, close surfaces around hospital bed), with a particular focus on streptococci and the ways it spread. Paradoxically, the intense study of streptococci directed HAI control away from controlling environmental contamination as an inefficient strategy (Williams, 1960, p. 19; Ayliffe and English, 2003, pp. 139–140). Around 1950s, the prevalence of streptococci suddenly declined, creating an illusion whereby HAI appeared to be a disappearing problem in medicine (Forder, 2007, p. 1161).

4.2.2. The Phase of New HAI-Causing Pathogens and Formation Struggles of HAI Control Discipline

The second phase of HAI control started when *Staphylococcus aureus* replaced streptococci as the main cause of HAI and focus of HAI control, dismantling the idea of HAI as yesterday's problem and clearly pointing towards loopholes in aseptic methods, antibiotic therapy and other 'magic bullets' in infection control. Although *Staph. Aureus* was discovered at the end of the 19th century and was identified as a widespread pathogen causing HAI, such as skin infections and post-surgical wound infections, this microbial agent first started to cause serious problems with the introduction of penicillin (Ayliffe and English, 2003, p. 153). Penicillin as an antimicrobial agent was introduced in medical practice in 1940; and two years later, penicillin resistant *Staph. Aureus* strains were already identified in hospital settings; and a little later on, in community settings as well. Twenty years later the same history repeated itself: another antibacterial agent was introduced (methicillin) and the bacteria developed methicillin-resistance, commonly known as MRSA (Deurenberg and Stobberingh, 2008, p. 748). Keeping the scientific and clinical focus on *Staph. Aureus* and its specific types and roots, it was discovered that these strains causing HAI not only travelled from patient to patient within a ward and hospital, but also spread across countries. Ayliffe and English (2003, p. 156) argues that this was the beginning of the global MRSA epidemics that already started in 1960s. However, only in 1990s this issue reached national health policy agendas.

Parallel to *Staph. Aureus*, another type of microorganisms gained importance in causing HAI: Gram-negative bacilli (e.g. Escherichia coli, Klebsiella pneumoniae), especially those organisms that were part of human body but now turned on their host, causing infections. This trend emerged with greater introduction of antibiotics and disinfectants (Forder, 2007, p. 1162). Today gram-negative organisms occupy almost all the WHO's list of the world's most dangerous superbugs.

As part of scientific and clinical studies of specific bacteria causing HAI, within hospital settings many types of microbes were isolated from almost every place and surface of hospitals – microbes were found in air, on floors and walls, on flower vases, on hands and instruments, on beddings and clothes. Unlike the Soviet model, these discoveries led to the discovery that in general, these microbes have a low pathogenicity; and as long as these microbes did not find a path via the hands of the medical personnel and equipment used for patient care to enter the patient's body, they did not pose a particularly high risk of infection. Instead of controlling hospital environments, HAI control was directed towards specific environments associated with specific microbial transmission routes and entry points in the patient's body. For example, during this period, a link between the catheterisation

of vascular system and urinary and respiratory tracts and HAI was established, turning these rather simple medical practices into high risk procedures (Eickhoff, 1981; Ayliffe and English, 2003, p. 167). Certain measures designed to reduce the patient's encounters with pathogenic organisms, such as isolating infected patients, hand hygiene and aseptic techniques, were identified as the core HAI control measures; and these have remained crucial until today (Ayliffe and English, 2003, p. 180). So if the Soviet model focused on keeping hospitals clean, the Western approach prioritised a regime of safety and risk management (Linde-Ozola, 2016).

Parallel to the in-depth studies of microbes, studies on hosts (patients) showed that various factors influenced the chance each patient had to get HAI, depending on their characteristics (e.g. previous history, disease, age, location within hospital wards). This inquiry revealed that the emergence of HAI is dependent on certain human-microbe relationships with specific qualities, characteristics and conditions.

In 1960 and 1970s, infection control specialists and committees for HAI control started to be appointed in hospitals; this led to the first professional organisations and international collaboration carrying out joint studies, thus establishing the presence of this field more clearly (Ayliffe and English, 2003, pp. 194–197). The first surveillance systems were established to monitor the dynamics of HAI prevalence. However, it was only in the 1990s that the HAI problem reached national governments attention; mainly due to the problem of antibiotic resistance and the additional costs of treating infections (ibid., p. 198). At the Second International Conference on Nosocomial infections in 1980, Theodore Eickhoff (1981) identified the three weakest areas of the field that undermined the stable representation of this discipline in healthcare: limited scientific evidence on the effectiveness of HAI control measures, lack of HAI control standards, and educational actions for behaviour change.

4.2.3. The Phase of Reaching the Global Health Agenda

The third period of HAI control development is related to the development of the patient safety movement and to AMR policy. In the 1990s, studies on the negative effects of healthcare on patient health began to put patient safety concerns on the international health agenda (Department of Health (UK), 2000; Kohn, 2000). Evidence revealed that HAIs and a range of adverse events, such as medication and diagnostic errors, device failures and conditions in healthcare settings, all contribute towards producing unsafe healthcare services. HAIs began to be articulated as a patient safety risk that ought to be managed (Pittet and Donaldson, 2006). The development of patient safety

policy was rooted in a specific theory of error that focuses on the role of organisational systems in producing error, while emphasising managerialism in order to prevent these errors (Waring 2004).

At the beginning of the 2000s, multiple international organisations developed patient safety policy principles (e.g. reporting and learning system, patient safety guidelines) for national healthcare systems, in order to improve the safety and quality of healthcare services. HAI control standards were developed by international and national organisations as a part of patient safety risk management in healthcare (World Health Organization, 2002b). HAI was now imagined as a preventable safety risk, provided that hospitals carried out active surveillance of HAI, applied standardised HAI risk management, followed evidence-based interventions and evaluated these via audits and trainings (Storr et al., 2017).

Although AMR, similarly as the problem of HAIs, has created significant problems for healthcare systems since the 1960s, this issue has only recently become a high profile issue for the global health agenda. AMR is now recognised to be the greatest patient safety risk. It is prioritised not only as an urgent issue for all national governments and their healthcare systems, but also for global security. Within global AMR policy, HAI control has been incorporated as part of the five pillars of fighting AMR (World Health Organization, 2015). This resistance-infection connection is not a new challenge for HAI control, as most of the HAIs are antibiotic resistant; it has however intensified the existing in-depth focus on the human-microbe connection which has been increasingly challenging to manage. For example, global surveillance systems (GLASS[28]) now track and monitor movements of the most dangerous pathogens, their respective strains and levels of resistance and their susceptibility to antibiotics on a worldwide scale.

The Soviet approach never prioritised the active role of patients in HAI control. By contrast, in the Western[29] model (albeit only in the last 15 years) the position of the patients has been made visible within HAI control. Patient engagement in HAI control is the last aspect I wish to highlight in the history of HAI control. Although the patient-HAI control connection can seem obvious, it was invisible to the history of medicine and science. Up until the 2000s, the experience of the patient was disconnected from suffering from HAI and from being part of HAI control policy and practices. Only when HAI control was linked with patient safety policy, did the patient's voice finally emerge in

[28] For more on the Global Antimicrobial Resistance Surveillance System (GLASS) please see: http://www.who.int/glass/en/

[29] Patients are able to raise their voice via legal proceedings.

relation to HAI control. For example: in 2005, the WHO introduced a patient engagement platform in the area of patient safety,[30] and developed a tool for patient involvement; in order to promote safe surgery, hand hygiene and other HAI control practices.

4.3. The Arrival of the 'Western' Model in Latvia

After regaining independence in 1991, Latvia chose so-called 'shock therapy' to reintegrate itself within the European space; meaning that all Soviet regulations, institutions and practices were discontinued, including the previous HAI control policy and regime. Distancing the country from Soviet policies was related to the national self-assertion as an independent country (Eglitis and Lace, 2009, p. 331). However, the old patterns of understanding and managing HAIs did not fade away so easily. For example, the perception of HAI as a sensitive 'internal issue' for hospitals has remained a stable assumption since independence.

In Latvia, the issue of HAI control has struggled for more than 20 years to gain political, public, and medical attention. I have divided the development of HAI control after independence into three main periods: the pre-EU period, the period up to 2013 and the period up to 2018. During the first period, HAI control remained invisible. Within the second phase, the current HAI control policy and practices were formed. The third period brought national political recognition, when a national multi-sectoral committee on tackling antimicrobial resistance was established. In this section, I demonstrate how certain connections, or indeed the lack of such, ended up determining the development of HAI control in Latvia.

4.3.1. The Invisible Issue

During the first phase of development, HAI control was a neglected issue in health policy and medical practice. Similarly to other post-Soviet countries, HAI control lacked political, professional, technological, and financial resources (Raka et al., 2006). When examining all this from a relational perspective, it becomes visible that the underlying connections of HAI control that would be necessary to build up this field were also lacking. An absence of stable connections was particularly visible in various unsuccessful attempts to formulate a national HAI control policy. In 1998, the first national

[30] For more about 'Patients for Patient Safety' please see: http://www.who.int/patientsafety/patients_for_patient/programme/en/

regulations related to HAI control were issued, as part of the hygiene requirements for hospitals (Cabinet of Ministers, 1998). Within this regulatory framework, HAI control was centred around the old perception of the human-environment connection, where the quality of hospital air and cleaning practices were the central focus of the HAI control policy. In this policy discourse, microbes were positioned as a part of the hospital environment, rather than being linked with patients and hospital personnel and with any risks that mighty possibly ensue from these encounters. The only role for microbes was to serve as one of the criteria for measuring the air quality in hospitals. Other criteria included air temperature, humidity etc. The regulation assumed that the microbial pollution of hospital air would be assessed by examining the amount of microbial colonies and specifically pathogenic staphylococcus colonies found in specific hospital rooms, along with the time of day. For example, the regulation defined that in an operating theatre, in the morning, there cannot be more than 500 microbial colonies in 1 m^3 air; but during work hours, the number of microbial colonies cannot exceed 1000. Whereas, in children's wards, there cannot be more than 4 pathogenic Staphylococcus colonies in 1 m^3. Operating rooms and rooms for childbirth were perceived to be the hospital spaces requiring the highest standards of air quality and cleaning. For example, if the rest of the hospital units had to be disinfected once a month, these two specific zones had to be disinfected once a week. Placing special buffer zones with separate hygiene facilities between these high-risk zones and the rest of the hospital, as well as installing special air filters, were the only two measures mentioned to control microbial pollution of the air. The regulations did not specify how exactly these hygienic requirements should be followed, nor how to achieve or monitor the defined number of microbes. According to this regulation, clean air and clean hospital premises were the main measures required to keep hospitals HAI-free (Cabinet of Ministers, 1998).

The State Sanitary Inspection was responsible for controlling the hospitals. However, up until 2006, there were no regulations for HAI control. During this period the only regulations that slightly mentioned HAI control were related to the actions required should a public health epidemic arise (Ministry of Welfare, 2001). The regulations defined the main counter-epidemic measures (infectious person isolation, reporting, disinfection, surveillance) if any one of 98 infectious diseases should result in an epidemic. One of these infectious diseases mentioned in the list were nosocomial infections related with labour, postpartum and surgical complications. This description of HAI matched the centuries old understanding of HAIs as a problem of childbirth and surgery only, along with the previous passive approach to HAI control where active risk control of human-microbe encounters was not applied. However, in 2004 these regulations were also cancelled. The only regulation that stayed

intact during this period were those requiring hospitals to report cases of infectious diseases, including HAIs (based on the same old understanding), to the public health agency. This requirement was adopted in 1999; and up to 2003, only 0.04% cases of HAIs were registered. These data did not reflect the actual situation with regard to HAI prevalence in the Latvian healthcare system (Pujate et al., 2003).

Attempts to formulate a new HAI control policy based on the Soviet understanding of human-environment connections were quickly contested in the context of greater political freedom and access to new biomedical knowledge. Without the framework of the Soviet ideology, the control of microbes circulating in hospital environment become a meaningless activity, a task lacking any clear medical or political rationale. Open borders and the flow of information that came with it after the collapse of the Soviet regime, provided an opportunity for comparing the previous biomedical knowledge and practical traditions with the knowledge and practice elsewhere, mostly in English-speaking healthcare contexts. And the experience of one of my informants does reflect this re-assessment of previous environment-human connections as the central foci of HAI control. During the Soviet regime, she worked in the SES; and in 2011,[31] when we had our interview, she was working enthusiastically in a hospital as an infection control specialist, which gave her a chance to assess and re-learn the previous 'truths' about HAI control. E.g. looking at it from the today's perspective, she saw the search of microbes in the air as useless and even ridiculous, even though she had already done this during her tenure at the SES. Other informants evaluated the Soviet HAI control regime as 'not making any sense' or even 'crazy.' However, the old practice of taking environmental samples to find out which microbes were circulating in a hospital was still reported by my informants, especially during 2011-2012; while during my 2017-2018 fieldwork, I only encountered one research participant that saw this practice as useful.

This strong association with the Soviet history of occupation, together with the opportunity to access new biomedical knowledge, was turning the previous connection of the human-environment connection into a meaningless relict of past. However, new or previously forgotten connections (e.g. human-microbe) did not replace the old connection right away. One of the explanations could be related to the missing half-century of debates and developments in HAI control that happened on the other side of the Iron Curtain. In the absence of stable and meaningful new

[31] I interviewed this informant during the previous study on HAI control in 2011. Unfortunately, I wasn't able to have another interview this time around; as the informant had passed away.

connections on which to build a new HAI control policy, this simply resulted in a period without any policies at all. Yet, the process of joining the EU, along with the first visible epidemic of HAI in newly independent Latvia, made it possible to revisit attempts to develop HAI control, on the basis of some new connections.

4.3.2. The Formation of HAI Control Standards

During the second phase (2004-2013), Latvia's current HAI control policy and practice standards were formed. In 2003, the first national level study on HAI prevalence was initiated and conducted by infection control specialists across 7 hospitals. The point-prevalence study revealed higher rates of HAI prevalence (3.9%) than the official statistics showed (0.04%). This study also revealed the levels of 'invisibility' of this problem in Latvian political and medical settings. For example, the absence of national HAI control policy had resulted in a situation where official definitions of different HAIs (e.g. ventilator-associated pneumonia) did not exist in the Latvian healthcare system. The new definitions of HAI went beyond any previous understandings of the problem. The researchers argued for more efficient national surveillance activities and evidence-based policies (Pujate et al., 2003). At the beginning of the 2000s, the first media articles were written about the emerging MRSA epidemics in Latvian hospitals. This was the first time when the topic of HAI control reached public debate. In these articles, health professionals warned about hospitals that were not safe for patients, and demanded politicians pay attention to this problem. A national regulation was issued in 2004, which required hospitals to report cases of MRSA.

In 2004, Latvia joined the EU, and had a chance to implement a new HAI control policy developed by the EU; during this period, this was incorporated into the global patient safety policy. However, the HAI-patient safety connection did not help with forming any national HAI control policy in Latvia. In fact, this connection has never been introduced in the Latvian context.[32] One possible reason might be the lack of broader public debates on quality and safety and on patient-centred health care; for these issues are rarely a part of public discussions or the health policy agenda. Another reason could be related to the challenging feasibility of patient safety policies in the post-Soviet context. For one of the underlying principles of patient safety policy, i.e. reporting safety risks, has been rejected by the medical community as a threat to their professional autonomy. And not only

[32] The national patient safety policy was established for the first time in 2017 but clear HAI-patient safety connection is absent from this policy.

this: the practice of reporting is also associated with the Soviet experience of being reported to the controlling authorities, such as KGB. The Soviet experience of reporting on somebody could lead to risks to job safety, freedom, health, and life. In the Latvian context, the link between reporting on somebody and safety risks to the person in question is still seen as a traumatic experience[33]; so breaking this association is a great challenge for those who wish to improve patient safety in Latvia. For example, one hospital head nurse shared her experience, where it provided challenging to change the practice of her nurses and convince them to report any medication errors, thereby improving patient safety:

> *The same applies to nurses for safe prescription of medicines. There are many things that we can change only with day-to-day activities to make them safe, but our way of thinking must be slightly changed at first. Shifting from hiding that, I have used the wrong medicines to reporting it. But we still need to learn in order to avoid punishment. People are afraid of that is obvious. During the Soviet times… if you did something wrong, that's it – you were fired, fined, reprimanded. And people are still afraid of that, thinking that they will be punished.*

Breaking the link between reporting patient safety risks and the historical trauma of reporting is still a great challenge, even in the Latvian hospital with the oldest and most sophisticated patient safety policy in the country. One of the informants from this hospital explained that patient safety risk reporting is still associated with the Soviet trauma, to which many are still keenly alive, of being reported to the authorities; something which could led to arrest, deportation to Siberian labour camps during the Soviet regime. The hospital has recently developed a completely new terminology to help re-formulate a local patient safety program to avoid historical connotations of 'reporting'; this is another attempt to disassociate patient safety risks from any personal risk towards the people involved in reporting.

In 2006, a new regulation was adopted describing basic requirements for HAI control (Cabinet of Ministers, 2006). HAI control was framed as a hygienic and counter-epidemic policy for healthcare facilities, thus linking it with a public health approach. For the first time, the Latvian HAI control policy was formulated, with the central focus being on governing human-microbe relationships within healthcare settings. A couple of my research participants were involved in developing this policy document, and they remembered this process as being long and complicated because the policy had

[33] In 2018, for the first time lists of people who had been recruited and worked as agents for Soviet security agency, KGB were made public; thus bringing the issue of reporting to the fore again and causing complex and painful public debates.

to be built up on the basis of completely new biomedical 'truths.' Or as one of my informants remembered this process:

> *I saw how this was done, global literature was read and the European experience was learned, trying to incorporate these in the Regulations of the Cabinet of Ministers. At first, we had a long instruction, like a book, where everything was based on evidence, but thereafter they said that nobody in the Cabinet of Ministers can approve such a long book and that this must be shortened. Then the long instruction was reshaped more concentrated where each word was carefully considered [...]*

It took several years to develop these regulations. For policy-makers (at first) and health professionals (later on), translating the governance of human-microbe relationships into meaningful forms of understanding and action also included figuring out how these new relationships could be incorporated into Latvian healthcare settings that were built based on a different theory of infection control and were chronically lacking in funding. For example, typical patient rooms with as many as 10 patient beds or reusable medical equipment now were linked with HAI risks.

Although based on the old definition of HAIs (called nosocomial infections), the new HAI control policy was embedded in the governance of human-microbe relationships in healthcare settings. It focused on human-microbe points of encounter, and specifically those encounters that could create risks of contamination and infection (e.g. encounters between the patient's body and the hands of medical personnel, medical devices, equipment); all of which were also divided into different levels of risk. The gaze of HAI control was now directed towards specific microbes, people, hospital equipment, devices, medical manipulations, and rooms; all of which required constant infection risk assessments when these objects interacted. The encounters between patient and hospital staff now were based on the precautionary principle and implied that every patient and all their body parts and fluids were potentially infectious and should be treated as such; for example, by using disposable protection equipment (e.g. gloves, mask, eye protection). The policy paid special attention to hand hygiene, as adopted from the WHO policy: hand hygiene was differentiated from washing, disinfecting and surgically disinfecting hands; and there was a distinction between different types of gloves and their use. Not only hand hygiene but also the hospital rooms, equipment and medical devices had to be divided and classified into different categories of infection risk that all required different levels of risk control (e.g. either clean, disinfect or sterilise). Patients with an infection had to be isolated from other patients; either by placing them in a separate room or in an adjusting multi-bedroom, for the purposes of isolation. Also, increased HAI control measures had to

be applied, which were categorised in accordance with infectious agent transmissions (e.g. spreading by contact, droplets). The policy also defined 7 dangerous multi-resistant microbes causing HAI (later on, this list was adjusted to new trends of pathogenic transmission) that had to be subjected to surveillance and risk control. Because of this public health approach, the policy introduced the following definition: if at least two cases of HAI are detected, then similarly to other emergency situations, it had to be defined as an outbreak, requiring counter-epidemic measures. Later on, it became clear that responses to HAI more often fell into the category of 'part of everyday healthcare' and less in the category of 'outbreak and emergency,' as HAI itself was often endemic to hospital wards (Cabinet of Ministers, 2006).

Although embedded in the public health approach, the regulations defined HAI control at facility level, keeping HAI control as a hospital issue only: the head of the hospital was defined as 'responsible for the restriction of the outbreak and spread of infectious diseases in the institution.' (Cabinet of Ministers, 2006). Each hospital had to develop their own HAI control plan, by taking into consideration basic requirements set in the regulation and the local hospital situation. The regulation also determined that each hospital ought to appoint one person to take charge, or else establish a commission for implementing this plan. These regulations set basic requirements for HAI control, but the hospitals themselves were responsible for any guidelines or programs on how to achieve it. The implementation of the HAI control-public health connection was also hindered by weak institutional support from the national public health agency; during this period, this institution was subjected towards never-ending reforms of the institution's goals, status, functions; on account of numerous political interests and ambitions. At one point, the national public health agency was liquidated altogether for several years; however, a new agency was established in 2012. Without national level coordination and practice standards, HAI control policy resulted in highly fragmentised HAI control practices across the country, all based upon diverse approaches and understandings on how to achieve good HAI control (Linde-Ozola, 2016). On the level of individual hospitals, various specialists were appointed to implement a local HAI control plan; for example, hospital head nurses, surgeons, infectious disease physicians, public health specialists were all appointed to take on this task; often in addition to their existing job roles. Until now, only the two largest hospitals have infection control departments with dedicated teams of at least of 5 infection control specialists; and these still occasionally struggle with achieving true autonomy whenever they are required to take on

unrelated/additional tasks.[34] The necessity of developing an HAI control plan, created enormous problems for specialists appointed to implementing HAI control plan due to the substantial time and knowledge investments and new capacities required to implement it. And as infection control specialists pointed out during a 2011-2012 study, hospitals took different approaches when developing these plans: some developed detailed evidence-based plans, but for some hospitals, plans were just a bureaucratic formality to fulfil. It also become clear that the new HAI control plans only covered the basic requirements; but additional guidelines and protocols also needed to be developed. Not all the hospitals were interested in formalising HAI control practices into binding standards; due to the additional resources required, and widespread negative attitudes towards so-called 'algorithm medicine.' However, some hospitals developed their own guidelines and protocols; for example, guidelines on how to prevent and control MRSA, or protocols for safe insertion and care of the central line, in order to prevent bloodstream HAIs. Relational resources (e.g. previous contacts) served as an important medium for sharing, collaborating and co-developing some of the guidelines together with other hospitals. This collaboration resulted in several HAI control guidelines (prevention of specific HAIs) which were turned into national level recommendations.

In the absence of any comprehensively consistent coordination, support, and standards for HAI control at the national level, an alternative model was developed by infection control specialists themselves as a response to existing policy shortcomings at the national level. A group of infection control specialists, who started their collaboration when the first HAI prevalence study was organised in 2003 and the HAI control guidelines were developed, took on multiple state functions regarding HAI control, especially in connection with EU policies. For example, when HAI surveillance data collection was disrupted at a national level, one hospital stepped in and volunteered to coordinate the collection of surveillance data for all hospitals nation-wide. This was also sent to the European surveillance system, so that Latvia would not end up falling out of the European surveillance network. On other occasions, they represented the country when the issue was discussed or when HAI related activities were planned at the EU or WHO level. Specialists also served as national coordinators and focal points for several EU and WHO programs and projects of HAI control. This group of specialists set an example of good HAI control practice, also providing some much-needed support when dealing with daily HAI control issues. This pattern continued when the national action plan on tackling

[34] In Latvia, infection control physicians and infection control nurses do not exist as officially recognised positions.

antimicrobial resistance was initiated and drafted. This group of specialists has stayed as the leading voice in formulating public and political discourse on HAI control. These specialists have produced relevant evidence bases (e.g. prevalence data, guidelines), especially when governmental institutions lacked such evidence. They have also promoted evidence-based medicine and policy.

4.3.3. Reaching National Health Policy Agenda

The third period (2013 to now) of HAI control development has achieved broader political and public recognition for this topic. In the global context of antibiotic resistance, the connection between antibiotic resistance and HAI control was a more successful vehicle for ensuring HAI control was a high-profile matter in the Latvian context. And in 2013, a multi-sectoral committee of stakeholders was established to develop a national action plan for tackling antibiotic resistance. The national action plan included five strategic aims; and strengthening HAI control in healthcare settings was defined as one of them. The action plan is due to be enforced in 2019 (for more please see Chapter 6).

This period also brought some changes to the previous regulation of basic requirements for HAI control in hospitals. The new regulation was adopted in 2016, and addressed several shortcomings of the previous regulations; such as harmonising HAI control practice differences between hospitals, and facilitating access to evidence-based HAI control. The position of infection control specialists was strengthened by insisting that each hospital have at least one infection control physician and nurse; while in multi-profile hospitals, HAI control teams should be established. The new regulation expanded the governance of human-microbe relationships by including new requirements for medical personnel (e.g. requirements on appearance, mandatory vaccination), decontamination of medical equipment and devices (e.g. infection risk criteria; standardisation of all stages of decontamination), standardisation of invasive procedures (e.g. insertion and care of central venous catheter) and medical waste management. The HAI control-public health connection was strengthened when the national public health agency (now called the Centre for Disease Prevention and Control) produced guidelines on developing hospital HAI control plans. This connection was also enhanced by conducting epidemiological surveillance of 6 of the pathogens causing HAIs, while utilising said epidemiological data to analyse the epidemiological quality and safety of hospitals. Although a summary of basic surveillance data should be sent on a quarterly basis to the public health agency, the HAI control-public health connection in this case had been kept at a facility level: hospitals were obliged to develop their own surveillance systems and approaches towards analysing the data

collected on HAIs. Although the new regulations were intended to address some shortcomings of positioning HAI control solely as a hospital issue, the deficits of the old strategy have largely been reproduced by the new regulations (for more please see Chapter 7).

Summary

In this chapter, I explored the historical production of HAI control. I paid particular attention to how HAI control was assembled through two approaches – the Soviet and the Western. In the Soviet regime, humane-microbe relationships were made into a political instrument with a much broader use; while in the Western model, human-microbe relationships were more narrowly defined and utilised in the context of HAI control. Both models took on the management of human-microbe relationships with different political effects; however, in both models, HAI control as an area struggled to remain a visible political and medical issue. The official Soviet model of HAI control ended in 1991; but further development of the Western approach put HAI control on the global health agenda, by establishing a link with patient safety and AMR policies. The last aspect I highlighted in the development of HAI control was the incorporation of the patient's position and experience of HAI control. The mainstream historical narrative on HAI control is formed from the perspective of medicine: physician's efforts, hospital reforms and public health interventions. The patient voice in producing historical account of HAI control is the most recent one. In the last section, I traced the interaction of both HAI control approaches and relationships in the context of Latvia after regaining independence. Here, the change was not linear; rather, it was highly complex and contradictory.

In the following chapters, I explore how HAI is produced as an object of knowledge and targeted for interventions in a Latvian context at the intersection of the Soviet and the Western approaches to HAI control. Both models are not taken for granted, and are thus required to provide analytical lenses for exploring the dynamics of these models and their underlying connections. I continue to examine the (re)production of HAI control as a relational process; establishing, maintaining, and cutting human-microbe relationships is at the centre of my analytical focus for exploring the phenomenon of HAI control.

Chapter 5. The Evolution of Public Discourse on HAI Control in Latvia: Fluid Understanding and Fragile Modes of Governance

Introduction

The previous chapter focused on the historical analysis of HAI control in general and in the Latvian context. This chapter turns the focus more towards contemporary settings and analyses the evolution of public discourse on the phenomenon, and in particular, on what discursive frames are used to assemble the discourse on HAI control. This exploration of the public domain addresses the first research question on how HAI control is assembled in public discourse. I chose Latvian electronic media (online news portals and newspaper websites) as a significant site where public debates on human-microbe relationships have taken place, and discourse on HAI control has been negotiated and assembled.[35]

Media coverage and representations are considered to be one of the sources for public understanding of scientific, technological, and medical topics (Devereux, 2007). Research has demonstrated that the media contributes towards constituting attitudes, perceptions and responses towards health issues and public health epidemics (Collins, Jaspal and Nerlich, 2018; Bouchoucha, Whatman and Johnstone, 2019). Considering the role of mass media in forming public understanding and awareness on health issues, of the case of Latvia shows this role becoming explicitly significant. As the previous chapter has revealed, the issue of HAIs was historically kept away from the public eye; a real tradition of public discussion only became possible only from the beginning of the 1990s. Thus, this chapter focuses on what is being made knowable and visible about the HAIs, as well as measures for managing it in the public sphere; as well as how the newly acquired status of visibility and openness for HAI control is being negotiated in media discourse (Nimmo, 2016).

In this chapter, I have adopted the ANT understanding of written texts: I perceived media texts not as mere representations of reality, but rather as enactments of reality. Nimmo (2016, p. 114) summarises this by saying that texts actively 'assemble, shape and connect practices, and in doing so enact objects, constitute subjects and inscribe relations, ontological boundaries and domains.' Thus, public discourse not only offers understanding of HAI control, but also of how involved actors form relations with the subject matter and each other. In addition, I have approached this chapter by treating articles and their comments sections as data sources of equal value; therefore, both are

[35] List of analysed media articles available in Appendix 2.

included in the media discourse analysis. Washer & Joffe (2006) have pointed out that usually media analysis on HAI control only includes in the analysis media articles and reports, and not commentary from readers. Here, I have adopted Slavtcheva-Petkova's (2016, p. 1117) understanding that electronic media commentary sections can serve as arenas for 'public discussion by regular citizens' and 'enhance citizens' role as active participants in critical debates.' This consideration becomes particularly significant in those settings where previously the public debate on the particular issues has been absent from the public domain for political, historical or other reasons.

In the chapter, I began by describing leading and silenced voices shaping public discourse on HAI control; giving insights into the dominant stakeholders and the authority to decide what is made knowable and visible about HAI control. Then I briefly introduced the formation of public discourse at the beginning of 2000s. Then I moved on to three identified discursive frames used in the media when covering the issue of HAI control. The first frame constructs HAIs as a part of war on microbes and consists of two discursive perspectives. The second frame perceives HAIs as consequence of an imbalance of the human-microbe ecosystem and is formed by three discursive perspectives. The third frame is the youngest and more marginal, constructing HAIs as being part of conspiracy theories.

5.1. The Leading and Silent Voices in Shaping Discourse on HAI Control

This section identifies dominant positions in media coverage shaping the discourse on HAI control (i.e. what is presented as a truth, in what manner, how other stakeholders are positioned). Similarly to HAI control policy, public discourse is mostly shaped and maintained by infection control specialists. For example, the Head of the Department for Infection Control in the second largest Latvian hospital was mentioned in the selected 198 articles 86 times. He can be considered as the most prominent opinion leader, proactively expressing his opinions and giving interviews to journalists; while also preparing his own articles and reporting on conducted studies on infection control, prudent use of antibiotics, and HAI control.

The Centre for Disease Prevention and Control could also be considered as another opinion leader in shaping public discourse on HAI control.[36] The voice of the Centre for Disease Prevention and Control could be identified in media on various topics such as infection control and hand hygiene;

[36] The Centre for Disease Prevention and Control was established in 2012; before that, the centre was under a different name – the Public Health Agency.

but this mostly happened when the Centre organised or took part in some kind of campaigns, like on hand hygiene, antibiotic awareness, and other topics. The Centre was mentioned 89 times in selected articles.

It was also possible to identify other stakeholders voicing their positions and opinions; such as scientists, representatives from the Ministry of Health, the European Centre for Disease Prevention and Control, EU and WHO. For example, the Ministry of Health was mentioned in selected articles 34 times but Minister of Health 25 times.

The media analysis not only showed the most dominant voices in the public discourse on HAI control, but also those who are absent from shaping the discourse. There were only couple of articles actively engaging the patient voice. I was able to identify only two articles where the opinions of the patient organisations were covered. Though patients had limited access to the main media platform (articles), this stakeholder was present in commentary sections where broadened the public discourse on HAI control, adding dimensions not covered by specialists and policy-makers in the main article content. In commentary sections, the experiences of those who actually suffer the most from the problem of HAIs was presented, thus speaking about HAI control as an issue concerning the safety and quality of healthcare, a framing not used by other stakeholders. This tendency can be interpreted as parallel public surfaces shaping discourse on HAI control.

5.2. Assembling the public discourse on HAI control

HAI control issues were brought to the public awareness in the beginning of the 2000s, when the first articles on HAI control appeared online. For example, this 2003 article written by one of the current opinion leaders introduced the HAI problem to the public:

> *When receiving treatment at a hospital, the patient can suffer from serious infectious diseases. For example, surgical wound can fester, or a pneumonia can develop, or after a long time after discharge, the patient can be diagnosed with hepatitis. That is a nasty issue which should be averted [...] In the Soviet era, it was not allowed to even mention these infections. They were not included in the official statistics. When epidemics were exceedingly large, "those at fault" were mercilessly punished. Therefore, hospitals have always strived to keep information about these diseases to themselves and to solve problems on their own [...] Latvians must learn more about the possibility of becoming sick at hospital [...] the most important thing here is to start to talk about it at all. (Diena, 26.11.2003)*

One of the first narrative on HAI control in Latvian media diverged from the Soviet tradition by dealing with HAI control and bringing this problem into the public spotlight, talking about it in an open and blame-free manner.

The first time that HAI control was introduced into public discourse, it was framed more around the urgency of bringing this problem to public awareness; however, further HAI issues were shaped by the MRSA epidemics emerging in Latvian hospitals during the early 2000s. Up until 2006, the HAI problem was linked solely with MRSA that was often labelled a 'superbug.' In later articles MRSA was replaced with other resistant pathogens that were framed as being more dangerous than MRSA.

Overall, within the analysed time period (2000-2016) within Latvian public discourse, human-microbe relationships were represented in a broader spectrum, exceeding the previous discursive limitations of HAI control. I was able to identify three different discursive frames shaping public discourse on HAI control. Each frame represented a different understanding of microbes and modes of managing human-microbe relationships (see table 7).

Table 7. Identified discursive frames of public discourse on HAI control

Frame	**Perspective**	**Positioned agency within human-microbe relationships**		**Discursive gaze**	
		Active position	**Passive position**	**Causes**	**Consequences**
WAR ON MICROBES	**Catastrophic**	Microbes	Humanity	Human activities across multiple industries	End of humanity
	Infection control/ hygiene	Microbes Hospital stakeholders Policy-makers	Patients	Insufficient infection control/hygiene/ policy responses	Rise in antimicrobial resistance, prevalence of HAIs
HUMAN-MICROBE ECOSYSTEM	**Technological utilisation**	Scientists	Microbes Consumers	Scientific developments	Advancing human wellbeing/ Livelihood
	Ecological reciprocity	Concerned citizens-consumers	Microbes	Excessive infection control/hygiene/ sanitation	Ecological endangerment/ Declining human health/immunity
	Ecological morality	Concerned humanity	Microbes and other	Lack of moral judgment/ moral	Moral decline of humanity

			endangered non-human 'others'	crisis towards non-human 'others'	
ARTIFICIAL PROBLEM	**Conspiracy theories**	Specific 'elites' of individuals, corporations, groups, industries	Microbes Human population	Individual interests of 'elites'	Monetary/power gains for 'elites' using artificially created microbial agents

Multiple framings of human-microbe relationships showed that understanding and anthropocentric evaluation of microbes was a process not so much homogenous or static, but rather, as dependent upon various interactions and connections with microbes. The first frame saw mainly threats in human-microbe encounters, and this one dominated the public discourse. Within this discursive space, the public construction of HAI control was assembled. This frame consisted of two related discursive perspectives: the catastrophic perspective was rooted in an idea of the lost war against microbes because of human activities (e.g. the overuse of antibiotics) across multiple human spheres, and its devastating consequences for humanity. The infection control/hygiene perspective was less apocalyptic in its formation, but was also constructed on the perception of insufficient/inappropriate measures for fighting microbes that could lead to increasing challenges for tackling 'bad germs' efficiently.

The other two discursive frames can be considered as reactions towards the dominant *war on microbes* frame. The second frame, *human-microbe ecosystem,* saw human-microbe encounters not just as threats but also as potentially providing beneficial, reciprocity and moral possibilities. This frame was assembled by three discursive perspectives. The first perspective was rooted in power of scientific progress to utilise microbes as resources for advancing human wellbeing and livelihood. The second perspective was rooted in the perception that excessive infection control practices (sanitation, hygienic and antiseptic practices, antibiotic use) lead to the development of 'superbugs' and declining human immunity for fighting bad germs. This perspective can be considered as an alternative to the hygienic/infection control perspective, where both of them take opposite positions with regard to infection control practices. The third perspective was rooted in an understanding of human-microbe relations as part of morality. This perspective links the understanding of microbes with broader debates on preserving the biological diversity of genes, species, ecosystems. The last frame, that of an *artificial problem*, was the most recent one; it first appeared in public discourse at the end of the

2000s, and was rooted in the rhetoric of conspiracy theories and of a deep distrust towards global authorities and industries.

Before I turn to each of these frames, I want to point out that regardless of whether the microbes were imagined as good or bad, there was an almost unanimous perception (except in the case of conspiracy theories) whereby microbes themselves were represented in an anthropocentric manner. The language of 'attack' and 'threat' could be used when describing microbes; but at the same time, microbes were imagined also as performing and sharing the same activities and values as humans. For example, the microbes were described with such expressions as 'they are here to stay,' 'bacillus also want to live,' 'bacillus have become smarter,' ' give a job to bacteria,' 'have a happy and prosperous cohabitation [with bacteria],' 'bacteria teach us a simple truth – we must unite,' 'bacteria want to eat,' 'biologists are spying on the conversations of bacteria.' By making these social and cultural linkages with microbial agents that are invisible to the naked eye, microbes are made meaningful and agentic.

Now I focus towards exploring the different discursive perspectives of managing human-microbe relationships, as well as how these perspectives play out in constructing discourses on HAI control.

5.2.1. Frame 1: HAIs as a Part of War on Microbes

The frame of a *war on microbes* constituted much of the public discourse on HAI control in the analysed period in Latvian electronic media both in article and commentary sections. This frame is assembled by two perspectives: apocalyptical and hygienic/infection control. Such expressions as 'invincible infection,' 'dangerous bacteria,' 'deadly infection,' 'invisible predator,' 'infection – dark side of healthcare' were used to represent the notion of microbes in this frame.

In this discursive frame, human-microbe relations were represented as a fight that humans must win in order to survive and thrive, thus creating germ-free living conditions. A colourful example of this perspective was the coverage of E. coli epidemics; this was one of the most covered epidemics in Latvian media, who framed it as a war against the enemy that has resulted in a human victory over this microbial agent. In a short span of time from 25 May to 27 July 2011, Latvian news site Apollo.lv produced 45 news stories on the E. coli epidemic in Europe (please see an extract from one of the

articles in Box 1). In this particular case E. coli was not associated with hospital-acquired infections,[37] as it was believed that the microbe in question spreads via unclean vegetables, thereby creating a dangerous and deadly infection risk for consumers. The representation is international - starting with an epidemic in Germany. It is interesting to note that apart from microbes, there were no active stakeholders who could be blamed for the outbreak.

Box 1. Translated extract from one of 45 articles covering the E. coli epidemics in Apollo.lv

Possible E. coli source in Europe revealed

On Tuesday, the European Food Safety Authority (EFSA) declared that they have identified a cargo of Greek clover (Trigonella foenum-graecum) seeds sourced in Egypt as the possible culprit of the spread of dangerous enterohemorrhagic E. coli (EHEC) in Germany and France [...]

The Ministry of Agriculture of Egypt last week denied any possibility that Greek clover seeds exported to Europe could be the cause of E. coli infections, responsible for the lives of 50 people, mostly in Germany.

Ali Suleiman, the head of the Egypt's Central Agriculture Quarantine Administration, sees the EFSA's notice as "completely untrue."

"The presence of this bacteria in Egypt is completely unproven, and it has never been registered before," the official told news agency MENA.

Furthermore, the Egyptian company exporting these seeds back in 2009 confirmed that Greek clover seeds were delivered to the Netherlands, and not Germany, Great Britain, and France [...]

After the initial article that reported the outbreak, 44 news stories following the outbreak represented a 'chase, find and kill' of the microbe at fault; blaming everything and everyone from Germany to Egypt, from cucumbers to grains and seeds. Articles portrayed chase of the microbe across two continents as if it was a fugitive on the run, showing that the epidemic has originated in Germany, then moved on to France and 12 other European countries, from where it crossed the European borders and moved beyond the continent. The plot of this narrative began by blaming cucumbers; and a suspect farm was even found in Germany where this microbe allegedly originated and then travelled across the borders to other European countries. As it continued to develop, scientists posed as experts representing microbes; they suggested that there might be other suspect vegetables, farms of interest and even countries and routes of travel for this dangerous microbe. By this stage of the story, the entire country of Egypt was suspected to be at fault; however, soon enough all these theories were abandoned; thereby releasing both Egypt and seeds from the responsibility

[37] Pathogenic E. coli strains are also one of the most common pathogens causing hospital-acquired infections.

for the widespread outbreak. By this time the media had started to hyperbolise; suggesting, for example that this 'murderous microbe slays everyone, from French children to Estonian punks.' There even was an opportunistic story that suggested that this 'murderous microbe' could be converted into biofuel. This fierce chase lead to the last suspects which were believed to be sprouted grains and seeds of an unknown origin, and without any hope of finding the source. Although this example illustrated a lack of transparency and thus of accountability in the globalised food system, this cluster of representations ended with a heroic story, showing a victory of humanity over a microbial agent. It suggested that the 'murderous E. coli' was defeated, picturing this outbreak as a war where people celebrated their victory over a microbe.

5.2.1.1. Catastrophic Perspective

This perspective was on the pessimistic spectrum of framing a *war on microbes,* as it represented the war as one humanity had lost. In this perspective, microbes were positioned to assume the active agentic position, by ordering catastrophic plots against humanity. This perspective was illustrated by such statements as 'the world faces a new and terrifying epidemic', 'the world is under attack from infectious diseases'. The representation of HAI-causing microbes was framed using such signifiers as dangerous, horrific, hotbed, predator, killer, bacteria-mutant, superbug. Here is one example of representing the problem of HAIs in this discursive perspective:

> *A few days ago, the World Health Organization informed about the end of the pandemic outbreak of swine flu, but on Wednesday we learned that humanity faces a new threat: bacteria resistant against antibiotic treatment. Scientists even argue that the new type of bacteria signals the end of the era of antibiotic use, because pretty soon, the toolkit of humanity will lack antibiotics powerful enough to combat these harmful microorganisms. (Diena, 12.08.2010)*

HAI-causing microbes and broader antimicrobial resistance epidemics have been represented from a catastrophic perspective, and not by Latvian media alone. But as argued by Nerlich (2009), such rhetoric devices as "disaster" and "apocalypse" have become a globalised and dominant discursive strategy for framing antibiotic resistance and superbugs. For example, in 2014, the WHO introduced the first global report on antibiotic resistance by also issuing a warning:

> *[...] world is headed for a post-antibiotic era, in which common infections and minor injuries which have been treatable for decades can once again kill. (WHO, 2014)*

These are rather drastic changes in representation of antibiotics, that for a long time have been constructed as the 'big guns' in war against microbes and the triumph of modern medicine (Wallinga, Rayner and Lang, 2015, p. 1319). Now they are linked with the representation of a shared 'ecological crisis of late industrialism' (Landecker, 2016, p. 20).

This perspective of catastrophism and apocalypse comes from the discourse of climate change. Such an approach does make it possible to draw the attention to the issue; but paradoxically, the climate change researchers and activists have come to the conclusion that this is not the best strategy for encouraging any behavioural changes. Therefore, experts from the field of climate change are now moving away from this approach for it is not the right framing that allows us to address the problem efficiently (Nerlich, 2009). Nevertheless, in terms of superbugs and antimicrobial resistance, this discursive perspective has become the main outlet for global organisations to discuss these issues.

5.2.1.2. Hygienic/infection control perspective

Unlike the catastrophic perspective, the *hygienic/infection control* perspective has constituted microbes as a manageable and eradicable risk. In this perspective, microbes, policy makers and medical specialists are represented in an active position, but patients and the general public are represented as passive: either as collateral damage of the problem, or as irresponsible service-users.

In this perspective, microbial threats were imagined as omnipresent in the daily lives of humans, ready to attack:

> *We would be shocked to learn how many different viruses, infection disease causes "sit" with us on the bus, trolley, and airplane; how many of them "sit" beside us in a cinema and on door handles. (TVNET, 18.11.2008)*

This threatening microbial presence was often linked with specific places and objects in public (e.g. airplane seats, trolleys, public transport, money, restaurant menus, elevator buttons and gym equipment) and home spaces (e.g. water faucet, toothbrush, light switch, dish washing sponge, phone, door knobs, bed, salt and pepper sets, dish towel, plastic spatula and knife rack). Hospitals were also imagined as places of extensive microbial presence, particularly HAI-causing ones:

> *Hospitals are a source of new infections – the more you stay at a hospital, the more likely it is that you will catch something. This is not only in Latvia but elsewhere in the world too (Reader, 14.11.2013)*

In this perspective antibiotics, disinfectants, hygienic measures became 'weapons' in the war against microbes (Gauthier, 2011). For example, in case of perceived dangerous daily objects, the act of removing excess microbes from objects has restored the notion of the safe use and cleanness of these objects, free from microbes. It is noteworthy that microbes at home were imagined as something that can be fought; for example, by cleaning a door knob; whereas in hospital settings, the presence of microbes was imagined as a 'permanent resident' that was less easy defeat:

> *You can clean them or not, but these bacteria live in the walls and then enter the bloodstream. (Reader, DELFI, 16.04.2011)*
>
> *At the same time, they [microbes] are in-house residents of hospitals. If you manage not to get them after surgery, that's a miracle. (Reader, TVNET, 14.11.2013).*

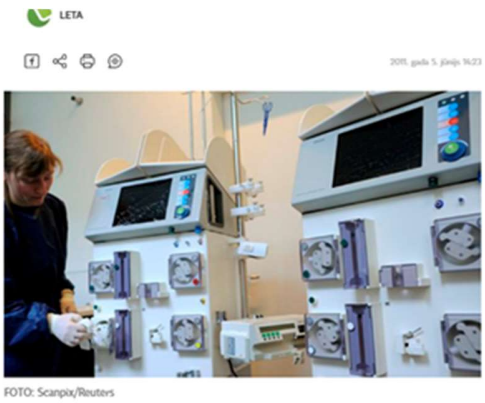
This differentiation in locality suggests that understanding of microbe as a threat was not homogenous, but depended on other factors.

This differentiation in understanding also manifested itself in media discourse, whenever women were positioned as responsible for controlling microbial threats in general. The majority of articles relating to the treats of microbes in a household setting were posted under the media sections designated for women who were thereby deemed to be responsible for controlling microbes at home. It is noteworthy that articles covering other infection control issues often put pictures of women as visual representation of the article; e.g. women hands holding laboratory samples, women medical specialists in individual protection gear, women medical personnel taking care of patient. A visual example of this gendered association of infection control is represented below in Box 2, where on the left, the picture of a woman cleaning the kitchen is used for article on microbial risks in kitchen. On the right article, the picture of a woman cleaning medical equipment is used to cover an article on the spread of dangerous E. coli epidemics.

Box 2. The visual representation of gendered infection control in media. Sources, NRA, 2016; Apollo, 2011

Good to know: millions of microbes in kitchen

Uncertainty around the spread of dangerous bacteria is increasing; new versions emerge



Women were not only positioned to take responsibility for tackling microbial risks, they also were portrayed as posing a higher risk of carrying excessive amounts of microbes and creating microbe-related health hazards. For example, there was an assumption that women's handbags were 'a true hotbed of bacteria,' without giving any further explanations as to how bacteria were capable of telling the difference between men's or women's bags. Several media have contributed to the discussion by publishing a study[38] suggesting there were more microbes on women's hands than men's. In media discourse, there was also a considerable inconsistency of argumentation; because on one hand, it was argued women's hands had more microbes, but at the same time, it was suggested that the reason for this could be the fact that women wash their hands too often and treat their skin with skincare products.

> *Women's skin is more favourable for living organisms habiting in there; that is, women treat their skin, they wash their hands more often and do a lot of things that create a perfect environment for a lot of bacteria. Whereas men's skin is salty and acidic; and therefore, many microorganisms do not choose it. (TVNET, 16.05.2013)*

On the one hand, it was expected that women would take greater responsibility for both microbial control at home and their personal hand hygiene; but on the other hand, it was clear to see that in the media, and especially the comment sections, that women were being blamed for a failure

[38] A study done by Initial Washroom Hygiene was used in these articles. However, full references were not published in the articles.

to practice good hand hygiene. For whatever reasons, the existing hand hygiene practices were being imagined as creating beneficial conditions for microbes, even though this conflicts greatly with generally accepted knowledge about hand hygiene as being one of the pillars of infection control.

Such gendered infection control practices in media were not associated with HAI control as such, but the ethnographic analysis in the Chapter 7 shows how female-based infection control is reproduced at a hospital level when dealing with HAIs. This understanding of gendered infection control creates gaps in HAI control, where it is associated with and thus expected from only half of the people.

Fighting bad germs in HAI cases

The hygienic/infection control perspective shaped a significant part of assembling public discourse on HAI control; as it not only represented the recognition, understanding and management of HAI, but also, within this discursive perspective, the medical, political and patient facets of the issue were represented; not only towards the issue of HAI, but also towards each other. In this perspective, the discourse of HAI control was carefully crafted, and in particular by medical and political actors, as the representation of the issue got entangled with the representation of the actors themselves. Thus, this perspective was assembled in a more dynamic and contradictory manner than the rest of the identified discursive perspectives; with the various discursive tensions over constituting the subjects, relations and ontological boundaries (Nimmo, 2016, p. 114). In this case, the war on microbes got explicitly undermined by the embedded locality and relational dynamics of the stakeholders.

In this perspective, the *war on microbes* was constituted by defining the problem of HAIs as a complex microbial evolutionary, medical and political problem endangering health care and patients. The general understanding of HAIs as a threat was an area in this perspective displaying a stable common ground between medical, policy and lay positions. The dangerous character of HAI-causing microbes in this perspective was linked with the actions of microbes and humans. The responsibility of for microbes was shaped by evolutionary argumentation and microbial behaviour:

> *Dimina argues – although there are no special new bacteria only now emerging, the uneasiness in the world and Latvia is shaped by the fact that they become resistant to many known antibiotics and thus – harder-to-treat.*
>
> *'Antibacterial resistance is a natural process. Bacteria were on Earth million years before us. As much as we can learn to fight them, they will always find mechanisms*

> *for self-preservation. They can 'swallow' antibiotics and then 'spit them out,' creating around them a thicker wall which cannot be penetrated by antibiotics, or they can secrete a substance dividing antibiotics,' says a specialist. (TVNET, 8.06.2016)*

Here the problem of HAI was constructed in terms of the consequences of the natural evolutionary behaviour of microbes. Together with this line of argument, general human activity was also linked with the rise of HAI risks; and in particular, with inadequate infection control practices in the war against microbes:

> *[...] hospital infections are caused by increased durability or resistance to antibiotics, disinfection and other agents used in medicine. (Reader, TVNET, 8.06.2016)*

> *Due to the continued reckless use of antibiotics, the harmful bacteria which up until now could be combated with antibiotics, now become resistant. Therefore, many diseases like pneumonia in future could once again become deadly. (Diena, 23.11.2008)*

Similarly, the problem of HAI was shaped here in terms of the natural consequences of modern medicine, thus representing the threat of HAI as (both biologically and medically) naturally occurring phenomenon.

In the media, this representation of the dangerous character of HAIs has been strongly shaped by medical and public health experts; for example, articles written by infection control specialists, or interviews and commentaries with experts as part of the content of an individual. This tendency differs from other media analysis covering HAI control where a lack of expert voices was reported (Boyce, Murray and Holmes, 2009). In addition, in the case of Latvia, readers also shared this understanding of HAIs as a problematic but natural biological and medical issue. This shared perception between experts and laypeople serves as good grounds for further public debates; especially in terms of moving the narrative on HAI control away from its legacy of being perceived as a sensitive issue. However, this understanding also produces risks for efficient debates on solutions; as this understanding can also be approached in a passive way, where there are not so many possibilities being perceived and defined to help actively fight back against this 'naturally' occurring epidemic. This passive approach was commonly shared among readers, as shall shortly be discussed.

However, this shared understanding of the HAI threat split into different directions when media discussions moved on to solutions, responses, and responsibilities for tackling the threat. Solutions and responsibilities then were constituted between policy makers, medical specialists and

patients; thereby creating gaps, friction and tensions between these lines of reasoning and groups of stakeholders, while also producing certain discursive effects to assist the understanding of HAI control as a manageable problem. To address this problem, these tensions and frictions were shaped by external attribution of responsibility or what Collins, Jaspal and Nerlich (2018) calls 'blame-games.' Within this perspective, policy stakeholders, medical specialists, patients and the general public put responsibility on others, while also sidestepping their own involvement in dealing with the HAI problem. This tendency has been reported in other studies on media discourse on antibiotic resistance and HAI control (Chandler, Hutchinson and Hutchison, 2016; Bouchoucha, Whatman and Johnstone, 2019). As result, in this perspective, the focus on controlling the HAI threat drifted away; instead, it focused more on *who* should take on responsibility for dealing with the problem.

Friction of Responsibility Between Policy-Makers and Medical Community

Throughout the analysed period, a steady stream of calls by the hospitals for national-level government involvement in addressing and dealing with the problem of HAIs was present; whereas politicians and policy-makers actively distanced themselves from the problem in media space by taking a passive stance on it. For example, some argued that this problem was not a priority for national health policy, it was too expensive to deal with, and solutions should come from hospitals and health professionals themselves. The articles with titles such as 'Ministry will not fight a superbug,' 'Hospital infections endanger patients, government pretends not to know' particularly addressed the lack of interest of politicians and policy-makers have showed towards dealing with HAI epidemics:

> *For the most part, medical treatment facilities have thought about how to fight hospital (nosocomial) infections; however, due to the lack of money and personnel, not all measures can be taken. Although the Ministry of Health does not deny the significance of the issue, it offers only indirect ways of fighting the problem; however, the Ministry at this point is not ready to implement a national programme to prevent these infections and neither has the Ministry allocated any funding just for this purpose [...] The Minister [of Health] adds that hospital-acquired infections is an 'issue of professionals' and, therefore, the MoH [Ministry of Health] will wait for suggestions. (Diena, 05.07.2005)*

In the media, hospital representatives usually claimed that it was not possible to solve infection problems without the support of the state; but policy-makers argued that it falls on the hospitals themselves to manage their own health risks. This friction can be linked with the perception

of policy and medical stakeholders that taking responsibility over this issue could risk endangering their public image by becoming a 'scapegoat' for all HAI control problems. Nevertheless, this 'othering' of responsibility and involvement weakened the public debate on how to actually deal with the HAI problem; as a 'blame-game' makes it impossible to move the public debate further (Bouchoucha, Whatman and Johnstone, 2019).

As a result of these frictions, both policy makers and hospital representatives in this perspective directed their responsibility elsewhere, particularly towards out-of-date and obsolete hospital infrastructure. Old hospital infrastructure was represented as responsible for spreading the germs, but new hospitals were represented as the solution for this problem:

> *Rindalds Muciņš, the Secretary of State of the MoH and the former Minister of Health, informed the newspaper that in many medical treatment facilities, built long time ago, ventilation systems, floorings, and layout of patient rooms and units could be deemed unfit; however, millions would be necessary to change all of this. (TVNET, 2.07.2005)*

The old hospital infrastructure was actively blamed for the spread of HAIs and the inability to implement the necessary HAI control regiments in media coverage. Meanwhile, in the UK media, MRSA and the call for matrons were used as a symbol that expressed nostalgia for those days in the past when antibiotics and clean hospitals were effective means of containing diseases (Crawford et al., 2008; Boyce, Murray and Holmes, 2009). In the Latvian case, public discourse was dominated by the desire for new hospitals and infrastructure. Thus, any solution to help control the problem of HAIs was deferred to an imagined, better future where new infrastructure could help enact good HAI control.

This construction of HAIs as a problem of obsolete infrastructure diverted scrutinising away from the stakeholders, as this problem was represented as too fundamental and complex to be addressed immediately. This construction also strategically overshadowed narratives on the healthcare worker's role in HAI control practices. In the media, certain groups like nurses and physicians were freed of any responsibility for spreading HAIs or failing to follow HAI control practices. Instead, the infrastructure was being blamed for the overall failure to comply with HAI control regiments. Only occasionally did readers take the trouble to point out that the medical staff also contribute to the spread of HAIs through contacts.

However, this line of reasoning backfired when it was utilised in a certain case of 'media hype.' Representatives from one hospital (it is noteworthy that this did not include infection control

specialists) publicly declared that there were horrific and deadly bacteria living in the walls of the old hospital building and attacking patients, in order to speed-up the construction of the new hospital block which at that time had been put on ice (please see box 3).

Box 3. Visual and commentary representation of one of articles (titled as Invisible Predator or what Lives in the Old Walls of Stradiņš Hospital?) covering the 'media hype' on predatory microbes in hospital walls. Source: TVNET, 2016.

Ceturtdiena, 19. aprīlis Vārda dienas: Fanija, Vesma

TVNET ZIŅAS | APOLLO | SPORTS | AUTO

Neredzamā plēsoņa jeb Kas mīt Stradiņa slimnīcas vecajās sienās?

Dita Deruma/Apollo 2016. piektdiena 10. jūnijs 18:01

Foto:

«Mani tā mugura moka nost. Stradiņos man dikti labs dakters, bet tur es nebraukšu, tur tā briesmīgā infekcija, neiešu jau sāpošas muguras dēļ aiziet

Shouldn't the NHS react to such statements and suspend any activities at such a hospital due to it being unsafe? (Reader, TVNET, 8.06.2016)

Such an infection is a pressing issue in new hospitals in developed countries too. A new building will not solve the global issue of bacteria which are resistant to all types of antibiotics. (Reader, TVNET, 8.06.2016)

Could this infection be created in order to steal taxpayer's money on a more rapid pace and with greater success? (Reader, TVNET, 8.06.2016)

These were the most commented media articles on the topic of HAIs in the analysed time frame. Although a small portion of readers expressed concern as to how safe it was to receive treatment at this hospital, the majority of readers perceived this as a PR stunt and a type of corruption to attract more funding to the hospital using non-transparent methods and the 'fictional' problem of predatory microbes. Thus, the message on the HAI problem was lost in this media coverage.

This strong focus on shaping HAI control-hospital infrastructure link can be interpreted as a medical and policy stakeholder strategy to avoid taking ownership of HAI control. However, this construction produces a misleading understanding of HAI control, producing a merely passive approach where broader proactive or immediate HAI control measures cannot be expected to be implemented. In the case of HAI control, the *war on microbes* in media discourse was construed as issue for the future and not a matter demanding an immediate response.

What about the Patient's Position?

As mentioned at the beginning of this subsection, in the *hygienic/infection control* perspective, the patients and general public manifested as passive and marginalised member of said perspective. Patients and the general public were mostly represented in commentary sections, forming a parallel surface of public understanding of HAI control within this discursive perspective.

This passive position of the patients manifested when other stakeholders (from policy and medical fields) used their political and expert power to pass down blame and responsibility to patients for spreading antibiotic resistance by not following instructions on antibiotic use, hand hygiene:

> *Unfortunately, patients often demand that doctors give them "most expensive, strong and potent" medicines and, therefore, doctors recommend them broad-spectrum antibiotics, targeting many types of bacteria. (TVNET, 20.11.2008)*

This line of blame was even utilised in contradictory ways. For example, when the article reported that Latvian hospitals have the highest antibiotic consumption compared to other EU countries, there were multiple reminders that patients should use antibiotics responsibly and only according to the doctor's instructions. As patients in hospital are usually not informed about what kind of medicines they receive and have limited decision-making power (at least in Latvia), this suggestion gets problematic. At the same time, victim-blaming patients produces a distorted picture of physicians who can so easily abandon evidence-based medicine in front of a demanding patient. As Chandler (2016) points out, similar 'blame-games' about physicians as over-prescribers of antibiotics and patients as misusers are popular in public discourse, producing a problematic understanding of managing antibiotic-resistant pathogens and overlooking broader factors; such as the social and economic inequalities and inequities that produces vulnerabilities of being exposed to infection.

While this discursive perspective was dominated by the friction to frame the issue either as a hospital or a state issue, the human angle in the perspective was almost completely absent. The patient voice in the public HAI discourse emerged only for a short period of time; especially at the beginning of the 2000s, in stories about patients dying from MRSA and hospitals not being a safe place anymore. During this brief period, the media news cycle was dominated by one particular story of a young football player who survived a car crash but who was now dying from contracted MRSA. The media occasionally stressed that the risk of HAIs is the highest for hospital patients, especially those in intensive care unit or with weakened immune system due to a serious health condition; yet, the patients still remained voiceless, apart from the comment sections where they shared their

experience. It was only in the comment sections where this issue was framed as a part of the debate of healthcare safety and quality. None of the main media platforms, i.e. articles, saw the safety and quality of healthcare as a framework for discussing HAI control, thus taking a marginal position in public discourse.

In the case of HAI control, patients adopted a passive stance towards this issue, suggesting that nothing much can be done to fight the problem of HAIs:

> *[...] Unfortunately, my father suffered from many complications and lost all hope of regaining health and died at the end due to hospital-acquired MRAB [MRSA]. The doctors also admitted that this bacteria was obtained as a result of their medical manipulations… The bacteria do not harm a healthy human being but as soon as you get sick or have a weakened body… That's it. You're done. Funny this is still happening in the 21st century… And it is not true that one gets resistant to antibiotics if he or she has used them recklessly/unnecessary. My father was a healthy man who did not use antibiotics. (Reader, Apollo, 10.06.2016)*

The passive approach especially manifested in narratives where patients shared their experience when they or their family members suffered from a HAI, stating that things like this just happen at hospitals. In the public discourse, the patients did not call for any action; neither by initiating court procedures, nor by mobilising in any type of activity to call for improving the health care and hold stakeholders to account.

For readers, the issue of HAIs has also become a symbol of shortcomings in the healthcare system that they have experienced as patients. For example, when multiple news portals reported an EU study saying that Latvia has the lowest HAI prevalence in Europe, the readers largely interpreted this information not as an indicator for qualitative healthcare but a symptom of limited access thereto:

> *People have no money to go to hospitals to get these infections!!! (Reader, TVNET, 18.09.2013)*

Readers also emphasised such shortcomings as health access inequality, distrust of the health system, and images of widespread corruption within health system, whenever HAI control matters were covered in the media. This suggested that more pressing issues for patients are overshadowing the problem of HAIs.

To summarise: the frame *war on microbes* shaped a significant part of public discourse on HAI control. This frame was split between two discursive perspectives, where the catastrophic perspective imagined this war as being lost by humans, while the hygienic/infection control perspective perceived

humans as having the upper hand in the fight against microbes. Although both perspectives shared the representation of microbes, including HAI-causing ones, as an enemy that should be beaten, both perspectives lacked a public debate on the specifics of how to manage the problem of HAIs. The catastrophic perspective can galvanise public attention towards the issue (Bouchoucha, Whatman and Johnstone, 2019); but as the analysis has revealed, it has not facilitated the production of discursive space for solutions. The hygienic/infection control perspective was overshadowed by the understanding of the HAI problem as a problem of abstract categories (e.g. the problem attributed to bacteria themselves, society as whole, obsolete hospital infrastructure) and tensions and blame-games between stakeholders. As a result, in public discourse, HAI control was represented as almost unmanageable problem; as there was little focus on immediate solutions and tools for fighting against these microbes. A similar conclusion was reached in the systematic review of health communication about antibiotic resistance where 'mobilising messages, solutions and measures that individuals can employ were poorly reported in the media' (Catalán-Matamoros, Pariente and Elías-Pérez, 2019, p. 1435). In addition, this approach also did not promote understanding of HAIs as a shared responsibility where each one plays a role in preventing this problem (Collins, Jaspal and Nerlich, 2018). In the case of HAI control, the *war on microbes* frame was assembled as a rather *weak* war against these microbial threats. Although this framing is highly popular, Wallinga, Rayner and Lang (2015) question the appropriateness of this framing for the purposes of understanding and dealing with antibiotic-resistant pathogens. They argue that this war framing undermines a comprehensive and interdisciplinary political and societal response to this epidemic.

5.2.2 Frame 2: HAI as a Consequence of a Misbalanced Human-Microbe Ecosystem

Alongside the frame *war on microbes,* other frames could be identified in media. Although less popular, the frame *human-microbe ecosystem* has been present in media from the beginning of the period examined, both in media articles and commentary sections. In this frame, scientists and concerned citizens-consumers took an active position; but microbes were positioned either as scientific objects or as semi-victims needing human protection. In this frame, the discursive gaze was directed towards quality of human-microbe relations. This frame often manifested itself in reactive relations to the *war* frame; for example, if articles discussed the use of antibiotics or hygienic practices as part of fighting infections, this frame arose as a response offering an alternative take on these practices. Thus, this frame was part of media discourse on HAI control; one that not only included Pasteurian microbiopolitics, but also added more nuance to it.

This frame was assembled by three perspectives: technological utilisation, ecological reciprocity and ecological morality all sharing a positive representation of microbial encounters. Such expressions as 'good bacteria,' 'friendly bacteria,' 'bacteria that can be useful/helpful for preserving human health' were used in this framework. Gauthier (2011) points out that the representation of 'friendly germs' contradicts the *war on microbes* perspective, thereby assembling an alternative imagination and possibilities for microbes in media discourse.

5.2.2.1. Technological Utilisation

In this perspective, scientists were positioned as active agents, but microbes were positioned as objects of scientific experimentations, innovations and possibilities for advancing human wellbeing and livelihood. In this perspective, microbes were constructed as natural resources to be pragmatically utilised for the needs of humans. In the media, this perspective manifested when microbes were constructed as capable of being used for technological purposes in various fields such as the environment, computers, healthcare and design. For example, with the help of bacteria, waste can be modified into electricity; it was suggested that fairly soon bacteria will be the source of energy for portable devices such as laptops, mobile phones etc. There was also an article stating bacteria had been discovered that were capable of extending human life to 140 years. A similar perspective also manifested in public discourse about probiotics; either in food, or as supplements aiding the health of the human digestive system and the immune system (Koteyko, 2010). One example of this perspective is represented in Box 4, where a microbe is represented as 'hired' for human needs, and visually presented as a toddler being fed by a woman.

Box 4. Title of article: Hire a Bacterium! How the Biological Sewage System Works [Translation]. Source: LA, 2014

When a host hires bacteria, that is, equips the house with a bacteriological purification device, he also undertakes not only to regularly feed them but also to frequently take care of them. This must be kept in mind to guarantee a long and joyful cohabitation [..] (LA, 20.09.2014)

Although this perspective went beyond a hegemonic framing of HAI control as a war on microbes, this perspective did manifest itself, albeit marginally, when discussing the problem of HAIs. One example is when HAI-causing microbes were considered capable of being utilised technological opportunities and thus controlled in this manner; for example, in one article it was reported that the pathogen *E. coli* could be utilised in biodiesel. Similar speculations were shared among readers as a way of possibly dealing with HAI-causing microbes.

5.2.2.2. Ecological Reciprocity

The other perspective in the frame *human-microbe ecosystem*, dubbed as *ecological reciprocity*, continues to construct microbes in alternative ways, rather than being purely dangerous to humanity. This perspective focused on the benefits of the microbial presence in human lives and in the broader environment, while calling into question the previous discursive frame; particularly the excessive use of strategies to carry out the war on microbes, using the argumentation of immunity.

This perspective was assembled by constructing human-microbe relations as balanced and mutually beneficial in different environments, such as the human body and the broader ecological surroundings. Thus, the presence of microbes in human affairs was imagined as necessary. This perspective saw excessive practices of hygiene, cleanness and sterility such as the use of antimicrobial products and hyper-hygienic practices as risks both causing and endangering this ecological balance:

> *Disinfecting everything and living in a sterile cleanliness is a swift way to a certain death. [...] At least 98% of microbes are good or not harmful, and we must encounter the rest of them to make ourselves immune. (Reader, NRA, 24.01.2010)*

This viewpoint portrayed microbes and humans as interconnected in one shared ecosystem. This perspective was similar to the current 'One Health' approach towards dealing with global epidemics of antimicrobial resistance defining AMR as a problem of microbial interconnectedness between human health, animal health, agriculture, environment and food system (World Health Organization, 2015):

> *More and more scientific evidence shows that the use of antibiotics in agriculture contribute to the spread of antibiotic-resistant bacteria among humans. (Reader, TVNET, 19.05.2016)*

However, if the current 'One Health' approach mainly focusses on contamination and transmission of pathogens within this shared ecosystem (Hinchliffe, 2015), this discursive perspective

of *ecological reciprocity* focuses on mutually beneficial relationships of which the ecosystem is constituted, along with risks endangering the quality of these relations:

> *The whole world around us is full of life. The life is in water, air, earth and solid substances. Sometimes we are unaware of the fact that we all are closely connected in a single chain of life and that without any of the parts in this chain we all would be endangered. (Apollo, 4.06.2009)*

> *It is a sterile environment that makes a person more sensitive to all bacteria and fungus. Humans are a part of the ecosystem, and not inhabitants of a sterile environment. (Reader, Apollo, 6.02.2015)*

In this perspective, every element had their own right to be there, and the removal of microbes is imagined as endangering the ecology of this system and thus humans as well. In this perspective, an environment without a microbial presence was perceived as 'unnatural' for humans.

This perspective produced certain discursive effects for the perception of HAI control. In case of HAI control, the public discourse viewed that the spread of antibiotic resistant microbes was linked with excessive use of disinfection products and hygienic practices. In this perspective the problem of HAI was imagined not so much as a consequence of insufficient or inappropriate infection control measures (causes represented in *frame war on microbes*), but as of the *excessive* use of them. For example, the use of antibiotics was not only viewed as a measure for protecting human health, but also ought to be viewed in light of the need to protect microbes beneficial to humans.

This viewpoint positioned human immunity as a natural protection mechanism against 'bad germs' and as the main tool for maintaining balanced human-microbe relationships. Here, misbalanced relationships were not only associated with the creation of superbugs, but also weakened immunity:

> *A strong immune system is important for a human's body. If a person has strong immune system, the body fights diseases and unwanted microbes in a natural way. To have a strong immune system, there must be a normal microflora. However, a person's microflora is often disrupted by daily hygiene products: toothpaste, soap, and mouth washes. Why? Nowadays, many these products contain antibacterial agents which strengthen bacteria, allowing them at the same time to be unconcerned about the body's natural immune system. (TVNET, 31.01.2011)*

> *All of this is because at one point they were too reckless with the use of antibacterial products and used them everywhere, thus destroying natural resistance, and that's why people lost their immunity. Hospital hallways and walls*

were washed with these extra super potent disinfection products. In the end, staphylococcus changed, multiplied [...] (Reader, TVNET, 27.12.2010)

This perception that bacteria is crucial for strengthening the immune system comes from the 'hygiene hypothesis': the lack of childhood exposure to germs, due to sterile environments, is linked to the rise of allergies and autoimmune diseases (Gauthier, 2010, p.272). Thus, to deal with HAIs is to have good immunity that is 'trained' by exposure to different microbial encounters (Gilbert and Tauber, 2016).

5.2.2.3. Ecological Morality

This perspective was assembled in the commentary sections of analysed media sources. This perspective of *ecological morality* was uncoupled from the previous perspective; insofar as it did not construct human-microbe relationships in terms of reciprocity, but instead questioned the moral grounds of human superiority over non-human 'others,' including bacteria. For example, a commentary under an article on the rational use of antibiotics raised a morally charged question:

How can we live with ourselves when we destroy so many living beings by using disinfection, disinsection and deratisation products? (Reader, TVNET, 31.01.2011)

In this perspective, relationships of care, affinity, and sensibility towards non-human communities were imagined as morally right (Yusoff, 2012). This viewpoint problematised the power relationships between humans and microbes by giving microbes an agency of their own and power to fight back against human supremacy:

Bacteria show who the ruler on the face of the earth is. (Reader, Apollo, 10.06.2016)

By destroying microbes, humans just bring themselves more misfortune while there is little-to-nothing to gain. (Reader, DELFI, 01.09.2011)

The incorporation of microbes as a part of a plurality of biodiversity requiring more nourishing relations opens the perception of microbes to previously uncharted ontological spaces that can reconsider the foundation of the *war on microbes* metaphor (Yusoff, 2012). This perspective reflects broader debates on human-environment relations; particularly environmentalist discourses where different responsibilities (like protecting, nurturing, living together) towards non-human 'others,' biodiversity and ecosystem are imagined and maintained (Yusoff, 2012; Jeffery, 2013). However, as Pálsson (2004) points out that this movement also fetishises the nature and rights of all its inhabitants,

including humans, animals and other species. However, this representation in the Latvian media rather romanticised human relations, with microbes as being a constitutive part of nature and thus needing conservation and protection from harmful human activities:

> *We must learn how to coexist and not destroy since there is no other solution that would lead anywhere good. (Reader, Apollo, 10.06.2016)*

Linking microbes with broader debates on preserving the biological diversity of genes, species, ecosystems in Latvian context can also be related with broader debates about sustainable development and national identity. In her ethnography, Schwartz (2006) demonstrated that debates about preserving biodiversity for Latvians are simultaneously debates about 'who Latvians are and what their proper relationship to nature should be' (2006, p. 7); as the social construction of nature and sustainable development are also sources for Latvian nationalism.

To summarise: the frame *human-microbe ecosystem* offers an alternative microbiopolitics of human-microbe relations; one where microbes are recognised and understood in beneficial, reciprocal and moral terms, while microbial encounters are constructed towards mutually beneficial strategies of co-existing and symbiosis; as well as striving for coupling and alliance within the ecosystem, in order to keep it running.

The strong presence of the notion of 'good bacteria' in public discourse shows that the understanding of human-microbe relationships is not static; instead, they are dynamic and context-driven (Gauthier, 2011). Indeed, in Latvian settings, media coverage about HAI control produced alternative debates about human-microbe relations going beyond the *war on microbes* framework. The prevailing general opinion about microbes argued that we must fight against their harmful effects and destroy them. However, this frame represented a more nuanced understanding of the good and bad qualities of microbial encounters, as well as of some more balanced management approaches towards them.

Although this perspective promoted a more nuanced recognition and assessment of microbes, it produced its imagination of HAI control in a rather abstract way; as it depended on ecological processes and levels of immunity that were not necessary imagined as controllable by individuals themselves. As a result, HAI control was constructed as unmanageable – one can only hope for their immunity to fight HAI risks on their own. This ecological but passive understanding of HAI control was shared by my research informants (both medical and patients) that good HAI control doesn't necessarily depend on infection control measures, but rather depends on one's own 'natural'

protection of immunity. Thus, this approach did not promote an active position towards dealing with the problem of HAIs.

5.2.3. Frame 3: Conspiracy Theories and HAI as an Artificially Created Problem

The discursive frame of conspiracy theories emerged in Latvian media around 2009-2010 as the youngest frame. This frame was assembled in the commentary sections of analysed media sources. It is noteworthy that this frame often arose as a reactive response to articles framed from the catastrophic perspective. Although people tended to deny the catastrophe as such, they often saw the threat of superbugs as one purposely created by humans. In this view, HAIs were not associated with *real* patient safety and public health risks, but with some rather different risks factors.

Within this particular frame, certain industries (e.g. the pharmacy industry), corporations, and ethnic or social groups were positioned as active agents. Microbes were positioned as passive instruments in hands of these industries and groups to be manipulated for their own personal interests. In this framework, the general public were also inscribed as passive, positioning them as masses that were being used by the narrow 'elites' for the purposes of power and material gain:

> *There are plenty of large laboratories in the world where new viruses and mutant-bacteria are created, because those who are powerful in this world are programmed to eliminate as many people as possible, because they have decided to reduce the world's population to a minimum; and therefore, they use billions to achieve their dream. Everyone knows that, and there is no lack of information online. (Reader, Apollo, 19.05.2016)*

> *I completely agree that this is now a new type of business where a new bacillus is created, and then shortly afterwards, expensive drugs are put on the market; as a result, the epidemic is averted and millions are pocketed. (Reader, TVNET, 12.08.2010)*

Within this frame microbes, and particularly those that cause HAIs, were positioned as an artificially created problem. In this viewpoint, human-microbe encounters were imagined as being strategically utilised and engineered for certain purposes. It was imagined that these 'artificially engineered microbes' were used by certain groups to take control over others, to dominate, to rule the world, reduce the population, to perform experiments with people, and to control people in the sense of getting them addicted to certain medicines and thus allowing these dominant groups to get more profits.

This framing is the most transcendental one, as this particular discursive approach does not focus on the specific actions, responsibilities and strategies of known stakeholders (antibiotic use among patients, medical personnel prescription practices) but on secretive and invisible power schemes by secretive individuals, organisations, groups (Konkes and Lester, 2017). As result, within this frame, the recognition, assessment and management of HAI manifests in abstractions where it becomes impossible to discuss causal factors, responsibility distribution and possible solutions as they are imagined as strategically kept invisible to a broader public in name of narrow interests of few rather than the public interests. Thus, this frame constitute the problem of HAI as outside of public's control and without much of concrete possibilities how to deal with it. Moreover, this framing also foster to address the issue with anger, mistrust, and fear (Smallman, 2018).

Although any truly in-depth scholarly analysis of conspiracy theories is lacking, recently they have been increasingly recognised as part of mainstream media discourses, which indicates that official and popular explanations of public issues are being rejected and alternative explanations are being sought after instead. (Konkes and Lester, 2017). Framing the problem of HAIs as part of a conspiracy theory is example of this tendency. However, the rise of this framing in case of HAI control can be interpreted in terms of the consequences of the discursive limits of other framings. When analysing narratives circulating about Zika epidemics in Brazil, Smallman (2018) showed that the rise of conspiracy theories was linked to the lack of comprehensive scientific, public health information about the Zika virus. Similarly, in the Latvian context, the rest of the discursive framings on HAI control do not offer a streamline of empowering information on solutions and measures (e.g. rigorous hand hygiene routine) on the phenomenon that individuals can employ instantly (Catalán-Matamoros, Pariente and Elías-Pérez, 2019). In addition, health communication plans for different stakeholders would also help to address this framing of the HAI problem, as it clearly diverges public's attention away from real factors of HAIs and broader antibiotic resistance problems (Smallman, 2018).

Summary

This chapter has explored the public discourse of HAI control in the Latvian electronic media, by analysing the understanding of microbes and modes of managing human-microbe relations. This chapter addresses a gap in the current scholarship: most of the media studies on superbugs and antibiotic resistance originate from high-income English-speaking contexts, while there is a lack of studies from more diverse settings (Catalán-Matamoros, Pariente and Elías-Pérez, 2019). The chapter revealed that the discourse on HAI control has been assembled by three discursive frames. The first

frame focused on microbes as threats to humans, the second frame searched for a different understanding of quality of human-microbe relations and the consequences of misbalanced relations. The third frame constituted microbes as part of conspiracy theories, indicating a worrying trend in the public understanding of emerging public health epidemics. Thus, these findings suggest that public discourse on HAI control is polyphonic in terms of understanding the phenomenon and perceiving measures for managing the problem of HAIs. Pálsson (2004, p. 77) suggests that such multiple framings should not be treated as 'bounded regimes' but as interactive and dynamic. As this chapter has revealed, the multiple framings of human-microbe relationships indicate that the understanding and anthropocentric evaluation of microbes is not homogenous or static, but rather a dynamic process which depends on various interactions and connections with microbes.

In media discourse analysis scholarship, HAI control has been dominantly explored within the framework of *war against microbes*; for example studies have been carried out from the perspective of scientific uncertainty (Koteyko et al., 2007), emerging infectious diseases (Washer and Joffe, 2006), risk management (Washer and Joffe, 2006; Crawford et al., 2008), catastrophe discourse (Nerlich, 2009), discourse of mutation (Brown and Crawford, 2009). However, in this media analysis, the strong presence of the notion of 'good bacteria' in public discourse shows that understanding of human-microbe relationships even when covering the problem of infections are not static, but instead they are dynamic and context-driven (Gauthier, 2011). In Latvian settings, media coverage on HAI control has produced alternative debates about human-microbe relations that goes beyond the *war on microbes* framework and its resultant shaping of public discourse on HAI control. This chapter has also revealed that the hegemonic *war* paradigm has also contributed to the rise of public perception of HAIs as part of conspiracy theories, thus undermining the understanding of the issue as a matter of emerging public health epidemics.

The role of media in health communication, raising awareness and mobilising responses by producing literature is recognised as a crucial force for managing the epidemics of antibiotic-resistant pathogens (Collins, Jaspal and Nerlich, 2018; Catalán-Matamoros, Pariente and Elías-Pérez, 2019). However, as this chapter has already revealed, this potential is not being fully realised in Latvian public discourse on HAI control. Although discourse is assembled by multiple framings, there is a lack of representation of action, solutions and responses towards managing the problem of HAIs; thereby employing the understanding of HAI control as abstract categories in terms of causes, and without any concrete measures to deal with the problem. For example, within the *hygienic/infection control*

perspective the issue of HAI control got overshadowed by tensions and frictions between stakeholders and a failure to include patients in shaping the perspective. As a result, HAI control lost the potential of becoming more visible and stable in the public debates. Collins, Jaspal and Nerlich (2018) suggest adopting the approach of 'solutions journalism' where a media audience is regularly exposed to comprehensive but empowering representations of possibilities where the audience may individually and collectively contribute towards preventing the problem of HAIs.

In the next chapter, I move on to explore how the phenomenon of HAI control is managed in policy settings; particularly during the process of developing new policies.

Chapter 6. Negotiating Stakeholder-Microbe Relationships: Development of Hospital Infection Control Policy

Introduction

After discussing in the previous chapter how the phenomenon of HAI control has been negotiated and assembled into a public issue, in this chapter I turn my focus on how the phenomenon is assembled into a policy that sets the direction and standards of how HAI control should be done (Castro and Singer, 2004, p. xi). I view policy as microbiopolitical in character: a crucial tool for governing the problem of HAIs, whereby certain policy instruments (e.g. regulations, action plans and programmes, whether national or global in character) give stakeholders a framework within which to operate and to establish their relations with the policy problem and each other. Therefore, the following policy analysis enables me to understand how HAI control is negotiated as an object of knowledge and as a target for interventions in policy settings; this is a neglected research area in contemporary HAI control literature (Wallinga, Rayner and Lang, 2015; Dar et al., 2016; Price et al., 2018).

In this chapter, I specifically investigate the development of the national antimicrobial (AMR) action plan.[39] I chose to focus on this specific policy process for three reasons. Firstly, as mentioned in Chapter 4, Section 4.3.3., HAI control was integrated and defined within the AMR action plan as one of the policy priorities for tackling antimicrobial resistance. As a result, and for the first time in a Latvian policy context, HAI control was positioned as a national healthcare issue. Previously in Latvia, HAI control was defined and regulated only as an internal hospital issue; whereas, after this incorporation into the AMR action plan, the HAI policy position could be defined for the first time in terms of politically strategic goals, programmes, funding, and expected policy indicators; thereby broadening its political reach as a much more visible subject of policy. Secondly, since my research investigates how HAI control is negotiated and navigated, the development of the national AMR plan has served as a significant platform where political negotiations have taken place. I conceptualise policy as a constantly moving process which does not stop after approval; instead, policy is evolving, and is continuously negotiated and furthered at various different stages and settings (e.g. planning, implementing, exporting to other contexts, challenging, assessing) (Shore, Wright and Pero, 2011).

[39] The policy development process dates back to 2013; as of now (June 2019) the action plan has not yet been adopted. During this period, there have been four Ministers of Health.

Therefore, I see a particular value in analysing this stage of the AMR policy development which, as of now, has not yet resulted in an approved policy document; but which still offers some significant insights into the policy process. Thirdly, this chapter addresses the process of establishing a new microbiopolitics, where a framework of governance of how relationships with microbes should be recognised, understood and managed has been created. In the context of emerging global AMR epidemics, the current microbiopolitics is insufficient for managing microbial risks, and new forms of governing human-microbe relations are required. This new microbiopolitical attempt is rooted in the necessity of advancing control over microbes.

I begin this chapter[40] by giving contextual information on the HAI-AMR connection and its political effects on the global and national levels. Thereafter, I analyse how normative stakeholder-microbe relationships have been negotiated over the course of the policy development process. I map out four different normative stakeholder-microbe relationships negotiated during the policy-development process: i.e. laboratory-microbe, patient-microbe, state-microbe, and hospital-microbe relationships.[41] I analyse how all four connections were established discursively, how they were debated and negotiated, and how these negotiations manifested in a draft action plan.

6.1. HAI-AMR Connection on Global Health Agenda

Before I focus on the Latvian context, it is crucial to address the global roots of the policy in question, because the Latvian action plan on combating AMR is based on a broader microbiopolitical attempt of enhancing control over microbial threats. Thereafter, the chapter gives insights on how this global AMR policy agenda has been taken up and managed in the Latvian context.

Over the course of the past decade, AMR policy and subsequently HAI control have reached the highest global political levels. This high priority of the global health agenda has resulted in a highly standardised global AMR policy, as outlined by the World Health Organization (WHO), which serves as a blueprint for AMR activities throughout the world (European Commision, 2017, p. 18).[42] The

[40] This chapter is based on empirical data from my PhD fieldwork (interviews with stakeholders involved in drafting the AMR action plan), combined with data from fieldwork conducted prior to my PhD studies (participation in AMR policy-planning meetings; please see Chapter 3, Section 3.4.4.)

[41] I have focused solely on relationships relevant to HAI control. For example, I did not carry out further investigation into outpatient care-microbe relationships, as these do not fall under the scope of my research.

[42] EU has its own AMR Action plan ('A European One Health Action Plan against Antimicrobial Resistance (AMR).') It is based on a WHO Global action plan. Please see: https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf

global action plan on antimicrobial resistance was adopted by the WHO in 2015; the UN, among other global authorities, is also involved in implementing the AMR policy (United Nations, 2016). In the plan, HAI control is defined as one of the five strategic objectives[43] for achieving the overall goal of 'for as long as possible [...] treat and prevent infectious diseases with effective and safe medicines.' (World Health Organization, 2015, p. 8).

The WHO's Global Action Plan is rooted in the so-called 'One Health' approach, which recognises the interdependence of human, animal, and environmental health. The One Health approach expands human-microbe relationships and connects them with animal and environmental health. From a relational perspective, the problem of AMR is a problem of interconnectedness. The interdependent links between microbes, humans, animals, food, soil, air, and water have led to a public health crisis; not only on account of causes and routes for diseases (e.g. zoonotic diseases rooted in people-animal connections) but also because of the antibiotic-resistant microbes that travel through these connections; and which thereby pose challenges for human, animal, and environmental health and sustainability. These globalised networking processes have brought microbes, humans, animals, and environment into such a close connection that antibiotic resistance is assumed by global policy authorities to be present in every country; therefore, this problem is now identified as a global risk which exceeds the capacity and resources of any single organisation or nation to deal with on their own (WHO, 2015:5). Or in other words, the problem of AMR requires an expansion of microbiopolitics. This means that human, animal, and environmental encounters with antibiotic resistant microorganisms should be controlled and governed more than ever before, as previous microbiopolitical practices (e.g. antibiotic use, infection control) have turned out to be inadequate means of controlling microbes.

The prevailing AMR policy has not only created a new relationship between HAI control and AMR, but also new relationship pathways between the global authorities on human, animal, and environment health. For example, the Global Food and Agriculture Organization of the United Nations and the World Organisation for Animal Health have developed a collaboration model for coordinating global AMR activities (The FAO-OIE-WHO, 2010). Moreover, several global health authorities, e.g. the

[43] The remaining four strategic objectives are as follows: increased awareness and understanding of antimicrobial resistance; knowledge via surveillance and research; optimising the use of antimicrobial agents; sustainable investments that take account of the needs of all countries concerned, with increased investments in new medicines, diagnostic tools, vaccines and other interventions. (http://www.who.int/antimicrobial-resistance/global-action-plan/en/)

WHO, the OECD, the UN, and the EU, are pushing for all member states to develop their own action plans, all of which should be rooted in a One Health approach, with the same objectives as outlined in the WHO's Action Plan.

Wallinga et al (2015) points out although evidence on the increasing prevalence of antimicrobial resistance has been systematically documented since the 1950s, global policy responses towards this problem have been surprisingly slow and ineffective. For example, in 2001, the WHO adopted the Global Strategy for Containment of Antimicrobial Resistance; but this first attempt to set a global action plan to tackle the AMR problem failed to reach progress in terms of implementation (Wallinga, Rayner and Lang, 2015, p. 1318). Further research is necessary to help understand this policy failure.

When comparing the WHO global plans of 2001 and 2015, both policy documents are aimed at the prevention of infections and tackling the spread of antibiotic-resistant microorganisms (WHO, 2001, p.12; 2017, p.1). However, the 2001 policy did not have the same scope as the new action plan. Under a relational lens, the previous policy document lacked some significant underlying connections that are central to the new document. For example, although the 2001 AMR policy document addressed AMR as a global problem, interventions were mostly directed towards national governments and health systems: i.e. the problem of AMR was not conceptualised under a One Health approach, thus failing to recognise the interconnectedness of the human, animal, and environmental aspects of the AMR problem. The previous policy document was directed towards much narrower policy target groups: patients, healthcare specialists, national governments and health systems. It was mostly rooted in human health only marginally addressing the use of antimicrobials in food-producing animals. While the previous global strategy conceptualised the AMR policy as an isolated policy to be carried out in each individual healthcare system, thereby positioning the issue as an internal matter for each country, the new action plan defines international collaboration and coordination as a key element of the new policy. 'This action plan underscores the need for an effective 'One Health' approach involving coordination among numerous international sectors and actors, including human and veterinary medicine, agriculture, finance, environment, and well-informed consumers' (WHO, 2015: VII). Building the new AMR policy on broader conceptual connections (humans-animals-environment) has allowed it to establish new relationships between different policy stakeholders, who are approaching the problem of AMR more holistically.

6.2. HAI-AMR Connection in the Latvian Context

The current global AMR policy expects each national government to develop their own national action plans, all centred around standardised strategic goals (ensuring a robust national action plans for dealing with antibiotic resistance, improving the surveillance of antibiotic resistant infections, strengthening policy measures to prevent and control infections, regulating and promotion proper use of quality medicines, informing public on antibiotic resistance), thus incorporating HAI control into a national AMR policy. National action plans are also expected to be built upon a 'One Health' approach (WHO, 2015).

In the Latvian context, the HAI-AMR connection materialised in 2013, when a multi-sectoral national committee was established and rooted in a One Health approach; this included policy stakeholders from both the human and animal health sectors. The Committee was formed and approved by the Ministry of Health. With the establishment of the Committee, the AMR policy development process finally commenced.

Before the Committee was officially established, an informal meeting was convened, inviting various potential participants.[44] These included infection control specialists, along with representatives of the Ministry of Health and the Centre for Disease Prevention and Control (CDPC). At the initial meeting, none of the parties were willing to chair the Committee and to take charge of the overall development of the action plan; albeit for different reasons. Infection control specialists did not wish to be in charge, as their previous efforts had turned out fruitless, given their lack of political power. The CDPC's position was that it lacked sufficient human resources; but the Ministry of Health argued that this issue does not fall under the responsibility of the Ministry, as it was considered to be a public health issue. Since the CDPC was subordinated to the Ministry of Health, it took on the chairing role. During the initial meeting, negotiations took place as to whether the Committee was to be policy- or expert-oriented. Since the field was perceived as highly specific and required certain specific forms of knowledge, a lot of attention was paid to the composition of the Committee and to the involvement of the 'right' stakeholders. The Committee had to possess both

[44] My participation in this meeting was accidental – I happened to be invited to present study results on HAI control policy analysis. During this meeting, I was able to witness the formation of a national committee on tackling AMR. This meeting was significant not only in terms of further policy development, but for me personally as well; as instead of simply helping me conclude my research in this area, this meeting opened up new pathways for my research.

political impact and people with expert knowledge. In the end, the Committee was not only interdisciplinary, but also included policy-makers and experts from the field.

The Committee was delegated with the task of evaluating the antimicrobial resistance situation and the current national regulatory framework. The Committee also had to develop a national action plan and any other necessary policy recommendations to help tackle the problem. According to the agreement reached in the initial meeting, the AMR Committee was formed of 21 members, representing the Ministry of Health, the Ministry of Agriculture, the CDPC, the National Health Service, the Health Inspectorate, the State Agency of Medicines, laboratory specialists in human and animal health, representatives from all three university hospitals (infection control specialists and high level hospital managers), a patient NGO, representatives from the General Practitioner Association and the Tuberculosis Association. The Head of Committee was a representative from the CDPC; but the deputy was from the Ministry of Health, as agreed in the initial meeting.

It was generally expected that all the experts involved in development of policy-planning documents should have policy-planning and implementation capacities, as they were asked to carry out the functions of a public authority in policy planning. In the first meeting, the work of the Committee was divided into five working groups, similar to the strategic goals defined in the WHO Action plan:

- AMR surveillance and consolidation of laboratory capacity
- Rational use of antibiotics
- HAI control
- Educational interventions and public campaigns
- AMR prevention in the field of animal health

The activities of these working groups were mainly carried out by experts from their respective fields; while representatives of the state authorities who were members of the Committee mainly refrained from engaging in any working groups, and only took part in the general activities of the Committee. This separation and the political consequences ensuing from it are analysed further on in the chapter. The Committee members were permitted to take part in several working groups at

the same time; especially infection control specialists, who participated in multiple working groups. The meeting minutes have been made publicly available.[45]

The Committee had to follow a technical procedure that determined the formulation of the AMR action plan.[46] When health policy documents in Latvia are developed, they are expected to consist of certain parts. The first part of any policy-planning document positions and links the action plan with normative acts, legislation, and policies; both on a national and a global level. The next part is a situation analysis with the available data, statistics, and studies; in order to describe the situation and identify the main problem areas to be solved. After this, the policy planning document needs to define some directions for action, specific measures, responsible institutions, implementation deadlines, and the funding required to implement any planned activities; along with the sources of any required funding. After preparing a draft action plan in line with the above formula, the Committee had to submit their plan to the Ministry of Health. As the Committee proceeded to conduct its work, most of the meetings were dedicated to describing the situation and identifying any problems; and only a small fraction of meetings addressed the development of activities to help solve any of the problems identified. The final development stage for every policy document is a public consultation by the Ministry of Health, where a policy document draft becomes openly available for the purposes of public review. During this phase, everybody can help contribute to the policy document draft by submitting their comments, questions, and suggestions. Up to now, action at the national level has not reached this stage. But once the document is finalised, a decision has to be made about attracting funding.

Although AMR policy development started in 2013 with the establishment of a multi-sectoral Committee responsible for drafting the plan, the development process is still continuing (please see table 8).

[45] The minutes for each meeting were highly detailed, and thus represented a helpful source for the purposes of data analysis.

[46] A description of the technical procedure is available here (in Latvian): http://tap.mk.gov.lv/valsts-parvaldes-politika/arhivs/attistibas-planosana/strategiska-planosana/

Table 8. History of AMR policy development

2013	2014	2015	2016	2017	2018	2019
Committee established to draft national action plan. Three Committee meetings held.	Six Committee meetings held.	Two Committee meetings held. Draft action plan submitted to the Ministry of Health. Head of the Committee left the position both in the Committee and the CDPC.	Draft action plan processed by the Ministry of Health.	Draft action plan processed by the Ministry of Health.	Committee meeting held to 'reanimate' the draft action plan.	Draft action plan processed by the Ministry of Health.

The actual work process of the Committee took place from 2013 to 2015, and during this time 10 meetings were held (3 meetings in 2013; 6 in 2014; 1 in 2015). The final official meeting of the Committee took place in 2015, and in the same year a draft action plan was submitted to the Ministry of Health. Thereafter, in 2016 and 2017, the action plan was held up by the Ministry of Health; and around the same time, the Committee suspended its activities, because the Head of the Committee had left the CDPC. It is worth mentioning that the Committee has been without a head ever since.[47] At the initiative of a few members of the Committee (infection control specialists), there were some attempts in 2018 to 'reanimate' the action plan and work of the Committee. At the beginning of 2018, a Committee meeting was held, in order to proceed with the approval of the draft action plan. As of now, the action plan is still in process at the Ministry.

This chapter continues the analysis by focusing on the most active policy development stage: i.e. the active work period of the Committee (2013-2015). As of now, the plan has not yet been approved or enforced; but the structure of the action plan, the AMR situation analysis, and the

[47] I conducted my PhD fieldwork during 2016-2017 when the action plan was still on 'stand-by.' During this fieldwork I interviewed most of the Committee members. A lot of them did share their frustration with this situation.

strategic goals of the plan all provide good foundations for the analysis. Therefore, the negotiation process leading up to the draft action plan is relevant and does have value, providing a better understanding of the dynamics of policy development processes.

6.2.1. Reflexive Note on my Participation in the Committee's Work

Due to my research interests and my previous experience with the topic of HAI control, I was also invited to participate in the Committee's meetings. My involvement in these meetings provides an illustrative lens on policy making process where the matter who is being involved represents the fluidity and dynamics of policy making process. Throughout the meetings, my status was classified as 'other participants,' and I positioned myself as a social science researcher interested in the topic and its various developments. I treated these policy-planning meetings as fieldwork, so I made observations and took notes.[48] I was not the only one participating in the meetings as an unofficial member of the Committee; since from time to time, other people were also invited to participate in different meetings, most of them being experts from their respective fields (e.g. infection control; hospital management). Although initially I positioned myself as a passive observer, I gradually became a participating observer. For example, at one point the HAI control working group asked for my input on the position and role of patients in the context of HAIs and, therefore, I was invited to contribute to the work of the working group with conclusions from a study (HAI control policy analysis) I had conducted before the formation of the Committee. Thereafter, I was positioned by the members of the working group as someone voicing a patient position. As a result, I was given a chance to make a small contribution to the draft action plan, by adding some insights regarding patient positions.

Looking back at the meetings and putting my participation under a more critical lens, I do feel responsible for not pushing the patient voice and position more actively, especially after the Patient Ombudsman (the only representative of the patient position) gradually stopped participating in these meetings; while late still, the organisation ceased to exist. For example, I could have argued more actively that patient experience must be included in the policy-making process, and that the patients cannot be left marginalised with a passive voice, and that instead they must be a part of the policy-making process; and their voice must be as significant as that of all the other stakeholders. It was not my intention to become a patient lobbyist, so instead I chose the middle ground – I tried to make the

[48] I had an agreement with the Head of the Committee that I could also participate as researcher and take notes.

patients more visible in the policy-making process, while avoiding any confrontations; given that I never had a guaranteed invitation to any subsequent meetings.[49]

6.3. Negotiating Stakeholder-Microbe Relationships

Now I turn my focus to how the new policy was assembled, by analysing how stakeholders negotiated their relationships with microbes as policy subjects over the course of the aforementioned 10 Committee meetings. I analyse how stakeholders engage with microbes as policy subjects, how they negotiate relationships with policy subjects and other stakeholders and what kind of outcomes were produced through these negotiations, thereby setting a framework for how HAI control should be done. Therefore, I see HAI control policy as a result of relational work, where relationships between the policy stakeholders and with the policy subject are either reshaped or established anew (Hunter, 2008, p. 522). This allows me to see that policy is not only an instrument of governance and power, but also works as a significant organising principle of the broader social order. In the further analysis, I adhere to the viewpoint of Shore et al (2011:2) that 'through the analysis of these policy processes we are able to observe the way fragments of culture and society are brought into new alignments with each other to create new social and semantic terrains.' Looking at policy processes more broadly enables me to analyse how these processes classify and organise humans, microbes and ideas in new ways, with the policy then becoming a vehicle 'for social change or reproducing the existing social order' (Shore, Wright and Pero, 2011, p. 3).

I have focused on four different stakeholder-microbe relationships that were negotiated during the policy-development process, i.e. laboratory-microbe relationships, patient-microbe relationships, state-microbe relationships, and hospital-microbe relationships. Each of these relationships were manifested in different parts of the AMR policy. Laboratory-microbe relationships produced evidence about the prevalence of the AMR problem, while patient-microbe relationships represented those affected by AMR and the target audience of this policy. Both state and hospital-microbe relationships represented parties responsible for managing AMR problems and implementing AMR policy. By approaching policy development analysis in this manner, I was able to

[49] My shifting position in the Committee's meetings did not change the way I approached the data analysis. Instead, I have been even more mindful about the manner in which I have interpreted the data. I believe my participation in the Committee's meetings was beneficial, since this gave me access to some data which would not be available to me otherwise. Data triangulation (meeting minutes, my personal notes, and interviews with stakeholders) enabled me to consistently ensure the validity of the data.

explore how each of these elements were negotiated and navigated during the policy development process, and also how they were assembled in the policy document (Latour, 2005). Here, I aligned this analytical approach with critical policy analysis studies focusing on discourses, meanings, assumptions, rhetorical strategies embedded within policy processes themselves; thereby illustrating the problematic, messy and ambiguous character of political processes, and thus moving beyond the conceptualisation of policy as a rational and linear problem-solving cycle or as a mere series of logical stages (Turnbull, 2006; Yanow, 2007; Shore, Wright and Pero, 2011; Fairclough, 2013).

Each of these four relationships were negotiated by stakeholders involved in the Committee's work (please see Table 9). I have defined the aim for each of these negotiations. For example, it quickly became clear that closer relationships with microbes (e.g. expanded coverage of pathogens within laboratory surveillance systems; better diagnostic tools for gaining more in-depth knowledge about antibiotic resistant microbes) were not on the agenda of medical laboratory stakeholders. Instead, their aim was to stabilise their current relationships with microbes (nationally standardise antibiotic resistance detection diagnostic tools; carry out quality and capacity audits of microbiological laboratories).

Table 9. Stakeholder-microbe relationships

Stakeholder-microbe relationships	Stakeholders initiating perspective	Aim of negotiations
Laboratory-microbe	Medical laboratory stakeholders	Stabilise the current laboratory-microbe relationships
Patient-microbe	Stakeholder from Patient Ombudsman	Establish and maintain patient-microbe relationships
State-microbe	State stakeholders from human health: Stakeholders from Ministry of Health, the Centre for Disease Prevention and Control, the National Health Service, the Health Inspectorate, the State Agency of Medicines State stakeholders from animal health: Stakeholders from Ministry of Agriculture, the Food and Veterinary Service, the Institute of Food Safety, Animal Health and Environment	Strengthen state-microbe relationships
Hospital-microbe	Stakeholders from three university hospitals	Standardise and advance hospital-microbe relationships

In the text to follow, I detail how all four connections were established, how they were debated and negotiated, and what policy results these negotiations produced. Each connection was represented in the text in a similar manner: first, I started by a representing microbial perspective in the sense of what difference the microbe is making; and in particular, for the stakeholder (Latour, 2005, p. 71) or how the microbial presence matters for this particular policy domain (Ingram, 2011); then I describe how significant the connection was during the AMR policy development process, and what the aim of the negotiations was. Then I analysed what kind of strategies, tactics, approaches were used during the negotiation process, and what policies resulted from each negotiation. Where possible, I have provided a possible interpretation for why each of these connections were negotiated and developed in certain ways. I represent these connections in the order shown in Table 9.

6.3.1. Laboratory-Microbe Relationships

Laboratory-microbe relationships might have seemed straightforward and obvious. However, microbes become visible and knowable to humans only through these relationships; and the ability of microorganisms to resist antimicrobial treatment, especially antibiotics, has challenged the ability and capacity of microbiological laboratories to detect and identify the presence of microorganisms and to interpret diagnostic results in a rapid, efficient and credible manner. On the one hand, laboratories throughout the world have been able to produce enough evidence to set in motion the global AMR policy; however, it has become clear that existing laboratory methods and available tools are insufficient, and that there is a great need for faster, more qualitative and reliable diagnostic tools and surveillance systems. From a relational perspective, laboratories are currently facing the imminent task of establishing closer and more effective relationships with microbes, in order to make it to possible to learn more about microorganisms and thus exercise more efficient control over them (Struelens, Denis and Rodriguez-Villalobos, 2004; Zhang, Gowardman and Rickard, 2011; Zhang et al., 2015).

During the policy-making process, laboratory-microbe relationships emerged as one of the central connections; as these relationships were discussed in 7 out of 10 Committee meetings. At the very first meeting, it was decided a separate working group would be established to strengthen AMR surveillance and laboratory capacities.

Over the course of the Committee's meetings, the overall purpose of negotiations was not to advance or strengthen laboratory-microbe relationships *per se* (e.g. through new diagnostic tools, surveillance systems, monitoring new pathogens or increasing surveillance over old ones). Instead, the key aspect was the need to stabilise already existing relationships. The connection between laboratories and microbes was seen as unstable and highly problematic. The laboratory stakeholders argued repeatedly that laboratory data produced up until now is not reliable and cannot be trusted. The critical attitude of the laboratory stakeholders towards the data produced by their own laboratories made the stakeholders argue that the work of the Committee is meaningless in the absence of credible data:

> *What is the point of the Committee when there are no reliable data? (Laboratory stakeholder)*
>
> *[...] there is no point to talk while there is not a unified laboratory testing standard. The data cannot be trusted. (Laboratory stakeholder)*

However, not all members of the Committee agreed with this assessment, arguing that certain studies and projects have given high-quality and credible data on certain microorganisms (e.g. MRSA) which can then be utilised as part of the task of building a 'foundation' of evidence.

During the meetings, laboratory-microbe relationships were positioned by laboratory stakeholders as highly unstable; this was linked to the shortcomings of current lab work. Firstly, this instability was linked with the fact that laboratories in Latvia used two different laboratory standards for the detection of resistance;[50] thus, different AMR networks represented different resistance situations in Latvia (the data was considered incomparable, as different standards produced different data). Secondly, laboratory stakeholders drew attention to some quality issues with daily laboratory operations; i.e. laboratories often failed to use the updated versions of these various sets of standards, which were already different to begin with. Stable and standardised connections between laboratory and the microbes to be analysed were also considered to be challenging, due to the lack of a functioning national laboratory accreditation system, as well as the lack of national

[50] Laboratories use two types of standards in determining antimicrobial susceptibility: the Clinical and Laboratory Standards Institute's (CLSI) standard and the European Committee on Antimicrobial Susceptibility Testing's (EUCAST) standard. One based on US standards and the other uses EU standards for determining microbial sensitivity; so two different sets of laboratory equipment and procedures are required. It is noteworthy that as of now, it has not been publicly disclosed that there are two types of testing standards used in the country; which means that testing of the same sample in two different laboratories can provide incompatible data.

methodological guidelines that would set a uniform standard for how laboratories ought to produce evidence about AMR.

Thirdly, it became clear during the negotiations that laboratory-microbe relationships were insufficiently mobilised. I.e. microbiological tests were not prescribed for a sufficient number of patients; as a result of which, there was insufficient data about the resistance situation in the country. Therefore, no proper conclusions could be drawn with regard to this problem. Laboratory stakeholders argued that this was how hospitals tried to save money. Furthermore, the analysis of data about microbes was not seen as being in-depth enough; that is, they were analysed only phenotypically, when this should have also been done on a molecular level instead.

The laboratory stakeholders pursued four negotiation approaches, in order to stabilise the current laboratory-microbe relationships. Over the course of the meetings, these negotiation approaches became more like efforts to strengthen laboratories and improve quality of their current work, but they avoided taking a closer look at how to improve the laboratory data on AMR. Firstly, they used the European Centre for Disease Prevention and Control (ECDC) audit visits and their reports as a negotiating tactic, in order to argue for some necessary changes to laboratory-microbe relationships. For example, the ECDC auditors have argued several times that it is necessary in Latvia to improve the quality and the representativeness of data acquired through laboratory testing, to strengthen a continuous mechanism for the analysis of typing results, and to define responsibility on a national level for these tasks. At one point, the work of the laboratory working group was significantly delayed because the group was waiting for the ECDC's audit report to be available. This clearly demonstrates how far the stakeholders were relying on the authority of the ECDC. The ECDC's audits were seen by laboratory stakeholders not as a controlling, disciplinary or punitive measure, so much as a possibility to get noticed, and to ensure their needs were heard and addressed (Street, 2012). The laboratory stakeholders showed a real eagerness to use the audit reports and recommendations as an instrument to argue for change.

The second negotiation approach pursued by the laboratory stakeholders was demanding that the Ministry of Health initiate a State-mandated shift to a united AMR detection standard that all laboratories in the country should be required to follow. This rather coercive tactic was pushed by laboratory stakeholders at the Committee meeting, after they had failed to persuade the community of laboratory microbiologists to make this shift voluntarily. These laboratory stakeholders had organised a meeting at the Association of Microbiologists, which is a professional organisation for all

laboratory microbiologists. Here, they argued that the shift from CLSI to ECAST was highly necessary, due to various reasons: e.g. the EUCAST standard was available free-of-charge, but CLSI was not. Most of the Member States of the EU had already made the switch; the European standard was more suitable for the strains of microorganisms in circulation throughout Europe at that time (that is, it better met the realities of Latvia); and the ECDC had already strongly recommended switching to the EUCAST standard. This attempt to initiate a switch between standards was not successful; it was not supported by the laboratory microbiologist community. Specialists from smaller laboratories were not interested in switching to another system, because they did not have time to learn the system and develop new methods. As the stakeholders had not succeeded in enabling a switch to a new standard through the Association of Microbiologists, an argument was made at the meeting of the working group that they should turn to Ministry of Health, who would then have to decide about the shift to a new standard; but on a Ministry level, by the issuing of a new regulatory enactment. As a result of these negotiations, the Committee issued an official request to the Ministry of Health to initiate the shift from CLSI to EUCAST. During the meetings of the Committee, no official response was received from the Ministry of Health.

Another vehicle used for negotiating laboratory-microbe relationships was the discussions about incorporating laboratory electronic data systems into an e-health platform which was in development at the time. This integration was seen as a significant way of stabilising and standardise laboratory data and the accumulation of such; since up to that point, every laboratory accumulated data in different systems, with different approaches towards infection classification and resistance determination. When this possibility was negotiated, the National Health Service (NHS), the authority charged with the development and implementation of e-health, quickly rejected such an option; they argued that this would lead to unnecessary costs for laboratories. Furthermore, it was argued that the NHS was not able to achieve this objective alone, nor did the Ministry of Health also did not have any tools to enable incorporation of laboratory computer systems into the platform of e-health. No further discussions were held about this topic, nor were did any negotiations bear fruit.

The final negotiation strategy employed by the laboratory stakeholders was discussing the option of making laboratory-microbe relationships more public in character, thereby making them more stable. There were repeated discussions about whether laboratory testing data should be made publicly available; for example, to describe patterns of resistance in different regions. However, such a possibility was rejected, and data confidentiality was favoured instead; given that this was a better

way of encouraging reporting. Therefore, public access to data was seen as a threat, rather than as an opportunity for improving laboratory-microbe relationships.

As a result of these negotiations, the main planned activities were as follows: shifting to a unified laboratory standard for AMR detection (EUCAST); subjecting microbiological laboratories to quality assessment; determining the functions of the national reference laboratory; improving the education and strengthening the capacities of laboratory specialists; and more active sampling of resistant microorganisms associated with outbreaks of infections, along with clear procedures for funding allocation.

Throughout the process of negotiations, the main focus was on strengthening the existing relationships between laboratories and microbes; though, paradoxically, the focus on microbes themselves was lost. The negotiations did not address the development of new tests, in-depth analysis of microbiological samples, data comparison. Instead, the negotiations focused more on addressing the visibility and capacities of the laboratories themselves. Although the laboratory stakeholders drew attention to the unreliable character of the testing data, this data was nonetheless used in the action plan's description of the AMR situation, thus being represented as adequately stable. Paradoxically, during interviews with the very same laboratory stakeholders, the informants were unwilling to share their experiences of dealing with these shortcomings, and avoided discussing them in detail.[51] One possible explanation might be distrust towards the researcher, and the fear of having their professionalism undermined, in the expectation of producing 'authoritative' evidence that should not be doubted (Latour, 1987).

6.3.2. Patient-Microbe Relationships

Patient-microbe relationships are the most fundamental connection, as infections caused by resistant pathogens place the heaviest burden on those patients who are suffering from them. However, throughout the development process of the AMR policy, patient-microbe relationships were the most neglected. Somehow, this connection was left undebated for the most of the Committee's meetings.

These relationships were the most marginal ones, and they were only discussed in three of the Committee's meetings. They first emerged in the first Committee meeting, when the sole patient

[51] All of them also refused to audio record interviews.

stakeholder suggested to focus the work of the Committee and the action plan on patient safety, as well as on patient education and involvement. The same stakeholder also led one of the working groups ('Education Interventions and Public Campaigns'). At the outset, these relationships were established with some great potential for negotiation and for becoming ever more relevant and visible to other stakeholders; but they did not materialise any further, and ended up not being very fruitful. There are a couple of reasons for this. First of all, starting from the second meeting, the focus on patients as a separate target group for this policy was lost, and redirected more towards public campaign activities, like Antibiotic Awareness Day. Focusing on patients versus a broader audience requires different policy instruments; specifically addressing patients asks for more in-depth and specific engagement with the target group. Moreover, focusing on patients requires a more long-term policy commitment, while public campaigns can happen less regularly.

Secondly, the sole stakeholder representing the patient connection oftentimes did not present themselves and the connection between patients and microbes in the most efficient way. Many suggestions made by this stakeholder were rejected: e.g. when the patient stakeholder suggested that a study must be conducted into existing knowledge on the use of antibiotics, another stakeholder responded that there already was a study conducted by Eurobarometer on knowledge and habits in this regard. Eventually, the stabilisation of these relations was greatly affected by the fact that this stakeholder clearly lacked the capacity to effectively lead the working group; and as a result, different representatives of the patient organisation were involved in the working group. That led to a situation where another Committee member (hospital stakeholder) took over the leadership's position of the working group. As a result of these changes, the focus on patients was marginalised even more; because the working group re-organised its work once again, and now focused on professional education and education interventions for medical practitioners.

One possible explanation is that whenever speaking about resistance issues, patients are usually detached from the problem as such, mostly failing to address or articulate how this challenges those patients who have first-hand experience with the microbes that are the very subject of the whole policy. It was also hard to fully establish and maintain this connection, due to how patient-microbe relationships were maintained solely by one stakeholder (a patients' rights organisation) which at one point withdrew its participation from the Committee, and so the organisation ceased to exist altogether. Whereas other relationships had several spokespersons at the Committee's meetings, the connection between patients and microbes was lacking representation. Moreover, the

field as such is perceived as highly technical and expert-driven; therefore, patients are not involved, nor are they seen as being able to give any kind of contribution. Thus, tackling the problem of resistance is seen as something that must be done to patients, rather than with them. The weak position of the patients during the work of the Committee can also be explained by the overall state of patient organisations in the country. None of the patient organisations in Latvia receive any state funding; while the Patient Ombudsman, before it was closed, operated as a private initiative, rather than as an independent state organisation. Therefore, it is challenging for patient organisations to stay sustainable, and only a handful of patient organisations have managed to stay afloat since the country first regained its independence. As one journalist specialising in reporting health care issues pointed out:

> *Patient organisations, you see, are based on a single disease. And that is dangerous because you can probably imagine what is their sole source of funding, right? Pharmacy! So, they have a very, very specific position, mostly dictated by the pharmacy. As bad as it sounds, money determines content. Since our legislation does not provide for other funding for non-governmental organisations, you cannot say that these organisations are doing something wrong. They stand for the rights of their associates, relatives and themselves to gain access to medicines. That is the most crucial thing they stand for.*

The way patient NGOs perceive healthcare issues exceeding the realms of a single disease, like healthcare quality or patient safety, is dictated not only by the unsustainable conditions in which patient organisations have to function, but also by their own narrow focus on individual diseases:

> *As an association we have never dealt with this matter [HAI], as this is a specific and narrow topic, and nobody talks about it! And it is hard to imagine that there will ever be a patient organisation… support group for patients with hospital-acquired infections… or something like that. No, there will never be anything like that, that is too specific. That is too complicated [...] everything is therefore in the hands of professionals, and depends on how capable they will be in lobbying about this matter." (Interview with patient NGO representative)*

As this quote demonstrates HAI control or broader AMR issues are not imagined as part of the agenda of patient organisations; it is for medical specialists to deal with.

Patient-microbe relationships were initially established with some great potential in terms of becoming relevant to the development of AMR policy. But as the Committee's work proceeded, these relationships struggled to gain any foundation or permanent presence in negotiations. The overall policy could only gain traction if the stakeholders would refocus their AMR policy on patients; as they,

in the end, are the central element of the issue as such. Although the field is seen extremely technical, and patients are not considered as being able to give any contribution to the development of policies, the work of the Committee clearly showed that the experts were not voicing the patient position. As a result, in the absence of patient representation, the voice of patients was lost from these discussions.

6.3.3. State Institutions-Microbe Relationships

Microbial activity, behaviour and adaption to human-created conditions (excessive use of antibiotics, ineffective infection control) have made it an urgent necessity for national health authorities to produce new governing tools in response to newly created microbial challenges; because previous policy instruments are no longer enough. Furthermore, this also requires national health authorities to develop national policies that reach beyond human health limitations, and that instead include animal and environmental health authorities too. The emerging approach to the AMR policy is a result of these collaborative relationships, and the work of the Committee serves as another proof of these newly established across the aisle of relationships.

Although the new AMR policy was shaped through the One Health approach, which insists that there must be a single national policy, the work of the Committee expressed two kinds of state-microbe relationships: state-microbe relationships within animal health and within human health. This means that the state stakeholders representing animal and human health established two different relationships with microbes. Both types of relationships developed differently and were negotiated in rather opposite ways, resulting in quite different policy-planning results. In the following text, I go into more detail as to how each of these relationships were discussed and negotiated.

6.3.3.1. State-Microbe Relationships within Animal Health

State-microbe relationships within animal health were not the centre of the Committee's focus (the main attention was still on human health). Throughout the work of the Committee, this connection was addressed in 3 meetings. The State-microbe relationships within animal health were dealt with in a separate working group ("Tackling AMR in Animal Health") of the Committee, which was composed of animal state stakeholders and representatives of animal health laboratories. However, it is noteworthy that the same working group continued its work on tackling AMR in animal health as a part of a larger working group at the Ministry of Agriculture; the extended working group

at the Ministry of Agriculture included many other professionals from other academic and professional associations.

The purpose of the negotiations was to establish new state-microbe relationships; because according to an interview I conducted with one of the animal health policy stakeholders, the Ministry of Agriculture had little experience in the field of AMR, since it had only been working on the matter for a couple of years. From the standpoint of policy results, this connection turned out to be the most successful one, despite the lack of extensive experience; because it resulted in its own action plan for tackling AMR in animal health. The National Three-Year Action Plan 'On Tackling Antimicrobial Resistance and Responsible and Prudent Use of Antibiotics in Animal Health' was approved by the Ministry of Agriculture in 2017, defining specific tasks for achieving the pre-determined goals.[52] Although the overall plan (analysis of the situation) is not available to the public, the detailed plan of measures to tackle AMR in animal health is publicly accessible, and it is also structured in the same way as the general AMR Action Plan: (1) strengthening of laboratory capacity and microorganism resistance surveillance; (2) animal infection prevention and control; (3) prudent use of antibiotics in animal health; (4) scientific evidence and public awareness on animal health.

From a relational perspective, the success of this connection could be explained by a certain eagerness and motivation for establishing close relationships with microbes by gaining in-depth knowledge and evidence on microbes via new surveillance systems, conducting studies and expanding existing monitoring activities. The interests of animal state stakeholders regarding microorganisms is free of any historical legacy of this being a sensitive issue.[53] As a result, the entire policy-development process was directed towards accumulating more data and evidence and better public awareness. By contrast, human health stakeholders constantly debated and doubted the necessity of making AMR data publicly available. Through their deep interest in microbe circulation, characteristics, and prevalence, the animal state stakeholders played an active role in establishing new relationships with microbes, finally resulting in an AMR policy for animal health. However, as one of the policy stakeholders admitted in an interview, maintaining these new relationships does not come easily:

> *[...] our country has many priorities and many things happen only either within an existing budget, or thanks to enthusiasts who pay for everything themselves. [...] This is also important; maybe there are not many people talking about it, but it is*

[52] Information about progress in implementing these goals is not publicly available.
[53] Please see the history chapter on reasons why these issues are perceived as 'sensitive' within the Latvian health care context.

nevertheless worthwhile [...] Nevertheless, we feel responsible of what happens in the country. We feel responsible for ensuring better public health. It was once said about us veterinary surgeons, that in the end, we're still treating people, because environment, food, animals, everything is [linked] [...] We feel the need to develop; we believe that we cannot be bystanders, simply watching what happens.

The interest the animal state stakeholders had in establishing stable relationships with microbes resulted in the application of a One Health approach to the development of the AMR policy. They saw the AMR problem within the framework of the One Health approach; i.e. resistant microorganisms circulating in the environment and among animals and humans create problems which need to be dealt with through shared responsibility:

Multi-sectoral collaboration is a crucial precondition for combating resistance. (Animal health stakeholder)

Therefore, it can be argued that the animal state stakeholders were interested in shaping stronger relationships not only with microbes, but with other human health stakeholders too, by taking an active part in the work of the Committee. However, the One Health approach was followed only as far as the current political system allowed; and it was hindered by the existing legislative procedure, whereby each sectoral ministry is responsible for adopting policy documents for their own respective fields. Therefore, the current institutional structure prevented them from fully capturing the benefits of the One Health approach. As a result, the AMR policy was divided into two branches. It is, however, noteworthy that the AMR plan developed by the Ministry of Agriculture includes several tasks for strengthening collaboration with stakeholders from human health: e.g. publishing joint data on AMR surveillance results. Out of all the state stakeholders, the Ministry of Agriculture was the most active. Upon occasion, it tried to empower stakeholders from the Ministry of Health or other stakeholders from human health sector, by actively offering advice on what they themselves would do, or have done, in a similar situation where human health stakeholders encountered any issues.

State institutions-microbe relationships within animal health can be seen as the most successful ones, as they ended up with the best results: e.g. their own national action plan. The success of this connection was rooted in their deep interest in establishing closer relationships with microbes by pushing for new evidence and surveillance data to better control the problem of AMR, not only in animal health, but also in the broader animal-human-environment ecosystem; by seeking closer relationships not only with microbes, but also with stakeholders from other spheres. However,

the One Health approach reached its limits with state stakeholders for animals approving their own national animal health AMR action plan.

6.3.3.2. State-Microbe Relationships within Human Health

State-microbe relationships within human health were the most ambivalent of all relationships. On one hand, this was the key connection in the AMR policy; since a new AMR policy document had to be developed as a result of negotiating these relationships. Moreover, these had to be the central relationships to base the whole policy: because up until this moment, neither HAIs nor AMR were being addressed or regulated comprehensively on a national level. The significance of these relationships was shown by the fact that they were addressed in all the Committee meetings. On the other hand these relationships were also problematic, because none of the state stakeholders took an active part in advancing these relationships. Unlike animal state stakeholders, who chose to establish active relationships with microbes, the state stakeholders in human health chose certain negotiation strategies instead, which allowed them to stay passive and to distance themselves from the policy-making process and policy subject. As a result, the negotiation of state-microbe relationships was pushed in opposite directions. On the one hand, a fraction of the members of the Committee, especially experts and working groups, pushed to advance state-microbe relationships in a new manner; but, on the other hand, there were other members of the Committee, especially those representing state institutions, who tried to distance themselves from advancing state-microbe relationships.

One of the ways stakeholders negotiated their distance was by only partially involving themselves in the AMR policy-making process. Almost none of the state stakeholders participated in the working groups of the Committee. Instead they positioned themselves in a more advisory role. For example, in the second meeting of the Committee, a hospital stakeholder presented an example of good practice of HAI control in the Neonatal Department in one of the hospitals, and asked how this pilot project could be expanded and continued as a national program. The state stakeholder gave the following advice on policy procedures:

> *In order to recommend the implementation of the proposed monitoring and find funding, the necessary activities must be defined step-by-step. Starting with what the problem is and how much everything costs. You can also frame this matter as an issue affecting children and the demographic situation in the country. You must specify the benefits and a reduction of the overall costs. Then, a proposal must be*

prepared. The Committee should be the one that moves this program further. (State stakeholder)

This is a good example of how consultations were given regarding procedural aspects of policy-making, while at the same time, state stakeholders did not see themselves as a part of this process. Such consultations took place throughout the work of the Committee about a myriad of technical and procedural aspects. The state stakeholders also provided consultations about how the action plan should be approved, and on what level any decision about the funding for the action plan should be made.

Although giving advice on policy planning was one of the major channels through which state-microbe relationships manifested, this was often problematic; as state stakeholders provided conflicting information about the procedural aspects of policy planning. For example, when the Committee had been working for almost a year, negotiations escalated when one of the stakeholders from the Ministry of Health suddenly raised doubts about the previous agreement about who was going to approve the action plan, and how the required funding would be allocated. Up until that moment, the Committee had presumed that the plan would be approved by the Ministry of Health, and that in the first year of implementation, there would be no additional funding allocated; therefore, the implementation of the plan would have to start with activities that could be carried out within the existing budget, with no additional funding. All activities from the plan that required additional funding had to start with the second year of implementation. However, the Committee members were now being informed that should the action plan require any additional funding, it would be necessary for the plan to be approved by Cabinet of Ministers, as this was the sole mechanism for attracting additional funding. This puzzled other members of the Committee, because they had reached an agreement with another representative from the Ministry of Health (who was also the co-chair of the Committee) stating that the plan was to be approved by the Ministry of Health, and that there was going to be a mechanism in place to allocate additional funding for activities requiring funds. This was quickly rejected by the new representative of the Ministry of Health, once again stressing that no additional funding was to come from the Ministry of Health. As the situation escalated further, other members of the Committee asked to be involved in the work of the Committee, and for the initial representative of the Ministry of Health to clarify the situation. Therefore, at the next meeting of the Committee, the co-chair informed other members on the following:

> *It does not really matter who approves [the action plan] – the Ministry of Health or the Cabinet of Ministers. There are numerous plans approved by the Cabinet of Ministers without a penny for implementing the plan. [...] In plans like these, for example, a Rare Disease Plan, the priority activities can be taken into account when planning new policy initiatives. However, it is never clear whether or not there will be any additional funding. It is not a certain thing that submitting the plan for the Cabinet of Minister's approval will result in allocation of the required funding. (State stakeholder)*

Within state-microbe relationships, the topic of funding allocation for the AMR action plan was placed in the very centre of negotiations. As one of the state stakeholders explained:

> *Money matters above everything else. We already have empty [policy] plans[54] in primary care, cardiology, oncology.[55]*

Negotiations among the Committee members gave them the chance to argue that, paradoxically, the AMR action plan in these relationships was not the most central or crucial product of the policy-planning process; instead, funding became the main axis around which the negotiations revolved. As a result, the allocation of funding within these relationships became the most discussed topic, and the Committee members debated where and how to obtain this crucial currency of power. Although funding clearly became the main vehicle in negotiating state-microbe relationships, much of the process remained abstract; since none of the stakeholders were in a position to say whether or not there would be any funding allocated for the planned activities, how much would be allocated, or how much would be taken away from already allocated funding. Stakeholders from medical and other fields suggested attracting funding from several different sources, such as the EU; but it was again argued that there was no clarity as to which activities would be successful in attracting funding, or how much. It was also suggested that HAI expenses should be included in hospital price rates; but this also did not lead to any clear answers from the state stakeholders. These extensive discussions regarding possible sources of funding for AMR activities did not obtain any fruitful results, as the state stakeholders did not provide any clear answers. They argued that, in general, AMR activities should be included in the plan; but nobody at this juncture, including them was able to provide assurances that the plans were going to receive any actual funding. As a result, although the topic of funding

[54] In this context, 'empty' means with no allocated funding.
[55] Paradoxically, cardiology and oncology are defined as two of four public health policy priorities. The other two are mental health and mother-child health.

allocation was a useful vehicle for conducting negotiations within these relationships, there was a real lack of clarity on these matters; thus, much of the abstractness remained.

There were other instances when the tendency of state stakeholders to distance themselves from the issue of AMR was communicated bluntly. For example, when Latvia prepared to take the Presidency of the Council of the European Union, and the European Commission had recommended AMR as one of the priority areas during the Presidency of Latvia, one of the state stakeholders argued:

> *AMR is not the Ministry of Health's priority. However, the topic could be at least negotiated during the Presidency. (State stakeholder)*

> *I have to say that when it comes to resistance, not even once – at least I do not remember any such cases – has this problem been defined or identified as a matter on which Latvia would like to receive any support or expert conclusions from the World Health Organization; this has never been defined as a priority. (Interview with WHO representative in Latvia)*

In terms of state-microbe relationships, there is clear ambivalence. For, although the work of the Committee resulted in an actual action plan which was later submitted to the Ministry of Health, the undeniably abstract relationships between the state shareholders and the rest of the field were not by any means mended as a result of this measure. The willingness of some to distance themselves from actual policy-planning, the limited advisory functions, and some outspoken doubts about the ability to ever implement the action plan did not permit the quality of state-microbe relationships to be elevated to a better, higher level. In the following sub-sections, my fieldwork interviews with the state stakeholders from this Committee and other policy-makers about the process of policy making offer a deeper interpretation of the reasons why this relationship modality remained this problematic.

'Stable Instability' of Health Policy-Making

One of possible interpretation could be linked to the 'stable instability' in health policy-making in the Latvian context. The lack of continuity of the already initiated policy directions, reforms, and priorities has resulted in the presumption that healthcare is a highly problematic and unsustainable policy area. One the one hand, the health policy arena is associated with ideological tensions and contestations over interests and issues, leading to slow political changes (Koon, Hawkins and Mayhew, 2016). On the other hand, the OECD has argued that highly unsustainable health policy-making is to be recognised as one of the greatest challenges of the Latvian healthcare system (OECD, 2016). This discontinuity is substantially rooted in the frequent changes undergone in the role of Minister of

Health. Each new Minister is allowed to come up with new priorities, without any obligation to continue any policies that have already commenced before they took up their position. Since establishing the Ministry of Health in December 2003,[56] one of the youngest Ministries in Latvia, there have been 13 Ministers of Health; this is the most active rotation of Ministers among all the Ministries of Latvia.[57] Moreover, new Ministers almost always change most of the highest-level executives at the Ministry and subordinated health agencies, causing instability throughout the governmental and administrative structure of the system.[58] This has led to a situation where there have been many attempts to reform the whole healthcare system and to define some clear priorities; but all such attempts have failed, due to a change in the Minister of Health or a new government being elected, so that any previous directions and intended reforms have consistently ending up either being suspended, or revoked completely. As interviews with policy-makers reveal, this unstable policy-making has been in some sense normalised. For example, when I asked a policy maker that has worked in the field since the Ministry was first established, this instability was described as having been part of the policy-making process since the very beginning:

> *[...] And then comes a new Minister with a completely different perspective. It is very hard to work like this because… Ministers change too often, especially in the field of healthcare. And it just somehow happens all the time that the new Minister always disagrees with the previous one. But all these state officials who work in the Ministry giving their best effort to a draft law, regulatory enactment or a policy planning document… they have done everything to move the plans forward and often their plans are even approved, but then comes a new Minister with a different perspective, disapproving anything done before. Then you must stop your work completely – you have worked a whole year on this, but then you are told that we will not move this further to the Government, it is no longer our priority. And even if your plan is approved, there might be no funding for your activities; since funding is always lacking. Priorities must be defined in terms of who gets the money and who does not. I often feel that we change our priorities far too often. Now there is slight emphasis on quality of healthcare, but this can also change any day now. [...] If the current Minister is put out of the office, these matters could*

[56] The Ministry of Health was established in 2003 when health care policy functions were separated from the Ministry of Welfare.

[57] For comparison, the Ministry of Agriculture has a much longer history in the Latvian political system, as it was established simultaneously with the Republic of Latvia in 1918; however, within the same timeframe (since 2003), there have been 5 Ministers of Agriculture.

[58] This instability affected the fieldwork I conducted for my HAI control policy analysis (2011-2012) because during this time the public health agency was twice fully reorganised from top-down. Moreover, during my PhD fieldwork the Ministry of Health reorganised the Health Inspectorate; this had an impact on my access to the field, because most of the previous arrangements were no longer valid.

very well sink deep down out of our sight, because we lack any succession of priorities.

This quote also reveals that these fluctuations in health policy priorities, agendas, and directions lead to policy-makers adopting a purely passive position, where they see themselves merely as the passive subjects of changes. During my fieldwork, I had a chance to see how this passive position takes shape. At the beginning of my fieldwork, I met an enthusiastic research participant who had just started to work in the state administration, full of ideas on how to improve governance. However, when I met the same participant couple of months later, the participant was already adapting to the position of passivity, ending our interview by saying:

Here, in state administration, we often say – maybe exaggerating a little bit – it can only go down in two ways – you will either be broken by the system or you will leave the system. But you will never break the system.

This lack of agency in dealing with highly unstable policy-making practices has also been experienced by those NGOs who have had some experience with working alongside policymakers. For example, one of the research participants from an NGO shared their observations:

There [in state administration] it is something like this – someone comes to you and says that you must go in a certain direction, then you turn around and go there. Someone else then stands in your way and says – no, stop moving and turn around. At the end, you already knew that going there was wrong, but you went there nevertheless. You are just a desk clerk, insignificant… first of all, it is hard for them, there is always this political pressure.

A good example of stable instability can be seen in the recent approach to the development of patient safety policy in Latvia. Up until now, patient safety had never been a priority for any of the former Ministers of Health; but for the first time, this field was recently brought into the national healthcare agenda, by developing a patient safety planning document and creating a new national-level regulation for implementing patient safety activities. This is largely because patient safety was a priority for the recent Minister of Health, since she was previously the head of the Children's Hospital, where the patient safety system was implemented. Therefore, her intention was to ensure that other hospitals throughout Latvia follow the lead of her previous hospital in terms of patient safety. Addressing medical professionals at a patient safety conference, the Minister opened the conference with a normalisation of this instability:

*This issue is important to me - **as long as I am allowed** [my emphasis], I will try to implement this matter nationally.*

This patient safety policy was developed in a great hurry, without any public debates; it was pushed through just because the Minister of Health could change almost at any given moment.[59] Paradoxically, such an approach actually endangers the quality and already shaky sustainability of the policy, along with any chance that the policy will be actually implemented and funding be allocated for the activities:

> *At the moment I have a feeling that [Minister's people] want to work very fast. They work on such a rapid pace as if there is no tomorrow. And I do understand them – they work under the current Minister who is here today but tomorrow she can be replaced. (Interview with policy-maker)*

The enormous speed of developing a patient safety policy was necessary, as there is no guarantee that the next Minister will continue with the development of the patient safety policy. The varying speeds in the development of different policies is rooted in the need to look for certain moments of opportunity when the topic in hand might gain some supportive traction either in the Ministry of Health or among other policy-makers; otherwise, the policy risks never being implemented. One of the first critical policy analysts, Lindblom (1959) has called this policy-making process as 'muddling through,' as part of an incremental approach towards policy change.

This stable instability manifests itself not only through short-term and sporadic policy priorities and directions and in the development of new policies, but also in the assessment of the policy results of an activity which has already been implemented. For example, one policy-maker shared their frustration and sense of helplessness when policy impact is assessed in such an unsustainable policy environment:

> *Problems are when… when the [policy] plan covers three years… and out of five activities funding is granted for only two, but three of these five are left without any funding. But sometimes these two also receive only 50% of the required funding, and so on. Then, something else can be completely removed from the original plan and replaced with something else. Something is always being changed, and by the end you can no longer tell why you did not reach the aim. Did you fail because only two activities were funded, but three were not? Or because something was replaced with something else? Maybe because funding was awarded at the end of the year and not at the beginning, and at the end there is no point doing anything? So, you did not achieve anything, and maybe it would be the same if you hadn't done anything at all. So, the whole policy and activities are*

[59] In October 2018, general elections were held, and the political party of the previous Minister of Health was not invited to join the coalition; and therefore, she lost her office.

so inconstant that you… at the end… realise that nothing is possible and there is no point in measuring the impact.

The unsustainable relationships policy makers have with the policy process result in unstable relationships with the policy subject itself. A high-level policy-maker shared this disconnection through their perception of health as an object of policy-making that was too unstable and elusive to be governed:

This field is too complicated, with too many specialists involved… it is unbelievable how many stakeholders there are, more than in other sectors, and everybody wants something else and nobody can agree on anything. We joke around saying that with no patients, there would not be anything wrong with healthcare and the system would work perfectly. [...] You just cannot come here, receive services and leave. There is a more philosophical approach to this – if the field of healthcare were well-organised, our whole life would be well-organised. But this is a priori impossible.

As a result, policy-makers position themselves towards the policy subject and proceed passively, with only a limited ability to stabilise the overall system. Subsequently, passive relationships can lead to people distancing themselves from policy-planning, as was seen in the Committee's meetings.

For some of the policy-makers interviewed, their passive position towards the policy process led to conceptualising policies not as solutions, but as burdens overloading not only those who make the policies, but also those to whom the policy is applied. On one hand, the authorities responsible for developing sectoral policy, e.g. the Ministry of Health, suffer the burden of making connections with other regulations: i.e. national-level regulations must be harmonised and linked across all spheres of law:

We are often asked why a certain field is not regulated, but the thing is… the Ministry of Justice often tends point out that we do not have a mandate to regulate certain matters. We have to see that literally each and every word in a new regulation align with other laws… that's very hard. And it gets harder year by year. [...].

On the other hand, any new policy or regulation is also a burden for those to whom these regulations apply. One of the policy-makers interviewed argued that there is a special burden on entrepreneurs, hospitals, and all those involved in the healthcare system:

As a rule, our regulations always burden someone else. Therefore, for us to put such a burden, we need to know why we do it.

These passive relationships with the policy subject and process prevent policy-makers from seeing beyond the burden. For example, when I talked with a policy-maker involved in developing new HAI control regulation for hospitals, the policy-maker saw this regulation as a burden to hospitals. Her passive position and disassociation from the policy subject prevented this policy-maker to see beyond the perceived burden, and to imagine the policy as something that could possibly improve certain people's lives; as in this case, the patients could receive safer and better healthcare as result of this policy. However, this possibility was not articulated by the policy-maker during the interview.

Stabilising the Health Policy-Making Environment

Cooperation between policy-makers and the application of evidence emerged with some potential for stabilising the policy-making process. Collaboration of different policy-makers and other stakeholders during the Committee's work serve as a good example of how policy subject 'survived' in unsustainable policy environment. For example, when the head of the Committee left the position, the other Committee members continued the work.

As pointed out in the literature, the availability of reliable research-informed evidence can be just one of the competing 'frames' when making policy decisions (Turnbull, 2006; Williams and Glasby, 2010; Koon, Hawkins and Mayhew, 2016). For example, maintaining the support of allies, protecting positions of power, mitigating other risks can indeed compete with the body of research evidence in shaping the policy-making process (Head, 2010). However, in the Latvian context, research-informed evidence is not only capable of guiding the policy-making process towards more unbiased and qualitative outcomes, but also carries a potential in the Latvian context to stabilise the instable policy-making process; as evidence is broadly considered as capable of offering universal applicability and accountability (Behague et al., 2009). One way evidence makes it possible to pursue a policy development is to find evidence for possible policy solutions with the 'right' locality. For policy-makers, it was important to find in the policy process evidence which is associated with the particular locality that is considered most suitable to and similar to, and ultimately preferred to, the Latvian situation: like the Baltic States, the Scandinavian countries, Germany, the United Kingdom, or the Netherlands:

Zane: When developing or amending [policy] – what kind of information you usually rely on – statistics, studies, expert opinions?

Answer: Statistics, for sure, are very important, if available. Then, of course, we take a look at the experiences of other countries. We try to avoid America and Australia, and are more appreciative if we can find some experiences from European countries.

Z. You look how others have solved the problem?

A. Yes, it is good when we can see the results of this [policy]. And if we can see how this plays out in the Baltic States, then we are truly happy. (Policy-maker)

Evidence was often rejected simply because it could not be related to the Latvian context, and so the stakeholders argued that such evidence would not work in Latvia. There are many instances when the Latvian situation was imagined as being extremely peculiar or unique, such that evidence gathered elsewhere simply could not work.

Another path by which evidence can help to stabilise the policy-making process is when evidence becomes a tool for confirming an already approved policy direction:

In policy planning documents, there is a section where you need to have a description and justification of the situation. Mostly, this is where you include statistical data and study results; yes, this is what you mostly include there. We also use a lot of data from national registers, if there is any topic-related information in them. However, I have to say that unfortunately a part of these decisions – and a large part as a matter of that – is not based on any evidence. Basically, you can prove anything you want. If the Ministry instructs you to prove something, you sit here until you have proven what they want. Well, maybe not completely wrong arguments, but other matters… then you simply find a source which confirms your argument. (Policy-maker)

Although evidence can serve as a factor for stabilising an unsustainable policy-making environment, its potential is not yet being fully realised, and is used only to a limited extent.

In conclusion, the highly unsustainable policy-making context did affect how state-microbe relationships were maintained and negotiated, and these did struggle to materialise in more concrete policy results (e.g. allocated funding). As a result, the instable policy-making process prevented policy-makers from actively engaging with the policy subject and policy-planning, thereby distancing themselves from the topic and policy-making processes.

Negotiating state-microbe relationships showed great contrasts between state stakeholders from animal and human health. While state-microbe relationships in animal health were developed with the view of improving the recognition, understanding and management of microbial risks, the state-microbe relationships in human health went in the direction of distancing. I.e. clear efforts were made not to engage with these relationships; rather, they were avoided as a burden.

6.3.4. Hospital-Microbe Relationships

Within the context of AMR, hospital-microbe relationships can be seen as both the cause and the solution for the problem of AMR. The rise of AMR epidemics is closely linked to the irrational use of antibiotics and insufficient infection control practices, especially in hospital settings. The ever-increasing capacity of microbes to resist antibiotics and infection control solutions is challenging hospitals to re-evaluate their already established and deeply rooted hospital practices with regards to tackling the spread of pathogenic microbes. The development of new practices for the prudent use of antibiotics and more effective infection control is also resulting in new microbe-hospital relationships.

Throughout the Committee meetings, this was an especially important connection as the hospital-microbe relationships manifested through two working groups – the working group on use of antibiotics (AB) and the working group on HAI control. The AB working group were especially focused on the use of antibiotics in hospitals, since hospitals were defined as the most problematic healthcare settings in terms of irrational antibiotic consumption. The HAI control group also focused on hospital settings. These relationships were established, maintained, and navigated mostly by hospital stakeholders. Both of these working groups showed actual work results much sooner than other working groups; as they came to the fourth meeting not only with a situation analysis, but also with specific solutions to be implemented. This can be explained by the fact that both working groups mostly consisted of infection control specialists, and their efforts to push forward policy in the field already had a long history. Here, their efforts finally started to materialise.

The aim of hospital-microbe relationships throughout the work of the Committee was to gain a higher degree of standardisation, thus making them more stable. At the moment, hospital-microbe relationships are highly fragmentised and without any universal standards. This is because each hospital deals with the issue according to its own policy, understanding, and resources:

> *Officially, in Latvia, there is no such specialty of infection control physician or infection control nurse – you cannot get any education or qualification in this field. At the moment, only self-taught enthusiasts work in this field. [...] At the moment, everything [in HAI control] is done without any coordination – sporadically as individual campaigns. (Hospital stakeholder)*

As a result of these shortcomings, hospital-microbe relationships are highly fragmented and ultimately unsustainable. This is why hospital stakeholders have been trying to negotiate a national status for hospital-microbe relationships via national-level guidelines, recommendations, and standardisation. We were already on the fourth meeting when both working groups presented activities to be implemented in their respective fields. This clearly showed that the stakeholders already had a clear agenda and understanding about how to elevate hospital-microbe relationships; by navigating these relationships out of their original hospital settings and defining a national standard about how they ought to be. Both groups unanimously argued that there was a great need for national guidelines and a national position on the use of antibiotics and HAI control; something which was clearly lacking.

The hospital-microbe relations were negotiated by discussing several good practice examples from hospitals, along with how to extrapolate these specific hospital practices into a national standard. One of these examples was a neonatal ICU surveillance pilot project in one of the hospitals. This pilot project was implemented in one of the hospitals and showed great success; therefore, hospital stakeholders were highly motivated to continue the project and turn it into a national programme, recommending that such a surveillance programme should be implemented in all the neonatal ICUs throughout the country. The above pilot project was repeatedly presented not only by the members of the Committee, but also by other healthcare practitioners who were invited from several ICUs throughout Latvia. Both parties provided demonstrations of the data and revealed some personal stories and insights to help show the efficiency and necessity of the programme, as well as its suitability in terms of national standardisation. The former head of the ICU in the hospital where the neonatal pilot project originated was invited to the Committee to share their experience:

> *The surveillance system allowed us to notice unnecessary use of central lines. The second benefit was not only reduced cases of infection, but also reduction in colonisation with Ac.Baumanii.[60] Without this surveillance system, we would not have noticed the problem and could not have seen the effect of the intervention. If we were to suspend the system, it would be hard to get it running again. Would it*

[60] One of the common pathogens causing HAIs.

be possible to implement such surveillance system in all hospitals? How could this working group support the implementation of such a system? (Hospital stakeholder)

Not only did the hospital stakeholders negotiate for national guidelines in the prudent use of antibiotics and HAI control; they also employed another strategy, where they addressed changes in the public status of HAI prevalence and antibiotic use. By contrast with the discussion about national guidelines, here the stakeholders lacked a united position on publicising evidence on the spread of HAIs and the consumption of antibiotics, associating the prospective public status of such information with certain perceived risks. On one hand, some of the stakeholders argued that if such data were treated as a sensitive topic with only public disclosure, the problem of AMR could never become a national level issue:

The biggest problem is the fact that we do not have national-level data on healthcare-associated infections and their consequences, impact on mortality rates; therefore, it is hard to prove that these infections are as serious a problem as oncological and cardiovascular diseases. According to [stakeholder's] estimates, every year in Latvia about 1,000 people die, but the official statistics show only two cases. Most of these mortality cases are linked with HAIs. The prevalence of resistant microorganisms – both gram negative and gram positive – is at least 20%. Unfortunately, these numbers are unknown because we do not have such statistics. If we would have such statistics, it would be easier to fight for funding, because this is a real problem. People in Latvia ever day die from HAIs caused by resistant pathogens! (Hospital stakeholder).

On the other hand, not everybody saw any benefits in this, and argued that there are certain risks associated with public information pertaining to HAIs and AB consumption:

Stakeholder X ask about publicly available surveillance data on healthcare-related infections. Stakeholder Y argues that mandatory reporting would not be appropriate for these infections. This is a sensitive matter [...] Mandatory reporting results cannot be trustworthy and valid for the purposes of interpretation. It is hard for physicians to report these infections, because they are perceived as their personal work errors. Therefore, it is crucial to implement local reporting systems in hospitals not for the purposes of seeking persons at fault, but for strengthening infection control measures.

As a result of these negotiations, some clear policy results were produced at the Committee's meetings. The stakeholders argued for the necessity of standardising HAI surveillance systems throughout the country, and for producing national-level data on both the prevalence of HAIs and the use of antibiotics. It was also decided that there was a need for standardising competencies for the

staff responsible for the control of HAIs in hospitals; as well as for establishing national guidelines for HAI control and the prudent use of antibiotics.

Throughout the process of the negotiations, these relationships were established and negotiated with a high sense of purpose: to develop closer relationships with microbes, by raising their national profile. The discussions on hospital-microbe relationships encouraged a shift towards national guidelines and standardisation. In the current climate of AMR, managing this issue purely as a hospital issue is not enough, for it requires more stable and standardised governance at the national level. The unified position was undermined only when addressing the public status of prevalence of HAIs and use of antibiotics, thus showing that the issue of sensitivity still persists; and that it is not yet resolved, and it continues to affect policy-making in this area. Moreover, voicing concerns about data sensitivity prevents stakeholders from seeing and voicing the same level of protection for patients who are burdened by the problem the most.

Summary

This chapter has offered an account of how HAI control was assembled as part of a new AMR policy; by focusing on the negotiations and debates encountered during the policy making process. The chapter showed that the process of assembling this policy framework about how to exercise control over antimicrobial-resistant microorganisms was complex, ambiguous, contingent and open-ended. The analysis highlighted that policy-making process was only partly lead by concerns on how to increase the 'war on microbes.' Instead, as demonstrated by the analysis, health policies can be shaped by the relational dynamics between stakeholders, vested interests or a lack of such, and policy practice patterns. Moreover, as Biehl and Petryna (2013) argue, health policies are capable not only of producing policy solutions, but also of reproducing structural violence and other inequalities. Therefore, a critical analysis of HAI control policy is needed not only to assess their prescribed direction to tackle microbial risks (Padoveze et al., 2017; Mizuno et al., 2018), but also to evaluate consequences for the lives of people targeted by the policy-in-question (Castro and Singer, 2004).

The chapter has also illustrated the dynamics between global and local AMR policy-developing processes. Although the issue of AMR is currently enjoying the spotlight on the global health agenda, this topic has a long history of policy failures to be addressed at the global scale (Wallinga, Rayner and Lang, 2015); also, a better understanding of factors reinforcing the refusal to act on a policy level is needed. For example, Dar et al (2016) links their explanation to the lack of a sufficient evidence base;

but Wallinga et al (2015) refuses this explanation, by demonstrating the documentation of a half-century long trail of evidence. Although global human and animal health and environmental organisations are currently pressing for all national governments to form a coherent and globalised approach, in order to strengthen their efforts in combating AMR, the situation gets much more complex when this global health issue reaches the national health arena. As this chapter shows, eight years have passed since the first efforts to develop the national AMR plan; which clearly suggests that the sole fact that a problem is high on the global agenda right now does not mean that the same issue is going to translate straight away into a national health priority. The progression of such a health priority status is going to take a longer, more complex and less predictable development path than was originally envisaged in the global action plan on combating AMR; since globally recognised issues do not simply translate automatically into national level priorities.

The problem of AMR has been characterised as a 'wicked problem,' similar to global climate change - a complex and contested problem with diverse perspectives and interests, as well as ambiguous perceptions of the problem itself and of possible directions for solutions (Lee and Motzkau, 2013; Wallinga, Rayner and Lang, 2015; Head, 2018). This chapter has illustrated the ever-increasing 'war on microbes' is complex and contested process that is not necessarily straightforward and pre-given by a homogeneous phobic understanding of microbes; rather, it is entangled in heterogeneous assemblage of microbial, medical, agricultural, veterinary, environmental, food, trade, consumer, patient bodies that in turn generate this effort into a 'wicked' policy problem. Head (2018) argues that 'wicked' policy problems should be approached through processes of dialogue, conflict resolutions, learning, and negotiations to help work towards a shared understanding and coherent action for managing the challenge; focusing less on 'solving' or 'fixing' them. Turnbull (2006) adds to this perspective, by arguing that problem solving is a 'myth' of the policy-making process.

One way this complexity manifested itself was the differences between the approaches taken on by the Ministry of Agriculture and the Ministry of Health. The Ministry of Agriculture showed a deep interest in establishing closer relationships with microbes by pushing for new evidence and surveillance data to better control the problem of AMR; not only in animal health, but also in the broader animal-human-environment ecosystem. They also showed interest in advocating more for a One Health approach, while taking an active stance towards improve people's understanding about how to combat treatment-resistant microorganisms. On the other hand, the Ministry of Health's participation was more passive in character, and did not lead to any active policy responses to the

various microbial challenges under discussion. The differences outlined here between policy-making patterns in human and animal health could be explained by the different 'learned dispositions' the policymakers showed towards policy practices. The learned 'habitus' of policy-makers produces positionings, inclinations and dispositions that organise the understanding and enactment of policy-making practices (Bourdieu, 1977). Turnbull (2006) refers to these internalised ways of acting as political 'nous.' Further research is required to help analyse and assess these various different policy-making practices and patterns; for example, by comparing the relative policy-making capacity of different ministries (Mirzoev, Green and Van Kalliecharan, 2015).

This chapter's close focus on the negotiating processes involved in developing the new policy has revealed that the implementation of One Health approach will take much more effort than previously expected. Policy planning can only capitalise on the One Health approach if all the previously existing and fundamental relationships (e.g. state-microbes, hospital-microbes) are stable enough in terms of their definition in any of the national-level policy plans or guidelines that are supposed to determine how this domain of policy should be undertaken. As negotiations at the Committee's meetings have shown, the focus on One Health was gradually lost, because it was necessary to stabilise certain existing relationships. But without doing so, it was not possible to merge the human-animal-environment spheres and to implement the One Health approach.

Chapter 7. '*Wash Your Own Fingers Before You Point to My Stains*'[61]: Managing Human-Microbe Relations in Hospital

Introduction

In the previous chapter, I showed how human-microbe relationships were managed in a policy setting. I revealed how policy-makers are trying to distance themselves from the topic, and to position HAI control as something that should be dealt by hospitals themselves internally. This chapter focuses on a hospital setting, which is the last locality where I have been tracing the management of human-microbe relationships. While the media and policy chapters have permitted me to provide a discursive and political analysis of human-microbe relationships, the present chapter brings in another aspect – the enactment of human-microbe relationships.

I begin this chapter by introducing specialists who are responsible for developing, implementing and coordinating HAI control in hospitals. These people are the focal point for establishing what the human-microbe relationships should be in a hospital, along with how they should be coordinated and controlled. In addition, I analyse how infection control specialists are positioned in the hospital internal structure; as they are the main focal points of HAI control. This allows me to see them as an embodiment of the HAI issue within the hospital structures, as I analyse how HAI control is managed. Next, I move on to explaining the HAI control policy: what the human-microbe relationships should be in a hospital, including how they should be managed. Afterwards I introduce and analyse a specific social infrastructure which represents a significant element within the management of human-microbe relationships. In this section, I address how social relationships (and the quality of such) between hospital staff is shaping how human encounters with microbes are managed. Next, I analyse various stages of the management of human-microbe relationships. I initially address the management of HAI control through imagination work; which is a crucial process in the control of human-microbe relationships, due to the fact that in daily hospital practice, the risk of HAIs is invisible. Therefore, imagination work helps us make the risks of daily hospital routines more present to us. Next, I take a closer look at making HAIs visible as an object of governance. This requires three stages of visibility work: sampling, laboratory work, and data use. Next, I analyse how human-

[61] This is a quote from a medical conference I attended during my fieldwork, where the discussions addressed how to deal with mistakes in medical practice. This quote illustrates that HAI control is not only about infection control in the pure medical sense; it also involves moral judgment.

microbe relationships are controlled and managed through three hospital mediums: space, equipment, and people. Finally, I analyse patient involvement in HAI control practices and routines.

7.1. Infection Control Specialists: Focal Points of Managing Human-Microbe Relationships in Hospitals

HAI control as a medical field is relatively new in the Latvian healthcare system. The current HAI control staff positions were formed in hospitals towards the end of the last century's 90s and throughout the first years of the 00s.[62] Most of my research participants (infection control specialists) were the ones who formed either infection control units or separate infection control positions in their respective hospitals; so their role in HAI control was a pioneering one; not only in individual medical treatment facilities, but in Latvia as a whole.

In this section, I focus on infection control specialists as focal points for HAI control. The first sub-section focuses on the profession of infection control specialists, and their struggle to navigate the challenge of autonomy in the healthcare system. This involved taking a closer look at the duties, competencies, capacities, and recruitment of infection control specialists. I turn my attention in the following sub-section to the ambivalent position of infection control specialists in hospitals, also discussing how infection control specialists navigate their insider-outsider position in the hospitals.

7.1.1. Navigating the Professional Autonomy of Infection Control Specialists

It is generally assumed that any truly effective governance of infection control requires specialised infection control staff holding leadership positions at individual medical treatment facilities. The bigger the hospital, the more complex the management of human-microbe relationships will inevitably be. The sole national regulations on this matter stipulates that all multi-profile hospitals or university hospitals must establish an infection control team who are in charge of developing and implementing the hospital's HAI control policy; such a team must include one infection control physician per 500 hospital beds, as well as one infection control nurse per 250 hospital beds. There are three hospitals in Latvia with established permanent infection control teams; however, none of

[62] Funding for HAI control activities is not considered as part of the state-granted budget funding for hospitals. So each hospital looks for funding from its own budget, allocating money for HAI control activities in line with a range of widely varying and indeed subjective principles; because there are no official rates determining how much HAI control activities cost. Please see the Policy Chapter for more information on the stabilisation of funding allocation.

these have a personnel ratio compliant with the above requirements. According to the national regulations, the rest of the hospitals must appoint a person in charge of the development and implementation of the hospital's HAI control policy. However, in most of the cases, infection control is assigned as an additional task that is separate from the main job. For example, in many hospitals, the head nurse or a surgeon are assigned to be the persons in charge of carrying out the HAI control policy.

Regardless of whether or not the hospital has an established infection control team or a person-in-charge for infection control measures, the national regulations do list some specific **duties** for these specialists. The infection control team (or person-in-charge) must:

- Ensure the implementation of the hospital's HAI control plan; plan the division of the premises into zones of different levels of cleanliness
- Determine a procedure for carrying out a hygienic and anti-epidemic regimen in zones of elevated level of cleanness
- Inform the hospital's management in the event of a outbreak
- Carry out and coordinate anti-epidemic plans
- Register any epidemiologically significant bacteria findings in the hospital
- Identify and analyse risk factors of HAIs and develop suggestions for preventing any risks
- Inform other medical treatment facilities or social care institutions, should there be any doubt whether a patient has been admitted from these institutions with infection-causing bacteria
- Organise employee training according to the requirements of the hospital's hygienic plan
- Inform employees of the required anti-epidemic plans and epidemiological surveillance results, should there be any outbreaks of HAIs.

Overall, the foregoing core duties of infection control specialists, as specified in the national regulations, do comply with the EU Reference Paper on Core Competencies for Infection Control and Hospital Hygiene Professionals in the EU (European Centre for Disease Prevention and Control, 2013a). The biggest difference is that the Reference paper argues that one of the core competencies of infection control specialists should be quality improvement activities; whereas Latvian regulations do not see quality improvement activities as part of the work of infection control specialists. This is mostly attributable to the fact that in Latvia, HAI control is not considered as falling under the domain of healthcare quality system.

However, infection control specialists see the listed duties as an excessive burden, especially in circumstances where infection control specialists do not have sufficient budget or tools (e.g.

national guidelines, standards), while practically all infection control efforts in hospitals are lacking human resources as well:

> It makes you think whether it is fair to ask from these people to carry out all these tasks. I think finding such a conversant and versatile person would be challenging for any institution. This only lists what these persons should officially do. [...] But in reality, these people, despite their principal jobs, are responsible for the selection of disinfectants, employee vaccinations, in some hospitals – mandatory health checks which should be addressed by labour protection specialists. They are responsible for antibiotic use policy too. Infection control. Sterilisation. A single person-in-charge must carry an immense burden. You should be tolerant towards these people, because they are not capable of tackling all of these functions. Therefore, in reality, it most often looks like it's only the person in charge who is putting out fires. (Medical conference)

In order to deal with their duties in the absence of human, financial and other resources, the infection control specialists I interviewed managed these shortcomings by prioritising certain areas and focusing on certain specific infection control duties; those which, as far as they believed, were the most important, or which they felt the most qualified to do, or which had proven to be most crucial in their own medical treatment facility. For example, one infection control specialist, who was the sole infection control specialist for the whole hospital, had chosen to focus strictly on the HAI surveillance system and on antibiotic stewardship; while slightly neglecting other activities, such as hand hygiene and other infection control procedures. As a result, HAI control is unevenly provided across healthcare facilities.

Although the national regulations provide for the necessity of establishing an infection control unit (or appoint a person-in-charge) in all hospitals, there is no officially established occupation of an infection control physician and nurse. This has certain consequences: e.g. it is not possible to get the kind of education in Latvia that will qualify one for such a position in a hospital. For a large proportion of the interviewed infection control physicians, the professional background is infectious disease physicians; although in the Latvian context, these are mostly different infectious diseases, like tuberculosis, hepatitis, diphtheria, etc. Whereas infection control nurses usually have a general nursing education – in the best-case scenario, they are specialised in surgery or intensive care where they might have gained skills better to them, or been more exposed to managing HAI cases. However, since infection control personnel lack any truly unified educational background or training, their understanding of the duties is different and they have different capacities. A couple of interviewed infection control specialists said that they also feel sorry for new infection control specialists,

especially if they are the only ones who work with these matters in a hospital; because currently there is a complete lack of any support system. There are no education or training options to help them gain any necessary competencies. According with informants, the only thing you can rely on is your personal contacts with other specialists who have worked in the field for a while, because there are no handbooks or guidelines about how to carry out these work duties.

There has been no definition on a national level of the specific professional **competencies and occupational requirements** for someone to become an infection control specialist or a person in charge for infection control at a hospital; thus, the education, skills and other competencies of infection control specialists do significantly differ. My informants argue that only true enthusiasts for the field work in these positions. Some of them have studied HAI control abroad, but others are self-taught. As a result, the capacities of infection control departments and individuals are very different. For example, one infection control department has become an unofficial leader or national centre for the whole field in the country, because people working for the department are involved in the policy-making process, represent the country in various international collaboration networks, international organisations (e.g. the EU and the WHO) and are the focal point where all the Latvian studies on the topic of HAI control are initiated and coordinated; thus allowing the department to become the leading research facility on HAI control. Another hospital's infection control department has issued a handbook on antibiotic stewardship. This started as a self-initiative and was meant solely for internal use. However, now the handbook is used by other medical treatment facilities too.

As infection control specialists have different backgrounds, there is often a lack of consensus among the infection control specialists on what the proper infection control practices ought to be. For example, one infection control specialist shared her experience where another specialist contested one of her HAI control practices:

> *I was told that my own colleagues erased my work and messed up everything I had done. For example, it took me one or one-and-a-half years to get to the point where every medical practitioner carried a hand disinfectant in their pocket. But then an infection control nurse returned from a longer leave and cancelled everything, arguing that this is not right, because it leads to contamination. (Infection control specialist)*

Furthermore, there are huge capacity differences between Riga and other regions of Latvia, because most of the capacity is concentrated in the capital city, while local regions are left struggling with a lack of infection control specialists. Furthermore, the people in charge of infection control at the regional hospitals argue that they feel a wide gap between the hospitals in Riga, stressing that

there is a clear lack of voices advocating in favour of regional hospitals. They feel that they cannot reach the level of hospitals in Riga. Furthermore, there are differences even within one region. For example, a regional health inspector[63] observed capacity differences among as many as three hospitals in one region. In one of the hospitals, HAI control efforts were active, but purely based on the enthusiasm of one person; while in another hospital with a similar healthcare profile, no HAI control activity was detected, although the hospital's head nurse was appointed as the person-in-charge of the hospital's infection control measures. But the third hospital, which was managed by a former Minister of Health, insistently argued that they did not have any HAI problems at all.

The struggles of this profession can also be seen in terms of the recruitment of new specialists. The specialists who over the years have managed to gather a team of infection control specialists shared their experience with struggles to recruit new specialists, meaning physicians and nurses for infection control, because there were no official channels (e.g. training, education programmes) to look for them. It was often argued that it took years to convince the administration of the hospital that there was a great necessity to form new positions of infection control specialists. But finding these specialists turned out to be just as challenging:

> *I cannot find [infection control] nurses – not in this area of healthcare. [...] This job is not like regular nurse job, based on shifts where you can be at the hospital the hours you need to be here and see the patients you need to see – you need to have a certain degree of understanding and interest about this field. Therefore, it is certainly hard, because there are no people like this, and maybe it is because of the field as such… because at least at the beginning, nobody cares about things like this. (Infection control specialist)*

It is hard to recruit medical specialists for the positions of infection control specialists; because in Latvia, it is seen as more prestigious to work with other infectious diseases such as hepatitis or HIV. Since it is hard to recruit new specialists, the current human resources in HAI control are clearly insufficient.

Not only are the existing human resources insufficient, but the currently appointed infection control specialists struggle with professional autonomy. The daily practices of the infection control specialists I interviewed show that they have to carry out tasks other than the requisite infection

[63] Such officials represent the State Health Inspectorate, which is a public authority responsible for the external control of hospitals – in this case, it also monitors and controls how hospitals follow the national regulations on HAI control.

control activities, because all of them simultaneously provided clinical consultations, see, diagnose and treat their own patients:

> *Our infection control specialists would love to be involved in infection control activities, but their workload is immense, as it is due to their treatment duties, patient consultations, seeing patients in a clinic. They simply do not have time for this. (Infection control nurse)*

It is noteworthy that the workload of infection control specialists in some cases is highly excessive, and three out of thirteen interviewed infection control specialists admitted that they are considering quitting their job.

Regardless of whether an infection specialist works in the infection control department or as a person in charge of infection control matters, HAI control is never their sole (or core) work duty, but just one of many. In my 2012 study, all the infection control specialists I interviewed complained that it was very challenging for them to gain autonomy in their positions (or at least job duties) because they constantly were entrusted with other duties that were completely unrelated to infection control (there was even an instance when an infection control specialist had to manage the hospital's procurement commission), because they were seen as somewhat multifunctional specialists, and were thus entrusted with duties that did not have a clear match in other departments. Data from my PhD fieldwork shows that the situation for the infection control specialists I interviewed has not changed a lot, because they had to constantly deal with additional work duties that were not directly related to their official work assignments. For example, one infection control specialist described an almost comical situation where many samples of window blinds suddenly appeared on the desk; because out of nowhere, the specialist had been appointed to select some blinds for the whole hospital. There were other instances too where infection control specialists were mandated to perform other unrelated tasks, such as dealing with hospital waste management.

Although on a national level, certain duties have been set for infection control specialists, there are no specifically regulated skills, capacities and education expected from infection control specialists. The fact that any medical professional can become an infection specialist, even without any prior competence, skills and knowledge training, shows that the field of HAIs is imagined as being deeply embedded in hospital care. As a result, medical practitioners assigned to the position of infection control specialists are expected to know what to do and how to act in the face of infections. Consequently, this impression is reproduced among medical personnel, leading them to believe that one does not need any special skills or knowledge to work with HAIs. Such an approach to hospital

infection control shows how this issues is struggling for visibility on a national level; while on a hospital level, this shows that infection control specialists experience a lack of stability and autonomy in their positions within the hospital structures, because it is imagined that infection control specialists do not need any special training, apart from their general medical education.

7.1.2. Ambivalent Status of Infection Control Specialists in the Hospital Structure

The status of infection control specialists in the hospital structure is ambivalent, as they are simultaneously managing their status of both belonging and not belonging to the fabric of a hospital. The fieldwork data shows that this sense of ambivalence stems from the higher hospital management, infection control specialists themselves, and the rest of the hospital staff.

Infection control functions, whether as a separate department or a person in charge of infection control measures, are usually are a part of hospital administration, rather than a clinical unit within the hospital. In most cases, infection control functions are directly subordinated to the head of the hospital. This means that HAI control is a part of the administration's agenda, as the hospital head is legally responsible for ensuring HAI control measures; however, the daily involvement of the higher hospital management, as observed during the fieldwork, shows some different tendencies. And in reality, infection control specialists – and the issue of HAIs as such – are largely seen by the hospital board as being outside the scope of hospital administration, and falling more under the ambit of clinical work:

> *Z.: How much you have to deal with infection control, resistance?*
>
> *A1: Not much at all…*
>
> *A2: Only what we hear from treatment meetings about some hospital infections, only superficial information.*
>
> *A1: More only in critical cases…*
>
> *A2: For example, now there is influenza infections and all units start...*
>
> *A1: … administering vaccines…*
>
> *A2: … and there are quarantines…*
>
> *A1: … some patient rooms are closed, patients must be isolated, some of them we do not know where to place – these are the cases when we hear about infections, but we do not attend any meetings about infection control matters.*

Z: Would you like to hear more about these matters, how often infections are encountered, how much they cost?

A1: It is hard to say… maybe only general things, but not in more detail…

A2: No, not in more detail. (Hospital Board Members)

In this quote, the higher hospital management mimics the same distancing strategies shared by policy-makers (as analysed in the previous chapter). The interviewed infection control specialists also shared a common experience of the hospital board's lack of involvement in solving the issue of HAIs.

The same sense of insider/outsider status was reflected by how infection control specialists saw themselves within the hospital structure. A part of the interviewed infection control specialists shared their feeling of belonging to the facility as an integral part of the hospital:

I think that our place and role is quite clear. If we were to suddenly close everything here, I am not sure they would be relieved and happy. [...] I think that we are a part of the hospital. People here count on us, we help them. (Infection control specialist)

At the same time, among the interviewed infection control specialists there was also a shared sense of feeling like an outsider. This sentiment was more commonly shared by those infection control specialists who were simply assigned to work with infection control issues, as well as those who were more prone to choosing a 'find and punish' approach as a way how of dealing with the problem of HAI control.

The ambivalent status of infection control specialists was also reflected by the general medical personnel, as infection control specialists were perceived fluidly, either as belonging to routine hospital practices or just being a disturbance. Fieldwork observations and interview data show that on one hand, they are part of the hospital structure; but on the other hand, they are also outsiders to some degree, because their role is to review mundane hospital practices and habits and change them in order to reduce HAI risks. When I asked an ICU head nurse how HAI control has changed throughout the years, this was the first thing that came to her mind:

It has changed a lot since the hospital has an infection control department which helps us because the department's mission is not to control but to help. (ICU head nurse)

At the same time, the role of infection control staff was also seen as a disturbance to their day-to-day works. Such positioning was mostly associated with the perception of infection control staff as having only controlling and supervising functions, rather than advisory and helpful:

The main problem I have encountered, and not only in Latvia, is that if you are an infection control specialist, you only bother me and don't allow me to work as I want. Well, this is how both therapeutic physicians and surgeons think – you are bothering me, better don't come at all. (Head of the Decontamination unit)

The infection control specialists often shared their experience that general hospital staff was afraid of them – they were often perceived as a threat or a 'bogeyman.' Infection control specialists commonly shared that whenever they go visiting other units, employees there suddenly 'disappear,' and it often looks that the whole unit is deserted. They also often observe that general hospital staff try not to perform any mundane healthcare practices in their presence, purely to avoid reviewing and criticism:

People see infection control specialists as inherently evil people – they don't think that we are here to cooperate or collaborate or to help patients; they instead think that we are attacking them. (Infection control nurse)

This could suggest that infection control specialists are in an inconvenient position, where they problematise hospital practices and their professional work by shedding light on some of the shortcomings and unintended consequences produced by medical practice.

In the next Section, I turn my attention to another essential element of HA control practices: operationalisation of the national policy in hospital settings, which sets how HAI control should be done.

7.2. Operationalising HAI Control Policy in Hospitals

The national regulations (Cabinet of Ministers, 2016) sets standards for how human-microbe relationships should be governed in hospitals. The regulatory framework sets the core requirements for medical treatment facilities to help prevent the spread of HAIs. Under the regulations, the management of a medical treatment facility must do the following:

- ❑ Develop and introduce the institution's hygienic and anti-epidemic regiment plan
- ❑ Provide administrational support and secure collaboration between the infection control team or person in charge, management team of the treatment facility and departments
- ❑ Appoint a person-in-charge for the processing of medical equipment
- ❑ Develop methodical documents for the processing of medical equipment
- ❑ Develop a standards for invasive procedures
- ❑ Supervise consumption of antimicrobial medicines to promote prudent use of antibiotics

- ❑ Establish a procedure for screenings to identify carriers of multi-resistant microorganisms
- ❑ Stipulate in an employment agreement, management instructions or job descriptions of employees the duty of all employees to follow the plan of the institution
- ❑ Plan, furnish and maintain the territory and premises of the medical treatment facility in a way that allows the efficient flow of patients and that prevents any contamination of the territory, premises, devices and medical equipment, while also making cleaning easier.

In 2016, the Centre for Disease Prevention and Control (2016) developed good practice guidelines for medical treatment facilities, with regards to how to implement the national HAI control policy, to try and aid them in the development of their hygienic and anti-epidemic regiment plans. The core objectives of these guidelines are assisting the personnel of medical treatment facilities in their efforts to follow proper infection control practices, thus reducing the risk of HAIs; easing the development of hygienic and anti-epidemic regiment plans; reducing differences in practices between medical treatment facilities and optimising infection control measures; improving the surveillance of HAI and antimicrobial resistance in medical treatment facilities; easing the shift towards evidence-based infection control activities.

Thus, according to the national regulations, all hospitals are required to develop their own hygienic and anti-epidemic regiment plans, where each hospital must determine what kind of human-microbe relationships are allowed in the hospital. These plans are developed by infection control specialists and approved by higher hospital management. The plan (the gold standard for human-microbe relationships in a hospital) must include spatial division in areas and cleaning standards; hand hygiene for employees and visitors; requirements for outer appearance of employees (e.g. clothes, hands, accessories); use of individual protective measures; decontamination and sterilisation of medical equipment; laundry management; waste management; epidemiological surveillance procedure for patient infection risks; procedures and information exchange in case of diagnosed or suspected HAIs; procedures for employee vaccination and actions in cases of employee infections; internal control of the HAI control plan. In addition to the hygiene plan, all hospitals must develop their own invasive procedure (e.g. central catheter, mechanical ventilation) standards where hospitals should describe the use of these high-risk procedures in a manner that eliminates any possibility of infection. Hospitals are also required to establish an antibiotic stewardship programme as a part of HAI control.

Although basic HAI control principles are set by the national regulations and guidelines, infection control specialists often shared how complicated and time-consuming it is to develop a HAI

control plan and other documentation at a hospital level. During the fieldwork, many infection control specialists updated their hospital plans according to the new national requirements. As one specialist shared, the national regulation is abstract and theoretical, and their task is to 'translate' these requirements into 'practical' and thus 'real' HAI control policies. For them, the national regulations are something you can interpret differently, while hospital policy should be written in such a manner that there is no room for 'interpretations' about how HAI control should be done.

HAI control policy at the hospital level not only requires reviewing daily hospital practices, but also requires standardisation of these; for example, hand hygiene must be practiced in a certain and specific manner, catheterisation must be standardised, and patient screening samples must be collected in a strictly standardised way. HAI control policy implies that only through highly standardised control measures safe and proper healthcare is possible. However, in the Latvian context the standardisation of the HAI control policy is highly contextualised and situation-dependent: each hospital has to create their own standards in the absence of national equivalents, as HAI control is something that each hospital deals with on its own. The contradiction between this understanding of safe healthcare and a national policy position manifests itself in hospitals: HAI control practices are highly diverse not only from hospital to hospital, but also from unit to unit within one hospital. At the hospital level, the same understanding of 'HAI control as an inner thing' replicates in units too. As a result, HAI control policy is introduced and implemented not in the whole hospital at the same time, but often in each unit separately. The daily experience of infection control specialists reflects this diversity. One specialist shared that she had been working closely with one unit a couple of years now, where she had implemented multiple HAI control interventions with good results. Now she had started to work with a new unit where medical personnel challenged the most basic HAI control measures as unnecessary, and so her work of introducing HAI control started from scratch.

In the next section, I show how people in hospitals engage with the HAI control policy, while taking a closer look at four types of understanding how HAI control should be done.

7.3. Understanding of HAI Control Policy or How it Should be Done in Hospital

The ideal HAI control model or management of human-microbe relationships is defined by the national regulation and hospital HAI control plan; yet in everyday life, HAI control is understood in diverse patterns both by infection control specialists and general hospital staff. While the preferred

understanding is provided for in the national and local hospital documents, it is crucial to understand how medical staff engage with these documents (the normative model) and how they make sense of it; in other words, it is important to understand the relationships medical staff have with the regulations and the hygiene plan.

HAI control understanding manifests through how hospital staff engages with the hygiene plan, which describes how human-microbe relationships should be managed in the context of HAIs. The research data allowed me to separate four approaches towards engagement with HAI control policy:

- ❑ The approach where HAI control is seen as a burden
- ❑ The hospital environmental cleanness approach
- ❑ The bureaucratic approach
- ❑ HAI control as part of hospital quality management.

The first of these approaches is the least comprehensive understanding of HAI control, whereas the last one is the most comprehensive. The following text details all four approaches separately, although in practice, engagement with HAI control policy can be situational and context-dependent (Chatfield et al., 2016)

The first type of understanding doubts the very meaning and necessity of HAI control, seeing it as either a luxury or not important enough, but either way, not an integral part of healthcare. This is the most passive approach of addressing HAI risks, where people do not completely understand the meaning of HAI risk management and what the actual benefits are; or else they do agree that HAI risks need to be managed, but that would put too much of a burden on the hospital – due to a chronic lack of funding and human resources, they see the healthcare system as being too fragile and thus unable to deal with additional tasks, such as HAI control. Proper implementation of HAI risk control is seen as a burden, and not as a solution; they argue that there are other more pressing issues to be solved, and HAI control will not solve any problems here and now:

> *The hardest thing is to organise quality systems that actually work. This would mean checklists, regular seminars, instructions, trainings… and considering our current workload, faced by the whole healthcare system, an additional workload without clear, tangible results and with a mere promise of some global systematic improvements, it is my feeling that this is why people are against it… If both of us now would step outside and tell nurses that there will be an instructional meeting about these topics in 15 minutes, all of them would say that they need to work, and they have patients waiting. That is why there is resistance. [...] Yeah, I am afraid that all of those stories about overworked and burned-out medical*

personnel are true. Therefore, piling up on already overworked people with something that is not yet understood and does not give clear results… well, it would be like making them learn a Polynesian language – okay, this can be done, but why? Why now and why me? What are the benefits? To me, my family, my unit? And why a Polynesian language? (Head of Medical Therapy clinic)

How can you ask anything from a person working here if they are paid less than people working as a supermarket cashier or somebody else? How can you ask them to change gloves? (Surgeon)

The second type of understanding still employed by the infection control specialists is an 'old-school' approach stemming from Soviet infection control practices. Such a model means that HAI control mirrors SES practices. Firstly, human-microbe relationship control is focused on ensuring a clean and hygienic hospital environment. Secondly, HAI control is an outside inspection that manifests itself as sudden inspections in units without warning. According to this understanding, sustainable relationships between infection control specialists and unit's staff are not necessary for proper HAI control. My research participants identified this mode of operation as still being present in some places.

It would be easier, you know, to go there and take [environmental] samples – it is much easier to sample the whole world because you do not have to talk to anybody, you do not have to explain or do anything else… You simply go there, everybody sees that you have come for sampling, they got scared, they all respect you, and you have preserved this authority of yours… (Infection control specialist)

Our job should be going to units, controlling them, and then leaving. (Infection control nurse)

There is still a belief that infection control is simply cleanness checks and things like that. (Infection control specialist)

Infection control specialists, who during my PhD fieldwork shared the above point of view, disclosed that most of their day-to-day infection control efforts were focused on environmental cleanness. One outspoken infection control specialist sharing this perspective also clearly questioned some other HA control practices, like patient isolation, excessive hand hygiene, and the efficiency of individual protective measures.

If the sole focus of infection control efforts is environmental cleanliness, infection control becomes highly limited; because infection control specialists only deal with the cleaning staff, nurse assistants and sometimes head nurses. Thus, infection control becomes very narrow and only relates

to a limited number of staff. Yet physicians, for example, do not experience or witness infection control at all; because they are not in any way, shape or form involved with environmental cleanliness.

The third mode of engagement with infection control in general is certain bureaucratic relationships with HAI control, where the regulation of infection control is a set of written rules which have to be followed no matter what. Such understanding demands following the state regulations and internal hospital policies as the core element of infection control. Overall, this was the most common approach I encountered among infection control specialists; where they justified infection control measures by arguing that such practices must be followed because they are inscribed in the national and hospital policies. This approach makes following the state or internal hospital regulations into some sort of panacea – the central and most crucial element of infection control:

> *This is our [HAI control policy] plan.[64] We have it in all the units, there are such folders in all the units holding everything that is necessary for infection control – our regulations, Cabinet of Ministers regulations which we use for guidance in our work. We also have a hygiene measure plan for each unit and each room so that the units can display these plans on the wall or cabinets or in folders. If the staff has any questions, they can read these regulations. If a controller comes and staff members are under a lot of stress and cannot say anything, they can say – we read these, we have developed these rules, we have them on all cabinets [...] (Infection control specialist)*

> *The training session for new employees of [one of the largest hospitals in country], which was led by an infection control specialist, started with a presentation of the hospital's HAI control document. The infection control specialist encouraged new employees in the attendance to read the plan, as it formed an integral part of the hospital's infection control policy. The document was noticeably voluminous. The employees took a look at the document and no copies were distributed. Then, the training session moved on to hand hygiene. (Fieldwork observation)*

The bureaucratic relationships with HAI control policy are manifested by requiring employees to officially sign for reading the documents, thereby agreeing to follow the requirements set forth in these hospital policies. This marks a certain peculiar feature which I encountered during my fieldwork, whereby it was often assumed that a problem is solved as soon as a regulation – law, local procedure – has been adopted. But while regulations surely are of crucial importance and can indeed help to solve the situation, they do not automatically guarantee a solution to the situation. Therefore, those infection control specialists who shared this bureaucratic approach were often frustrated that people

[64] The folder shown to me was really voluminous, and saturated with large quantities of information. Similar volumes were shown to me elsewhere too.

did not follow the regulations, and that the rules did not automatically solve infection control issues. As a result, infection control becomes first and foremost an attempt to follow the regulations.

One rather common occurrence was that this understanding of infection control, although quite popular among infection control specialists, was not shared by the other hospital staff; because scrupulous following of state or internal hospital regulations did not make sense to the hospital personnel. I.e. this is not an effective way of understanding infection control, because there is a high risk that following legislation becomes the main aim; rather than an instrument in the fight against hospital infections. Moreover, hospital staff argues that the units are overflowing with documents and regulations, and the hospital staff have neither the time nor the resources to become acquainted with all of them:

> *Well, there are piles on piles with documents – some of these huge folders might be about infections, but who knows – nobody reads them thoroughly. (Nurse)*

> *Z.: Does infection control plan apply to your daily work?*
>
> *A: You know, these e-mails with all sorts of guidelines and instructions come in almost every day – I always filter them out and in cases when things do not apply to my work in a very direct way, I really do not pay attention to all of these regulatory documents. Maybe you could tell me now about it… (Surgeon)*

Some infection control specialists were aware that such a bureaucratic approach must undergo some changes, making HAI control bureaucracy more 'user-friendly;' given that the existing approach does not work:

> *Yes, you see we had an epidemiological plan developed in great detail on about 100 pages, but in reality people cannot read 100 pages – they neither have the time nor the desire to do that. Only the most enthusiastic people take this plan and read it through. Only a head nurse and those who feel the greatest passion for the topic and want to learn more. Others, they only go through the plan on paper and sign for it. But such formal signing is not okay; neither with me nor with the management. So, there was an idea that we should redevelop the epidemiological plan – which is already required according to the legislation – into instructions that were more detailed, but also practical instructions; and this would not be so voluminous. These instructions would instead be easy to understand, with tables, schemes, images and other elements. These instructions would be practical, addressing each section of the epidemiological plan. I am currently in the final stages of doing this. (Infection control specialist)*

The fourth mode of engagement with HAI control policy is the way hospital staff (both infection control specialists and general medical personnel) imagine and understand HAI control as part of a more extensive hospital quality system. In this understanding, HAI control is seen as a comprehensive set of procedures, like standards, data gathering and analysis, feedback, risk management, and education, for the principal purpose of providing safe and high-quality healthcare services with no harm to patients:

> *It is definitely necessary to change the attitude of the infection control staff, so that we can grasp the whole system and its compliance, and not only individual items. We should address all procedures and systems and not work only with documents; we should work with people who use and apply these documents in practice; because even now, in the clinic, there are instances where a document is written, but nobody has taken any interest in how this document is used and applied to practice. (Infection control specialist)*

Unlike other modes of HAI understanding, this approach does not put the main emphasis either on scrupulous abiding by the rules or the cleanliness of hospitals, but it rather aims at achieving that medical practitioners are internalising HAI control:

> *When seeing each patient, all employees should ask questions about the risks of patients. I'll give you few examples. When taking care of a patient, we must think – either for a second – whether the patient might have an infection. Whether they have an infection that is worrying me? Or maybe bedsores? [...] And I would also ask whether the patient has diabetes. That means that they are more susceptible to infections. We can also ask whether the patient has been hospitalised or had a surgery before. That can help in making a decision on the screening, these [HAI] tests. (Training seminar)*

> *We will never have perfect [HAI control] guidelines, as there might be too many deviations in everyday practices. Instead, we have to learn to think about the [HAI] risk. (Infection control specialist discussion)*

In this approach, HAI control is understood as knowing what the potential risks are and how they can be managed, then continuously applying this knowledge to routine practices (Paxson, 2008, p.82).

This understanding of HAI control also challenges the current approach to overall hospital quality management, by pushing it to go beyond current practices. As of now, it is widely recognised that in general, quality assurance in hospitals is a creation of documents; either procedure descriptions, work procedures, protocols or medical practice documentation. The existence of a document is often seen as a guarantee of quality, without any need to ask about actual safety and risk

management. However, within this HAI control understanding, quality assurance goes further and means not only creation of documents and standards, but also practical implementation, assessment, re-evaluation or procedures as well as feedback and personnel training. To show the absurd reality of the quality management, one of my informants shared a story about a clinic where a certain procedure and a hygiene plan was changed, but the department in charge for distributing the updated document among other departments and units only uploaded the document onto the hospital's data system and did nothing more to communicate the changed policy. Such a passive approach, for the sole purposes of checking a box that official procedure has been followed leads to a situation where nurses or assistant nurses who may not have a computer in their station but who are front-line personnel who need to follow the regulations, do not receive the policy, and the new regulations are not communicated to them.

The variety of ways people approach HAI control shows that a unified understanding of HAI risks is not shared by everybody; this leads to differences of opinion about how to handle and organise them, and how HAI control should be done (or if any). The approaches at times range from a complete denial of the necessity of HAI control efforts, to including HAI control in overall healthcare quality management. As a result, different understandings of how HAI control should be done lead to different expectations, practices and results – what is enough for somebody might be lacking for somebody else; what is necessary and imperative for one group of people, oftentimes is completely redundant for others. That leads to contested practices and a lack of agreement.

In the next section, I show how the introduction and implementation of HAI control policy is negotiated and navigated through the social relationships shared between infection control specialists and general hospital personnel.

7.4. Social Infrastructure of HAI Control

The ethnographic exploration of how human-microbe relationships are managed in a hospital enables me to discover another type of relationship, without which, implementation of HAI control in a hospital is not possible. The visible HAI control elements, like national regulations, local hospital policies, infection control staff and others, remain of paramount importance; but great emphasis should also be placed on social relationships that work as an invisible but stable infrastructure on which HAI control is built and put into practice. Within this context, 'social infrastructure' means a 'glue' holding together the implementation of HAI control. Similar role of social relationships in HAI control and broader antibiotic use in hospitals has been demonstrated elsewhere as well (Broom,

Broom and Kirby, 2019). HAI control not only aims at governing human-microbe relationships, but also depends upon the management of social relationships. The social infrastructure is a way of making HAI control an 'insider issue' where infection control specialists use their social relationships with other people in the hospital. All the infection control specialists I interviewed shared their experience in establishing and maintaining relationships with certain key persons, hospital staff or units as the first major step, a central building block; a base they can use to establish HAI control implementation upon:

> *It's common – at least in Latvia – if you don't have a normal personal contact with people working for a unit or with the head of the unit, you cannot wish to simply go there and say them – okay, this is how we will do things starting with tomorrow. (Infection control specialist)*

One infection control nurse felt sorry for the new infection control specialists who start working in the hospital, because they struggle with establishing social relationship capital. Unlike other medical staff in a hospital where it is enough for them to have social relationships within their unit or field of medicine, infection control specialists need to have – and cultivate – social relationships across the entire structure of the hospital, from administration to all clinical and support units. Therefore, they struggle with approaching general hospital staff and whoever they should be addressing. This means that implementation of HAI control in a hospital does not come naturally, but instead is a fragmented and complex process. The infection control specialists have realised that it is not fruitful to try to implement HAI control in the whole hospital simultaneously, because such an approach in their experience does not give good results. Instead the implementation process should begin in certain units that are more open to HAI control measures:

> *In [x] hospital, the people are more daring, not so afraid what somebody else will say, because all of this at the end is based on evidence on effectivity, safety and other factors, but nevertheless in the same hospital there were certain units where we did not even try to implement something because we knew that there will be such a resistance; since the staff is rather limited, we work with people who are ready to work [with us]. I believe that this is a key to success – you do not need to work with the whole hospital, but only with units where things can be done and where you can prove that there might be results. (Infection control specialist)*

Another example how complex is implementation of HAI control in units is shown by the fact that this objective can be achieved, at least partially, by the help of social relationships and good personal contacts. An infection control specialist shared their experience how they struggled with a unit where it was hard to implement HAI control; however, the situation got a little better when they

established good personal contact with some of the unit's staff. As a result, at least in this the case social infrastructure aided implementation of HAI control practices.

> *I struggle with [X] physicians – there I have a head physician and other doctors… if you can come here with fingers full of rings, if the head physician can examine patients with bare hands, checking how much urine is in the urine collection bag and then see the next patient without washing hands… it is hard there, they believe that multi-resistant Acc.baumani is a normal thing, that everybody has them, that it causes no harm, no hospital infections… But I have at least a good collaboration there with the head nurse who works very hard with her staff. Nurses and nurse assistants follow our instructions, but doctors – do not… With surgeons we have had discussions – hmm, doctor, could you, please, put on at least disposable coat? (Infection control specialist)*

The infection control specialists employ various strategies to establish social infrastructure required for their work: firstly, they use and build on already existing personal relationships; secondly, they go to other hospital units to see and consult patients and at the same time establish relationships with the unit's staff to be able to implement HAI measures in a 'friendlier' manner. My informants also disclosed certain cases when the infection control specialists were invited by a unit's head nurse or other management representative to scold the other employees of the unit for disciplinary purposes; however, infection control specialists saw this as a chance to establish relationships with the management and other personnel. Although there are always hospital units where the staff is open to implementation of HAI control measures, it was clearly argued by the infection control specialists that the actual implementation – and success thereof – depends on the quality of social relationships. The need for strong social infrastructure shows a paradox where, on one hand, governance of human-microbe relationships is completely obvious and self-evident, but, on the other hand, the governance is a process which must be continuously socially negotiated. This means that governance of human-microbe relationships will be limited or even impossible without strong underlying social infrastructure and implementation structures.

When managing social relationships, quality of communication becomes a highly important element for both navigating social relationships and navigating HAI control. Both infection control specialists and general hospital staff recalled instances when the HAI control message had lost its meaning. In cases of poor communication, HAI control turns into something else; e.g. HAI control efforts are misrepresented as an attempt to control general hospital staff, or as something unclear, an attack to the whole unit, or personal criticism or a threat to day-to-day medical practices.

Therefore, communication skills – how you deliver the message – are just as important as the content of the message:

> *There have been cases when people did not want to hear [HAI data], they did not like the results and they reacted with rejection. It is not hard to get that – when somebody says that you are doing something completely wrong or you should not do something… The first reaction then, of course, is rejection. [...] I don't like to think that we should do things in a more gentle way, but sometimes people tend to have big personalities when we try talking with them as if we are trying to teach a puppy to pee outside the house. Well, they really hate that. (Surgeon)*

One of the infection control specialists critically reflected on their own communication skills arguing that these skills, although not articulated as important in HAI control or as one of the skills required for infection control specialists, are of high importance to establish efficient social infrastructure that enables better HAI control:

> *We are angry too often, we speak in angry voices… about things that are done incorrectly. And that is not right! I saw how things should be done in [hospital] – remarkable peace and kindness in consultations. [...] I promised to myself not to get mad, to learn from them, to imitate their politeness. But sometimes I cannot stand things and get angry and sharp. And sometimes… we might not be rude or impolite, but we definitely are sharp and dissatisfied, angry; we often dislike things and then ask the worst question in world – why? Why didn't you do it? Why you do not have this? Why didn't you collect samples? [...] Mistakes are made constantly… and we are angry because situations constantly are the same… for years the same situations. (Infection control specialist)*

As a result, the communication skills become a tool for determining what is – and what is not – articulated in HAI control: either the importance of following rules, regulations, and control, or else communicated message of encouragement, development and improvement.

When implementing HAI control, it is important to create social relationships and personal contacts with the management of the units – either the head physician or head nurse, because it is unofficially agreed that head nurses are the ones who are responsible in units for HAI control. Therefore, it is essential to have good relationships with head nurses:

> *We might think that everything is determined in documents, everything looks smooth, the WHO could tap us on the shoulder and pin medals to our chests, but we must talk about routine procedures here. I have given lectures to rooms full of people but without any results. Results come only when you work directly with units and personnel. It is important to have support from the key personnel – head physician or mostly head nurses. As long as the head nurse resists and says that all*

disinfectants are a waste of money, nothing will change in here [unit]. (Infection control specialist)

The social infrastructure not only stimulates HAI control as its impact can also interfere with the work in a negative sense. Firstly, the quality of relationships can become an obstacle to the implementation of HAI control. For example, one infection control specialist shared her experience about how her good relationships with the unit made her feel uneasy when she needed to reprimand people about HAI control violations:

It's also probably my fault because all of us here get along very well and we truly have a good team here. That's why it is uncomfortable for me to reprimand and address these things, like the fact that rings should be taken off before starting a shift [...] (Infection control specialist)

Secondly, the relational structures can not only interfere with the work but also cause HAI risks. The relational hierarchy that is dominant in hospitals creates HAI risks and makes it harder to implement effective HAI control measures. Often, in hospitals, social status is seen as more important than HAI control requirements; and; as a result, HAI control requirements are not distributed among the medical staff evenly. My research participants reported cases when medical practitioners of a higher status were often allowed not to follow the same infection control rules as the other hospital staff, and the same HAI risk management requirements did not apply to them:

Nobody points out to the professor that he should not shake hands with every other patient in the mornings, but we regular people are reprimanded. (Surgeon)

A: Residents ask why should we follow [rules] when professors walk around like Christmas trees?

B: It must be understood that a professor rarely touches patients, and nurses are the ones who approach patients most often; therefore, there is a greater risk that they will cause any harm.

A: Yeah, but psychologically it is hard. (Infection control specialist discussion)

My fieldwork data allows to see that HAI control challenges current social structures in a hospital, revealing relational issues between various medical practitioners. The misbalance becomes clear when taking a closer look at relationships between physicians and nurses, as well as physicians and patients. For HAI control to be effective, relational hierarchy is a disturbance which should be re-arranged into a team work, with effective organising around HAI risk management. For example, if a nurse sees that a physician has forgotten to change gloves in-between patients, it is more important

to address the potential HAI risk, and this is something the nurse should feel free to prioritise above her place in the hospital staff's hierarchy. Since historically speaking, nurses in Latvian hospitals are seen as relatively lower in the hospital hierarchy, it is often frowned upon for somebody with a lower status to reprove somebody who has higher status. Communication mostly runs only in one direction – top to down, and rarely vice versa:

> *I have had truly negative experience with physicians – I have been thrown out from an ICU, because the physician, still following Soviet-style traditions, cannot accept that a nurse is reproving him. He cannot understand why a nurse should be allowed to reprove him just because he stands in an isolation room without a coat or gloves alongside a bunch of students. (Infection control nurse)*

Such situations require infection control nurses to learn special kind of skills to deal with physicians; but this does not come easily, because it makes both of the parties involved restructure their relationships.

Furthermore, there is a strict hierarchy in physician-patient relationships too. Although patient treatment requires team work, physician-patient relationships often are strictly closed off, and physicians often feel a sense of ownership in their relationships with patients, not permitting other specialists, like infection control specialists or clinical pharmacists, to be involved in the treatment process:

> *[...] Surgeons see their patients as their property – as a property that needs not to involve the rest of the team. They see them as their work object – see, this is my patient, I am the one responsible for them. [...] In reality, they are not responsible. [...] That is a bit arrogant, coming from the Soviet Union where a surgeon was completely responsible for the patient. Although, in reality, twenty people can work on the same patient and the surgeon only does one task. [...] They do not delegate too well. They decide what antibiotics patients need, because they want to be responsible for results. [...] (Infection control physician)*

As a result, medical instructions, including information on HAI risks, flow top to down only. Within these relational structures, the limited flow of information can lead to concealing and hiding HAI issues, as well as the presence of fear in the context of solving HAI risks (Dixon-Woods, 2010). One of the examples from my fieldwork data materialised in a story of a cleaner and indeed highly revealing hierarchical relational structure, along with the limited flow of information about HAI risks. During my fieldwork at the hospital, I had a chance to shadow a cleaner taking a closer look at her daily cleaning duties in a unit. In the hospital, the cleaner worked for a separate cleaning department and not as a part of a specific clinical unit. While on a cleaning route, we approached a table on which

there was tea, juice, and water for patients; cups were also provided on the same table. On that day, I shadowed the cleaner during a flu quarantine and, therefore, several patients were placed in isolation. The table with patient refreshments was located next to the isolation room, the doors of which during our conversation were wide open, because the medical staff were allowing some fresh air into the patient isolation room. The cleaner had already noticed this situation and asked my opinion about possible infection risks, although cleaning the table, products and dishes on it was not her duty; as this had to be done by the kitchen staff. She was worried that kitchen staff did not have necessary disinfectants to clean the table and cups and thus this table with shared drinks could create the risk of infection, especially when localised next to a patient room under strict isolation regimen. When I asked her if she had communicated this observation to anybody else, for example, during a meeting of the unit, she immediately responded – 'no, no, what can we do here… we are only 'little elves' here.' We continued talking and she revealed that she never allowed herself to pass on information like this to higher hospital staff. The cleaner had noticed a potential HAI risk, but did not dare to breach the limits of the hierarchy where she, coming from the lowest of the hospital hierarchy levels, was obliged to approach somebody from higher levels with an observation of hers.

Furthermore, relational hierarchies promote practices where HAI risk control is replaced with human control, only to maintain the current hierarchy. As another consequence, hierarchies lead to a situation where people in hospitals feel passive and invisible; they do not see themselves with an active agency, and they often feel powerless within the given power relationships. For example, people in various hierarchy positions have often said to me that they feel like 'hospital furniture,' which shows their passive position. This passive position interferes with the principles of HAI control where an active position is a core precondition for good HAI control.

The social infrastructure is a vehicle that makes it possible to introduce and embed HAI control practices in the hospital fabric. As a result, infection control specialists utilise this infrastructure by navigating their insider status, in order to reach the other hospital staff. However, the social infrastructure also shows both positive and negative aspects in terms of introducing and taking on HAI control policy. Social relationships, on one hand, make it possible to implement HAI control routines, but on the other hand, these HAI control practices do challenge social infrastructure, as they make visible how social infrastructure also produces HAI risks and creates gaps in HAI control.

After establishing policy and social grounds of HAI control, in the next section I explore how governance of human-microbe relationships starts with the complex process of making HAIs visible and thus manageable objects of governance.

7.5. Ambiguous Status of Microbes in Hospitals

This section addresses how microbes are recognised, assessed and positioned in hospitals. In the following subsections, I take a closer look at how microbes are understood as an entangled part of hospital life and landscape, thus becoming a mundane part of daily practices. Thereafter, I move onto practical efforts of making microbes explicit, visible and governable. As a result, this section illustrates the ambivalent microbial status where they simultaneously belong and don't belong in hospitals.

7.5.1. Understanding Microbes as a Part of Hospital Landscape

My hospital research participants shared a subjective feeling that the overall awareness of HAIs has grown in a hospital setting. The same feeling was shared by infection specialists too, who I had a chance to interview both back in 2012 and during my PhD fieldwork; they argued that the awareness of HAIs had grown. In 2012, infection control specialists were concerned that they were the only ones worrying about HAIs. During my PhD fieldwork, this was no longer their concern, because they also acknowledged that the role of HAIs had become more visible among the hospital staff:

> *Slowly and gradually everybody has started to realise how long it takes for a patient to recover from a hospital infection, how much that costs, how painful that can be, and how horrible that is. Both expenses and duration of hospital treatment escalate. That should not be left without attention. (ICU head nurse)*

The awareness of HAIs in a hospital is a slow process. One of the possible explanations could be associated with the understanding of microbes where they are not visible to a naked human eye. This makes recognition and assessment of microbes challenging and the entire problem of HAIs – abstract and hard-to-grasp:

> *The microbe and infection… it's something you cannot see. They neither scream or dance nor shine from afar when you look at them. [...] we have infections that know how to hide. (Infection control specialist)*

> *It is simply because we cannot sniff, feel or see them. We do not know whether they are or are not here. And since we do not know that for sure, it is better to operate under an assumption that they are here. And we must deal with that. (Head of Decontamination unit)*

The fieldwork data shows that HAI risks can also go easily unnoticed during daily routines of health care. The HAI risks can be overlooked as part common presence of different complications, changing conditions and situations in the processes of diagnostics and treatment:

> *They can easily go unnoticed due to classification under other symptoms, which cannot be said about conventional infections. It is so easy to leave them unnoticed. Doctors need to work on noticing them so that we would honestly say that we have hospital infections, without sweeping anything under the carpet. That is not a random complication, instead it is an infection. (Infection control specialist)*

Another aspect that makes the problem invisible is that not only can they easily go unnoticed in the process of identification and diagnostics, but medical staff must also be able to recognise hospital infection consequences; these are mostly manifested as a prolonged treatment, more severe disability, higher morbidity and mortality risks, greater expenses etc. All of these are 'big-picture' consequences of which it might be hard to think during day-to-day medical practices:

> *The fact is that we do not see consequences of resistance immediately. If a person dies from a trauma, we do see it right there on the spot. If somebody yells that they are not getting paid, we see that as well. But consequences of resistance we see only in a while. (Hospital pharmacist)*

> *At least in Latvia, there are other areas in medicine where money should be invested, because, let's be real, the risk of infections is not something you can wrap your head around. I can give money to a surgery because I see the results, but all these infection risks… that is something abstract, you cannot grasp it completely. The problem here is somewhat like a neglected child. (Hospital waste management specialist)*

The understanding of microbes was not only linked with imagining microbes as an invisible part of the hospital, but also a natural part of the hospital (Hor et al., 2017, p. 558). In one of the fieldwork seminars, I heard that hospitals are 'nice and warm' places for pathogens. Microbes are imagined as loving hospital environment, with great abilities to adapt, making hospitals into entangled and dynamic localities which are more than a human space. Thus, the hospital space is imagined as a locality of living together with microbes (Wolf, 2016), for example:

> *In hospitals, there are great pressure of antibiotics and disinfectants forcing microbes to change themselves on a genetic level and thus causing resistance. (Laboratory worker)*

> *Infections are getting smarter – microbes also wish to survive. (State official)*

The language medical staff use to speak about microorganisms is another factor that proves what an integral part of the hospital microbes are. Many of my informants have argued that each hospital – and even each unit – has its own microflora (the most common pathogens found there). Talking about the presence of microbes, one of my informants even said that for every hospital they are like pets; thus imagining these microorganisms as domesticised. It is generally believed among the hospital staff that this microbial presence in hospitals cannot be eliminated, and microbes have become a part of the hospital's landscape. Several of them have argued that only burning the hospital to the ground would help to completely get rid of them. Not only are microorganisms imagined as an integral part of the hospital, but their content in terms of their dynamics has also changed. The main difference noted by my informants was that other pathogens have outrivalled MRSA as the most common cause of HAIs. The microbial hospital flora has become significantly more diverse; there was a consensus among my hospital informants about the fact that if only couple of years ago MRSA was their main concern, but now the list of hospital pathogens has grown significantly longer. My research participants had several theories – but no clear answers – where has MRSA gone: it was argued that MRSA was outrivalled by other, stronger microbes, in the presence of which MRSA was not able to survive; the second opinion argued that MRSA has never been completely gone; it is only slightly more latent, awaiting a comeback:

> *We now encounter microorganisms with such names we did not have before… names for many of them may very well be the same, but surnames have changed for sure. (Hospital head physician)*

My research participants-patients also see HAIs as a natural part of hospital treatment; but their position is expressly passive, as if there is nothing they can do about it. It was often argued that the sole thing they can rely on is their own immunity, hoping that their immune system will protect them against HAIs.

> *[...] microbes are in all hospitals. The hospital does not need to be old, rusty, and unrepaired – that is almost a standard. [...] I do not think you can protect yourself from them that well… if your immunity is okay, everything should be somewhat fine. (Patient)*

The hospital staff also articulates how only couple of years ago they were afraid of microbes of which they had heard of from afar, and how unusual the presence of such dangerous microbes in hospital setting seemed to them; but over the course of just a few years, many of these microbes have become the reality in their own hospitals:

Seven years ago, I read… no, a colleague from [another hospital] told me – oh no, there is vancomycin-resistant enterococci in Japan. Well, that's it – end of the world. But now the same microbe sleeps in our ICU. No problems – we have everything. And, of course, there will be new ones too. (Head of Medical Therapy clinic)

Imagining microbes as a natural part of hospital landscape leads to a risk where HAIs are taken for granted and the medical staff does not actively and efficiently engage with the problem. Difficulties to imagine this problem as a global epidemic is another challenge that it makes it harder to actively imagine the presence of HAIs:

If we look at the picture globally, my own feeling is that we still lack awareness of global resistance in Latvia, because our indicators are still not that dramatic. There is around 8% MRSA, some hospitals have ESBL, others – Acinetobacter baumannii, but we still do not have any Carbapenems, they still have not reached us. Those few patients we have had have been brought to us from somewhere else as we do not have them locally. We are somewhat different from, let's say, old Western Europe, Spain, Italy, we have less global resistance indicators for certain microbes. That's why I say that we do not yet perceive it globally, but there are some individual doctors who have encountered these microbes and may perceive the problem globally. (Infection control specialist)

The feeling that the Latvian situation still lacks a strong focus on the global may lead to the misconception that it is still not an important issue in Latvia. On the one hand, the fieldwork data shows a preconception that Latvia has not yet been impacted by many of the microbes common around the world, and this does reduce awareness. On the other hand, once a certain level of awareness is reached, there is also the comprehension that Latvia lacks the resources to protect itself.

Due to this perception of HAIs, they are not always imagined as manageable. In this understanding, the problem of HAIs is positioned as an inevitable and global process, arguing that our actions here in Latvia will not change anything in general global processes.

There are objective processes in the world which we do not know about, but which are changing the situation around the globe. […] The process essentially is unmanageable – and the same can be said about resistance issues. It is clear that the excessive use of antibiotics has led to this and that, and what not; but the same could have happened without it too. Some sort of flu can suddenly appear, and erase lives of countless people, just like hundreds of years ago. […] It falsely seems that everything will be okay if we clean up our act, if we use gloves as much as possible, and do everything by the book… (Surgeon)

Such a fatalistic and passive understanding of HAIs can make day-to-day HAI control practices, like robust hand hygiene, as something meaningless and redundant. Depending on how hospital staff understand and perceive human-microbe relationships, it becomes possible to understand how to look for them in the hospital setting.

As Paxson (2008) has argued, microbiopolitics starts with the recognition and assessment of microbes – are they good or bad? In hospitals, microbes are not narrowly understood as only pathogenic; instead ,they are given deeper and more dynamic meanings, and they are thereby imagined them in the hospital environment as invisible, mundane, a natural part of hospitals, and thus meta-relational (Jiménez, 2013, pp. 107–109). Since microbes shape the very fabric of hospitals, they were seen by my research participants as entangled with everyday routines where one co-exist together with them.

7.5.2. Visibility Work of HAIs

The understanding of microbes is materialised and leaves the meta-relational (and invisible) state through visibility work. The latter requires a complex set of processes: assembling patient bodies, screening samples, laboratory work and HAI data. I borrow here Michel Foucault's concept of the medical gaze (Foucault, 2003), which helps me analyse this visibility work of HAIs. Foucault (2003) demonstrated that modern medicine subjects the patient's disease and body to a medical gaze which is not only a source of information about the disease and body in question, but also serves as a technology of control. Therefore, the medical gaze is both a form of special knowledge and an effective tool used to train and discipline (patient) bodies (Gibson, 2004).To Foucault, the 'gaze' is an act of seeing or a technology through which the object (the patient's body) becomes visible, and thus knowable to the observer (medical professional) (Farrell and Lillis, 2013). Making the problem of HAIs visible requires mobilising the same medical gaze directed at patient bodies; not only to see symptoms, diseases and treatments, but in the case of HAI control, also making visible and governable the entire problem of HAIs. In this case, the visibility work at a hospital consists of three stages – clinical and screening sampling, laboratory work, and HAI data use. To effectively carry out all of these stages, human-microbe relationships become of paramount importance; however, it's also rather paradoxical that the search for microbes is not a straightforward process, but instead takes place through controlling patients' bodies (finding out what grows on them):

If I want to find out what [microbes] are circulating in my hospital, I have to test patients [...]. The more we will have patient samples, the better understanding we will have… [...] If the sampling culture is high, I can learn what circulates here. [We] must look at what grows on people. (Infection control specialist)

This information not only determines each individual patient's health condition (e.g. infected/not infected and thus subjected/not subjected to a certain treatment process), but also describes what kinds of microorganisms circulate in the hospital.

7.5.2.1 Clinical and Screening Samples

The patients' bodies are controlled either through clinical sampling when there is a reasonable suspicion of an infection (to diagnose infection); or through screening sampling when there might be no clinical suspicion of an infection, but is necessary simply to screen at-risk groups of patients who do not yet suffer from an infection but might be carriers of microorganisms (early identification). The national guidelines recommend screening patients who have been transferred from, or within the last month have been admitted to, an intensive therapy unit in another hospital; patients who have underwent surgeries during the last 6 months; patients who at the admission suffer from purulent wounds, trophic ulcers, long-term catheter; patients who have been hospitalised outside Latvia during the last year; patients who have had a multi-resistant microorganism detected during their most recent stay in hospital.

However, the main purpose of controlling the patients' bodies is to search for specific microorganisms – the multi-resistant pathogens that cause HAIs. To understand the hospital's HAI landscape, the national guidelines require hospitals to monitor Methicillin-resistant Staphylococcus aureus (MRSA); Vancomycin-resistant Staphylococcus aureus (VRSA); Vancomycin-resistant (VRE); Clostridium difficile; Carbapenem-resistant Acinetobacter spp./Acinetobacter baumannii; Extended-spectrum beta-lactamases (ESBL) and Carbapenemase-producing Gram-negative bacteria. If a hospital pays proper attention to the above microorganisms, or succeeds in 'chasing' them, they become an indicator for characterising what kind of HAI-causing bacteria are present in the hospital. Furthermore, 'chasing' the said most common microorganisms also allow hospitals to carry out timely infection control measures (e.g. patient isolation), control whether infection control measures are followed, succeed in early identification of infection outbreaks at a hospital, and assess whether the measures implemented to date have been successful.

Although the hospitals visited during the PhD fieldwork did not show differences in the main subject of the screening efforts (patients' bodies), there were differences in terms of which patient bodies were seen as risky. The joining factor here was that patients who had been in another healthcare setting were seen as especially risky; furthermore, it did not matter whether the patients were transferred within a hospital (e.g. from long-term care), from one hospital to another or from one country to another. The key to distrust here is the fact that it is rather convenient to imagine HAIs as an 'outside problem':

> *I have managed to arrange that no patients are transferred here from other clinics without bacteriological screening. Without any questions. I say to them – sorry, nurses or unit heads, I will not admit the patient while I do not know what they have there [in other healthcare settings]. (Person-in-charge for infection control/hospital head nurse)*

Latvia is on the receiving end of a critique from the ECDC (2013b, 2018b) about a significantly insufficient number of screened samples. Moreover, the lack of a unified patient information system between hospitals also make it harder to determine which patients should be subjected to screening. In the current conditions, most of the transferred patients are received with no background information about any HAI findings in previous healthcare institution. There are few hospitals that have implemented their own local information exchange system: if a patient is repeatedly admitted to the hospital, the system shows whether they have been diagnosed with an infection during any previous treatment episodes.

More than often patient screening is not only a way how to control and 'catch' microorganisms circulating in hospitals, but it also serves an instrument to navigate relationships between hospital units. If patients are moved between units, they are screened to protect the image of the unit so that the unit would not be blamed for spreading HAI-causing bacteria:

> *We always screen when patients come here from other units. [...] To protect ourselves. To protect not only patients but ourselves too. So that it does not look that we are the ones who spread [microorganisms]. (ICU head nurse)*

Most often units screen patients moved to them from the ICU, just to make sure that the unit is not blamed for an infection 'caught' at the ICU. But the same reputation protection efforts work the other way too – ICUs screen patients before sending them to units, just to prove that they had no infections when discharged from the ICU. Here, control of a unit's reputation shifts the focus away from actively searching for HAIs.

5.2.2.2 Laboratory Work

When surveillance and clinical samples arrive at a hospital laboratory, they serve as a first-line information source about HAIs and bacterial presence. Laboratory samples are also relational, since they contain and represent certain human-microbe relationships (what grows on which patients). Consequently, these relationships also represent the HAI situation at the hospital.

The laboratory work on making HAI pathogens visible and diagnosable starts with the arrival of samples in various forms. In case of a conventional infection (or suspicion about presence of infection), only one bodily substance is sampled and tested; e.g. sputum for diagnosing tuberculosis. However, in the case of HAIs, the situation is more complex, and information sources are more diverse. Basically every bodily substance can be a carrier of an infection, and consequently used for testing (e.g. blood, bronchoalveolar lavage sample, skin samples, saliva, mucous swaps); furthermore, all artificial bodily extensions, like catheters and artificial breathing mechanisms, can also be used for laboratory testing purposes. All of these samples can either confirm or disprove the presence of a HAI, but they can also show an intermediate stage and bacterial colonisation, where a person can be a carrier of, for example, Staphylococcus aureus. This means that the individual-in-question is colonised by a certain number of bacterial colonies, but these bacteria have not yet multiplied enough to lead to an actual HAI. As a result, HAI screenings not only provide a clear answer of the presence of HAIs but can also lead to a somewhat grey area where bacteria are present but have not caused an HAI yet.

The laboratory work can also show that a sample is contaminated. Laboratory workers shared that many samples show contamination, but physicians do not always believe them. Sample contamination means that the sample has been collected improperly, failing to make sure that the surrounding environment and human-microbe relationships are controlled enough. As a result, it is no longer possible to tell what the source of infection is, and what has 'accompanied' the sample on its way to the laboratory.

Through certain laboratory procedures (e.g. microscopic analysis of samples, culture growth and antibiotic susceptibility tests), which take up to 5 days, bacteria become 'workable objects' (Knorr-Cetina, 1999, p. 29) which then can be made visible. These results shape the next step in HAI control, defining diagnostic and treatment path for patients and identifying the burden (circulation) of specific pathogens in a hospital. The laboratory results, consequently, make it possible to carry out and evaluate HAI control activities in a hospital.

Revealing microbes in samples is also a relational process, manifesting through laboratory worker's relationships with a sample and need to study and understand the sample on a deeper level: whether it is *Acinetobacter baumannii*, or whether it is resistant to specific antibiotics; strain microbes belong to the latter category. The core purpose of all laboratory processes is in-depth study of microbes. Here I follow the conceptualisation by Erin Koch (2013a, p. 119), where the laboratory is not a place where natural facts are discovered, but rather it is a place where human-microbe relationships are enacted. The laboratory work depends not only on enacting human-microbe relationships (isolating microbes, culturing, carrying out various tests to find out specific strains and their characteristics) as the laboratory is also a place where local microbiology is produced and reproduced, meaning that laboratory diagnostics is always contextualised within particular settings. Firstly, as already addressed in the policy chapter, laboratory standards in Latvia are not unified and can vary between different laboratories; therefore, since it is not determined what standards must be used in laboratory testing, laboratories themselves select standards to be used (e.g. antibiotic susceptibility standards). Secondly, laboratory is also a site where 'local microbiology' is produced because laboratories make visible microbes characteristic to the specific hospital. Therefore, local microbiology can be different – the deeper microbiology is analysed, more differences can be detected.

The encounter between a laboratory employee and microbes as a work object starts when they receive a sample at a laboratory:

> *In this laboratory, samples are received through a small window next to a call button to ring a laboratory technician. On the other side of the window, there is a disinfectant, disposable glove box, and a small bin to dispose all disposable protective measures. I tried to disinfect my hands, but the disinfectant container was empty. A laboratory technician receives the sample dressed in a special laboratory gown wearing gloves to avoid any direct contact with the sample. Before I enter the laboratory, I also put on a disposable gown and boot covers. These precaution measures are necessary to avoid any sample contamination with the laboratory environment and prevent the risk of infection. In this case, my presence in the laboratory is also a cause of a possible contamination. Therefore, samples enter laboratory with limited exposure to any possible contamination. (Field notes)*

All these precaution measures are necessary not only to protect laboratory technicians against possible infection risks, but also to protect the potential microbe presence from contamination with other microbes. Once the sample is collected at the window, it is then registered

in a special laboratory system – each sample having its own unique code. The samples are translated into a laboratory language, thereby getting a completely new identity. The relationships between a laboratory technician and potential microbe are enacted further by preparing the sample for diagnostic slide-making:

> *Then the sample travels to the adjacent room where a specialist, under a luminaire, prepares the sample for analysis. All rooms where lab samples are processed have luminaires, in case extra caution is needed when managing the samples. This is where samples are cultured on laboratory plates (Petri dishes). To corroborate that the sample (e.g. swap, mucus, faeces, saliva) actually holds a harmful microorganism, it must be made visible through a procedure where a laboratory specialist creates environment preferred by the microorganism. There are microorganisms cultured on plates while others are grown in liquid environment – depending on what the microbe 'likes.' Placed in a favourable environment, the microorganism, if present, will start to grow.*
>
> *Further laboratory work shows that a part of samples is stored in a special device ensuring exact temperature of 36.6 °C (average body temperature of a human). Thereafter, the laboratory technician shows me sepsis samples kept in a separate, special machine. My informant explains that the machine shows that there is indeed microbial growth in the sample. Entering a password and selecting a sample number (slot of the sample) it shows on the screen a small curved and slightly upward-faced line. This means that there is growth in the sample. If the curve is steep and upward-faced, the pathogen grows and allows to make a sepsis diagnosis. This is the exact moment when a simple sample turns from something unknown into specific information. However, this requires long and complex process because "to see a microbe" one must create an environment where the microbe can grow and "appear" in front of human eyes by using any of the visualisation methods.*
>
> *My informant takes a plate holding Acinetobacter baumannii which looks like a slimy mucous. I was already warned by my informant that over the years one develops a 'special nose' for microorganisms which allows knowing what the microbe might be. Acinetobacter baumannii has a very specific smell, making one think of decaying fish. She asks me if I want to try to smell the sample, encouraging by saying that while the plate is sealed, nothing can go wrong. She repeats this multiple times, saying that microbes do not have wings – unless you touch them, nothing bad will happen. (Field notes)*

Although devices and machinery at the laboratory ease the diagnostics and visibility work, the laboratory work would still not be possible without expertise of laboratory technicians who possess skills to recognise what exactly grows in the sample. The laboratory technicians shared that the ability

to recognise what is growing in the sample is a skill that must be learned through experience; this is how laboratory employees cultivate their relationships with microbes:

> *Laboratory technician recalls how her ability to recognise what she seeks started to develop. At first, she called her colleagues to double-check whether they see the same thing. She tested the sample using another method to see whether the same conclusions can be confirmed. (Interview notes)*

> *I ask how it was to start working in a laboratory. At first, she was afraid, there were cases when she was not right. Great responsibility and fear. Then you must open the Big Bible (microbiology textbook) with over 2,000 pages to find out what you see in the sample. Nothing has changed after these 15 years. The book can say one thing, but in life it can look completely different. (Interview notes)*

Then, laboratory employee-microbe relationships are cultivated further and, if a microbe is indeed found in the sample, a technician determines its susceptibility to certain antibiotics:

> *My informant puts on gloves and shows me couple of cultured plates on the table. The first one is MRSA which, as she admits, seems rather unusual and shows strange susceptibility. On the plate there are six circles with different number of dots in their central parts. The dots are black, but circles are light grey-brown. Four circles are noticeably larger than the remaining two, with blurry circle edges which means that they are susceptible. Whereas the other two circles look rather solid, small and roundish which means that they are resistant – fenced from the antimicrobial agent and thus protected against its effects. Most of the samples are tested against specific antimicrobial agents. (Field notes)*

Laboratory work to make microbes visible also include not only enactment (diagnostics, culturing, determination of susceptibility) of laboratory employee-microbe relationships, but also the rigorous control of all laboratory activities (efforts to avoid contamination of samples). As a result, laboratory results must easily travel across different sites and contexts and come in a universal language, giving hospitals data on HAI situation.

7.2.2.3 HAI data

When laboratory results are ready, the further visibility work is continued by infection control specialists and general hospital staff. Microbes turn from workable objects of laboratory into governable objects of hospital.

> *We then see what kind of microbes grow where; if there is an outbreak of some sorts, we see that we must go to a certain unit to see what goes on there. (Infection control specialist)*

After the laboratory work, it is up to each hospital individually to determine how easy to access their data is going to be. There are hospitals with electronic laboratory systems which can be easily accessible to see the HAI situation in the hospital (whatever data is rendered in the laboratory); however, there are also hospitals where access to laboratory data is more complicated, because infection control specialists need to visit each unit to seek paper-based patient case histories – thus infection control hospitals must chase not only microbes, but also documents too. Furthermore, laboratory information can also become HAI data, showing not only human-microbe relationships at the respective hospital, but also proving that the seamless travel of data across sites and contexts is not as straightforward as intended.

The further use of HAI data is a great reflector of the meanings inscribed in the data. The national regulations require hospitals to monitor the aforementioned six pathogens, which are used as a benchmark for characterising the burden of microorganisms in medical treatment facilities. Once every quarter, hospitals are required to submit these data to the Centre for Disease and Prevention and Control. The data use on the national level, however, is very limited. Firstly, as reported by my research participants, they have never received any feedback about the data submitted. Secondly, HAI data is not made publicly available; and thirdly, the national regulations pay more attention to the ways in which data will not be used, than to how they will actually be put to use. It is stipulated that the data submitted by the hospitals will not be used to identify the hospitals with higher number of microorganisms or any outbreaks of infections in specific hospitals; furthermore, the data will not be used to compare medical treatment facilities. The limited use of data on the national level reflects the legacy of sensitivity still inscribed in the HAI data. By proposing not to carry out an in-depth and comparative analysis on a national level and leaving this matter in the hands of each individual hospital, the national regulator intends to encourage hospitals to report any microorganisms found in the treatment facility. The historic charge of HAI data is still alive; as these data do not belong to the public, and are left as an internal hospital matter. Although this is how the national regulator attempts to encourage data reporting – as limited as these efforts are – the current approach still reproduces the old procedure where HAIs are made an in-house issue of hospitals. This gives the impression that the national regulations are more directed towards protecting hospitals than patient interests:

> *My understanding is that in Latvia information on nosocomial infections is hidden and concealed, because people believe that such information puts the hospital to shame; therefore, we do not disseminate or make such information public, we try*

not to talk about things like these so that we can polish the image of the organisation, or to harm the reputation of the organisation. (Infection control specialist)

Paradoxically, hospitals internally engage with HAI data the same way HAI data are dealt with outside the hospital walls by treating HAI data as a sensitive subject. As a consequence, HAI data is not losing its sensitive status; either within nor outside hospitals. Almost all hospital infection specialists stressed that presenting HAI data can be challenging, due to opposing attitudes from the rest of the hospital staff:

Z.: Do you electronically collect all infection cases found at the hospital?

A: Yes, we do have [electronic laboratory result system] implemented back in 2015. The system allows us to view certain time periods and hospital units. Once every quarter, we send these data to the Centre for Disease Prevention and Control as required in the Cabinet of Ministers Regulations. We even do annual statistics. I make the statistics, calculate and prepare a presentation showing what kind of microorganisms have been grown where.

Z.: Do you present these data during meetings with units?

A: Yes, we do.

Z.: How do people usually react to these presentations?

A: They react with rejection, as if we would condemn them. This is how they react to our presentations about what has grown where. They instantly think that we blame them.

Z.: Don't they believe you?

A: They do believe us, but always try to find another explanation, saying that they have done nothing wrong and that they are not at fault here. (Infection control specialist)

One of the interpretations how to explain sensitive data status within the hospital could be related with the hospital personnel's inability to detach themselves from HAI data. When HAI data is presented or shared internally, medical staff still see within these data a representation of themselves and their work, not so much of the microorganisms circulating around the hospital.

Our units are afraid of information, they are afraid that their name could be tarnished more than they deserve. [...] When we present these data, I always wish to lay down specific things, but they are misinterpreted by the units… they feel that we besmirch them, because they… well, it's a medical phenomenon of some sorts,

because each unit is just like a cell, its own kingdom; they will do whatever they need to do to protect their name. They do not see what good can come out of this; we rarely manage to convince them that they can benefit from the things we say them. (Infection control specialist)

Another challenge for fully engaging with HAI data is the fact that it is not required for anyone to register and monitor what HAIs (e.g. surgical wound infections, ventilator-associated pneumonia) are actually caused by these pathogens. As a result, all surveillance efforts in hospitals are partial and insufficient. Although national guidelines recommend registering HAIs, there are no actual requirements to do, so as it is believed that registering HAIs would be too much of a burden on the existing healthcare system. Nevertheless, there are several hospitals trying to register at least few infections (these data, however, is kept internally, solely for the needs of the hospital); because without this data, infection control cannot function fully efficiently and properly. A couple of my research participants have reflected on their attempts to suggest to the hospital management that this should be a priority.

Z.: Do you need more data to better understand the HAI situation in hospital?

A: We currently collect data on bacteremia incidence, but it would be good if we would have all these nosocomial infections registered – urinary tract, surgical infections, ventilation-cause pneumonia. This is still lacking; because currently, we only have bacteremia. But I cannot do this on my own – this requires involvement on a departmental level and a physician's opinion to clarify the diagnosis. (Infection control specialist)

Through these stages of visibility work (collecting samples, laboratory work, and use of HAI data), human-microbe relationships are made into an object of control. Throughout the visibility process, the enactment of human-microbe relationships not only makes microbes visible, knowable and governable, but also reflects the historic legacy of a sensitive topic. The visibility work thus can become a tool for maintaining both the internal and external relationships in terms of how we look to others (Street, 2012). The concept of 'how we look' can sometimes become the main drive behind HAI data. The sole outlet where the issue of HAIs is not considered sensitive is when these data travel outside the hospital and outside the country, as part of surveillance networks and international research agendas. Under such circumstances, HAI data loses its sensitive status; because HAIs are then disassociated from the specific medical personnel, unit or hospital, and instead represent the country as a whole. However, in these cases, HAI data still maintain their original 'how we look' perspective; because this allows hospitals to become part of EU-level studies. It becomes a matter of

prestige to belong to research networks, projects and other activities requiring HAI data. My research participants with experience in such research networks, studies and projects spoke about their experiences with great pride, and saw many benefits from sharing HAI data; none of them shared any concerns about anybody interpreting their data unfavourably. As a result, the laboratory data not only represent human-microbe relationships, but also goes deeper by becoming an instrument for navigating other relationships; e.g. with colleagues, hospital, state, Europe.

In conclusion, it takes a rather complex and long process for HAIs to become a visible problem in hospital settings. Only through the imagination of HAI, sampling, laboratory work and data use can human-microbe relationships and one of their central manifestations – the problem of HAIs – can become an object of governance. Analysis has also showed that the visibility work of HAIs in hospital is shaped by broader historical, social and political context.

The next section focuses how the governance of human-microbe relationships works on a daily basis.

7.6. Enacting Governance of Human-Microbe Relationships

On a daily basis, the governance of human-microbe relationships in hospital settings is rather paradoxical. In order to control microbial encounters, one needs to control hospital space, equipment, and people; as a result, these mediums also become subjected to microbial control. Just like the previous stage, where HAI visibility was attainable only through the intermediation of a patient body, the control of human-microbe relationships also becomes possible only when enacted through these specific hospital mediums. These mediums enable us to visualise where HAI risk control should be directed. Each of these mediums is categorised according to the level of HAI risk (e.g. high-risk unit, low-risk medical instrument) and then controlled according to the allocated risk level. For example, if the medical personnel imagine HAI control as an issue of environmental cleanness, then their focus would be focused mainly on governing hospital space. Or, if HAI control is imagined as a comprehensive quality system then their focus would be directed towards how to manage human-microbe relationships as a 'process-in-the-making' between space, equipment, and people (Latour, 2005).

As discussed in the previous subsection, in the case of managing hospital infections, the medical gaze is not only directed toward bodies of patients to surveillance and discipline them; it also makes visible the problem of HAIs. In this section I explore medical gaze further, adjusting Foucault's (2003) concept of the medical gaze into a concept of microbial gaze which is now directed towards

the bodies of the hospital staff, space and equipment; searching the localities where microbes might be localised at a specific time, in order to enact control over them:

> *Infection control as such… well, it's a form of art. When you enter a room and see how people operate, you have to see things others do not see. (Head of the Decontamination unit)*

Through the medical gaze, human bodies become the same surfaces as hospital space or equipment from which microbes should be removed. And training the microbial gaze is a toilsome endeavour for infection control specialists too. During my fieldwork, the infection control specialists organised two national level meetings to share their experiences of developing HAI control policies at their hospitals; or in other words, they used this information as an outsider gaze, to help review their own hospital routines and avoid their 'mundanity,' which is often what turns HAI risks invisible.[65] Specialists also used exchange visits to other hospitals in Latvia and elsewhere as another instrument for avoiding this phenomenon. Also, participation in research projects served as another tool for reviewing the daily practices of hospitals and another angle for the outsider gaze. One of my informants admitted that they had updated and improved their HAI control policy; after all, research projects have provided a 'fresh pair of eyes' to review hospital routines. To develop HAI control policy at the hospital level, it is necessary to balance the insider gaze and outsider gaze – infection control specialists must be familiar with the hospital's specifics, but they must preserve their outsider gaze too, in order to carry out proper HAI control.

On a daily basis, the governance of human-microbe relationships in hospital settings is also rather paradoxical. The fieldwork data revealed that in order to control microbial encounters, one must control the hospital space, equipment, and people. Just like in the previous stage, where HAI visibility was attainable only through the intermediation of a patient body, the control of human-microbe relationships also becomes possible only when enacted through these specific hospital mediums. These mediums make it possible to visualise where HAI risk control should be directed, thus becoming relational objects through which HAI risks and their management are being 'moulded' (Sneath, Holbraad and Pedersen, 2009, p. 5). Each of the mediums is categorised accordingly with the level of HAI risk (e.g. high-risk unit, low-risk medical instrument) and then controlled according to the allocated risk level. For example, if medical personnel imagine HAI control as an issue of

[65] This phenomenon of the invisibility of mundane hospital practices was one of the biggest surprises during the fieldwork: how come from an outsider's perspective it was so easy to identify HAI risks (e.g. inappropriate use of gloves) but it remained invisible to an insider's perspective (e.g. hospital personnel?)

environmental cleanness, then their focus would be focused mainly on governing the hospital space. Or, if HAI control is imagined as a comprehensive quality system then their focus would be directed towards how to manage human-microbe relationships as a 'process-in-the-making' between space, equipment, and people.

7.6.1. Space

The hospital space, according to the hospital's hygiene plan, is divided into cleanness zones, depending on where the highest microbial contamination is imagined to be. The hospital premises are divided into three zones: elevated cleanness zone, regular cleanness zone, and potentially contaminated zone. In elevated cleanness zones, microbial contamination must be removed completely, because this is where high-risk procedures take place and microbial presence could harm patients the most (e.g. operating theatres, ICUs, burn units). In regular cleanness zones, only day-to-day regular procedures take place, and it is assumed that this is where microbial presence does not possess high risk to patients, because these rooms are not meant for high-risk procedures (e.g. patient waiting rooms, patient rooms, hallways). It is expected that potentially contaminated zones (e.g. the room of an infected patient, microbiological laboratory, showers, toilet) have high levels of microbial contamination and, therefore, it is important that microbial contamination is not carried out from these zones to other hospital premises. It is noteworthy that this zoning can change at any given moment, due to microbial conditions; for example, it can be found out during a surgery that a patient is potentially contagiously infected; therefore, the room immediately changes its status from an elevated cleanness zone to a potentially contaminated zone.

Although, on paper, the special division seems simple and straightforward, such categorisation of hospital space into strict zones of risk is challenging in practice; as neither the utilisation of hospital space nor HAI risk are static. In addition, one of the infection control discussions made clear that efforts to standardise hospital space according to HAI risks have fallen short. Few hospitals had introduced colour system for each spatial zone. However, it turned out that these colours were used differently among the hospitals. For example, if in one hospital, the colour orange a signified regular cleanness zone, in another hospital the same colour was used to label an elevated cleanness zone. For medical personnel moonlighting in these hospitals or changing jobs, this standardisation could only create confusion and the unnecessary risk of following the wrong HAI control measure.

Special cleaning requirements are applied to these zones depending on the cleanness level – how often they must be cleaned, what cleaning products must be used, the content of the disinfectants (strictly setting the slightest proportions). These and many more cleanness practices depend on what is imagined as necessary for cleaning the room, according to the pre-determined cleanness level.

On a daily basis, medical personnel follow their own unofficial zonings – divisions according to where the hospital staff imagine a higher or lower microbial presence. For example, one hospital had a 'clean' and an 'unclean' ICU; moreover, in units there can be a clean part and unclean part, which means that patients with contagious diseases are located in one part, but those without contagious diseases are found in the other part of the unit. During one of my fieldwork visits in an ICU, I noticed on the floor a red tape, and asked my informant what the tape meant. I was explained that the tape separates two areas: the side where we stood at that moment was regarded as the 'staff's area' where patient treatment procedures were not carried out. As soon as one steps over the red tape, they must be properly clothed, because this is where the patient treatment area starts. The red tape was used as a symbolic border where any microbial presence was no longer allowed, and people had to take proper precautions to avoid contaminating area across the line: it was imagined that microbes could not cross the line. Thus, controlling HAI risks not only depends on controlling physical space but conceptual one as well (Vansteelandt et al., 2015, p. 151).

For medical personnel, the struggle to find the best possible way of controlling hospital space was linked not only to finding the optimal cleaning service, but also with managing the cleaning personnel. This shows that controlling space means controlling not only the cleanness of the environment, but also cleaners. However, the voice of the cleaners was not represented in discussions about the best possible cleaning method; there was no discussion of how cleaning looks from their position and experience.

In the control of space, medical personnel see risks to themselves as well. One risk is posed by their exposure to various disinfectants, because microbes require the use of increasingly strong disinfectants:

> *I think when I will be old, I will feel the consequences of all these disinfectants, sprays and wet-wipes. We yet do not know what will happen after we have inhaled all these fumes. It might be felt by my children, their children… all of this might be inherited, because my youngest child has asthma while the oldest does not – and I did not work in surgery as much back then. All of our nurses have children with asthma. And it is only asthma – what will happen later? (Unit's head nurse)*

Hospital staff dealing with infectious waste are also exposed to risks of infections. These individuals at times even accidentally cut themselves with sharp medical objects, which in turn endangers their own health.

The prevailing general opinion about microbes says that we must fight against their harmful effects and destroy them. However, the medical personnel encountering microbes on daily bases speaks also of the need to protect microbes, and that we must be conscious of their good qualities and how necessary human-microbe relationships are. This opinion was shared by different medical staff (e.g. nurses, laboratory workers, technicians). The medical personnel often shared the opinion already observed in popular discourse about the need to maintain proper human-microbe relationships (please see Chapter 5, section 5.2.2.); one where microbes are not completely destroyed, but instead are preserved, because people can benefit from microbes too.

> *Human immunity does not work in a sterile environment, it is not trained, with no contacts with bacteria. Bacteria train immunity. (Head of hospital laboratory)*

Even people who work on a daily basis with highly dangerous and contagious microbes acknowledge that human-microbe relationships are not one-dimensional or simple. Medical personnel's relationships with microbes tend to be shared ones; e.g. what they should be in a hospital and what kind of cautionary principles must be observed. However, their relationships with microbes are also deeply personal. Therefore, when facing HAI control practices, medical personnel should negotiate when to follow the prescribed infection control measures and when to refuse to protect themselves from exposure.

7.6.2. Medical Equipment

Just like how hospital space is categorised in infection risk categories, all medical devices, instruments and materials are similarly categorised under categories for whatever purposes the equipment is used for, rather than according to the type of equipment. The HAI control policy categorises low infection, medium infection and high infection risk equipment. The equipment with low infection risk (e.g. blood pressure devices, thermometer, and stethoscope) comes into contact with healthy patient skin, and it is believed that skin serves as a barrier preventing microorganisms from entering the patient's body. Medium risk equipment comes in contact with patient mucous membranes or damaged or infectious skin because this is imagined as a much more likely passageway for microorganisms to enter a patient body (e.g. anaesthesia devices, endoscope). High risk groups

include all medical equipment (e.g. surgical instruments, catheters, and implants) that come in contact with the inner environment of a patient body (e.g. blood, organs, tissue).

All hospital equipment is further subjected to a microbe removal process. Certain decontamination stages are prescribed according to the risk category attributed to the medical equipment; this depends on how contaminated the equipment is imagined to be. Once the category is determined, the equipment undergoes one, two or all three stages. The first stage is cleaning and washing, which means removing any visible dirt. The next level is disinfection, which is imagined as the reduction of viable microorganisms down to a level which is perceived as not being harmful to patient health. The highest level is sterilisation, where all microbes are completely removed. The decontamination stages of medical equipment show how long and complicated process governing human-microbe encounters is, where microbes are first imagined on a scalpel, then at the end, all relationships with microbes are cut. For example, the equipment is considered as sterile only when 14 stages of sterilisation are carried out (e.g. equipment is treated throughout all eight processing stages, the sterilisation is made traceable, a sterile instrument is safely transported and stored). Only when all these specific and highly standardised stages are done, can one assume that there is no presence of microorganisms on the equipment.

Not only it is not possible to see the presence of microbes with your own eyes, but it is also impossible to visually detect absence of microbes. One still must operate with an assumption that microbes are eliminated. One of my informants who managed equipment decontamination department argued that sterility is 'only a probability,' meaning that there are indicators and measurements which allow to measure sterility indirectly but never directly:

> *This is only a probability because testing mechanism does not exist for conforming sterility [...] When after decontamination I return instruments back to the surgical unit, the instrument might be packed as sterile, but I cannot 100% assure that the instrument's surface is sterile – I cannot say that because I cannot check that. To check that, I must open the package, take it to laboratory but the moment the package is open it is no longer sterile. [...] I can only say with a greater of smaller degree of probability – yes, it might be clean. This probability depends on what have I done before and how accurately I did it. How I checked every step. This is a good thing, but it is an indirect testing, because it is simply impossible… You know, results in medical treatment can be actually seen. After a surgery – immediately, in overall medical treatment – maybe in a while, but we here will never see the result of our work. (Head of Medical Equipment Decontamination department)*

The use of a bronchoscope and appropriate decontamination has been a mundane hospital practice for many years; but during my fieldwork, the bronchoscope was a source of problems for many of my informants, as it posed a risk of causing HAIs. In one of the occasions, a link between a bronchoscope and a HAI was actually discovered:

> *There was a moment when practically each procedure with a bronchoscope caused MRSA. Then they really asked for my help how can this happen. [...] We found out the weak spot in the decontamination procedure – due to shortage of instruments and frequency of manipulations, the instrument was not fully and properly decontaminated in-between every two procedures. The instrument was manually immersed for fifteen minutes in disinfect, then dried and that's all. [...] Maintenance works also were not performed often or timely enough and MRSA had already found its place in the inner circulation filters. As a result, each of the following bronchoscope were infected. (Head of Medical Equipment Decontamination unit)*

Another aspect where the risk of HAIs challenges mundane hospital practices is daily invasive procedures; e.g. the insertion and use of blood vessel catheters, urinary catheters, central line catheters, artificial ventilation devices. Although the use of all such equipment is part of mundane medical practice and makes treating patients significantly easier, but in terms of HAI control, they are believed to be high-risk procedures. In accordance with national regulations, each hospital must develop its own standards for use of invasive equipment as part of their overall HAI control policy. In a hospital routine, invasive procedure equipment is often not seen as possessing the imagined HAI risk, while others believe that the use of catheters cannot be standardised. One possible explanation could be that catheters and any other medical equipment are too mundane and self-evident and, therefore, medical staff find it hard to see them as something dangerous:

> *In my opinion, it is not inherently a good thing that they have only physicians and no nurses who perform these intravenous manipulations – insertion of a catheter – because I see how many doctors do these things. I do not think that they are doing this more carefully than nurses. To be honest, doctors tend to do these minor procedures more recklessly than nurses. I also think that the insertion of a venous catheter is not big of a deal. When you do something important, you get your mind straight, because these things can get serious. But this venous catheter is not an important thing, but sometimes this is enough for [HAI] (Surgeon)*

The same argument is aided by the fact that catheters are not used in operating theatres where the infrastructure is built around eliminating HAI risks, but instead they are used in regular hospital units

where the mundane nature of the catheters prevents medical staff from seeing the underlying risk of HAIs.

7.6.3. People

When it comes to people as mediums for controlling human-microbe relationships, it is important for them to not become agents carrying microbes to patients and thus causing HAIs. People, and this especially applies to medical personnel, have to manage two types of human-microbe relationships at the same time. One type of relationship involves avoid infecting patients; the other type means avoiding infecting themselves. In order to prevent any contact with contaminating microorganisms, requirements for medical staff include hand hygiene, requirements for outer looks, and use of individual protection measures. Furthermore, the higher the risk of infection (e.g. highly invasive procedures or treating patients with an already existing infection), the stricter these requirements are for medical personnel.

To govern both types of human-microbe relationships, there are three kinds of hand hygiene: hand washing with soap, hand disinfection (with an alcohol-containing product), hand surgical disinfection. It is imagined that there are certain moments when hand hygiene is especially important, and the threat of contamination is especially high. Before contact with patient; before aseptic procedures; after possible contact with bodily fluids; after contact with a patient; after contact with object in a patient's zone (imagined space around the patient). Furthermore, each method of hand hygiene includes strict steps to be followed addressing the right way how to do it and which method to pick. For example, surgical hand hygiene – which is recommended before inserting the central venous line – includes eleven steps, in order to remove all possibility of microorganism contamination occurring via hands.

The next requirement imposed on medical staff is a certain degree of appearance control. Firstly, hospitals define what work clothes must be worn by employees (e.g. elbow-length sleeves, because long sleeves interfere with proper hand hygiene); secondly, hospitals also control the appearance of hands and nails (e.g. no nail polish, nail extensions, hand watches or rings); thirdly, certain individual protection measures must also be in place – the use of disposable gloves, aprons and medical gowns as well as facial and eye protectors. Fourthly, medical staff also should be vaccinated, to prevent the spread of such infectious disease as diphtheria, hepatitis B, influenza and many more. All of these protective measures must be used in order to avoid getting infected or

transmitting infections further. It expected that medical staff will manage human-microbe relationships by following the above practices.

However, the appearance of control is itself associated with another risk: it is very easy for infection control staff to not control HAI risks, but instead direct their focus onto people, losing the focus on safe and proper healthcare and using their role as a tool of power. As a result, people think that the infection control staff are controlling them instead of HAI risks:

> *It is truly easy for infection control specialists to stop controlling infections and start controlling employees. Everyone who has been involved in infection control work can say that it is easy to start controlling employees – people – forgetting about the main thing – infection control measures. (Training seminar)*

Medical personnel carry the double burden of managing human-microbe relationships; as a result, their hand hygiene, appearance and other bodily routines have a crucial role in HAI control. However, my fieldwork shows that relationships with microbes in hospitals are highly intertwined, and that the process of managing these relationships is hard:

> *This morning I joined two infection control specialists on their visit to the ICU, which they had labelled as highly problematic in terms of the endemic problem of hospital infections and insufficient hospital infection control practices. When the infection control nurse explained the main infection control problems she had observed in the Unit over the course of last couple weeks, the head nurse objected saying that it could not be true that these microbes were encountered here, so quickly after a patient was admitted to the Unit. Infection control physician responded that it simply takes one wrong touch to get a hospital infection. (Field notes)*

The medical staff's double relationships become more obvious and easy to manage through individual protection measures as soon as risk becomes visible:

> *I find it funny how my colleges behave sometimes - medical practitioners assume that all the patients who come to us are potentially infectious – this is what was taught to us, and this is how we do things. But the patient can come to us and reveal if they are infected with something, but the patient just as easily can not disclose this information – that is completely up to the patient. But when we know about the infection – it becomes a big deal down here, then we put on three masks and five pairs of gloves because we know that the patient is infected. But then you have to ask yourself – are you sure that the next patient is not infected? When we find this out, it's a catastrophe down here – it is noticeably declared that this is the end for all of us, because we simply have an infected patient. (Head nurse of unit)*

However, while the risk of HAIs is invisible, it is quite easy to let human-microbe relationships slip through the cracks. In such cases, improper use of individual protection measures can actually lead to adverse results and cause HAIs:

> *I have a surgeon who puts on an apron and gloves to see a severely ill patient who lies on a bed. Then surgeon suddenly gets a phone call. He simply sits down and takes a call. But after that – where are you going, sir? To see the patient! Then you have to change! Why? When I explain, then – yes, the surgeon listens to me. He thinks that only in the operating theatre conditions are different and special. (Infection control specialist)*

An unremoved ring, properly unwashed hands, nail polish and hand watch on the medical staff's body in HAI control; all these become a visual sign of an HAI risk. These specific requirements for healthcare practitioners to control both types of human-microbe relationships make medical staff discipline their bodies in strict and specific ways. In order to control HAIs and protect themselves from possible infections, they need to manage their own bodily practices and appearances. Foucault's (2003) concept of the medical gaze helps me analyse these specific HAI control practices as applied to medical staff. The medical gaze turns human bodies into the same surfaces as hospital space or equipment from which microbes should be removed, serving as both a form of special knowledge and an effective tool used to train and discipline bodies; both patients and medical staff. However, in the case of managing hospital infections, the same medical gaze now is directed not only toward bodies of patients, but also towards the bodies of the hospital staff. It suddenly becomes important what medical practitioners are wearing, and do they have an open hairstyle, and what is on their hands; e.g. rings, watches, bracelets. Through the same mechanism of the medical gaze, the bodies of hospital staff can be seen as a form of knowledge, and at the same time as something that can be disciplined and trained through certain acts:

> *There is a huge problem with the improper use of gloves. People here already know – if I catch somebody in the hallway with their gloves on, I will make them remove these gloves in my presence. You have no reason to walk around the unit with gloves on! [...]. This year I intend to remove gloves from everybody I catch with them! (Infection control nurse)*

Open-plan units are no longer only a surveillance instrument for monitor patients' bodies. The same open-plan design now has become an effective tool for infection control specialists to monitor medical personnel:

I would recommend going to units and working with units where the problems are most burning, because a hospital must always start with solving problems at the ICU. Moreover, it is also rather easy to measure [hand hygiene] at the ICU because there is only one nurse's desk and numerous patient's beds. You can stand on one side of the window and they think that you are measuring something there; although in reality you measure something completely different, just because this allows you to observe this hand hygiene practice. (Discussion between infection control specialists)

The hospital staff's appearance is another way of expanding the medical gaze; one where medical practitioners must discipline not only their bodily practices, like hand hygiene, but also their external appearance. For example, from the standpoint of infection control, a physician's white coat,[66] which for such a long time was a significant symbol of authority of modern medicine, becomes an HAI risk:

At the moment, we mostly have to deal with consultants. They come with their own coats, but we do not know when they have put them on and what kind of patients they have seen in them. It is our policy that they must take their coats off and put on disposable coats, or at least put a disposable coat over their own coats. (ICU head nurse)

The medical gaze often is also strongly gendered. During fieldwork observations and interviews the medical gaze was especially noticeable in controlling the appearance of nails thus mostly addressing women. There were special awareness campaigns organised on nail safety, arguing that gel or other type of artificial nails are not allowed in medical settings. The matter of nails was addressed in one of the meetings of the infection control specialists, where one infection control specialist shared that she has invented a new disciplinary system. This aroused interest among other infection control specialists, who were struggling with coming up with a solution for appearance issues.

A: We got tired of all the nails here, so we started to give misconduct protocols developed in collaboration with the Quality Department. [...] The standard criteria are based on a certain clause in the hygiene plan, and a nurse is breaching the plan by treating a patient with nail polish on. The protocol shows the first and last name as well as the required corrective actions – removal of nail polish before the start of the next shift. [...] I come back when she has her next shift and check whether she has removed the nail polish. If she has failed to do so, we issue another protocol

[66] In Latvia, hospitals and other healthcare facilities traditionally do not hand out medical clothing to medical practitioners, who have to purchase work clothes by themselves; other than in exceptional cases.

[...] If the same person has two protocols for the same reason, we send these documents to HR. This is the most threatening, psychological option.

B: We had something similar, but it was hard to fill in the protocol. We asked for the person's consent and the person had to sign the document. Then we asked for the head physician's signature. And, oh my God, the Head of the Economics Department called me a traffic cop, and nobody likes traffic cops.

C: Well, yes, but they will say that they will leave the job then. I have had cases when we gave a very strict reprimand and they said that they will leave the job. I had to deal with a head nurse then. (Infection control specialist discussion)

Women are seen harder to discipline and causing a greater risk of HAIs, due to their external appearance. When discussing the risk of HAIs and ways how to discipline women-medical practitioners, many my informants used misogynistic language, addressing them as 'girls.' In the meantime, men were never addressed by using derogatory forms of language; and only one informant argued that men are more problematic than women, as women tend to follow HAI requirements better than men:

These girls, you know, they want to look pretty. But I tell them – when you have finished work on Friday, do whatever you want during the weekend, go home and paint your nails, but remove the nail polish on Sunday evening before you come back to work. (Head of surgery block)

The expanded gaze then becomes one of the most central points of friction between the HAI control policy and general medical personnel; where medical practitioners are, on some level, deprived of authority, and instead must subject themselves to the same control mechanisms they routinely use toward patients' bodies. All the infection control specialists shared their experiences of the different strategies medical personnel use to avoid their gaze; for example by avoiding or refusing to do any medical procedure while infection control personnel are present, or directly confronting them and questioning their authority to be present in a specific patient room or hospital unit. The practices of disciplining medical personnel (e.g. annual flu vaccines, prohibition of jewellery) often serve as a reason for general medical personnel to protest against mistreatment in hospital (e.g. low salaries) or position these requirements as a redundant bureaucratic burden. The general medical staff's reaction to HAI control is not a way how they manage human-microbe relationships, but instead it becomes a vehicle for expressing their dissatisfaction of their place of work and agency too:

They refuse to remove wedding rings,[67] because they believe that their marriages will fall apart as a result – or they believe in other similar superstitions. The same can be said about nails… nails with polish on them. They argue – I am a woman and I work so much, where else could I show off my nails? How else can I express myself?! (Infection control specialist)

The general medical staff also do not agree with the infection control staff; as to the threat possessed by the management of their own human-microbe relationships; because their perception of HAI control is rather different from that of the infection control personnel. The general medical staff, to which the extended medical gaze and disciplining practices apply, do not see themselves as possessing the same high risk of HAIs as medical space and equipment. Where infection control people see high risks to patient health, a part of medical personnel does not see the threat, arguing that their appearance or mundane practices cannot cause such HAI risks and harm patients:

So many people do not believe that! They think that these bacteria are somewhere in ventilation and somewhere else, but never in their nails or on their hands. (Infection control specialist)

I don't do such a harm by not washing my hands. (Field notes)

Since the general medical staff must manage two forms of human-microbe relationships, they conceptualise some HAI control practices in a way that leads to a conflict between both types of relationships. For example, they see excessive hand hygiene as a threat to their own personal relationships with microbes, in the sense that they wish to preserve 'good bacteria' on their hands in the name of their own health. They argue that removal of the protective layer from their hands make them more easily invincible against external pathogens. As a result, they have to do a trade-off of sorts; whether to engender themselves in the name of HAI control or to protect themselves by causing HAI risk:

Nothing damages skin like excessive washing and disinfecting with chemicals. In reality, one person harms their own health. But, in the context of public health, the same person manages and prevents the overall problem as such. There is no balance… we need to scarify a lot by making our job conditions a lot worse, scarifying our comfort on job, by preserving the public health. There is a conflict between individual health and public health.(Head of Therapy clinic)

[67] During the fieldwork I also encountered this cultural phenomenon. When in the field, I followed the basic HAI control requirements and I followed HAI control principles about my appearance (e.g. I didn't wear a watch, wedding ring etc.). On various occasions I was asked about my marital status, because I wasn't wearing my wedding ring.

Although management of human-microbe relationships in hospitals might seem straight-forward and self-explanatory in the sense that strict microbial eradication and control to prevent any microbial outbreaks should be unanimously agreed upon, the control and disciplining practices of humans revealed that the ways how humans manage their relationships with microbes may be very different – the management of human-microbe relationships is neither universal nor uncontested.

7.7. Patient-HAI Relationships

> *Z.: Have you ever heard of hospital-acquired infections?*
>
> *A: Yes, I have heard and read about them. There have been cases in my family too – my grandmother got pneumonia after surgery. And my friend took her daughter to a hospital with one type of stomach virus, but got another stomach virus at the hospital.*
>
> *Z.: Would you want to learn more about these topics?*
>
> *A: You know, sometimes I wish had never read or heard something at all. I think you cannot protect yourself in a hospital – as long as your immunity is okay, things should be fine. (Patient)*

The above quote was said by a patient who turned out to possess the most comprehensive understanding of HAIs among the patients I interviewed during my fieldwork. This patient was rather unusual, due to a prolonged period of healthcare experience where she was in and out of hospitals for a whole decade. She was different from the other interviewed patients because she took an active position believing that the patients themselves need to gather information, and all medical decisions must be shared between a healthcare practitioner and a patient. She took an active part in selecting her treatment course and believed that patients should take responsibility for their health and healthcare. Although she was not given any special hand hygiene training, she nevertheless felt that washing one's hands was very important, so she paid special attention to these matters. She described in detail how hand hygiene had become a part of her daily life, regardless of whether she was in a hospital or at home. However, from her ten years of hospital experience, my informant did not recollect any attempts by the hospital staff to involve her in HAI control in any capacity. On the contrary, she was once considering getting a flu vaccine before a scheduled surgical operation, but her surgeon talked her out of doing so, arguing that a vaccine would not benefit her in any way.

Just like microbes, patients can easily become invisible in HAI control practices. The fieldwork data shows that patients lose their visibility when they are positioned only as a surface from which

samples are taken, and which must be protected against microbial contamination. The longer patients stay in a hospital or the more severe their health condition is, the higher the risk of contamination where the patients again become only a surface for microbes. Patients are also invisible by the fact that they are imagined and positioned in healthcare system as passive participants of overall healthcare, especially in hospitals. The general medical staff shared their view that the overall belief in hospitals is that the patients should be grateful and happy just for being admitted to a hospital:

> *Our patients are glad that they are in a hospital at all – they do not dare to object when somebody comes to see them unvaccinated or without gloves. Or when a nurse takes blood samples without gloves – they are all scared to object, even when they see a total nonsense. (Infection control specialist)*

As a result, all my hospital informants shared their subjective assessment that patients have very limited knowledge on the problem of HAIs and on any possible preventive measures. This subjective feeling of my informants resonates with the results of the media analysis, which showed that the HAI topic was rather marginalised in the public space:

> *They do not know so much about resistance. I always tell them that they have a resistant bacteria which you can get in a hospital, and our hospital has this bacteria, but overall patients are poorly educated. Knowledge about resistant bacteria – that is too much to ask… (Infection control specialist)*

The patients and visitors are subjects of the same human-microbe management as any other individuals in a hospital, but hospitals have only recently started to articulate this message; consequently, the patient and visitor involvement in managing human-microbe relationships is still marginalised. During my fieldwork, the hospitals worked on informative posters to inform patients and visitors about hand hygiene and precautionary measures for HAI prevention. On the one hand, patient involvement and visibility in active HAI control is very much contested, even among medical practitioners themselves; because more active patient positions and the demand for safe and qualitative healthcare would surely benefit HAI control. For example, a couple of hospital informants hoped that patients will start requesting compensation for from the National Risk Fund for HAI infections they have suffered. The same informants also hoped the patients themselves would show some initiative, both by learning about such an option and acting on it:

> *We have discussed these matters with [infection control specialist] – when patients start asking for more compensations from the National Risk Fund, we will start taking these matters more seriously. We, as an organisation, are not allowed to speak about these things, but that's just the way it is. (Hospital head nurse)*

However, patients themselves will not become active without the healthcare sector making active investments in their awareness, by explaining the possible legal remedies and healthcare expectations. Patients are not well placed to show initiative in taking a more active role in HAI control, because they feel too unprotected and fragile in healthcare, where too much of a burden could make them even more insecure.

> *I think it's better not to scare them [patients]. It will not change anything if we simply tell the people lying in hospitals for weeks, because they will not be able to do anything about it… [...] People have fragile nervous systems and crazy phobias by default. If you tell them that they can catch something mystical just by laying in a hospital bed… This is not for Latvia. [...] This can only be told to physicians. (Patient)*

The marginalised position of the patients is also shown by the way infection control specialists sometimes have a chance to deal with patients who show an active position and notice HAI control shortcomings, such as inappropriate hand hygiene or the external appearance of the medical staff. However, even if patients seek assistance from infection control specialists for cases like these, they still do not look for active solutions, because they often believe that complaining might endanger their treatment; and, they will need to return to the same specialists anyway. Driven by the desire not to worsen their relationships with medical staff, patients put up with compromising qualitative healthcare, and end up shifting the focus away from the prevention of HAI risks. This again points to a well-established and strong social hierarchy (see Section 7.4.) in a hospital where information on HAI risks flow solely top-down, and rarely the other way around.

On the other hand, more active patients involved in HAI control are simultaneously imagined as being risky actors for already fragile healthcare system. Medical practitioners argue that the current healthcare system is not ready for patients who are active in exercising their rights and affirming their positions. For example, when infection control specialists discussed among themselves patient involvement in healthcare measures, this conflict became especially apparent:

> *A: In Sweden, they have campaigns where a patient takes a brief survey after the doctor's visit, where they show whether they are satisfied with medical personnel's hand hygiene practices during the visit.*
>
> *B: I believe that such patient involvement in Latvia is not possible for now. In [Latvian hospital] there are many units where patients are placed in hallways – and they do not even complain, they are happy that they are even admitted to the hospital (others expressively agree). If the patients complain about nails being too long, they will receive no healthcare at all.*

A: They can do it only on their way out…

B: Yeah, but they still might need to return.

C: I was thinking the same.

B: There is no mechanism for us in place to involve patients. (Infection control specialist discussion)

While the relationships the patients have with microbes in hospitals are the most saturated and even direct, they are still highly marginalised. Patient involvement in managing these relationships is not yet part of the hospital routine, and parties involved in healthcare also do not see that the system is ready for such an involvement. Therefore, active patient involvement in HAI control could serve as a good practice example to help challenge the myth of a fragile healthcare system with a fragile patients.

Summary

Throughout the chapter, I show how the ambiguous and contested nature of human-microbe relationships in hospital and actual management of these relationships is a complex process. Thus, in this chapter I have called into question a dominant representation of HAI control as a linear process of complying with policy requirements in hospital settings; instead, I offered an alternative understanding of what HAI control in hospital entails. HAI control was evidenced as a dynamic, negotiated and embedded process, contingent upon different human and non-human actors, situations and interactions. The microbiopolitical order that makes HAI control possible involves mobilising heterogeneous elements of infection control specialists, national regulation, hospital hygiene plans, standards, social relations, patient bodies, samples, laboratories, microbes, data, instruments, space, surveillance systems, and hospital personnel into open-ended and ever-expanding assemblages of hygienic governance (Paxson, 2008). This governance includes the mobilisation of these elements into intermediations through which HAI risks get visualised and identified, assessed and categorised into different risk levels and is subjected to controlling and disciplining practices; thereby illustrating the governance of HAI risks not as part of formal structures, rules and regulations but as situated and embedded practices (Allen et al., 2016, p. 193).

The chapter not only revealed dynamics and complexity *between* heterogeneous human and non-human actors as part of the constitution of HAI control; but also focused on illustrating specific historical and local embeddedness and dynamics and ambiguities *within* the elements themselves,

thus also shaping and transforming the understanding and practice of HAI control (Lindenbaum and Lock, 1993; Janes and Corbett, 2009). In particular, this means approaching these constituting elements (like microbes, medical objects, professional status, policies) not as given or pre-defined in their categorisation, understanding and enactment; instead applying Latour's (2005) instruction to follow these elements as closely as possible as they were 'enacted and materialised in their different becoming' (Kazimierczak, 2018, p. 191).

This chapter has revealed the unstable and ambiguous status of infection control specialists; who are focal points for HAI control, but simultaneously struggle with professional autonomy and navigate ambivalent insider/outsider status in hospital landscape. They use their sense of belonging by cultivating and engaging with the social infrastructure of the hospital as a way of embedding HAI control as part of their hospital routines. At the same time, they are required to rely on an outsider's gaze to review the mundane hospital routines in order to enact effective governance practices across space, equipment and people.

Understanding and engagement with HAI control policy was illustrated as a situational and dynamic process. The national level regulation was seen by my research participants as purely abstract and theoretical in character, requiring them to 'translate' these requirements into 'practical' and thus 'real' HAI control policies. At the same time, their engagement with local hospital policy was directed by multiple approaches: positioning HAI control policy as an unnecessary burden to an already fragile healthcare system; tackle the problem of HAIs by exercising environmental cleanness; using bureaucratic approach; or more comprehensive healthcare management approach. The diverse way of approaching HAI control shows that a unified understanding of HAI risks is not shared by everybody, leading to differences in opinions on how to handle and organise these risks, and about how HAI control should be done (or if any). As a result, different understandings of how HAI control should be done lead to different expectations, ways of doing and HAI control results.

I also addressed the importance of social infrastructure, which is a crucial tool allowing people to introduce and embed HAI control practices into the hospital landscape. This vehicle of social infrastructure empowers infection control specialists to navigate their insider status, in order to implement HAI control practices. However, the chapter argues that there are inherit positive and negative aspects in the social infrastructure when it comes to introducing and taking on HAI control policy. While social relationships, on one hand, make it possible to implement HAI control routines, these HAI control practices do still challenge social infrastructure, as they tend to make visible how social infrastructures also produce HAI risks and creates gaps in HAI control.

The chapter also analyses the ambiguous status of microbes in hospitals, revealing the long and complex process by which HAIs can become a visible problem in hospital settings. Only through the active imagination of HAIs, sampling, laboratory work and data use can human-microbe relationships and one of their central manifestations – the problem of HAIs – become an object of governance.

The chapter showed that in order to control microbial encounters, one must control hospital space, equipment, and people by the use of a microbial gaze; this is a special skill that needs to be developed to meet the needs of HAI control.

I have argued that while patient relationships with microbes in hospitals are the most saturated and even direct, they are still highly marginalised. Despite the fact that the patients are the ones suffering the consequences of HAIs, their involvement in managing these relationships is not yet a part of the hospital routine; the parties involved in healthcare also do not see that the system is ready for such involvement.

Chapter 8. Discussion: Rethinking the Phenomenon of HAI Control

Introduction

Despite infection control being a quintessential element of biomedicine, the problem of HAIs is the most common patient safety problem worldwide (World Health Organization, 2013). Policy and healthcare responses towards HAI problems have been concentrated upon (microbial and social) behaviour change interventions, implementation projects, audits of compliance and noncompliance as part of efforts to improve suboptimal levels of HAI control. It remains enmeshed in tensions and debates on how to fill the gap between how HAI control should be and is done. This has resulted in the representation of HAI control as an imperative of deficit in contemporary healthcare, especially in developing settings. In this study I have offered a recalibration of the HAI problem: instead of scrutinising this deficit imperative, I have steered my research towards ethnographically examining HAI control itself and how it is assembled in the first place.

In this study, I aimed to understand the phenomenon of HAI control by looking at how HAI control is negotiated and navigated within and between different settings and people in Latvia. The research was guided by the consideration that an in-depth understanding of the phenomenon itself is of fundamental importance for improving policy and practice responses to the problem of HAIs (Farmer, 1999; Harper, 2006; Biehl and Petryna, 2013). Thus, my intention was to go beyond the categories of behaviour deficit/change, compliance/noncompliance, barriers/facilitators of HAI control; and to unpack the subject matter itself and look for deeper factors determining HAI control. In particular, in this study, I explored how HAI control is assembled in discourse, policy and modes of practice through negotiations between heterogeneous actors and navigations through different settings; as well as what kind of practical implications can be drawn from this kind of exploration.

The Latvian context served as a suitable research ground for exploring the phenomenon of HAI control by problematising current ways of thinking and dealing with the problem of HAIs. The specific context allowed me to move the research focus away from the pre-given, fixed and taken-for-granted 'essence' of medical practice towards approaching it as a process-in-the-making, as a negotiable and contested practice. In contemporary Latvia, HAI control is an area where historical developments are being reconfigured, public debates are evolving, new policies and modes of practices are being created and negotiated. Thus, this study contributes to a more nuanced understanding of the phenomenon of HAI control. This study also offers a different research account

about HAI control in the post-Soviet sphere; one which looks beyond the already documented accounts of shortages of human, technical and financial resources, or of a lack of political and medical commitment towards this field (B. E. Ider et al., 2012; B.-E. Ider et al., 2012).

In this chapter, I summarise key findings from the individual results chapters. Then I discuss my overarching conclusions in light of previous HAI literature, along with my contribution to the existing body of literature, and policy and practical recommendations.

8.1. Summarising Research Objectives and Key Findings

In this section, I address my research objectives and summarise key findings. My research objectives were as follows:

1. To analyse how HAI control is conceptualised public discourses.

2. To explore how different actors (e.g. state officials, health professionals and patients) negotiate and assemble HAI control as a policy issue.

3. To analyse how different actors manage HAI control and engage with each other when dealing with HAIs and with their management in everyday hospital practice.

4. To develop policy and practice implications for improving HAI control policy and practice in the Latvia.

I have addressed objectives 1 through 3 in this subsection, but the fourth research objective is addressed in subsection 8.4.

Looking back at the PhD study, I realise that my research data, analysis and evolved thinking goes beyond my initially defined research objectives. With my current knowledge and understanding on the subject matter of HAI control, I would most probably have defined the objectives differently. That being said, I do not see this as a research failure, but rather as a process of learning and an encouraged practice within ethnographic studies, whereby ethnography leans towards exploring the 'messiness,' contingency, and non-coherence of multiple and overlapping life worlds of their subjects (Law, 2004; Nimmo, 2016). Ethnography is not about answering strictly defined questions, but rather about opening up to new understandings of the subject matter itself; and this indeed was my intention all along as I strove to carve out some space for approaching the subject matter differently. In ethnographic research, data and results often challenge and even completely change one's initial preconceptions and understandings about the subject matter. I have also embraced ANT's approach of following the subject-matter as closely as possible and seeing where it leads (Latour, 2005). For

example, the research objectives did not address the historical analysis of HAI control. Although I initially intended to only include the historic development of HAI control as contextual information for the literature review, I found that over the course of this study, the role and instrumentality of the historical analysis was changed, which made it crucially necessary to write a separate chapter on this. Consequently, I have treated my research objectives as guides on how to address the heterogeneity and messiness of everyday life, and to analyse how HAI control is negotiated as an object of knowledge, without sticking to predefined expectations.

This study started to unpack the phenomenon of HAI control by deconstructing how it is ontologically assembled in the current literature. **Chapter 2** revealed that currently, HAI control in research is approached as a matter either of microbial or human affairs. This study approached HAI control by exploring how human encounters with microbes are understood and regulated, thus proposing that we approach HAI control as a relational phenomenon; a viewpoint that is less commonly utilised in current scholarship. Borrowing concepts from science and technology studies and anthropology, the analytical frame of the microbiopolitics of human-microbe relations was developed, in order to carry out the proposed conceptual approach and to more effectively analyse the subject matter of HAI control.

Then I continued to explore the phenomena through the historical production of HAI control in **chapter 4**. Particularly, in this chapter I focused on how human-microbe relations were introduced and embedded in two approaches to HAI control, labelled as Soviet and Western. In Latvian context, HAI control experienced double invisibility: within the Soviet system, infection control was a part of the Soviet political ideology and thus highly politicized issue, producing an unintended consequence of hiding the problem in healthcare. After regaining independence, the Western approach arrived in the Latvian context but with its own problem of invisibility due to being positioned as a narrow and mundane issue of hospital care.

The chapter demonstrated that only when linked with patient safety, healthcare quality and antimicrobial resistance, HAI control became a part of a broader movement of reviewing and monitoring healthcare performances. This shift allowed to navigate HAI control out of its peripheral status in healthcare and reach again frontline position but now within global health agenda. In Latvian context, neither patient safety, nor healthcare quality have aided the topic to become more recognized. However, through the incorporation into AMR policy, HAI control has reached more stable presence in Latvian healthcare policy arena.

This study then moved on to investigate the phenomenon of HAI control within the contemporary Latvian context. Throughout chapters 5-7, the subject matter was traced through various media, policy and hospital settings; these chapters explored how it was negotiated and navigated into assemblages of public discourse, new policy and hospital practice. Thus, the thesis can be considered as answering Julie Szymczak's (2018, p. 764) call to open a 'space of discovery for unexpected, the unusual, the informal and the adaptive' in HAI control research.

Chapter 5 analysed public discourse on HAI control in the media, in order to address my first research objective. This chapter revealed that in media discourse, encounters with microbes were understood and assembled in multiple framings; like the war on microbes, the human-microbe ecosystem, and an artificial problem. As this chapter has revealed, multiple framings of human-microbe relationships indicated that the understanding and anthropocentric evaluation of microbes was not a homogenous or static process, but rather a dynamic one, depending on various interactions and connections with microbes. Nevertheless, the topic of HAIs was constructed as transcendental in character, linking it with outdated hospital infrastructure, hopes for a better future, conspiracy theories, and the impossibility of regulation, and thus impeding public debate on evolving and negotiating HAI control as a governable subject. As this chapter has revealed, the public discourse of HAI control has been carefully crafted, particularly by medical and political actors; while the representation of the issue has got entangled with the representation of the actors themselves. This is where my research data went beyond the original research objectives, because the public discourse was also about maintaining discursive relationships between stakeholders. Thus, this public discourse was not only about understanding and regulating HAI-causing microbes, but also about how that discourse represented those actors involved in shaping it.

Chapter 6 analysed how HAI control is managed between policy stakeholders in the process of developing a new policy, thus addressing my second research objective. The chapter revealed a need for new forms of governing human-microbe relations, as the current microbiopolitics was insufficient for managing microbial risks. The chapter, however, demonstrated that this requirement of advancing human control over microbes was neither straightforward nor simple to achieve; thus permitting me to argue that gaps, uncertainties and ambiguities are not only a part of healthcare (how HAI control *is* performed) but also inscribed into policies themselves (how it *should* be). The chapter showed that through negotiations between policy stakeholders and microbes as policy subjects, a new policy was assembled into uneven relations between the new policy's core elements – microbes,

patients, laboratories, hospitals, and state, thus creating a problematic and incoherent order with regards to how HAI control should be enacted.

Chapter 7 analysed how HAI control was managed in hospital settings, thereby addressing my third research objective. The chapter showed that the line between the imperative of how HAI control should be done and how it is taken upon and enacted gets blurred in hospital settings and every-day practices. As a result, this is where my research data exceeded the third research objective; given that HAI control practices were evidenced as a dynamic, negotiated and embedded process, contingent upon different human and non-human elements. In order to manage human-microbe relations, HAI control was produced through fluid assemblages of humans (policy-makers, healthcare professionals, patients) and non-humans (microbes, standards, protocols, spaces, devices). Furthermore, it was necessary not only to assemble all of these moving parts into a coherent network, but also to turn the whole assemblage 'inside out' and to look at the HAI problem with an 'outsider's gaze,' in order to make it knowable and governable in the first place. However, this gaze of surveillance and discipline also produced spaces of neglect and ambiguity (e.g. by excluding patients) when dealing with the problem of HAIs.

In the next section I address synthesised conclusions drawn from individual results chapters and my contribution to the existing body of literature in understanding the phenomena of HAI control.

8.2. Drawing Research Conclusions and Expanding the Understanding of HAI Control

In this section, I address synthesed conclusions, which is organized around four themes: understanding of microbes, assembling and engaging with HAI control policy, enacting HAI control in hospital and unequal distribution of HAI control.

8.2.1. Understanding of Microbes

In line with the ANT approach, I have brought into my social analysis microbes, their presence and the effects they have produced on human affairs in the case of HAI control. So for example, in the policy chapter, I demonstrated how microbes brought together different stakeholders in a new policy-making committee; one tasked with the goal of responding to the effects produced by microbes. Thus, I have represented microbes not merely as the blurred background of human affairs, but as agents with who we live together and maintain diverse forms of encounters and relations (Pyyhtinen and

Tamminen, 2011). In this way, microbes make it possible to think through the phenomenon of HAI control in symmetrical terms with human experience (Cooper, 2012, p. 113). Bringing in the social analysis of microbes as a separate category for HAI exploration has thus allowed me to gain an in-depth understanding of how my research participants perceived, understood and managed their relationships with microbes.

Although we live in an antiseptic world, one almost phobic to microbes (Pyyhtinen and Tamminen, 2011), this study has revealed that the given understanding of microbes was not so simple and straightforward. Microbes were not perceived in the context of HAI control as being inherently pathogenic and threatening only: context, situations and interactions mattered in terms of how microbial encounters were recognised, understood and assessed (Lorimer, 2017). So for example, my analysis in Chapter 5 illustrated this polyphonic understanding of microbes, where multiple discursive framings have shaped the perception of microbes and sometimes overlapped. The understanding of microbes in public debate on HAI-causing microbes went beyond perceiving microbes as inherently eradicable. The media discourse analysis demonstrated that the perception of microbes was diverse; perceiving microbes, for example, as having the potential for beneficial, reciprocity and moral possibilities. However, the understanding of microbes could also be rooted in a completely different line of thinking, like conspiracy theories. Regardless of the specific mode of thinking about microbes that was at issue – whether good or bad – they were imagined with human-like qualities and intentions. This allowed me to argue in Chapter 5 that multiple framings should not be treated as 'bounded regimes,' but as interactive and dynamic (Pálsson 2004, p.77).

Such a diverse understanding of microbes did manifest itself in hospital settings. On the one hand, encounters with microbes were expected and experienced as collective relations, rooted in a pathogenic understanding of microbes, while led by a 'contain-and-control' approach (Ingram, 2011) towards all interactions with microbes, this being part of the hospital's HAI control policy and necessitating the involvement of everybody (from cleaner to executive) in the hospital, to try and prevent HAI problems (Szymczak, 2018). On the other hand, encounters with microbes among medical personnel were also perceived and experienced as personal in character. Their approach towards managing their own individual relations with microbes was more nuanced: weighing microbes between 'bad' and 'necessary' for individual health and immunity. In this case killing *all* microbes (or enacting Pasteurian order) was perceived not as something to strive for, but rather avoid. This attitude towards microbes tends to characterise the post-Pasteurian approach (Kirksey, 2014; Paxson, 2008).

In these cases, the understanding of microbes as pathogenic only was called into question, viewing HAI control not as a way of ensuring germ-less and safe healthcare, but as a risk to medical personnel. For example, sub-sections 7.6.1. and 7.6.3. showed that use of disinfectants and excessive hand hygiene were perceived as harmful to their own health, where excessive removal of microbes from their bodies left them exposed to harm and unprotected. A similar understanding was identified by Martin (1994, p. 88) whose informants (medical practitioners) also shared that eradicating all microbes was considered to be a health risk; and that health was not an issue of eliminating all microbes, but rather an attempt to maintain the right balance and right proportion in the right place. Consequently, the understanding of microbes as pathogenic only is neither pre-given nor inscribed in HAI control; instead, this study showed that this understanding can be much more dynamic, and needs to be considered when planning and implementing HAI control practices.

The dynamic understanding of microbes in hospital settings was also manifested in terms perceiving them as simultaneously belonging and not belonging in hospital settings; having insider and outsider status at the same time. On the one hand, this microbial presence was inherited in the hospital landscape and relationships (e.g. patient-physician relationships) through the normalisation and 'domestication' of their presence in hospital. Consequently, the presence of microbes becomes a mundane part of hospital life, leading to a passive approach in the search and recognition of HAI risks, seeing the presence of HAI risks as a normal part of hospital routines, and neglecting any or some HAI control practices. On the other hand, microbes at the same time operated as outsiders and 'invaders,' interrupting and challenging healthcare in hospitals, as well as the hospital's representation as a space of scientific order, rationality safety and cleanness (Foucault and Miskowiec, 1986; Foucault, 2003). Such an understanding enabled a more active position in dealing with HAI risks.

These study conclusions encourage us to rethink the 'friend-or-foe model' (Kirksey, 2014) in the Pasteurian and post-Pasteurian scholarship as insufficient for thinking and acting with when dealing with microbial encounters; as human-microbe relations do not always fit into these separated boxes of hygienic and probiotic attitudes and practices; instead they were mixed, unstable and ambiguous. As evidenced in this study, even when these relationships operated in the Pasteurian framework of infection control, these encounters were situational and dynamic: context and relations determined in what format these relationships will be mobilised (Lorimer, 2017). In one situation, a 'control-and-kill' approach could be enacted, but in others, efforts to live together in an ecological and safe manner could be mobilised (Ingram, 2011; Ironstone, 2018). As this study has showed, these

relations could also be neglected and left ungoverned. However, some studies (Mikelsaar, 2011; Wolf-Meyer, 2017) have already offered an alternative approach towards imagining human-microbe relations and thus HAI control; one where microbial encounters are simultaneously managed in both a Pasteurian and post-Pasteurian manner.

8.2.2. Assembling and Engaging with HAI Control Policy

This study has demonstrated that in the process of achieving germ-free and thus safe healthcare, not only is compliance with HAI control policy a significant matter; but in addition, it depends on the quality of the policy and on the ways people engage with it, or on what the policy means to different actors. Thus, this section contributes to the understanding of phenomenon of HAI control by arguing that not only it is important to understand HAI control as a practical category (how it is practiced or complied with) but also how it is understand, developed and engaged with as a normative category of how it should be done.

Tracing the phenomenon of HAI control through policy settings enabled me to critically analyse how the normative foundation of HAI control (or in other words, how it should be done) was articulated and produced. By unpacking these dimensions of HAI control, this study addressed a 'blind spot' in the current HAI control literature that tends to treat the prescribed HAI control (e.g. policy, programme) as pre-given by the Pasteurian order (H Gröndal, 2018), or else represented as an unproblematic instrument of governance that only needs to be implemented or complied with (Padoveze et al., 2017; Nogueira-Jr and Padoveze, 2018) and thus without any need for critical analysis. This has produced a common perception about effective HAI control policies and ineffective performances of HAI control without any critical assessment of these policies.

In line with ANT thinking, this study has offered a different account on HAI control policy. Approaching HAI control policy not as a 'thing' but as an 'assemblage' (Shore, Wright and Pero, 2011, p. 20), this study has illustrated, in Chapter 6, how the apparent universality and homogeneity of the Pasteurian order and the instrumentality of policy-making has been undermined by its specific historical and local embeddedness (Rapp, 1993). As soon as the governance of HAI-causing microbes stopped being an abstract concept and was put into a specific form (part of policy-making), efforts to govern microbes became more complex and less straightforward. As Chapter 6 revealed, assembling HAI control into a new policy was only partly led by Pasteurian considerations and solution-seeking, as they got enfolded into a broader assemblage of historical and political particularities (e.g. the Soviet

legacy of a sensitive topic, specific health policy-making patterns); as well as broader networks of discursive and social relationships (e.g. the state's distancing strategies from the issue). This study has demonstrated that policy has not merely included a prescribed framework on how HAI control should be done. It also included tensions (e.g. unsolved friction between state stakeholders within human health and the medical community), particularistic interests (e.g. the management of the status of HAI data in the interests of the hospitals, not the public) uncertainties (e.g. laboratory stakeholders unaddressed doubts over validity of HAI data), inequality (e.g. marginalisation of patients position) that were reproduced and inscribed in this policy as well. Thus, these conclusions make it possible to argue that HAI control policy does not arrive in healthcare settings as neutral, objective, coherent and uncontested 'immutable mobile'[68] (Latour, 1987). Instead, it may came with its own embedded inequalities, uncertainties and contradictions (Mol, 2002), challenging the common perception of HAI control as a deficit of healthcare only.

In line with the conclusion outlined here, this allows me to argue that it is necessary not only to critically analyse how HAI control is complied with and achieved, but also how this process is influenced by the quality of policies and the way policies are developed, as well as whose interests are represented by the policies. For example, the policy analysis in Chapter 6 showed that HAI control policy overlooked and neglected patients as a group. Here, I argue that this shortcoming can be rectified by assessing the quality of HAI control policy; taking a closer look not only at how HAI control policy is implemented and complied with, but also by incorporating an evaluation of the consequences for the lives of people targeted by the policy in question (Castro and Singer, 2004). This conclusion contributes towards building further and more stable HAI control policy analysis by asking for further studies, where the question of how policy actually affects the people in question is critically evaluated. Examples of assessments of other health policies at the national (Castro and Singer, 2004) and global level (Biehl and Petryna, 2013), along with their intended and unintended effects, all serve as evidence and do demonstrate the necessity of conducting serious HAI control policy analysis.

In order to enable a more in-depth understanding of the phenomenon of HAI control, this study has revealed that it is not only crucial to understand how HAI control policy is assembled, but also how it is engaged with by medical personnel in hospital settings. Particularly, in Chapter 7 sections 7.2. and 7.3. illustrated what HAI control policy meant to different medical specialists. These sections

[68] For Latour, an immutable mobile is an entity (e.g. a device or intervention) that does not change its underlying foundation and connections when transferred from one context to another.

revealed that policy did change as it entered into a new domain of hospital and relations with different actors. So for example, the analysis revealed that medical personnel engaged with the policy in four different ways:

1) A burden and unnecessary 'luxury' for already fragile healthcare

2) Part of maintaining hospital environmental cleanness

3) Bureaucratic approach

4) Part of hospital quality management.

Diverse engagement with the policy leads to a diverse understanding of HAI control should be done (if any) and different and contested expectations, practices and results. Although these understanding are not static and are conditioned to change, they nevertheless lead to contested practices and a lack of agreement on how HAI control should be done and complied with. Thus, it can be concluded that on the one hand, the seeming universality and taken-for-grantedness of the Pasteurian order of HAI control policy at hospital level has been undermined by different and sometimes contradictory meanings of the policy. On the other hand, in the line of ANT thinking HAI control policy had its own 'social life,' outliving its own authors and their original intentions (Shore, Wright and Pero, 2011, p. 20).

8.2.3. Enacting HAI Control in Hospital

Throughout Chapter 7, I have been demonstrating that in hospital settings the recognition, understanding and regulation of HAI-causing microbial encounters are all broader and thus complex than the Pasteurian framework implies and orders. Thus, this study offers a different ethnographic account that looks beyond the prevailing understanding of HAI control in healthcare settings, or indeed some merely linear process of complying with HAI control policy requirements. This study has illustrated that enacting HAI control has been a complex, negotiable process; one which is contingent upon different human and non-human actors, situations and interactions.

I have demonstrated that in hospital settings, making HAI control possible involves mobilising heterogeneous elements of infection control specialists, national regulations, hospital hygiene plans, standards, social relations, patient bodies, samples, laboratories, microbes, data, medical instruments, space, surveillance systems, and hospital personnel into an assemblage of Pasteurian governance. This thesis has demonstrated a way in which understanding of the phenomenon of HAI

control is expanded beyond the accepted, as with the issue of deficits in healthcare. If we look at the HAI control only as a matter of inputs (HAI control requirements) and outputs (compliance with these requirements), then other materialities, actors, processes, practices involved in HAI control are thereby rendered invisible (Latour, 1987; Cooper, 2012). In this sense, HAI control is understood as an effect of the assembled relations between heterogenic human and non-human entities. In particular, this study has made a contribution towards illuminating the role of material entities like microbes, space, medical equipment, and bodies; arguing that they do not merely form the background of HAI control, but instead are centrally involved in mediating HAI control (Nimmo, 2016).

The analysis of the various hospital settings under discussion demonstrated that the enactment of HAI control is not a linear process; instead, it is dynamic and contingent, as it must be achieved through daily socio-material practices in settings that are associated with high stakes between life and death and the daily dramas of diagnosis, treatment and care (Street and Coleman, 2012). It also includes heterogeneous human and non-human actors that are mobile and which often defy perceived conceptualisations and boundaries (e.g. medical personnel can not only utilise the microbial gaze to actively identify HAI risks but also actively cultivate gaps in it); or again, they can be part of different orderings with contesting agendas (Street and Coleman, 2012) (e.g. hierarchical relational structure in hospital). As a result, microbial ordering, including hand hygiene or use of disinfectants, is not in the frontline of daily hospital operations. For example, Redelmeier and Shafir (2015) point out that this lack of prestige of core HAI control practices is embedded in healthcare itself. Such skills as a good bedside manner, surgical or diagnostic skills and others are seen as great virtues for medical practitioners, but good hand hygiene does not generate the same prestige in healthcare.

Alongside providing insights into the enactment of HAI control, I argue that the phenomenon of HAI control cannot be fully grasped without examining the human and non-human entities who are making HAI control happen. A closer examination of infection control specialists as focal points of managing human-microbe relationships in hospitals reveals that specialists have been confronted with the unstable status of their own profession within the healthcare system, as well as its ambivalent status within the hospital fabric itself. Infection control specialists have struggled to navigate the unsolved matter of the autonomy and standardisation of their profession which has prevented these specialists from being a truly stabilising presence within the hospitals. These specialists have also been navigating their ambivalent insider/outsider status within these hospital

structures. This ambivalence has been reported in other studies on infection control specialists as well (Yuan et al., 2009; Pogorzelska-Maziarz et al., 2019). On the one hand, they have managed to cultivate their insider position by being part of hospital staff (e.g. by mobilising their social relationships to implement local HAI control policy; having already been selected from hospital personnel to carry out HAI control policy). But on the other hand, they often shared the feeling of having the status of an outsider while they reviewed, interrupted and challenged the everyday routines of other hospital staff and the status quo of healthcare. This points towards this the inconvenient and uncomfortable position of this profession, whereby specialists problematise hospital practices and medical professional work by constantly shedding light on some of the shortcomings and unintended consequences that medical practices have been producing. This ambivalent status of the infection control specialists has been further reproduced within the field of HAI control, hindering any strengthening of the role of HAI control in the field of healthcare and hospital structures. While social infrastructures, as this study has showed, were a way of making HAI control into an 'insider issue' where infection control specialists made use of their social relationships with other people in the hospital, the same social infrastructures did not elude the scrutinising gaze of HAI control, whereby social infrastructures were also assessed from the standpoint of HAI risks and thus questioning their status quo.

This study demonstrated that in the process of enacting HAI control, the work of visibility has played a significant part, requiring a complex set of processes: assembling patient bodies, clinical and screening samples, laboratory work and HAI data. Here patient bodies become a medium for visualising the risk of HAIs in hospitals: what grows on patient body is extrapolated to what is circulating within the hospital itself. So as a result, a patient body becomes a representation of the HAI problem in a hospital. However, it takes a rather complex and long process for HAIs to become visible. To begin controlling and managing HAI risks, microbes first must be turned into an object of inquiry (clinical or screening samples) and then into a workable object of the laboratory; and only then can microbes be turned into a governable object of hospital. Consequently, this study showed that in order to control microbial encounters, one must control hospital space, equipment, and people; as a result, these mediums also become subjected to microbial control. They enable us to visualise where HAI risk control should be directed. Each of the mediums was categorised according to the level of HAI risk (e.g. high-risk unit, low-risk medical instrument) and then controlled according to the allocated risk level.

This study has showed that in order to control the above mediums, hospital staff had to develop a microbial gaze – a special skill for specifying and materialising human encounters with microbes, by making HAI risks visible. This could take place by imagining where microbes might be localised at a specific time, or else via laboratory sampling, hospital risk categorisation and other measures. How and where these risks were imagined all forms part of a highly situational and dynamic process. For example, in ICUs, a red line on the floor was imagined as a symbolic border that was not to be crossed by any HAI risks. Foucault (2003) demonstrated that modern medicine subjects a patient's disease and body to a medical gaze which is not only a source of information about the disease and body in question, but also serves as a technology of control. Therefore, the medical gaze is both a form of special knowledge and an effective tool used to train and discipline (patient) bodies (Gibson, 2004). However, in the case of managing hospital infections, this study showed that the same medical gaze – or microbial gaze for the purposes of infection control –was now directed not only toward the bodies of patients, but also towards the bodies of hospital staff. It suddenly became important what medical practitioners were wearing, or whether they had an untied hair, or what was on their hands (e.g. rings, watches, bracelets). Through this very same mechanism of the medical gaze, the bodies of the hospital staff could be seen as a form of knowledge; and at the same time as something that can be disciplined and trained through HAI control practices. Therefore, the focus on microbial control got entangled with efforts to avoid this gaze, in order not to become the objects of surveillance and disciplinary measures.

However, even when a microbial gaze was exercised by the hospital staff, HAI control nevertheless often operated with uncertainty about the presence or absence of microbes on surfaces, medical instruments, and bodies. For example, as demonstrated in sub-section 7.6.2., although it took fourteen steps to sterilise a medical instrument, it still was impossible to visually detect the absence of microbes. Therefore, one had to operate only with an assumption that the microbes had been eliminated; or, as one of my informants put it, sterility was only a probability. This uncertainty about microbial presence or absence challenges the biomedical "rule" of seeing the problem. Or as the medical anthropologists Goods (1993; 1993) showed in their quintessential ethnography on medical education processes at the Harvard Medical School: in order to become competent physicians, medical students (through their medical education) have to learn an alternative way of 'seeing', like 'seeing' anatomically, histologically, and pathologically; so that they can learn to see a disease. This dilemma does make HAI control especially complicated; because HAIs cannot be perceived and detected with the same level of clarity as a pathology in X-ray image or in biochemical analysis of

blood sample; which does make HAI risk management a problematic endeavour. This requires enacting HAI control over space, medical equipment, and bodies without this certainty of 'seeing' the HAI risk.

As Chapter 7 has showed, efforts to make HAI control visible in hospital settings have aimed not only to mobilise the gaze in order to control microbial encounters, but also to navigate social visibility, or how we look to others (Street, 2012). Shedding a light onto the problem of HAIs could also be linked with casting a shadow on one's own prestige, reputation, and image. Therefore, social visibility has also regulated what was made visible and thus knowable to others about HAI control. The hospital chapter also showed that such visibility work, like collecting laboratory samples and dealing with surveillance data, could be a way not only to make the problem of HAI visible, but also as a way of navigating social relationships between departments and colleagues. As a result, social visibility could end up becoming even more important than microbial visibility. One of the interpretations here could itself be related to the hospital personnel's inability to detach themselves from HAI data. When HAI data were presented or shared internally, medical staff still saw within these data a representation of themselves and their work, and not so much microorganisms circulating within the hospital.

8.2.4. Unequal Distribution of HAI Control

The last conclusion I want to emphasise is the uneven distribution of HAI control, whereby managing microbial encounters is not attributed to and expected from everybody on equal terms. Here, HAI control does not produce recognition and governance of HAI risks, but rather produces spaces of exclusion and neglect (Gibson, 2004). This was explicitly shown by the lack of patient involvement, gendered HAI control and hierarchical relational structures found in hospitals.

One way how HAI control is unevenly distributed is by excluding patients from HAI control practices. This study has showed that in the context of HAI control media content, policy development processes and healthcare practices, patients can easily disappear. This is rather paradoxical, because although patients are the ones who are most affected by the problem of HAIs, they are actually excluded from public debates, policy-making processes and HAI control practices in hospitals. This marginalisation of patients reaches its culmination in hospital settings, where they are positioned merely as one of the hospital's surfaces involved in HAI control, and not as agents to which the governance of microbial encounters is attributed as well. One of the explanations as to why patients

are excluded from HAI control is that their passive and thus low status in healthcare practices is prevailing over ongoing attempts to control microorganisms. In the Latvian context, the passive and paternalistic patient position is justified and labelled with the category of 'fragile patients.' This is a cultural understanding of patients as being incapable of properly dealing with health-related information; and so, they cannot be involved in healthcare practices and decision-making processes. However, any improvements in patient status in Latvia serve as a double-edged sword, and active patients are not encouraged and empowered as beneficial for the health system; instead, they are perceived as a threat to a perceived 'fragile' healthcare system. Therefore, this deeply rooted imagination of fragile patients in a fragile healthcare system creates some limits for how HAI control is enacted. The perspective of human-microbe relations challenges these grounds for exclusion, as patients and visitors should be subjected to the same practices of management of human-microbe relationships as any other individuals in hospital. For example, Landers et al (2012) discusses the role of patients in HAI control in this manner: patient involvement in transmitting HAI-causing microbes, and their involvement in cutting these encounters by practicing HAI control measures, such as hand hygiene. This allows me to conclude that proper HAI control could be more achievable by prioritising microbial control over perceived patient status.

This study findings showed that gender and social hierarchies in hospital contributes to the uneven distribution of HAI control. In Chapter 7, I discussed how HAI control practices are gendered, while women who are hospital staff are more subjected to HAI control measures. Furthermore, women's responsibility of managing microbial risks is not only associated with HAI control practices; for as the media chapter shows us, the management of microbial risks in public sphere is presented as a 'women's issue.' Consequently, better compliance with HAI control requirements is unachievable while this gender inequality is inscribed into HAI control expectations and requirements, while men get overlooked in HAI control measures. As microbes do not follow gendered lines, HAI control might benefit from being rooted in more equal involvement.

HAI control is unequally distributed not only along the lines of gender, but also in terms of relational hierarchies in hospital. This study's findings showed that medical practitioners with a higher status were often allowed not to follow the same infection control rules as other hospital staff; while the same HAI risk management requirements did not apply to all hospital staff equally. The medical setting itself creates and reproduces a space of non-compliance, making it impossible to achieve compliance with HAI control requirements across the board.

According to the HAI control literature (Edwards, Charani, et al., 2012; Huis et al., 2012; Weinshel et al., 2015), compliance with HAI control measures is suboptimal, and it is necessary to improve compliance. However, this finding contradicts the above premise, as it is getting increasingly unrealistic to expect better compliance with HAI control requirements while the actual given medical settings are continuing to reproduce practices of non-compliance, along with unequal relationships that are themselves creating microbial risks.

8.3. Some Reflections on Future Research

My reflections on future research here are two-fold: where this research can go forwards and be continued, as well as more general areas in HAI control scholarship where a space for future research can be discerned.

This research has the potential to be continued in multiple directions: to explore human-microbe relationships and their management in other areas beyond HAI control; to assess policy-making capacity of different ministries, as already concluded in Chapter 6; to conduct an action research on strengthening patient role in HAI control both on policy and practical levels; based on gained understanding of HAI control, to conduct an intervention-oriented research on a hospital level.

This study identified certain areas for future HAI control research. Firstly, in order to improve our understanding of the phenomenon of HAI control, one field of study is to bring into HAI control research theories, concepts and frameworks from other disciplines and scholarships; e.g. science-technology studies, actor-network theory and others. Such an approach not only allows to better understand the subject matter itself but also pushes to analyse anew taken-for-granted categories, assumptions, connections of HAI control; thereby encouraging ourselves to rethink how the problem and boundaries are defined and then operationalised in research, policy, public debates, and medical practice. This might reveal new approaches how to deal with the problem of HAIs. One of the areas that need further research is exploring our understanding of microbes and encounters with them and how these understandings feed into HAI control policies and practices.

Secondly, there is room for more inclusive research; one more conscious of whose voices are included and represented. Future studies might find it helpful to address groups of actors more marginalised in the current HAI research, like other hospital staff (apart from nurses and physicians), patients and caregivers. More inclusive research would also help HAI control literature not to

reproduce stereotypical assumption about HAI control; for example, HAI control as an issue for nurses only. Future HAI research also has room for more diverse settings; which means that there could be studies conducted outside hospitals and in other healthcare institutions.

Thirdly, there is a great need for studies critically exploring how HAI control should be done, thus addressing policy and regulations of HAI control before they arrive in hospital settings to be implemented and complied with. The studies in this area are particularly promising in terms of their connection to ongoing worldwide efforts towards developing national policies on tackling AMR. Consequently, such studies could help offer research-informed evidence to assist in the development of such policies.

8.4. Research Practical Implications: Recommendations for Media, Policy and Hospital Settings

Based on the research results, I have developed recommendations for public, policy and hospital settings to help contribute to improving HAI control policy and practice in Latvia. Overarching recommendations for all three fields of inquiry include 'de-sensitisation' of the topic by developing a new HAI control narrative; free of associated historical traumas. For this topic to break out of the grey area, it is necessary to develop further patient involvement in public debates, policy-making processes and daily HAI control practices in hospital settings. If HAI control's marginalised status within the Latvian healthcare system if so to successfully challenged, HAI control needs to be incorporated as a part of patient safety and healthcare quality policy. There must be active work on new HAI control understanding where HAI control is not a frightening bogeyman from the past, but rather an integral part of AMR policy, healthcare quality and patient safety.

This PhD study has been an effort to carve out a space for understanding and thinking about HAI control differently, thereby creating some potential for how HAI control could be approached in a different manner. Below, there are recommendations for each of the settings where contemporary HAI control has been explored.

8.4.1. Media

Normalise and settle HAI control as a public issue. As shown in Chapter 5, the media domain is a fruitful resource for creating a different narrative and understanding of HAI control; however, it

is not currently being used to its full potential. Mass media platforms have the potential to address HAI control not so much as an abstract phenomenon, promising a solution somewhere down the line, but rather to speak of things and measures that can be taken today to better existing HAI control practices, thus practising 'solution journalism' in this area. It could be beneficial, among other things, to remind ourselves that that the problem of HAIs affects everyone, and so it must be dealt with by everyone. The media resource has the potential of promote HAI control principles as an integral part of healthcare, in order to establish a strong link between HAI control and (for example) hand hygiene and the prudent use of antibiotics. As of now, these cornerstones of HAI control are being addressed by victim-blaming patients; but this could also serve as an instrumental reference point for medical personnel. Although currently media articles are mostly addressed to laypersons, they could also become a productive outlet to help address medical personnel who often do not have the opportunity to encounter existing information about HAI control basics in hospitals.

Improving public dialogue between stakeholders. As shown in Chapter 5 section 5.2.1., public dialogue on HAI control dominantly takes place between the policy and medical communities; however, it also requires patient stakeholder involvement. The media analysis in this study has shown that patients have used their comments in media spaces to speak of HAIs as an issue of healthcare quality. Furthermore, as patients are the main victims of HAIs, it is their right to have their voice also included in the media discourse. The introduction of another key stakeholder could help overcoming the existing 'responsibility footballing' between the policy and medical communities, changing the discourse down to its very foundations – and operating with an understanding that this issue mostly affects patients, and it is not the burden of policy-makers and hospitals alone.

8.4.2. Policy

Integration in the policy of patient safety and healthcare quality. On the one hand, incorporating HAI control in both policy fields would give HAI control visibility and resources, thereby allowing it to escape its currently marginal and narrow position in hospitals. On the other hand, such integration would be reciprocally beneficial to the policy fields of patient safety and healthcare quality as well; because HAI control, with its accumulated practical experience, carries the potential for becoming a flagship area for the simultaneously improvement of all three fields together. Integrating these areas in one policy framework would be the first step.

Enhancing HAI control policy through developing national practice standards. This study showed that legislation and regulatory enactments are not enough for implementing HAI control in

practice. It is crucial to develop and introduce national practice standards, e.g. catheter care standards, specific HAI risk assessment, identification, diagnostic, and treatment standards; in order to avoid situations where hospitals must develop these and other measures on their own, allowing them instead to adapt some standards already in existence to specific individual situations. This would standardise the existing diversity of understanding and practices within the area of HAI control, preventing discrepancies in how HAI control should be and is done. Moreover, HAI control standardisation across the board would rectify current HAI practice differences between large-scale and regional hospitals, where resources to produce practice guidelines are significantly more limited.

Strengthening the profession of infection control specialists. As of now, the duties of infection control specialists are defined nationally, but without setting any standards for competences and capacities. Without strengthening the professional position of infection control specialists, consolidating the HAI control field in its own right will prove impossible. The enthusiasm-based work of infection control specialists risks preventing the field of HAI control from developing in a sustainable manner. Since any medical professional at a hospital can be appointed to the field of infection control, even without any prior knowledge of HAI control, this hinders the field's autonomy, visibility, and image. Setting competence and capacity standards for infection control specialists risks ending the notion of HAI control as a field not requiring any specialisation, additional knowledge and skills. The capacity of infection control specialists must also be strengthened, in order to rectify discrepancies between infection control specialists themselves; because as of now, not all specialists share the same understanding and notions of how their work should be done.

Continuation of interdisciplinary and interinstitutional collaboration. The policy chapter has revealed that interdisciplinary and interinstitutional collaboration through shared stakeholder meetings, working groups and conferences is an exceptional resource for developing and adopting healthcare policy amidst the current unstable healthcare environment in Latvia. There is added value in bridging the experiences and approaches of policy-makers from other fields (like it was with agriculture when developing the AMR plan), as this can become a productive outlet for exchanging good practices and complementing each other's policy-making shortcomings. Moreover, this would give HAI control much-needed allies, so that it would no longer be simply a problem of infection control specialists. In the context of emerging AMR epidemics, this format of collaboration is an important pre-condition for responding to such complex health, environmental, political problem as antibiotic-resistant pathogens.

Putting patients at the centre of HAI control policy. Currently, HAI control policy is based on the assumption that it is something which burdens hospitals and healthcare policy; instead, policy work in this area should be based on patient interests, which in turn should be aligned with the policy and hospital resources and capacities. This study showed that in debates on the public availability of HAI data, patient interests were disregarded; thus failing to recognise that patients have the right to get information about patient safety and the quality of their healthcare in terms of HAIs.

8.4.3. Hospital

From the bureaucratic approach to the risk management approach in HAI control. This study showed that the purely bureaucratic (rule-following) approach to HAI control, which focuses mainly on the implementation of laws and regulations, is flawed and unproductive. Instead, it would be more practical to base HAI control on risk management, where all parties involved in HAI control not only follow the rules and regulations, but also internalise and visualise HAI risks and their control. This study data showed that people's understanding of and engagement with microbes is very situational and diverse; therefore, HAI control principles cannot be based on the assumption that everybody share the same views about microbes and will consequently manage them in the same way; therefore, it is important to visualise and communicate HAI risks. This could be achieved through some changes in approach to HAI control – with hospital-wide and in-depth training on HAI risks, visual schemes and depictions of infection risks and challenges. It might be beneficial if the hospital staff were trained to develop their HAI control gaze: this means seeing through the mundanity of daily hospital practices, thus and perceiving HAIs not as an abstract possibility but as an ever-present and real threat; and so to recognise, in a self-reflective and self-disciplinary way, which places and situations cause HAI risks. It could be very helpful to visualise the consequences of HAI problems; i.e. the impact on patient health and life, or the burden on a unit or clinic in terms of prolonged treatment, human resources, and finances.

From controlling humans to controlling microbes. Hospital-wide efforts should be made to ensure that in HAI control measures the main focus is maintained on microbes, and not humans only. As a result, HAI control would be focused on preventing infections, rather than on exercising control over hospital staff. It would thereby become possible to move away from the punishment-based approach of the past, shattering the notion of HAI control as a bogeyman; focusing instead on encouragement, skill development and improvement. One way of moving away from punishment

towards empowerment is represented by those situations where people are trying to find out about a HAI control violation. In such situations, it may be more practical not to punish or reprimand the individual, but instead to invite them to training courses and involve them in organising this training process, thereby strengthening HAI control skills. On a wider level, every time any audit data on HAI control performance is presented, all issues and challenges found should be presented, alongside with encouragement and good practice examples that can offer personnel clear and practice-based solutions to daily challenges. Such an approach would also help rectify those situations where medical personnel and/or hospital units feel pressured to conceal or otherwise navigate HAI data, simply to maintain their image. On a hospital level it might be fruitful to reach a clear agreement on 'chasing the HAI risk,' rather than finding a scapegoat.

From relational hierarchy to teamwork. It might be fruitful to reach an unequivocal hospital-wide agreement on what is more important – to respect hierarchy or prevent infection risks. It is very likely that the hospital management would need to adopt an approach emphasising that in their hospital, infection risks are prioritised over maintaining hierarchical relationships. Such an approach could encourage top-to-bottom, open and two-directional communication on identifying and dealing with HAI risks. This could cultivate an environment where HAI risks are reported in a blame-free way that is not understood as simply destabilising the hierarchy; regardless of the person's status in the hospital. However, such an endeavour cannot be tackled by infection control specialists; an executive decision should be made by the higher hospital management. This study has clearly demonstrated that good teamwork leads to good HAI control practices, and intensive teamwork and communication led to intensive HAI control efforts. Moreover, hospital-wide teamwork will also help infection control specialists better integrate themselves within the overall body of hospital personnel, thereby transforming the current situation whereby they are often seen as a threat to the unit; when instead, they should be treated as an integral part of patient care.

No more fragile patients in fragile healthcare. This study has demonstrated that it is important not to treat patients solely as a passive surface on which the issue of HAIs manifests and becomes visible; but instead, it might be productive to see them as an active part of preventing infection risks. Of course, it might not be fruitful to take as given that all patients already know the basic principles of infection control. Future work with patients should start from a point where those patients who are eager and willing are given a chance in an informed way to learn what they can do to navigate and control HAI risks in their treatment. For example, rather as there is a strong link

between sitting in a car and putting on a seatbelt, the same kind of connection could be cultivated on a patient level; by establishing a clear link between hospital care and the practice of regular and thorough hand hygiene.

Summary

This study has offered a conceptual framework that proposes approaching HAI control as a relational phenomenon which has made it possible to study the subject-matter in a more holistic manner. The research has also offered a different research account about HAI control in post-Soviet space that looks beyond already documented accounts of shortages of human, technical and financial resources, as well as the lack of political and medical commitment in this field. In this study, I have demonstrated that practical recommendations can be made through an in-depth exploration and understanding of the phenomenon of HAI control, thereby merging conceptually-oriented and applied research approaches as reciprocally beneficial.

The study has revealed that process of achieving germ-free and safe healthcare goes far beyond the organisational barriers and facilitators, individual and isolated behaviour of compliance and non-compliance with HAI control requirements. Instead, research has illustrated that the phenomenon of HAI control has local and historical embeddedness and it is an instance of dynamic epistemic and socio-material assemblages of human and non-human entities. The study therefore has demonstrated that context- and situational-dependent recognition and understanding of microbes and management of microbial encounters manifest in different and sometimes contradictory approaches to HAI control. Moreover, achieving HAI control not only depends on levels of compliance with HAI control policy but also on the quality of policy itself. As study revealed, HAI control can not only produce recognition and management of HAI risks but also spaces of neglect and exclusion.

This research has been an effort to push the understanding about HAI control into new conceptual, normative and practical terrains and thus opening space for thinking, imagining, approaching and engaging with the issue from new angles and points of representations. Through exploring different sites, connections, different people and their relationships with microbes and HAI control I have attempted to build up HAI control as a shared issue.

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Appendices

Appendix 1. Broader healthcare context of Latvia

Latvia is one of three Baltic States located in the North-Eastern Europe. The country reclaimed its independence from the Soviet Union in 1991, and the current population reaches 1.9 million people. Latvia is often categorized by different international indicators as 'middle income' country which suffered a hard financial hit by the global financial and economic crisis of 2007-2008. This forced the country to make deep spending cuts across most of the social policy sectors, including healthcare. This had severe effects, for example resulting in one of the highest poverty rates among EU Member States (EU Social Protection Committee, 2015)(EU Social Protection Committee, 2015). Although there have been strong signs of economic and financial recovery and stabilization ever since 2012, the social and economic inequality nevertheless is one of the highest among the EU Member States resulting in intensive emigration, low life expectancy and low accessibility to healthcare, particularly for more economically vulnerable people (33% of the population is at risk of poverty or social exclusion) (OECD, 2015). Life expectancy at birth for women is 78.9 years, for men – 69.3 years (average in the EU: 83.3 years for women and 77.8 years for men) (EUROSTAT, 2015).

The central governmental authority responsible for the development and coordination of the national health policy is the Ministry of Health. The National Health Service (NHS) is in charge of allocation of healthcare funding and implementation of healthcare policies. The Centre for Disease Prevention and Control is a national public health institution, responsible for planning and monitoring public health activities, including control of infectious and non-infectious diseases. The Health Inspectorate is entrusted with a task to carry out national supervision in the field of healthcare in order to prevent risks to public and individual health. The overall healthcare system in the country is state-funded where the state pays for medical services within a predefined scope of healthcare and patients participate with contributions. It was the state-funded national healthcare system that made the healthcare sector this vulnerable and susceptible to the effects of overall economic crisis as many previously state-funded healthcare services had to be cut having a direct cost effect on patients and making an even greater barrier to healthcare services, especially for the poorest population segment (Roots, Ainsaar and Nahkur, 2019).

Since regaining the independence, the healthcare system and policy throughout the country has been a subject to endless reforms in terms of organisation and funding. There have been attempts to move towards more health insurance-based healthcare system, but unsuccessful so far. The never-

ending reforms have resulted in one of the poorest health indicators and limited EU funding (Mitenbergs et al., 2012). It has led to high dependence on out-of-pocket payments and low levels of efficiency of the healthcare system.

Organization of healthcare policy and system

The healthcare services are provided by the state, local government and private care providers contracted by the NHS. The primary health care is provided by independent general practitioners (there is specific type of entrepreneurship only for general practice specialists). The secondary ambulatory care (including secondary outpatient care) is provided by 32 private and municipalities-owned institutions. Most of the pharmacies and dental practices are owned by the private sector. Hospital care in Latvia is provided in three categories:

- multi-specialty hospitals at local, regional and national level,
- specialized hospitals (e.g., psychiatry, trauma, maternity),
- 'care' hospitals providing long-term medical care.

Currently there are 21 local, regional and national level hospitals, 12 specialized hospitals and 6 'care' hospitals. The 'care' hospitals and local/regional multi-specialty hospitals are usually owned by municipalities. Few regional multi-specialty hospitals are co-owned by multiple municipalities. National level multi-specialty hospitals (e.g., university hospitals) are owned by the state, whereas specialized hospitals are mostly owned by the state and some – by municipalities (Mitenbergs et al., 2012).

Appendix 2. List of Analysed Media Articles (translated)

No	Article title	Year	Source
1	No disinfectants are needed at home	2000	Delfi
2	Why you need to wash hands not only before eating?	2001	Delfi
3	Get the support of friendly bacteria	2003	Delfi
4	What dairy products with good bacteria do?	2003	Delfi
5	The little-known Norvalka virus raged in Aluksne	2003	Delfi
6	Hospital-acquired infections?	2003	Diena
7	Hospital infection is a threat to patients	2003	Diena
8	The hand is a microbial bridge	2004	Apollo
9	New microbes can become a 'new norm'	2004	Apollo
10	Calls for improving awareness on the proper use of antibiotics	2004	Diena
11	Doctors are lacking medical gloves	2004	Tvnet
12	Staphylococcal infection has caused a major problem in Latvia	2005	Apollo
13	Healthcare institutions may not always report the detection of a dangerous MRSA infection	2005	Delfi
14	For hospitals the fight against superbugs can cost hundreds of millions of lats	2005	Diena
15	Hospital infection is a threat to patients, the government pretends of not knowing about it	2005	Diena
16	Superbugs	2005	Diena
17	Trading of the diseases	2005	Diena
18	Ministry will not fight against superbugs	2005	Diena
19	Antibacterial soaps are not better	2005	Diena
20	Staphylococcal infection has caused a major problem in Latvia	2005	Tvnet
21	Epidemiologists urge healthcare institutions to report cases of staphylococcal infections in hospitals	2005	Tvnet
22	Attention: antibiotics!	2006	Apollo
23	Do not exaggerate with cleanness	2006	Apollo

24	Russian money carries sickness and death	2006	Delfi
25	National regulation to fight hospital infections has been developed	2006	Diena
26	Tuberculosis microbes have become smarter	2006	Diena
27	The guilt of household chemicals	2006	Diena
28	Why it is so important to use antibiotics properly	2007	Apollo
29	Hand washing - a simple but necessary procedure	2007	Apollo
30	Are new superviruses are coming?	2007	Tvnet
31	Strong medicines or no to antibiotics	2007	Tvnet
32	Water is more important than soap	2007	Tvnet
33	Human skin - an impressive zoo of microorganisms	2007	Tvnet
34	Viral infections are treated without antibiotics	2008	Apollo
35	Bacteria choose women hands over men's	2008	Diena
36	How good is it to use antibiotics?	2008	Diena
37	Pneumonia will become deadly again	2008	Diena
38	Antibiotics could soon become ineffective	2008	Tvnet
39	The world's first antibacterial glass	2008	Tvnet
40	Specialists call for proper use of antibiotics	2008	Tvnet
41	Viruses, bacilli and diseases around us	2008	Tvnet
42	Are microorganisms always harmful?	2009	Apollo
43	Sponges restore the power of antibiotics	2009	Tvnet
44	About unwashed hands	2009	Tvnet
45	Cleaning products	2009	Tvnet
46	Friendly bacteria - probiotics	2009	Tvnet
47	The world is facing a new horrifying epidemics	2010	Apollo

48	BKUS: hospital stay often leads to Rota virus	2010	Delfi
49	Get to know – antibiotics!	2010	Delfi
50	Activities of good bacteria	2010	Delfi
51	In the lawsuit against TOS Zatlers will not be questioned	2010	Delfi
52	Bacteria that 'eat' pollution will be grown	2010	Diena
53	Use medicines wisely: antibiotics	2010	Diena
54	Antibiotic resistance of dangerous bacteria is increasing	2010	Diena
55	Microbes are right here in every house	2010	NRA
56	A new type of resistant staphylococcus discovered in the US	2010	Tvnet
57	Found a bacterium that can extend the human life span to 140 years	2010	Tvnet
58	Bacteria-warriors against antibiotics	2010	Tvnet
59	Warns about new and horrific epidemic	2010	Tvnet
60	Inappropriate use of antibiotics toughen bacteria	2010	Tvnet
61	Cockroaches as rescuers of humanity	2010	Tvnet
62	Scientists: A person can be identified by bacteria living on hands	2010	Tvnet
63	In hospitals, 100 patients per month are infected with bacteria that are not susceptible to antibiotics	2011	Apollo
64	'The killer E.coli' is defeated	2011	Apollo
65	LIC: the global outbreak of Dengue fever, people suffering from E.coli infections	2011	Apollo
66	'Killer' E.coli: 'Rimi' and 'Maxima' stop selling germinated grains and seeds	2011	Apollo
67	The PVD inspects the load of imported seeds in Latvia, which could contain E.coli	2011	Apollo
68	Russia will restore vegetable imports from Poland	2011	Apollo
69	'Killer' E.coli spreads faster: it has proven to be contagious	2011	Apollo
70	'Killer' E.coli found in seeds were imported to Estonia. Do you have to worry about it in Latvia?	2011	Apollo
71	Discover the potential source of E.coli in Europe	2011	Apollo

72	E. coli is detected in mineral water	2011	Apollo
73	Experts state from which country the 'killer' E.coli may have travelled	2011	Apollo
74	'Killer' E.coli will be converted into biofuel	2011	Apollo
75	In Sweden, sprouts were taken from the store shelves due to E.coli infection	2011	Apollo
76	Experts warn: E.coli bacteria infect drinking water	2011	Apollo
77	In Russia, several holidaymakers were poisoned after dinning in the sanatorium	2011	Apollo
78	The deadly dangerous E.coli bacterium has already been found outside Europe	2011	Apollo
79	Europeans are being poisoned: from French children to Estonian punks	2011	Apollo
80	Uncertainty around E.coli: The bacterium was also found in meat from Germany	2011	Apollo
81	In France, six children with E.coli infection are hospitalized	2011	Apollo
82	A two-year-old child dies from a dangerous intestinal infection	2011	Apollo
83	The outbreak of the dangerous E.coli bacterium continues; it is also found in salads	2011	Apollo
84	Germany: this particular outbreak of E.coli infection is most serious in the history of humanity	2011	Apollo
85	The number of E.coli victims is increasing; people from already 16 countries have fallen sick	2011	Apollo
86	Is there a cause for concern about the spread of E.coli bacteria in Latvia?	2011	Apollo
87	In Germany, the first sprouts infected with E. coli have been found	2011	Apollo
88	Sprouting seeds are being blamed for causing a dangerous infection	2011	Apollo
89	In Germany, a hazardous infection is found in the waste bin	2011	Apollo
90	Epidemic in Germany: citizens tell about the outbreak and the situation in the city	2011	Apollo
91	Experts on dangerous bacteria: time is short, it can be too late	2011	Apollo
92	Germany struggles to manage the «bacteria-mutant»; new versions appear	2011	Apollo
93	The link between sprouted seeds and outbreak of E.coli infection is not confirmed	2011	Apollo
94	In Poland, the first case of EHEC bacterium caused infection is detected	2011	Apollo
95	A possible source of a dangerous infection has been identified in Germany	2011	Apollo

96	Qatar bans importing vegetable from Germany and Spain	2011	Apollo
97	Uncertainty around the spread of dangerous bacteria is increasing; new versions emerge	2011	Apollo
98	Cases of infections caused by dangerous bacteria have been found in 12 countries	2011	Apollo
99	Russia sets conditions for the resumption of importing vegetables from the EU	2011	Apollo
100	Russia bans importing vegetable from the EU	2011	Apollo
101	German experts question the cucumber's guilt in the spread of dangerous bacteria	2011	Apollo
102	Known which farms distribute 'deadly cucumbers'. They are not imported in Latvia	2011	Apollo
103	'Deadly cucumbers' cannot be bought at Riga Central Market	2011	Apollo
104	The number of victims of 'deadly cucumbers' is increasing; the situation may get worse	2011	Apollo
105	'Deadly cucumbers» have already spread in Europe	2011	Apollo
106	The Czech Republic has imported infected cucumbers	2011	Apollo
107	Spreading infection has been identified in Germany: foreign tourists have also become sick	2011	Apollo
108	An outbreak of unknown cause has been identified in Germany	2011	Apollo
109	EC: 25,000 people die each year from infections caused by antibiotic-resistant bacteria	2011	Delfi
110	Destructive antibiotics	2011	Delfi
111	In hospitals, 100 patients per month get infected with 'invincible bacteria'	2011	Delfi
112	Study: microbes have learned to protect themselves from antibiotics 30,000 years ago	2011	Delfi
113	Europe will celebrate Antibiotic Awareness Day	2011	Diena
114	Get to know antibiotics!	2011	Tvnet
115	0.3 million lats will not be recovered from TOS	2011	Tvnet
116	WHO: Antibiotic resistance can become the end of modern medicine	2012	Apollo
117	Doctors call for the use of antibiotics only according to the doctor's instructions	2012	LSM
118	Which is one of the dirtiest places in the world?	2012	Tvnet
119	Jacuzzi procedures are dangerous to health	2013	Apollo

120	Professor Danilans on gastrointestinal problems	2013	Apollo
121	Anatoly Danilans: good and bad bacteria – let's have it clear	2013	Delfi
122	How true is the legendary five-second rule?	2013	Delfi
123	Study: the lowest prevalence of hospital-acquired infections in the EU has been reported in Latvia	2013	Delfi
124	The future of manufacturing antibiotics is at risk. People will die from tiny injuries once again?	2013	Delfi
125	Hand washing can save life! Hand wash ABC	2013	Delfi
126	Seven shocking facts about our hygiene habits	2013	Delfi
127	Women's handbag 'inhabits' more microbes than found on the toilet surface	2013	Delfi
128	Latvian hospitals have the highest antibiotic consumption in Europe	2013	Diena
129	The world is attacked by infectious diseases	2013	Diena
130	In hospitals, shortages in hospital staff and diagnostics are compensated with antibiotic prescription	2013	Diena
131	When does it make sense to use probiotics in addition to food?	2013	LA
132	Latvian hospitals have the highest antibiotic consumption in Europe	2013	LA
133	Doctors are worried about the misuse of antibiotics in case of children	2013	LA
134	Microflora	2013	LA
135	To hear the bacteria	2013	LA
136	Women's hands – bacteria like them more?	2013	LA
137	Doctors tend to overuse antibiotics in case of children	2013	LSM
138	When antibiotics are used frequently, bacteria become resistant to them	2013	LSM
139	Cooperation on combating the spread of cross-border infections will increase	2013	LSM
140	Study: Euro bank-note is the cleanest paper money	2013	LSM
141	Study: Hospitals in Latvia use too many antibiotics	2013	LSM
142	A surprising experiment: what happens to a bread when touched with dirty hands	2013	NRA
143	Children vaccination is just as important as reading-skills	2013	Tvnet

144	Latvian hospitals have the highest antibiotic consumption in Europe	2013	Tvnet
145	Study: the lowest prevalence of hospital-acquired infections in the EU has been reported in Latvia	2013	Tvnet
146	Women's bags are a true bacterial hotbed	2013	Tvnet
147	There are more bacteria on a woman's hand than on a man	2013	Tvnet
148	Scientists discover what threatens us in public toilets	2014	Apollo
149	The world's first microbial museum is opened in Amsterdam	2014	Delfi
150	Seven important things to know about antibiotics	2014	Delfi
151	Biggest microbial colonies	2014	Diena
152	Antibiotics should be only used by strictly following the doctor's instructions	2014	LA
153	Hire bacterium at work! How the biological sewage system works	2014	LA
154	Hand - wash, nourish, moisturize, protect	2014	LA
155	Seven important things to know about antibiotics	2014	LA
156	WHO: Antibiotic resistance is the 'biggest global threat' to health	2014	LSM
157	No one dies from getting hands little dirty or why sterility is not needed	2014	Tvnet
158	Worldwide Hand Hygiene Day. Do you know how to wash your hands properly?	2014	Tvnet
159	Daily items that are dirtier than a toilet seat	2015	Apollo
160	In public transport informs about proper hand hygiene	2015	Apollo
161	Doctors remind about the importance of proper hand hygiene and launch a website for children and parents	2015	Delfi
162	Global threat - antibiotic resistance. How to use antimicrobials properly?	2015	Delfi
163	Latvia is one of the largest users of antibiotics in the EU	2015	Delfi
164	In Latvia there is a tendency for irrational prescription of antibiotics; recommendations for children patients developed	2015	Delfi
165	Clean hands as health guarantee. How often, how and why should you wash your hands?	2015	Delfi
166	EC initiates changes in usage of antibiotics	2015	Diena
167	Latvia is one of the largest users of antibiotics in the EU	2015	Diena

168	Latvia is one of the largest users of antibiotics in the EU	2015	LA
169	The hands should be washed, but not unnecessarily disinfected	2015	LA
170	Find out why antiseptics should be used in moderation	2015	LA
171	The possibility of getting infected when using public transport scares the population of Riga the most	2015	LSM
172	Latvia is one of the largest users of antibiotics in the EU	2015	LSM
173	Clean hands protects from infections similarly as vaccination	2015	LSM
174	The consumption of antibiotics in Latvia is not that high; resistance widespread in all Europe	2015	NRA
175	Do you know how often you have to clean your phone or change the sheets?	2015	Tvnet
176	The East Hospital has developed guidelines for antibiotic use in clinical care	2016	Apollo
177	Invisible predator or what lives in the old walls of Stradins Hospital?	2016	Apollo
178	The world is threatened by epidemics that will kill more people than cancer	2016	Apollo
179	The dirtiest and most dangerous thing in your house	2016	Apollo
180	The most risky places on an airplane where you can 'catch' a nasty disease	2016	Apollo
181	In the walls of old building of the Stradins Hospital lives an infection that is particularly dangerous to patients	2016	Apollo
182	Bacteria live on the bank-note for up to eight days	2016	Delfi
183	A doctor answers to parents questions about children's hand hygiene in summer	2016	Delfi
184	10 dangerous diseases that can kill in 24 hours	2016	Delfi
185	Study: Latvia is one of the three most hygienic countries in the world	2016	Diena
186	Cardiologist explains what is sepsis infection	2016	LA
187	A bit scary: the hygienic risks of gym mattress, gym balls and changing rooms	2016	LA
188	Saving on the account of patients and medical personnel's health	2016	LA
189	EU plans to ban use of antibiotics in healthy livestock	2016	LSM
190	Traditional doctors' white coat can carry causing agents of infections	2016	LSM
191	Good to know: millions of microbes in kitchen	2016	NRA

192	Dirty money (in the literal sense) circulates in Latvia	2016	NRA
193	Study: Bank-notes contain 9 times more bacteria than payment cards	2016	NRA
194	Invisible predator or what lives in the old walls of Stradins Hospital?	2016	Tvnet
195	Study: Latvia - one of the three most hygienic countries in the world	2016	Tvnet
196	Deadly infection in the walls of the Stradins Hospital	2016	Tvnet
197	Stop! Excessive cleanness is harmful	2016	Tvnet
198	There are more bacteria on the mobile phone than on the toilet seat	2016	Tvnet

Appendix 3. Example of Interview Plans

Hospital staff

1. Introduction. *These questions will allow to understand a context of informant's experience.*

1.1. What is your role? How did you start working here? What it involves and for how long have you had this job/these duties?

2. Overall perception on HAIs prevalence. *These questions will enable to understand how HAIs are perceived in the informant's opinion. Here it is important how the informant talks about HAIs, for example as a natural order of things/as urgent/not important healthcare issue. The last two questions in this sections provide link to the next section about informant's experience.*

2.1. In your opinion, have microbes causing these infections always been a problem in healthcare or this is something that has emerged as an issue only recently? How urgent/topical of a problem are HAIs in Latvia/at your hospital? And why/with what factors it could be related? Has the situation changed over the years? If yes, how? Have any of these changes affected your job? If yes, in what ways?

3. HAI control activities: organization and experience. *This section starts with more general questions as it is expected that informants at first will talk about more general things. Questions about work experience (3.1), practice standards in dynamic (3.2.) etc. will gradually deepen the answers. Subsection 3.6. will allow to verify previous answers in this section from another angle.*

3.1. How HAI control is organised at your workplace? What HAI control activities are practiced at your workplace (e.g. patients screening, hand hygiene practices, antibiotic stewardship)? Are there any practice standards (e.g. guidelines, bundles, policy)? If yes, what kind and in what areas? Are there any HAI control guidelines/protocols that you have to follow? Are they necessary? Why yes/no? How do you usually learn about the most effective types of infection control, for example, by using guidelines developed by another country, through literature studies, or experience?

3.2. Please tell about your professional involvement in HAI control activities! How did HAI control become a part of your job/duties? Approximately, what proportion of your work day is shaped by activities related with HAI control? What are the most typical things you have to do with regard to HAI control? Does it require special knowledge, skills, and resources?

3.3. If and how the ways how to deal with HAIs have changed over the years (e.g. infection risks, knowledge about these infections, measures to deal with them, new specialists involved)?

3.4. What is yours hospital's strengths in providing good HAI control? Could you give an example? What are the areas where there still is room for improvements? Any example? Are infection control activities evaluated/monitored? Is it necessary?

3.5. What characterises efficient HAI control? How it should be developed, managed and implemented? Please describe the best possible conditions for you to implement HAI control. What preconditions should be met so that HAIs would not be a problem at your hospital/country? If you would be trusted with authority of the Minister of Health, what would be your most essential improvements in the fight against infections?

3.6. Could you share, in general terms, your experience in solving the last three HAI cases? How did you make sure that the risk of HAIs is under control?

4. Collaboration. *This section will allow to understand how HAI control is co-produced between different actors. Similar as in the previous section, this section starts with more general questions about collaboration and then goes into more detail about collaboration experience and its quality.*

4.1. How and what responsibilities are shared between different specialists? How HAI control activities are coordinated within your workplace? Is teamwork practiced when dealing with HAI control? If yes, could you give an example? Do you consider it necessary?

4.2. With whom do you work most closely when dealing with these infections? With whom do you most commonly collaborate outside your workplace? How does it usually go? What types of cooperation you usually use (e.g. information exchange, consultations, joint meetings)? Is there any communication with specific groups of stakeholders (if not already mentioned):

4.2.1. In hospital: patients, their caregivers / other hospital staff

4.2.2. Outside hospital: specialists from other healthcare facilities / policy-makers / state officials / NGOs / media representatives.

In general, do these actors/stakeholders should be included when dealing with HAIs? Why yes/not? Is there any other actor/stakeholder who should be included/excluded?

4.3. What usually turns out to be successful in this cooperation? What could be improved in the current collaboration model?

5. Beliefs about how to deal with microbes that cause HAIs and microbes in general. *This section allows to understand the informant's perceptions about HAI control on more conceptual level, therefore questions are asked from various angles. Subsection 5.3. is included for verification of answers collected previously from this section.*

5.1. At global/EU level, HAI control is crucial issue, for example, it is expected that by 2017 in every country there will be HAI control policy as part of action plan on antimicrobial resistance. Do you think that current local, national, global efforts are sufficient enough to tackle the problem of HAIs? What else could be done? In general, to what extent it is possible to control these infections? Is it possible that we can completely be free from these microbes causing these infections? Why yes/no?

5.2. Do you personally feel safe from these infections? What you usually do to feel safe from risks caused by these and other microbes at your workplace/public places/home? In what occasions you take extra care of yourself? Outside your workplace, how do you protect yourself and close ones (e.g.

family members) against these microbes that cause infections and other microbes around us, for example antibacterial hand gels, antibacterial cleaning products? On what occasions you usually use antibacterial products? How important for you it is to use antibacterial products, for example, when cleaning at home, after using public transportation? Are there any situations when you feel that microbes are beneficial to us?

5.3. Recently, a study showed that Latvia is one of the three most hygienic countries in world. How it looks from your experience? How would you generally assess public knowledge on microbes causing HAIs and microbes in general? What are the most common beliefs that people have about how to deal with microbes causing HAIs and how to deal with other microbes in general?

6. Closing section.

6.1. Are there any other persons with whom you would recommend me to speak with? Which documents you recommend me reviewing?

6.2. Is there anything you would like to add? Do you have any questions?

Appendix 4. Participant Information Sheet and Informed Consent Form

LEEDS INSTITUTE OF HEALTH SCIENCES
Faculty of Medicine and Health

UNIVERSITY OF LEEDS

Participant Information Sheet

You are invited to take part in research study.
Before you decide whether to take part please read this information sheet.
The researcher will go through this sheet with you and answer any questions you have.

What is the study about?

- Research is part of PhD studies carried out at the University of Leeds, UK. The purpose of the research is to gain in-depth understanding of current situation in hospital-associated infection control and search for solutions that is based on Latvian context and recognizing actual needs.

Why have I been chosen?

- You have been approached because of your experience and/or current work in hospital-acquired infection control field. Various research participants (patients and if feasible their caregivers, health professionals, laboratory specialists, hospital support staff, hospital administration, policy makers, state officials, NGOs and media representatives) will be recruited for this research.

What will happen to me if I agree to take part?

- You will be asked to complete a consent form. You will be asked to answer questions in an interview format. During the interview researcher will ask you to share your views and experience with hospital-acquired infections and their control.

What are benefits and risks from taking part in this study?

- The benefits of taking a part are that the collected information will lead to a better understanding of the current situation in this field and seek healthcare quality and safety improvements in this area based on actual needs and local context.
  You may feel uneasy when the researcher is present during the observation research. To reduce the inconvenience, the researcher will not interrupt the flow of a meeting. You will be able to ask at any time not to be observed or ask the researcher to leave the meeting.

Do I have to take part?

- No, it is up to you whether or not you decide to take part.

Can I change my mind?

- Yes, you are free to withdraw at any time up until data collection ends (30/06/2017), without giving any reason, this includes after you have completed the consent form.

Will my taking part in this study be kept confidential?

- Yes, any information you provide will be treated in confidence and will not be disclosed to third parties. You will not be identified in any reports, publications or presentations.

Who is funding the research?

- Research is supported by University of Leeds 110 Anniversary Research Scholarship.

Who can I contact?

- If you would like further information or have questions about the study please contact:

Zane Linde-Ozola, researcher
Leeds Institute of Health Sciences
umzlo@leeds.ac.uk; 26470737

Dr Tolib Mirzoev, Associate Professor in International Health Policy and Systems, Leeds Institute of Health Sciences, University of Leeds

This study has been reviewed and given a favourable opinion by:
1. Research Ethics Committee at the University of Leeds on 21/10/2016, ethics reference MREC16-003
2. Medical and Biomedical Research Ethics Committee of the Riga East Clinical University Hospital's Support Foundation on 06/10/2016, ethics reference 15-A/16.

Research project	*Document type*	*Version #*	*Date*
Hospital-acquired infection control in post-Soviet Latvia	Participant information sheet	3	27/09/2016

LEEDS INSTITUTE OF HEALTH SCIENCES
Faculty of Medicine and Health

UNIVERSITY OF LEEDS

Consent to take part in PhD research project on hospital-acquired infection control in post-Soviet Latvia	Please initial each box
I confirm that I have read and understand the information sheet dated 19.08.2016 explaining the above research project.	
I have had the opportunity to ask questions about the research and questions I have asked have been answered sufficiently.	
I understand that my participation is voluntary and that I am free to withdraw at any time until data collection ends (30/06/2017) without giving any reason and without there being any negative consequences. If I do not wish to answer any particular question or questions, I am free to decline. If I decide to withdraw from research, I will be approached to decide about already provided data.	
I agree that interview is audio-recorded and transcribed for research purposes.	
I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the reports that result from the research. I understand that my responses will be kept confidential.	
I agree to be contacted again for purposes of this research (provide additional information after an interview, possible field visit, invitation to participate in stakeholder workshop).	
I agree to take part in the above research project.	

Name of participant	Date (dd/mm/yyyy)	Signature of participant

Name of researcher	Date (dd/mm/yyyy)	Signature of researcher

Appendix 5. Letters of Ethical Approval

UNIVERSITY OF LEEDS

Faculty of Medicine and Health Research Office
School of Medicine Research Ethics Committee (SoMREC)

Room 9.29, level 9
Worsley Building
Clarendon Way
Leeds, LS2 9NL
United Kingdom

✆ +44 (0) 113 343 1642

21 October 2016

Zane Linde-Ozola
PhD Student
Leeds Institute of Health Sciences
Faculty of Medicine and Health
Leeds Institute of Health Sciences
Charles Thackrah Building
101 Clarendon Road
LEEDS LS2 9LJ

Dear Zane

Ref no: **MREC16-003**

Title: **Microbiopolitics of human-microbe relationships: hospital-acquired infection control in post-Soviet Latvia**

Your research application has been reviewed by the School of Medicine Ethics Committee (SoMREC) and we can confirm that ethics approval is granted based on the following documentation received from you and subject to the following condition *which must be confirmed as fulfilled prior to the study commencing*:

- **Evidence of in-country approval must be submitted from the Medical and Biomedical Research Ethics Committee of the Riga East Clinical University Hospital's Support Foundation in Latvia**

Document	*Version*	*Date Submitted*
2_Ethical_review_from_v7	7.0	22/08/2016
3_1_Information sheet_interview_v3	3.0	03/10/2016
3_2_Information sheet_observation_v3	3.0	03/10/2016
3_3_Information sheet_stakeholderworkshop_v3	3.0	03/10/2016
4_Poster_For_Patients_v2	2.0	03/10/2016
5_Basic_topic_guide_interviews_v3	3.0	03/10/2016
6_Fieldwork_Assessment_Form_low_risk_final_protected_v3	3.0	03/10/2016
6_Review_Confirmation_from_Ethics_Comittee_in_Latvia	1.0	22/08/2016
2-1_Consent_form_interview_v1	1.0	22/08/2016
2-2_Consent_form__observation_v1	1.0	22/08/2016
2-3_Consent_form_stakeholderworkshop_v1	1.0	22/08/2016

Please notify the committee if you intend to make any amendments to the original research ethics application or documentation. All changes must receive ethics approval prior to implementation. Please contact the Faculty Research Ethics Administrator for further information (fmhuniethics@leeds.ac.uk)

Ethics approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

We wish you every success with the project.

Yours sincerely

Dr Roger Parslow
Co-Chair, SoMREC, University of Leeds

(Approval granted by Co-Chairs Dr Roger Parslow on behalf of committee)

afonds.ētika
MEDICĪNISKO UN BIOMEDICĪNISKO PĒTĪJUMU ĒTIKAS KOMITEJA

Darbojas saskaņā ar SHK LKP noteikumiem

Nr. 15-A/16
06.10.2016.
Rīgā

Rīgas Austrumu klīniskās universitātes slimnīcas atbalsta fonda
Medicīnisko un biomedicīnisko pētījumu Ētikas komitejas

ATZINUMS

Pētījuma nosaukums : Cilvēku-mikrobu attiecību mikrobiopolitika: slimnīcā iegūtu infekciju kontrole postpadomju Latvijā (Microbiopolitics of human-microbe relationships: hospitalacquired comtrol in post-Soviet Latvia)

Pētījuma pieteikuma iesniedzējs: Zane Linde-Ozola

Pētījuma pieteikuma iesniedzēja darba vieta: SIA „Rīgas Austrumu klīniskā universitātes slimnīca"

SIA "Rīgas Austrumu klīniskās universitātes slimnīcas" atbalsta fonda Medicīnisko un biomedicīnisko pētījumu Ētikas komiteja(sēdes prot. 10/16., 06.10.2016.) ir izvērtējusi plānotā zinātniskā pētījuma nozīmi un mērķi, iesniedzēja sniegto paredzamā ieguvuma un riska novērtējumu un tā pamatotību. Balstoties uz iesniegto dokumentu izvērtējumu, komiteja nolēma izteikt:

- ■ pozitīvu atzinumu
- ☐ negatīvu atzinumu, ar iespēju veikt izmaiņas un iesniegt pieteikumu atkārtoti
- ☐ negatīvu atzinumu

par pieteikuma atbilstību zinātnisko pētījumu ētikas prasībām.

Rīgas Austrumu klīniskās universitātes slimnīcas atbalsta fonda
Medicīnisko un biomedicīnisko pētījumu
Ētikas komitejas priekšsēdētājs Roberts Stašinskis

Rīga, Hipokrāta iela 2, LV1038
t. 20281174

[TRANSLATION]

/logotype/

ETHICS COMMITTEE FOR MEDICAL AND BIOMEDICAL RESEARCHES

Operates under the ICH-GCP regulations

No. 15-A/16
06.10.2016
Riga

Support Foundation of the Riga Eastern Clinical University Hospital
Ethics Committee for Medical and Biomedical Researches

OPINION

Name of the research: Microbiopolitics of human-microbe relationships: hospital-acquired infection control in post-Soviet Latvia

Person submitting the research application: Zane Linde-Ozola

Place of examination of the research application: LLC Riga Eastern Clinical University Hospital

The Ethics Committee for Medical and Biomedical Researches of the Support Foundation of the Riga Eastern Clinical University Hospital has examined the essence and purpose of the intended scientific research, as well as the assessment and justification of the benefits and risks as estimated by the applicant herself (session minutes No. 10/16, 06/10/2016). Based on the assessment of the submitted documents, the Committee agreed to render the following opinion on whether the application complies with ethics requirements set for scientific researches:

- ▪ positive opinion,
- □ negative opinion with an option to apply changes and submit the application again,
- □ negative opinion.

Roberts Stašinskis, the Chairman of the Ethics Committee
for Medical and Biomedical Researches
Support Foundation of the Riga Eastern Clinical University Hospital
/signature/

2 Hipokrata Street, Riga, LV1038
phone 20281174

Hospital's X institutional approval for conducting research

1.pielikums **Kārtība, kādā tiek veikta akadēmiskā pētniecība** [redacted]	I P-Zin-1.2/01 Versija 02 Spēkā no 30.03.2016.

[redacted] inātniskā institūta direktoram

IESNIEGUMS AKADĒMISKĀ PĒTĪJUMA ATĻAUJAS SAŅEMŠANAI

2016. gada 30. novembrī

IESNIEGUMA IESNIEDZĒJS / PĒTĪJUMA AUTORS VAI AUTORU KOLEKTĪVA VADĪTĀJS

Vārds, uzvārds	Zane Linde-Ozola		
Tālr.	26470737	E-pasts	umzlo@leeds.ac.uk
*Izglītības iestādes nosaukums**	Līdsas Universitāte, Anglija		
Studiju programma*	PhD programma, Līdsas Veselības zinātņu institūts, Veselības un medicīnas fakultāte		

PĒTĪJUMA ZINĀTNISKAIS VADĪTĀJS*

Vārds, uzvārds	Dr Tolib Mirzoev
Izglītības iestādes nosaukums, amats	Līdsas Veselības zinātņu institūts, Līdsas Universitāte, asociētais profesors starptautiskajā veselības politikā un veselības aprūpes sistēmās
Zinātniskā vadītāja paraksts, datums	01.12.2016.

PĒTĪJUMA NOSAUKUMS

Cilvēku-mikrobu attiecību mikrobiopolitika: slimnīcā iegūtu infekciju kontrole pēcpadomju Latvijā (angl. Microbiopolitics of human-microbe relationships: hospital-acquired infection control in post-Soviet Latvia)

PĒTĪJUMA NORISES VIETA

Klīnika/centrs/nodaļa	[redacted]
Klīnikas/centra/nodaļas vadītāja saskaņojums par pētījuma veikšanu	
Slimnīcas darbinieks- galvotājs** paraksts, datums	6.12.16

NORISES LAIKS

Pētījuma norises laiks, norādot sākuma un beigu datumu	12.12.2016. 31.03.2017. Pagarināts līdz 30.06.2017.

IZMANTOJAMĀS PACIENTU SLIMĪBAS VĒSTURES

Pētījumā paredzēts izmantot ≤ 100 ☐ *≥ 100**** ☐ netiks izmantoti.
Slimības vēsturu diagnožu kodi (SSK-10) vai Slimības vēsturu numuri ja zināmi
Pacientu slimības vēstures netiks izmantotas šajā pētījumā.

* Šo sadaļu aizpilda studenti, maģistranti un doktoranti

** ja iesnieguma iesniedzējs pats vai zinātniskā darba vadītājs nav Slimnīcas darbinieks nepieciešams galvotājs (Slimnīcas darbinieks, ārstniecības persona, kura ir atbildīga par pētniecības norisi un juridiskajām sekām).

*** *ja paredzēts izmantot vairāk kā 100 Slimības vēstures, iesniegumam nepieciešams pievienot rakstisku pamatojumu brīvā formā*

05/12/2016 /datums/

[redacted] /iesniedzēja paraksts, atšifrējums/ Z. Linde-Ozola

Zin-1-006 versija 02

06.12.2016.

26.04.2017.

Annex 1 Procedure of conducting academic research in */redacted/*	DP-Zin-1.2/01 Version 02 Enforced on 30.03.2016

To the Director of Scientific Institute of */redacted/*

APPLICATION CONCERNING RECEIPT OF PERMISSION FOR ACADEMIC RESEARCH

30th November 2016

APPLICANT/AUTHOR OF THE RESEARCH OR HEAD OF THE TEAM OF AUTHORS

Full name	Zane Linde-Ozola		
Phone	26470737	E-mail	umzlo@leeds.ac.uk
Name of the place of education*	University of Leeds, England		
Study programme*	PhD programme, Leeds Institute of Health Science, Faculty of Medicine and Health		

RESEARCH SCIENTIFIC SUPERVISOR*

Full name	Dr Tolib Mirzoev
Name of the place of education, position	Leeds Institute of Health Science, University of Leeds, Associate Professor of International Health Policy and Systems
Signature of the scientific supervisor, date	01.12.2016 */signature/*

TITLE OF THE RESEARCH

Microbiopolitics of human-microbe relationships: hospital-acquired infection control in post-Soviet Latvia

RESEARCH SITE

Clinic/center/unit	*/redacted/*
Approval of the head of the clinic/center/unit concerning the research	*/redacted/*
Employee of the hospital – guarantor**signature, date	*/redacted/* 06.12.16

TIME OF RESEARCH

Time of the research, specifying both start and finish date	12.12.2016 31.03.2017 Extended up to 30.06.2017

USED PATIENT CASE FILES

The research intends to use ≤ 100 ☐ ≥ 100 *** ☐ Not to be used

Disease history diagnosis codes (SSK-10) or Case file numbers, if any

This research will not use any patient case files.

* This section is to be filled-in by students, postgraduate students and PhD students

** If the applicant or supervisor of the scientific work is not employees of the hospital, a guarantor is required (hospital employee, medical practitioner who shall be responsible for the course of the research and any legal consequences).

*** *If more than 100 case files are to be used, a free-form written justification must be appended to the application.*

05/12/2016 */redacted/* */signature/* /Z. Linde-Ozola/

/date/ /applicant's signature and full name/

Zin-1-006 version 02
06.12.2016

Appendix 6. PhD Achievements

2016
Medical conference on patient safety risks in clinical practice, Riga Stradiņš University, Latvia
Oral presentation
Patient Safety Risks: Social Science Perspective.

2018
EASST2018: Meetings-Making science, technology and society together. Lancaster University, UK
Oral presentation
Managing Human-Microbe Relationships: Hospital-Acquired Infection Control in Latvia.

2018
Association for the Advancement of Baltic Studies conference, Stanford University, USA
Oral presentation
Can Anthropological Theory Help Fighting Antibiotic Resistant Superbugs? Searching for Answers in Latvia.

2018
Social Science and AMR Research Symposium, Antimicrobials In Society Research Programme at the London School of Hygiene & Tropical Medicine, London, UK
Poster presentation
Microbiopolitics of Human-Microbe relationships: Fight Against Hospital Superbugs in Latvia.

2018
Medical conference on tackling antimicrobial resistance, WHO Regional Office for Europe, Ministry of Health of the Republic of Latvia, Ministry of Agriculture of the Republic of Latvia, Riga Stradiņš University, Latvia
Oral presentation
Healthcare-Associated Infection Control. Anthropological Perspective.

2019
Medical seminar, Children's Clinical University Hospital, Latvia
Invited lecture
Healthcare-Associated Infection Control. Anthropological Perspective.

2019
77th International Scientific Conference of the University of Latvia, Latvia
Oral presentation
Tolerance beyond Anthropocentrism: Managing Hospital Superbugs in Latvia.