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Multiplying Ignorance, deferring Action: Dynamics in the Communication of Knowledge and Non-Knowledge

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Abstract:

Under the umbrella terms, ‘agnotology’, ‘strategic ignorance’, and ‘willful ignorance’, scholars have identified and unpacked the mechanisms and strategies involved in producing and maintaining ignorance. These analyses tend to have in common that strategic ignorance is about avoiding, hiding, or rendering existing knowledge unreliable. Drawing on Niklas Luhmann’s sociological concept of communication, we supplement these accounts with an analysis of how ignorance can be produced and maintained by means of communicative selection. Taking the emergence of the zoonotic disease LA-MRSA in Denmark as our empirical case, we explore the management of ignorance under conditions of non-knowing. Our analysis demonstrates how ignorance may be not only maintained but also multiplied without hiding knowledge, keeping secrets, or creating doubts. The analysis thus sheds new light on the dynamics through which ignorance is produced, while knowledge is on full display and acknowledged. The analysis furthermore shows how strategic interests are coupled to ignorance by means of communicative selection.

Keywords: agnotology; ignorance; non-knowledge, strategic ignorance; zoonosis

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Introduction

Ulrich Beck and Peter Wehling (2012, 33) argue that ‘numerous spheres of action and politics in contemporary societies are conditioned by non-knowing rather than by knowledge’. As examples of societal challenges, they mention human-made climate change, the release of genetically modified organisms, and the swine flu. Indeed, they define non-knowing as a contemporary condition under which decisions are made and actions are taken. This raises the question of how societies and organizations manage existing ignorance, inviting scrutiny into what Beck and Wehling (2012) have called the ‘politicisation of non-knowing’. The politicisation of non-knowing manifests in different interpretations of what is known, and in conflicts regarding how to react to and manage the non-knowing (Beck and Wehling 2012, 34). For instance, in relation to COVID-19, we have witnessed controversies surrounding the possible consequences of non-knowing, as well as the emergence of strategies and politics for its management (Parviainen, Koski, and Torkkola 2021; Bleicher 2021).

Beck and Wehling (2012, 34) distinguish ‘between strategies for *governing non-knowing* and strategies for those who seek to *govern through non-knowing*’. The *governing of non-knowing* has been studied in relation to environmental and technology studies (Wehling 2011; Gross 2010). Scholars have also analyzed how society and organizations manage non-knowing under terms like ‘risk’ (Beck 1986; Luhmann 1991) and ‘uncertainty’ (Kessler 2015; Thompson 2003) related to ignorance regarding future events. *Governing through non-knowing* concerns the intentional use of ignorance for specific purposes and interests, and is often the privilege of those who hold the power to define, determine, and distribute the known and the not known (McGoey 2019). In recent years, a burgeoning body of literature has studied governing through non-knowing under the umbrella terms of ‘strategic ignorance’ (Brice, Donaldson, and Midgley 2020; McGoey 2012b, 2019), ‘agnotology’ (Proctor and Schiebinger 2008), and ‘willful ignorance’ (Mason 2020; Schaefer 2018). These studies form part of a broader interest in the production, maintenance, and social functions of ignorance (Gross and McGoey 2015).

This paper examines how the *governing of non-knowing* entangles with strategies for *governing through non-knowing* in the production and maintenance of ignorance. We do so by means of an empirical case analysis concerning the management of the zoonotic disease, livestock-associated methicillin-resistant staphylococcus aureus (LA-MRSA) in Denmark. As a new zoonotic disease (infectious disease naturally transmissible from vertebrate animals to humans), LA-MRSA emerged surrounded by ignorance regarding its form of transmission, level of danger, treatment,

and elimination etc., but it was also deeply entangled with strategic interests, as the disease and the potential societal and organizational reactions could influence the entire Danish pig production and its significant export industry. We analyze how ignorance regarding which pig herds were infected was maintained, despite the scientific advisors' repeated recommendations to test the herds. Over four crucial years, from 2010–2014, tests were not performed, ignorance about infected herds was maintained, and the prevalence of LA-MRSA rose to irreversible levels.

Using a communicative lens (Luhmann 1995), our analysis supplements studies of strategic ignorance that analyze how ignorance is produced and maintained by means of the creation of doubt (Michaels 2020; Proctor 2008), secrets (Costas and Grey 2014), suppression (McGoey 2019), decoupling (Schaefer 2018), or denial (Jacques, Dunlap, and Freeman 2008). We show how ignorance does not exclude communicative acknowledgement of knowledge. Continuously connecting to non-knowledge rather than knowledge in communication makes maintaining ignorance possible, without requiring that knowledge is absent or uncertain. We also show how ignorance is maintained in a dynamic 'play' (Derrida 1978, 280) between knowledge and the objectives of knowledge production. In this 'play', preventive action is deferred indefinitely. Hence, our analysis unpacks the communicative dynamics, that unfolded in the crucial years between 2010–2014, and that contributed to the maintenance of ignorance. This attention to the temporal–processual development is particularly important in cases such as ours, wherein ignorance is maintained over a period of time, during which it is repeatedly challenged, yet remains intact. We further argue that these communicative dynamics are connected to combinations of interest protection, bureaucratic silo-thinking, and protection against knowledge calling for action, demonstrating that strategic interests and ignorance are coupled in the way that communication selects and connects to non-knowledge vis-à-vis knowledge.

In the following, we briefly account for extant literature on strategic ignorance. Next, we develop a theoretical approach apt to capture how ignorance is communicatively maintained. We then present our case study before turning to the analysis. Finally, we discuss the implications of our study.

Strategic Ignorance

We relate our study to the broad field of ignorance studies premised on ignorance not as a mere lack of knowledge, the not yet known, but also as a social construct (Kessler 2015; McGoey 2012b, 2012a; Otto, Pors, and Johnsen 2019; Schaefer 2018). The literature on socially constructed

ignorance focuses on the ‘mechanisms involved in producing or maintaining ignorance’ (Proctor 2008, 8). For instance, Proctor (2008) studies how the tobacco industry has worked to create doubt about the causal relationship between smoking and cancer, McGoey (2007) shows how knowledge about the correlation between antidepressants and suicide has been suppressed, and Heimer (2012) analyzes how awkward knowledge is kept inert in HIV-clinics as information is sequestered and ignorance distributed. We also find studies of climate science denial as willful hermeneutical ignorance (Mason 2020), in which the production of doubt in scientific knowledge (Oreskes and Conway 2010) is a core strategy. Furthermore, studies focus on how actors not only try to hide knowledge from others but also from themselves to avoid uncomfortable (Rayner 2012), awkward (Heimer 2012), disconfirming (Schaefer 2019), potentially destructive (Goffman 1990), excessive, and toxic (Schwarzkopf 2020) knowledge and information. Such self-inflicted ignorance is identified in forms such as decoupling (Schaefer 2019), forms of inattentiveness (Knudsen 2011), unseeing (Otto, Pors, and Johnsen 2019), and denial and dismissal (Rayner 2012).

Extant literature thus greatly improves our understanding of the mechanisms involved in producing and maintaining ignorance. Adding to these accounts, our study develops a communication theoretical analytical framework that allows us to unpack how ignorance is produced and maintained over time. Furthermore, in drawing attention to communication and the dynamics it unfolds, we come to notice, how ignorance is produced and maintained without keeping secrets, creating doubt, or hiding, denying, and suppressing knowledge. Attending to communication, we shed new light on how ignorance can be produced and maintained, while knowledge is fully acknowledged. Finally, focusing on communication attunes our analytical gaze to how ignorance is entangled and coupled with strategic interests *in* communicative operations.

Theoretical Framework

We begin by specifying the form of ignorance that is analyzed in this paper. The literature remains somewhat ambiguous regarding the conceptual meaning of ignorance (El Kassar 2018; Santos 2021), which is related to the fact that ignorance presents itself in the form of absence (Croissant 2014; Kerwin 1993). A common way of clarifying ignorance conceptually has been to build typologies (Alcoff 2007; Croissant 2014; Kerwin 1993; Roberts 2013; Woomer 2019), which are often constructed based on degrees of awareness (Beck and Wehling 2012, 38). Elements of common typologies include known unknowns, unknown unknowns, taboos, and denials (Kerwin 1993).

In this paper, ignorance is defined in terms of Gross' (2007, 2010) concept of *non-knowledge*. Gross suggests that ignorance should function as a cover term for knowledge about the limits of knowing in a certain area, as a 'type of knowledge where the limits and the borders of knowing are taken into account for future planning and action' (2007, 751). Thus, non-knowledge is 'knowledge about what is not known' (Gross 2010, 68). Non-knowledge is not a mere absence of knowledge as such (what Gross suggests calling 'nescience'), rather it always involves knowledge of what is not known. Hence, we distinguish between non-knowing, which is a condition, a premise to be managed, and non-knowledge as specified ignorance. Producing and maintaining such ignorance retains the condition of non-knowing. In relation to our interest in how societies and organizations manage non-knowing, the concept of non-knowledge is suitable for helping us clarify the specific kind of ignorance that we are interested in; namely, that which is known precisely as not known.

To follow how specific non-knowledge is maintained over time, we draw on Luhmann's (1995, 137ff) sociological concept of communication, which has also been called second order observation theory (Esposito 1996) as it is concerned with observing observations. In relation to our study, this means that we observe how the relevant actors observe knowledge and non-knowledge through communication. Thus, our object of analysis is communication regarding knowledge and non-knowledge. We find related second order analyses in Beddos (2019) and Essén, Knudsen, and Alvesson (2021), who analyze 'ignoring rationales', defined as explanations given by actors for their own acts of ignoring.

At its core, Luhmann's (1995, 137ff) concept of communication consists of recursivity. Communication is essentially a self-referential process in which communication connects to prior communication. Social systems (e.g., organizations) cannot communicate about everything simultaneously, meaning that in connecting to prior communication, social systems make selections in a horizon of possibilities – something is always said (actualized) by selecting from a horizon of other possibilities that could have been selected (Luhmann 1995, 59ff). Luhmann's concept of communication is wide-ranging, yet surgically precise. It allows us to observe different forms of communication (documents, reports, mails, transcripts of meetings, and related materials) as selections and connections to prior communication. We are not interested in reducing communication to interactions between participants, but in observing how social systems make selections of knowledge or non-knowledge. In these selections, communication binds expectations for future communication, i.e., selections of specific knowledge/non-knowledge create conditions

for subsequent communicative events in the form of expectations for the continuation of communication (Luhmann 1995, 286–87). In our case, this means that expectations are produced through communicative selections that condition the ongoing management of non-knowing.

Thus, to follow how specific non-knowledge is maintained over time, we employ Luhmann's (1995) concept of communication, allowing us to observe different forms of communication as selections and connections to previous communication. Observing selections attunes our analytical gaze to how expectations that condition the management of non-knowing are produced. In our analysis, these expectations evolve into dynamics that turn the communication in specific direction, thereby contributing to the maintenance of ignorance. Finally, we investigate how such selections are related to strategic objectives and interests, demonstrating how ignorance and strategic interests are coupled in selections of knowledge vis-à-vis non-knowledge.

Case Study

We investigate the communicative production and maintenance of ignorance by means of a case study concerning the zoonotic disease, LA-MRSA. The UN-sponsored science-policy platform on biodiversity and ecosystem services (IPBES) warns that a rise in zoonotic diseases should be expected. Intensified agriculture and forestry, increased global trade, climate change, and non-sustainable use of natural resources disturb the natural interactions between wild animals and their microbes, creating changes in the contact points between wild animals, domestic animals, and human beings (IPBES 2020). Moreover, industrial agriculture's overuse of antibiotics (and other drugs, such as hormones (Ehrenfeld 2006)) in very large livestock populations increases the risk of antibiotic resistance and the emergence of diseases that are difficult to treat with known means. Indeed, according to the World Economic Forum (2020), antimicrobial resistance is the cause of death for 700,000 people per year worldwide.

[Figure 1]

To zoom in on how ignorance was produced and maintained with regard to LA-MRSA in Denmark, we focus on the communication between the central actors involved; namely, the Danish Veterinary and Food Administration (DVFA) and The National Food Institute (Food) at the Technical University of Denmark (DTU), which acts as the official scientific advisor for DVFA.

[Table 1]

The case began in 2008, when an article was published (Lewis et al. 2008) showing that humans can be infected with LA-MRSA from pigs, and reporting a considerable increase in the number of humans infected. In 2009, a screening of 250 Danish pig herds estimated that 3% of the herds were infected. In June 2010, increased media attention prompted the Danish Minister of Food, Agriculture, and Fisheries to order DVFA to develop a LA-MRSA control plan. DVFA consulted advisors at DTU (chief amongst a leading internationally recognized expert in the association between use of antimicrobial agents to farm animals and the emergence and spread of antimicrobial resistance), who replied that it was crucial to test the top of the breeding pyramid to avoid contact through trade between negative and positive pigs. Danish pig production is organized into sophisticated breeding programs arranged in a pyramid. In 2010, the top of the pyramid comprised 27 farms sending semen and sows to thousands of farms further down the production pyramid. **In 2010, there were approx. 13 million pigs in Denmark. 90% of the production was exported; almost 2 million tons of pork at a value of DKK 28.169 billion [approx. USD 4.3 billion]. 5% of the total Danish export consisted of pork (Landbrug & Fødevarer 2011, 23).**

During the ensuing four years, DVFA asked DTU several times for advice, and each time the response was the same; start testing from the top of the breeding pyramid and get knowledge about the infected livestock. Yet, the tests were not performed, and ignorance about the prevalence of LA-MRSA was maintained. In these years, the bacteria spread in the livestock to a level that was, in effect, irreversible.

No statistical records exist from 2010 (due to no tests being administered), but in 2008, tests recorded no occurrences of LA-MRSA in Danish breeding herds. In 2016, six breeding herds were tested anonymously—they all tested positive (DANMAP 2016). Finally, in 2017, it was assumed that, if not all, then the large majority of Danish pig herds were infected (Ministry of Environment and Food of Denmark 2017). It was known from Holland that LA-MRSA had the potential to spread if no measures were taken; thus, 60–80 % of the Dutch pig livestock was already infected in 2008 (DVFA 2014). According to the National Auditors, in 2010–2014, the DVFA initiated LA-MRSA research projects for more than six million Euro (Rigsrevisionen 2015, 24). Yet, the scientific advisors' recommendation to test the herds was not followed, and knowledge of positive/negative herds remained lacking. **Finally, the costs of a potential eradication of infected herds were also not known, as no such calculations were made until 2017, where LA-MRSA**

had already spread widely between the herds. Figure 2 illustrates the development in the number of LA-MRSA infected human beings in Denmark since 2007. Table 2 presents the number of human beings who have died from sepsis (blood poisoning) related to infections with LA-MRSA.

[Figure 2]

[Table 2]

Our analysis is based on written documents. We invoked the Danish Freedom of Information Act and gained access to an extensive archive of documents stemming from the years 2008–2016. Some of the documents are freely available on the internet, and in those cases, we provide full references to the documents in the list of references. However, many of the documents were obtained through our applications for access to documents directly from DVFA or DTU. In these cases, we can only state the authors, dates, and formats of the documents in in-text references, e.g., ‘(Report from DTU to DFVA, June 3, 2010)’. The documents comprise emails (primarily between DTU and DVFA), reports, meeting minutes, and other relevant material. Data analyses comprised systematic readings and coding of the documents according to (1) communication about knowledge and non-knowledge, (2) the dynamics following communicative connections to either knowledge or non-knowledge, and (3) possible reasons for maintaining ignorance. All excerpts presented in the analysis have been translated by the authors.

Maintaining Ignorance in Communicative Selections of Non-knowledge

In the first part of the analysis, we follow communicative dynamics and investigate how non-knowledge was (re)produced and maintained. We begin by analyzing the contingent communicative connections to non-knowledge.

The Multiplication of Non-knowledge

We commence our analysis with a correspondence between DVFA and DTU from June/July 2010. The responsible ministry requested an account of extant knowledge, including options for how to control LA-MRSA. DVFA consulted its official scientific advisors at DTU on the matter. Below, we present two quotations illustrating how DTU and DVFA acknowledged both knowledge and non-knowledge. However, while DTU ended up connecting to knowledge, DVFA connected to non-knowledge, and that distinction had clear consequences for future action (not) taken. In the two

quotes, we have italicized the portions connecting to non-knowledge. The following excerpt is from DTU's response, sent to DVFA on July 7, 2010:

For the time being, it is not possible to estimate the relative significance of the above factors (trade, tetracycline, cephalosporin, beta lactam, zinc), nor to what extent yet unknown factors may have an influence. It is, therefore, not possible either to estimate, whether changes to one or more of the factors would decrease the prevalence, outright reduce colonization, or possibly a complete elimination of MRSA. Based on prior experiences with resistance, we do, however, estimate that a potential elimination should, as a minimum, include a stop of new introductions through trade contacts and other sources (...) A potential elimination plan would thus require establishing a secure test to point out MRSA positive and negative herds, in part to be able to clear a herd for MRSA. (Report from DTU to DVFA, July 7, 2010)

One day later, on July 8, DVFA sent its report to the ministry. The report included the following excerpt:

Based on prior experiences with resistance, the Food institute, DTU, estimates that a potential elimination should, as a minimum, include a stop of new introductions through trade contacts and other sources, and the removal of selective factors such as certain antibiotics and possibly metals, e.g., zinc (...) *Currently, it is, however, not possible to estimate the relative significance of the above factors, nor to what extent yet unknown factors may have an influence. There exist no prior experiences to draw on, when estimating, whether killing MRSA-positive herds is an effective strategy, and whether a re-introduction can be avoided. Additionally, the financial costs are expected to be very comprehensive and without assurance of the efficacy of the elimination. Therefore, DVFA's assessment is that extant knowledge does not satisfy the above-mentioned prerequisites for an effective control strategy.* (Report from DVFA to the ministry, July 8, 2010)

Both DTU and DVFA described a situation characterized by a combination of knowledge and non-knowledge. In the first excerpt, the scientific advisors at DTU explicitly stated that there was still much they did not know about LA-MRSA (the italicized part of the quotation). However, they also pointed to existing knowledge, namely the knowledge about trade being a significant factor in the

spread of LA-MRSA. DTU proposed connecting to this knowledge and to make strides toward a control and prevention plan. Moreover, DTU recognized a specific non-knowledge regarding which herds were positive/negative. Producing this knowledge would allow new introductions through trade between positive and negative herds to cease. DVFA accounted for the same knowledge and non-knowledge; yet, instead of connecting to knowledge and establishing a test procedure, DVFA connected to non-knowledge and emphasized the not known (the italicized portions of the quotations). Based on this non-knowledge, it stated that ‘it is presently not possible to give recommendations on which type of strategy that can most effectively control MRSA CC398 in Danish pig herds’ (Report from DVFA to the ministry, July 8, 2010). The conclusion was that more knowledge was required before a strategy could be recommended and any action could be taken. This connection to non-knowledge relates to what, in the same report to the ministry, DVFA established as the precondition for formulating a strategy; namely, turning three pieces of non-knowledge into knowledge:

The prerequisites for formulating an effective control strategy are among others: (1) That the extent of the problem is known or can be clarified; this requires a diagnostic method (...) (2) Sufficient knowledge about how the bacteria spreads between herds, and (3) Sufficient knowledge about how the bacteria can be eradicated from a positive herd... (Report from DVFA to the ministry, July 8, 2010)

Here, three pieces of non-knowledge (diagnostic methods, modes of transmission, and possible eradication strategies) are listed by DVFA as preconditions for action. The pieces of non-knowledge are furthermore made dependent on each other: determination of a diagnostic method depends on the ways the disease is transmitted (airborne? via human beings? direct contact? via food?), but producing knowledge about the mode of transmission presupposes that a diagnostic method has been developed. The different types of non-knowledge refer to each other and the communication can only continue in a circular movement, where one non-knowledge actualizes the other by pointing to it as its own precondition. The result is a form of communication that cannot lead to action to turn non-knowledge into knowledge. In marking one piece of non-knowledge, the communication tends to actualize more non-knowledge.

Our next example concerns non-knowledge in relation to test procedures. In 2011, DTU had conducted investigations of different methods to test herds for LA-MRSA. Based on the investigations, DTU made the following recommendations:

Based on the results, we recommend using air sampling in the initial stages, and then, subsequently, direct culturing of the filters and PCR verification to find MRSA-positive herds (...) Simultaneously, it should be tested, whether the sensitivity of the air sampling and the ear sampling methods can be further optimized. (DTU Food 2012, 3)

DTU's recommendation was clear; however, it also contained the marking of non-knowledge, regarding whether the tests could be further optimized. In June 2012, DVFA published a MRSA report that once again demonstrated how DVFA refrained from connecting to knowledge, opting instead to connect to non-knowledge. The report reads:

In the autumn of 2011, DVFA in collaboration with DTU carried out a project in 47 herds to find a suitable method for the screening of multiple herds. In the project's conclusion, a test method is recommended, but this method should still be evaluated further for sensitivity and specificity, before using it can become a reality. (Ministry of Food, Agriculture and Fisheries 2012, 6)

DVFA connected to non-knowledge regarding the test method. Again, connecting to non-knowledge did not lead to action through the recommended test methods to produce knowledge about positive/negative herds. Instead, the communication was directed toward further evaluation of the test method. Thus, rather than acting on the problem, connecting to non-knowledge actualized further non-knowledge.

Our third example is from 2012. The Ministry of Food, Agriculture and Fisheries of Denmark asked DVFA for a report on the current status of LA-MRSA. On March 21, DVFA reached out to DTU, who responded on April 16 with a report accounting for extant knowledge and non-knowledge. DTU marked as its first point that 'The primary source of MRSA introduction in herds is introduction of MRSA-positive animals' (Report from DTU to DVFA, 16 April 2012). The report further reads:

As trade has such a significant influence on infection between herds, it should be possible to a very large extent to prevent new introduction in MRSA-free herds. A top-down approach should be used to minimize and limit the spread of MRSA as much as possible. Focus should be on breeding herds, where trade of animals between herds should be

limited as much as possible, and MRSA-negative herds should not receive animals from MRSA-positive herds (...) we have sufficient knowledge on the influence of trade to recommend this as a first step to prevent further spread of MRSA. (Report from DTU to DVFA, April 16, 2012)

Based on this DTU report, DVFA/the Ministry of Food, Agriculture and Fisheries of Denmark sent a report to the Danish Parliament in June 2012. This report was loyal to DTU's central points:

In the spread of animal diseases, trade with animals has a significant influence on the transmission of infectious matters between herds. Therefore, it should be possible to minimize or possibly prevent new introduction in MRSA-free herds.

But the DVFA-report also added a long list of non-knowledge. We quote in length to demonstrate how DVFA piled up non-knowledge:

However, there exists no scientific documentation for MRSA transmission being prevented exclusively through MRSA-free trade patterns (...) There exists no experience with how to eliminate MRSA, and therefore this initiative requires further research. Moreover, there is a lack of knowledge on the survival of MRSA-bacteria in the surroundings, even though all the animals have been removed from stable parts or from the entire herd (...) Before MRSA initiatives can be implemented, it is very important to make a prioritization in relation to the significance of pig herd related and other zoonotic problems, including MRSA, ESBL and salmonella. This is important in relation to both the prioritizing of resources, and to prevent a situation, where there is a focus on one zoonotic problem at the expense of another, perhaps more important, problem. (Ministry of Food, Agriculture and Fisheries 2012, 7-9)

In the report from April 2012, DTU marked both knowledge and non-knowledge. Based on knowledge on the significance of trade, DTU recommended to limit all trade between herds and to test the herds, starting with the breeding herds, to prevent new introduction into negative herds. In the June 2012 MRSA report, DVFA also marked the knowledge regarding the significance of trade. However, it also emphasized non-knowledge. Moreover, DVFA actualized further non-knowledge by connecting LA-MRSA to other zoonotic problems, such as salmonella and ESBL, which is an enzyme produced by bacteria that make the microorganism harder to kill with antibiotics.

The above examples indicate that DTU was much more inclined to connect to knowledge and continue its communication based on knowledge. This is revealed in expressions such as, ‘we have sufficient knowledge...’ and ‘based on prior experiences, we recommend...’ Conversely, DVFA connected to non-knowledge, as indicated in expressions such as: ‘no scientific documentation,’ ‘no experience,’ ‘further research required,’ ‘there is a lack of knowledge,’ and ‘extant knowledge does not satisfy the above-mentioned prerequisites for an effective control strategy’ and ‘this initiative requires further research.’ Importantly, both parties recognized knowledge and non-knowledge. Nothing was suppressed (McGoey 2007), doubted (Michaels 2020; Oreskes and Conway 2010; Proctor 2008), or kept secret (Costas and Grey 2014). In this sense, the production and maintenance of ignorance were unclouded, on full display.

The deferral of Knowledge and Action

Connections to non-knowledge also unfolded a specific dynamic between knowledge and objectives that contributed to the preservation of non-knowledge. We term this dynamic, a ‘play’, referencing Derrida (1978, 280), to emphasize how both the objectives for the control strategy and the specification of which knowledge was relevant remained unfixed and undetermined. In the absence of an authoritative voice, the relation between knowledge and objectives was one of mutual interdependence, subjected to an extending play of differences and substitutions that deferred any preventive action indefinitely. Consider, initially, the following excerpt from a DTU report sent to DVFA in November 2010:

The focus of potential, future research or clarification projects will also depend on the potential strategy that the authorities and the industry will work towards in the future. If the objective is a complete or partial elimination of MRSA, it would require a different type of investigations, than if the objective is to reduce human exposure to already positive herds. (Report from DTU to DVFA, November 7, 2010)

DTU claimed that the question of which knowledge was relevant depended on the potential future strategy. At the same time, DVFA communicated that a future strategy depended on knowledge:

Therefore, DVFA’s assessment is that extant knowledge does not satisfy the above-mentioned prerequisites for an effective control strategy. On that basis, it is presently not

possible to give recommendations on which type of strategy that can most effectively control MRSA CC398 in Danish pig herds. (Report from DVFA to the Ministry of Food, Agriculture and Fisheries of Denmark, July 8, 2010)

DTU asked DVFA for an objective according to which it could evaluate the knowledge that was necessary to formulate a strategy. Conversely, DVFA maintained that it did not have sufficient knowledge to specify an objective for the efforts against LA-MRSA. In this play, action (producing knowledge, formulating strategy, and specifying objectives) was continuously deferred. DVFA demanded knowledge, whereas DTU requested objectives according to which relevant knowledge could be determined. The communication continued in a loop of mutual interdependence between knowledge and objectives, and in this loop, non-knowledge was reproduced and multiplied, and action was continuously deferred as the objectives underwent repeated reformulations. This point can be further demonstrated with an example. In 2012, a working committee and a steering committee were established by the Ministry for Food and the Danish Ministry of Health to handle LA-MRSA-related issues. The committees consisted of representatives from government departments, DTU, University of Copenhagen, the Danish Agriculture & Food Council, and others. In October 2013, a meeting was held in the steering committee. The following excerpt stems from the meeting minutes:

The steering committee estimated that because the resources are limited, it will be most relevant to focus the efforts on initiatives that can be expected to contribute to reducing the spread of MRSA CC398 to humans (...) Therefore, the steering committee believes that, to begin with, further investigations of herds should not be implemented besides the ongoing, and that the resources should instead be used on other initiatives. (Steering committee meeting minutes, October 9, 2013)

Until 2013, knowledge and non-knowledge had been discussed in relation to potentially preventing the spread of LA-MRSA between herds. In the steering committee meeting, this objective was reformulated in terms of averting animals infecting humans. As a result, knowledge about which herds were positive/negative lost its relevance, and knowledge was now discussed in relation to hygiene initiatives, and in relation to modes of transmission from animals to humans. In 2014, the Ministry of Food, Agriculture and Fisheries requested approval from the Finance Committee of the Parliament to assign money for research that could produce estimations of ‘...which initiatives that

could be employed at the lowest possible cost to reduce the prevalence and spread of MRSA' (The Danish Parliament 2014). This objective meant that knowledge was now relevant in terms of 'how and why the spread occurs in the observed scale' (The Danish Parliament 2014). These shifts and reformulations of the objectives maintained non-knowledge, as relevant knowledge was not designated, meaning that non-knowledge continued to stand in the way of knowledge. When the objective shifted, knowledge on the prevalence in the herds became irrelevant. At the same time, the lack of knowledge rendered it difficult to specify clear objectives that again could have designated the relevant knowledge. The objectives and the relevant knowledge were both contingent on one another, and insofar as neither obtained even a temporary fix, they were both indefinitely deferred along with any corrective or preventive action.

Our analysis also revealed how this play between knowledge and objectives was related to other initiatives and activities that replaced the testing and identification of positive/negative herds. Most notably, these were organizational activities. Hence, in 2012, the aforementioned working and steering committees were established. The committees held meetings and developed suggestions, and as long as they were working, no one else did anything LA-MRSA related. In April 2013, a steering committee meeting was held, in which it was decided to establish a 'forum for the exchange of LA-MRSA-data between the different governmental authorities' (Steering committee meeting minutes, April 30, 2013). Thereby, the relevant authorities could meet quarterly and exchange information. Furthermore, the committee discussed a communication strategy, but it was decided that this strategy should be further discussed later. It was also decided to describe the scale of future monitoring of LA-MRSA in pig herds. In connection to this, it was decided that future tests should be anonymous so positive/negative herds could not be identified (Steering committee meeting minutes, April 30, 2013).

Descriptions of future anonymized investigations instead of tests and an actual monitoring; counseling services; hygiene initiatives; communication strategies, numerous activities and initiatives, were suggested that came to replace specific tests that would have identified positive/negative herds. It seems that because LA-MRSA was a recognized problem, something had to be done, however, as an objective was never specified to make the testing of herds relevant, various replacement initiatives were implemented. These initiatives seem to have produced the noise that obscured their function as replacements, and thereby also obscured the fact that they contributed to the preservation of non-knowledge.

The Coupling of Ignorance and Interests: Why was Non-knowledge preserved?

Above, we analyzed how the specific non-knowledge regarding positive/negative herds was maintained as DVFA consistently connected to non-knowledge. This raises the question of why this non-knowledge was preserved. Below, we argue that the communicative dynamics were entangled with particular strategic interests.

We begin with the industry's role and the relation between the industry and DVFA. The agricultural industry's interest organization, the Danish Agriculture & Food Council, was explicitly against testing the herds and producing knowledge about positive/negative herds. In an internal mail from 2011, a DVFA employee wrote:

I can tell you that the Danish Agriculture & Food Council has contacted us regarding projects. They do not want the MRSA-stamp, because they have a duty of disclosure to their members according to their own rules. Therefore, they say that it has trade-related consequences. (DVFA internal mail, September 2010)

Because, according to its own rules, the Danish Agriculture & Food Council was obligated to inform members of potential LA-MRSA in specific herds, the organization did not want this knowledge. Here, we encounter a kind of double strategic non-knowledge in which, (1) The Danish Agriculture & Food Council was against producing knowledge that could potentially place the industry in a difficult situation. (2) Neither did the organization want this knowledge because it would then be obligated to inform others about it.

The Danish Agriculture & Food Council was especially against testing the breeding herds at the top of the pyramid (the knowledge that DTU recommended to produce). This relates to the significant role of the breeding herds in the Danish pig production:

The basis of the success of Danish pig production is the quality of the breeding work, which takes place in the few herds in the breeding top. Removal through elimination of a large part of the herds in the breeding top will have large genetic consequences, and the breeding work would be taken back, which would have large consequences for Danish pig production. (DVFA 2014, 26f)

On this basis, knowledge that could produce pressure to eliminate infected breeding herds was extremely unwelcome. Throughout the course of our case, the Danish Agriculture & Food Council

clearly operated with and protected a strategic ignorance. Although, while the Danish Agriculture & Food Council explicitly stated why it did not want this knowledge, it seems less obvious why DVFA contributed to the preservation of non-knowledge. In the following, we offer an interpretation based on DVFA's self-perception and organization.

An integrated part of DVFA's self-perception is to take the agricultural industry's interests into account. In 2015, DVFA's executive director wrote that the food and agricultural sector is 'one of the largest export successes in the history of Denmark.' This success owes itself to 'The principle of cooperation between business organizations, NGO's and food authorities, when dealing with food safety, healthy food choices etc.' (Ministry of Environment and Food of Denmark 2015, 7). Furthermore, DVFA specified that its 'main goal is to promote safety, health and quality in food production and economic growth in the food and agricultural sector' (Ministry of Environment and Food of Denmark 2015, 7). Thus, DVFA perceives itself as collaborating with and contributing to economic growth in the agricultural sector. Its self-perception is as a part of the industry's success.

DVFA's role in the preservation of non-knowledge may also be understood as a form of bureaucratic silo-thinking (Essén, Knudsen, and Alvesson 2021), i.e., a narrow focus on its own area of authority, without consideration for the broader context. DVFA's veterinary director held the overall responsibility for managing LA-MRSA. Formally, the veterinary director is responsible for animal welfare, animal health, veterinary medicine, veterinary control units, and related concerns. As LA-MRSA did not significantly affect the animals, the veterinary director did not consider it a problem. As DVFA stated in a report to the ministry, 'MRSA does, however, not cause diseases in pigs, and it is therefore not a veterinary problem' (Report from DVFA to the ministry, 8 July 2010). Silo-thinking was also manifested in the form of absence; namely, absence of a broader consideration. In their assessment of DVFA's handling of LA-MRSA, the National Auditors wrote:

The National Auditors find that DVFA has prioritized the efforts in consideration of the costs of LA-MRSA to the agricultural industry. The ministry has had general knowledge about the fact that LA-MRSA brings increasing costs to the health care sector, but the ministry cannot demonstrate that this knowledge was included in the prioritizing of the efforts. The National Auditors estimate that the ministry has thus not prioritized the efforts on a holistic basis. (Rigsrevisionen 2015, 37)

The ministry not prioritizing on a holistic basis can precisely be understood as silo-thinking. Other relevant considerations that could have been, but were not, considered were the costs to the health care sector and the overall problem of antibiotic resistance that presents a future threat.

Finally, it does appear that DVFA simply did not know how to handle LA-MRSA. The breeding herds represent years of hard work and investment, and throughout our case, it was unclear whether it would be possible to disinfect the stables after a potential eradication of the animals. Producing knowledge on positive/negative herds would have placed DVFA under pressure to act, and as they did not know how to act appropriately, it seems that DVFA did not want this knowledge. Under those conditions, connecting to non-knowledge was preferable as it enabled DVFA to avoid acting upon the problem. If communication connects to knowledge, it potentially becomes obligated to act upon this knowledge. In contrast, the communication of non-knowledge sets one free from obligation (Luhmann 1992, 178).

Discussion/Conclusion

In this paper, we have analyzed how ignorance was produced and maintained in the management of the zoonotic disease, LA-MRSA. In the literature on strategic ignorance, keeping secrets (Costas and Grey 2014), creating doubt (Oreskes and Conway 2010; Michaels 2020; Proctor 2008), and suppressing evidence (McGoey 2007, 223ff) are keywords for some of the strategies that scholars have identified for the production and maintenance of ignorance. Other mechanisms of self-afflicted ignorance have been defined in forms such as denial (Rayner 2012), inattentiveness (Knudsen 2011), dismissal and decoupling (Schaefer 2018), sequestering of inconvenient facts (Heimer 2012), and unseeing (Otto, Pors, and Johnsen 2019). What these analyses tend to have in common is that strategic ignorance is about avoiding, hiding, or rendering existing knowledge unreliable. We have supplemented these accounts with an analysis of how ignorance can be produced and maintained by means of communicative selection.

Focusing on LA-MRSA and applying a communicative approach, we demonstrated how non-knowledge was (re)produced and maintained over time by selecting and actualizing non-knowledge in situations wherein both knowledge and non-knowledge existed. While DTU connected to knowledge, and was thus able to recommend specific tests, DVFA connected to non-knowledge, which meant that non-knowledge was maintained and multiplied. By consistently selecting non-knowledge, DVFA created conditions for the continuation of the communication that became oriented toward and actualized further non-knowledge. This meant that taking preventive or

corrective action was always halted by non-knowledge actualized in communication. We also identified the emergence of a play between knowledge and the objectives for the control strategy. This play emerged as the objectives were made dependent on knowledge, while what counted as relevant knowledge depended on the objectives. In sum, DVFA continuously connected to non-knowledge in communication, which unfolded a play of mutual dependency between knowledge and objectives. The result was the production, maintenance, and multiplication of ignorance, and ultimately, a deferral of action to mitigate the prevalence of LA-MRSA.

Thus, in selections of knowledge/non-knowledge, DTU and DVFA produced the conditions for the communication to unfold in different directions and dynamics. In DTU's communication, we saw how connecting to knowledge specified relevant non-knowledge and produced a clear direction. Contrastingly, DVFA's connections to non-knowledge led to the multiplication and preservation of non-knowledge. Systematically connecting to non-knowledge constituted a centripetal force that continuously actualized furtherance of non-knowledge. A similar dynamic emerged in the relationship between knowledge and action. As DTU connected to knowledge, it could also recommend specific actions. Contrastingly, when DVFA connected to non-knowledge, neither possible action nor specific non-knowledge was designated, which opened space for further non-knowledge to be actualized. In the lack of a clear direction for the communication, non-knowledge was multiplied, as any question would draw in other pieces of potentially relevant non-knowledge. As a result, the management of the condition of non-knowing proceeded in circular movements that did not produce conditions for exploring concrete solutions.

The literature on strategic ignorance seems to implicitly conceptualize knowledge as something one can possess, hide, or lose. Strategic ignorance is consequently about preventing some from getting ahold of this possession, or making them doubt whether the knowledge is actually reliable and thus worth possessing (e.g., Heimer 2012; McGoey 2007; Oreskes and Conway 2010; Proctor 2008). In our analysis, we did not conceive of knowledge as a possession, but as something that is actualized in communication. This enabled a different perspective on how ignorance may be produced and maintained. The analysis demonstrated how communication can take a radically different direction depending on how the distinction between knowledge and non-knowledge is navigated. The management of a new zoonosis like LA-MRSA inevitably involves both knowledge and non-knowledge, making selection between knowledge/non-knowledge an undeniable condition. If non-knowledge is consistently selected in the junctions between knowledge

and non-knowledge, then communicative dynamics can evolve, leading to the maintenance of ignorance, although knowledge has neither been concealed nor doubted.

Thus, while the literature on, for example, doubt has demonstrated how ignorance may be produced and maintained by making existing knowledge uncertain and doubtful (Michaels 2020; Oreskes and Conway 2010; Proctor 2008), our analysis did not reveal claims of wrong or uncertain knowledge. DVFA and DTU did not disagree about existing knowledge. The difference was found in the ways in which they connected to what was known and to what was not known. We demonstrated how ignorance was systematically maintained, as DVFA continuously selected non-knowledge in the communicative processes of managing LA-MRSA. Selecting non-knowledge in the constantly reproducing and reemerging junctions between knowledge and non-knowledge maintained ignorance about positive/negative herds, and through four crucial years, the prevalence of LA-MRSA rose to irreversible levels.

Moreover, our findings highlight the problematics in treating Beck and Wehling's (2012) distinction between governing *of* and governing *through* non-knowing as separate spheres of political action. Our analysis suggests that strategies for the governing *of* non-knowing include, and indeed cannot be separated from, strategies for governing *through* non-knowing. Circumstances of non-knowing involve the selection of either knowledge or non-knowledge and these selections may very well be guided by interests. Our analysis also shows how interests and self-perceptions are entangled in communicative selections, and how the work of strategic ignorance is performed *in* communication. We have argued that DVFA's strong tendency to connect to non-knowledge is related to its interests. This concerns the interests of the Danish Agriculture & Food Council, but it also relates to the self-perception of DVFA, its silo-thinking, and its attempt to avoid knowledge that the organization does not know how to act upon.

The societal and organizational management of the condition of non-knowing entails complex work of engaging with knowledge and non-knowledge in the attempt to qualify actions and strategies. In this work, communicative dynamics entangle with strategic interests at the risk of impeding corrective and preventive efforts. We began this paper with an interest in the politicization of the condition of non-knowing (Beck and Wehling 2012). Our analysis raises particularly two questions, which are central in the development of politics for the governing of non-knowing: When organizations and social actors with economic or political interests can avoid the obligations inherent in knowledge by connecting to non-knowledge, how then is the risk of maintained ignorance (and deferred action) reduced? Conversely, how is a narrow connectivity to

knowledge (and thus action) avoided in situations wherein relevant and important non-knowledge must be considered? These questions are not only relevant for policymakers to consider, but they also point to a need for further research attending to the complex entanglements of political communication, strategic interests, and ignorance.

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Tables

Table 1. Description of central actors

The Danish Veterinary and Food Administration (DVFA)	A government agency under the Ministry of Food, Agriculture and Fisheries of Denmark. Its responsibilities concern the supervision and control of food and veterinary matters. It roughly compares to the US Food and Drug Administration.
The Technical University of Denmark (DTU)	A public Danish university of technical and natural sciences. The 2020 World University Research Rankings placed DTU as the world's second-best university and the best in Europe https://worldresearchranking.com
The National Auditors	An independent institution placed under the Danish parliament. Its task is ensuring the efficient and effective administration of public funds.

Table 2. Sepsis and number of deaths registered in Denmark related to LA-MRSA from 2009–2020

	2007–2009	2009–2013	2014	2015	2016	2017	2018	2019	2020	Total
<i>Sepsis</i>	*	*	8	6	7	4	8	8	10	51
<i>Deaths</i> <i>(Within 30 days)</i>	*	3	2	1	1	0	2	1	0	10

*Unknown as the Danish authorities did not keep records at that time.

Source: (Statens Serum Institut n.d.)

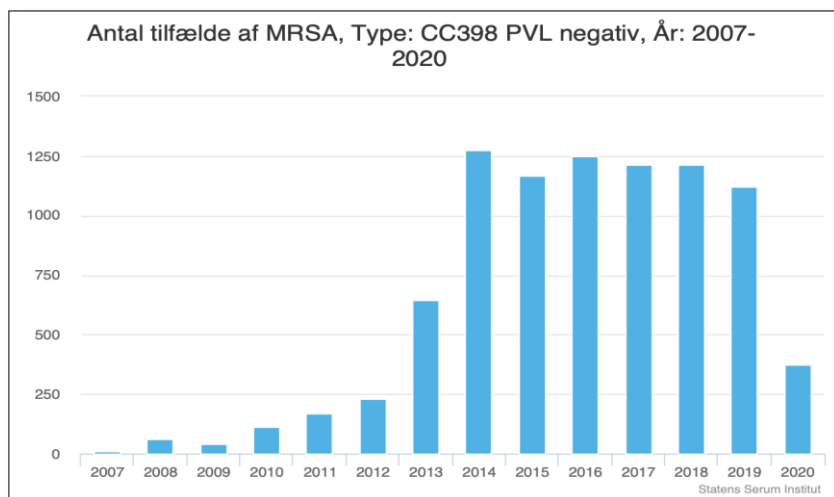
Figures

Figure 1. About LA-MRSA

- Methicillin-resistant staphylococcus aureus (MRSA) is a bacterium resistant to methicillin, which is a type of antibiotic often used against staphylococcus.
- In 2005, a new clone of MRSA (CC398) was found in pigs and in people in contact with pigs. As such, it became known as livestock associated MRSA (LA-MRSA).
- LA-MRSA spreads between animals, but it is also transmissible from animals to humans and between humans.
- It may cause skin and soft tissue infections, and in severe cases, lead to sepsis.

Source: (Sundhedsstyrelsen 2019)

Figure 2. Number of MRSA CC398 occurrences in humans from 2007–2020.



Source: (Statens Serum Institut 2020)