Giving (re)birth to a digital maternity record:

An ethnographic study of vulnerability, care practice, and technology

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ABSTRACT

Other studies have been done about how an online maternity record can contribute to care and thus better pregnancy trajectories. However, little research has taken a step back from a technological solution and solely investigated how pregnant women, especially those with vulnerabilities, experience pregnancy trajectories. With ethnographic methods, we have investigated 14 pregnant women with vulnerabilities, in a Danish context, revealing that vulnerability is both multiple, fluid, and ambivalent. This study reveals how these vulnerabilities can be manoeuvred by attentive and experimental care practices. Inconsistent to the multiplicity, the healthcare system predetermines and organises vulnerability. The discrepancy in the understanding of vulnerability is highly problematic, as pregnant women with vulnerabilities have not been included in the design of the digital maternity record. Instead, the technology is shaped by the health professionals' insights whose main practice is based on evidence-based assessments. This shows when it works towards a high degree of structured data. This study reveals how structured data might compromise the multiplicity, fluidity, and ambivalence that vulnerability entails. We suggest redefining the problem itself, the understanding of vulnerability, and a radical change in meaning in the way pregnant women with vulnerabilities are included in the design of the digital maternity record. This, to work towards a high degree of recognition - and thus better pregnancy trajectories.

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by Anna Sandner Jensen, Augusta Nybo Bennedbæk & Astrid Solvig Spangmose

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Abstract

Other studies have been done about how an online maternity record can contribute to care and thus better pregnancy trajectories. However, little research has taken a step back from a technological solution and solely investigated how pregnant women, especially those with vulnerabilities, experience pregnancy trajectories. With ethnographic methods, we have investigated 14 pregnant women with vulnerabilities, in a Danish context, revealing that vulnerability is both multiple, fluid, and ambivalent. This study reveals how these vulnerabilities can be manoeuvred by attentive and experimental care practices. Inconsistent to the multiplicity, the healthcare system predetermines and organises vulnerability. The discrepancy in the understanding of vulnerability is highly problematic, as pregnant women with vulnerabilities have not been included in the design of the digital maternity record. Instead, the technology is shaped by the health professionals' insights whose main practice is based on evidence-based assessments. This shows when it works towards a high degree of structured data. This study reveals how structured data might compromise the multiplicity, fluidity, and ambivalence that vulnerability entails. We suggest redefining the problem itself, the understanding of vulnerability, and a radical change in meaning in the way pregnant women with vulnerabilities are included in the design of the digital maternity record. This, to work towards a high degree of recognition - and thus better pregnancy trajectories.

Contents

1. Introduction

In the autumn of 2021, we were interns at The Danish Health Data Authority (Sundhedsdatastyrelsen) which is responsible for health data on a national scale in Denmark. We became aware that Sundhedsdatastyrelsen is currently developing a national digital maternity record. It is going to be a replacement for the current maternity record consisting of an internal record between health professionals, and a paper record, the yellow envelope, which wanders with the pregnant woman during her pregnancy. The project was initiated in 2018 and has now reached a point where it for the first time is being tested in healthcare practices across the three sectors. During the internship, we followed the project management and attended discussions, meetings, as well as a workshop with health professionals and IT architects - all with the purpose of preparing the technology for being used in practice. The project management described the digital maternity record as a possibility to create more sufficient information sharing in pregnancy trajectories. It became evident that the digital maternity record corresponds with the rationale behind the general movement towards digitisation in the healthcare system.

> *"Public digitisation should make everyday life easier for citizens and contribute to more coherent and efficient public service. [...] Digitisation can also strengthen the experiences of proximity and influence on one's own life situation as the citizen has easy access to service and information from home."* (Digitaliseringsstyrelsen 2022a).

The digital maternity record is seen as a technology that, by information sharing between health professionals and pregnant women, can create better pregnancy trajectories. When digitising is described by official authorities it sounds promising, and the digitisation of the maternity record thus becomes a natural development. Since we, as techno-anthropologists, are aware that technology interferes in unexpected ways when implemented in practice, we, during the internship, kept a critical distance toward the positive portrait of digitisation as a *"pre-conceived idea of what the ultimate good is"* (Willems & Pols 2010, 162). Instead of accepting the pre-conceived idea of digitisation as the ultimate good, we wanted to reveal more nuances - to be sensitive to different experiences of reality. The project has included experiences of realities such as health professionals and IT architects across both regions and sectors. These realities have shaped the current design of the digital maternity record. With our techno-anthropological gaze, we began to wonder: How are pregnant women included in the project? We became aware that the technology primarily was designed for approximately 75% of pregnant women, who go through so-called "basic" pregnancy trajectories (Sandner & Spangmose 2022, 11). It is this group of pregnant women that is currently a part of a pilot test of the digital maternity record. But what about the pregnant women who are outside the standard? The information sharing is seen as particularly relevant in *"complicated trajectories and in cases of vulnerable pregnant women"* (Rambøll & Qvartz 2018, 22) as "complicated" cases

require more cooperation across disciplines. The idea is that better information sharing in these cases can contribute to *"early and preventive effort"*(Syddansk Sundhedsinnovation 2022). The technology thus aims particularly at so-called "vulnerable" pregnant women, but their experiences of reality are not yet apparent in its design.

While Astrid and Anna were in the internship and gained an academic perspective on the digitisation of the maternity record, I, Augusta, was on maternity leave with my first child. I gained a bodily experience of being pregnant and becoming a mother with everything that it entails, including happiness and worries. When it was established that the digital maternity record was going to be the subject field in our master thesis, it gave me new perspectives on my experience. I found the yellow envelope, in a box where I save other stuff from my pregnancy and birth. It reminded me of my pregnancy. I was surprised that I attached any importance to the record, as it barely meant anything during my pregnancy. When I once went to the hospital and forgot the record, I remember wondering why it had not been digitised yet.

With first-hand insight into the digitisation project and a bodily experience of going through a pregnancy and becoming a mother, we investigate the digital maternity record from the realities of pregnant women with vulnerabilities. It is our belief that these insights can and should also contribute to the design of the digital maternity record, which leads to our research question.

> *How can an ethnographic study of experiences of vulnerability and care practices shape the design of the digital maternity record?*

With this question in mind, we investigate how vulnerability and care are practised in the network around pregnancy trajectories. Thereafter, we identify how the current maternity record is intertwined with these practices. The purpose is being able to imagine and discuss how the design of the digital maternity record can take different experiences of vulnerability and care into account. By investigating this, with a common techno-anthropological gaze and various experiences, we wish to bring new perspectives to the development of the digital maternity record.

2. Contextualising the field

Doing fieldwork includes stepping into a field. Therefore, it is necessary to ask oneself what defines the field. The anthropologists Trine Tjørnhøj-Thomsen and Susan Whyte make a distinction of the field - the empirical field and the analytical field (Tjørnhøj-Thomsen & Whyte 2007, 96). The analytical field we step into is shaped by previous negotiations between actors and some of these negotiations become visible in academic literature. By including studies relevant to the digitisation of the maternity record, we,

therefore, *"seek to connect various kinds of knowledge"* (Ibid.) and through that movement *"place and see things in their "right" context"* (Ibid.). Contextualising the field also includes stepping into the wilderness and accepting that something inevitably will remain untouched, since *"contextualisation always includes deselection"* (Ibid.). Creating this frame for our study both includes selection and deselection of what connections we want to make and what connections that are left out - or have not been noticed. It is a prerequisite for stepping into an analytical field that there exists a broad palette of unmentioned studies that also might be relevant and that might have shaped other interpretations of the field (Ibid.). We have selected studies from a broad literature search, in which we noticed that a great part of studies about various electronic patient records presents both patients and pregnant women as health data. Other studies of maternity records are more likely to include pregnant women as patients within a healthcare system. In this section, we contextualise our analysis by including relevant studies that both give a political and historical contextualisation of the digital maternity record and approaches to the inclusion of pregnant women. We use this to place ourselves in a broader analytical field before stepping into the empirical field which we will reflect further upon in section 4 which contains methodological reflections of our study.

2.1 Pregnant women as data

When searching for literature within the field of electronic patient records, including electronic maternity records, it becomes evident that the digitisation of patient records has provided researchers and public authorities with an enormous amount of health data, that is used in the development of public health (Sharma et al. 2021; González-Juanatey et al. 2022) and to predict and prevent illness or health-related complications (Ford et al. 2018; Poirier et al. 2021). It is also used as a foundation for new initiatives within the healthcare sector (Venkateswaran et al. 2018). Recently, health data has been used in the handling of the COVID-19 pandemic (Stanley et al. 2021). The Danish Ministry of Health (Sundhedsministeriet) describes the application of health data as an opportunity to *"improve the healthcare system and the health of Danes"* (Sundhedsministeriet 2021). In this perspective, pregnant women are represented through data applied in evidence-based studies that can contribute to the enlightenment and development of public health.

2.2 Pregnant women as patients

Several projects have been carried out in the attempt to digitise the maternity record, however, no digital solution has yet been implemented. Both professor of ethnography and STS, Brit Ross Winthereik (2008) and PhD graduate from ITU, Nis Johannsen (2009), stood on the sideline of one of the previous digitisation projects of the maternity record back in 2005 (Rambøll & Qvartz 2018). Both studies circulate what

is called *shared care*. The term, however, still appears vaguely and inconsistently defined. This is particularly visible in Johannsen's (2009) descriptions in 'Reconfiguring Maternity Care? - Reflections on two Change Initiatives'. Through ethnographic fieldwork, from within the research group HealthCare IT, he describes how shared care was performed differently in the project. It is both about *"being able to access the relevant information about the patient"* (Johannsen 2009, 129), but it is also about *"activating the patient"* (Ibid.). Despite differences in the exact focus and approach, he describes shared care as *"a strategy for organising the care involved in patient trajectories that is based on sharing of responsibility and information"* (Johannsen 2009, 59). Since shared care seems to be centred around knowledge sharing, *"information technology is seen to be the saviour"* (Johannsen 2009, 125). Johannsen's and Winthereik's work are important to the problem we are addressing because they raise the question of what the care strategy is all about, or more specifically whether the care strategy can be defined as being an information-sharing strategy. Another attempt to digitise the maternity record in 2017 is directly referred to as 'The Shared Care Project' (Region Syddanmark 2017). In this case, the maternity record was supposed to be integrated into a Shared Care Platform. Even though integrating a maternity record did not succeed, an evaluation of the Shared Care Platform revealed that shared care had several purposes: 1) creating a more rational use of resources, 2) improving the quality of treatment, 3) including patients, 4) optimising corporation across sectors, and 5) reducing the risk of losing information in patient trajectories (CIMT 2016, 8). Any clear definition of shared care seems difficult to find, however, we identify a consistent focus that more information sharing equals better care.

> *"The point expressed by the project manager is that by sharing the data related to the care, the pregnant woman would no longer be the main coordinator in the process. The advantage of the EMR is that the health care professionals will serve the patient better because of improved access to relevant data."* (Johannsen 2009, 60).

The former project manager's description of shared care raises important questions: Where does the responsibility for information sharing lie? And who benefits from the information flow? These questions are touched upon in 'Shared care and boundaries: lessons from an online maternity record', where Winthereik (2008) investigates how the online maternity record can work as a means to create shared care in a Danish context. Winthereik's examination is based on the same online maternity record project as Johannsen had as subject field, just as she also presents the field of Science and Technology Studies (STS) and applies ethnographic methods. Winthereik, however, is slightly more focused on the involvement of pregnant women. She describes that the project management perceived the main problem of maternity care as the boundary between home and clinic, meaning that there is an unequal relationship between the pregnant woman and the health professionals (Winthereik 2008, 417). According to the former project management, an online maternity record should be the solution to that, as the pregnant women would

get access to the same information as the health professionals. The home clinic boundary would thus align, the pregnant women would *"participate more in their own care"* (Winthereik 2008, 421), and the health professionals' work practices would thus be relieved. What Winthereik found, however, was that the online maternity record caused an emerging and unexpected version of *the responsible patient* to occur that was instead concerned with the boundary between primary and secondary sector care. That the pregnant got access to their own data caused them to notice deficient communication between the primary and secondary sector. This caused the pregnant women to actively help the health professionals fill out the missing links in consultations to align information between the sectors: *"taking upon herself the role as mediator between the professional in front of her and professionals in other settings"* (Ibid.). Johannsen described that the assumption was that the online maternity record would relieve the pregnant woman from the responsibility of carrying around the yellow envelope and thus also from being the co-ordinator of her own pregnancy. However, Winthereik's descriptions showed that the online maternity record made the pregnant woman an even more active coordinator in her pregnancy trajectory. The project management figured that the online maternity record would be a tool to create more well-informed, well-prepared pregnant women, which was perceived as freedom for them: *"it refers to the freedom established within the shared care frame. It refers to the possibility of accessing electronic and standardised data, i.e., knowing oneself as a medical case"* (Winthereik & Langstrup 2010, 200). What happened in practice was that the pregnant woman's access to her own data drove her to strive for a *complete record*. The online maternity record thus created a new interest in the organisation of documenting and sharing information which without the technology did not seem to draw a lot of attention. The pregnant women became responsible patients, but in unexpected ways (Winthereik 2008, 423).

The presented studies of former attempts at digitising the maternity record give a unique insight into experiences and unexpected outcomes of implementing a digital maternity record. As the previous project in many ways is similar to our subject matter, they contribute to important learnings that are still relevant and that we have to consider: What has changed since then? And what is still the same? Both Johannsen's and Winthereik's analysis implies a certain focus on the pregnant women - namely a focus on pregnant women in their relation to health professionals. They are the ones who share information. Shared care is not an explicit strategy in the current digitisation of the maternity record, however, the idea that information sharing and thus access to data equals better pregnancy trajectories is the main rationale. Focusing on and valuing information sharing is thus also a key argument for the current digitisation of the maternity record. We use the studies to keep an eye on missing links appearing in the current project and to discover what role information sharing plays in "vulnerable" pregnancy trajectories.

2.3 Pregnant women as experts

The rationale behind digitising the maternity record is that better information sharing equals better pregnancy trajectories since health professionals can use relevant information to serve the patient better. It is argued that information sharing is particularly key when it concerns pregnant women who are "vulnerable" or "complicated cases". These cases often imply more cross-disciplinarity than a "basic" pregnancy trajectory does - for example, cooperation between midwives, GP's, psychiatrists, other medical specialists, and social services (Sundhedsstyrelsen 2021, 74). Following the underlying rationale of the digitisation project, the pregnant women with vulnerabilities are thus going to be the ones who benefit the most from the digital maternity record. In a pre-analysis from 2018, carried out by the two consultant firms Rambøll and Qvartz, both women with "basic" pregnancy trajectories and more "complicated" trajectories were invited to a workshop. The pregnant women were invited to provide suggestions about how pregnancy trajectories can be digitally supported, by contributing with *"wishes and needs for the future digital support of pregnancy trajectory."* (Rambøll & Qvartz 2018, 6). Since then, pregnant women have not actively been included: *"After the analysis [...] we made some workgroups with all the parties [...] Actually there were no pregnant women there. We agreed that we had as much input as we needed."* (Appendix 19: Lone Dalager, 124). Instead, the current technology has been designed based on the perspectives of health professionals as well as IT architects from all the Danish regions.

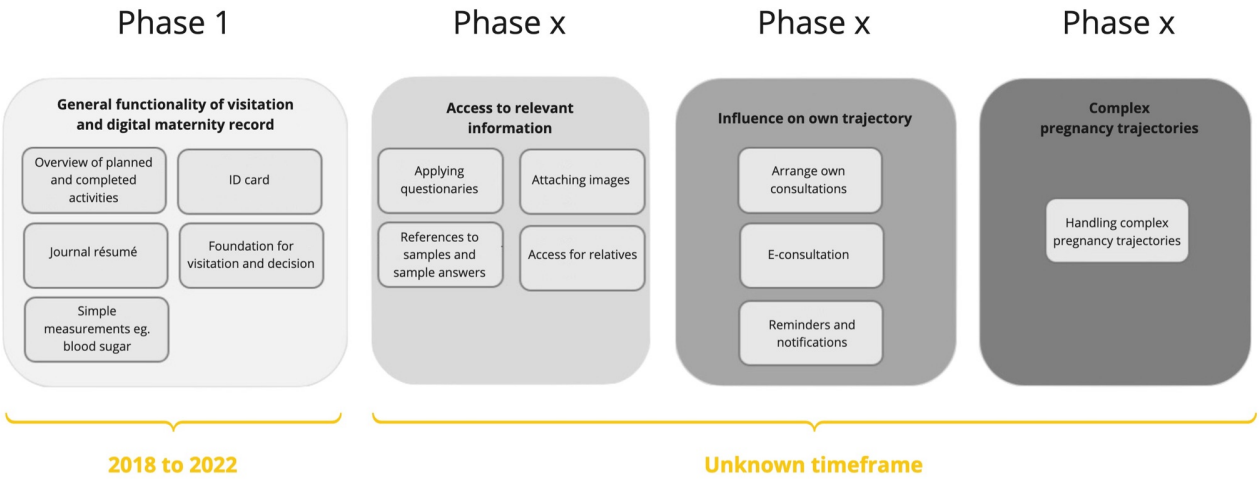

Figure 1: The project management's overview of the different phases in the project translated from Danish. The yellow part has been added to visualise the timeframe of the phases.

As figure 1 shows, the project work is organised in phases where the pilot test is the final point of the first phase. In the first phase, which has been running since 2018, the technological development has been carried out with a *minimum viable product* approach (Regionernes Sundheds-it 2018, 4). During our

time as interns in Sundhedsdatastyrelsen, this was described by the project management as a way to secure *"enough features to support approximately 70 to 75% of all pregnant women with a standard pregnancy trajectory"* (Sandner & Spangmose 2022, 11). Pregnant women, who by the healthcare system, are perceived as "vulnerable" since they have "complicated" trajectories, are thus postponed to a "phase x", as shown in figure 1 (Sundhedsdatastyrelsen 2020, 8). Pregnant women with vulnerabilities have thus been excluded from the pilot tests in both the current project and the one in 2008, even though they constitute a central part of the argument for developing a digital solution. Back then the argument was that *"the initial case should not be overly complicated."* (Johannsen 2009, 63). The project wishes to improve the trajectories for "vulnerable" pregnant women, but there seem to be boundaries for the complexities that the digitisation project can accommodate - it is simply too complicated to include them in the pilot test. It is not unusual to design for the "standard" user (Star 1991). We, however, believe that when the very aim is to create better pregnancy trajectories for pregnant women with vulnerabilities, it must be relevant to be curious: What does it even mean to be "vulnerable"? And what is a better pregnancy trajectory? We take a step back from the underlying assumption that information sharing in itself is key to creating better pregnancy trajectories for pregnant women with vulnerabilities. Therefore, we have carried out interviews with 14 women, who all have a bodily experience of going through a pregnancy. Their experiences have contributed to new perspectives on what vulnerability means to them, and how their vulnerability is connected to care practices. We perceive the women as experts in being pregnant with vulnerabilities. Their experiences are included in the design processes so that the technology becomes more responsible for different experiences that constitute the practices that the technology will be placed in.

3. Theoretical resources

Another contributor to place ourselves within the analytical field is the selection of theoretical resources. They have contributed to the formation of our study of how the digital maternity record might be intertwined with different experiences of vulnerability in care practices. Firstly, we introduce the ontology and central terms within classical Actor-Network Theory (ANT), as it is the underlying ontology behind our descriptions of the field. ANT represents a socio-technical perspective making it possible to notice and describe how technology, as the digital maternity record, is intertwined with social constellations, such as practices of vulnerability and care. Secondly, we present two critiques of the framework, which have shaped our analysis. The first critique is a feministic perspective on marginalised actors which is key to our point of entry in our analysis, namely from the perspective of the marginalised, the ones with vulnerabilities. Another critique is presented in the after ANT-movement, where *multiplicity* is one of the key concepts. This approach is central to the way we describe and understand how vulnerability and

care are enacted by and between pregnant women and health professionals, but also through and with the digital maternity record as well as other technologies.

3.1 Actor-Network Theory

ANT is a theoretical orientation based on the ontology of relational practices that originated in STS in the early 1980s. Since then, it has been enrolled in diverse fields of social sciences where it questions how science and technology are woven into society and nature (Olesen & Kroustrup 2007, 63). As the name indicates, ANT theoreticians see the world constituted by actor-networks - but what does that imply? ANT abolishes the sharp distinction between text and material, as well as humans and non-humans and thus rejects the assumption that the social possesses a fundamental explanatory power. In this perspective, *networks* not only consist of human collectives but are formed through a continuous intertwining of heterogeneous human and non-human actors in nodes and connections (Latour 1991, 116). This way of viewing the world involves a radical reinterpretation of what constitutes social structures. With the tools from material-semiotics, ANT explores the weaving of networks which is both semiotic (because they are relational and/or have meanings) and material (because they are artefacts that are caught and formed in these relations) (Law 2019, 3).

Dualisms such as human/nonhuman, micro/macro, nature/culture, truth/false are repealed and materials of the world are thus equally social. This kind of repeal is also known as the principle of generalised symmetry (Olesen & Kroustrup 2007, 95). It should not in advance be defined what constitutes an actor since they do not have inherent characteristics and, therefore, do not belong to predetermined categories. All actors, human and non-human, must, therefore, be investigated based on the same principle and terminology (Callon & Law 1997; Latour 1999). This, however, challenges well-established dichotomies. Micro- and macro-actors do exist, but the difference between them emerges through negotiations within the network (Olesen & Kroustrup 2007, 74). Whether actors are human or non-human, whether statements are true or false, they are effects of activities in a network. The compositions of actors fundamentally constitute and give each other new meanings. Things are what they are in relation to other things and in relation to each other, and not because of inherent characteristics: *"A theory, a scientific fact, a technology, a disease or any other object is what it is by virtue of its relations to other entities."*(Elgaard 2003, 7). ANT thus understands the world as constituted through processes that are effects of connections between heterogeneous actors that form weaves of networks. This reveals a focus on transformations and development of networks as well as interrelations between actors. Michel Callon (1986), who is a prominent figure in ANT, describes these processes as *translations* where *"the identity of actors, the possibility of interactions and the margins of manoeuvre are negotiated and delimited."*(Callon 1986, 201). Networks thus constantly change into different shapes and the interrelations between actors get displaced.

The conceptual establishment of ANT cannot be separated from the laboratory studies published in 1979 by anthropologist and philosopher Bruno Latour and sociologist Steve Woolgar, who both can be seen as founding fathers of ANT. Latour and Woolgar investigated processes and negotiations involved in knowledge production including how knowledge in laboratories was created and stabilised. The idea of examining the processes of knowledge production and the preceding controversies thus became the foundation of ANT (Olesen & Kroustrup 2007, 64-68). In ANT it is claimed that the scientific and social order, which often appears objective and unquestionable, is merely a stabilised result of a series of translations. A stabilised phenomenon is seen as a result of a long line of network activities. This is referred to as a *blackbox* - a complex phenomenon that at first gaze appears simple or as a truism. Once a phenomenon has been stabilised as a blackbox and takes on a natural character, it becomes more difficult to question how it is constituted (Olesen & Kroustrup 2007, 83). It is, therefore, central in ANT to open up blackboxes and *"remove the screws and other binding material, that makes a certain order appear inevitable and as a truism."*(Olesen & Kroustrup 2007, 75).

As in ANT, we see the world as a constantly changing network of heterogeneous actors. We believe that humans and technology are inseparably intertwined. Users of the digital maternity record are thus going to translate the technology when it is implemented, and the technology is at the same time going to translate the users - it is thus not neutral. This constitutes an ontological argument of the relevance of our study. The digital maternity record is going to shape enactments of reality, and therefore it is relevant to investigate how the digital maternity record, as an actor, will be intertwined in a network of other actors. Our study differs from studies within classical ANT, since the technology is not yet a stabilised phenomenon. Rather, it is a *relatively existing object*, meaning that its *"existence has not yet been settled, stabilised, or blackboxed"*(Bruun 2015, 411). Therefore, we do not focus on closure but on the multiplicity that constitutes the practices that the technology will become a part of. This leads to two critiques of classical ANT that have been central theoretical resources to our analysis.

3.2 Two critiques of ANT

Classical ANT has to a high extent managed to influence the agenda within social sciences (Olesen & Kroustrup 2007, 63). The establishment of ANT has involved that different approaches and methods have been placed under the same name - it has been defined and institutionalised. This gives an impression of stability. When ANT claims that the world is complex and diverse and constantly changing through translations, how can ANT, as a theory, at the same time act as a stable and immutable entity? A critique is that it should also be possible to translate ANT into different contexts and use it in all possible ways depending on the network it becomes part of. With that in mind, it is not possible to designate a true definition of ANT. What ANT is, like everything else, depends on the network into which it is weaved

(Gad & Bruun 2007, 93-95). The blackbox that classical ANT constituted, has been opened through different critiques. One of the critiques is presented by sociologist and feminist STS researcher, Susan Leigh Star, who criticises ANT for being too marginalising with the argument that actor-network analyses tend to focus on strong and well-established actors. Another critique is presented by ethnographer and philosopher Annemarie Mol. She criticises ANT for being too singular in its focus on closure and that the framework, therefore, does not embrace the multiplicity that constitutes practices. The critique has led to what today is referred to as *after ANT* (or post-ANT), of which Mol has become one of the front figures. After ANT should not be understood as an abandonment of classical ANT but rather as an extension, a translation, of the theoretical framework.

3.2.1 Too marginalising

Star (1991) has criticised the way ANT traditionally focuses on strong and well-established actors, who are often easily identifiable. She describes that typically the consequence of this way of constructing networks is that weaker, marginalised, actors in a network are overlooked. As a result, marginalised actors do not get to have a visible influence on the design of the network. Star uses her allergy to onions as a case to make visible the costs of technologies designed for the majority, the standard. On her visit to McDonalds, she orders a hamburger - no onions. While everyone around her gets their order right away, her hamburger is served after 45 minutes. The next time she had the same experience and thought: *"I get it. They simply can't deal with anything out of the ordinary"* (Star 1991, 34). The McDonald's experience reflects her critique of classical ANT.

> *"McDonald's may provide sameness and stability for many people - in John Law's words, it may order five minutes of their world each day - but for me and for others excluded from their world, it is distinctly not ordered. Rather, it is a source of chaos and trouble."* (Star 1991, 42).

From an ANT perspective, McDonalds can be perceived as a blackbox, that has been stabilised through negotiations between heterogeneous actors. The problem with such an approach is that the construction of the big and popular McDonalds network at the same time makes certain perspectives invisible. She thus criticises ANT to be *"biased toward the point of view of the victors (or the management)"* (Star 1991, 33). Focusing on privileged actors makes ANT blind to the fact that networks can also be established in ways where management and control are not primary driving forces. Feminist researchers have also observed that networks often appear quite different to marginalised actors living on the edge of the network. The argument is that the world looks different if the researcher starts from the periphery rather than the centre (Law 2019, 6). The non-users, the outcast, those in wheelchairs, door-makers, secretaries, and in our case pregnant women with vulnerabilities *"are good points of departure for our analysis, because they*

remind us that, indeed, it might have been otherwise" (Star 1991, 53). Star does not claim that *"conventions or standards are useless"* (Ibid.), but she encourages researchers to think about *"where to begin and where to be based in our analysis of standards and technologies."* (Ibid.).

The description of how the world is arranged around strong and well-established actors has resulted in marginalised actors to be overlooked. This becomes relevant in our study of the digital maternity record since the perspective of the marginalised, the ones with vulnerabilities, is deselected in the pilot test. Women with vulnerabilities do, thereby, not get the same influence on the design of the digital maternity record as pregnant women with less "complicated" trajectories. Star would view this as problematic since it might end up excluding people from their own world and become a source of chaos and trouble. Instead, she would argue that the marginal position would make it possible to see things that otherwise would have remained invisible. Stepping into a marginal position, therefore, is powerful (Star 1991, 52). As techno-anthropologists, we wish to reflect Star's approach by making the marginalised, the ones with vulnerabilities, perspective the starting point of our study.

3.2.2 Too singular

Based on Mol's critique that classical ANT is too focused on closure, she introduces the term *multiplicity* to describe how some networks remain unclosed. In Mol's key work, 'The Body Multiple*'* (2002), she follows a Dutch hospital practice around the disease atherosclerosis. She highlights how the disease gets *enacted* in overlapping and diverging ways within various doings. It is demonstrated how atherosclerosis is *done* in multiple ways with the involvement of both the patient, the doctor, the radiographs, and all kinds of apparatuses connected to it. The patient has the daily life version, where the body is something lived with from hour to hour and day to day. Here the disease takes the shape "pain when walking". In the hospital, it takes a clinical shape, where the laboratory results do the disease with different kinds of measurements. Radiographs see it as narrowed places in arteries, when using Doppler measurements, it is an increased blood velocity, and in the operating room, it is a grey-white paste to be scraped out of blood vessels. Mol argues that what is mostly assumed, and what is reinforced by a powerful narrative, is that only one single reality exists, in the patient, and that different diagnostic techniques offer different perspectives on atherosclerosis as a single disease. This assumption implies that it is muscle pain caused by decreased blood flow that comes from narrowed blood vessels where the blood flows quickly past the obstruction, which can then be surgically removed. Rather than seeing it as different aspects of atherosclerosis, she describes it as different and overlapping enactments of the disease. Atherosclerosis, the body, reality, and in our case vulnerability, becomes *"more than one - but less than many."* (Mol 2002, 55). The body multiple is different bodies - it is, however, not fragmented as it also hangs together. So, for Mol: *"no object, no body, no disease, is singular. If it is not removed from the practices that sustain it,*

reality is multiple." (Mol 2002, 6), and if reality is enacted and is historically, culturally, and materially situated, then it is also multiple. What comes after the word multiple is best put in plural - multiple realit*ies*, multiple ontolog*ies*, multiple understanding*s*. However, it should not be understood separately but as different versions of reality that are connected and intertwined (Mol 1999, 75). They are not simply opposed to, or outside, one another. One reality may follow the other, it might stand in for the other, and, surprisingly, one may include the other. This means that *"what is 'other' is also within"* (Mol 1999, 85), and the multiple realities do not only co-exist side by side but are also found inside one another. So, multiplicity entails that *"while realities may clash at some points, elsewhere the various performances of an object may collaborate and even depend on one another."* (Mol 1999, 83).

While classical ANT describes negotiations leading to one single definition, Mol identifies how multiple definitions or ontologies can exist simultaneously. Instead of seeing a phenomenon as singular, Mol, with the introduction of multiplicity, embraces different interpretations of how a phenomenon appears (Gad & Bruun 2007, 102). Realities or ontologies are *"brought into being, sustained, or allowed to wither away in common, day-to-day, sociomaterial practices."* (Mol 2002, 6). Reality is manipulated through intervention and enactment with, for example, the involvement of various tools in a diversity of practices. She thus follows the principle of symmetry as she avoids committing to the understanding of certain actors (Mol 1999, 77). Actors are active, acting, and committed to enacting atherosclerosis. If atherosclerosis was understood as being a unique "natural phenomenon" which is simply interpreted differently, it would imply different and equal understandings of the disease. According to Mol, however, actors must be considered participatory creators of reality. There is thus no "natural" or "objective" basis for this active creation of reality (Gad & Bruun 2007, 105).

That reality is overlapping and diverging within various doings also shows when Mol unravels her concept of *care* in another of her key works, namely 'The Logic of Care - Health and the Problem of Patient Choice' (2008). Here, she unfolds *the logic of care* in contrast to *the logic of choice* in her analysis of daily life with diabetes. She begins with a case example where she is a part of a panel that discusses a situation where a patient on a psychiatric ward does not want to get out of bed. The panellists, consisting of ethicists and psychiatrists, are asked if they want to allow the patient to stay in bed or not. They give different answers where they reflect on whether a choice may harm the patient, whether the patient is capable of making choices, and if such choices will affect the value of being a part of the community in the ward. The panellists' reflections are all based on common ground rules and procedures for a certain way of doing things, based on the patient's treatment or how to adapt to shared rules. One panellist, however, contributes with another perspective. Care in this situation should not begin from procedures, but rather from asking *why* the patient does not want to get out of bed - letting the patient talk (Mol 2008, x-xi). In

this case, the logic of choice is reflected when decisions are based on *"Pros and cons, one side versus the other"* (Mol 2008, 53). Good is thus a matter of *"weighing and balancing"* (Mol 2008, 78). Choosing what is a good act in practice, *"the moment a choice is being made, is embedded in a sequence: (neutral) facts → (value-laden) choice → (technical) action."* (Mol 2008, 54). In the logic of care, on the other hand, care action is not based on procedures - it is about careful experimentation and trying to be *"attentive to what happens, adapt this, that or the other, and try again."* (Mol 2008, 53). Trying might not be comfortable, as it is impossible to foresee how this trying will work in practice, however, she argues that *"action itself is moral."* (Mol 2008, 78). In 'Care in Practice - On Tinkering in Clinics, Homes and Farms' (2010), Mol et al. unfold the logic of care further. Care is described as something that *"seeks to lighten what is heavy, and even if it fails it keeps on trying"* (Mol et al. 2010, 14). This trying may involve *practical tinkering* which is an enactment between human and non-human actors.

> *"putting a hand on an arm at just the right moment, or jointly drinking hot chocolate while chatting about nothing in particular. A noisy machine in the corner of the room may give care, and a computer can be good at it, too. And while your cows may respond to the tone of your voice when you talk, they don't much mind what it is that you are saying."* (Mol et al. 2010, 10).

Negotiation of what is good in a specific local practice is not always verbal as it also may involve bodily negotiation. In practice, seeking a compromise of what is good, does thus not necessarily depend on talk. It may also be a matter of attentive and careful experimentation and practical tinkering in a world that is full of multifaceted, ambivalence, and shifting tensions (Mol et al. 2010, 14). As care is *"something to do, in practice, as care goes on"* (Mol et al. 2010, 13) it does not make sense to raise an argument about *"which good is best 'in general'"* (Ibid.).

When classical ANT investigates blackboxes it also implies an extended focus on closure. To this, Mol asks: How do we handle phenomena which are continuously unfolded and not seeking towards closure? As a part of after ANT, she commits to the notion that there exist many different networks that constitute multiple versions of reality - realities that are only seemingly unambiguous. With the notion of multiplicity, she lays bare *"the permanent possibility of alternative configuration"* (Mol 2002, 164) and demonstrates how there are always alternatives, and that reality is *"never so certain that it might not be different; reality is never so solid that it is singular."* (Ibid.). In our study, Mol would say that vulnerability is never so solid that it is singular. Even though the digitisation of the maternity record presents a definition of who "vulnerable" pregnant women are, it should not be considered a blackbox. Mol suggests that *"instead of bracketing the practices in which objects are handled we foreground them"* (Mol 2002, 4). By foregrounding life experiences of vulnerability, we describe how the world is enacted in multiple ways which sometimes clash, other times overlap, and are inevitably intertwined with care practices. We take a step

back and describe the multiple, overlapping, and non-stabilised versions of reality by asking: What is vulnerability? And how is it enacted in care practices by pregnant women, health professionals, and the digital maternity record?

4. Methodological reflections

One part of the current maternity record, the yellow envelope, is also called *the wandering record* as it wanders from hand to hand between the pregnant woman and the health professionals. The name of the record reveals that it crosses different contexts. It is, thereby, not a single-sided phenomenon but rather a technology that moves across multiple sites. Anthropologist, George Marcus (1995), would analyse such a phenomenon through the idea of *following the thing* (Marcus 1995, 106) while Latour would *follow the actor* (Latour 2005, 12). It seems easy to grasp that the maternity record physically is moved from site to site and thus constitutes a *multi-sited* subject field, but what if the subject field is a condition instead of an object? Is it also possible to follow enactments of vulnerability and care across sites? Marcus also describes *following the life* as a method where lifeworlds *"are shaped by unexpected or novel associations among sites and social contexts suggested by life history accounts"* (Marcus 1995, 110). Instead of having lifeworlds as a subject field in itself, we investigate how vulnerability, as well as care practices, are enacted in unexpected ways across sites to identify how the maternity record is intertwined in those enactments. This is indeed closely attached to pregnant women's lifeworlds, which is why we have conducted interviews with 14 women who are or have been pregnant. Vulnerability and care practices are also attached to the health professionals and their work practices. Therefore, we have interviewed three health professionals with different roles in pregnancy trajectories - a general practitioner (GP), a midwife, and a healthcare visitor. Furthermore, we have gained insight into care practices from participating in five consultations both with and without the digital maternity record. These insights concretise how the maternity record is (or is not) intertwined with enactments of vulnerability. We use the contextualisation of the analytical field and theoretical resources to step into the empirical field, where new empirical insights take shape. We thus get closer to the empirical field which is constructed of *"the concrete activities that one participates in and observes throughout the fieldwork"* (Tjørnhøj-Thomsen & Whyte 2007, 96).

4.1 Sundhedsdatastyrelsen as site

When two of us in autumn 2021 were interns at Sundhedsdatastyrelsen, we attended meetings, prepared project materials, helped with technical tasks, contributed to workshop preparations, etc. As interns, we placed ourselves within the field and became active participants in the project and its pre-existing agenda and routines (Sandner & Spangmose 2022). Our empirical work at the time primarily consisted of field

observations, but we also interviewed the executive manager of the project, Lone Dalager, from Health Innovation Centre of Southern Denmark (Syddansk Sundhedsinnovation). In the previous semester project, we investigated how the digital maternity record has both been stabilised and negotiated at the same time. It was in this process that it became evident that the pregnant women did not take part in the negotiations around the technology. When we, in a few cases, use empirics from the previous semester project, it is important to emphasise that it is used to shed light on new perspectives. When we, as an example, include the interview with Lone Dalager, we use it to describe how "vulnerable" pregnant women have been considered in the project, while the interview in the previous project was used to nuance the involvement of health professionals and IT architects. Our entrance into Sundhedsdatastyrelsen as a site has influenced our access to other sites, but more importantly, it has given us access to a room, where decisions are being made about the development of the digital maternity record. Furthermore, the internship has to a high extent formed our interest in the field, namely, to focus on pregnant women.

4.2 Pregnant women's lifeworlds as sites

Our ambition to follow vulnerability across sites, also involves getting access to them, since this is defining for where and how our study of vulnerability takes place (Geertz 2005, 59). In our case, it was paramount to reach pregnant women with vulnerabilities, since it is their perspectives that we wish to make visible. Star argues that *"Marginality is a powerful experience"* (Star 1991, 52), and from the marginal position it is possible to see things that otherwise would have remained invisible. Initially, we believed that the most responsible way to get in touch with pregnant women was through health professionals as they could assess whether the individual pregnant woman was able to participate in our study. However, midwife, and head of section in The Family Outpatient Department at Hvidovre Hospital (Familieambulatoriet), Michelle Kolls, changed our perspective on this matter. She argued that if the health professionals asked the pregnant women to participate, it might be perceived as pressure. Therefore, she argued that it would be more responsible to reach informants independent of the healthcare system since it would ensure that they participated based on self-interest instead of pressure. On her recommendation, we used several Facebook groups to reach out to pregnant women with vulnerabilities, where one post, in particular, got a lot of responses. We also got in touch with a pregnant woman on Instagram, who publicly has spoken about her personal experiences of fertility treatment and pregnancy. The advance of our approach is that the women we have interviewed have contacted us ourselves and agreed to an interview. Therefore, they have also been motivated to talk with us and let us enter the sites that each of their lifeworlds constitutes in this study. From our interpretation, some women participated to get the opportunity to talk about important experiences. For example, one woman texted us prior to the interview: *"Thank you for letting me share it with you, it's really nice to share it and it's been a long time since I've*

been thinking about births." (Appendix 6: Ellen, 33). Others expressed a wish to contribute to a better system around pregnancy: *"Whatever it takes to improve this area [...] If I can just make it better for one other woman."* (Appendix 5: Dicte, 32).

4.2.1 The pregnant women

We have conducted semi-structured interviews with 14 Danish women who all have a bodily experience of being pregnant, some of them more than once. A few of the women are still pregnant, most of them gave birth recently, while one had her latest birth a couple of years ago. Nonetheless, we choose to refer to all our informants as *the pregnant women*, since it is the women's experiences of being pregnant which is our central focus. They differ in age, in which region they live in, and in civil status. In figure 2, we have made a short presentation of the pregnant women to create awareness of some of the different circumstances related to their pregnancy that might be relevant to their enactment of vulnerability. A relevant circumstance could, for example, be experiencing going through fertility treatment, living with anxiety, or having experienced a miscarriage. The figure, however, is a simplified presentation. Throughout the analysis, we apply relevant nuances to unfold the multiplicity, fluidity, and ambivalence which cannot be schematised. Therefore, we also distinguish the pregnant women from each other by referring to cover names that also appear in the figure.

Presentation	Circumstances for pregnancy
Camilla is 47 and works as a project manager	She is a solo mom for two children, of which the youngest is born in May 2021 as a result of fertility treatment. She left the father of her eldest child due to violence which has caused her post-traumatic stress disorder (PTSD).
Carina is 36 and works as a psychologist	She is a solo mom who had her first child in December 2021 with her former partner. Since she has lost both of her parents, she has a small network. Furthermore, she has a history of anxiety and other unknown diagnoses.
Christel is 41 and works in an office	She is a solo mom and is pregnant with her second child after fertility treatment.
Cindy is 32 and works as a graphical designer	She is a solo mom and is pregnant with her second child after four years of fertility treatment. The first pregnancy resulted in a missed abortion in the 12th week of the pregnancy.
Dicte is 42 and is educated in Danish and communication	She is a solo mom and pregnant with her second child after two years of fertility treatment. She had a traumatic birth with her first child.
Ellen is 42 and works as a schoolteacher	She is a mother of four children, of which she had the youngest in 2019 with her partner. She had a traumatic birth with her second child, and in her latest pregnancy, her BMI was categorised as heightened.
Frida is 32 and works as a journalist	She is a mother of two children, of which she had the youngest in May 2021. Her husband was diagnosed with cancer right before her latest pregnancy.

Jeanette is 35 and works as a visual fashion merchandiser	She is pregnant with her first child after 1,5 years of fertility treatment with her partner. She is bipolar and lives with anxiety.
Line is 36 and has a master's in educational psychology	She had her first child in September 2021 with her husband. She is diagnosed with ADHD.
Mette is 31 and studies a master's in pedagogy	She is pregnant with her first child after four years of fertility treatment with her husband. She is diagnosed with borderline as a result of sexual abuse in her childhood.
Rebekka is 29 and works as a pedagogue	She is a mother of two children, of which she had the youngest in September 2021 with her partner. She had a traumatic birth with her first child.
Sofie is 29 and works as a nurse	She is a mother of two children, of which she had the youngest in December 2021 with her partner. She suffers from anxiety and she had a traumatic birth with her first child.
Stine is 31 and teaches in pedagogy	She had her first child in December 2021 with her partner. Because she had her oviducts removed, she has been through fertility treatment.
Trine is 36 and works as a journalist/podcast producer	She had her first child in January 2022 with her partner. She has a history of stress and depression.

Figure 2: Overview of informants at the given time of the interview, including a summarisation of circum-stances relevant to their pregnancy. The informants are presented by their given cover names.

4.2.2 Enacting a safe space with the pregnant women

Due to the COVID-19 pandemic, we asked the pregnant women whether they wanted to do the interview online or physically - 12 of them chose the online format. This calls for methodological reflections. We feared that an online platform would distance us from the pregnant women and thus compromise our possibility to build *rapport*.

> *"Rapport refers to [...] a basic sense of trust [...] that allows for the free flow of information. Both the ethnographer and the informant have positive feelings about the interviews, perhaps even enjoy them"*(Spradley 1979, 44).

We were unsure if the physical distance between us and the pregnant women would make it difficult to create a free flow of information. In a few cases, we experienced technical breakdowns which interrupted the flow of the conversation. Furthermore, the online platform may have blurred our bodily empathy when a woman for example cried during an interview. It also hindered us in detailed interaction with physical objects such as the yellow envelope. Despite these pitfalls, the online platform acted as a safe space for us to talk with the pregnant women. One woman walked around her garden, pushing a baby stroller, with the sun touching her face. Another sat leaned back on her couch while breastfeeding her few months old child who sporadically drew its mother's full attention by a little noise. In this way, we entered their safe space while they did not have to act as hosts, as the two pregnant women, who we interviewed physically, did when they served cinnamon buns and green tea. While we, through the online platform, "entered" the pregnant women's home, they also entered ours. From that perspective, we were on equal terms which

created a conversational feeling in the interview. We did not experience that the physical distance created a poorer flow of information. In some situations, it might have even improved it. It might have been less intimidating for some of the pregnant women to talk about such a personal subject, that pregnancy nevertheless is, online than sitting face to face with us. The rapport was, however, not solely a result of an online platform, as the sense of trust that occurred also was an enactment between us and the pregnant women.

First, it is a beneficial prerequisite that the pregnant women themselves reached out to us and they were thus motivated to share their experiences. Furthermore, we also let the pregnant women decide when and how they wanted the interview to take place, just as we willingly rearranged if something came in the way. In that relation, it has been an advantage that one of us has just been on maternity leave and, thereby, can relate to how difficult it can be to plan and anticipate the course of the day with a baby. Here, the relatability between us and the women is exemplified. We are also women, who have experiences and/or reflections of pregnancy in our personal lives. As the sociologists, Martyn Hammersley and Paul Atkinson describe: *"The researcher cannot escape the implications of gender"* (Hammersley & Atkinson 1995, 92). In this case, our gender did not become something that we tried to escape from. Rather, it became an important part of building rapport: *"as a woman she had access to the world of women, which no man could ever attain."* (Hammersley & Atkinson 1995, 93).

That we have insisted on being open instead of insisting on moving in a predetermined direction has been an essential part of the free flow of information. Our ambition has been to follow Husserl's epoché rule which means to *"put your own expectations and preconceptions in parentheses and open up for an immediate experience of the concrete and unique world that is presented for you"* (Jacobsen et al. 2015, 229). We enter the field with preconceptions, however, we try to put parentheses around our preconceptions by being open and curious about their experienced lifeworlds, for example, by asking: *"can you recognise yourself in the categorisation of being vulnerable?"* (Appendix 20: Interview guide, 130). With such questions, we welcomed new understandings of what vulnerability is. This has allowed us to notice that vulnerability is enacted in multiple ways. It was through asking open questions that the multiplicity and messiness occurred. It felt like a risk to ask such open questions since it might result in unexpected turns and situations where it is difficult to get back on the planned path of questions. We experienced both. However, none of it reduced the quality of the interviews - quite the contrary. The unexpected turns are the very reason why we investigate the field. If we knew everything in advance, what would be the point? Situations where some of the pregnant women, for example, in detail described their experiences of giving birth, were evidently not central to our analysis, but it was important to the rapport that we built with them. Even though the interviews had a limited time frame of one hour, we found it important to

take the time to let them tell us about things or situations of great importance to them. During the process of analysing the interviews, experiences such as giving birth, have unexpectedly shown to be central in the analysis due to the high degree of detail. The invitation into the sites, that each of the pregnant women's lifeworlds constituted, has given an insight into their enactment of vulnerability and reflections on how the digital maternity record does or might take part in that enactment.

4.3 The healthcare sector as site

As the pregnant women, the healthcare sector also takes part in enactments of vulnerability. However, entering the health sector as site required more negotiation and conviction than was the case with the pregnant women. We contacted one of our own GP's, Good Mothers (Mødrehjælpen), and Centre for Vulnerable Pregnant and People on Maternity Leave (Center for Sårbare Gravide og Barslende). They all gave the same answer: *"We are very busy at the moment"* or *"we get so many similar requests, so we have to say no to all of you"*. Therefore, we drew on our relation to Sundhedsdatastyrelsen, our workplaces, and our network to get in touch with health professionals who wanted to give some of their time, which certainly is limited. In this process, we became aware that negotiating access to a certain site might be built upon patience and sometimes steadfastness. This became particularly exemplified when we wanted to enter the site of one of the hospitals that takes part in the pilot test of the digital maternity record. Even though we at first were welcomed to join the unit for the midwife clinic in Aabenraa for a day, it at the same time depended on technical obstacles as well as coordination between the health professionals. For two months we were placed in a waiting game, where we both wanted to show respect for the busyness that constitutes their work, but at the same time needed to insist on the importance of our study. Since we knew that the health professionals in the same period were interviewed by the project management as a part of a midterm evaluation of the pilot test, we knew that we had to take as little time from the health professionals' work as possible. Therefore, it became necessary to move away from email correspondences and instead call the section leader and tell her: *"all we want is to step inside the doors and maybe observe a few consultations if it's possible"*. Meeting the health professionals in their busyness and clarifying our interest in their work practices became the key to the site in this case.

4.3.1 Interviewing experts in healthcare practices

Consultations with health professionals have been a significant part of the pregnant women's enactment of vulnerability, and, therefore, we have been curious about how different health professionals take part in these enactments. We arranged three interviews with different health professionals that most pregnant women meet during their pregnancy trajectory: a GP, a midwife, and a health visitor. In these cases, the interviews can be characterised as expert interviews, since the health professionals have specialised

knowledge about pregnancies and procedures around them (Littig & Pöchhacker 2014, 1088). Sociologist Beate Littig, and Professor of Interpreting Studies, Franz Pöchhacker, describe that an expert interview can be used for different purposes, namely to 1) explore, 2) systemise, or 3) generate theory. Our interviews with health professionals can be characterised as *theory-generating expert interviews*, where the researcher seeks to *"elicit the specialized knowledge gained through the expert's professional activities as well as the tacit interpretive knowledge that shapes professional practices"* (Ibid.). We have been interested in procedures around pregnancies, but what has been even more interesting was the health professionals' interpretive knowledge of the field and *"what types of knowledge explicitly and implicitly informed their decisions"* (Littig & Pöchhacker 2014, 1089) - particularly regarding enactments of vulnerability in the healthcare system. By conducting the expert interviews after interviewing the pregnant women, it was possible to get immediate responses to the questions that occurred from the preceding insights from interviews with the pregnant women. Questions about care, surveillance, and self-written record notes were for example inspired by the interviews with the pregnant women.

The health professionals are experts in their healthcare practices, and they have contributed to the multiplying in the enactments of vulnerability. This also means that more interviews with health professionals probably would have resulted in even more nuances and important insights. Three interviews with health professionals might be seen as a limited foundation in a discussion of how health professionals enact vulnerability. A central methodological problem within ANT is revealed, namely that networks are endless. This entails a methodological challenge of demarcation. In an interview, Latour was asked: *"When do you stop? My actors are all over the place. Where should I go? What is a complete description?"* (Latour 2004, 68). His somehow provoking response was: *"you stop when you have written 80,000 words or whatever is the format"* (Ibid.). In other words, researchers have to live with the fact that something will be left out in the analysis due to practical circumstances such as a given time frame or a word limit. Researchers have to make choices and at the same time be aware that it might have been otherwise, as Star declares (cf. section 3.2.1).

4.3.2 Observing healthcare practices

Since most of the interviews took place on an online platform, we were driven to get out and place ourselves in the field more literally speaking.

> *"The researcher must leave the office, the library or the laboratory and move to the place, where she for a while lives with the people she wishes to study, no matter if they are in a hospital ward or in a little island community."* (Tjørnhøj-Thomsen & Whyte 2007, 90).

Through our private network, we got in touch with a woman, who was early in her pregnancy. She allowed us to join her first consultation at her GP where her maternity record was created - this situation is shown in figure 3. We also made participatory observations at a Hospital of Southern Jutland (Sygehus Sønderjylland) in Aabenraa where the digital maternity record currently is being tested. It is a small, decentralised midwife clinic in the centre of Aabenraa city that, due to a lack of pregnant women with "basic" pregnancy trajectories to participate in the pilot test, has extended the inclusion criteria to include pregnant women with psycho-social issues. However, the pregnant women with psycho-social issues participate on the same terms as women with "basic" pregnancy trajectories, as the platform is not yet designed to communicate with disciplines outside the obstetrics. Through participation in four consultations with pregnant women enrolled in the pilot test, we gained insight into how the digital maternity record is currently being used and tested in practice - how it becomes a part of different enactments of care.

Figure 3: Picture from field work with drawings representing the consultation situation at a GP.

We spent five to ten minutes each consultation, as we were only invited to participate in the last part of the consultation where data was entered into the digital maternity record. This way of doing participatory observation differs radically from a classical anthropological approach where the researcher over a longer period *"achieve[s] a place in the community being studied"* (Tjørnhøj-Thomsen & Whyte 2007, 91). We,

on the other hand, only shared a very limited time in the field, and therefore one might, compared to conventional anthropology, describe our approach as *"quick and dirty"* (Pink & Morgan 2013, 351). However, like the anthropologists Sarah Pink and Jennie Morgan, we argue that short-term ethnography does not have to equal poorer quality. Instead, the short time frame is a circumstance for our research activities, and instead of *"hanging around, waiting for things to happen"* (Pink & Morgan 2013, 355) we chose to *"implicate [ourselves] at the centre of the action"* (Ibid.).

Both at the GP consultation and the four midwife consultations, our role was to a higher extent characterised by being observers of the field than being participants (Hammersley & Atkinson 1995, 104). This was to a certain extent defined by *"the nature of the setting"* (Hammersley & Atkinson 1995, 109). It seemed inappropriate to interfere in the consultations, so we rather became spectators.

> After explaining my presence at the consultation, I sat on a chair at a distance to the midwife and the pregnant woman in terms of not "interrupting" the conversation between them (Appendix 18: Field notes, 115).

Being present at the consultation can be seen as an opportunity to *"notice the not-spoken, the secret, the not-reflected, the bodily, the situated, the interactions between actors"* (Szulevicz 2015, 87). In our case, we were particularly interested in how the technology in practice became an actor in the enactment between the pregnant woman and the health professional. However, that we only were present in a small part of the consultations is a circumstance that we must keep in mind in the descriptions of the interaction between the health professional, the pregnant women, as well as the digital maternity record. This partial insight into the consultations reinforces the risk of misinterpretation that already exists when being a passive observer (Hammersley & Atkinson 1995, 110). Our focus as observers thus became to describe as precisely as possible what happened in the time that we were there: What is said? What is done? We also made short follow-up questions after the consultations, with approval from the pregnant women, asking quick questions mainly focused on their experience with the pilot project. Mette Rasmussen, section leader midwife at the midwife clinic in Aabenraa, also offered to follow up on our stay at the clinic by answering our questions. This was a great possibility to ensure any misunderstandings that we might have regarding the use of the digital maternity record. She showed us, in detail, how to use the platform and in the meanwhile, we asked questions.

Being present at five different consultations contributed with an insight into how the yellow envelope is used and how the digital version might change the enactment between pregnant women and health professionals. In that relation, it is important to emphasise that the digital maternity record is unpolished. Therefore, we must bear in mind that technical issues or irritations, as a result thereof, will not necessarily appear when the solution is fully integrated. The observations, however, can still be used in a reflection

and discussion of how the future design of the digital maternity record can take multiple enactments of vulnerability and care into consideration.

4.4 Entering the network

The investigation of multiple enactments of vulnerability and care implies that we, as researchers, enter the network. It is important to keep in mind that networks do not exist as objective or neutral networks, but rather are an expression of an analytical gaze that the researcher has brought to the investigated field (Gad & Bruun 2007, 105). Our analysis and descriptions thus cannot be separated in an absolute sense from our political beliefs and normative aspirations. Mol would say that we, as researchers, are not merely onlookers, we are actors who have an impact - not just on how reality is perceived but on reality itself: *"knowledge is not understood as a matter of reference, but as one of manipulation."* (Mol 2002, 5). In other words - reality is never simply there for us to observe or for science to reveal it. Rather, reality is constantly being enacted through practice. We have followed enactments of vulnerability across sites, and we have described important methodological reflections. As Mol argues, we enter the network that we investigate and take part in the construction of it. With pre-interpretations, we construct the empirical field from a certain point of view shaped by our age, gender, education, ontology, etc. We also enter the field with different experiences, such as being former interns in Sundhedsdatastyrelsen or going through a pregnancy and giving birth. With all that we carry with us, as researchers and human beings, we are co-constructors of the stories being told. We have designed the research, we have formulated the questions, and both our presence and appearances have influenced our empirical findings. Our empirical work can thus be seen as an enactment between us, the informants, and a row of other actors, such as practical arrangements. We thus cannot be neutral and fortunately, we do not aim to. Investigating the messiness of multiple enactments of vulnerability in care practices reveals how *"good care co-exists with other logics as well as with neglect and errors"* (Mol 2008, 10). We, however, attempt to focus on the good in the enactments of care *"in order to distil a 'pure' form out of mixed events"* (Ibid.). We do not wish to focus on errors. Our aim is to ask: *"How can we built better?"* (Latour 2003, 42). Mol argues that building better entails descriptions of multiplicity.

> *"But attending to the multiplicity of reality is also an act. It is something that may be done - or left undone. It is an intervention. It intervenes in the various available styles for describing practices. Epistemological normativity is prescriptive: it tells how to know properly."* (Mol 2002, 6).

Mol argues that descriptions also can be normative, and hence contribute to building better - to create a better construction. By unfolding multiple enactments of vulnerability, we thus strive to know properly to make it possible to develop the digital maternity record properly. It is based on the contextualisation

of the analytical field and reflections of our approach to the empirical field, that we have become curious to study how multiple enactments of vulnerability and care can shape the design of the digital maternity record. To make any conclusions on that matter, in part I, we unfold the multiplicity that constitutes vulnerability. Unfolding this multiplicity both include experiences from the pregnant women, interactions with health professionals, and research of official documents from the healthcare system. In part II, we unfold how vulnerability is intertwined in care practices. We use different logics to describe enactments of care that have shown to be central to the way women experience their pregnancy trajectory. These insights are used in part III to unfold how the maternity record is intertwined in the enactments of vulnerability in care practices. Furthermore, we have described the current maternity record to reflect on how the digital maternity record differs when it comes to enactments of vulnerability and care practices. This is done by imagining how the digital maternity record might interfere in practice. Lastly, we discuss how the design of the digital maternity record can take not only "basic" pregnancy trajectories, but multiple enactments of vulnerability and care into account. This is to make the technology live up to the goal of supporting "vulnerable" pregnancy trajectories.

5. Part I: Multiplying vulnerability

With the aim of including pregnant women with vulnerabilities in the design of the digital maternity record, we need to investigate what vulnerability is - what does it mean to be a "vulnerable" pregnant woman or a "complicated case"? Based on Star's argument of starting from the marginalised point of view, we want to *"bring a stranger's eye to such experiences"* (Star 1991, 38) of vulnerability. With inspiration from Mol, we describe how vulnerability is done - how it is enacted between pregnant women and health professionals. By describing enactments of vulnerability, it is revealed that it multiplies when investigating it. We unfold how health professionals' enactment of vulnerability in practice is correlated to official recommendations within maternity care. Furthermore, four key situations told by the pregnant women reveal how they enact vulnerability differently. Some of the key situations have been chosen as a representation for enactments that have been profound across the interviews with the pregnant women. Others have been chosen to exemplify that enactments of vulnerability in some cases clash. Common for all situations is that the pregnant women's enactment of vulnerability crosses with a health professional's enactment. It is shown how enactments of vulnerability overlap and sometimes clash - and how it is inevitably dependent on care practices in the healthcare system.

5.1 Enacting vulnerability as a health professional

> Two minutes later a nurse calls her name. We follow her to a small consultation room with a desk in the corner where the nurse places herself and points invitingly at the empty chair next to her. [...] The nurse says: *"I might as well announce that one has to hand over a lot of information to get pregnant in today's Denmark."* [...]. Firstly, the personal data is verified. Secondly, the pregnant woman is asked about social relations, such as civil status, previous pregnancies, or births. She is also asked about fertility treatment and chronic diseases. [...] The nurse continues the bombardment of questions: What do you do on a daily basis? Do you have any allergies? Heart problems? Metabolic problems? Have you ever been hospitalised? Have you struggled with cystitis or UTI? Condyloma? Herpes? Do you smoke? Drink? Drugs? Are you a vegetarian? Vegan? Have you been vaccinated for that? That? Or that? Breathless after the many questions, her weight and height are measured, and blood and urine samples are taken. [...] After the consultation, the pregnant woman said to me: *"Did you get it all? It all went so fast!"* (Appendix 18: Field notes, 115).

Usually, pregnant women get a consultation at their GP around pregnancy week six to ten, and as the description from such consultation reveals, the pregnant woman must hand over a lot of information to the healthcare system. But what is all this information used for? A GP describes how the first consultation is about gathering a lot of basic information and assessing the well-being of the pregnant women to *"allocate them in a risk group"* (Appendix 15: GP, 87). This is described as a question of *"what kind of person stands in front of me here? Is there something we need to pay attention to?"* (Ibid.). The first meeting with the pregnant woman, and the information that is gathered, is seen as a possibility to allocate resources within the healthcare system in a way to *"secure the best possible support to the right persons [...]. Those with the greatest needs, right?"* (Appendix 15: GP, 89). The healthcare system refers to these as "vulnerable" or "complicated cases" (Sundhedsstyrelsen 2021, 73). It is a so-called visitation that has the role of allocating pregnant women to a certain ward that is defined by the information gathered at the GP. If a pregnant woman is "vulnerable", then she gets allocated to a ward specialised in that, just as a pregnant woman with a heart disease is allocated to a hospital with doctors specialised in heart diseases. Familieambulatoriet at Hvidovre Hospital is an example of a ward specialised in psycho-social stresses. Here, section leader and midwife, Michelle Kolls' daily practice is to arrange what kind of trajectory each individual pregnant woman needs: *"Systematically, we focus a lot about the psychological pregnancy"* (Appendix 16: Midwife, 98). One of the differences between a "basic" midwife consultation and the work in Familieambulatoriet is that it is a cross-disciplinary team of both midwives, obstetricians, and health visitors but also psychologists and social workers are represented. As an example, a pregnant woman can be allocated to Familieambulatoriet due to anxiety. It is their focus to arrange a trajectory that is supported by the right cross-disciplinary team, for example, by providing more consultations with a midwife and in the case of anxiety, a consultation with a psychiatrist might be relevant. The ambition is that the individual trajectory is arranged in negotiation with the ward and the pregnant woman.

> *"It's all about taking into account where [the families] are and what kind of needs they have. It's also about tracing risks and identifying resources together with the families"* (Appendix 16: Midwife, 99).

An important part of organising an individualised trajectory is to *"strengthen the families in the transition from one sector to another"* (Ibid.). In most pregnancy trajectories, the healthcare visitor only meets the families right after the birth of the child. However, when a healthcare visitor receives a correspondence about a "vulnerable" pregnant woman, the healthcare visitor can assess whether the couple needs an additional consultation before the birth (Appendix 17: Healthcare visitor, 107). In the transition between hospital and healthcare visitation, the sharing of information again becomes relevant. In addition to the information that has been gathered in a record at the GP, a correspondence message with a summarisation of the pregnant woman's trajectory is sent. We have interviewed a healthcare visitor who receives correspondences sent by midwives and identifies who needs additional consultations.

> *"Every day we receive many [correspondences] because we both get ones, twos, threes, and fours [...] Threes and fours are obvious. We can have doubts about what to do with ones and twos."* (Ibid.).

It becomes apparent that something underlying influences the health professionals in their work of defining vulnerability. When the healthcare visitor talks about ones, twos, threes, and fours, she refers to The Danish Health Authority's (Sundhedsstyrelsen) categorisation of four so-called *care levels* within the official 'Recommendations for Maternity Care' (Sundhedsstyrelsen 2021). A pregnant woman with *"no increased risk"* (Sundhedsstyrelsen 2021, 49) is placed in care level 1 and gets enrolled in a *"basic trajectory"* (Sundhedsstyrelsen 2021, 55), which includes a number of meetings with different health professionals (see figure 4). This usually includes three consultations at the GP and six or seven consultations with a midwife. However, the number of consultations is dependent on the time of birth (Ibid.).

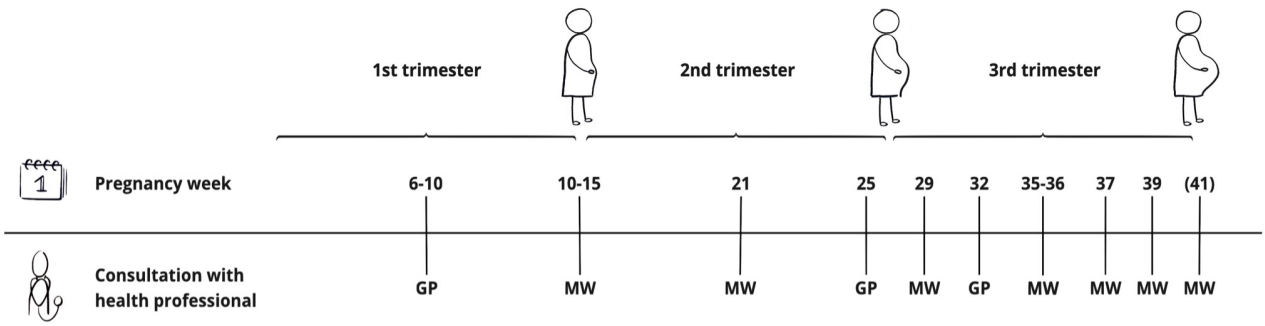

Figure 4: Overview of "basic" pregnancy trajectory based on pregnancy weeks and the "basic" consultations arranged with a GP (general practitioner) and MW (midwife). The figure is based on the official 'Recommendations for Maternity Care' (Ibid.).

Sundhedsstyrelsen describes that pregnancy trajectories are predefined for pregnant women placed in care level 1, while pregnant women placed at care level 2 to 4 are offered a more *"tailor-made trajectory"* (Sundhedsstyrelsen 2021, 50) including extra time and consultations to ensure the health of mother and

child-to-be. One of the main differences between the prior recommendations and the revised version is an extended focus on pregnant women and families placed at care level 3 and 4, who are defined as *"vulnerable and socially exposed"* (Sundhedsstyrelsen 2021, 73). The care levels are used as a tool to identify different circumstances that influence the degree of vulnerability in each case - figure 5 shows an overview of how. Sundhedsstyrelsen's definition of care levels is thus a part of the health professionals' enactment of vulnerability.

Care level	Definition	Pathway	Examples of circumstances
1	Parents who are healthy, without risks and have an uncomplicated pregnancy	Standard trajectory	None
2	Parents with a need for more or longer consultations within the maternity care, than offered in a standard pathway	Extended trajectory with more or longer consultations within the maternity care e.g., GP, midwife or obstetrician	1) smoking, 2) overweight, 3) twin pregnancy, 4) traumatic birth experience, 5) loss of child, 6) experience with unsuccessful breastfeeding, 7) well-treated somatic or mental disorder
3	Parents who are vulnerable, socially exposed or have complicated somatic or mental disorders	Extended trajectory including an effort across sectors and disciplines such as psychiatrist, the health visitation, and the social services	1) diabetes, 2) obesity, 3) heart disease, 4) anxiety, 5) depression, 6) ADHD, 7) OCD, 8) conflicting or violent relation at home, 9) economic issues, 10) small network, 11) young age/mental immaturity, 12) lack of engagement in pregnancy, 13) previous abortions/handicapped/diseased child, 14) long-term fertility treatment, 15) serious sickness in the family, 16) recent loss of a close relative
4	Parents with particularly complicated problems	Extended trajectory including cooperation with the social services and often also specialised departments such as a family outpatient department	1) harming use of alcohol, drugs, or medicine, 2) severe mental disorders, 3) socially deprived, 4) risk of attachment issues between parents and child

Figure 5: Description of the four care levels from the official 'Recommendations for Maternity Care' (Sundhedsstyrelsen 2021, 30-49).

5.2 Enacting vulnerability as a pregnant woman

When pregnant women step out the door at their GP, something has changed. The information extraction and the health professional assessment of the pregnant woman have now placed her in a certain care level that influences her trajectory through the healthcare system. No matter if the pregnant woman understands her placement at the care level, it inevitably sets in motion reflections about what vulnerability means and how she recognises herself in the category that she has been put into. Through a presentation of four situations, we unfold how the pregnant women's enactment of vulnerability both takes the shape of the meeting with the health professionals but also from previous experiences, medical history, and

suddenly occurred worries. We thus move away from what Sundhedsstyrelsen have predefined as "vulnerable" by describing the pregnant women's enactments of vulnerability.

5.2.1 Putting a hand on the record

> *"When we got to the first midwife consultation, we got a "hand"-mark on my record and were told that if I needed it, I could get attached to a vulnerability team and get additional consultations"* (Appendix 13: Stine, 75).

Stine went for her first consultation in week 16 of her pregnancy with a midwife who is described as a kind elderly woman but also *"a bit direct"* (Ibid.). Stine cried throughout the whole consultation and the midwife concluded: *"you are definitely vulnerable"* (Ibid.) and she then got a hand mark on her maternity record. She cried because of the things her, and her partner have been through before the pregnancy. In 2020 they found out that Stine could not get pregnant naturally, since both of her oviducts were blocked. Therefore, they began fertility treatment. This both included an egg extraction and an operation where both of her oviducts were removed.

> *"It's a bit of an upheaval of my self-interpretation. [...] Because I got my oviducts removed it felt like it was more vulnerable. I felt that the pregnancy was in the hands of others. [...] I think it's relevant to know the whole trajectory up till then since it created a pretty significant vulnerability about the pregnancy in me. I used the first many months to be enormously worried and insecure [...] if anything would go wrong."* (Appendix 13: Stine, 74-75).

Stine's experiences antecedent to her pregnancy made her feel vulnerable and she recognised herself as being *"a bit extra vulnerable"* (Appendix 13: Stine, 75), which the little hand mark on the record indicated. It was calming to her to be enrolled in a vulnerability team, as she was *"a little worried that it could develop into a reel pregnancy or postpartum depression"* (Ibid.). To her the offer meant an extra eye was kept on her child-to-be: *"I got confirmed that my baby was okay"* (Appendix 13: Stine, 77). In Stine's case her vulnerability is directly related to the fear of miscarriage, and this has shown to be a fundamental fear in most of the pregnant women.

> *"I work at a gynaecological ward and was actually pretty worried to become one of the examples I see myself at work with miscarriages"* (Appendix 12: Sofie, 69).

> *"Even though I knew that I was pregnant, there was still a little fear of... what if I wasn't anyway?"* (Appendix 9: Line, 53).

> *"When you're going through fertility treatment, you have the time to consider EVERYTHING that might go wrong. You have 1,5 years or more, where you can read about how common it is to have a miscarriage"* (Appendix 8: Jeanette, 50).

> *"When you've had bleedings during the pregnancy, which is unexpected when you're pregnant, it automatically provokes concerns"* (Appendix 3: Camilla, 19).

The concern of having a miscarriage can be attached to many different circumstances. For Stine, the worries were enhanced because of the fertility treatment they had been through, which also was the case with other pregnant women. However, she at the same time described that she thinks that pregnancy, in general, comes with a feeling of vulnerability for most pregnant women: *"you become more exposed both emotionally and sensorily. It's in many ways a different way to be in the world."* (Appendix 13: Stine, 76). Augusta, the one of us who has been pregnant, recognises experiencing concerns during her pregnancy despite not being categorised as "vulnerable". For many of the pregnant women, this different way of being in the world, also included a sharpened attention to potential risks, resulting in suddenly occurring concerns. They could occur due to a bodily experience such as bleeding or a period of no sign of life from the child-to-be. Concerns could also be a result of something extraneous that created sudden worries, for example getting ill from COVID-19, going to a sauna, or eating liquorice, or eating recalled mayonnaise. In these situations, a vulnerability suddenly occurred that could only be eased by consulting with a health professional or getting proof, via an extra scan, that the child-to-be was okay.

> *"It made me less insecure about being pregnant [...] to see that she was fine. That there was a heartbeat and that she grew as she should. I'm pretty sure that the extra check-ups have made me less vulnerable than I would've been otherwise."* (Appendix 13: Stine, 77).

Due to an intertwinement of several actors, concerns both arise and are being shut down. The liquorice becomes an actor that together with other actors raises concerns. On the other hand, the ultrasound is an actor that together with other actors shuts down or eases concerns. Different actors thus participate in the enactment of Stine's vulnerability which can be turned on and off due to previous experiences or sudden situations: *"The thing about vulnerability is that it is somehow fluid. You might not feel vulnerable if things are turning in your favour, but you can still become vulnerable."* (Ibid.). Stine describes that her vulnerability is characterised by being fluid. Even though she was the only one that made the fluidity in her vulnerability explicit, other pregnant women described the fluidity in other ways. For Rebekka the fluidity in her vulnerability happened at the midwife consultations. She sat in front of her midwife and felt: *"right now I'm pretty okay"* (Appendix 11: Rebekka, 65). In that situation, she did not feel the need for extra consultation that she was offered due to a previous traumatic birth. She described how her worries came and went: *"You can easily feel fine but then end up in a similar situation and all those feelings end up right back in your face."* (Appendix 11: Rebekka, 66). Several of the pregnant women described the first 12 weeks of the pregnancy as particularly vulnerable due to the increased risk of miscarriage (Trolle 2022): *"it was insane how horrible I felt the first three months"* (Appendix 8: Jeanette, 50). Another pregnant woman described vulnerability as something that she might *"phase out of"* (Appendix 1: Cindy,

4) after the first three months. The enactment of vulnerability thus might include a fluidity where the vulnerability during pregnancy is both influenced by previous experiences, suddenly occurring situations, and not at least worries about the future - particularly in regard to the child-to-be.

5.2.2 An indescribable happiness and a huge sorrow

By the time Cindy was 15 years old, she got the message that she would never be able to get pregnant. This is because she has endometriosis - a chronic disease that might cause infertility (WHO 2021). After several examinations, she was told in her late twenties that there might be a chance for her to get pregnant anyway. She went through fertility treatment and after four years she got pregnant (Appendix 1: Cindy, 2). At pregnancy week 12, she went for the nuchal translucency scan which turned out to be an unfortunate experience.

> *"I begin the consultation by saying that I've tried to get pregnant for three years, that it has been a long battle, and that I'm so happy that it proved successful [...] and then I was announced that the heart had stopped beating. There was no compassion, no care, nothing. I was just told, "Your baby is dead". [...] She also told me that I shouldn't be sad since she gave many other couples the same message every day [...] and most of them come back pregnant again in a couple of months [...] Then I felt: "We JUST talked about how that's not going to happen to me.""* (Appendix 1: Cindy, 3).

While the scan for others was an actor that eased the worries and thus the vulnerability, in this situation it became an actor that realised the worst-case scenario. Cindy describes the situation as traumatising, and this is of course related to the fact that all her dreams were taken away from her at that moment. However, it has also something to do with the way vulnerability is enacted by the health professional in the situation. For Cindy, it felt like a once-in-a-lifetime opportunity to carry a child which suddenly disappeared. For the health professional, miscarriage is a normal part of the daily work. This should be understood in relation to the fact that 20 to 25% of all pregnancies end in miscarriage (Sundhedsstyrelsen 2021, 184). In this situation, the enactments of vulnerability clashed. Cindy did not feel acknowledged in her enactment of vulnerability in that specific situation as she felt a sense of cynicism, which scarcely was what the health professional intended. The situation ended up being an experience that affected her second pregnancy that happened after four new treatments of in vitro fertilisation.

> *"I was SO happy. It was HUGE. But at the same time, I felt torn because I was terrified of losing again [...] torn between an indescribable happiness and a huge sorrow and fear"* (Appendix 1: Cindy, 2).

An ambivalence occurs. Happiness and sorrow are intertwined, and the worries have only been intensified from experiencing a miscarriage: *"The fear of carrying a child that does not live - it was BRUTAL!"*

(Appendix 1: Cindy, 4). An ambivalence also occurred from Camilla's experiences. She describes an ambiguous feeling during her pregnancy as she felt both happy about her pregnancy but concurrently processed things that made her last pregnancy unsafe due to a violent father: *"It was the grieving process of what I didn't get to experience while carrying my daughter. A HUGE sorrow which almost overshadowed the joy that was different this time."* (Appendix 3: Camilla, 14). The similarity between Cindy's and Camilla's experiences is the ambivalence that characterises their vulnerability. There, however, is a difference between how they are enrolled in the healthcare system, which also shows to influence their enactments of vulnerability. While Camilla was enrolled in a specialised vulnerability team, Cindy was not - she has only gotten a few extra scans. When we asked Cindy if she recognises herself as vulnerable, she answered promptly: *"Definitely!"* (Appendix 1: Cindy, 4). She explained that she felt particularly vulnerable the first three months of the pregnancy, and therefore, she has been sad that she was not enrolled in a team specialised in handling "vulnerable" pregnant women: *"It would have had a major impact to talk more into that fear, I carried with me"* (Ibid.). Even though Cindy has felt extremely vulnerable, she felt treated like the standard by the healthcare system. At the scan in her first pregnancy, she got the standard message that she would probably get pregnant again soon, even though that was probably not going to be the case. As it is the standard to only have midwife consultations at the end of the pregnancy, she felt alone with the fear of having another miscarriage during the first three months of her second pregnancy. Cindy has not been enrolled to a specialised team or gotten a hand mark on her record. She has not been categorised as "vulnerable" by the healthcare system, however, Cindy has definitely seen herself as vulnerable. While other pregnant women were surprised to be categorised as "vulnerable", Cindy was surprised that she was offered a "basic" pregnancy trajectory. This is problematic in Cindy's situation as her enactment of vulnerability is incompatible with how the healthcare system, in this case, enacts vulnerability. The multiplicity in vulnerability reveals itself. It is both ambivalent as it contains contradictory feelings - one can feel an incredible happiness and feel a huge sorrow at once. Furthermore, it becomes apparent that pregnant women's enactment of vulnerability inevitably is dependent on how the healthcare system enacts vulnerability.

5.2.3 Feeling watched

> *"I actually just got a message in my e-Boks, and they had booked a lot of appointments [...] I just got stuffed into that offer [...] that was kind of strange" (Appendix 12: Sofie, 71).*

The e-Boks invitation made Sofie wonder why she was being categorised as "vulnerable" by the healthcare system. She was in a good place at the time, and it was thus difficult for her to rationalise why the healthcare system saw her in another way: *"And then I thought: "I am not that vulnerable. Or am I? What does it even mean to be vulnerable?""* (Ibid.). It turned out to be the GP that had allocated her to the offer

which surprised her because her GP normally includes her in that kind of decisions: *"I didn't understand it at all. It must have been a mistake, I thought. Because in our society vulnerability often means something negative"* (Ibid.). She wondered if her GP wanted to keep an extra eye on her, if the GP was worried about something and if someone had filed a report on her. Finally, at her first consultation with the midwife, she got an explanation: *"She was really sweet. She explained to me that when you're diagnosed with anxiety then you have to be extra attentive as there's an increased risk for developing a birth depression."* (Appendix 12: Sofie, 72). Sofie ended up appreciating being offered to be in a vulnerability team when she understood what it implied.

> *"I was relieved about the offer when I read what it implied. However, it was something I, myself, had to research and figure out what it actually meant. And then it made total sense [...] then I was kind of sad that I wasn't offered the same trajectory in my first pregnancy"* (Appendix 12: Sofie, 71).

Because Sofie was enrolled in a vulnerability team through a message in e-Boks, it left her time to make her own assumptions about why she was categorised as "vulnerable". Consequently, it made her fear that she was being controlled by the system and that someone had filed a report on her. The feeling of being controlled by the healthcare system is something others of the pregnant women can relate to.

> *"Do they have an obligation to report? I'm sitting here and telling my worst fears whilst she [the health professional] writes: "This child has a mentally unstable mom". I lack transparency regarding if I'm being watched or helped"* (Appendix 14: Trine, 81).

> *"Well, I can take care of a baby. You don't have to watch me."* (Appendix 8: Jeanette, 49).

> *"I was scared that they thought I was so sad, that they had to file a report to the municipality"* (Appendix 3: Camilla, 14).

> *"I thought it was some kind of control authority, like: "Is Carina capable of taking care of a baby?" [...] I didn't relate it with something helpful."* (Appendix 4: Carina, 22).

What was helpful to Sofie was a verbal explanation by the healthcare system of why she was offered to be on a vulnerability team. The importance of a proper introduction is backed up by Jeanette. When it was explained what the vulnerability team was about, she *"got super calm and thought that it sounded like the right thing"* (Appendix 8: Jeanette, 45). Some of the pregnant women understood why they were enrolled in a vulnerability team: *"The reason why I'm at risk is that: 1) I'm old and 2) that it's a double donation. [...] I was placed in that box. Apparently, there were many different boxes. And this was what I got."* (Appendix 2: Christel, 7). Many of the pregnant women, however, did not understand what the offer entailed as they did not get a proper introduction to it.

> *"The offer was not logical to me. I really didn't understand what it was [...] what is it? What do I get out of it?"* (Appendix 14: Trine, 81).

> *"Oh well. We can do that [be on a vulnerability team], but I didn't really know what it was about"*(Appendix 4: Carina, 26).

> *"I could have wished for a more careful introduction. It wasn't really an offer, I think."*(Appendix 3: Camilla, 16).

For the pregnant women, the result of not understanding the offer, in some cases, is that they feel controlled by the system. Feeling controlled by the system is also related to the connotations that the word "vulnerability" raises. All the pregnant women consider themselves resourceful and, in some ways, they feel that it clashes with their perception of what it means to have vulnerabilities.

> *"A well-educated resourceful woman that's able to take care of herself doesn't harmonise with the person, I also am, who's super vulnerable and in some periods isn't able to take care of my job. [...] It's like two sides of me that's difficult to merge"*(Appendix 3: Camilla, 16).

> *"Well, I'm kind of vulnerable because of the things I've been through [...] but when I hear the word "vulnerable" it makes me think of someone who has no control of their life and then I can't identify myself with."*(Appendix 7: Frida, 41).

> *"My boyfriend really had to convince me that it was okay [to be on a vulnerability team]. I didn't want to be seen as someone weak"*(Appendix 13: Stine, 79).

> *"Oh, can I please be free of that [vulnerability team]. Can I just be me? [...] should I really be that Carina that's having a hard time? I really wanted to be free of that"*(Appendix 4: Carina, 25).

> *"It's like there are two boxes. Either you are mentally ill and a bit of a loser or else you don't have any issues."* (Appendix 14: Trine, 82).

To reconcile perceiving oneself as resourceful on the one site and being categorised as "vulnerable" on the other side is thus experienced as a difficult exercise. This is complicated by the fact that most of the pregnant women appreciate the offer of being on a vulnerability team: *"It has really been a great help"* (Appendix 3: Camilla, 15). In Camilla's enactment of vulnerability, the categorisation of vulnerability arises an ambivalence which has been visible in many of the pregnant women's experiences: How can the pregnant women sustain their perception of being resourceful whilst at the same time agreeing to be on a vulnerability team? On one side the pregnant women perceive themselves as being resourceful, but on the other side, they recognise themselves as being vulnerable. For several of the pregnant women, the ambivalence became outspoken when they were invited to a vulnerability team. This "invitation" made them reflect on their vulnerability and some of the women's vulnerability for a while became intensified

as they had a feeling of being put in a box or watched by the healthcare system. Despite different enactments, the pregnant women were convinced to accept the health professional's enactments of vulnerability, as they appreciated the extra healthcare services they were offered when they, by the healthcare system, was defined as "vulnerable". The convincing, however, required that health professionals gave a proper introduction to the offer, as it eased their vulnerability of feeling watched. Being defined as "vulnerable" shows to contain an ambivalence as most of the pregnant women feel both resourceful and vulnerable at the same time. When the vulnerability team is not introduced properly, it is an example of how the ambivalence is not taken into account in the healthcare system's enactment of vulnerability. This results in clashes between the pregnant women and the health professionals. The health professionals, therefore, have to convince the pregnant women of their enactment of vulnerability for the pregnant women to feel met in their vulnerability. There thus exist multiple enactments of vulnerability, however, these multiple enactments can coexist depending on how the healthcare system's enactment is translated.

5.2.4 When the focus is totally wrong

During Ellen's latest pregnancy her sister, who works as a midwife, recommended a midwife who would be a perfect match for her. So, in advance of her first consultation with the hospital, Ellen called the hospital to ask if she could be attached to that midwife: *"and then I was told that it was not an option because I was put in this category."*(Appendix 6: Ellen, 34). Ellen wondered what that was about. She went for her first midwife consultation and noticed that she was followed to another room than in her previous pregnancy: *"Then the conversation was very much about whether I was eating healthy, if I exercised [...] not about me being pregnant"*(Ibid.). Apparently, Ellen was put in the category of overweight pregnant women, something that the GP had initiated at her first consultation. It, for example, implied that the hospital could not allow her to give birth the way she wanted to and that she had to attend consultations with a midwife specialised in diets. For Ellen, it was a bad experience. Mainly because she was not asked if she wanted to be a part of the team: *"How about talking with me and figure out who I am?"*(Ibid.). Ellen has four kids that she has all given birth to. When looking back at all her pregnancies, she has felt an enormous vulnerability to the feelings that arise when giving birth.

> *"I get so touched by the fact that a human being is brought to life by me. And this new role that occurs in me both in the pregnancy and in the moment where the baby arrives at birth [...] I'm not afraid of the birth but my reaction afterwards. I can't even talk about it without crying."*(Appendix 6: Ellen, 37).

Additionally, she experienced the birth of one of her kids as very chaotic and she felt that it was a miracle that she even survived. Because the birth went how it should with everyone surviving, no one talked about the chaos afterwards (Appendix 6: Ellen, 38). Generally, she expresses that she has felt alone with the vulnerability that is attached to giving birth and could have wished for a more individualised trajectory.

> *"I've met acceptance and recognition [...] there's been a professional acceptance like "oh there's a person here that's pretty emotional". But I haven't been met by someone who could enter a dialogue with me about it."* (Ibid.).

Conflicting enactments of vulnerability arise. The healthcare system enacts vulnerability regarding health risks. The vulnerability is done through measurements of weight and height - through physical measures that are calculated by the scale of BMI. To Ellen, this focus seemed *"TOTALLY wrong"* (Appendix 6: Ellen, 36). Her enactment of vulnerability instead is about giving birth and she thus wishes to be seen and heard in that. This also shows when she proactively tried to get attached to a certain midwife. Ellen even ended up lying to the midwife about her weight to make the consultation concern her enactment of vulnerability: *"I have come here to hear the heartbeat of my baby. That's what I want [...] then I just told them that I'd gained less weight than I did because I simply couldn't stand that show"* (Appendix 6: Ellen, 35). Ellen's experiences show how different enactments can clash and nuance what these clashes might result in. In this case, it was not possible to make the health professionals' and the pregnant women's enactment of vulnerability coexist. As Ellen perceived the health professional's enactment of vulnerability as totally wrong, it resulted in her counteracting the health professionals' enactment. Ellen's case shows that clashing enactments of vulnerability might result in a feeling of not being met by the healthcare system.

5.3 Summarising part I

The reflections that the pregnant women have of vulnerability point in multiple directions and can be attached to circumstances such as diagnosis, fertility treatment, or previous traumatic births. At the same time small life events, such as eating liquorice, or more comprehensive worries about the future, make vulnerability fluid. It also contains ambivalence and contradictory feelings, as pregnant women might feel both vulnerable and resourceful at the same time or feel both happy and scared about the pregnancy. Vulnerability is done in multiple ways. It is enacted in messy networks of events and actors that constantly translate vulnerability and make it non-stable. The healthcare system, on the other hand, categorises vulnerability in four predefined care levels based on physical as well as psycho-social conditions. Through collecting data about the pregnant women, the individual health professional defines vulnerability and as a result pregnant women might get attached to a vulnerability team. This way of categorising vulnerability makes some pregnant women feel squeezed into a certain box of being "vulnerable". This does not mean that the individualised offer that comes with being defined as "vulnerable" is not appreciated. Oppositely, most of the pregnant women were pleased about the extra time and attention as they felt met by the healthcare system. This appreciation, however, is dependent on whether the healthcare system and

the pregnant woman's enactments of vulnerability can co-exist. The pregnant women's enactment of vulnerability is namely highly intertwined with how the healthcare system enacts vulnerability as they rely on each other. As there inevitably is a difference in the enactment of vulnerability dependent on whether one is a pregnant woman or a health professional, their relationship can be characterised the same way as when Mol describes how two people mutually attempt to: *"insert each other into their own highly specific agendas."*(Mol 1999, 81). Their relationship thus depends on whether they succeed in convincing each other of their respective enactments of vulnerability. In most situations, the pregnant women manage to make their enactment of vulnerability co-exist with the health professional's enactment as they appreciate the extra healthcare services they are offered. In some situations, however, the pregnant women's enactment of vulnerability clashes with the healthcare system's enactment in a way that makes them incompatible. Clashes create a distance between the pregnant women and the health professional resulting in some pregnant women feeling neglected or misunderstood. What is at stake, in the enactments of vulnerability, is how the healthcare services, and thus care, will be perceived by the pregnant women. Manoeuvring in multiple enactments of vulnerability, in practice, thus depends on how care is practised.

6. Part II: Manoeuvring with care practices

When different enactments of vulnerability overlap in one way or the other, the result depends on care work. The multiple ways vulnerability is done thus show that vulnerability inevitably is intertwined with care practices. Since the digital maternity record aims at creating better maternity care for "vulnerable" pregnant women, it is relevant to unravel the relation between vulnerability and care to understand how care is enacted and can be enacted in future pregnancy trajectories. By investigating the official recommendations for maternity care, interviews with health professionals, and situations described by the pregnant women, it is revealed how enactments of care sometimes are structured and evidence-based (based on the logic of choice) and sometimes are intuitive and surprising (based on the logic of care).

6.1 Evidence-based enactments of care

In this section it is described how some enactments of care are based on evidence and professional arguments. Firstly, the recommendations for maternity care are introduced as this is a representation of how maternity care is officially organised by Sundhedsstyrelsen. As the official document is published by Sundhedsstyrelsen, who is the supreme healthcare authority, we perceive the document as an actor that constitutes the healthcare system's formalised ontology of care. It is analysed how these recommendations shape care practices by drawing on some of the situations that have already been presented (cf.

section 5). These are used to unfold how the health professional's enactment of vulnerability is influenced by certain enactments of care - from the logic of choice.

6.1.1 Organised enactments of care

In the official, and recently updated, recommendations for maternity care, Sundhedsstyrelsen describes that the overall aim in the maternity care is to ensure that the healthcare system in the best possible way *"takes care of the individual woman's special needs related to pregnancy and childbirth so that we achieve the greatest possible public health."* (Sundhedsstyrelsen 2021, 7). Sundhedsstyrelsen acknowledges that pregnancy and birth is a life event for the single woman, but it is apparent that the main focus is that pregnancies are of *"great importance for public health"* (Sundhedsstyrelsen 2021, 9). Pregnancies are obviously a necessity for the sake of reproduction, but it is also described as a period that affects the health of both the mother and child-to-be. It is thus a period where it is possible to prevent negative health effects (Sundhedsstyrelsen 2021, 12). In this matter, Sundhedsstyrelsen concludes that the risks of negative health effects during pregnancies are more present when concerning "vulnerable" and "socially exposed" women (Sundhedsstyrelsen 2021, 73). For example, evidence reveals that occurrences of premature birth, stillbirth, low birth weight, malformations, infant death, and birth depression are more frequent when pregnant women are socially exposed. Furthermore, mental disorders or traumatising experiences can be of great importance for the pregnancy trajectory and its outcome (Ibid.). Sundhedsstyrelsen defines maternity care as *"a collective term for the healthcare services' efforts during pregnancy, childbirth, and maternity leave."* (Sundhedsstyrelsen 2021, 7). In their definition of maternity care, it is thus visible that more healthcare services equal more care. In the attempt to allocate healthcare services, and thus achieve public health, Sundhedsstyrelsen differentiates maternity care into four care levels. The doors to healthcare services that get opened are, thereby, defined by the circumstances that the family brings with them: *"We strive to provide equal health for all and, therefore, we focus on the weakest groups"* (Appendix 15: GP, 88). The categorisation of vulnerability in four care levels is thus used as a tool to organise a system for maternity care. Pregnant women with more "complex" problems get access to more healthcare services. Sundhedsstyrelsen directly connects vulnerability and care to achieve better public health. This way of organising care reflects Mol's argument that *"Health care becomes something to be governed."* (Mol 1999, 85). It is thus Sundhedsstyrelsen's role to govern and allocate care, which has been done by creating structures around it. What permeates how Sundhedsstyrelsen governs care is evidence-based arguments. For example, Sundhedsstyrelsen advises on diet, physical activity, and work environment as evidence shows that it affects the pregnancy and the child-to-be (Sundhedsstyrelsen 2021, 94-121). They also advise controlling blood pressure and taking urine samples to check for e.g., preeclampsia (Sundhedsstyrelsen 2021, 126). Furthermore, the foetal growth and heart sound should be checked to ensure the health of the child-to-be (Sundhedsstyrelsen 2021, 128). This way of enacting care resonates

with Mol's description of the logic of choice where good acts are based on a sequence of arguments - facts leading to choices leading to certain acts (cf. section 3.2.2). An enactment from the logic of choice could begin with a routine consultation showing high blood pressure and protein in the urine of the pregnant woman - this is seen as a fact. There is thus a risk of preeclampsia - this is also a fact that is based on evidence. From the facts, a choice has arisen of whether to induce labour or to advise the pregnant woman to go home and relax depending on how severe the condition is and how far she is in the pregnancy. As the pregnant woman is in week 39 the GP assesses the need for further examination. The action in this situation thus becomes that the GP sends a referral to the hospital with an eye to a possible inducement of labour (Dalsgaard 2022). The logic of choice includes the understanding that time is linear meaning that facts result in a certain sequence of choices leading to certain actions. Sundhedsstyrelsen recognises that some circumstances might overlap, and care levels thus might change during pregnancy due to changing circumstances, which makes the structures less rigid (Sundhedsstyrelsen 2021, 30). Assessing the pregnant women's care level is not only a result of the official recommendations as the assessment is supposed to happen in an interplay between the health professionals and the pregnant women as it *"to the extent possible should be based on the pregnant woman's own perception."* (Sundhedsstyrelsen 2021, 28). However, the health professional's assessments and choices should always be based on evidence. The recommendations are thus a guideline to organise maternity care which inevitably influences practice, but they do not determine care in practice. Mol argues that care *"is infused with experience and expertise and depends on subtle skills that may be adapted and improved along the way."*(Mol et al. 2010, 14). We unfold this experience and expertise by describing situations where care is enacted.

6.1.2 Following the recommendations

When several of the pregnant women felt watched (cf. section 5.2.3), we have become aware that it is a result of the healthcare system's enactment of care. If the healthcare system detects a case where a child's health or wellbeing is at risk, maternity care also includes the *tightened duty to report* (Sundhedsstyrelsen 2021, 291).

> *"Once in a while we get more concerned than the families do themselves [...] then our perspective changes since we have a tightened duty to report [...] the perspective shifts from the pregnant woman, the parents, to the child, because then we, as an authority, in the municipalities, and as a society, have a responsibility for the children who are born - that they're born in a caring environment, which meets the needs they have."*(Appendix 16: Midwife, 100).

The rationale behind the tightened duty to report is to secure the health and wellbeing of the child. It is done as an enactment of care. The GP also expressed that they have *"an ultra-extended focus on the*

child" (Appendix 15: GP, 88), and said that securing the health of the children is *"what it's all about"* (Appendix 15: GP, 92). The health visitor declares that *"no matter what, we also function as a control operation"* (Appendix 17: Health visitor, 112). Therefore, the pregnant women's vulnerability attached to the worries of being watched do not come from nowhere. It comes from the way that the healthcare system not only enacts care for the sake of the pregnant woman but also for the sake of the child-to-be. The GP reflects on the ambivalence that the tightened duty to report entails.

> *"That's the price you must pay in society to take care of those who cannot take care of themselves. [...] In other words, those who have nothing to hide must put up with surveillance because it serves a purpose."* (Appendix 15: GP, 93).

The health professional argument is that it is necessary to act as a control function when the parents' vulnerability might affect the child-to-be. It is meant as an act of care. Sundhedsstyrelsen's enactment of care, in this case, is an example of what Mol describes as the logic of choice. It is a fact that there are children in Denmark whose parents cannot take care of them, and the healthcare system has a tightened duty to detect such cases (Sundhedsstyrelsen 2021, 291). Based on the parents' psycho-social conditions, health professionals have to assess the risk for a child's health - this can be described as the choice that health professionals have to make. This assessment might result in the act of writing and sending the report to the social administration. These procedures of tighten duty to report is a tool to manoeuvre in cases where vulnerability needs special attention to ensure the wellbeing of the child. This enactment of care, however, "comes with a price" as it in some cases results in pregnant women getting worried of being watched when they are categorised as "vulnerable". Because they are not enlightened in the logic behind the enactment of care, they become worried that decisions about their motherhood are made without them.

When Ellen was categorised as overweight, the health professionals also acted from the logic of choice. While Ellen's enactment of vulnerability took shape from a previous traumatic birth, she experienced that the healthcare system solely enacted her vulnerability through a heightened BMI, which clashed with her own enactment of vulnerability.

> *"Some of it is also about the pregnancy itself being vulnerable [...]. This can also cause special attention and special vigilance. So, it's not just the mental parameters."* (Appendix 15: GP, 89).

It is thus a part of the healthcare system's enactment of care to take physical measurements into account. The focus on the physical pregnancy was also apparent in the GP consultation, we attended, where the bombardment of questions to the pregnant woman concerned her anamnesis, lifestyle, as well as physical measurements (cf. section 5.1). Evidence shows that weight, physical activity, and other lifestyle choices

such as smoking and drinking alcohol, are factors that have an impact on the health of the mother as well as the child-to-be (Sundhedsstyrelsen 2021, 94-121). The physical aspect of a pregnancy is thus important in a health professional perspective. It contributes with important facts that can define the health professional's enactment of vulnerability and thus what kind of care the pregnant woman is offered.

> *"You could say that it's a healthy pregnancy if the mother thrives, but it's also necessary that she's healthy. You may have an experience of well-being but be a heavy smoker. Some physical things need to be in place."* (Appendix 15: GP, 90).

According to the BMI scale, Ellen is by fact overweight, and from a health professional perspective, it is a fact that being overweight comes with many potential health risks. There is thus a sequence of health professional arguments that verifies the need to prevent these health risks. This results in a health professional choice of enrolling Ellen in an individualised trajectory. Different preventive actions are then being initiated, in this case, the action is to roll out a trajectory with consultations about diets. Even though the healthcare system can logically argue that a focus on BMI is enacted as care, it was not perceived that way by Ellen. Instead, the focus on the physical aspect of Ellen's pregnancy resulted in irritations and frustrations. Here, it is confirmed that *"There is no single, crucial moment when all relevant fact values are available. Problems emerge and as they are tackled new problems arise."* (Mol 2008, 54). Care practices are overflowing with multiple notions of what good care is, and it must be safe to say that everyone wishes care to be good. However, as it is also the case with the ambivalence that the tightened duty to report entails, there is not necessarily an agreement on what *"this 'good'"* should look like (Willems & Pols 2010, 162). Reality might not be that obvious, rather *"Good and bad may be intertwined; good intentions may have bad effects; if one looks hard enough any particular 'good' practice may hold something 'bad' inside it (and vice versa)."* (Mol et al. 2010, 13).

We see the recommendations for maternity care as the healthcare system's formal ontology of care - a procedure for maternity care. In practice, these recommendations are expressed when the health professionals perform and assess based on evidential arguments - as when there is a tightened duty to report or a heightened focus on BMI. The ontology resonates with what Mol describes as the logic of choice. In the cases we have described, the pregnant women are not involved in the logic of choice. This result in clashes occurring between the health professionals and the pregnant women, who end up being worried or frustrated - in Ellen's case she even ended up counteracting the health professional's care enactment (cf. section 5.2.4). In both the recommendations and in the two described situations, care is mainly enacted based on health professional evidential arguments - based on the logic of choice where time is linear. However, when vulnerability both takes multiple, ambivalent, and fluid forms it proves that *"time twists and turns"* (Mol 2008, 54). This entails that care enactments cannot exclusively be based on a linear

sequence of arguments: *"in most cases, the starting point of care is not population measurements, but people going to the doctor because they feel they have a problem."*(Martin et al. 2018, 301).

6.2 Intuitive enactments of care

In the following, it is unfolded how care is not always enacted on evidential reasoning but instead enacted through intuitions. By presenting four care situations, we show how care also emerges unexpectedly - how care is *"active"*(Mol et al. 2010, 15). We have chosen these situations to show that care cannot always be predetermined but instead is a result of careful and attentive experimentation as well as continuous practical tinkering - from the logic of care (Ibid.). We show how this kind of care influences pregnant women's enactment of vulnerability.

6.2.1 Caressing her forehead

"To me [care] is all about seeing me. That one uses a moment to consider: "Who's in front of me?""(Appendix 6: Ellen, 36). Ellen is feeling cared for when being asked how she is and what she needs. It also implies that she feels that she and the health professionals are a team with a joint focus of giving birth to her child. During the birth of her third child, she felt a certain kind of care that has been of great importance to her both at the time and since. What characterised the birth, was that it all went very fast as the contractions escalated quickly and suddenly her child was about to be born. Therefore, she was not able to accompany it neither painfully nor mentally. A lot of people entered the room and it all felt like massive chaos to her. In the middle of it all, someone walked in and caressed her forehead.

> *"I didn't even notice who it was. Three minutes after I gave birth to my child and got her up on my stomach, I remembered that it was the section leader midwife that I had met once before. She just showed up and caressed me a bit, and it meant... I get so moved... It meant so much to me [she cries]. Someone just came with care without any further function. It was just that, and then she left. I'll never forget that."*(Appendix 6: Ellen, 37).

The feeling of care was released and remembered afterward only by a quick caressing of her forehead, a physical kind of care. At that moment, she felt that the midwife was only a human, a human who *"walks around caressing foreheads"* (Ibid.). Ellen described her vulnerability as closely related to giving birth. This probably influenced why the caressing of her forehead, which might appear as a tiny care enactment, touched Ellen. Her perception of the care enactment is thus shaped by her vulnerability, and the enactment of care is at the same time influencing her vulnerability in the situation. The experimentation, which can also be described as practical tinkering, was, in this case, well-received. The situation also shows how care is not solely verbal which makes it difficult to express. It does not make it less important

to describe. Physical touch is one example of a non-verbal tinkering used in the enactment of care. Another experience of practical tinkering happened when Frida experienced a situation where she was hospitalised in the maternity ward because of early contractions.

> *"[My midwife] takes the face mask off and says: "Do you see? It's me. Take it easy, we'll see each other in two weeks" [...] and then I felt: "Oh well, if she's calm then I can also be calm about not going into early labour""* (Appendix 7: Frida, 42).

The enactment of care, including both non-verbal and verbal acts, made Frida feel calm and cared for in a situation where she felt scared. Both in the case of Ellen and Frida, the enactment of care is based on intuition, not evidence. This intuition resonates with the logic of care where there is room for experimentation and attempts to adapt to a given situation. Both pregnant women emphasised the situation in the interviews, which reveal that practical tinkering has left a mark in their memories. The GP also confirmed that *"Small things that have not been put into a formula mean a lot"* (Appendix 15: GP, 91) in care practices. However, practical tinkering can also be something that cannot be expressed verbally - it might not even get noticed. Despite that, it is still an important part of the enactment of care. It appears in practice, and we do thus not have many examples represented in our empirics since it mostly consists of verbal interviews. However, during our observations in the midwife clinic in Aabenraa, we saw how enactments of care through practical tinkering often and sporadically occurred, even though we were only present in consultations for a few minutes at a time - a genuine hug, an arm on the shoulder to make one feel welcome, fresh coffee on the table, and that the midwife carefully juggled between the screen and the couple (Appendix 18: Field notes, 117-122).

6.2.2 Teaming up

During week 20 of Sofie's pregnancy, she experienced Braxton Hicks contractions and was, therefore, invited to a consultation with an obstetrician. By monitoring the contractions, the obstetrician confirmed that there were many of them. However, she was sent home and agreed to keep an eye on it. At week 28 of her pregnancy, intense contractions appeared again and this time Sofie got really scared. She went to the hospital and was informed that the contractions were not just false labour but real labour. Suddenly, five people were in the room as the situation got critical, and serious worries began to fill her thoughts: *"She [the child-to-be] was not nearly big enough. My mind went by 300 km/t. She could survive but it wouldn't be fun. She might have a sad future with complications."* (Appendix 12: Sofie, 70). Fortunately, it stopped being critical as her cervix was not shortened which indicates that she was not about to give birth anyway. Not long after the critical situation, a midwife told Sofie that she could be sent home.

> *"It was no more than half an hour ago since the critical situation and even though it didn't turn out to be critical, it felt like it was in the situation [...] and then I was just suddenly released. But then the section leader midwife ran after me and said: "To me, it seems a bit too much that the one second, you're told that you're in labour and now you're about to leave. Can we arrange that you get back here tonight? For ours and your own sake, we'll check your cervix again and verify that nothing's wrong. Then we're all at peace."* (Appendix 12: Sofie, 71).

It was a frightening situation for Sofie as she reached a point where she was thinking about the future of her child. Vulnerability shows its fluidity in this situation as it occurs, not due to her underlying vulnerability, but as a reaction to a frightening situation. To tackle Sofie's sudden-occurred vulnerability, the midwife extended the logic of choice (by following the procedure of sending her home since her cervix was not shortened) by acting from the logic of care (by meeting her in the fear she had just been confronted with). By enacting from the logic of care, the midwife manoeuvred in the vulnerability that suddenly occurred to Sofie. Frida also experienced the same when her midwife reached beyond what the procedure tells her to act upon.

> *"Normally they don't tell you what to do. But I had such a hard time making a decision. And then she said: "I think you should have a scheduled c-section". That was really nice."* (Appendix 7: Frida, 41).

For Frida, it was a relief that the midwife understood what she needed in the situation - that she took responsibility and made the hard decision for her. She felt taken care of since her midwife took part in the responsibility. Both Sofie's and Frida's respective midwives manoeuvred in their vulnerability with the logic of care, which gave a feeling of being teamed up with their midwife, and despite the unpleasant situation, it became manageable. Other pregnant women also described the importance of feeling that they, together with the health professionals, had a shared responsibility for easing the worries that occur during pregnancy.

> *"My midwife was so nice. She told me that I should rather call one time too much than one time too little if I'm getting worried. Just by her saying that, I didn't feel the need to call."* (Appendix 7: Frida, 41).

> *"If you have any questions, text me! "Do you Google?", "Yes.. I Google", "Don't! Text me. I'm Google.""* (Appendix 2: Christel, 7).

> *"I got the feeling that I could always call her. I didn't. But just to know that I could call someone made me feel safe."* (Appendix 4: Carina, 25).

> *"I got her work number and was told: "You can just call and write to this number, and then I call you back [...] rather 15 times too much than one time too little""* (Appendix 8: Jeanette, 47).

The shared responsibility in these cases is a matter of having a lifeline in situations where worries and thus vulnerability occur. Just knowing that there exists a lifeline with the possibility to get a professional assessment of the given situation, gives the pregnant women a feeling of care and thus helps them to manage the vulnerability that sporadically can occur during pregnancy. The need of having a lifeline appeals to the logic of choice since the need for health professional assessments that follow procedures, and that are evidence-based, might be actualised when situations of vulnerability suddenly occur during pregnancy. However, what kind of care gets enacted in a specific situation, where the lifeline is used, depends on the specific situation. We have previously described situations, where health professionals' enactments of care, from the logic of choice, clashed with pregnant women (cf. section 6.1). In the situations in this section, however, the health professionals' enactments from the logic of choice are perceived as acts of care. The lifeline provides a feeling that the pregnant women are not alone with the responsibility for the health of their child-to-be. When health professionals have told the pregnant women to call at any time or have given their private work number so that women can text them, it is an act from the logic of care. The health professionals' manoeuvre in the fluidity of vulnerability - that worries appear and disappear due to unforeseeable circumstances. When pregnant women call for help, they call for a health professional assessment, they call for enactments from the logic of choice. Even though it has shown that acting from the logic of choice can result in frustrations, these situations show the importance of the health professionals acting from the logic of choice as health professional assessments can create fewer worries for pregnant women. It is, however, also shown that the logic of choice cannot stand alone as it depends on how the professional assessment is translated with the logic of care. The two logics do thus not have to be separated as they are also intertwined.

6.2.3 An unidentifiable feeling

Due to a violent relationship with the father of her older daughter, Camilla suffers from PTSD. She told how she, in the time being, was also exposed to systemic violence as she was forced, by the system, to cooperate with the father in concern to their child, despite the history of aggressive abuse. Consequently, she today feels resistance towards authorities and particularly public authorities. As she later got pregnant it struck her that it meant facing public authorities again - doctors, midwives, health visitors, etc. Due to her former experiences with abuse and accompanying PTSD, it also required her to be part of a vulnerability team: *"I was kind of choked. I really couldn't cope with that."* (Appendix 3: Camilla, 13). Anyways, she accepted the offer and was met by a midwife that enacted the kind of care that she needed.

> *"It was a match made in heaven. She saw me and how afraid I was. Even with a face mask on. She understood what I'd been through. That trust had to be built for her to even talk to me, to make me stay in the system. She promised me that no matter what I entrusted her with, she wouldn't get worried [...] the frequent conversations never had a deadline. Or at least I didn't notice a deadline. She dared to be straightforward about what I've been through [...] and not be judgemental of who I am."* (Ibid.).

The logic of care is particularly noticeable in Camilla's situation as the midwife was able to build a certain kind of trust that Camilla has not experienced from the system before. This building of trust is not based on evidence, but on the midwife's ability to manoeuvre in her vulnerability. The way the midwife enacted care was aligned with Camilla's own interpretation of what care is: *"It's something about following the person that stands in front of you. That you have some kind of empathy"* (Appendix 3: Camilla, 16). It was noticeable to Camilla that the midwife was specialised in handling vulnerability: *"She had the expertise and the vocabulary."* (Appendix 3: Camilla, 18). Through the feeling of endless time and unprejudiced conversations, the midwife gained a trust that Camilla otherwise had been in opposition to. It made Camilla *"lean back"* (Appendix 3: Camilla, 14) in the process of her pregnancy despite her history of distrust towards the system in general. The relationship between Camilla and the midwife shows how difficult it is to pinpoint exactly what created the kind of care that ended up being so central in Camilla's pregnancy trajectory - expertise, time, chemistry. It is an assemblage of things that are difficult to pinpoint and describe in words. It is an unidentifiable enactment of care, which other women also have experienced.

> *"I felt that an adult was present - one who looked after me, somehow"* (Appendix 7: Frida, 44).

> *"I was allowed to be sad and happy and angry and all kinds of stuff. There was time for everything."* (Appendix 6: Ellen, 36).

> *"I was treated like a human being with individual circumstances"* (Appendix 14: Trine, 84).

The above explanations contain a *"large non-verbal component of what is specific to care practices"* (Mol et al. 2010, 10). While caressing a forehead or offering a lifeline is a concrete enactment of care, it is difficult in these situations to find the words to describe how care concretely is enacted. Care can thus be non-identifiable, something that the pregnant women cannot describe - it is something that limits *"using words at all"* (Ibid.). In these situations, there is no logic of choice. There is just that "something". Something that might happen through chemistry between humans, because of the atmosphere in the room, due to body language, a feeling of endless time. It is about the setting, the circumstances, the health professional's expertise, and being attentive to what happens in the situation. It resonates with Mol's description of the logic of care - and that "something" creates a room for manoeuvring in the vulnerability that pregnant women might feel in that specific situation.

6.2.4 Encouragement instead of epidural

Trine has a history of depression and additionally, her mother got diagnosed with cancer a month before she realised that she was pregnant. Dealing with her mother's disease resulted in Trine distancing from the healthcare system: *"I think I'm enough in the hospital with my mom"* (Appendix 14: Trine, 81). Her distance towards hospitals contributed to her planning a home birth. Together with her partner, she wrote down wishes for the birth on a large poster, saying: *"Tell me what you do. Ask me first. My boyfriend speaks English… And so on"* (Appendix 14: Trine, 83). However, due to vaginal bleeding, she ended up giving birth at the hospital, and the poster with her wishes was left at home.

> *"When I got to the hospital, I got a midwife where all she wanted to give me for my pain was an epidural which I had written off a long time ago since that's not an option in home births. I don't want any kind of medication. I have a hard time with hospitals and anaesthesia."* (Ibid.).

In the situation, Trine was in a lot of pain, and the midwife's way of handling it was by offering an epidural. From a health professional perspective, the midwife attempted to release her from some of the pain and to follow procedures to make sure that the birth proceeded safely with a minimum of health risks for Trine and her child. The midwife's enactment of care follows the logic of choice. The fact that Trine was in pain caused the midwife to make a choice of suggesting an injection of local anaesthesia into her spinal cord. It was meant as an act of care, however, it was perceived differently, since Trine did not feel met in her vulnerability that lies in the resistance towards hospitals and anaesthesia. Consequently, Trine felt afraid, insecure, and helpless: *"you don't listen to me and everything that I say isn't considered. I never understood why I should have an epidural."* (Ibid.). Due to Trine's vulnerability attached to anaesthesia, she simply did not perceive the midwife's care enactment as care resulting in their respective enactments clashing. Trine ended up being frustrated with the midwife.

> *"I just don't want to be a pregnant woman in an assembly-line […]. They don't make assessments based on me but based on a scheme. It's the feeling of being a scheme or a statistic that isn't pleasant to me. I want to be Trine, who is pregnant and a damn happy soon-to-be-mother. I need someone to believe in me. I need someone I trust who can give me a sense of comfort and encouragement"* (Ibid.).

"Cut to change of shift" (Ibid.), Trine said and then described how *"a dream team"* (Ibid.) entered the delivery room and two hours later she gave birth. The "dream team" asked a lot of questions: *"What does your body tell you? […] What do you want? […] What do you need? What do you think? […] Do you want to be in another position? […] What about nitrous oxide?"* (Ibid.). She suddenly felt empowered: *"It was a completely different feeling that I could do this myself!"* (Ibid.). She described that it meant a lot being encouraged and being told: *"You're doing great!"* (Ibid.). She ended up leaving the hospital with a feeling of: *"Damn! The woman's body is freaking awesome! I was the greatest at giving birth!"* (Ibid.). Being asked

questions about her state of mind and being encouraged throughout the process was, to her, perceived as care. The effect of the different enactments of care from the two birth teams shows. The first birth team enacted according to the logic of choice, where a focus on professional arguments had the consequence that they did not notice Trine's vulnerability. This left her frustrated with a feeling of being a pregnant woman in an assembly-line rather than a pregnant woman with individual circumstances. Instead of using professional arguments, the second birth team enacted according to the logic of care by being extremely attentive to Trine's vulnerability - they used the attentiveness to experiment carefully. The logic of care was thus used to manoeuvre in her vulnerability during her birth.

6.3 Summarising part II

In the research of the official recommendations for maternity care, it has been shown how the public health authorities enact care according to what Mol describes as the logic of choice. Enacting from this logic entails that evidence-based arguments are preceding the care that is being offered - an act of care is based on a linear sequence of arguments. This is also how and why Sundhedsstyrelsen organises vulnerability in four care levels. They create a direct link between vulnerability and care - the identified vulnerability defines the healthcare services that the pregnant women get. However, when it is revealed that vulnerability is more multiple, fluid, and ambivalent, than the four care levels represent, it also means that enactment of care cannot always be based on procedures (the logic of choice), as it also requires practical tinkering and careful experimentation (the logic of care). To meet the multiplicity that constitutes vulnerability it is necessary trying, adapting, and just doing something. Care is not solely a matter of evidence-based arguments to make the right health professional assessments in a given situation but also a matter of trying to understand the pregnant women. There have shown to be *"different, sometimes conflicting ways of conceptualising good care."* (Willems & Pols 2010, 162). The point, however, is not to raise an argument about what good is the general best, but to negotiate *"how different good might coexist in a given, specific, local practice."* (Mol et al. 2010, 13) - how enactments overlap one another. In the presented situations, we have focused on situations where care was enacted "successfully" - but while a caress on the forehead was perceived as an act of care by one pregnant woman, it might have been badly received by another. That is the premise of care when it is about careful experimentation. The effect of the experiment remains unknown until it is carried out. Common for all the care situations is that the logic of care makes the pregnant women feel less vulnerable. This is what makes them feel met in the multiplicity that constitutes the vulnerability that they experience. By that we do not say that the logic of choice is irrelevant in care practices - *"rather the logic of care wants professionals not to blindly apply the results of clinical trials, but to translate them carefully."* (Mol 2008, 85). What we do say is that it is important to act from the logic of care. It is about the health professionals carefully translating their

enactments of vulnerability in a way so that the pregnant women perceive it as care. The logic of care can help health professionals to manoeuvre in multiple enactments of vulnerability. The question that follows is whether the digital maternity record can also take part in this careful translation of multiple enactments of vulnerability and thus take part in the care work.

7. Part III: Keeping up with the record

What has not yet been central in our descriptions of vulnerability and care, is technology. This is because technologies have either been invisible or placed in the background, in the stories that the pregnant women have told. Technologies, however, *"influence how people act, and - the other way around - people influence the way technologies act"* (Willems & Pols 2010, 168). And technology has thus also enacted in the care situations - the lifeline is dependent on a cell phone, consultations with a midwife require a chair, and an ultrasound scan can remove the fear of miscarriage - at least for a while. What technology also entails, however, is that: "*It is hard to predict the shape these 'experimental' practices will take when new technologies enter."* (Ibid.). So, when the digital maternity record enters as a new technology in the network around pregnancy trajectories, it is necessary to investigate how it might influence enactments of vulnerability and care. To do so we, firstly, take a step back from the digital form, and unfold how the current maternity record has been an actor in care practices which lead to the argument for digitising it. Secondly, we, through imaginations, analyse how the digital maternity record can take part in enactments of care and thus contribute to better pregnancy trajectories.

7.1 The current shape of the maternity record

The current maternity record consists of two central elements - firstly, a record that circulates internally among the health professionals, and secondly, an external record, the yellow envelope, which consists of two pieces of paper carried around by the pregnant women between the health professionals. Both the internal and external record have the purpose of containing important information relevant to the pregnancy. Pregnant women do not usually get access to information from the health professional's internal record, and the yellow envelope is thus their only guaranteed access to information concerning their pregnancy. Besides the continuous measurements and samples taken at midwife consultations, most of the information in the maternity record is gathered at the GP around pregnancy week six to ten. At the GP consultation we attended (cf. section 5.1), we experienced that creating the maternity record was a situation where information somehow was extracted from the pregnant woman. The flow of information was one-way. The experiences of setting up a maternity record reflect its intended function, namely, to pass on information between the three sectors: the GP, the hospital, and the municipal health visitor.

The technology is thus designed to share information, but how is the information sharing technology intertwined in the enactments of vulnerability in care practices?

7.1.1 Wandering with the yellow envelope

The yellow envelope was implemented in 1976 after a law from 1972 focusing on better orchestration of births and preventive health examinations (Jordemoderforeningen 2019; Gørvild et al. 2010, 42). The aim with technology back then was that it could *"contribute to notice the single woman in a complex system"* (Gørvild et al. 2010, 42). The GP confirmed that the information to a high extent intends to identify and place the pregnant woman in a certain risk group to give her a good and adjusted treatment in the healthcare system: *"It's about collecting all the basic information [...] what kind of person is facing us here?"*(Appendix 15: GP, 87). To succeed in passing on information between the three sectors, it currently requires that the pregnant woman wanders around with the yellow envelope through the healthcare system. Exactly that circumstance is perceived as *"hopelessly obsolete"* (Appendix 4: Carina, 26). Another pregnant woman describes that it is particularly problematic when being vulnerable: *"I, as a vulnerable pregnant woman, had to deliver information myself from the birth ward to my doctor. And the other way around. That's not smart."* (Appendix 3: Camilla, 18). What makes it absurd for the pregnant women, is that the maternity record barely has been used by the health professionals as a tool to pass on information.

> *"So, I do have the yellow envelope, but nothing's in it"*(Appendix 1: Cindy, 5).
>
> *"I have a physical piece of paper that nobody wanted to use"*(Appendix 14: Trine, 81).
>
> *"it's unbelievable that I have dragged it with me almost every time and there's just nobody who's used it"* (Appendix 4: Carina, 26).
>
> *"I think it's silly that I must bring that yellow envelope with me. [...] I haven't had it with me at any of my births, and I've given birth anyway"*(Appendix 11: Rebekka, 67).
>
> *"No, they don't use it. I've noted my weight myself. There's not really anybody who uses it for anything"*(Appendix 5: Dicte, 30).

In this context, it is relevant to mention that the COVID-19 pandemic has influenced the use of the yellow envelope. As it is a piece of paper, viruses can wander with the record too and some health professionals have thus rejected using it during the last two years: *"It was during corona, so nobody wanted to touch it"*(Appendix 3: Camilla, 18). However, it was used in Augusta's pregnancy, even though she was pregnant during COVID-19 (figure 6), which reveals that the use of the record varies across practices. We still wonder: If the healthcare system does not break down when the yellow envelope is taken out of the equation, as it has been for most of the pregnant women's trajectories during COVID-19, what role does

it even play? Syddansk Sundhedsinnovation (2022) has decided to replace the maternity record with a digital solution, however, the yellow envelope has become invisible in pregnancy trajectories, so what is being digitised? One of the pregnant women laughed and said: *"at the end [of the pregnancy] the envelope is semi-crumbled"* (Appendix 6: Ellen, 34). And when the pregnant women describe the yellow envelope as an obsolete and silly object, it seems like it is not only semi-crumbled but completely crumbled.

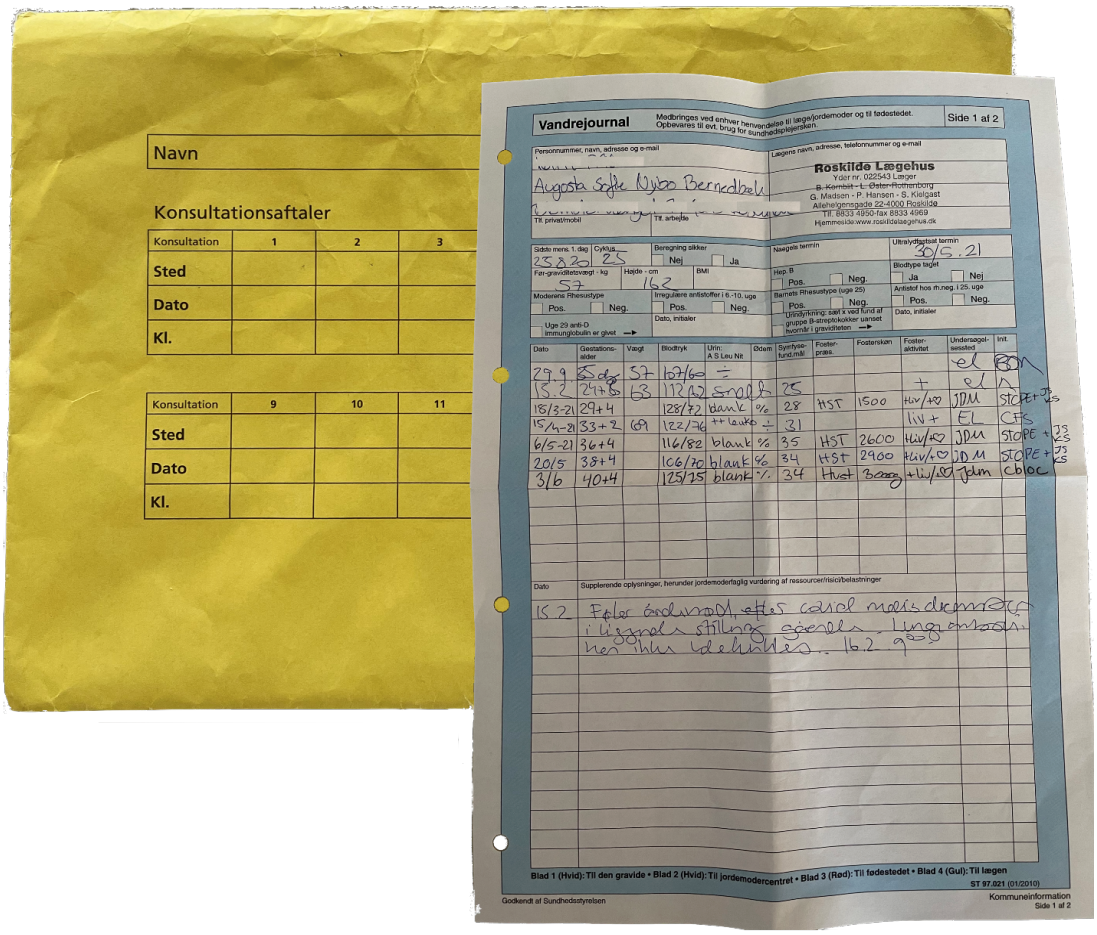

Figure 6: The yellow envelope and one of the two papers that the record contains.

All the pregnant women agree that the yellow envelope is functionally outdated, and, therefore, some of the pregnant women do not attach any certain value to it. However, some of the pregnant women expressed the opposite: *"It's completely crumbled, but still pretty pleasant"* (Appendix 4: Carina, 26). The yellow envelope is seen as a nostalgic object, and, therefore, some of the pregnant women wish to include it in a scrapbook or keep it in a box together with scanning images, the hospital bracelet, and the birth certificate: *"It's some very physical things that remind me of the pregnancy [...] It feels weird to throw it out."* (Appendix 9: Line, 57). The yellow envelope means something to some pregnant women, however, it is not perceived as anything crucial in their meeting with health professionals in care practices. For the pregnant women the yellow envelope is not perceived as a tool that has contributed to notice them

in a complex system. Rather it functions as a gimmick to them. The poor functionality of the yellow envelope, therefore, outweighs the sentimental value of it, and the pregnant women are, therefore, excited about the digitisation of the record.

7.1.2 An internal flow of information

Besides the yellow envelope, there also exists an internal record only for the health professionals that is used to circulate information about the pregnant women between the different health professionals. The practice around the internal record varies as some health professionals for example send the record to their colleagues electronically while others do it by post: *"Until [last month] big envelopes were sent by post"* (Appendix 15: GP, 92). That one part of the record is internal, also means that some information only circulates between health professionals and that the pregnant women, therefore, do not have access to it. The secret flow of information makes it difficult for the pregnant women to reflect on how the internal record has been an actor in their trajectories, as it is often invisible. However, through the pregnant women's descriptions, it becomes visible that the health professional's way of sharing information influences their experience of their pregnancy trajectory. This information sharing might also be attached to the use or non-use of the internal maternity record. Several of them mention that they experienced that the health professionals lacked information about them when they came to consultations.

> *"It's so weird that the midwife and the hospital have one system while the GP has another. Nobody knows anything about what the other has said"* (Appendix 3: Camilla, 19).

> *"It's like [the health professionals] have to repeat themselves again and again. Every time I meet them, they have to write the same and the same and the same."* (Appendix 4: Carina, 24).

> *"The biggest problem has been that you tell the same story over and over and over again. You get crazy"* (Appendix 5: Dicte, 28).

> *"I would have liked to use the time [at consultations] of not having to repeat myself"* (Appendix 14: Trine, 84).

As well as it was the case with the yellow envelope it appears that the internal flow of information is not working properly. There exist missing links in the information flow between the health professionals, which causes pregnant women to tell their stories over and over again. This results in frustrations. Dicte, as an example, feels frustrated that she has to repeat that she is a solo mom: *"Even though they read my record, they kept saying "remember to tell your partner…". I am a solo mom. How many times do you want me to say the same thing?"* (Appendix 5: Dicte, 30). Dicte's circumstance is thus not noticed. The information was thus present in the record, but it was not taken into account. The consequence was that the pregnant women ended up feeling that they were the ones responsible for collecting important information about their pregnancy and passing on information to the health professionals.

> *"That nobody looks [at the record] has proved to me that I, myself, must know what's important. [...] I used so much energy to ensure that what the health professionals said was true."* (Appendix 13: Stine, 76).

> *"I felt like I had to find all the answers myself which I found very unsafe"* (Appendix 4: Carina, 23).

The cases above are examples where the non-use of the internal record resulted in an unsafe feeling. Oppositely, Cindy described the positive influence it has when a health professional read into her record before the consultation as it made her feel met and understood.

> *"I was met in another way than before. Someone had read my story. I was listened to. They noticed my red eyes when I walked in. And they understood that it was a difficult situation. They mentioned both the process [of fertility treatment] and the fact that I miscarried last time. It makes all the difference."* (Appendix 1: Cindy, 3).

This example shows that information sharing through the internal record can be a part of care enactment as it makes it possible for health professionals to read pregnant women's histories, and thus manoeuvre in their enactment of vulnerability. A successful use of the internal information sharing, however, depends on a line of circumstances - what information is entered into the record, whom the information is sent to and thus shared with, if it is read, and how it is interpreted before the pregnant women step into the consultation room. And due to the previous examples of the pregnant women repeating themselves again and again, it seems like the current internal record does not work properly to serve the "right" people, the "right" knowledge at the "right" time. It is thus of great importance for the pregnant women to feel that the health professionals are informed about their trajectory, but the current maternity record seems limited in its contribution to this information sharing. The yellow envelope seems to be an irrelevant technology as it is barely used. The health professional's internal record, which is supposed to pass on information about the pregnant woman, does also seem to be inadequate as many of the pregnant women have had to repeat themselves in the meeting with the health professionals. The current maternity record does thus not live up to its expectations that were set in 1972 to notice the single pregnant woman in a complex system which is particularly problematic for women with "vulnerable" pregnancy trajectories. We are left with two technologies which do not seem to be intertwined in the enactments of care between health professionals as it is intended. We thus recognise the challenges of the current shape of the maternity record which also have been the starting point of the process of digitising it.

7.2 The future (digital) shape of the maternity record

The GP told an anecdote she got from a midwife employed at her medical practice about how digitising the current maternity record goes back in time: *"When she began her midwife education 25-30 years ago, they also back then talked about a digital maternity record."* (Appendix 15: GP, 87). She said that back then they assumed that the maternity record was the first thing that was going to be digitised. However,

it is probably closer to the reality of what a midwife we have met stated, that the yellow envelope *"is the only paper that is left in the healthcare system"* (Appendix 18: Field notes, 115). At least it appears old-fashioned to both the pregnant women and the health professionals we have talked to. The inadequacy of the current maternity record is thus a challenge that was identified many years ago. The challenge was described by its lacking ability to share information with both pregnant women and health professionals which was confirmed by the invisible and often unused yellow envelopes that the pregnant women showed us. Since 2005 several projects have been carried out to digitise the maternity record, however, none of these have been implemented (Rambøll & Qvartz 2018, 4). The pre-analysis by Rambøll and Qvartz concluded that previous projects *"has not resulted in the desired success"* (Rambøll & Qvartz 2018, 5). Furthermore, it was concluded that *"not all central actors have been possessing digital maturity"* (Ibid.). By increasing digitisation of the healthcare sector, it was concluded that health professionals had gained the necessary digital maturity to implement a digital solution to pregnancy trajectories, and digital immaturity was thus no longer a barrier. This should be understood in the light of a general movement towards digital solutions within the healthcare sector in the past years, such as Sundhed.dk, Fælles Medicinkort, Sundhedsplatformen. The Danish healthcare system has become more digital over the years, and this has happened due to a perception of digitisation as something that contributes to more efficiency, more value, and better communication leading to more coherent trajectories throughout the healthcare system (Digitaliseringsstyrelsen 2022b; Sundhedsministeriet 2022; Sundheds- og Ældreministeriet 2018). The positivity towards a digitisation of the maternity record was confirmed by the health professionals, who pointed out how a digital solution can contribute to ease their daily practices: *"it has great potential"* (Appendix 16: Michelle Kolls, 105). The pregnant women also described the digitisation of the maternity record as a positive and natural development.

> *"With my third child, I was surprised that [the maternity record] was still on paper"* (Appendix 6: Ellen, 39).
>
> *"Weirdly, it's on paper nowadays where everything else is digital"* (Appendix 4: Carina, 26).
>
> *"[Digitising it] makes total sense"* (Appendix 11: Rebekka, 67).

With a regained belief that a digital solution could be accomplished, a network of relevant stakeholders was established to carry out the project. Since the pre-analysis in 2018, the digitisation of the maternity record has been carried out as a national project, and the digital solution is going to replace the current maternity record within the next few years. The national project was initiated by a steering group within The National Board of Health IT (Den Nationale Bestyrelse for Sundheds-It) with representatives from both Danish Regions (Danske Regioner), Local Government Denmark (KL), The Danish Organization of General Practitioners (PLO), IT-architects from the Danish regions, Sundhedsdatastyrelsen and

Sundhedsstyrelsen. The steering group makes decisions and directs the project, while a project management has been established to take responsibility for developing the digital solution. The responsibility is shared between Syddansk Sundhedsinnovation, who functions as the overall project management, and Sundhedsdatastyrelsen, who is responsible for the it-management (Sundhedsdatastyrelsen 2022). But what is the official rationale behind the digitisation of the maternity record?

The purpose is that the Danish healthcare sector can offer *"an individualised and flexible digital pregnancy trajectory, where data flow across sectors in favour of the pregnant woman"* (Syddansk Sundhedsinnovation 2022). The project management presents four central ambitions for the digital solution, which is: 1) creating flexible and targeted healthcare services with increased differentiation and individualisation, 2) creating coherent patient trajectories across sectors, 3) creating an increased focus on early and preventive intervention, and 4) involving pregnant women and their partners more (Ibid.). The rationale behind the digital version does thus not differ much from the ambition to notice the single pregnant woman in a complex system that was the ambition with the yellow envelope back in 1972 (cf. section 7.1.1). There appears to be a broad agreement that the current maternity record is inadequate and that a digital maternity record has great potential. However, it remains unclear how this potential should be fulfilled. When the project management describes the visions of creating better coherency as well as more flexible and targeted healthcare services for pregnant women, they also describe that this is particularly important to a certain group, namely those with "complicated" pregnancy trajectories. The argument is that this group has a *"special need for cross-functional cooperation"* (Rambøll & Qvartz 2018, 22). This is where it becomes relevant to talk about how the digital maternity record might be intertwined with enactments of vulnerability and care. When the digital maternity record aims to create better and more adjusted pregnancy trajectories, it becomes necessary to talk about the multiplicity that constitutes the practice that the technology will be placed in. We, firstly, unfold how the current design of the technology reflects a certain enactment of vulnerability and care. Secondly, we discuss the potential of the technology by hypothetically "placing" it in some of the situations that we have presented and thus imagine how the technology might interfere in practice. From our experiences as interns and our observations at the pilot test in Aabenraa, we have both gained insight into the design process, technical specificity, as well as the use of the digital maternity record in practice. We use these insights to unfold some of the previously presented situations to analyse how a digital maternity record could have interfered in practice. The aim is to get closer to when and how the digital maternity record can become central in the enactments of care, and thus how it can contribute to better pregnancy trajectories.

7.2.1 Developing the digital maternity record

To understand how the digital maternity record might take part in enactments of care, it is necessary to unfold how it is designed. As it is visualised in figure 7, the technology consists of three main components, namely The Pregnancy Map (Graviditetsmappen), The Pregnancy Portal (Graviditetsportalen), and MyPregnancy (MinGraviditet). Graviditetsmappen functions as the core of the solution and is similar to the functionality of iCloud (Trifork 2022). In contrast to the yellow envelope, a digital version ensures that all parties can access data related to the pregnancy at any time. Involved health professionals enter data to Graviditetsmappen via the user-interface Graviditetsportalen. Correspondingly, the pregnant woman has access to all data related to her pregnancy through her user interface, which is the app MinGraviditet (see figure 8). There is thus no longer data that is only shared between health professionals.

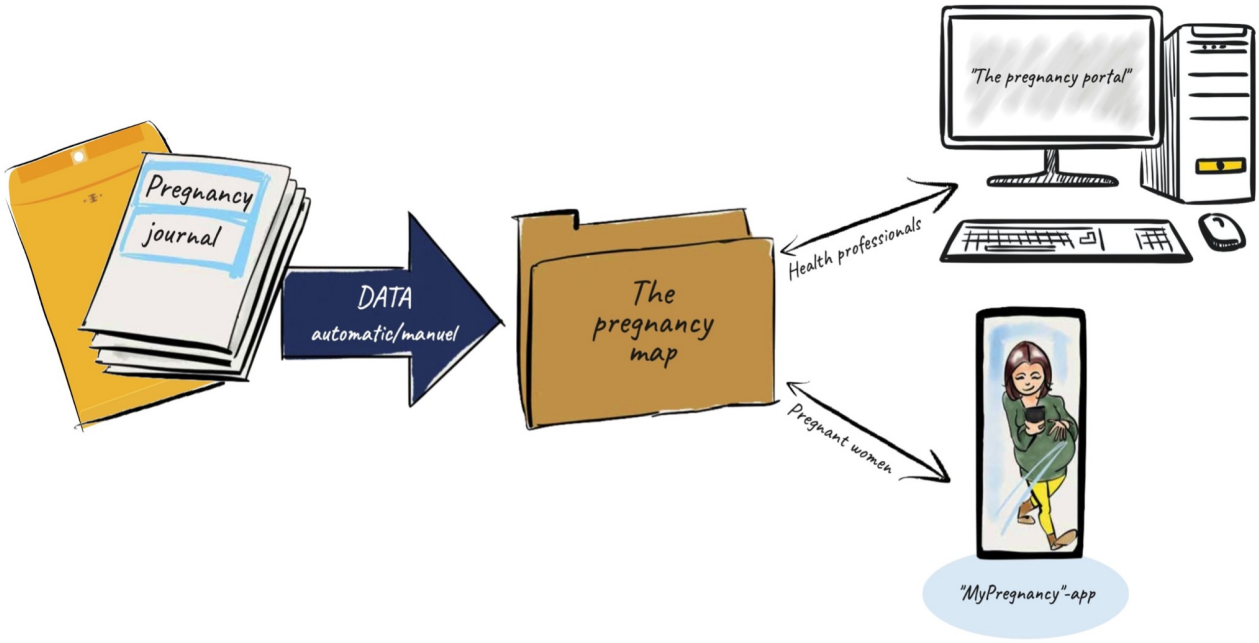

Figure 7: The development from the current maternity record to the digital maternity record, including the three main components 1) The Pregnancy Map, 2) The Pregnancy Portal, and 3) MyPregnancy-app (Sandner & Spangmose 2022, 12).

The digital solution can be described and illustrated in a relatively simple way, however, a long chain of negotiations has preceded its current shape. Rambøll and Qvartz' pre-analysis has in several ways constituted the foundation for the technological development of the digital maternity record. This was confirmed by the project manager, who described the pre-analysis as a fundamental pillar, as the project is built upon the results from it (Sandner & Spangmose 2022, 18). The pre-analysis thus kick-started the project after which the technological development has mainly been shaped by negotiations between health professionals and IT-architects across all the Danish regions. In contrast to a previous project, the design process has not simply been to *"electrify a piece of paper"* (Rambøll & Qvartz 2018, 4), but rather to improve it.

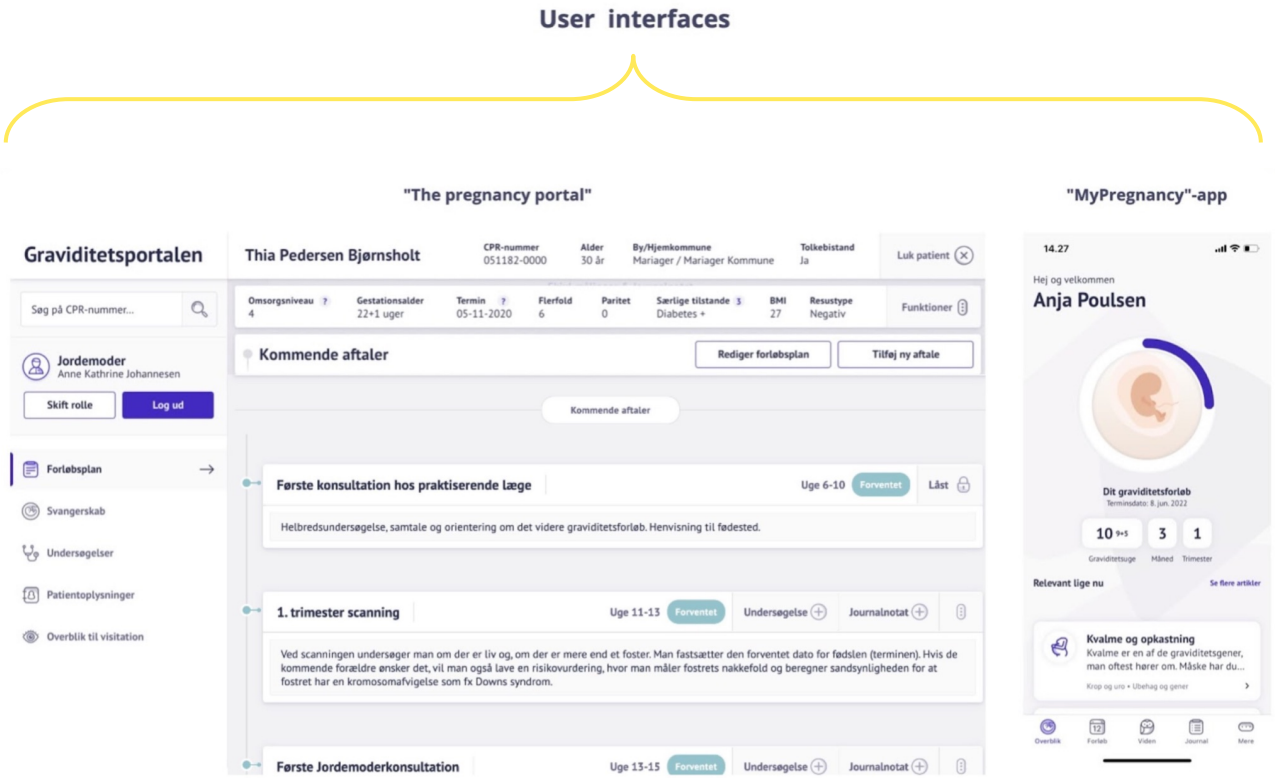

Figure 8: Screenshots of the two interfaces for respectively health professionals and pregnant women.

One of the central aspects of improving the current maternity record is to reduce the amount of *free text fields* where it is possible for health professionals to make free writing notes in the record. At a workshop we attended during the internship, the health professionals described that the issue of free text fields is that it allows "irrelevant" information in the record. The opposite to free text fields is structured data that instead is based on predetermined options. It was argued that predetermined options ensure that health professionals only type in "relevant" data into the record. The digital platform was thus seen as an improving tool as it allows much more data fields than two pieces of paper - it is not constricted by space. Another argument was that a digital platform, mainly consisting of structured data, can collect huge amounts of data about pregnant women and, thereby, provide a large register for research (cf. section 2.1). Something the public authorities have not had access to before because it has been paper-based and not structured. Most importantly, a digital maternity record corresponds with the health professionals' wish to ensure that only relevant data is entered, as the platform, in principle, can be formed and designed in various ways. But what is meant by "relevant" data? At the workshop, we noticed that there existed many understandings of what relevant data is. To talk about what relevant data is, it is necessary to discuss what information is important for pregnant women and health professionals. As an example, the midwives argued that the visitation determines what information that is relevant. The visitation allows the midwives to make the right referrals and is, therefore, an important tool to offer the pregnant women as qualified

trajectories as possible. Structured data is, by the midwives, seen as key as it can function as a guideline to the GPs of what kind of information they see as relevant in the visitation process. It was, therefore, crucial for the midwives that the design of the digital maternity record would point in the direction of more structured data because ensuring relevant information flow, in their perspective, is by creating more structured data fields. The disagreements on what relevant information is were highly determined by profession and personal experience in practice. However, despite that the health professionals were not completely aligned regarding what relevant information is, there existed a broad agreement that more structured data, and thus more information sharing, will improve pregnancy trajectories (Sandner & Spangmose 2022, 22).

There exists a correlation between the health professional's positive attitude towards structured data and Sundhedsstyrelsen's official organisation of care levels in the recommendations for maternity care, which is confirmed in a project document: *"The solution has, among other things, a solid suspension in Sundhedsstyrelsen's recommendations for maternity care"* (Sundhedsdatastyrelsen 2020, 5). The structured data is collected at the GP, in the bombardment of questions, and is used to structure pregnancy trajectories during the visitation to place the pregnant women at different care levels. The digital maternity record thus reinforces the logic of choice. Factual information about a pregnant woman leads to a health professional's choice of, for example, what kind of hospital a pregnant woman should be allocated to depending on her needs. Lastly, the choice results in an act which could be a midwife sending a referral to a certain hospital where the pregnant woman can be attached to a vulnerability team. Following this argument, the digital maternity record can be a contributor to making evidence-based assessments about pregnancy trajectories by being a provider of relevant and qualified data. It can be seen as a technology that can substantiate the logic of choice. The core of the digital maternity record is to provide care as it is seen as something that can contribute to better pregnancy trajectories - particularly in complicated cases where more consultations will be carried out and thus more facts have to be structured and more choices have to be made. When structured data is seen as such a central actor in the design of the technology, it also makes information sharing the key contributor to better pregnancy trajectories. It resembles former attempts of digitising the maternity record as they also relied on information sharing - back then it was described as shared care (cf. section 2.2). What is problematic about this shared care tendency is that *"real shared care was not about care, but about information sharing"* (Winthereik & Langstrup 2010, 201). Both the current and previous projects tend to perceive a structured information flow as a source of creating better care and thus handle vulnerability. But what happens when vulnerability cannot be reduced to structured data? We have revealed that vulnerability is multiple that both includes ambivalence as well as fluidity. This erases the idea of well-defined boundaries that is implied when vulnerability is categorised in care levels. Furthermore, care has shown to be about more than making the right

evidence-based health professional assessments from the logic of choice. To manoeuvre in the multiplicity that constitutes vulnerability the logic of choice is inadequate. The logic of care is needed, as it entails intuitive acts as well as continuous experimentation and tinkering. The digital maternity record might be intertwined in the logic of choice, but how can the technology become an actor in enactments from the logic of care?

The supreme healthcare authority, as well as health professionals, enact maternity care from the logic of choice, which is also what has shaped the design of the digital maternity record. However, the logic of care has shown to be central in making pregnant women feel less vulnerable. But can technology be a care provider? Mol et al. take distance from the contradictions that have been made between care and technology, where *"care was other to technology."* (Mol et al. 2010, 14). They describe that care often has been perceived as something to do with love and warm hands, while technology, on the contrary, has been perceived as cold, shiny, and instrumental. They erase the dichotomy between care and technology and argue that technology is central in enactments of care (Ibid.). When the digital maternity record supports the logic of choice, it becomes an instrument. It becomes a means to an end. Mol asks: *"What if [technologies] go beyond, and indeed transform, the ends they are supposed to serve?"* (Mol 2008, 50). Mol argues that technologies are not only instruments, but also *inventive mediators* with unexpected effects.

> *"Technologies are unruly. Once introduced into a world where they interfere in unexpected ways with lots of other erratic entities and configurations, they change much more than they were intended to, and are ultimately transformed themselves as well."* (Ibid.).

The logic of care is attuned to the unruliness interference that identifies technology. From the logic of care technology is not seen as a mean to a predefined end, but as something that should be attuned to practices which are shaped in unexpected ways. It is thus not possible to rely on what is intended with the design of the technology. However, what is possible to rely on is that technology interferes with practices. As the digital maternity record is not a stabilised blackbox but rather a relatively existing object, we cannot investigate exactly how it interferes in practice. However, Mol argues that we must *"keep a close eye on [our] tools"* (Ibid.). This is what we attempt to do in the following, where we accept the premise of investigating a relatively existing object by imagining how the technology will interfere in practice in both expected and unexpected ways. To reflect on this question, we imagine how the digital maternity record could have interfered in some of the key care situations that have been presented previously. We both describe situations the record might be intertwined in enactments of care as, and we describe situations where care is related to something else.

7.2.2 Imagining the technology in practice

Cindy and Trine have experienced that important information has not successfully been communicated to the health professionals who they have met during their pregnancy trajectories. There has been a lack in the flow of information. In Trine's situation the information about her vulnerability, which is connected to hospitalisation and anaesthesia, was not passed on to the midwife who offered her an epidural. In Cindy's situation, the fact that she has been through years of fertility treatment was not taken into account when she was told that her foetus no longer had a heartbeat. Both situations are examples of missing links, where information between the health professionals, or between the pregnant woman and the health professional, is either lost, non-existing, or misinterpreted. One of the main rationalities behind the technology is to fill out missing links in the data flow: *"what is some of the most crucial with vulnerable pregnant women is that no data gets lost"* (Appendix 19: Lone Dalager, 128). We imagine whether the digital maternity record might have been able to fill out the missing links in these situations. In Trine's situation, the information about her resistance towards anaesthesia could have avoided the clash in the enactment of care that she experienced with the first midwife during her birth - it could have been avoided that she repeatedly was offered an epidural. Cindy's experience might also have been otherwise if information about her preceding fertility treatment had been noticed by the midwife who carried out the nuchal translucency scan. A hand-mark on her record, for example, might have helped the midwife manoeuvre in Cindy's enactment of vulnerability and, thereby, translating knowledge more carefully instead of acting from standard procedures.

In both situations, the digital maternity record could have provided relevant data to the health professionals. There might also be situations where it might have been useful for the pregnant women to access their personal data. Some of the pregnant women imagined that they would find comfort in accessing their data through an app: *"my PTSD brain makes all kinds of stories, so it could have been nice to look at [the app] ensuring that the baby develops as it should"* (Appendix 3: Camilla, 19). The situations where the pregnant women felt watched by the system might also have been avoided if the pregnant women had access to their own data - then they might have been less worried that a health professional had filed a report on them behind their back. However, the feeling of being watched arose when the pregnant women were not introduced properly to being attached to a vulnerability team. When they got a verbal explanation and got the opportunity to ask questions about what the team is about and why they were categorised as "vulnerable", it helped them to understand that the team is first and foremost about extra care and support, and not about control. We have seen how verbal information sharing is crucial to the pregnant women, as one of them put it: *"I would rather get information verbally than to read it myself"* (Appendix 18: Field notes, 122). A verbal component is by any means not a part of the design of the digital solution. Therefore, it is important to consider how the digital maternity record will change the way information

is shared between the health professionals and the pregnant women - will the technology reduce or even replace verbal information sharing? Or will it enlighten the pregnant woman? It is the obvious assumption that the technology will contribute to more information sharing both between the health professionals and the pregnant women. However, the information will inevitably be in a written format, as data. What about all the information that does not circulate on paper, but instead occurs in the room in the enactment? It was important for Cindy that the health professionals had read her record, however, care happened in an interplay with them noticing her red eyes. In other situations, care enactments were not about information sharing at all but rather about the health professionals reading the room, using intuition. For example, when Ellen had her forehead caressed during her birth, or when several pregnant women experienced an unidentifiable feeling of safety. We wonder how the digital maternity record will interfere in care enactments, which are less about sharing information and more about sharing time and place. One could imagine that the technology would release time so that the health professionals would have more time to enact care. This, in fact, is a common argument behind digitisation in general (Digitaliseringsstyrelsen 2022b) which was also confirmed by the GP.

> *"It releases time. It's as simple as that. You don't have to talk about: "Where's the yellow envelope? When did you see the midwife at the hospital?" If you get the digital overview, and we assume that it works optimal, and it's filled out, then it frees time to the conversation and the presence. So yes, it can [improve pregnancy trajectories]. You use a lot of time to look for information."* (Appendix 15: GP, 93).

The GP imagines that the digital maternity record is going to release time. She sees that as the main potential of the technology. Following this imagination, the digital maternity record can both contribute to the logic of choice through information sharing but also to the logic of care through time releasing. If time is released there might be more time for endless tinkering and careful experimentation. There might be more time to notice the red eyes or caress foreheads. The GP, however, also mentions that there are some prerequisites for the digital maternity record to be a time releaser. Firstly, she mentions what has already been described - that the digital maternity record is dependent on data being entered into the solution. Secondly, the digital solution must work optimally, indicating that it must be free of technical disturbance. This becomes relevant to unfold with our observations at the midwife clinic in Aabenraa where they are currently testing the digital maternity record as a part of the pilot test. It is necessary to mention that the context of the technology, in the pilot test, is at a temporary state - in an unpolished form. The technology is not yet fully implemented, which makes some of the work practices around it less fine-tuned than intended when it is going to be fully implemented. For example, the midwives use both the yellow envelope and the digital platform concurrently. Furthermore, central functions such as direct communication between the local electronic patient record system and the digital maternity record or booking appointments are not integrated yet. The system does thus not work optimally in the pilot

test. It is difficult to determine what influence it is going to have in practice that the digital maternity record is a new and unpolished technology, a relatively existing object, but the observations can despite technical issues be used to exemplify how technologies have unexpected effects.

> The midwife immediately, with high speed, begins typing on the keyboard and says to me: *"I just jumped the gun - or else I wouldn't be able to remember it all"* [...] while the midwife is about to transfer information from the yellow envelope to Graviditetsportalen, it for a short period becomes silent in the consultation room. The pregnant woman breaks the silence by asking a question about the weight of their child-to-be. The midwife explains it and continues typing on the keyboard [...] The couple sits in silence and stares out in the air while the midwife types and clicks (Appendix 18: Field notes, 118).

This observation shows how the technology seemed to attract a lot of the midwife's attention, and it seems to interfere with the care practice. That a screen will interfere in the contact between the health professional and the couple, is evident regardless of the technology being unpolished or fully integrated. So, the technology does not necessarily release time in practice. Rather the section leader midwife, Mette Rasmussen, indicates that the technology influences the way of enacting care by depriving time.

> *"[The care] is lost. We use a lot more time in front of the screen. Just the fact that we're faced the other way from [the patients] contributes to a lack of intimacy. I really try to consider how I sit. But when you have to type something, you physically have to be faced against the screen. It interferes with the contact."* (Appendix 18: Field notes, 119).

She describes how she often has to run back and forth between the examination couch and the computer to enter data. The constant focus on registering data disrupts the contact with the families and thus also disrupts the care. We have imagined how the technology will interfere in practice which confirms that it can do so in various ways. It might release time, disrupt time, contribute to more information, restrict information sharing, neglect that information is not always key in the enactment of care - and many other unexpected things. However, it remains impossible to calculate how the technology is going to interfere in care practices. What possibilities does that leave us with then? It leaves us with an obligation to discuss, and by that take into account, how we can be responsible for all the various ways such mediating technology will interfere with care practice.

7.3 Summarising part III

The current maternity record has shown to be an inadequate actor in pregnancy trajectories and it, therefore, makes sense to seek changes. When describing the development of the digital maternity record it shows that collecting and sharing information, by the healthcare system, is seen as the key contributor to better pregnancy trajectories - to better care. The digital maternity record is argued to provide more

information sharing that will contribute with more efficient allocation of resources in favour of "vulnerable" pregnant women. The healthcare system's enactments of information sharing as care have shaped the design of the digital maternity record that works towards a high degree of structured data. The design of the digital maternity record substantiates the categorisation of the four care levels and the focus on collecting information. One of the differences between the current maternity record and the digital maternity record is that the digital form works towards a high degree of structured data which includes predetermined data fields. This also entails that the digital maternity record is designed to support the logic of choice. By imagining how the digital maternity record might interfere in care practices, we see that the technology is not necessarily going to act as expected. Better information flow might create a breeding ground for a more individualised enactment of care in some situations and thus be a way to manoeuvre in multiple enactments of vulnerability. The technology is an inventive mediator, and it might support health professionals in translating knowledge carefully. It might contribute with more time, or it might steal focus in the interaction between the pregnant woman and the health professionals. It is going to be intertwined in practices of vulnerability and care in unexpected ways. In some situations, it might be a contributor to care while in others it might compromise it. In all situations, however, it will be dependent on the care work that happens around it. This entails that technologies *"do not work or fail in and of themselves. Rather, they depend on care work."* (Mol et al. 2010, 14). Technology in care practices is thus dependent on the willingness to *"adapt their tools to a specific situation while adapting the situation to the tools, on and on, endlessly tinkering."* (Mol et al. 2010, 15). Following this argument, the digital maternity record cannot fill out missing links itself. Rather, it is dependent on how the health professionals incorporate the technology in their daily care practices. What information is entered? Is it read? How is it interpreted? And is it used to translate knowledge carefully in practice? The digital maternity record cannot be a care provider itself, but it might become an actor in enactments of care. However, it is dependent on how it is used and adapted, as well as its design.

8. Discussion

The current design of the digital maternity record has been influenced by the health professionals who have contributed with perspectives of what is relevant information and how this information can be sufficiently shared. However, as it is the aim to improve pregnancy trajectories for "vulnerable" women, it is also important that pregnant women's enactments of vulnerability are reflected in the digital maternity record. Since we have identified that vulnerability is multiple, fluent, and ambivalent, it is relevant to discuss how the digital maternity record can embrace just that. How can a technology, that is based on the organisation of structured data flow, take multiplicity, fluidity, and ambivalence into account? By taking multiple enactments into account, we intend to discuss how the technology can be an inventive

mediator that also substantiates more careful experimentation between health professionals and pregnant women.

This discussion has its starting point from the core of the digital maternity record's design, namely structured data. The relevance of talking about structured data is that it reflects what the health professionals see as relevant information and how this should be integrated into the solution. That the digital maternity record mainly has been designed following structured data includes that it is also designed for providing better health professional assessment. Moving towards more structured data also results in a more standardised technology. Standards can be argued to have several benefits, however, *"a standardized network often involves the private suffering of those who are not standard"* (Star 1991, 43). There is thus a risk that using structured data comprises the individual trajectory that takes multiplicity into account. When the technology is designed from the perspective of a "basic" pregnancy trajectory, there is a risk that it might suffer from not being able to contain the multiplicity that constitutes vulnerability. This is particularly problematic as handling vulnerability is one of the very purposes of the technology. Structured data comes with the risk that pregnant women cannot recognise themselves in the system, which might result in clashes in the enactments of vulnerability and care. The use of structured data provides several beneficial purposes such as giving a quick overview of a pregnant woman's trajectory, creating more sufficient visitation, and providing data for future statistical research. We, therefore, do not neglect the value of structured data and the health professional argument that lies behind it as it makes sense to structure the physical circumstances in pregnancy, such as blood pressure, blood samples, height, weight, etc. It can support enacting from the logic of choice by making a better foundation for evidence-based assessments. However, when designing the technology, it is important to keep an eye on the limitations of such structured data. Based on our study of multiple enactments of vulnerability, we question whether structured data is adequate when it concerns psycho-social aspects of a pregnancy. Reducing information to a checkmark in a box in some cases gets too simple. It reduces the multiplicity of vulnerability. What if a pregnant woman does not fit into the predetermined categories? How can multiplicity be integrated into a structured data flow? The way data is selected and structured might be defining for how the pregnant woman is met by the health professionals during her trajectory: *"it was a feeling of having one identity in the system and one identity of my own"* (Appendix 4: Carina, 23). Knowing that the record might be perceived as a reflection of pregnant women's identities, makes it important to design the technology towards a high degree of recognition for the pregnant women. One of the pregnant women described it as *"becoming visible as the pregnant woman you are"* (Appendix 13: Stine, 80). That is because, if they cannot recognise themselves in the record there is a risk that they will feel misunderstood, neglected, or like a burden. If pregnant women should be able to recognise themselves in the digital maternity record, it becomes necessary to integrate their enactments of care and vulnerability in the solution - with all the

ambivalence and fluidity that it entails. The multiplicity that constitutes enactments of vulnerability does not always align with a structured data flow, as there might exist relevant information that cannot be predefined and thus cannot be structured.

To give an example, it is possible to predetermine psychiatric diseases, but it is not possible to predetermine the symptoms they come with for the individual pregnant woman. It is important to consider things that cannot be predetermined as it influences a pregnant woman's trajectory. In our empirics, for example, we have seen how a pregnant woman with PTSD has certain triggers that are relevant information for her experience of giving birth: *"Coldness and shakes remind me of my anxiety and my PTSD. The feeling of coldness and shivers is common during a large operation and natural to feel during a c-section"*(Appendix 3: Camilla, 19). This information was something that she, herself, had to bring with her on paper to her birth. Even though health professionals might recognise the relevance of such information, working towards structured data might neglect it. This neglect might compromise the health professional's ability to make the right assessments in the birth situation and thus the pregnant woman's experience of her birth. There thus exists information, that both the health professionals and the pregnant women see as relevant, that cannot be structured. There is, however, also information that might not be important in a professional assessment but is considered as relevant for the pregnant women. It is irrelevant information in the health professional assessment that a pregnant woman has accidentally eaten "too much" liquorice, or that she is a solo mom. From the logic of choice, this kind of information is not relevant to the health professionals as they simply cannot act upon it, and it thus does not change their practice. However, they can act on it from the logic of care as it influences how the pregnant woman is met as a person with the multiplicity that constitutes their vulnerability. For the pregnant woman eating something wrong can be relevant information as it can trigger a vulnerability that makes them worry: Have I harmed my baby? Am I now a bad mother? Furthermore, it is relevant for the pregnant woman that the health professionals remember that she is a solo mom, as it is important for how she is met as a person. So, what information the pregnant women see as relevant, in some situations, does not necessarily correspond with what the health professionals see as relevant. There is a risk that information such as "have I done something to harm my child-to-be? Can I handle the birth? Can I live up to the role of being a mom?" consequently fall outside the scope of the digital maternity record's design. As Mol describes, it is important to investigate patients' representations of themselves, as we have done when we have represented the pregnant woman's enactments of their vulnerability. Concurrently, she also argues that it is *"at least as important to ask how they are represented in knowledge practices"*(Mol 1999, 86). Discussing how pregnant women are represented in knowledge practices becomes even more evident when the pregnant woman, in the future, will have access to all the data that flows between the health professionals - she will know herself as a medical case. The pregnant woman will therethrough be able to notice if the health professionals'

representation of her aligns with her enactment of vulnerability. It also entails the risk that the pregnant woman becomes the mediator of ensuring that her self-interpretation is aligned with the health professionals' representation of her in the record, as it was the case in Winthereik's study of a previous pilot test of an online maternity record (cf. section 2.2). Therefore, we ask: Is it possible to represent the individual pregnant woman's trajectory? And is it possible to take the pregnant woman's enactment of vulnerability and care into account? At least these questions get complicated by the fact that it is only the health professionals that have been able to negotiate the design of the technology and thus decide what relevant information is, and also by the fact that it is only the health professionals that can enter data into the record. However, there has been an increased focus on *"making it possible for all users of the healthcare sector to participate more actively in their own treatment"* (Sundhedsstyrelsen 2021, 15). This new focus on activating patients, in general, is concretised in the discussions of and movement towards the use of patient-reported outcomes, the so-called PRO-schemes, in the healthcare sector - also in the maternity care.

> *"The use of patient-reported outcomes is a developing area that is expected to be tested and implemented in the coming years. Information about [the pregnant woman], that is gathered through a standardised questionnaire, and that is sent digitally, can supplement information from general practice. The use of patient-reported outcomes can increase the quality of the visitation, strengthen the involvement of the patient, and give the opportunity to use the time in consultation sufficiently."* (Sundhedsstyrelsen 2021, 48).

PRO-schemes are applied as something that can contribute with a higher degree of patient involvement, which also is one of the ambitions with the digital maternity record (cf. section 7.2). But are PRO-schemes a contributor to appropriate involvement of pregnant women? The PRO-schemes are based on standardised questionnaires, and it will, thereby, inevitably be a representation of what the healthcare system sees as relevant information to gather. Therefore, PRO-schemes will not necessarily contribute with an involvement that makes more recognition for the pregnant woman which we have identified as important.

In the context of discussing how to make pregnant women recognise themselves in the digital maternity record and be met in their enactments of vulnerability, a topic has repeatedly emerged during our study - self-written record notes. This is something the pregnant women both directly and indirectly have expressed would provide the feeling that the health professionals understand their enactment of vulnerability. One pregnant woman, for example, expresses a wish for the possibility to write small notes before and after each consultation or react to a health professional's note. Another pregnant woman would have liked the possibility to communicate her wishes for the birth. This is an expression of a wish to be able to represent oneself in the maternity record. The pregnant women wish to use their own words so that there is less risk of them being misinterpreted by the health professionals. However, more involvement

through self-written notes at the same time raises new concerns: *"It would at least require a match of expectations"* (Appendix 18: Field notes, 119). The concern is that if pregnant women would get the opportunity to write notes in their records, it would create a certain expectation that the health professionals would also read them and respond to them in consultations. Due to limitations in the time available, one of the midwives argued that this is *"not always realistic in the clinical practice"* (Ibid.). The GP also stated that it might result in a *"mismatch between expectations and reality"* (Appendix 15: GP, 94). They both expressed concerns that self-written notes would create unrealistic expectations for the service within the healthcare system. Implementing self-written notes is thus no easy solution to more involvement of pregnant women as it gives rise to new concerns and obligations. If the record is opened for pregnant women, and their input is not being taken into account by the health professionals, it might result in the opposite effect - that pregnant women feel rejected and neglected. We do not intend to determine what is the right solution to a higher degree of involvement and recognition. What we do want to determine is the necessity of taking the multiplicity that constitutes vulnerability into account, which will imply changes in the way that relevant information is perceived and adapted into new technologies. It implies that relevant information does not necessarily have to contribute to a linear sequence of arguments in a health professional assessment. Relevant data can also be information that creates a better breeding ground for careful experimentation and thus for health professionals to act from the logic of care. It is about meeting women in their own enactments of vulnerability with the multiplicity that it entails. In this case, it is also important to manoeuvre in the multiplicity that constitutes vulnerability, since this entails that a representation of a pregnant woman cannot simply be captured in a solid form. When vulnerability is fluid, due to shifting tensions and suddenly occurring circumstances, it also requires the digital maternity record to be more flexible. It should, therefore, be discussed whether pregnant women should be able to communicate directly with the health professionals through the platform when worries suddenly occur. And if it should be possible to change, add, and delete data due to changed circumstances in the enactment of vulnerability. In the discussion of taking the multiplicity that constitutes vulnerability into account in the design of the digital maternity record, it becomes clear that it is not possible to reach an easy "fix", as the problem is not well-defined.

Pregnant women have been included early in the project but on different terms. They were invited into the project in a way that reflects a traditional product development management used in the 90s where innovation *"implies "finding" a solution, with the implicit assumption that the problem is well defined and that actually an optimal solution to a problem does exist out there"* (Verganti & Öberg 2013, 89). We, however, question whether a classical design approach covers the issue in this case. Can a problem be seen as well-defined when it is entangled with multiplicity? Roberto Verganti, expert in innovation and

design, and Åsa Öberg, PhD student in innovation management, suggest being more radical in the approach to innovation. They suggest opening discussions as *"a way to redefine the problem itself"* (Ibid.). Instead of seeking a solution to a pre-defined problem, they want to create changes in the meanings connected to a technology. With this study, we thus move away from the 90s' approach to design. Instead, we wish to create changes in the meaning of vulnerability and care and use it in the design of the digital maternity record. As a technology stabilises over time and becomes blackboxed, gradually it becomes more difficult to open it up and renegotiate it. As the digital maternity record is not fully stabilised yet, it, therefore, makes sense to talk about innovation. With the digital maternity record being a relatively existing object, that is not jet blackboxed, it is possible to shape the technology following the new meanings of vulnerability and care that have been revealed. We believe that it is crucial to change meanings in the way the project has included pregnant women in the design of the technology. It is necessary to renegotiate, that it has been chosen only to include the 70 to 75% women with "basic" pregnancy trajectories in the pilot test (cf. section 2.3). An argument for designing for the standard is that it is a way of *"limiting the possibilities of negative overflows or externalities"* (Winthereik & Langstrup 2010, 202) that complex trajectories might come with. Working towards a broader understanding of multiplicity, requires welcoming the remaining percentage into the frame of the design process instead of postponing the complexities, the "vulnerable" perspective, to a "phase x" (cf. section 2.3). One might say that this approach of welcoming the remaining percentage is "too complicated" since the involvement of more entities makes it harder to reach an agreement. It *is* complicated, but it is not *too* complicated, and the alternative of not taking multiplicity into account might jeopardise the very aim behind the digitisation of the maternity record. The digital maternity record might contribute to manoeuvre in multiple enactments of care and thus be a mediator of translating different, and sometimes clashing enactments, carefully. It requires, however, that multiplicity is taken into account in the design of the digital maternity record. Then the digital maternity record, in the interplay between pregnant women and health professionals, might make it possible to provide better care in all kinds of pregnancy trajectories.

9. Conclusion

To keep a close eye on our tools, in this case on the digital maternity record, we have removed screws and other binding material and investigated multiple enactments of vulnerability and care. This, to move away from a preconceived idea of what "vulnerability" is and understand how experiences of vulnerability and care practices can shape the design of the digital maternity record. We have unravelled multiple enactments of vulnerability and care in the network around pregnancy trajectories - both from the healthcare system and pregnant women with vulnerabilities. The healthcare system enacts vulnerability as something that can be predetermined and categorised. The pregnant women, on the other hand, reveal that

vulnerability is much more multiple, ambivalent, and fluid. The pregnant women's enactment of vulnerability thus cannot be set in stone. As the pregnant women and the health professionals' enactment of vulnerability rely on one another, they overlap in the meeting between them. Sometimes enactments coexist, other times they clash. It depends on care work. Health professionals often enact care from a logic of choice, as they act on evidence-based arguments to make the right assessments. We, however, conclude that the logic of choice should not stand alone in care practices. When vulnerability is multiple, fluid, and ambivalent, the enactment of care cannot always be based on procedures but should also be based on practical tinkering and careful experimentation. These care practices become a means to manoeuvre in multiple enactments of vulnerability, and, therefore, we have discussed how the digital maternity record can take part in this manoeuvring. We conclude that the digital maternity record is designed from the logic of choice as it is based on a high degree of structured data that contributes to health professional assessments. However, when following the multiplicity that constitutes vulnerability, the digital maternity record is limited in what type of information it allows. It is striving towards structured data which limits the possibility to enact from the logic of care as the multiplicity gets lost. By imagining how the digital maternity record will act in practice, we can conclude that information can be used to enact from the logic of care if it is entered, interpreted, and applied properly. It can create a better opportunity to provide care by substantiating the health professionals manoeuvre in the multiplicity and thus to translate knowledge carefully. The technology can, however, not provide care alone, as it depends on how it is used and adapted as well as the care work around it.

So, *how can an ethnographic study of experiences of vulnerability and care practices shape the design of the digital maternity record?*

As the digital maternity record is implemented to handle "vulnerable" pregnancy trajectories, we argue that it is important to include the vulnerable perspective in the design of the technology. From investigating this perspective, we conclude that vulnerability is both multiple, ambivalent, and fluid. These insights call for a change in the meaning of vulnerability and a discussion of how it can be taken into account in the design of the technology. When recognising that vulnerability is multiple, the limits of structured data is revealed, since multiplicity does not fit into predetermined categories. We conclude that these limitations are important to consider as structured data might blur the pregnant women's recognition of themselves and their vulnerability in their record. Lack of recognition in the digital maternity record might have the consequence that pregnant women do not feel met in their vulnerability by the healthcare system. Until now it has mainly been the health professionals who have had the opportunity to assess and thus define what relevant information is in the design of the digital maternity record. We, however, conclude that when discussing the extent of integrating structured data, it is important to

include pregnant women with vulnerabilities' perspective of what relevant information is. This creates the opportunity of reaching a point of more recognition for the pregnant women with vulnerabilities in the digital maternity record. It is indeed complicated to take multiplicity, ambivalence, and fluidity into account. But it is even more complicated to postpone these insights as the technology gets more and more stabilised as time goes on. The risk is that the technology will be fully stabilised before the remaining 25% of pregnant women get to influence the very technology that is being implemented *for* them.

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