Rethinking the Logic of Early Diagnosis in Cancer

Abstract

To reduce morbidity and mortality of cancer, more countries have implemented strategies to detect cancer, based on the logic of 'the sooner the better'. *Time* is thereby an essential component in how cancer research, policies, and prevention are practiced today. Where the logic of early diagnosis benefits some, the logic also produces harms. In this article, we use a cross-disciplinary case-study design to discuss how different notions of time and linearity are essential in today's research ontology of cancer, describe the individual and societal consequences of such ontology, and invite a rethinking of time in cancer. Drawing on theoretical concepts of time together with cancer epidemiological, historical, and ethnographical data, we analyse how the logic of early diagnosis has been established as a stable concept. Although evidence supporting the logic points in different directions, the message 'the sooner the better' is currently not being challenged by research, policy, or society. This at least partly, can be explained by a linear perception of time and societal traces of neoliberalism and acceleration in our society together with cancer still being a somewhat enigmatic disease that requires acute action. To support a sustainable healthcare sector, we argue there is a need to nuance the logic of early diagnosis. Continuing the linear perception of symptoms and cancer, risks doing more harm than good by making more people patients unnecessarily and by spending health resources on those with the least need.

Introduction

Globally, overdiagnosis; making people unnecessarily into patients by detecting pathological changes that was never going to cause harm (Brodersen et al., 2018) is rising (Glasziou et al., 2019). A body of research shows, that part of the overdiagnosis stems from finding cancerous cells 'too early' as many will never develop or grow into disease, yet, the benefits of 'early diagnosis' are stated in both medical sciences and societal discourses. Hence, there is a need for cross-disciplinary research that nuance and provide deeper understandings of the 'early diagnosis' paradigm. To this end, we have conducted a case study that includes epidemiological and ethnographic data in a combined analysis to discuss when and why the logic of early diagnosis has been established as a stable concept, influencing health policies on cancer. Presenting the complexity we provide arguments for when early diagnosis benefits and when it harms, and the societal and cultural drivers that influence our perceptions of time in relation to diagnosis.

In health sciences, policies, and prevention, early diagnosis has been deemed an essential means to decrease cancer morbidity and mortality (Danish Health Authority, 2005; National Institute for Health and Care Excellence, 2015). The emphasis on time is reflected in how variations in cancer survival between countries have been explained by delayed diagnosis and treatment (Storm et al., 2011). To reduce the time to diagnosis and treatment, national screening programmes and early cancer initiatives, such as fast-track cancer patient pathways (CPPs), have been introduced in Denmark since 2007, and similar strategies are being introduced in the rest of the Global North. The rationality behind these strategies is rooted in the logic that early detection of symptoms of cancer (such as blood in stool or lump in the breast) can either 1) prevent cancer from occurring or 2) detect cancer at a localised stage and thereby reduce morbidity and mortality of cancer. Since the implementation of CPPs, what we term 'the logic of early diagnosis' has expanded diagnostic practices, and the threshold for when to investigate people for the risk of cancer has been lowered. The logic of early diagnosis is a conceptual framework inspired by Mol's logic of choice (Mol, 2008). To Mol, the term logic suggests how events somehow tend to fit together; there are affinities between them. Like in a discourse, words, materialities, and practices hang together in a specific, historically, and culturally situated way (Mol, 2008). We use the logic of early diagnosis to emphasise the rationales of how diagnostic procedures, particularly in cancer, are based on manifest moral imperatives and understandings of time, symptoms, and disease that permeate research, individuals, and society. One example is the CPP for non-specific symptoms of cancer (NSSC-CPP) implemented in Scandinavia and the UK (Danish Health Authority, 2022; Helsedirektoratet, 2019; Cancercentrum, 2018; ACE, 2019). Here, general practitioners (GPs) can refer patients to diagnostic testing at the hospital when their patients have vague or non-specific symptoms of cancer such as fatigue or weight loss. In short, the idiom 'The sooner, the better' summarises the main principle of the logic of early diagnosis within these cancer initiatives and has become a stable concept within common understandings of cancer diagnostics. In fact, it is so stable that it is taken for

granted within different research disciplines. For example, when reading the background section of scientific epidemiological studies on early cancer diagnostics, they often tend to emphasise the importance of early diagnosis without referring to any study proving this association (Arndt et al., 2002; Forrest et al., 2014; Allgar and Neal, 2005). However, it is important to note that tumour biology, growth, and etiology are highly complex, both within specific organs and across different types of cancer (Welch and Black, 2010). Consequently, the existing body of evidence fails to establish a consensus regarding the nature of associations between various time intervals in the diagnostic process and subsequent clinical outcomes (Neal et al., 2015; Jensen et al., 2016).

Taken the sooner the better for granted is also evident in current public cancer awareness campaigns. In a campaign from 2023, the Danish Cancer Society encourages all Danish citizens to check their moles every third month to detect any cancers as early as possible (The Danish Cancer Society, 2023). Notably, these campaigns promote citizens to act - the message is not only to react when experiencing symptoms of potential cancer but also to actively look for symptoms, signs, and changes in the body. Yet, the best available evidence does not suggest any benefit of such an initiative but more likely harms (Johansson et al., 2019), but the logic of early diagnosis is validated and reproduced through such messages. This logic continues to be reflected in public perception and discourses around prevention and the benefits of early detection as well as impacting social practices (Byskov Petersen et al., 2020).

In this paper, we argue that the rationale of the logic of early diagnosis is linked to notions of time and how citizens in the Global North interpret time as linear, cumulative, irreversible, and fast moving (Ostenfeld-Rosenthal and Bjønness, 2003). Thus, having a linear perception of time, we often tend to orient ourselves toward the future. As acknowledged by anthropologist Fredrik Barth, time 'runs'; it is cumulative, and as time, innovation, and development have a direction pointing forward or going back, none of which are neutral spaces (Barth, 1980). Time, however, is not to be taken for granted (Munn, 1992). Within sociology, Emilie Durkheim introduced the notion of time as socially constructed, and to Durkheim, all conventional time periodicities (days, months, years) are socially derived (Miller, 2000). On the contrary, anthropologist Alfred Gell argues that such categories are not purely social constructed, but rather adaptations to the physical environment in which social life takes place (Gell, 2021). This represents a tension between how scholars believe categories come into existence, which in turn form how time is perceived and studied. Other contributions to discussions of time have explored the dichotomous abstractions of circular vs. linear time. In societies with a cyclical understanding of time, the social, natural, or cosmic events, and not time periodicities, mark progression or change. The circular-linear opposition has also been questioned on the basis that so-called 'circular' (repetitive) time does not logically exclude 'linear' sequencing because each repetition of a given 'event' necessarily occurs later than the previous ones (Munn, 1992), which alone allows us to say, 'Wednesday – again' (Gell, 2000).

Historically, an industrialised economy fuelled by factory labour in which lives were segmented, sequenced, and synchronised led to the more artificial temporality of clock time (Sugarman and Thrift, 2020). The emerged money economy brought recognition of the link between profit and time, which was visible in sayings such as 'time is money', but it also came with an aspect of moral character with the obligation to make good use of one's time and not to waste time. To make the most of time, competition becomes central and accelerates the desire for even faster technologies in the processes of production (Sugarman and Thrift, 2020). With the rise of neoliberalism after the financial crisis of the 1970s, this perception of acceleration was not only endorsed in the production of goods but transferred into other aspects of human life (Rosa, 2010). The German sociologist Hartmut Rosa has described how social acceleration is dominating in our current society, both explained as technological acceleration but also as the acceleration of social change and acceleration of the pace of life (Rosa, 2010). Undoubtedly, this paradigm of time as linear, cumulative, and accelerated is also present in how the link between time and cancer has been established within various research disciplines. It seems not really to be questioned if a fast diagnostic process of cancer is more favourable than a slow process – neither from a societal nor an individual perspective – and the logic of early diagnosis becomes established based on a seemingly natural way of perceiving time. In most countries in the Global North, a specific timeframe (number of days) is assigned to every step of the diagnostic process of cancer, and these time units are used directly to evaluate the quality of the diagnostic process. Thereby acceleration of pace, i.e. saving time, means high quality within the logic of early diagnosis. Besides the feature of acceleration, the neoliberalistic paradigm is premised on the belief that the social good is best served by bringing market rationality to all domains of human action and endeavour. Hence, healthcare systems are in the welfare state permeated by neoliberalistic values, often linked to what Michel Foucault coined as governmentality (Foucault, 2012).

This paradigm entails an ambiguity as it can be interpreted as both a positive consequence of the Enlightenment era, with the idea of empowering individuals with greater health literacy and freedom to choose, but also imposed more responsibility on the individual. Several social science studies have highlighted how governmentality has informed the individual responsibility in cancer prevention and treatment (Merrild, 2018; Frumer et al., 2021; Ziebland et al., 2019). Within this framework, individuals are expected to enhance their own utility, which, in terms of health, translates into recognizing and responding to symptoms ‘in due time’. Drawing on Foucault’s concept of bio-power this can be understood as a form of biomedical governance that aims not only to control individuals but also to encourage individuals to govern themselves through the negotiation of truths and the internalisation of ideas concerning appropriate health behaviours (Foucault, 2012). Indeed, the concept of "biological citizenship" as proposed by sociologists Nikolas Rose and Carlos Nova recognizes the internalization of biomedical knowledge and practices in shaping a new form of citizenship (Rose and Novas, 2007). This concept highlights how advancements in biological knowledge, genomics, biotechnology, and

biomedicine have influenced our understanding of various aspects of life that were previously seen as beyond human control or left to fate. Instead, these aspects are now subject to deliberation and individual decision-making, as individuals are encouraged to take an active role in managing their own health and well-being. This notion of biological citizenship reflects a shift towards the inclusion of biological factors in the construction of identity and the exercise of citizenship. Within this framework, citizens are promised empowerment through the dissemination of national awareness campaigns and encouraged to take proactive steps in seeking healthcare. In this context, a prompt response is seen as the desirable outcome, with the individual being regarded as the responsible agent for their own health. However, if individuals fail to adhere, they are not only blamed by others but are also likely to blame themselves. This places a significant burden on individuals to conform to societal expectations and reinforces the notion that timely action is crucial for positive health outcomes.

Based on a critical approach to the stable and predominant logic of early diagnosis and a scrutiny of the notion of time, in this paper, we aim to discuss how different notions of time and linearity are essential in today's research ontology of cancer, highlight individual and societal consequences of such ontology, and invite a rethinking of time in cancer.

Methods

The healthcare context for this article is the Danish welfare state, which offers services such as childcare, education and student grants, healthcare, and social benefit schemes financed through taxes, and many services are allocated irrespective of an individual's income (Vrangbaek, 2020). As default, citizens are assigned a general practitioner (GP) who functions as the gatekeeper to diagnostics and treatment at the hospital sector. Consultations and treatments in general practice and in the hospital sector are free-for-service with no co-pay, and are generally regarded as citizens' rights.

The article builds on previous literature including CSD's PhD project on the cancer patient pathway for non-specific symptoms of cancer (NSSC-CPP) in Denmark (Damhus, 2022). In short, the PhD study aimed to investigate benefits and harms of the NSSC-CPP and included an organisational analysis of how the NSSC-CPP was implemented (Damhus et al., 2021), epidemiological registry studies on the outcomes of the NSSC-CPP (Damhus et al., 2022b; Damhus et al., 2023), and a qualitative paper on the experience of patients completing the NSSC-CPP (Damhus et al., 2022a). In conducting these studies, CSD scrutinized relevant literature across various research disciplines. In this analysis, a pattern emerged across different types of literature, indicating a linkage between time and cancer, despite the unclear epidemiological evidence regarding their association. Our aim was to further investigate this phenomenon in a separate study. Accordingly, the methodology of this article relies on a case-study approach combined with a mixed-methods approach. As a case study, it sets out to explore the

phenomenon of ‘the sooner the better’ in cancer diagnostics. In this exploration, it draws on both quantitative and qualitative sources to capture contextual, scientific, and experiential dimensions of the case and to develop an exploratory and critical analysis (Crowe et al., 2011; Priya, 2021). Quantitative data and qualitative data are used concurrently in the mixed methods design (Creswell and Clark, 2011). This methodology allows us to fusion disciplines and sources which we see as a strength of the study. The choice of sources is limited in the sense that they serve to explore the case, but are based on reviews and empirical studies through a critical case sampling strategy (Patton, 2014).

The present article draws on both the foundational literature and conducted studies from the PhD project. This included systematic reviews and prospective cohort studies assessing the association between time and cancer. The selected epidemiological studies all investigated the significance of time concerning cancer diagnosis, progression, or patient prognosis. We included studies addressing cancer overall rather than specific types. It should be noted that the epidemiological studies used in the analysis may face challenges from cancer-type-specific studies. We find however, that our case refers mainly to the epistemology of early cancer diagnosis rather than the ontology of cancer development. Further, the empirical examples stem from the qualitative paper of the PhD project including participant observation and repeated interviews with six participants, one man and five women, in the age range of 52 to 89 years initiating an NSSC-CPP in Denmark in 2021 (for more methodological details, see separate publication) (Damhus et al., 2022a). To achieve validity in this study, as further elaborated in the published version of the article, we employed reflexivity and transparency (Roberts and Priest, 2006). Reflexivity was integral, as we were cognizant of how our perspectives on the harms of early diagnosis influenced the field, and we ensured transparency by clearly presenting all analytical steps. We acknowledge that this article pertains to a specific patient group, as all individuals included have been referred to the NSSC-CPP. Their experiences and thoughts regarding symptoms and cancer may not necessarily be generalized to other populations at risk for cancer, considering the limitations in representativity. However, we believe that the analysis is transferable to other patients involved in diagnostic assessment for cancer. In addition, the empirical examples are crucial in the present study as they illustrate how we, along with other qualitative studies, have identified that patients and citizens do not necessarily describe and experience symptoms in a linear manner pointing toward a cancer diagnosis. To delve deeper into the significance of time and linearity in cancer prevention and awareness campaigns, we incorporate insights from selected medical historical papers. These papers were selected based on their meticulous evaluation of the temporal dynamics and the relationship between time and cancer.

In what follows, we will unfold studies within different research disciplines to discuss the logic of early diagnosis and show how perceptions of time as linear progression are entangled in diagnostic assessment and in lay peoples' perception of cancer, the latter both confirming and troubling linear time.

In our pursuit to analyse the individual and societal consequences of the existing research ontology of cancer, we recognise that prioritizing multiple levels of analysis will unavoidably lead to a reduction in the level of detail for each specific level. Nevertheless, we contend that this approach is crucial in strengthening our arguments concerning the importance and durability of the logic of early diagnosis.

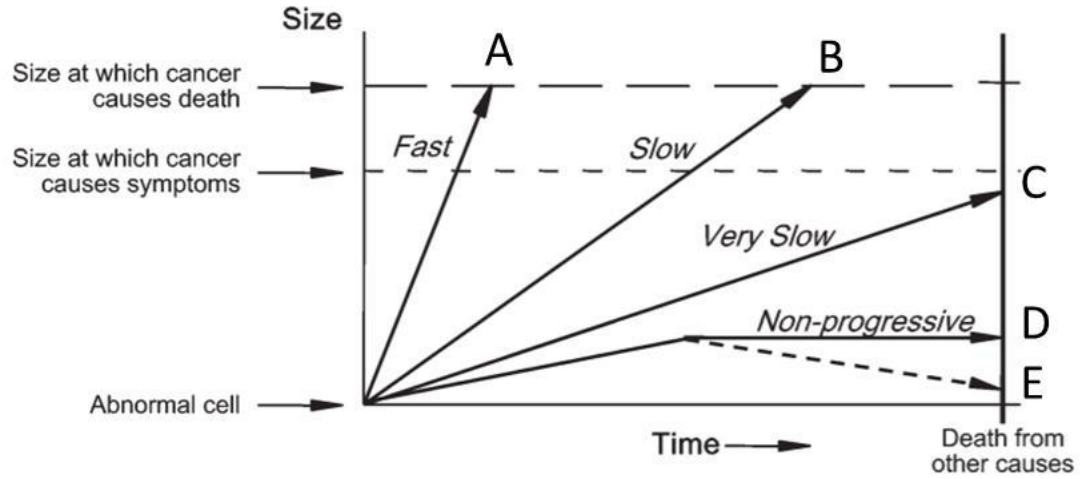
Progression of cancer

The understanding of time has permeated how various disciplines have assigned meaning to cancer. The following section provides a selection of perspectives that in different ways unfold the link between time and cancer in the beginning of the 1900s and in more contemporary local settings. First, a short perspective on cancer and tumour progression.

Cancer does not represent one disease. Tumour biology, growth, and aetiology are much more complex, both within the organ-specific tumour and between different cancer types (Welch, 2022). As put by physician and cancer researcher H. Gilbert Welch: 'In clinical practice, to say that a person has cancer gives as little information about the possible course of his disease as to say that he has an infection. There are dangerous infections that may be fatal, and there are harmless infections that are self-limited or may disappear. The same is true of cancers. Cancer is not a single entity. It is a broad spectrum of diseases related to each other only in name' (Welch, 2022).

This complexity is reflected in a Danish epidemiological study comparing the size of head and neck cancers at the time of diagnosis with the size at the start of treatment (Jensen et al., 2007). The authors found that 38 out of 61 tumours grew, but the growth varied between 6-495% in tumour volume (Jensen et al., 2007). These large variations in tumour growth, within the same cancer type, exemplify the complexity of tumour biology, which is further illustrated in Figure 1 (Welch and Black, 2010).

Figure 1 Heterogeneity of cancer progression" by Welch and Black



Source: “Figure 1. Heterogeneity of cancer progression” by Welch and Black with modifications (Welch and Black, 2010) is used by permission of Oxford University Press.

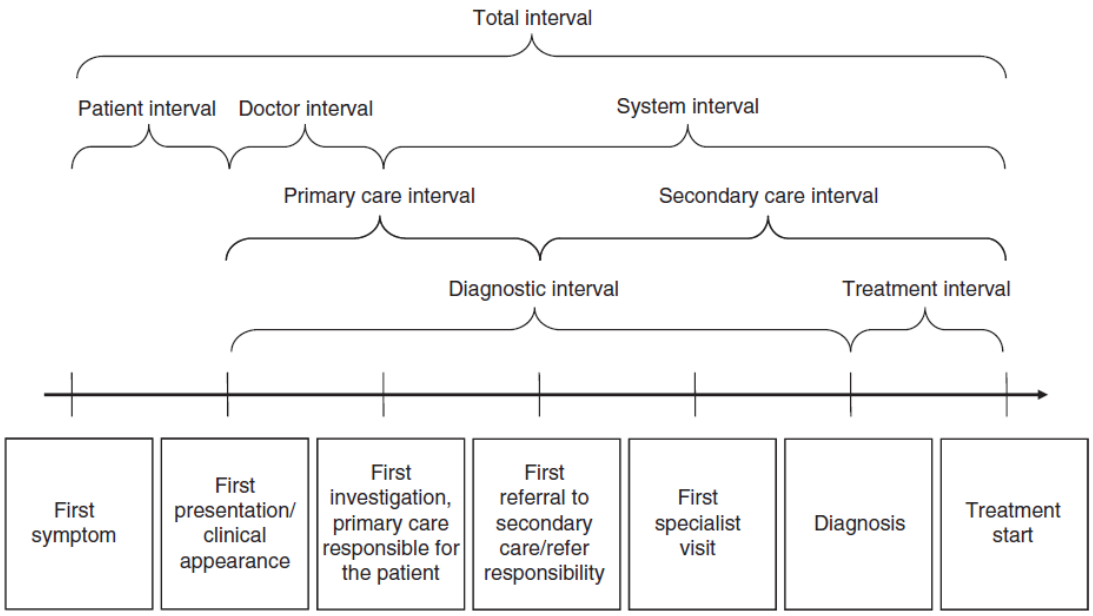
Figure 1 shows the heterogeneity of cancer progression (Welch and Black, 2010). Considering Figure 1, cancer-A grows fast, leaving a very short window of opportunity from symptoms to treatment before the person will die of that cancer. These are often referred to as aggressive tumours, and no screening programmes or early cancer initiatives seem to be able to detect them at a localised stage. Cancer-B grows slowly, and the open window of opportunities from symptoms to the person's death is longer. For some B-cancers, this enables screening participants and patients seeking their GP to be diagnosed with a localised cancer, and via earlier treatment, these patients might not die from their cancer. Cancer-C grows very slowly, and the patient will die of other causes before the cancer will give any symptoms. Cancer-D+E are non-progressive conditions that meet the pathological definition of cancer but never cause symptoms (D), and some grow and then regress (E). This suggests that for B-cancers, timely diagnosis and treatment might reduce cancer mortality. In contrast, cancer C+D+E might be harmed by being overdiagnosed, meaning that they receive a diagnosis that will not cause them disease in their lifetime (Brodersen et al., 2018). Put simply, overdiagnosis occurs because it is not possible to determine if a detected cancer is an A-cancer or one of the other cancers (Figure 1). Thereby, some cancers are diagnosed and some of these are treated, although these cancers would not have caused disease in the person's lifetime. According to an Australian study, approximately 20% of cancers diagnosed in Australia are overdiagnosed (Glasziou et al., 2019). Besides the physical harms from possible overtreatment, these patients risk negative psychological consequences and labelling effects of getting a cancer diagnosis (Bond et al., 2013). To recap, the different aetiology and growth of cancer tumours imply that early diagnosis of cancer can reduce cancer mortality for some, but others are overdiagnosed and overtreated. This means that even within the same cancer type, it is difficult to estimate the benefit of expedited time between symptoms, cancer diagnosis, and cancer mortality.

The logic of early diagnosis of cancer

Epidemiological studies on early diagnosis of cancer have been conducted since the beginning of the 1900s. The following will focus on how cancer epidemiologists in the Global North have investigated and concluded on the association between time and cancer, especially since the beginning of the 2000s, where fast track cancer patient pathways (CPPs) and related initiatives to expedite the diagnosis of cancer were implemented in the Global North. We argue that the research questions within these epidemiological studies acted in an interplay with policy decisions and other vectors that reformed how cancer is prevented and treated today (Andersen and Tørring, 2023; Mæhle et al., 2021). In the late 1990s, epidemiological studies confirmed that especially the UK and Denmark appeared at the bottom of tables ranking the survival of patients with cancer (Storm et al., 2011). Authors suggested that:

‘Danish cancer patients are treated at later stages, suggesting *delays* in presentation, diagnosis and treatment’ (Vedsted and Olesen, 2015). When cancer epidemiologists want to investigate the effect of a delayed cancer diagnosis, time is managed as a variable that needs to be controlled, or at least fixed while investigating the outcomes of it. This serves as the rationale for cancer epidemiologists to divide time into intervals. Figure 2 is commonly used within early cancer diagnostic studies to facilitate such a standardised and uniform definition and reporting of studies in this area (Weller et al., 2012).

Figure 2 Intervals from the first symptom to treatment by Weller and colleagues



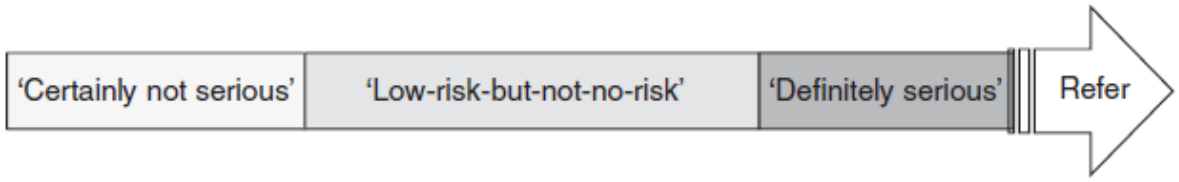
Source: “Figure 2 An illustration of the overall milestones and time intervals in the route from first symptom until start of treatment” by Weller et. al 2012 (Weller et al., 2012) is licensed under CC BY 4.0

Figure 2 consists of different intervals ranging from the first time the patient experiences a potential symptom of cancer to treatment start. The authors thereby distinguish between a patient interval, doctor interval, and system interval corresponding to each period of time where delay might happen in the linear process from symptoms to treatment. Due to ethical and methodological challenges, the association between delayed diagnosis and cancer outcomes is not an easy association to investigate. Within cancer epidemiology, the ideal study design includes a randomized controlled trial where some participants are included in a study arm that delays the diagnosis of cancer and others are not. However, the perception that rapid diagnosis of cancer is essential means that patients are unlikely to participate, and makes ethical approval difficult or even impossible to obtain. This and other methodological challenges and biases also mean that no trial has included a sufficiently large cohort to address the issue of whether or not expedited cancer diagnosis is beneficial, in terms of either mortality or morbidity (Hamilton et al., 2016). Therefore, current evidence within this topic largely includes observational evidence with several potential biases, and their findings point in different directions (Neal et al., 2015).

A systematic review from 2015 aimed to determine whether there is an association between time to diagnosis, treatment, and clinical outcomes across all cancers for symptomatic presentations (Neal et al., 2015). The authors found that even within specific cancer types, there is only moderate consensus regarding the nature of any associations between various time intervals in the diagnostic process and clinical outcomes. Some studies showed no associations, while others showed better outcomes with shorter time intervals and vice versa (Neal et al., 2015). A Danish study investigated the length of the diagnostic interval prior, during, and after CPP implementation. The authors found that the diagnostic interval (see Figure 2) was shorter after CPP implementation, but no favourable development in tumour stage across the time of CPP implementation was observed (Jensen, 2015). This again points to the complexity of whether the logic of early diagnosis can prevent disseminated cancer. These are a few examples from the epidemiological literature, but current epidemiological evidence does not suggest any clear association between early diagnosis and improved cancer outcomes as a whole.

However, the question of time is still relevant to cancer epidemiologists as an increased number of studies aim to develop new methods to predict cancer at an even earlier point in time, by identifying non-specific or vague symptoms of cancer, but also by genes and blood markers (Larkin et al., 2022; Deng et al., 2022). The underlying concept is that symptoms or even biomarkers exist on a continuum, developing in a forward-moving manner if not slowed down by detection. Figure 3 suggests how symptoms increase clinical significance, thus becoming more and more indicative of cancer (Vedsted and Olesen, 2015). This figure shows symptoms on a continuum from 'certainly not serious' to 'low-risk-but-not-no-risk', ending with 'definitely serious' (Vedsted and Olesen, 2015). However, this contradicts Figure 1, in which some but not all symptoms will progress into serious disease (Welch and Black, 2010).

Figure 3 Symptoms on a continuum



Source: "Figure 3. The symptom continuum in general practice" by Vedsted and Olesen (Vedsted and Olesen, 2015) is licensed under *CC BY 4.0*

From this point of view, Figure 3 seems misleading as studies suggest that even the 'definitely serious' symptoms, also referred to as alarm symptoms of cancer, are highly prevalent among individuals seen in general practice, yet have low positive predictive value (PPV) of cancer (Svendsen et al., 2010). For example, in a given year, 15% of the Danish general population have had alarm symptoms of breast, colorectal, urinary tract, or lung cancer (Svendsen et al., 2010). However, only a small number of these 15% will have cancer (Svendsen et al., 2010). Importantly, the logic of early diagnosis expressed in

Figure 3 has been the rationale for lowering the threshold for when to suspect cancer in general practice. With the introduction of the CPP for non-specific symptoms of cancer (NSSC-CPP), people with the so-called 'low-risk-but-not-no-risk' are eligible for intensive cancer diagnostic work-up. This different view on the association between symptoms and cancer seems to split researchers in which research questions they ask and how they interpret their findings.

In the late 1970s, sociologist Susan Sontag analysed illness as metaphors and described cancer as a mysterious illness that can only be demystified by breaking with the military metaphors used to fight and treat cancer (Sontag, 1989). The logic of early diagnosis is present in her description of cancer symptoms as invisible until the last stage when it is too late. Cancer works slowly, has stages, and will eventually lead to death (Sontag, 1989). 'Once cancer is present, it cannot be reversed or diminished by moving to a better (i.e., less carcinogenic) environment' (Sontag, 1989). Robert A. Aronowitz, a medical doctor and professor in social sciences, has questioned the seemingly self-evident logic between time and cancer (Aronowitz, 2001). In his historical analysis of breast cancer, he explores the changing actors, institutions, interests, ideas, and values that have sustained the narratives of time and cancer from 1900-1970 (Aronowitz, 2001). He explores how popular and medical writings and public health messages about cancer since the beginning of the 20th century have consistently exhorted women and men to seek medical attention as soon as they notice any symptoms that could signal cancer (Aronowitz, 2001). Interestingly, the public message 'do not delay' in cancer care-seeking was already established in the early 1900s, before epidemiological studies proved an association between early diagnosis of cancer and mortality (Aronowitz, 2001). Aronowitz quotes James Ewing, the preeminent cancer pathologist of the first half of the 20th century, who stated that 'if a woman neglects a cancerous lump in her breast, involvement of the axilla, or armpit, will occur in approximately six months' time' (Aronowitz, 2001). Such a statement reflected the widely held assumption that cancer always spreads in a linear, orderly, and incremental manner and enforced the message 'cancer is curable if taken in time' (Aronowitz, 2001). This message justified and promoted a style of practice that accentuated acute, fast-paced, diagnosis-driven care as opposed to a more familiar, lifelong, slower-paced, person-oriented one (Aronowitz, 2001). Aronowitz argues that the unknown etiology of cancer, medical uncertainties in treatment, and the gaps between specific cancer cases and the cancer ideal-type reinforced blame and responsibility. The 'delay message' made people responsible for their disease while at the same time minimising some of the existential, moral, and medical uncertainties of taking care of individual patients for clinicians (Aronowitz, 2001).

While Sontag described cancer as a slow killer, it has also been established as an acute disease (Tørring, 2023). Anthropologist Marie Louise Tørring proposes four vectors supporting the reframing of cancer as an acute disease based on a comprehensive content analysis of Danish newspapers from 1987 to 2017 and interviews with key stakeholders (Tørring, 2023). These vectors include complex biological, social, and cultural processes that established the need for urgency and action within cancer diagnosis and

treatment. Tørring describes how clinical epidemiological studies produced ‘unknowns’. This is uncertainties about the dangers of delaying that were initially tamed and managed as calculable risks and later used as a wild card to promote vigilant planning (Tørring, 2023). In the Danish national cancer plan from 2005 is stated: ‘Studies investigating the effect of delays on prognostic factors for these cancers point in different directions, and the effect is thus not finally clarified’ (Danish Health Authority, 2005). Despite, uncertain evidence, the government introduced fast-track CPPs as part of the national cancer plan (Danish Health Authority, 2005).

With the establishment of cancer as an acute disease, the logic of early diagnosis's inherent message of ‘do not delay’ seemed reconfirmed in the form of implementing CPPs, focusing on reducing any delay in the diagnostic process. Hence, the core of the ‘delay’ message has survived in a somewhat stable form, as it is still dominant in how cancer is treated today and included in the Danish Government's latest cancer strategy from 2023 (The Ministry of the Interior and Health, 2023).

‘First symptoms’?

Figure 2 presents a time line, starting from the first symptom running to the potential diagnosis of cancer and later treatment. Thereby, time is understood as linear and cumulative but at the same time not neutral. We argue, the intervals have implicit moral modalities that assigns partly responsibility to different actors (patient, doctor or system).

The first interval is named *first symptom* and is part of the *patient interval*. This holds two principles: 1) that such thing as a *first symptom* exists 2) and that the individual can recognise and is responsible for reacting to such a first symptom. However, by drawing on others and own ethnographic work with patients investigated with the suspicion of cancer, we found that first-symptoms are not that simply put as people did not always experience their bodies in such a linear, forward-moving process (Damhus et al., 2022a; Merrild and Andersen, 2021). Further, people might not be able to interpret their ‘first symptom’ as such, because they are not necessarily free of symptoms to begin with or even aware of their bodies in such ways. In a study by Merrild and Andersen, based on repeated ethnographic interviews with 10 socially deprived patients with cancer in Denmark, the interlocutor, Liz, has previously been treated for breast cancer and is now being seen for follow-up tests in the hospital (Merrild and Andersen, 2021). Liz is disabled by her deteriorating backbone so when she describes her health problems, it is often hard to distinguish between her previous cancer, her back pain or her swollen lymph nodes, the bulge of skin growing under her arm, or the lumps in her breast – it is all a blur (Merrild and Andersen, 2021). Similar, contextual and intertwined interpretation of first symptoms can be found in CSD’s interviews with Inga an 84-year-old woman investigated with the suspicion of cancer within the NSSC-CPP (Damhus et al., 2022a). In the interviews with Inga, she told about her back pain from a fall and the abnormal blood test result that was the reason why she was referred to the NSSC-

CPP. However, when she in the diagnostic centre at hospital was asked when her symptoms started she answered:

'It is because my husband Fred has had a long course of disease (five years), he died in September and the last months, I was sitting next to him and took care of him the whole time, and therefore I did not take care of myself.'

Inga explained that she reacted on her symptoms after her husband's death while at the same time indicating that her symptoms might have been there the entire disease course. Inga explained her bodily changes as a narrative intertwined with the disease course and her everyday life with her husband. It seemed like it made no sense to Inga to describe the one without the other. This suggests that symptoms are not isolated occurrences, but rather intertwined with the environmental, cultural, and social context in which individuals experience them. It seemed impossible for Inga and Liz to report their first symptoms as suggested in Figure 2. Their bodies were not free of symptoms to begin with and to isolate first symptoms of cancer from other symptoms and other part of life were not meaningful or might even possible.

Also, depending on time and context, symptoms might be interpreted as more or less important. When CSD met Susanne, a 70-year-old woman, at her first diagnostic-pathway consultation, she reported headache as the most important symptom. In a later interview with Susanne, her headache was reduced but difficulty breathing was now more dominant in her everyday life as she was back doing housework and joining her weekly dance sessions (Damhus et al., 2022a). This suggests that the dominant understanding of time as linear between symptoms and diagnosis, as depicted in Figure 2, does not accurately capture the varied and complex experiences of symptoms. Symptoms can be experienced as single events, coming and going, or varying in importance to the individual at different moments in time. The linear model fails to account for the dynamic nature of symptoms and the significance they hold for individuals. Our findings are in line with how anthropologist Cameron Hay, refers to symptoms as created in a continuous feedback relationship in which a specific cultural, historical, political or social context contributes to different expectations that influence when and if bodily sensations are interpreted as symptoms (Hay, 2008). Furthermore, several medical anthropological studies have explored how individuals experience bodily sensations and attribute meaning to them (Macdonald et al., 2019; Offersen et al., 2016; Offersen et al., 2017; Merrild et al., 2017). These studies align with our findings, highlighting that symptoms are informed by social contexts, including moral imperatives.

Additional, in Figure 2, by referring to a *patient interval*, there is an implicit expectation that the individual is responsible for taking action in terms of reacting on symptoms and appropriate healthcare seeking.

This responsibility is not new as citizens have long been made accountable for acting on potential symptoms of cancer in a timely matter (Aronowitz, 2001). In the 1920s, the unknown aetiology of

cancer reinforced physicians to blame time or the patient if bad outcomes happened. Importantly, neoliberalism did not create cancer as an acute disease, but rather confirmed and amplified the logic that was already established. This by encouraging individuals to govern themselves, creating space for individual action and involvement, but also assigning blame if the individual does not succeed. It is noteworthy that with the advancements in our understanding of tumour biology and cancer treatment, the once mysterious nature of cancer has gradually diminished. Nevertheless, cancer continues to possess an inherent enigmatic nature, as exemplified by the persistent absence of a definitive solution for its ultimate prevention or treatment. Furthermore, it remains one of the diseases that elicits the greatest fear within the general population (Vrinten et al., 2017; Balmer et al., 2014). Therefore, traces of holding citizens responsible and blame time might still be reflected in how cancer is understood and prevented today.

The responsibility of reacting on symptoms and seeing the doctor in time, comes with the counterpart of not wasting the doctor's time, by seeing the doctor too often. Not to waste time and the moral obligation to make good use of time, Rosa and others argue is characteristics of our current society where market logics including features of competition have accelerated the pace not only in technological development but to all part of social action in our society (Rosa, 2010; Petersen, 2016).

After being investigated with the suspicion of cancer as part of the NSSC-CPP, Susanne discusses her future healthcare seeking:

'I think I go to my doctor a bit earlier than I normally would, when I have these issues with breathing and coughing, I need to be sure that it is not just a flu, but I think I will do it faster now. But of course, one should not complain to the doctor about everything.' (Damhus et al., 2022a)

Susanne's reasoning demonstrates that she feels responsible for appropriate and timely healthcare seeking. Not too much and not too late. The NSSC-CPP build on the rationality of the logic of early diagnosis of cancer where what counts as symptoms of possible cancer is expanded. Coughing which is also experienced in the general population might be a symptom of cancer. This challenges Susanne (and others) in how and when to seek care, when also feeling responsible for not wasting the doctor's time. Thereby incentives to accelerate diagnostic practices have resulted in a vast expansion of what are considered symptoms of cancer. Still, individuals are expected and responsible to navigate in this expanded room of what might be cancer.

Tom, a 70-year-old participant did not experience any symptoms but was referred to the NSSC-CPP based on a slightly low blood count found in a routine consultation (Damhus et al., 2022a). During CSD' interviews with Tom, he repeated how the doctor soon after the referral had dismissed the suspicion of cancer and how Tom had changed his diet to increase iron which he believe would increase his blood count. He expressed worries of what he termed a 'half diagnosis' referring to biological findings that might not be cancer but for which he would need further doctor appointments or tests.

Tom’s story illustrates how the room of expansion of what might be cancer include worries and uncertainties calling for the doctor’s word of being fine, and individual action such as health change behaviours in order to maintain responsibility of own health.

Figure 2 has laid the foundation for how much research within early cancer diagnostic is conducted today. However, we argue, Figure 2 supports a linear understanding of bodies and biologies that are not recognised by the individuals who experience them or in the complex biological association between symptoms and cancer tumour progression (Figure 1). By naming parts of Figure 2 the patient interval, the authors implicitly place responsibility on patients to react to symptoms, symptoms which are steadily being expanded. Figure 2 supports the thinking of internalised individual responsibility for one's own health as a core tenet in our society, and it supports a continued emphasis on the logic of early diagnosis in cancer.

The sooner the better as a stable concept in the Global North

Following our analysis, we argue that the message - the sooner the better – is a stable concept within common understandings of cancer diagnostics in the Global North. In fact, so stable that it is taken for granted within different research disciplines. Studies within medical anthropology have challenged the linear thinking by including contexts and moral imperatives to come to understand how bodily sensations and symptoms are understood and given meaning to by individuals (Merrild et al., 2017; Offersen et al., 2016). Still, where these studies come to understand how people interpret their body, the studies seem to contain traces of ‘do not delay’ in their interpretation of why sensations might (not) lead to ‘proper’ healthcare behaviour (Macdonald et al., 2019; Offersen et al., 2016; Offersen et al., 2017; Merrild et al., 2017). Researchers within medical anthropology have argued that the term ‘patient delay’ might not be a relevant issue when viewed from the perspective of patients (Fainzang et al., 2010). First, because the act of interpreting bodily sensations as potential symptoms is contextual. Second, because acting on symptoms might interfere with social obligations, remove people from their social roles and challenge the definition of the self. However, the same authors argue, that patient delay can be a meaningful concept from a biomedical perspective, springing from a concern to initiate treatment as fast and efficient as possible (Fainzang et al., 2010). It indicates that anthropological studies have challenged the linear thinking between symptoms and cancer that is they have challenged healthcare seeking as a simplistic and linear rational action. However, when acknowledging the significance of early diagnosis as a valuable biomedical perspective, we contend that the underlying logic has not been substantively challenged. Tørring's proposition that epidemiological studies generate 'unknowns' that are strategically employed to promote acute cancer diagnostics underscores the non-evidence-based nature of early diagnosis (Tørring, 2023). However, this paper aims to go beyond mere description and analysis of the non-evidence-based logic of cancer, by also highlighting the detrimental

consequences of this approach and advocating for a substantial rethinking. Despite the important contributions made by Tørring and other medical anthropologists in terms of epistemological, theoretical, and methodological assumptions, a critical gap remains in cancer research, namely the absence of studies that question the underlying logic of early diagnosis and its discursive influence on cancer.

Why does the sooner the better stick in our time?

By analysing epidemiological, historical and ethnographical work in relation to the logic of early diagnosis, we have argued that the literature includes *unknowns* in the relation between time and cancer. Where the logic of early diagnosis benefit some, the logic also produces harms such as overdiagnosis, overtreatment, internalized expectations of moral responsibility and embodied changes in health practices. Further, the logic of early diagnosis has expanded the population of who is eligible for diagnostic cancer testing, which does not come without consequences. First, the expansion has complicated the answer to what constitutes symptoms of cancer? This (research) question needs its own analysis, but our present analysis indicates that, we might all have symptoms of cancer which might vanish the meaning of cancer symptoms. Second, investigating more people with the suspicion of cancer, risks spending healthcare resources among those with the least need, which on the societal level is not sustainable in a public funded healthcare sector with limited resources. However, the more than one hundred years old assumption 'cancer is curable if taken in time' (Aronowitz, 2001) hasn't changed but is exactly the same as the message from the newest malign melanoma campaign from the Danish Cancer Society 'malign melanoma is curable if taken in time' (The Danish Cancer Society, 2023). It is striking, that despite the lack of evidence to support this message, no researchers, politicians or individuals seem to challenge the logic of early diagnosis within cancer diagnostics. Within our linear understanding of time, death is the end. Death is feared and regarded as something that should be avoided or at least postponed by us. Such paradigms coupled with the fact that cancer is a leading cause of death, support the increased focus on cancer prevention and legitimises the logic of early diagnosis. Rosa argues that social acceleration has become a totalitarian force in and of modern society (Rosa, 2010). To Rosa, a power is totalitarian when it exerts pressure on the wills and actions of subjects, when it is inescapable, when it is not limited to one area of social life and when it is hard or almost impossible to criticise and fight it (Rosa, 2010). We argue social acceleration is essential in the logic of early diagnosis and thereby traces of a totalitarian power is present in how it seems almost impossible to criticise or fight the logic of early diagnosis, while at the same time one cannot escape it.

Based on the above analysis, we argue, there is a need to question and nuance this somewhat linear and stable ontology of time and cancer within the logic of early diagnosis. We acknowledge such attempt

might fail, among others, due to our linear perception of time and the totalitarian characteristics of social acceleration, constituting central elements of the logic of early diagnosis.

Conclusion

In this paper, we have drawn on theoretical concepts of time to come to understand how, what we argue is, a dominant linear view on symptoms and cancer, came into being and how it is sustained in our healthcare sector. We found how the message 'do not delay' have been prominent in the prevention of cancer in more than one hundred years and seem rather stable in our time where it has been supplemented by the 'the sooner the better'. Thus, evidence from different scholars suggest that symptoms and cancer are much more complex than this linearity, the logic of early diagnosis has survived, both within political decisions on cancer prevention, different research disciplines and within the public awareness about cancer. We argue this, at least partly, can be explained by the power of a linear perception of time and societal traces of neoliberalism and acceleration in our society together with cancer still being a somewhat enigmatic disease that requires acute action. To support a sustainable healthcare sector, we argue there is a need to nuance the logic of early diagnosis. Structural primary prevention of cancer is unquestionable important in today's societies but continuing the linear perception of symptoms and cancer in medical prevention, risks doing more harm than good. In short, by making more people patients unnecessarily and by spending health resources among those with the least need.

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