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Drawing from the insights of biology, sustainable healthcare systems should prioritise robustness over optimisation

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Abstract

The concept of performance has gradually become established in health policies. Presented as necessary and positive, it is often reduced to efficiency, which results in policies and management styles aimed at optimisation. While they are supposed to guarantee the sustainability of our healthcare systems, these practices have made them fragile. Insights from the life sciences help us understand why. Indeed, biologists observe that living beings do not prioritise optimisation but robustness. To cope with fluctuations, a robust organisation operates with redundancies, apparent waste, heterogeneity, organised fluctuations, slowness, and hesitation. It functions suboptimally. This article offers a theoretical reflection and management directions for more robust healthcare systems.

KEYWORDS

healthcare system, nursing care management, optimisation, performance, robustness

1 | INTRODUCTION

In recent years, the concept of performance has gradually become entrenched in health policies, even finding its way into the writings of the highest international bodies. For instance, the World Health Organisation (WHO) issued a call for improving the performance of healthcare systems in its 2000 health report. The WHO defines performance as achieving the best possible results with the same resources (Murray & Frenk, 2000; World Health Organisation, 2000). Beneath this call for enhanced performance, which is presented as necessary and positive, lies an underlying push for greater efficiency. Efficiency can be broadly defined as the ability of a machine, technique, person, or organisation to deliver the "desired results with little or no waste (as of time or materials)" (Merriam-Webster, 2024). In other words, the ratio between production, work, and the total value of the units contribute to achieving it.

Over the past few decades, numerous healthcare systems have been equipped with a Health System Performance Assessment Framework to measure their performance (Health system performance assessment a framework for policy analysis, 2022). The concept of efficiency permeates these frameworks, although they may vary in their specific elements based on organisational context and temporal factors (Klassen et al., 2010). For example, the Canadian Institute for Health Information (CIHI) proposed a performance measurement framework for the Canadian healthcare system in 2015 (Canadian Institute for Health Information, 2015). Regarding efficient service delivery, the CIHI defines it as "the extent to which a hospital maximises the volume of health care services delivered for the minimal amount of resources used" (Canadian Institute for Health Information, 2015, p. 36). This idea of efficient service provision consistently resurfaces in CIHI reports, emphasising the need to avoid waste of equipment, supplies, ideas, and energy, while maximising services offered within a given set of resources or minimising the resources (inputs) required to achieve specific outcomes.

In Belgium, the Belgian Health Care Knowledge Centre (KCE) has drawn inspiration from the pan-Canadian framework developed by the CIHI to establish the conceptual framework for evaluating the performance of the Belgian healthcare system. Within the Belgian framework, efficiency is considered a transversal dimension of performance. According to KCE, efficiency "usually concerns the relation

between inputs (i.e., sustainability indicators such as financial resources, workforce, infrastructure) and intermediate outputs (i.e., accessibility and quality indicators such as waiting times, etc.) or ultimate health outcomes (i.e., health status indicators such as the life years gained)" (Gerkens et al., 2024, p. 22). This definition aligns with the same logic found in the Canadian framework.

2 | OPTIMISATION FOR GREATER EFFICIENCY

Pursuing greater efficiency involves optimising care and service production processes within the healthcare system. According to the CIHI, "any deviation from the maximum health improvement or positive patient experience that could have been produced with the same level of resources indicates inefficiency. Attaining this outcome contributes to the wider health system objective of value for money" (Canadian Institute for Health Information, 2015, p. 33). Notably, the CIHI's stance legitimises process optimisation and service production within the healthcare system as an objective in itself (Canadian Institute for Health Information, 2013). This perspective aligns with the "triple aim" articulated by the Institute for Healthcare Improvement in 2008, which encompasses improving individual care experience, enhancing population health, and reducing per capita healthcare costs (Whittington et al., 2015).

This drive for optimisation is explicitly rooted in the belief that this change is linked to societal demands for efficiency (Whittington et al., 2015). To achieve optimisation, policymakers and managers introduce principles borrowed from the private commercial and industrial sectors to 'improve processes'. These principles are grounded in positivist convictions about the potential of new technologies and the ability to predict and control phenomena. As a result, there are pressures on healthcare personnel to enhance the efficiency of care processes, even when resources remain constant or decrease—essentially, to increase their efficiency (Mahmoud et al., 2021). Performance-related financing mechanisms are implemented, sometimes including budget cuts as sanctions for organisations deemed less effective, even though the financial benefits of process optimisation remain to be demonstrated (Evans et al., 2023).

Some authors suggest that the ethos of managers sometimes conflicts with that of healthcare professionals. The mental models of the former are based on a socio-political discourse where change in healthcare organisations is driven by societal demands for greater efficiency and a focus on cost-effectiveness (Simonet, 2019; Storkholm et al., 2017). In contrast, healthcare professionals actively engaged in clinical practice consider change from the perspective of ethics, scientific research findings, and the availability of technological advancements (Simonet, 2019; Storkholm et al., 2017).

Cost reduction policies would be presented as 'opportunities for improvement' by the former, while in the minds of the latter, they would be synonymous with a decrease in the quality of care (Storkholm et al., 2017). However, this opposition needs to be nuanced. Healthcare professionals appear divided on these issues, with some supporting the policies advocated by the managers (Simonet, 2019).

3 | OPTIMISATION WITHIN HEALTHCARE INSTITUTIONS

Let's take hospitals as an example and examine some of the optimisation strategies implemented by policymakers and managers, considering their impact on nurses, patients, and the environment.

4 | SOME OPTIMISATION STRATEGIES

One way to optimise is by pushing for shorter hospital stays without necessarily considering the nonmedical determinants of health for individuals whose stays are shortened, despite calls for vigilance in this regard (Clarke, 1996). Simultaneously, policies may encourage more patients to undergo day surgery for a wider range of procedures. In this case, the patient remains hospitalised for a shorter duration, requiring similar care despite technological and scientific advancements (Aiken, 2008; Cho et al., 2014). As a result, healthcare professionals must deliver care within shorter timeframes within organisations or the community, even if the latter is not necessarily prepared to assume this responsibility. Another way to increase care intensity is by maximising occupancy rates: as soon as one patient is discharged, another takes their place. This reduces the perceived need for hospital beds and, consequently, the required staff when nursing positions are calculated based on the number of physical beds.

Also, it is said that team schedule overlaps are unnecessary, and as a result, they are reduced: double-shift work (morning and afternoon or night-morning) disappears or is minimised, even though it is essential for continuity of care and patient safety because it is indispensable for information transmission (Welsh et al., 2010). Consultation times are timed to achieve a quantified goal in terms of the number of patients per hour. In the field of nursing, there is also a trend in some healthcare systems, particularly in Europe, to replace qualified nursing professionals with less or non-qualified individuals to perform certain tasks at a lower cost (Adams et al., 2000; Dubois & Singh, 2009). Consumable and pharmaceutical product stocks are reduced in care units and at the central pharmacy level, with negative consequences in terms of product availability reported by some authors (Moraros et al., 2016). These stock volume reductions can, in turn, lead to the reduction or disappearance of storage spaces near care areas. Let us also consider the recent COVID-19 pandemic during which healthcare professionals faced shortages of personal protective equipment from the outset of the crisis, as stocks were reduced, and healthcare facilities relied on production chains located thousands of kilometres away.

5 | CONSEQUENCES OF OPTIMISATION ON HUMAN BEINGS AND THE ENVIRONMENT

In our societies, neoliberalism dominates the discourse in the political arena (Foth et al., 2017). This current of thought aims to radically transform liberal democracies by subjecting all dimensions of existence to economic rationality. According to some authors, it can indeed be observed that neoliberalism is a political rationality that "organises… policies and goes beyond the market" (Brown, 2003). Consequently, it appears that organisational solutions aligned with the ideological foundations of the system are favoured in all domains. Foth et al. (2017) identifies fundamental trends at the international level: the increasing economic pressure on healthcare systems, leading to profound transformations resulting in nurses' accountability in the "rationalisation" of their patient care services, particularly within a context of growing privatisation of social and health services that were once funded and administered by the state. The logic of efficiency translates everywhere into a dynamic of optimisation (Foth et al., 2017). However, scientific literature has demonstrated for many years that current management and organisational practices, stemming from the logic of optimisation, lead to human suffering in our healthcare organisations (Bourbonnais et al., 2005; Meredith et al., 2022). Optimisation contributes to increasing the intensity of nursing work and constantly places professionals in situations of relative scarcity: a lack of human resources to meet required care, lack of humanity with patients and among colleagues, reduced safety in care provided by less qualified personnel, and even shortages of equipment and medications (Rinaldi et al., 2017). Thus, low or inadequate staffing levels for nurses, shifts exceeding 12 h, inflexible schedules, time constraints, high professional and psychological demands, limited task diversity, etc., all contribute to professional burnout, resulting in negative consequences such as deterioration of overall health, increased sick leave, and intentions to leave their jobs (Dall'Ora et al., 2020). This vicious circle hurts the quality of care, particularly by compromising patient safety. This results in adverse events, medication errors, infections, and falls, leading to patient dissatisfaction (Dall'Ora et al., 2020). It's worth noting that average scores for professional burnout and secondary traumatic stress measured by researchers tend to increase year by year, with the COVID-19 pandemic (Xie et al., 2021) exacerbating an already critical situation (Rizzo et al., 2023). When unexpected events occur—such as a team member's absence or a delay of more than 48 h in the delivery of supplies—the quality of care is potentially compromised due to insufficient personnel or available resources (Jouve & Campagnac, 2019). Additionally, in addition to the pressures placed on healthcare personnel, optimisation practices also transfer an additional burden to patients and their families, with negative consequences for those involved (Clarke, 1996; Lilleheie et al., 2021; Liu et al., 2008).

6 | RESPONDING TO DISASTERS

Our healthcare systems routinely face both natural disasters (such as volcanic eruptions and tsunamis) and those caused by human activities (such as industrial accidents or transportation incidents). Changes in our ecosystems related to climate change (increased frequency of extreme weather events such as heatwaves, floods, and storms, air pollution) and biodiversity collapse (ecosystem collapses and associated service losses) directly impact our biophysical and mental health (vector-borne diseases, water, and foodborne illnesses, respiratory diseases, food shortages). These changes also contribute to social and political instability, an indirect consequence of these phenomena (loss of homes, poverty, mass migrations, and violent conflicts) (Watts et al., 2018). These multiple pressures continually force healthcare systems to adapt. However, as demonstrated by the recent COVID-19 pandemic, our healthcare systems, already strained during routine operations, struggle significantly when responding to disasters they should be prepared to withstand. Their inability to adapt puts citizens' safety and the lives of healthcare professionals at risk. It is both opportune and legitimate to delve deeper and question the logic of optimisation, which has already shown its limitations in practice.

The question arises: Are our healthcare systems equipped to handle these new realities? Some healthcare systems are beginning to address these concerns. For instance, the KCE has recently revised its conceptual framework for assessing the performance of the Belgian healthcare system, introducing a new dimension: system resilience (Gerkens et al., 2023). Inspired by European research, system resilience is defined as the system's ability to anticipate shocks, absorb them, and adapt in a way that allows it to (1) continue providing essential services, (2) return to optimal performance levels as quickly as possible, (3) adjust its structure and functions to strengthen itself and (4) potentially reduce vulnerability to future shocks and structural changes.

While the term "optimal" remains in this definition, the need to consider healthcare system performance in terms of resilience to fluctuations and adaptability is evident. Recent work in biology can help us reflect on these questions.

7 | THE RESILIENCE OF LIVING BEINGS: A MATTER OF ROBUSTNESS

In his book "La Troisième Voie du Vivant" (The Third Way of Life), Dr. Olivier Hamant, a biologist, examines life to explore avenues that would allow us to thrive amidst these fluctuations, which he defines as spontaneous deviations from the average (Hamant, 2022). The author delves into a thoughtful discussion about the resilience of living beings and their capacity for adaptation. According to him, the resilience of living beings, from the simplest organisms (microorganisms) to the most complex (plants and animals), comprises three interconnected abilities: robustness, adaptability, and transformability. A resilient organism can transform its nature or functions

to ensure viability by adapting to variations and unforeseen environmental changes, but it can only do so because it is robust. The key to adaptability and transformability lies in robustness, which Hamant defines as the property of a system "to establish a new equilibrium in the presence of internal or external fluctuations" (Collart Dutilleul et al., 2023).

8 | LIVING WITH THE FLUCTUATIONS OF THE WORLD

In ecosystems, everything is always dynamic, out of balance, and therefore fluctuating. What is noteworthy today is that the current environmental degradation will further accentuate these fluctuations, which in turn will be exacerbated by largely unpredictable feedback loops resulting from these changes (Arneth et al., 2020). Even if, according to Hamant, it is likely that our human societies will not collapse, the risk is high that they will also not be capable of adapting to fluctuations as humanity has never experienced before. Incorporating a long-term perspective is a major challenge to overcome. However, according to Hamant (2023), a proper reading of Darwin's "On the Origin of Species" teaches us that it is not the most adapted individuals who survive and thrive but rather the "satisfactory" individuals who demonstrate the best adaptability and capacity for adaptation. It is not about being the best but rather about maintaining the widest margin of manoeuvre possible. This allows relying on internal resources to operate autonomously and thus maintain stability in the short term and evolve over the long term. Hamant (2022) refers to this as 'integrating a long time'.

9 | SUB-OPTIMALITY FOR VIABILITY

A robust organism operates sub-optimally: it accepts that certain things are not efficient. According to Hamant (2022), living beings are imperfect, and that imperfection is what allows them to stay alive. Sub-optimality implies that the system does not operate at its maximum capacity. This ability enables a living being to evolve over the long term by using its limitations or apparent weaknesses as springs for adaptability. Hamant illustrates sub-optimality and its virtues using the example of our body temperature. Our bodies typically function at 37°C, which is the temperature at which enzymes work 'well'. However, the optimal functioning temperature would be around 40°C. Why not strive for this temperature daily? The difference allows our body to mount a defence against infections by raising its temperature, inducing fever to surprise intruders with an immune boost. Additionally, beyond 40°C, the temperature causes the denaturation of numerous proteins and inflicts damage on the body, ultimately leading to its death. Thirty-seven degrees Celsius is a satisfactory, viable temperature. According to Hamant, biology indicates that aiming for a single optimum can only lead us to non-viability, as it makes us unable to cope with system fluctuations.

10 | RETHINKING HEALTHCARE SYSTEMS IN TERMS OF ROBUSTNESS

Begun et al. (2003) proposed considering our healthcare systems and the organisations within them as complex adaptive systems (CAS), akin to "living" systems. The term "complex" implies diversity—a wide variety of elements. "Adaptive" suggests the capacity to modify or change, the ability to learn from experience. A "system" comprises interconnected or interdependent elements. Among the characteristics of CAS, the authors highlight robustness, which they define as the ability to adapt in response to information. According to Marion and Bacon (1999), CAS, functioning like networks, can redirect the function of a malfunctioning subpart to other areas of the network. This capacity reduces the likelihood of damage or destruction to the complex system. Complex systems offer multiple creative avenues for action: they can effectively adapt to a broad range of environmental changes, endowing them with "astonishing resilience" (Marion & Bacon, 1999). However, they are threatened by optimisation logic. Biological sciences shed light on this. Taking the example of a human body's temperature, we could describe our optimised healthcare systems—complex adaptive systems—as living organisms intentionally kept in a perpetual fever state, compromising their short-term survival. According to Hamant (2022) the key to the survival of our healthcare systems and organisations lies in their adaptability to ensure transformation, requiring robustness. Drawing from the insights of biology, Hamant offers us some inspiring concepts to enhance the robustness of our healthcare systems and organisations, which have been made more fragile by years of optimisation.

11 | REDUNDANCIES

Hamant (2022) defines redundancy as the simultaneous existence of multiple ways to achieve the same result. According to Hamant, redundancy is a principle of living beings that enhances autonomy, which he defines as the capacity of organisms to thrive with fluctuations without external assistance. Conversely, the absence of redundancy renders them fragile because it compromises adaptability. Redundancy involves duplicates in terms of structural elements and processes. These duplicates may appear inconsistent when considered individually and in the moment. Still, they have demonstrated their utility or could be useful at an undetermined time without a systematic a priori determination of exact circumstances (Hamant, 2022).

In healthcare, certain redundancies are well-known and sometimes even encouraged. They can take the form of repetitions. For instance, many guidelines incorporate redundancies to ensure patient safety: hemovigilance recommendations involve

multiple checks of blood bags and patient identity before transfusion, performed by different individuals at different times. Additionally, maintaining the practice of recording observations in a paper patient file may seem redundant even when an electronic patient file exists. However, if the organisation falls victim to a cyber-attack and all its processes rely on information technology, it would be unable to function without this 'duplicate'. Considering a hospital as a building, it is equipped with a redundant generator: this generator can take over in case of a power outage from the grid. No one would consider removing it, even though it operates only occasionally.

In addition to repetitions, Hamant also emphasises that having "inactive" structural elements, a reserve, is also a constitutive aspect of redundancy. This reserve can take over when necessary. If we apply the concept of redundancy to nursing care management, why would it be inconsistent for nurses to be supernumerary and sometimes inactive? Considering Nadot's work on nursing activity, inactivity is even part of the usual functioning of hospitals and is inherent in the dynamics of a complex institution with multiple purposes (Nadot et al., 2013; Nadot, 2003). More radically, deliberate inactivity could be planned in anticipation of potential failure. This approach extends the logic of 'reinforcement teams', which already exist, normalising the fact that colleagues may sometimes act as reserves, akin to firefighters awaiting an emergency call. In the absence of a need for reinforcement, the relative temporary overcapacity of personnel could slow down the pace of work and allow nurses to provide more attentive care to patients and their families, as they would have more time. This available time could also be used to evolve care practices by enabling nurses to discuss and reflect. In a networked healthcare system, reinforcement teams could even be shared to assist needy organisations.

12 | APPARENT WASTAGE

According to Hamant (2022), wastage is how living beings manage abundance and scarcity. When dealing with abundance, an excess of resources, living beings dissipate the surplus into their environment: they redistribute these resources to others by nourishing their ecosystem. The sharing of reinforcement teams within the healthcare network mentioned earlier could be akin to managing abundance. As for coping with scarcity, it involves creating resource stocks. The COVID-19 pandemic, still fresh in our minds, reminded us not to consider stockpiling materials as wasteful, contrary to the practices of Lean Management enthusiasts (Bouville & Trempe, 2015). In March 2020, Belgium faced a shortage of protective masks because authorities decided not to replenish the strategic stock that had been part of its pandemic plan since 2011. Establishing stocks that account for fluctuations in our ecosystems over the long term contributes to stability: these apparent "wastages" are factors of adaptability.

13 | HETEROGENEITY

According to Hamant (2022), robustness is also supported by heterogeneity. By heterogeneity, the author literally means the diversity of structural elements and processes within an organism or system. For Hamant, heterogeneity is a rich source of information that also involves developing collaborations to benefit from it. Heterogeneity enhances adaptability in the face of fluctuations by ensuring a greater variety of possible responses to diverse demands. Personnel diversity in healthcare systems and organisations contributes to offering more tailored services and care for individuals (Schot et al., 2020). Healthcare organisations frequently serve patients with multiple chronic health issues. If their services are specialised, they struggle to provide appropriate support. Thinking about heterogeneity can inspire innovation: why not hire a clinical nurse specialist in mental health for an internal medicine department that provides general care? Or for a geriatrics department? Through collaborations, the skills she could bring would enable the team to handle diverse care situations. These organisational approaches contrast with the current mode that favours overspecialisation (Anderlini, 2018).

14 | ORGANISED FLUCTUATIONS

As previously mentioned, Hamant (2022) defines fluctuations as spontaneous deviations from the average. Living beings experience fluctuations, which serve as external constraints. However, they also organise themselves to coexist with these fluctuations. Likewise, healthcare services are subject to well-known fluctuations. During winter, paediatric teams are often overwhelmed by an influx of young patients suffering from bronchiolitis. It becomes evident that their capacity is insufficient during epidemic periods. In summer, as heatwaves become longer, and more frequent, elderly individuals in long-term care services suffer from dehydration due to a shortage of nursing staff. What if we robustly considered these seasonal fluctuations natural occurrences and adapted by fluctuating in response? Consequently, could healthcare teams' size, structure, and functions also vary over time, assuming that healthcare services are not fixed, perfect entities? Exploring healthcare facilities designed as versatile modular spaces offers another avenue for consideration. Once again, it involves envisioning sustainable solutions over the long term.

15 | SLOWNESS AND HESITATION

According to Hamant (2022), slowness, which allows for hesitation, is also a factor in robustness. Slowness promotes adaptability by providing enough time for adjustment, plain and simple. In living beings, slowness also facilitates growth and development by allowing for hesitation, meaning repeated, failed attempts to find viable solutions. As previously mentioned, in our healthcare systems, systematically and indiscriminately shortening hospital stays to save on personnel

costs can reduce the quality of care and increase work-related stress for healthcare professionals. Moreover, it intensifies the workload for professionals, preventing them from offering all necessary care and contributing to burnout (Cho et al., 2014). For instance, this has been demonstrated in the context of postpartum stays (Bowers & Cheyne, 2016). Some states have legislated minimum hospital stay durations (embracing slowness) to prevent complications (Datar & Sood, 2006). As mentioned earlier, policies aimed at reducing hospitalisation lengths have also been shown to create treatment inequalities, disproportionately affecting socioeconomically vulnerable individuals (Clarke, 1996). For example, their health may be compromised when community services are unavailable, leading to more frequent readmissions. Offering certain patients the option to extend their hospital stay (embracing slowness) could facilitate better recovery. Additionally, when rethinking interprofessional teamwork in a heterogeneous context, it has been demonstrated that this approach requires available time (Hook, 2006). The same holds for involving patients and their families in care decisions (Hook, 2006). Slowness is desirable to foster the development of innovative practices: it is appropriate to hesitate and take the time to test multiple solutions rather than swiftly implementing standardised healthcare policies for optimisation purposes.

16 | ROBUSTNESS, CIRCULARITY AND COLLECTIVE IMPORTANCE

To be comprehensive, according to Hamant (2022), in addition to robustness, it is also essential not to overlook two other pillars of life: circularity and the importance of the human collective and its interaction with 'nonhumans'. More broadly, beneath the surface of healthcare system optimisation logic lies unexamined aspects, including questions about available resources and negative externalities.

Firstly, regarding the principle of circularity, Hamant encourages us to consider the long-term feedback loops associated with each of our choices. As for negative externalities, beyond direct human suffering, healthcare system activities significantly impact the environment (Lenzen et al., 2020): carbon-generating infrastructures and logistics chains, excessive packaging, single-use materials leading to waste, the use of halogenated gases in anaesthesia responsible for 10%–15% of human-induced greenhouse gas emissions, and equipment containing endocrine-disrupting substances, among others (Jouve & Campagnac, 2019). The sustainability of equipment and material choices often takes a back seat in drafting specifications and public tenders, favoring the most efficient and cost-effective solutions (Kalogirou et al., 2021).

On the other hand, Hamant (2022) emphasises the importance of the collective among human beings and with non-humans, which is essential for ensuring the group's survival. Regarding the human collective, respecting human rights, particularly the right to health, would require that the financing of healthcare systems, the resources made available for their operation, and their commodification be examined from a wide and integrated social justice perspective (Yanicki et al., 2015). This approach contradicts the neoliberal political theory discussed earlier, which advocates for efficiency and drives optimisation logic. Some authors extend their reflection on social justice not only to the present but also to the future of the human collective: in a world where human activity exceeds planetary boundaries, extractivism and productivism, they argue, jeopardise the future of our descendants by depleting the essential resources needed for their well-being (Van Reybrouck & Standaert, 2023).

Finally, in the face of threats posed by biodiversity collapse and climate change, along with the fluctuations these disruptions cause and their consequences for our societies, the current challenge for human beings is, according to Hamant (2022), to invent a new social contract that extends to interactions with 'nonhumans', a 'natural contract', to borrow Michel Serres' terminology (Collart Dutilleul et al., 2023). Optimisation is often anthropocentric and stems from a worldview that sees the world as “an inert realm, devoid of intention or purpose, a world at our disposal where nonhuman living beings sometimes formed a vague landscape, sometimes an unnecessary or inconvenient hindrance, and sometimes resources to extract or consume, a world, exploitable at will, made of matter” (Despret et al., 2023). In contrast, a robust project contributes to the common well-being, encompassing human health, social health, and the health of natural environments (Collart Dutilleul et al., 2023).

17 | CONCLUSIONS AND OUTLOOK

Effectiveness and efficiency values are often prioritised when managing healthcare systems and organisations. In the healthcare sector, the concept of performance is often reduced to that, regardless of the accompanying political discourse. Paradoxically, decision-makers often state their intention to ensure the viability of the healthcare system, while the implemented policies are, in reality, detrimental. Optimisation is a debatable “success” when considering its outcomes, and its overall impact is often disastrous when accounting for all externalities, especially in the medium and long term.

Furthermore, we observe that our healthcare systems, as complex adaptive systems, are threatened by the logic of optimisation. Biological sciences help us understand why. This way of functioning is an aberration: for a living being, there should be no question of operating at full throttle without respite and genuine adaptability to fluctuations. We recognise that operating optimally, with performance reduced solely to efficiency, is operating outside the realm of the living. The same applies to our healthcare systems. Optimisation introduces structural fragility into our healthcare systems, rendering them nonviable. Therefore, adopting robustness as a guiding principle for healthcare policies and management practices while moving away from performance-driven logic becomes imperative to ensure the adaptability of our health systems.

Certain management methods, such as “waste hunting” or relentless standardisation aimed at optimisation, are “zombifying”

processes rooted in positivist illusions of prediction and control (Bernard, 2021). These practices transform organisations into lifeless entities, where the principles of vitality are considered dysfunctions. Yet, these organisations are meant to be spaces inhabited by living beings caring for others. It is time to abandon the unreasonable notion of optimisation that shackles the bodies and minds of healthcare professionals, pushing them to proactively transform into machines, believing in a "progress guided by the invisible hand of performance" (Hamant, 2023), thus becoming instruments of industrial society's violence (Horkheimer & Adorno, 1974). These neoliberal management practices align with the prevailing political mindset, which now threatens the lives of all our ecosystems. Thinking in terms of robustness calls for contemplating an alternative societal model and challenging the policies that govern our healthcare systems and organisations from a perspective of collective well-being (Collart Dutilleul et al., 2023). We must persistently deconstruct the principle of optimisation and prioritise suboptimal organisations. Urgent action is essential because robustness can only be built when margins of manoeuvrability allow for it, necessitating investments in time and resources (Hamant, 2023).

Thus, a robust healthcare system and organisations would coexist with redundancies, apparent wastage, heterogeneity, organised fluctuations, slowness, and hesitation. All these factors, often deemed problematic within the context of industrial optimisation imposed on living systems in the 21st century (Hamant, 2023), can actually serve as elements for constructing robust organisations and may even be intentionally encouraged or organised. This would undoubtedly result in what might be perceived as inconsistencies, errors, imprecisions, incompleteness, and imperfections. However, these very characteristics are also associated with robustness.

We should now prioritise robust projects at all levels, including the healthcare sector. Following Hamant's outlines (Hamant, 2021, 2022, 2023), we invite healthcare professionals to embrace the third way of life.

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