

# Pandemic Life-lines

## A Multimodal Autoethnography of COVID-19 Illness, Isolation, and Shared Immunities

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### Abstract

As a crosscutting concept in biology, anthropology, and philosophy, immunity has been a critical ‘site’ of debate on the relations between self and other, organism and environment, risk and responsibility, the corporeal and the political. In this Research Article, I trace how these relations and everyday life during the COVID-19 pandemic relied on a web of coordinated—and sometimes unexpected—lines of communication, restriction, and solidarity. Using an experimental approach that combines multimodal autoethnography and multiscalar relational analysis, I present a first-person account of travelling during, testing for, and falling ill and isolating with COVID-19 in late 2021. I explore how pandemic life-lines, including public health measures, vaccinations, devices, and helplines, as well as mundane gestures of care and ecologies of support, acted together as shared immunities. In this exploration, I propose to reconceptualise ‘immunity’ as a process network rather than a defence apparatus, shedding light on how these life-lines may influence differential trajectories of disease and healing. To conclude, I discuss how my conceptual and methodological approach contributes to a social ecological understanding of immunity, that goes beyond the biopolitical, in times of pandemic and in the future.

### Keywords

COVID-19 pandemic, Illness experiences, Immunity, Life-lines, Multimodal autoethnography.

## Introduction

The outbreak of coronavirus disease (COVID-19) in December 2019 soon spread from China to other countries, leading the World Health Organization (WHO) to declare COVID-19 a pandemic in March 2020 (for an overview, see Caduff 2020). Everyday life was rapidly reconfigured by public health guidelines and new social arrangements that sought to prevent the transmission of the SARS-CoV-2 virus prior to vaccine development, including lockdowns and mandatory curfews, alongside travel restrictions, isolation protocols, and physical distancing (Long 2020). From frontline workers that put their ‘lives on the line’ to public policies that saw us ‘walk the line’ differently, images of lines, boundaries, and thresholds have shaped our collective, albeit unequal, experiences of the COVID-19 pandemic. Take for example the charts tracing daily numbers of infections and deaths which gave rise to the slogan of ‘flattening the curve’ in the first year of the pandemic; the 1–2m individual perimeters within which children played and adults queued for services; the networks of communication and lines of support that enabled some people to carry on with their daily lives, while other lives and livelihoods were radically altered by and lost to COVID-19 (Flood et al. 2020; Manderson, Burke, and Wahlberg 2021; Msemburi et al. 2023).

Whether curvy or flat, digital or physical, social or infrastructural, these everyday life-lines and relations evoke what scholars, across feminist science and technology studies (STS), anthropology, sociology, and philosophy, have characterised as the *paradigm* or *logic* of immunity. The logic of immunity is that which seeks to defend an organism from invasion or danger by demarcating the boundaries of body/self against non-self/other bodies (Martin 1990; Haraway 1991; Cohen 2009; Esposito 2011; Zach and Greslehner 2023). This immunological discourse conflates biological and political discourses about the body and its borders (i.e., both the organismic body and the body politic), through metaphors of aggression/response that seem to imply the protection—and conversely also the negation—of life (Cohen 2009; Filipe 2010, 2014a). Seen as a quintessential figure of biopolitics, ‘the immune apparatus has become the *point* of tangency—of connection and tension—between all contemporary languages’ and ‘the internal *limit* which cuts across community [that] constitutes or reconstitutes community precisely by negating it,’ as described by Roberto Esposito (2011, 9, 149, emphasis added).

But how do these points and lines, limits and languages, intersect in practice? What if there are other ways of conceiving of immunity—and what do they imply in terms of how we understand the relations between organism and environment, individual and community, disease and vulnerability? How have these conceptions and relations come to matter during the COVID-19 pandemic? In this article, I

address these questions by considering—and going beyond—the vocabulary of biopolitics in order to illuminate what immunity is, does, and means in the context of COVID-19. My argument is that immunity can be better understood if seen not as a closed defence apparatus or a stable threshold, but as a process network that hinges on lines of flow and (partial) relations between beings and living environments.

I begin this essay by reviewing scientific and philosophic critiques of immunity as a defence system, in contrast with conceptions of immunity as a process and (social) network. By devising an experimental method that combines multimodal autoethnography and multiscale relational analysis, I delve into a concrete set of events that led me to travel, test for and fall ill with COVID-19, and isolate in a hotel room, in late 2021. I explore how everyday life-lines, including lines of communication and public health guidelines, vaccines, and devices, as well as mundane gestures of care and ecologies of support, acted as *shared immunities*. Throughout these empirical sections and in dialogue with the scientific literature in anthropology, philosophy, biology, feminist STS, and public health, I offer a first-person account of embodied stories and portraits of COVID illness and immune process networks. This account highlights how the interplay of biosocial, juridico-political, and ecological affordances can modulate disease progression and recovery, with effects well beyond the period of contagion. Finally, I discuss how my theoretical, methodological, and empirical foray invites a shift in our understanding of everyday life-lines and relations as ‘hidden’ variables that shape disease risk, immunity, and vulnerability, in the context of the pandemic and beyond.

## **The concept of immunity, its others, and their relations**

In his widely cited book *Immunitas*, Roberto Esposito sketches the outlines of a genealogy and philosophy of immunity, tracing its etymological roots to the Latin *munus*: a duty, gift, or obligation from which ‘immunity’ exempts—and from which the word ‘community’ also derives. He goes on to describe immunity as ‘the crucial point in which the body encounters what is other than itself ... the hub that connects various interrelated entities, species, and genera, [and] the point of tangency—of connection and tension—between all contemporary languages’ (2011, 149). Body stands here both for the *organismic body*—wherein immunological systems defend the individual against pathogenic aggressions—and for the *body politic* of the nation-state, which enforces territorial boundaries and confers protections upon its population (Filipe 2010, 2014a). In this double sense, the logic of immunity is at the heart and centre of biopolitics, that is, of the government of life (*bios*). Life and politics appear ‘intimately interwoven in [this] immune system rationality that is both corporeal and institutional. In both medical

and juridical discourse, immunity is a form of exemption, protection or untouchability' (Brown and Williams 2015, 4). 'Immunity' becomes a synonym of 'invulnerability' that enables the organism/body to resist an aggression and/or wage a counterattack (Cohen 2009) in the face of adverse environments (for a discussion, see Filipe, Lloyd, and Larivée 2021).

These vocabularies are pivotal to modern scientific understandings of the physiological body as a bounded unit—yet their critique is not new, spanning anthropology, STS, philosophy, biology, and immunology itself. Already in the 1930s, physician and epistemologist Ludwik Fleck ([1934] 2008, 107) cautioned that the scientific conception of immunity as a battlefield relies on 'mythological notions of danger and combative models of biological attack-defence: the organism seen as a unit closed onto itself and the pathogen as the hostile agent that invades it.' Anthropologists and feminist STS scholars have further examined what this conception means and implies for understanding self/other and organism/environment in terms not of relations but of dichotomies. For instance, Emily Martin (1990) examined how the image of immunity as a network of coordinated efforts was replaced by the notion of immunity as a system or line of defence and, during the Cold War, subsumed by military metaphors of fighting pathogenic invaders and waging war on disease. The latter immunological discourse about the body and its defence served to express a logic of constraint in a hostile environment, 'in a world full of difference, replete with non-self' (Haraway 1991, 214). More than a rhetoric, this is a highly consequential discourse, since it reduces 'the entirely necessary intimacy of organism and environment to a single salient type of engagement: aggression/response,' as Ed Cohen (2009, 5) notes.

Yet, this biopolitical framing of immunity poses a vital paradox. For immunisation programmes and immune systems to work, for organisms to live, and for bodies to heal, they need to engage with the 'other' and remain permeable, to some degree, to their living environment (Martin 1990; Cohen 2009; Filipe, Lloyd, and Larivée 2021). In the prescient words of Donna Haraway (1991, 225), immunity may be alternatively understood 'in terms of shared specificities; of the semi-permeable 'self' able to engage with others (human and non-human, inner and outer), but always with finite consequences; of situated possibilities and impossibilities of individuation and identification; and of partial fusions and dangers.' What happens, then, if one applies Haraway's hypothesis to the pandemic context? What if we conceive of immunity not as a limit or line of defence but a bundle of lines; not as an apparatus that enfolds the body unto itself, but a meshwork of relations unfolding between bodies, entities, and environments? And what might this process look like in the context of COVID-19? To answer these questions, it is important to consider three kinds of relations and the limits of their

dichotomic frames: (1) immunity and community; (2) organism and environment; (3) aggression and resistance.

First, the relationship between immunity and community is one of overlap and intersection. By tracing both terms to a common etymological root, Esposito depicts immunity as ‘the internal limit that cuts across community, folding it back on itself in a form that is both constitutive and deprivative’, such that ‘one [becomes] the contrasting background for the other, but also the object and content of the other’ (2011, 9). In Esposito’s work, as Brown and Williams (2015, 5) note, ‘immunity and community are far from polarised [and their] complex interpenetrations’ may, in effect, engender forms of association and exchange—and, I would add, of enmeshment and interdependency. In the context of the COVID-19 pandemic, this implies that the interplay of biological specificities, preexisting medical conditions, and ecologies of support (or lack thereof) has fostered protections and solidarities in some cases while also enhancing vulnerability in others (see Kieslich et al. 2023; Ford et al. 2023).

Second, it is important to recognise that organism and environment are not autonomous but interdependent. As Tim Ingold argues in *Being Alive*, the organism, seen as ‘a nexus of life and growth within a meshwork of relations, is *not limited by the skin*’ (2011, 86, emphasis in original). He suggests that our bodies are porous, our environments are fluid, and both more enmeshed than we might realise. Drawing on the foundational work of Gregory Bateson, James Gibson, John Law, Annemarie Mol, and Gilles Deleuze, Ingold suggests that our lives unfold along lines of growth, movement, and becoming within our bodies and in our living environments: ‘every line – every relation – in a fluid space is a path of flow’ (2011, 86; see also Biehl and Locke 2017). These life-lines of the organism, as Ingold puts it, exist always in relation with the environment: one cannot be without the other, much like the spider weaves and lives off her web (see Deligny 2015). Here, the imagery of the life-line and the web is meaningful, since it evokes the idea of links, lines of support or communication, or even safety nets that enable one to withstand or escape danger.

In the context of COVID-19, these life-lines have taken on different forms, ranging from financial support, communication networks, and social protections, to different preventative measures and protective equipment (e.g., respirators and face masks, physical distancing, and movement restrictions). While these may seem trivial for some, Felicity Callard cautions, ‘people’s differential abilities to access healthcare and other services in relation to COVID-19; other on-going illnesses, disabilities [and/or] situations of precarity and exclusion – these will also influence how COVID-19 and long Covid are lived and experienced’ (2020). What is more: in basic science, the analogy of the social network has been used to

reconceive the immune system as a web of coordinated efforts. In their large-scale quantitative proteomics study of human immune cells, for example, Rieckmann et al. found that the ‘coordinated action of the immune system resembles a social network which enables complex immunological tasks beyond the sum of the functions of individual isolated cell types’—and which, through lines of communication, ‘enables protection against disease’ (2017, 583). In other words, the architecture of immunity is founded on lines of flow and relations, and its syntax operates by means of coordination and choreography.

Third, and following from this point, immunity works in intricate ways that override the metaphorical battleground of aggression and response. In his foundational work, Fleck posited that some viral infections, more than instilling a defensive reaction to aggression, may engender a ‘complicated revolution’ ([1934] 2008, 111) within the organism that varies in scale and genre, according to its given situation. In the case of COVID-19, the interplay between infection and immunity may lead to different and unexpected trajectories of disease, viral load, and immune response (Day et al. 2021), which may be complicated by other biosocial factors and concomitant health variables (i.e., genetics, cardiovascular disease, loss of immunocompetence with age or underlying conditions). Similarly, in their recent conceptual framework for understanding immunity, Zach and Greslehner nudge us to think about immune systems less in terms of strength/weakness of response, focusing instead on contextuality, regulation, and trade-offs ‘between resisting an infection, i.e., the clearance of pathogens, and the tissue damage arising from the immune response, i.e., the immunopathology’ (2023, 18). An immune response that is delayed or overly tolerant poses the risk of severe infection and deterioration, whereas one that is too resistant or drawn out carries the risk of tissue damage and autoimmune disease.

This paradoxical aspect of immunity is corroborated by an exhaustive review recently published by the US Patient-Led Research Collaborative. In it, Davis et al. (2023) chart how autoimmunity and immune dysregulation, neuroinflammation, vascular dysfunction, and other biological mechanisms (e.g., T cell exhaustion, cytokine storms, delayed viral response, and/or viral persistence) help explain post-infectious disease sequelae and the multisystemic illness that we now know as long COVID. Public health experts have cautioned, moreover, that ‘herd immunity’—a concept that migrated from livestock farming to public health (Jones and Helmreich 2020)—may promote a decontextualised and misleading view of immunity thresholds as applied to SARS-CoV-2 and other respiratory viruses. In this context, immunity becomes a more ‘fluid concept, ranging from complete and durable (long-lasting) immunity that fully protects against infections, to immunity that protects against severe disease but does not prevent reinfection and onward transmission’ (Morens, Falkers, and Fauci 2022, 196).

To put it simply, immunity, or immunities, if we pluralise the term, vary in scale and scope. The appropriateness and effectiveness of immune responses to infectious disease is not fixed: these are contextual and temporally sensitive, since immunity depends on the coordination of different biological and biosocial elements, as well as of ‘outer’ and ‘inner’ environments such as the microbiome (see Zach and Greslehner 2023). It follows from these arguments that the meaning of immunity may be poorly construed as a synonym of ‘invulnerability’ and antonym of ‘community’, or through the biopolitical vocabularies of bodies, borders, and battlefields. Instead, as I argue in this article, immunity may be best framed as a process network that hinges on multiple relations between organisms and their living environments, and between people and their diverse life circumstances.

Going beyond the idea of ‘being immune’ as an index of strength or a fixed state, the perspective I advance here emphasises how people might ‘become immune’ in relation to biological, ecological, and socio-political variables. From this perspective, I draw attention to a web of entities, people, and forces with varying degrees of agency (Biehl and Locke 2017) and communicability, and to their relations. Regardless of whether this web comprises infectious agents and viral mutations; vaccination programmes and pre-existing medical conditions; online communities and helplines; frontline workers’ efforts and global public health guidelines—configurations of some or all these elements shape how people have experienced COVID-19, in sometimes paradoxical ways. Insofar as ‘relations’ and lines have the capacity to at once connect and separate, engage and exclude (Strathern 2020), I will argue that they are capable of enabling or constraining *shared immunities*. Shifting the framing of immunity from a metaphorical battlefield to that of a meshwork allows us to understand how, in the context of COVID-19, lines of communication, protection, and support may have fostered immune affordances and shaped differential disease trajectories.

## **From theories to experiences: A note on experimental and multimodal autoethnography**

Since the onset of the COVID-19 pandemic, around the world, diaries, photo blogs, and other creative outlets have been used to portray everyday life and illness experiences. From the US to China, people found in such portraits and stories a ‘self-reflexive way of coping by bearing testimony’ to this historical moment (Gammel and Young 2022, 28). Some of these photo diaries and testimonials represented acts of both defiance and solidarity in the context of lockdowns and confinement, where those affected had limited means of documenting their lived experiences or sharing this information with others. Felicity Callard’s early essay on ‘mild’ COVID-19 (2020) was one of the first to combine a first-person voice with a scholarly critique of medical classification and

disease ontology, inspiring my own analysis. Since then, autoethnographies of pandemic experiences have been published. Examples of these include Salman Khan's visual autoethnography of lockdown in Scotland (2022) and Sarah Davies et al. 'pinboard' autoethnography of academic care practices in Austria (2022). Both studies share an interest in how assemblage and network theories and methods help uncover pandemic experiences and practices of sense-making.

This article shares the ethos of some of these photo diaries and autoethnographies: first, by bearing witness to a concrete phase of the COVID-19 pandemic and, second, by devising an experimental approach—where 'experimental' is understood in a dual sense, of experiential and exploratory. My proposed approach of *multimodal autoethnography* represents an exploration into everyday pandemic living that centres 'hidden' variables and experiences of COVID-related illness, isolation, and immunity, while also situating them in relation to wider social ecologies and histories of the present. This approach comprises elements of multimodal ethnography (see Varvantakis and Nolas 2019), since my study features discursive, pictorial, and experiential and sensory insights that are narrated in the first person. I further combine these insights with a targeted review of basic, clinical, and public health research, as well as social scientific literature, which enables a multiscalar relational analysis (see Filipe 2023). My approach is also akin to what Roberts and Sanz called 'bioethnography', insofar as my study charts the 'larger histories and life circumstances that shape health [and] disease' (2018, 749) and how biological, epidemiological, and ecosocial aspects of immunity and healing 'emerge in coordination with each other' (2018, 750).<sup>1</sup>

It is worth noting that I did not begin my foray as an ethnographer would, 'out on fieldwork'. Rather, it was in the process of journalling and relating my experiences to friends and healthcare workers, taking pictures, and looking back on all of these, that I repositioned myself as a social researcher immersed in a field of pandemic and illness experiences. As Veena Das describes, 'the experience of living one's personal life as well as the life of an anthropologist result in ethnography touching on elements that are autobiographical, much as autobiography becomes suffused with one's ethnographic experience' (2020, 5). After I tested positive for COVID19 and subsequently had to isolate in a hotel room in Lisbon, I started taking notes, paying attention to medical callbacks and questionnaires, observing mundane objects, recording signs and symptoms, and taking pictures on my smartphone. As I increasingly used these tools to make sense of my experiences, they began to take on analytical and empirical significance.

1 This method or 'platform' of bioethnography, as the authors describe it, represents 'a contribution to the growing insistence across the social sciences on the relationality of phenomena instead of the autonomy of objects' (Roberts and Sanz 2018, 749; see also Mol 2003). As such, I take the prefix *-bio* in 'bioethnography' to encapsulate all things autobiographical, biosocial, bioethical, and biopolitical (Filipe 2010, 2014a; Ferreira and Filipe 2019).

I realised that a story began forming—not least because illness and ‘case’ storytelling was required by healthcare workers, administrators, and hotel staff. And this story deserved to be told, given the absence of scholarly publications at the time of writing that accounted for experiences and symptoms of COVID in a first-person voice. Here, I was inspired by Arthur Frank’s notion that ‘bodies set in motion the need for new stories when its disease disrupts the old stories [and] these embodied stories have two sides, one personal and the other social’ (1997, 2). By telling these embodied stories, my aim is to reveal social aspects of experiences of ‘illness in confinement’ that would otherwise remain concealed. I am also inspired by the work of Kathleen Stewart (2017) on ordinary affects and how to explore these through photography and other methods. Photographs become useful tools for eliciting mundane affects and gestures, spaces and limits, pieces of information and reflection (Rose 2007). And since my photographs were time-stamped, they work as storied portraits that helped me chronicle my symptoms, illness experiences, and their trajectories.

Through this process of journaling and storytelling, and eventually through the writing of this article, I have endeavoured to make sense of how a mix of partial privilege, serendipity, and solidarity shaped the conditions in which I isolated with COVID— and how I experienced illness and healing subsequently. This consideration warrants a note on positionality and reflexivity. I am an adult cisgender woman and a first-generation academic and migrant living in the Global North. I had access to vaccines in May and July 2021 in Canada, after which I was able to visit my family in Portugal, where I happened to contract COVID-19 for the first time. While I was far from my next of kin and isolated in a hotel room, I enjoyed the benefits of citizenship and spoken language, scientific literacy, and friendships. I had experienced an autoimmune condition (rheumatic fever) that had resolved many years ago and, although my COVID infection was deemed mild to moderate, it turned out to be highly symptomatic, leading to post-COVID syndrome and flareups that have subsided at date of publication.<sup>2</sup>

Writing about multimodal ethnography, Varvantakis and Nolas posit that ‘sensemaking in the field and after is a multi-sensory practice [and a process] that is at once an intellectual and visceral. Such sense-making implies various forms of entanglement: of body and mind, field and desk, past and present, to name a few of these enmeshments’ (2019, 368). My conceptual and methodological approach dovetails with this image of enmeshment between object and representation, experience and analysis. The empirical sections that follow bring

2 The use of ‘post-COVID’ here, which is a term proposed by the World Health Organization, and of ‘long COVID’ in other instances in this article, is intentional and does not signal a preference for one over the other. My aim is to do justice to the category of long COVID, which was coined by patients themselves, and reserve the term for long haulers who continue to experience illness, disability, and life-altering sequelae—often lacking access to specialist care.

together multisensory illness storytelling and multiscalar relational analysis (Filipe 2023) from the double vantage point of social researcher and (former) COVID patient. As such, this foray illuminates some (not all) possible configurations of illness and healing, and how these are shaped by concrete life circumstances and broader social environments.

## **Crossing borders: Passports, immunities, and vaccination rates**

*End of September 2021.* After 18 months of pandemic living, on/off confinements and mandatory curfews in Quebec, Canada, I decided to travel to my home country, Portugal, at a time when it was hailed as 'Europe's vaccination frontrunner' by the *Financial Times* (2021). By then I had received two doses of the Moderna vaccine. I booked my flights, took a PCR test 72 hours before flying, which came back negative, and printed my vaccine certificates to accompany the QR code stored in my smartphone travel app. As a citizen with a valid biometric EU passport and a negative PCR test, who had been twice vaccinated, I had two kinds of immunity that allowed swift passage across an international border. Going through Lisbon Airport's e-gates, no questions were asked.

I was surprised that all the credentialed paperwork I had gathered and printed went unchecked. I was also confronted by the fact that this was not the case for other passengers and fellow travellers arriving from countries considered to be high-risk, or who had been inoculated with different vaccines. Countries and border agencies in the Global North were deploying the biopolitical apparatus of immunity-as-defence by using travel restrictions and controls to protect their populations, for understandable, albeit inconsistent, reasons. This meant that borders were selectively controlled and closed when global health cooperation and pandemic solidarity were needed, which Des Fitzgerald (2023) ascribes to a logic of viral nationalism in the case of the United Kingdom. Conversely, in the case of Portugal, a discourse of vaccine triumphalism dominated the international and local news media, which enabled the reopening of borders to travel and tourism in the last quarter of 2021.

I entered Portuguese soil at a time when stricter prevention and control measures to curb the transmission of COVID-19 were in place—and then suddenly relaxed. These measures included the requirement of a valid vaccination passport or, alternatively, a negative antigenic test, to enter commercial and hospitality spaces, along with the use of face masks. It turned out that these temporary ‘state of emergency’ measures were revoked by decree-law on 29 September (*Diário da República* 2021), following a successful vaccine rollout, as noted in the legal text. A *New York Times* piece headlined ‘In Portugal, there is virtually no one left to vaccinate’ was published on 1 October 2021—a memorable Friday that marked deconfinement and was dubbed ‘Freedom Day.’ In a matter of days, by 11 October 2021, Portugal had been declared the most vaccinated country in the world, relative to population size, at a rate of 86.46% (see Figure 1).

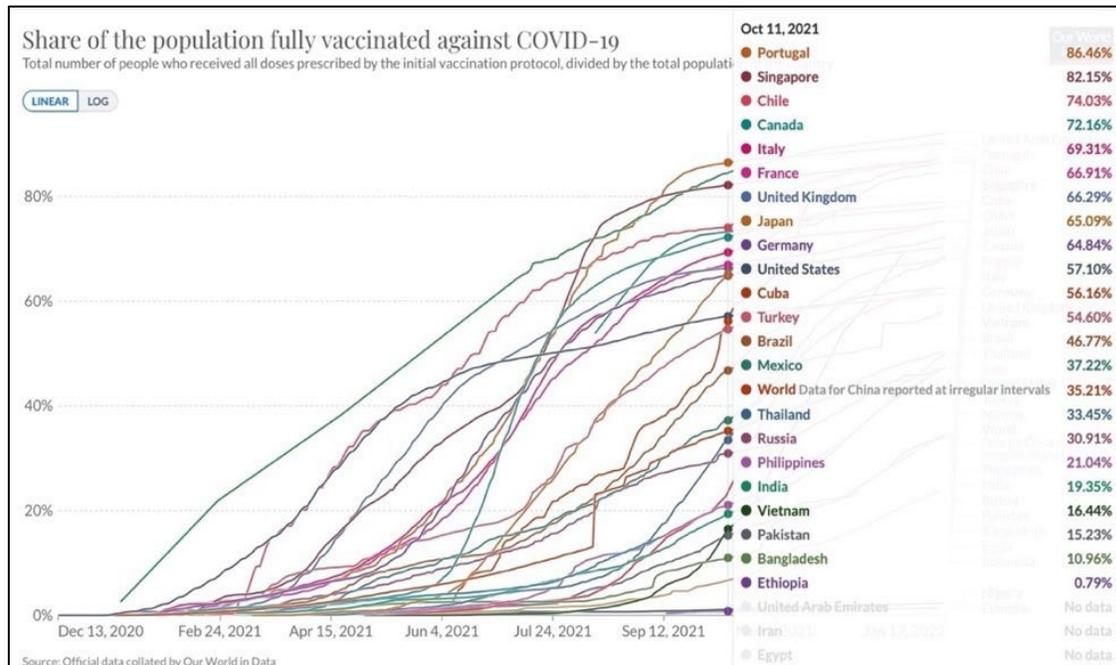


Figure 1: Share of the population fully vaccinated against COVID-19 (% per country of people who received all doses in the initial vaccination protocol). Source: *Our World in Data*, 11 October 2021. [OurWorldInData.org/coronavirus](https://OurWorldInData.org/coronavirus). Downloaded and reproduced under CC BY license. The data and terminology used in this chart may have been modified or updated.

So far, epidemiological charts of the pandemic had focused on active infections, hospitalisation, and death counts. Now, charts were showing lines of growth in immunisation rates. The global public health slogan of ‘flattening the curve’ of daily infection cases of COVID-19 (Caduff 2020) gave way to an international race to develop, acquire, store, and/or rapidly dispense vaccines. Portugal’s was a tale of success in this regard as media representations shifted attention from a healthcare system on the verge of breakdown to ‘winning the battle’ against the coronavirus (DN 2021).

This convergence of immunological and military discourses is by no means a coincidence (see Cohen 2009; Esposito 2011), and it became particularly salient in the Portuguese context during this period. Local and international news media attributed this national success to a change of leadership in the vaccination campaign, whose taskforce was now spearheaded by a vice-admiral (DN 2021), signalling a successful combination of vaccine efficacy with the effectiveness of military command. Efforts to achieve ‘group-level protection’ and ‘population immunity’ through rapid vaccination roll-out, as the taskforce lead put it, were starting to curb disease incidence, thereby helping people to ‘regain their lives’ (DN 2021). These ideas, paired with notions of ‘strong’ immune protection (Zach and Greslehner 2023), visualisations of growing vaccination rates, and the alleviation of public health measures, conveyed a sense of hope for a quick return to ‘normal’ social life.

In effect, during these first weeks of my visit to Lisbon, I did not come across anyone who remained unvaccinated, consistent with the stories reported in *Financial Times* and *New York Times*. But as public health measures relaxed, the streets of the Portuguese capital became suddenly crowded with tourists flocking to enjoy the balmy weather. Over the summer of 2021, the highly contagious and more pathogenic Delta variant of the coronavirus had become dominant and was responsible, as reported by the US Centers for Disease Control and Prevention (CDC 2021), not only for a new wave of infections but also for cases of reinfection and so-called ‘vaccine breakthroughs’ or ‘breakthrough COVID’ cases. By 21 October, the Portuguese health directorate (Direção-Geral da Saúde, DGS) had reported a considerable decrease in the number of new infections and deaths attributed to COVID, with a slight increase in hospitalisations due to the disease (Dantas and Rios 2021). And as the virus continued to mutate across Europe and international travel restrictions were gradually relaxed, 20 further subvariants of Delta were detected in Portugal during that period (Lusa 2021), raising concerns about the appearance of a potentially more aggressive variant.

## **‘Breakthrough’ COVID: Signs, symptoms, and diagnoses**

I recall waking up one morning feeling terribly sick. I had stayed at a friend’s place and self-tested at least twice; as the primary caregiver of an elderly person, he also was testing regularly. At the local pharmacy, my emerging symptoms were quickly dismissed as those of a ‘common flu.’ One by one, friends concurred via text message: ‘you’ve caught a bug, you know, kids are now back in school and parents back to work,’ or ‘it’s this crazy October weather, everyone’s down with a cold.’ I felt worse day after day. I returned to the pharmacy wearing a respirator mask and was asked if I had any cough, fever, or classic symptoms of COVID. I bought a digital thermometer (which read 38.5°C the next day) and, as the

situation progressed, headaches began, and a wave of fatigue washed over my body. A sore throat and intense nasal congestion followed suit, along with bouts of violent sneezing, which reinforced the informal diagnosis of ‘this is not COVID.’

It turned out that these symptoms were most often reported by those who, like myself, had received two jabs and then contracted SARS-CoV-2. I experienced, almost in order, the top five symptoms listed in the UK-based ZOE Health Study—a large-scale study gleaning data from online patient-reported symptoms (ZOE Study 2021). Emerging findings from these reports were now displayed on the study’s website accompanied by the following note:

Generally, we saw the same symptoms of COVID-19 being reported in the app by people who had and hadn’t been vaccinated, including *loss of smell (anosmia), cough, fever, headaches and fatigue* ... Curiously, we noticed that people who had been vaccinated and then tested positive for COVID-19 were more likely to report *sneezing* [emphases added] as a symptom compared with those without a jab).

Another odd symptom was the combination of cluster headaches with ocular tension and itchiness. Days earlier, I had woken up with my eyes lined in red and I could not bear to wear contact lenses. I went to see an ophthalmologist, who promptly examined me and asked if I suffered from ocular tension or had had conjunctivitis recently because he could see traces of these. ‘Not that I know of, no,’ I replied. These may have been early signs of post-viral conjunctivitis and what became popularly known as a ‘COVID eye’, which was considered a rare manifestation of SARS-CoV-2 in the early days, but has been shown to have a pooled prevalence of around 11% of cases (Akbari and Dourandeesh 2022). The coronavirus disease made its presence gradually felt through these odd signs and symptoms, and traces of inflammation in different parts of my body marked its path of travel.

By then, I had checked into a small and inexpensive hotel in Lisbon with a stock of over-the-counter medicines, respirator masks, and lateral flow tests (LFTs), as I was preparing to fly back to Canada. My mother, who I had already visited earlier in my trip, suggested we see each other again ahead of my departure, and given some of her health vulnerabilities and how far away she lives from the Portuguese capital, we agreed that I would self-test beforehand. On my first test, the stripe (T) was immediately visible but the control (C) seemed absent. ‘Invalid test’ according to the leaflet, I thought. I did not repeat the procedure immediately since I was still due to receive the results of my pre-flight PCR test. Meanwhile, I started to notice new symptoms: digestive disturbance, back pain, and fatigue. As I drank a cup of tea, I realised that my sense of smell was gone.



Figure 2: Positive SARS-CoV-2 lateral flow test.

*Anosmia*. This symptom alone was so characteristic of COVID-19 that I told myself: ‘I have it, no doubt about it.’ I pulled out a second test kit, which yielded a similar reading to the previous but, this time, a second stripe emerged. My nasal congestion and sneezing had worsened, to the point of a minor nosebleed, and my sore throat had evolved into a palpable swelling. This string of disparate symptoms and the visible lines of infection displayed on the lateral flow test (LFT) became points of departure for the telling of my COVID story that led to my isolation in that same hotel room. As inarticulate as these signs may sound, my ailing body spoke in the ‘language of pains and symptoms’, and these became ‘the cause, topic, and instrument’ of new embodied stories (Frank 1997, 2) to be told—to family and friends, healthcare workers, and hotel staff.

### **Isolation: Helplines, timelines, and partial relations**

Next morning, around 5 a.m., my PCR test results arrived by email in a multilingual PDF that read ‘ARN SARS-CoV2 – COVID-19 *detected*.’ I immediately called my mother: ‘Don’t come, I’m positive.’ A rollercoaster of phone calls, emails, and text messages ensued. That first day, I spent most of my time either online (cancelling flights, answering epidemiological questionnaires) or on the phone, at least until my voice gave way.



Figure 3: My hotel bedside table and telephone.

The first step was to call the Portuguese national health service (NHS) helpline, *Saúde 24*, where I was told that a public health delegate would follow up on my case within 12 hours. The second step was to text friends with whom I had been in close contact over those last few days, asking them to do their own LFTs and to share the results. One by one, they sent me pictures of negative LFTs with invisible C stripes. As pointed out by Rushforth and colleagues (2021), illness-related storytelling is key to making sense of one's troubles, and often begins with guilt-ridden questions of 'how did this happen?' or 'why now?' These were questions I had started asking too, finding no chain of transmission, no line of causation.

Practitioner No. 1, the first in a series of medical practitioners I was to interact with during the coming days, called me in the afternoon to say that I would undergo not 14 but 10 days of isolation, according to the current public health norms. Partway through her epidemiological questionnaire, she surprised me by asking whether I was confused, because I could not determine who in my network constituted a 'high-risk contact' (i.e., someone with whom I had spent more than 15 minutes in close proximity and/or unmasked). These timelines and thresholds of risk were fuzzy in my memory amid a profuse 'brain fog', which is a commonly reported problem by people with COVID-19 or post-infection (Callan et al. 2022). I was able to flag two people, who were called for confirmation tests and ordered to go into prophylactic isolation, and became trapped in the lines of a bureaucratic public health web. As it turned out, they would not have been required to self-isolate, as the Portuguese health agency had recently changed their COVID-19 norms and

directives, so that high-risk contacts were now those who had been exposed to a confirmed COVID-19 infection *and* remained unvaccinated.

Practitioner No. 2, calling from my hometown medical centre, was a senior nurse. She seemed concerned about my situation and kindly gave me her mobile number. She told me, surprised, she had never seen a case like mine: ‘a person who got COVID on her way out of the country.’ What she may not have realised immediately is that to (re)enter Canada, at that time, residents had to present their ArriveCan vaccination proofs and codes alongside a 72-hour pre-travel molecular test—or else a positive test and recovery certificate dating back at least 14 days, following guidelines issued by Public Health Agency Canada (PHAC 2022). My ‘case’ was less a matter of where, when, or how I contracted the coronavirus on my way back from Portugal to another country, but of how international travel requirements and public health norms in that country yielded a diagnosis early on in my disease trajectory. The nurse warned me that because, while I had a valid NHS user number, I was not registered with a Portuguese primary care doctor or GP, my case would be harder to manage, and my file’s path through the healthcare web could become convoluted. Despite this, she also assured me that my dossier would be quickly sent through to the regional health administration where I was physically situated.

The third step was for me to inform the hotel staff, who seconded the nurse (‘we’ve never heard of a case like yours’) and reassured me that they would implement a safety protocol: clear bags for litter and black bags for laundry, plus room service that would bring a daily meal to my doorstep. Although I was far from home and family, doing my isolation in a place I had stayed before did help. Hotels are impersonal spaces, but this place felt less distant and more familiar to me than I expected. Without exception, front desk would call me every day at around 7 a.m. to ask what I would like for breakfast. And then again at 3 p.m. and 8 p.m. to check if I was keeping well. Breakfast would arrive on a tray, carefully covered in cling film, and generous enough that I could save some for lunch in a small fridge inside the room closet, which helped reduce expenditure. The hotel staff and I even came up with a rudimentary signalling system: one knock on my door for delivery, two knocks for when the delivery person left. This system allowed them to signal that a delivery had arrived without interrupting a callback from healthcare services or producing a window of exposure.



*Figure 4:* Room service: breakfast wrapped in cling film and served on a tray.

This threshold between my hotel room and the world, the cling film that carefully enwrapped my food, and the disposal bags and respirators I used, all acted as protective life-linings. Since my body had to be temporarily isolated from the outer world (to prevent transmission), my basic needs had to be met by other means. In between pandemic lines of communication and enclosure, I soon realised that relations-between, simultaneously affective and socio-spatial, mattered not only for my daily sustenance but also in terms of managing disease and encouraging recovery. As Marilyn Strathern astutely puts it, these ‘relations can turn out to be as trivial—because of their pervasiveness—as powerful—given their capacity to at once join and separate’ (2020, 3).

## **Experience: Storylines of illness, solidarity, and immune disruption**

My room was on the fifth floor, facing a pedestrian street from where I could hear people talking and soak in the buzz of the city. The room had a tiny square window that, unlike in many hotels, I could open for fresh air. As important, the window faced a tall tree; I gazed at green leaves, passing birds, blue skies, while the sun warmed my cold, pale feet. Sticking my head outside the room window on one occasion, I looked down and was struck by how the colourful outer world seemed to stop short of a dark line on the typical Portuguese pavement.



*Figure 5. The street as seen from my bedroom window.*

Crossing this line were bags of provisions and essentials gathered by friends that would be left at the hotel reception and brought to my door on a trolley. This everyday labour was done by members of the hotel staff over the course of a week, following protocol and their own common sense. Outside the hotel, friends (and on two occasions, Uber drivers delivering meals) navigated the external world for me. Since friends talk to friends, I also received calls from unexpected quarters. In one of these, a friend told me about his experience of COVID-19 and of quarantining with his family earlier that year. He brought me a kettle that same day, as the room didn't have one, and I also received a book to read and a notebook from another friend. These were forms of connection and experience-based pandemic solidarities that I could not have foreseen. They represented modest gestures and what Das describes as 'acts of care [that] allow life to knit itself back' (2020, 16); they kept me fed and allowed life to keep flowing while I was, clearly, going nowhere. The spatial horizons and durations of those days in isolation were long but fugitive: taking time-stamped pictures on my smartphone came handy as a journaling tool.

On day three of my quarantine, the weather was still warm for late October and I craved something cool and juicy. Luckily, I received lunch with a salad on the side and a basket of fruits from room service and friends' deliveries. As I ate, I noted the feeling of shredded beetroot in my mouth and jotted down some words: 'cold, moist, acid?' Phenomenologically, I could qualify the properties of a beetroot based on my embodied memory, but I could not savour it, as my senses of taste and smell were gone. The role that these senses play in our embodied

experiences of health and illness has been overlooked in modern Western medicine (Dagognet 2008). Yet these have regained attention in the context of COVID-19, where sensory disruptions have presented both as symptoms of the coronavirus infection and as post-viral disease sequelae. For instance, my anosmia would last for three months, followed by another half year of parosmia, during which I experienced multiple olfactory distortions—a condition that affects as many as 43% of all infected people who have experienced olfactory loss (Walker et al. 2022).

In addition to anosmia, I was now experiencing fatigue and paradoxically also insomnia, as well as joint pains and tachycardia—some of which flared up months after the infection and have been documented as frequent sequelae of COVID-19 (Davis et al. 2023). I also experienced chest pain and shortness of breath. Luckily, I had seen primary care physicians on social media recommend purchasing a pulse oximeter and a friend of mine offered to collect one from a 24-hour pharmacy that had it in stock. Another friend, a junior doctor, advised me on how to interpret my oxygen saturations. This simple medical device and informal guidance spared me an emergency visit to an already very crowded hospital. The oximeter also allowed to monitor my pulse rate and note sudden hikes in heartbeat counts (greater than 100 bpm).



*Figure 6:* Pulse oximeter displaying my oxygen saturations in % and pulse rate in bpm.

Reading the lines and indicators on the oximeter made me wonder if the coronavirus was engendering not simply an invasion but rather a revolution in my body (Fleck [1934] 2008). My coronavirus infection left traces along its multiple

paths of travel—from a ‘COVID eye’, to a patch of purpura on my right leg, to tinnitus, and postural orthostatic tachycardia syndrome (POTS). While some of these traces initially represented symptoms of the infectious respiratory disease, others developed over time, suggesting further imprinting of post-COVID sequelae. Their occurrence and persistence in long COVID (Davis et al. 2023) appears to be linked to inflammation, autoimmunity, and/or vascular dysregulations that last many months beyond the infection, without necessarily correlating to its initial severity or mildness (see Spudich and Nath 2022; Bohnacker et al. 2022; Phetsouphanh et al. 2022).

Autoimmunity and, in this context, long COVID, raise a vital paradox for the logic of immunity-as-defence (Cohen 2004): if the body or organism fails to recognise itself and to achieve a timely balance between immunological tolerance and resistance, it may become its own aggressor. Moreover, as Callard (2020) notes, the notion of ‘mild COVID’, popularised in the first year of the pandemic, was founded on an ontology of disease and on a scale of normality and severity that could not foresee the sequelae and resulting disabilities that have ensued. Historically, this has also been the case for chronic fatigue syndrome (CFS), which frequently overlaps with long COVID (Davis et al. 2023), and which Joe Dumit (2006) poignantly observes to be an illness that patients must ‘fight to get’. Similarly, the creation of the term ‘long COVID’ is owed to the transnational coordination of patient activism (Callard and Perego 2021) that grew in the face of medical agnosticism and divides regarding explanatory models for post-COVID disease sequelae and disabilities (Barker et al. 2022).

## **Discharge: Life-lines and fault-lines in ecosystems of care**

On day five of quarantine, I was lying in bed and watching the local news when an investigative documentary on the Portuguese NHS showed. The Portuguese NHS is considered one of the major social achievements of the democratic transition of the 1970s, following almost half a century of dictatorship, and was modelled, at least in its principles, on the British NHS (Filipe 2014b). In the documentary, a senior doctor was interviewed, who used the metaphor of a ‘half full/half empty’ glass to describe the Portuguese NHS and the paradoxes of a healthcare system that is constitutionally defined as public and universal, but suffers from longstanding issues of unequal access, both geographic and socioeconomic (see Nunes, Filipe and Matias 2008).

According to recent data from the Organisation for Economic Co-operation and Development (OECD 2021), out-of-pocket household spending on health in Portugal is among the highest in Europe, with families and charities historically

acting as proxies for care provision (Nunes, Filipe and Matias 2010; Filipe et al. 2014). Amid the COVID-19 pandemic, under-resourced healthcare ecosystems were facing new challenges and existing paradoxes, which followed on from the preceding years of recession and Troika's economic adjustment measures (see Legido-Quigley et al. 2016). These issues became even more salient during the pandemic: a mesh of care needs and life-lines woven together with the fault-lines of austerity cuts in public health and healthcare spending which dominated the previous decade.

On day six of quarantine, Practitioner No. 3 called me from the regional health administration headquarters in Lisbon. He explained how my files travelled around the country, passing through four units, since I was a national but non-resident. When I recounted my situation and mentioned the oximeter, he congratulated me and suggested that if everyone were like me, emergency services would not be so overburdened. This thought reminded me of my position of relative privilege (citizenship, scientific and linguistic literacy), and how unequal different people's COVID-19 experiences may be. A Brazilian woman I had referred as a potential-risk contact, for example, called me saying she was unable to access a free-of-charge PCR due to an issue with her healthcare ID number (she was a resident but non-national). She was worried about exposure, given her part-time job as a carer for vulnerable elderly people. This anecdote illustrates how the micropolitics of healthcare systems predicated on nationality rights and bureaucracies may have reinforced the unequal distribution of risks and responsibilities during the pandemic.

By day six, my dossier had been forwarded to another regional trust, where I had last been registered to a GP practice, back in my undergraduate days. The following day, Practitioner No. 4, a young GP from that trust, called and promptly reassured me that a 'highly qualified team was now following my case and prepared to assist me.' She surprised me by saying that, given the recent change of norms issued by DGS, I would not have to stay much longer in the hotel. The isolation (and viral transmission) period would be counted from the onset of symptoms, not the date of the test. A day later I received a medical discharge letter in my email inbox, written in both Portuguese and English. Practitioner No. 5, a senior nurse from my hometown regional health trust, would then add this recovery certificate and a copy of my overseas vaccination records to their files. This allowed them to issue a Digital EU Vaccination and Recovery Certificate by day eight, which now appeared on my smartphone app. This brought my isolation to a close—and this storytelling almost full circle—as I was now deemed 'immune' and allowed to travel again.

As Rushforth and colleagues (2021, 2) note, during the pandemic under-resourced and overwhelmed healthcare systems sought to prioritise, for understandable reasons, ‘life-threatening conditions’, with short callbacks and healthcare apps updates replacing ‘rich clinical dialogue’, which was deemed necessary only in other cases. My experience of COVID-19 illness and post-infection sequelae was one of repeated yet fragmented storytelling through e-questionnaires, apps, and calls that did not follow a cohesive clinical and therapeutic thread. It was noticeable to me that the attentive and excellent professionals with whom I spoke have had to spend much of their time making connections between different points of contact, files, and forms, or re-establishing lines of communication due to backlogs in case management. Despite this challenge, a safety net was formed around me, extending from the onset of disease to my medical discharge. This net comprised multiple life-lines integrating human and non-human elements of care (Mol et al. 2010), webs of communication, and administrative support, such as apps, webforms, and medical devices. Along with my previous vaccination overseas and the successful rollout of vaccination programmes in Portugal, this ecology of supports (Duclos and Criado 2020) made itself present during my enforced period of isolation and rest, which helped to prevent disease progression and potentially hospitalisation.

## **Conclusion: Towards an ecology of immunities?**

This article represents an intervention in ongoing debates on the concept and biopolitics of immunity; it is also a foray that illuminates a concrete set of events and experiences in times of pandemic narrated in a first-person voice—from pandemic travel, testing, and isolation, to illness experiences, supports, and post-COVID symptoms. While this may strike some readers as an implausible combination of topics and positions, I will suggest otherwise. Biopolitics and lived experiences, embodied stories and life circumstances, immunity and community intersect one another, and in ways that have become even more apparent since the COVID-19 pandemic.

From this perspective, I propose to revisit the biopolitics of immunity in ways that do not take states of exception and exemption at face value, as underscored by Joelle Abi-Rached (2021). I have suggested that we tend, instead, to how travel restrictions and public health measures, social protections, and informal supports (or lack thereof) shape what immunity is and does, for whom, and under what circumstances. Immunity emerges then as an important ‘site’ of critical and crossdisciplinary inquiry into questions about not only the *boundaries of*, but importantly also the *relations between* self and other, individuality and solidarity, biology and sociality, risks and responsibilities, bodies and their environments. In

this way, this essay makes three key contributions: empirical, methodological, and theoretical.

Empirically, as I explore in these pages, biological and juridico-political forms of immunity conferred by my previous vaccination and citizenship were overlaid with the contingent windows of exposure brought on by fast-changing public health norms. At the time of my visit and contracting COVID-19, high rates of vaccination and lower disease incidence meant that my home country rapidly moved from a state of emergency and exception to one of deconfinement, travel and tourist influx, during which numerous subvariants emerged. Parallel to this, the travel restrictions and testing requirements of Canada, my temporary country of residence at the time, entailed an early diagnosis of COVID-19 that resulted in mandatory isolation. Access to a public healthcare system and social support networks enabled immediate assistance, turning my isolation into an effective prevention of viral transmission and of disease progression by means of protective rest. In this process, ordinary gestures of care and the everyday labour of friends and frontline workers (including healthcare professionals, hotel staff, and food delivery people) allowed my needs to be met, reducing the financial burden of mandatory isolation. The availability of medicines, devices, and testing kits, alongside informal professional advice, the relative familiarity of space, and my existing scientific literacy and social networks aided, altogether, in a timely response to COVID-19.

Theoretically, I have sought to contextualise and pluralise our understanding of 'immunity' in order to consider how pandemic life-lines and, within these, lines of solidarity, biosocial protections, and ecologies of support (Duclos and Criado 2020) may jointly act as shared immunities. I argue that these shared immunities intersect and complement other lines of immunity, such as those acquired through vaccination, in ways that are sometimes choreographed and intentionally coordinated and, other times, unanticipated. It follows from these arguments that, in the context of COVID-19, we may reimagine the social ecology of immunity as a meshwork that relies on individual and physiological specificities, environmental contingencies, and on multiscalar, non-local relations between them, as emphasised by social and life scientists alike (see e.g., Martin 1990; Haraway 1991; Cohen 2009; Rieckmann et al. 2017; Zach and Greslehner 2023). The conceptual point made here should not diminish, in any way, the devastating impacts of the COVID-19 pandemic to date; quite the contrary. What I seek to highlight is that immunity is not always a synonym of invulnerable bodies, enclosed boundaries, or battlefield resistance. In this context, immunity is very much about a cross-coordination of different entities, efforts, environments, and their affordances and lines of communication.

What is more, how immunity–infection interactions play out in the context of infection caused by the SARS-CoV-2 virus may be an elusive and even paradoxical phenomenon when considering the immunopathological dysregulations that it engenders in the human body (Day et al. 2021; Zach and Greslehner 2023), and the multisystemic illness and disability that may ensue from the coronavirus disease (Callard and Perego 2021; Davis et al. 2023). It is therefore important to distinguish, ethically and empirically, what I refer to here as ‘shared immunities’ (encompassing social protections, support ecologies, and solidarities) from the logic of ‘herd immunity’ as applied to COVID-19. The latter, without accompanying efforts of prevention, protection, and preparedness, has led to unwarranted exposures to and the unequal distribution of disease risk—not the least because of continuous mutations and asymptomatic transmission of the coronavirus (Morens, Falkers and Fauci 2022). Classical framings of immunity thresholds and strengths, and of disease severity and ontology, have had to grapple with a string of complexities, paradoxes, and indeterminacies raised by the COVID-19 pandemic. As we now know, not everyone has been affected by or responsive to the infection in the same way, some were not afforded adequate and timely immunities, and far too many lives and livelihoods have been lost to the pandemic or scathed by long COVID (Manderson, Burke and Wahlberg 2021; Msemburi et al. 2023).

By offering a reconceptualisation of immunity as a process network, I seek to draw attention to the role that life-lines, biosocial and ecosocial protections, and relations between them have played during the pandemic. Insofar as lines and relations have the power to join, safeguard, and withhold risk for some, these same lines and relations have the capacity to separate and differentiate, cutting out others who cannot afford being or becoming immune in the same way. My multimodal autoethnography tells a story of success and serendipity wherein pandemic and illness experiences presupposed lines of flow, support, and protection that acted as *shared immunities*. Yet these same experiences will have been directed along other gendered, racialised, and biopolitical lines in other instances. That which represented a life-line in my life circumstances and disease experiences may have resembled a fault-line for others: a crack in the system, a challenge that was not immediately obvious. While in some instances and parts of the world life-lines and social protections were effectively in place during the pandemic, in others, the ‘fault lines of pre-existing structural inequities’ (Flood et al. 2020, 10) were exposed as resulting in *unequally shared vulnerabilities*.

My argument is that the relations between these life-lines and fault-lines act as ‘hidden’ variables that shape immune affordances, responses, and experiences of COVID-19, with consequential impacts on disease trajectories and post-viral conditions. These life-lines and fault-lines might be ‘in relation’ with each other,

but the former can only temporarily withhold or remediate the latter. There is a considerable number of affordances and variables implied in this argument that should be further probed. How do life-lines and fault-lines intersect and, in so doing, how do they play along existing gender, race, and global health inequities in other national or regional settings? How can we further theorise and empirically test this conceptual frame when it comes to post-viral disease sequelae and long COVID? And, finally, how might these perspectives contribute a more responsive understanding of disease risk, vulnerability, and immunity in other pandemic and public health contexts?

Conceptually and methodologically, this article considers the cumulative and interactive role of biosocial variables and ecological factors that shape immunity and disease progression. This consideration speaks to what Merryl Singer and colleagues (2021) define as a ‘syndemic’—a complex interplay of factors that can exacerbate disease and/or enhance vulnerability—and that calls, some have argued, for another politics of life (e.g., Horton 2020). This approach also calls, I suggest, for new analytical frameworks beyond the biopolitical. When informed by interdisciplinary research and multimodal methodologies, these frameworks can deepen our understanding of trajectories of disease and vulnerability, and of health and healing—in ways that support and give voice to those affected by post-viral disease sequelae and disabilities. My proposal is in line with Nancy Krieger’s call for a fractal-like analysis of ‘current and changing population patterns of health, disease and well-being in relation to each level of biological, ecological and social organization’ (2001, 671). My methodological and conceptual frame is an exemplar of how we may do this by integrating multimodal ethnographic methods for biosocial research with the multiscale relational analysis that is required by ecosocial theories (Krieger 2001; for other examples, see Filipe et al. 2021, Filipe, Lloyd and Larivée 2021).

It is crucial that these analytical frameworks integrate pathophysiological and social ecological insights in ways that do not normalise or downplay long COVID, and that instead centre the need for critical inquiry and political accountability—for coordinated actions and inaction, for policies that make social protections possible or impossible. To argue that the pathways of immunity, health, and illness reside not only in our individual bodies and behaviours but in our living environments and life-lines is to call for recognition of both their vitality and vulnerability, in times of pandemic and in the future.

## Authorship statement

I am the sole author of this work.

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