

The Transductive Flu : Disruptive Virality and Biosocial Immunity

Nicolas Rutherford

Thesis submitted to the University of Ottawa
in partial Fulfillment of the requirements for the
Master of Arts degree in Anthropology

School of Sociological and Anthropological Studies
Faculty of Social Sciences
University of Ottawa

Table of Content :

Abstract _____	iv
Acknowledgments _____	v
[Introduction & Method] _____	1
1. Initial Forays "Into the Flu" _____	1
2. Drifting & Moving - Developing a "Viral Anthropology" _____	5
[Part one : A doctor's office] _____	12
1. A Familiar First Step _____	12
2. Observations and Interactions at the GP Practice _____	13
3. Gestures and Programs _____	18
[Part two : A pharmacy] _____	22
1. Mobilization of a Public Health Apparatus _____	22
2. Several Paths to Immunity _____	25
3. Activated Potentials _____	30
[Part three : A pharmaceutical company GSK] _____	35
1. At the Beginning, a Dead End _____	35
2. Accidental Encounters _____	37
3. Viral Potentials _____	40
4. Unexpected Individuations _____	44
5. Immune Needs and Aspirations _____	47
[Part four : A non-profit advocacy group] _____	50
1. Social Networks and Digital Prostheses _____	50

2. Manufacturing Virality _____	54
3. Power of Affect _____	58
4. Mechanized and Mechanizing Gestures _____	61
[Part five : A public health branch] _____	64
1. Monitoring and Managing Viral Risk _____	64
2. Sterile Immunities _____	68
3. (Auto)Immunity and its Precipitates _____	71
4. Map and Territory _____	73
[Part six : A hospice] _____	75
1. Care as a Cocoon _____	75
2. Cross-Contaminations at the Pub _____	78
[Thesis Knot] _____	83
[Bibliography] _____	90

Abstract :

This thesis explores the multifaceted nature of the flu virus, examining its biological, socio-cultural, and cyber-technological dimensions to understand how these viralities might interact and shape both the virus's potential becomings, and our responses to it.

Methodologically, the study employs an ethnographic approach, relying on intentional explorations and spontaneous encounters in the context of a multi-site fieldwork that mostly took place in Ottawa—including visits to a doctor's office and a pharmacy, conversations with various healthcare professionals and volunteers, as well as digital encounters. Findings highlight that effective collective immunity against the flu requires a multimodal understanding and approach that integrates biological, social, and cyber-technological perspectives, and that building adaptive, flexible resilience involves fostering community connections through shared experiences and relational gestures, rather than relying solely on isolation and control.

Acknowledgments :

I am most indebted to my supervisor, David Jaclin, whose patience, understanding, and mentorship greatly surpassed the ordinary bounds of academic guidance.

I also extend my heartfelt thanks to all those I encountered during this project, especially those who shared their stories and experiences with me. Your openness has deeply affected me, illustrating the power of positive contagion and the transformative potential of unexpected encounters and interactions.

[Introduction & Method]

1. Initial Forays "Into the Flu"

I first set out to find signs—or traces—of the flu virus in the fall while living my daily life as a graduate student at the University of Ottawa. Like many students, I regularly traversed—"across and along", in Tim Ingold's (2007) words—the busy campus paths to attend classes, dine, study, and meet friends. With the continuous movement of people, I anticipated that I'd eventually encounter signs of the flu. And soon enough, I noticed others who, in their sneezing and coughing, were perhaps inadvertently displaying signs of having contracted the virus, which, as Celia Lowe (2017, p.93) notes, only "becomes apparent through the experience of infection."

However, trying to decipher which potential symptoms were caused by the flu virus was never going to be very fruitful. Indeed, it's a difficult illness to confidently identify from exterior symptoms alone—even for medical doctors—in part because most of these are common to many other respiratory infections, such as colds, pneumonias, or bronchitis. Instead, a more straightforward and constructive past-time was to try to pay attention to the other ways in which the presence of the virus "became apparent", such as the increasing visibility of flu and vaccination-related materials around campus. Educational posters and leaflets, strategically displayed in high-traffic areas like the student center,

library, and most building entrances, acted as reminders and motivators for everyone to remain alert about the flu and to seek out the influenza vaccine, also commonly referred to as the flu shot.

Outside of campus, there were more signs of the approaching flu season. One morning, while driving to school, I noticed a large, neon-lit billboard at a nearby pharmacy announcing the upcoming availability of flu shots. Occasionally, I came across people wearing face masks, which I interpreted either as a precautionary gesture on their part or as another tangible sign of illness, possibly the flu. Meanwhile, on the radio, health segments began to extensively cover the flu shot, featuring medical experts who discussed expected flu strains, vaccine safety, and efficacy rates. They emphasized broader public health strategies like herd immunity, urging listeners to get vaccinated at local clinics or pharmacies to protect both themselves and vulnerable community members. My social media feeds reflected this uptick in flu and vaccine-related discussions, with several friends and acquaintances sharing their personal vaccination stories and opinions, alongside re-posts from health organizations that included infographics on flu prevention, updates on global flu activity, and even live Q&A sessions with health experts to tackle common myths about the flu vaccine and vaccines in general.

This heightened focus on the flu, noticeable in both physical and digital spaces, was signaling by proxy that the microscopically tiny flu virus was beginning to circulate more widely in the area, even before it was officially confirmed by medical case reports.

More than just a hint at its invisible presence, the attention being paid to the flu was communicating to the public its associated harms and risks, as well as the necessary behaviours or gestures one should adopt in order to safeguard against it.

To better track these various "manifestations" of the flu and understand the broader "anti-flu" or immune response apparatus I was beginning to perceive, I started maintaining a personal journal. In it, I documented each notable encounter and impression related to the flu. These observations peaked in late November, when rarely a day passed without me recording some form of flu or vaccine-related messaging. Whether on campus, elsewhere in the city, or online, I noted manifestations of the flu's presence—or specters of it—such as classmates using hand sanitizers, a stranger sniffing incessantly on the bus, or grocery stores prominently displaying tissues and over-the-counter cold remedies.

In a bid to stay updated on current flu-related developments in Ottawa and beyond, I configured a Google alerts system to funnel a daily digest of local, national, and international flu and vaccine-related news straight to my email inbox. By doing so, I plugged into a different kind of "virality"—one related to communication and media—that granted me access to a vast and potentially equally infectious flow of information and discourses on the flu and vaccination efforts.

During this period, Ingold might say I was searching for lines to cling to or grab hold of. Like an anemone or an octopus, my desire—in the "fluid reality" we inhabit—was to

both seek and send out "tendrils" that could bind me to others, allowing me to "find a place for myself" and "resist the current" that was otherwise carrying me elsewhere (Ingold, 2015, p. 11). Indeed, I initially felt overwhelmed by the abundance of signs, opinions, data, and stories about the flu that I encountered while searching for a clear connecting thread to anchor me.

Eventually, it became clear to me that efforts were visibly underway to counter the flu's rapid and widespread transmission—its biological virality—by harnessing the viral potential of media and communication channels to promote vaccine messaging. If successful in reaching and persuading a broad audience to get vaccinated, such messaging could significantly curtail the flu virus's capacity to proliferate within the community. In other words, criss-crossing forms or expressions of virality—biological, socio-cultural, and cyber-technological—might give rise to temporary bio-social defenses against the flu virus's formidable potential to spread and cause harm.

In the past, pandemic flu—which refers to an infectious outbreak spreading across multiple countries and continents—has precipitated several global health crises. Noteworthy examples include the Spanish flu, claiming tens of millions of lives worldwide from 1918 to 1920, and subsequent pandemics such as the Asian flu in 1957 and the Hong Kong flu in 1968, each responsible for over a million deaths (Honigsbaum, 2020). More recently, the H1N1 "swine flu" pandemic emerged in 2009, infecting millions worldwide and leading to over 18,000 confirmed fatalities, although the actual number is thought to be much higher (Simonsen et al., 2013).

In its seasonal variation, the flu affects/infects approximately one billion people globally each year, leading to between 290,000 and 650,000 deaths. In Canada alone, the flu is responsible for an estimated 3,500 deaths annually, according to the Public Health Agency of Canada (2020).

In this context, I was led to my research question : *"In what ways could various viralities, including those expressed in biological, socio-cultural, and cyber-technological forms, interact with each other? And how might such ways contribute to creating new or different forms of immunity against the biological flu virus?"*

2. Drifting & Moving - Developing a "Viral Anthropology"

Eventually I began looking for potential fieldwork sites. Practicality mattered, but my main objective was to "follow the flu virus" and see what contagious pathways I could become ensnared in.

As Lowe (2017) points out, while viruses are everywhere, they remain unseen by the naked eye, only being perceptible at cellular levels within our bodies. Historically, the concept of a virus only came to be known in the late 19th century when Dutch biologist Martinus Beijerinck linked Tobacco Mosaic disease to a "contagious living fluid", which he termed as a "virus". But it wasn't until the 1930s, with the invention of the electron microscope, that the actual visual representation of viruses became possible.

Given this inherent invisibility, any attempt to discern or "map" influenza required instead that I pay attention—or become more sensitive—to signs of its potential interactions and

frictions within the physical, social, and even virtual environments that we share. This meant paying attention not only to clear signs such as posters and flyers on campus but also monitoring ongoing anti-flu measures in Ottawa, including vaccination campaigns, and paying attention to the diverse narratives—both informative and conspiratorial—circulating online.

While I always traveled, in the course of my fieldwork, from an initial point A to a subsequent point B, my paths weren't necessarily set in advance. In fact they were often actualized as I moved and continued to circulate in the milieu. In this sense I traveled, in Tim Ingold's words, "along" a line that "advances from the tip" and where I had to "sustain [myself] both perceptually and materially, through an active engagement with the country that open[ed] up along [my] path" (Ingold, 2007, p. 24-25).

My pattern of travel could often be likened to "wayfaring", again in the Ingoldian sense. Like the flu virus which is often on the move, engaging with its surroundings to both sustain and propagate itself, my journey was characterized by a continuous exploration and need for adaptation, with no fixed destination or end : my line was one that "develop[ed] freely, and in its own time" (Ingold, 2007, p.73).

The lines that I ended up tracing were often winding, irregular, and entangled, as I encountered various other people and environments, creating in my wake a meshwork of interactions that formed a more or less close-knit fabric. Like the virus then, my movement was an ongoing, unpredictable sequence and process of interactions.

Underpinning all of this is a logic of virality, understood here as an affective and interconnected process of imitation and adaptation that operates across biological, socio-cultural, and cyber-technological domains. A logic that early on I supposed existed, but that I especially came to feel deeply, and even depend on, as I sometimes searched for, and more often stumbled into, my various "flu terrains".

The virus is at the mercy of others for its movements, in terms of where it goes. Indeed, it's an obligate parasite in the sense that it must be carried by a host, until it's either passed on to others—transmitted through contagion—or until it's expelled outside of the body and onto a surface, where it might survive for a time, only to be unexpectedly picked up and "transported" again, and so on.

The virus' inherent dependency on a host injects a degree of randomness to the movements it traces, assuring it all sorts of potential opportunities—in terms of meetings—as well as unpredictable individuations.

I navigated my various terrains by foot, car, public transport and even once by plane, sharing many of the same "lines of transport" that carry the biological virus today. And I also followed them online, where the flu converges with digital communication viralities.

As I moved in the milieu, in essence a continuous space "made up of all kinds of things brought in to relation with one another by a universe of spaces through a continuous and largely involuntary process of encounter [...]", and "full of multiple monadic singularities" within which "the social, psychological, and biological are folded" (Sampson, 2012, p.4), I both affected and was affected by each one of my encounters. Like the virus, I didn't remain the same over time and from place to place, or from

encounter to encounter : my "orientation and pace" were "continuously responsive to [my] perceptual monitoring of the environment that [was] revealed along the way." I "watched, listened and felt as I went, my entire being alert to the countless cues that, at every moment, prompted the slightest adjustments to my bearing" and that "through the journey", with "all its twists and turns", I "grew into a knowledge of the world around [me]" (Ingold, 2007, p.87).

Drawing on Dupré and Guttinger's (2016) perspective that a virus is better understood as a dynamic "process" rather than a static, discrete "thing", one could liken the progression of my fieldwork to the evolving stages of a viral infection. Just as a virus undergoes various phases—from attachment and entry to replication, assembly, and release—my research too transitioned through distinct states, rhythms and activities.

There were instances where, inspired by a virus's capacity to spread, I strategically positioned myself in areas of heightened potential for encounters, akin to a virus proliferating through fomite transmission—the phenomenon where it thrives on frequently touched surfaces like door handles or touch-screen devices. This intent-driven movement was evident during my visits to my local pharmacy, as discussed in chapter two, or my trip to Sudbury for a conference on northern health issues, highlighted in chapter five. Much like a virus optimizing its surroundings for transmission, I aimed to be in the optimal environment for the desired interactions to then naturally unfold.

Other times I drifted at my own pace—very slowly and speculatively—with no particular destination in mind. Just being present in the milieu, whether in movement or even while standing still, meant that I could expect to eventually become the site of a contamination and to contaminate in return ; it implied an ongoing potential for new encounters, and as such many unexpected things had a chance to "happen".

So even as I went about my ordinary, everyday life—whether as a student on campus, a volunteer in town, or simply being at home—it was still possible for me to slowly "accumulate" new potential opportunities to get acquainted with, and maybe follow, the flu. The key, I learned, was to try to be sensitive to these unexpected opportunities and to be ready whenever one materialized. In this way, my fieldwork unfolded like a contagion might, at times accidentally and unexpectedly, and through forces larger than myself.

In his exploration of multi-sited ethnography—an approach that involves following connections, associations, and relationships between different sites or locations, rather than focusing on a single, bounded field site—Marcus (1995) emphasizes the importance of serendipity as a driving force in ethnographic research. This approach is particularly well-suited for examining complex, global phenomena and processes, such as global health issues, digital cultures, or the spread of information across networks. It was also well-suited here, as I traveled along the various trans-viral contagion routes that I became ensnared in.

Meanwhile, just as a virus might utilize a host to transmit and propagate itself, there were other moments when I had to rely on others as proxies or intermediaries in order

to "infect" me with their personal experiences and knowledge, especially if I couldn't establish a literal presence for myself in a given place, because that location in the milieu, or that section of the apparatus, was off-limits to me. In other words, gaining access to a sensitive fieldsite—like a pharmaceutical lab, in Chapter Three—was only possible by remaining on the periphery, and accessing it indirectly through others, who had experienced it firsthand and were willing to communicate that experience to me. I was relying on mediated and mediating relationships, which put me in indirect contact with the places and "happenings" I had hoped to experience for myself.

This thesis follows my own speculative mapping of the flu virus, and by extension of my own journey of becoming-virus : it's the drawing of a map which, as Ingold comments, didn't preexist its deployment (Ingold, 2015, p. 114). Instead, it was created from the traces left by the virus in its coupling with other bodies, and which I attempted to follow whenever I was able to tune into its presence. I navigated these traces speculatively—by trying things out, waiting, risking gestures, or until something happened or emerged.

My thesis was largely written "from the middle out"—reflecting both the nature of the virus and of my fieldwork ; I've followed a winding, rhizomatic path instead of a clear linear one.

The following chapters have been pieced together, each highlighting my interactions and observations within specific locations linked to the flu : a doctor's clinic, a pharmacy, a pharmaceutical corporation, an advocacy group, a public health division, and a hospice.

In the words of Anna Tsing, my chapters are "an open-ended assemblage, not a logical machine. They gesture to the so-much-more out there" (Tsing, 2015, p. 8).

[Part One : A Medical Doctor's Office]

1. A Familiar First Step

It's September, and I'm going to the doctor's office for a yearly physical check-up. I figure this visit could be a good opportunity to start my journey "into the flu". Dr. T has been my family physician, or general practitioner (GP), for the last 10 years, and I'm hoping he'll be able to take a few minutes, during my physical exam appointment, to speak with me about the flu virus, the upcoming flu season and the flu vaccine.

Rather than conducting a formal interview, I think my best bet will be to broach the flu topic from my own "patient centered point of view" during the scheduled appointment time. Since I'm asthmatic, I intend to ask Dr. T about my specific risk profile concerning the flu, given that the area of the body that it primarily affects—or "infects"—is the respiratory system. I'd also like to see with him about where I can get the flu shot, and if I can manage it, speak a bit about the reasons for getting vaccinated in the first place. But annual check-ups usually last no longer than half an hour, so I'm uncertain about what I'll be able to accomplish in that short period of time.

Dr. T's medical practice, situated on the fifth floor of an old, repurposed office building in downtown Ottawa, isn't quite a conventional one. He operates as part of a Family Health Organization (FHO), which means that he shares a workspace and resources

with around half a dozen other family physicians. Together, they all form a "primary healthcare team" that's capable of providing comprehensive care to their collective patients, while offering extended office hours and near round-the-clock on-call coverage for emergencies.

Having visited the practice numerous times before, I expect that when I arrive, other patients will be waiting to see their own GPs, maybe providing me with ample activity or interesting "happenings"—that is, things greater than the sum of their parts, according to Tsing (2015, p. 23)—to observe. To make the most of this opportunity, I've decided that I should arrive a few minutes early.

Drawing again from Ingold (2007), my initial trip to the GP's office is a journey I make "across" a familiar path—focused on my endpoint and taking the quickest, most direct route. However, upon reaching my GP's office, my experience shifts, and I begin to travel "along" the unfolding path. Like a wayfarer, I engage actively with the environment and try to remain open to new experiences and interactions that may arise. This shift represents two distinct ways of moving through the world : one that is goal-oriented and direct, and another that encourages exploration and sensitivity to new possibilities and encounters.

2. Observations and Interactions at the GP Practice

After checking in with the FHO's receptionist, I go to take a seat in the waiting area, in a corner of the room so that I can have a full and unobstructed view. A digital clock that hangs on the wall opposite to where I'm sitting, just above a coat rack for patients and

visitors, lets me know that I have about 10 minutes remaining before my scheduled appointment time.

To my surprise, there are only three other patients who are sitting and waiting as I am, in a space that could easily accommodate at least twenty more of us, I estimate in my head. My eyes are drawn to the room's most vivid feature, a colourful magazine rack that's filled to the brim with various titles, from Maclean's to Chatelaine ; I can even spot a few worn out issues of National Geographic. Nearby are two hand sanitizer stations ; one is situated next to the entrance and the other is positioned on the opposite side, near the doorway that leads to the consultation rooms.

Suddenly, the quiet is shattered by a series of harsh, rasping coughs, visibly affecting the visitor nearest to the cougher. Only a few seats away, they begin shifting uncomfortably, their shoulders tensing. As the coughing continues unabated, they fully turn their body away, presumably to minimize exposure to germs. Noticing their reaction and evidently self-conscious about this, the person coughing raises their hand in a sign of apology.

Before I can observe more, a nurse practitioner appears around the corner and calls my name: "*Nicolas? Hi, please follow me*". As we make our way from the waiting room to the consultation spaces, I find myself instinctively practicing what Roberto Esposito (2020) describes as an "immunitarian attitude". Indeed, perhaps in reaction to the coughing I've witnessed, I've reached out and pumped a squirt of hand sanitizer into my palms. As the cool, wet gel is absorbed by my skin—neutralizing most of the potentially harmful microbes—the nurse explains that the appointment before mine was canceled

at the last minute. This means that as soon as we complete a few routine tests, the doctor should be able to see me without delay.

The tests involve taking my weight measurements, as well as my heart rate and blood pressure levels, which the nurse records on an iPad. Afterwards, she invites me to enter the consultation room and take a seat, while she goes to the computer and brings my medical file on screen.

"*The doctor will be with you shortly*" she lets me know, before exiting and closing the door behind her.

The examination room is small and simply furnished, bathed in neutral beige tones, with a faint, lingering odor of disinfectant in the air. I am seated snugly between the examination bed, draped with a crisp, disposable paper sheet, and the doctor's own desk and chair. At the foot of the bed, a small sink equipped with disinfectant soaps is flanked by a yellow and red biomedical waste container hanging on the ledge, while above it, a poster taped to a small cupboard provides visual guidance on proper handwashing techniques. A digital blood pressure monitor hangs neatly, ready for use, on the wall behind me.

After about a five minute wait, Dr. T arrives and the consultation gets underway. He begins by checking my vitals—blood pressure and heart rate—and takes notes on a tablet as we chat about my general health. At about ten minutes in, we've finished going over the initial check-up portion of the visit, and the doctor asks me if I have any specific questions or concerns that I'd like to discuss with him.

I seize this opportunity to express my interest in learning more about the flu, mentioning the upcoming flu season and that I'm concerned about my heightened risk for complications due to my asthma and a recent bout that I've had with pneumonia.

Dr. T confirms that I am indeed part of an "at-risk" group, "*along with those who have underlying conditions or chronic illnesses like heart disease, liver disease or cancer, as well as very young children and the elderly*" he adds. His voice, warm and earnest, conveys genuine concern as he emphasizes to me several times that the "*safest thing to do*" would be to get vaccinated this year.

I mention to Dr. T that despite getting my annual flu shots, I've experienced flu-like symptoms in the past. I'm wondering aloud if these were genuine flu episodes or if I might be confusing them with severe colds. After nodding in understanding, Dr. T proceeds to clarify, with his usual thoroughness : "*It's a common challenge to distinguish the flu from other respiratory viruses, like the syncytial virus or rhinovirus, which can cause similar symptoms. Unfortunately, the flu vaccine doesn't protect against these other viruses.*"

Curious about the distinguishing features of influenza, I inquire further : "*How does the flu differ from a common cold?*"

Dr. T leans in slightly, his gaze intent and focused, ensuring that I grasp every word as he explains, "*Influenza typically causes fever, headache, cough, sore throat, muscle aches, and intense fatigue, sometimes lasting two weeks. Colds are generally shorter,*

primarily affecting the sinuses." He goes on : "So a stuffy nose, sneezing and a sore throat are common. More rarely there'll be fatigue, fever and headaches."

Throughout our conversation, Dr. T has addressed each of my questions with clarity and precision. His confident demeanor and open body language have a reassuring effect on me. I can tell he is attentive to whether his explanations resonate with me, ready to offer further details or delve deeper into the subject if necessary to ensure my understanding.

In an attempt to keep the conversation going, I change directions and ask him to tell me a bit more about the flu vaccine, and whether or not he gets many questions about it from his other patients. While I assume it's not a commonplace question that doctors typically encounter during their consultations, Dr. T's welcoming and obliging demeanor has made me feel that I'm not breaching any boundaries by asking him this.

Without skipping a beat, Dr. T. shares that in his experience, the flu vaccine is the one that receives the most push-back from the public. He also tells me, a grin momentarily flashing across his face, that not too many of the patients who come to see him are "*hardcore anti-vaxxers*". While there are some people who are skeptical and concerned about potential side effects, their primary concern is often related to the flu vaccine's efficacy.¹

"So most will say something along the lines of what you've told me, "I was vaccinated but I still caught the flu, so does it really work?", while others might come in and say that

¹ The flu vaccine's effectiveness varies yearly because the flu virus frequently mutates, creating new and unpredictable strains. Scientists develop an annual vaccine by predicting the most prevalent strains using global data and historical trends. However, due to the virus's unpredictable nature, the selected strains may not match those in circulation, leading to reduced vaccine effectiveness.

they heard that the vaccine wasn't effective last year or the year before, so what's the use, since it's too hit and miss."

Throughout our conversation, Dr. T's medical expertise and dedication to both his work and his patients' well-being have become increasingly evident : he tells me that each year, he and his colleagues at the FHO will read up on the latest flu information that's available in order to stay up to date, and he also mentions that in the past he's both asked and shared advice with other doctors and nurses about how to best approach a patient who's skeptical about the flu vaccine, and other vaccines. "*Step one always has to be to listen to what their concerns are, and then to go from there*" he says. In his role as a family physician, it's important he makes an effort to understand where people, and their doubts, might be coming from. "*Because how else can we address the issue?*" he says. "*It's part of our role to make time to try to help patients navigate this pretty confusing space.*"

What also seems evident to me is that Dr. T's ability to connect with his patients is deeply rooted in the trust he cultivates with them over time. His professional demeanor, engagement, and genuine empathy, demonstrated throughout our conversation and previous encounters, make it easier for patients like me to value his expert advice and feel confident in his care.

3. Gestures and Programs

In the context of Yves Citton's work, Dr. T's demeanor and behavior with patients can be understood as "gestures" ("gestes" in the original French) that effectively communicate the importance and benefits of receiving the flu vaccine. These gestures, which encompass body movements, verbal and non-verbal expressions, as well as attitudes and behaviors, can be intentional or spontaneous, conscious or unconscious, and are produced, interpreted, and adjusted according to shared expectations and social norms (Citton, 2012). Citton's theory highlights the ambivalent nature of gestures, which lie between calculated mastery and alienation, and always emerge or are deployed in relation to an "Other." He also distinguishes between "mechanizing" ("machinants" in French) and "mechanized" ("machinisés" in French) gestures, with the former being conscious, reflective, and controlled, and the latter performed unconsciously and in a mechanical way.

It's clear from my appointment that Dr. T employs a combination of gestures in his interactions with patients. For example, while intentionally discussing the flu and the vaccine in adapted and accessible terms, taking the time to go over particular points or questions in more detail if necessary, he might also perform spontaneous gestures, such as expressing genuine grins, or non-verbal ones like maintaining eye contact and shifting in his seat in order to adopt a more open posture.

These gestures—whether intentional, spontaneous, "mechanizing" or "mechanized"—help to create an open and empathetic connection with patients, and are to some extent informed by what Citton calls "programs" (Citton, 2012). In this context, "programs" refer to the structured sets of norms, practices, and expectations

that inform or guide Dr. T's behavior and interactions with his patients. These programs encompass, among other things, his previous (and ongoing) medical training, the ethical codes and guidelines of the medical profession, and learned communication tactics for dealing with vaccine hesitancy. They inform and direct his gestures, both verbal and non-verbal, making them "mechanized" in the sense that they conform to the broader public health framework as well as the vaccination goals that are set by the "social machine" that is the healthcare system.

Through repeated practice and experience, Dr. T has internalized and refined his gestures, allowing him to skillfully and creatively adapt them to individual patients and specific situations. This so-called "virtuosity" enables him to effectively address the unique needs, concerns, or barriers that might prevent a patient from deciding to get the flu shot. His gestures thus become "mechanizing" as they have the potential to influence and communicate to his patients the action of getting the flu shot, itself a gesture in Citton's sense.

By balancing intentional and spontaneous gestures, Dr. T fosters trust and empathy with his patients, creating an environment where they feel understood and supported.

This supportive atmosphere may help shield patients from misinformation about the flu vaccine and fears about its potential side effects, increasing the likelihood that they will embrace the pro-vaccine message. By alleviating their concerns and directly addressing their apprehensions, Dr. T can more effectively dismantle misconceptions or anxieties related to the flu vaccine, potentially fostering a more favorable view of immunization.

Reflecting on this, I realize that my consistent decision to get the flu vaccine each year is likely influenced by the trusting, nurturing relationships I've developed with general practitioners like Dr. T. This feeling of trust and being cared for has undoubtedly played a significant role in shaping my own health outlooks and decisions.

I wonder out loud about getting the flu shot right then, but he stops me in my tracks and says that won't be possible, because we're still in October and no doctor's practice has yet received this year's flu vaccine from the provincial Health Ministry.

He says I could come back later in the month to get it done (during one of several "flu shot" days held at the FHO), or that I can go to a nearby pharmacy if I really want to get the shot sooner. Pharmacies will typically receive the vaccine a bit earlier than most doctors' offices, he says.

"Is there any difference to getting it done in a pharmacy vs. here in the office?" I ask. "None", he replies, "well, none for someone your age. But it's probably going to be more convenient."

As if to drive the point home, he tells me that he'll be taking his own family to a local pharmacy in order to get the shot, when the time comes.

[Part Two : A Pharmacy]

1. Mobilization of a Public Health Apparatus

It's November in Ottawa, and I'm preparing to follow my doctor's advice to get a flu shot before the flu season peaks. One morning, during my regular school commute, I listen to a guest epidemiologist on CBC radio explain that new flu cases are expected to rise sharply in the next month—and stay elevated until at least February—following a bell curve distribution. This pattern, they explain, is a predictable one that emerges from the intricate relations between environmental factors, human behaviour, and the flu virus's own resilience.

As winter sets in, people tend to gather more indoors, in closer quarters, creating ideal conditions for the flu to spread. Concurrently, the flu virus thrives in colder climates, maintaining its presence longer on various surfaces, which then become key vectors for transmission. In other words, the onset of winter not only alters our environment and behaviours but also amplifies the flu virus's capacity to transmit ; the drop in temperature correlates with an increased likelihood of encountering and contracting the flu, ultimately accelerating its spread in communities.

Listening to the radio has also kept me informed about the City of Ottawa's preparations for the looming flu season. I learned from a news segment that conventional healthcare and vaccine distribution sites such as clinics and pharmacies are already receiving their

first shipments of flu vaccines from Public Health Ontario (PHO). Additionally, a number of other locations around the city are being converted into temporary vaccination centers.

Curious about the many options available, I do an online search and quickly find information on the Ottawa Public Health (OPH) website about special "vaccination days". From November through February, anyone aged six months or older is eligible to receive a flu shot, on a walk-in basis, at any one of the temporary clinics that have been set up at City Hall, as well as in several high schools, sports arenas, and recreation centers around town. Operating several days a week, they are "making apparent" the city's efforts to expand vaccine accessibility, which would, in theory, mechanically translate into extended immunity coverage among residents.

This is all part of the province's Universal Influenza Immunization Program (UIIP), first initiated in 2000, involving public health organizations like the Public Health Agency of Canada (PHAC), Public Health Ontario (PHO), and municipal units such as Ottawa Public Health. The mission is clear : to protect the public from the annual threat of the flu by coordinating a variety of groups and resources—healthcare professionals, vaccination sites, vaccine manufacturers, health education campaigns, flu monitoring systems, media outlets, and more—to promote and facilitate the uptake of "flu immunization gestures" across the province. Concurrently, the UIIP ensures the province is prepared with strategies and procedures to address the ever-present threat of a pandemic flu outbreak.

This potential harm, with its capacity to jeopardize human health and even cause death (Lowe, 2017, p. 94), is precisely what mandates life to be "managed in a controlled, limited, restrained form", explains Esposito (2013, p.104). In the face of such dangers, survival must be a deliberate orchestration, since it is not guaranteed. In this paradigm, the flu virus isn't just a biological entity. In Citton's terms, it's a "mechanizing" force that catalyzes a reconfiguration of social relations. And when diseases like the flu metamorphose into global pandemics, they wield the authority to "produce [their] own reality according to which our habits and worlds must bend and adapt" (Sampson and Parikka, 2020).

At its core, the UIIP is a manifestation of Agamben's concept of the apparatus (Agamben, 2009). This intricate assemblage of actors, institutions, processes, norms and technologies is meant to function as a bulwark, fulfilling roles such as providing "immunity barriers, protection and apparatuses aimed at reducing, if not eliminating, the porosity of external borders to contaminating toxic germs" like the influenza virus (Esposito, 2013, p. 123).

At the onset of each flu season, the UIIP works to achieve several objectives, like clearly communicating the threat of the flu and emphasizing the protective value of immunization, while also orchestrating the flow of people to accessible vaccination sites where they can receive their shot, thus transforming individuals from potential disease vectors into active contributors to public health protection.

Again in Citton's terms, the apparatus functions as a "mechanizing" gesture, harnessing the viral potential of existing media and information networks in order to boost public awareness about the impacts of the flu, and the importance of getting vaccinated. This is accomplished by amplifying its public health messaging across various communication channels, such as public radio, TV, and social media, creating an informational cascade that enhances the visibility and perceived urgency of flu vaccination. This is important because as long as immunization "remains at an individual level, and is not incorporated into a wider social mechanism, it remains exposed to the risk of rapid dissolution" (Esposito, 2013, p.106). By enhancing both the uptake of the vaccine and its social contagiousness—the extent to which the act of getting vaccinated is visible, normalized, and emulated—the apparatus increases the overall immunization rate among the population. If effective, this not only raises the level of individual protection but also limits the potential spread of the biological flu virus, contributing to community-level resistance and better containment of the pathogen.

2. Several Paths to Immunity

Aside from the temporary clinics set up by the city's public health unit, another option that's available to me is to return to my GP's office, where also on select days each week, any regular patient of the FHO can walk in and receive a vaccination from trained medical personnel. Ultimately, though, I decide to follow my GP's initial advice and visit a pharmacy that's located a few streets away from my home in South Ottawa. The convenience of its location, coupled with extended hours that suit my schedule, makes it

an easy choice. According to Health Canada data that I found online, pharmacies have increasingly become the preferred location for Canadians to receive flu vaccines, with 53% of vaccinations occurring in pharmacies in 2021, compared to 22% in doctor's offices (Government of Canada, 2021).

The pharmacy near where I live happens to be a Shoppers Drug Mart. Another quick google search on my phone—a tool I often make use of to tap into helpful digital information streams—tells me that this particular branch is one of about twenty in the Ottawa area alone, and that Shoppers extends its reach all the way across Canada with an expansive network of over 1300 locations, making them a readily accessible option for many Canadians seeking flu immunization.

From the exterior, the Shoppers I'm stepping into seems less like a pharmacy and more like a multi-purpose retail store. Directly in sight are aisles teeming with products like cosmetics, personal care accessories, food groceries and even electronics. But above all this, hanging conspicuously in the distance, is a large blue and white sign reading "Health Watch: Prescriptions". I head in its direction and soon arrive at the pharmacy counter, tucked away at the back end of the store. Several people are already lined up, awaiting their turn with the on-duty pharmacist or else one of her lab techs, all of whom are already engaged in filling prescription orders.

The term "pharmacy" originates from the Greek word "pharmakeia" (φαρμακεία), referring to the practice of preparing, compounding, and dispensing drugs. The latter's etymological roots can be traced back to "pharmakon" (φάρμακον), ambivalently

meaning a "drug, whether healing or noxious", or a figure for something that is both "disease and antidote, poison and cure, potion and anti-potion" (Esposito, 2013, p. 127). This inherent duality lies at the heart of the pharmaceutical practice (Derrida, 1981). Indeed, pharmacists must tread the delicate balance of handling and dispensing substances that can either heal or harm, with outcomes largely determined by factors like preparation, method of administration, and crucially, dosage.

Here, poison and cure aren't just polarities, in fact they often each serve as the "instrument of the other", explains Esposito (2013, p.125). This dynamic is especially manifest in the case of the flu virus and its vaccine, since the vaccine, which is derived from the virus it aims to protect against, involves introducing an unactivated version of the virus into the body. While in appearance counter-intuitive, this process equips the body with the means to combat future infections from the very virus used in the vaccine's creation. The flu vaccine thus epitomizes the "pharmakon"—it's a fragment of the "poison" that also simultaneously acts as the shield against the ailment. As Derrida, cited in Esposito (2013, p.127), explains, the "pharmakon" counters its opposing force not by rejecting it but by absorbing and mimicking it, embodying both the "evil and what opposes it" in its very essence.

When it's my turn to be seen, I arrive at the counter and let the pharmacist know that I'd like to get the flu shot. "Sure", she says, "*may I see your health card?*". Anticipating the request (having navigated this line before, in the Ingoldian sense) I quickly hand over my Ontario health (OHIP) card. She records my details and subsequently returns it, along with a "Seasonal Inactivated Influenza Vaccination Screening and Consent form"

that I need to complete. The form is divided into two parts : one is for personal information and the other acts as a health screening questionnaire. I fill it out promptly and sign my name at the bottom, which records my agreement to get vaccinated.

I can perceive here the underpinnings of Agamben's anti-flu apparatus at work. Presenting my Ontario health card is more than an administrative formality—it marks me as an Ontarian, binding me to the province's flu prevention efforts. In fact, the card's very existence, and its role in granting me a flu shot for free at this particular point of use, reflects a strategic approach to boost community immunization rates through the removal of any financial barriers. Meanwhile, the screening and consent form further manifests the apparatus's reach and influence, since its pre-configured set of questions and responses, which imposes a structured, standardized and protocol-based interaction, isn't just about gathering data ; it's funneling individuals like me through a controlled process to gage our health compatibility for vaccination while ensuring our informed choice to participate remains documented.

The pharmacist is already at work preparing the flu shot, so I place the form on the counter and watch as she carefully draws the vaccine from a small vial into the syringe. Her movements - precise, quick, and gentle - are captivating to me. They remind me of Brian Massumi's (1992) description of a woodworker, in the sense that both the pharmacist and the woodworker display a deep familiarity with their tools and materials, honed by experience. While the pharmacist's gestures are about precision in a clinical setting, the woodworker's involve a more tactile engagement with a natural material, with each responding to different textures and resistances—the fluidity of a liquid

vaccine versus the solidity of wood. Both, though, transform their learned skills into almost unconscious, fluent movements through repetition and practice.

Soon after I'm prompted to enter the consultation space and to take a seat. I notice, on a shelf beside me, a box of rubber gloves, as well as a needle disposal container, a first aid kit, bandages and some antiseptic cream. These are more of the tools of trade, I think to myself. The pharmacist, who has by now followed me in, half closes the glass panes and asks me to take off my coat and sweater while she begins to prepare her station.

"What exactly will I be injected with?" I inquire.

"It's called the "Afluria Tetra P-FS" influenza vaccine", she replies, making a point of showing me the sticker on the vaccine packaging box, which she's brought into the space with her. *"It's just the regular flu vaccine, but it's one of several flu vaccines that have been manufactured this year."*

"They're all doing the exact same thing", she adds, in a tone meant to reassure. In fact, she says, it's not uncommon for pharmacies to receive one brand of flu vaccine at the beginning of flu season, and then receive different ones later on : *"It just depends on city stock levels."*

Curious about how this all works, I probe further. She tells me that the flu shots are dispatched in weekly deliveries coordinated by the Provincial Public Health units. The first shipment of the season is the most substantial, and thereafter, pharmacies predict and request whichever quantities they forecast are needed for the subsequent week. This estimation is critical, with an emphasis on avoiding surplus to prevent wastage.

Drawing again from Ingold's (2007) perspective, the flu virus traces a "meshwork" of paths, circulating contagiously "along" lines, from body to body, while its counterpart (or alter ego) the flu vaccine—an inactivated fragment of the virus—embarks on a different journey. This journey takes it "across" a complex network of predetermined routes, passively transported in specialized, insulated containers kept at low temperatures, to various destinations like the pharmacy I'm in, or other vaccine dispensing venues. This mode of travel is destination-oriented, planned and executed with precision, carrying the vaccine from one location to another without altering its nature, so that it can be administered "as is" to individuals like myself.

With my arm bare, the pharmacist proceeds to clean the injection site with an alcohol pad, before picking up and uncapping the needle. "*Are you ready?*" she asks. Feeling a bit hot and anxious, I take a deep breath and nod that I am, averting my gaze in anticipation of the inevitable pinch.

3. Activated Potentials

As my mind races, the sting of the needle hits sharply. I blink rapidly a few times, and then, just as quickly, it's over. Quiet relief washes over me as I sit momentarily lost in

thought. I ponder why I always anticipate the pain being worse than it actually is. Stépanoff notes that "our emotions and our bodies do not treat the imaginary as if it constituted a distinct domain from another domain that we would call the 'real'" (2019, p.2). In this moment, my mind has blurred the lines between the anticipated fear and the actual experience of the needle, causing my body to react as though the two were inseparable.

That half inch needle penetrated my left shoulder's epidermis, sinking into my deltoid muscle. Right there, the viral payload—a quarter milliliter of influenza vaccine solution—was pushed through. As the flu vaccine solution enters my muscle tissue, it encounters a bustling microcosm of cells and molecules that make up my body's immune system. Unlike the live virus fragments used in early inoculation practices, the flu particles in the vaccine solution—known as antigens—are inactivated, meaning they can't precipitate the illness. But their presence is enough to activate my immune system. Inside my body, these flu antigens are first detected by my dendritic cells, which capture and transport them to my lymph nodes. There, they are presented to T cells, which are crucial for coordinating the immune response : the interaction with the antigens prompts my now activated T cells to activate, in turn, B cells which respond by producing new antibodies specifically tailored to combat those flu virus antigens introduced by the vaccine. Since I've received "Afluria Tetra P-FS," a quadrivalent vaccine, I am now building an immune response against four different flu virus strains. These new antibodies will circulate throughout my body, ready to recognize and neutralize any of those strains should I encounter them in the future.

And like that, I've become part of the approximately 40% of Canadians who get a flu shot in a given year (Statistics Canada, 2022). I don't have much to show for this experience except that I'm now sporting a cotton bandage to cover up the point of penetration. And because I've asked for it, the pharmacist gives me a "receipt" attesting that I received the shot ; on it are noted the vaccine name as well as the date and time it was injected.

She also recounts to me an anecdote from earlier in the day : a person took a phone selfie while they were receiving the shot, and then shared it on their social media account, thus transforming their personal vaccination experience into a public digital event. Citton might call this a performative and potentially "mechanizing" gesture, one that communicates trust in the vaccine, participation in public health, as well as community solidarity. By extending beyond the individual, this act gains a potentially contagious quality, encouraging that the gesture be imitated among the person's social media circle, and beyond.

As I'm holding the cotton ball in place, the pharmacist lets me know that I should wait inside the pharmacy for 15 additional minutes, in case I develop an allergic reaction. She shows me the epipen she'll use if I do go into anaphylactic shock. Maybe interpreting a slight look of worry on my face, she explains that most times people will have a sore arm and nothing more. Ward (2015) highlights the inherent tension between the goal of public health initiatives to standardize and protect populations, and the reality that individuals have diverse responses to vaccines. This complexity arises from

the challenges in creating a universally effective vaccine for heterogeneous populations, with factors such as immune system variations, manufacturing substances, and underlying health conditions influencing the range of reactions observed.

When the pharmacist is called away by one of her technicians, I decide to wander off and look at some of the pharmacy's other wares. I head towards an aisle containing symptom relief products, where on display are dozens of types of medications, many for cold and flu. There are syrups, lozenges, pills, creams and nasal inhalers. Some are for night time, others for day time, some are manufactured by brand names, others by no name, and so on.

These medications aren't prescribed, per se, instead they're "over the counter" products, and it's clear that they're being advertised. While I can see that the prescription medications from behind the pharmacist's counter come in bland, white bottles or receptacles, here they've all been packaged into colourful, eye-catching boxes, and some of these also sport attention-grabbing slogans (on the box of a Buckley's cough medicine I read : "It tastes awful and it works!").

Beyond its health impact, it's clear that the flu's cyclical nature catalyzes a broad spectrum of economic activities centered on prevention, treatment, and symptom management. Pharmaceutical sales surge with demands for medications and vaccines, especially during peak flu seasons, while ancillary product sales, like tissues and hand sanitizers, also rise (Woleben & Gibney, 2019). The pharmacy represents a unique intersection between healthcare and consumerism ; as a place for obtaining medications and healthcare products, it simultaneously functions as a retail space that

encourages customers to explore and purchase items beyond their immediate health needs.

A few hours later at home, I notice a soreness in my left arm, a common after-effect of the flu shot that persists for about a day. Having been unvaccinated when I entered the pharmacy, I now possess a newly activated immune potential thanks to the vaccine. This simple gesture of getting vaccinated has set in motion a complex immune response within my body. As per the pharmacist's explanation, my immune system will be busy over the next ten to fourteen days, building antibodies specifically designed to combat the four strains of flu targeted by the vaccine. These antibodies will circulate in my system, ready to defend against potential flu encounters. The soreness in my arm is a minor, yet noticeable indicator of the microscopic biological processes now at work inside of me, unseen and unfelt.

[Part Three : A Pharmaceutical Company]

1. At the Beginning, a Dead End

It's Spring and I've come to Toronto to attend the wedding of a close friend. The marriage ceremony is set to happen on the upcoming Friday, but I've made plans to arrive a few days early ; since I'm going to be in the city anyway, I thought this could be an opportunity to try to make contact with a pharmaceutical company that's involved in producing vaccines. A bit of research—once again performed on my handy phone—reveals that GlaxoSmithKline (GSK), a UK-registered multinational, operates such a facility within the Greater Toronto Area. In fact, their operations extend to a major complex located in Mississauga, just a short distance from where I'm staying.

A few months prior, I'd noticed GSK's "FluLaval Tetra" vaccine listed with several other flu vaccines on the Health Canada website. Now, with a visit to GSK's Mississauga offices on my agenda, I'm speculatively hoping that I might get the opportunity to meet with one of the company's scientific representatives, and that maybe this could also lead to seeing parts of the vaccine manufacturing process up close.

However, when I'd previously tried to contact the company's public relations team, identifying myself as an Anthropology graduate student and inquiring about organizing a possible visit for research purposes, I received no response. Nonetheless, as I'm in town, I figure that I should try to go anyway, to feel things out in person and see if I can still make any meaningful inroads and contacts.

GSK's Mississauga offices are situated in a sprawling technopark west of Toronto's Pearson Airport. I make my way there by car, leaving downtown Toronto late in the morning to bypass the worst of rush hour traffic. After parking in the designated visitor area, I follow the signage to a long, bridge-like pathway offering a panoramic approach to the complex's main entrance, nestled amid a cluster of towering structures with bright white exteriors and striking turquoise windows. Inside, the reception area maintains the same crisp white theme, contrasted only by green plants hanging over the reception desk. An imposing, totem-like piece of indigenous artwork serves as the visual focal point, but my attention and curiosity are drawn to the set of restricted doors leading deeper into the facility.

I introduce myself to the receptionist, briefly explaining my thesis project on influenza and my interest in GSK's flu vaccine production. The receptionist, unsure how to assist, eventually gives me the Media Relations team's contact number. However, upon reaching out to them, I'm politely informed that facility access isn't an option. Instead, they reiterate some familiar facts about GSK's extensive vaccine portfolio, which I had already seen on their website : *"GSK has one of the most comprehensive vaccine portfolios in the industry, which is helping to protect children, adults and seniors against diseases like hepatitis, shingles, whooping cough, the flu, and many more infectious diseases"*. This brief interaction and information are the extent of my access to GSK.

Though I tried to deploy and rely on my own improvised gestures—from initially reaching out beforehand to personally introducing myself on-site—my attempts to penetrate GSK's secure environment and observe their flu vaccine production process were unsuccessful. GSK has established robust security measures and protocols, akin to an immune system, that carefully regulate interactions with outsiders to preserve the integrity of its controlled environment and ensure operational confidentiality. In this context, my casual attire—backpack, t-shirt, jeans, and ball cap—clearly set me apart from the more formally dressed staff and visitors at GSK, underscoring my outsider status. Faced with this barrier, I experienced a moment of uncertainty about how to advance my research. Analogous to a virus in search of a host, I found myself momentarily stalled, contemplating my next steps.

2. Accidental Encounters

A few months later, I cross paths with a man named Greg at an event that's organized by the Museum of Nature, in Gatineau, Quebec. The Museum has opened the doors of its off-site Collections Facility to the public, and I've come with the intention of visiting the brand new cryolab on the premises, with fellow HAL² members. The cryolab is a state of the art facility where tissue samples from tens of thousands of Canadian plants

² HAL, or HumAnimaLab, is a multi-disciplinary research group at uOttawa that focuses on the Anthropocene, the new geological, environmental, political and cultural age that the world is said to have entered.

and animals are treated and stored in supercooled freezers, allowing for the genetic material they contain to be preserved almost indefinitely.

Greg, who happens to be one of the volunteers posted in the cryolab on the day of our visit, turns out to be a retired scientist who had previously worked at a GSK pharmaceutical lab near Quebec City. Struck by this incredibly unlikely coincidence, I promptly share my research project with him and ask if he'd be willing to sit down with me to do an interview in the coming weeks. If it wasn't possible for me to get access inside a GSK lab, then Greg, who I would later learn had spent ten years inside one of them working on a nasal spray flu vaccine, could share valuable insights from his own recollected point of view.

This chance encounter with Greg exemplifies Marcus's (1995) concept of serendipity as a potential driving force in multi-sited ethnography. It presented a new and valuable connection that would have been difficult for me to anticipate or plan for. By remaining open and flexible, and by recognizing and responding to this chance opportunity when it came, new avenues of inquiry could be followed and explored, demonstrating the non-linear and dynamic nature of my fieldwork.

A few weeks following our initial meeting, Greg accepts my invitation for an interview and we decide to meet at a Second Cup coffee shop in South Ottawa, a convenient location for both of us. This coffee shop, nestled in a suburban strip mall between a bustling medical clinic and a fast-food restaurant, offers a familiar setting. Inside, the aroma of coffee blends with the subtle scent of baked goods. The interior is a mix of

basic wooden furniture, a few potted plants, and generic artwork hanging on the walls, while soft music playing in the background serves as a soundtrack to the many conversations and transactions that are taking place. A dozen or so tables, as well as a separate area with a few worn sofas, provide the seating options ; most of these are occupied but turnover is swift, as people typically arrive, sit down to consume what they've bought, before promptly leaving again to go on with their day. Among this transient crowd there is a subset, most who appear to be students like me, who linger for longer periods, their laptops and notebooks spread across their tables as they immerse themselves in their school work.

Within this coffee shop, amidst the steady flow of patrons, a hidden meshwork of interactions becomes apparent. Every door handle touched, every transaction at the counter, and every seat occupied and then vacated, weaves a complex web of connections that subtly highlights the potential for viral spread in such communal spaces. Presumably unaware of the microbial exchanges accompanying their conversations and transactions, customers unwittingly contribute to the transformation of the coffee shop from a social hub into a potential epicenter for infection. Only the occasional cough or sneeze, barely noticeable amid the general buzz, serves as a reminder that pathogens could be transferring from person to person, or are lingering on common surfaces, ready to be unwittingly passed on.

Amidst this unseen network, a simple yet deliberate gesture by one of the baristas catches my attention. As I wait in line, I notice him putting on plastic gloves before

handling a customer's mug, a precaution likely mandated—or "programmed", in Citton's terminology—by corporate health protocols and training.

This mindful approach to hygiene by the barista underscores the perpetual risks of biological contagion in such bustling environments. It also serves as a stark reminder of the unequal exposure to potential health risks across different occupations and social strata. This resonates with Merrill Singer's concept of a "syndemic", which suggests that health risks are not isolated issues but are compounded by social and economic factors (Mendenhall et al., 2022). These intertwined factors exacerbate the vulnerability of certain populations, particularly those in lower-income or service-oriented jobs who face greater exposure and have fewer resources to mitigate these risks.

3. Viral Potentials

Coffees in hand, Greg and I settle into a spot at a quiet table in the corner. Over the next hour, our conversation spans topics from the nature of the flu virus and vaccination to his firsthand experiences working on a flu vaccine production line at GSK. Greg, who appears to me to be in his late fifties, explains that by the time he retired, which was very recently, he'd worked in several laboratories, all over the course of a nineteen year career in the private sector. The last ten of those years were spent working at the GSK vaccine manufacturing facility in Ste-Foy, Quebec, where he was part of the team that produced a nasal intake flu vaccine.

"Could you explain to me what the flu virus is?" I decide to ask first, wanting to start from the top.

"Well, first of all, viruses come in many shapes and forms, but all of them are essentially tiny segments of genetic material, either DNA or RNA strands, surrounded by a capsid, which is a kind of protein shell with specific markers on the surface. The flu, or influenza as we call it, is an RNA virus, and there are three major types that affect humans : A, B and C, with influenza type A usually being the most pathogenic of the three. Many subtypes also exist, and these are composed of different combinations of the virus's hemagglutinin and neuraminidase surface glycoproteins, so for example subtype H1N1 or H5N1. Each of these subtypes has varying levels of virulence."

I interrupt Greg to ask him what "hemagglutinin" and "neuraminidase" are.

"They're the glycoproteins that surround the virus", he answers. "Basically, hemagglutinin helps the virus enter a host cell, and neuraminidase helps newly created viruses to exit a host cell."

The information is coming quick and fast, and grasping some of the scientific terms and explanations that Greg shares with me can be a bit challenging as we go. When I mention this to Greg, he explains that he wants to tell me things precisely, because some of the colloquial language we use to speak about viruses can be misleading. This is a point that is also highlighted by Thierry Bardini (2020), who notes that when a

person says they've "*caught a virus*", they're actually referring to an infection by tens of thousands of virions—the free-floating particle forms that a virus takes when it's not inside a host cell.

This common oversimplification leads to a flawed appreciation of how viruses operate, since in reality, an infectious virus never exists or circulates on its own. Instead, it manifests and propagates as swarms or multitudes of viral particles. Celia Lowe describes viruses as dynamic and interacting processes, more akin to "clouds"—a useful metaphor for describing the many genomes that are found in any single instance of influenza infection—than discrete entities (2010, p.626). In this context, the gesture of referring to viruses as singular entities highlights the performative aspect of language and its impact on our comprehension of complex biological processes. By simplifying viruses into singular forms and labeling them as such, we inadvertently distort our understanding of their nature as dynamic, interactive processes with intricate interdependencies. In other words, the language we use to describe the supposed reality of the flu virus actively shapes our perception of it, influencing how we engage with and respond to it.

I wonder out loud about the nature of viruses, addressing a common point of confusion and scientific debate : "*Are viruses living organisms?*"

"*It's complicated*", answers Greg, before pausing for a few seconds. "*No, most biologists would say that they don't fit the current biological definition of Life.*"

While Nobel laureate André Lwoff once commented that "whether or not viruses should be regarded as organisms is a matter of taste", what Greg refers to are the seven common criteria points that biologists reflect on to determine if something is alive. These stipulate that, to be considered alive, an organism must possess or demonstrate all of the following characteristics : (1) be composed of one or more cells, which are the basic unit of life, (2) have the ability to convert energy from their environment in order to grow and maintain cellular processes, (3) have the ability to maintain a stable internal environment in response to external changes, (4) possess the ability to grow and develop, (5) have the ability to reproduce, (6) be able to respond to stimuli, and (7) it must be capable of evolutionary adaptation (Van Regenmortel, 2010).

"The best you could say is that viruses demonstrate some of the characteristics of life but not all of them. That's part of what makes them so interesting, they're hard to classify", he continues.

For instance, while viruses can certainly replicate, they're incapable of doing it on their own : *"In the case of influenza, once the viral particles enter a body, they have to hijack the cellular machinery of the cells that they infect in order to create more copies of themselves. Those newly created viral particles then exit the cell and spread further in the body, repeating the replication process by hijacking new cells, and so on..."*, Greg explains to me.

In Citton's terms, the viral particles are "mechanizing" host cells, effectively turning them into "factories" to multiply the virus exponentially, since within a matter of days following the initial infection event, the quantity of flu virions that are present in the body undergoes a dramatic surge, escalating from several tens of thousands to hundreds of millions, or even billions, at the peak of infectiousness (Baccam et al., 2006).

Greg goes on to detail how the replication of virions doesn't produce exact copies each time. Instead, a process called "antigenic drift" causes random mutations to accumulate in the viral genome after each replication cycle, and it's these changes which provide the virus with the capacity to continually find new ways to evade the host's immune system. When the accumulated mutations are significant enough to "make a difference"—in the Deleuzian sense—the result is the birth or emergence of new flu strains. In other words, each mutation shouldn't be understood merely as a variant or deviation from an original, "pure" form of the virus, but rather as an integral aspect to the virus's very mode of existence. The flu's adaptability and resilience lie not in its sameness, but rather in its capacity for difference. In Deleuzian terms, it is in fact continually "becoming-difference".

4. Unexpected Individuations

Delving a bit deeper, Greg explains that our human lineage has been interwoven with that of viruses for millions of years. As humans diverged from other apes approximately six and a half million years ago, specific viruses, including the precursors of influenza, evolved in tandem. Each time a pandemic struck, those who survived tended to be

those with inherent immunities, who then transmitted their biological defenses to their offspring, exerting in turn an evolutionary pressure on the flu to individuate into newer forms that could yet again be infectious (Shao et al., 2017). Meanwhile, the flu strains that once reached pandemic levels of virulence typically ended up integrating into the pool of common seasonal flu viruses. A contemporary example of this process, or evolutionary path, is the Spanish flu, which is a precursor of the now common H1N1 strain ; today's influenza A variants are genetically descended from this 1918 virus, having undergone various genetic drifts and reassortments (Hay et al., 2001).

Such intricate evolutionary relationships underscore a pivotal facet of life : rather than discrete entities which are isolated from each other or from their environments, we are all in fact "relational beings", engaged in a perpetual and non-linear process of co- and trans-individuation, to echo the thoughts of Gilbert Simondon (in Combes, 1999). Through this lens, both viruses and the human immune system are engaged in a relational, non-linear process of "co-becoming", each constantly adapting and responding to the other, where the development of one is always deeply interwoven with the evolution of another.

Meanwhile, human activities have dramatically reshaped the ecological landscape where influenza viruses evolve, transmit, and—from time to time—take on pandemic forms. While mutations enabling antigenic drift may occur randomly within individual hosts, the trajectories and outcomes of influenza's spread are closely intertwined with anthropogenic forces (Singer, 2015).

Modern transportation networks and increased global connectivity have fundamentally altered influenza transmission dynamics. As MacPhail (2014) points out, our dense transportation grids essentially "materialize" viral outbreaks, acting as conduits that enable influenza's biological virality to harness the propagation potential that's intrinsic to our globalized techno-social-transportation systems.

They also accelerate the virus' spread. Past influenza pandemics, such as the 1957 H2N2 "Asian flu" and the 1968 H3N2 "Hong Kong flu", propagated relatively slowly, taking around six to nine months to disseminate globally along trade routes and shipping lines (Taubenberger and Morens, 2006). In contrast, the 2009 H1N1 "swine flu" demonstrated the accelerated pace of modern pandemics by circling the globe in under six weeks, rapidly transmitting across global air transit routes (Neumann et al., 2009).

As Brundtland (2001) notes, Humanity now inhabits a "single microbial sea" where viruses can flow readily between geographically distant populations. Globalization has granted influenza unprecedented access and mobility, profoundly shifting the spatial ecology of transmission. This is also evidenced by the increasing frequency of zoonotic spillover events and viral gene flow between previously isolated host reservoirs (Greger, 2007).

Indeed, beyond enabling rapid pandemic spread, human activities are directly shaping viral evolutionary trajectories via ecological disruption. Climate change, pollution, deforestation, and agricultural intensification driven by human actions are forcing increased contact between previously isolated species, enhancing the probability of viral reassortment events and the emergence of novel strains (Morand and Lajaunie, 2021).

Particularly concerning are influenza strains that evolve the capability to transmit from animal reservoirs to humans. By introducing unknown antigens into new populations, such zoonotic strains can potentially cause more severe disease and pose significant pandemic threats.

5. Immune Needs and Aspirations

In the face of all this, Greg notes that we humans have armed ourselves with the flu vaccine, a "technical artifice" that we must rely on to address the "natural deficiency" of the human body in combating the virus (Esposito, 2013, p.109). As Greg explains, all vaccines function on the same fundamental principle : *"They introduce the immune system to weakened or inactivated flu virus particles, usually via a low-dose injection, which has the effect of stimulating the production of antibodies."*

In other words, the vaccine embodies a gesture of "imitative difference", presenting the immune system with a version of the virus that is similar enough to provoke a response, yet different in its harmlessness.

At GSK, Greg's work was focused on producing these inactivated flu particles, essentially viral proteins that emulate the properties of active, circulating flu strains—and similarly enhancing their numbers, reminiscent of viral replication processes in host cells.

He explains: *"In my role in the lab, the objective was to upscale the production of viral particles from minuscule amounts, a few micrograms, to much larger scales, milligrams*

or grams. This involved transforming the pure protein and increasing its quantity massively, while making sure that the final product remained as pure, effective, and identical as possible to the original protein in terms of its properties."

Greg also touches upon the unique challenges associated with the flu vaccine compared to others, namely that the flu virus's rapid mutation rate presents a significant challenge in terms of predicting which actual strains will prevail each year, come flu season. *"We have to start producing flu vaccines well in advance of flu season, guided by the World Health Organization's predictions. But these forecasts aren't always correct. There's always a risk that the strains chosen for the vaccine won't match the strains that actually circulate during the flu season. This means people might end up being vaccinated against types of flu they never encounter."*

Yet, despite these difficulties, Greg maintains a balanced outlook on the future of flu vaccines, echoing a belief in what Esposito has called the "power of transformation of the hands" (2013, p.110), in reference to human skill in manipulating and adapting things in the world, including living beings, to suit our purposes. As Greg states : *"I don't doubt that the flu vaccines we're creating will continue to improve, and one day become very effective"*.

He cautions, though, against blind faith in technological solutions, bringing to mind Leo Marx's idea of the "technological sublime" and its illusory promise of mastery over nature (Marx, 1964, p. 198). *"It's very difficult to have a so-called perfect vaccine when our so-called opponent is Mother Nature. She's always one step ahead and she has an*

incredible capacity to invent. You realize this when you're working on your garden. You always have to weed it, there are constantly insects that come in, that eat everything, and so on. Unless you're in a closed environment, you can't control what happens in Nature."

[Part four : A Non-Profit]

1. Social networks and digital prostheses

It's summertime in Ottawa, and the allure of mostly blue skies hasn't diminished my attachment to the digital world : despite the inviting weather, I find myself consistently drawn to my phone and laptop, clocking in several hours daily. It's not just me ; for a growing number of people, digital platforms and social media have transformed into primary channels for news consumption, especially regarding health topics. Another quick check of my phone underscores this behavior : in 2021, sixty-nine percent of Canadians reported that online content shaped their personal treatment choices (Statistics Canada, 2021).

In my own family, it's a common practice to look up our symptoms online. I find out that it's the same in my neighbour Tony's family as well—him, his wife and their phones are a "ménage à trois", he jokes to me one day, after we run into each other outside. Tony mentions that, much like myself, he always keeps his phone within reach, regarding it as a vital companion in his daily routine. Smartphones and similar devices have been conceptualized as "material extensions of ourselves" that not only enhance, but also shape our abilities to communicate, retain information, and navigate our surroundings (Turkle, 2011).

In fact, as "carriers of memory and symbols", digital technologies like our phones, laptops and social media apps, are what Anne Alombert names "technologies of the mind"—a mind being "neither a material thing nor an immaterial thing, neither a biological thing nor a machine thing, for the mind is simply not a thing" (2022, p. 24). Rather, it is something that merely "passes through and circulates in the techno-symbolic environments by which we are surrounded", like an activity or relation that "always presupposes living bodies and a technical milieu in which to exercise itself : the mind circulates between brains (and therefore between bodies), which connect via technical supports, which are also symbolic supports" (Alombert, 2022, p. 24).

"Technologies of the mind", therefore, are those supports through which individuals think, reflect, imagine, project themselves, and so on. They are today's principal vectors for the publication and circulation of thought, and they have enabled an unprecedented diversification of information production sources and new sharing and contribution practices (Alombert, 2022). Throughout my own fieldwork and writing process, I've relied on these technological tools as integral supports and extensions of my thinking and analytical processes.

When either Tony or his wife get sick, he says they'll often turn to their phones to find out more information, right away : *"It's just practical, and reassuring too, I think. There's lots of stuff there"* he tells me, *"even though sometimes it can be too much."*

Indeed, a person doing a quick online search will immediately find an abundance of information on the flu, ranging from scientific details about the virus's biology and chemistry to practical advice regarding symptoms and treatment options. There are

even personal advice forums where flu sufferers can gather to share their experiences and post reviews of over-the-counter medicines or alternative treatments they have tried.

Tony tells me he is aware of at least one Facebook group that promotes flu awareness, and that he sometimes sees people in his own friend group share flu related content in his Facebook timeline. He mentions that in the past he's even visited the online discussion forum Reddit.com in order to "*ask a question to the community*". At the time, he was presenting flu-like symptoms that wouldn't go away, and instead of making an appointment to visit his doctor, he posted about them online first : "*I wanted to know if anybody else was going through the same thing.*"

His example—and many others—show that the internet has made (medical) knowledge easily accessible, and it comes as no surprise then that ordinary people are using it to self-diagnose, for education, and for support.

The digital age has revolutionized the dissemination and consumption of health information, leading to a democratization of knowledge where a multitude of voices contribute to the health discourse. Shifting from a top-down model, where information is primarily dispensed by healthcare professionals and institutions, to a more participatory model, has significant implications for public health literacy and decision-making.

At times, the proliferation of health-related content online has contributed to "infodemics", a term first coined during the 2002-2003 SARS outbreak. It describes the overwhelming mix of accurate and inaccurate information that can spread rapidly,

especially during health crises. Such abundance—or saturation—of information can lead to confusion and difficulty in discerning credible sources, a challenge partially noted by Bruno Latour (2012), who observed that media-driven narratives can sometimes eclipse expert opinions, contributing to a blurring of the lines between validated information and speculation or misinformation.

In this context, individuals like Tony navigate a complex information landscape, encountering a diverse array of narratives that compete for their attention, and influence their perceptions of health issues. Online communities, in particular, serve as breeding grounds for a mix of accurate insights, misinformation, and even conspiracy theories. The interactions within these communities—comprising shared experiences, learnings, validations, and fears—create a virtual ecosystem that can significantly impact individual beliefs and choices regarding health matters.

In this dynamic, we see a reflection of what could be termed as a "transindividual" process, a concept developed by Gilbert Simondon (Combes, 1999). The term "transindividual" refers to a stage of individuation that occurs beyond the individual level, encompassing both the pre-individual (unstructured potential) and the individual, integrating collective and interpersonal forces. It describes how individuals are shaped not only by internal factors but significantly through their ongoing interactions within a group or community. In the digital context, this process is amplified as individuals are not only influenced by their immediate physical communities but also by the vast and interconnected online networks they engage with.

In other words, just as the flu virus is transmitted through social contact, various health narratives are spreading (in part) through digital interactions, with each individual's understanding and response to health issues being shaped by the collective digital milieu they are immersed in.

2. Manufacturing Virality

For the past few months, I have been closely observing the online activities of Families Fighting Flu (FFF), a grassroots health advocacy group based in the United States. This non-profit organization is committed to increasing public awareness about the flu's health impacts and advocating for annual flu vaccination in order to lower the risk of severe complications and fatalities. To get a deeper understanding of their work, I reached out to FFF for an interview. Serese, who introduces herself as the chief operating officer (COO) of the organization, but also as the mother of a child who passed away after contracting the H1N1 flu in 2009, is the person who responds to my request. Ever since her son Joseph's death at the age of five, she explains, she has been fervently working to prevent similar losses in other families.

FFF effectively uses personal stories of those affected by flu-related tragedies to highlight the virus's risks and lethal potential. Their website features nearly sixty such poignant narratives, often from grieving relatives, complete with photographs of the departed. During our phone conversation, Serese underscores the impact of these stories, noting that they "*put a face to the cost of the illness*" and bring a human element

to the statistics that agencies like the Centers for Disease Control and Prevention (CDC) provide. These accounts are meant to honor those who have passed and to serve as potent reminders of the flu's dangers, underlining the importance of vaccination in protecting individuals and communities.

Serese explains to me that her role as COO is centered on steering FFF's online engagement. In much of her work, she is engaged in trying to "manufacture trends" to enhance the popularity—or "virulence"—of FFF's content. Herbert A. Simon's (1971) notion of an "attention economy" in consumer societies is particularly relevant here. He posits that human attention is a finite resource, and therefore in a world saturated with messages and other information content, FFF must compete for attention among a myriad of other material and cultural products. The challenge is to stand out enough to grab attention, provoke a reaction, and thus have the message transmitted further, potentially "going viral".

Utilizing platforms like Facebook, Twitter, and Instagram, Serese and her team share moving stories of families affected by unexpected, flu-related fatalities. These narratives are not just shared for their emotional impact ; they are part of a larger strategy leveraging the intrinsic potential for virality of the internet and social media, "mechanizing" these platforms and online networks to amplify their pro-vaccine and flu awareness messages. What once would have been limited to direct conversation, or later handwritten communication, can now rapidly go viral, spanning continents and cultures. This shift mirrors David Harvey's notion of "compression of space", highlighting

how modern connectivity breaks geographical barriers, bringing global distances closer (Harvey, 1990).

The effectiveness of FFF and Serese's messaging is amplified by what Nigel Thrift, in Tony D. Sampson's work (2011), describes as a novel "prosthetic impulse" or vector for social imitative encounters, in reference to the internet ; it acts as a new type of "neural pathway, transmitting faces and stances as well as discourse... [and] forging new reflexes" (Thrift, in Sampson, 2011 p. 56). Drawing on contagion theories by Gabriel Tarde, cited and later expanded on by Sampson (2011), these affective gestures can spread contagiously from one person to another, radiating outwards via a ripple effect through social networks and communities. Tarde's notion of "micro-imitations" comes into play here, emphasizing the spread of content not as individual units but as flows or waves across the digital landscape (Deleuze and Guattari in Sampson, 2011, p. 8).

However, this amplification potential is not exclusively beneficial. Just as FFF's stories can gain widespread traction, misinformation about the flu and its vaccine can also rapidly spread, using the same digital pathways. Misinformation competes with genuine flu and vaccine facts, fueling anti-vaccine sentiments and exacerbating societal divides (Welch et al., 2023).

In regards to some of the vaccine hesitancy or vaccine refusal stories and narratives that myself—or my neighbour Tony—come across elsewhere, and which are especially egregious in online spaces, I ask Serese how she typically responds to these kinds of attitudes. She's conciliatory ; she explains that it's ok to feel skepticism about the

vaccine, and that she thinks it actually often comes out of a place of love, and of caring for loved ones. In fact she explains to me that she often feels like she knows where they're coming from, because she's been hesitant about vaccines herself.

"As a parent, my daughter is 16. A couple years ago, it was time to get the HPV vaccine... This was at the height of the HPV controversy. I told the doctor, "I know she needs it, and she'll get it, but my comfort level isn't there yet. I hear all this negative stuff and it scares me. I need you to give me more information so I can go home and digest it and increase my comfort level."

She continues : *"I'm an educated person, who knows the science, knows the importance of vaccines, and I was still swayed by that negative sentiment. It's not just gullible people who fall victim to misinformation. As parents, it's very easy to be scared by things that we're hearing."*

I ask her if she can recount some of the most common misconceptions about vaccines that she's heard, or that have been told to her by others. Without hesitation, she enumerates them :

"I've heard people say that vaccines are dangerous because they contain too many chemicals, or that vaccines diminish natural immunity. Some people think that we either get too many vaccinations or that they're too closely spread together, and others are saying that vaccines are just a ploy by Big Pharma to make money. The list goes on... But I also have people coming up to me and saying "My child went through all the

vaccinations and has never been the same since", like they're far less alert. You only need one first-hand experience like that and you're going to disregard everything else you've heard. Because that's someone who has nothing to gain either way."

Serese wants me to know that, *"all of this comes back to why stories are so important. It's not vaccine stats that sway people, it's the stories, the emotions. People are making vaccine decisions based on emotion, one way or another. And you have to fight emotions with emotions."*

"*Why do you think this is?*" I ask her.

"*Because people have told me this*" she replies.

3. Power of Affect

In conjunction with the cyber-technological infrastructures that define the digital age, the concept of affect plays a significant role in understanding how emotionally charged, flu-related content can quickly "go viral", particularly in the context of promoting flu vaccination. Brian Massumi (1995) describes affect as a pre-personal, non-conscious intensity—a bodily reaction to stimuli that precedes cognitive processing. Emotions, in contrast, are the subjective, conscious experiences or interpretations of these affects, categorized into familiar terms like love, hate, fear, or empathy.

Visitors to the FFF website or viewers of its social media posts encounter personal flu stories that carry potent affective charges, since media content that features the loss or death of children often triggers particularly strong reactions. Drawing further on Massumi's insights, visual elements—such as pictures or videos of the children who have passed—are particularly prone to provoking visceral reactions, distinct from the reactions elicited by the more neutral, factual flu information typically disseminated by Public Health authorities.

Furthermore, when these images are paired with narratives from grieving relatives, the initial affective impact is not just maintained but amplified. Such stories, especially those involving young children, evoke powerful emotional responses like empathy, fear, and sadness—emotions that are generally less prominent or absent in more straightforward informational messaging. Again echoing Massumi, these intense emotional reactions are likely to be more memorable and have a greater lasting impact on audiences.

The combination of personal, true stories with powerful visuals characterizes new modes of attention, making individuals in the public who encounter them more susceptible to being influenced—or "infected"—by the pro-vaccination messages accompanying these poignant and ultimately contagious narratives.

This approach followed by Serese seems to be effective. She often receives positive feedback after her public engagements, with many attendees expressing a change of heart : *"I've changed my mind after hearing your story"* she's frequently told.

However, not all reactions are favorable. On a few occasions, she has been called names, and she has even been the target of a death threat. *"But I don't think they're necessarily bad people"*, she maintains.

Ultimately, Serese says she wants to promote vaccination from a community perspective, also mentioning that she prefers the term "community immunity" over "herd immunity", because *"the word 'herd' makes it sound like we're all farm animals or something. But the key is to remind people that we're all connected, that our choices impact others, that we're part of one big community and we should be looking out for each other"*, she explains.

Similar to Lowe's (2010) concept of the "viral cloud", where a diffused and diverse enough concentration of virions is what ultimately enhances the flu's ability to spread and bypass immune defenses, "community immunity" works best when a substantial and diverse enough segment of people—across a large area—is vaccinated. This "immunity that's spread out" acts as a protective shield, restricting the flu's ability and potential pathways to spread by reducing the number of susceptible individuals it can infect in the first place.

In this sense, the flu presents, like other illnesses that are communicable and infectious, a challenge that is "monumentally ethical" : individuals are called upon to strike a balance between personal emotions and desires while also considering the impact of their actions on others. The virus, again in Citton's "mechanizing" sense, "demands of us to accept a quintessentially Spinozan ethics of positioning, of emplacing one's body

in a geography of awareness of how affects circulate between us and others” (Sampson and Parrika, 2020).

Illustrating this perspective, Serese shares with me the story of her neighbour : *"He's in his early 60s and he was never vaccinated against the flu. And I have just been systematically having conversations with him, and then I finally talked about community immunity, and how it was important for him to be vaccinated against the flu, because his son is diabetic, and therefore is immune-compromised. For him, a light bulb went off and he went out and got vaccinated for the first time in his life. That concept is something we need to continue messaging on."*

4. Mechanized and Mechanizing Gestures

On a regular basis, Serese says that she and her team reflect on how to improve their messaging efforts : *"We look back and think "What did we hear, what were the questions we got, what unmet needs, who needs our message?" Because that's another thing, we're trying to message to a lot of different target demographics. Who do we need to be focusing on? Because the flu is constantly changing, we're constantly trying to keep up with the flu because it's that shape shifter, so our messaging has to be dynamic. We have to be talking about the flu activity. What's going on this year, who's affected, what strains are we talking about, so absolutely our messaging is always evolving with what's going on. We're talking about the research that's happening and*

keeping audiences up to date with everything they need to know about the flu and vaccination."

To achieve their goals, Serese and FFF volunteers regularly publish a variety of content on their group's social media accounts, including personal flu stories from FFF members, expert advice from health professionals, and resources such as educational infographics about how the flu vaccine works.

These efforts entail a careful selection of thumbnail images, post titles, and phrases that are designed to be easy to understand, eye-catching, and emotionally resonant, thereby increasing the likelihood of further sharing within the network. Consistent posting—almost daily—is crucial, as it helps enhance the visibility of their posts in accordance with social media algorithms that favor regular engagement.

In the framework proposed by Citton, FFF's approach can be understood as one that's conditioned by a "mechanizing logic". They must not only keep pace with the network's demands for content, which translates into increased visibility to the rest of the network, but they also have to adhere to a visual aesthetic and grammar that ensures their content is recognizable and gains traction.

It should be noted, however, that the virality of a specific message or campaign cannot be guaranteed. As noted by Sampson and Parikka (2020), "the relationality and accidentality of the viral event supersede deterministic thinking. Contagious behaviours are not solely predetermined by an evolutionary code." This underscores the unpredictable nature of viral content, where external factors and chance significantly influence what captures the public's attention.

Ultimately, Serese's commitment to promoting the flu vaccine is unwavering. Her open and empathetic approach, which eschews complex medical jargon in favour of matter-of-fact experience and conversation, makes her messaging more accessible and relatable, highlighting the power of simplicity in effective health communication.

But no doubt the most impactful aspect of her approach is the sharing of her profoundly personal and painful experience—the loss of her son Joseph to the flu. This tragedy, coupled with her openness to speak about it with anyone, strongly resonates, even with staunch vaccine skeptics. *"I always try to see the person in front of me"*, Serese reflects. This empathetic stance not only humanizes her but also vividly illustrates the risks associated with the flu and the critical importance of vaccination. Her audiences, upon hearing Serese's story, are faced with a powerful, personal example of the consequences of the flu, making the need for vaccination more immediate and compelling.

[Part Five : A Public Health Branch]

1. Monitoring and Managing Viral Risk

It's nearly Fall again in Ottawa. After reaching out to several public health professionals, I successfully arrange a phone conversation with Dr. B-W from Public Health Ontario (PHO). She's a public health physician in the Communicable Diseases, Emergency Preparedness and Response (CDEPR) department, and the only one who responded to my impromptu introductory email.

During our discussion, Dr. B-W provides an overview of her department's role at PHO. Their primary mission, she explains, is "*keeping people healthy and preventing illness and premature death*" by actively supporting a range of key public health initiatives, including "*immunization, infection control in clinics and hospitals, along with managing the detection of pathogens and their lab testing.*" This encompasses epidemiological investigations, outbreak tracing, and monitoring immunization campaigns, making them a cornerstone of scientific and technical support for both healthcare professionals in Ontario and the general public.

In regards to flu management, Dr. B-W delves into the specifics of their work : "*We operate the Public Health lab that tests flu specimens and conducts molecular subtype testing to identify precisely what strains are circulating. We also monitor provincial trends. Each week, we publish a respiratory pathogen bulletin detailing current viral*

activity, so whether it's influenza or something else like RSV, what are the specific strains, where are they impacting, and so on. We do surveillance and monitoring because these are very important for people on the ground like clinicians, hospitals, and Public Health units."

Intrigued by how the provincial efforts Dr. B-W describes align with national ones, I inquire about an initiative I discovered while browsing the Health Canada website, called FluWatch.

"On the national scale, much of the flu surveillance work is conducted through FluWatch. It's our country's continuous flu surveillance system, helping us stay ahead of outbreaks", Dr. B-W explains. She offers to connect me with a couple of epidemiologists on their team—an opportunity I readily accept. Within a week of her introduction, I speak with Jessica and Olivia³ over the phone. They explain that FluWatch is tasked with monitoring flu activity throughout Canada, and its principal objectives include providing early alerts on flu activity, tracking the virus's spread, and assessing its impact on the Canadian population.

"All of this is based on a sentinel surveillance system, which involves collecting data from a representative sample of healthcare providers, including primary care physicians, nurse practitioners, and laboratories across the country. We use this data to track the spread of the flu on a weekly basis, identify outbreaks, and indirectly monitor the effectiveness of each season's flu vaccines", Jessica elaborates.

Olivia adds, *"It's not just about counting cases. We analyze trends, examine variances in strains, and assess how the flu is evolving. For example, some years we might notice*

³ Pseudonyms have been used to protect individuals' privacy.

a particular strain being more dominant in one area, while another region may experience a different dominant strain. Understanding these patterns helps us predict future trends and also aids vaccine developers in formulating the next season's flu shot, following recommendations from the World Health Organization."

This surveillance of influenza which involves carefully tracking its physical manifestations and movements in order to discern epidemiological patterns, exemplifies a profound shift in societal approaches to disease management, as elucidated by Michel Foucault in his 1975 work, *"Surveiller et Punir: Naissance de la Prison"*.

Foucault contrasts the management of diseases like leprosy, where the afflicted were effectively isolated from society to minimize contact with the healthy population, with more strategic and "disciplinary" responses to plague outbreaks. In cases of plague, towns were meticulously divided into districts and quarters, each closely monitored and controlled to prevent the spread of the disease. This included strict regulation of movements, constant surveillance, and compulsory reporting of health status, which allowed authorities to quickly identify and isolate new cases. Foucault describes this as the embodiment of a "perfectly governed city."

This shift in disease management has evolved into contemporary methods of dealing with infectious diseases such as influenza. Today's systematic surveillance of populations reflects the legacy of the plague's disciplinary schemas, where detailed control and monitoring have become intrinsic to public health strategies.

The flu's movement, which could be described as "intrinsically dynamic and temporal", aligns with Ingold's concept of a line "free to go where it will" (Ingold, 2007, p.73). In order to capture this fluidity and convert it into actionable knowledge, FluWatch temporarily "freezes" these movements: the flu's continuous lines being traced across the land are thus pieced apart into scattered dots on a map, each representing isolated instances or manifestations of the flu ; they might denote an outbreak, specific reported cases, or unaffected zones.

After taking these "dots" or "snapshots", FluWatch then attempts to reconnect them, so that the flu's journey can be "viewed all at once", as Ingold suggests (Ingold, 2007, p.73), in a way that's conducive to human understanding and intervention ; the scattered becomes coherent, the unpredictable becomes plotted, and the invisible becomes visible.

This process of reconnection is reminiscent of cartography : in map-making, the world isn't captured in its real-time dynamism but is frozen and viewed from a multitude of fixed points. Knowledge isn't gleaned from continuous experience but from a culmination of these fragmented experiences. As Ingold mentions, "knowledge is assembled by joining *up*, into a complete picture, observations taken from a number of fixed points" (Ingold, 2007, p.88). As in FluWatch's methodology, this type of "knowledge is integrated not by going along but by building up", fitting these site-specific fragments into overarching, inclusive structures (Ingold, 2007, p.88).

FluWatch's approach, focused on capturing and analyzing data points, is a clear manifestation of biopolitical control. Its continuous monitoring allows Canada's public health apparatus to obtain insights into the Canadian population's health, informing policies, vaccination strategies, and the allocation of health resources.

This information is shared with health agencies and the public via weekly updates on the PHAC website, keeping all parties updated on regional flu trends. This knowledge plays a pivotal role in shaping public health actions, from determining the annual flu vaccine's formulation to crafting strategies for mitigating the virus's spread.

2. Sterile Immunities

A few weeks later, back on the university campus, I bump into a professor and mentor while waiting for the elevator. During our casual chat, the topic of my thesis comes up, and my professor suggests that I reach out to their friend, Maya, who they believe could offer valuable perspectives for my research.

Acting on this advice, I contact Maya Goldenberg, an Associate Professor of Philosophy at the University of Waterloo, specializing in the Philosophy of Science and Medicine. Her most recent research addresses the growing issue of vaccine hesitancy in Canada. In a Skype conversation, I share with her some of the perspectives on vaccine hesitancy that I've collected from public health experts, particularly highlighting the belief that education-based strategies can help reduce flu vaccine hesitancy.

"Well..." begins Maya, "the fact remains that a majority of Canadians each year don't get the flu shot, and that around 25% continue to be hesitant of all vaccines to some degree. If misunderstanding or misinterpretation of the scientific evidence were the problems, an education based approach providing accurate information would presumably correct this. But many years of education campaigns have not substantially decreased numbers of vaccine refusers."

Maya's observations bring to mind an experience I had in Sudbury, Ontario, the previous winter. I was attending a health conference in the city, searching for potential fieldwork opportunities, when I met Jeanine, a nurse practitioner at the Centre de Santé Communautaire (CSC) du Grand Sudbury. During a tour of the center, I noticed several promotional materials about flu awareness and vaccination. These included a digital slideshow presenting flu facts and preventative measures in a clinical, somewhat dispassionate tone. Jeanine mentioned that these materials were supplied by provincial health organizations, aiming to educate and persuade the public to adopt preventive health measures like vaccination, frequent hand-washing, and isolation when sick, as outlined by Public Health's mission (Barbour et al., 2015). Curious about their effectiveness, I asked Jeanine whether she thought these factual and statistical presentations were having an impact on the vaccination habits of CSC visitors. *"It's probably not very effective"*, Jeanine quickly responded. *"I don't think many people who see this change their mind if they're already skeptical of vaccines."*

Jeanine also confided that many of her healthcare colleagues opt not to receive an annual flu shot. This observation aligns with a study by Buchan and Kwong (2016), which suggests that only about fifty percent of healthcare personnel in the province get vaccinated each year.

This statistic poses a significant challenge to the effectiveness of traditional public health education strategies, which primarily aim to correct scientific misconceptions. Despite the extensive broadcasting of these messages in schools, health centers, and through various media channels such as radio and online platforms, traditional public health approaches—rooted in cognitive models like rational choice theory—do not seem to resonate deeply enough to alter social behaviors towards widespread vaccination adoption necessary for achieving herd immunity.

The fact that healthcare professionals, despite their extensive scientific knowledge, show vaccination rates only slightly higher than the general public—around 40% on average (Statistics Canada, 2022)—suggests that these strategies do not address deeper, potentially non-rational factors influencing behavior, such as fear, anxiety, or lack of trust. This is in stark contrast to the emotionally charged, personal storytelling used by organizations like Families Fighting Flu.

Maya emphasizes, "*Fighting an education deficit instead of first building trust with patients and the public is a mistake*", pointing out the importance of validating worries the public may have. She notes, "*whether the concerns are warranted or not isn't the point. Public health can't reach its immunization goals without public trust, and members of the public are signaling points of discord that require attention.*" Public concerns

range from skepticism about the vaccine's varying effectiveness to fears of possible side effects. Maya observes, "*Some individuals are simply cautious about the non-zero risk of vaccine effects on themselves and their loved ones.*"

The nuances between genuine public concerns, questions, and fears on the one hand, and outright vaccine refusal or conspiracy theories on the other, are often blurred in public health discussions, explains Maya, and "*this strategy of demonizing those skeptical of vaccines risks alienating individuals who might otherwise be open to dialogue. The frustrating lack of traction in public health outreach has created the damaging suspicion that vaccine skeptics cannot be reasoned with, thereby warranting a hard line approach.*"

3. (Auto)Immunity and its Precipitates

Esposito's concept of immunity provides a multifaceted lens to view this dynamic, suggesting it is more than just a physical defense against pathogens ; it also encompasses a socio-cultural process of distinguishing between "inside" and "outside" elements. As Esposito notes, immunity can act like a "negative community", establishing defensive boundaries and distancing itself from elements it perceives to be foreign (Esposito, 2013, p.75).

This delineation between "inside" and "outside" can create palpable tensions, sometimes leading to polarized—or "feverish"—encounters. For example, last fall, in the

midst of a discussion about health services on campus, someone passionately questioned my vaccination status, clearly uneasy about engaging with anyone not fully supportive of vaccines.

"Are you pro-vax? Really pro-vax? I don't want to talk to anybody who isn't completely pro-vax. I'm about to get my kids vaccinated, and we're actually going to the doctor's tomorrow. I don't want anyone who isn't vaccinated to be around myself or them until we all get the shot."

Maya points out that the pro-vaccination efforts by Public Health authorities, aimed at countering vaccine skepticism and promoting vaccination as a biopolitical norm, may inadvertently be pushing away those with genuine concerns. These individuals are often labeled as "anti-science" and perceived as harmful "contaminants" within the social body—similar to how Foucault described lepers—whom society must barricade against and isolate to prevent further "infection".

These vaccine skeptics or deniers, who may formerly have been on the "other side" of things but who may have since been "contaminated" by online disinformation, or fallen victims to conspiracy theorists, are perceived as akin to "the body's own cells become the invaders", or the "inside projected outside itself" (Esposito, 2013, p. 162).

While immunity—as a protective mechanism in both biological and societal contexts—is necessary for survival, Esposito emphasizes that its application requires careful balance. Excessive immunization or overly rigid societal defenses can provoke social

crises and lead to mechanisms of desocialization. This is akin to an overactive immune system that might mistakenly attack the body's own tissues, causing autoimmune diseases. As Esposito notes, "subsequent overactive defenses of the body, in seeking to strike at the enemy, also cause harm to itself" (Esposito, 2013, p. 163).

4. Map and Territory

Reflecting the "multispecies accommodation" concept referenced by Ghosh (in Jue and Ruiz, 2023), the seasonal flu virus's presence is recognized and needs to be monitored and managed by Public Health authorities to prevent it from saturating community health resources and becoming a more widespread and dangerous pandemic threat.

To this end, Public Health's anti-flu efforts have excelled in developing sophisticated methods and tools for identifying and tracking the influenza virus, which is effectively invisible and non-localizable. FluWatch, leveraging a network of human sentinels and powerful data modeling tools, functions as an "augmented cyborg ear" designed to detect phenomena that cross the threshold of detectability. Indeed, through a process of "strained listening" (Jue and Ruiz, 2023), FluWatch effectively monitors the first signs of flu outbreaks, which is key in determining the success of any public health response to such a threat.

However, according to Maya, Public Health authorities are sometimes less attuned and less sensitive to the subtleties and concerns of those within the community who are

hesitant about vaccines. This can lead to their reluctance or outright refusal to get vaccinated. Such oversights can also lead to negative consequences, such as increased social polarization around the issue, the spread of conspiratorial news about vaccines, and ultimately reduced vaccine uptake. This situation illustrates Korzybski's (1931) observation that "a map is not the territory", highlighting the disconnect between Public Health's data-driven modeling of the flu and vaccine efficacy, and the real-world complexities of vaccine hesitancy.

[Part six : A Hospice]

1. Care as a Cocoon

I have been volunteering at a local hospice for over two years, contributing in two different capacities. On the first and third Sundays of each month, I serve at the main reception desk, greeting family and friends of patients in palliative care, handling administrative duties such as answering calls, receiving deliveries—often including medications—and maintaining visitor logs. On the second and fourth Sundays, I work in the residence area, where I assist in providing respite care. The hospice houses up to twelve residents at a time, and my role as a volunteer involves creating a comforting atmosphere, interacting with patients according to their preferences, which may involve chatting or simply sitting quietly with them. I also help with meals and snacks, and under the supervision of nursing and personal support worker (PSW) teams, I support personal care tasks—such as helping residents with bathing or toileting—as needed. Additionally, I've been trained to offer emotional support to families, providing a listening ear and comfort during their visits.

At the hospice, strict precautions are maintained throughout the year to protect vulnerable palliative care residents from infectious diseases. These measures include requiring all medical staff, volunteers, and visitors to use hand sanitizer upon entering the reception area and again before entering any resident's room. On the first day of my

volunteer training, we were asked to locate all eleven hand sanitizer stations around the hospice, not including those in each patient room, in an exercise aimed at familiarizing us with their locations and instilling the habit of regular hand sanitization.

Visual cues throughout the hospice reinforce this focus on cleanliness. Posters strategically placed around the facility promote hygiene, and a prominent stop sign at the reception advises anyone displaying signs of illness not to enter. Meanwhile, consistent messages to volunteers like "*If you have any symptoms or feel unwell, stay home and call!*", serve as ongoing prompts for responsible behaviour and gestures, in line with the hospice's broader health protocols and mission.

Each year, as winter—and flu season—arrives, the protective measures at the hospice become even more stringent. New protocols are added to the daily routine, including wearing gloves when preparing food trays and donning masks when interacting closely with residents, whether assisting them with eating, personal hygiene, or mobility.

Not respecting these rules is cause for a warning, and repeated violations may result in a reprimand from senior volunteers and permanent hospice staff. All of this is informed by a shared sense of responsibility that binds the hospice community together, and transforms care—which may refer to the attention given to something, the concern felt for someone, and the active care provided for them, according to Citton (2012)—from an isolated act into a regimented, collective effort.

In my first year volunteering at the hospice, the care management team, which includes a group of palliative medicine doctors and nurses along with hospice management,

stipulated that all volunteers who have direct contact with residents must receive the flu shot. Without it, one would only be able to volunteer at the reception desk.

As is especially clear for everyone at the hospice, our biological immune defenses are neither perfect nor permanent ; all of our bodies are inherently susceptible to illness and decay. Here, community and communal responsibilities like getting the flu shot can be framed as compensations for these inherent vulnerabilities—both to external threats of infectious disease and to existential fears surrounding death. This collective action helps us manage our fears and find a degree of solace or protection from the unpredictable nature of life (Oliva, 2006, p. 71).

The flu shot requirement recognizes this precarious vulnerability and attempts to protect the "integrity of the individual" within the hospice from the "entropic powers aimed at their dissolution" (Esposito, 2013, p.155). It is a gesture aligned with the medical staff's Hippocratic oath to guard against illness, safeguarding the remaining life force of palliative care residents. More than protecting physical health, this measure also promotes emotional well-being and offers reassurance to concerned loved ones, fostering a sense of security and protection.

All of this is part of a "cocooning" strategy, a holistic approach that emphasizes maintaining the dignity, autonomy, and personhood of residents in their final days. This strategy encompasses not only rigorous health precautions but also involves creating a community that supports both residents and their families, helping to alleviate the isolation often associated with end-of-life care. Care practices are made visible and

understandable, ensuring that families see and appreciate the comprehensive care their loved ones receive, which helps to build trust and reassurance.

Francis⁴, another volunteer, eloquently sums up our "cocooning" policies : the hospice is a place for "end-of-life care," not "end of life-care." His words highlight the distinction between merely managing the end of life and actively enhancing the life that residents continue to live. Despite their terminal diagnoses, it is hospice staff's duty to affirm their personhood, protect their identities, and uphold the quality of life they still possess. Here, the notion of care shifts from the traditional medical model focused on curing and repairing to one prioritizing comfort, pain avoidance, and quality of life at the end (Castra, 2003), embodying an "ethics of good death"—a death that is dignified, peaceful, and in accordance with the wishes and needs of the dying person.

2. Cross-Contaminations at the Pub

Once a month, Francis, other volunteers, and I get together for a meal and a drink at a pub located a block away from the hospice. While all forty or so volunteers are invited, typically only about a dozen of us, often the same core group, end up attending. We usually gather around two large tables at the back of the pub, which the staff reserves for us. The atmosphere is lively, filled with catching up on the latest hospice news and sharing anecdotes from the past month, though mostly we discuss other topics. The

⁴ All the names that are mentioned in this Chapter are pseudonyms, in order to protect individuals' privacy.

group is diverse, consisting of mostly retirees, with a few students and young professionals like myself. The ambiance is always friendly and relaxed, with plenty of engaging conversations over food and drinks.

Several times lately, the topic of conversation has pivoted to the flu and to the hospice's vaccine policy. It seems that not everyone agrees with the policy or has decided whether to get vaccinated. In fact, a few volunteers have expressed no intention of getting the vaccine at all.

On one occasion, I hear a volunteer named Marta tell those within earshot of her : *"I don't get the flu shot, I never do. I use natural remedies instead. I think we're probably forcing the flu to become more dangerous by having all these vaccines. It always finds a way around them anyway, so we're pushing it to become more effective, right? I don't think we really know what we're doing. If there's a flu outbreak, I just won't come in at all [to hospice]. People look at me like I'm crazy when I tell them I don't get the shot. But I trust my own immune system, the one I've had since I was a kid... It's all about keeping clean, your hands, face..."*

Eda, who, as usual, is seated next to Marta, jumps in to respond : *"I get it every year! And have done since I don't know when. I have friends who don't get the shot either, and they say they've been sick because of it, but I think that's just rubbish. You know, if you get the shot, even if it isn't a perfect match, you won't get as sick. It drives me crazy."*

Marta : *"Well I just don't want to have to get something that isn't necessary. I take all the precautions anyway. On the bus I wear a mask. Some people think that's too much but I don't care! I've got all sorts of tricks. I drink a lot of tea with honey as well. That works."*

Another volunteer, Frank, chimes in : *"I get it each year now, I don't miss it, ever since I had pneumonia. I caught pneumonia 7 years ago for the first time, it was terrible. So I also got the 5 year pneumonia vaccine afterwards, free with OHIP. The 10 year one you have to pay yourself."* (A few of those who are listening respond to this last bit with short, sympathetic groans).

Marta and Eda are engaged in a quiet conversation that I can't quite hear over the ambient noise from the rest of the table and the pub. They are slightly turned towards each other, speaking directly and exclusively to one another. From what I can observe, Eda's expression of friendly concern and Marta's occasional eye rolls make me think that Eda might be trying to convince Marta of the benefits or legitimacy of the vaccine. However, without hearing their words, I can't be certain.

Here, in a gathering that each month becomes a "happening", antagonistic points of view are sometimes being expressed, but on the whole everyone is listened to, and feelings are respected. Not everybody is having their mind changed, but some do.

The issue of vaccination often invokes strong opinions about individual rights and freedoms. People who are vaccine-hesitant sometimes frame their resistance in these terms, perceiving vaccination as an imposition from which they can claim "immunity". According to Esposito (2013), this "proprietary" understanding of the self and the body reflects a narrow and exclusionary view of freedom. He contrasts this with a broader understanding of community, which involves a radical openness to others and a recognition of our fundamental interconnectedness.

Norm, who sometimes volunteers in the Residence during the same shift period as me, says he has had a change of heart recently.

This year he's made the decision to get the flu shot, for the first time in his life he says, and the main reason for this is that he doesn't want to have to stop helping out in the Residence : *"I don't know how much good it'll do. But I spoke with Jennifer [a longtime, senior volunteer] about it last week and she explained that it's not so much about me, it's about the residents and what's best for them, and I guess I didn't think about it that way before. I wouldn't get it otherwise, but if it means I won't get anyone there sick and I can still come into hospice to see everyone, then that's fine... so be it."*

While a criticism of Public Health bodies might be that they often embody what Ingold describes as blobs, meaning discrete, self-contained, self-interested, externally-bounded entities with clear insides and outsides, this group of hospice volunteers, in the setting of the social pub, are more akin to "combinations of blobs and

lines" (2015, p. 14). Indeed, they're the actors and subjects of interpenetrations, or "enmeshings"—that are sometimes conducive to "producing immunity".

Esposito (2013) suggests that by inviting a controlled level of opposition or questioning into the dialogue, the robustness and resilience of the larger community can be enhanced. This strategy, intrinsic to our biological immune systems and at the heart of vaccines, allows for the integration of foreign elements to stimulate a more adapted response, ultimately preserving the health of the organism.

As exemplified by Norm's case, new potentials are regularly actualized in this supportive and trusting environment. Here, volunteers—who are neither strangers nor always friends—are bonded by their experiences at the hospice. "Everyone carries a history of contamination; purity is not an option" (Tsing, 2015, p. 27), leading them to connect and "make community". Indeed, as Tarde suggests (in Sampson, 2012), we, as social subjects, are never completely self-contained. We are continuously influenced by the infectious affect of others, and perpetually "leaking our own".

[Thesis Knot]

My journey "into the flu" began with an effort to observe various signs and manifestations of the virus in my everyday life in Ottawa. Through both intentional exploration and ordinary encounters, I eventually tuned into not only the flu's biological virality but also how other forms of virality—socio-cultural, cyber-technological, and more—can influence its capacity and pathways to spread or "be contagious".

These various expressions of virality—which, according to Sampson (2011), can be understood as "positively sociological events" that begin at an underlying, pre-discursive "molecular level" before being expressed or manifested in forms that are biological, social, informational, and more—play crucial roles in both the reproduction and transformation of the flu virus and our shared social and material realities.

As such, the emergence or maintenance of a collective biological immunity against the flu virus can be linked to enhancing certain virilities, such as social adhesion to vaccine uptake, while mitigating others, like the online spread of vaccine misinformation.

This understanding led to my initial research questions : "In what ways could various virilities, including those expressed in biological, socio-cultural, and cyber-technological forms, interact with each other? And how might such interactions contribute to creating new or different forms of immunity against the biological flu virus?"

During my multi-site fieldwork—unfolding as I moved through the milieu much like a virus might—I identified several elements directly related to my initial research questions.

- At my general practitioner's clinic, I witnessed how Dr. T relies on a combination of deliberate and spontaneous gestures, informed in part by mechanizing "programs" as described by Yves Citton, to build trust bonds with his patients. These gestures—which can be understood not only as physical movements but also imbued with social, symbolic, and affective significance—help to create a supportive and attentive atmosphere which is crucial for Dr. T to effectively perform his healthcare duties. The development of professionally intimate relationships can help with patients becoming more receptive to Dr. T's expert medical advice and advocacy, especially regarding vaccination, and as a result increase the likelihood that patients will choose to get the flu shot. In other words, forming and maintaining trusting connections can be essential for a gesture like vaccination to be effective, in the sense of becoming more widely imitated/adopted.
- Later, at my local pharmacy, I received the seasonal flu shot, a decision influenced by what might be described as an "anti-flu apparatus"—of which my family doctor and public health campaigns are constituting actors and elements—that endeavors to facilitate vaccination gestures by removing accessibility barriers such as travel distance to vaccination sites and cost. It also leverages media and cyber-technological networks to widely promote and normalize the gesture. As such, getting vaccinated extends beyond a simple medical procedure ; it becomes a significant social gesture, which Citton refers to as a "hypergesture" in the sense that it carries deeper social, symbolic, and

transformative implications, potentially "inaugur[ant] de nouvelles lignées de gestes grâce à son irradiation transductive" [inaugurating new lineages of gestures through its transductive irradiation] (Citton, 2012, p.56).

- In conversation with Greg, the retired virologist, at a coffee shop that was both a hub for social and microbial connections and contagions, it became clear that rather than being discrete entities isolated from each other and our environments, we are all in fact "relational beings". Through this lens, both viruses and humans (along with their immune systems) are engaged in non-linear processes of "co-becoming" and transindividuation, perpetually adapting and responding to each other, as well as other forces, in our shared environments. Contagion also operates within this context of relationality, in the sense that for an infection to spread, there must be multiple individuals or hosts who can be affected/infected, while the various forms and paths that flu contagions manifest are partly influenced by the existing connections or relationships linking these individuals in the first place. Ultimately, the flu virus underscores the deep interconnectedness of the world—a fact that becomes particularly evident when it breaches our containment measures, as seen most recently in the context of the global COVID-19 pandemic.
- The internet and its supporting cyber-technological infrastructure allow individuals and communities to access, or be exposed to, unprecedented flows of information. While physical travel networks facilitate the rapid mutation and

dissemination of flu strains, digital networks can help or hinder public health efforts. On one hand, communication technologies like the internet and social media can serve as "protective tools" when they're effectively spreading awareness about flu prevention and vaccination. On the other hand, these same platforms can be vectors for the infectious propagation of misinformation and vaccine skepticism, potentially leading to reduced vaccination rates and, as a result, increased physical transmission of the virus.

Throughout my entire thesis journey, I have been entangled in this digital realm, using technological tools as essential supports and extensions of my thinking and analytical processes. In this online space, I encountered Families Fighting Flu and its COO, Serese. I discovered their work harnessing the internet and social media's inherent virality to amplify the already powerful affects intrinsic to their personal stories and experiences of flu loss. This affective amplification spreads awareness about the importance of vaccination gestures and enhances their contagious potential/intensity, ultimately influencing public attitudes and behaviors towards flu prevention.

- Ultimately, the flu virus, as well as COVID-19, can be understood not just as a biological entity but as a complex "bio-socio-cyber-technological" construct. This perspective acknowledges the ways in which biological, socio-cultural, and cyber-technological factors/forces collectively shape the virus's potential behaviours and expressions, blurring the distinctions between human and non-human and between physical and digital realms.

As such, building resilience or immunity against the flu surely requires a perspective and an approach that can criss-cross multiple media and modes, reflecting the interconnected, rhizomatic ecosystem of biological, social, and cyber-technological relationships that traverse and condition it. Donna Haraway's (2006) insight that there is no fundamental separation between machine and organism, or between technical and organic, highlights the importance of this comprehensive view ; limiting our understanding of the flu virus, or any virus, to a purely biological entity risks overlooking crucial aspects of its evolving nature, as well as our potential responses to it.

Public Health's observed challenges in improving flu vaccination rates also highlight a blindspot issue ; indeed, there seems to be a significant socio-cultural gap between those considered "inside" the healthcare consensus and those who are "outside", leading to "feverish" tensions that could metaphorically be understood as an "auto-immune disorder" within the social body. These tensions can escalate—or saturate—into broader socio-political conflicts, especially as vaccine advocates and skeptics increasingly view each other through a lens of mistrust and disdain, "precipitating" into a more polarized and xenophobic society. The risk is that a form of autoimmunity is engaged, described by Esposito as “a force that turns against its own essence, causing the destruction of everything that surrounds it and, ultimately, itself” (2013, p. 182).

- A collective immunity suitable for viral threats like the flu or COVID-19 should avoid rigid categorizations and instead adopt porousness as a core principle. During discussions at the pub with fellow hospice volunteers, it emerged that

social interactions and shared experiences—developed through time spent with vulnerable hospice residents, their families, other volunteers, as well as permanent hospice staff and its medical professionals—can serve as important preconditions for the emergence of new potential individuations or becomings, leading some individuals to overcome their previous apprehensions or refusals regarding flu vaccination gestures.

In the face of antiseptic tendencies and growing polarizations, pathways toward solidary futures and reconciliations are difficult to plan, but their emergence, like a virus, can be facilitated by intentional gestures that encourage regular, repeated points of contact and exchange.

Achieving collective immunity in this context requires fostering community links, which ultimately involves "becoming contaminated" by others' experiences and vulnerabilities, transforming them into shared challenges—or adopting another's vulnerabilities as our own. Community members, who in "making community" come to be bound by a common "munus" or shared obligation, end up engaging in "liveable collaborations" which entail being able to "work across difference", explains Anna Tsing (2015).

To achieve this, Citton (2013) reminds us of the power of our gestures—namely “affective”, “immersive” or “critical” ones—which are powerful precisely because they can be reproduced or become contagious and because such relational gestures—that invite us to have more open perspectives on the world, or that immerse us in the stories and experiences of others, or that promote critical thinking attitudes—are capable of creating community, a necessary foundation

for the kind of adaptive, flexible immunities that can provide effective protections against an ever-evolving and multimodal "bio-social-cyber-technological" virus.

[Bibliography]

ALOMBERT, A., 2023, Schizophrénie numérique, Paris, Editions Allia, 88 p.

AGAMBEN, G., 2009, What is an apparatus? : and other essays, Stanford, Calif, Stanford University Press.

ARNOLD, M., GOLDSCHMITT, M., & RIGOTTI, T., 2023, Dealing with information overload: a comprehensive review, *Frontiers in psychology*, 14, 1122200. URL : <https://doi.org/10.3389/fpsyg.2023.1122200>

AUGÉ, M., 2016, Everyone Dies Young, Translated by Jody Gladding, Columbia University Press, 112 p.

BACIU, A., 2010, Biopolitics and the influenza pandemics of 1918 and 2009 in the United States : Power, immunity, and the law, Doctoral Dissertation, URL : <https://pqdtopen.proquest.com/doc/518724525.html?FMT=AI>

BARBOUR, J. B., DOSHI, M. J., & HERNÁNDEZ, L. H., 2016, Telling Global Public Health Stories: Narrative Message Design for Issues Management, *Communication Research*, 43(6) : 810-843, URL : <https://doi.org/10.1177/0093650215579224>

BARDIN, A., 2015, Epistemology and Political Philosophy in Gilbert Simondon, Springer, 258 p.

BARDINI, T., 2015, Vade Retro Virus: Numéricité et Vitalité, *Terrain : Anthropologie et Sciences Humaines*, 64, 104-121, URL : <https://doi.org/10.4000/terrain.15640>

BARDINI, T., 2006, Hypervirus: A clinical report, URL : <https://journals.uvic.ca/index.php/ctheory/article/view/14470/5312>

BARDINI, T., 2014, Simondon, Individuation and the Life Sciences, Interview with Anne Fagot-Largeault, *Theory, Culture, Society*, 31 (4) : 141-161.

BACCAM, P., BEAUCHEMIN, C., MACKEN, C. A., HAYDEN, F. G., & PERELSON, A. S., 2006, Kinetics of influenza A virus infection in humans. *Journal of virology*, 80(15) : 7590–7599.

BISS, E., 2014, *On Immunity : An Inoculation*, Greywolf Press, Minneapolis, 205 p.

BUTLER, C., 2012, Infectious disease emergence and global change: thinking systemically in a shrinking world, *Infectious Diseases of Poverty*, 1(5) : 1-17.

CADUFF, C., 2012, The semiotics of security: infectious disease research and the biopolitics of informational bodies in the United States, *Cultural Anthropology*, 27 : 333-357.

CADUFF, C., 2015, *The Pandemic Perhaps: Dramatic Events in Public Culture of Danger*, UofC press, Berkeley California, 270 p.

CASTRA, M., 2003, Les Transformations Sociales du Mourir, in M. Castra, *Bien Mourir : Sociologie des Soins Palliatifs* (pp. 21-55), Paris cedex 14: Presses Universitaires de France.

CITTON, Y., 2012, *Gestes d'Humanités*, Armand Colin, Paris, 313 p.

COMBES, M., 1999, *Simondon, individu et collectivité : Pour une philosophie du transindividuel*. Presses Universitaires de France, 125 p.

CONNERTON, P., 1989, *How Societies Remember*, Cambridge University Press, 128 p.

ESPOSITO, R., 2013, *Immunitas: The protection and negation of life*, Cambridge, Polity Press, 207 p.

FELDMAN, G., 2011, If ethnography is more than participant-observation, then relations are more than connections : the case for nonlocal ethnography in a world of apparatuses, *Anthropological Theory*, 11 (4) : 375-395.

FOUCAULT, M., 1975, *Surveiller et punir*, Gallimard, 340 p.

GOLDENBERG, M. J., 2005, On evidence and evidence-based medicine : Lessons from the philosophy of science, *Social Science and Medicine*, 62 : 2621-2632.

GUSTERSON, H., 1997, Studying up revisited, *Political and Legal Anthropology Review*, 20 (1) : 114-119.

HADLER et al., 2016, Influenza-Related Hospitalizations and Poverty Levels: United States, 2010–2012, *Morb Mortal Wkly*, 65 : 101-105.

HARAWAY, D., 2006, A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late 20th Century. In *The International Handbook of Virtual Learning Environments*, edited by Joel Weiss, Jason Nolan, Jeremy Hunsinger, and Peter Trifonas, 117-58. Dordrecht: Springer Netherlands.
https://doi.org/10.1007/978-1-4020-3803-7_4.

HARAWAY, D., 2008, *When species meet*, Minneapolis: University of Minnesota Press. 438 p.

HARVEY, D., 1990, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, Cambridge, MA: Blackwell, 379 p.

HAY, A. J., GREGORY, V., DOUGLAS, A. R., & LIN, Y. P., 2001, The evolution of human influenza viruses, *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, 356 (1416) : 1861–1870. <https://doi.org/10.1098/rstb.2001.0999>

HONG, H., & KIM, H. J., 2020, Antecedents and Consequences of Information Overload in the COVID-19 Pandemic, *International journal of environmental research and public health*, 17 (24) : 9305. <https://doi.org/10.3390/ijerph17249305>

HONIGSBAUM, M., 2020, Revisiting the 1957 and 1968 influenza pandemics, *Lancet*, 395 (10240) : 1824–1826. [https://doi.org/10.1016/S0140-6736\(20\)31201-0](https://doi.org/10.1016/S0140-6736(20)31201-0)

INGOLD, T., 2007, *Lines : A Brief History*, Routledge, 200 p.

INGOLD, T., 2015, *The life of lines*, Routledge, Abingdon, 172 p.

KECK , F., 2010, *Un Monde Grippé*, Flammarion, Paris, 352 p.

KECK, F. and MANCERON, V., 2011, En suivant le virus de la grippe aviaire, de Hong Kong à la Dombes : 65-74 in S. HOUDART et O. THIERY (dir.), *Humains non-humains. Comment repeupler les sciences sociales*, Paris, Éditions La Découverte.

KEMBER, S. and ZYLINSKA, J., 2012, *Life after new media: mediation as a vital process*, The MIT Press, 44 p.

KIRKSEY, S.E. & HELMREICH, S., 2010, The emergence of multi species ethnography, *Cultural Anthropology*, 25 (4) : 545-576.

KLEINMAN, A., 2008, Avian and Pandemic Influenza: A Biosocial Approach, *The Journal of Infectious Disease*, 197 (1) : 1-3. <https://doi.org/10.1086/524992>

LARSON, B. M. H., NERLICH, B. and WALLIS, P., 2005. Metaphors and Biorisks: The War on Infectious Diseases and Invasive Species. *Science Communication*, 26 (3) : 243-268.

LATOUR, B., 1993, The pasteurization of France, Harvard: Harvard University Press, 283 p.

LATOUR, B., 2012, Enquête sur les modes d'existence. Une anthropologie des Modernes, Paris, La Découverte, coll. « Hors collection Sciences Humaines », 504 p.

LEACH, M., and SCOONES, I., 2013, The social and political lives of zoonotic disease models: narratives, science and policy, *Social Science and Medicine*, 88 : 10–17.

LEDERBERG, J., 2000, Infectious history, *Science*, 288 (5464) : 287-93.

LOWE, C., 2010, Viral clouds: becoming H5N1 in Indonesia, *Cultural Anthropology*, 25 : 625–649.

MacPHAIL, T., 2014, The Viral Network: a Pathography of the H1N1 Influenza Pandemic, Cornell U. press, Ithaca NY, 232 p.

MARCUS, G.E., 1995, Ethnography in/of the World System : The Emergence of Multi-Sited Ethnography, *Annual Review of Anthropology*, 24 : 95-117.

MARTIN, E., 1990, Towards an Anthropology of Immunity : The Body as Nation State, *Medical Anthropology Quarterly*, 4 (4) : 410-426.

MARX, L., 1964, The Machine and the Garden : Technology and the Pastoral Ideal in America, Oxford University Press, 430 p.

MASSUMI, B., 1995, The Autonomy of Affect, *Cultural Critique*, 31, 83-109. <https://doi.org/10.2307/1354446>

MASSUMI, B., 2002. *Parables for the Virtual: Movement, Affect, Sensation*. Duke University Press, 408 p.

McNEILL, J. R., 2010, *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620-1914*, Cambridge University Press., 371 p.

MENDENHALL, E., KOHRT, B.A., LOGIE, C.H. et al., 2022, Syndemics and clinical science. *Nat Med*, 28, 1359-1362.

MUKHERJEE, S., 2016, *The Gene: An Intimate History*, Scribner, New York, 608 p.

NAPIER, D., 2013, A new sociobiology: immunity, alterity, and the social repertoire, *Cambridge Anthropology*, 31 (2) : 20-43.

PANDIAN, A., 2012, The Time of Anthropology: Notes from a Field of Contemporary Experience, *Cultural Anthropology*, 27 (4) : 547–571.

PUBLIC HEALTH AGENCY OF CANADA, 2020, Influenza (flu): For health professionals, Government of Canada. URL : <https://www.canada.ca/en/public-health/services/diseases/flu-influenza/health-professionals.html>

SAMPSON, T.D., and PARIKKA, J., 2020, “The New Logics of Viral Media”, *Boundary 2* (blog). April 10, 2020. URL : <https://www.boundary2.org/2020/04/tony-d-sampson-and-jussiparikka-the-new-logics-of-viral-media/>.

SCHILLINGER, D., CHITTAMURU, D., & RAMÍREZ, A. S., 2020, From "Infodemics" to Health Promotion: A Novel Framework for the Role of Social Media in Public Health. *American Journal of Public Health*, 110 (9), 1393–1396. <https://doi.org/10.2105/AJPH.2020.305746>

PERNICK, M., 2002, Contagion and Culture, *American Literary History*, 14 (4) : 858-865.

SAMPSON, T., 2012, *Virality : Contagion Theory in the Age of Networks*, University of Minnesota Press, 248 p.

SHAO, W., LI, X., GORAYA, M. U., WANG, S., & CHEN, J. L., 2017, Evolution of Influenza A Virus by Mutation and Re-Assortment, *International Journal of Molecular Sciences*, 18 (8) : 1650. <https://doi.org/10.3390/ijms18081650>

SIMON, H. A., 1971, Designing Organizations for an Information-rich World, Johns Hopkins University Press, Baltimore, 36 p.

SINGER, M., 2014, Anthropology of Infectious Disease, Routledge, 320 p.

SMITH, P., 2021, Vacca : Imagining Vaccination, *Spectra*, 8 (2) : 19–30. <https://doi.org/10.21061/spectra.v8i2.179>

STÉPANOFF, C., 2019, Voyager dans l'invisible : Techniques chamaniques de l'imagination, La Découverte, 468 p.

TSING, A., 2015, The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins. Princeton University Press. 352 p.

TSUYUKI, R.T., ET AL., 2018, Pharmacists as accessible primary health care providers: Review of the evidence, *Canadian Pharmacists Journal*, 151 (1) : 4-5.

TURKLE, S., 2011, Alone Together : Why We Expect More from Technology and Less from Each Other, Basic Books, 384 p.

VAN REGENMORTEL, M. H. V., 2010, Logical puzzles and scientific controversies : The nature of species, viruses and living organisms, *Systematic and Applied Microbiology*, 33 (1) : 1-6.

WALD, P., 2008, Contagious, cultures, carriers, and the outbreak narrative, Durham and London: Duke University Press, 392 p.

WELCH, V. L., METCALF, T., MACEY, R., MARKUS, K., SEARS, A. J., ENSTONE, A., LANGER, J., SRIVASTAVA, A., CANE, A., & WIEMKEN, T. L., 2023, Understanding the Barriers and Attitudes toward Influenza Vaccine Uptake in the Adult General Population : A Rapid Review, *Vaccines*, 11 (1) : 180. <https://doi.org/10.3390/vaccines11010180>

WOLEBEN, J. & GIBNEY, M., 2019, Seasonality of cold, flu offers predictability of over-the-counter pharma sales, S&P Global, URL : <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/seasonality-of-cold-flu-offers-predictability-of-over-the-counter-pharma-sales-51625806>